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UPGRADE GUIDE

For Windows

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Upgrade Guide

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Before You Begin

Thank you for purchasing Application Storage Manager™ (ASM), the most flexible storage management system for Microsoft® Windows® NT/2000. ASM allows you to extend the capacity of NTFS volumes by automating migration of files to storage media. ASM uses separate media services to manage media in storage devices, so that all drive, library, and media handling issues are performed and optimized by the media service (like ASM MediaStor). This allows ASM Data Manager to focus specifically on the management of files, allowing clients to simply save and retrieve files to and from any extended NTFS volume.

ASM allows you to make large amounts of data storage available on an NTFS volume without adding to the physical capacity of the hard disk where the volume is located. ASM can be used to represent the contents of multiple pieces of media as folders on a single volume, keeping track of the exact location of all files on media. CD-ROM, magneto-optical, WORM, DVD, Network Attached Storage (NAS), EMC Centera™ (EMC), Tivoli® Storage Manager (TSM), WORM-tape, and tape media can all be managed easily and effectively, using a variety of file systems.

ASM adds value to the NTFS file system and enhances Windows native capabilities by providing file migration services. Because of the design of ASM, file migration can be added without losing any Windows features. Windows NT/2000 still manages all issues like security, long file name support, and network connectivity.

ASM provides a rule-based system for file storage management. Rather than simply migrating all files to media without distinction between files, ASM allows you to set criteria that govern which files will be stored where. Using the rules you create, ASM manages file storage locations in the background, moving files to media and purging their data to make space on the extended drive. To the end user, however, all files appear to be located on the drive extended by ASM.

ASM provides comprehensive file management capabilities, a single point of administration, and scheduling features to optimize system performance. Time-consuming processes that compete for system resources – such as media restore, media compaction, and file movement to media – can be set to occur at convenient times. ASM also monitors system warnings and errors, and can be configured to send alerts to specific users or computers.

This Upgrade Guide provides detailed instructions on how to upgrade your ASM system from previous versions, including earlier versions of ASM, ASM

4.x, and ASM 3.x. It also provides information on moving files from one media type to another. For more information, see the following chapters:

- *Chapter 1: Upgrading from Previous Versions of ASM on page 1*
- *Chapter 2: Converting from ASM 4.2 on page 11*
- *Chapter 3: Converting from ASM 3.2 on page 27*
- *Chapter 4: Moving Files from One Media Type to Another on page 67*

Related Documentation

Refer to the following additional documentation:

- *ASM Data Manager Getting Started Guide*
- *ASM Data Manager System Guide*
- *ASM MediaStor System Guide* if using ASM MediaStor as a media service
- StorageTek ACSLS™ documentation if using ACSLS as a media service
- Tivoli Storage Manager documentation if using TSM as a media service
- EMC Centera documentation if using EMC as a media service
- Microsoft Cluster Server documentation if using ASM in a clustered environment
- Windows 2000 documentation if you plan to upgrade ASM to a Windows 2000 server while using the Windows 2000 Server Active Directory service on your network

Documentation Conventions

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

Table 1. 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.
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.

Upgrading from Previous Versions of ASM

1

This chapter describes how to use the setup wizards to upgrade ASM Data Manager and ASM MediaStor to version 5.40.102 from previous versions. The upgrades maintain all current Data Manager and MediaStor information, including service login and licensing information. You do not have to fill that information into the upgrade wizards as you did when you first installed the products.

Note: The steps in this chapter pertain only to upgrading from previous versions of ASM. Upgrades from older versions of ASM (4.x or 3.x) are considered conversions and require a different set of steps. Do *not* use the setup wizards described in this chapter to upgrade an ASM 4.x or ASM 3.x system. For conversion information, see *Chapter 2: Converting from ASM 4.2 on page 11* or *Chapter 3: Converting from ASM 3.2 on page 27* as appropriate.

For more information, see the following sections:

- "Upgrading in a Clustered Environment, " which follows
- “Upgrading Data Manager” on page 2
- “Upgrading MediaStor” on page 6

Upgrading in a Clustered Environment

If you are running ASM Data Manager or ASM MediaStor in an active/passive cluster environment and you want to upgrade Data Manager or MediaStor to a newer version, you must run the setup wizard to upgrade Data Manager or MediaStor on both nodes in the cluster. Once you upgrade the first node, shut it down. Next, run the upgrade on the remaining node and shut it down. Finally, restart the server that should serve as the primary node, and then restart the remaining node.

If you are running ASM Data Manager in an active/passive cluster environment and you choose to upgrade Data Manager to a newer version, Storagetek does not support conversion of your cluster environment from active/passive to active/active. To change from active/passive cluster configuration to active/active and upgrade Data Manager, you must uninstall Data Manager and reconfigure both Cluster Administrator and Data Manager.

For more information on clustering, refer to *Appendix A: Clustering* of the *ASM Data Manager Getting Started Guide*.

Upgrading Data Manager

The ASM Data Manager setup wizard leads you through the necessary steps for upgrading Data Manager.

If you are using Tivoli Storage Manager (TSM), please note that Data Manager requires TSM version 4.2 or higher, which provides UNICODE support. If you are upgrading from earlier versions of TSM (prior to 4.2) and Data Manager (prior to 5.4), and currently have media in your system that was created before the upgrades, you can continue to migrate files to the media as long as the files are not named with UNICODE characters. Files named with UNICODE characters must be migrated to media created in TSM 4.2 or higher and Data Manager 5.4 or higher.

Note: If you are upgrading from ASM version 5.4, and you are using EMC Centera as a media service, be advised that after upgrading, you will need to run a File Restore task on all of your ASM v5.4 EMC media. Restoring the legacy media is required in order for Data Manager to enforce retention on the extended drive for the previously migrated files. See the *Managing Storage Media* chapter of the *ASM Data Manager System Guide* for more information on the File Restore task.

Note: If you need to upgrade from ASM for EMC Centera v1.0, you must compact all of your media, uninstall, and then reinstall ASM (there is no direct upgrade from this version). See the *ASM Data Manager System Guide* for instructions on compacting media and uninstalling Data Manager.

For your convenience, the setup wizard allows you to upgrade Data Manager on multiple computers at once, provided those computers are visible on your network and you are a member of the local Administrators group for the computers on which you want to run the upgrade. To take advantage of this feature, you may want to determine which computers are to have Data upgraded on them before you run the setup wizard, enabling you to run the upgrade only once rather than multiple times.

To upgrade earlier versions of ASM Data Manager to ASM Data Manager version 5.40.102:

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

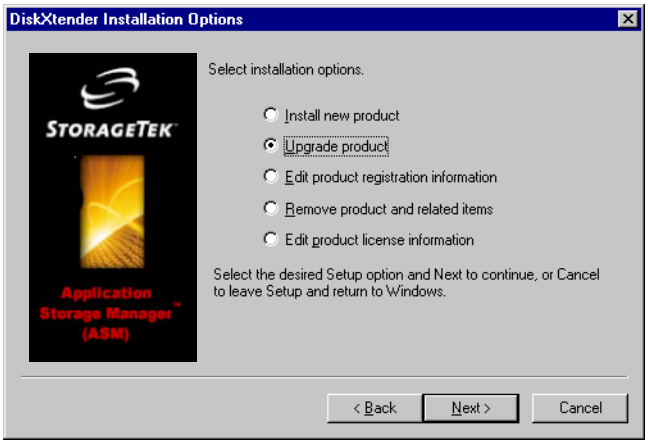
D:\DX2000.XXX\DISKXTENDER\SETUP.EXE

(In this path, `D` represents the drive holding the setup CD-ROM and *XXX* represents the ASM version number.)

Note: The upgrade steps for the Remote Administrator and the Explorer Add-ons are almost identical to those provided here. The only difference is the path in which the setup.exe file is found. For those upgrades, use the Remote Administrator or Explorer Add-Ons folder instead of the ASM folder as described in the step above.

4. Once the file/path appears in the Open text box, click OK. The setup wizard appears, starting with the welcome page. The welcome page briefly describes the installation process.
5. Click Next. The Installation Options page appears.

Figure 1. ASM Data Manager Upgrade Wizard -- Installation Options Page

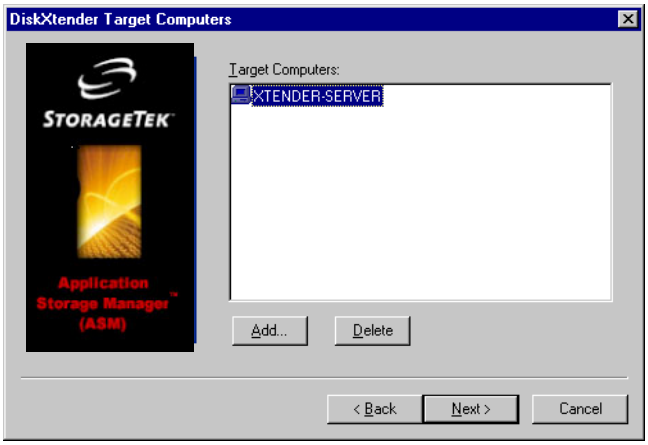


6. Select Upgrade product and then click Next. The License Agreement page appears.

Figure 2. ASM Data Manager Upgrade Wizard -- License Agreement Page

7. You must accept the terms of the license agreement before you can proceed with the upgrade. Scrolling to the bottom of the agreement allows you to enable the Accept terms of agreement check box. Check the box and click Next. The Target Computers page appears.

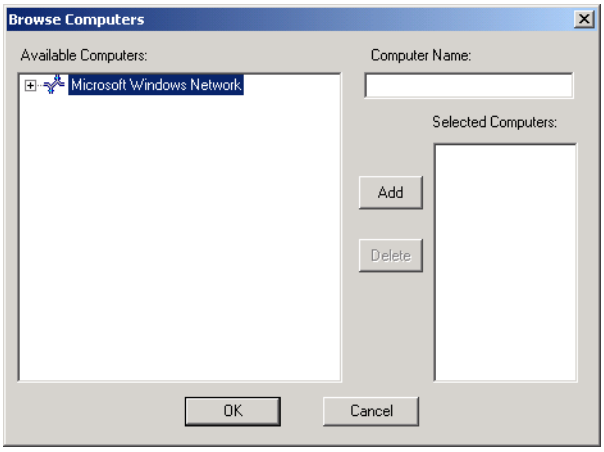
Figure 3. ASM Data Manager Upgrade Wizard -- Target Computers Page



8. You have the following choices:

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

Figure 4. Browse Computers Dialog Box



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

   - Under Available Computers, navigate to and select the computer on which you want to upgrade Data Manager 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 upgrade Data Manager 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 upgrade Data Manager. When you finish, click OK. You are returned to the Select Target Computers page. Click Next. The Summary page appears.

10. Verify the accuracy of the information in the summary.

11. If all information is correct, click Finish. A dialog box displays the status of the upgrade.

    You have the following choices:

    - If you ran the upgrade on one or more remote computers (in addition to or instead of the local computer), the ASM Setup Result dialog box appears, listing the installation results for each computer you targeted for upgrade. Take note of any computers where a reboot is required (or computers on which the installation failed), and then click OK.
    - If you ran the upgrade on the local computer, a message appears, indicating that the upgrade has been successfully completed. Click Restart to close the setup wizard and reboot the Data Manager computer, or click Exit to close the setup wizard without restarting the computer.

    Note: If you are upgrading multiple ASM products, you can reboot the computer after you upgrade all products (rather than rebooting after each upgrade).

Upgrading MediaStor

The ASM MediaStor setup wizard leads you through the necessary steps for upgrading MediaStor. For your convenience, the setup wizard allows you to upgrade MediaStor on multiple computers at once, provided those computers are visible on your network and you are a member of the local Administrators group for the computers on which you want to run the upgrade. To take advantage of this feature, you may want to determine which computers are to have MediaStor upgraded on them before you run the setup wizard, enabling you to run the upgrade only once rather than multiple times.

To upgrade ASM MediaStor to version 5.40.102:

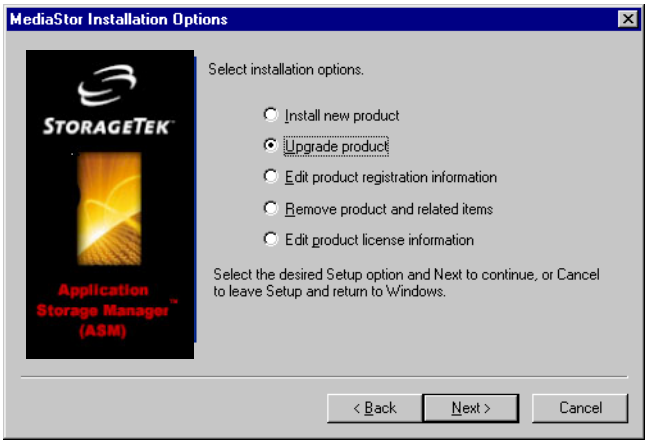
1. Exit all applications on the computer(s) on which you want to upgrade MediaStor. If other software is running, the setup wizard may not be able to write to all necessary files
2. Insert the ASM CD-ROM into the drive. From the Windows Start menu, select Run.
3. In the Run dialog box, you can either browse to the following 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.)

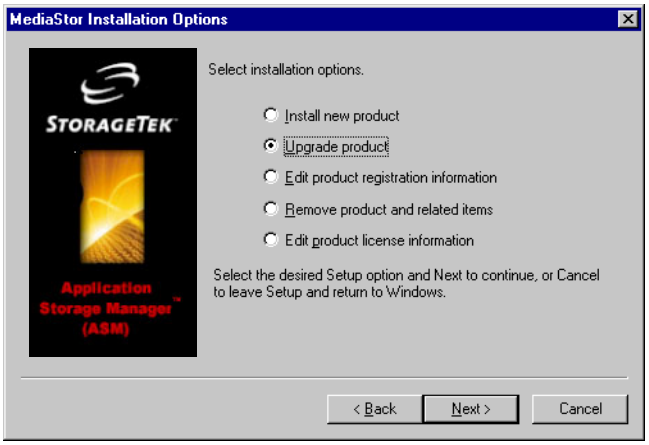
   Note: The upgrade steps for the Remote Administrator are almost identical to those provided here. The only difference is the path in which the setup.exe file is found. For those upgrades, use the MediaStor Remote Administrator folder instead of the MediaStor folder as described in the step above.
4. Once the file/path appears in the Open text box, click OK. The setup wizard appears, starting with the welcome page. The welcome page briefly describes the installation process.
5. Click Next. The Installation Options page appears.

Figure 5. ASM MediaStor Upgrade Wizard -- Installation Options Page



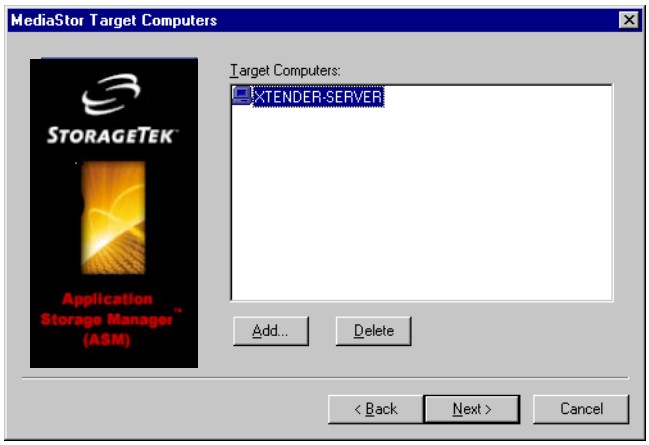
6. Select Upgrade product and then click Next. The License Agreement page appears.

Figure 6. ASM MediaStor Upgrade Wizard -- License Agreement Page



7. You must accept the terms of the license agreement before you can proceed with the upgrade. Scrolling to the bottom of the agreement allows you to enable the Accept terms of agreement check box. Check the box and click Next. The Target Computers page appears.

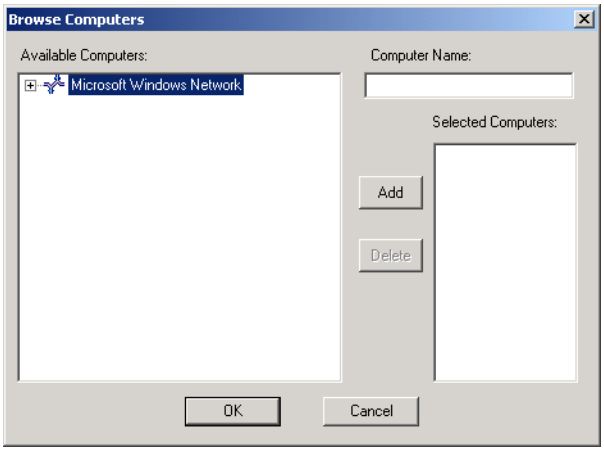
Figure 7. ASM MediaStor Upgrade Wizard -- Target Computers Page



8. You have the following choices:

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

Figure 8. Browse Computers Dialog Box



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

   - Under Available Computers, navigate to and select the computer on which you want to upgrade 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 upgrade 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 upgrade MediaStor. When you finish, click OK. You are returned to the Select Target Computers page. Click Next. The Summary page appears.

10. Verify the accuracy of the information in the summary.
11. If all information is correct, click Finish. A dialog box displays the status of the upgrade.

    You have the following choices:

    - If you ran the upgrade 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 targeted for upgrade. Take note of any computers where a reboot is required (or computers on which the installation failed) and then click OK.
    - If you ran the upgrade on the local computer, a message appears, indicating that the upgrade has been successfully completed. Click Restart to close the setup wizard and reboot the MediaStor computer, or click Exit to close the setup wizard without restarting the computer.

    Note: If you are upgrading multiple ASM products, you can reboot the computer after you upgrade all products (rather than rebooting after each upgrade).

Converting from ASM 4.2

2

The conversion process for upgrading from ASM 4.2 to ASM 5.4 has been designed to accommodate the needs of users with existing 4.2 systems. Because the functionality between ASM 4.2 and ASM 5.4 is very similar, the conversion process is simple and should take very little time, depending on the number of servers and agents you need to convert.

The conversion process runs in three stages or phases. The first phase of the conversion stops the ASM 4.2 service and removes ASM 4.2 from your system. The second phase of the conversion utility installs the ASM 5.4 Data Manager and the ASM MediaStor programs for you, and then converts the media and hardware from the 4.2 system to the ASM system, including assigning media to each extended drive. Phase 3 assigns media to move groups and media folders.

Note: If you are converting from an earlier version of ASM 4.x, you must first upgrade to ASM 4.2 before running the conversion. For more information, see “Upgrading to the Correct ASM Version” on page 14.

The functionality of the ASM system remains basically the same, with some added features and options. Files are still saved to media folders on the extended drive, those files are still migrated to media based on move rules and purged based on purge rules, and media tasks and drive scans can still be scheduled for whenever fits your network traffic and file request needs. We recommend that after your conversion is complete and you have verified the conversion, that you take some time to review the *ASM Data Manager Getting Started Guide*, the *ASM Data Manager System Guide,* and the *ASM MediaStor System Guide* to familiarize yourself with the added functions and new features of your ASM system.

For more information, see the following sections:

- "Comparing ASM 4.2 and ASM 5.4, " which follows
- “Planning the Conversion” on page 14
- “Before You Convert” on page 16
- “Running the Conversion Utility” on page 21
- “Verifying the Conversion” on page 23
- “Removing the Conversion Utility” on page 24

Comparing ASM 4.2 and ASM 5.4

Before you convert your ASM 4.2 system to ASM 5.4, it is important to understand the differences between the two systems. For more information, see the following sections:

- "ASM 4.2 vs. ASM 5.4 Architecture, " which follows
- “Configuration Changes” on page 12

ASM 4.2 vs. ASM 5.4 Architecture

The fundamental difference between ASM 4.2 and ASM 5.4 is the architecture of the system, and the separation of duties between components of the system. Instead of using a server/agent architecture, ASM has divided the hardware device management responsibilities from the file migration responsibilities.

ASM is a system where one program, ASM MediaStor, controls the hardware devices and makes the media in those devices available for read/write commands, and another program, ASM Data Manager, controls the file migration activities, including media tasks, activity scheduling, and extended drive and service management.

In addition, because the hardware device responsibilities have been separated out from the file migration function, Data Manager can interact with other programs that make storage available (like Tivoli Storage Manager or ACSLS for UNIX). This architecture allows Data Manager to use NAS devices for storage as well.

Security and network connectivity between the end user and the extended drive for ASM are still managed through Windows NT/2000 as it was for ASM 4.2. In addition, service management functions can still be accessed either through the ASM interface or through the Services option in the Control Panel (Windows NT) or Administrative Tools (Windows 2000).

Configuration Changes

Because of the similarity in basic system setup between ASM 4.2 and ASM, hardware and system configuration is retained when upgrading. Extended drive settings, move groups, and move, purge, and delete rules should also remain intact through the conversion process.

For more information, see the following sections:

- "Hardware Configuration, " which follows
- “Network Configuration” on page 13
- “System Configuration” on page 13

Hardware Configuration

In ASM 4.2, hardware management was done through the ASM Server, and each device was listed under a Hardware Tree in the ASM Administrator. In ASM, hardware management is done through ASM MediaStor, but the MediaStor Administrator setup and access to devices through a hardware tree remains the same. As with ASM 4.2, the tree structure allows you to easily view all devices attached to the MediaStor computer (formerly the ASM Server) and the drives in each device. You can access device management functions with a single mouse click, using commands on the device and drive shortcut menus.

Network Configuration

ASM 5.4, like ASM 4.2, uses the Windows operating system to manage share-level, file-level, and user-level security. Windows NT/2000 also handles network connectivity between the end user and the extended drive.

Since the hardware and file migration responsibilities have been separated so that they can be handled by MediaStor and Data Manager, respectively, the two programs must be able to access one another through the network. If both programs are installed on the same machine, this connectivity is not an issue. It becomes a concern, however, if the programs are installed on separate machines, or if you have multiple Data Manager and MediaStor machines (replacing multiple ASM Servers and ASM Agents). In these cases, you must be sure that access between Data Manager and MediaStor is enabled through network topology and through network security.

System Configuration

Despite some wording changes and some “placement” changes, the functionality of system settings remains essentially consistent between the two versions. For example, the compaction function in ASM works identically as it did in ASM 4.2. However, this function, previously managed as a hardware function by the ASM Server, is now managed by Data Manager (formerly the ASM Agent) as a data management function. In addition, many functions are now “extended drive-based” meaning that they can be configured separately for each extended drive, rather than system-wide. For example, the media task scheduler must be set up for each extended drive separately, as opposed to being able to use a server-level scheduler to set task schedules for the entire ASM Server (and all associated extended drives).

In addition, move, purge and delete rules have changed slightly to accommodate the additional option of configuring exclusion-type rules. ASM 4.2 allowed you to configure the Age, Attributes, and Size pages to exclude certain files from move, purge, or delete. ASM still allows you to do that, but does that through exclusion-type rules. What this means is that if your ASM 4.2 rules utilized any of the exclusion options, those options will carry over to

ASM 5.4 after the conversion but will appear slightly differently in the rule properties.

For example, if you have a purge rule configured in ASM 4.2 to exclude files with the System attribute from purge, after the conversion, you will see an inclusion-type purge rule that is applied to all types of files except those with a System attribute.

What you may want to plan to do is to re-configure your rules after conversion so that you have both inclusion and exclusion-type rules to qualify (or not qualify) the same files for move, purge, and delete as your ASM 4.2 rules did.

Planning the Conversion

Before converting from ASM 4.2, it may be advantageous to plan the steps that you will take in the upgrade in order to anticipate any preparation needed for upgrading to ASM. You need to consider the following issues:

- What version of ASM do you have installed now? If you have a version of ASM that is older than ASM 4.2.106, you must upgrade to version 4.2.106 before running the conversion. For more information, see "Upgrading to the Correct ASM Version, " which follows.
- Do you need to provide read and write access during the conversion? For more information, see “Setting Access Restrictions During Conversion” on page 15.
- What hardware/extended drive space will ASM require? For more information, see “Evaluating System Requirements” on page 15.

Upgrading to the Correct ASM Version

ASM version 4.2.106 or higher must be installed on the machine. The conversion process does not upgrade any earlier version of ASM. If upgrading from a previous version, please follow the recommended upgrade paths (listed in the table below).

The following table provides the recommended upgrade paths for moving from a previous version of ASM 4.2 to ASM 5.4. Please note that prior to converting to ASM, you must be running Windows NT 4.0 with Service Pack 6a, or Windows 2000 with Service Pack 2 or 3 installed. If you are planning to upgrade your operating system from Windows NT to Windows 2000, you should run the conversion before upgrading the operating system. If you only require an upgrade to the latest Windows NT service pack, please upgrade Windows NT before the conversion process. For detailed information on

upgrading to interim versions, please consult the documentation shipped with those versions.

Table 2. Recommended Upgrade Paths for an ASM 4.x Conversion

Current Version	Upgrade Path
4.00.xx	4.00.xx → 4.20.106 → 5.4
4.10.xx	4.10.xx → 4.20.106 → 5.4
4.20.xx	4.20.xx → 4.20.106 → 5.4
4.21.xx	4.21 → 5.4

Note: In order to make sure the upgrades are successful, you should successfully start up ASM for each version upgrade before proceeding to the next.

Setting Access Restrictions During Conversion

Prohibiting access to the ASM 4.2 Server and ASM 4.2 Agents is required while running the conversion. This is necessary because of the need to reboot all servers and agents during the conversion process to load new services and drivers and to make appropriate changes to the registry settings for all computers being converted. In addition, prohibiting access to the extended drive(s) during conversion eliminates the possibility of data loss due to files being overwritten during conversion.

Access restrictions for the conversion from ASM 4.2 to ASM 5.4 should cause minimal disruption in that the conversion process is not designed to take an extraordinary amount of time. The time the conversion takes is entirely dependant on the number of ASM Servers and ASM Agents that need to be converted.

Evaluating System Requirements

System requirements and recommendations for the ASM Data Manager computer(s) are listed in the *Planning Your Data Manager System* chapter of the *ASM Data Manager Getting Started Guide*. System requirements and recommendations for the ASM MediaStor computer can be found in the *Getting Started* chapter of the *ASM MediaStor System Guide*. As with ASM 4.2, the extended drive should be separate from the volume where the system files are stored. An extended drive sizing guide is provided to help you determine the size of the extended drive you need.

If you planned your ASM 4.2 system using the guidelines provided with that version, you should not have any problems with ASM (unless you have current extended drive space issues). However, if you are upgrading your system from Windows NT to Windows 2000, you may want to recalculate your

extended drive size requirements to accommodate file tag size differences between the two operating systems.

ASM 4.2 required the Windows NT 4.0 (Service Pack 3 or greater) operating system on both the ASM Server and the ASM Agent computers. ASM requires either Windows NT 4.0 with Service Pack 6a, or Windows 2000 with Service Pack 2 or 3. Since your 4.2 system is replaced by programs that require a higher operating system, if your 4.2 Server and/or Agent computers are running on Windows NT 3.51 or Windows NT 4.0 with less than Service Pack 6a, you must upgrade those machines to Windows NT 4.0 with Service Pack 6a (or greater).

If you ultimately will be running your ASM system on a Windows 2000 platform, we recommend waiting to upgrade to the Windows 2000 operating system until after the conversion to ASM is complete. This is because both ASM 4.2 and ASM 5.4 will run on Windows NT, but ASM 4.2 is not certified to run on Windows 2000.

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

Before You Convert

Once your data access restrictions have been set and all system requirements are met, you should perform the following steps before beginning the conversion:

- "Running ASM 4.2 System Reports, " which follows
- “Verifying Hardware Connections” on page 17
- “Installing the ASM Version 4.2 Conversion Utility” on page 17

Running ASM 4.2 System Reports

In order to have an accurate record of your ASM 4.2 system configuration prior to beginning the conversion process, you should run the following reports (selecting the Full detail option where applicable) using the Report Wizard in the ASM 4.2 Administrator. Be sure to save each of the generated reports once they appear in DXPAD. They will assist you in restoring your ASM system if there is a problem.

- Agent Information – Run a report for each agent in your ASM system.

- Extended Drive Information – Run a report for each extended drive in your ASM system.
- Hardware Configuration – Run a report from each ASM server where hardware is configured.
- Media Files – If possible, run a file report task on all media and a media files report to generate an accurate list of the files on the media. While this report is optional, it is highly recommended if time and resources permit.
- Media Properties – If possible, run a media properties report for all media in your system.
- Media Roster – Run a report to gain summary information on the media if you cannot run a media properties report on all media in the system.
- Media Tasks – There should be no pending media tasks when the conversion is run. To be sure, you may want to run a media tasks report prior to conversion.
- Server Registry Information – Run a report for each ASM server in the system.
- System Settings – Run a report for each ASM server in the system.

After the conversion, you can consult the reports for configuration information from the ASM 4.2 system to verify the configuration of your new ASM system.

Verifying Hardware Connections

Before converting your ASM system, you should confirm that the hardware is properly configured, specifically SCSI devices. For any SCSI device to work correctly (regardless of its use with ASM), all devices and the SCSI adapter must be properly terminated. Problems could also arise if the SCSI cable exceeds the maximum cable length specified by the host adapter documentation. Additionally, all SCSI devices should be powered on before starting Windows NT/2000.

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. In addition, the size of a library adds to the amount of SCSI cable used.

Installing the ASM Version 4.2 Conversion Utility

The conversion utility must be installed on the ASM 4.2 Server machine in order to perform the conversion. During conversion, the utility automatically upgrades all Agent computers along with the Server computer. For this reason, the conversion utility only needs to be installed (and run) on the ASM 4.2 Server.

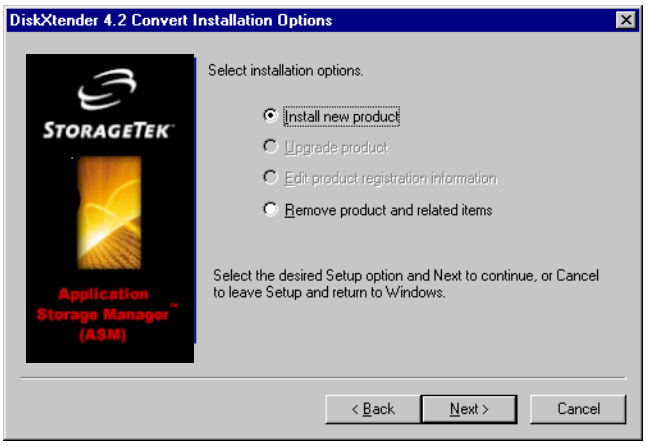
To install the ASM 4.2 conversion utility:

1. Exit all applications on the computer(s) on which you want to install the conversion utility. 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 conversion utility setup wizard or type the following path in the Open text box:

   D:\DX2000.*XXX*\DXCONVERT42\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. The ASM 4.2 Conversion Utility Setup Wizard appears, starting with the Introduction page. The Introduction page briefly describes the installation process.
5. Click Next. The Installation Options page appears.

Figure 9. ASM 4.2 Conversion Utility Setup Wizard -- Installation Options Page



6. Select Install new product. Click Next. The License Agreement page appears.

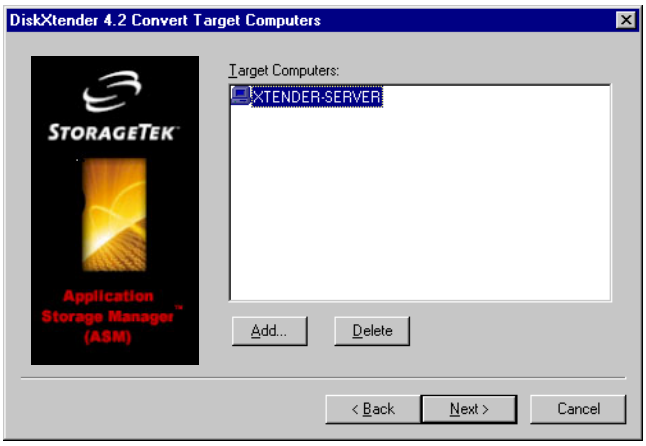
Figure 10. ASM 4.2 Conversion Utility Setup Wizard -- License Agreement Page

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

Figure 11. ASM 4.2 Conversion Utility Setup Wizard -- Registration Page

8. Enter the customer name and organization name and then click Next. The Target Computers page appears.

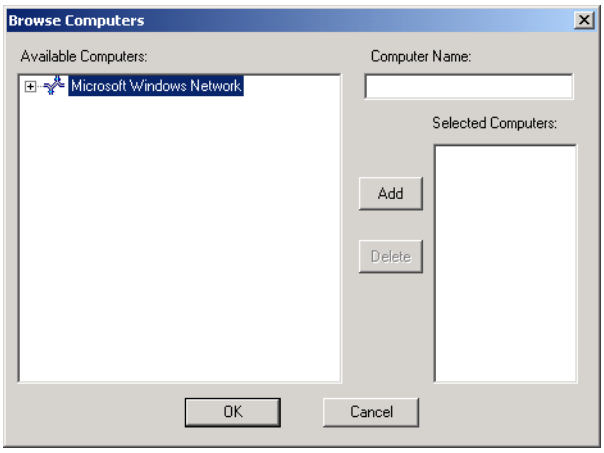
Figure 12. ASM 4.2 Conversion Utility Setup Wizard -- Target Computers Page



9. You have the following choices:

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

Figure 13. Browse Computers Dialog Box



10. 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 conversion utility 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 conversion utility 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 conversion utility. When you finish, click OK. You are returned to the Target Computers page. When the Target Computers list is complete, click Next. The Summary page appears.

11. Verify the accuracy of the information in the summary.
12. If all information is correct, click Finish.

    You have the following choices:

    - If you ran the install on one or more remote computers (in addition to or instead of the local computer), a results dialog box appears, listing the results for each computer you targeted for conversion utility installation. Take note of any computers where a reboot is required (or computers on which the installation failed) and then click OK.
    - If you ran the install on the local computer, a message appears, indicating that the conversion utility has been successfully installed. Click Restart to close the setup wizard and reboot the computer, or click Exit to close the setup wizard without restarting the computer.

Running the Conversion Utility

Once you have installed the ASM 4.2 conversion utility and run the necessary reports and registry backup files, you can convert your ASM 4.2 system to ASM 5.4. The conversion process essentially runs an upgrade of your system from ASM 4.2 to ASM 5.4 and installs the programs necessary (ASM Data Manager and ASM MediaStor) to make that happen. The conversion process also transfers all configuration information to the new programs and automatically loads all necessary services and drivers for the ASM system.

The conversion process runs in three phases.

- The first phase backs up your existing 4.2 registry configuration and removes the ASM 4.2 service. At the end of the first phase, you are prompted to restart the server computer. Upon restarting, the second phase automatically runs.
- The second phase replaces the ASM 4.2 Agent software with the ASM 5.4 Data Manager program, and the ASM 4.2 Server software with the ASM 5.4 MediaStor program. It also runs a hardware conversion and a media conversion (with media pool assignment). At the end of the second phase, you are prompted to restart the server and all agent computers. Upon restarting, the third phase automatically runs.
- The third phase finalizes the conversion process by assigning media to the appropriate move groups and media folders within your ASM configuration.

The ASM 4.2 conversion utility functions as a wizard, leading you through the necessary steps for converting your 4.2 system to ASM 5.4.

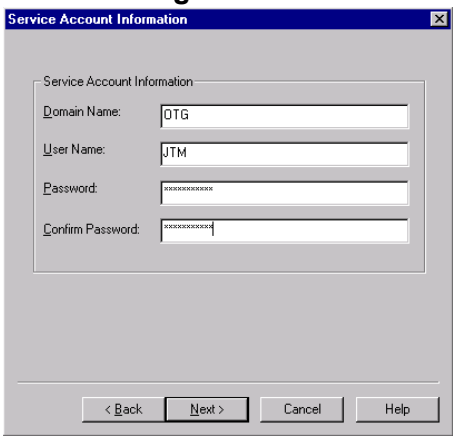
If you have any questions or concerns about the conversion, or about any of the following issues, please contact your technical support representative before beginning the conversion process.

If the procedure is cancelled at any time during the conversion, your 4.2 configuration is automatically restored. If the conversion is aborted unintentionally during processing (system failure, power outage, etc.) and the 4.2 system does not automatically restore, use the 4.2 restore utility located in the conversion utility program group. For more information, see "Recovering a Failed Conversion, " which follows.

To run the ASM 4.2 Conversion Utility:

1. From the Start menu, choose Programs, Storagetek ASM 4.2 Convert, and then ASM 4.2 Convert. The Welcome page appears.
2. Click Next to continue. The Confirmation page appears. The Confirmation page provides a reminder that the conversion process is permanent and cannot be undone.
3. Click Next to continue. The Summary page appears.
4. Verify the information in the summary and click Finish. The conversion utility backs up the current ASM 4.2 registry, stops the ASM 4.2 service, and removes the service from the computer. When complete, the wizard automatically restarts all computers. After the computer restarts and you log in again, Phase 2 begins automatically and the Phase 2 Welcome page appears.
5. Click Next to continue. The Service Account Information page appears.

Figure 14. ASM 4.2 Conversion Utility -- Service Account Information Page



6. Enter the account information for the account you want ASM to use to log on as a service and then click Next. The Summary page appears.

7. Click Finish to continue with the conversion. A progress bar appears while the Data Manager and the MediaStor program files are copied onto the agent and server computers. After installation of the programs, conversion of the media and hardware takes place. This process may take several minutes.
8. When complete, the wizard automatically restarts all computers. After the computer restarts and you log in again, Phase 3 begins automatically, and the Phase 3 Welcome page appears.

   Note: It is recommended that you allow all libraries to complete their inventory before continuing with Phase 3.

9. Click Next to continue. The Summary page appears.
10. Review the information in the summary and click Finish to complete the conversion. When completed, a message appears to inform you that the conversion has completed without error.
11. In the message, click Return to Windows to exit the conversion utility.

After completing the conversion, be advised that media does not come online until associated libraries complete the inventorying process. Depending on the size and number of libraries used, this process may take some time.

In addition, the conversion process installs an evaluation copy of Data Manager and MediaStor. After conversion is complete, you need to install XtenderSolutions License Server and license your Data Manager and MediaStor software. See the *License Server System Guide* for information on installing and configuring the License Server. Contact your technical support representative to obtain the necessary Data Manager and MediaStor licenses.

Recovering a Failed Conversion

The Recover Failed Conversion utility allows you to restore your ASM 4.2 system to the state it was in prior to the conversion. This utility is specifically designed for use in the event a conversion failed, or if for some reason the conversion was inaccurate or incomplete.

Selecting this option removes the ASM 5.4 program and setup wizard and restores your ASM 4.2 configuration.

Verifying the Conversion

Once the conversion is complete, open the ASM MediaStor Administrator (now located on the ASM Server) and verify that the media and hardware devices in the ASM 4.2 system were successfully moved to the MediaStor hardware configuration.

Then open the ASM Data Manager Administrator and verify that your media folders, move groups, and move, purge, and delete rules were all transferred over to Data Manager during the conversion process.

Since the report generation function in ASM 5.4 is very similar to the one in ASM 4.2, you may want to run reports in Data Manager and MediaStor and compare the information in them to the ASM 4.2 reports you ran prior to the conversion.

Removing the Conversion Utility

Once you are certain that all media and configuration information was transferred to ASM 5.4 correctly, you can remove the conversion utility from all ASM Servers on which it was installed. You can remove the ASM 4.2 conversion utility using the same wizard you used to install the utility.

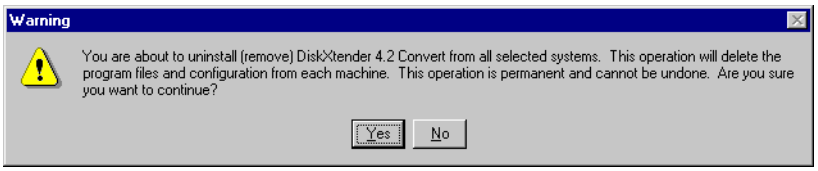
To remove the ASM 4.2 conversion utility:

1. From the Start menu, select Programs, Storagetek ASM 4.2 Convert, and then Setup. The welcome page appears.
2. Click Next to continue. The Installation Options page appears.

Figure 15. ASM 4.2 Conversion Utility Removal -- Installation Options

3. The only option that should be available is Remove product and related items. Select that option and click Next. A warning message appears.

Figure 16. Uninstall Warning Message



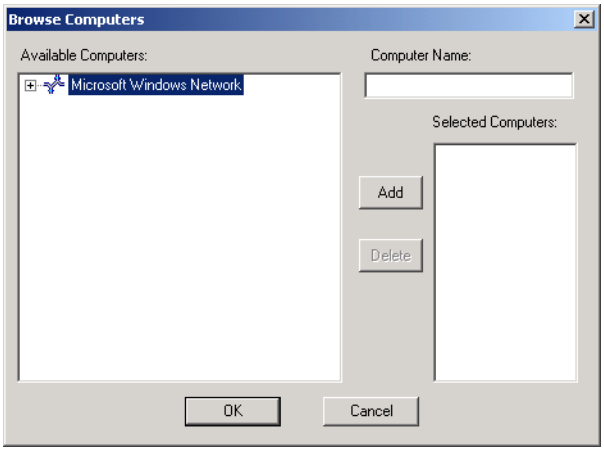
4. Click Yes to continue. The Target Computers page appears.

Figure 17. ASM 4.2 Conversion Utility Removal -- Target Computers Page

5. You have the following choices:

   - To remove the conversion utility from only the computer(s) listed in the Target Computers list, click Next. The Summary page appears.
   - To remove the conversion utility from other computers in addition to the one(s) listed in the Target Computers list (if you have completed and verified the conversion for all of those ASM 4.2 Servers), click Add. The Browse Computers dialog box appears.

Figure 18. 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 conversion utility 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 conversion utility 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 conversion utility. When you finish, click OK. You are returned to the Target Computers page. When the Target Computers list is complete, click Next. The Summary page appears.

7. Review the information in the summary.
8. 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 computers, separate progress bars appear for each computer.

   When the uninstall is finished, a message appears to inform you that the conversion utility has been removed from the system and to prompt you to reboot the computer(s).
9. Click Restart to close the message and reboot the computer immediately.

You have now successfully upgraded to ASM. Please keep in mind that default settings for the added functionality from ASM 4.2 have been implemented for your ASM service and extended drive. We recommend that you check all settings and refer to the *ASM Data Manager Getting Started Guide* and the *ASM System Guide* for details on using the various components of Data Manager. Refer to the *ASM MediaStor System Guide* for details on using MediaStor.

Converting from ASM 3.2

3

The conversion process for upgrading from ASM 3.2 to ASM 5.4 has been designed to accommodate the needs of users with existing 3.2 systems. ASM 3.2 uses a database to track files and system parameters. ASM no longer requires a separate database. ASM uses the Windows registry to track system parameters, and the Windows Master File Table to track ASM file attributes. The conversion process transfers information from the ASM 3.2 database to the Windows Master File Table on an NTFS volume “extended” by ASM, and transfers media hardware duties to the ASM MediaStor program.

Because the hardware and system requirements for ASM are considerably higher than those for ASM 3.2, it is ***highly recommended*** that you plan to install the ASM components on a different machine than the one on which ASM 3.2 is currently installed. If you choose not to do this, be sure the minimum hardware specifications and operating system on the ASM 3.2 computer are upgraded (if necessary) to at least meet (preferably exceed) the minimum requirements for ASM. Hardware and system requirements for ASM Data Manager can be found in the *Planning Your Data Manager System* chapter of the *ASM Data Manager Getting Started Guide*. Hardware and system requirements for ASM MediaStor can be found in the *Planning Your MediaStor System* chapter of the *ASM MediaStor System Guide*.

Data Manager and MediaStor can be installed on a single machine, as long as it is a computer to which your hardware devices can be attached.

For more information, see the following sections:

- "Comparing ASM 3.2 and ASM 5.4, " which follows
- “Planning the Conversion” on page 36
- “Before You Convert” on page 42
- “Running the Conversion Utility” on page 53
- “Verifying the Conversion” on page 57
- “Removing the Conversion Utility” on page 58
- “Removing ASM 3.2” on page 60
- “Setting Up Your New ASM System” on page 61

Comparing ASM 3.2 and ASM 5.4

Before you convert your ASM 3.2 system to ASM, it is important to understand the differences between the two systems. For more information, see the following sections:

- "What's New in ASM 5.4?, " which follows
- “What's the Same in ASM 5.4?” on page 29
- “ASM 3.2 vs. ASM Terminology” on page 30
- “Configuration Changes” on page 33

What's New in ASM 5.4?

ASM provides the same mass storage flexibility and utility provided in ASM 3.2 (ASM 3.2), with a multitude of added features that increase its power and efficiency.

- ASM 3.2 Conversion Utility for database conversion
- Long filename support
- UNICODE foreign language character set support
- No separate cache

  ASM can extend file storage on NTFS volumes on a file-by-file basis, removing the need for a separate cache.
- No separate database

  ASM can store ASM extended file attributes in the Windows Master File Table, removing the need for a separate database. System settings are maintained in the Windows registry.
- **Share-, directory- and file-level security and network connectivity managed through Windows NT/2000**

  Kernel-level integration with Windows NT/2000 allows direct use of Windows NT security and networking functionality for files in the ASM system.
- Serverless architecture

  The ASM architecture avoids server bottlenecks by allowing each Data Manager computer to handle its own data and media management tasks. Yet ASM still allows several Data Manager computers to share media service resources.
- Media grouping

Move groups allow you to group media within a media folder, then target file movement to a specific group of media.

- Automated media management

  Move group automation features allow you to automatically label media for a move group when needed and compact media within a move group when needed.

- Enhanced control over file migration

  Move rules and purge rules let you use file extensions, size, attributes, and age when creating rules for movement of files to media, and rules for garbage collection (purge) of moved files.

- Media Task Queue Manager

  You can manage media tasks within a queue where all media scheduled for processing are displayed.

- Prefetch Request Manager

  You can set up prefetch requests to retrieve files before they are needed. Frequently used files can be fetched at times when other use on the system is minimal. The Prefetch Request Manager lets you manage your requests as needed from one central place.

- Media Prepare Manager

  You can perform formatting and labeling for many media at once through the Media Prepare Manager.

- Simplified media copy

  ASM automatically updates and synchronizes copy media with original media; you only have to add and label the copy and then schedule times for media updates.

- Increased system reporting capabilities

  The Reports feature allows you to keep configuration records and to analyze activity on your ASM system by running reports on various aspects of the ASM system. Alert configuration lets you set up ASM to send messages to users or workstations whenever an error or a warning (or both) occurs.

What’s the Same in ASM 5.4?

- File caching on the extended drive (based on move rules and purge rules you set) for reduced hardware usage and faster access
- Time-based migration of files
- Garbage collection watermarks to insure free space on extended drives

- Extensive list of supported devices
- Event scheduling for unattended file migration, media compaction, and system administration
- SCSI Manager and Jukebox Manager utilities, as well as other command line utilities for ease of administration
- Service management from within the ASM interface

ASM 3.2 vs. ASM Terminology

Several components of ASM are similar to components of ASM 3.2. Aspects of the functionality for the two programs are compared and contrasted in this section and in “Configuration Changes” on page 33. This section focuses on defining ASM terminology in comparison with ASM 3.2 terminology. For more information, see the following:

- "Partitions and Extended Drives, " which follows
- “Cache Space and Extended Drives” on page 31
- “Media Paths and Media Folders” on page 31
- “Media in Write Paths and Media in Move Groups” on page 31
- “Write Paths and Move Rules” on page 31
- “Direct Read Settings” on page 32
- “Cache Garbage Collection and Purge Rules” on page 32
- “Cache Watermarks and Purge Watermarks” on page 32
- “Forced Migration Watermark and Force Moves When Nothing to Purge” on page 32
- “Shares and Windows Security” on page 32
- “Database and Kernel-level Integration” on page 33
- “Database Maintenance” on page 33

Partitions and Extended Drives

ASM contains a conversion utility that converts ASM 3.2 partitions to ASM media folders on one or more ASM extended drives. A directory is created on the extended drive for each ASM 3.2 partition, while the directory structure and files for each partition remain intact.

Extended drives provide the directory structure seen by clients, but they are physical NTFS volumes. The directories on an extended drive are NOT virtual as partitions are in ASM 3.2. The only virtual element of ASM lies in whether a file’s data is actually on the extended drive or has been moved to media and

purged from the drive. If the file is on media and the file data has been purged from the extended drive (usually done according to a purge rule you set), a file remains to make the entire file *appear* to be on the extended drive.

Cache Space and Extended Drives

In ASM 3.2, files are kept in write cache until they can be written out to media and in read cache if they are frequently accessed. In ASM, if the file has not yet been moved to media or is being kept online for rapid read access, the entire file is stored on the extended drive. When a file is moved out to media, it becomes eligible for purging from the extended drive. When the file qualifies for a purge rule, it is written to the purge list. When space is needed, ASM purges, or removes the file data for, files listed on the purge list from the extended drive. A file tag containing the file information and location on media is sent back to the Windows Master File Table, which uses this information to make the file appear to be resident on the drive, and thereby making it retrievable to clients accessing the extended drive.

Media Paths and Media Folders

A media folder and a media path both contain the files from the media on which they are located. However, a media path is a logical construction that exists only in a database. In ASM, you create an actual folder on the extended drive. Media is then added to the folder through ASM and the information for the files on the media is restored to that folder in the Windows Master File Table. The media folder on the extended drive lists file information for all of the files and directories actually on any of the media in the folder.

Media in Write Paths and Media in Move Groups

In ASM 3.2, media is added to a write path to target movement of files from that write path to that media. In ASM, media is grouped into move groups and move groups are used as target media for move rules. Move groups allow you to make subgroups of media within a folder. Media of the same type within the same media folder can be added to move groups.

Write Paths and Move Rules

Write paths “contain” media in ASM 3.2. If you write files to a write path, the files are moved to media in that write path. Move rules in ASM point to a target move group of media. Move rules define which files within the specified directory will be moved, when they will be moved, and to what media (move group).

Move rules in ASM allow more control by providing complex time-based rule-making options. Whenever the extended drive is scanned, each file is checked against the configured move rules, and if it qualifies for move, is added to the move list.

Direct Read Settings

In ASM 3.2, direct read is configured through device settings, during media restore, in write cache rules, and in the file list node. In ASM, you can choose to set direct read for all files on a piece of media, set direct read for all files on an extended drive, set direct read for only certain files based on their qualification for a purge rule or even set direct read for individual files.

Cache Garbage Collection and Purge Rules

In ASM 3.2, the files in read cache that are least frequently used are “garbage collected.” Purge rules in ASM allow more control by providing complex time-based rule-making options. Whenever the extended drive is scanned, and whenever a file is moved to media, each file is checked against the configured purge rules, and if it qualifies for purging, is added to the purge list by priority.

Cache Watermarks and Purge Watermarks

In ASM 3.2, cache watermarks trigger file movement and garbage collection. Because there are no separate cache spaces in ASM, two global purge watermarks are set in relation to the entire capacity of the extended drive. These purge watermarks control processing of the purge list. When a file has been moved to media and becomes eligible for purge according to the purge rules you have set, it is added to a purge list for the extended drive. A purge start watermark causes ASM to start processing the purge list when the specified percentage of the extended drive disk space is used. A purge stop watermark stops purging when the disk space used drops below the percentage specified.

Forced Migration Watermark and Force Moves When Nothing to Purge

ASM allows you to set a used space watermark for the extended drive, which activates processing of the purge list in order to clear space. Processing of the purge list will continue until the purge stop watermark is reached. Both watermarks can be configured through the extended drive Properties options. However, because ASM will not purge files until they have been moved, you may end up with a situation where more space needs to be cleared, but the purge list is empty (all files on it have been processed). ASM allows you to enable an option to force the processing of the move list (move files) in this situation. Once the files have been moved, they may be eligible for purging, allowing more space on the extended drive to be cleared.

Shares and Windows Security

Since the “Virtual File System” is actually maintained in a database in ASM 3.2, shares are managed in the Shares node of the Administrator module. Security for drives extended by ASM is managed through Windows NT/2000.

Database and Kernel-level Integration

ASM tracks files through the Windows Master File Table rather than relying on a database for file information storage. This enables ASM to use native NT/2000 functionality (such as long filenames) and prepares it to take full advantage of functionality in future versions of Windows NT/2000.

Database Maintenance

ASM does not use a database to track files and directories. Therefore, database maintenance is no longer needed.

Configuration Changes

Because of the substantial changes in system architecture from ASM 3.2 to ASM, hardware and system configuration is not retained when converting. However, file locations on media are preserved and transferred through the ASM 3.2 Conversion Utility.

Once the ASM 3.2 database has been converted and devices have been relocated to the ASM system, you can use the MediaStor Administrator to add hardware to the ASM system, and the Data Manager Administrator to configure system settings and extended drive properties. The Administrator in both programs is the interface through which configurations are set and maintained.

Security and network connectivity between the end user and the extended drive for ASM is managed through Windows NT/2000.

For more information, see the following sections:

- "Database Configuration, " which follows
- “Hardware Configuration” on page 34
- “Cache Configuration” on page 34
- “Network Configuration” on page 35
- “System Configuration” on page 35

Database Configuration

ASM 3.2 uses a database to track file, directory, security, and network configuration information. ASM no longer needs a separate database to track file locations. Windows NT/2000 maintains file, directory, security, and network configuration information for the files in an ASM system.

Information for each file in the ASM system is copied into the Windows Master File Table (MFT) whenever a file is written or restored to an extended drive. When a file is moved out to media and purged, the file data is removed, leaving a file “tag” on the extended drive. The file tag is a set of extended

attributes stored in the Windows Master File Table that contains a pointer to the location of the file on media.

ASM makes a file that has been moved and purged appear to be present on the extended drive by substituting into the MFT the actual file size of the file on media (in place of the zero byte size of the file actually on the drive). Windows then displays the file information for the file on media in Windows Explorer, rather than the file information for the file actually on the drive. To the client connecting to the extended drive, the full file appears to always be on the drive, even if the file data is actually only out on media.

Hardware Configuration

In ASM 3.20, hardware management is done through the Console. In an ASM system, hardware is listed under a Hardware Tree in the MediaStor Administrator. The tree structure allows you to easily view all devices attached to the MediaStor computer and the drives in each device. You can access device management functions with a single mouse click, using commands on the device and drive shortcut menus. A new Manage Media function lets you view, insert, move, and eject library media from within the Administrator.

Despite the new interface, hardware configuration in ASM remains essentially the same as in ASM 3.2. Aside from the starting point for adding new devices, the sequence used to add and configure devices has not changed from the ASM 3.2 procedures. Library drives, for example, still need to be configured in the proper order, and ASM retains the Auto Config and Test Config functions to assist you in configuring library drives.

Cache Configuration

In ASM 3.2, ASM files are separated into write, compact, and read cache. You set the total amount of the cache and configure watermarks controlling the percentage of the cache drive that is used for each type of cache. If the percentage of the drive allocated for write cache is reached, files can no longer be written to ASM. If the percentage of compact cache is exceeded, the compaction is paused and files from the media being compacted are moved out to media automatically. Normally, files are moved to media according to a move schedule; however, if the Force migration watermark is reached, files are automatically moved out to media. Free space in cache is used for read file caching, and garbage collection of the least recently used files occurs automatically as space was needed.

In ASM, the size of an extended drive is determined by the size of the NTFS volume that is extended. A file is moved to media and then purged depending on the move rules and purge rules that apply to that file. Move rules add eligible files to a move list; purge rules add eligible files to the purge list. Instead of automatic garbage collection of read files, there is a purge watermark that triggers processing of the purge list when free space on the drive goes below a set level. The move list is processed according to a move schedule. If after processing of the entire purge list, the extended drive free

space is still less than the amount set for the purge stop watermark, and if the Force moves when nothing to purge option is enabled, processing of the move list begins regardless of the move schedule. Since files cannot be purged until they have been moved, processing of the move list may make more files eligible for purging, thereby making it possible for the purge stop watermark to be reached.

Network Configuration

In ASM 3.20, shares, users, and network connectivity is configured on the Network Configuration dialog box. ASM lets you manage share-, file-, and user-level security through Windows NT/2000. Windows also handles network connectivity between the end user and the extended drive.

Since the hardware and file migration responsibilities have been separated to be handled by ASM MediaStor and ASM Data Manager, the two programs must be able to access one another through the network. If both programs are installed on the same machine, this connectivity is not an issue. It becomes a concern, however, if the programs are installed on separate machines, or if you have multiple Data Manager and MediaStor machines. In these cases, you must be sure that access between Data Manager and MediaStor is enabled through network topology and through network security.

System Configuration

Some of the settings configurable through the System Configuration dialog box in ASM 3.2 can be configured from the Hardware tree in MediaStor or through the Service Properties in Data Manager. Despite some wording changes, the functionality of these system settings remains essentially consistent between the two versions. Drive saver settings for spinning down inactive standalone drives and dismounting inactive library drives are still available. Each drive saver setting is enabled by default, with 5 minutes set for spindown and 60 seconds for idle time dismount. In addition, the compaction function is now managed by Data Manager separately from the MediaStor hardware management. This means that you no longer need to schedule idle minutes before compaction begins because compaction is now a media task and can be scheduled for specific times.

The options on the Options tab in the System Configuration dialog box are now accessible using the Event Settings option in the Service menu of both the Data Manager and the MediaStor Administrators. These include logging options specified service events, and for writing errors and warnings to Windows Application logs.

Planning the Conversion

Before converting from ASM 3.2, it may be advantageous to plan the steps that will be taken in the upgrade in order to anticipate any preparation needed for upgrading to ASM. You need to consider the following issues:

- What version of ASM do you have installed now? If you have a version of ASM that is older than ASM 3.20.90, you must upgrade to version 3.20.90 before running the conversion. For more information, see "Upgrading to the Correct ASM Version, " which follows.
- What version of Microsoft SQL Server do you have installed now? You must upgrade to version 6.5 in order to run the conversion.
- Do you need to restrict read and write access during the conversion? For more information, see “Setting Access Restrictions During Conversion” on page 37.
- How long will it take to convert the ASM 3.2 database to an ASM system? During the conversion, read and write access is prohibited, so system downtime should be estimated and scheduled for a time period in which it will least impact users. For more information on estimating conversion times, see “Estimating Conversion Times” on page 37.
- What hardware/extended drive space will ASM 5.4 require? For more information, see “Evaluating System Requirements” on page 41.

Upgrading to the Correct ASM Version

ASM 3.20.90 must be the version installed prior to converting to ASM. The conversion process will not upgrade any version of ASM earlier than 3.20.90. If upgrading from a previous version, please follow the listed recommended upgrade paths.

The following table provides the recommended upgrade paths for moving from a previous version of ASM 3.x to ASM 5.4. Please note that to install the conversion utility, you must be running the Windows NT 4.0 operating system with Service Pack 6a or higher applied. If your ASM 3.x computer’s operating system requires upgrade, please upgrade ASM to 3.20.90 before you upgrade Windows NT for use with the conversion utility. For detailed information on upgrading to interim versions of ASM, please consult the documentation shipped with those versions.

Table 3. Recommended Upgrade Paths for Conversion

Current Version	Upgrade Path
3.00.xx	3.00.xx → 3.10.90 → 3.20.90 → 5.4
3.10.xx	3.10.xx → 3.10.90 → 3.20.90 → 5.4

Table 3. Recommended Upgrade Paths for Conversion

Current Version	Upgrade Path
3.20.xx	3.20.xx → 3.20.90 → 5.4

Note: You *must* successfully initialize ASM for each version upgrade before proceeding to the next.

Setting Access Restrictions During Conversion

You must prohibit users from writing to or reading from the targeted ASM extended drive while running the ASM 3.2 database conversion.

Removing read and write access to the ASM 3.2 system is also required during the conversion process. You must be sure that access to partitions is not re-enabled after the conversion is complete; this could result in data being stored to the wrong location and ultimately cause potential data loss.

Note: Before converting the final piece of media in ASM 3.2, make sure that all files in write cache have been moved to media.

Estimating Conversion Times

Using benchmarks obtained through testing, we have developed estimated database conversion times.

Note: Be advised that the times listed here are rounded benchmarks specifically for the configurations shown. The actual time of your system conversion may vary. For specific results of benchmarking tests of ASM 3.2 to ASM conversions, see "Conversion Benchmark Test Results, " which follows.

If you are using a single processor, the following table contains estimates of how long it will take to convert a database with a certain number of files:

Table 4. Single Processor Conversion Times by Number of Files

Number of Files	Estimated Conversion Time
1,000,000	3 hours
5,000,000	15 hours
10,000,000	30 hours

Similarly if you are planning your conversion for a certain amount of time, the following table contains estimates for how many files a can be converted during that time period:

Table 5. Single Processor Conversion Times by Length of Conversion

In	You Can Convert a Database with About
24 hours	8,000,000 files
48 hours	16,000,000 files
72 hours	32,000,000 files

If you are using a dual processor, the following table contains estimates of how long it will take to convert a database with a certain number of files:

Table 6. Dual Processor Conversion Times by Number of Files

Number of Files	Estimated Conversion Time
1,000,000	2.5 hours
5,000,000	12.5 hours
10,000,000	25 hours

Similarly if you are planning your conversion for a certain amount of time, the following table contains estimates for how many files a can be converted during that time period:

Table 7. Dual Processor Conversion Times by Length of Conversion

In	You Can Convert a Database with About
24 hours	9,500,000 files
48 hours	19,000,000 files
72 hours	29,000,000 files

Conversion Benchmark Test Results

The conversion estimates in the previous section are based on benchmark test results. There are three conversion scenarios benchmarked for these examples:

- Single processor with Data Manager and MediaStor on the same machine
- Single processor with Data Manager and MediaStor on separate machines
- Dual processor with Data Manager and MediaStor on the same machine

The tables below summarize the results of benchmarking tests for conversion from ASM 3.2 to ASM 5.4 under the three scenarios.

Table 8. Single Processor – Data Manager and MediaStor on the Same Machine

Number of Files	Conversion Time	Tested Configuration
1,000,000	2 hours 56 minutes	550-MHz Pentium III processor 20 GB IASM drive to 20 GB IASM drive 256 MB of RAM No other programs running No read or write access during conversion
5,000,000	13 hours 20 minutes	550-MHz Pentium III processor 20 GB IASM drive to 20 GB IASM drive 256 MB of RAM No other programs running No read or write access during conversion
10,000,000	29 hours 37 minutes	550-MHz Pentium III processor 20 GB IASM drive to 20 GB IASM drive 256 MB of RAM No other programs running No read or write access during conversion

Table 9. Single Processor – Data Manager and MediaStor on Separate Machines

Number of Files	Conversion Time	Tested Configuration
1,000,000	2 hours 24 minutes	550-MHz Pentium III processor 20 GB IASM drive to 20 GB IASM drive 256 MB of RAM No other programs running No read or write access during conversion

Table 9. Single Processor – Data Manager and MediaStor on Separate Machines

Number of Files	Conversion Time	Tested Configuration
5,000,000	12 hours 37 minutes	550-MHz Pentium III processor 20 GB IASM drive to 20 GB IASM drive 256 MB of RAM No other programs running No read or write access during conversion
10,000,000	25 hours 49 minutes	550-MHz Pentium III processor 20 GB IASM drive to 20 GB IASM drive 256 MB of RAM No other programs running No read or write access during conversion

Table 10. Dual Processor – Data Manager and MediaStor on the Same Machine

Number of Files	Conversion Time	Tested Configuration
1,000,000	2 hours 25 minutes	600-MHz Pentium III dual processor 30 GB IASM drive to 30 GB IASM drive 512 MB of RAM No other programs running No read or write access during conversion
5,000,000	12 hours 20 minutes	600-MHz Pentium III dual processor 30 GB IASM drive to 30 GB IASM drive 512 MB of RAM No other programs running No read or write access during conversion

Table 10. Dual Processor – Data Manager and MediaStor on the Same Machine

Number of Files	Conversion Time	Tested Configuration
10,000,000	25 hours 28 minutes	600-MHz Pentium III dual processor 30 GB IASM drive to 30 GB IASM drive 512 MB of RAM No other programs running No read or write access during conversion

Evaluating System Requirements

ASM has a service component that provides file migration services for NTFS volumes extended by ASM Data Manager, and manages communication with one or more media services (like ASM MediaStor). Those media services, in turn, manage the mass storage devices and the media contained therein. To determine hardware requirements, you will need to decide whether Data Manager and MediaStor will be installed on the same machine, or whether there will be a Data Manager machine and a separate MediaStor machine.

System requirements and recommendations for Data Manager can be found in the *Planning Your Data Manager System* chapter of the *ASM Data Manager Getting Started Guide*. System requirements and recommendations for MediaStor can be found in the *Planning Your MediaStor System* chapter of the *ASMMediaStor System Guide*. Both chapters contain basic minimum system requirements and recommended upgrades for optimization of your ASM system. In addition, the *Planning Your Data Manager System* chapter in the *ASM Data Manager Getting Started Guide* provides sizing worksheets to allow you to accurately determine how large your extended drive will need to be in order to function most effectively.

Note: We recommend that when calculating estimated extended drive space requirements, that you determine how much space you will need for the conversion, determine how much space you expect to need going forward, and add those figures together in order to gain a more accurate estimate of your extended drive hardware needs.

The drives extended by ASM must be located on the Data Manager computer, and must be NTFS volumes. The extended drive should be separate from the volume where the system files are stored.

Both Data Manager and MediaStor require either Windows NT 4.0 with Service Pack 6a, or Windows 2000 with Service Pack 2 or 3 to be installed on the Data Manager and MediaStor computer(s). Systems running on Windows NT 3.51 or Windows NT 4.0 without Service Pack 6a or greater must upgrade to Windows NT 4.0 and apply Service Pack 6a or greater *before* upgrading.

Note: For information on the latest Window NT service packs and hot fixes certified for use with ASM, please contact your technical support representative.

Before You Convert

All applications other than ASM 3.2 should be shut down before the conversion is performed. In addition, you should prepare both the server on which ASM 3.2 is currently installed and the machine(s) on which you plan to install ASM before you begin the conversion (if they are different). For more information, see the following sections:

- "Preparing the ASM Computer(s), " which follows
- “Preparing the ASM 3.2 Server” on page 48

If you have any questions or concerns about the conversion, or about any of the following issues, please contact your technical support representative *before* beginning the conversion process.

Preparing the ASM Computer(s)

Before converting your ASM 3.2 system to ASM, you must prepare the machine(s) on which you plan to install ASM Data Manager and ASM MediaStor.

To prepare the ASM computer(s):

1. Determine hardware/extended drive requirements for the ASM system. For more information, refer to the *Planning Your Data Manager System* chapter in the *ASM Data Manager Getting Started Guide*, and the *Planning Your MediaStor System* chapter in the *ASMS MediaStor System Guide*.
2. Install Data Manager and MediaStor on the planned machine(s). They may both be installed on the same machine or on different machines.

   Note: Because the system requirements for ASM 5.4 are considerably higher than those for ASM 3.2, it is ***highly recommended*** that you plan to install the ASM components on a different machine than the one on which ASM 3.2 is currently installed. If you choose not to do this, be sure the minimum hardware specifications and operating system on the ASM 3.2 computer are upgraded (if necessary) to meet or exceed the minimum requirements for ASM.

   MediaStor requires no other configuration aside from installation on a computer accessible to the Data Manager computer. (This connectivity is not an issue if the programs are installed on the same machine.) Do *not* move hardware from the ASM 3.2 server to the MediaStor computer (if appropriate) until conversion is completed.

For more information, see the *Installing Data Manager* chapter of the *ASM Data Manager Getting Started Guide* and the *Installing MediaStor* chapter of the *ASM MediaStor System Guide*.

3. Configure the MediaStor media service in Data Manager, and create at least one extended drive.

   If you have installed MediaStor on multiple computers, and plan to use multiple MediaStor media services with a single Data Manager computer, you must configure a separate MediaStor media service in Data Manager for each MediaStor computer.

   The extended drive should have enough free space for at least the number of files to be converted. Additional space for system expansion is *highly* recommended.

   Do *not* create any media folders on the ASM system at this time.

   For more information, see "Creating the Media Service and Extended Drive(s), " which follows.

Creating the Media Service and Extended Drive(s)

ASM requires configuration of the ASM MediaStor media service and creation of at least one extended drive in order to run the conversion successfully. Below you will find an abbreviated listing of the necessary steps and procedures for configuring the MediaStor media service and creating the extended drive(s). You can find detailed information for configuration (and later editing) of the MediaStor media service in the *Setting Up Media Services* chapter of the *ASM Data Manager Getting Started Guide*.

Note: To successfully set up a MediaStor media service in Data Manager, you must have already installed MediaStor on a computer accessible to the Data Manager computer. For instructions, refer to the *Installing MediaStor* chapter of the *ASM MediaStor System Guide*.

To open and configure the Administrator:

1. You have two options for starting the Administrator:

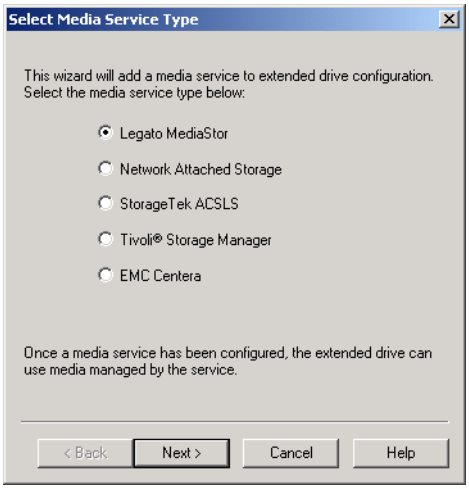
   - Immediately after Data Manager installation, when the Installation Complete message appears, asking if you would like to start ASM, click Start.
   - From the Windows Start menu, select Programs, then Storagetek ASM. From the ASM menu, select Administrator.

   The Administrator window appears, and all registered computers are listed in the Computer drop-down list and in the tree view, regardless of whether they successfully connect.

2. Select the Data Manager computer for which you want to configure a media service. From the Service menu, select Configure Media Services.

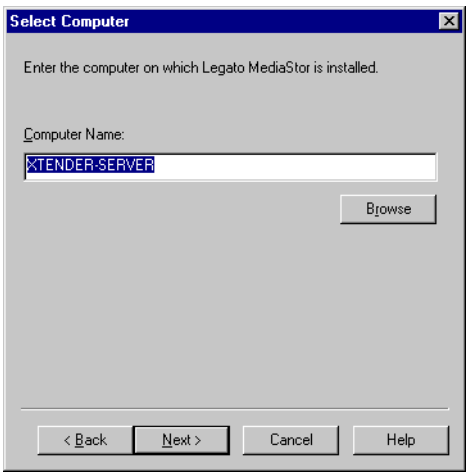
The media service wizard appears, starting with the Select Media Service Type page.

Figure 19. Media Service Wizard -- Select Media Service Type Page



3. Select the Storagetek MediaStor option and click Next. The Select Computer page appears with the local computer listed by default.

Figure 20. Media Service Wizard -- Select Computer Page



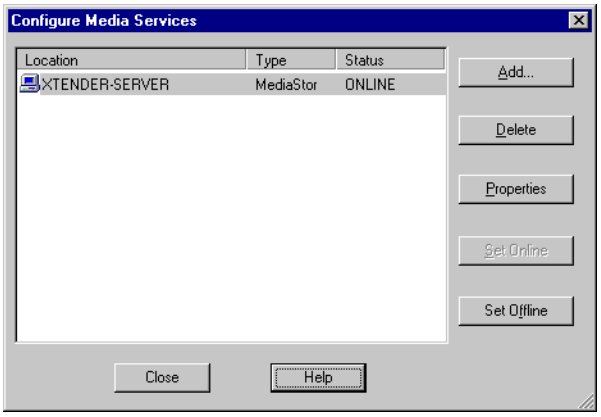
The Select Computer page allows you to specify the computer on which MediaStor has been installed and to which you want to connect.

4. In the Computer Name text box, if it is not already there, enter the computer name of the MediaStor computer you want to use. You can type in the path to the computer or you can browse for the computer on the network by clicking Browse.

5. When the computer name where MediaStor is installed appears in the Computer Name text box, click Next. The Summary page appears.

6. On the Summary page, review the information you have provided through the media service wizard.
7. If the information is correct, click Finish. A progress message appears. Once the media service is created, the Configure Media Services dialog box appears, listing the MediaStor media service you just configured.

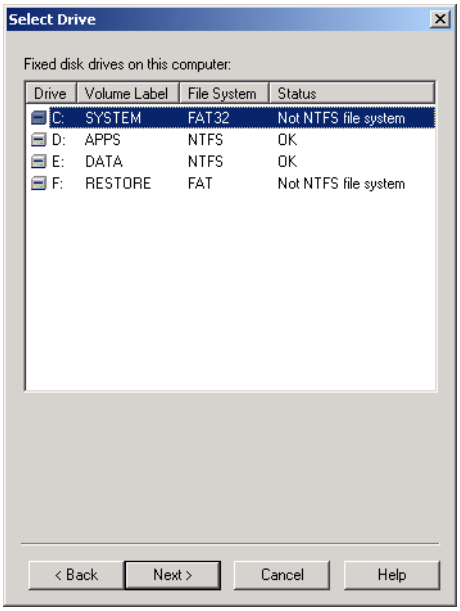
Figure 21. Configure Media Services Dialog Box with MediaStor Media Service Added



Note: If you plan to use multiple MediaStor services with a single Data Manager computer, select Add from the Configure Media Services dialog box and proceed from step 3 above. Repeat for each MediaStor computer/service you want Data Manager to use.

8. Click Close to close the Configure Media Services dialog box and return to the Administrator. A message appears asking whether you want to create an extended drive.
9. Click Yes. The New Extended Drive Wizard appears starting with the Introduction page. The Introduction page lists the steps that must be performed after an extended drive has been created in order to begin file migration.
10. Click Next. The Select Drive page appears.

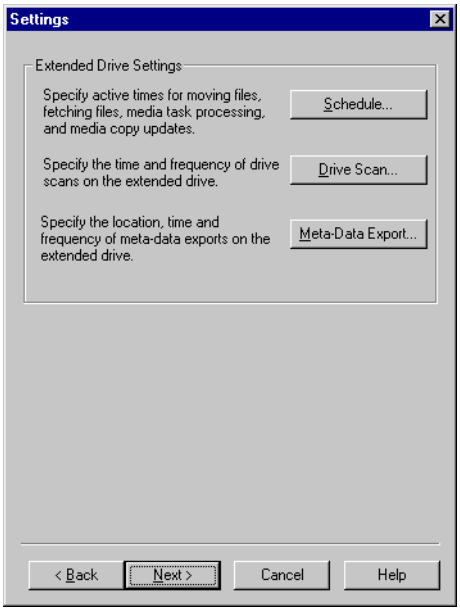
Figure 22. New Extended Drive Wizard -- Select Drive Page



The Select Drive page lists all partitioned drives on the Data Manager computer, along with the file system and status of each drive. Only drives listed with a status of OK can be extended.

11. From the Select Drive page, select the NTFS volume you want to extend and click Next. The Settings page appears.

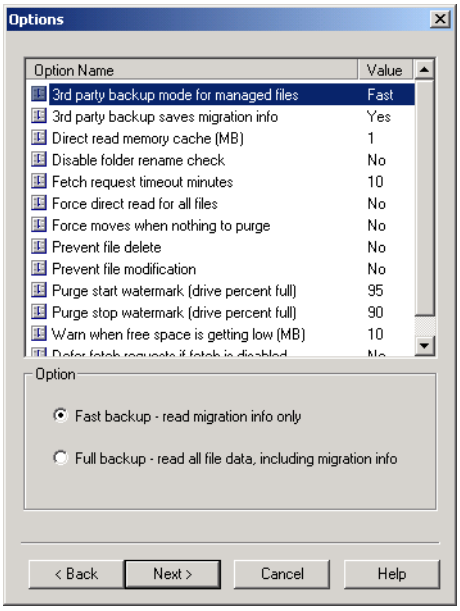
Figure 23. New Extended Drive Wizard -- Settings Page



The Settings page contains three buttons: Schedule, Drive Scan and Backup. You can configure these settings later.

12. Accept the defaults and click Next. The Options page appears. You can configure these settings later.

Figure 24. New Extended Drive Wizard -- Options Page



13. Accept the defaults and click Finish. The extended drive is created and appears in the Administrator tree view.

14. When you have completed adding your extended drive(s), a message appears asking if you would like to add a media folder to the new extended drive.

Figure 25. Add Media Folder To Extended Drive? Message

15. Click No.

    Note: You must *not* create any media folders prior to the conversion.

    The Administrator appears and should contain an extended drive in the tree view.

16. You have the following choices:

    - If you are using one extended drive on a single Data Manager computer, you are finished.
    - If you are using more than one extended drive on a single computer for the conversion process (you are using multiple extended drives on one Data Manager computer to convert multiple ASM 3.2 partitions), select

the New Extended Drive command from the Service menu to create an additional extended drive, and continue beginning with step 11. You may create as many extended drives as you want.

- If you are using extended drives resident on more than one Data Manager computer for the conversion, repeat the instructions for configuring the media service and creating the extended drive(s) on each Data Manager computer.

Preparing the ASM 3.2 Server

Before you convert your ASM 3.2 system, you must prepare the server on which ASM 3.2 is currently installed.

To prepare the ASM 3.2 server for conversion:

1. If necessary, determine the upgrade path for your existing ASM system, and upgrade to ASM version 3.20.90. For more information, see “Upgrading to the Correct ASM Version” on page 36.
2. If you are using Microsoft SQL Server, be sure you are using at least version 6.5. If you are using an earlier version, upgrade to 6.5 before running the conversion.
3. Run Server Reports. For more information, see “Running Server Reports” on page 48.
4. Prepare the ASM 3.2 server for database conversion – back up the server, rebuild indexes, run SQL Server optimization scripts, remove read and write access to the database, and migrate all files to media. For more information, see “Preparing Microsoft SQL Server” on page 49.
5. Install the ASM 3.2 Conversion Utility on the ASM 3.2 server. For more information, see “Installing the ASM 3.2 Conversion Utility” on page 50.
6. Determine database conversion time based on the number of files in ASM 3.2. For more information, see “Estimating Conversion Times” on page 37.
7. Decide on and set access restrictions during conversion. For more information, see “Setting Access Restrictions During Conversion” on page 37.
8. Empty the write cache. For more information, see “Emptying Write Cache” on page 53.

Running Server Reports

In order to have an accurate record of your ASM 3.2 system configuration prior to beginning the database conversion process, you should run the following reports using the Report Wizard in the ASM 3.2 Administrator:

- Partition report

- Media report
- Write Path report
- Share report
- System report
- Registry report

During the database conversion, and when configuring the ASM system after conversion, you can consult the reports for configuration information from the ASM 3.2 system.

Preparing Microsoft SQL Server

Microsoft SQL Server 6.5 must be installed on the ASM 3.2 machine. If the machine is running SQL Server Version 6.0 or earlier, the ASM 3.2 database conversion will not run.

Multi-processors

If you are using a computer with multiple processors, set the affinity mask for multi-processors to 254 in SQL Configuration.

ASM 3.2 Optimization

Note: SQL Server configuration should be optimized for faster performance. SQL scripts for optimizing configuration settings can be downloaded from the Download Area of the Technical Support page at http://www.support.storagetek.com. Go to the Download Software page and select SQL Server Scripts/Utilities.

DBCC Full

You should run a Database Consistency Check (DBCC Full) on your database through ASM 3.2 prior to running the conversion.

Update Statistics

You should update statistics on your database through ASM 3.2 prior to running the conversion.

Rebuild Indexes

Before upgrading ASM 3.2, you can rebuild indexes on the ASM database to make the conversion process more efficient.

Database Backup

Before converting, perform a database backup. The ASM database *must* be backed up before proceeding. SQL Server Backup is recommended, rather

than NT Backup. If NT Backup is used, the reliability of the results is not guaranteed.

Installing the ASM 3.2 Conversion Utility

The conversion utility must be installed on the machine where ASM 3.2 is running in order to perform the database conversion. The conversion utility installation sets up this module on the ASM 3.2 computer. The conversion utility can be run on a Windows NT server or workstation.

Note: Before running the conversion utility setup wizard, exit all applications. Setup may not be able to write to all necessary files if other software is running.

To install the ASM 3.2 Conversion Utility:

1. Insert the ASM setup CD-ROM into the drive. From the Windows Start menu, select Run. The Run dialog box appears.
2. You can either browse to the setup wizard or type the path to the following file in the Open text box:

   D:\DX2000.*XXX*\DXCONVERT32\SETUP.EXE

   (In this path, `D` represents the drive holding the setup CD-ROM and *XXX* represents the ASM version number.)
3. Once the file/path appears in the Open text box, click OK. The conversion utility setup is initiated (which may take up to two minutes), and the conversion utility setup wizard appears, starting with the ASM 3.2 Convert Setup page. The ASM 3.2 Convert Setup page briefly describes the installation process.
4. Click Next. The ASM 3.2 Convert Installation Options page appears.

Figure 26. ASM 3.2 Conversion Utility Setup Wizard -- Installation Options Page

5. Select Install new product and then click Next. The ASM 3.2 Convert License Agreement page appears.

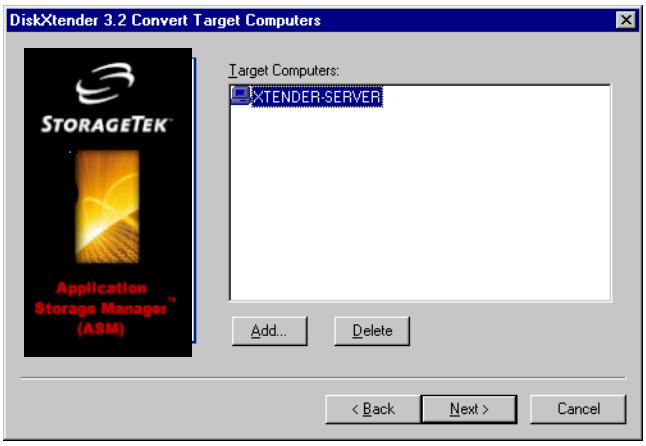
Figure 27. ASM 3.2 Conversion Utility Setup Wizard -- License Agreement Page

6. You must accept the terms of the license agreement before you can proceed with the installation. Enable the Accept terms of agreement check box and then click Next. The ASM 3.2 Convert Registration page appears.

Figure 28. ASM 3.2 Conversion Utility Setup Wizard -- Registration Page

7. Enter your customer name and organization name and then click Next. The Convert Target Computers page appears.

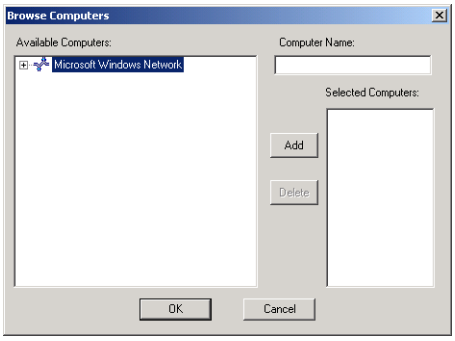
Figure 29. ASM 3.2 Conversion Utility Setup Wizard -- Target Computers Page



8. You have the following choices:

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

Figure 30. Browse Computers Dialog Box



9. 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 conversion utility 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 conversion utility 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 conversion utility. When you finish, click OK. You are returned to the Target Computers page. When the Target Computers list is complete, click Next. The Summary page appears.

10. Verify the accuracy of the information in the summary.
11. If all information is correct, click Finish. A dialog box appears, informing you whether the installation of the conversion utility was successful.
12. Click Exit to close this dialog box.

Emptying Write Cache

The ASM 3.2 Conversion Utility allows you to keep data in read cache during the conversion process. However, before the database conversion process is started, write cache should be emptied to insure that all files in write cache are moved to media. If write cache has not been flushed, data in cache will not be moved to the new ASM system. All files should be migrated to storage media (no pending file migration).

You can enable an option to copy cached files to the extended drive during partition conversion. This will allow you to copy files in read cache over to the extended drive. For systems that use forms of media with slower fetch rates, this copy feature can be used to eliminate the time-consuming retrieval of files from media for files that were recently accessed.

Running the Conversion Utility

Once you have installed ASM and the ASM 3.2 Conversion Utility, prepared your ASM 3.2 database for conversion, and created an extended drive in ASM, you can convert the ASM 3.2 database. Converting the database moves the media information stored in the database into the Windows Master File Table on the extended drive. Once the database has been converted, the converted media is listed under the Media node in the Extended Drive tree in the Data Manager Administrator.

If you abort the procedure during database conversion, you must call Technical Support to run the conversion a second time. Although database conversion does not alter the ASM 3.2 database in any way, stopping the conversion in process and restarting it may result in data not being correctly copied to the target extended drive.

To open the ASM 3.2 Conversion Utility:

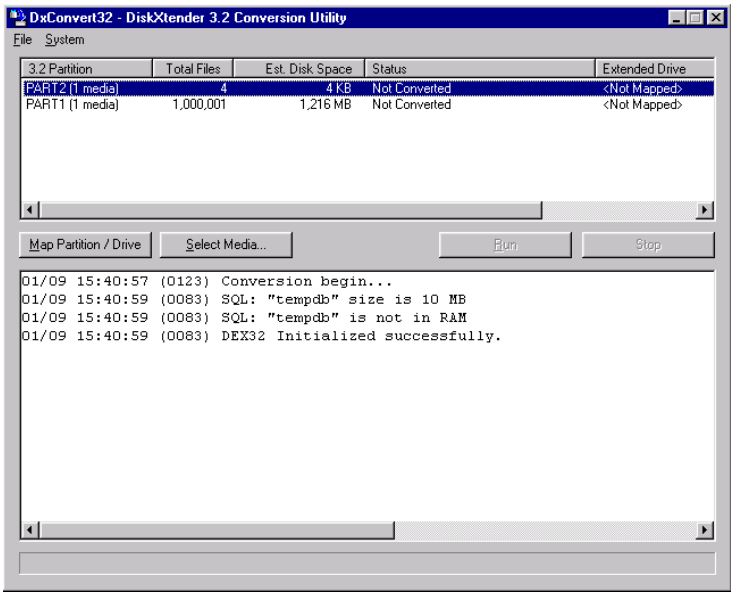
1. From the Start menu, select Programs, Legato DiskXtender 3.2 Convert, and then DiskXtender 3.2 Convert.
2. The Enter DiskXtender (ASM) 5.x Location dialog box appears.

Figure 31. ASM 3.2 Conversion Utility -- Enter ASM 5.x Location Dialog Box

The Server Name text box contains the local server name by default.

3. Replace the Server Name with the name of the computer on which ASM Data Manager is installed (if necessary).
4. When the appropriate server name appears in the text box, click Connect. The ASM 3.2 Database Conversion window appears showing the available 3.2 partitions for database conversion.

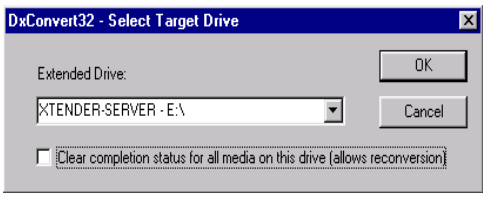
Figure 32. ASM 3.2 Conversion Utility Window



The ASM 3.2 Database Conversion window lets you select partitions to be converted, designate the target extended drive for the conversion, select media to be converted, and view conversion progress.

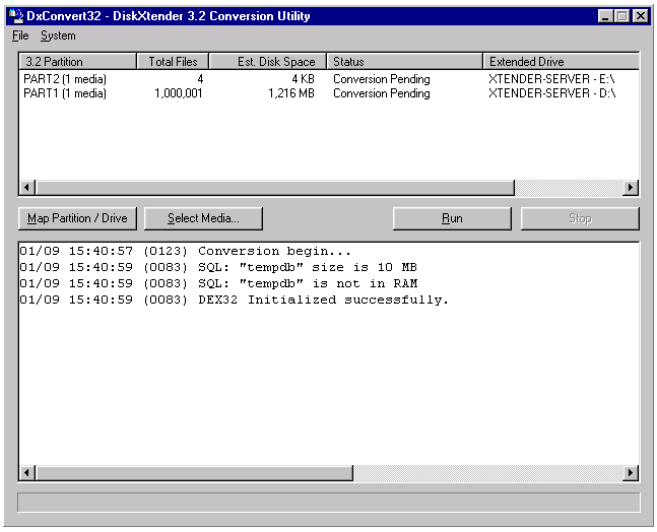
5. Highlight a partition name and click Map Partition/Drive to configure the location of the target extended drive.
6. The Select Target Drive dialog box appears.

Figure 33. ASM 3.2 Conversion Utility -- Select Target Drive Dialog Box



7. Select the destination extended drive for the conversion from the Extended Drive drop-down list.
8. If the database is to be converted again later, enable the Clear completion status for all media on this drive (allows reconversion).
9. Click OK. You are returned to the Conversion Utility window, with the targeted extended drive selected appearing to the right of the partition.
10. Repeat this process until each partition has a targeted extended drive.

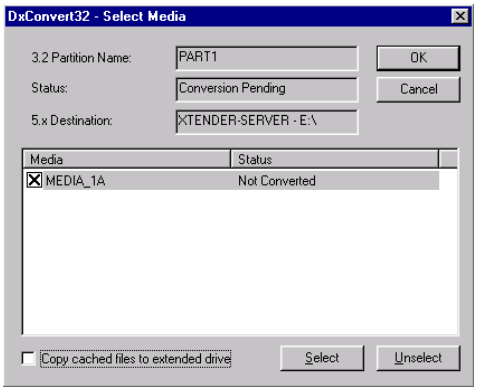
Figure 34. ASM 3.2 Conversion Utility Window



The Conversion Utility window displays a status of “conversion pending” for each partition after a target extended drive is selected.

11. You can convert all or some of the media in a database. To select media in the partition to be converted, highlight a partition and click Select Media. The Select Media dialog box appears showing the available media in the partition.

Figure 35. ASM 3.2 Conversion Utility -- Select Media Dialog Box

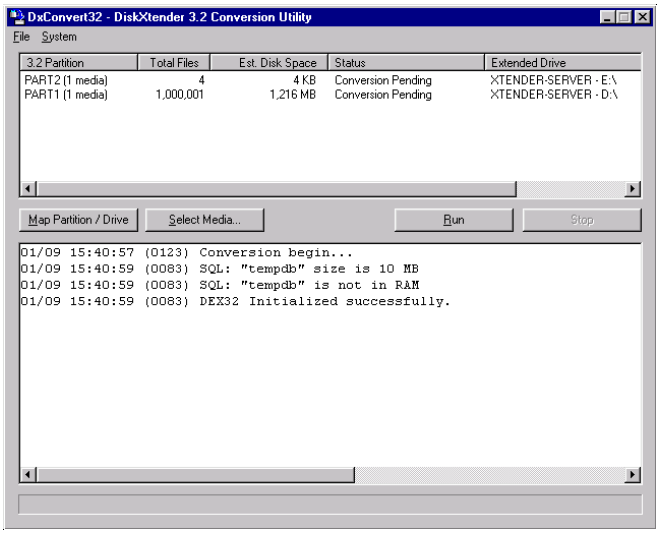


12. Highlight a piece (or pieces) of media and use the Select or Unselect buttons to enable which media to use for conversion. If the box next to a piece of media contains an “X”, that media is selected and will be converted.

13. If appropriate, enable the Copy cached files to extended drive option. This will ensure that any files currently in the read cache will be copied to the targeted extended drive. This option is intended for systems with large amounts of cached data and slow media retrieval times.

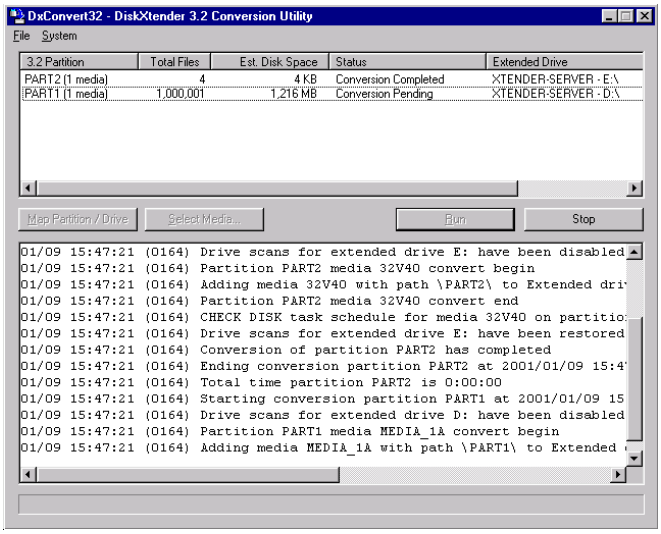
14. Click OK to accept the selected media for conversion. You are returned to the Conversion Utility window.

Figure 36. ASM 3.2 Conversion Utility Window



15. When all media conversion settings have been configured and all partitions have been assigned a target extended drive, click Run. The Conversion process begins.

Figure 37. ASM 3.2 Conversion Utility Window with Conversion in Progress



System progress messages appear in the bottom pane of the window, accompanied by the date and time of each message.

In addition, the Stop button becomes active in the event you need to stop the conversion process once it has begun. Remember, however, that if you abort the procedure during database conversion, you must call Technical Support to run the conversion a second time. Although database conversion does not alter the ASM 3.2 database in any way, stopping the conversion in process and restarting it may result in data not being correctly copied to the target extended drive.

As partitions are converted, their status changes from Conversion Pending to Conversion Completed. Upon conversion completion of each partition, the log file in the bottom pane of the window shows the total time for partition conversion.

Viewing the Conversions Log

To view a log of the conversion process, open the System menu in the conversion utility window and then select View Convert Log. The log can be saved, printed, or sent by e-mail.

■ Verifying the Conversion

Once the database conversion is complete, open ASM MediaStor and ASM Data Manager and verify that the media in the ASM 3.2 system was successfully moved to the MediaStor system and allocated to the Data Manager extended drive. Using the server reports you ran prior to conversion,

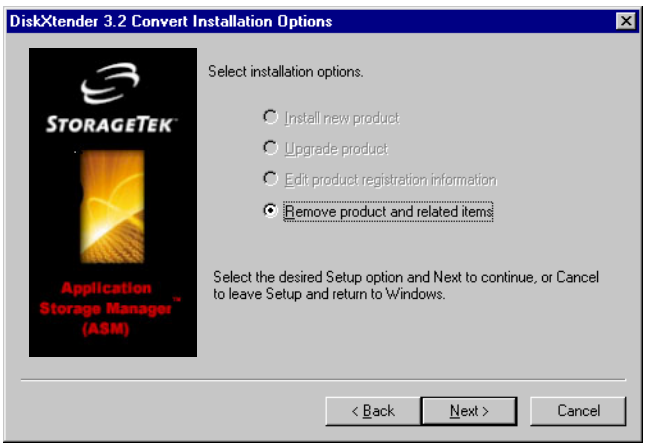
you can check that all media have been moved. Because the ASM 3.2 Conversion Utility does not make any alterations to the ASM 3.2 database, you can run reports after the conversion and they will still be accurate.

Removing the Conversion Utility

Once the database conversion process is complete and you have verified that the media and files have been successfully transferred to the ASM system, you can remove the ASM 3.2 Conversion Utility.

1. From the Start menu, select Programs, Storagetek ASM 3.2 Conversion Utility, and then Setup. The ASM 3.2 Conversion Utility Setup Wizard appears.
2. Click Next to continue. The Installation Options page appears.

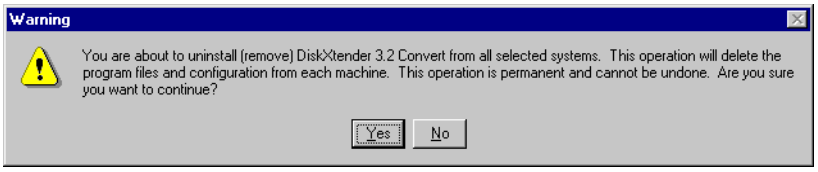
Figure 38. ASM 3.2 Conversion Utility Removal -- Installation Options



The only option that should be available is to Remove product and related items.

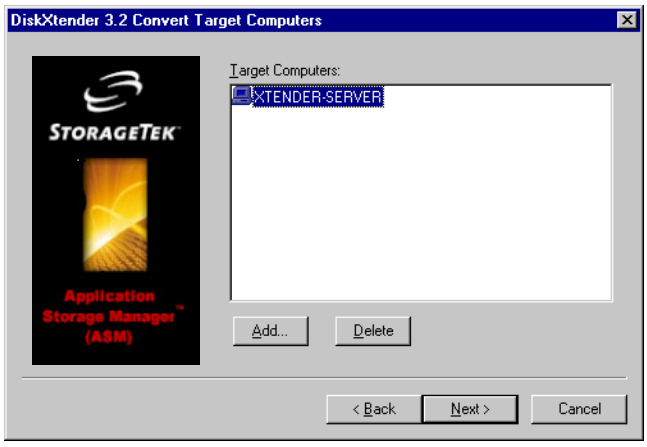
3. Select that option and click Next. A warning message appears.

Figure 39. Uninstall Warning Message



4. Click Yes to continue. The Target Computers page appears.

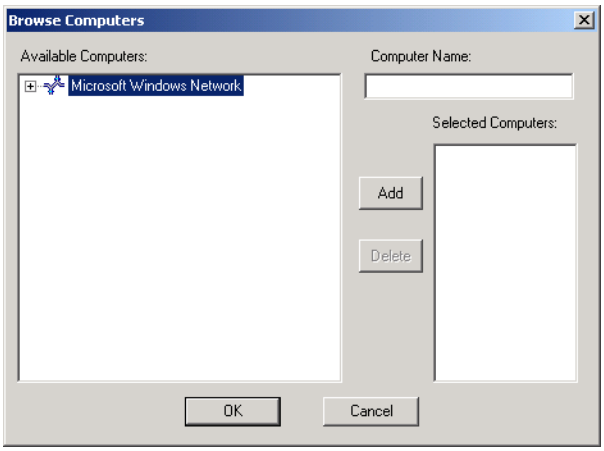
Figure 40. ASM 3.2 Conversion Utility Removal -- Target Computers Page



5. You have the following choices:

   - To remove the conversion utility from only the computer(s) listed in the Target Computers list, click Next. The Summary page appears.
   - To remove the conversion utility from other computers in addition to the one(s) listed in the Target Computers list, click Add. The Browse Computers dialog box appears.

Figure 41. 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 conversion utility 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 conversion utility 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 conversion utility. When you finish, click OK. You are returned to the Target Computers page. When the Target Computers list is complete, click Next. The Summary page appears.

7. Review the information in the summary.
8. If the information in the summary is correct, click Finish. A message appears stating that the ASM 3.2 Conversion Utility has been removed from the system, and that you must restart the computer to complete the uninstall process.

Figure 42. ASM 3.2 Conversion Utility Removal Complete – Restart Computer Dialog Box

9. Click Restart to complete the removal.

Removing ASM 3.2

Once the database conversion is complete, you can also remove ASM 3.2 (ASM 3.2). When ASM 3.2 is removed, all configuration settings and system files are deleted. When reinstalled, new settings must be configured. Caution should be taken when removing the product, as all settings are permanently lost.

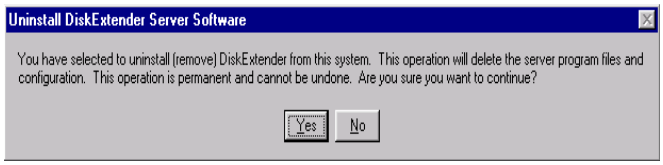
To uninstall ASM 3.2:

1. Select Setup from the ASM program group. The Setup page appears.

Figure 43. ASM 3.2 Removal -- Setup Page

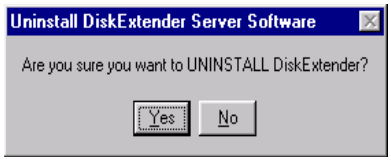
2. Select the Remove product and related items option and click Next. A message appears, prompting you to verify removal of ASM.

Figure 44. Uninstall Confirmation Message



3. Select Yes to continue. An additional confirmation message that appears.

Figure 45. Uninstall Further Confirmation Message



4. Select Yes. The ASM database, all program files in the specified installation path, and the ASM program group/folder are removed.

   Note: During uninstall, any files/directories that were not deleted must be deleted manually through Windows.

Setting Up Your New ASM System

You have now successfully upgraded to ASM 5.4. Once you are certain that all media information was transferred to ASM MediaStor and ASM Data Manager correctly, you can remove your hardware device from the ASM 3.2 system,

attach it to the MediaStor computer (if necessary), and configure it to the MediaStor service.

Please keep in mind that default settings have been implemented. Extended drives, media folders, move groups, move rules, purge rules, and delete rules can be created and/or changed through the Administrator. You will then need to finish configuring Data Manager:

- Add additional media services, if needed;
- Create new media folders, if needed;
- Create move groups within the new media folders and/or the media folders created by the conversion process (each partition/write path combination is now a media folder);
- Add media to the move groups so files can be written to the media;
- Create move rules for any files that should or should not be moved to media and point those move rules to the appropriate move groups.
- Create purge rules and delete rules to reclaim space on the extended drive.

Following is a checklist that you should refer to once your upgrade has been completed to insure that you identify the remaining configuration steps to get your ASM system up and running. For detailed information, refer to the *ASM Data Manager Getting Started Guide* and the *ASM Data Manager System Guide* for details on using the various components of Data Manager. Refer to the *ASM MediaStor System Guide* for details on using MediaStor.

Do you need to add devices to the MediaStor computer?

In order to use MediaStor as a media service to manage the media to which Data Manager writes files, you must add the device(s) containing the media to the MediaStor computer.

Do you want to create additional media folders?

Each directory that contained media on the partition becomes a media folder on the extended drive. If media was located in the root of the partition, the directory that was created for the partition will be a media folder. If media was located in a media path that was a subdirectory of the partition, that media path (including the partition as the lowest directory) becomes a media folder. You can create additional media folders on the extended drive, and add media and configure move and purge rules as appropriate.

Do you want to reassign media among the existing media folders?

When an upgrade is performed, media is assigned to media folders according to which media was associated with which write paths in ASM 3.2. You can add additional media to any media folder, or remove media from a media folder.

Have you grouped media within each media folder into move groups?

In order to create move rules and move files to media in ASM, you must first create move groups, and add the media in the media folders to the move groups. You cannot write to a piece of media until the media is added to a move group.

Have you created move rules to specify which files should and should not be moved to which move groups?

Once you have created move groups, you then create move rules to specify which files should be moved, and to which move group. You can move files according to their file extension, attributes, size, and age. You can create as many move rules as are necessary to set up the file migration pattern you want. You can also create move rules to specify what files you do *not* want to move to media.

When the extended drive is scanned, each move rule is checked for each file on the drive. Any files eligible for move under any move rule are added to a move list, which is processed during the times scheduled for file movement to media. The fewer move rules and move groups created, the simpler the ASM system. More move rules and move groups allow greater flexibility but also make the system more complex.

Have you created purge rules to specify which moved files should and should not be purged of file data on the extended drive?

Purge rules are used to control which files are purged from the extended drive after they have been moved to media. When the extended drive is scanned, each purge rule is checked for each file on the drive. Any files eligible for purge under any purge rule are added to a purge list, which is processed whenever extended drive usage exceeds the start watermark for purging. You can purge files according to their file extension, attributes, size, and age. You can create as many purge rules as are necessary to set up the garbage collection scheme that you want. You can also create purge rules that specify which files you do *not* want purged from the extended drive. The fewer purge rules created, the simpler the ASM garbage collection system. More purge rules allow greater flexibility but also make the system more complex.

Have you created delete rules to specify which moved files should and should not be automatically deleted on the extended drive and from media?

Delete rules can be used to automatically clean unused files from the extended drive and from media. You can also create delete rules that specify which files you do *not* want deleted from the extended drive. Please note that while files deleted using delete rules may not be deleted from the media (depending on the media type and file system used), those files are no longer tracked by the ASM system.

When the extended drive is scanned, each delete rule is checked for each file on the drive. Any files eligible for delete under any delete rule are immediately

deleted. You can delete files according to their file extension, attributes, size, and age. You can create as many delete rules as necessary to set up the storage management scheme that you want.

Do you want to adjust default watermarks?

Purge watermarks in ASM control when the purge list for the extended drive is processed. The defaults are configured so that purging starts when free space on the extended drive falls below 5 percent of the drive and stops once 10 percent of the space on the drive is free. You can set the start and stop watermarks to the levels that you want.

Do you want to change the default schedule for drive scans for your extended drive(s)?

The answer to this question is a resounding “Yes,” because extended drive scans are disabled by default. The purpose of an extended drive scan is to scan the contents of the extended drive, checking each file against all move and purge rules. When a file is eligible, it is added to the move list and/or purge list as appropriate. Only files listed on the move list will be moved to media, and only files listed on the purge list can be purged from the extended drive.

If you configure any move rules or purge rules to have age-delays, you *must* perform regular extended drive scans to update the move and purge lists. Files that qualify against move or purge rules with no age delay are typically written to the lists as soon as they are saved to the extended drive.

In addition, file-sharing issues or sharing violations can prevent files from being added to the move list when appropriate. Data Manager must have full access to a file in order to obtain information required for the move list. If the file is open or otherwise being accessed by a program or user, Data Manager cannot add it to the move list.

Regular drive scans are required to be sure that all appropriate files are written to the move list when they qualify, and as such, are being written out to storage media (in coordination with your Move files to media schedule). Because drive scans for very large extended drives can be time-consuming, you may want to schedule your drive scans to occur during times of low extended drive and system traffic.

Do you want to change the media activity schedule times?

Each extended drive in the ASM system has its own separate media activity schedule. Moving files to media, updating media copies, processing media tasks in the media task queue, and allowing fetches from media are all media activities that can be scheduled. By default, the first three activities listed are scheduled from 8 p.m. to 8 a.m., while the Allow fetches from media schedule is always active (24 hours/7 days a week) by default.

Do you want to set up regular extended drive backups?

The Data Manager's extended drive backup utility is specifically engineered to allow you to reliably back up all of the data on your extended drives while you are using ASM. During an extended drive backup, ASM inventories *all* of the files on an extended drive and sees that the appropriate information (file data for files that are not managed by ASM and file metadata, including file tags, for files that are managed by ASM) is saved. ASM then creates a data set file containing all of the information obtained from the inventory. You can set a network path for the backup data set file, set your backup schedule, and choose to run both incremental and/or full backups. You can then back up that file to another location using a standard backup program.

Do you want to set up prefetch schedules?

ASM's prefetch utility allows you to schedule file retrieval of purged file data. You can designate which files should be fetched to the NTFS volume and schedule when the file retrieval will occur. Any files that you know will be needed can be marked for prefetch so that they will already be present on the NTFS volume when they are requested.

You can schedule a prefetch request to occur once at a set time, to reoccur at set times, or to be processed immediately. Prefetching files at low traffic times frees system resources and speeds read request response during high traffic times.

Moving Files from One Media Type to Another

4

At some point you may decide to change the type of media to which your ASM system writes files. You may also decide that you want to completely transition from the old media type to the new type, transferring all of the files currently written to the old media.

ASM Data Manager allows you to do this through a combination of the use of the compact media task and temporary changes to your existing move rules, purge rules, and media activity schedules.

The compact media task is designed to retrieve the file data for purged files so that those files can be moved to a different piece of media (and the original media removed or recycled). It does this by fetching all *active* files from a piece of media back to the extended drive (the files are written to the media folder to which the piece of media is assigned). A file is considered “active” when there is a file tag associated with the file still on the extended drive (meaning the file tag has not been deleted from the extended drive). When the files are fetched via compaction, the file is then treated as if it was never moved to media (so that it can be moved again when it qualifies for a move rule).

In addition, if a file’s data is still resident on the extended drive (the file has been moved to media but not yet purged), that file is skipped during compaction (because the data already exists on the extended drive). Only active files whose data has been purged from the extended drive are written back to the drive from the media.

After the compact media task completes, the media is automatically removed from the media folder. This is because the media is no longer needed to retrieve files since all file data from the media has been written to the extended drive. The compacted files (those placed on the extended drive) remain on the extended drive until transferred to other storage media based on the move rules established for the media folder in which they reside. This is how the old files are transferred to the new media. By adding the new media to the media folder and pointing your move rules to a move group containing the new media, the old files compacted back to the media folder are written out to the new media type.

Because compacting media involves potentially copying all files from a piece of media back to the extended drive, be sure that you have *at least* the equivalent of one side of the media of free space on the extended drive. While it is possible and even likely that not *all* of the file data on the media will be

written back to the drive (some files may be inactive/deleted, some files may have been moved and not purged), making sure you have enough space on the extended drive reduces the likelihood that a situation will arise that will require user intervention.

If, however, during the compaction of a piece of media, the extended drive becomes so full as to not be able to receive any more files, the compact task for the media goes into a Suspended state for one hour. In addition, no other compact tasks are processed until the original hour (for which the first compact task was suspended) has expired. After an hour has passed, Data Manager retries the original compaction. If the compaction is successful, Data Manager processes all remaining compaction tasks.

This suspension of all compact tasks accomplishes two things: it allows Data Manager to use system resources to move and purge files in order to clear off needed extended drive space, and it ensures that drives are not being used to attempt compact tasks that cannot complete successfully until there is sufficient space on the extended drive.

Before setting up your Data Manager system to transition to the new media type, there are some questions you should consider:

- How do I want to schedule the transition? All at once (for example, over a weekend), or incrementally (for example, during the evenings over several days or weeks)?
- How much extended drive space do I have to work with? Will I need to move and purge files as soon as they are compacted, or can I choose to purge files only as my disk fills up (leaving more files on the extended drive longer)?
- Should I restrict user access to purged files so that the storage device is only being used to complete compaction tasks (rather than mounting media for user file requests)? If I do that, will I need to prefetch files for users?

For more information and instructions on transitioning the media in your ASM system, see the following sections:

- "Before You Transition Your Media, " which follows
- “Upgrading ASM Media” on page 70
- “Verifying the Upgrade and Resetting the ASM System” on page 74

Before You Transition Your Media

Before you begin the transfer of your ASM Data Manager files from one media type to another, you should perform the following steps.

1. **If applicable, upgrade your ASM installation.**

   If you are upgrading your product version as well as your media type, you should upgrade the ASM installation before transitioning your media. See the appropriate chapter of this guide for information and instructions on upgrading Data Manager.

2. **Create backups of your Data Manager system.**

   This is so that you can restore the original configuration if there is a problem with the media transition. We recommend that you run the Repair Disk Wizard to save a copy of the Data Manager registry settings, and run an extended drive meta-data export of the files and file tags on the extended drive.

   Note: The extended drive meta-data export utility was called the extended drive backup utility in versions of ASM Data Manager prior to 5.3 Service Release 1.

   For more information and procedures, refer to the *Data Manager Backup and Recovery* chapter of the *ASM Data Manager System Guide*.

3. **Run a Media Files Report.**

   This will allow you to compare current file information to the information in a report you will run after the upgrade so that you can verify that all files are transferred to the new media.

   For more information and procedures, refer to the *Running Data Manager Reports* chapter of the *ASM Data Manager System Guide*.

4. Add the new media to Data Manager.

   This is done via the following steps:

   - Add the new device to ASM MediaStor, or add the new media service to Data Manager, as appropriate.
   - Add the media to the device, or create the media (if you are transitioning to Tivoli Storage Manager, EMC Centera, or Network Attached Storage media).
   - Allocate the media to the same Data Manager extended drive(s) as the media from which you are upgrading.

   For more information and procedures, refer to the *Setting Up Media Services* chapter of the *ASM Data Manager Getting Started Guide*.

5. **Add the new media to the same media folder(s) as the media you are upgrading.**

6. **Create new move groups containing the new media.**

   What steps 5 and 6 do is prepare the new media to receive both new files written to the media folder and files written to the media folder via

compaction of the old media. For more information, refer to the *Setting Up File Migration* chapter of the *ASM Data Manager Getting Started Guide.*

7. **Set your purge start watermark to a lower level (Extended Drive Properties, on the Options tab).**

   Setting the purge start watermark to a percentage lower than you typically would helps maintain enough extended drive space during the compaction. When this watermark is reached, Data Manager automatically begins purging files from the extended drive until the purge stop watermark is reached. If you choose to purge all files as soon as they are migrated to media (by enabling the purge after move option in your move rules), this setting change will probably not be necessary, but making the change helps ensure that adequate free space is maintained. For more information, refer to the *Managing the Extended Drive* chapter of the *ASM Data Manager System Guide*.

8. **Enable the Force moves when nothing to purge option (Extended Drive Properties, on the Options tab).**

   Remember that Data Manager does not purge files from the extended drive until they have been moved to media. After being moved, files qualifying for configured purge rules are written to the purge list. If the extended drive gets filled to the purge start watermark but there are not enough files on the purge list to free up the space needed to get to the purge stop watermark, Data Manager needs to move files to media to make them eligible for purge. Enabling this option forces Data Manager to migrate files so it can then purge them to create needed free extended drive space. For more information, refer to the *Managing the Extended Drive* chapter of the *ASM Data Manager System Guide*.

9. **Configure the Warn when free space gets low option (Extended Drive Properties, on the Options tab).**

   Enabling this option tells Data Manager to send a warning when the amount of free space on the extended drive gets to a configured point. If you properly set up your system for the transition of files from the old to the new media, you should not receive this warning. However, enabling the warning allows you to intervene and make sure files are being purged so that the media compaction and file transfer can continue without interruption. For more information, refer to the *Managing the Extended Drive* chapter of the *ASM Data Manager System Guide*.

■ Upgrading ASM Media

When you are ready to begin the transition of your files from the old media to the new, you need to make some changes to several other Data Manager functions and settings in order to tell Data Manager to start writing files to the

new media, and to tell Data Manager when you want the files moved from the old media to the new.

Be advised that the aggressiveness of your transition schedule dictates exactly what settings to use for some options. For example, if your goal is to have the files transitioned over a weekend, you should set the Move files to media and the Process scheduled media tasks schedules to run 24/7 over the weekend. This allows the assigned compact tasks and the movement of the compacted files to the new media to take place continuously over the time allotted for the transition. If your goal is to transition the files incrementally over a period of several days or weeks, you can set these schedules to run only in the evenings (or during other periods of low system use).

In addition, you may want to restrict user access to purged files during the transition period in order to limit the mounting of media to completion of the compaction tasks. You can restrict user access to purged files by setting the Allow fetches from media schedule to be *inactive* during the time of media transition.

Use the following steps to begin the transition of your ASM Data Manager files from one media type to another.

Note: You should perform the steps below *only after* completing the steps listed in “Before You Transition Your Media” on page 68.

To upgrade ASM media from one type to another:

1. Disable the meta-data export and drive scan schedules for the time period during which you are performing the upgrade.

   This limits the amount of additional system activity during the upgrade, and is particularly important if you have planned an aggressive transition (all at once over a short period of time). However, even if you are running an incremental transition, be sure that your meta-data export and drive scan schedules are not set to run at the time(s) during which you schedule the compact media tasks and the Move files to media schedule. For more information, refer to the *Data Manager Backup and Recovery* chapter of the *ASM Data Manager System Guide* and the *Setting up File Migration* chapter of the *ASM Data Manager Getting Started Guide*.

2. Set the Process scheduled media tasks schedule to be active for the time period during which you want to have the old media compacted.

   If you are running an aggressive transition, be sure that you set this schedule for a period of time long enough to complete compaction of all of your old media. If you are running an incremental transition, you should set this schedule to run all evening (or during an extended period of low system usage). The media activity scheduler is accessed by clicking Schedule on the Settings tab of the Extended Drive Properties dialog box. For more information, refer to the *Managing Storage Media* chapter of the *ASM Data Manager System Guide*.

Note: This step is only necessary if you are planning to run the compact media task on a scheduled basis (as opposed to ASAP).

3. **Set the Move files to media schedule to be active for the time period during which the compaction will take place.**

   This allows files to be migrated to the new media type as they are compacted back to the extended drive. Writing the files back to the extended drive does not change any of the basic qualities of the file. This means that since the file already qualified for movement (when it was originally moved to the old media), it should qualify for movement again immediately upon being written back to the extended drive.

   If you have set the compact tasks for the old media to run on a scheduled basis, you should schedule this activity for the same time period as the Process scheduled media tasks schedule (see previous step). If you are running the compact tasks ASAP, set this schedule to be active before assigning the compact task to the media.

   For more information on configuring the Move files to media schedule, refer to the *Setting up File Migration* chapter of the *ASM Data Manager Getting Started Guide*.

4. If desired, set the Allow fetches from media schedule to be *inactive* for the time period during which the compaction will take place.

   This tells Data Manager to refuse user requests for purged files, allowing library resources to be used exclusively for the compaction of the old media. Users will be able to access files whose data is still resident on the extended drive. If you choose to do this, you may want to prefetch any purged files you think will be needed by users.

   For more information on configuring the Allow fetches from media schedule, refer to the *Managing Storage Media* chapter of the *ASM Data Manager System Guide*. For more information on prefetching files, refer to the *Managing File Migration* chapter of the *ASM Data Manager System Guide*.

5. **Point your existing move rules to the new move groups (those containing the new media created in step 6 of the previous section).**

   You can change the move group that a move rule points to using the Settings tab of the Move Rule Properties dialog box. Be sure to change the move groups for *all* of the move rules currently pointing to the old media move groups. This ensures that the new files written to the extended drive are written to the new media, not the old.

   For detailed instructions, refer to the *Managing File Migration* chapter of the *ASM Data Manager System Guide*.

6. If necessary, change your move rules to be sure that no age delay is set (enable the Move files of any age option on the Age page of the Move Rule Properties).

   If an age delay is configured for a move rule, a drive scan is required to write those qualifying files to the move list, and therefore to move them to media. Remember that step 1 of this section instructed you to disable drive scans for the transition period to keep unnecessary system resources from being used.

   If your move rules have *no* age delay, files that qualify for movement are written to the move list as soon as they are written to the extended drive (either by compaction or by users saving files to the drive). Since files being compacted back from the media will likely qualify for move immediately, they can be written to the move list and then migrated to the new media when the Move files to media schedule is active, which should be for the duration of the compaction.

   If this change is necessary for your move rule(s), you may change this setting back to its original configuration after the transition of files from the old media is complete.

   For detailed instructions on configuring move rules, refer to the *Managing File Migration* chapter of the *ASM Data Manager System Guide*.

7. **Configure a purge option to maintain extended drive space.**

   You have the following choices:

   - If the only criteria you need for purging files is that they have been moved to media, enable the Purge files immediately after move option on the Settings tab of the Move Rule Properties dialog box. This is the optimal configuration if you are running an aggressive transition. With this option enabled, files are purged as soon as they are moved to the new media.
   - If you want to purge files based on other criteria, such as the age or size of the file, configure purge rules. Files are then purged when disk space is needed (when the purge start watermark is reached). Remember that drive scans were disabled in Step 1 of this section, so the Purge during extended drive scan option (located on the Settings page of the Purge Rule Properties), even if selected, will not apply.

   For more information on move rule or purge rule settings, refer to the *Managing the Extended Drive* chapter of the *ASM Data Manager System Guide*.

8. Force a drive scan (right-click the extended drive in the tree view, and select Force Drive Scan from the shortcut menu).

   Since you disabled drive scans in Step 1 of this section, forcing a drive scan at this point makes sure that all files currently awaiting move and

purge are written to the move and purge lists, respectively, and moved out to media when appropriate.

9. **Remove the old media type you are replacing from its move group(s).**

   You can do this through the Media tab in the Move Group Properties (select the media in the list and click Remove) or by assigning the remove from move group media task before assigning the compact media task. If you choose to remove the media through the Move Group Properties, you can delete the move group once it's empty (as it is no longer needed). For more information, refer to the *Managing File Migration* chapter of the *ASM Data Manager System Guide*.

10. **Assign the compact media task to all pieces of media from which you want to transition files.**

    Be sure to determine ahead of time whether you want the media compaction to take place as a scheduled event (when the Process scheduled media tasks schedule is active) or ASAP, and select the appropriate option when assigning the task. For more information, refer to the *Managing Storage Media* chapter of the *ASM Data Manager System Guide*.

Once the compaction is finished, the compacted media is removed from the media folder. Since the media is no longer being used, you may decide to reformat the media (if applicable to the media type) or remove it from the Data Manager system and archive it, in the event it is ever needed to restore a file.

Note: Be sure to verify the success of the file transition ***before*** reformatting or removing the old media from the system.

Verifying the Upgrade and Resetting the ASM System

After the compact task is finished for the selected media and the upgrade is complete, you should follow the steps below to verify that the upgrade was successful and to return your ASM Data Manager system to normal operations.

To verify the upgrade and return the system to normal operations:

1. Run a Media Files Report on all pieces of new media to which the files should have been moved. For instructions, refer to the *Running Data Manager Reports* chapter of the *ASM Data Manager System Guide*.
2. Compare the information in the new report to the information in the Media Files Report you ran before the upgrade, to verify that the file transition was successful.

3. After verifying the success of the file transition, and if applicable, reset the following file migration controls to their original or desired configuration:

   - Move rules
   - Purge rules
   - Purge watermarks
   - Drive scan schedule
   - Media activity schedules
   - Meta-data export schedule

4. If appropriate, reformat and/or remove the old media from your Data Manager system.

   Note: Do not reformat the old media or remove it from the extended drive until you are completely satisfied that the transition of files was successful.

   To reformat the media, assign the format task to the media. For more information on the format task, refer to the *Managing Storage Media* chapter of the *ASM Data Manager System Guide*.

   To remove the media from the Data Manager system entirely, deallocate the media from the extended drive. Depending on the type of media, you may also want to remove the media from the media service and/or remove the media service. For instructions, refer to the *Managing Storage Media* chapter of the *ASM Data Manager System Guide*.

   As always, if you think there may have been problems with the media upgrade, or you do not think that the transition of files to the new media was complete, please contact your technical support representative.

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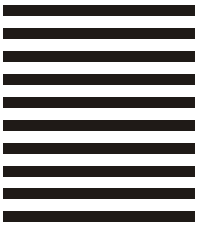

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