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MEDIASTOR SYSTEM GUIDE

For Windows

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MediaStor System Guide

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Preface

Thank you for purchasing Application Storage Manager™ (ASM) MediaStor, the most flexible hardware management system for Microsoft® Windows® NT/2000. MediaStor allows you to make storage media available to the ASM Data Manager, and to manage the media in storage devices attached to the MediaStor computer. All drive, library, and media specific issues are handled and optimized by MediaStor, allowing clients to simply save and retrieve files as needed.

MediaStor provides comprehensive drive and library management capabilities, allowing you to make multiple types of media and media devices available to Data Manager. MediaStor also monitors system warnings and errors, and can be configured to send alerts to specific users or computers.

This System Guide explains how to install, configure, and utilize MediaStor to manage the hardware being used for file migration. It contains all the necessary information to achieve the best results for implementing and customizing your ASM automated data storage solution.

Chapter Summary

The following table summarizes each chapter of this guide:

Table 1. Chapter Summary

Chapter	Description
Chapter 1: Introduction on page 1	This chapter provides a brief overview of the system, including its concepts and components.
Chapter 2: Planning Your MediaStor System on page 13	This chapter contains planning recommendations, system requirements, storage media information, and other considerations for your MediaStor system.
Chapter 3: Installing MediaStor on page 31	This chapter contains instructions for installing the MediaStor software. It also provides an overview of the steps required to configure MediaStor in order to begin managing libraries, towers, and standalone drives.
Chapter 4: Working in the Administrator on page 43	This chapter describes the Administrator interface and basic MediaStor functionality.

Table 1. Chapter Summary (Continued)

Chapter	Description
Chapter 5: Managing Hardware on page 55	This chapter provides details on configuring MediaStor hardware and managing libraries, towers, and standalone drives.
Chapter 6: Managing Storage Media on page 99	This chapter deals primarily with accessing information about the media in MediaStor hardware devices, as well as how to move the media between the Application and Scratch Pools.
Chapter 7: Managing the MediaStor Computer on page 111	This chapter discusses how to manage the MediaStor service and MediaStor computer properties, as well as how to troubleshoot using logs and event viewing.
Chapter 8: Running MediaStor Reports on page 135	This chapter discusses how to run MediaStor reports, and set up and save custom layouts for your MediaStor reports. It also provides information on the data contained in the reports.
Chapter 9: MediaStor Backup and Recovery on page 149	This chapter discusses the functions available in MediaStor to allow you to effectively back up your MediaStor system, as well as procedures for restoring your MediaStor system in the event of disaster or failure.
Chapter 10: Remotely Administering MediaStor on page 157	This chapter describes how to install the Remote Administrator component, which allows you to administer MediaStor from a computer not attached to your hardware device(s).
“Using SCSI Manager” on page 171	This chapter describes the SCSI Manager utility, which allows you (independent of MediaStor) to view all SCSI devices connected to the MediaStor computer and perform diagnostics.
“Using Jukebox Manager” on page 205	This chapter describes the Jukebox Manager utility, which allows you (independent of MediaStor) to view all libraries connected to the MediaStor computer.
“Using RtfPad” on page 217	This chapter discusses how to save, print, and e-mail the MediaStor logs and reports using RtfPad. It also contains information on looking up errors that appear in logs in RtfPad.
“Removing MediaStor and Its Components” on page 223	This chapter provides detailed instructions for uninstalling MediaStor and the Remote Administrator.

Related Documentation

Refer to the following additional documentation:

- ASM Data Manager Getting Started Guide
- ASM Data Manager System Guide
- ASM Upgrade Guide

Online Help

Help is available online from any MediaStor dialog box. For a description of the dialog box, press the <F1> key. A Help window appears, outlining the dialog box parameters and fields.

A knowledge base help file with error descriptions, tech notes, software notes, fixed/known software defects is available on the StorageTek website at http://www.support.storagetek.com. The knowledge base is also available on the StorageTek MediaStor program group on the Start menu. All ASM guides, including this one, are also available in PDF format on the installation CD.

Documentation Conventions

Consistent formatting is used throughout all ASM guides to represent certain information.

Table 2. Documentation Conventions

This Cue	Represents
monospaced text	Characters that must be typed on your screen exactly as they appear in this document.
<ALL CAPITALS>	Keys on your keyboard used in combination or sequence. For example <ALT>+B means to hold down the <ALT> key while pressing b, and <ALT>, F, X means to press and release each of the keys in order: first <ALT>, then f, then x.
ALL CAPITALS	Directory names, filenames, and acronyms.

Table 2. Documentation Conventions (Continued)

This Cue	Represents
italics	References to manual titles, chapter titles, and section headings; placeholders; and emphasis.
Note Explanatory note between two lines.	Additional information needed as you follow the step-by-step operations in this manual.

Introduction

1

ASM MediaStor is a remote storage solution that provides transparent hardware control and support for multiple media types and device types. You can use MediaStor to make terabytes of data accessible to applications that need extended storage capabilities.

For example, users on your network may typically save data to an NTFS volume on your Windows NT/2000 file server. If ASM Data Manager is installed on the file server, the Data Manager can migrate files to media in devices attached to a computer where MediaStor is installed. MediaStor receives requests from Data Manager for pieces of media in devices and retrieves media within a device according to those requests.

You are the architect of the ASM system. MediaStor allows you to leverage your existing hardware configuration or create a new one. MediaStor combines an easy-to-use graphical user interface with extensive device support to provide a device management solution that can be adapted to almost any Windows NT/2000 environment. Because ASM supports several media types, file systems, and a multitude of storage devices, you can select the configuration most suited to your available resources and your storage needs.

Before setting up your storage system, you should be comfortable with MediaStor terminology and concepts. Take the time to read all sections of this guide, as this will help you attain the best performance, functionality, and organization for your storage solution.

The following sections identify key terminology and concepts that are central to an understanding of MediaStor. Included are descriptions of MediaStor modules, conceptual and practical definitions, as well as guidelines for planning and implementing your ASM storage strategy.

- "A MediaStor Glossary, " which follows
- “MediaStor Components” on page 4
- “The Role of a Media Service in Remote Storage” on page 8
- “MediaStor Concepts” on page 8

A MediaStor Glossary

The terms used in the following concepts discussions and throughout this guide are described in the table below.

Table 1. MediaStor Glossary

Term	Definition
Application Pool	A reserve of pieces of media allocated for use with a particular Data Manager extended drive
Cluster	A processing environment consisting of two or more server computers and other resources that act as a single system and enable high availability
Data Manager	An ASM module that allows you to extend the storage capabilities of NTFS volumes by using file migration services to move files from the NTFS volume to other, less-expensive storage media
Device	Hardware. Throughout this guide, the term “device” is used to describe towers, standalone drives, and library systems.
Dismount Media	The process of removing media from a drive. In the case of a standalone drive or tower, the media is dismounted when you manually remove it from the drive. In the case of a library, the media is dismounted by an internal mechanism in the library that removes the piece of media from the drive and places it on a shelf in the library.
Extended Drives	An NTFS volume (hard drive) or partitioned part of a hard drive for which Data Manager provides file migration services by moving files to media and fetching files from media according to the parameters you set.
File Migration	The movement of files and file data from one type of media (a hard drive) to other types of media (such as optical or tape media)
File System	Software that provides an interfac e for saving and retrieving files on storage media. File systems control all aspects of media management, including directory/file structures, data layout, and data transfer.
Hardware Device	A device that contains drives where media can be accessed

Table 1. MediaStor Glossary (Continued)

Term	Definition
Jukebox/ Library	A hardware device containing one or more removable media drives, shelves for pieces of media, and a mechanism for moving pieces of media between the shelves and the drives. The terms “jukebox” and “library” are interchangeable. In most instances in this manual, the term “library” is used to refer to libraries or jukeboxes.
Media	A physical medium on which data is written and from which data can be retrieved. Depending on the type of media, the medium may be different and the information may be recorded in different ways. In most instances in this guide, the term “media” refers to the storage media contained in a device managed by MediaStor.
Media Pool	A reserve of pieces of media available for use with a particular extended drive.
Media Service	An access provider for the media to which Data Manager migrates files. In some cases, the media service is a connection to a network share. In other cases, a media service is a device management service that retrieves a specific piece of media and mounts the media in a device such as a library when requested. MediaStor is a media service.
Media Type	The type of a piece of media, which is determined by the composition of the media and the method used to record information on that media. Some examples of media types are magneto-optical, CD-ROM, DVD-RAM, and tape.
Mount Media	The process of inserting media into a drive. In the case of a standalone drive or tower, the media is mounted when you manually insert it in the drive. In the case of a library, the media is mounted by an internal mechanism in the library that retrieves the piece of media from a shelf and inserts it in the appropriate drive.
Overwritable	Describes media that allows files to be written to any available location on the media. For ASM, this pertains specifically to how the UDF file system writes files to some types of media.
Removable Media Drive	A drive where different pieces of media can be inserted and removed as needed, such as a CD-ROM drive

Table 1. MediaStor Glossary (Continued)

Term	Definition
Removable Media	Media that must be mounted in a drive before it can be accessed. Removable media can be inserted and removed as needed to allow for access to multiple pieces of media.
Scratch Pool	A reserve of pieces of media that have not been allocated for use with a particular Data Manager extended drive
Sequential	Describes media that require files to be written in sequential order (one right after another) on the media. For ASM, this pertains specifically to how the UDF file system writes files to some types of media.
Stationary Drive	A drive where the same piece of media is always mounted, such as the hard drive on your computer
Stationary Media	Media that is always mounted in a drive and cannot be removed without removing the entire drive

MediaStor Components

MediaStor is comprised of several components, and each has specific functionality within the system. For more information, see the following sections:

- "MediaStor, " which follows
- “Command Line Utilities” on page 7

MediaStor

The MediaStor component consists of the following modules:

- "MediaStor Setup, " which follows
- “MediaStor Service” on page 5
- “MediaStor Administrator” on page 5
- “MediaStor Remote Administrator Setup” on page 6
- “MediaStor Remote Administrator” on page 6
- “SCSI Manager” on page 6
- “Jukebox Manager” on page 7
- “Online Help” on page 7

MediaStor Setup

The MediaStor Setup module is used to install MediaStor and to upgrade from previous versions of MediaStor. The MediaStor Setup module installs the MediaStor Administrator, Online Help, and Jukebox and SCSI Manager utilities.

The module remains in the StorageTek MediaStor program group, where it can be used to modify registration and license information. If necessary, the module can also be used to uninstall MediaStor.

For more information on running MediaStor Setup, see “Running the Setup Wizard” on page 33. For more information on upgrading MediaStor, refer to the *ASM Upgrade Guide*.

MediaStor Service

The MediaStor service is a Windows NT/2000 service that runs on the computer where MediaStor is installed. All of the hardware devices used to access media in the ASM system are attached to the MediaStor computer. MediaStor coordinates all hardware device management in response to requests for media from other applications. MediaStor service functionality can be managed through the MediaStor Administrator, either on the MediaStor computer or from any remote installation of the MediaStor Administrator.

MediaStor Administrator

The MediaStor Administrator allows you to view and configure the underlying structure of the MediaStor system, providing a single interface for managing the hardware devices in the system and the allocation of media in those devices. Through this module, you can manage all major aspects of the MediaStor system, such as:

- Hardware (storage devices attached to the MediaStor computer)
- Allocation of media to Data Manager extended drives
- MediaStor status (tracking of events, errors, or warnings; running of reports; and configuration restoration if needed)

The Administrator has an intuitive “tree” view where each of the hardware devices added to MediaStor are listed as nodes on the tree. The tree also has nodes for Application Pools, which list media that have been allocated for use by Data Manager. In addition, a “Scratch” media pool lists media not yet allocated to a Data Manager extended drive.

Within the Administrator, you define the resources that are used by MediaStor. You can add and configure hardware (standalone drives, towers, and libraries) and configure system parameters. Devices can be set online or offline, and device properties can be viewed or modified through the Administrator.

When you add media to devices in use by MediaStor, each piece of media appears in the Scratch Pool. Media listed in MediaStor are shown under nodes describing the media (original, copy, duplicate, blank, foreign, unknown, unformatted, and corrupt). As Data Manager services configure MediaStor for use as their media service, the Data Manager extended drives appear in the MediaStor Administrator as Application Pools. You can assign storage media to for use by a particular Data Manager extended drive by moving or dragging media from the Scratch Pool to the appropriate Application Pool.

For more information on the Administrator, see “Working in the Administrator” on page 43.

MediaStor Remote Administrator Setup

The MediaStor Remote Administrator Setup module is used to install the MediaStor Remote Administrator and to upgrade from previous versions of the MediaStor Remote Administrator. The MediaStor Remote Administrator Setup module installs only the MediaStor Administrator interface and Online Help.

The module remains in the StorageTek MediaStor Administrator program group where it can be used to modify registration information.

If necessary, the module can also be used to uninstall the MediaStor Remote Administrator.

For more information on running MediaStor Remote Administrator Setup, see “Installing the Remote Administrator” on page 159.

MediaStor Remote Administrator

Regardless of whether you are running a full installation of MediaStor or only the Remote Administrator, the Administrator interface for MediaStor can be used to configure any MediaStor computer visible on the network (provided security settings allow access and the MediaStor installation is the same version as or higher than the Remote Administrator).

Because enterprise (remote) administration capability is automatically installed when you install MediaStor, you can remotely administer any MediaStor computer from any other MediaStor computer.

MediaStor (full installation) needs only to be installed on computers where the hardware devices containing the storage media for the ASM system are attached.

For more information on using the MediaStor Remote Administrator, see “Remotely Administering MediaStor” on page 157.

SCSI Manager

The SCSI Manager utility is a diagnostic tool for performing direct SCSI device commands independent of the MediaStor Administrator. Included are features for viewing device profiles, browsing media (drives only), issuing standard or

vendor unique commands, and retrieving sense, log, or other data from devices. For more information on SCSI Manager, see “Appendix A: Using SCSI Manager” on page 137.

Jukebox Manager

The Jukebox Manager utility provides an interface for performing direct library device diagnostics independent of the MediaStor Administrator. Both SCSI and serial libraries can be managed through this utility. Included are features for viewing library profiles, performing a library inventory, performing media operations (mount, dismount, insert, eject, flip), and reporting errors for specific SCSI or serial sense information. For more information, see “Using Jukebox Manager” on page 205

Online Help

MediaStor contains context-sensitive help links that provide instructional help and examples. The online help is automatically installed with MediaStor and with the MediaStor Remote Administrator. Press the <F1> key at any time to get help on the currently displayed dialog box, window, or wizard page. There is also a knowledge base help file with error descriptions, tech notes, software notes, and fixed/known software defects available on the StorageTek website at http://www.support.storagetek.com. You can also access the knowledge base from the StorageTek MediaStor program group in the Start menu.

ASM License Server

Licensing information for your ASM system is managed on the ASM License Server. The License Server is the program through which the licenses for your ASM products are registered and maintained. The License Server program is included on the ASM installation CD and can be installed on an ASM computer or on a separate computer, as long as that computer is visible to the ASM computer through the network.

Use the Edit product license information option in the MediaStor Setup Wizard (accessed through the StorageTek MediaStor program group) to point to the License Server computer once your licensing information has been registered in the License Server. For more information on using the License Server, refer to the *License Server System Guide*.

Command Line Utilities

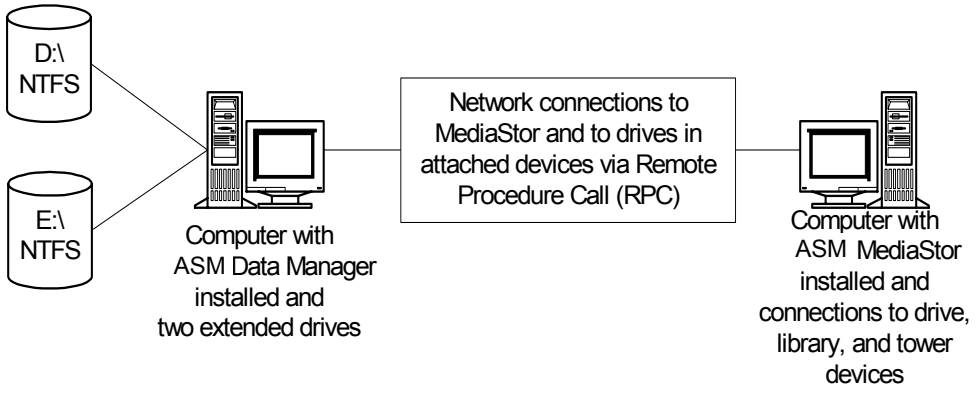
MediaStor includes several utilities that allow you to perform device troubleshooting independently. These utilities are located in the \Program Files\Legato\MediaStor\Bin\ directory, and are run from the command prompt. The Knowledge Base contains additional information about the command line utilities. However, if you are planning to run any of the command line utilities, we strongly recommend you contact your technical support representative.

The Role of a Media Service in Remote Storage

Media services provide access to media. MediaStor was designed for use in conjunction with the ASM Data Manager, which provides file migration services. MediaStor provides device management services, passing commands to the robotics within hardware devices on behalf of Data Manager.

For example, a Data Manager computer is storing files to media in an optical library managed by MediaStor. When a Data Manager computer requests a piece of media so it can write files to that media or retrieve files from the media, MediaStor sends commands to the library that cause the picker arm for the library to move to the shelf where the piece of media is located. The picker arm picks up the piece of media and inserts it in a drive for use by Data Manager.

Figure 1. MediaStor With Data Manager



Several hardware configurations can be used with MediaStor, allowing you to create a storage system suited to your needs and available resources. MediaStor can reside on the same computer as Data Manager, or it can be installed on a separate computer. A MediaStor system can manage devices on behalf of multiple Data Manager services (computers).

MediaStor Concepts

The following concepts are integral to understanding MediaStor:

- "Storage Devices, " which follows
- “Media Types” on page 10
- “MediaStor System Management” on page 10

Storage Devices

Storage devices are hardware devices that allow you to access multiple pieces of high-capacity removable storage media. Adding a new piece of media can always increase the total storage capacity available through a storage device. Use of a storage device through MediaStor provides you with practically unlimited storage space.

Note: The term “device” refers to hardware and is used throughout this guide to describe towers, standalone drives, and library systems.

MediaStor can manage one or many standalone drives, towers, and library devices (limited only by software licenses and system bus resources). For more information, see the following sections:

- "Library, " which follows
- “Standalone Drive” on page 9
- “Tower” on page 9

Library

Sometimes referred to as autochangers or jukeboxes, libraries have shelves for storing media, one or more drives, and a robotic (or picker) arm that can be controlled via software to mount and dismount media. MediaStor manages library devices and handles mounting and dismounting of requested media automatically, transparent to the client application. For more information on adding and managing libraries in MediaStor, see “Managing Libraries” on page 56.

Standalone Drive

Standalone drives (internal or external) are non-library drive devices managed by you and MediaStor. You are responsible for mounting and dismounting media in standalone drive devices, and MediaStor and the Data Manager computers it services automatically manage the media once the media is in the drive.

When using standalone drives, you receive an error when you attempt to access data files on offline media. The MediaStor alert viewer tells you what media to mount, and, once the media has been mounted, you can retry the request and retrieve the file.

For more information on managing standalone drives, see “Managing Standalone Drives” on page 89.

Tower

A tower is a case containing several standalone drives. You and MediaStor manage tower devices. You are responsible for mounting and dismounting

media in tower drive devices, and MediaStor manages the media once the media is in the drives.

When using tower drives, you receive an error when you attempt to access data files on offline media. The MediaStor alert viewer tells you what media to mount, and, once the media has been mounted, you can retry the request and retrieve the file.

For more information on managing towers, see “Managing Towers” on page 81.

Media Types

MediaStor supports many high-capacity storage media types. The functionality accessible through a device depends on the type of media used in the device. The following table defines all media types currently supported:

Table 2. Currently Supported Media Types

Media Type	Support Type
CD-ROM	Read Only
DVD-R	Read/Write
DVD-ROM	Read/Only
DVD-RAM	Read/Write
Magneto-Optical	Read/Write
Tape	Read/Write
WORM	Read/Write
WORM-Tape	Read/Write

Once you have configured a MediaStor media service and created an extended drive in ASM Data Manager, you can allocate media to that extended drive through MediaStor or through Data Manager. Allocating media to a Data Manager extended drive makes the media available to the Data Manager service so that you can begin migrating files to and reading files from that piece of media.

For more information on managing media, including allocating media, see “Managing Storage Media” on page 99. For more information on the types of media that MediaStor supports, see “Storage Media Considerations” on page 14.

MediaStor System Management

MediaStor contains several features that allow you to administer, diagnose, and troubleshoot the system, as well as to back up the system and restore it in the event of a system failure. In addition, because the MediaStor program

functions as a Windows NT/2000 service, part of administering the MediaStor computer includes administering the MediaStor service. For more information, see the following sections:

- "MediaStor as a Service, " which follows
- “Logs and Reports” on page 11
- “Backup and Recovery” on page 11

MediaStor as a Service

MediaStor functions as a Windows NT/2000 service rather than as a user-mode application. As a Windows NT/2000 service, MediaStor can continue to be active even after you log off Windows, as long as the computer is still running.

You can start, pause, and stop MediaStor, as well as configure it for various startup settings, including automatic startup, which starts MediaStor upon Windows system startup, and manual startup, which allows you to start the service manually. You can manage the service either through the MediaStor Administrator or through Windows.

For more information, see “Managing the MediaStor Service” on page 111.

Logs and Reports

MediaStor has built-in utilities for monitoring events, errors, and warnings on the system. The Event Viewer contains a listing of all MediaStor events, errors, and warnings. This information is also logged to event logs. The Event Viewer and event logs can help identify and solve potential problems during runtime that might otherwise become critical problems if ignored. For more information on the Event Viewer and event logs, see “Tracking MediaStor Events, Errors, and Warnings” on page 127.

The MediaStor reporting feature is a useful tool for tracking system statistics. Using the Report Generator Wizard, you can create various reports of system activities, including media information, hardware configuration, and MediaStor registry settings. In addition, the reporting function allows you to create and save custom layouts for your reports, and to choose the layout you want when the report is run. For more information on reports, see “Running MediaStor Reports” on page 135.

Backup and Recovery

Because constant and reliable access to your data is one of the most critical parts of your system, we recommend that you have a comprehensive disaster recovery plan in place in the event of system problems or an entire system shutdown. MediaStor allows you to create a backup of your MediaStor system configuration, which is stored in registry settings, when needed using the repair disk utility.

In the event of system failure, you can restore the MediaStor system configuration. For more information, see “MediaStor Backup and Recovery” on page 149.

In addition, if you use a clustered environment to manage fault-tolerance for your system, MediaStor can be installed and run on a clustered environment, allowing for automatic fail-safe of your MediaStor system. For more information, refer to *Appendix A: Clustering* of the *ASM Data Manager Getting Started Guide*.

Planning Your MediaStor System

2

Before installing ASM MediaStor, you will want to consider the optimal hardware and configuration for your system. Some issues to consider include:

- The number of MediaStor computers to use
- What type(s) of hardware devices to use
- What type(s) of storage media to use
- What type(s) of file systems to use

Some organizations have existing file storage systems, and may have already decided on an optimum arrangement for file servers. There is no need, in implementing MediaStor, to modify your chosen arrangement. Additional hardware devices can be added to a MediaStor system as file storage needs on a network increase.

For more information on planning your MediaStor system, see the following sections:

- "System Requirements, " which follows
- “Storage Media Considerations” on page 14
- “Windows NT/2000 Security” on page 22
- “Maximizing MediaStor Performance” on page 25

System Requirements

Before you install MediaStor, be sure that your hardware and operating system meet the MediaStor system requirements. For more information, see the following sections:

- "Operating System Requirements, " which follows
- “MediaStor Computer Specifications” on page 14

Operating System Requirements

Because MediaStor functions as a Windows service, we recommend using the following operating systems:

- Windows NT 4.0 Server with Service Pack 6a, or
- Windows 2000 with Service Pack 2 or 3.

The Windows NT/2000 Server editions optimize performance and are recommended but not required.

If you are using a different operating system on the server on which you plan to install MediaStor, you must upgrade the operating system *before* installing MediaStor. Consult your Windows NT/2000 documentation for information on installing the operating system.

In addition, if you are planning to install MediaStor on a clustered environment, be sure to check your operating system requirements, and make sure the hardware in your cluster meets or exceeds the minimum specifications noted by the operating system documentation. MediaStor cluster installation is supported on Windows NT Enterprise Edition 4.0 with Service Pack 6a or Windows 2000 Advanced Server Edition with Service Pack 2 or 3 using Microsoft Cluster Server. For more information on using MediaStor with Microsoft Cluster Server, refer to *Appendix A: Clustering* of the *ASM Data Manager Getting Started Guide*.

For information on the latest Windows service packs and hot fixes certified for use with MediaStor, contact your technical support representative. For information on operating system issues that may affect performance on your MediaStor system, consult the ASM Knowledge Base. The Knowledge Base can be found online at http://www.support.storagetek.com.

MediaStor Computer Specifications

MediaStor computers should have the following minimum configurations:

- Pentium class PC
- At least 128 MB of RAM for Windows NT, or 256 MB of RAM for Windows 2000
- One or more SCSI host adapters supported by Windows NT/2000
- One or more SCSI or serial storage devices supported by MediaStor

Storage Media Considerations

Storage media is an integral part of your ASM system. The type of storage media you use determines how your media, and therefore your files, must be managed.

MediaStor supports many high-capacity storage media types for the media to which files are migrated. The functionality accessible through a device depends on the type of media used in the device. You need to evaluate the following when considering what media is best suited to your MediaStor system:

- "Types of Media, " which follows
- “Types of Media File Systems” on page 17

Types of Media

MediaStor supports many high-capacity storage media types. Once added to the MediaStor system, these media are the storage to which your files are migrated. The following table defines all media types currently supported:

Table 3. Currently Supported Media Types

Media Type	Support Type	For More Information, See...
CD-ROM	Read Only	"CD-ROM Media, " which follows
DVD-R	Read/Write	“DVD-R Media” on page 16
DVD-RAM	Read/Write	“DVD-RAM Media” on page 16
DVD-ROM	Read Only	“DVD-ROM Media” on page 16
Magneto-Optical	Read/Write	“Magneto-Optical Media” on page 16
Tape (DLT, AIT, 9840, Magstar, 8mm DAT)	Read/Write	“Tape Media” on page 16
WORM	Read/Write	“WORM Media” on page 16
WORM-Tape	Read/Write	“WORM-Tape Media” on page 17

Note: MediaStor does *not* currently support CD-R, CD-RW or DVD-RW media.

CD-ROM Media

CD-ROM stands for Compact Disc – Read Only Memory. As its name indicates, CD-ROM media is read only and cannot be written to. The data is stamped onto the CD by the vendor and cannot be erased. CD-ROM can use the ISO-9660, High Sierra or Joliet file systems. Each of these are most effectively recognized and readable through ASM using the NTFS file system; however, CSS, the ASM CD file system, can also read CD-ROM media.

DVD-R Media

DVD-R (DVD - Recordable) media is both readable and writable; however, you can write data to it only once (although in multiple sessions). Once DVD-R media is full, you can finalize the media, at which point it becomes read-only.

DVD-RAM Media

DVD-RAM is a rewritable, high-density optical disc media. DVD originally stood for Digital Versatile Disc or Digital Video Disc, but is now simply referred to as DVD. RAM, or Random Access Memory, refers to the way data is written to and read from the disk. RAM media can be written to and read from randomly, as opposed to sequentially, accessing files and space wherever necessary.

DVD-ROM Media

DVD-ROM stands for DVD - Read Only Memory. As its name indicates, DVD-ROM media is read-only; you cannot write files to it. Like CD-ROM, DVD-ROM media is pre-manufactured, meaning the data is stamped onto the media and cannot be erased. Most manufactured DVD-ROMs use the ISO-9660 file system format, which, like CD-ROM, is recognized by ASM using the NTFS file system. Be advised, however, that the ASM interface identifies DVD-ROM media as CD-ROM because the file system drivers cannot distinguish between the two types of media and only recognize the ISO-9660 file system format.

Magneto-Optical Media

Optical media refers to removable media that is written to by lasers. Magneto-optical media (also often called erasable optical) are optical disks that can be written to, erased, and loaded with new data.

Tape Media

Tape media are electromagnetic data storage devices that are typically both readable and writable; however, you can write data to each sector on a piece of tape only once unless you reformat the media in order to reuse it. Tape media are read by tape drives that mount, write to and read from the tape. Tape media is often encased in a tape cartridge that protects the magnetic tape itself and makes it easily portable.

ASM supports the following types of tape media: 8mm DAT, AIT, 9840, Magstar, and DLT.

WORM Media

WORM stands for Write Once Read Many. WORM is an optical disk technology that allows you to write data to a disk only once, but read that data

back as often as needed. Once written to, WORM media acts just like CD-ROM media in that the data on the media is permanent.

WORM-Tape Media

WORM-tape media are identical to tape media, in that they are electromagnetic data storage devices that are typically both readable and writable. However, you can write to a piece of WORM-tape only once (Write Once Read Many), and unlike standard tape, the media cannot be reformatted for reuse. Once written to, WORM-tape media acts just like CD-ROM media in that the data on the media is permanent and cannot be altered. WORM-tape media are supported by drives that have firmware loaded that support WORM media. Please contact the specific vendor to verify that they support WORM media in their drives, and to acquire the firmware version that supports the WORM media.

Types of Media File Systems

When a hardware device is configured, a file system must be selected for that device: either a Windows Native file system, an ASM file system, or a Universal Disk Format (UDF) file system. A file system is software that provides an interface for saving and retrieving files on storage media. File systems control all aspects of media management, including directory/file structures, data layout, and data transfer.

Media can be formatted for file systems that are supported by both the media itself and the device (used by the media service) in which the media resides. Once a file system is selected for a device, all media used in the device must be formatted with that file system in order for the device to read from or write to the media. Any media containing a different file system must be reformatted using the supported file system to be recognized by the device.

Although multiple file systems can be used in one MediaStor service (using multiple devices), they cannot be mixed in the same hardware device. Multiple file systems are recommended only for advanced systems with higher data organization requirements. In general, however, one file system should be chosen, and all devices and media should be formatted for that file system. This allows all media to be interchangeable between devices.

Windows NT/2000 installs the Windows Native file system drivers, and ASM MediaStor installs the ASM and UDF file system drivers. There are three Windows Native file systems (NTFS, CDFS, and FAT), three ASM file systems (OSS, TSS, and CSS), and two types of UDF file systems (overwritable and

sequential). The following table lists MediaStor file system support by media type:

Table 4. MediaStor File System Support by Media Type

Media Type	Supported File Systems
CD-ROM	CDFS (Windows Native file system, read-only)
	CSS (ASM file system, read-only)
DVD-R	UDF file system (sequential)
DVD-RAM	OSS (ASM file system)
	UDF file system (overwritable)
DVD-ROM	CDFS (Windows Native file system, read-only)
Magneto-Optical	OSS (ASM file system)
	UDF file system (overwritable)
	NTFS (Windows Native file system)
	FAT (Windows Native file system, read-only)
Tape	TSS (ASM file system)
WORM	OSS (ASM file system)
WORM-Tape	TSS (ASM file system

When formatting media through ASM Data Manager, the option of what file system is used for the media is determined by the file system selected for the device in which the media is contained.

Note: The MediaStor interface only refers to “ASM”, “UDF”, and “NTFS” where media file systems are noted. The media type determines which file sub-system is applied.

Each file system has benefits and limitations relating to the features and performance of the media to which it is applied. In some cases, you do not have a choice as to which file system to use: WORM, WORM-tape, and tape can only use an ASM file system, and DVD-R can only use the UDF file system. For magneto-optical and DVD-RAM media, however, you must choose a file system that best suits your needs. There are two factors to consider: media portability and media performance.

Media portability refers to the ability to read and write to media on Windows managed devices outside of ASM. If, for example, media used to archive files through ASM will be distributed to locations that do not have an ASM installation, media portability is a concern and should be considered when determining what file system and type of storage media you will use.

Media performance refers to the speed with which ASM can write to and read from storage media.

As a general rule, if portability of optical media is a concern, choose Windows Native file systems. Windows Native file systems are overwritable, meaning that files are written to any available location on the media. While these file systems have a performance disadvantage for optical media in comparison to ASM file systems, they are 100% portable (media written in these formats can be read on any Windows system, with or without ASM).

ASM file systems are optimized for ASM media performance. Unlike Windows Native file systems, which are more generic and feature-rich, ASM “storage subsystems” implement the minimum set of features required to store and retrieve data. For example, ASM file systems are sequential, meaning that files are written in sequential order on the media. As a result, runtime overhead is very low and data is contiguously organized, enhancing overall performance. If portability of storage media is not a concern, choose ASM file systems to provide the best overall system performance.

ASM supports UDF file systems in order to support the use of DVD-R media. Although you can format magneto-optical media using UDF, it may perform slower than OSS or NTFS formatted magneto-optical media, and it does not provide a portability advantage over NTFS. (Use FAT for magneto-optical media only if you want to provide access to files on media that has already been formatted using FAT.) Similarly, for DVD-RAM media, UDF does not provide a performance advantage over OSS, and media using UDF is only portable to the few systems that support UDF, such as Windows XP.

Note: For optical media, NTFS is not recommended unless media portability is essential. Windows Native file systems are not designed for use with optical media.

For more information on file systems, see the following sections:

- "Windows Native File Systems, " which follows
- “ASM File Systems” on page 20
- “UDF File Systems” on page 21

Windows Native File Systems

Windows Native file systems are provided with Windows NT/2000 and are loaded onto the system at the time of the operating system installation. These are feature-rich file systems meant for hard drives, but may be desirable for storage media if you have portability concerns.

ASM supports three Windows Native file systems:

- "NTFS - New Technology File System, " which follows
- “FAT - File Allocation Table” on page 20
- “CDFS - CD-ROM File System” on page 20

NTFS - New Technology File System

This Windows Native file system is supported only by Windows and provides an optimized file system for large volume media. It is specially designed to provide fast access and management of very large volumes of information (gigabytes or even terabytes) and is used primarily for magnetic disks (like hard drives).

You can choose NTFS for magneto-optical media.

FAT - File Allocation Table

This Windows Native file system is supported by many different operating systems, including DOS, Windows 95/98, and Windows NT/2000. It is an older file system that was designed for small-volume (less than 4 GB) management, and is not widely used in Windows NT/2000 server environments.

FAT is not recommended for optical storage management. It is based on older file system technology and does not handle large volume sizes that today's media capacities require. In addition, the data storage strategy is prone to fragmentation and, over time, deteriorates file read/write performance.

The FAT file system is supported by ASM as a read-only file system. This means that ASM cannot write (migrate files) to media formatted using FAT.

You can use the FAT file system with magneto-optical media; however, you should only use FAT if you want to provide access to files on media that has already been formatted using FAT.

CDFS - CD-ROM File System

This Windows Native file system reads three types of CD-ROM and DVD-ROM formats: ISO 9660, High Sierra, and Joliet. These formats are supported by many different operating systems, and are supported natively by Windows. Most manufactured DVD-ROM media uses the ISO-9660 format, and is readable by ASM using this Windows Native file system.

ASM File Systems

ASM file systems are installed with MediaStor and are optimized for ASM media performance. Unlike Windows Native file systems, which are more generic and feature-rich, ASM "storage subsystems" implement the minimum set of features required to store and retrieve data. For example, ASM file systems are sequential, meaning that files are written in sequential order on the media. As a result, runtime overhead is very low and data is contiguously organized, enhancing overall performance.

There are three ASM file systems:

- "OSS - Optical Storage Subsystem, " which follows
- "TSS - Tape Storage Subsystem" on page 21

- “CSS - CD-ROM Storage Subsystem” on page 21

OSS - Optical Storage Subsystem

This ASM file system supports WORM, DVD-RAM, and magneto-optical media. Files are stored contiguously from the beginning to the end of each piece of media, with single-seek read and write access. This file system provides the best overall read/write performance of all optical file systems supported by ASM.

OSS-formatted media requires ASM for reading and writing. This type of media may be moved from one ASM system to another, but cannot be read without ASM.

When a Delete command is issued, files residing on OSS-formatted media are not deleted; only the file tags on the extended drive are actually deleted. Deleted file space cannot be reclaimed until the media is compacted (all files with file tags on the extended drive are moved back to the extended drive) and the media is reformatted. In addition, files that reside on media but whose file tags are deleted from the extended drive are restored to the extended drive when media is restored to a media folder.

If WORM media support is required, the OSS file system *must* be used, as it is the only one supported by ASM for that type of media.

TSS - Tape Storage Subsystem

TSS is the only file system provided for tape and WORM-tape media management. Specifically, ASM supports Digital Audio Tape (DAT) and Digital Linear Tape (DLT). Files are stored contiguously from the beginning to the end of each tape, as with all tape file systems.

TSS-formatted media requires ASM for reading and writing. This type of media may be moved from one ASM service to another, but cannot be read without ASM.

CSS - CD-ROM Storage Subsystem

This ASM file system supports CD-ROM media, and is provided to allow use of certain devices that cannot use the CDFS file system, which is a Windows Native file system. We recommend that you try to use the CDFS file system for a device and then use CSS if CDFS does not work with the device.

UDF File Systems

ASM’s UDF implementation meets the specifications (version 2.01) laid out for the UDF (Universal Disk Format) file system by the Optical Storage Technology Association (OSTA), a nonprofit international trade association. For more information on OSTA, refer to the OSTA website, http://www.osta.org.

Support for the UDF file system was added to ASM in order to support the use of DVD-R media, but you can also use UDF with magneto-optical and DVD-RAM media.

UDF is intended to allow file interchange between different operating systems; however, only a few operating systems, such as Windows XP, currently support the 2.01 specification and can read media using UDF.

There are two types of UDF file systems: overwritable and sequential. For more information, see the following sections:

- "Overwritable, " which follows
- “Sequential” on page 22

Overwritable

The overwritable UDF file system allows you to read files from and write files to DVD-RAM and magneto-optical. Files are written to any available location on the media.

Sequential

The sequential UDF file system allows you to read files from and write files to DVD-R media. Files are written in sequential order on the media, and you can write files to media only once, although you can write files in multiple sessions.

You can also finalize the media so that it can be read in a Windows XP environment. Once media is finalized, you can no longer write files to it.

Windows NT/2000 Security

The user account that MediaStor uses to log on as a service must be a member of both the local Administrators group and the local MSAdministrators group, and must also have the log on as a service privilege. Since MediaStor uses the account entered during installation to log on the MediaStor service, this privilege is added to that account during installation. In addition, to manage the MediaStor service, the user logged into the MediaStor computer must also be a member of both groups (though the log on as a service privilege is not necessary).

Note: If you are installing MediaStor on Windows 2000 Server in an Active Directory service environment, be advised that MediaStor only supports certain configurations. For details on those configurations, and any additional steps required for installing in an Active Directory service environment, refer to the ASM Knowledge Base.

In order to prevent unauthorized users from connecting to MediaStor computers, MediaStor creates a local MSAdministrators group on the

MediaStor computer when it is installed. MediaStor then automatically adds the Domain Admins group for the MediaStor computer's primary domain to the MSAdministrators group.

When users log into the MediaStor computer, MediaStor checks the user group(s) to which they belong. Users who are only members of the MSAdministrators group can perform all functions in MediaStor except for managing the service. In order to manage the MediaStor service (start, pause, and stop the service, and configure service startup settings), a user must be a member of both the local Administrators group and a member of the MSAdministrators group.

You can verify whether a user is a member of local Administrators group or the MSAdministrators group in a few steps. Because MediaStor automatically includes all Domain Admins to the MSAdministrators group when you install MediaStor, no re-configuration of user rights may be necessary. However, in the event you need to either restrict administrator access to the MediaStor service, or you need to add or remove administrators from the local Administrators or MSAdministrators group, you can do so through Windows. For more information, see the following sections:

- "Checking Administrative Group Membership, " which follows
- “Adding Users to Administration Groups” on page 24
- “Removing Users from Administration Groups” on page 25

Note: If you are running MediaStor in a clustered environment, changes or additions to the Administrators and the MSAdministrators group must be configured on *each* of the servers in the cluster.

Checking Administrative Group Membership

Only local Administrators have the necessary rights to view the membership of user groups. Before attempting the procedures below, be sure you are logged into the MediaStor computer as a local domain Administrator.

To access the Administrators and MSAdministrators groups and users:

1. You have the following choices:
   - If Windows NT is the operating system on the MediaStor computer, open the Windows NT Computer Manager. From the Start menu, select Programs ---> Administrative Tools ---> User Manager. If you are not already logged into the local domain, select Select Domain from the User menu and browse to or type in the local computer name.
   - If Windows 2000 is the operating system on the MediaStor computer, open the Windows 2000 User Manager. From the Start menu, select Programs ---> Administrative Tools ---> Computer Management.

The groups for the local domain are listed in the Groups list. The MSAdministrators group was automatically added to this list when MediaStor was installed. In addition, all members of the local Administrators group were added to the MSAdministrators group during install.

2. Double-click the Administrators or MSAdministrators group name (or highlight the name in the list and select Properties from the User menu). The Local Group Properties dialog box for the group appears. The Members list for the group lists all of the users and groups that are members of the selected group.

   For the MSAdministrators group, users must be listed here, or they must be members of a group listed here, to perform functions in MediaStor. Users who should have rights to manage the MediaStor service must be listed (or be members of groups that are listed) in both the MSAdministrators group *and* the Administrators group.

Adding Users to Administration Groups

Only local Administrators have the necessary rights to change the membership of user groups. Before attempting the procedures below, be sure you are logged into the MediaStor computer as a local domain Administrator.

To add a user to the Administrators or MSAdministrators group:

1. You have the following choices:

   - If Windows NT is the operating system on the MediaStor computer, open the Windows NT Computer Manager. From the Start menu, select Programs ---> Administrative Tools ---> User Manager. If you are not already logged into the local domain, select Select Domain from the User menu and browse to or type in the local computer name.
   - If Windows 2000 is the operating system on the MediaStor computer, open the Windows 2000 User Manager. From the Start menu, select Programs ---> Administrative Tools ---> Computer Management.

   The groups for the local domain are listed in the Groups list.

2. Double-click the Administrators or MSAdministrators group name (or highlight the name in the list and select Properties from the User menu). The Local Group Properties dialog box for the group appears.
3. In the Local Group Properties dialog box for the group, click Add. The Add Users and Groups dialog box appears.
4. Select the appropriate domain from the drop-down list of domains.
5. From the Names list, select the user name.
6. Click Add. The user is added to the list at the bottom of the window.

7. When all users you want to add to the group are listed, click OK. The users are added to the Members list for the selected group.

Removing Users from Administration Groups

Only local Administrators have the necessary rights to change the membership of user groups. Before attempting the procedures below, be sure you are logged into the MediaStor computer as a local domain Administrator.

To remove a user or group from the Administrators or MSAdministrators group:

1. You have the following choices:
   - If Windows NT is the operating system on the MediaStor computer, open the Windows NT Computer Manager. From the Start menu, select Programs ---> Administrative Tools ---> User Manager. If you are not already logged into the local domain, select Select Domain from the User menu and browse to or type in the local computer name.
   - If Windows 2000 is the operating system on the MediaStor computer, open the Windows 2000 User Manager. From the Start menu, select Programs ---> Administrative Tools ---> Computer Management.

   The groups for the local domain are listed in the Groups list.
2. Double-click the Administrators or MSAdministrators group name (or highlight the name in the list and select Properties from the User menu). The Local Group Properties dialog box for the group appears.

   In the Local Group Properties dialog box for the group, highlight the user or group you want to remove and click Remove. The user or group is removed from the Members list for the selected group.

■ Maximizing MediaStor Performance

There are several ways to configure your MediaStor system to maximize performance and ensure data security. For more information, see the following sections:

- "Recommended Upgrades for Optimization, " which follows
- “Minimizing System Vulnerability” on page 28

Recommended Upgrades for Optimization

The system resources on the MediaStor computer should be taken into consideration when planning a MediaStor system. The size and number of hard drives, amount of available RAM, processing power, and network cabling and configuration can all affect the performance of the MediaStor system.

Although not required, implementation of the following methods will help you achieve greater system efficiency:

- "Appropriate Hardware for Desired Performance and Function, " which follows
- “Dedicated Host Adapter for Each SCSI Device” on page 27
- “Dedicated MediaStor Computers” on page 27
- “Two Hard Drives on the MediaStor Computer” on page 27
- “Faster Than Minimum CPU” on page 27
- “As Much RAM as Possible” on page 27
- “Multiple-processor Machines” on page 28
- “Fast Network Topology” on page 28

Appropriate Hardware for Desired Performance and Function

Hardware requirements vary depending upon an organization’s needs. A careful assessment of these needs should be performed to determine what combination of storage devices (drives and libraries) would provide the greatest efficiency. For example, an organization that requires many users to access a large amount of information at once would benefit the most from a library with many drives, whereas one that requires only a small amount of information to be accessed may only need a library with one or two drives.

In addition to performance, you also need to make sure you have purchased and configured the appropriate hardware for your functional needs. In particular, this pertains to a system that uses DVD media. Because different types of DVD media can be read and written in different types of DVD drives, you need to be sure your hardware is configured so that the appropriate drives can perform the appropriate function(s). There are two particular items you may want to note:

- If you will be using DVD-R media and you will be keeping copies of that media, be advised that unfinalized DVD-R media cannot be mounted in a read-only drive (a drive not configured to write to DVD-R media). This means that if you intend to update copies of DVD-R media before the originals are finalized, you must have at least two DVD-R “write” drives in your system (one for the copy and one for the unfinalized original). This is not an issue if you plan to only update the copy after the original is finalized.
- If you will be using a library that contains both a read drive and a write drive, you must be sure that the drives are on separate buses (as per typical manufacturer instructions). As always, be sure to follow all manufacturer recommendations for hardware configuration before setting up hardware in your ASM system.

A complete listing of MediaStor supported drives and libraries can be found in the Supported Device List available on the StorageTek website at: http://www.support.storagetek.com. The Supported Device List can also be found on the install CD. Known hardware issues and recommendations can be found in the ASM Knowledgebase as well as on the StorageTek website.

Dedicated Host Adapter for Each SCSI Device

A separate host adapter for each SCSI drive or library device will improve MediaStor performance. If, for example, there are three drives or libraries on one host adapter, then the three devices are sharing the adapter resources. If there is a 1:1 ratio, then all devices have optimal throughput.

Dedicated MediaStor Computers

If many other processes are running on the same machine as MediaStor, performance may decrease. System resources may become overloaded if other programs are running on the same computer, particularly if the MediaStor computer is running Data Manager as well. Therefore, you may want to consider installing MediaStor on a machine dedicated only to MediaStor.

We recommend that the MediaStor computer *not* be a Primary Domain Controller (PDC) or a Backup Domain Controller (BDC) for your network. While MediaStor *can* run on a PDC or BDC, for performance reasons it is not recommended.

Two Hard Drives on the MediaStor Computer

If you do decide to install Data Manager on the same computer where you install MediaStor, two hard drives – one containing Windows NT/2000 program files and MediaStor and one for use as an extended drive by Data Manager – will maximize performance. Data can be written to one drive, while system processes use the other drive. Dedicating one drive for data storage provides better read/write performance, especially in a system where large amounts of data is being migrated through MediaStor (for example, in a heavy scanning environment). If possible, avoid extending a system drive.

Faster Than Minimum CPU

In order to optimize the performance of MediaStor, we recommend that the MediaStor computer have a faster than minimum CPU to improve processing speed.

As Much RAM as Possible

The more memory on the MediaStor computer, the faster Windows NT/2000 and MediaStor will perform and the faster data access will be.

Multiple-processor Machines

MediaStor fully supports the use of multiple-processor machines. Using a multiple-processor machine for the MediaStor computer improves performance, because multiple tasks can be performed at the same time with each processor carrying out a separate task concurrently.

Fast Network Topology

MediaStor uses a dedicated RPC connection for communication between the MediaStor service and the Data Manager service. MediaStor detects and enables RPC settings during installation. Because MediaStor handles the RPC connection, no optimization of the MediaStor service/Data Manager connection is necessary. However, network topology and Windows NT/2000 configuration can affect throughput between networked MediaStor service machines and Data Manager machines.

In cases where network MediaStor computers are installed, network cabling designed for high volume throughput, such as Fast Ethernet or fiber optic, can improve file transfer speeds between the MediaStor machines and the Data Manager computers using the MediaStor media service.

Minimizing System Vulnerability

To ensure that all data in the system is safeguarded against system failure (including Windows NT/2000 failure), certain security measures are recommended. Some of these recommendations are discussed briefly in the following sections:

- "Using Repair Disk to Back up the MediaStor Registry, " which follows
- “Installing MediaStor in a Clustered Environment” on page 28

Using Repair Disk to Back up the MediaStor Registry

The Repair Disk feature backs up the MediaStor registry settings for the MediaStor computer. This provides a way to recover MediaStor settings without reconfiguring them in the event of a system failure on the MediaStor computer. As with any repair disk backup, you should save the backup of the MediaStor repair disk on a separate volume from the system files, and ideally on a separate computer. For more information on using the Repair Disk function to back up the MediaStor registry settings, see “Backing Up Your MediaStor System” on page 149.

Installing MediaStor in a Clustered Environment

Clustering is the process of connecting two or more computers together in such a way that they behave like a single computer, and so that they share a single storage device.

In a cluster configuration, each computer automatically updates the other computer with registry information so it can intervene when needed. If one of the servers stops functioning, the other server assumes the workload of the failed server. The act of transferring functions to another server in the cluster is called fail-over. Fail-over ensures continuous availability of critical applications and data located on the cluster.

The server computers that are part of the cluster are called nodes or systems, and can be either active or passive. An active node is always running and processing user requests. A passive node, however, is idle and does not process user requests until an active node fails.

Cluster configurations can be either active/active or active/passive.

- In an active/passive configuration, applications and services running on the active node transfer over to the passive node when the active node fails. The active node is also called the primary node, while the passive node is called the secondary node.
- In an active/active configuration, applications and services can be running on both of the active nodes and transfer over to one node if the other fails. The applications and services that were originally running on the failed node are then restored to the node when it comes back online.

MediaStor 5.2 or higher can run on an active/passive cluster environment where Microsoft's Cluster Administrator is installed. In an active/passive cluster, MediaStor runs as a single service on the active, or primary, node. When the primary node fails, the service is transferred to the secondary node, which is then considered the primary node because it becomes active. All MediaStor functionality is available on the primary node and completely transfers in the case of a fail-over.

ASM Data Manager 5.3 or higher using MediaStor as a media service can run on an active/active cluster environment where Microsoft's Cluster Administrator is installed; however, MediaStor itself can run only in an active/passive cluster mode.

For detailed information on installing and configuring MediaStor in a clustered environment, refer to *Appendix A: Clustering* of the *ASM Data Manager Getting Started Guide*.

Installing MediaStor

3

Installing ASM MediaStor is an easy process, with system prompts that guide you through every step of the installation process. After MediaStor is installed, and you open the Administrator for the first time, you will be able add the basic components necessary to get your MediaStor system up and running. You may create them at this time or choose to do it later.

For more information, see the following sections:

- "Before Running the Setup Wizard, " which follows
- “Running the Setup Wizard” on page 33
- “Configuring MediaStor” on page 39
- “Licensing MediaStor” on page 39

Before Running the Setup Wizard

Before you run the setup wizard to install MediaStor, there are several issues you may need to consider, depending on your specific configuration. For more information, see the following sections:

- "Licensing, " which follows
- “Creating a Service Account” on page 32
- “Verifying Hardware Connections” on page 32
- “Clustering” on page 32
- “Upgrading from Previous Versions of ASM or MediaStor” on page 33

Licensing

During the installation of MediaStor, you will be prompted to select whether you are installing a licensed version of MediaStor or a 30-day evaluation version. ASM Software product licenses are managed through the ASM License Server, which is a separate product and installed separately from ASM, although the License Server software is included on the ASM CD. For information on installing and configuring your license server, refer to the *License Server System Guide*.

Creating a Service Account

If you do not already have a service account that you would like MediaStor to use to log on as a service, you should create the service account before installing MediaStor. The account should be an administrator on the machine on which you are installing MediaStor. For more information, see “Windows NT/2000 Security” on page 22.

Before running the installation, you should log on to the computer using this service account, so that you can specify the account during setup as required. Because the service account that MediaStor uses to log on the service requires the Log on as a service privilege, this privilege is automatically added to the account specified during setup. Creating the service account ahead of time, and entering that account during setup eliminates the need to add that privilege separately.

Note: If you are installing MediaStor on Windows 2000 Server in an Active Directory service environment, the ASM service accounts require additional configuration to ensure that they have the security privileges necessary to move, store, and retrieve files over the network. For more information, refer to the ASM Knowledge Base.

Verifying Hardware Connections

Before installing MediaStor, you should confirm that the hardware is properly configured, specifically SCSI devices. For any SCSI device to work correctly (regardless of its use with MediaStor), all devices and the SCSI adapter must be properly terminated.

Additionally, all SCSI devices should be powered on before starting Windows NT/2000. If the devices you are using require that specific drivers be installed, those drivers should be installed and access to the devices should be tested, if possible through Windows NT/2000 prior to adding the devices to MediaStor.

Note: Keep in mind that SCSI cable length includes not only the external cable, but the internal cabling as well. For each drive, one foot of cable should be added to the total cable length.

Note: For more information on SCSI and library devices, see “Appendix A: Using SCSI Manager” on page 137 and “Using Jukebox Manager” on page 205. These utilities aid in verifying hardware connections and troubleshooting hardware problems.

Clustering

If you are planning to run MediaStor in a clustered environment, you must obtain a cluster-enabled license and follow the instructions in *Appendix A: Clustering* of the *ASM Data Manager Getting Started Guide* to set up Microsoft Cluster Administrator and install MediaStor.

Upgrading from Previous Versions of ASM or MediaStor

If you are converting your system from a different or previous version of MediaStor, or if you are converting your ASM system from 3.2 or 4.2 to ASM, you must take additional steps to convert your system *before installing MediaStor*. For more information, refer to the *ASM Upgrade Guide*.

Running the Setup Wizard

The MediaStor setup wizard leads you through the steps to install MediaStor.

For your convenience, the setup wizard allows you to install MediaStor on multiple computers at once, provided those computers are visible on your network and you have Administrator privileges and rights to log onto the destination computers as a service.

To take advantage of this feature, you may want to determine which computers are to have MediaStor installed on them (and configure the appropriate rights if necessary) before you run the installation wizard, enabling you to only run the installation once rather than multiple times. To configure the appropriate rights, see “Windows NT/2000 Security” on page 22.

Note: If you are converting your system from a different or previous version of MediaStor, refer to the *ASM Upgrade Guide* to follow the correct steps to convert your system *before installing MediaStor*.

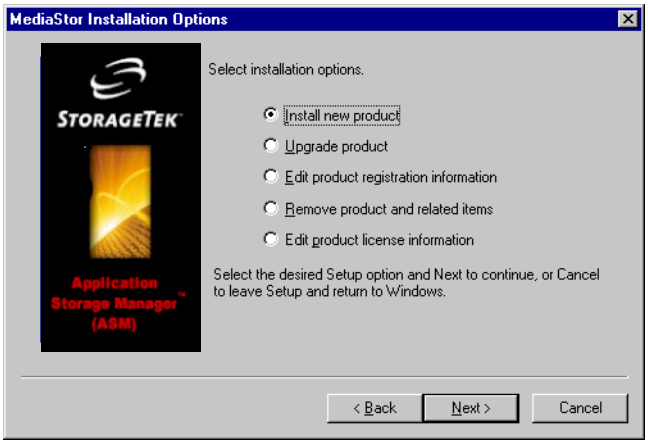
To run the MediaStor setup wizard:

1. Exit all applications on the computer(s) on which you want to install MediaStor. If other software is running, the setup wizard may not be able to write to all necessary files.
2. Insert the ASM setup CD-ROM into the drive. From the Windows Start menu, select Run. The Run dialog box appears.
3. You can either browse to the file or type the path in the Open text box:

   D:\DX2000.*XXX*\MEDIASTOR\SETUP.EXE

   (In this path, D represents the drive holding the setup CD-ROM and *XXX* represents the ASM version number.)
4. Once the file/path appears in the Open text box, click OK. MediaStor setup is initiated, and then the setup wizard appears, starting with the MediaStor Installation page. The MediaStor Installation page briefly describes the installation process.
5. Click Next. The Installation Options page appears.

Figure 2. MediaStor Setup -- Installation Options Page

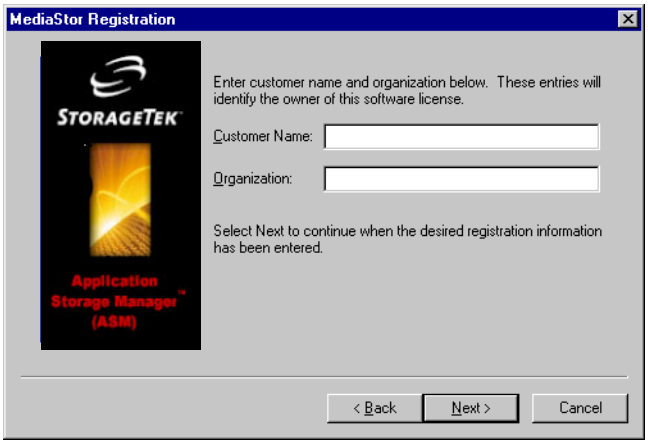


6. Select Install new product and then click Next. The License Agreement page appears.

Figure 3. MediaStor Setup -- License Agreement Page

7. You must accept the terms of the license agreement before you can proceed with the installation. Scroll to the bottom of the agreement to enable the Accept terms of agreement check box. Check the box, and then click Next. The Registration page appears.

Figure 4. MediaStor Setup -- Registration Page



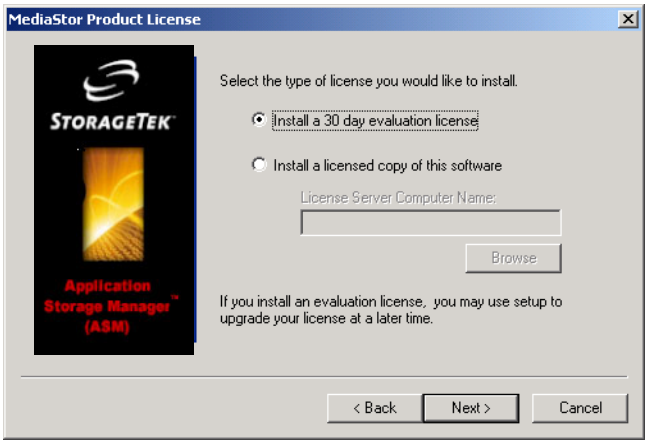
8. Enter the customer name and organization name and then click Next. The Service Account page appears.

Figure 5. MediaStor Setup -- Service Account Page

9. Enter and confirm the password for the account that you want to use as the MediaStor service account. For more information on the MediaStor service account, see “Creating a Service Account” on page 32.

10. Click Next. The Product License page appears.

Figure 6. MediaStor Setup -- Product License Page

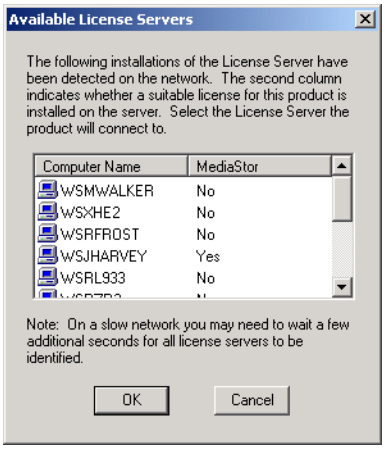


11. You have two choices:

    - Select the Install a 30-day evaluation license option to install MediaStor without using License Server. This allows you to use MediaStor for 30 days. After the 30-day evaluation period, you can use the Setup option in the StorageTek MediaStor program group to update your license. For more information, see “Licensing MediaStor” on page 39.
    - Select the Install a licensed copy of the software option if you have installed and configured the License Server already. Type in the name of the computer where License Server is installed, or use the Browse button to find the License Server computer on the network.

    If you click Browse, the Available License Servers dialog box appears.

Figure 7. Available License Servers Dialog Box

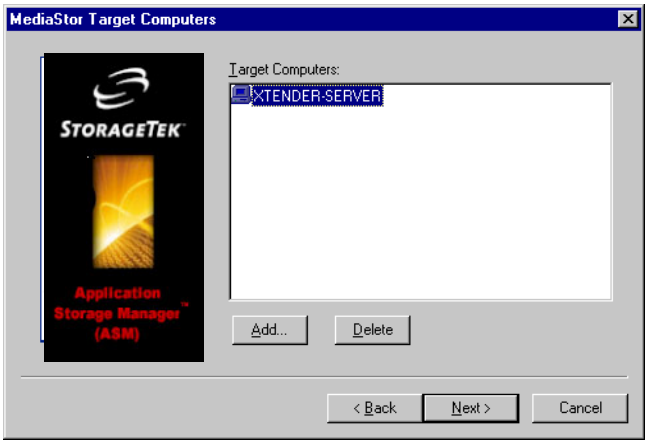


The Available License Servers dialog box lists all network computers where License Server is installed and running, and indicates whether a MediaStor license is configured on that License Server. Highlight the License Server computer to be used to license this installation of

MediaStor and click OK. The Product License page returns, displaying the selected License Server computer in the License Server Computer Name text box.

12. When you finish selecting a licensing option, click Next. The Target Computers page appears.

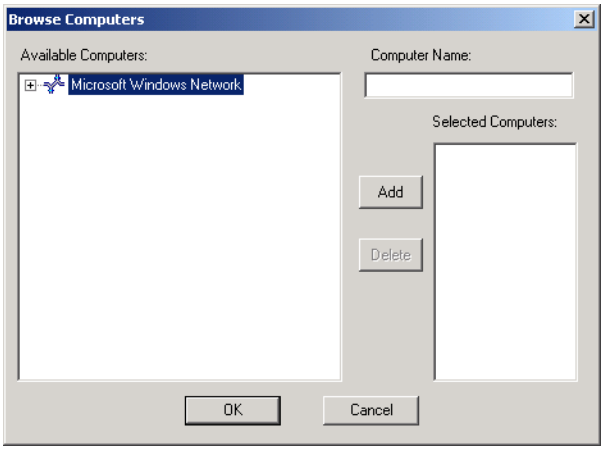
Figure 8. MediaStor Setup -- Target Computers Page



13. You have the following choices:

- To install MediaStor only on the computer listed in the Target Computers list, click Next. The Summary page appears.
- To install MediaStor on other computers in addition to the one listed in the Target Computers list, click Add. The Browse Computers dialog box appears.

Figure 9. Browse Computers Dialog Box



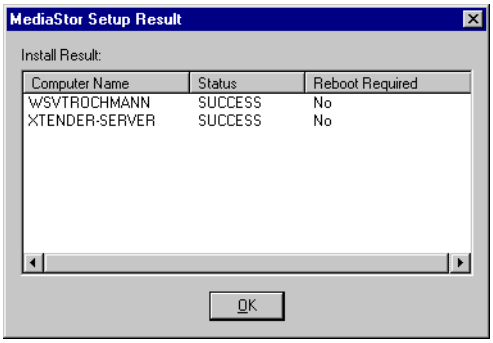
14. In the Browse Computers dialog box you have two choices:

- Under Available Computers, navigate to and select the computer on which you want to install MediaStor and then click Add to add the computer to the Selected Computers list.
- In the Computer Name text box, type in the name or the IP address of the computer on which you want to install MediaStor and then click Add to add the computer to the Selected Computers list.

Repeat this step for each additional computer on which you want to install MediaStor. When you finish selecting target computers, click OK. You are returned to the Target Computers page.

15. When the Target Computers list is complete, click Next. The Summary page appears.
16. Verify the accuracy of the information in the summary.
17. If all information is correct, click Finish. The setup wizard copies all program files into the Program Files\StorageTek directory on the system drive, and adds MediaStor configuration entries and the program group to the system configuration of every target computer selected. A dialog box displays the status of the operation.
18. You have the following choices:
    - If you installed the program on one or more remote computers (in addition to or instead of the local computer), the MediaStor Setup Result dialog box appears, listing the installation results for each computer you specified.

Figure 10. MediaStor Setup Result Dialog Box



Take note of any computers where a Reboot is required (or computers on which the installation failed) and then click OK.

- If you installed MediaStor on the local computer, a dialog box appears, indicating that the MediaStor installation has been successfully completed. Click Start to close the setup wizard and start MediaStor, or click Exit to close the setup wizard without starting MediaStor.

Configuring MediaStor

The following is a condensed list of the steps necessary to start using MediaStor to manage your library, tower, or standalone media.

To install and configure MediaStor:

1. Add and configure hardware devices. For instructions, see “Managing Hardware” on page 55.
2. If not already present, add media to hardware devices. For instructions, “Managing Hardware” on page 55.
3. In ASM Data Manager, add the MediaStor media service. This creates application pools in MediaStor. For instructions, refer to the *Setting up Media Services* chapter of the *ASM Data Manager Getting Started Guide*.
4. Allocate media to the application pools so that the media is available to begin migrating files to it. You can allocate media either through MediaStor or through Data Manager. To allocate media through MediaStor, see “Allocating Media to Application Pools” on page 99. To allocate media through Data Manager, refer to the *Setting Up Media Services* chapter of the *ASM Data Manager Getting Started Guide*.

Licensing MediaStor

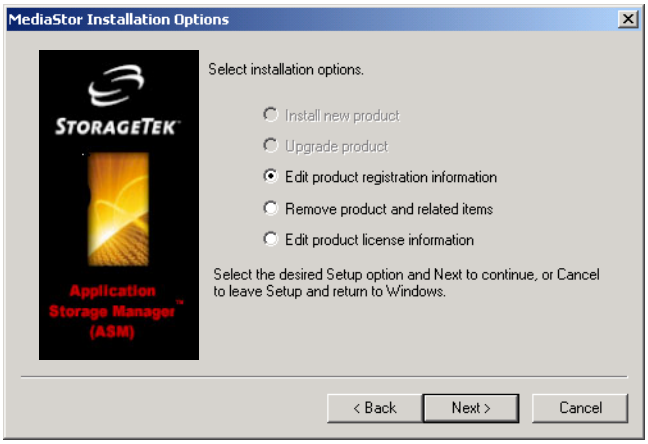
If you installed an evaluation copy of MediaStor and you are ready to upgrade to a fully licensed copy, or if you need to change your license (for example, to add hardware to your system), you can update your license information through the MediaStor setup wizard.

Before you update the license information, be sure that you have installed and configured the ASM License Server, including adding the new license to License Server. For instructions, refer to the *License Server System Guide*.

To update the MediaStor license:

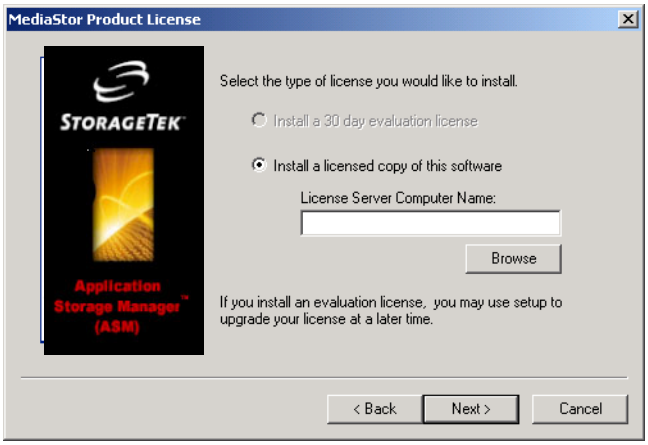
1. From the Windows Start menu, select Programs, StorageTek MediaStor, and then Setup. The setup wizard appears, starting with the Welcome page.
2. Click Next. The Installation Options page appears.

Figure 11. MediaStor License Update -- Installation Options Page



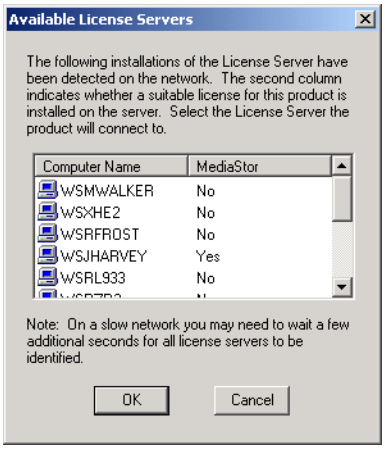
3. Select Edit product license information and then click Next. The Product License page appears.

Figure 12. MediaStor License Update -- Product License Page



4. Select the Install a licensed copy of the software option. Type in the name of the computer where License Server is installed, or use the Browse button to find the License Server computer on the network. If you click Browse, the Available License Servers dialog box appears.

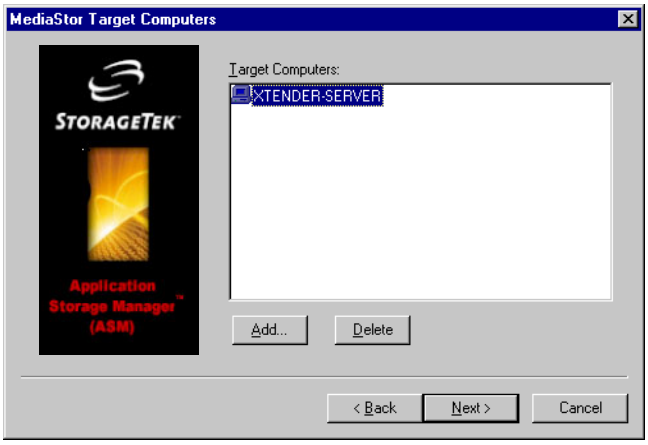
Figure 13. Available License Servers Dialog Box



The Available License Servers dialog box lists all network computers where License Server is installed and running, and indicates whether a MediaStor license is configured on that License Server. Highlight the License Server computer to be used to license this installation of MediaStor and click OK. The Product License page returns, displaying the selected License Server computer in the License Server Computer Name text box.

5. When you finish selecting a licensing option, click Next. The Target Computers page appears.

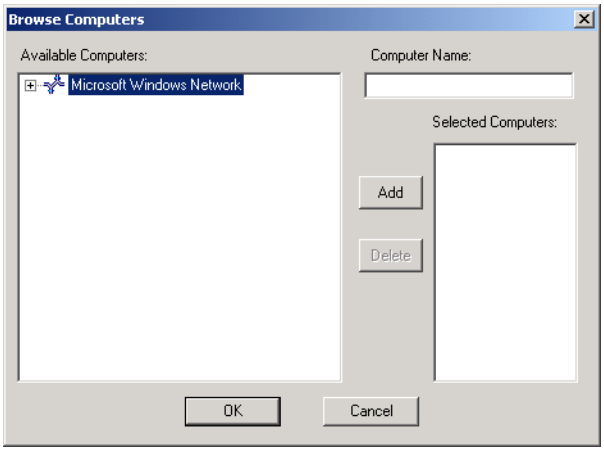
Figure 14. MediaStor License Update -- Target Computers Page



6. You have the following choices:

   - To upgrade the MediaStor license for only the computer listed in the Target Computers list, click Next. The Summary page appears.
   - To upgrade the MediaStor license for other computers in addition to the one listed in the Target Computers list, click Add. The Browse Computers dialog box appears.

Figure 15. Browse Computers Dialog Box



7. In the Browse Computers dialog box you have two choices:

   - Under Available Computers, navigate to and select the computer on for which you want to upgrade the MediaStor license and then click Add to add the computer to the Selected Computers list.
   - In the Computer Name text box, type in the name or the IP address of the computer for which you want to upgrade the MediaStor license and then click Add to add the computer to the Selected Computers list.

   Repeat this step for each additional computer for which you want to upgrade the MediaStor license. When you finish selecting target computers, click OK. You are returned to the Target Computers page.

8. When the Target Computers list is complete, click Next. The Summary page appears.
9. Verify the accuracy of the information in the summary.
10. If all information is correct, click Finish. The MediaStor license is updated on the selected computer(s), and a message appears, indicating that the wizard has been successfully completed. Click Start to close the setup wizard and start MediaStor, or click Exit to close the setup wizard without starting MediaStor.

Working in the Administrator

4

Because ASM MediaStor is a Windows-based package, the same navigational standards apply to all of its components. The Administrator provides a user-friendly interface that allows you to easily create and configure MediaStor components as well as manage MediaStor computer properties and hardware on one or more MediaStor machines.

The Administrator has an intuitive “tree” view that displays the underlying structure of the MediaStor system. Each MediaStor computer appears as a primary tree node, and the configured hardware and media are grouped as sub-trees for ease of use. In addition, the media in the Scratch Pool and Application Pool(s) are grouped by media classification. You can search for text in the tree, as well as refresh the contents of the tree.

The Administrator can be run on the same computer where MediaStor is installed or from a remote workstation using the Remote Administrator. For more information on remote administration, see “Remotely Administering MediaStor” on page 157.

This chapter explains the basic layout of the Administrator, as well as its general functionality. Included are explanations of window features and methods for carrying out system operations. For more information, see the following sections:

- "Starting the Administrator, " which follows
- “The Administrator Window” on page 44
- “Refreshing the Administrator Window” on page 52
- “Searching in the Administrator” on page 53

Starting the Administrator

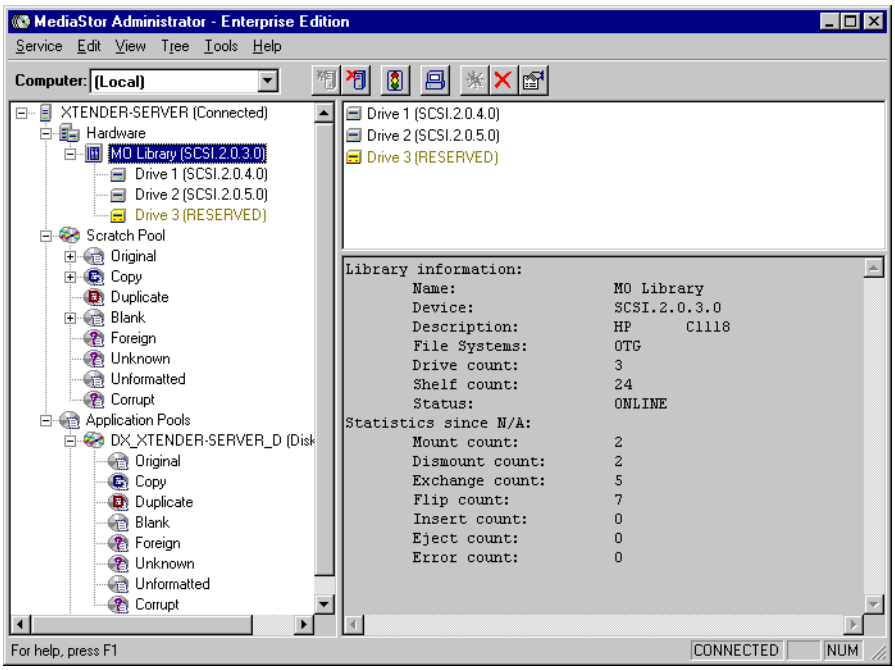
Starting the Administrator allows you access to media and hardware information. You can connect to local or remote MediaStor computers through the Administrator. Using the Administrator, you can add and remove hardware devices, set drive properties, and make media available to Data Manager by adding media to the Application Pools.

Upon successful connection to one or more MediaStor computer(s), the Administrator displays all configured MediaStor components in a tree-like structure.

To open the Administrator:

- From the Windows Start menu, select Programs, StorageTek MediaStor, and then Administrator. The Administrator window appears.

Figure 16. MediaStor Administrator Window



When the Administrator opens, it automatically connects to all registered MediaStor computers. If this is a full installation of MediaStor (as opposed to a Remote Administrator installation) the local computer is automatically registered, and therefore automatically appears in the Administrator. In addition, if you installed MediaStor on multiple target computers, MediaStor automatically registers and attempts to connect to all target computers identified during MediaStor install. Once these connections have been made, the Administrator displays information relevant to each connected MediaStor service.

If you want to administer the MediaStor service on computer(s) other than those currently connected, you must register the MediaStor computers through the Administrator. For more information on registering MediaStor computers, see “Registering a Computer for Remote Administration” on page 163.

The Administrator Window

The main portion of the Administrator window is for navigation and information display, and is split into three panes:

- The left pane of the window, or the tree view, contains the tree-like structure from which most commands are performed. For more information, see "The Tree View: Exploring MediaStor, " which follows.
- The top right pane, or the contents view, displays the contents of the item currently selected in the tree. For more information, see “The Contents View: Node Details” on page 49.
- The bottom right pane, or the description view, displays a description or detailed properties of the item selected. For more information, see “The Description View: Item Details” on page 50.

Split bars separate the panes of the Administrator window. These split bars can be moved to change the size of each pane.

To move the split bar:

- Drag the bar to its new location.

The Administrator window also contains several additional components that allow you to navigate through and configure MediaStor:

- The menu bar contains the menu commands and can be found at the top of the window. For more information, see “Menu Bar” on page 50.
- The Computer drop-down list, which allows you to switch between registered MediaStor computers, can be found just below the menu bar on the left. For more information, see “Computer Drop-Down List” on page 50.
- The toolbar, containing toolbar buttons that allow you to perform frequently used functions, can be found just below the menu bar to the right of the Computer drop-down list. For more information, see “Toolbar” on page 50.
- The status bar, which displays information about the selected command or toolbar button, can be found at the bottom of the window. For more information, see “Status Bar” on page 52.

The Tree View: Exploring MediaStor

The left pane of the Administrator window contains a tree showing all hardware configured for registered MediaStor computers.

Commands for managing MediaStor functionality can be accessed from the tree. When you right-click on a tree node, a shortcut menu containing commands for performing MediaStor functions appears. The shortcut menu items vary depending on what item you select in the tree view.

Each node in the tree indicates whether it is expandable; that is, whether it contains items beneath it. A plus sign (+) marks a node that is expandable. Once a node has been expanded, the plus sign changes to a minus sign (-), indicating that it has been expanded and can now be collapsed.

To expand a node:

- You have the following choices:
  - Click the plus sign to the left of the node.
  - Double-click the item.
  - Select the item, and then choose Expand from the Tree menu.

To collapse a node:

- You have the following choices:
  - Click the minus sign to the left of the node.
  - Double-click the item.
  - Select the item, and then choose Collapse from the Tree menu.

If a node appears with neither sign, that means it currently contains no items within it. For example, if the Blank node of the media tree does not have a plus (+) or minus (-) sign in front of it, there are no Blank media in that pool.

A Hardware node, Scratch Pool node, and Application Pools node appear underneath each root node for a MediaStor computer. For more information, see the following sections:

- "Hardware, " which follows
- “Media Pools” on page 47

You can also configure the Administrator to display the status of items in the tree view by color. For more information, see “Configuring Status Display” on page 49.

Hardware

The Hardware tree in the tree view contains all hardware devices currently managed by MediaStor. You can add, modify, and delete hardware devices managed by MediaStor from the Hardware tree. In addition, you can set devices online or offline and manage the insertion, movement, and ejection of media in the device.

Three types of devices can be added to MediaStor: libraries, towers, and standalone drives.

When a hardware device is added to the MediaStor system, the media in the system is automatically added to the appropriate node of the Scratch Pool.

Note: While MediaStor is running and SCSI devices are in use or being configured, do not run any other applications that access the devices. Two different applications sending SCSI commands to the same device may cause commands to fail and may cause damage to the

hardware. For example, do not run SCSI Manager while configuring hardware.

Media Pools

The MediaStor Administrator lists two media pool trees in the tree view: Scratch Pool and Application Pools. The Scratch Pool tree contains all media in the MediaStor system that is not currently assigned to an application. The Application Pools tree displays all extended drives configured for each Data Manager computer currently using MediaStor as a media service.

Each application media pool is identified by three characteristics: the application using MediaStor as a media service, the name of the computer where the application is installed, and the extended drive letter.

For example, the name of an application media pool, as it appears in the Application Pools tree might be: DX_WSTVERNON1_D. In this example, the Data Manager computer using MediaStor is identified as “DX”, the name of the computer running Data Manager is “WSTVERNON1”, and the “D” drive has been configured as a Data Manager extended drive. This naming convention allows you to quickly identify where you should assign the media from the Scratch Pool, if you choose to allocate the media through MediaStor. Media can also be allocated through Data Manager.

The media in both the Scratch Pool and the Application Pools are grouped by class. Explanations of the classifications for media can be found in the following sections:

- "Original Media, " which follows
- “Copy Media” on page 48
- “Duplicate Media” on page 48
- “Blank Media” on page 48
- “Foreign Media” on page 48
- “Unknown Media” on page 48
- “Unformatted Media” on page 48
- “Corrupt Media” on page 49

Original Media

All media that have been prepared and ready for use are listed under the Original Media node. For a piece of media to appear in this list, the media must be formatted for the file system for which the hardware device is configured. It must also be labeled.

Copy Media

Copy media are media that are identical copies of other media in the ASM system. The only difference between an original piece of media and its copy is the serial number for each piece of media.

Duplicate Media

Duplicate media is any media with the same serial number as another piece of media in the ASM system. Duplicate media is unusable with ASM and must be reformatted before it can be used. Reformatting assigns a different serial number to the media.

Blank Media

Blank media are media that have been formatted for use, but are not yet labeled. Through Data Manager, blank media can be labeled, reformatted, or labeled for use as a copy (if the media allows it).

Foreign Media

Foreign media is a piece of media where the media type is recognized, but the media has been formatted with a file system that does not correspond to the file system configured for the device in which it resides. If possible, this media must be reformatted using the appropriate file system in order to be used.

Note: Unformatted DVD media may appear as Foreign rather than Unformatted if the device in which it resides is configured to use the UDF file system.

Unknown Media

Unknown media encompasses any media in the hardware device that MediaStor does not recognize. The problem most likely is that the media is of an unsupported type, though the media may not be recognized because it contains an unsupported file system. For more information, see “Foreign Media” on page 48.

Unformatted Media

Unformatted media usually encompasses media that was unpackaged and placed in the device and has not yet been formatted for the first time. This media will have to be formatted before it can be used.

Note: Unformatted DVD media may appear as Foreign rather than Unformatted if the device in which it resides is configured to use the UDF file system.

Corrupt Media

The Corrupt Media classification identifies specifically corrupted DVD media using the UDF file system. Corrupt media is media that the system recognizes but cannot use due to problems with the media itself. Media corruption most often occurs as a result of a power failure while the media was being written to. Performing a check disk media task on the media may allow you to find and repair the media errors. For more information on performing a check disk media task, refer to the *Managing Storage Media* chapter of the *ASM Data Manager System Guide*.

Configuring Status Display

You can configure the items in the tree view of the MediaStor Administrator to change color depending on their status. The following table lists each color and describes the status indicated by each color:

Table 5. Status Indicated by Color

Color	Status
Black	Online but not running a task
Green	Online but with a task either pending, in progress, or suspended
Red	Error
Yellow	Offline

To configure the tree view to indicate status by color:

- From the View menu, select Enable Color. A check mark next to the Enable Color option signifies that the option has been enabled. If this option is disabled, all items in the tree view appear black, regardless of status.

The Contents View: Node Details

The top right pane of the Administrator window contains the contents of the node currently selected in the tree on the left. These contents include the same information displayed underneath the node in the tree when the node is expanded. For example, selecting the Original node of the Scratch Pool tree lists all available formatted and labeled media in the contents view. The same information is listed underneath the Original node when that node is expanded. You can select an item either in the tree view or in this contents view to make the appropriate commands available.

The Description View: Item Details

The bottom right pane of the Administrator window contains details about the item currently selected in the tree on the left. This section provides helpful information about the current configuration and settings. For example, if a piece of media is selected, the description view displays information about that piece of media including the name, file system, serial number, total number of bytes, and the device in which that media is located.

Menu Bar

The menu bar contains a list of options with commands for carrying out functions in the Administrator. Although functions are easily performed using shortcut mouse clicks, all functions can be performed through the menu commands as well. When you select a node in the tree view, the Edit menu changes to contain the same commands available on the shortcut menu for that node.

Computer Drop-Down List

The Computer drop-down list displays the name of the currently active computer. You can activate a different MediaStor computer in the Administrator by either selecting the computer from the Computer drop-down list or highlighting the computer in the tree view of the Administrator.

In order for a computer to appear in the Computer drop-down list, the computer must be registered through the Administrator. For additional information on registering MediaStor computers to add them to this list box, see “Registering a Computer for Remote Administration” on page 163.

Toolbar

The MediaStor toolbar is located directly beneath the menu bar, to the right of the Computer drop-down list. The toolbar contains buttons that provide quick access to many of the Administrator commands and features.

To identify the function of a button, point to the button with the mouse. The button’s function appears in the status bar at the bottom of the window, and as a pop-up tool tip when the mouse is held over the button.

The toolbar button is grayed out if it is not available for the item you have selected in the Administrator.

To show or hide the toolbar:

- From the View menu, select Toolbar. A check mark beside the command indicates that the toolbar is displayed.

Figure 17. Administrator Toolbar

Table 6. Administrator Toolbar Buttons

Button	Name	Menu Option	Function
	Connect to Service	From the Service menu, select Connect.	Connects to the selected MediaStor computer. For more information, see “Connecting to MediaStor Computers” on page 169.
	Disconnect from Service	From the Service menu, select Disconnect.	Disconnects from the currently active MediaStor computer. For more information, see “Disconnecting from a MediaStor Computer” on page 169.
	Service Manager	From the Tools menu, select Service Manager.	Opens the Service Manager so that you can manage the MediaStor service. For more information, see “Managing the Service Using the Administrator” on page 112.
	Register Computer	From the Service menu, select Register.	Displays the Register Computers dialog box, which allows you to register MediaStor computers for remote administration. For more information, see “Registering a Computer for Remote Administration” on page 163.
	New	From the Edit menu, select New.	Displays a dialog box that allows you to create a new object. The dialog box that appears is determined by the current selection.

Table 6. Administrator Toolbar Buttons (Continued)

Button	Name	Menu Option	Function
	Delete	From the Edit menu, select Delete.	Deletes or removes the selected object.
	Properties	From the Edit menu, select Properties.	Displays the Properties dialog box for the selected object.

Status Bar

The status bar is located at the bottom of the Administrator window and displays information about the selected command or toolbar button. Translations of certain commands or important messages to the user appear on the status bar.

To show or hide the status bar:

- From the View menu, select Status Bar. A check mark beside the command indicates that the status bar is displayed.

Refreshing the Administrator Window

Refreshing updates the contents of the Administrator window and repaints everything in the window. The Administrator window is refreshed when each of the following occurs:

- A command is performed.
- A node in the tree is expanded or collapsed.
- You press <F5> or select Refresh from the Tree menu. (This is considered a forced refresh.)
- The time specified for automatic refresh frequency has expired. For more information, see "Configuring Auto Refresh Frequency, " which follows.

Configuring Auto Refresh Frequency

You can configure the frequency of the automatic refresh of the Administrator window. The default refresh rate is 5 seconds.

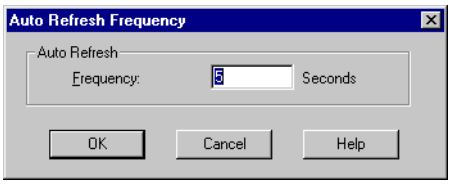
To enable or disable auto refresh:

- From the Tree menu, select Auto Refresh.

To change the auto refresh frequency:

1. From the Tree menu, select Auto Refresh Frequency. The Auto Refresh Frequency dialog box appears.

Figure 18. Auto Refresh Frequency Dialog Box



2. In the Frequency text box, enter the appropriate number of seconds between refreshes and then click OK.

Searching in the Administrator

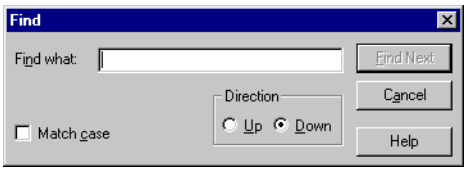
As multiple hardware devices and pieces of media, as well as multiple MediaStor computers (for remote administration), are added to the system, the MediaStor tree in the Administrator window may become so large as to become difficult to locate a specific node of the tree. The Find command in the Tree menu can be used to quickly locate occurrences of text within the MediaStor tree. This can be especially useful for finding a specific piece of media or a specific hardware device.

The Administrator searches from the currently highlighted position in the tree to either the end or to the beginning of the tree, depending on the direction you choose. To search the entire tree, select an item either at the top or bottom of the tree before beginning the search and select the Up or Down direction as appropriate.

To search for specific text in the tree:

1. From the Tree menu, select Find. The Find dialog box appears.

Figure 19. Find Dialog Box



2. In the Find what text box, type the text you want to find.
3. Select the direction in which you want MediaStor to perform the search. You have the following choices:
   - Enable the Up option to search up in the tree from the currently highlighted position.

- Enable the Down option to search down in the tree from the currently highlighted position. This option is enabled by default.

4. Choose whether you want MediaStor to match the case of the selected text. You have the following choices:
   - Enable the Match case check box to find only words having a certain pattern of uppercase and lowercase letters. For example, select this option to find “MEDIA” but not “media.”
   - Disable the Match case check box to find all words matching the text in the Find what text box, regardless of case. This option is disabled by default.
5. Click Find Next. The first occurrence of the text is highlighted in the tree.
6. If the tree is not visible, move the Find dialog box by dragging its title bar.
7. To find the next occurrence, click Find Next again.
8. When you find the text you are looking for, click Cancel to close the Find dialog box.

Note: After you close the Find dialog box, you can select Find Next from the Tree menu (or press F3) to find the next occurrence of the most recently specified text.

Managing Hardware

5

Three types of hardware devices can be added, modified, and deleted in MediaStor: libraries, towers, and standalone drives. The following sections contain information on hardware organization in the MediaStor Administrator, as well as information on managing the insertion, movement, and ejection of media in the devices:

- "Device Names, " which follows
- “Managing Libraries” on page 56
- “Managing Towers” on page 81
- “Managing Standalone Drives” on page 89

For a complete list of supported hardware devices, refer to the Supported Device List available on the StorageTek website at http://www.support.storagetek.com. The Supported Device List is also available on the ASM installation CD.

Device Names

When you add a device to MediaStor, you may need to select it from a list of available devices. MediaStor uses standardized naming conventions for hardware devices. Understanding the format for a device name simplifies identification of the device in MediaStor.

MediaStor supports standalone drives, towers, and SCSI and serial libraries. When SCSI devices are added and configured in MediaStor, the supported devices listed in the Windows registry are automatically listed for use in MediaStor. These devices appear in order according to their model and their device address. SCSI and serial addresses are displayed differently and are configured using different methods. For more information, see the following sections:

- "SCSI Device Names, " which follows
- “Serial Library Device Names” on page 56

SCSI Device Names

The SCSI address is the same as the character string that names this device in SCSI Manager. Look at the icon for this device in SCSI Manager; its device

name (address) is shown in quotes under the icon. For more information on SCSI Manager, see “Appendix A: Using SCSI Manager” on page 137.

The numbers in the device address represent the SCSI port, bus, target ID, and logical unit ID, respectively. For example, on a typical system with one host adapter, a CD-ROM drive at target ID 2 would be SCSI.0.0.2.0. The first zero (0) in the address is the SCSI port, the second zero is the bus, the two (2) is the target ID, and the third and final zero is the logical unit ID.

Serial Library Device Names

If a library with serial robotics is used, the serial port designation and the robotics controller ID must be provided. For example, the address for a serial library with one drive attached could be COM1-0. COM1 designates the MediaStor computer’s COM port to which the library is connected; 0 designates the RS-232 ID for the robotics controller. Up to fifteen devices may be daisy-chained on a serial port.

Note: For more information on how to identify the RS-232 for your library, refer to the manufacturer’s documentation.

Managing Libraries

MediaStor supports a wide variety of libraries. (For a full list of supported libraries, refer to the Supported Device List available on the StorageTek website: (http://www.support.storagetek.com). The Supported Device List is also available on the ASM installation CD.

You can add and remove libraries in the MediaStor system. MediaStor also provides robotics management for libraries, allowing you to insert, eject, and move media within the library. MediaStor internally performs all necessary mount and dismount operations for media read/write requests from Data Manager. For more information, see the following sections:

- "Adding a Library, " which follows
- “Managing Media in a Library” on page 72
- “Modifying a Library” on page 76
- “Viewing Library Properties” on page 77
- “Setting a Library Offline” on page 79
- “Setting a Library Online” on page 79
- “Deleting a Library” on page 81

Adding a Library

MediaStor treats libraries as single storage devices. A SCSI address exists for the library, and one for each drive in the library. Any supported library currently listed in the Windows registry, as well as any supported serial library, can be added to MediaStor.

The Hardware Wizard leads you step-by-step through the process of adding a library to MediaStor. You can configure the library at the time you create it, or you can access and change these configurations later through the Hardware Wizard and, in some cases, through the Properties dialog box for the library. The tabs of the Library Properties dialog box are identical to the corresponding pages of the Hardware Wizard.

For instructions on running the Hardware Wizard to add a library to MediaStor, see the following sections:

- "Starting the Hardware Wizard, " which follows
- “Configuring the Library Configuration Page” on page 59
- “Configuring the Serial Library Information Page” on page 61
- “Configuring the Library Drives Page” on page 61
- “Configuring the Library Auto Clean Page” on page 69
- “Configuring the Library Options Page” on page 70

Starting the Hardware Wizard

This section describes how to start the Hardware Wizard and configure the Add New Hardware Device and Select New Library pages.

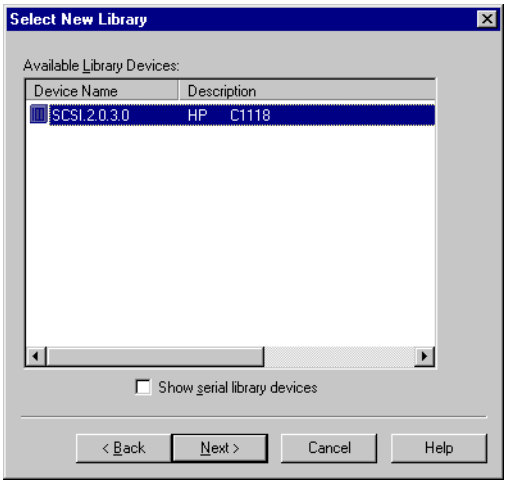
To add a library:

1. Right-click on the Hardware node and select New from the shortcut menu to start the Hardware Wizard. The Hardware Wizard opens, starting with the Add New Hardware Device page.

Figure 20. Hardware Wizard -- Add New Hardware Device Page

2. Select the Library option and click Next. The Select New Library page appears.

Figure 21. Hardware Wizard -- Select New Library Page



The Select New Library page lists all of the SCSI libraries currently listed in the Windows Registry that have not yet been added to the MediaStor hardware configuration.

3. If you are adding a serial library device, enable the Show serial library devices check box to show the available serial library devices. Otherwise, proceed to the next step.

4. Highlight the library you want to add and click Next. The Library Configuration page appears. For detailed information, see *"Configuring the Library Configuration Page, " which follows.*

Configuring the Library Configuration Page

The Library Configuration page provides information on the device being added, and allows you to enter a device name, and select the drive type (media type) and default file system for the library. You can also enable or disable automatic initialization of the library on MediaStor startup.

When selecting the file system for the library, keep in mind that any media in the library to be used by ASM must also be formatted for that file system. Any library media formatted for a file system other than the one selected for the library is considered Foreign and must be reformatted before ASM can use it.

When selecting the drive type for the library, be advised that the library type controls the functionality of both the drives and the media in the library. This pertains specifically to DVD libraries where different types of DVD drives may be installed.

As long as the drives in the library are the same type as the selected drive type, they function as read/write drives. If a drive in the library is of a different type (though still compatible with the library), the drive functions as a read-only drive. If the library contains combo drives, these drives are set to the selected drive type selected for the library.

Note: If you are using DVD-R media and plan to have copies of that media in your ASM system, keep in mind that unfinalized media cannot be mounted in a read-only drive, and therefore if you plan to update copies of unfinalized DVD-R media, you need to have at least two “write” drives for DVD-R media (one for the unfinalized original and one for the copy).

In addition, media in the library that is not of the same type as the drive type selected for the library (as long as it is compatible with the drive) is set to be read-only media during library inventory. For example, if you have DVD-RAM media in the library, but select DVD-R as the drive type for the library, all DVD-RAM media is set as read-only media. The same is true for DVD-R media in a DVD-RAM drive-type library.

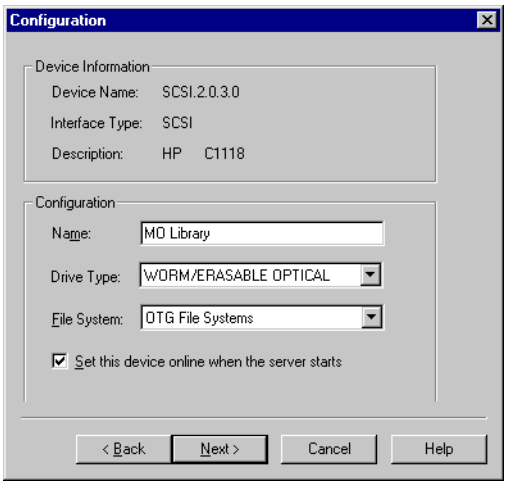
For libraries containing combination drives and/or different drive types, all media must be readable in *all* library drives. For example, if your library contains both DVD-R and DVD-ROM drives, you cannot insert DVD-RAM media into the library because DVD-RAM media is not readable in DVD-ROM drives. In addition, all read/write library media must be both readable and writable in all read/write library drives.

Note: If you are configuring a read-only drive and a write drive in the same library, the two drives *must* be on separate buses. As always, you should follow all manufacturers recommendations for setting up hardware devices before adding them to your MediaStor system.

To configure the Library Configuration page:

1. Enter a name for the library. Library names are used only for user interface purposes and can be any alphanumeric string, up to 32 characters.

Figure 22. Hardware Wizard – Library Configuration Page



2. From the Drive Type drop-down list, select the type of drive (media) that the library contains.

   If the library is a DVD library containing different types of DVD drives (including combo drives), the drive type selected for the library determines how the drives and the media in the library function, and which of the drives and media are read/write or read-only.

3. From the File System drop-down list, select the file system to be used for the media and drives in the library. All drives within a library must use the file system specified. For more information on file systems, see “Types of Media File Systems” on page 17.

4. Select whether to set this device online when the MediaStor service starts. You have the following choices:

   - To set the device online when the MediaStor service starts, leave the default setting of enabled for the Set this device online when the service starts option. This allows the system to automatically set the library online during system startup.
   - Disable the Set this device online when the service starts check box to prevent the library from being set online when the MediaStor service starts. If you disable this option, you need to set the library online manually.

5. Click Next. One of the following occurs:

- If you are configuring a serial library, the Serial Library Information page appears. For instructions, see "Configuring the Serial Library Information Page, " which follows.
- If you are configuring a SCSI library, the Library Drives page appears. For instructions, see “Configuring the Library Drives Page” on page 61.

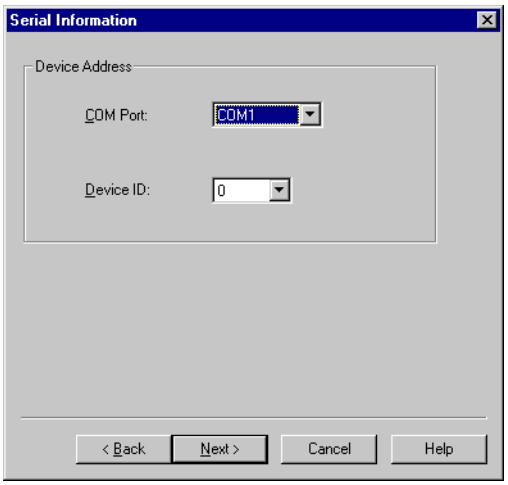
Configuring the Serial Library Information Page

If you are configuring a serial library, the Serial Library Information page allows you to choose a COM port and Device ID (if applicable) for the serial library.

To configure the Serial Library Information page:

1. On the Serial Library Information page, select the appropriate COM port to which the serial library will be connected to the MediaStor computer.

Figure 23. Hardware Wizard – Serial Library Information Page

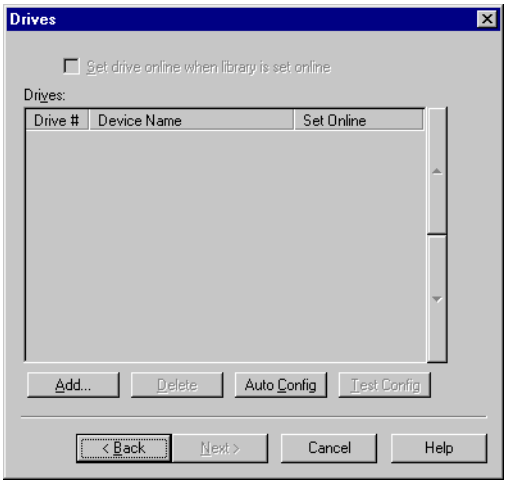


2. If applicable, select the device ID assigned for the RS-232 interface with the robotics controller. Consult your hardware documentation for more information on the device ID (also called the RS-232 ID or the COM ID).
3. Click Next to continue. The Library Drives page appears. For instructions, see "Configuring the Library Drives Page, " which follows.

Configuring the Library Drives Page

When the Library Drives page initially appears, no drives are listed, as shown in the figure below.

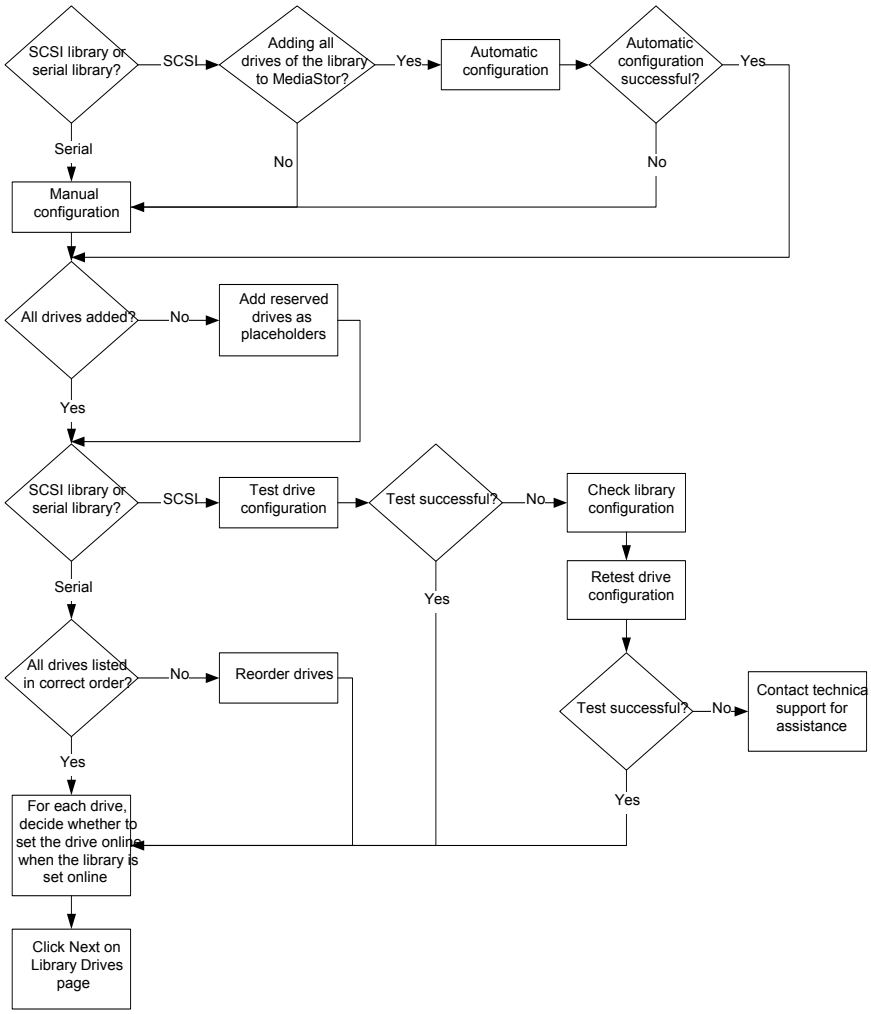
Figure 24. Hardware Wizard – Library Drives Page



Library drives must be added. For SCSI libraries, MediaStor contains an automatic configuration feature that allows you to add and configure library drives automatically. You can also configure your library drives manually; for example, if you are adding a serial library, if automatic configuration fails, or if you don't want to add all of the drives in the library.

The process for adding drives is detailed in the figure below:

Figure 25. Adding Library Drives Process



To configure the Library Drives page:

1. You have the following choices:

   - If you are adding a serial library, click Add. For further instructions, see “Manually Configuring Drives” on page 65.
   - If you are adding a SCSI library and want to add drives manually, click Add. For further instructions, see “Manually Configuring Drives” on page 65.
   - If you are adding a SCSI library and want to add and configure drives automatically, click Auto Config. For further instructions, see “Automatically Configuring Drives” on page 65.

2. If you choose to add only some of the drives in a library, you must add reserved drives as placeholders for the drives that are not added. For more information, see “Adding Reserved Drives” on page 66.

   Note: Some libraries are configured in a way that there are physically two drives, but the library firmware expects four drives. When automatic configuration is run, reserved drives are added for those bays in the library where the drive is missing.

3. If you added drives manually, be sure that the library’s drives, including reserved drives, are defined in the order that the vendor numbers its drive elements. If they are not listed in order, see “Setting Drive Order” on page 67 to change drive order.

   Note: If you are adding a SCSI library, you can perform a configuration test to see whether the library’s drives are listed in the correct order. For instructions, see “Testing Drive Configuration” on page 68.

4. Configure drive activation settings. You have the following choices:

   - Leave the default setting of enabled for the Set drive online when library is set online option. This sets the drive online when the library comes online.
   - Disable the Set drive online when library is set online check box to prevent a drive from being set online when the library comes online.

   Note: At least one drive must be configured to be set online when the library is set online. Otherwise, the library remains offline.

5. If you added a drive you do not want to use, delete the drive. On the Library Drives page, select the drive you want to delete and then click Delete.

   Note: If you delete a drive, you may need to add a reserved drive in the place of the deleted drive. For instructions, see “Adding Reserved Drives” on page 66.

   Note: If you have a hardware problem with a library drive and want to prevent its use, but do not want to remove the drive from the library configuration, you can temporarily disable the drive by setting it offline. In this situation, you may also want to disable the Set drive online when library is set online check box. For more information, see “Setting a Library Offline” on page 79.

6. Once the drives are listed and configured correctly on the Library Drives page, click Next. One of the following occurs:

   - If you are configuring a tape library, the Library Auto Clean page appears. For instructions, see “Configuring the Library Auto Clean Page” on page 69.

- For all other types of libraries, the Library Options page appears. For instructions, see “Configuring the Library Options Page” on page 70.

Automatically Configuring Drives

Some SCSI libraries support automatic drive configuration, which allows you to add and configure the drives in one step through the interface. Automatic configuration automatically adds all the drives in a SCSI library and orders the drives as they exist in the library, with their corresponding SCSI ID, which is usually, but not necessarily in order of lowest to highest.

Note: Automatic configuration is not supported for serial libraries.

Note: If the library and drive are not on the same bus, automatic configuration fails. You must add the drives manually. For instructions, see "Manually Configuring Drives, " which follows.

To automatically configure SCSI library drives:

1. On the Library Drives page, click Auto Config. A message appears asking you to confirm the automatic configuration.
2. Click Yes. One of the following occurs:
   - If the automatic configuration is successful, a status message appears. Click OK.
   - If the automatic configuration fails, a message indicates that the drives must be added manually. For instructions, see "Manually Configuring Drives, " which follows.

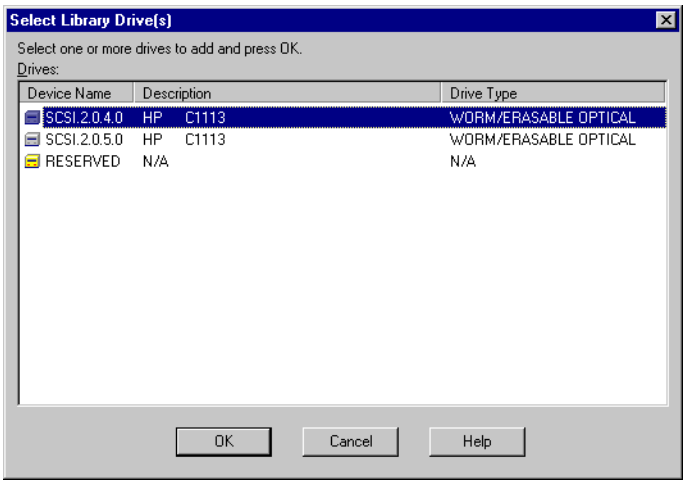
Manually Configuring Drives

Serial libraries and some SCSI libraries do not support automatic configuration. Automatic configuration fails if the selected library does not support it. In those cases, the library drives must be added and configured manually.

To manually add library drives:

1. Click the Add button on the Library Drives page. The Select Library Drives dialog box appears, showing all drives currently listed in the Windows registry, including standalone drives.

Figure 26. Select Library Drives Dialog Box



Be advised that the Select Library Drives dialog box only lists drives that are compatible with the drive type selected for the library (either as read/write or read-only drives).

2. Select the drive(s) you want to add and then click OK. Be sure to only select actual library drives. While the system allows you to select standalone or external drives from this window, the configuration test run afterwards will fail.

   Note: When manually adding drives, you must add them in the order of the drive number and not the SCSI ID. For example, if drive 1 has SCSI ID 1050 and drive 2 has SCSI ID 1040, the SCSI addresses of the drives do not appear in ascending order; SCSI ID 1050 (drive 1) appears before SCSI ID 1040 (drive 2). In the Drives list box 1040 (drive 2) still appears first.

   Note: If you add only some of the drives in the library, you must add reserved drives as placeholders for the drives you do not add. For more information, see "Adding Reserved Drives, " which follows.

Adding Reserved Drives

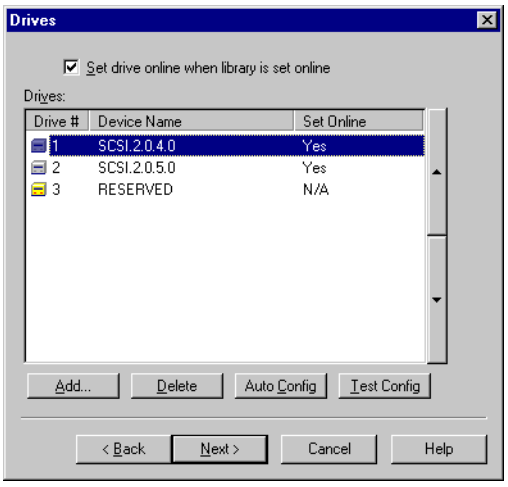
If you choose to add only some of the drives in a library, you must add reserved drives as placeholders for the drives that are not added. This is particularly important if your library contains drives that are not compatible with the drive type selected for the library, and therefore cannot be added to the configuration.

Note: Some libraries are configured in a way that even though there are physically two drives, the library firmware expects four drives. When automatic configuration is run, reserved drives are added for those bays in the library where the drive is missing.

To add reserved drives:

1. Click Add in the Library Drives page. The Select Library Drives dialog box appears with a device listed as “Reserved.”
2. Highlight the Reserved Device Name entry and click OK. The Library Drives page appears with the reserved drive listed.

Figure 27. Hardware Wizard – Library Drives Page with Reserved Drive



3. Repeat this process until you have added a reserved drive in the place of each actual library drive that is not being added. The total number of drives, actual and reserved, listed in the Library Drives page must equal the total number of drives in the library.

   In addition, all drives in the library, including reserved drives, must be defined in the order that the vendor numbers its drive elements. For example, if you have a library with four drives and you are not using the third drive in the library, the reserved drive must appear in place of the third drive in the list. For more information, see "Setting Drive Order, " which follows.

Setting Drive Order

When you add drives manually, you must be sure they are ordered according to the drive order in the library. If you are adding a SCSI library, a configuration test can tell you if the order of the drives is correct.

To change the order of a library drive:

1. Highlight the drive and then use the up and down arrows to the right of the Drives list to promote or demote the drive's position in the list.
2. If you are adding a SCSI library, perform a configuration test to determine if the order of the drives is correct. For instructions, see "Testing Drive Configuration, " which follows.

Testing Drive Configuration

When you manually add SCSI library drives, you should perform a configuration test on the library to ensure the drives are ordered properly. Media must be present in the library before you can perform a configuration test. Automatic configuration should order your drives properly when they are added, but you may wish to perform a configuration test anyway.

Note: The configuration test function is not supported for serial libraries.

Note: Before performing a configuration test on a DVD library, make sure there is no unformatted media in the library. This has been known to cause an error in the configuration test, even though the library configuration itself is correct. We recommend you place a piece of formatted media into the library prior to the test.

To perform a configuration test:

1. Click Test Config on the Library Drives page. A status message appears while the library and its drives are assessed.

   After the test is complete, a message returns stating whether the test succeeded.
2. Click OK to exit the message and return to the Library Drives page.
3. If the configuration test fails, verify each of the following:
   - The drives are ordered properly. To change drive order, see “Setting Drive Order” on page 67.
   - The number of drives in the library matches the number of drives listed. If any of the drives in the library are not listed, either add the drive manually or add a reserved drive as a placeholder. For instructions, see “Manually Configuring Drives” on page 65 or “Adding Reserved Drives” on page 66.
   - No standalone or external drives have been selected.
   - There is media in the library. For DVD libraries, make sure there is formatted media in the library. Unformatted media may cause a configuration test to fail.
4. Perform another configuration test to ensure accuracy.

Configuring the Library Auto Clean Page

The Library Auto Clean page allows you to set up automatic cleaning options based on read/write usage for tape library drives. This allows you to store a cleaning cartridge in the library and clean the drives automatically without manual intervention.

If you are not configuring a tape library, the Library Options page appears. For instructions, see "Configuring the Library Options Page, " which follows.

To configure the Library Auto Clean page:

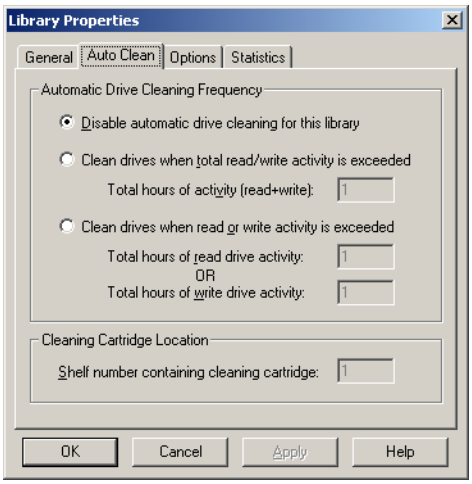
1. Be sure that the cleaning cartridge is resident in the library. This allows MediaStor to find the cleaning cartridge and insert it into the library drives when appropriate.

   Note: The cleaning cartridge must *not* be placed in the *first* shelf of the library. Otherwise, the hardware inventory for the library may fail.

2. On the Library Auto Clean page, you have the following options:

   - To disable automatic cleaning, select Disable automatic drive cleaning for this library.

Figure 28. Hardware Wizard – Library Auto Clean Page



   - To set up automatic cleaning to occur after a specified amount of total read/write activity has occurred, select Clean drives when total read/write activity is exceeded. Then enter the total number of hours the drive must be in use before the drive is cleaned in the Total hours of activity text box.

   - To set up automatic cleaning to occur after a specified amount of either read or write activity has occurred, select Clean drives when read or write activity is exceeded. Then enter separately the total number of hours each drive must be in use for read or for write before the drive is cleaned.

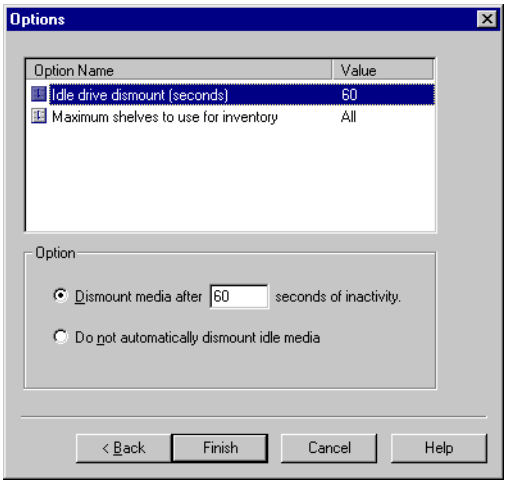
3. If you enabled automatic cleaning, enter the shelf number where the cleaning cartridge is located. The cleaning cartridge must already be resident in the identified shelf.

4. Click Next. The Library Options page appears. For instructions, see "Configuring the Library Options Page, " which follows.

Configuring the Library Options Page

The Library Options page lists all configurable options available for the library.

Figure 29. Hardware Wizard – Library Options Page



The configuration options that appear in the lower part of the Library Options page correspond to the option selected in the list in the upper part of the Library Options page.

To configure the Library Options page:

1. Configure the Idle drive dismount option, which allows you to specify whether you want to dismount media in the library after a specified amount of time has passed without read or write requests. You have the following choices:

   - To allow the library to dismount media from a drive after a certain number of seconds has passed without a read or write request for that media, enable the Dismount media option. Then enter the number of seconds that should pass before the library dismounts the media. The default value is 60 seconds.

   - To leave media in a drive regardless of how long the media has been inactive, select the Do not automatically dismount the media option. Media is dismounted when another piece of media must be mounted in the drive for a read or write request.

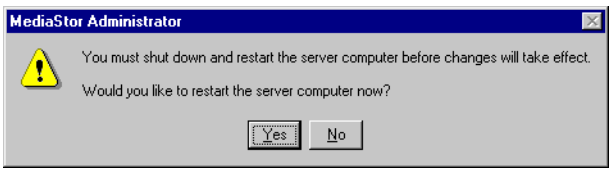
2. Configure the Maximum shelves to use for inventory option, which allows you to specify how many shelves MediaStor should use. This feature can

be used to partially utilize a library with a damaged shelf or to prevent automatic inventory of a large number of shelves, which can take a long time. You have the following choices:

- Select the Use all shelves in this library option to use all of the library shelves to hold media for the media service. This is the default.
- Select the Use only the first __ shelves option to only use a select number of shelves (consecutively starting with the first shelf) to hold media for the media service. Then enter the number of consecutive shelves (starting from the first shelf and including the specified shelf) that MediaStor should use.

3. Click Finish. In most cases, MediaStor requires that the computer be rebooted when new devices are configured. If reboot is required, MediaStor prompts you to reboot the computer.

Figure 30. Reboot MediaStor Computer? Message



4. Click Yes to reboot the MediaStor computer. Once the computer reboots, the device is added to the MediaStor configuration.

Note: You may receive an “Invalid Driver” error after restarting the MediaStor computer. This occurs most frequently on a Windows 2000 platform with libraries with 4 or more drives, and typically happens for one of two reasons: either the native Windows plug-and-play drivers claimed the devices before the MediaStor drivers could, or the MediaStor service completed startup before all of the drives were initialized. To clear the error, try stopping then restarting the MediaStor service. If that does not clear the error, contact your technical support representative, who may advise you to run the ScsiUpdate command line utility.

Note: If you add a library to MediaStor in a clustered environment and the initial inventory of the library fails after the first several pieces of media, set the library offline and then online again, and when prompted, run a full inventory and force a hardware reset, in order to properly inventory the library. For more information on setting the library offline and online, see “Setting a Library Offline” on page 79 and “Setting a Library Online” on page 79. For more information on clustering, see *Appendix A: Clustering* of the *ASM Data Manager Getting Started Guide*.

Managing Media in a Library

When adding media to a library, certain hardware issues must be addressed. The procedures for adding media are dictated by the specific library being used. Some libraries require that the device be taken offline before inserting media, while other devices allow for media insertion while online.

Library procedures differ by model. For example, some libraries have a mailslot into which media is placed before it is put on a shelf or mounted in a drive. Some libraries use magazines that hold several pieces of media, so that when a magazine is removed, multiple pieces of media are removed as well. Libraries using magazines must be taken offline before you eject the magazine. Once you re-insert the magazine, you can set the library online and it can be inventoried. Always be sure to inventory those shelves where the media status has changed, even if you've switched media on two different shelves.

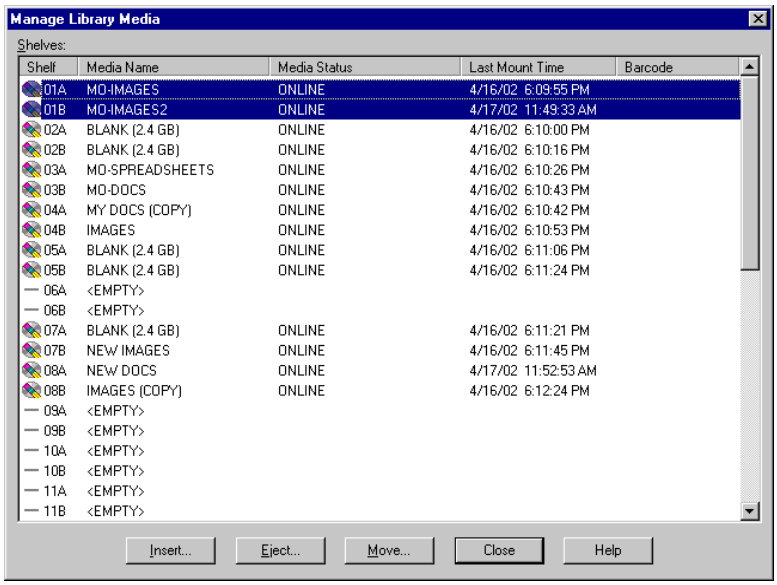
For instructions on setting libraries online and offline, see "Setting a Library Offline" on page 79 and "Setting a Library Online" on page 79.

Quick access to all aspects of library media management is available through the Manage Media feature. Depending on the limitations of the library, you may be able to insert, move, and eject media using this dialog box. You can also monitor media status.

To manage library media:

1. Right-click on the name of the library in the Hardware tree and select Manage Media from the shortcut menu. The Manage Library Media dialog box appears.

Figure 31. Manage Library Media Dialog Box



The Manage Library Media dialog box lists the library drives and shelves, along with what media is located on each shelf and the status of the media.

2. You have the following choices:

   - Insert a piece of media into the library. For instructions, see "Inserting Media, " which follows.
   - Move a piece of media from one library shelf to another. For instructions, see “Moving Media” on page 74.
   - Eject a piece of media from the library. For instructions, see “Ejecting Media” on page 75.

   Note: Some options may not be available, such as when the library does not support certain commands or has no mailslot. In those cases, the appropriate buttons are disabled.

3. When you finish, click Close to close the Manage Library Media dialog box.

Inserting Media

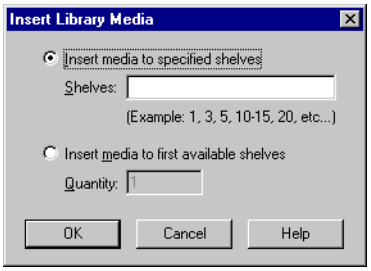
Some library models have individual procedures for inserting media, such as opening up a door to place media into the shelves. This type of model also requires the library be taken offline while media is inserted, and then set online and inventoried once the media is in place. For information about inserting media into your library, refer to the individual library documentation.

If the library supports it, you can insert media using the Insert Library Media function.

To insert media into a library:

1. Click the Insert button in the Manage Library Media dialog box. The Insert Library Media dialog box appears.

Figure 32. Insert Library Media Dialog Box



Note: If specific shelves are selected in the Manage Library Media dialog box at the time you click Insert, MediaStor automatically enables the Insert media to specified shelves option and enters those shelf numbers in the Shelves text box.

2. There are two options for inserting media:
   - To insert media to specific shelves, select Insert media to specified shelves and then enter the numbers of the appropriate shelves in the Shelves text box.
   - To automatically insert media to available shelves, select Insert media to first available shelves and then specify the quantity of media you are inserting.
3. Click OK. The media is inserted onto the shelves as configured. The status of the shelf reads “Inventory Pending” until the media is mounted.

Note: If the library in use has no mailslot, special considerations apply. The library must be set offline before you manually place media in the shelf or magazine location. Once the desired media is inserted, the library must be set back online, and MediaStor prompts you to inventory the library. For instructions on setting libraries online and offline, see “Setting a Library Offline” on page 79 and “Setting a Library Online” on page 79.

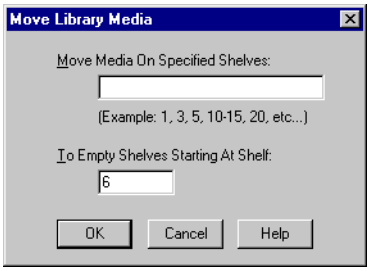
Moving Media

From the Manage Library Media dialog box you can move a piece of media from one library shelf to another. The Move feature allows you to optimize system performance by keeping the most frequently used pieces of media closest to the library drives. It also allows you to group media for organization purposes, such as for each department in the workplace.

To move media in a library:

1. Click the Move button in the Manage Library Media dialog box. The Move Library Media dialog box appears.

Figure 33. Move Library Media Dialog Box



Note: If specific shelves are selected in the Manage Library Media dialog box at the time you click Move, MediaStor automatically enters those shelf numbers in the Move Media On Specified Shelves text box.

2. In the Move Media On Specified Shelves text box, enter the number(s) of the shelf/shelves where the media to be moved is currently located.

3. In the To Empty Shelves Starting At Shelf text box, enter the number of the shelf where MediaStor should start to place media. MediaStor will begin to move the media to that shelf and continue to place media on each available shelf in sequence until all moved media is remounted.

4. Click OK. The specified media is moved.

Ejecting Media

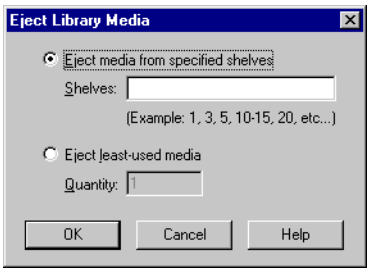
From the Manage Library Media dialog box, you can eject a piece of MediaStor media from the library. You can choose to eject a specific piece of media, or some quantity of the least frequently used media. MediaStor continues to track ejected media and prompts you to reinsert the media when read and write requests are received.

Note: If the library in use has no mailslot, special considerations apply. The library must be set offline before you manually remove media from the shelf or magazine location. Once the media is removed, the library must be set back online, and MediaStor prompts you to inventory the library. For instructions on setting libraries online and offline, see “Setting a Library Offline” on page 79 and “Setting a Library Online” on page 79.

To eject media from a library:

1. Click the Eject button in the Manage Library Media dialog box. The Eject Library Media dialog box appears.

Figure 34. Eject Library Media Dialog Box



Note: If specific shelves are selected in the Manage Library Media dialog box at the time you click Eject, MediaStor automatically enables the Eject media from specified shelves option and automatically enters those shelf numbers in the Shelves text box.

2. There are two options for ejecting media:

   - To eject media on specific shelves, select Eject media from specified shelves and then enter the numbers of the desired shelves in the Shelves text box.
   - To eject the least frequently used pieces of media, select Eject least-used media and then specify the quantity of media to be ejected.

3. Click OK. The specified media is ejected.

Modifying a Library

Several aspects of a library's configuration can be changed at any time, if necessary. You can modify the library name, drive type, or file system setting, add or remove drives as needed, change the drive event settings, and reconfigure library options.

Modifying a library takes you back through the steps of the Hardware Wizard you used to add the library. You can change the information on each of the pages in the same way you set the library up when you added it to MediaStor.

To modify a library:

1. Set the library offline. For instructions, see "Setting a Library Offline" on page 79.
2. Right-click the library you want to modify and then select Modify from the shortcut menu. A confirmation message appears.
3. Click Yes. The Hardware Wizard Library Configuration page appears. For instructions, see "Configuring the Library Configuration Page" on page 59.
4. Click Next. One of the following occurs:
   - If you are configuring a serial library, the Serial Library Information page appears. For instructions, see "Configuring the Serial Library Information Page" on page 61. Then click Next. The Library Drives page appears. For instructions, see "Configuring the Library Drives Page" on page 61.
   - If you are not configuring a serial library, the Library Drives page appears. For instructions, see "Configuring the Library Drives Page" on page 61.
5. Click Next. One of the following occurs:
   - If you are modifying a tape library, the Library Auto Clean page appears. For instructions, see "Configuring the Library Auto Clean Page" on page 69. After you finish configuring the Library Auto Clean page, click Next. The Library Options page appears. For instructions, see "Configuring the Library Options Page" on page 70.
   - If you are not modifying a tape library, the Library Options page appears. For instructions, see "Configuring the Library Options Page" on page 70.
6. Click Finish. You may be required to reboot to allow changes to be made to your SCSI configuration.

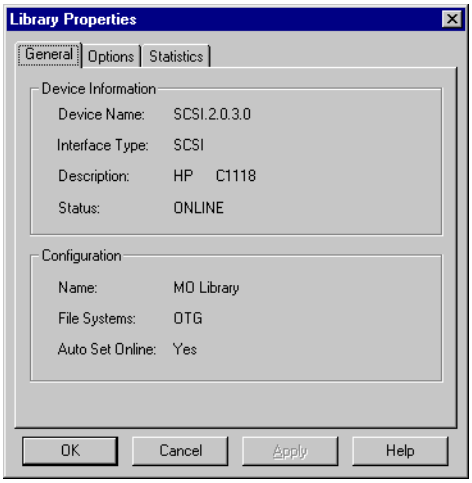
Viewing Library Properties

Accessing the Library Properties dialog box and selecting each of the tabs allows you to view and change the settings established when the library was added to MediaStor.

To view library properties:

1. Right-click the library whose properties you want to view and then select Properties from the shortcut menu. The Library Properties dialog box appears with the General tab active by default.

Figure 35. Library Properties Dialog Box



Library Properties are summarized on the following tabs:

- The General tab corresponds to the Library Configuration page of the Hardware Wizard you used to add the library to MediaStor, except that none of the fields are editable. For more information, see “Configuring the Library Configuration Page” on page 59.
- The Auto Clean tab, which only appears if you are viewing the properties for a tape library, corresponds to the Library Auto Clean page of the Hardware Wizard. You can edit the automatic cleaning settings on the Auto Clean tab. For more information, see “Configuring the Library Auto Clean Page” on page 69.
- The Options tab corresponds to the Library Options page of the Hardware Wizard. You can edit the options. For more information, see “Configuring the Library Options Page” on page 70.
- The Statistics tab contains information about media mounts and file read and write statistics. For more information, see "The Statistics Tab, " which follows.

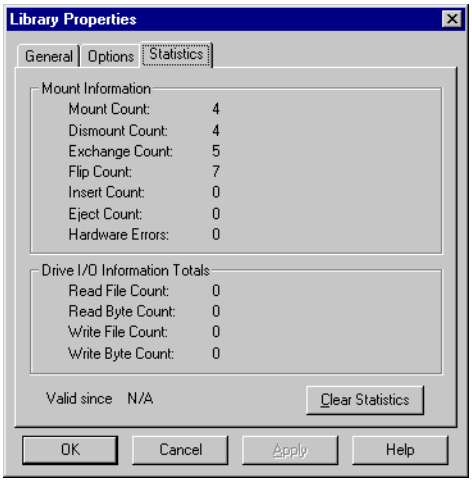
2. As with most Properties functions in ASM, when you finish you have three options:

- To save changes and close the Properties dialog box, click OK.
- To save changes and keep the Properties dialog box open, click Apply.
- To discard all changes made since the Properties dialog box was opened (or since the Apply button was last used) and close the Properties dialog box, click Cancel.

The Statistics Tab

When you select a drive in the Drives list and click the Statistics tab in the Library Properties dialog box, the mount information and Drive I/O totals for that drive are shown.

Figure 36. Library Properties – Statistics Tab



The following table describes each of the items appearing on the Statistics tab:

Table 7. Library Properties Dialog Box – Statistics Tab Items

Item	Description
Mount Count	Number of mounts per current session
Dismount Count	Number of dismounts per current session
Exchange Count	Number of times media on a shelf is exchanged with media in a drive per current session
Flip Count	Number of pieces of media that were flipped during current session
Insert Count	Number of pieces of media that were inserted during current session
Eject Count	Number of pieces of media that were ejected during current session
Hardware Errors	Number of hardware errors encountered per current session

Table 7. Library Properties Dialog Box – Statistics Tab Items

Item	Description
Read File Count	Number of read requests during current session
Read Byte Count	Number of bytes of files read during current session
Write File Count	Number of write requests during current session
Write Byte Count	Number of bytes of files written during current session
Valid Since	The date from which the statistics on this tab are calculated
Clear Statistics button	To clear the statistics and reset the date from which the statistics on this tab are calculated, click Clear Statistics.

Setting a Library Offline

If a library is experiencing hardware problems or needs to be opened for maintenance or troubleshooting, it should first be taken offline. Once the problem is corrected, the library may then be placed back online.

To set a library offline:

1. Right-click the library in the Hardware tree. If the library is online, the Set Offline option is active in the shortcut menu.
2. Select Set Offline from the shortcut menu. A confirmation message appears.
3. Click Yes.

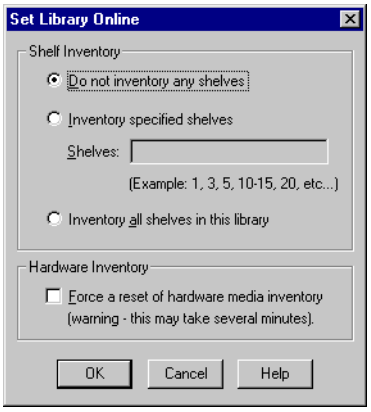
Setting a Library Online

A library must be online in order for MediaStor to perform media functions in that library. If the library is offline, then all drives are inactive and programs cannot write to or read from the media. You can, however, view shelf position and label information for offline media in a library. This information appears in the Manage Library Media dialog box, which can be accessed by right-clicking on the name of the library in the Hardware tree and selecting Manage Media from the shortcut menu.

To set a library online:

1. Right-click the library in the Hardware tree. If the library is offline, the Set Online option is active in the shortcut menu.
2. Select the Set Online option from the shortcut menu. The Set Library Online dialog box appears.

Figure 37. Set Library Online Dialog Box



3. Choose whether you want to inventory the shelves in the library. You have the following choices:

   - To set the library online without inventorying shelves (the latest shelf inventory is assumed to be accurate), select Do not inventory any shelves.
   - To inventory only certain shelves, select Inventory specified shelves and then enter the number of each shelf to be inventoried. To inventory a certain range of shelves, specify the first and last shelf numbers (separated by a hyphen [-]) from lowest to highest. You can also specify individual shelves by listing the shelf numbers separated by commas.
   - To inventory every shelf in the library, select Inventory all shelves in this library. Note that an inventory of the entire library may take a long time. This is the default.

   Note: If a library is configured not to be set online automatically on startup, the first time the library is set online, all shelves are inventoried.

   Note: MediaStor stores which shelves contain media and the applicable media labels in the Windows registry. When a library inventory is performed, MediaStor checks each shelf for changes in the status of the shelves or the media. For shelves selected for inventory, MediaStor mounts the media and reads the labels.

4. If you do *not* want to perform a full inventory of all shelves, full and empty, upon setting the library online, disable the Force a reset of hardware media inventory check box.

5. Click OK. One of the following occurs:

   - If you left the defaults (full inventory and hardware reset), the library is inventoried and set online.

- If you changed the defaults, a warning message appears. To return to the Set Library Online dialog box and change your selections, click No. To continue setting the library online, click Yes.

Note: Media is not mounted to a library drive that is offline. This is helpful for troubleshooting, repair, and maintenance of library drives without deleting the library from MediaStor. Never service any device while it is online, including offline drives that reside in an online library.

Deleting a Library

A library can be deleted from the MediaStor hardware configuration at any time. Once a library is deleted, it is permanently removed from configuration. In order to use this library, it must again be added through the Hardware Wizard. Care should be taken when deleting a library, as it may be more helpful to set the library offline if it is to be used again. This is helpful if a problem occurs with the library and it is necessary to remove it only temporarily from the configuration.

To delete a library from MediaStor:

1. Set the library offline. For instructions, see “Setting a Library Offline” on page 79.
2. Right-click the library you want to delete and then select Delete from the shortcut menu. A confirmation message appears.
3. Click Yes.

Note: You may be required to reboot to allow changes to be made to your SCSI configuration.

Managing Towers

A tower is a group of standalone (non-library) drives in which you manually mount and dismount media during runtime. You can manage the drives in each tower and set them online or offline. From the shortcut menu on each tower’s node in the Hardware tree, you can add, modify, and delete towers and their drives.

For more information, see the following sections:

- "Adding a Tower, " which follows
- “Modifying a Tower” on page 86
- “Viewing Tower Properties” on page 87
- “Setting a Tower Offline” on page 88

- “Setting a Tower Online” on page 88
- “Deleting a Tower” on page 88

Adding a Tower

The Hardware Wizard leads you step-by-step through the process of adding a tower to MediaStor. You can configure the tower at the time you create it, or you can access and change these configurations later through the Hardware Wizard. The tabs of the Tower Properties dialog box are identical to the corresponding pages of the Hardware Wizard.

Any drive currently listed in the Windows registry can be added to MediaStor.

Note: The Windows Registry contains an inventory of all SCSI devices connected, powered on, and responding upon startup. For a full list of supported towers, refer to the Supported Device List available on the StorageTek website: http://www.support.storagetek.comand on the install CD.

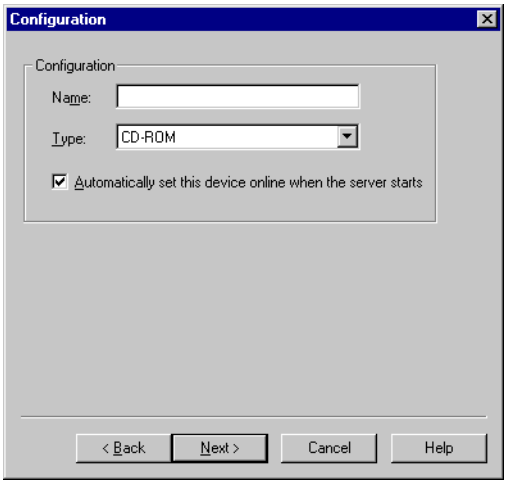
To add a tower:

1. Right-click on the Hardware node and select New from the shortcut menu to start the Hardware Wizard. The Add New Hardware Device page appears.

Figure 38. Hardware Wizard -- Add New Hardware Device Page

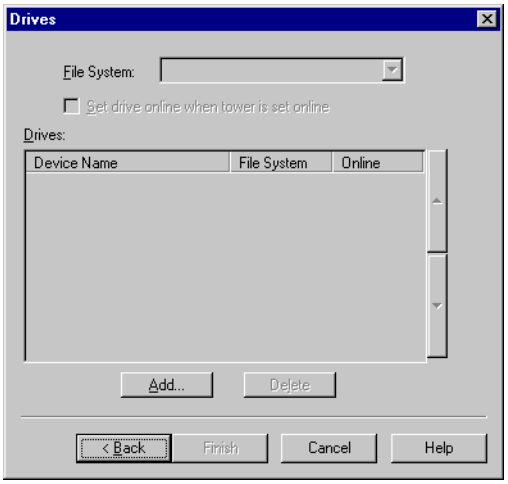
2. Select the Tower option and click Next. The Tower Configuration page appears.

Figure 39. Hardware Wizard – Tower Configuration Page



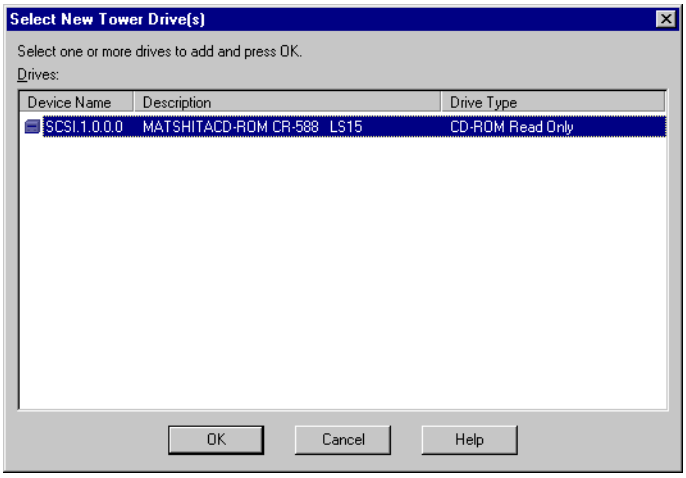
3. In the Name text box, enter a name for the tower. Tower names are used only for user interface purposes and can be any alphanumeric string, up to 32 characters.
4. Select the type of media the tower uses. MediaStor detects the type of tower and enters that type by default.
5. Select whether to set the tower online when the MediaStor service starts. You have the following choices:
   - To set the tower online when the MediaStor service starts, leave the default setting of enabled for the Automatically set this device online when the server starts option. This allows the system to automatically set the tower online during system startup.
   - Disable the Automatically set this device online when the server starts check box to prevent the tower from being set online when the MediaStor service starts. If you disable this option, you need to set the tower online manually.
6. Click Next. The Tower Drives page appears.

Figure 40. Hardware Wizard -- Tower Drives Page



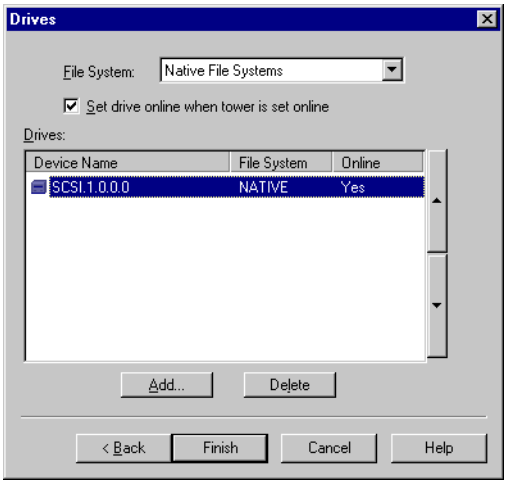
7. To add drives to the tower, click Add. The Select New Tower Drive(s) dialog box appears. This dialog box lists all drives currently available for addition to the tower configuration.

Figure 41. Select New Tower Drive(s) Dialog Box



8. Select the drives you want to add and then click OK. The Tower Drives page reappears listing the drives that have been added.

Figure 42. Hardware Wizard -- Tower Drives Page with Drive Added



For each drive added, the Tower Drives page shows the SCSI device name along with the default file system selected for the drive.

9. If necessary, highlight each drive in the list and select the appropriate file system for the drive from the File System drop-down list. For more information on file systems, see “Types of Media File Systems” on page 17.

   Note: You cannot combine different file systems within a single tower. All drives must use the Windows Native file system, ASM file system, or UDF file system.

10. Make sure the tower drives are listed in the same order that they exist in the tower. To change the order of a drive, select the drive and then use the up and down arrows to the right of the Drives list to promote or demote the drive’s position in the list.

11. Configure the drive activation settings for each drive. You have the following choices:

    - Leave the default setting of enabled for the Set drive online when tower is set online option. This sets the drive online when the tower comes online.
    - Disable the Set drive online when tower is set online check box to prevent a drive from being set online when the tower comes online.

    Note: At least one drive must be configured to be set online when the tower comes online. The tower cannot be set online without any online drives.

12. To delete a drive from the tower configuration, select the drive from the Drives list and then click Delete.

13. Click Finish.

Note: Adding some devices causes MediaStor to prompt you to reboot.

Modifying a Tower

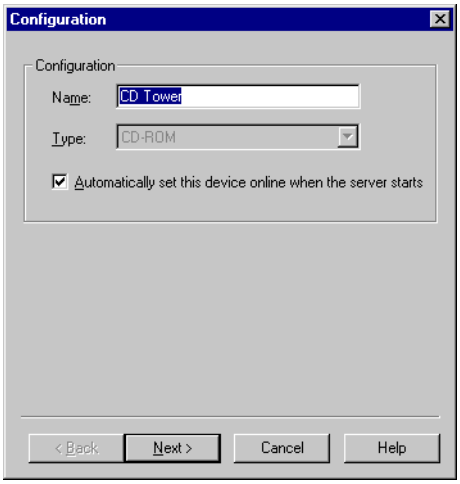
A tower's configuration can be modified at any time, if necessary. You can modify the tower name and startup setting, add or remove drives as needed, and change the drive activation settings.

Modifying a tower takes you back through the Hardware Wizard you used to add the tower to MediaStor. You can change the information on each of the pages in the same way you set the tower up when you added it to MediaStor.

To modify a tower:

1. Set the tower offline. For instructions, see "Setting a Tower Offline" on page 88.
2. Right-click the tower you want to modify and then select Modify from the shortcut menu. A confirmation message appears.
3. Click Yes. The Hardware Wizard Tower Configuration page appears.

Figure 43. Hardware Wizard -- Tower Configuration Page



The Tower Configuration page is identical to the page you configured when you added the tower except that you cannot change the tower type. For instructions, see "Adding a Tower" on page 82.

4. Click Next. The Tower Drives page appears and is also identical to the page you configured when you added the tower.
5. Click Finish. You may be required to reboot to allow changes to be made to your SCSI configuration.

Viewing Tower Properties

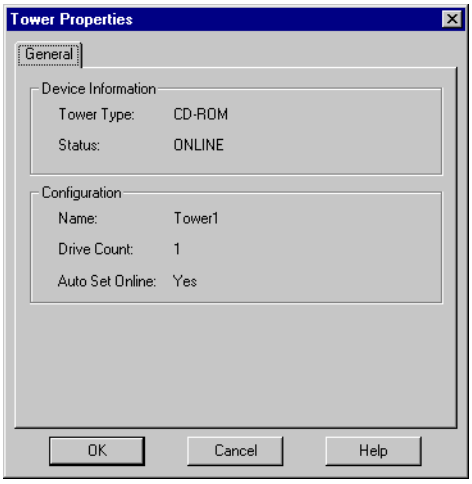
Accessing the Tower Properties dialog box allows you to view the settings established when the tower was added to MediaStor.

Note: Properties can also be viewed for individual drives within the tower. Drive properties for tower drives include the General tab, with general drive information, and the Statistics tab. For details on these tabs, see “Viewing Standalone Drive Properties” on page 92.

To view tower properties:

1. Right-click the tower whose properties you want to view and then select Properties from the shortcut menu. The Tower Properties dialog box appears.

Figure 44. Tower Properties – General Tab



The information provided is described in the following table:

Table 8. Tower Properties General Tab Information

Item	Description
Tower Type	The type of media the tower uses
Status	Whether the tower is online or offline
Name	The name assigned to the tower
Drive Count	The number of drives in the tower
Auto Set Online	Whether the device is automatically set online when MediaStor starts

2. As with most Properties functions in ASM, when you finish you have three options:
   - To save changes and close the Properties dialog box, click OK.

- To save changes and keep the Properties dialog box open, click Apply.
- To discard all changes made since the Properties dialog box was opened (or since the Apply button was last used) and close the Properties dialog box, click Cancel.

Setting a Tower Offline

If a tower is experiencing hardware problems or needs to be opened for maintenance or troubleshooting, it should first be taken offline. Once the problem is corrected, the tower may then be placed back online.

To set a tower offline:

1. Right-click the tower in the Hardware tree. If the tower is online, the Set Offline option is active in the shortcut menu.
2. Select Set Offline from the shortcut menu. A confirmation message appears.
3. Click Yes.

Note: As some tower drives support automatic eject (for example, HP), and some do not (for example, Ricoh), MediaStor does not automatically eject media when set offline. Media must be ejected using the front panel of the drive.

Setting a Tower Online

A tower must be online for MediaStor to perform media functions using drives in that tower. If the tower drives are offline, they are inactive and you cannot view media statistics, or write to or read from the media.

When a tower is set online, MediaStor inventories the media inserted to determine if it recognizes the file format. If the media has never been formatted, or if it has been formatted for a file system other than the one configured for the drive, MediaStor identifies the media as “foreign.”

To set a tower online:

1. Right-click the tower in the Hardware tree. If the tower is offline, the Set Online option is active in the shortcut menu.
2. Select Set Online from the shortcut menu. A confirmation message appears.
3. Click Yes.

Deleting a Tower

A tower can be deleted from MediaStor at any time. Once a tower is deleted, it is permanently removed from configuration. In order to use this tower again, it

must be added through the Hardware Wizard. Care should be taken when deleting a tower, as it may be more useful to set the tower offline if the tower is to be used again. This is helpful if a problem occurs with the tower and it is necessary to remove it only temporarily from the configuration.

To delete a tower from MediaStor:

1. Set the tower offline. For instructions, see “Setting a Tower Offline” on page 88.

1. Right-click the tower you want to delete, and then select Delete from the shortcut menu that appears.

2. Click Yes.

Note: If an ASM file system was used in the device, you must reboot to allow Windows drivers to reclaim the device for use within Windows. Additionally, drive letters may not be reassigned to devices using Windows file systems until after reboot.

Managing Standalone Drives

Standalone drives can be useful as alternate devices, especially in the case of library malfunction. Standalone drives are non-library drives in which you manually mount and dismount media during runtime.

For more information, see the following sections:

- "Adding a Standalone Drive, " which follows
- “Modifying a Standalone Drive” on page 92
- “Viewing Standalone Drive Properties” on page 92
- “Setting a Standalone Drive Offline” on page 97
- “Setting a Standalone Drive Online” on page 97
- “Deleting a Standalone Drive” on page 97

Adding a Standalone Drive

The Hardware Wizard leads you step-by-step through the process of adding a standalone drive to MediaStor. You can configure the standalone drive at the time you create it, or you can access and change these configurations later through the Hardware Wizard.

Once a standalone drive has been added to the MediaStor hardware configuration, it appears in the Hardware tree. A drive can be modified at any time if necessary.

The Windows Registry contains an inventory of all SCSI devices connected, powered on, and responding upon startup. Any supported standalone drive currently listed in the Windows registry can be added to MediaStor. For a full list of supported devices, refer to the Supported Device List available on the StorageTek website: http://www.support.storagetek.com/, and on the install CD. You can also open SCSI Manager to see if the configuration file is loaded for the device. If it is, you can configure the device in MediaStor.

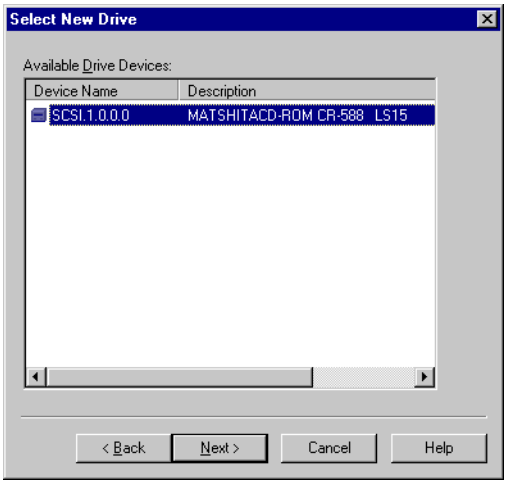
To add a standalone drive:

1. Right-click on the Hardware node and select New from the shortcut menu to start the Hardware Wizard. The Add New Hardware Device Page appears.

Figure 45. Hardware Wizard -- Add New Hardware Device Page

2. Select the Standalone drive option and click Next. The Select New Drive page appears.

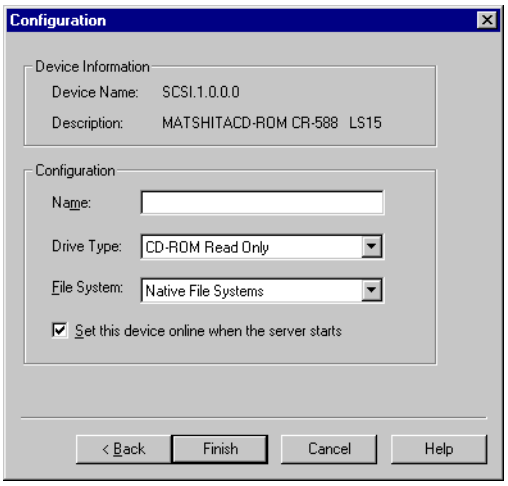
Figure 46. Hardware Wizard -- Select New Drive Page



The Select New Drive page lists of all the standalone drives currently listed in the Windows Registry that have not yet been added to MediaStor.

3. Select the standalone drive you want to add and click Next. The Standalone Drive Configuration page appears.

Figure 47. Hardware Wizard -- Standalone Drive Configuration Page



4. In the Name text box, enter a name for the standalone drive. Standalone drive names are used only for user interface purposes and can be any alphanumeric string, up to 32 characters.
5. From the Drive Type drop-down list, select the type of drive (media) that the standalone drive contains.
6. Select the file system the standalone drive uses. For more information on file systems, see “Types of Media File Systems” on page 17.
7. Select whether to set the standalone drive online when the MediaStor service starts. You have the following choices:
   - To set the standalone drive online when the MediaStor service starts, leave the default setting of enabled for the Set this device online when the server starts option. This allows the system to automatically set the standalone drive online during system startup.
   - Disable the Set this device online when the server starts check box to prevent the standalone drive from being set online when the MediaStor service starts. If you disable this option, you need to set the standalone drive online manually.
8. Click Finish.

Note: You may be required to reboot to allow changes to be made to your SCSI configuration.

Modifying a Standalone Drive

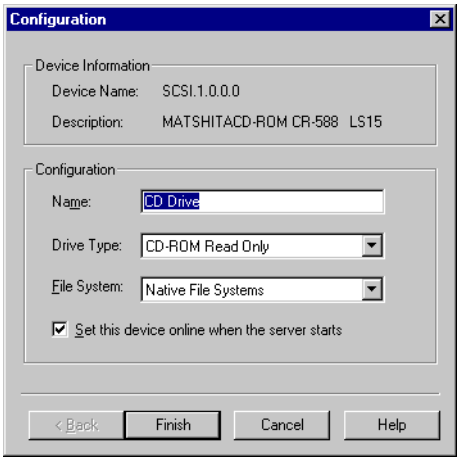
A standalone drive's configuration can be modified at any time, if necessary. You can modify the standalone drive name, drive type, file system, and startup setting.

Modifying a standalone drive takes you back through the Hardware Wizard you used to add the standalone drive to MediaStor. You can change the information in the same way you set the standalone drive up when you added it to MediaStor.

To modify a standalone drive:

1. Set the standalone drive offline. For instructions, see "Setting a Standalone Drive Offline" on page 97.
2. Right-click the standalone drive you want to modify and then Select Modify from the shortcut menu. A confirmation message appears.
3. Click Yes. The Hardware Wizard Standalone Drive Configuration page appears.

Figure 48. Standalone Drive Configuration Page



The Standalone Drive Configuration page is identical to the page you configured when you added the standalone drive. For instructions, see "Adding a Standalone Drive" on page 89.

4. Click Finish. You may be required to reboot to allow changes to be made to your SCSI configuration.

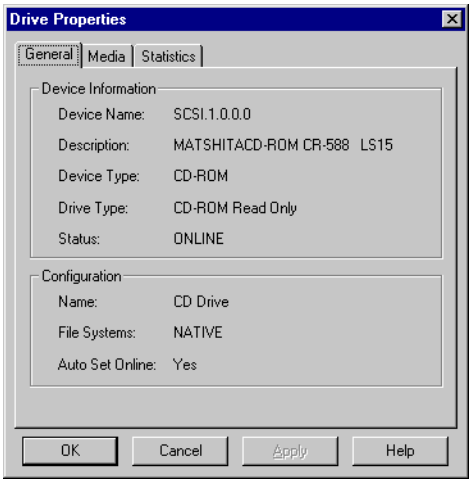
Viewing Standalone Drive Properties

Accessing the Standalone Drive Properties dialog box and selecting each of the tabs allows you to view the settings established when the standalone drive was added to MediaStor.

To view standalone drive properties:

1. Right-click the standalone drive whose properties you want to view and then select Properties from the shortcut menu. The Standalone Drive Properties dialog box appears with the General tab active by default.

Figure 49. Standalone Drive Properties – General Tab



2. Select and view the information on each of the tabs as necessary. For more information, see the following sections:

   - "The General Tab, " which follows
   - “The Media Tab” on page 94
   - “The Statistics Tab” on page 95

   Note: The Media tab appears only when there is media in the drive and the drive is online.

3. As with most Properties functions in ASM, when you finish you have three options:

   - To save changes and close the Properties dialog box, click OK.
   - To save changes and keep the Properties dialog box open, click Apply.
   - To discard all changes made since the Properties dialog box was opened (or since the Apply button was last used) and close the Properties dialog box, click Cancel.

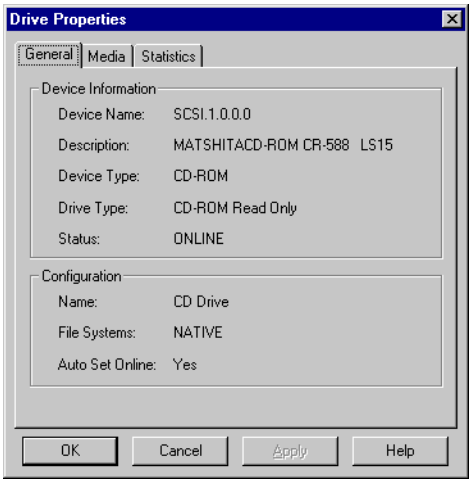
The General Tab

The General tab provides general information about the standalone device and the configuration.

To view the General tab:

- Select the General tab of the Standalone Drive Properties dialog box.

Figure 50. Standalone Drive Properties – General Tab



The General tab contains the following information:

Table 9. Standalone Drive Properties – General Tab Information

Item	Description
Device Name	The name of the interface to which the device is connected
Description	The device description derived from the inquiry string for the device provided by the hardware manufacturer and referenced in the Windows NT/2000 Registry
Device Type	The type of media used by the device in which the drive is contained
Drive Type	The type of media the drive uses
Status	Whether the drive is online or offline
Name	The name assigned to the drive when the drive was added to MediaStor
File System	The file system selected when the drive was added to MediaStor
Auto Set Online	Whether the device is set online when MediaStor starts

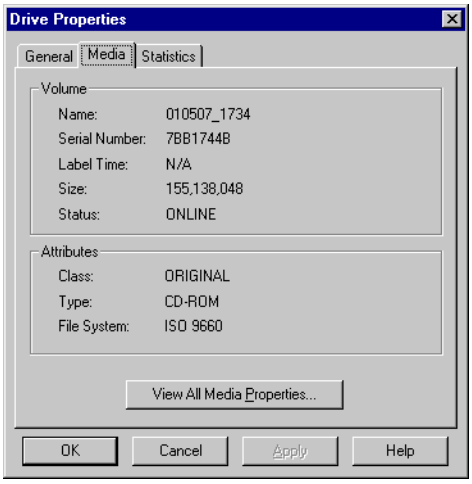
The Media Tab

The Media tab provides general information about media currently in the drive. This tab appears only when there is media in the drive and the drive is online.

To view the Media tab:

- Select the Media tab of the Standalone Drive Properties dialog box.

Figure 51. Standalone Drive Properties – Media Tab



The Media tab contains the following information:

Table 10. Standalone Drive Properties – Media Tab Information

Item	Description
Name	The name of the piece of media, taken from the volume label on the media
Serial Number	The serial number for the piece of media
Label Time	The date and time the media was labeled
Size	The amount of data on the media
Status	The current status of the media
Class	The media classification being used to track the function of the media (such as original or copy)
Type	The type of media in the drive
File System	The file system for the media
View All Media Properties	Allows you to view the Media Properties dialog box for the media in the drive. For more information, see “Viewing Media Properties” on page 102.

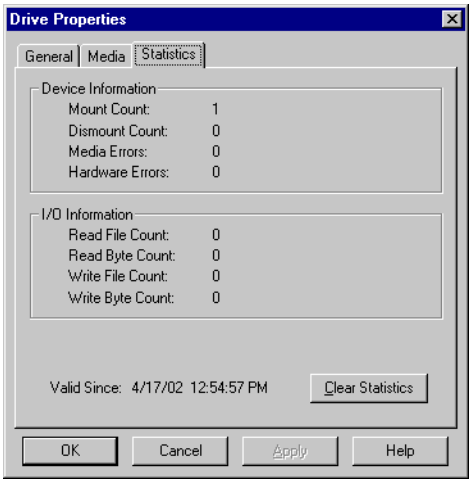
The Statistics Tab

The Statistics tab provides statistics on drive usage.

To view the Statistics tab:

- Select the Statistics tab of the Standalone Drive Properties dialog box.

Figure 52. Standalone Drive Properties – Statistics Tab



- The Statistics tab contains the following information:

Table 11. Standalone Drive Properties – Statistics Tab Information

Item	Description
Mount Count	The number of times media has been mounted in the drive
Flip Count	The number of times media in the drive has been flipped
Read File Count	The number of files read from media in the drive
Read Byte Count	The total number of bytes of files read from media in the drive
Write Byte Count	The total number of bytes of files written to media in the drive
Write File Count	The number of files written to media in the drive
Media Errors	The total number of errors that have occurred relating to media in the drive
Hardware Errors	The total number of errors that have occurred relating to the drive hardware
Valid Since	The date from which the statistics on this tab are calculated
Clear Statistics button	To clear the statistics and reset the date from which the statistics on this tab are calculated, click Clear Statistics.

Setting a Standalone Drive Offline

If a device is experiencing hardware problems or needs to be opened for maintenance or troubleshooting reasons, it should first be taken offline. Once the problem is corrected, the device may then be placed back online. Once a drive is offline, it is inactive and you cannot view media statistics or write to or read from the media.

Standalone drives always require the drive be taken offline while media is ejected or inserted. Once inserted, place the drive online to read the media.

Note: As some standalone drives support automatic eject (for example, HP), and some do not (for example, Ricoh), MediaStor does not automatically eject media when set offline. Media must be ejected using the front panel of the drive.

To set a standalone drive offline:

1. Right-click the drive in the Hardware tree. If the drive is online, the Set Offline option is active in the shortcut menu.
2. Select Set Offline from the shortcut menu. A confirmation message appears.
3. Click Yes.

Setting a Standalone Drive Online

A drive must be online in order for MediaStor to perform media functions using that drive. For example, standalone drives always require the drive be taken offline while media is ejected or inserted. Once inserted, place the drive online to read the media.

When a drive is set online, MediaStor inventories the media inserted to determine if it recognizes the file format. If the media is unsupported by MediaStor or has been formatted for a file system other than the one configured for the drive, MediaStor identifies the media as ‘foreign.’

To set a standalone drive online:

1. Right-click the drive in the Hardware tree. If the drive is offline, the Set Online option is active in the shortcut menu.
2. Select Set Online from the shortcut menu. A confirmation message appears.
3. Click Yes.

Deleting a Standalone Drive

A standalone drive can be deleted from MediaStor at any time. Once a drive is deleted, it is permanently removed from configuration. In order to use this

drive again, it must be added through the Hardware Wizard. Care should be taken when deleting a drive, as it may be more useful to set the drive offline if it is to be used again. Setting a drive offline is helpful if a problem occurs with the drive and it is necessary to remove it temporarily from the configuration.

To delete a standalone drive from MediaStor:

1. Set the standalone drive offline. For instructions, see “Setting a Standalone Drive Offline” on page 97.
2. Right-click the drive you want to delete, and then select Delete from the shortcut menu that appears.
3. Click Yes.

Note: You may be required to reboot to allow changes to be made to your SCSI configuration.

Managing Storage Media

6

By adding media to the MediaStor hardware devices, you create a supply of storage media that you can allocate for use by connected ASM Data Manager services. Media are listed in the MediaStor system as soon as they are inserted in the device and inventoried.

Media that have been added to the system but have not yet been allocated to a Data Manager extended drive appear in the Scratch Pool media tree. Media that have been allocated to a Data Manager extended drive can be found under their specific extended drive node in the Application Pools media tree.

When a piece of media is initially added to a media device, MediaStor evaluates the media, and places it in one of the eight nodes in the media tree. Which node it is placed in depends on the media's attributes, such as whether the media is formatted with a recognized file system, or if the media is not yet labeled. Once media attributes are determined, the media is added to the appropriate media class node. For more information on media class nodes, see “Media Pools” on page 47.

The following sections deals primarily with accessing information about the media and how to move the media between the Application and Scratch Pools:

- "Allocating Media to Application Pools, " which follows
- “Moving Media to the Scratch Pool” on page 101
- “Viewing Media Properties” on page 102
- “Deleting Media” on page 109

For more information about the types of media that MediaStor supports, see “Storage Media Considerations” on page 14.

Allocating Media to Application Pools

Once you have configured a MediaStor media service and created an extended drive in ASM Data Manager, you can allocate media to that extended drive using the Allocate Media to Application Pool feature in MediaStor. Allocating media to a Data Manager extended drive makes the media available to the Data Manager service so that you can begin migrating files to and reading files from that piece of media.

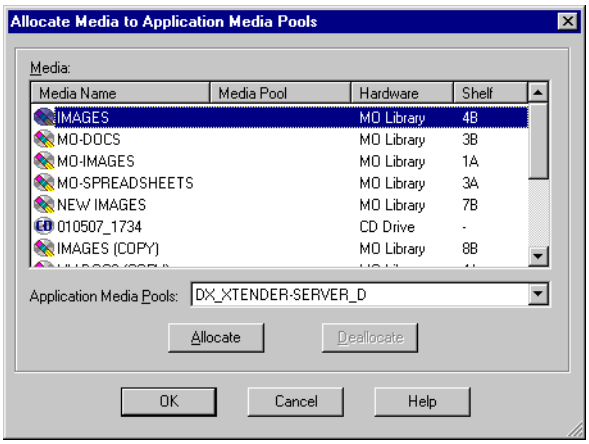
Note: You can also allocate media to an extended drive through the Data Manager interface. For instructions, see the *Managing Storage Media* chapter of the *ASM Data Manager System Guide*.

To allocate media to an application pool:

1. You have the following choices:

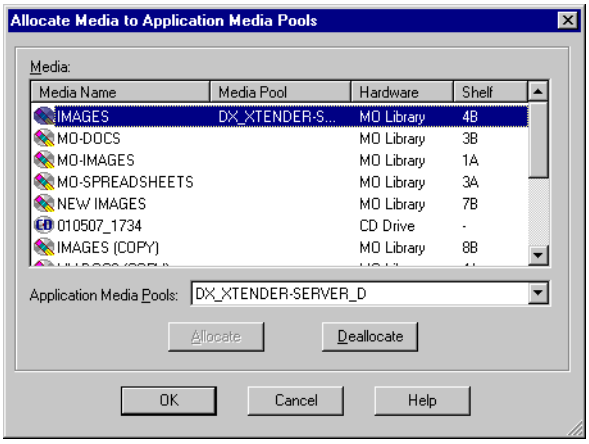
   - Select the piece of Scratch Pool media you want to allocate and then drag it to the application pool to which you want to allocate it. Click Yes on the confirmation message that appears. The media is allocated to the application pool.
   - Right-click a piece of Scratch Pool media and then select Allocate Media to Application Pool from the shortcut menu that appears. The Allocate Media to Application Media Pools dialog box appears.

Figure 53. Allocate Media to Application Media Pools Dialog Box



2. From the Application Media Pools drop-down list, select the Application Pool to which you want to allocate media.
3. Highlight the media you want to assign (or “allocate”) to that Application Pool.
4. Click Allocate. The selected media pool appears to the right of the media in the Media list.

Figure 54. Allocate Media to Application Media Pools Dialog Box



5. Repeat steps 2 through 4 for any remaining media you want to assign to any available Application Pool.
6. If you allocate media to an Application Pool incorrectly, highlight the media and click Deallocate.
7. When finished, click OK. In the tree view, the selected media is moved to the appropriate Application Pool(s). In Data Manager, the media appears under the Original media node for the extended drive.

Moving Media to the Scratch Pool

If you want to remove a piece of media from an Application Pool (ASM Data Manager extended drive), you can do so from either Data Manager or from MediaStor. Within Data Manager, you “deallocate” the media; within MediaStor, you move the media back to the Scratch Pool. For instructions on deallocating media in Data Manager, refer to the *Managing Storage Media* chapter of the *ASM Data Manager System Guide*.

To move media to the Scratch Pool:

1. You have the following choices:
   - Select the piece of application pool media you want to move and then drag it to the Scratch Pool.
   - Right-click the piece of Application Pool media that you want to move to the Scratch Pool, and then select Move Media to Scratch Pool from the shortcut menu that appears.

   A warning message appears to remind you that once removed, the media will no longer be available to the application.

Figure 55. Move Media to Scratch Pool Warning Message

2. Click Yes to remove the media from the Application Pool and place it in the Scratch Pool.

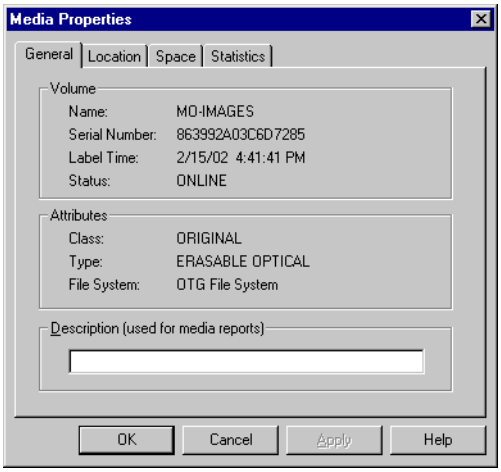
Viewing Media Properties

The properties command is always available for every piece of media in the MediaStor system, regardless of the current use, assignment, or status of the media. The Media Properties window consists of up to four tabs, including: General, Space, Location, and Statistics. The tabs that appear depend on the type of media and its status. For example, the Statistics tab does not appear for Blank media.

To view media properties:

1. In the tree view of the Administrator, right-click the media whose properties you want to view, and then select Properties from the shortcut menu that appears, or press <F2>. The Media Properties dialog box appears.

Figure 56. Media Properties Dialog Box



2. View and modify the settings on each of the tabs as necessary. For more information, see the following sections:
   - "The General Tab, " which follows
   - “The Location Tab” on page 105

- “The Space Tab” on page 106
- “The Statistics Tab” on page 107

3. As with most Properties functions in ASM, after making changes you have three options:
   - To save changes and close the Properties dialog box, click OK.
   - To save changes and keep the Properties dialog box open, click Apply.
   - To discard all changes made since the Properties dialog box was opened (or since the Apply button was last used) and close the Properties dialog box, click Cancel.

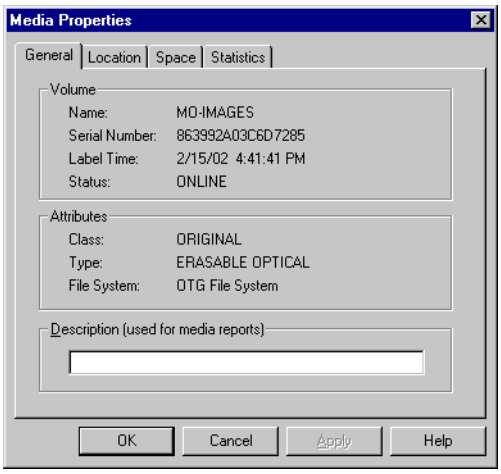
The General Tab

The General tab of the Media Properties dialog box provides identifying information for the selected media. For all except foreign, blank, and unformatted media, you can use this tab to enter a brief description of the media. This description is then used for media reports.

To view the General tab:

- Click the General tab.

Figure 57. Media Properties – General Tab



The information on the tab is separated into three sections: Volume, Attributes, and Description. The following table describes each of the items appearing on the General tab:

Table 12. Media Properties – General Tab Information

Item	Description
Name	Name assigned to the media when labeled.
Serial Number	Serial number of the media. For more information, see "Media Serial Numbers, " which follows.
Label Time	Date and time the media was labeled.
Status	Current status of media (typically online or offline).
Class	Current class of media, corresponding to the media's listing in the media pool tree. For more information, see “Media Pools” on page 47.
Type	The type of storage media.
File System	The media's file system.
Description	An editable field where you can enter a media description to be used for media reports. The maximum number of characters that can be entered into the Description text box is 64.

Note: For blank, foreign, unknown, unformatted, and corrupt media, the General tab displays “N/A” in the Name, Serial Number, and Label Time fields, and the Description field is not available for editing.

Media Serial Numbers

Because media can be taken from one ASM system and imported or placed in another, media name is not sufficient for tracking media. While not recommended, ASM does allow more than one piece of media with the same name. Therefore, ASM must use the serial number of media to track the media and the files migrated to the media.

ASM can support more than one piece of media with the same name on an extended drive, provided they have different serial numbers. If ASM identifies two pieces of media with the same serial number, it classifies one as Duplicate and requires that it be reformatted (which gives the media a new serial number) before it can be used.

Media serial numbers provide a way to track all ASM media uniquely, irrespective of the ASM system in which they were formatted. The serial number is an eight-byte integer, represented as a hexadecimal string in the following format: XXXXXXXXYYYYYYYY. The serial number is broken down as follows:

Table 13. Serial Number Interpretation

Position	Description
(XXXXXXXX)	The serial number from the Windows system boot drive (usually drive C:). Windows assigns this number when the hard drive is formatted. This number is unique for all hard disks.
(YYYYYYYY)	The encoded date/time that the media was labeled, expressed in seconds elapsed since midnight on January 1, 1970.

The Location Tab

The Location tab of the Media Properties dialog box provides information about the physical and logical location of the selected media. You can also enter an offline location for the media, which is used for mount requests and media reports. This location is also shown when a MEDIA NOT FOUND error appears.

To view the Location tab:

- Click on the Location tab.

Figure 58. Media Properties – Location Tab

The information on the tab is separated into three sections: Physical, Media Pool, and Offline Location. The following table describes each of the items appearing on the Location tab:

Table 14. Media Properties – Location Tab Information

Item	Description
Drive	The drive in which the media is mounted.
Library	The library in which the media is located, and the media's location in the library (drive and/or shelf number).
Name	The name of the media pool to which the media is assigned.
Application	The name of the application using the media.
Offline Location	Physical location where offline media are stored. Enter up to 32 characters in the text box (for example, Second Floor Storage Room, Shelf 25D).

Note: For blank, foreign, unknown, unformatted, and corrupt media, the Location tab displays "N/A" for the Folder field, and the Offline Location text box is unavailable for editing.

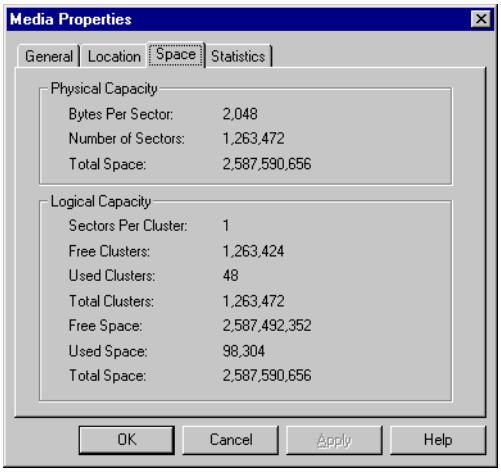
The Space Tab

The Space tab of the Media Properties dialog box provides statistical information on the physical and logical capacity of the media.

To view the Space tab:

- Click on the Space tab.

Figure 59. Media Properties – Space Tab



The information on the tab is separated into two sections: Physical Capacity and Logical Capacity. The following table describes each of the items appearing on the Space tab:

Table 15. Media Properties – Space Tab Information

Item	Description
Bytes per Sector	Number of bytes written to the media per sector (determined by media)
Number of Sectors	Total number of sectors on media
Total Space	Total media space, in bytes
Sectors per Cluster	Number of sectors per cluster
Free Clusters	Number of free clusters on the piece of media
Used Clusters	Number of used clusters on the piece of media
Total Clusters	Total number of clusters on the piece of media
Free Space	Free space in bytes on the piece of media
Used Space	Written space in bytes on the piece of media
Total Space	Total space in bytes on the piece of media

Note: For blank, foreign, unknown, unformatted, and corrupt media, the Space tab displays “N/A” for all fields in the Logical Capacity region of the tab. For unformatted media, the Space tab displays “N/A” for all fields in the Physical Capacity region. For blank, unknown, unformatted, and corrupt media, the Total Space is set to zero.

The Statistics Tab

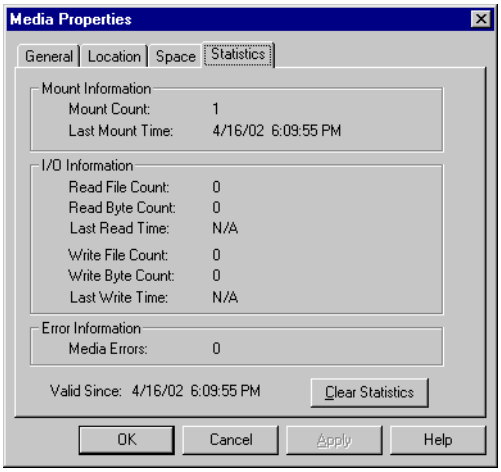
The Statistics tab of the Media Properties dialog box provides statistics relating to mounts, file input and output, and errors for the selected media.

Note: The Statistics tab does not appear for foreign, unformatted, blank, or corrupt media.

To view the Statistics tab:

- Click on the Statistics tab.

Figure 60. Media Properties – Statistics Tab



The information on the Statistics tab is separated into three sections: Mount Information, I/O Information, and Error Information. It also provides information on the date from which the statistics are calculated. The following table describes each of the items appearing on the Statistics tab:

Table 16. Media Properties – Statistics Tab Items

Item	Description
Mount Count	Number of mounts per current session
Last Mount Time	Time the media was last mounted
Read File Count	Number of read requests during current session
Read Byte Count	Number of bytes of files read during current session
Last Read Time	Time the media was last read
Write File Count	Number of write requests during current session
Write Byte Count	Number of bytes of files written during current session
Last Write Time	Time the media was last written
Media Errors	Number of errors encountered per current session
Valid Since	The date from which the statistics on this tab are calculated
Clear Statistics button	To clear the statistics and reset the date from which the statistics on this tab are calculated, click Clear Statistics.

Deleting Media

Once you delete media from MediaStor, you can remove the media from the media device. If you do not remove the media from the hardware device, it reappears in the Scratch Pool the next time the device is inventoried (if the media is still present at that time).

The hardware device must be set offline before media in the device can be deleted. In addition, only Scratch Pool media can be deleted from MediaStor.

To delete media from media pools:

1. Move the media you want to delete to the Scratch Pool. For instructions, see “Moving Media to the Scratch Pool” on page 101.
2. Make sure the hardware device where the media is located is offline. For instructions, see one of the following sections:
   - “Setting a Library Offline” on page 79
   - “Setting a Tower Offline” on page 88
   - “Setting a Standalone Drive Offline” on page 97
3. You have the following choices:
   - Select the media you want to delete. From the Edit menu, select Delete.
   - Select the media you want to delete. Press the DELETE key.
   - Right-click the media you want to delete and then select Delete from the shortcut menu that appears.

   A confirmation message appears.
4. Click Yes. You can now remove the media from the hardware device.
5. Set the hardware device back online. For instructions, see one of the following sections:
   - “Setting a Library Online” on page 79
   - “Setting a Tower Online” on page 88
   - “Setting a Standalone Drive Online” on page 97

Note: If you do not remove the deleted media from the hardware device, you can set the device online without inventorying the media and the deleted media will not appear. Deleted media still resident in the device reappears in MediaStor the next time the device is inventoried.

Managing the MediaStor Computer

7

ASM MediaStor contains several functions that allow you to administer, diagnose, and troubleshoot MediaStor. In addition, because the MediaStor program functions as a Windows NT/2000 service, part of administering the MediaStor computer includes administering the MediaStor service. This chapter discusses the available tools for administering your MediaStor computer through the Administrator interface (and through Windows where applicable).

The Service Properties dialog box lets you view and manage MediaStor computer configuration, including general information about the MediaStor installation.

Troubleshooting can be done using the diagnostic utilities in the Tools menu and the Service menu. You can look up error definitions in the Administrator using the Error Glossary feature. Information on each of these utilities is provided in this chapter.

For more information, see the following sections:

- "Managing the MediaStor Service, " which follows
- “Configuring MediaStor Service Properties” on page 120
- “Tracking MediaStor Events, Errors, and Warnings” on page 127

Managing the MediaStor Service

MediaStor functions as a Windows NT/2000 service rather than as a user-mode application. As a Windows service, MediaStor can be configured for various startup settings, including automatic startup, which starts MediaStor upon Windows system startup, and manual startup, which allows you to start the service manually. You can also disable the service, which prevents the service from starting until that status is changed to either manual or automatic.

As a Windows NT/2000 service, MediaStor can continue to be active even after you close the Administrator and log off Windows, as long as the computer is still running.

Since the service will continue to run as long as the computer is running, if you are planning to shut down the MediaStor computer, we highly recommend

stopping the MediaStor service before doing so. This allows the service to complete whatever function it was performing before the system shuts down. In the case where ASM is writing a file to media, stopping the service before shutting down the computer reduces the possibility of file write and/or media errors occurring during shutdown.

You can manage the service either through the Administrator or through Windows.

Note: If MediaStor is installed in a clustered environment, the MediaStor service should *only* be stopped, paused, or started using the Cluster Administrator. You should *not* manage services through either the Service Manager or the Windows Services feature. If you stop the service in the Administrator or through the Windows Services feature, the system detects that the service failed and fails over to the other node in the cluster. For more information on clustering, see *Appendix A: Clustering* of the *ASM Data Manager Getting Started Guide*.

For more information, see the following sections:

- "Managing the Service Using the Administrator, " which follows
- “Managing the Service Using the Windows NT Control Panel” on page 115
- “Managing the Service Using the Windows 2000 Administrative Tools” on page 117

Managing the Service Using the Administrator

Management of the MediaStor service can be performed through the Administrator using the Service Manager. You can start, pause, and stop the service, as well as change the startup type and the account MediaStor uses to log on as a service.

You can manage the MediaStor service on more than one computer if the computers are registered in the Administrator even if the computer is not currently connected through the Administrator. MediaStor computers that are not connected are listed in the tree view with a status of `(Disconnected)`. For more information on registering remote MediaStor computers, see “Registering a Computer for Remote Administration” on page 163.

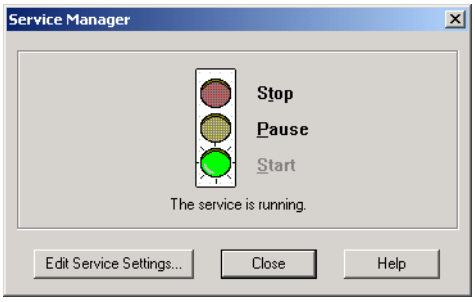
To manage the service through the Administrator:

1. In the Administrator, select the computer for which you want to manage the MediaStor service by choosing the computer from the Computer drop-down list or by selecting the extended drive of the computer whose service you want to manage.
2. Open the Service Manager. From the Tools menu, select Service Manager, or click the Service Manager toolbar button.

Figure 61. Service Manager Toolbar Button

The Service Manager dialog box appears.

Figure 62. Service Manager Dialog Box



The Service Manager indicates the status of the MediaStor service just below the traffic light signal in the center of the Service Manager dialog box. A green light indicates the service is started, a yellow light indicates the service is paused, and a red light indicates the service is stopped. Stopping the service suspends all user and application access to the hardware devices and the media in those devices.

3. Configure the service settings as necessary. You have the following choices:

   - To stop the service, double-click Stop. A confirmation message appears. Click Yes.
   - To pause the service, double-click Pause. A confirmation message appears. Click Yes.
   - To start the service, double-click Start. A confirmation message appears. Click Yes.
   - To edit service settings, including the startup type and the account MediaStor uses to log on as a service, click Edit Service Settings. For more information, see "Configuring Service Settings in the Administrator, " which follows.

4. When you finish configuring service settings, click Close to return to the Administrator.

Configuring Service Settings in the Administrator

The MediaStor service, like any Windows NT/2000 service, can be set to start in a number of ways. For example, you may want the service to start immediately upon system startup, or you may want the ability to manually start or even disable the service.

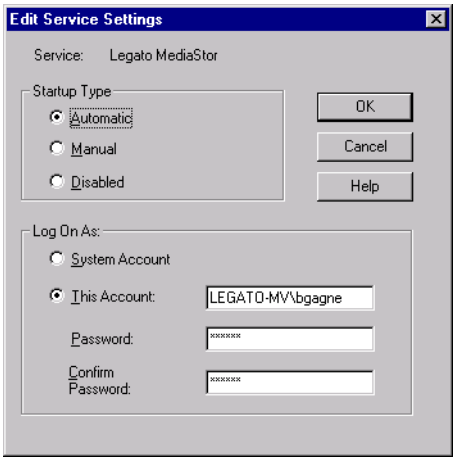
You may also need to change the user name or password for the account that MediaStor uses to log on as a service.

Note: If you change the account that MediaStor uses to log on as a service, be sure the new account you are using has the Log on as a service privilege.

To edit service settings through the Service Manager:

1. In the Service Manager dialog box, click Edit Service Settings. The Edit Service Settings dialog box appears.

Figure 63. Edit Service Settings Dialog Box



2. Select a startup type. You have the following choices:
   - Choose Automatic if you want the service to start every time the Windows system starts. This is the default.
   - Choose Manual if you want the service to be started by a user or by a dependent service.
   - Choose Disabled to prevent the service from starting until the startup type is changed to Automatic or Manual.
3. In the Log On As section, This Account option is enabled by default and should contain the login and password entered on installation of MediaStor on the computer. You have the following choices:
   - To change the domain name or user name MediaStor uses to log on, enter the new name(s) in the This Account text box.
   - To change the password MediaStor uses to log on, enter the new password in the Password text box. Then re-enter the password in the Confirm Password text box.
   - To have the service log in as the system account, enable System Account.

Note: Unless you have specific reason to do so, you should not enable the System Account option for logon. The local system account may not have all of the rights necessary to perform all MediaStor functions, particularly if Data Manager resides on a different machine.

4. Click OK to save your changes and return to the Service Manager.

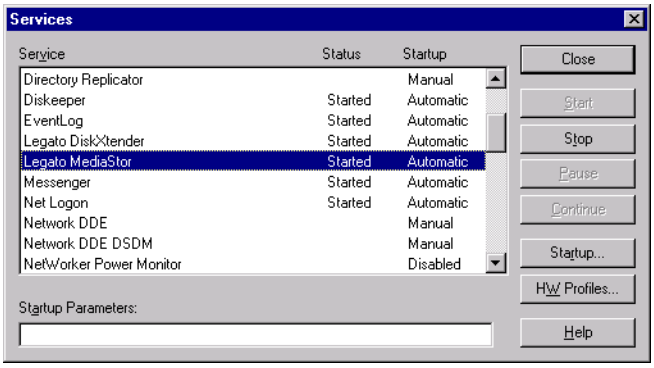
Managing the Service Using the Windows NT Control Panel

The Control Panel in Windows NT allows you to modify the service while working in Windows. The Services option in the Control Panel allows you to start and stop Windows NT services as well as configure service parameters for services running on the local machine, including the MediaStor service.

To manage the service using Windows NT:

1. On the MediaStor computer, open the Windows Service Manager. From the Start menu, select Control Panel and then Services.

Figure 64. Windows NT Services Dialog Box



2. From the services list, select StorageTek MediaStor.
3. You have the following choices:
   - To stop the service, click Stop. A confirmation message appears. Click Yes.
   - To start the service, click Start.
   - To pause the service, click Pause. A confirmation message appears. Click Yes.
   - To edit service settings, including the startup type and the account MediaStor uses to log on as a service, click Startup. For more information, see "Configuring Service Settings in Windows NT, " which follows.
4. When you finish configuring service settings, click Close to close the Services dialog box.

Configuring Service Settings in Windows NT

The MediaStor service, like any Windows NT service, can be accessed and edited through the Services option in the Windows NT Control Panel. You can change the startup options for the service, to set the service to start immediately upon system startup, or to be started manually. There is also an option to disable the service.

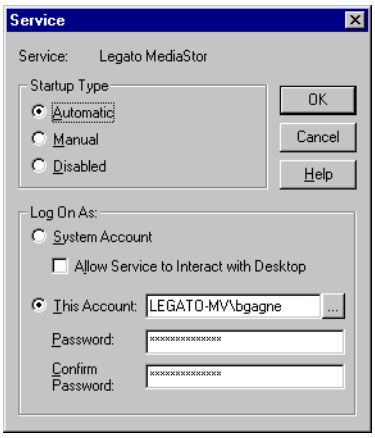
You can also change the user name and/or password for the account that MediaStor uses to log on as a service.

Note: If you change the account that MediaStor uses to log on as a service, be sure the new account you are using has the Log on as a service privilege.

To edit service settings through Windows NT:

1. In the Services dialog box, select StorageTek MediaStor and then click Startup. The Service dialog box appears.

Figure 65. Service Dialog Box



2. Select a startup type. You have the following choices:
   - Choose Automatic if you want the service to start every time the Windows system starts. This is the default.
   - Choose Manual if you want the service to be started by a user or by a dependent service.
   - Choose Disabled to prevent the service from starting until the startup type is changed to Automatic or Manual.
3. In the Log On As section, the This Account option is enabled by default and should contain the login and password entered on installation of MediaStor on the computer. You have the following choices:
   - To change the domain name or user name MediaStor uses to log on, enter the new name(s) in the This Account text box.

- To change the password MediaStor uses to log on, enter the new password in the Password text box. Then re-enter the password in the Confirm Password text box.
- To have the service log in as the system account, enable System Account.

Note: Unless you have specific reason to do so, you should not enable the System Account option for logon. The local system account may not have all of the rights necessary to perform all MediaStor functions, particularly if Data Manager resides on a different machine.

4. When you finish configuring service settings, click OK to save your changes and return to the Services dialog box.

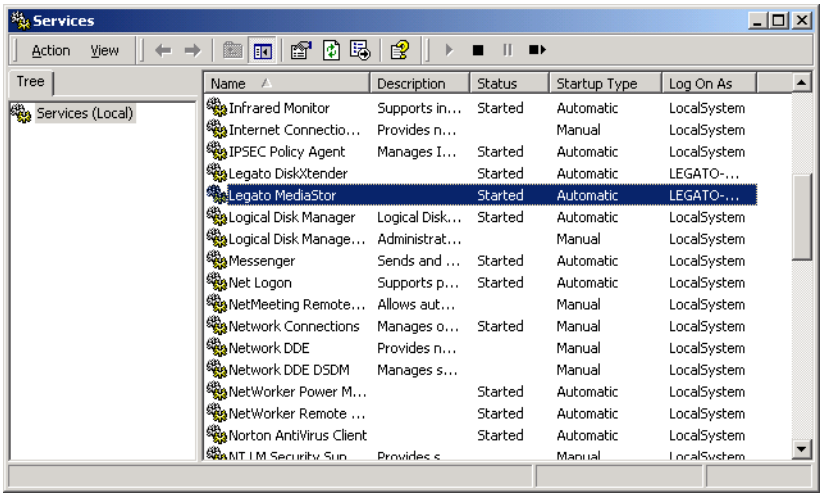
Managing the Service Using the Windows 2000 Administrative Tools

The Administrative Tools application in Windows 2000 allows you to modify the system while working in Windows. The Services and Applications option in the Administrative Tools allow you to start and stop Windows 2000 services as well as configure service parameters for services running on the local machine, including the MediaStor service.

To manage the service using Windows 2000:

1. On the MediaStor computer, open the Windows Service Manager. From the Start menu, select Programs, Administrative Tools, and then Services. The Services dialog box appears.

Figure 66. Windows 2000 Services Dialog Box



2. From the services list in the right pane of the Services dialog box, select StorageTek MediaStor.

3. You have the following choices:
   - To stop the service, click the Stop button or choose Stop from the Action menu.
   - To start the service, click the Start button or choose Start from the Action menu.
   - To pause the service, click the Pause button or choose Pause from the Action menu.
   - To stop and then restart the service in one step, click the Restart button or choose Restart from the Action menu.
   - To edit service settings, including the startup type and the account MediaStor uses to log on as a service, double-click on the service to open the StorageTek MediaStor Properties dialog box. For more information, see "Configuring Service Settings in Windows 2000, " which follows.
4. When you finish configuring service settings, click the Close button to close the Services dialog box.

Configuring Service Settings in Windows 2000

The MediaStor service, like any Windows 2000 service, can be accessed and edited through the Services and Applications option in the Windows 2000 Administrative Tools. You can change the startup options for the service, to set the service to start immediately upon system startup, or to be started manually. There is also an option to disable the service.

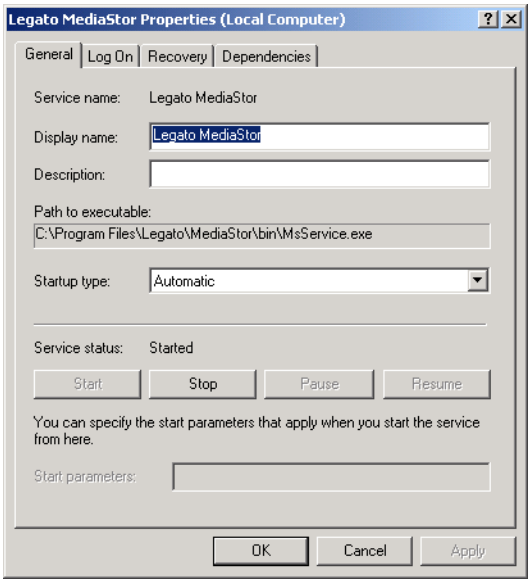
You may also need to change the user name or password for the account that MediaStor uses to log on as a service.

Note: If you change the account that MediaStor uses to log on as a service, be sure the new account you are using has the Log on as a service privilege.

To edit service settings through Windows 2000:

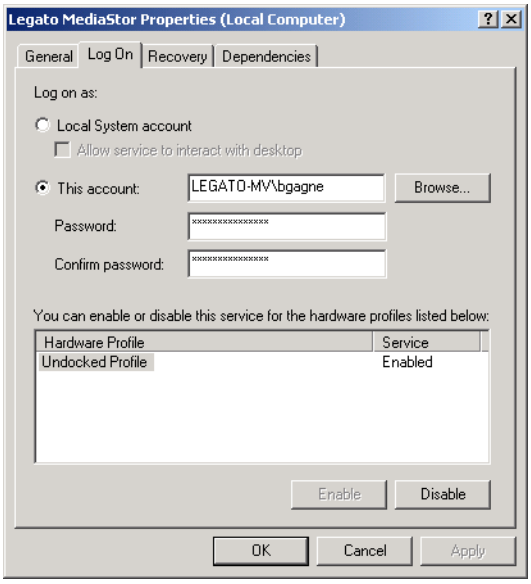
1. In the services list of the Services dialog box, double-click StorageTek MediaStor. The StorageTek MediaStor Properties dialog box appears with the General tab active by default.

Figure 67. StorageTek MediaStor Properties Dialog Box



2. From the Startup type drop-down list, select a startup type. You have the following choices:
   - Choose Automatic if you want the service to start every time the Windows system starts. This is the default.
   - Choose Manual if you want the service to be started by a user or by a dependent service.
   - Choose Disabled to prevent the service from starting until the startup type is changed to Automatic or Manual.
3. Select the Log On tab.

Figure 68. StorageTek MediaStor Properties Dialog Box – Log On Tab



4. The This account option is enabled by default and should contain the login and password entered on installation of MediaStor on the computer. You have the following choices:

   - To change the domain name or user name MediaStor uses to log on as a service, enter the new name(s) in the This account text box.
   - To change the password MediaStor uses to log on, enter the new password in the Password text box. Then re-enter the password in the Confirm password text box.
   - To have the service log in as the system account, enable Local System account.

   Note: Unless you have specific reason to do so, you should not enable the System Account option for logon. The local system account may not have all of the rights necessary to perform all MediaStor functions, particularly if Data Manager resides on a different machine.

5. When you finish configuring service settings, click OK to save your changes and return to the Services dialog box.

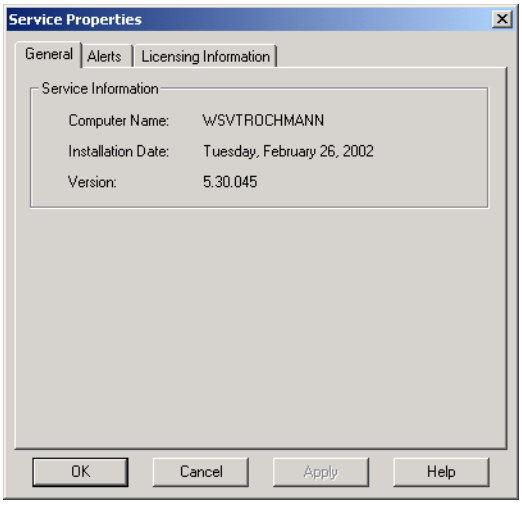
Configuring MediaStor Service Properties

MediaStor allows you to view and configure MediaStor service properties. Each MediaStor computer has a Service Properties dialog box that displays tabs of information pertaining to the MediaStor service. These tabs include: General, Alerts, and Licensing Information.

To configure MediaStor service properties:

1. From the Service menu, select Properties.

Figure 69. Service Properties Dialog Box



2. Modify and view the settings on each of the tabs as necessary. For more information, see the following sections:
   - "The General Tab, " which follows
   - “The Alerts Tab” on page 122
   - “The Licensing Information Tab” on page 126
3. As with most Properties functions in ASM, after making changes you have three options:
   - To save changes and close the Properties dialog box, click OK.
   - To save changes and keep the Properties dialog box open, click Apply.
   - To discard all changes made since the Properties dialog box was opened (or since the Apply button was last used) and close the Properties dialog box, click Cancel.

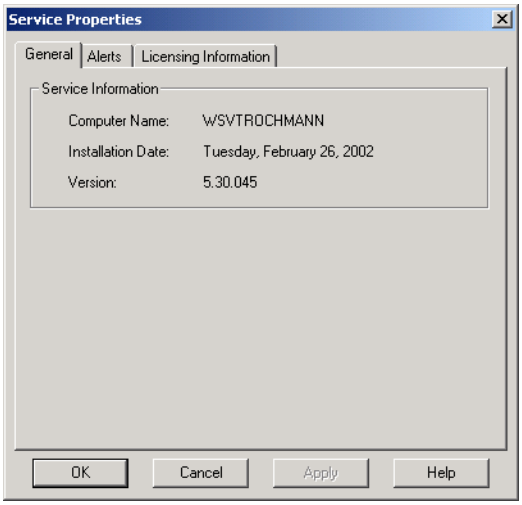
The General Tab

The General tab displays identifying information for the MediaStor computer.

To view the General tab:

- Click the General tab in the Service Properties dialog box.

Figure 70. Service Properties – General Tab



The following table describes each of the items appearing on the General tab.

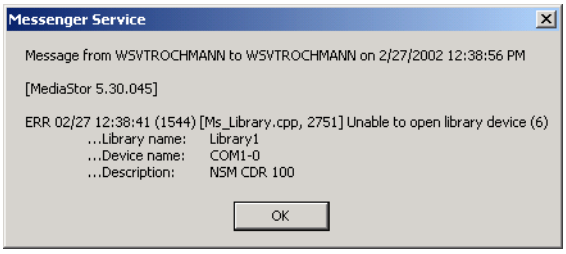
Table 17. Service Properties – General Tab

Item	Description
Computer Name	The Windows computer name for the MediaStor computer
Installation Date	The date that MediaStor was installed (or updated)
Version	The installed version of MediaStor

The Alerts Tab

The Alerts tab of the Service Properties dialog box allows you to configure MediaStor to send alerts to specific users, workstations, email addresses, or domains. An alert is a message box that appears to notify the recipient of an error or warning on the MediaStor system.

Figure 71. Alert Message



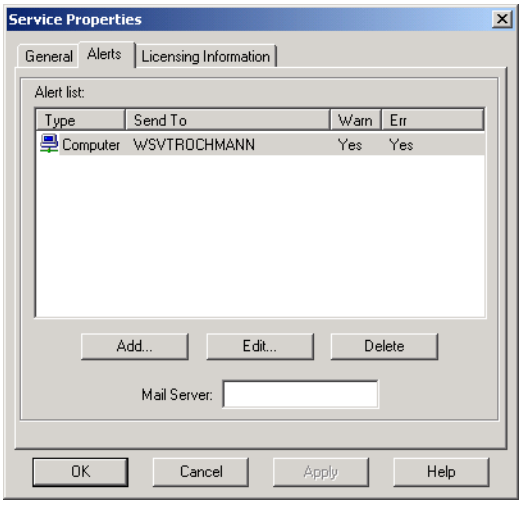
Alerts can be sent to a specific computer or user, to an entire domain, or to an email address.

A default alert for both warnings and errors is created for the MediaStor computer when MediaStor is installed.

To configure alerts:

1. Click the Alerts tab on the Service Properties dialog box.

Figure 72. Service Properties – Alerts Tab



2. You have the following choices:
   - Add an alert. For more information, see "Adding an Alert, " which follows.
   - Edit an existing alert. For more information, see “Editing an Alert” on page 125.
   - Delete an alert. For more information, see “Deleting an Alert” on page 125.
3. If you configured any email alerts, enter the name of the mail server being used to deliver the alerts in the Mail Server text box at the bottom of the Alerts tab. The well-known port for SMTP servers is supported, so no additional configuration should be required for use with mail servers, routers, or firewalls.

   Note: An email client must be installed and configured on the MediaStor computer on which you are configuring the alert in order for email alerts to work.

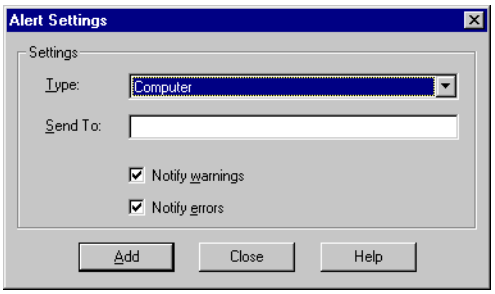
Adding an Alert

To send alerts to specific users, workstations, email addresses, or domains, you need to add an alert from the Alerts tab of the Service Properties dialog box.

To add an alert:

1. On the Alerts tab of the Service Properties dialog box, click Add. The Alert Settings dialog box appears.

Figure 73. Alert Settings Dialog Box – Adding an Alert



2. From the Type drop-down list box, select the type of alert that you would like to configure. You have the following choices:
   - Computer
   - Domain
   - E-Mail
   - User
3. In the Send To text box, enter the email address, domain name, user name, or computer name to which you want alerts sent.
4. Below the Send To box you may configure the following options:
   - If you want the alert to be sent for warnings and errors, enable both the Notify warnings and Notify errors check boxes.
   - If you want an alert to be sent for warnings but not for errors, enable the Notify warnings check box.
   - If you want an alert to be sent for errors but not warnings, enable the Notify errors check box.
   - If you want to temporarily disable the alert, disable both the Notify warnings and Notify errors check boxes. You can enable either of these options at a later time.
5. When you are finished choosing the alert settings, click Add. The information in the Send To box disappears, and the recipient is added to the alerts listing.
6. You have the following choices:
   - Repeat steps 2 through 5 to add another alert.
   - If you are finished configuring alerts, click Close on the Alert Settings dialog box. The alert appears in the Alert list in the Alerts tab.

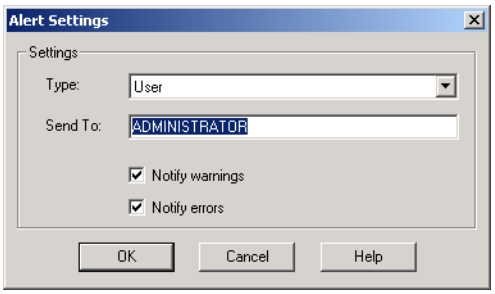
Editing an Alert

Once Alerts have been established, you can edit them.

To edit an alert:

1. On the Alerts tab of the Service Properties dialog box, select the alert you want to edit and then click Edit. The Alert Settings dialog box appears.

Figure 74. Alert Settings Dialog Box -- Editing an Alert



2. You have the following choices:
   - To change the type of alert that is sent, select a type from the Type drop-down list box.
   - To change the email address, domain name, user name, or computer name to which you want alerts sent, enter the new value in the Send To text box.
   - To change whether warnings are sent as alerts, enable or disable the Notify warnings check box.
   - To change whether errors are sent as alerts, enable or disable the Notify errors check box.
   - To temporarily disable the alert for the recipient, disable both the Notify warnings and Notify errors check boxes. You can enable either of these options at a later time.
3. When you finish editing the alert, click OK. The edited alert appears in the Alert list in the Alerts tab.

Deleting an Alert

If you no longer need an alert, you can delete it.

To delete an alert:

1. On the Alerts tab of the Service Properties dialog box, select the alert you want to delete and then click Delete. A confirmation message appears.
2. Click Yes.

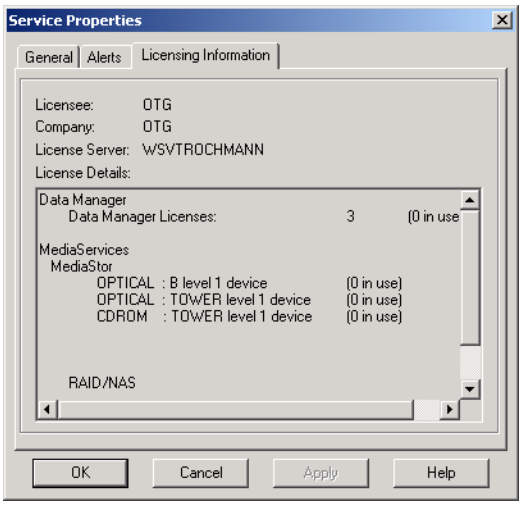
The Licensing Information Tab

The Licensing Information tab of the Service Properties dialog box displays license information for the MediaStor computer.

To view the Licensing Information tab:

- Click the Licensing Information tab in the Service Properties dialog box.

Figure 75. Service Properties – Licensing Information Tab



The following table describes each of the items appearing on the Licensing Information tab.

Table 18. Service Properties – Licensing Information Tab

Item	Description
Licensee	The user information entered during the MediaStor installation.
Company	The company information entered during the MediaStor installation.
License Server	The name of the computer containing the installation of License Server that is currently administering the MediaStor licenses for this MediaStor service.
Licensing Details	Detailed description of the Data Manager and MediaStor licenses configured in the License Server. This includes the number of Data Manager licenses, the number of MediaStor licenses, and type and file size capacity of the media services available for use with Data Manager, including the hardware licensed for MediaStor.

Tracking MediaStor Events, Errors, and Warnings

MediaStor has built-in utilities for monitoring events, errors, and warnings within the system. The Event Viewer contains a listing of all MediaStor events, errors, and warnings. This information is also logged to event logs. Errors and warnings are logged automatically, while MediaStor must be configured to log other events.

The Event Viewer and event logs provide a quick look at the activities of MediaStor. Logs can help identify and solve potential problems during runtime that might otherwise become critical problems if ignored. You can also look up errors you find in the logs, and configure event logging. If the Event Viewer and event logs become large and cumbersome to navigate, you can clear them.

For more information, see the following sections:

- "Using the Event Viewer, " which follows
- “Using Event Logs” on page 128
- “Looking up Errors” on page 129
- “Configuring Event Logging” on page 130
- “Clearing the Event Viewer and Event Logs” on page 133

Using the Event Viewer

The Event Viewer displays all events for the MediaStor service. If you do not want to automatically save a record of the events on your MediaStor computer, you can disable event logging in the Service Event Configuration dialog box and simply monitor events in the Event Viewer. For more information on disabling event logging, see “Configuring Event Logging” on page 130.

You can also take a “snapshot” of the contents of the Event Viewer and save it for later use. A snapshot is a capture of up to the last 2048 lines of the Event Viewer.

To open the Event Viewer:

- From the Service menu, select Event Viewer.

To take a snapshot of the Event Viewer:

- From the File menu in the Event Viewer, select Snapshot. The snapshot appears in RtfPad. You can save, print, and email the snapshot from RtfPad. For more information, see “Using RtfPad” on page 217.

Using Event Logs

In addition to the viewing capabilities offered by the Event Viewer, MediaStor also contains three event logs that save events, errors, and warnings for the MediaStor computer to log files.

- The All Events log lists all activities on the MediaStor service. Event logging is useful for tracing events of interest to you. You can configure which events are traced.
- The Errors Only Log lists only MediaStor system errors and is a useful tool for detecting and diagnosing those errors.

  Note: You can use the System Error Lookup feature to obtain additional information about each error, including the error's name and description, and to quickly translate error codes that appear in MediaStor. For more information, see "Looking up Errors" on page 129.

- The Warnings Only Log lists only MediaStor system warnings to warn you of possible problems in MediaStor, such as requests for media that could not be satisfied because the media was not present on the ASM system (not in any drive or library). The purpose of this list is to provide a simpler means of discovering where problems exist that are hindering MediaStor performance.

Errors and warnings also appear in the Event Viewer, but the Errors Only Log and Warnings Only Log provide a more precise focus on these important events. You can also configure errors and warnings to be sent out as alerts to a specific domain, user, computer, or email address so that you are automatically notified when they occur. For more information, see "The Alerts Tab" on page 122.

Because they are necessary for system diagnostics, error and warning logging cannot be disabled. If technical support is needed, you may be asked to open these logs and specify the information reported.

When opened, the logs slow down MediaStor performance. When closed, the impact they have on performance is insignificant. The logs should be opened and used only for debugging purposes.

Note: Because tracing events impedes system performance, no events are traced by default, though errors and warnings are logged automatically because of their necessity for troubleshooting. For more information, see "Configuring Event Logging" on page 130.

To open a log:

1. From the Service menu, select Event Logs. A shortcut menu appears.
2. Select the log you want to view. You have the following choices:

- All Events
- Warnings Only
- Errors Only

The selected log appears in RtfPad. The log displays both the time and a message for each event. The most recent events are last on the list (the list automatically scrolls to display the most current events).

3. You can save, print, and email the log from RtfPad. For more information, see “Using RtfPad” on page 217.
4. When you finish, open the File menu in RtfPad and then select Exit to close the log.

Looking up Errors

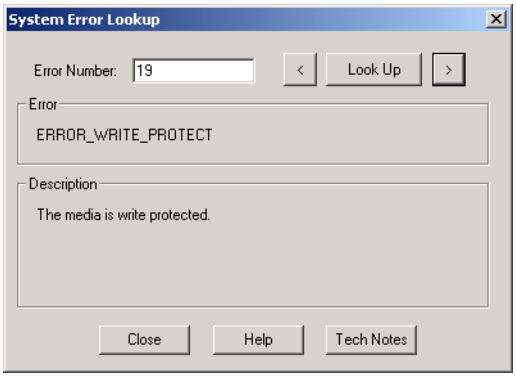
Each MediaStor error is displayed as an error number. The MediaStor error lookup feature allows you to obtain additional information about the error, including the error name and description, and to quickly translate the error codes provided in MediaStor messages.

To look up an error:

1. You have the following choices:
   - In the Administrator window, open the Help menu and then select Error Glossary. The System Error Lookup dialog box appears. Enter the error number in the Error Number text box and click Look Up.
   - Press <CTRL>+E. The System Error Lookup dialog box appears. Enter the error number in the Error Number text box and click Look Up.
   - Highlight the error code number in the event log and then select Error Lookup from the View menu in RtfPad.
   - Highlight the error code number in the event log and then press F2.

   The error string (if applicable) and its description are displayed in the System Error Lookup dialog box.

Figure 76. System Error Lookup Dialog Box



2. You have the following choices:
   - Click the forward or backward arrow buttons to scroll through the list of system errors.
   - When you finish, click Close to exit the dialog box.

Configuring Event Logging

Event logging is necessary only when tracing events of interest to you. You can configure which events are traced. Because tracing events impedes system performance, no events are traced by default, though errors and warnings are logged automatically because of their necessity for troubleshooting.

MediaStor allows you to configure which events are logged, and whether to trace the local service events or remote procedure calls (remote administration events).

For all logs, you can control the format of the log entries, and adjust the maximum sizes for the log files. For the All Events Log, you can disable logging and enable the tracing of events upon startup. You can enable logging to the Windows Application Log for the Warnings Only Log and the Errors Only Log.

For more information, see the following sections:

- "Log Properties Configuration, " which follows
- “Event Tracing Configuration” on page 132

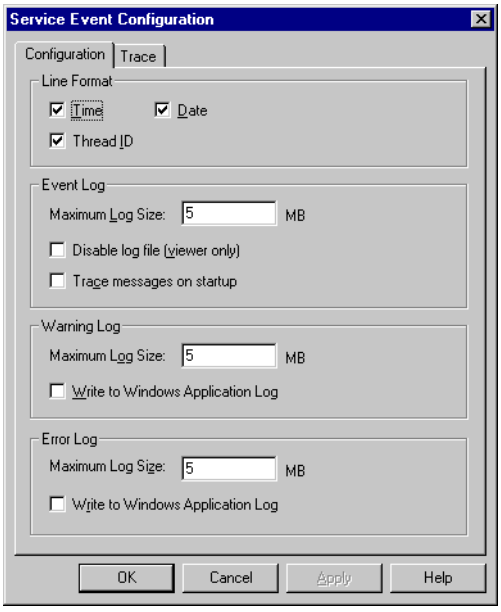
Log Properties Configuration

You can control several aspects of logging functionality, including log entry format, log file size, event logging, automatic startup of event logging, and logging of errors and warnings to the Windows Application Log.

To configure log properties:

1. From the Service menu, select Event Settings. The Service Event Configuration dialog box appears. The Configuration tab is active by default.

Figure 77. Service Event Configuration Dialog Box – Configuration Tab



2. In the Line Format section, specify logging of particular event attributes. These options are enabled by default. You have the following choices:

   - To disable logging the time each event occurs, disable the Time check box.
   - To disable logging the date each event occurs, disable the Date check box.
   - To disable logging the thread the event used to communicate with the processor, disable the Thread ID check box.

3. In the Event Log section, configure logging to the All Events Log. Event logging is enabled by default; however, no events are traced. For information on selecting events to trace, see "Event Tracing Configuration, " which follows. You have the following choices to configure event logging:

   - To change the maximum size in megabytes (MB) for the log file, enter a new value in the Maximum Log Size text box. The default size is 5 MB. After the maximum log size is reached, the log is truncated from the beginning of the file (oldest events).
   - To disable logging to the All Events Log, enable the Disable log file (viewer only) check box. Events are still logged to the Event Viewer.

- To automatically initiate event logging when MediaStor is started, enable the Trace messages on startup check box.

4. In the Warning Log section, configure logging to the Warnings Only Log. You have the following choices:

   - To change the maximum size in MB for the log file, enter a new value in the Maximum Log Size text box. The default size is 5 MB. After the maximum log size is reached, the log is truncated from the beginning of the file (oldest events).
   - To enable logging of MediaStor warnings to the Windows Application Log, enable the Write to Windows Application Log check box. Since MediaStor warning logs are cleared when the service is restarted, enabling this option allows the Windows Application Log to maintain a running log of MediaStor warnings regardless of whether the service is running.

   Note: To access the Windows Application Log, open the Start menu. Then select Programs, Administrative Tools, and Event Viewer.

   Note: You cannot disable logging to the Warnings Only Log and Errors Only Log.

5. In the Error Log section, configure logging to the Errors Only Log. You have the following choices:

   - To change the maximum size in MB for the log file, enter a new value in the Maximum Log Size text box. The default size is 5 MB. After the maximum log size is reached, the log is truncated from the beginning of the file (oldest events).
   - To enable logging of MediaStor errors to the Windows Application Log, enable the Write to Windows Application Log check box.

6. You have the following choices:

   - If you want to begin tracing events, click Apply to save your changes and then select the Trace tab to configure which events should be traced. For more information on tracing events, see "Event Tracing Configuration, " which follows.
   - If you are finished configuring log properties, click OK to save your changes and close the Service Event Configuration dialog box.

Event Tracing Configuration

You can configure which events are to be traced and reported to the Event Viewer and the All Events Log. By default, all event tracing is disabled. Unless instructed to enable tracing of events by a technical support representative, you can leave the default settings in place.

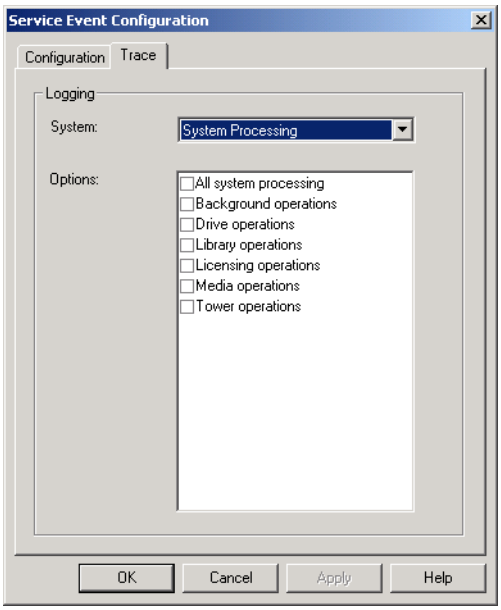
Note: Event tracing configuration affects events only; errors and warnings relating to events of the types listed are logged regardless of event tracing settings.

Note: Enabling event tracing hinders performance and should be performed only when debugging is required.

To configure events to be logged:

1. From the Service menu, select Event Settings. The Service Event Configuration dialog box appears.
2. Click the Trace tab. The System drop-down list displays System Processing by default.

Figure 78. Service Event Configuration – Trace Tab



3. From the System drop-down list, select whether to trace System Processing (local machine service events) or Remote Procedure Calls (remote administration service events).
4. In the Options list, enable the check box next to an event to begin tracing that event.
5. When you are finished, click OK to save the new settings and close the Service Event Configuration dialog box.

Clearing the Event Viewer and Event Logs

You can manually clear the information in the Event Viewer and the event logs. Event logs have a specific size limitation, after which the log is truncated from the beginning of the file. While the log size is regulated through automatic truncation (see “Configuring Event Logging” on page 130 for more

information), large logs are often cumbersome and difficult to navigate. Clearing event logs regularly makes it easier to find new information.

Note: You may want to save your log before clearing it. To save a log, open it and then select Save from the File menu in RtfPad.

To clear the Event Viewer or an event log:

1. From the Service menu, select Event Logs. A shortcut menu appears.
2. You have the following choices:
   - To clear the Event Viewer and the All Events Log, select Clear Event Log.
   - To clear the Warnings Only Log, select Clear Warning Log.
   - To clear the Errors Only Log, select Clear Error Log.
3. Click Yes on the confirmation message that appears.

Running MediaStor Reports

8

The ASM MediaStor reporting feature is a useful tool for tracking system statistics. Using the Report Wizard, you can create various reports of system activities, including media information, hardware configuration, and MediaStor registry settings.

You can run the following reports in MediaStor:

- The Media Report provides detailed information on the selected piece(s) of media. For more information, see “Media Report” on page 137.
- The Hardware Configuration Report provides detailed information on the hardware devices configured in MediaStor. For more information, see “Hardware Configuration Report” on page 139.
- The Product Registry Information Report lists all of the MediaStor information contained in the Windows registry for the selected MediaStor computer(s). For more information, see “Product Registry Information Report” on page 140.

You can also create custom layouts for your reports. Custom layouts are particularly useful because they can be saved and reused every time you run a report.

Since MediaStor is designed to allow you to manage multiple registered MediaStor computers from a single Administrator interface, you can run any one of the available reports on multiple computers. You can also run more than one report at a time, allowing you to view several different aspects or details about several different registered MediaStor computers in one consolidated report.

For more information, see the following sections:

- "Creating Reports, " which follows
- “Report Layout Editor” on page 141

Creating Reports

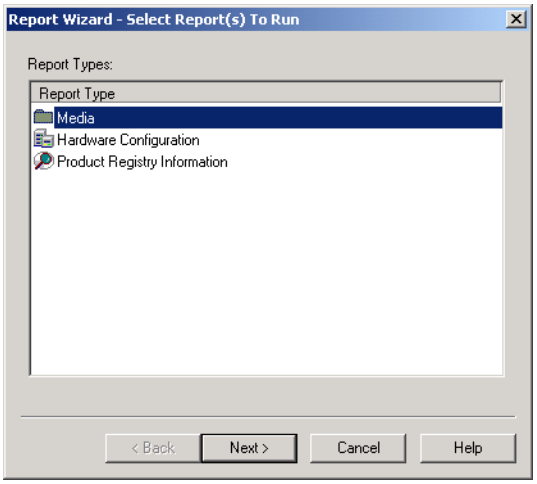
The Report Wizard allows you to create various reports of system activities on one or more registered MediaStor computers, including information about each of its components and media. It also allows you to run more than one

report at a time so that you can view several different aspects or details about several different registered MediaStor computers in one consolidated report.

To open the Report Wizard:

1. From the Tools menu, select Report Generator. The Report Wizard opens, starting with the Select Report(s) To Run page.

Figure 79. Report Wizard – Select Report(s) To Run Page



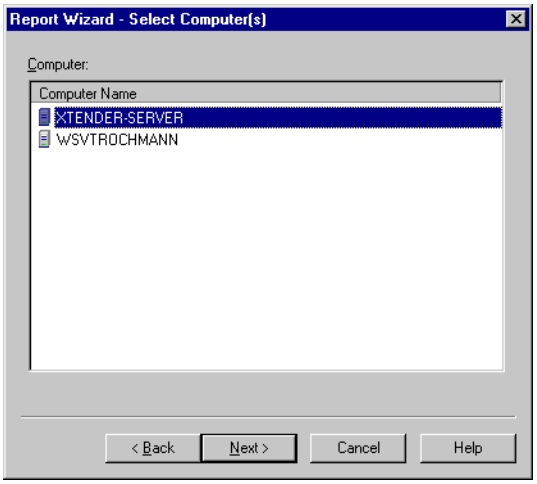
The Select Report(s) To Run page lists all available MediaStor reports. A description of the report appears as a pop-up text box when you rest the mouse pointer on any report option.

2. Select the appropriate report type(s).

   Note: If you choose multiple reports to run, the appropriate Report Wizard pages for each report are merged to form one wizard to lead you through the report generation process.

3. Click Next. The Select Computer(s) page appears.

Figure 80. Report Wizard – Select Computer(s) Page



The Select Computer(s) page lists all registered and connected MediaStor computers.

4. Select the MediaStor computer(s) for which you want to generate a report and then click Next. The next page of the Report Wizard for the selected report(s) appears. For more information, see the following sections:
   - "Media Report, " which follows
   - “Hardware Configuration Report” on page 139
   - “Product Registry Information Report” on page 140

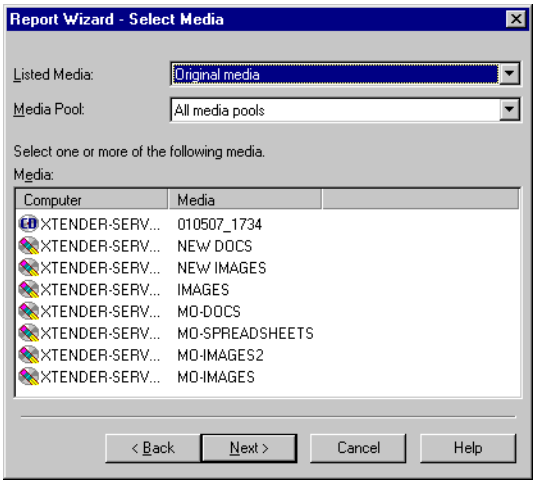
Media Report

The Media Report includes information on the selected media, either as a summarized list or a detailed description of properties. Information displayed in the detailed report includes location information, file system, total/free space, and read/write/mount statistics.

To run a Media Report:

1. After you select the MediaStor computer(s) for which you want to generate a report and then click Next, the Select Media page appears.

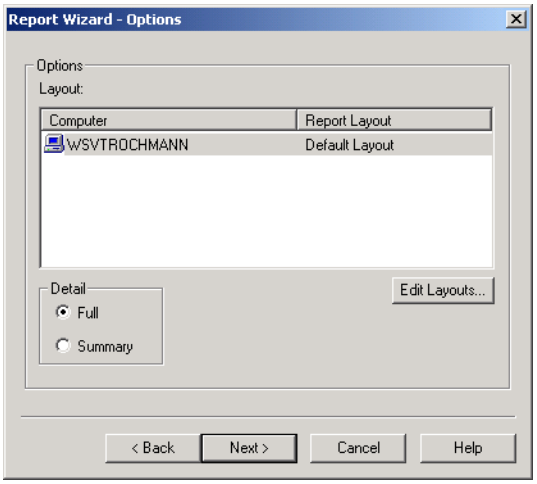
Figure 81. Report Wizard – Select Media Page



The Select Media for Media Report page lists all available media for which you can generate a report. It lists the MediaStor computer where the media is located and the name of the media.

2. From the Listed Media drop-down list, select one of the media types to narrow the number of media listed in the Media list and make it easier to find and choose media for the report.
3. From the Media Pool drop-down list, select a media pool. This also narrows the number of media listed in the Media list, and may make it easier to find and choose media for the report.
4. Select the media for which you want to generate the report and then click Next. The Options page appears.

Figure 82. Report Wizard – Media Report Options Page



5. If there is more than one layout/computer listed, select the one you want to use for your report. To edit a selected layout, click Edit Layouts. For instructions, see “Report Layout Editor” on page 141.
6. Select the amount of detail you want on the report: Full or Summary.
7. Click Next. The Summary page appears.
8. Review the information in the Summary page.
9. If the information in the summary is correct, click Finish. The report appears in RtfPad. As with any information appearing in RtfPad, you can save, print, or email the report. For more information, see “Using RtfPad” on page 217.

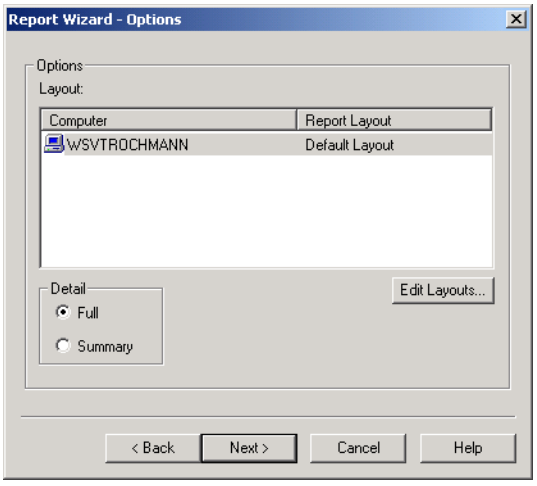
Hardware Configuration Report

The Hardware Configuration Report provides detailed information on the hardware devices configured in MediaStor. This includes hardware properties and whether the device is automatically set online when the service starts. Full reports also display statistics for the media in each hardware device.

To run a Hardware Configuration Report:

1. After you select the MediaStor computer(s) for which you want to generate a report and then click Next, the Options page appears.

Figure 83. Report Wizard – Hardware Configuration Report Options Page



2. If there is more than one layout/computer listed, select the one you want to use for your report. To edit a selected layout, click Edit Layouts. For instructions, see “Report Layout Editor” on page 141.
3. Select the amount of detail you want on the report: Full or Summary.
4. Click Next. The Summary page appears.

5. Review the information in the Summary page.
6. If the information in the summary is correct, click Finish. The report appears in RtfPad. As with any information appearing in RtfPad, you can save, print, or e-mail the report. For more information, see “Using RtfPad” on page 217.

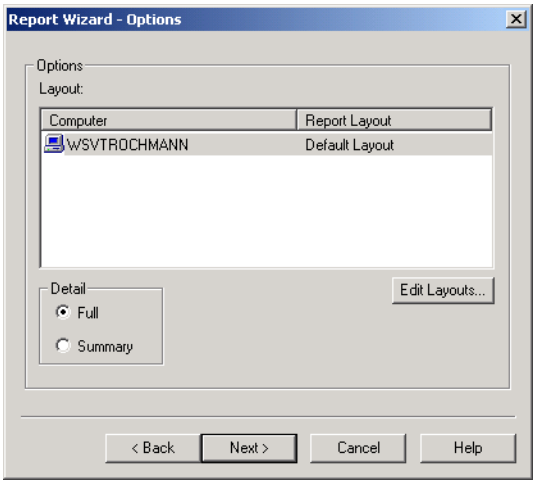
Product Registry Information Report

The Product Registry Information Report provides a complete listing of all information contained in the Windows registry about the MediaStor service on the selected MediaStor computer(s). The report information includes a listing of all registry keys (and associated values) used by MediaStor.

To run a Product Registry Information Report:

1. After you select the MediaStor computer(s) for which you want to generate a report and then click Next, the Options page appears.

Figure 84. Report Wizard – Product Registry Information Report Options Page



2. If there is more than one layout/computer listed, select the one you want to use for your report. To edit a layout, select the layout from the list and click Edit Layouts. For instructions, see “Report Layout Editor” on page 141.
3. Select the amount of detail you want on the report: Full or Summary.
4. Click Next. The Summary page appears.
5. Review the information in the Summary page.
6. If the information in the summary is correct, click Finish. The report appears in RtfPad. As with any information appearing in RtfPad, you can save, print, or email the report. For more information, see “Using RtfPad” on page 217.

Report Layout Editor

The Report Layout Editor allows you to define the font, font sizes, tab stops, and header and footer contents for MediaStor reports. The styles and layouts can be set and saved as report defaults; however, you can override these options whenever necessary.

MediaStor also allows you to create and save new layouts on different MediaStor computers. These layouts are available for use any time a report is run for that MediaStor computer, regardless of whether the report is being run from that MediaStor computer or from a remote MediaStor computer.

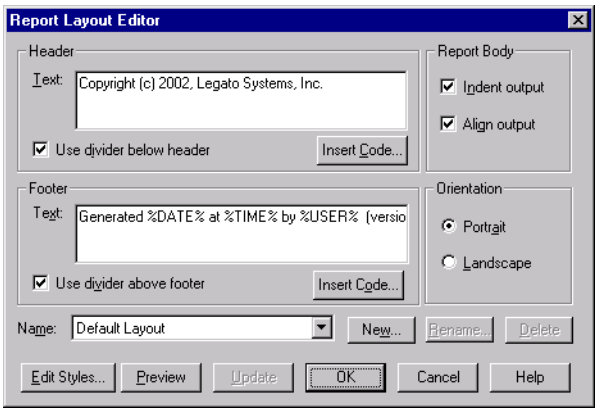
To customize report layouts:

1. You have the following choices:

   - If you are in the process of running a report and you want to edit an existing layout, select the layout on the Options page of the Report Generator Wizard and then click Edit Layouts.
   - If you are in the process of running a report and you want to create a new layout, on the Options page of the Report Generator Wizard, click Edit Layouts.
   - If you are not in the process of running a report, open the Tools menu and then select Report Layouts.

   The Report Layout Editor dialog box appears.

Figure 85. Report Layout Editor



2. You have the following choices:

   - Create a new layout. For more information, see "Creating a New Layout, " which follows.
   - Change the header or footer for a report layout. For more information, see “Changing Headers and Footers for Layouts” on page 142.

- Edit layout styles. For more information, see “Editing Layout Paragraph Styles” on page 144.
- Rename a layout. For more information, see “Renaming a Layout” on page 146.
- Switch from one layout to another. For more information, see “Switching from One Layout to Another” on page 147.
- Preview a layout. For more information, see “Previewing a Layout” on page 147.
- Delete a layout. For more information, see “Deleting a Layout” on page 148.

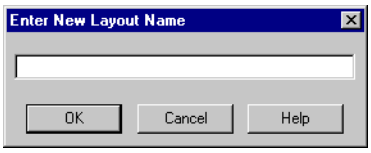
Creating a New Layout

Creating a layout is as simple as giving it a name. When creating a layout, remember that each layout should be identified by a descriptive name to make the layout easy to identify for use with your reports.

To create a new layout:

1. In the Report Layout Editor dialog box, click New. The Enter New Layout Name dialog box appears.

Figure 86. Enter New Layout Name Dialog Box



2. In the text box, type a name. Click OK. A new layout is created with that name and the default layout settings. To modify the default settings, see the following sections:
   - "Changing Headers and Footers for Layouts, " which follows
   - “Editing Layout Paragraph Styles” on page 144

Changing Headers and Footers for Layouts

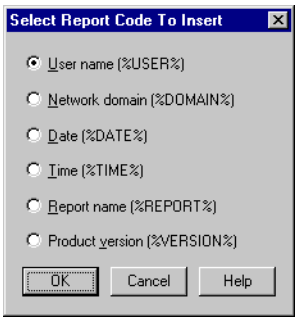
You can configure a customized header and footer for each report layout using the Report Layout Editor.

The header and footer can contain dynamic codes that retrieve specific values, such as date, time, user name, and domain, and write them directly into the header or footer. Placing these dynamic codes in custom headers or footers, and thereby on the reports generated with a custom layout, can help you identify, file, and retrieve reports later.

To change a header or footer for a layout:

1. Verify that the correct report appears in the Name drop-down list in the Report Layout Editor.
2. Click in either the Header Text box or the Footer Text box and type or edit the desired text.
3. To insert a dynamic code in the text, place the cursor in the Text box where you want the code value to appear. If you do not want to insert a dynamic code in the text, skip to step 7.
4. Click Insert Code under the appropriate text box. The Select Report Code to Insert dialog box appears.

Figure 87. Select Report Code To Insert



5. Select the code that you want to insert. You have the following choices:

Table 19. Report Code Options

Option	Description
User name	Inserts the user name of the current Windows user
Network domain	Inserts the domain on which MediaStor is running
Date	Inserts the system date the report is generated
Time	Inserts the system time the report is generated
Report name	Inserts the name given to the report when generated
Product version	Inserts the MediaStor version generating the report

6. Click OK to insert the code and return to the Report Layout Editor dialog box.

Note: Spaces are not automatically inserted around the code. If you want spaces to appear before or after the value the code inserts, place spaces in the text box before and after the code where you want spaces to appear.

7. Choose whether to use a dotted line as a divider between the header or footer and the report body. You have the following options:
   - If you do not want a dotted line to separate the header from the report body, disable the Use divider below header check box. This option is enabled by default.
   - If you do not want a dotted line to separate the footer from the report body, disable the Use divider above footer check box. This option is also enabled by default.
8. You have the following choices:
   - To preview the report layout, click Preview.
   - To save changes and keep the Report Layout Editor dialog box open, click Update.
   - To save changes and close the Report Layout Editor dialog box, click OK.

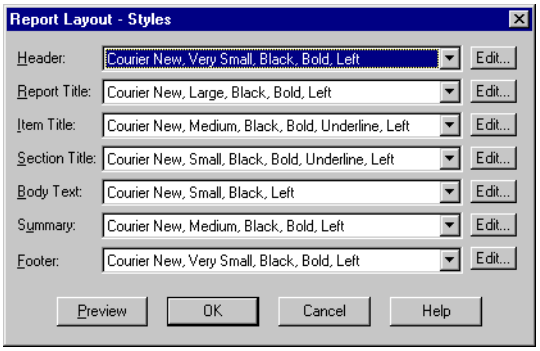
Editing Layout Paragraph Styles

The Report Layout Editor allows you to customize the look of your reports by giving you font, size, color, and other stylistic options for each type of paragraph used in generating report output. This makes it easier to call attention to specific information in the reports and may make your reports easier to read and interpret.

To edit styles for a layout:

1. Verify that the correct report appears in the Name drop-down list in the Report Layout Editor.
2. Click Edit Styles. The Report Layout - Styles dialog box appears.

Figure 88. Report Layout - Styles Dialog Box

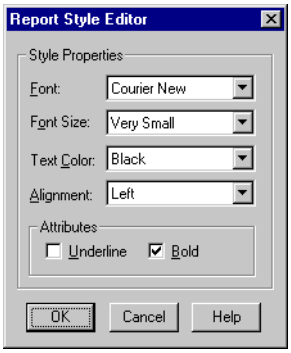


Each paragraph type has a drop-down list containing all available style profiles.

3. You have the following choices:

   - To use an existing style profile, select the profile from the drop-down list next to the paragraph type you want to change.
   - To create a new profile, click the Edit button to the right of profile drop-down list. The Report Style Editor dialog box appears.

Figure 89. Report Style Editor Dialog Box



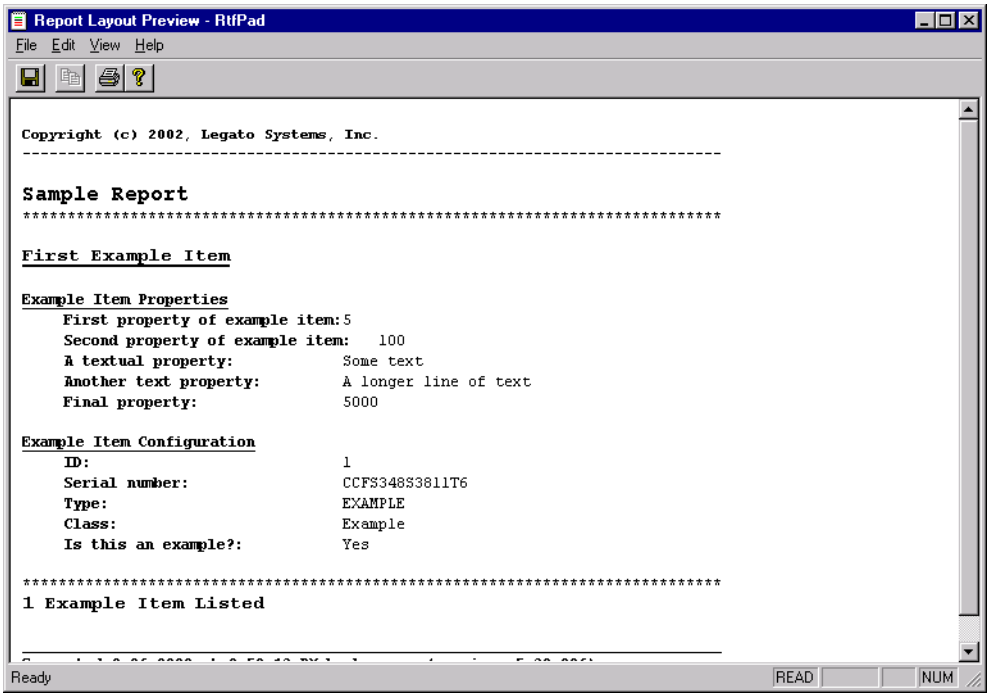
Select the desired characteristics for Font, Font Size, Text Color, and Alignment from the appropriate drop-down lists.

Enable or disable the Underline and Bold characteristics for the paragraph by clicking in the check box next to each option.

Click OK to save your changes to the paragraph style and return to the Report Layout - Styles dialog box. Your new style properties appear in the profile drop-down list.

4. Once you have configured all necessary styles, you can preview the report layout by selecting the Preview button on the Report Layout - Styles dialog box. A Report Layout Preview appears in RtfPad.

Figure 90. Report Layout Preview – Sample Report



5. When you are satisfied with your layout styles, click OK to save changes and return to the Report Layout Editor dialog box.

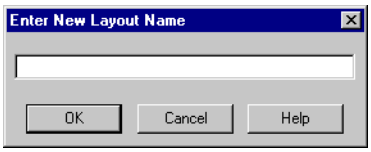
Renaming a Layout

If necessary, you can rename an existing custom layout.

To rename a layout:

1. In the Report Layout Editor dialog box, make sure that the correct layout appears in the Name drop-down list.
2. Click Rename. The Enter New Layout Name dialog box appears.

Figure 91. Enter New Layout Name Dialog Box

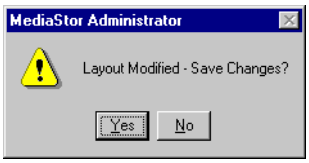


3. In the text box, type the new name.
4. Click OK. The new name appears in the Name text box in the Report Layout Editor dialog box.

Switching from One Layout to Another

If you have created or made edits to a report layout and you want to create or edit another one, you should click Update to save your changes. If you select another layout from the Name drop-down list or click New without clicking the Update button, MediaStor prompts you to save unsaved changes to the current layout.

Figure 92. Save Changes?



To save changes, click Yes. Or, to discard changes that you have made since the last time you clicked Update, click No.

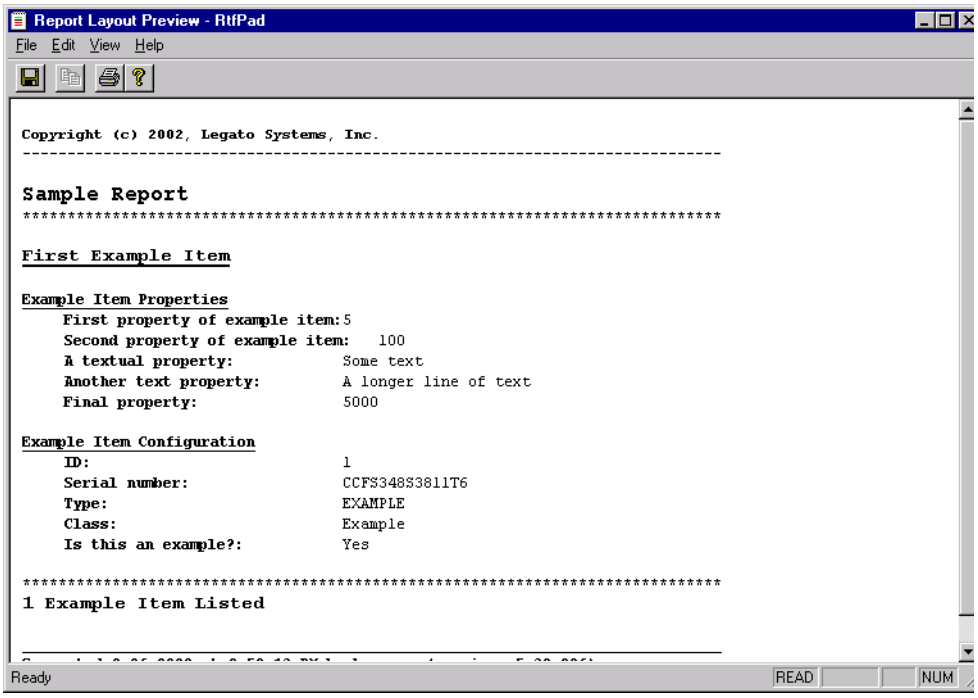
Previewing a Layout

You can preview a report layout so that you know what the report will look like before you run it.

To preview a layout:

1. In the Report Layout Editor dialog box, make sure the correct layout appears in the Name drop-down list.
2. Click Preview. A Report Layout Preview appears in RtfPad.

Figure 93. Report Layout Preview – Sample Report



3. When you finish, close the preview by selecting Exit from the RtfPad File menu.

Deleting a Layout

If you no longer need a custom report layout, you can delete it.

To delete a layout:

1. In the Report Layout Editor dialog box, make sure the layout you want to delete appears in the Name text box.
2. Click Delete. A confirmation message appears.
3. Click Yes.

MediaStor Backup and Recovery

9

Because constant and reliable access to your data is one of the most critical parts o-f your system, we recommend that you have a comprehensive disaster recovery plan in place in the event of system problems or an entire system shutdown. ASM MediaStor contains a registry utility that can help you back up and restore the MediaStor configuration, even when the problem is a minor one.

For more information, see the following sections:

- "Backing Up Your MediaStor System, " which follows
- “Restoring Your MediaStor System” on page 153

Backing Up Your MediaStor System

You can create a backup of your MediaStor system configuration, which is stored in registry settings, when needed using the repair disk utility. In the event of a MediaStor computer crash, you can then use the registry backup to restore the MediaStor configuration.

The repair disk utility can be used to create a backup copy of the registry information for the MediaStor system. MediaStor automatically updates the repair disk backup after the following actions:

- Every 15 minutes
- When the service starts or stops
- When hardware is added or deleted
- When hardware is inventoried
- When the repair disk backup location is changed (through the Administrator)

You can set the location where the repair disk is automatically saved, set a location for a copy of the repair disk for the current MediaStor configuration, or restore MediaStor registry settings using the Repair Disk Wizard.

This section provides procedures for setting the backup location for your repair disk and for creating a copy of the repair disk backup. For more information, see the following sections:

- "Setting the Repair Disk Backup Location, " which follows
- “Copying the Repair Disk Backup” on page 151

For information and instructions on restoring a repair disk file, see “Restoring MediaStor Configuration” on page 153.

Setting the Repair Disk Backup Location

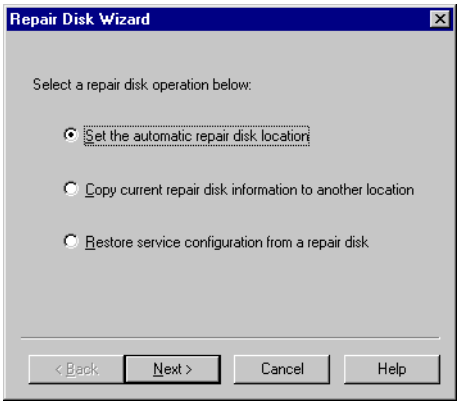
The Repair Disk Wizard allows you to designate where MediaStor stores the repair disk backup it creates. In order to ensure fail-proof disaster recovery, the backup should be copied to a location separate from your Windows server files. Ideally, you should copy it to a different volume.

Note: The repair disk backup should be backed up regularly to an additional location. Besides allowing for an additional backup of the repair disk file, this also allows for “versioning” of repair disk backup copies, in the event the last saved repair disk is corrupt or otherwise unusable for system restore.

To set the repair disk location:

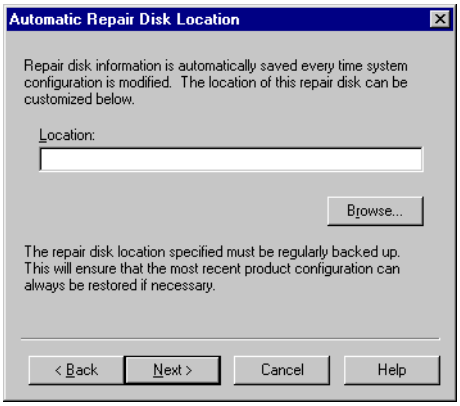
1. From the Tools menu, select Repair Disk. The Repair Disk Wizard appears.

Figure 94. Repair Disk Wizard – Introduction Page



2. Choose Set the automatic repair disk location and then click Next. The Automatic Repair Disk Location page appears.

Figure 95. Repair Disk Wizard -- Automatic Repair Disk Location Page



3. In the Location text box, enter the directory to which the repair disk backup should be saved. To browse to a directory, click Browse. You must use a UNC path.
4. Once you have entered a path in the Location text box, click Next. The Summary page appears.
5. Review the information in the summary.
6. If the information in the Summary is correct, click Finish to complete the wizard. A progress message appears, indicating that the auto disk repair location is being saved. Once the message disappears, the location setting is complete.

Copying the Repair Disk Backup

In addition to designating where the repair disk backup is stored, the Repair Disk Wizard also allows you to store a copy of the current repair disk at will. We highly recommend regularly creating a copy of the repair disk, in order to be sure you have a usable copy of your system configuration. In addition, because the normal repair disk is saved at a minimum of every 15 minutes, if some corruption took place before the new repair disk was saved, the primary copy of your repair disk file may be unusable for system restoration.

When you use the Repair Disk Wizard to set a location for a copy of the current configuration, MediaStor creates a copy of the MediaStor configuration as soon as the wizard is completed. The copy is a one-time backup and does not update regularly.

Note: Setting a location for a copy of the current configuration does not affect the location for automatic backup. MediaStor continues to back up MediaStor registry information to the location set for automatic repair disk creation.

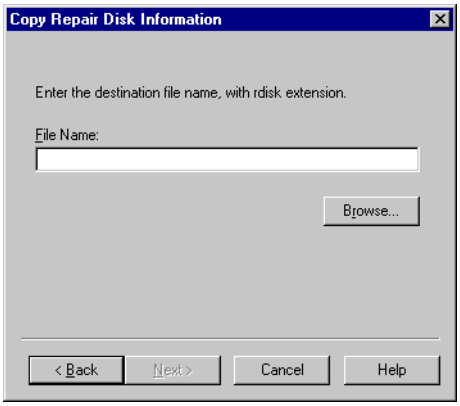
To copy the current repair disk backup:

1. From the Tools menu, select Repair Disk. The Repair Disk Wizard appears.

Figure 96. Repair Disk Wizard – Introduction Page

2. Select Copy current repair disk information to another location and then click Next. The Copy Repair Disk Information page appears.

Figure 97. Repair Disk Wizard -- Copy Repair Disk Information Page



3. Enter a directory path and file name in the File Name text box. To browse to a directory and/or file, click Browse.
4. Once you have entered a path in the File Name text box, click Next. The Summary page appears.
5. Review the information in the summary.
6. If the information in the Summary is correct, click Finish to complete the wizard. A progress message appears, indicating that the copy disk repair location is being saved. Once the message disappears, the copy is complete.

Restoring Your MediaStor System

In the event of catastrophic system failure, the same MediaStor utility that allows you to create backups of your registry settings also allows you to restore those backups to your MediaStor system. The restore function for the repair disk utility makes recovery and re-configuration of your system after a disaster both faster and more accurate.

This section provides information and procedures for restoring the registry configuration in the event you ever need to restore your MediaStor system after a disaster or catastrophic system failure.

When a system failure or disaster occurs, the following steps should be taken in order to most effectively restore your MediaStor system.

To restore your MediaStor system:

1. If necessary, reformat the MediaStor computer hard drive.
2. Reinstall Windows NT/2000.
3. Reinstall MediaStor. For instructions, see “Installing MediaStor” on page 31.
4. Restore the repair disk (MediaStor registry) file. For instructions, see "Restoring MediaStor Configuration, " which follows.

These steps should be sufficient to get your MediaStor system back up and running after a disaster or system failure. As always, however, if you run into any problems, contact your technical support representative for assistance.

Restoring MediaStor Configuration

When a system failure or disaster occurs on your MediaStor computer, you can restore your MediaStor registry configuration by using the Repair Disk Wizard to restore the backup copy of the registry settings after you have reinstalled all of the necessary software components.

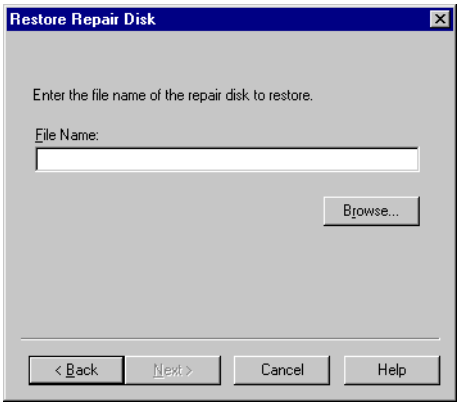
To restore the registry configuration:

1. From the Tools menu, select Repair Disk. The Repair Disk Wizard appears.

Figure 98. Repair Disk Wizard – Introduction Page

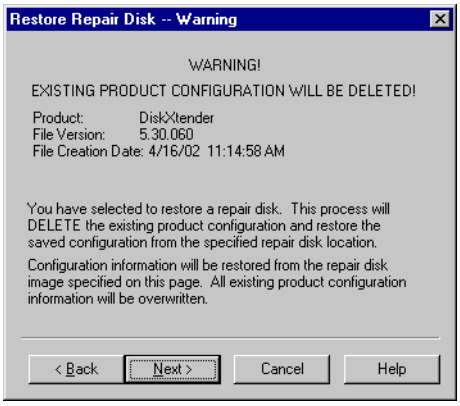
2. Choose Restore service configuration from a repair disk and click Next. The Restore Repair Disk page appears.

Figure 99. Repair Disk Wizard -- Restore Repair Disk Page



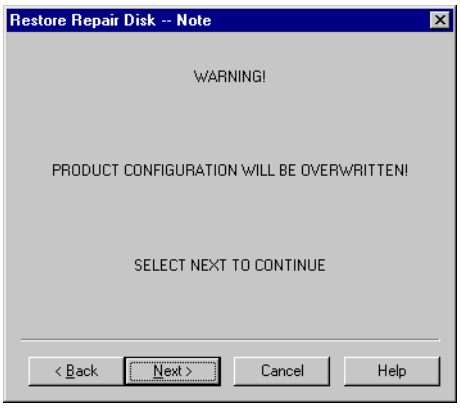
3. Enter the directory path and file name for the repair disk file in the File Name text box. To browse for a file, click Browse.
4. Click Next. The Restore Repair Disk – Warning page appears.

Figure 100. Repair Disk Wizard -- Restore Warning Page



5. Read the Restore Repair Disk – Warning page carefully.
6. When you finish, click Next. The Restore Repair Disk – Note page appears.

Figure 101. Repair Disk Wizard -- Restore Note Page



This page provides a reminder that the current product configurations will be overwritten with the saved configuration from the specified repair disk location.

7. To continue, click Next. The Summary page appears.
8. Review the information in the summary carefully.
9. If the information in the Summary is correct, click Finish to complete the wizard. The registry information is copied, and the backup MediaStor configuration is restored to your machine.
10. Restart the MediaStor computer.

After restoring your MediaStor system, you may want to run one or more of the available MediaStor reports to make sure that your system has been returned to the appropriate state. For more information, see “Running MediaStor Reports” on page 135.

Remotely Administering MediaStor

10

You can administer the ASM MediaStor system both from the computer on which MediaStor is installed and from remote computers. You can use the Administrator function that comes with a full installation of MediaStor to administer other MediaStor computers, or you can install the Remote Administrator, which simply provides you with the Administrator interface and the registration capability to attach remotely to one or more networked MediaStor computers. The remote administration function is the same whether you use a MediaStor Administrator (full installation) or a Remote Administrator.

The MediaStor computer(s) you plan to manage must be the same version or higher as the Administrator you are using (either a Remote Administrator, or a full MediaStor Administrator). For example, a MediaStor version 5.40.102 installation can be remotely administered using a lower 5.4 version or another version 5.4.102 Administrator. However, a version 5.4.102 Administrator will not be able to connect to a lower version 5.4 MediaStor service; the lower version MediaStor Administrator will need to be upgraded.

This chapter covers installation of the Remote Administrator, and briefly outlines procedures for starting the Remote Administrator for the first time. It also covers registering a MediaStor computer so that you can remotely administer it, and connecting to and disconnecting from MediaStor computers. For more information, see the following sections:

Before Installing the Remote Administrator

Before you install the Remote Administrator, you need to consider the following requirements:

Operating System Requirements

All ASM Remote Administrators, including the MediaStor Remote Administrator, can be installed and run on computers that use the following operating systems:

- Windows NT 4.0 with Service Pack 6a, or
- Windows 2000 with Service Pack 2 or 3
- Windows XP

Consult your Windows documentation for information on installing the operating system.

Windows NT/2000 Security

Remote administration of MediaStor computers works through a Remote Procedure Call (RPC) connection that enables communication between a remote MediaStor Administrator and the MediaStor computer. Security for that connection is managed by managing membership of the MSAdministrators group on the MediaStor computer. To administer the MediaStor system through a remote installation of the MediaStor Administrator, you must be a member of the MSAdministrators group. For more information, see “Windows NT/2000 Security” on page 22.

In addition, for your convenience, the Remote Administrator setup wizard allows you to install the Remote Administrator on multiple computers at once, provided those computers are visible on your network and you have Administrator privileges on those computers. To take advantage of this feature, you may want to determine which computers are to have the Remote Administrator installed on them and make sure you have administrative privileges on those machines before you run the setup wizard. This will enable you to run the installation only once rather than multiple times.

Clustering

If you choose to install the Remote Administrator in a clustered environment, install the program on the Primary server. Once the installation is replicated to the Secondary server, register each computer you want to remotely administer on both the Primary server and the Secondary server. For more information on Clustering, see *Appendix A: Clustering* of the *ASM Data Manager Getting Started Guide.*

Installing the Remote Administrator

For Remote Administrator workstations connecting to a MediaStor computer, a full MediaStor setup is not necessary. Connecting workstations need access to the Administrator only. A Remote Administrator installation sets up the Administrator interface as well as online help on the computer.

To install the Remote Administrator:

1. Exit all applications on the computer(s) on which you want to install the Remote Administrator. The Remote Administrator setup wizard may not be able to write to all necessary files if other software is running.
2. Insert the ASM installation CD-ROM into the drive.
3. From the Start menu, select Run. The Run dialog box appears.
4. You can either browse to the following file or type the path in the Open text box:

   D:\DX2000.XXX\MEDIASTOR REMOTE ADMINISTRATOR\SETUP.EXE

   (In this path, `D` represents the drive holding the setup CD-ROM and *XXX* represents the ASM version number.)
5. Once the file/path appears in the Open text box, click OK. MediaStor Remote Administration setup is initiated (which may take up to two minutes), and the Installation page appears. The Installation page briefly describes the installation process.
6. Click Next. The Installation Options page appears.

Figure 102. Remote Administrator Setup Wizard -- Installation Options Page

7. Select Install new product and then click Next. The License Agreement page appears.

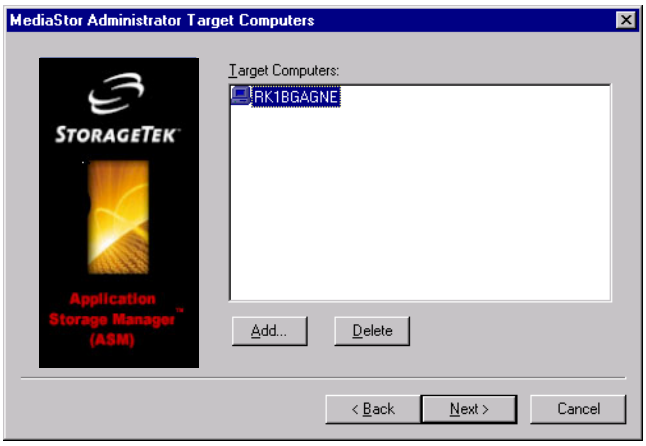
Figure 103. Remote Administrator Setup Wizard -- License Agreement Page

8. You must accept the terms of the license agreement before you can proceed with the installation. Scroll to the bottom of the agreement to enable the Accept terms of agreement check box. Check the box, and then click Next. The Registration page appears.

Figure 104. Remote Administrator Setup Wizard -- Registration Page

9. Enter your name and the name of your organization and then click Next. The Target Computers page appears.

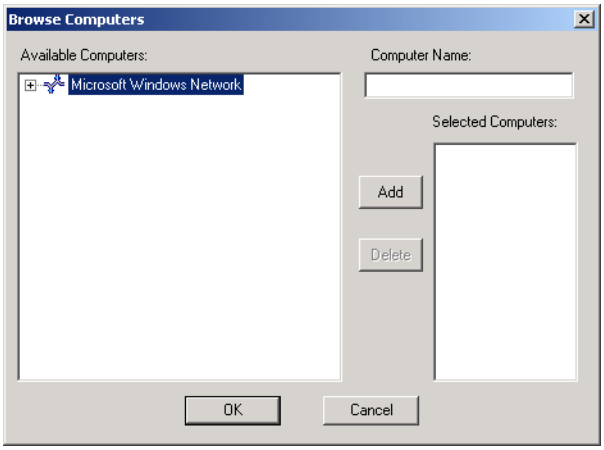
Figure 105. Remote Administrator Setup Wizard -- Target Computers Page



10. You have the following choices:

    - To install the Remote Administrator only on the computer listed in the Target Computers list, click Next. The Summary page appears.
    - To install the Remote Administrator on other computers in addition to the one listed in the Target Computers list, click Add. The Browse Computers dialog box appears.

Figure 106. Browse Computers Dialog Box



11. In the Browse Computers dialog box you have two choices:

    - Under Available Computers, navigate to and select the computer on which you want to install the Remote Administrator and then click Add to add the computer to the Selected Computers list.
    - In the Computer Name text box, type in the name or the IP address of the computer on which you want to install the Remote Administrator and then click Add to add the computer to the Selected Computers list.

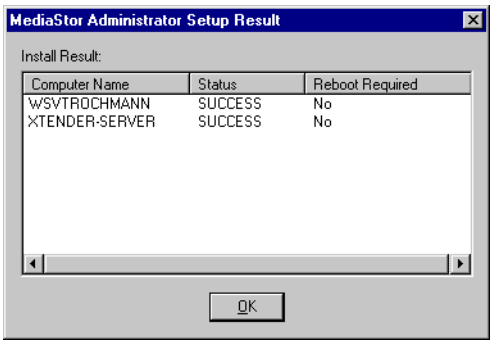
Repeat this step for each additional computer on which you want to install the Remote Administrator. When you finish selecting target computers, click OK. You are returned to the Select Target Computers page.

12. Click Next. The Summary page appears.
13. Verify the accuracy of the information in the summary.
14. If all information is correct, click Finish. Remote Administration Setup copies all program files onto the system and adds Remote Administrator entries and the program group to the system configuration for each target computer selected. A progress bar displays the status of the operation.

    When the installation is complete, one of the following occurs:

    - If you installed the Remote Administrator on one or more remote computers (in addition to or instead of the local computer), the MediaStor Administrator Setup Result dialog box appears, listing the installation results for each computer you specified.

Figure 107. Setup Result Dialog Box



Take note of any computers that need to be restarted (or computers on which the installation failed) and then click OK. Be sure to restart each computer on which it is required before you start the Remote Administrator.

- If you installed the Remote Administrator on the local computer, a message appears, indicating that the Remote Administration installation has been successfully completed. Click Start to close the Remote Administration Setup wizard and open the Administrator, or click Exit to close the Remote Administration Setup wizard without starting the Administrator.

Starting the Remote Administrator the First Time

Because the Remote Administrator functions as an interface for MediaStor services installed on other machines, you must register the other computers through the Administrator in order to use the remote functionality.

To start the Remote Administrator:

1. From the Start menu, select Programs, StorageTek MediaStor Administrator, and then Administrator.

   The first time you start the Remote Administrator, a message appears prompting you to register a MediaStor computer to the Remote Administrator.

Figure 108. Register a Computer? Message

2. You have the following choices:

   - To close the message box, but leave the empty Administrator window open, click No.
   - To begin registering computers, click Yes. For more information and detailed instructions on registering MediaStor computers, see "Registering a Computer for Remote Administration, " which follows.

Registering a Computer for Remote Administration

You can administer MediaStor both from the computer on which MediaStor is installed and from remote computers. You can use the Administrator function that comes with a full installation of MediaStor to administer other MediaStor computers, or you can install the Remote Administrator, which simply provides you with the Administrator interface and the registration capability to attach remotely to any networked MediaStor computer. Only computers where the same or higher version of MediaStor is currently installed can be registered.

The remote administration function is the same whether you use a MediaStor Administrator (full installation) or a MediaStor Remote Administrator. Regardless of which Administrator function you have installed, you have to

register the remote MediaStor computer in order to allow the Administrator you are running to find and connect to the remote MediaStor computer.

You can register MediaStor computers either using the auto-detect function or by adding the MediaStor computers manually. For procedures, see "Registering Computers Using Auto-Detect, " which follows, or “Registering Computers Manually” on page 166.

Registering Computers Using Auto-Detect

For large systems with several MediaStor computers, the manual registration process becomes unwieldy since you must browse to and select each computer on the network. The Auto-Detect Wizard allows you detect and select all currently running MediaStor services on the network without browsing the system to find individual MediaStor computers.

Note: The auto-detect function will only detect MediaStor installations whose version matches that of the Administrator you are running. To register a MediaStor service running a higher version than the Administrator, you must register the computer manually.

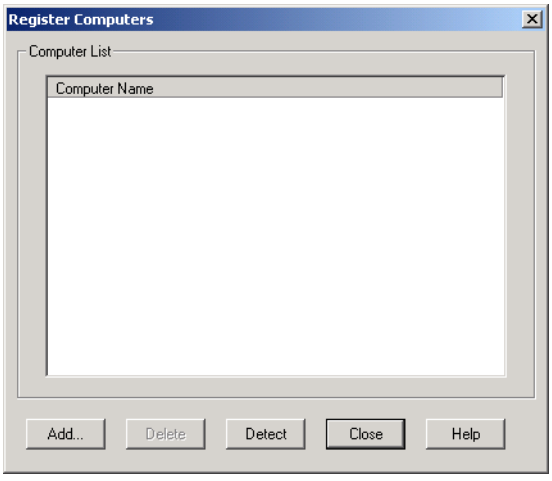
To register MediaStor computers using the Auto-Detect Wizard:

1. From the Service menu in the Administrator in which you want to register the computer(s), select Register, or click the Register Computer toolbar button.

Figure 109. Register Computer Toolbar Button

The Register Computers dialog box appears.

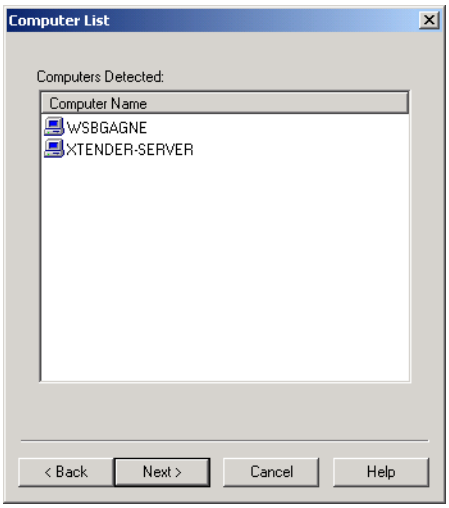
Figure 110. Register Computers Dialog Box



All computers already registered with the currently open Administrator appear in the Register Computers dialog box. If you are registering through a Remote Administrator and you have not yet registered any MediaStor computers, the Register Computers dialog box is blank.

2. Click Detect to start the Auto-Detect Wizard. The Introduction Page appears.
3. Read the Introduction and click Next. The Computer List page appears.

Figure 111. Auto-Detect Wizard -- Computer List Page



The Auto-Detect Wizard detects all computers on which MediaStor is installed and where the MediaStor service is actively running.

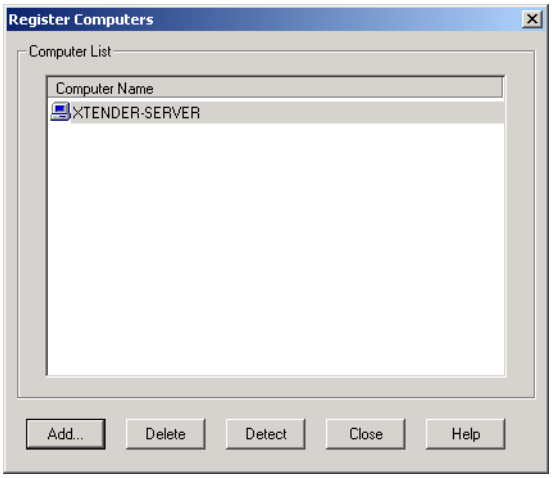
Note: The Auto-Detect Wizard does not detect MediaStor computers that have been powered off or where the MediaStor service has been stopped, or where the MediaStor version does not match that of the Administrator you are running.

4. Select the computer(s) you want to register and click Next.

Note: If a computer that you want to register does not appear in the Computers Detected list, you need to register the computer manually. See "Registering Computers Manually, " which follows.

5. Review the summary to make sure the computers you want to register are listed.
6. If the information in the summary is correct, click Finish. The selected computers are registered and appear in the Register Computers dialog box.

Figure 112. Register Computers Dialog Box with a Computer Registered



7. If you inadvertently list a computer you do not want to register, or you wish to delete a previously registered computer, select that computer and click Delete. Then click Yes on the confirmation message that appears.
8. Once the computers you want to remotely administer appear in the Register Computers dialog box, click Close. The Administrator attempts to connect to all registered MediaStor computers. All registered computer name(s) appear in the Computer drop-down list located directly beneath the menu bar in the Administrator, and in the tree view of the Administrator window.

The Administrator can be used to manage the MediaStor service on all registered and connected MediaStor computer(s). You can switch between registered computers by selecting different computer names from the Computer drop-down list or by selecting the computers in the tree view of the Administrator.

Registering Computers Manually

If the Auto-Detect Wizard does not detect a MediaStor computer you want to remotely administer, or if you want to select the computers yourself, you can register them manually. In addition, if you want to register a MediaStor computer that is running a higher version of the service than that of the Administrator, you will need to register the computer manually.

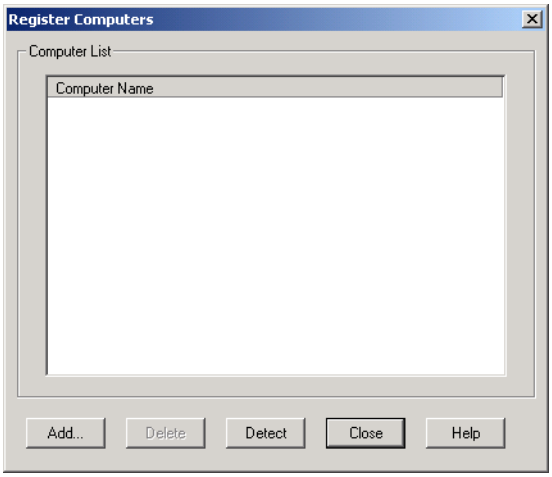
To manually register a MediaStor computer:

1. From the Service menu in the Administrator in which you want to register the computer(s), select Register, or click the Register Computer toolbar button.

Figure 113. Register Computer Toolbar Button

The Register Computers dialog box appears.

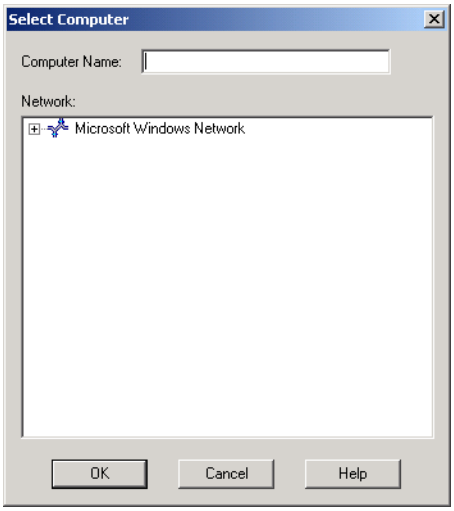
Figure 114. Register Computers Dialog Box



All computers already registered with the currently open Administrator appear in the Register Computers dialog box. If you are registering through a Remote Administrator and you have not yet registered any MediaStor computers, the Register Computers dialog box is blank.

2. Click Add. The Select Computer dialog box appears.

Figure 115. Select Computer Dialog Box



The Select Computer dialog box contains a list of machines on the current network. MediaStor must be installed on the remote computer before it can be registered for remote administration.

3. You have the following choices:

   - Select the MediaStor computer you want to register and click OK.
   - Double-click the computer you want to register.

   The Register Computers dialog box appears, listing the selected computer.

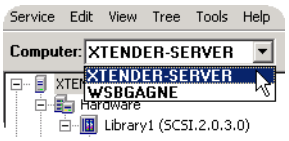
4. Repeat steps 2 and 3 for each computer you want to register.
5. If you inadvertently list a computer you do not want to use as a MediaStor service, or you wish to delete a previously registered computer, select that computer and click Delete. The computer is removed from the list.
6. Once the appropriate computers appear in the Register Computers dialog box, click Close. The Administrator attempts to connect to all registered MediaStor computers. All registered computer name(s) appear in the Computer drop-down list located directly beneath the menu bar in the Administrator, and in the tree view.

The Administrator can be used to manage the MediaStor service on all registered and connected MediaStor computer(s). You can switch between registered computers by selecting different computer names from the Computer drop-down list or by selecting the computers in the tree view of the Administrator.

Connecting to MediaStor Computers

When the Administrator is opened, it attempts to connect to all registered MediaStor computers (including the local computer for full installations of MediaStor). Once these connections have been made, the window displays information pertaining to each MediaStor service. The Administrator allows you to switch easily between registered MediaStor computers by selecting the computers in the tree view, or by selecting different computers from the Computer drop-down list.

Figure 116. Computer Drop-Down List



Remember, to successfully connect to a MediaStor computer in order to administer it, you must be a member of the MSAdministrators group on the computer you want to administer. For more information, see “Windows NT/ 2000 Security” on page 22.

Disconnecting from a MediaStor Computer

You may wish to disconnect from the currently active MediaStor computer. Disconnecting from the active service removes that computer’s MediaStor components from the tree view, though the computer still appears, listed with a status of `(Disconnected)`.

To disconnect from the active MediaStor computer:

1. In the tree view of the Administrator, select the computer from which you want to disconnect.
2. From the Service menu, select Disconnect, or click the Disconnect toolbar button.

Figure 117. Disconnect Toolbar Button

MediaStor removes the selected computer’s components from the tree view, and the computer is listed with a status of `(Disconnected)`.

Reconnecting to a MediaStor Computer

Disconnected MediaStor computers appear in the tree view of the Administrator with a status of `(Disconnected)`. Reconnecting MediaStor

computers re-displays their configured components so that you can administer them.

To reconnect to a MediaStor computer:

1. In the tree view of the Administrator, select the computer to which you want to connect.
2. From the Service menu, select Connect, or click the Connect toolbar button.

Figure 118. Connect Toolbar Button

MediaStor connects to the selected computer, and the computer's MediaStor components appear in the tree view of the Administrator so that you can administer them.

Using SCSI Manager

A

SCSI (Small Computer System Interface) is a hardware interface that allows for the connection of up to seven peripheral devices, such as libraries, or optical and CD-ROM drives, to a single SCSI board, called a SCSI host bus adapter. Thus, seven different devices are using only one expansion slot in the computer.

SCSI Manager is a software utility that provides an interface for viewing and troubleshooting SCSI devices. Shipped withASM MediaStor, SCSI Manager allows you to view SCSI device profiles and status, browse media data, and perform SCSI commands to manipulate the library. Through the SCSI Manager, you can see libraries and drives and view inquiry strings without going through MediaStor. SCSI Manager also provides configuration information that indicates whether the device is supported in the current version of MediaStor.

A working knowledge of SCSI, including commands and hardware connectivity, is necessary to fully utilize SCSI Manager features. The greater your SCSI knowledge, the more powerful this utility can be. For example, when you contact technical support, SCSI Manager provides a common interface in which the support representatives can guide you through troubleshooting hardware problems. For information on SCSI commands, refer to the SCSI Command Reference guide provided with the SCSI device (for example, your library).

For more information, see the following sections:

- “Shutting Down and Exiting SCSI Manager” on page 202

SCSI Concepts

Before using SCSI Manager, you should be familiar with certain areas and terms. The following concepts are important for use with SCSI Manager:

- "Hex, " which follows
- “CDB (Command Descriptor Block)” on page 173
- “Sense Data” on page 173
- “Element” on page 174
- “Buffer” on page 174

Hex

When commands are performed in SCSI Manager, the results appear in hex numbers. Hex is short for hexadecimal, which means 16. This is a base 16 numbering system used as shorthand for representing binary numbers. Each half byte (four bits) is assigned a hex digit as listed in the following table:

Table 20. Decimal And Hexadecimal Represented As Binary

Decimal	Hexadecimal	Binary
0	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000
9	9	1001
10	A	1010
11	B	1011
12	C	1100
13	D	1101
14	E	1110
15	F	1111

In a hex number, each digit position has a value 16 times greater than the one to its right. Two hex digits make up one byte; for example, A7 is equivalent to decimal 167 (10 X 16 + 7 X 1).

CDB (Command Descriptor Block)

A SCSI command and its parameters are sent as a block several bytes long (6, 10, or 12 bytes) called the Command Descriptor Block (CDB). A CDB contains the operation code, Logical Unit Number (LUN), block address, and transfer length fields. The CDB is required for all SCSI Manager commands. For more detailed information, refer to the SCSI specification and particular device manual.

Sense Data

When a SCSI command is carried out, its status is reported on two levels: a brief status in the Status field in the upper part of the Device window and a more detailed status in Sense Data. The Status field reports information such as whether execution of a command was successful or an error occurred, or other information such as “busy.” This status does not give any detailed information.

If the status reads “Check Condition,” it means that some condition exists that prevented successful completion of the command. It could be an error in the CDB, a hardware problem, or some external problem. Issuing the Request Sense command (for more information, see “Request Sense” on page 190) gives you detailed information on the condition, referred to as Sense Data. Sense Data is a set of flags and indicators that are continuously updated to reflect the current status. It is presented in a hierarchical manner, starting with general conditions and proceeding to specific conditions, as follows:

1. SENSE-KEY
2. ADDITIONAL SENSE CODE (ASC)
3. ADDITIONAL SENSE CODE QUALIFIER (ASCQ)

The Sense Key defines the class of error or condition information. There are fifteen Sense Keys, which classify the device condition as a hardware or software problem, fatal or recoverable error, and so on. The ASC together with the ASCQ provide more detailed information. For specific descriptions, refer to the SCSI specification and particular device manual.

Example:

ERR 16:34 (00151) [DE_JUKE.c, 1828] DE: Jukebox error encountered on DISMOUNT

Operation

00 00 00 ….DeviceName:SCSI2000

….ScsiCdb:a5 00 02 bc 01 f4 00 00 00

…

….BusStatus:4h

….TargetStatus:2h, CHECK CONDITION

….SenseData:70 00 06 00 00 00 00 0a 00

….00 00 00 29 00 00 00 00 00

….SenseKey:6h, UNIT ATTENTION

….AddSenseCode:29h

….AddSenseQual:0h

….ScsiError: 9824, SCSI_ERR_DEV_RESET

….JukeError: 9728, JUKE_ERR_DEV_RESET

Element

Elements are components in a library, including individual storage slots, mailslots, optical, CD-ROM, and tape drives, and picker mechanisms. Many SCSI commands refer to this term; for example, Read Element Status and Position to Element, which positions the transport element (picker) in front of another element (for example, a drive). For more information, see “Read Element Status” on page 194 and “Position to Element” on page 196.

Buffer

A buffer is a reserved segment of memory used to hold data while it is being processed. In SCSI Manager, the buffer is contained and displayed in the bottom part of the Device window and includes information about the specific SCSI device. When commands are performed, the results are shown in the buffer area, which is located in the bottom portion of the Device window. This buffer contains a scroll bar in order to view complete results.

Buffer length refers to the amount of space allotted in the bottom display portion of the Device window. Each command using the buffer has a default buffer length, in bytes. This number is usually adequate, but can be changed if necessary.

■ Supported Device Types

When SCSI Manager is initialized, it seeks out all SCSI autochangers and drives currently connected to the system. The following table lists the types of supported devices

:

Table 21. SCSI Manager Supported Devices

Device	Description
CD-ROM	Standalone CD-ROM drive
TAPE	Standalone tape drive (tape media cannot be browsed)
DVD-ROM	Standalone DVD-ROM drive
DVD-R	Standalone DVD-R drive
DVD-RAM	Standalone DVD-RAM drive
OPTICAL MEMORY	Standalone optical drive
WORM MEMORY	Standalone WORM drive
JUKEBOX	Library, either optical, DVD-RAM, DVD-R, DVD-ROM, CD-ROM, WORM, WORM-tape, or tape

Note: Serial libraries are not accessible through SCSI Manager. Only SCSI devices appear. For information on accessing and controlling serial libraries, see “Appendix B: Using Jukebox Manager” on page 167.

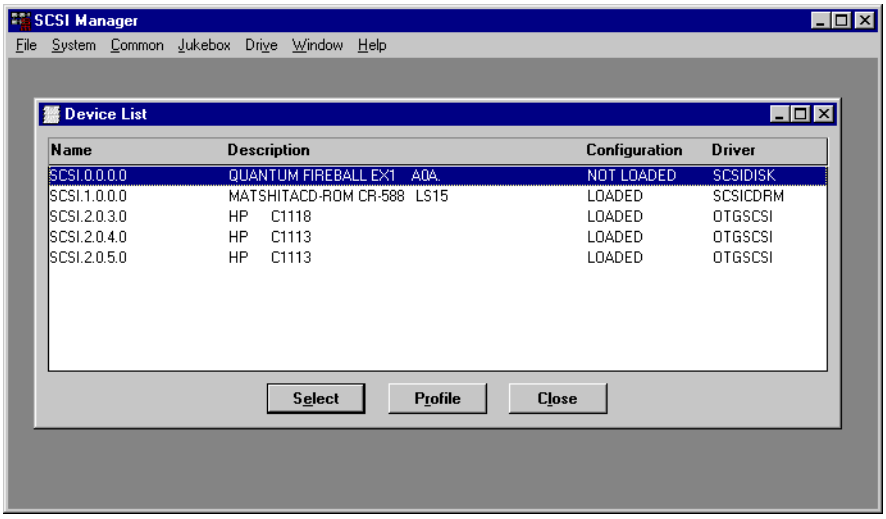
Starting SCSI Manager

Once you start SCSI Manager, you can begin using the utility to manage the SCSI devices in your MediaStor system.

To start SCSI Manager:

1. Be sure that neither Jukebox Manager nor the MediaStor service is running. SCSI Manager cannot initialize if MediaStor or Jukebox Manager is running. Only one of these services can access devices at a time. For more information, see “Shutting Down and Exiting Jukebox Manager” on page 174 and “Managing the MediaStor Service” on page 91.
2. From the Windows Start menu, select Programs, then ASM MediaStor, Utilities, and then SCSI Manager. The SCSI Manager window appears and SCSI Manager automatically initializes.

Figure 119. SCSI Manager Window



As SCSI Manager initializes, it looks for all SCSI devices on the system and lists them in the Device List window, shown in the figure above. The following information appears for each device in the Device List window:

Table 22. Device List Window Columns

Column	Description
Name	The SCSI device address
Description	The device vendor and model
Configuration	Whether the device driver is loaded in the ASM supported device list. If the device driver is not loaded, you cannot see the device when adding hardware to MediaStor.
Driver	The driver that has control of the device. If the device is configured with a Windows Native file system (NTFS), the drivers listed are SCSIDISK, SCSICDRM, or SCSITAPE; if the device is configured with an ASM file system, SCSIALL is listed as the driver.

Note: If SCSI Manager fails to initialize, you can initialize it manually. From the File menu in SCSI Manager, select Initialize. A check mark appears beside the Initialize command in the File menu, and the Device List window appears.

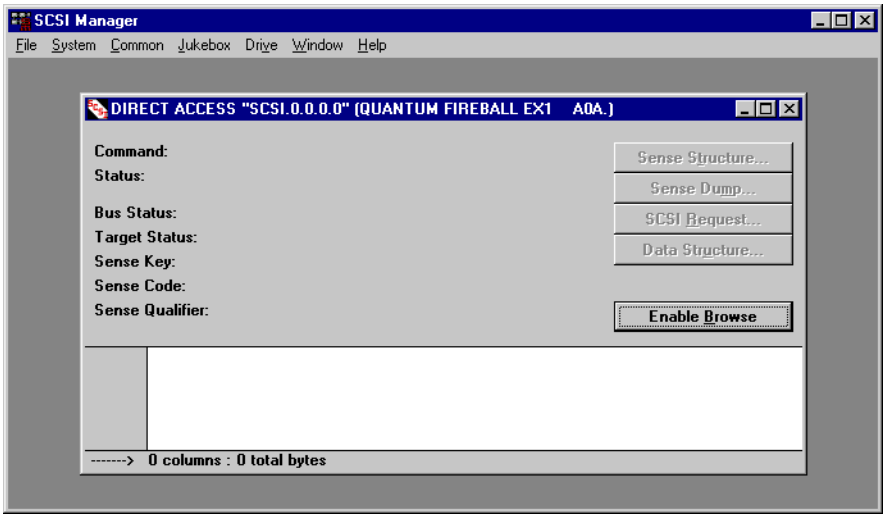
Note: If you close a Device window or shut down SCSI Manager, the Device List window also closes. You can reopen it by selecting the Device List option from the System menu (when SCSI Manager is initialized).

3. From the Device List window, you have the following choices:

   - View a device's profile. For more information, see "Viewing a Device Profile, " which follows.

- Open a Device window for a device, from which you can view and manage the device. To open a Device window, select the device you want to view and manage, and then click Select. (You can also double-click the device to open the Device window.)

Figure 120. Device Window



The Device window displays command status and results information for the selected device, providing a concise view of device events. The device description, including the SCSI ID, appears in the title bar of the Device window so that you can easily note which device's information is displayed in the active window.

The Device window is clear of all data until a command is performed. All commands for a device must be performed while the Device window for a device is active. Any command executed affects the active window.

When a command is performed, it is listed in the upper part of the Device window, along with status and other statistics. These statistics give insight into the inner workings of the SCSI command. The buttons at the right of the window become active and inactive depending upon the command performed. If an option is available after a command is performed, the button is enabled for use. This chapter describes each command and further options that can be performed.

Viewing a Device Profile

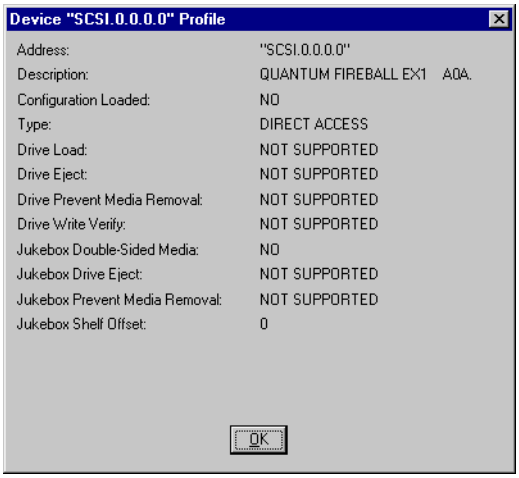
Since all SCSI devices are different and have slightly different functionality, the Device Profile is helpful for determining not only the SCSI ID and description of the device, but also particular functions of the device. For example, some libraries require that the *library* perform the media eject, and some require that the *drive* perform the media eject (with no intervention from the library). The

Device Profile tells you which features a specific device supports, and therefore whether those commands are applicable for the device.

To view a Device Profile:

1. From the Device List window, select the device whose profile you want to view and then click Profile. The Device Profile appears, with the SCSI address listed in the title bar.

Figure 121. Device Profile Dialog Box



2. When you finish, click OK to close the Device Profile dialog box and return to the Device List window.

Browsing Media

Browsing media allows you to read sectors one-by-one, or to read specific sectors on the media. In addition, you can search for occurrences of a data pattern on the media.

Browsing is disabled by default, so that in order to browse media, you must enable browsing in the Device window.

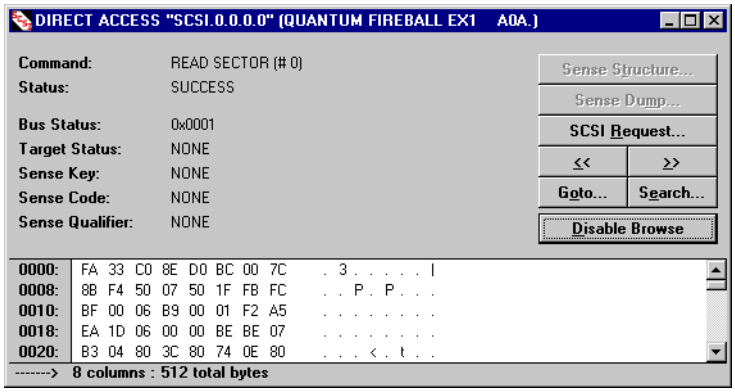
Note: When browsing is enabled, no other SCSI commands can be performed for the device. For example, commands in the Drive and Jukebox menus are not available while browsing is enabled.

To enable browsing:

1. Be sure that the media you want to browse is mounted and spun-up in the drive. Media must be mounted and spun-up before you can enable browsing.
2. Click the Enable Browse button in the Device window. The contents and active buttons in the Device window and available menu commands change to reflect that browsing is enabled. In addition, the Command field

at the top of the Device window displays “Read Sector”, and the Enable Browse button changes to Disable Browse.

Figure 122. Device Window with Browsing Enabled



3. You have the following choices:

   - To move forward from sector to sector in order, click the forward arrow button. You can also open the Drive menu, select Browse, and then choose Next Sector.
   - To move backward from sector to sector in order, click the backward arrow button. You can also open the Drive menu, select Browse, and then choose Previous Sector.
   - To search for a specific sector or group of sectors, see "Searching Sectors, " which follows.
   - To go directly to a specific sector, see “Going to a Specific Sector” on page 180.

4. When you finish, click the Disable Browse button on the Device window to disable browsing. The Device window changes to reflect that browsing has been disabled, and previously unavailable SCSI commands are now available in the SCSI Manager menus.

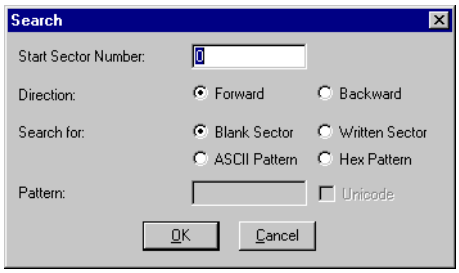
Searching Sectors

When browsing sectors on a piece of media, you can search for a specific sector or group of sectors.

To search for sectors:

1. With browsing enabled, click the Search button in the Device window, or, from the Drive menu, select Browse and then Search. The Search dialog box appears.

Figure 123. Search Dialog Box



2. In the Start Sector Number text box, enter a starting sector number.
3. Select the direction in which you want to search. Choose Forward if you want to search forward through the sectors, or choose Backward if you want to search backward through the sectors.
4. Select a search option. You have the following choices:
   - To search for a blank sector, choose Blank Sector.
   - To search for a written sector, choose Written Sector.
   - To search for an ASCII pattern, choose ASCII Pattern.
   - To search for a Hex pattern, choose Hex Pattern.
5. If you chose to search for an ASCII or Hex pattern, enter the pattern in the Pattern text box.
6. If you chose to search for an ASCII pattern, choose whether to search for Unicode.
7. Click OK. The search results appear in the lower portion of the Device window.

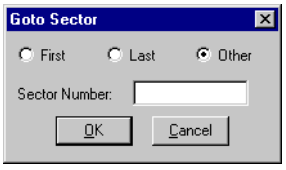
Going to a Specific Sector

If you know the sector of media you want to browse, you can go directly to that sector.

To go to a specific sector:

1. Click the Goto button in the Device window, or, from the Drive menu, select Browse and then Goto Sector. The Goto Sector dialog box appears.

Figure 124. Goto Sector Dialog Box



2. You have the following choices:

- To go to the first sector of the media, select First.
- To go to the last sector of the media, select Last.
- To go to a specific sector, select Other and then enter the number of the sector in the Sector Number text box.

3. Click OK. The Sector information appears in the lower portion of the Device window.

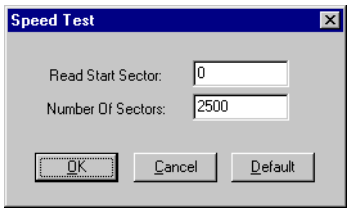
Performing a Speed Test

You can perform a Speed Test to determine the time required to read a specific number of sectors on a piece of media.

To perform a speed test:

1. With browsing enabled, open the Drive menu. Select Browse and then Speed Test. The Speed Test dialog box appears.

Figure 125. Speed Test Dialog Box



   The default value is to start the test at sector 0 and to read 2500 sectors.

2. To change the sector at which the speed test begins, enter the sector number in the Read Start Sector text box.
3. To change the number of sectors to test, enter the number in the Number Of Sectors text box.

   Note: If necessary, you can return the values in the Read Start Sector and Number Of Sectors text box by clicking Default.

4. Click OK to start the speed test. After the test is performed, a message appears with the number of seconds required to read the specified number of sectors.

■ Writing and Reading Data Files

You can create a data file that contains all of the data appearing in the buffer, which is displayed in the lower part of the Device window. (For more information on the buffer, see “Buffer” on page 174.) This allows you to save information at the time it appears.

Data files are saved with a .DAT extension and can be opened in SCSI Manager. When opened, they appear in the lower part of the active Device window.

For more information, see the following sections:

- "Writing Data Files, " which follows
- “Reading Data Files” on page 183

Writing Data Files

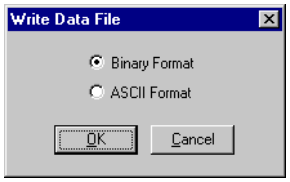
When creating a data file, you must decide between Binary and ASCII format.

- Binary information is stored in a binary coded form, such as data, text, images, voice, and video. One byte (8 bits) can hold values from 0 to 255. Two contiguous bytes (16 bits) can hold values from 0 to 65,535.
- An ASCII file contains data made up of ASCII characters. It is essentially raw text. In ASCII format, each byte in the file contains one character that conforms to the standard ASCII code. Program source code, DOS batch files, macros, and scripts are written as straight text and stored as ASCII files. ASCII text files become a common denominator between applications that do not import each other’s formats. If both applications can import and export ASCII files, files can be transferred between them.

To write a data file:

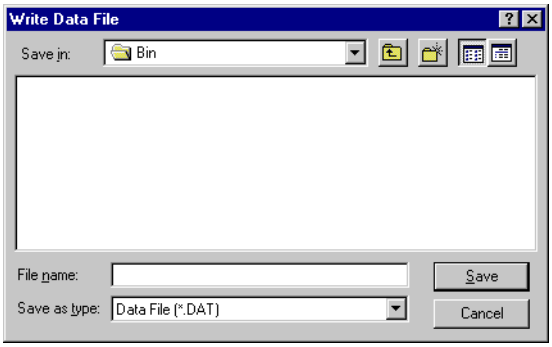
1. Enable media browsing so that there is data in the buffer. For more information, see “Browsing Media” on page 178. Other data can be accessed through the following commands:
   - “Inquiry” on page 188
   - “Request Sense” on page 190
   - “Receive Diagnostics” on page 191
   - “Mode Sense” on page 192
   - “Custom Command” on page 192
   - “Read Sector” on page 198
   - “Read Capacity” on page 200
2. From the File menu, select Write Data File. The Write Data File dialog box appears.

Figure 126. Write Data File Dialog Box



3. Select a format option. You have the following choices:
   - Choose Binary Format to write the data file to a binary format.
   - Choose ASCII Format to write the data file to an ASCII format.
4. Click OK. A dialog box appears allowing you to select a file location. The default location is the Bin directory within the program folder in C:\Program Files\Legato\.

Figure 127. Write Data File Dialog Box -- Choose Location



5. Select the directory in which you want to save the file.
6. In the File name text box, enter a file name.
7. Click Save. A confirmation message appears.
8. Click OK.

Reading Data Files

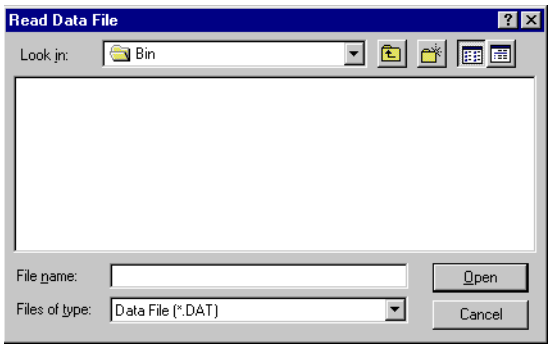
Saved data files can be accessed through SCSI Manager, with the file data displayed in the lower portion of the Device window. Use the scroll bar on the right side if necessary to view the entire file.

Note: You must disable browsing to read data files, because the buffer (lower part of the Device window) must be empty in order to read the data file to the buffer.

To read a data file:

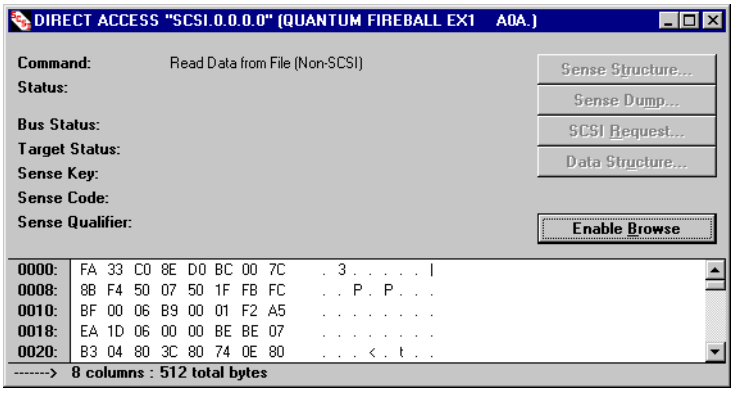
1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the File menu, select Read Data File. The Read Data File dialog box appears.

Figure 128. Read Data File Dialog Box



3. Navigate to and select the file you want to read, and then click Open (or double-click the file).
4. The data file information appears in the lower portion of the Device window.

Figure 129. Device Window with Data File Displayed



■ Device Window Commands

From the Device window, you can view additional Sense Data and the current status of the SCSI device. For more information, see the following sections:

- "Sense Structure/Sense Dump, " which follows
- “SCSI Request” on page 185

Sense Structure/Sense Dump

You can view additional Sense Data when you click the Sense Structure or Sense Dump buttons in the Device window. Sense Data can be useful for troubleshooting problems with the device. For more information on Sense Data, see “Sense Data” on page 173.

The following figures show examples of the data that appears when these buttons are selected.

Figure 130. Sense Structure Dialog Box

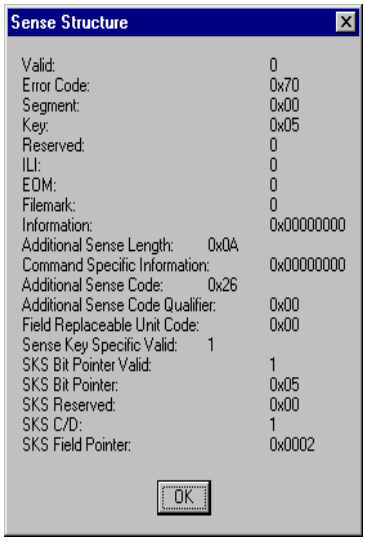
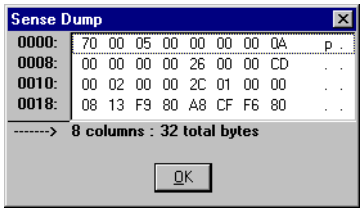


Figure 131. Sense Dump Dialog Box

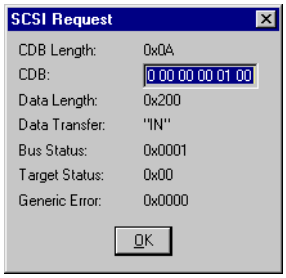


Click OK in either the Sense Structure or Sense Dump dialog box to close it.

SCSI Request

Clicking the SCSI Request button in the Device window allows you to view the current status of the SCSI device. The device status is returned in a standard format with a Sense Code in byte 2, and an Additional Sense Code (ASC) and Additional Sense Code Qualifier (ASCQ) in bytes 12 and 13. (For more information on Sense Data, including the ASC and ASCQ, see “Sense Data” on page 173.)

Figure 132. SCSI Request Dialog Box



Click OK to close the SCSI Request dialog box.

Common Menu Commands

The Common menu contains commands commonly used for communicating with SCSI devices. For more information, see the following sections:

- "Test Unit Ready, " which follows
- “Rezero Unit” on page 187
- “Inquiry” on page 188
- “Request Sense” on page 190
- “Send Diagnostics” on page 190
- “Receive Diagnostics” on page 191
- “Mode Sense” on page 192
- “Custom Command” on page 192

Note: Common menu commands can only be accessed when browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.

Test Unit Ready

The Test Unit Ready command determines the ready state of a device. A device is in a ready state when all SCSI devices are connected properly and it operates without error. A drive in a library is in a ready state when the media is loaded and spun up, and when read or write operations can complete successfully.

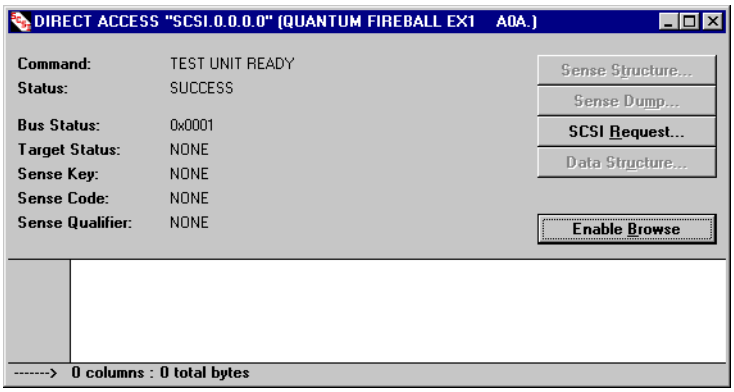
If the device is in a ready state when it receives the command, it returns a status of “Ready”. If the device is not in a ready state, the status is “Not Ready” or “Not Found”.

Note: The Test Unit Ready command is the first command that should be performed on a device. It is a basic method for testing whether the device is functional.

To test the ready state of a device:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Common menu, select Test Unit Ready. The command appears in the Device window and the device is tested.

Figure 133. Device Window with Test Unit Ready Results



The results appear in the Status and Sense fields in the upper portion of the Device window.

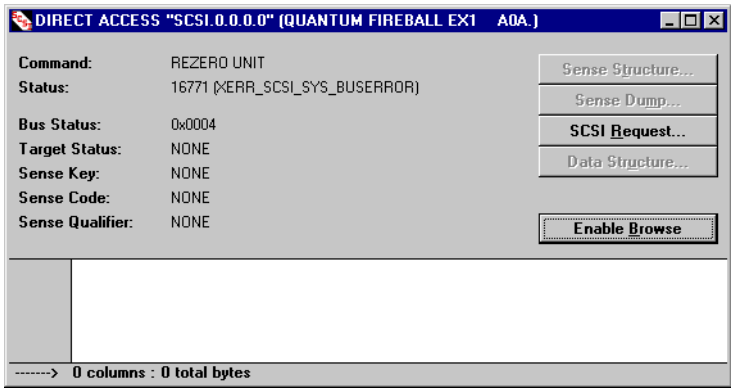
Rezero Unit

Rezeroing is typically done on libraries. This command calibrates the device and places it into an initialized state. Usually this command is performed automatically when the device is powered on; however, certain devices do not perform this command automatically. Failure of this command could indicate hardware difficulties, like a jammed drive, making it potentially helpful as a diagnostic tool.

To rezero a library:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. Be sure that media is present in the drive. A drive can only be rezeroed when media is present in the drive.
3. From the Common menu, select Rezero Unit. The command appears in the Device window and the device is calibrated.

Figure 134. Device Window with Rezero Unit Results



The results appear in the Status and Sense fields in the upper portion of the Device window.

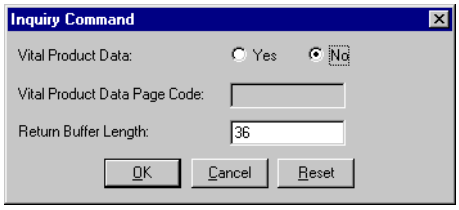
Inquiry

The Inquiry command is important during diagnostic testing, especially if you are unfamiliar with the hardware. It sends controller and drive information to the initiator. The result is a display of what is commonly called the “inquiry string”, which includes the device manufacturer, the product name, and firmware version.

To execute an inquiry:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Common menu, select Inquiry. The Inquiry Command dialog box appears.

Figure 135. Inquiry Command Dialog Box



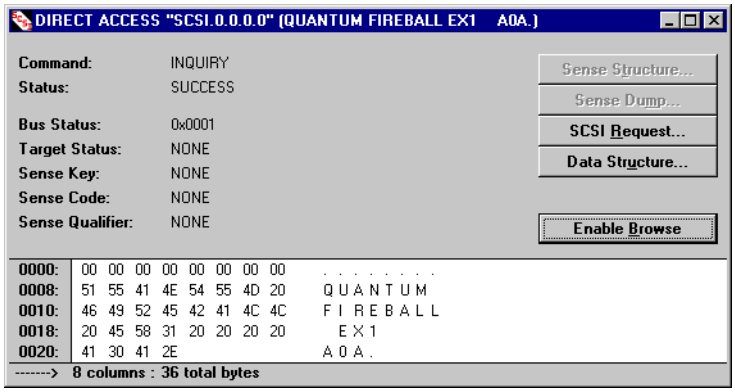
3. You have the following choices:
   - If the product you are using has additional page codes that can be used during inquiry and are unique to the device, select Yes for the Vital Product Data option. Then enter the page code in the Vital Product Data Page Code text box, as specified in the device manual.
   - Leave the default setting of No for the Vital Product Data option.

4. Enter a buffer length in the Return Buffer Length text box. The default value is 36. If a page code is entered, the buffer length must be changed to accommodate more data.

   Note: If you need to reset the values in the Inquiry Command dialog box to the default settings, click Reset.

5. Click OK. The results appear in the lower portion of the Device window.

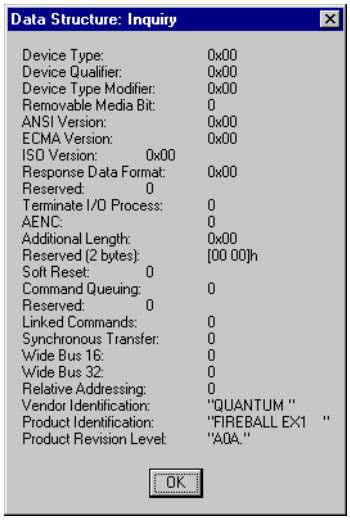
Figure 136. Device Window With Inquiry Data



In addition, the Data Structure button on the Device window becomes active.

6. To view further details, click Data Structure. The Data Structure: Inquiry dialog box appears with read-only information.

Figure 137. Data Structure: Inquiry Dialog Box



7. Click OK to return to the Device window.

Request Sense

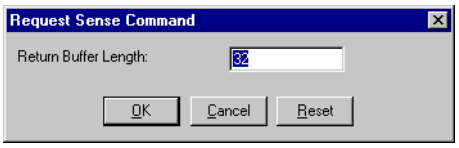
After every command, the status of the command is checked for errors. If an error occurs, a “Check Condition” status is reported and Sense Data is updated. Sense Data is preserved until retrieved by a Request Sense command or until the same drive receives another command. Initiating the Request Sense command at the time an error is returned allows you to determine the specific error condition. For more information on Sense Data, see “Sense Data” on page 173.

Note: If a Send Diagnostics command is unsuccessful, the status reads “Check Condition”. The first command after a “Check Condition” status resets the Sense Data. This means that if a Request Sense command is not issued at this point, the error information is lost. For more information on the Send Diagnostics command, see “Send Diagnostics” on page 190.

To request Sense Data:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Common menu, select Request Sense. The Request Sense Command dialog box appears.

Figure 138. Request Sense Command Dialog Box



3. Enter a buffer length in the Return Buffer Length text box. The default value is 32.

   Note: If you need to reset the buffer length in the Request Sense Command dialog box, click Reset.

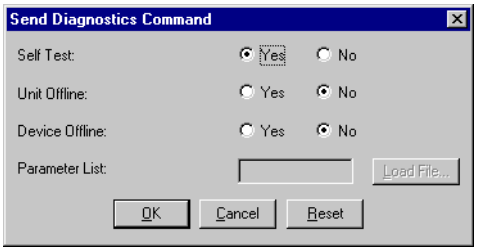
4. Click OK. The results appear in the lower part of the Device window.

Send Diagnostics

The Send Diagnostics command initiates certain predefined diagnostic tests/ exercise routines in order to perform a self-test. The information specified for this command is unique to the device being used. To send diagnostics:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Common menu, select Send Diagnostics. The Send Diagnostics Command dialog box appears.

Figure 139. Send Diagnostics Command Dialog Box



3. Set the appropriate options.

   Note: If you need to reset the values in the Send Diagnostics Command dialog box to the default settings, click Reset.

4. Click OK.

   Note: If the test is not successful, the status reads “Check Condition” and a Request Sense command should be performed to describe details about the failure. For more information on performing a Request Sense command, see “Request Sense” on page 190.

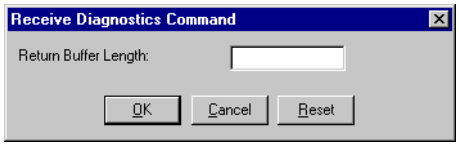
Receive Diagnostics

The Receive Diagnostics command collects and displays the information gathered using the Send Diagnostics command.

To receive diagnostics:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Common menu, select Receive Diagnostics. The Receive Diagnostics Command dialog box appears.

Figure 140. Receive Diagnostics Command Dialog Box



3. Enter a buffer length.

   Note: If you need to reset the buffer length in the Receive Diagnostics Command dialog box, click Reset.

4. Click OK.

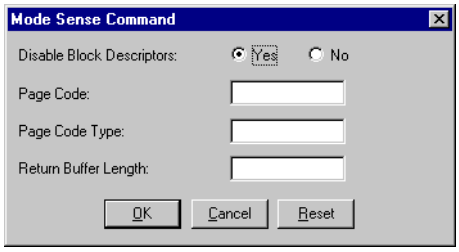
Mode Sense

This command retrieves element parameter information, including element addresses, number of drives, and element characteristics. The results are unique to the device being used. For more information on elements, see “Element” on page 174.

To execute mode sense:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Common menu, select Mode Sense. The Mode Sense Command dialog box appears.

Figure 141. Mode Sense Command Dialog Box



3. Enter the appropriate information.

   Note: If you need to reset the values in the Mode Sense Command dialog box to the default settings, click Reset.

4. Click OK.

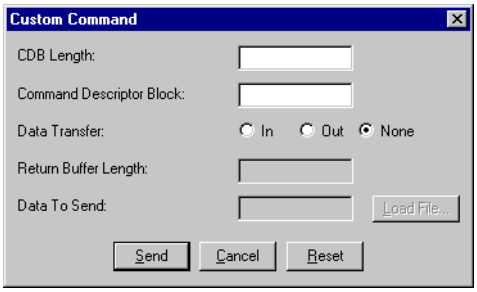
Custom Command

For any command that is not available through a menu option, a customized command can be performed directly from SCSI Manager. For detailed information on Command Descriptor Blocks, lengths needed, and so on, refer to the SCSI reference manual for the specific device.

To execute a custom command:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Common menu, select Custom Command. The Custom Command dialog box appears.

Figure 142. Custom Command Dialog Box



3. Enter the appropriate information.

   Note: If you need to reset the values in the Custom Command dialog box to the default settings, click Reset.

4. Click Send.

Jukebox Menu Commands

The Jukebox menu provides functions for working with a library and its elements. Elements include storage slots, mailslots, drives, and the picker mechanism. For more information, see the following sections:

- "Initialize Element Status, " which follows
- “Read Element Status” on page 194
- “Move Medium” on page 195
- “Position to Element” on page 196
- “Medium Removal” on page 196

Note: Jukebox menu commands can only be accessed when browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.

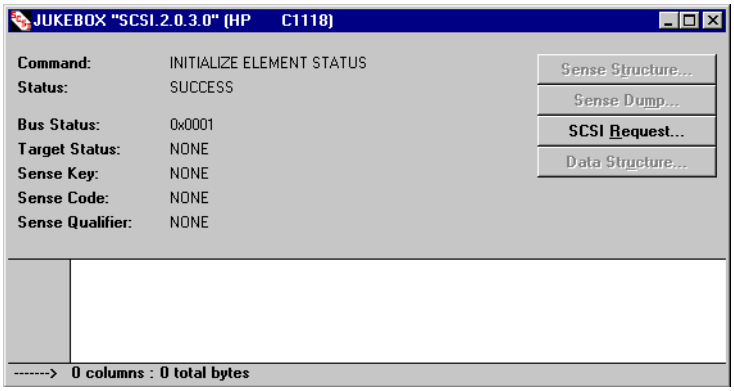
Initialize Element Status

The Initialize Element Status command checks all elements for relevant status. This command acts as a kind of soft reset, to make sure the element is ready to receive commands. This information is retained and is available through the Read Element Status command. For more information on the Read Element Status command, see "Read Element Status, " which follows.

To initialize element status:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Jukebox menu, select Init Element Status. The command appears in the Device window.

Figure 143. Device Window with Initialize Element Status Results



The status reads “success” when the initialization is successful.

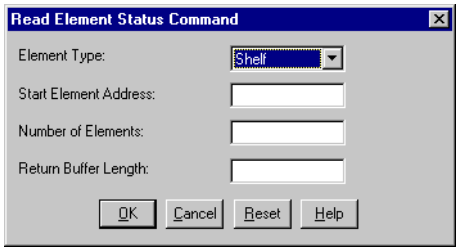
Read Element Status

The Read Element Status command gives the exact status of the various elements within the library.

To read element status:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Jukebox menu, select Read Element Status. The Read Element Status Command dialog box appears.

Figure 144. Read Element Status Command Dialog Box



3. Select the element type from the drop-down list.
4. In the Start Element Address text box, enter the address of the element with which you want to start.

5. In the Number of Elements text box, enter the number of elements.
6. In the Return Buffer Length text box, enter the maximum length of the return buffer.

   Note: If you need to reset the values in the Read Element Status Command dialog box to the default settings, click Reset.

   Note: For a list of Hex values needed for the specific device, click Help.

7. Click OK.

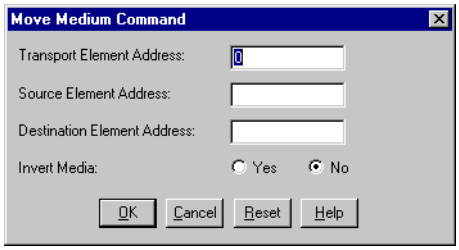
Move Medium

The Move Medium command allows you to move media between library elements. While you can perform this command using Jukebox Manager, it is advantageous to use SCSI Manager if you want to see the SCSI commands behind the action.

Note: When inserting media into a drive that uses the NTFS or FAT file system, use the FSMOUNT.EXE utility from a command prompt to mount the file system after the media is mounted. For details on using FSMOUNT.EXE, refer to the ASM Solutions Knowledge Base, which can be found either on the StorageTek website at http://www.support.StorageTek.com in the Customer Resource Center (CRC) section. To move media between library elements:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Jukebox menu, select Move Medium. The Move Medium Command dialog box appears.

Figure 145. Move Medium Command Dialog Box



3. In the Source Element Address text box, enter the address of the element that contains the media you want to move.
4. In the Destination Element Address text box, enter the address of the element to which you want to move the media.

5. If the media you are moving is double-sided, choose whether to invert the media while moving it. Click Yes to invert the media, or click No to move the media without inverting it.

   Note: If you need to reset the values in the Move Medium Command dialog box to the default settings, click Reset.

   Note: For a list of Hex values needed for the specific device, click Help.

6. Select OK.

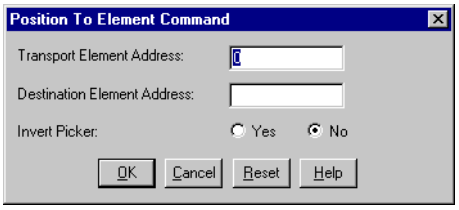
Position to Element

This command positions the picker (transport element) in front of the specified element. This is useful for setting the picker to rest in front of a certain drive for faster performance, or to a location that is out of the way from blocking access to a storage element that requires manual intervention.

To position the picker in front of an element:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Jukebox menu, select Position to Element. The Position to Element Command dialog box appears.

Figure 146. Position To Element Command Dialog Box



3. Enter the Transport and Destination Element Addresses, and select whether to invert the picker.

   Note: If you need to reset the values in the Move Medium Command dialog box to the default settings, click Reset.

   Note: For a list of Hex values needed for the specific device, click Help.

4. Click OK.

Medium Removal

The Medium Removal command allows you to specify whether media can be ejected from the library using the Eject button on the front panel of the library. The Allow command may need to be sent in order to eject media from a drive

that is locked. Likewise, sending a Prevent command locks access to a drive from any other thread trying to access it.

To allow media removal:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Jukebox menu, select Medium Removal. The Medium Removal Command dialog box appears.

Figure 147. Medium Removal Command Dialog Box

3. Choose whether to allow media to be removed from the drive using the Eject button on the front panel of the library.
   - Select Allow to allow media removal using the Eject button.
   - Select Prevent to require a SCSI command in order to remove media from the drive.

   Note: If you need to reset the value in the Medium Removal Command dialog box to the default setting, click Reset.
4. Click OK.

Drive Menu Commands

The Drive menu provides functions that deal specifically with drive performance and media read/write capabilities. For more information, see the following sections:

- "Read Sector, " which follows
- “Write Sector” on page 198
- “Read Capacity” on page 200
- “Start/Stop Unit” on page 200
- “Medium Removal” on page 201
- “Format” on page 202

Note: Drive menu commands can only be accessed when browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.

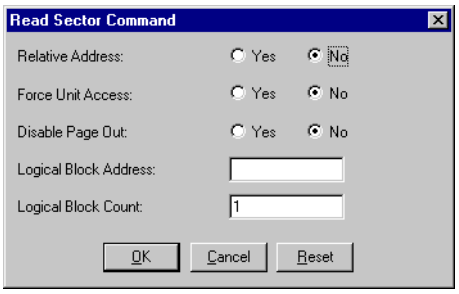
Read Sector

You can read information from a piece of media one sector at a time, or you can read multiple contiguous sectors at a time. The Read Sector command reads specified sectors and displays their contents.

To read media sectors:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. Be sure that media is mounted in a drive and spun up using the start/stop unit command. For more information, see “Start/Stop Unit” on page 200.
3. From the Drive menu, select Read Sector. The Read Sector Command dialog box appears.

Figure 148. Read Sector Command Dialog Box



4. Set the appropriate Relative Address, Force Unit Access, and Disable Page Out options. The default for each of these options is No.
5. In the Logical Block Address text box, enter the first sector to be read. (The starting sector is 0.)
6. In the Logical Block Count text box, enter the number of sectors to be read.

   Note: If you need to reset the values in the Read Sector Command dialog box to the default settings, click Reset.

7. Click OK. The sector data appears in the lower portion of the Device window and is saved in a memory buffer. All or part of the information can be written to a new media location to a specific sector or range of sectors. For more information, see "Write Sector, " which follows.

Write Sector

The Write Sector command is used in conjunction with Read Sector. Once information has been read, it is buffered and appears in the lower portion of the Device window. All or part of the information can be written to a new media location to a specific sector or range of sectors. For WORM media, this

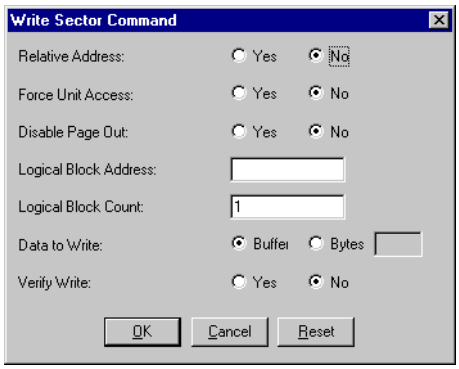
information can be written only if there are unused sectors. Information cannot be rewritten to WORM.

Note: Be sure that the number of sectors in the data buffer is at least as large as the number of sectors to be written. For example, if ten sectors are to be written, at least ten sectors must have been read and placed in the data buffer.

To write media sectors:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. Use the Read Sector command to display the sector data to be copied. For instructions, see “Read Sector” on page 198.
3. From the System menu, select Copy Data.
4. Activate the Device window for the device containing the media to which the information is to be copied.
5. From the System menu, select Paste Data. The information is pasted into the buffer.
6. From the Drive menu, select Write Sector. The Write Sector Command dialog box appears.

Figure 149. Write Sector Command Dialog Box



7. Set the appropriate Relative Address, Force Unit Access, and Disable Page Out options.
8. Select the sector or range of sectors to which the data should be written using the Logical Block Address and Logical Block Count text boxes.

   Note: If you need to reset the values in the Write Sector Command dialog box to the default settings, click Reset.

9. Click OK. The data is written to the specified sector(s) on the media.

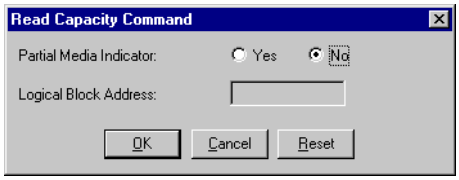
Read Capacity

The Read Capacity command reads the capacity of the media in the drive. The result is a hex value with total number of sectors.

To determine read capacity:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Drive menu, select Read Capacity. The Read Capacity Command dialog box appears.

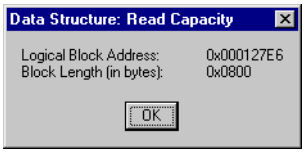
Figure 150. Read Capacity Command Dialog Box



3. You have the following choices:
   - To read partial sectors, select Yes and enter a starting sector number in the Logical Block Address text box.
   - To read the entire media, select No. This is the default.

   Note: If you need to reset the values in the Read Capacity Command dialog box to the default settings, click Reset.
4. Click OK. The results appear in the lower part of the Device window.
5. Click Data Structure to display a dialog box containing the read results.

Figure 151. Data Structure: Read Capacity Dialog Box



6. Click OK to return to the Device window.

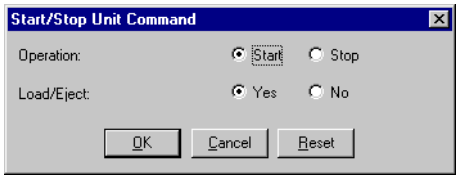
Start/Stop Unit

The Start/Stop Unit command starts or stops the rotation of the media in the drive and/or ejects the media from the drive.

To start or stop the unit:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Drive menu, select Start/Stop Unit. The Start/Stop Unit Command dialog box appears.

Figure 152. Start/Stop Unit Command Dialog Box



3. Choose whether to start or stop the unit by selecting the appropriate Operation option.
4. Choose whether to load or eject media by selecting the appropriate Load/Eject option. In some instances, media may need to be ejected in order to be spun down.

   Note: If you need to reset the values in the Start/Stop Unit Command dialog box to the default settings, click Reset.

5. Click OK.

Medium Removal

The Medium Removal command allows you to specify whether media can be ejected from the drive using the Eject button on the front panel of the device. The Allow command may need to be sent in order to eject media from a drive that is locked. Likewise, sending a Prevent command locks access to a drive from any other thread trying to access it.

To allow media removal:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Drive menu, select Medium Removal. The Medium Removal Command dialog box appears.

Figure 153. Medium Removal Command Dialog Box

3. Choose whether to allow media to be removed from the drive using the Eject button on the front panel of the library.

- Select Allow to allow media removal using the Eject button.
- Select Prevent to require a SCSI command in order to remove media from the drive.

Note: If you need to reset the value in the Medium Removal Command dialog box to the default setting, click Reset.

4. Click OK.

Format

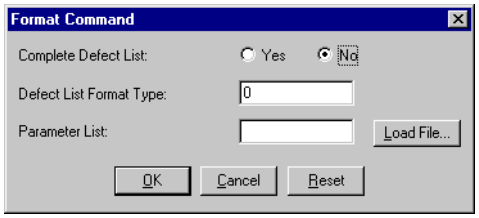
You can perform a low-level format on a piece of media in a drive.

Note: Do not use the Format command to low-level format a piece of DVD-R media. Since DVD-R media can only be written to once, you cannot write additional files to the media if you low-level format it.

To format media:

1. Be sure that media browsing is disabled. When browsing is disabled, the Enable Browse button appears on the Device window.
2. From the Drive menu, select Format. The Format Command dialog box appears.

Figure 154. Format Command Dialog Box



3. Select the appropriate options.

Note: If you need to reset the values in the Format Command dialog box to the default settings, click Reset.

4. Click OK.

Shutting Down and Exiting SCSI Manager

When you finish viewing and managing SCSI devices, you can shut down and exit SCSI Manager.

When you shut down SCSI Manager, SCSI Manager can run in a shutdown mode, so that SCSI devices can be seen and used by other applications/ services, such as MediaStor and Jukebox Manager.

If you are finished using SCSI Manager, you can exit the utility.

To shut down SCSI Manager:

- From the File menu of the SCSI Manager window, select Shutdown. A check mark appears by the Shutdown command in the menu, and all Device windows are closed.

To exit SCSI Manager:

- From the File menu, select Exit.

Using Jukebox Manager

B

Jukebox Manager is a software utility that provides an interface for viewing and troubleshooting system libraries. Shipped with ASM MediaStor, Jukebox Manager allows you to view library profiles, perform a library inventory, and insert, eject, move, mount, exchange, flip, and dismount media.

Jukebox Manager provides only a general overview of the library and its contents, including whether media exists in drives and shelves. It does not specify any information about the media or their contents, nor does it allow media-related functions. This is sufficient for some diagnostic procedures; however, if more detailed diagnostics are necessary, it may be more helpful to use SCSI Manager. For more information on SCSI Manager, see “Appendix A: Using SCSI Manager” on page 139.

Note: Jukebox Manager provides barcode information for tape and optical media if the library supports volume tags.

For more information, see the following sections:

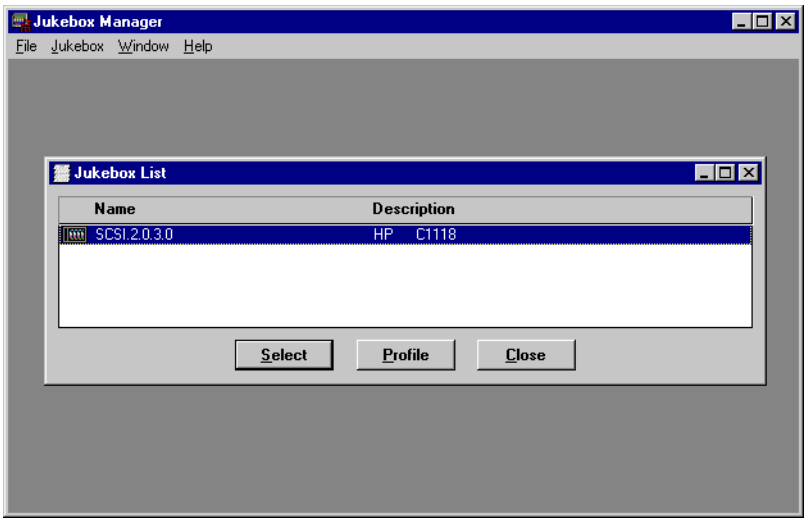
Starting Jukebox Manager

Once you start Jukebox Manager, you can begin using the utility to manage the libraries in your MediaStor system.

To start Jukebox Manager:

1. Be sure that neither SCSI Manager nor the MediaStor service is running. Jukebox Manager cannot initialize if MediaStor or SCSI Manager is running. Only one of these services can access devices at a time. For more information on shutting down SCSI Manager, see “Shutting Down and Exiting SCSI Manager” on page 165. For information on stopping the MediaStor service, see “Managing the MediaStor Service” on page 91.
2. From the Windows Start menu, select Programs, thenASM MediaStor, Utilities, and then Jukebox Manager. The Jukebox Manager window appears and Jukebox Manager automatically initializes.

Figure 155. Jukebox Manager Window



As Jukebox Manager initializes, it looks for all SCSI libraries on the system and lists them along with their SCSI addresses and descriptions in the Jukebox List window, shown in the figure above. The description for each library is the actual inquiry string from the device. This can be helpful when working with a technical support representative to try to resolve an issue.

Note: Serial libraries appear only after they are configured in MediaStor.

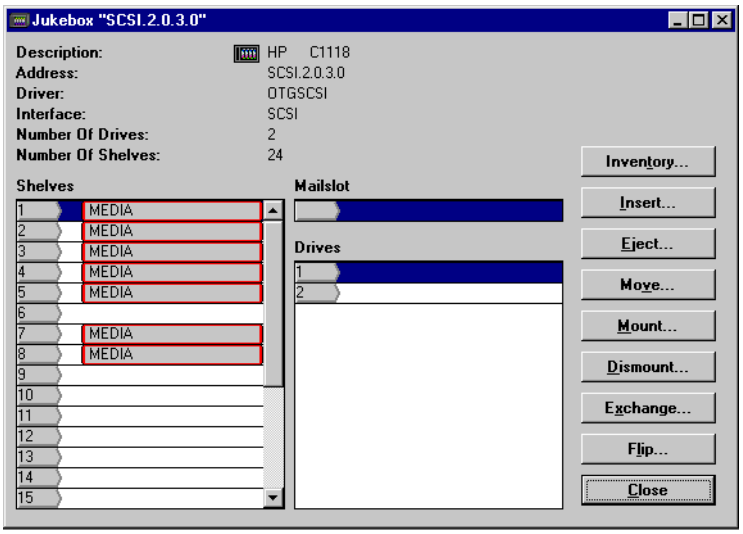
Note: If Jukebox Manager fails to initialize, you can initialize it manually. From the File menu in Jukebox Manager, select Initialize. A check mark appears beside the Initialize command in the File menu, and the Jukebox List window appears.

Note: If you close a Jukebox window or shut down Jukebox Manager, the Jukebox List window also closes. You can reopen it by selecting the List option from the Jukebox menu (when Jukebox Manager is initialized).

3. From the Jukebox List window, you have the following choices:

- View a library's profile. For more information, see "Viewing a Library Profile, " which follows.
- Open a Jukebox window for a library, from which you can view and manage media in the library. To open a Jukebox window, select the library you want to manage and then click Select. (You can also double-click the library to open the Jukebox window.)

Figure 156. Jukebox Window



The Jukebox window displays basic information about the library, including its description, SCSI address, library type, interface type, number of drives, and number of shelves.

In addition to basic information about the library, the Jukebox window also provides a shelf-by-shelf view of the library. Shelves are listed to the left of the window and a scroll bar allows you to browse all of the shelves. The center of the window lists the drives in the library, as well as the mailslot. Each shelf, drive, and mailslot appears at all times regardless of whether it contains media.

The SCSI address of the library also appears in the title bar of the Jukebox window so that you can easily note which library's information is being displayed in the active window. All commands for a library must be performed while that library window is active. Any command executed affects the active window. The following sections explain the commands that can be performed through Jukebox Manager.

Note: All procedures (except for the library profile procedure below) outlined in the following sections assume you have opened the Jukebox window for the library for which you want to perform that function.

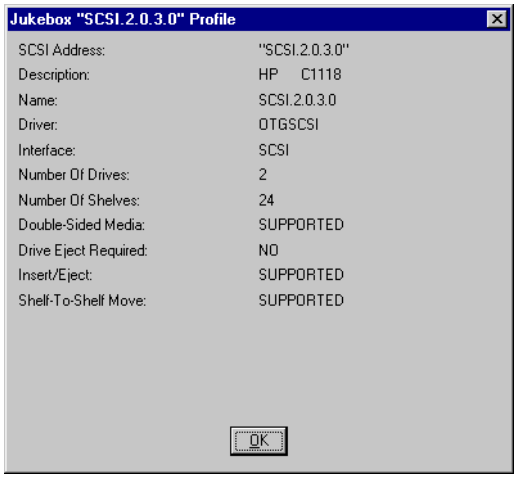
Viewing a Library Profile

Since all libraries are different and have slightly different functionality, the Jukebox Profile is helpful for determining not only the SCSI ID and description of the library, but also particular functions of the library, such as whether double-sided media is supported.

To view a library profile:

1. In the Jukebox List window, select the library whose profile you want to view and then click Profile. The Jukebox Profile dialog box appears, with the SCSI address listed in the title bar.

Figure 157. Jukebox Profile Dialog Box



The Jukebox Profile dialog box contains the following information:

Table 23. Jukebox Profile Information

Field	Description
SCSI Address	The SCSI address of the library
Description	A description of the library, including the library's vendor and model
Name	Whether the library driver is loaded in the ASM supported device list. If the driver is not loaded, you cannot see the device when adding hardware to MediaStor.
Type	The type of library
Interface	The type of interface the library uses
Number Of Drives	The number of drives in the library
Number Of Shelves	The number of shelves in the library

Table 23. Jukebox Profile Information (Continued)

Field	Description
Double Sided Media	Whether the library supports double-sided media
Drive Eject Required	Whether the library requires sending a command to eject a drive
Insert/Eject	Whether the library supports automated insert/eject of media
Shelf-To-Shelf Move	Whether the library supports automated movement of media from one shelf to another

2. When you finish, click OK to close the Jukebox Profile dialog box and return to the Jukebox List window.

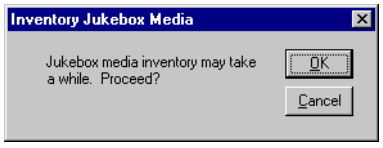
Inventorying a Library

When you inventory a library in Jukebox Manager, an account is taken for all shelves, full and empty. After an inventory, the Jukebox window shows whether each shelf, drive, or mailslot currently contains media.

To inventory a library:

- In the Jukebox window, click the Inventory button, or, from the Jukebox menu in the Jukebox window, select Inventory. A confirmation message appears.

Figure 158. Jukebox Inventory Confirmation Message



3. Click OK. An “Inventory in Progress” status message appears while the library is inventoried. Once the inventory is complete, the Jukebox window shows media and their locations within the library.

Inserting Media

You can insert a piece of media into a library onto any empty shelf. The maximum number of drives supported for each jukebox is 128.

To insert a piece of media into a library:

1. Place the piece of media into the mailslot.
2. In the Jukebox window, select the empty shelf into which you want to insert the media.

3. Click the Insert button, or, from the Jukebox menu, select Insert Media to Shelf. A status message reads “Inserting media” while the media is placed onto the shelf. Once inserted, the media appears on the selected shelf in the Jukebox window.

   Note: If you select the Insert command before you insert the media into the mailslot, Jukebox Manager prompts you to insert the media before it proceeds.

Moving Media

You can move a piece of media from one shelf location to another, provided the target shelf location is empty.

To move a piece of media to another shelf:

1. In the Jukebox window, select the shelf that contains the media you want to move.
2. Click the Move button, or, from the Jukebox menu, select Move Media From Shelf to Shelf. The Move Jukebox Media dialog box appears.

Figure 159. Move Jukebox Media Dialog Box

3. In the New Shelf Location text box, enter the location of the shelf to which you want to move the media. The default location is the next empty shelf.
4. Click OK. A status message appears to indicate that the move is in progress. When the move is complete, the media appears in the new location in the Jukebox window.

Mounting Media

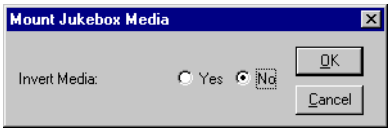
You can mount a piece of media from a shelf into an empty drive.

Note: When mounting media into a drive that uses the NTFS or FAT file system, use the FSMOUNT.EXE utility from a command prompt to mount the file system after the media is mounted. For details on using FSMOUNT.EXE, refer to the ASM Solutions Knowledge Base (accessed through either the StorageTek website, http://www.support.storagetek.com/ or the program group on the Windows Start menu.

To mount a piece of media:

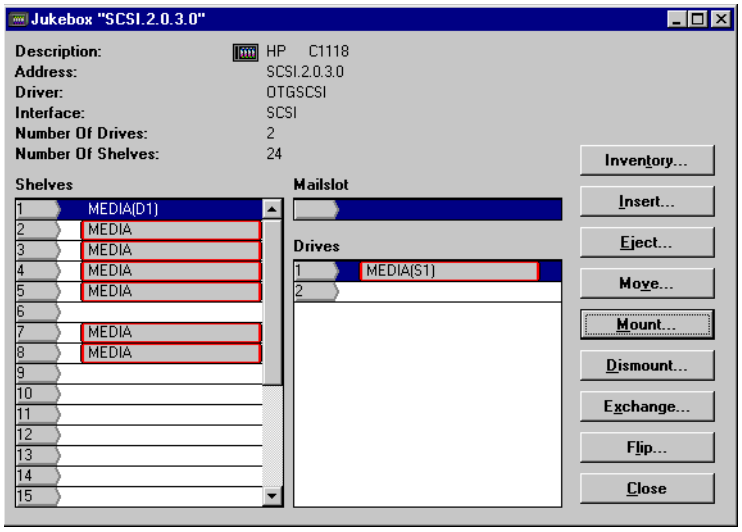
1. In the Shelves list of the Jukebox window, select the shelf that contains the piece of media you want to mount in a drive.
2. In the Drives list, select the drive in which you want to mount the media.
3. Click the Mount button, or, from the Jukebox menu, select Mount Media in Drive. The Mount Jukebox Media dialog box appears.

Figure 160. Mount Jukebox Media Dialog Box



4. Select an invert option. To mount the media with side A up, select No. To mount the media inverted so that side B is up, select Yes.
5. Click OK. A status message reads “Mounting…” while the media is mounted in the drive. In the Shelves list of the Jukebox window, the media appears with the drive number to indicate that it is mounted. In the Drives list, the media appears in the selected drive along with its shelf number.

Figure 161. Jukebox Window After Mounting Media



Flipping Media

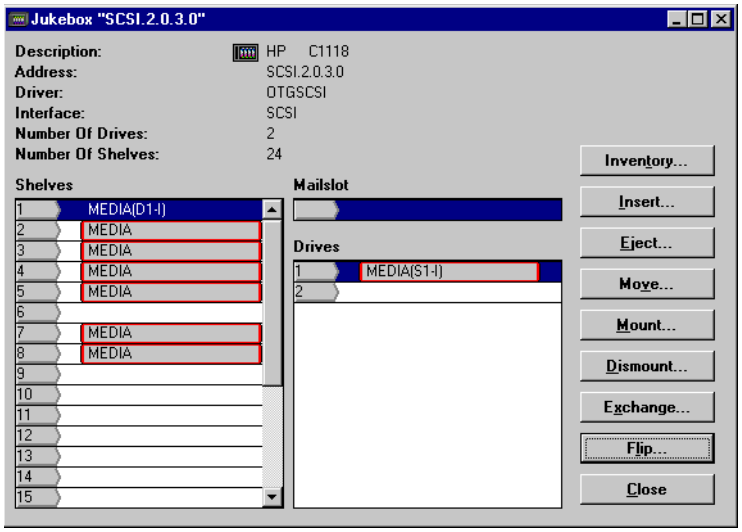
You can flip, or invert, dual-sided media in a drive.

To invert a piece of media in a drive:

1. In the Drives list of the Jukebox window, select the drive that contains the media you want to flip.
2. Click the Flip button, or, from the Jukebox menu, select Flip Media in Drive.

   The media is inverted. The Jukebox window reflects this by displaying the media with an "I" (for Inverted) after its shelf name (such as S18-I), in both the Shelves list and the Drives list.

Figure 162. Jukebox Window After Flip



Dismounting Media

You can dismount media in a drive and place it back on the shelf on which it was located before it was mounted in the drive.

Note: When dismounting media from drive that uses the NTFS or FAT file system, use the FSMOUNT.EXE utility from a command prompt to dismount the file system after the media is dismounted. For details on using FSMOUNT.EXE, refer to the ASM Solutions Knowledge Base (accessed through either the StorageTek website, http://www.support.storagetek.com/ or the program group on the Windows Start menu).

To dismount a piece of media:

1. In the Drives list of the Jukebox window, select the drive that contains the piece of media you want to dismount.
2. Click the Dismount button, or, from the Jukebox menu, select Dismount Media From Drive. The piece of media is dismounted and placed back on its original shelf.

Exchanging Media

You can dismount a piece of media from a library drive, return it to its original shelf, and mount a new piece of media in the drive using one command.

To exchange media in a library drive:

1. From the Shelves list in the Jukebox window, select the shelf that contains the media you want to mount in the drive.
2. From the Drives list, select the drive that contains the media you want to replace.
3. Click the Exchange button, or, from the Jukebox menu, select Exchange Media In Drive. The media in the drive is dismounted and placed back on its original shelf, and the other piece of media is mounted in the drive.

Ejecting Media

You can eject a piece of media from any shelf in the library, provided the media is not currently mounted in a drive. To eject media from a drive, you must dismount it from a drive first. For instructions, see “Dismounting Media” on page 212.

To eject a piece of media from a library:

1. From the Shelves list in the Jukebox window, select the shelf that contains the media you want to eject.
2. Click the Eject button, or, from the Jukebox menu, select Eject Media From Shelf. A status message reads “Ejecting media” while the media is ejected from the library. Once ejected, the media is placed into the mailslot. In the Jukebox window, the media appears in the mailslot.
3. Remove the piece of media from the mailslot.

Shutting Down and Exiting Jukebox Manager

Jukebox Manager can run in a shutdown mode so that libraries can be seen and used by other applications/services, such as MediaStor and SCSI Manager. Only one of these services can access devices at a time.

If you are finished using Jukebox Manager, you can exit Jukebox Manager.

To shut down Jukebox Manager:

- From the File menu of the Jukebox Manager window, select Shutdown. A check mark appears by the Shutdown command in the menu and all Jukebox windows are closed.

To exit Jukebox Manager:

- From the File menu, select Exit.

About Jukebox Manager

The About dialog box displays information about your copy of Jukebox Manager, including the version number, copyright, and legal notices.

Jukebox List Window

As Jukebox Manager initializes, it looks for all SCSI libraries on the system and lists them along with their SCSI addresses and descriptions in the Jukebox List window. The description for each library is the actual inquiry string from the device. This can be helpful when working with a technical support representative to try to resolve an issue.

Note: Serial libraries appear only after they are configured in MediaStor.

Note: If Jukebox Manager fails to initialize, you can initialize it manually. From the File menu in Jukebox Manager, select Initialize. A check mark appears beside the Initialize command in the File menu, and the Jukebox List window appears.

Note: If you close a Jukebox window or shut down Jukebox Manager, the Jukebox List window also closes. You can reopen it by selecting the List option from the Jukebox menu (when Jukebox Manager is initialized).

From the Jukebox List window, you have the following choices:

- View a library's profile.
- Open a Jukebox window for a library, from which you can view and manage media in the library. To open a Jukebox window, select the library you want to manage and then click Select. (You can also double-click the library to open the Jukebox window.)

Jukebox Window

The Jukebox window displays basic information about the library, including its description, SCSI address, library type, interface type, number of drives, and number of shelves.

In addition to basic information about the library, the Jukebox window also provides a shelf-by-shelf view of the library. Shelves are listed to the left of the window and a scroll bar allows you to browse all of the shelves. The center of the window lists the drives in the library, as well as the mailslot. Each shelf, drive, and mailslot appears at all times regardless of whether it contains media.

The SCSI address of the library also appears in the title bar of the Jukebox window so that you can easily note which library's information is being displayed in the active window. All commands for a library must be performed while that library window is active. Any command executed affects the active window. The following topics explain the commands that can be performed through Jukebox Manager.

- "Inventorying a Library" on page 209
- "Inserting Media" on page 209
- "Moving Media" on page 210
- "Mounting Media" on page 210
- "Flipping Media" on page 211
- "Dismounting Media" on page 212
- "Exchanging Media" on page 213
- "Ejecting Media" on page 213

Using RtfPad

C

Reports and event logs all appear in RtfPad. You can use RtfPad to save, print, and email logs, reports, and Event Viewer snapshots. You can also configure RtfPad to display event logs in a black-and-white interface, or with color to contrast errors and warnings from other events. When you encounter system errors, RtfPad allows you to easily find and view descriptions of the errors. For more information, see the following:

Saving in RtfPad

You can save a log, report, or Event Viewer snapshot for future reference.

To save in RtfPad:

1. From RtfPad’s File menu, select Save As. The Save As dialog box appears.
2. Navigate to the location where you want to save the file.
3. In the File name text box, specify a file name.
4. From the Save as type drop-down list, select the file format in which you want to save the file.
5. Click Save.

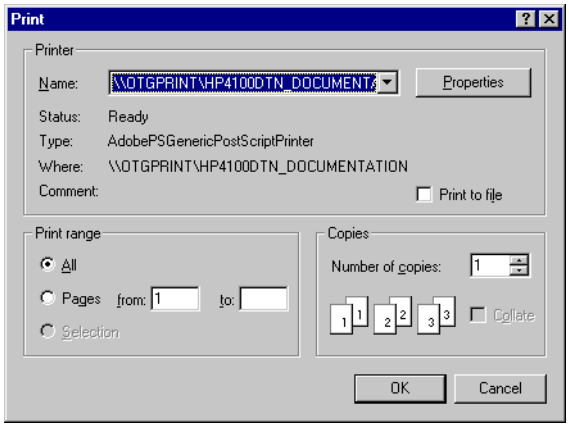
Printing in RtfPad

You can print a log, report, or Event Viewer snapshot for future reference.

To print in RtfPad:

1. From the File menu, select Print, or press <CTRL>+P. The standard Windows Print dialog box appears.

Figure 163. Print Dialog Box



2. From the Name list, select the printer you want to use.
3. In the Number of copies text box, specify the number of copies you want to print.
4. Make any other print setting selections and then click OK. The file is sent to the selected printer.

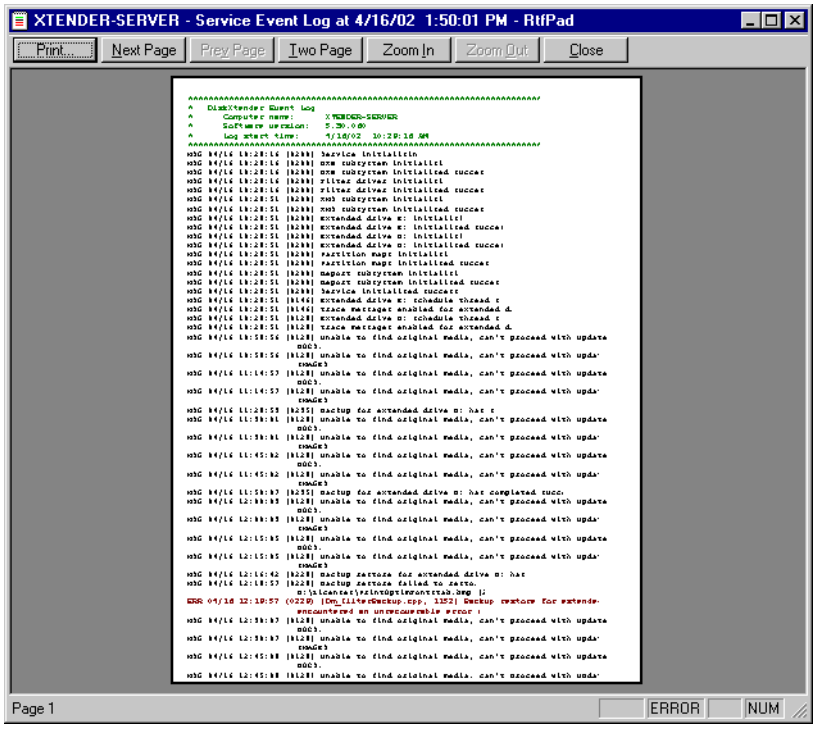
Previewing and Printing in RtfPad

You can print a log, report, or Event Viewer snapshot for future reference, and you can preview it before printing.

To preview and print in RtfPad:

1. From the File menu, select Print Preview. The text is displayed as it would appear when printed.

Figure 164. Print Preview in RtfPad



2. You have the following choices:
   - To navigate to the next or previous page, click Next Page or Prev Page.
   - To display two pages at a time, click Two Pages.
   - To display one page at a time, click One Page.
   - To zoom in on or zoom out, click Zoom In or Zoom Out.
   - To close the print preview without printing, click Close.
3. When you are ready to print the text, click Print.

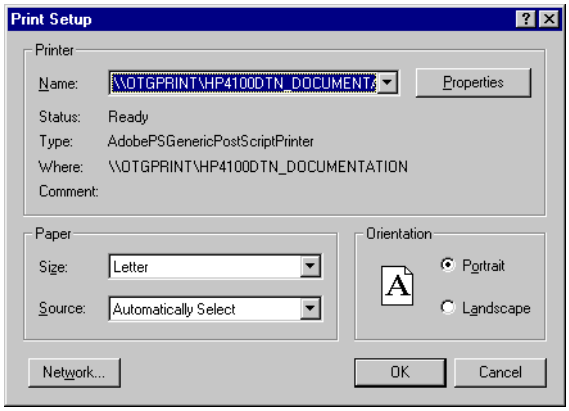
Setting up Printing in RtfPad

You can configure how a log, report, or Event Viewer snapshot is printed from RtfPad.

To set up printing in RtfPad:

1. From the File menu, select Print Setup. The Print Setup dialog box appears.

Figure 165. Print Setup Dialog Box



2. From the Name list, select the printer that you want to use as the default printer.
3. Select the default paper size, source, and orientation.
4. Make any other print setting selections and then click OK.

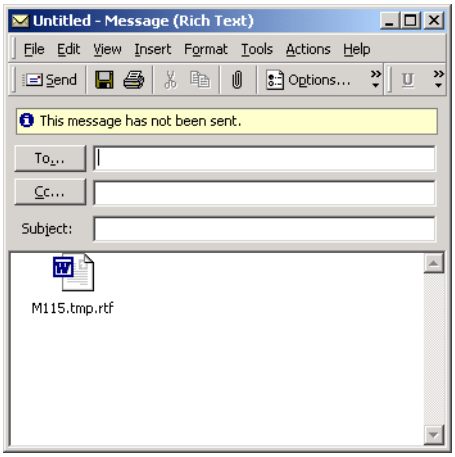
Sending from RtfPad

You can send a log, report, or Event Viewer snapshot to someone by email.

To send an RtfPad file as an email attachment:

1. From the File menu, select Send. A mail dialog box corresponding to your email system appears.

Figure 166. E-Mail Message with an RtfPad File as an Attachment



2. Address the message to the desired user.
3. Complete the message by adding any other comments.
4. Send the message using your email program's Send command.

Changing the Error Format

RtfPad can be viewed in a black-and-white interface, or with color to contrast errors and warnings from other events. If RtfPad is set for Error Format, text appears as described in the following table:

Table 24. RtfPad Error Format Colors

Text	Color
Errors	Red
Warnings	Yellow
Header	Green
All other text	Black

To set RtfPad to display information in error format:

- From the RtfPad View menu, select Error Format. This is a toggle command. When enabled (selected), a check mark appears to the left of the command.

To disable error format:

- From the RtfPad View menu, select Error Format again. This is a toggle command. When disabled, no check mark appears to the left of the command.

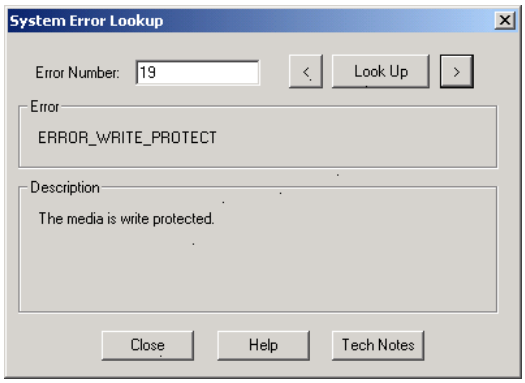
Using RtfPad Error Lookup

When an error appears in RtfPad, an error number appears in brackets with the error message. This error number identifies the error and allows you to use the RtfPad error lookup feature to obtain additional information about the error, including the error name and a brief description.

To obtain additional information about an error:

1. With the error log open, select the error number.
2. From the View menu, select Error Lookup, or press <F2>. The System Error Lookup dialog box appears with the error name and description.

Figure 167. System Error Lookup Dialog Box



3. You have the following choices:
   - To scroll through the list of system errors, click the forward or backward arrows.
   - To access context-sensitive help for the error glossary, click Help.
   - To close the System Error Lookup dialog box, click Close.

Removing MediaStor and Its Components

D

When ASM MediaStor is removed, all configuration settings and system files are deleted. If you reinstall MediaStor, new settings must be configured. Caution should be taken when removing the product, as all settings are permanently lost.

The MediaStor setup wizard, accessed through the StorageTek MediaStor program group in the Windows Start menu, takes you step-by-step through the uninstall process. However, you should remove several key components before you attempt to uninstall the program.

Note: If you plan to reinstall MediaStor later, you should create a copy of your MediaStor configuration before you uninstall MediaStor. The Repair Disk Wizard allows you to back up your MediaStor settings. For instructions, see “Copying the Repair Disk Backup” on page 151.

This chapter describes the steps you need to take before uninstalling MediaStor. In addition, you will find instructions on running the setup wizard to uninstall MediaStor and the MediaStor Remote Administrator. For more information, see the following sections:

- "Preparing for Uninstalling MediaStor, " which follows
- “Uninstalling MediaStor” on page 224
- “Uninstalling MediaStor Remote Administrator” on page 227

Preparing for Uninstalling MediaStor

For your convenience, the setup wizard allows you to uninstall ASM/DMS MediaStor from multiple computers at once. Be sure to prepare each computer from which you are removing MediaStor.

Note: The steps below are only necessary if you are removing MediaStor itself. The preparation steps do not apply if you are uninstalling the Remote Administrator.

To prepare for removing MediaStor:

1. Remove the MediaStor media service from any Data Manager service pointing to the computer from which you are removing MediaStor. For

instructions, refer to the *Managing Storage Media* chapter of the *ASM Data Manager System Guide*.

2. Set all drives and devices offline. For instructions, see the following sections:
   - “Setting a Library Offline” on page 79
   - “Setting a Tower Offline” on page 88
   - “Setting a Standalone Drive Offline” on page 97
3. Remove all hardware devices from the MediaStor configuration. For instructions, see the following sections:
   - “Deleting a Library” on page 81
   - “Deleting a Tower” on page 88
   - “Deleting a Standalone Drive” on page 97
4. Reboot each MediaStor computer.
5. Stop the MediaStor service. For instructions, see “Managing the MediaStor Service” on page 111.

Uninstalling MediaStor

Once you have completed the steps listed in the *Preparing for Uninstalling MediaStor* section above, you are ready to uninstall MediaStor. The same setup wizard that installed the program can be used to uninstall the program. Because the setup wizard allows you uninstall MediaStor from multiple computers at once, you may want to determine which computers are to have MediaStor removed from them before you run the setup wizard, enabling you to run the wizard once rather than multiple times.

Note: If you are removing MediaStor from an active/passive clustered environment, you should run the setup wizard to remove the product directly on the Primary server (the server node currently in control).

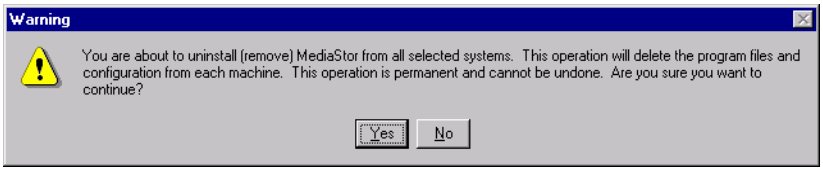
To remove MediaStor:

1. From the Windows Start menu, select Programs, StorageTek MediaStor, and then Setup. The setup wizard appears, starting with the welcome page.
2. Click Next. The Installation Options page appears.

Figure 168. MediaStor Removal – Installation Options Page

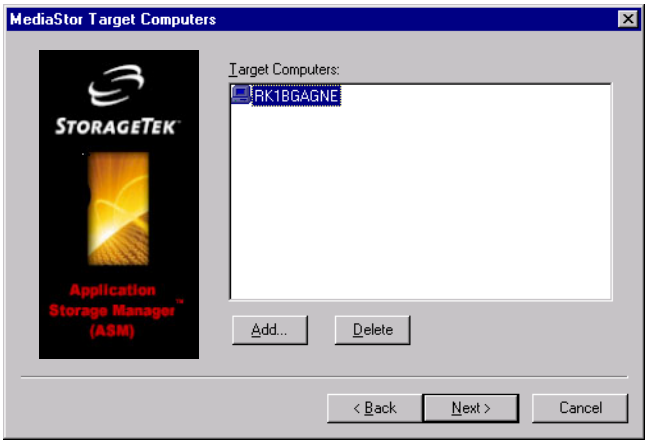
3. Select Remove product and related items and then click Next. A warning appears informing you that uninstalling cannot be undone.

Figure 169. Uninstall Warning Message



4. Click Yes to continue. The Target Computers page appears.

Figure 170. MediaStor Removal – Target Computers Page

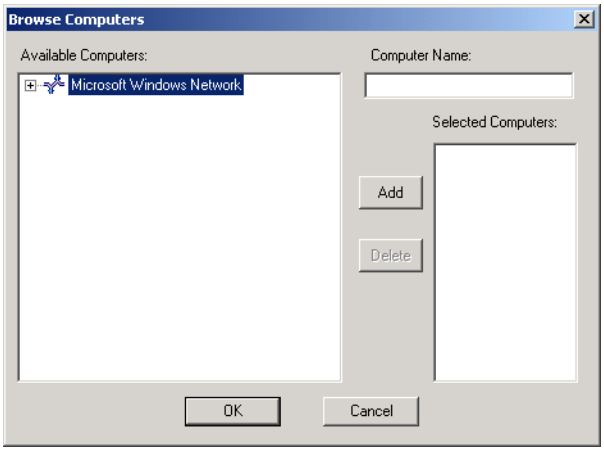


Note: If you are removing MediaStor from an active/passive clustered environment, select the logical cluster name as the target computer for removal.

5. You have the following choices:

- To remove MediaStor from only the computer(s) listed in the Target Computers list, click Next. The Summary page appears.
- To remove MediaStor from other computers in addition to the one(s) listed in the Target Computers list, click Add. The Browse Computers dialog box appears.

Figure 171. Browse Computers Dialog Box



6. In the Browse Computers dialog box you have two choices:
   - Under Available Computers, navigate to and select the computer from which you want to remove MediaStor and then click Add to add the computer to the Selected Computers list.
   - In the Computer Name text box, type in the name or the IP address of the computer from which you want to remove MediaStor and then click Add to add the computer to the Selected Computers list.

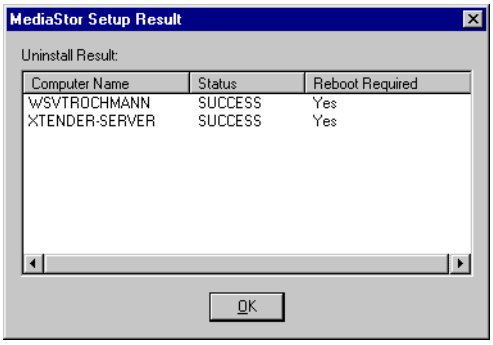
   Repeat this step for each additional computer from which you want to remove MediaStor. When you finish selecting target computers, click OK. You are returned to the Target Computers page.
7. When the Target Computers list is complete, click Next. The Summary page appears.
8. Review the information in the summary.
9. If the information in the summary is correct, click Finish. A progress bar appears, indicating the completion percentage of the removal process. If you are uninstalling from multiple MediaStor computers, separate progress bars appear for each computer.

   Any settings related to MediaStor in the Windows NT/2000 registry, all program files in the installation path, and the MediaStor program group/ folder are removed.

   Then, one of the following occurs:

- If you are uninstalling from one or more remote computers, the MediaStor Setup Result dialog box appears, listing the results for each target computer.

Figure 172. MediaStor Setup Result Dialog Box



Take note of any computers that need to be rebooted (or computers on which the uninstall failed) and then click OK. Restart each computer for which the MediaStor Setup Result dialog box indicates a reboot is required.

- If you are uninstalling from the local machine, a message appears to prompt you to reboot the computer. Click Restart to close the message and reboot the computer immediately, or Exit to close the message without rebooting.

Reboot is necessary after the MediaStor uninstall in order to reset any SCSI devices being used by MediaStor on the specified machine(s).

Uninstalling MediaStor Remote Administrator

ASM/DMS MediaStor Remote Administrator can be removed from a computer if necessary. Removing the Remote Administrator from a remote machine does not affect the MediaStor computer to which it points. Only the system files for the Remote Administrator and Service Manager are deleted. This means that you do not need to perform the preparation steps necessary for uninstalling the MediaStor program itself.

The same Remote Administrator setup wizard that installed the program can be used to uninstall the program. Because the setup wizard allows you to uninstall the Remote Administrator from multiple computers at once, you may want to determine which computers are to have the Administrator removed from them before you run the setup wizard, enabling you to run the wizard once rather than multiple times.

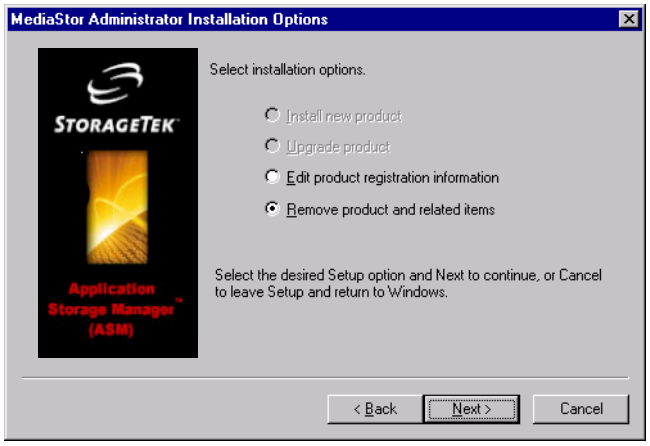
Note: If you are removing the Remote Administrator from an active/passive clustered environment, you should run the setup wizard to remove the

product directly on the Primary server (the server node currently in control).

To remove the Remote Administrator:

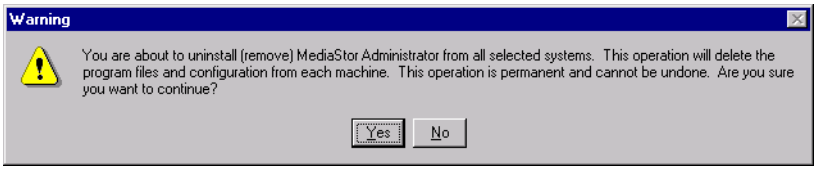
1. From the Start menu, select Programs, StorageTek MediaStor Administrator, and then Setup. The setup wizard opens, starting with the welcome page.
2. Click Next. The Installation Options page appears.

Figure 173. Remote Administrator Removal – Installation Options Page



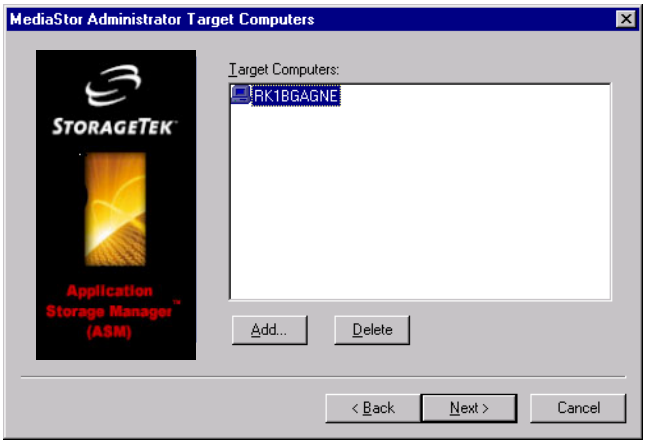
3. Select Remove product and related items and then click Next. A warning appears to inform you that the uninstall cannot be undone.

Figure 174. Uninstall Warning Message



4. Click Yes to continue. The Target Computers page appears.

Figure 175. Remote Administrator Removal – Target Computers Page

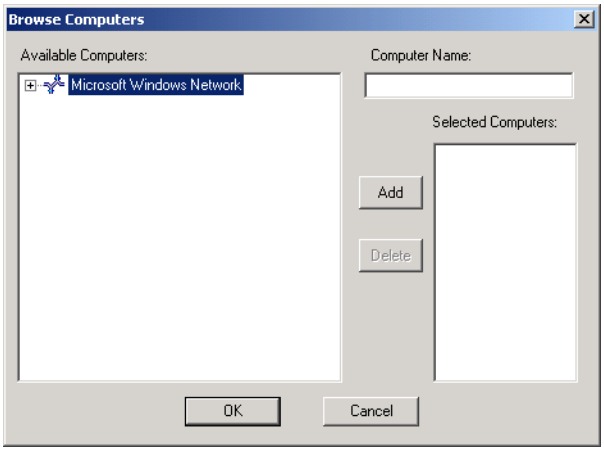


Note: If you are removing the Remote Administrator from an active/passive clustered environment, select the logical cluster name as the target computer for removal.

5. You have the following choices:

   - To remove the Remote Administrator from only the computer(s) listed in the Target Computers list, click Next. The Summary page appears.
   - To remove the Remote Administrator from other computers in addition to the one(s) listed in the Target Computers list, click Add. The Browse Computers dialog box appears.

Figure 176. Browse Computers Dialog Box



6. In the Browse Computers dialog box you have two choices:

   - Under Available Computers, navigate to and select the computer from which you want to remove the Remote Administrator and then click Add to add the computer to the Selected Computers list.

- In the Computer Name text box, type in the name or the IP address of the computer from which you want to remove the Remote Administrator and then click Add to add the computer to the Selected Computers list.

Repeat this step for each additional computer from which you want to remove the Remote Administrator. When you finish selecting target computers, click OK. You are returned to the Target Computers page.

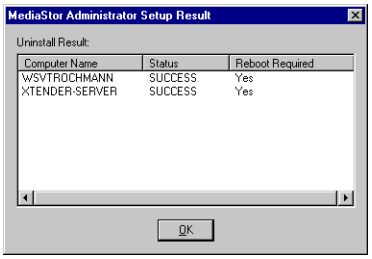
7. When the Target Computers list is complete, click Next. The Summary page appears.
8. Review the information in the summary.
9. If the information in the summary is complete, click Finish. A progress bar appears indicating the completion percentage of the removal process. If you are uninstalling from multiple computers, separate progress bars appear for each computer.

   Any settings related to the Remote Administrator in the Windows registry, all program files in the installation path, and the MediaStor Administrator program group/folder are removed.

   Then, one of the following occurs:

   - If you are uninstalling from one or more remote computers, the MediaStor Administrator Setup Result dialog box appears, listing the results for each target computer.

Figure 177. MediaStor Administrator Setup Result Dialog Box



Take note of any computers that need to be rebooted (or computers on which the uninstall failed) and then click OK. Restart each computer for which the MediaStor Administrator Setup Result dialog box indicates a reboot is required.

- If you are uninstalling from the local machine, a message appears to prompt you to reboot the computer. Click Restart to close the message and reboot the computer immediately, or Exit to close the message without rebooting.

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