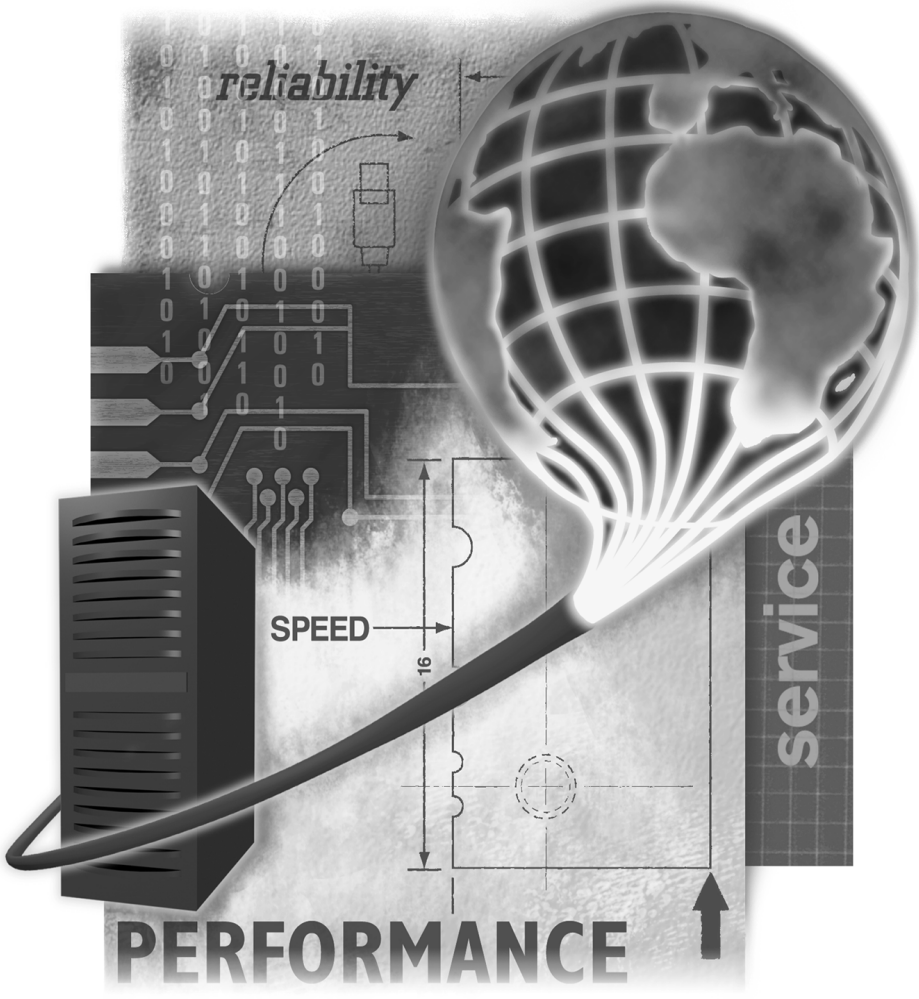
ServerMagic™ 4.0

for Windows NT®



User Guide

ServerMagic 4.0 for Windows NT
User Guide

ServerMagic by PowerQuest

Manual Edition 1—October 2000

PowerQuest Corporation
P.O. Box 1911 • Orem, Utah 84059-1911 • U.S.A.

PowerQuest® Server License Agreement

IMPORTANT: Read this before using your copy of PowerQuest software.

This document is a legal agreement between you (an individual or business) and PowerQuest Corporation (PowerQuest). Use of the software indicates your acceptance of these terms. As used in this License Agreement, the term "Software" means the software included on the CD or disk media provided with this License Agreement. The term "Software" does not include any software that is covered by a separate license offered or granted by a person other than PowerQuest.

IF YOU DO NOT AGREE TO THESE TERMS AND CONDITIONS, EITHER DESTROY OR RETURN, INTACT, THE SOFTWARE PACKAGE, CONTAINING THE CD OR DISK MEDIA, TOGETHER WITH THE OTHER COMPONENTS OF THE PRODUCT TO THE PLACE OF PURCHASE FOR A REFUND OF THE PURCHASE PRICE.

1. **PROPRIETARY RIGHTS.** The Software and any accompanying documentation are the proprietary products of PowerQuest or its licensors and are protected under national laws and international treaty provisions. Ownership of the Software and all copies, modifications, translations, and merged portions thereof shall at all times remain with PowerQuest or its licensors.

2. **GRANT OF LICENSE.** The Software and accompanying documentation are being licensed to you, which means you have the right to use the Software only in accordance with this License Agreement. The Software is considered in use on a computer when it is loaded into temporary memory or installed into permanent memory. This License may not be assigned or otherwise transferred without prior written consent from PowerQuest, and any unauthorized transfer is null and void.

PERSONAL LICENSE. This license is personal to you. You may not sublicense, lease, sell, or otherwise transfer the Software or any of the accompanying documentation to any other person. You may use the Software only for your own personal use if you are an individual, or for your own internal business purposes if you are a business. If you are a service bureau, integrator, value added reseller, or other type of service provider and wish to use this software on your clients' computers, you must purchase a Configuration License.

SERVER-SPECIFIC LICENSE. Each permitted copy of the Software may be used only in connection with one network server owned or leased by you. Once a copy of the Software has been used on a server, it may not be used on any other server. If the Software is made available on a network, it may be accessed only by ONE specific computer. Once the Software has been accessed by ONE specific computer it may not be used on any additional computers without purchasing additional licenses.

NUMBER OF COPIES LICENSED. You are authorized to use ONLY a single copy of the Software on the number of servers for which you have purchased a license as indicated on the accompanying license certificate. All copies of the Software must include the copyright, trademark, and patent notices.

BACKUP COPY. In addition to any copies authorized under this license agreement, you may make a single copy of the Software solely for backup purposes.

UPDATES, UPGRADES AND SUPPORT. You are entitled to receive complimentary technical support as outlined in the Software documentation. You are entitled to receive Software updates (updates are indicated by version number changes to the right side of the decimal) in accordance with PowerQuest policies as announced from time to time on terms comparable to those offered to other users of the Software under the server licenses.

TERM. This license is effective from your date of purchase and shall remain in force until terminated. You may terminate the license and this License Agreement at any time by destroying the Software and the accompanying documentation, together with all copies in any form.

3. **NONPERMITTED USES.** Without the express prior written permission of PowerQuest, you may not (a) use, copy, modify, alter or transfer, electronically or otherwise, the Software or documentation except as expressly permitted in this License Agreement, or (b) translate, reverse program, disassemble, decompile, or otherwise reverse engineer the Software.

4. **EXPORT CONTROLS.** Certain uses of the Software by you may be subject to restrictions under U.S. regulations relating to exports and ultimate end uses of computer software. You agree to fully comply with all applicable U.S. laws and regulations, including but not limited to the Export Administration Act of 1979 as amended from time to time and any regulations promulgated thereunder.

5. **U.S. GOVERNMENT RESTRICTED RIGHTS.** If you are acquiring the Software on behalf of any unit or agency of the United States Government, the following provision applies: It is acknowledged that the Software and the documentation were developed at private expense and that no part is in the public domain and that the Software and documentation are provided with RESTRICTED RIGHTS. Use, duplication, or disclosure by the Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013 or subparagraphs (c)(1) and (2)

of the Commercial Computer Software-Restricted Rights at 48 CFR 52.227-19, as applicable. Contractor/Manufacturer is PowerQuest Corporation/P.O. Box 1911/Orem, UT 84059-1911/U.S.A.

6. **LIMITED WARRANTY.** (a) PowerQuest warrants to you, the original end user, (i) that the Software, other than third-party software, will perform substantially in accordance with the accompanying documentation and (ii) that the Software is properly recorded on the disk media. This Limited Warranty extends for ninety (90) days from the date of purchase. PowerQuest does not warrant any third-party software that is provided with the Software, but PowerQuest agrees to pass on to you any warranties of the owner or licensor to the extent permitted by the owner or licensor. (b) This Limited Warranty does not apply to any Software that has been altered, damaged, abused, mis-applied, or used other than in accordance with this license and any instructions included on the Software and the accompanying documentation. (c) PowerQuest's entire liability and your exclusive remedy under this Limited Warranty shall be the repair or replacement of any Software that fails to conform to this Limited Warranty or, at PowerQuest's option, return of the price paid for the Software. PowerQuest shall have no liability under this Limited Warranty unless the Software is returned to PowerQuest or its authorized representative, with a copy of your receipt, within the warranty period. Any replacement Software will be warranted for the remainder of the original warranty period or 30 days, whichever is longer. (d) THIS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES NOT EXPRESSLY SET FORTH HEREIN, WHETHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, OR WARRANTIES ARISING FROM USAGE OF TRADE OR COURSE OF DEALING. (e) THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS; YOU MAY HAVE OTHERS WHICH VARY FROM STATE TO STATE. (f) Your failure to return the enclosed registration card or complete the electronic registration included with the Software may result in PowerQuest's inability to provide you with updates to the Software, and you assume the entire risk of performance and result in such an event.

7. **LIMITATION OF LIABILITY.** IN NO EVENT SHALL POWERQUEST'S LIABILITY RELATED TO ANY OF THE SOFTWARE EXCEED THE LICENSE FEES ACTUALLY PAID BY YOU FOR THE SOFTWARE. EXCEPT FOR A RETURN OF THE PURCHASE PRICE UNDER THE CIRCUMSTANCES PROVIDED UNDER THE LIMITED WARRANTY, NEITHER POWERQUEST NOR ITS SUPPLIERS SHALL IN ANY EVENT BE LIABLE FOR ANY DAMAGES WHATSOEVER ARISING OUT OF OR RELATED TO THE USE OF OR INABILITY TO USE THE SOFTWARE, INCLUDING BUT NOT LIMITED TO DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, AND DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR OTHER PECUNIARY LOSS, EVEN IF POWERQUEST CORPORATION HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, WHETHER SUCH LIABILITY IS BASED ON CONTRACT, TORT, WARRANTY, OR ANY OTHER LEGAL OR EQUITABLE GROUNDS. BECAUSE SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

8. **NO WAIVER.** Any failure by either party to this agreement to enforce a specific part of the agreement in a specific situation is not a waiver of rights under the agreement. The party may still enforce the rest of the agreement in that situation and may still enforce some or all of the agreement in other situations.

9. This License Agreement constitutes the entire agreement between you and PowerQuest pertaining to its subject matter. This License Agreement is governed by the laws of the State of Utah. Any litigation arising from this license will be pursued only in the state or federal courts located in the State of Utah. Even if part of the agreement is held invalid, the rest of the agreement is still valid, binding and enforceable.

Should you have any questions concerning this Agreement, or if you desire to contact PowerQuest Corporation for any reason, please write: PowerQuest Corporation/P.O. Box 1911/Orem, UT 84059-1911/U.S.A.

Table of Contents

Chapter 3: Completing Disk Operations

Chapter 4: Completing Advanced Disk Operations

Chapter 5: Managing Volume Sets

Chapter 6: Converting Partitions

Appendix B: Troubleshooting

Appendix C: PowerQuest Technical Support

Index

About This Guide

This user guide can help you set up and use PowerQuest® ServerMagic™.

The ServerMagic CD includes a searchable PDF version of this manual in the English/Docs folder. The filename is SM4_NT.PDF. PowerQuest recommends that you have Adobe® Acrobat® version 4.0 or later for best viewing quality. You can download the current version of Acrobat for free from the Adobe web site, *www.adobe.com*. In the PDF version of this manual, you can click cross-references (including page numbers in the table of contents and index) to jump to the relevant material. You can also click references to web sites to start your browser and go to the web site. The hand pointer in Acrobat changes to a pointing finger when it is located over text that is linked to other material.

The user guide consists of the following sections:

- The **Introduction** provides an overview of ServerMagic and includes a list of features that are new for version 4.0.
- **Chapter 1: Getting Started** includes system requirements, step-by-step instructions for installing and starting ServerMagic, and information for system administrators.
- **Chapter 2: ServerMagic Basics** includes a description of the main window, an overview of the process you use for making changes with ServerMagic, and steps for tasks that are common to all ServerMagic operations.
- **Chapter 3: Completing Disk Operations** provides information about and step-by-step instructions on using the Operations menu options, such as Resize/Move, Create, and Format.
- **Chapter 4: Completing Advanced Operations** explains how to use advanced partitioning operations, such as setting an active partition and resizing clusters.
- **Chapter 5: Managing Volumes** explains features that make it easier for you to move, copy, or change volumes on your server.
- **Chapter 6: Converting Partitions** provides step-by-step instructions on converting from one file system to another, for example, converting FAT to FAT32.
- **Chapter 7: Automating Tasks** explains the wizards you can use to perform some common tasks and includes an overview of ServerMagic scripting.
- **Chapter 8: Remote Agent** explains how you can perform ServerMagic operations across the wire to a remote server.
- **Chapter 9: Creating a New Boot Drive** explains how to use ServerMagic when you replace a disk on your server or add another disk to your server.

- **Appendix A: Using ServerMagic with Other Programs** provides information about using ServerMagic with programs such as operating system boot utilities and virus protection software.
- **Appendix B: Troubleshooting** provides answers to problems you may encounter while using ServerMagic and describes error messages and their solutions.
- **Appendix C: PowerQuest Technical Support** provides information on various technical support options.
- The **Index** helps you locate topics discussed in the user guide.

Introduction

What Is ServerMagic?

With ServerMagic™, you can quickly and easily create partitions on your hard disks for storing valuable information such as data files, applications, and operating systems. Storing information in separate partitions helps you organize and protect your data and reclaim wasted disk space.

ServerMagic enables you to secure your data by physically separating it from other files. Separate partitions also make backups easy.

In addition to powerful partitioning features, ServerMagic offers a variety of other options. For instance, you can perform partitioning operations and view the changes that will be made before applying them to your system. Additionally, you can view comprehensive information about your hard disk geometry and your hardware system, and you can resize root directories to make room for more long filenames.

New Features

PowerQuest ServerMagic 4.0 for Windows NT® includes the following new features:

- Volume-level operations
- Across-the-wire support for performing some operations on a remote server
- Ability to undelete partitions

- Ability to merge FAT and FAT32 partitions
- Ability to split partitions
- Improved interface: Explorer-like tree view of the disks and volumes on your server, ability to display “maps” of multiple disks, color key to indicate file system type, indicators for the 2 GB boot boundary and 1024 cylinder boundary, used and unused space indicators within partitions
- More options for converting file systems for a partition: NTFS to FAT, NTFS to FAT32, primary to logical, and logical to primary
- Wizards for common tasks: create new partition, merge partitions, redistribute free space, resize partitions, and copy partitions.
- Ability to view and modify a list of pending operations
- Added automatic error-fixing
- Improved user-interface for scripting

Getting Started

This chapter includes the following information:

- ServerMagic System Requirements
- Installing ServerMagic on a Windows NT Server
- Creating ServerMagic Rescue Disks
- Before Running ServerMagic
- Running ServerMagic
- Setting a Password for ServerMagic
- Uninstalling ServerMagic

ServerMagic System Requirements

	ServerMagic for Windows	ServerMagic rescue disks
Processor	Intel 486 DX or above (33 MHz)	Intel 486 DX or above (33 MHz)
RAM	32 MB minimum supported*	32 MB*
Hard-disk space	54 MB	1.4 MB (if installing to hard disk instead of running from floppy disks)
Operating system	Windows NT 4.0 Server with SP4 applied	MS-DOS 6.2 or compatible DOS (Caldera DOS is included on the rescue disks.)
3.5-inch diskette drive	High-density	High-density
CD-ROM drive	4 x	None
Monitor	VGA-compatible	VGA-compatible

* More memory may be required to manipulate FAT32 and NTFS partitions on hard disks larger than 4 GB.

To run under Windows® 2000 Server, ServerMagic requires: Pentium-compatible 133 MHz or faster processor, 128 MB RAM, 54 MB hard drive space, a high-density 3.5-inch diskette drive, a CD-ROM or DVD-ROM drive, and a VGA-compatible monitor.

Installing ServerMagic on a Windows NT Server

IMPORTANT! ServerMagic must be installed on a local drive, not on a network drive.

1. Insert the ServerMagic CD into your CD-ROM drive.
2. If the installation program does not start automatically, click **Start ➤ Run** on the Windows taskbar.
3. Type `drive:\AUTORUN`, where `drive` is the drive letter of your CD-ROM drive.
4. Click **Install**, and follow the on-screen installation instructions.

Creating ServerMagic Rescue Disks

You can create rescue disks to run ServerMagic from if your operating system fails or your computer becomes unbootable. See "Running ServerMagic from Rescue Disks" on page 20 for information about how the rescue disks vary from the Windows NT executable.

You must have two blank 1.44 MB floppy disks available before you begin this procedure (three disks for double-byte languages).

1. You can create rescue disks three ways:

To create rescue disks from:	Do this:
ServerMagic CD	Open the DOS-OS2 folder on the ServerMagic CD. Type `MAKEDISK A:`, where A: is the drive letter for your floppy disk drive.
ServerMagic main window	Click **Tools ➤ Create Rescue Disks** on the menu bar.
Windows	Click **Start ➤ Programs ➤ PowerQuest ServerMagic 4.0 ➤ Create Rescue Disks**.

2. Insert a blank formatted 1.44 MB disk into your 3.5-inch disk drive and click **OK**.

3. Follow the prompts and the instructions on the progress bar (located at the bottom of the window).

The rescue disks contain the following files:

ServerMagic 4.0 Disk 1	ServerMagic 4.0 Disk 2
• Partinfo.exe (utility program) • PTEDIT (utility program) • Keyb.com • Mode.com • Miscellaneous system files	• Mouse.com • SMHelp.dat (help file) • SMagic.exe • SMagic.ovl • SMagic.pqg • PQPB.rtc • Rescue.txt

If you create rescue disks for a double-byte language, the third disk includes fonts.

If you run out of space on the first rescue disk as a result of adding network, SCSI, or CD-ROM drivers to your boot sequence, you can delete the following files from the disk: chkdsk.com, fdisk.exe, ptedit.exe, and partinfo.exe. We recommend that you delete the files in that order, freeing up only the space that you need to accommodate additional files. These files are included in the Utilities folder on the ServerMagic CD where you can access them later, if necessary.

If you use an international keyboard or character set, you will need to modify the AUTOEXE2.BAT and CONFIG.SYS files on the rescue disks. Refer to "Using International Keyboards" on page 38 for additional information.

Before Running ServerMagic

Before the start of a ServerMagic session, you should always complete the following items:

- **Apply the most recent Windows NT/2000 service pack**

  Make sure you have applied the most recent service pack when running either Windows NT or Windows 2000.

- **Back up your hard disk**

  You should back up your hard disk before using ServerMagic. While ServerMagic has been thoroughly tested to be safe and reliable, other factors, (such as power failures, operating system bugs, and hardware defects), can put your data at risk. Before using *any* utility that makes extensive changes to your hard disk, you should back up your data.

- **Back up BOOT.INI**

  Before you modify the hard disk that contains the boot partition, back up the BOOT.INI file. If the disk contains the boot partition, the BOOT.INI file may be changed.

- **Shut down all applications**

  You should not run ServerMagic with other applications, including virus scanners and server-based computing tools.

- **Run Check for Errors option regularly**

  Before you manipulate any partitions or volume sets, you should always click **Operations ➤ Check for Errors**. Although ServerMagic checks partitions and volume sets for errors and can repair minor problems, more serious errors cause ServerMagic to abruptly end an operation.

Check for Errors can find and fix most common errors you will encounter. The Check for Errors option is dimmed (unavailable) on the Windows NT boot partition because there are always open files. For this partition, click **Operations ➤ Windows CheckDisk**. If errors are found, run CHKDSK /F from a command prompt to fix them before running ServerMagic.

- **Take the server offline**

  Having connected clients to the server increases the likelihood that ServerMagic will have to reboot the computer to perform an operation. You may want to consider scheduling ServerMagic sessions for off hours and notify clients that the system will be unavailable during that time.

  Or, if you must make changes during regular business hours and there are users connected to the server, ServerMagic will give you the option to disconnect all users from the server.

- **Create a Windows NT boot disk**

  The boot disk lets you boot Windows NT if your BOOT.INI file becomes corrupt. For information about creating a boot disk, refer to the Microsoft Knowledge Base on the Internet, article Q119467, "Creating a Boot Disk for an NTFS or FAT partition."

- **Connect to a UPS (Uninterruptible Power Supply)**

  ServerMagic will not be able to recover if a power failure occurs during repartitioning. By having the server and all connected hard drives protected by UPSs, you can avoid the problems caused by power failures.

Running ServerMagic

IMPORTANT! ServerMagic must be run from a local drive, not from a network drive.

1 Click **Start ➤ Programs ➤ PowerQuest ServerMagic 4.0 ➤ ServerMagic 4.0.**

If you attempt to run ServerMagic on a Windows 2000 machine where the boot partition (the partition where Windows 2000 is installed) is on a dynamic disk, you will receive the following error message: “Init failed: Error 183. Unable to identify the Windows partition.” To remedy this problem, you must place the boot partition on a basic disk.

Running ServerMagic from Rescue Disks

Create Rescue Disks is a wizard that helps you create diskettes you can use to boot your computer and run ServerMagic for DOS (SMAGIC.EXE). Rescue disks are useful when:

- You have hidden the partition where ServerMagic is installed and need to run ServerMagic to unhide the partition.
- You have accidently converted a partition to FAT32 and your operating system does not support FAT32, so your computer will not boot. (You can use the rescue disks to convert the partition back to FAT.)
- Other occasions arise when you do not have access to ServerMagic on the CD or hard drive.

When you boot your computer from the first rescue disk, SMAGIC automatically runs. You must insert the second rescue disk when prompted. The main screen appears different when you run ServerMagic from rescue disks than it does when you run ServerMagic from Windows. See “Rescue Disk Main Window” on page 29.

If you run ServerMagic from the rescue disks, you will not have access to the following features:

- Volume management (Volume Set view)
- Remote Agent (across the wire)
- Split partitions
- Shred partitions
- Undelete partitions
- Undo last change
- Wizards

Before you run ServerMagic from DOS, you should:

- Turn off third-party disk caches.
- Deactivate/unload any TSR programs that access or modify partitions being changed.

Do not run ServerMagic from a compressed drive.

You cannot run ServerMagic on a Windows 2000 Server that is in hibernation. To use the rescue diskette, Windows 2000 must have been shut down normally.

Checking an NTFS partition with the DOS version of ServerMagic may take an unusually long time. Since ServerMagic performs checks both before and after the move, copy, and resize operations, these operations may be slower with the DOS version of ServerMagic than with the Windows version.

IMPORTANT! The number of computers on which you can run the DOS-based version of ServerMagic is specified in your ServerMagic license agreement. Refer to your license agreement before using a rescue diskette.

Running a Script from the Rescue Disks

You can modify the rescue disks to run ServerMagic with a script file automatically.

1. Open the AUTOEXEC.BAT file on **ServerMagic 4.0 Disk 1**.
2. Edit the line that includes SMAGIC as follows, where SCRIPT.TXT is the name of the script file you want to execute:

   ```
   SMAGIC /CMD=SCRIPT.TXT
   ```

   IMPORTANT! Do not include a hard return at the end of the line that includes the SMAGIC command. Do not make any other modifications to the AUTOEXEC.BAT file.
3. Save the AUTOEXEC.BAT file.
4. Copy the AUTOEXEC.BAT file to **ServerMagic 4.0 Disk 2**.

   The file must be identical on both disks, or ServerMagic will not function properly.

   When you boot from the first disk, ServerMagic will execute the script file you specified. See "Scripting" on page 102 or the ServerMagic help.

Running ServerMagic Inside Windows Explorer

1. From Windows, click **Start ➤ Programs ➤ Windows Explorer**.

   The Exploring window appears.
2. Right-click on any drive object.

   A quick menu appears.
3. Click **ServerMagic 4.0**.

   The program loads, and the ServerMagic main window appears.

Running ServerMagic from My Computer

This option lets you start ServerMagic from My Computer.

1. Double-click on the **My Computer** icon.

The My Computer menu appears.

2 Right-click on any drive object.

A quick menu appears.

3 Click **ServerMagic 4.0**.

The program loads, and the ServerMagic main window appears.

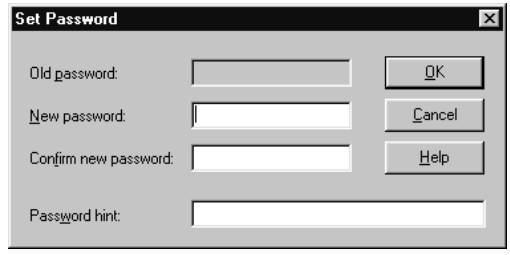
You can also right-click on the **My Computer** icon to access the quick menu.

Setting a Password for ServerMagic

You can assign a password that must be entered before ServerMagic will start.

1 Click **General ➤ Set Password**.

The **Set Password** dialog box appears.



2 Type a new password, then press <Tab>.

3 Confirm the new password, then press <Tab>.

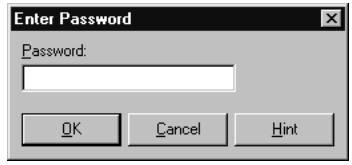
4 *(Optional)* Add a hint.

5 Click **OK**.

Each time you start ServerMagic, you will be prompted for a password before the program will run.

Entering a Password

When you start ServerMagic and there is a password assigned, the **Enter Password** dialog appears.



1. Type the password assigned to ServerMagic.

   You can click **Hint** to display a reminder. If you still cannot remember the password, refer to documentation for error 996 on page 138.

2. Click **OK**.

Changing a Password

1. Click **General ➤ Set Password**.
2. Type the old password, then press <Tab>.
3. Type the new password, then press <Tab>.
4. Confirm the new password, then press <Tab>.
5. *(Optional)* Change the hint.
6. Click **OK**.

Removing Password Protection

1. Click **General ➤ Set Password**.
2. Type the old password, and leave the remainder of the fields blank.
3. Click **OK**.

Uninstalling ServerMagic

1. On the Windows taskbar, click **Start ➤ Settings ➤ Control Panel**.
2. Double-click **Add/Remove Programs**.

3 Select **ServerMagic 4.0**.

4 Click **Add/Remove**.

CHAPTER 2

ServerMagic Basics

This chapter includes the following information:

- ServerMagic Main Window
- Rescue Disk Main Window
- Process Overview
- Selecting a Hard Disk
- Selecting a Volume Set
- Selecting an Operation
- Undoing an Operation
- Viewing Pending Operations
- Applying Changes to Your System
- Supported File Systems
- Changing ServerMagic Preferences
- Using International Keyboards
- Getting Help

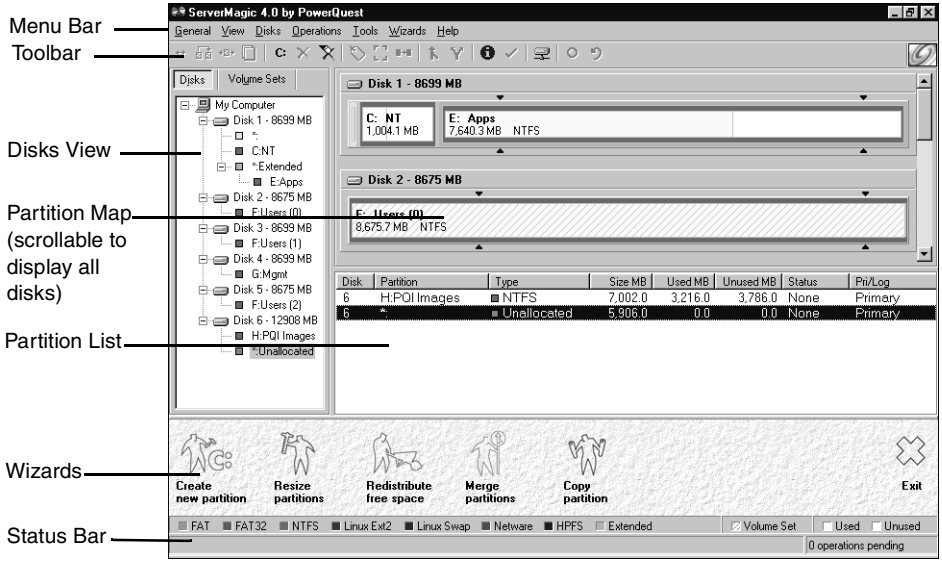
ServerMagic Main Window

The main window includes an Explorer-like tree view of the disks or volumes on your server, a map of each disk or volume, and a list of the partitions on the selected disk or volume. You control whether the screen displays disks or volumes by clicking the **Disks** or **Volume Sets** tab in the Explorer pane.

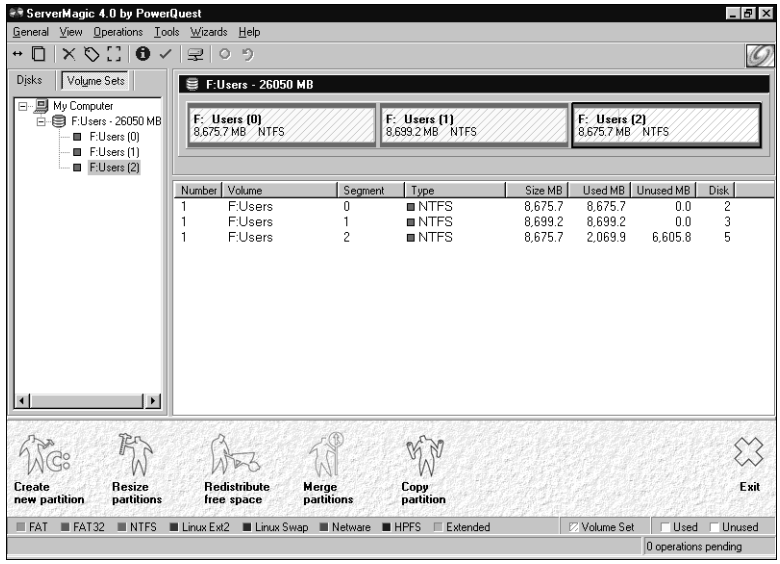
The menu bar and a toolbar appear at the top of the window. The menu bar gives you access to all of ServerMagic's features. When you choose a menu command, the status bar at the bottom of the screen shows what the command does. The toolbar gives you quick access to commonly used options. When the pointer is over a toolbar, the status bar shows what the button does.

Note that the main screen is different if you run ServerMagic from the rescue disks. See "Rescue Disk Main Window" on page 29.

Disk View



Volume View



Partition Information

The partition area displays information about the selected hard disk's partitions. It consists of two areas: the partition map, which displays information graphically; and the partition list, which displays partition information in text form.

Partition Map

The partition map shows the partitions approximately to scale. (You can also display disks by scale by clicking **View ➤ Scale Disk Map**.) Each partition is represented by a different color according to the file system it uses. If the selected hard disk contains logical partitions, the logical partitions are shown within an extended partition.

Each partition is color-coded to show the file system it uses and the used and unused space within the partition. Note that the operations you can perform on white (unformatted) or yellow (unknown) partitions are limited. A key at the bottom of the screen shows which file system each color represents.

The partition map also shows unallocated space (space not assigned to any partition).

There are triangle indicators to mark the 2 GB boot boundary and the 1024 cylinder limit. The boundary markers can help you as you create, move, or resize partitions, so you will not make primary partitions unbootable by accident. For additional information about the boot boundaries, refer to "Understanding the BIOS 1024 Cylinder Limit" or "Understanding the 2 GB Boot Code Boundary" in the ServerMagic online help.

Partition List

The partition list displays the following information about each partition: drive letter, volume label, file system type, size, amount of used and unused space, status, and whether the partition is a primary or logical partition.

Primary partition drive letters are flush left, followed by a colon and the volume name. Logical partition drive letters and volume labels are indented. An asterisk (*) appears in place of a drive letter for:

- Hidden partitions
- Extended partitions
- Partitions with file systems not supported by the active operating system
- Unallocated space

The partition size, used space, and unused space values are displayed in megabytes.

A partition's status can be:

- **Active:** The partition the computer boots from.
- **Hidden:** Under Windows NT, hidden partitions do not have a drive letter. Partitions can be hidden by the operating system (which may hide all primary partitions except the active one), or you can hide partitions with ServerMagic. Under Windows 2000, hidden partitions are allowed to have a drive letter.
- **None:** Partitions that are not active or hidden.

Wizards

To help you quickly and easily complete several common partitioning tasks, ServerMagic includes these wizards:

- Create new partition
- Redistribute free space
- Resize partitions
- Merge partitions
- Copy partition

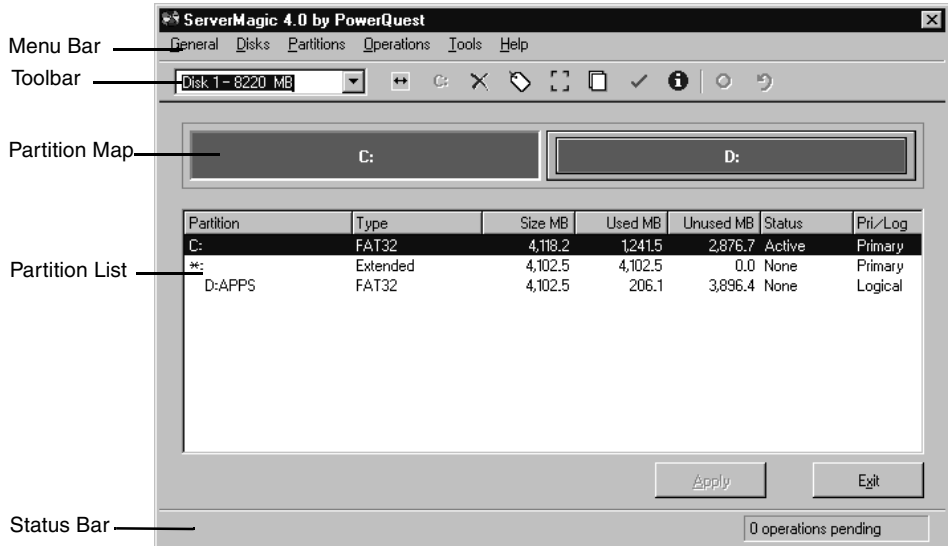
To start a wizard, click the wizard icon or choose a command on the **Wizards** menu. For more information about using the wizards, see “Wizard Overview” on page 100.

You do not have access to the wizards if you run ServerMagic from the rescue disks.

Rescue Disk Main Window

The main screen appears different when you run from rescue disks than it does when you run ServerMagic from Windows NT.

- **Menu bar** — gives you access to all of ServerMagic’s features.
- **Toolbar** — gives you quick access to commonly used options.
- **Partition information** — provides both a visual and text description of the partitions on the disk.
- **Status bar** — shows you how many operations are pending; also includes a brief description of the currently selected option.



Process Overview

To complete a task, follow this general process:

1. Select a hard disk and partition, or select a volume.
2. Select an operation and enter details about the changes you want to perform.
3. Apply changes to your system.

You can also perform some tasks using the wizards. Refer to "Automating Tasks" on page 99 for information about the wizards.

Note that the steps for selecting a hard disk and partition or a volume are included in this chapter of the user guide. You must follow these steps before you can perform any operation within ServerMagic.

Selecting a Hard Disk

Before you can select a disk, you must click the **Disks** tab in the tree view or click **View ➤ Disks**. There are three ways to select a hard disk:

- In the tree view on the left side of the main window, click the icon for the disk. If the tree view is not displayed, click **View ➤ Tree View**.
- On the disk map, click the title bar for the disk. You may need to scroll through the disk map area if you have several hard disks on your server.
- From the **Disks** menu, choose the disk you want.

When you select a disk, its partitions display in the partition list in the main window.

Using ServerMagic with Removable Media

ServerMagic is not designed to work on removable media. PowerQuest technical support does not guarantee they will be able to resolve problems you encounter when partitioning removable media.

Windows 2000 Disks

Windows 2000 uses basic disks and dynamic disks. You cannot perform ServerMagic operations on dynamic disks.

Selecting a Partition

Before you select a partition, click the **Disks** tab in the tree view. There are three ways to select a partition:

- In the tree view on the left side of the main window, click the partition. If the tree view is not displayed, click **View ➤ Tree View**.
- On the disk map, click the partition. You may need to scroll through the disk map area if you have several hard disks on your server.
- In the partition list, click the partition.

The selected partition is highlighted in all three locations.

If Remote Agent is running, you can select a partition on a remote server. See "Remote Agent" on page 103.

Selecting a Volume Set

Before you can select a volume set, you must click the **Volume Sets** tab in the tree view or click **View ➤ Volume Sets**. There are two ways to select a volume:

- In the tree view, click the volume.
- In the volume map, click the volume.

The segments for the selected volume display in the segment list.

The volume set must reside on a hard disk attached to a Windows NT 4.0 server. You cannot use ServerMagic to manipulate a volume set that was converted from Windows NT Server to Windows 2000 Server.

Selecting an Operation

After you have selected a partition or volume, you can select an operation using the toolbar, the context menu, the menu bar, or the keyboard. If an operation cannot be performed on the selected partition or volume, the operation appears dimmed on the menu.

- Click one of the operations buttons on the toolbar.

  When you place the pointer on a toolbar button, a pop-up window displays the button's function.

- In the partition map or partition list, right-click the partition or volume segment you want to change, then click the desired operation on the context menu.
- On the menu bar, click **Operations**, then choose the desired operation.
- Press **<Alt+O>**, then type the underlined letter of the desired operation.

For more information about the items on the **Operations** menu, see *Chapters 3 through 6* of this user guide.

Undoing an Operation

There are three ways to undo or reverse the last operation performed:

- Click  on the toolbar.
- Click **General ➤ Undo Last Change** on the menu bar.
- Press <Ctrl+Z>.

If you have performed an operation using a wizard, Undo Last will undo all the changes made by the wizard.

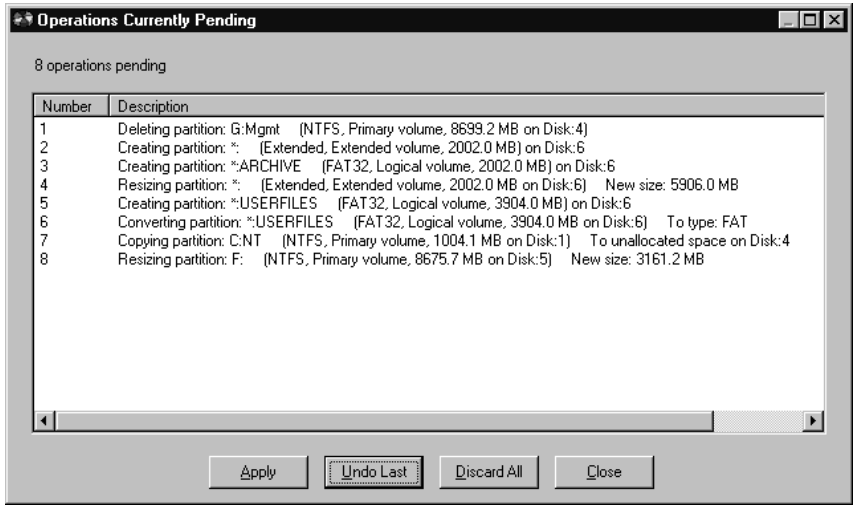
To discard all the changes performed and start over, click **General ➤ Discard all Changes**, or press <Ctrl+D>.

Viewing Pending Operations

ServerMagic queues operations until you apply them. You can view the operations that are pending at any time.

1. Click **Operations ➤ View Operations Pending**.

The **Operations Currently Pending** dialog appears.



From the list of pending operations, you can choose to undo the last change, discard all changes, apply all changes, or close the window.

If you are running ServerMagic from the rescue disks, you cannot modify pending operations from this window.

Applying Changes to Your System

As you complete tasks using the **Operations** menu, the partition map and partition list reflect the changes you have made. However, no changes physically take place on your system until you apply them. You can perform several operations and then apply all the changes at once.

You can tell when changes have been made but not yet applied to your system when the status box in the lower right corner of the main window indicates that operations are pending. If the wizard icons are displayed, the **Apply Changes** and **Undo Last** icons also display at the bottom of the window when there are operations pending.

To apply changes to your system, click **General ➤ Apply Changes**, or click  on the toolbar. If the wizard icons are displayed, you can also click the **Apply Changes** icon at the bottom of the window. If you have open files, ServerMagic may need to reboot your computer and apply the changes in boot mode.

You can click **Apply Changes ➤ Details** to view a list of the operations that will be applied.

To discard the changes and start over, click **General ➤ Discard All Changes**. With the exception of being able to undelete some partitions, you cannot discard or undo changes after you have applied them.

Forcing Users to Log Off

Before ServerMagic can apply any changes from within the ServerMagic program, it must have exclusive use of the system disk drives (no users logged on). If any users are connected to the server, ServerMagic will prompt you to do one of the following when applying changes:

- Click **Yes** to automatically disconnect remote users from the system, disable future logons, and apply changes. Several services are stopped. After applying the changes, ServerMagic restarts the stopped services and remote users are again allowed access to the server.

  The system administrator should notify users and allow them to log off before selecting **Yes**.

- Click **No** to stop the operation. ServerMagic will not apply changes or disconnect remote users.

- Click **Ignore** to apply changes without automatically disconnecting remote users. Under this condition, if ServerMagic cannot get control of the required drives or volumes, it will reboot your server to apply the changes in boot-mode.

Since Windows NT always has some open files, if you make changes to the partition containing the Windows NT operating system (or any partition which uses files from the Windows NT operating system) without logging off the users, you will need to reboot your system. However, if you make changes to a partition that does not share any Windows NT files, you do not need to log off remote users and your system will not need rebooting. For example, if you create a new partition in unallocated space, you do not need to log off the remote users before applying the change.

Administrative Shares

When you create, delete, move, format, merge, copy, or hide an NTFS or FAT partition, ServerMagic applies or deletes (depending on the function performed) administrative shares for the partition. This allows administrators remote access to the partition.

Supported File Systems

IMPORTANT! ServerMagic does not generally support stripe sets, stripe sets with parity, or partitions located on disk mirror/duplex sets configured using Windows NT Disk Administrator. However, you can resize partitions that are part of a mirrored/duplexed set. On Windows 2000, ServerMagic supports standard partitions located on basic disk sets only.

ServerMagic supports the following partition types.

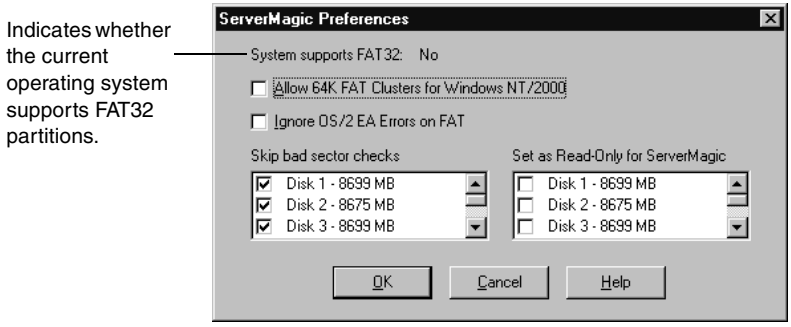
Partition Type	Description
Extended	The extended partition gets around the arbitrary four-partition limit for a disk. An extended partition is a container in which you can further divide your disk space by creating logical partitions. An extended partition does not directly hold data. You must create logical partitions within the extended partition to store data.
Extended-X	An extendedx partition functions like an extended partition but is not limited to the first 1024 cylinders on a drive. Linux kernels below 2.2 do not support Extended-X partitions.
FAT	Uses file allocation table (FAT) and clusters. The FAT file system is used by DOS, Windows 3.x, and most Windows 95 installations. A FAT partition is also accessible by Windows 98/Me/NT/2000 and by OS/2.
FAT16x	FAT16x is a proprietary file system developed by Microsoft to enable FAT partitions beyond 1024 cylinders (~8GB).
FAT32	FAT32 is an enhancement of the FAT file system. It uses 32-bit file allocation table entries, rather than the 16-bit entries used by the FAT system, so FAT32 supports larger disk or partition sizes (up to 2 terabytes). The minimum size for a FAT32 partition is 256 MB. A FAT32 partition is only accessible by Windows 95 OSR2 (version 4.00.950B), Windows 98/Me/2000. However, DOS, Windows 3.x, Windows NT 3.51/4.0, earlier versions of Windows 95, and OS/2 do not recognize FAT32 and cannot use files on a FAT32 partition.

Partition Type	Description
FAT32x	FAT32x is a proprietary file system developed by Microsoft to enable FAT32 partitions beyond 1024 cylinders (~8GB). Windows 95 OSR2, and Windows 98/Me/2000 may use FAT32x partitions.
HPFS	The High Performance File System (HPFS) is accessible only by OS/2, older versions of Windows NT (v. 3.51 and earlier), or versions of Windows NT that were upgraded from v. 3.51 or earlier.
HPFS/386	HPFS/386 is a file system used by OS/2 Advanced Server. The only difference from HPFS is that HPFS/386 uses Access Control Lists (ACLs), and HPFS does not. In both file systems, each file and directory structure is anchored on a structure called an fnode. In HPFS/386, each fnode has internal storage space for ACLs and Extended Attributes. If a file has more than 16 ACLs, they are stored outside of the fnode on disk, and the fnode has a pointer telling where to find the ACLs.
Linux Ext2	The Linux Ext2 file system is only accessible by Linux, a freeware version of UNIX. The Linux Ext2 file system supports a maximum partition size of 4 terabytes.
Linux Swap	Holds a Linux swap file. The maximum usable size of a Linux swap file is 2 GB. The default size shown when you create a Linux swap partition may be slightly larger because of the physical geometry on the hard disk.
NTFS	The NTFS (New Technology File System) is accessible only by Windows NT and Windows 2000. NTFS is not recommended for use on partitions less than 400 MB because it uses a great deal of space for system structures.
Unformatted	Unformatted partitions reserve a portion of the disk but are not assigned a file structure.
Unallocated space	Unallocated space is the portion of a hard disk that is not currently assigned to any partition.

Changing ServerMagic Preferences

1 In the main window, click **General ➤ Preferences**.

A check mark next to a preference indicates it is enabled.



2 Click checkboxes to enable or disable preferences, then click **OK**.

Allow 64K FAT Clusters for Windows NT/Windows 2000

This preference lets you create FAT partitions with 64 KB clusters, which allows you to use ServerMagic to create FAT partitions up to 4 GB.

IMPORTANT! Because DOS, Windows 3.x/95/98/Me do not support cluster sizes larger than 32K, you cannot access a 64K partition using these operating systems. You should only use 64K partitions with Windows NT and Windows 2000. If you are using multiple operating systems, PowerQuest recommends not using 64K clusters.

When enabled, the 64K cluster size is available in the **Resize/Move Partition** and **Resize Clusters** dialogs.

Ignore OS/2 EA Errors on FAT

This preference tells ServerMagic whether to ignore OS/2 Extended Attribute errors when it checks a FAT partition.

WARNING! If OS/2 is on your computer, do not enable this preference. Data loss could occur because problems might go undetected.

Skip Bad Sector Checks

When ServerMagic modifies partitions, it performs extensive testing to detect bad sectors on your hard disk. Newer disk types (such as Enhanced IDE and SCSI) often handle bad sectors internally, making such testing superfluous. For this reason, ServerMagic lets you bypass these tests with **Skip Bad Sector Checks**. When this preference is enabled, the Resize/Move, Create, Copy, and Format operations run faster.

WARNING! If you skip bad sector checks and your hard disk has bad sectors, data loss can result.

Bad sector checking is on by default. ServerMagic lets you set this preference individually for each of your hard disks. If your system has an older disk and a newer one, you could check the older disk and skip the newer one. A check mark next to a disk means to skip bad sector checking for that disk.

Set as Read-Only for ServerMagic

This preference lets you prevent ServerMagic from making any changes to a hard disk. You can set this preference individually for each of your hard disks.

If the disk contains the boot partition, some files may be changed, such as the Windows NT boot initialization (BOOT.INI) file.

Using International Keyboards

When you use the DOS version of ServerMagic (see "Running ServerMagic from Rescue Disks" on page 20), you may lose the ability to use your keyboard the way you are accustomed to or to view extended characters properly. The ServerMagic rescue disks include the files you need to resolve these problems.

If you use an international keyboard or character set, you must edit the AUTOEXE2.BAT and CONFIG.SYS files on the rescue disks.

1. The following lines are remarked in the AUTOEXE2.BAT file. Delete the `REM` from the beginning of the line, and replace the variables *xx* and *yyy* with the keyboard code and character set code page for your language.

   ```
   MODE CON CP PREP=((yyy)EGA.CPI)
   MODE CON CP SEL=yyy
   KEYB xx,yyy
   ```

   xx = two-letter keyboard code (for example, US or FR)

yyy = character set code page (for example, 437)

2 Save the AUTOEXE2.BAT file.

3 The following line is remarked in the CONFIG.SYS file. Delete the `REM` from the beginning of the line, and replace the variable *yyy* with the character set code page for your language.

```
DEVICE=DISPLAY.SYS CON=(EGA,yyy,)
```

4 Save the CONFIG.SYS file.

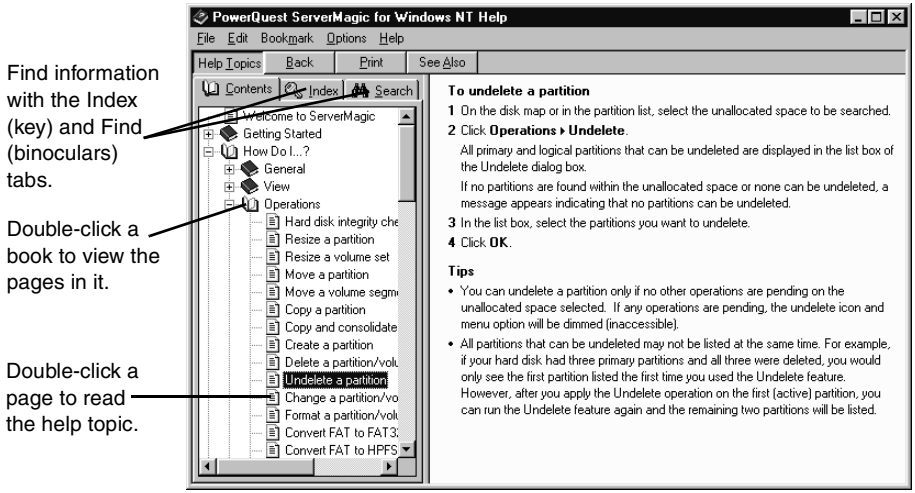
5 Reboot from the first rescue disk.

Getting Help

ServerMagic Help provides in-depth information on features as well as step-by-step instructions for specific tasks.

To access Help, click **Help ➤ Contents** on the menu bar in the ServerMagic main window.

The **PowerQuest ServerMagic Help** is organized into books and pages.



Each book focuses on a different aspect of ServerMagic, so you can quickly locate the information you need. When you double-click a topic, the information displays in the right window.

You can click the key tab to search for a topic using keywords.

Context-Sensitive Help

By clicking **Help** in the lower right corner of a dialog, you can open context-sensitive help for the dialog. Clicking **Hints** in a wizard dialog displays helpful information about the task the wizard is performing.

Readme File

The READMESM.TXT file includes information that changed since this guide was written, corrections to the manual or help system, and information specific to installation or configuration issues.

CHAPTER 3

Completing Disk Operations

This chapter includes the following information:

- Integrity Checks
- Resizing and Moving Partitions
- Creating Partitions
- Deleting Partitions
- Undeleting Partitions
- Changing Partition Labels
- Formatting Partitions
- Copying Partitions
- Checking Partitions for Errors
- Merging Partitions
- Splitting Partitions
- Getting Information About Partitions
- Scanning a Disk for Errors

IMPORTANT! Before you perform any operations in ServerMagic, you should be familiar with the material explained in "ServerMagic Basics," which begins on page 25.

Integrity Checks

ServerMagic checks disk integrity with a sophisticated system of analysis and validation that operates behind the scenes every time you start the program or complete an operation. An initial integrity check scans your disk and reports any partition problems that may prevent ServerMagic from operating properly. This integrity check acts as an early warning system that informs you of your disk's status and assures that the disk's structure is thoroughly analyzed and verified before you alter it.

If your physical disk passes the initial integrity check, you can select the disk's partitions and use ServerMagic's options; otherwise, an error message appears instead of the partition list. This indicates a problem with your disk, not with ServerMagic (because no disk modification operations have been initiated). If ServerMagic finds errors that it can fix automatically, you will be prompted. It is safe to allow ServerMagic to fix errors. Correct the disk problem, and then restart ServerMagic. For additional information, see "Resolving Partition Table Errors" on page 122.

In addition to the integrity check at startup time, ServerMagic performs two integrity checks during any operation. The first check tests the integrity of the file system in the partition before an operation begins (similar to CHKDSK), and the second check validates your disk's data after an operation is completed. From start to finish, ServerMagic examines your disk and informs you immediately if it detects any irregularities.

Resizing and Moving Partitions

The Resize/Move operation lets you change the size of a partition and/or move it to another location on a hard disk.

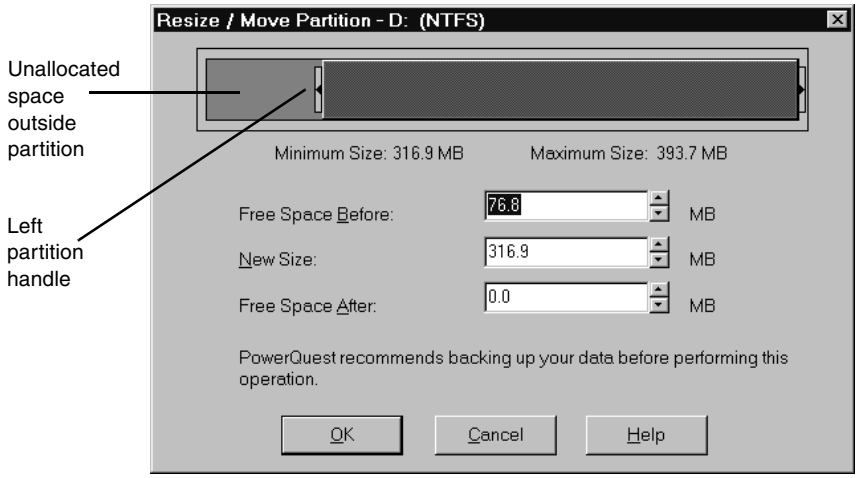
1. Select the partition you want to resize/move.

   You cannot move Windows NT volume or stripe sets with parity created by Disk Administrator.

   To move a volume segment, see "Moving Volume Segments" on page 85.

2. Click **Operations ➤ Resize/Move**.

The **Resize/Move Partition** dialog appears.



The current size of the partition is shown on a partition map at the top of the dialog. The map also depicts the used (dark gray) and unused (green) space within the partition and the unallocated space surrounding the partition (if any exists). The minimum and maximum sizes to which you can resize the partition appear below the map.

3 Choose whether to resize or move the partition.

To do this:	Do this:
Move	**1** Place the pointer on the partition. The pointer changes to  . **2** Drag the partition to the desired location. There must be unallocated space adjacent to the partition to move it. If there is none, and the partition contains unused space, make the partition smaller and then move the partition. You cannot move unknown partitions, partitions failing the Check for Errors operation, or unallocated space.

To do this:	Do this:
Move *(continued)*	Your Windows NT system partition cannot be moved past 4 GB, or Windows NT will not be bootable. ***IMPORTANT!*** Exercise caution when moving a bootable partition. Operating systems can become unbootable if moved beyond certain boundaries. For more information, see "Creating Bootable Partitions" on page 48.
Resize	**1** Place the pointer on the left or right partition handle. The pointer changes to ↔. **2** Drag the handle until the desired partition size is reached. You can also resize the partition by typing new values in the **Free Space Before**, **New Size**, and **Free Space After** boxes or by clicking the arrows next to the boxes. The values you enter may change slightly to values supported by the drive's geometry. The arrow buttons resize the partition by the minimum increment, allowing you to make very fine adjustments. Changes are reflected in the partition map. To make a partition smaller, unused space must exist within the partition. To enlarge a partition, there must be unallocated space adjacent to it. For additional information about resizing partitions, refer to "Notes about Resizing Partitions" below. ***IMPORTANT!*** Resizing your NTFS system partition over 7.8 GB may render your server unbootable. If you resize an NTFS system partition over this limit by accident, you can recover your system by using the ServerMagic rescue disks to resize the NTFS system partition below 7.8 GB.

If you know your disk has no bad sectors, **Skip bad sector checks** in **Preferences** to make **Resize/Move** operations faster.

3 *(Optional)* Click the **Cluster Size** drop-down list and select a new size.

ServerMagic changes the **Free Space Before**, **New Size**, and **Free Space After** values to show how the partition size is affected.

This option is only available for FAT and FAT32 partitions. For more information, see "Resizing Clusters" on page 72.

4 Click **OK**.

Notes about Resizing Partitions

When you resize a partition, data is consolidated, not compressed. To make a partition smaller, unused space must exist within the partition. To enlarge a partition, there must be adjacent unallocated space. If there is unallocated space on the disk, but it is not adjacent to the partition you want to enlarge, adjust the location of the space by moving other partitions.

IMPORTANT! Exercise caution when resizing partitions smaller, especially a partition containing an operating system. Leave at least 50 MB more space in the partition than the operating system requires. Swap files, drivers, and other files may require the extra space. Additionally, operating systems can become unbootable if moved beyond certain boundaries. For more information, see "Creating Bootable Partitions" on page 48.

Resizing FAT and FAT32 partitions smaller may reduce the amount of wasted space on a hard disk. When you resize a FAT or FAT32 partition, ServerMagic automatically resizes the clusters to their optimal size for the partition. For more information, see "Resizing Clusters" on page 72.

You should be aware of the following limitations when resizing partitions:

- You cannot make a partition smaller unless it contains unused space. You can only reduce a partition to the used size shown in the partition map plus a small buffer area. During a Resize/Move operation, data is consolidated to the front of the partition as needed, but no data compression takes place. Because of the way a FAT partition is structured, you can often resize a partition a second time and make it even smaller or larger than the first time you resized it.
- In certain instances, you cannot make a FAT partition larger when the partition contains no unused space. If you have a full partition and plenty of unallocated space adjacent to it, yet are not able to enlarge your partition, you may have to delete some files in the partition so that ServerMagic has room to work. You may be able to slightly enlarge the partition (1 MB or less) and then enlarge the partition a second time to provide the necessary buffer area for ServerMagic. To see how much space is needed in a partition to resize past a cluster boundary, see the table in "Freeing Disk Space Before Enlarging a FAT Partition" in Help.

- It is difficult to calculate in advance the minimum size to which an NTFS or HPFS partition may be resized. During an NTFS or HPFS Resize/Move operation, if ServerMagic runs out of space, it returns an error without completing the operation. The integrity of the NTFS or HPFS partition and data is never compromised.

Resizing Partitions in Mirrored Sets

ServerMagic does not support any partitions located in mirrored sets configured using Windows NT Disk Administrator. However, you can use ServerMagic to ultimately manipulate the size of a mirrored set.

1. Use Disk Administrator to break the mirrored set.

   You will have to reboot your server.

2. Use ServerMagic to change the size of the master portion of the previously mirrored set.

3. Use Disk Administrator to re-establish a mirror.

Creating Partitions

The Create operation lets you create primary partitions, extended partitions, and logical partitions.

If you have multiple hard disks and partitions, the process and available options may differ slightly from the following steps.

1. Select a block of unallocated space.

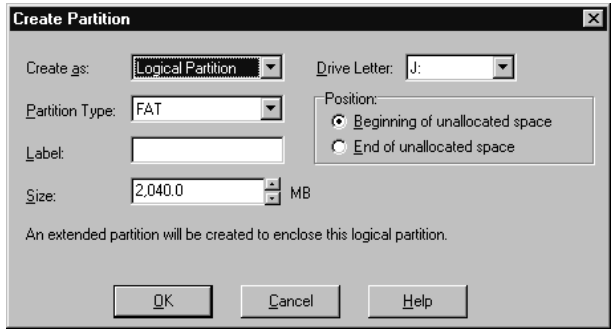
   If no unallocated space exists, you must resize or delete an existing partition to create unallocated space. For instructions on resizing and deleting partitions, see “Resizing and Moving Partitions” on page 42 and “Deleting Partitions” on page 50.

   If Remote Agent is running, you can create a partition on a remote server.

   On a single hard disk, you can have up to four primary partitions or three primary partitions and one extended partition. Within an extended partition, you can create unlimited additional subdivisions called logical partitions.

2. Click **Operations ➤ Create**.

The **Create Partition** dialog appears.



3 From the **Create as** drop-down list, select **Logical Partition** or **Primary Partition**.

You should create primary partitions to install operating systems and logical partitions for all other purposes (such as storing data and applications). If you have multiple hard disks, you can improve speed by installing operating systems and applications on separate disks. If you do not know what type of partition you want to create, see "Understanding Partitions" in Help.

You should create a primary partition if you plan to install an operating system. Refer to "Creating Bootable Partitions" on page 48.

If you select **Logical Partition**, ServerMagic automatically creates an extended partition to enclose the logical partition, or, if you already have an extended partition, resizes the extended partition larger to encompass the logical partition (the free space must be inside of or adjacent to the extended partition).

If **Logical Partition** is unavailable, you may already have four primary partitions on the hard disk. Or, if you have an extended partition, you may not have selected a block of free space inside of or adjacent to the extended partition.

If you create a second, third, or fourth primary partition on a physical disk, ServerMagic will create the new primary partition as unhidden. However, ServerMagic will automatically hide the other primary partitions on that disk when performing a Set Active operation.

4 From the **Partition Type** drop-down list, select the desired file system type:

FAT is the most common file system type. It is used by DOS, OS/2, and all versions of Windows.

FAT32 is used by Windows 95 OEM Service Release 2, Windows 98, Windows Me, and Windows 2000.

HPFS is used by OS/2 and Windows NT 3.51 (and earlier versions).

NTFS is used by Windows NT and Windows 2000.

Linux Ext2 and **Linux Swap** are used only by Linux.

Extended creates an extended partition which can contain any number of logical partitions. **Extended** is not an option if the hard disk already contains an extended partition or four primary partitions.

Unformatted creates an unformatted partition on your hard drive.

5. *(Optional)* Enter a label (up to 11 alphanumeric characters for FAT and 32 alphanumeric characters for NTFS) for the new partition.

6. In the **Size** box, enter the desired size for the partition.

   ServerMagic automatically calculates a recommended size (based on the most efficient use of disk space), which you can accept or change.

7. If the size you specified for the new partition is smaller than the available unallocated space, you can position the partition at the beginning (recommended) or end of the unallocated space. In the **Position** box, click **Beginning of free space** or **End of free space**.

8. In the **Drive Letter** box, type or select the drive letter you wish to assign to the partition.

9. Click **OK**.

WARNING! Because of conflicts that can result from different hardware and system configurations, do not create a partition on a hard disk and then move that hard disk to another computer. Data loss may occur.

Creating Bootable Partitions

Before creating a partition where you plan to install an operating system (a bootable partition), you should understand the information outlined in the following table.

Operating System	Boots from Primary or Logical	Supported Partition Types	Boot Code Boundary	Space Required
DOS 6.22 and earlier	Primary	FAT	2 GB	8 MB

Operating System	Boots from Primary or Logical	Supported Partition Types	Boot Code Boundary	Space Required
Windows 95	Primary	FAT or FAT32*	8 GB	90 MB
Windows 98	Primary	FAT or FAT32	>8 GB	175 MB
Windows Me	Primary	FAT or FAT32	>8GB	295 MB
Windows NT	Primary**	FAT or NTFS	4 GB	125 MB
Windows 2000	Primary**	FAT, FAT32, or NTFS	>8 GB	1 GB
Linux	Either	Linux Ext2	8 GB	250 MB
OS/2	Either	FAT or HPFS	4 GB	110 MB

* A FAT32 partition is only accessible from Windows 95 if you have a version OSR2 (4.00.950B) or above.

**Windows NT and Windows 2000 must boot from a primary partition on the first drive. However, only a few Windows NT/Windows 2000 files must reside on that partition; the remaining files can reside on a logical partition, which can be located on the first or a subsequent drive. The Windows NT/Windows 2000 boot partition can be shared with another operating system. Additionally, Windows NT must be installed on a FAT partition, and Windows 2000 must be installed on a FAT or FAT32 partition. During the installation, you can convert the partition to NTFS.

IMPORTANT! When you create, move, or resize a bootable partition, the partition must begin below the boot code boundary specified in the above table in order for the operating system to boot. With the exception of DOS 6.22 (or earlier) and OS/2, partitions beyond 8 GB are visible to the current operating system. For more information, see “Understanding the BIOS 1,024 Cylinder Limit” and “Understanding the 2 GB Boot Code Boundary” in Help. The partition map in the ServerMagic main window displays indicators for the 2 GB boot boundary and the 1024 cylinder (8 GB) limit.

ServerMagic displays a warning if you attempt to create, move, or resize a bootable partition outside of the 2 GB boot code boundary. If you continue with the operation, you may not be able to boot or to see the partition. In either case, you can resolve the problem by moving the partition back within the boot code boundary with the ServerMagic rescue disks.

Some I/O cards (typically older RAID cards) only provide access to the first 8 GB of a disk under DOS. Consequently, if you resize the operating system partition beyond 8 GB and it becomes unbootable, the ServerMagic rescue disks may not allow you to manipulate partitions on that drive. You should be cautious about resizing any operating system partition beyond 8 GB.

Deleting Partitions

The Delete operation deletes a partition and makes its data inaccessible. The Delete and Shred operation destroys the data in a selected partition by overwriting the disk sectors. Once a partition has been shredded, it cannot be undeleted.

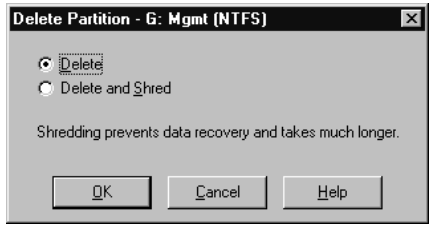
1. Select the partition you want to delete.

   To delete an extended partition, you must first delete all logical partitions within the extended partition. You cannot shred unallocated space.

   If Remote Agent is running, you can delete a partition on a remote server.

2. Click **Operations ➤ Delete**.

   The **Delete Partition** dialog appears.



3. Click **Delete** or **Delete and Shred**.

   Be aware that deleting and shredding a partition takes much longer than deleting a partition.

4. Click **OK**.

Undeleting Partitions

The Undelete operation restores FAT, FAT32, and NTFS partitions that have been deleted on disk. Undelete works best when you use it to restore a partition that you just deleted by accident. If you are undeleting partitions after you have made other changes (written data to them, resized existing partitions, etc.), see "Restrictions on Undeleting Partitions" on page 52.

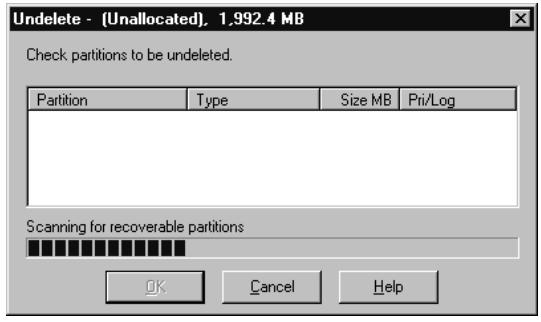
1. Select the unallocated space to be searched.

   If Remote Agent is running, you can search unallocated space on a remote server.

2. Click **Operations ➤ Undelete**.

   IMPORTANT! You can undelete a partition only if no other operations are pending on the unallocated space selected. If any operations are pending, the undelete icon and menu option will be dimmed (inaccessible).

   The **Undelete** dialog appears, and the selected unallocated space is searched.



   All primary and logical partitions that can be undeleted are listed. If no partitions are found within the unallocated space or none can be undeleted, a message appears indicating no partitions can be undeleted.

3. Within the scrollable list, click the checkbox of the partitions you wish to undelete.

   While it is possible to undelete more than one partition at once, PowerQuest recommends that you undelete partitions one at a time, beginning with the one that you want most. Doing so helps ensure the integrity of the data within the partition.

4. Click **OK**.

Restrictions on Undeleting Partitions

There are some situations in which a partition that has been deleted cannot be undeleted and will not be displayed in the scrollable list. They include the following:

- You cannot undelete a primary partition if your hard disk contains four primary partitions.
- You cannot undelete a logical partition that was deleted and now is not within an extended partition.
- You cannot undelete a primary partition that was deleted and now is within an extended partition.
- The partition includes file system errors. If ServerMagic finds a partition, it checks for errors before undeleting it. If the partition has errors, it cannot be undeleted.
- You cannot undelete a partition that has been completely or partially overwritten by another partition or file system. Because of this limitation, if you see two partitions in the **Undelete** dialog and undelete one of them, the other may no longer appear in the list.
- If two deleted partitions claim some of the same disk space, PowerQuest cannot guarantee the integrity of the data in those partitions when they are undeleted. For example, suppose you had two partitions, a 500 MB E: and a 500 MB F:, and you deleted F: and resized E: to claim all the space (1 GB). Then you saved data to E:. Later, you deleted E:. Now you want to undelete partitions, and you can see both E: and F: in the **Undelete** dialog. If you restore E:, it is fine and F: is no longer displayed in the dialog (because its space has been claimed). However, if you undelete F: instead of E:, you may get some data that you had saved to E:. Undeleting F: could make your computer unbootable or cause applications not to run.

Changing Partition Labels

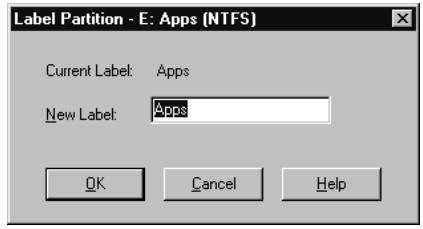
The Label operation lets you change a partition's label. Meaningful names make partition management easier.

1. Select the partition with the label you want to change.

   If Remote Agent is running, you can label partitions on a remote server.

2. Click **Operations ➤ Label**.

The **Label Partition** dialog appears.



3 In the **New Label** box, type the new label.

NTFS volume labels can contain up to 32 alphanumeric characters. FAT volume labels can contain up to 11 alphanumeric characters and cannot contain the following characters:* ? [ ] < > | + = : ; , . \ / ".

4 Click **OK**.

Formatting Partitions

The Format operation formats a partition, destroying all its data in the process. Formatting enables you to put a different file system on a partition.

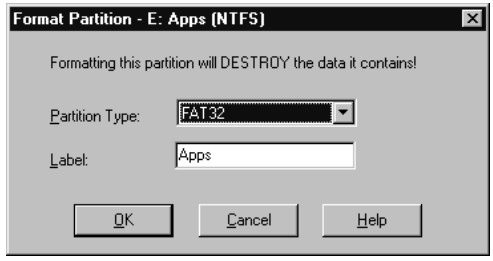
ServerMagic has several conversion options that let you convert from one file system to another without destroying existing files in a partition. See "Converting Partitions" on page 89.

1 Select the partition you want to format.

If Remote Agent is running, you can format partitions on a remote server.

2 Click **Operations ➤ Format**.

The **Format Partition** dialog appears.



3 From the **Partition Type** drop-down list, select the desired file system type.

If the partition is too small or too large, some partition types may not be available.

4 *(Optional)* Type a label for the partition.

5 Click **OK.**

Copying Partitions

The Copy operation lets you to make an exact duplicate of a partition. To copy a partition, you must have unallocated space that is equal to or larger than the partition you are copying.

Reasons why you might want to copy a partition include:

- To duplicate your operating system before upgrading to a new version or a different operating system (so that you can remember how the old operating system's windows, program icons, and properties were set up).
- To quickly move a smaller hard disk's contents to a larger, new hard disk.
- To change the relative order of partitions.
- To back up a partition.

1 Select the partition you want to copy.

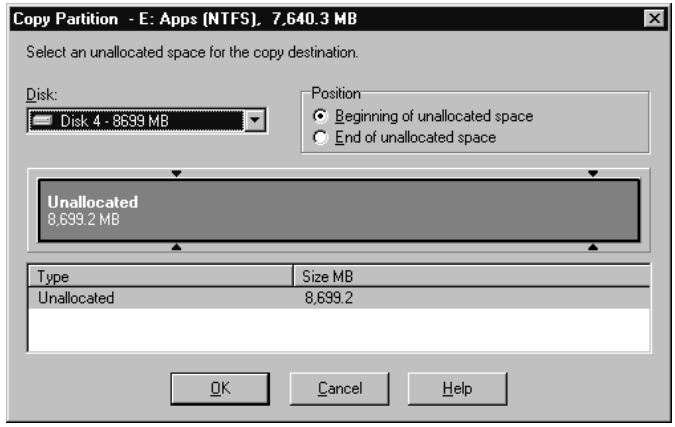
The **Copy** command is dimmed if there is not enough unallocated space on your disk for the partition.

If Remote Agent is running, you can copy partitions to or from a remote server.

You cannot use ServerMagic to copy Windows NT stripe sets, stripe sets with parity, or duplex/mirrored sets.

2 Click **Operations ➤ Copy**.

The **Copy Partition** dialog appears.



3. From the **Disk** drop-down list, select the disk where you want to copy the partition.
4. In the partition list, select the unallocated space where you want to copy the partition.
5. If the partition you specified is smaller than the available unallocated space, you can position the partition at the beginning (recommended) or end of the unallocated space. Under **Position**, click **Beginning of free space** or **End of free space**.
6. Click **OK**.

The copy is the same size (or slightly different if copied to a disk with a different geometry) and file system type and contains the same data as the original.

Copying the Boot Partition

If you copy the Windows NT boot partition to a different drive and Windows NT is booted to run from the new location, all the user-assigned drive letters will be dropped. When Windows NT boots, it compares current disk geometries to those stored in the registry for all user-assigned drive letters. When the stored values do not match a partition, the drive letter assignment is reset. Consequently, if Windows NT is booted from the copied partition, you could see error messages about services not starting. In Event Viewer, you may see Stop errors with event IDs 2511 and 7000.

To fix the problem, you must reassign the boot partition its original drive letter. You may need to reboot Windows NT more than once to completely reassign all drive letters to their original designations.

Checking Partitions for Errors

The Check for Errors operation checks the integrity of a partition.

Each time ServerMagic is started, it performs a check on all attached drives and their partitions. If the check finds a problem, “Check failed” appears in the partition list window under the **Type** column. This check is separate from the Check for Errors operation and is not as exhaustive.

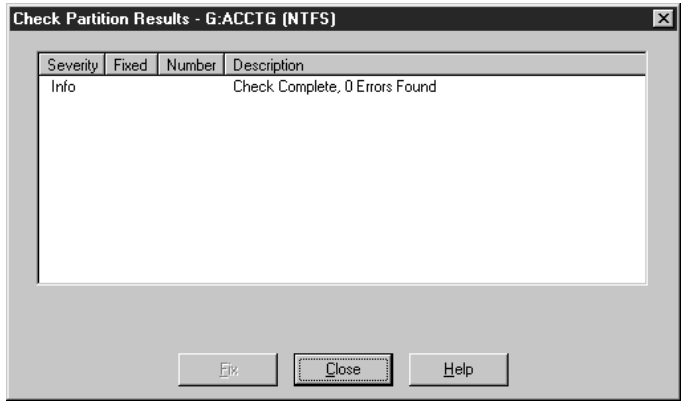
1 Select the partition you want to check.

ServerMagic can only check partitions that it can lock (that is, partitions that do not have open files on them). If there are open files on a partition, the Check for errors command on the menu will be dimmed.

If Remote Agent is running, you can check partitions on a remote server.

2 Click **Operations ➤ Check for Errors**.

The **Check Partition Results** dialog appears.



If Check for Errors does not discover any errors, an Info entry appears with “Check Complete” in the **Description** column.

If a Check for Errors operation fails, “Check Failed” appears in the **Used** and **Unused** columns in the partition list. You should fix any errors encountered. For more information, see “Resolving Check Errors” on page 121.

If Check for Errors finds an error, such as cross-linked files, lost clusters, or bad directory information on an NTFS volume and can fix it, a **Fix** button appears at the bottom of the dialog. For each error found, ServerMagic displays the following:

- **Severity** describes the seriousness of the problem, which can be one of the following:

Severity	Description
Info	The information given is helpful but not critical. Does not correspond to any error.
Warning	The error may or may not cause problems.
Error	A problem was encountered, but ServerMagic may still be able to make changes to the partition. Run CHKDSK to fix the error, or click **Fix**, if available.
Critical	A catastrophic problem. ServerMagic cannot make any changes to the partition.

- **Fixed** displays **Yes** for each problem you fix on an NTFS volume. Not applicable for FAT, FAT32, or HPFS partitions.
- **Number** shows a number corresponding to the error. For more information, see "Error Messages and Solutions" on page 125.
- **Description** gives a brief description of the problem.

3. To fix an error, highlight the problem and click **Fix**.
4. If you want to skip one listed error, click **Skip**.

   If you want to skip all listed errors, click **Skip All**.
5. When you are finished viewing the check results and fixing NTFS errors, click **Close**.

Check for Errors does not display information about the status and structure of a partition as do the DOS, Windows, and OS/2 CHKDSK utilities. To view that information, use the Info operation. For details, see "Getting Information About Partitions" on page 61.

ServerMagic checks for OS/2 Extended Attribute errors on FAT partitions. If you do not use OS/2 or previously used OS/2 but no longer do, consider enabling the **Ignore OS/2 EA Errors on FAT** preference, as these errors are not a concern. For more information, see "Changing ServerMagic Preferences" on page 37. OS/2 users should not enable **Ignore OS/2 Errors on FAT**, as undetected errors could cause data loss.

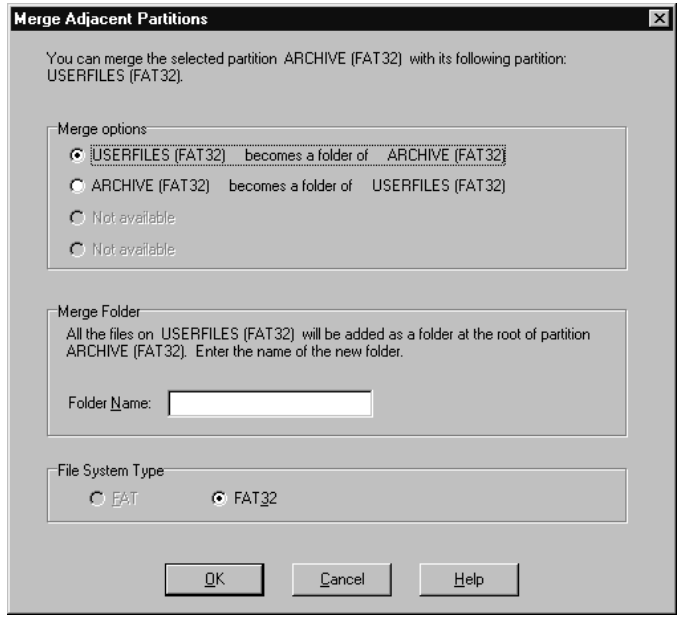
Merging Partitions

You can merge two FAT or FAT32 partitions that are adjacent to each other on a disk. It is useful to merge partitions if you have reached the maximum number of partitions on your disk, but you do not want to delete a partition. It is also useful if you want to combine FAT partitions and convert them to one large FAT32 partition.

IMPORTANT! Merging partitions may take a long time (possibly hours), depending on the partition sizes and amount of data they contain. If you wish to check whether your machine is still operating, you can press the NumLock key and see if the light toggles. It may take a few seconds to register activation of the NumLock key on your keyboard. If you plan to merge partitions, you may wish to schedule it for a time when you will not need to use your system for an extended period of time. **If you shut down or turn off your computer while ServerMagic is still working, it will cause corruption to the file system, which will result in data loss.** Do not shut down the system until after the process is complete.

1. Select one of the two partitions you want to merge with another partition.
2. Click **Operations ➤ Merge**.

   The **Merge Adjacent Partitions** dialog appears.



3 Under **Merge options**, choose the partitions you would like to merge.

The contents of one partition will be moved into a folder within the other partition.

You should not merge partitions that contain different operating systems.

4 Under **Merge Folder**, type a name for the new folder that will be created in the partition you are keeping.

5 Choose **FAT** for **FAT32** for the format of the partition you are keeping.

If you are combining FAT partitions, be careful not to convert them to FAT32 unless you have access to FAT32 partitions. Windows 95b or later, Windows 98, Windows Me and Windows 2000 can access FAT32 partitions.

6 Click **OK**.

The partition map in the main window changes to show the merged partitions.

Splitting Partitions

Use Split to divide a FAT or FAT32 partition into two contiguous partitions. The new partition is created to the right of the original partition; the original and new partitions together occupy the same amount of hard disk space as the original partition. The file system for the partition does not change. For example, if you had a 2 GB FAT partition and you split it, the left and right partitions together would use 2 GB and both would be FAT partitions.

When you split a partition, you can select the files and folders that you want the new partition to include. You can also label the new partition and specify whether it is primary or logical.

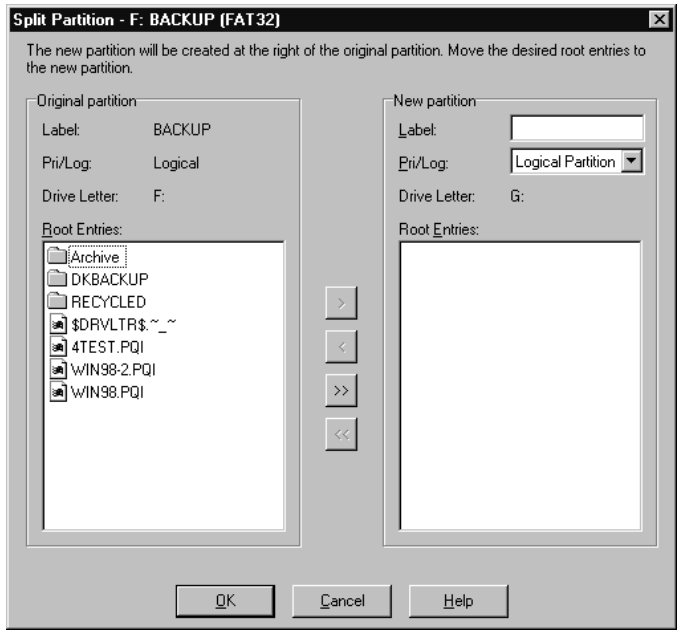
1 Select the partition you want to split.

You cannot split a partition that is smaller than 100 MB.

A FAT partition must have at least 5% unused space, or the Split command will be dimmed on the menu. A FAT32 partition requires 10% unused space to split.

PowerQuest does not recommend splitting your operating system partition.

2 Click **Operations ➤ Split**.



3 Under **Original Partition**, select the files and folders you want to move to the new partition, then click the single right arrow.

Click the left arrow to remove selected files and folders from the new partition. To move all files and folders to the new partition, click the double right arrow. You can also click the left arrow to move selected files and folders back to the original partition if you change your mind. You must, however, have at least one file or folder remaining in each partition.

4 *(Optional)* Type a name for the new partition in the **Label** text box.

5 Select a partition type for the new partition from the **Pri/Log** drop-down list.

You cannot use the Split operation to convert the original partition from primary to logical or vice versa.

6 Click **OK**.

The size of the new partition is based on the minimum possible size and the total byte size of the files you are adding to the new partition. Any remaining free space is split proportionally between the two partitions according the data in the partitions. For

example, if the two partitions used 2 GB and you included 700 MB of data in the original (left) partition and 300 MB of data on the new (right) partition, you would have 1 GB of free space available; the original partition would get 700 MB of unused space, and the new partition would get 300 MB of unused space.

Both the original and new partitions must be at least 40 MB. On hard disks larger than 4 GB, ServerMagic will round the size of the partition up to at least 47 MB.

Getting Information About Partitions

The Info operation displays information about the status and structure of a selected partition.

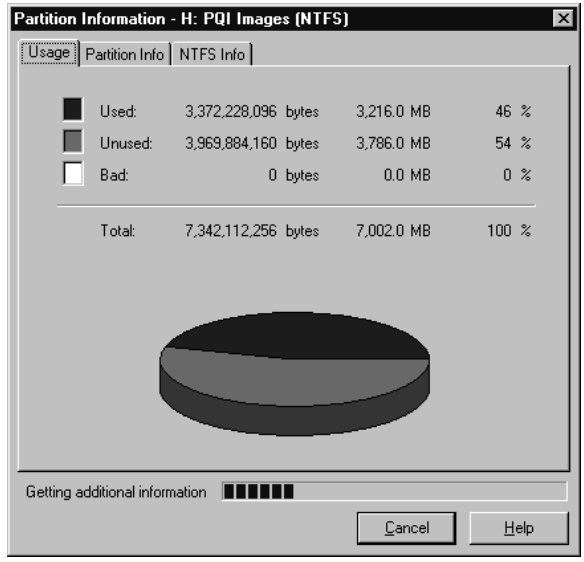
If you select a volume segment (in Disk view), the Info operation displays information about the selected volume segment, not the entire volume set. To display information about an entire volume set, see "Displaying Information About Volume Sets" on page 79.

1. Select the partition you want information about.

   If Remote Agent is running, you can get information about a partition on a remote server.

2. Click **Operations ➤ Info**.

The **Partition Information** dialog appears.



Information is displayed in tabbed pages. To view a page, click its associated tab, which is always visible at the top of the pages. Based on the file system the partition uses, different pages appear.

3 Click the tab for the page you wish to view.

Each page is described in the following sections.

4 Click **Close** when you are finished viewing information.

Usage

The **Usage** page is available for the FAT, FAT32, NTFS, and HPFS file systems. This page displays the following information in bytes, megabytes, and as a percentage:

- **Used** space on the partition, including space wasted by clusters
- **Unused** space on the partition
- **Bad** space on the partition
- **Total** space on the partition (the sum of Used, Unused, and Bad space)

ServerMagic also displays this information in a pie chart.

Cluster Waste

The **Cluster Waste** page applies only to partitions using the FAT or FAT32 file systems.

This page displays the following information:

- **Current Cluster Size** in bytes or kilobytes
- **Data** stored on the partition in bytes and megabytes
- **Wasted** space on the partition in bytes and megabytes
- **Total** used space in bytes and megabytes (the sum of Data and Wasted space)

ServerMagic also displays this information in a bar chart.

Partition Info

The **Partition Info** page is available for all types of partitions, including unallocated space and extended partitions. Information on this page includes the following:

- **Partition type** is shown in hexadecimal followed by a text description of the partition or file system type (such as FAT, FAT32, NTFS, or HPFS). The hexadecimal designation is the conventional way to display partition types.
- **Serial Number** is shown if the partition's file system uses serial numbers.

The lower portion of the page shows physical information about the partition:

- **First physical sector** shows the logical number and the location (cylinder, head, and sector) where the partition begins.
- **Last physical sector** shows the logical number and the location (cylinder, head, and sector) where the partition ends.
- **Total physical sectors** displays the number of sectors in the partition.
- **Physical Geometry** shows the total number of cylinders, heads, and sectors on the physical disk where the partition resides.

File System-Specific Info Pages

The last page in the **Partition Information** dialog corresponds to the file system used on the selected partition. For example, if the file system is FAT or FAT32, the page is **FAT Info**; if the file system is NTFS, the page is **NTFS Info**, and so forth.

FAT Info

This page applies to partitions using the FAT or FAT32 file systems.

The first section provides the following information:

- **Sectors per FAT** shows the number of sectors in each file allocation table and the number of file allocation tables on the selected partition.
- **Root directory capacity** shows the number of possible entries and the number of sectors in the root directory. Because a FAT32 root directory can grow as needed, this line is blank for FAT32 partitions.
- **First FAT sector** shows the logical sector number within the partition where the FAT begins.
- **First Data sector** shows the logical sector number within the partition where the data portion of the partition begins.

The next section provides the following information:

- The number of bytes in files on the partition, the number of files, and the number of those files that are hidden
- The number of bytes in directories on the partition, the number of directories, and the number of those directories that are hidden

The final section of this page, **FAT Extensions**, provides the following information:

- The number of bytes used for OS/2 Extended Attributes and the number of files and directories affected by Extended Attributes
- The number of bytes used for long filenames and the number of files and directories using long filenames

NTFS Info

This page applies to partitions using the NTFS file system. The first section shows the following information:

- **NTFS Version** shows the version number. The NTFS version does not match the OS version. For example, Windows NT 4.0 uses NTFS version 1.3.
- **Bytes per NTFS sector** displays the number of bytes in each logical sector on the selected partition. (There are always 512 bytes in each physical sector.)
- **Cluster size** displays the size of each cluster and the number of sectors in each cluster on the selected partition.
- **First MFT Cluster** shows the logical number of the first cluster in the master file table (MFT).
- **File Record Size** gives the size of file records in the MFT.

The next section displays information similar to that shown by NT CHKDSK:

- The number of files on the partition and the bytes and clusters allocated to them
- The number of wasted bytes in file clusters
- The number of indexes (directories) and the bytes and clusters allocated to them
- The number of bytes and clusters reserved for other system structures

HPFS Info

This page applies to partitions using the HPFS file system.

The first section displays the following information:

- **Partition status** shows one or more of these values:
- **Active:** OS/2 is running and data has been written to the partition.
- **Dirty:** Windows NT or OS/2 was shut down improperly and is not running.
- **Corrupt:** One or more sectors are bad, and the partition needs to be checked.
- **Hot Fixes:** Problems have been hot fixed.
- **Not Active:** The partition is not in use.
- **DirBlock sectors** shows the range of sectors in the DirBlock band. The DirBlock band is usually preallocated near the center of the disk to reduce head movement.
- **Free DirBlocks** displays the number of unused DirBlocks in the DirBlock band and the total number of DirBlocks. If the DirBlock band fills up, additional DirBlocks are allocated from the data area.
- **HotFixes used** displays the number of hotfix sectors used and the total number of hotfix sectors available. Hotfix sectors are used temporarily to handle write errors. CHKDSK /F transfers the data from a hotfix sector to a good sector and makes the hotfix sector available again.

The last section displays information similar to that shown by OS/2 CHKDSK, including:

- The number of bytes and files on the partition and the number of sectors used for files
- The number of unused bytes in file sectors, which is equivalent to wasted bytes in FAT clusters. (Because HPFS allocates space by sectors, less space is wasted than in FAT clusters.)
- The number of bytes in directories, the number of directories on the partition, and the number of sectors used for directories
- The number of bytes in file/dir Fnodes, also shown as a number of sectors

  An Fnode is a key structural element of the HPFS file system. Each Fnode is 512 bytes (one sector). One Fnode exists for each file or directory in the partition.

- Number of bytes reserved by the system, also shown as a number of sectors
- Number of bytes used for Extended Attributes (EAs)

Scanning a Disk for Errors

You can run the Windows NT CheckDisk utility (CHKDSK.EXE) from ServerMagic. Use CheckDisk to scan a disk or volume set for errors.

1. Select the disk or volume set you want to scan for errors.
2. Click **Operations ➤ Windows CheckDisk**.

   CheckDisk only scans drives, partitions, and volumes with assigned drive letters; it does not scan unallocated space, and volumes and partitions with file systems not supported by Windows NT. (Windows NT supports FAT and NTFS. Windows 2000 supports FAT, FAT32, and NTFS.)

   ServerMagic invokes CheckDisk in read-only mode. In most instances, including the /F switch to fix errors on an NTFS partition requires a system reboot. If you want to fix discovered volume errors, you should exit ServerMagic and run CHKDSK /F from a command window. For more information about NT CheckDisk, consult Windows NT help.
3. When NT CheckDisk is finished, the results appear in the command window.

4. When you are finished viewing the results, press any key to close the command window.

CHAPTER 4

Completing Advanced Disk Operations

This chapter includes the following information:

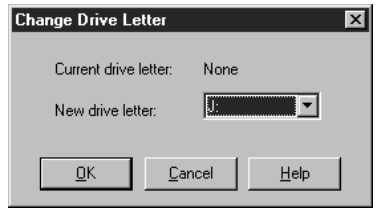
- Changing a Drive Letter
- Retesting Bad Sectors
- Hiding and Unhiding Partitions
- Resizing the Root Directory
- Setting an Active Partition
- Resizing Clusters

Changing a Drive Letter

The Change Drive Letter operation lets you change the drive letter assigned to any partition visible to and supported by Windows NT.

1. Select the partition whose drive letter you want to change.
2. Click **Operations ➤ Advanced ➤ Change Drive Letter**.

   The **Change Drive Letter** dialog appears.



3. In the **New drive letter** box, type or select the drive letter you want to assign to the partition.
4. Click **OK**.

Retesting Bad Sectors

The Bad Sector Retest operation lets you check sectors on FAT and FAT32 partitions that have been marked bad and recover sectors that are usable.

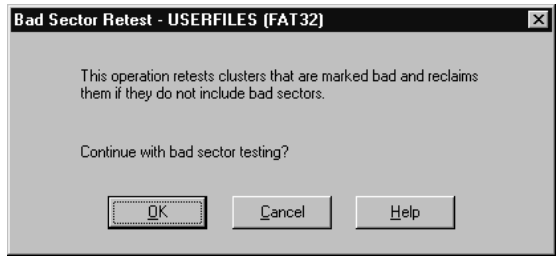
The FAT and FAT32 file systems allocate disk space for file storage in units called clusters, which are composed of a fixed number of sectors. Because the FAT or FAT32 file system tracks bad sectors at the cluster level, it marks an entire cluster bad even though the problem may exist in a single sector. Use **Info** to discover whether a partition contains bad clusters. For more information, see “Getting Information About Partitions” on page 61.

As a conservative measure, when you move or resize a partition or increase cluster size, ServerMagic marks all new clusters containing any part of old bad clusters as bad (even though the clusters may not actually contain bad sectors). Likewise, when you decrease a partition’s cluster size, ServerMagic divides bad clusters into multiple bad clusters. If, after you complete these tasks, ServerMagic reports bad sectors, you can perform **Bad Sector Retest** and reclaim the good sectors that were marked bad.

1. Select the partition you want to retest.

2 Click **Operations ➤ Advanced ➤ Bad Sector Retest**.

The **Bad Sector Retest** dialog appears.



3 To continue with the test, click **OK**.

Some sectors marked as bad are "marginally bad," meaning that one time the sector works fine and another time it does not. Bad Sector Retest may mark a marginally bad sector as good. This can result in data loss if the marginally bad sector fails in the future. Most modern hard drives detect bad sectors and automatically remap the sector, so in general, you do not see bad sectors on modern hard drives. If you do get bad sector errors on a modern hard drive, it is recommended that you replace the drive.

Hiding and Unhiding Partitions

The Hide Partition operation lets you secure partitions against unwanted user access. You can perform this operation on FAT, FAT32, NTFS, and HPFS partitions.

When you hide a partition, it will not be assigned a drive letter the next time you boot your computer.

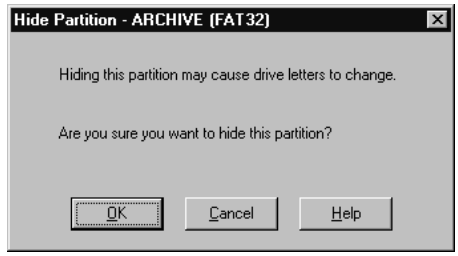
1 Select the partition you wish to hide.

If Remote Agent is running, you can hide or unhide a partition on a remote server.

2 Click **Operations ➤ Advanced ➤ Hide Partition** (or **Unhide Partition**).

Note that unless you are running Windows NT or Windows 2000, unhiding multiple primary partitions may cause data loss.

The **Hide Partition** dialog appears, warning you that drive letters may change.



3 To confirm that you want to hide the partition, click **OK**.

Under Windows NT, partitions are not hidden automatically; therefore, you can have multiple visible primary partitions.

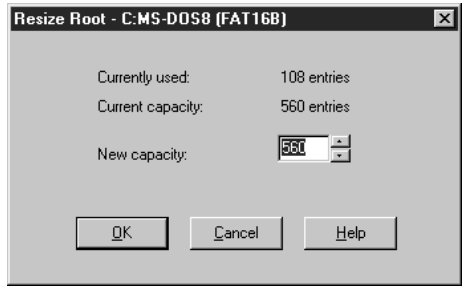
Resizing the Root Directory

The Resize Root operation lets you change the maximum number of entries that can be placed in the root directory of a FAT partition. The number of root entries is set at the time the partition is formatted; the limit does not expand automatically as it does in a subdirectory or in a FAT32 partition. Consider increasing this number if you use Microsoft long filenames in the root directory. During this operation, data within the partition is unaffected.

1 Select the partition whose root directory you wish to resize.

2 Click **Operations ➤ Advanced ➤ Resize Root**.

The **Resize Root** dialog appears, displaying the number of used entries and the current capacity.



3 In the **New capacity** box, type or select the number of entries you want the root directory to have.

   The number you type will be rounded to one that preserves the current cluster alignment.

4 Click **OK**.

Occasionally, enlarging the root directory displaces the first few files on the partition (such as IO.SYS and MSDOS.SYS if the partition contains an operating system). If the root directory is on a boot partition and the partition fails to boot after resizing the root directory, you should run SYS.COM to move the displaced files back to the front of the disk.

Setting an Active Partition

The Set Active operation lets you make a partition the active partition (the partition the computer boots from). Only one partition can be active at a time. To boot your computer from a partition, the partition must be on the first disk, and it must contain an operating system. When your computer boots, it reads the partition table of the first disk to find out which partition is active and boots from that partition.

IMPORTANT! Before you make a partition active, it must be bootable. If the partition is not bootable or if you are not certain if it is, have a boot diskette ready.

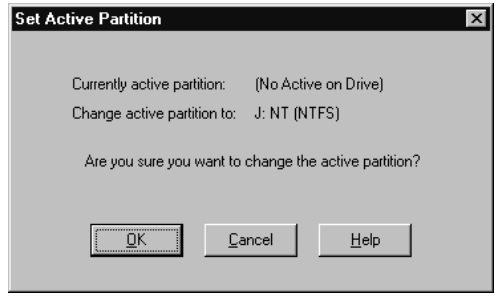
ServerMagic hides inactive FAT, NTFS, and HPFS primary partitions (unlike Windows 9x and DOS FDISK programs which cannot hide or unhide partitions). Hiding inactive primary partitions makes it easy to install multiple operating systems and choose the one you want to set active. For example, if you have Windows 95 and want to install Windows NT in a separate partition, you can make the Windows 95 partition smaller, create another primary partition, set it as the active partition, and then boot from the Windows NT installation diskettes.

1 Select the partition you want to make active.

2 Click **Operations ➤ Advanced ➤ Set Active** on the context menu.

   In a configuration with mixed IDE and SCSI hard disks, Windows NT does not always see the boot drive as the first disk. ServerMagic displays drives in the order that Windows NT reports them. As a result, you may see your boot device as drive 1, 2, etc. ServerMagic may also incorrectly report that there is no active partition. Be sure you identify which which drive is the boot drive.

The **Set Active Partition** dialog appears.



3 Click **OK**.

Resizing Clusters

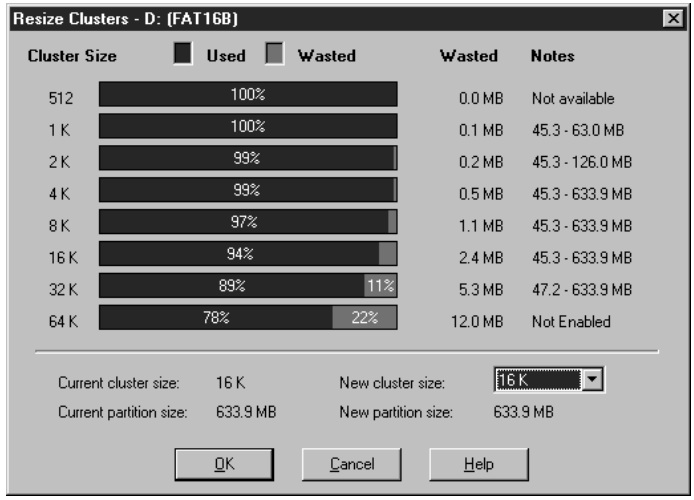
The Resize Clusters operation lets you change the cluster size on FAT and FAT32 partitions. Reducing cluster size may help you reclaim wasted space on your hard disk.

All files on FAT and FAT32 partitions are stored in allocation units called clusters. Each file on a partition is allotted at least one cluster. The size of a partition determines cluster size. Unless the size of a file is an exact multiple of cluster size on the partition where the file is located, the file includes wasted space. Larger partitions have larger clusters, and, therefore, more wasted space. For more information, see “Making Efficient Use of Disk Space” in Help.

1 Select the partition where you want to resize clusters.

2 Click **Operations ➤ Advanced ➤ Resize Clusters**.

The **Resize Clusters** dialog appears.



For each cluster size, ServerMagic displays the following:

- A bar graph and percentages represent how much space would be used and how much space would be wasted if you chose that cluster size for the currently selected partition
- Wasted space (in megabytes)
- The range of allowable partition sizes (in megabytes) or other information
- If a cluster size requires a partition that is too small for the data and files on the partition, “Not Available” appears in the **Notes** column. “Not Enabled” appears in the **Notes** column for the 64 K cluster size because it is only used for Windows NT/2000. You can enable the 64 K cluster size, but it is not recommended. For more information, see “Allow 64K FAT Clusters for Windows NT/Windows 2000” on page 37.

The lower portion of the **Resize Clusters** dialog displays information about the current and new cluster size and the current and new partition size (based on the new cluster size).

3 Using the information in the dialog, decide which cluster size you want to use (and can use) and select it from the **New cluster size** drop-down list.

ServerMagic adheres to the established limits for partition and cluster sizes. You cannot select a cluster size that is invalid for the selected partition.

It is not recommended that you use the smallest cluster size on partitions containing a single, large file, such as a database or swap file.

Choosing a smaller cluster size may resize the partition smaller, creating unallocated space next to the partition. You can use this unallocated space by creating a new partition.

4 Click **OK**.

Default Cluster Sizes

A partition's cluster size is set by the DOS FORMAT operation, based on the size of the partition, as shown in the following tables.

DOS and Windows default FAT cluster sizes

Partition Size (MB)	FAT Type	Sectors Per Cluster	Cluster Size
0-15	12-bit	8	512 bytes
16-127	16-bit	4	2 K
128-255	16-bit	8	4 K
256-511	16-bit	16	8 K
512-1,023	16-bit	32	16 K
1,024-2,047	16-bit	64	32 K
2,048-4,096	16-bit	128	64 K*

*Only available with Windows NT and Windows 2000 and a 2-4 GB disk.

Windows 95 OEM Service Release 2, Windows 98, Windows Me, and Windows 2000 default FAT32 cluster sizes

Partition Size (GB)	Sectors Per Cluster	Cluster Size
0.256- 8.01	8	4 K
8.02-16.02	16	8 K
16.03-32.04	32	16 K
> 32.04	64	32 K

CHAPTER 5

Managing Volume Sets

This chapter includes the following information:

- Copying Volume Sets
- Resizing Volume Sets
- Formatting Volume Sets
- Changing Volume Set Labels
- Displaying Information About Volume Sets
- Deleting Volume Sets
- Checking Volume Sets
- Moving Volume Segments

IMPORTANT! Before you perform any operations in ServerMagic, you should be familiar with the material explained in "ServerMagic Basics," which begins on page 25. All but one of the operations in this chapter require that you select a volume from the Volume Sets window in ServerMagic. The Move Segment operation is available from the Disks window.

Copying Volume Sets

The Copy and Consolidate operation copies all the data from a volume set and consolidates it to an unallocated space you specify. This procedure creates a new partition which can be accessed from the Disks window (not the Volume Sets window).

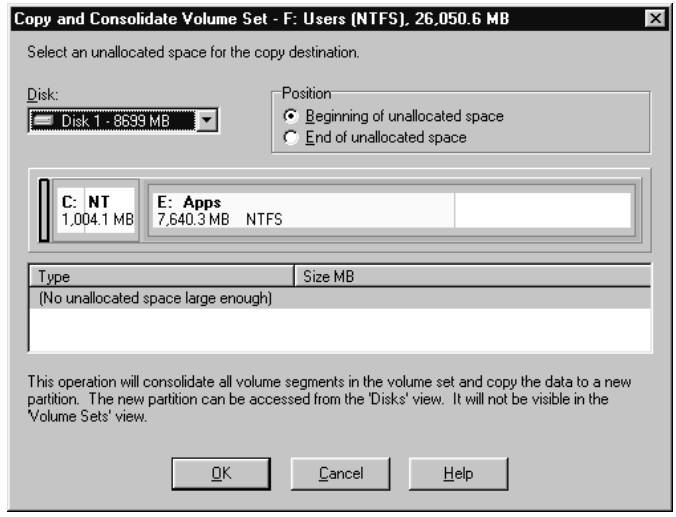
IMPORTANT! To copy and consolidate a volume set, you must have unallocated space that is equal to or larger than the volume set.

1 Select the volume set you want to copy.

If Remote Agent is running, you can copy and consolidate volume sets to a remote server.

2 Click **Operations ➤ Copy and Consolidate**.

The **Copy and Consolidate Volume Set** dialog appears.



3 From the **Disk** drop-down list, select the disk where you want to copy and consolidate the volume set.

The type and size of the space available is reflected in the partition map and partition list. The disk you select must have a sufficient amount of unallocated space.

4 In the **Position** box, click **Beginning of unallocated space** or **End of unallocated space**.

5 Click **OK** to add the operation to the ServerMagic queue.

ServerMagic changes the view from the Volume Sets window to the Disks window.

Resizing Volume Sets

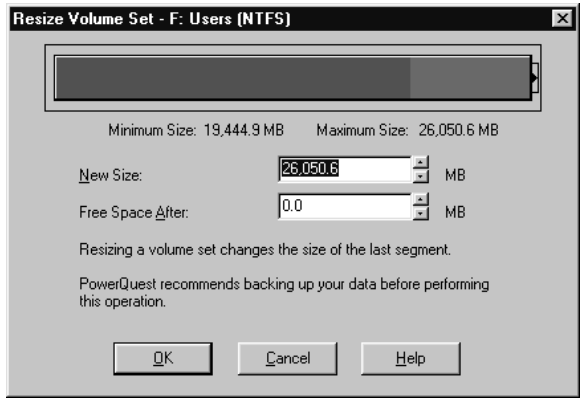
The Resize operation lets you change the size of a volume set by resizing the last segment within the set. If you are decreasing the size of the volume, data is shifted from the last segment to other segments in the volume set as needed. If you are increasing the size of the volume, the last segment is expanded.

1 Select the volume set you want to resize.

IMPORTANT! You cannot resize FAT16 volume sets.

2 Click **Operations ➤ Resize**.

The **Resize Volume Set** dialog appears.



The current size of the volume set is shown on the volume set map at the top of the dialog. The minimum and maximum sizes to which you can resize the volume set also appear in the dialog.

3 Place the pointer on the volume set handle (the right edge) and drag the handle to the left or right until you reach the desired size.

The pointer changes to a double-headed arrow when it is positioned over the handle.

You can also resize the volume set by typing new values in the **New Size**, and **Free Space After** boxes or by clicking the arrows next to the boxes. The arrow buttons resize the set by the minimum increment, allowing you to make fine adjustments. Changes are reflected in the volume set map.

When you enlarge a set, there must be free space adjacent to it. If, for example, there is a partition next to the last volume segment, you cannot resize larger, only smaller.

When you reduce the size of a set, ServerMagic shifts the data from the last segment to one or more other segments in the volume set. The amount by which you can reduce the size of a volume set is dependent on either the amount of data in the volume set or the sum total of all the segments minus the size of the last segment plus one cylinder (which ever scenario is greater).

4 Click **OK**.

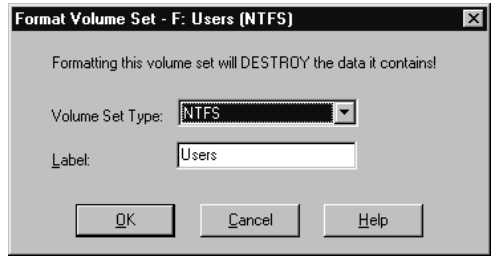
Formatting Volume Sets

The Format operation formats a volume set, destroying all its data in the process. Formatting lets you put a different file system on a volume set.

1 Select the volume set you want to format.

2 Click **Operations ➤ Format**.

The **Format Volume Set** dialog appears.



3 From the **Volume Set Type** drop-down list, select the desired file system type.

You can only choose between FAT or NTFS. FAT is unavailable if the volume set is greater than 2 GB (or 4 GB if 64K clusters are enabled in preferences).

4 *(Optional)* Type a label for the volume.

Changing Volume Set Labels

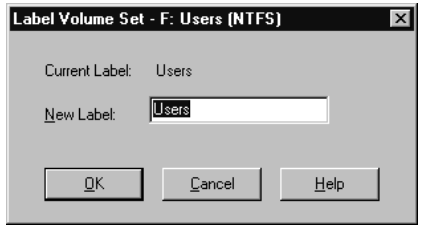
Use the Label operation to change a volume set label. Giving your volumes meaningful names makes managing them easier.

1 Click **Volume Sets** to display the Volume Sets window.

2 From the volume map, list, or tree view, select the volume set you want to label.

3 Click **Operations ➤ Label**.

The **Label Volume Set** dialog appears.



4 In the **New Label** box, type the new label.

NTFS volume labels can contain up to 32 alphanumeric characters. FAT volume labels can contain up to 11 alphanumeric characters and cannot contain the following characters:*?[]<>|+=:;,.\ /".

5 Click **OK**.

Displaying Information About Volume Sets

The Info operation displays information about the status of a selected volume set.

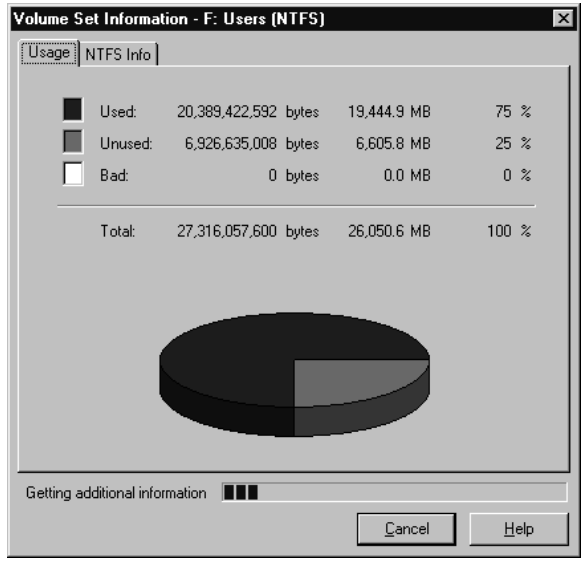
1 Click **Volume Sets** to display the Volume Sets window.

2 From the volume map, list, or tree view, select the volume set on which you want information.

3 Click **Operations ➤ Info**.

The **Volume Set Information** dialog appears.

Information is displayed in tabbed pages. To view a page, click its associated tab, which is always visible at the top of the page. Based on the file system the volume set uses, different pages appear.



4 Click the tab for the page you want to view.

Each page is described in the following sections

5 Click **Close** when you are finished viewing information.

Usage

The **Usage** page displays the following information in bytes, megabytes, and as a percentage:

- Used space in the volume set, including space wasted by clusters.
- Unused space in the volume set.
- Bad space in the volume set.
- Total space in the volume set (the sum of Used, Unused, and Bad space)

ServerMagic also displays this information in a pie chart.

FAT Info

The page applies to volume sets using the FAT16 file systems.

The first section provides the following information:

- **Sectors per FAT** shows the number of sectors in each file allocation table and the number of file allocation tables in the volume set.
- Root directory capacity shows the number of possible entries and the number of sectors in the root directory.
- First FAT sector shows the logical sector number within the volume set where the FAT begins.
- **First Data sector** shows the logical sector number within the volume set where the portion of the volume begins.

The next section provides the following information:

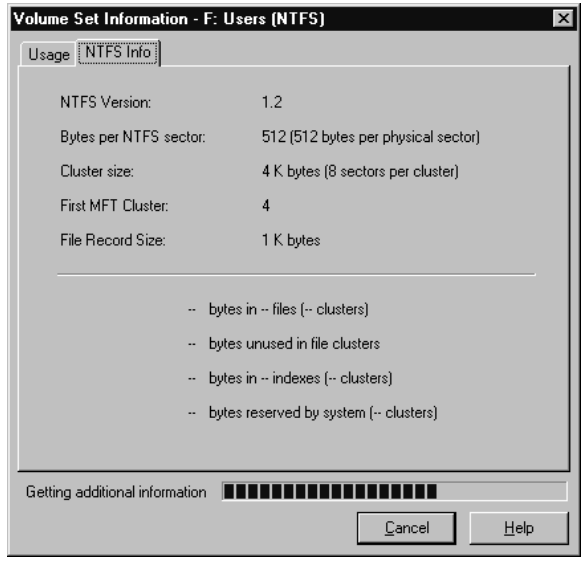
- The number of bytes in files in the volume set, the number of files, and the number of those files that are hidden.
- The number of bytes in directories in the volume set, the number of directories, and the number of those directories that are hidden.

The final section of this page **FAT Extensions**, provides the following information.

- The number of bytes used for long filenames and the number of files and directories using long filenames.

NTFS Info

This page applies to volume sets using the NTFS file system.



- **NTFS Version** shows the version number as reported by the file system. Note that the file system version is not the same as the operating system version.
- **Bytes per NTFS sector** displays the number of bytes in each logical sector on the selected volume set. (There are always 512 bytes in each physical sector.)
- **Cluster size** displays the size of each cluster and the number of sectors in each cluster on the selected partition.
- **First MFT Cluster** shows the logical number of the first cluster in the master file table (MFT).
- **File Record Size** gives the size of the file records in the MFT.

The next section displays information similar to that shown by NT CheckDisk:

- The number of files in the volume set and the bytes and clusters allocated to them
- The number of wasted bytes in file clusters
- The number of indexes (directories) and the bytes and clusters allocated to them
- The number of bytes and clusters reserved for other system structures

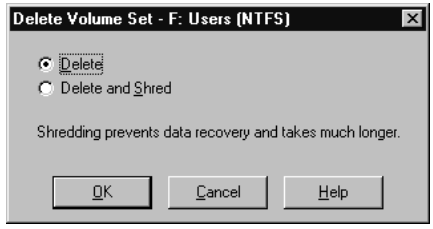
Deleting Volume Sets

The Delete operation deletes a volume set and makes its data inaccessible. The Delete and Shred operation destroys the data on a volume set by overwriting the disk sectors occupied by the volume set.

You cannot delete a volume segment, only a volume set. Additionally, you cannot undelete a volume set.

1. Select the volume set you want to delete.
2. Click **Operations ➤ Delete**.

   The **Delete Volume Set** dialog appears.



3. Click **Delete** or **Delete and Shred**.
4. Click **OK**.

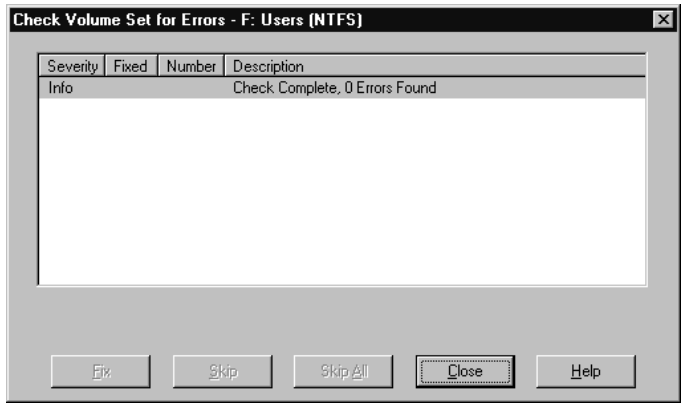
Checking Volume Sets

The Check for Errors operation checks the integrity of a volume set.

1. Click **Operations ➤ Check for Errors**.

   ServerMagic can only check volumes that it can lock (that is volumes that have no open files on them). Consequently, sometimes the Check for Errors option is disabled.

The **Check Volume Set for Errors** dialog appears.



If ServerMagic does not discover any errors, an Info entry appears with “Check Complete” in the **Description** column.

If a Check operation fails, “Check Failed” appears in the **Used** and **Unused** columns in the partition list. You should fix any errors encountered. For more information, see “Resolving Check Errors” on page 121.

If Check for Errors finds an error (such as cross-linked files, lost clusters, or bad directory information on an NTFS volume) and can fix it, the **Fix** button is enabled at the bottom of the dialog.

For each error found, Check for Errors displays the following:

- **Severity** describes the seriousness of the problem, which can be one of the following:

Info	The information given is helpful but not critical. Does not correspond to any error.
Warning	The error may or may not cause problems.
Error	A problem was encountered, but ServerMagic may still be able to make changes to the volume set. If available, click Fix to fix the error. If ServerMagic is unable to fix the error, run CHKDSK /F from the command prompt.
Critical	A catastrophic problem. ServerMagic cannot make any changes to the partition.

- **Fixed** displays Yes for each problem you fix on an NTFS volume.

- **Number** shows a number corresponding to the error. For more information about error messages, see “Error Messages and Solutions” on page 125.
- **Description** gives a brief description of the problem.

2. To fix an error on an NTFS volume, select the problem and click **Fix**.
3. If you want to skip one listed error, click **Skip**. If you want to skip all listed errors, click **Skip All**.
4. When you are finished viewing the check results and fixing NTFS errors, click **Close**.

Check for Errors does not display information about the status and structure of a volume as does DOS, Windows, and OS/2 CHKDSK utilities. To view that information, use the Info option.

ServerMagic checks for OS/2 Extended Attribute errors on FAT partitions. If you do not use OS/2 or previously used OS/2 but no longer do, consider enabling the **Ignore OS/2 EA Errors on FAT** preference, as these errors are not a concern. See “Integrity Checks” on page 42.

Each time SeverMagic is started, it performs a check on all attached drives and their partitions. If the check finds a problem, “Check Failed” appears in the partition list window under the Type column. This check is separate from the Check for Errors operation and is not as exhaustive.

Moving Volume Segments

The Move Segment operation lets you move a volume set segment (not a volume set) to the left, right, or a new location. Note that this operation is available from the Disks window, not the Volume Sets window.

Left or Right

You can move a volume segment to a new location by selecting the segment from the tree view or partition map then dragging and dropping it to adjacent unallocated space on the same hard disk.

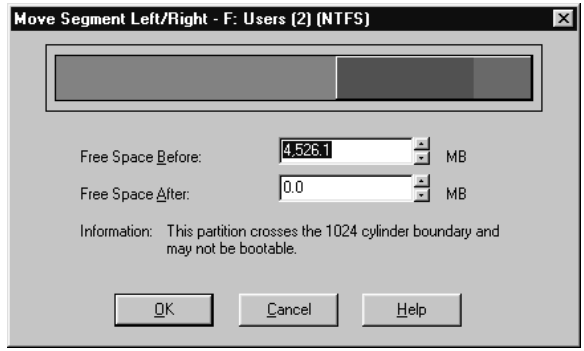
1. Click **Disks** to display the Disks window.

   This operation is available from the Disks Window, not the Volume Sets window.

2. Select the volume segment you want to move.

3 Click **Operations ➤ Move Segment ➤ Left/ Right**.

The **Move Segment Left/Right** dialog appears. The current size of the volume segment is shown on the volume segment map at the top of the dialog.



4 To move a volume segment, place the pointer on the segment and drag it to the desired location.

The hard disk must have free space adjacent to the segment.

The pointer changes when it is located over a segment.

You can also move the segment by typing new values in the Free Space Before, and Free Space After, boxes or by clicking the arrows next to the boxes. The arrow button moves the segment by the minimum increment, allowing you to make fine adjustments. Changes are reflected in the volume segment map.

5 Click **OK**.

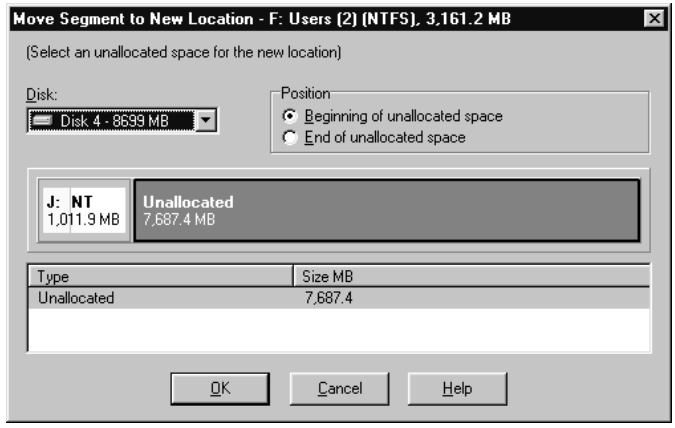
New Location

1 Click **Disks** to display the Disks window.

2 Select the volume segment you want to move.

3 Click **Operations ➤ Move Segment ➤ New Location**.

The **Move Segment to New Location** dialog appears.



4 From the **Disk** drop-down list, select the disk where you want to move the volume segment.

The type and size of the space available is reflected in the partition map and partition list. The disk you select must have a sufficient amount of unallocated space.

5 In the **Position** box, click **Beginning of unallocated space** or **End of unallocated space**.

6 Click **OK**.

CHAPTER 6

Converting Partitions

This chapter includes the following information:

- Procedure for Converting Partitions
- Converting FAT Partitions to FAT32
- Converting FAT Partitions to HPFS
- Converting FAT Partitions to NTFS
- Converting FAT32 Partitions to FAT
- Converting FAT32 to NTFS
- Converting NTFS Partitions to FAT or FAT32
- Converting Partitions to Logical or Primary

Procedure for Converting Partitions

You can convert the following file formats:

- FAT partitions to FAT32
- FAT partitions to HPFS
- FAT partitions to NTFS (Windows NT/2000 only)
- FAT32 partitions to FAT
- FAT32 partitions to NTFS (Windows 2000 only)
- NTFS partitions to FAT
- NTFS partitions to FAT32

You can also convert primary partitions to logical and logical partitions to primary.

You cannot convert FAT or FAT32 partitions to NTFS if you are running ServerMagic from the rescue disks.

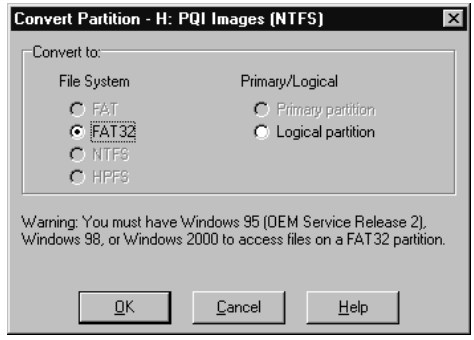
You should not convert file system types on compressed drives. First, uncompress the drive, then run the conversion.

The basic conversion steps (1-5) are found below. However, for each file type there is specific information you need to know before beginning any conversion. Please see the appropriate heading listed in this section before completing the conversion procedure.

1 Select the partition you want to convert.

2 Click **Operations ➤ Convert**.

The **Convert Partition** dialog appears.



3 Under **Convert to**, choose the file system to which you want to convert the partition.

Depending on the file format of the partition you are converting, some options may appear dimmed.

If you want to convert your partition to primary or logical, see "Converting Partitions to Logical or Primary" on page 97.

4 Click **OK**.

Converting FAT Partitions to FAT32

FAT32 partitions have less wasted disk space than FAT partitions. (For more information, see "Resizing Clusters" on page 72.) However, you should be aware of these issues:

- You must have Windows 95 OEM Service Release 2, or Windows 98/Me/2000 to access files on a FAT32 partition. If you run an operating system other than these, FAT32 partitions will be inaccessible when the other operating system is running, even if one of these operating systems is installed on your machine.
- Some laptops have a sleep mode that saves all memory to disk. Because this function sometimes requires a FAT partition, consult your laptop manual or contact the manufacturer before converting to FAT32.
- The minimum recommended size for a FAT32 partition is 256 MB.

The steps for this process are listed on page 90.

Converting FAT Partitions to HPFS

During this operation, ServerMagic preserves data, long filenames (created by Microsoft Windows NT/95/98/Me), and Workplace shell long name Extended Attributes.

WARNING! You must have OS/2 to access files on an HPFS partition. Without it, you will lose all files on the converted partition. Proceed with caution when performing this conversion, as it cannot be reversed.

1 Before you convert, back up the data on your boot drive.

Because the conversion cannot be reversed, we strongly recommend that you take this precautionary step.

If a Corrective Service Facility (CSF) has been applied to your version of OS/2, you must make new Install/Utility diskettes and use them in place of your original OS/2 diskettes.

2 Reboot your system from a diskette, from a partition other than the one you are converting, or from DOS.

3 Run ServerMagic from a partition other than the one you are converting.

4 Follow the conversion steps listed on page 90.

5 If you have open files, a prompt appears indicating that the changes you have made require rebooting. Click **OK** to make the changes. After the changes are made, the computer is rebooted.

If you do not have any open files, the **Batch Progress** dialog appears. When all operations are complete, click **OK** to return to the ServerMagic main window.

IMPORTANT! Complete the remaining steps only if the partition you converted to HPFS contains OS/2.

6 Copy SYSINSTX.COM from the OS/2 Installation Disk to the root of the new HPFS partition.

7 Copy UHPFS.DLL from the OS/2 Disk 2 to the root of the new HPFS partition.

If you have an OS/2 CD-ROM, consult your IBM documentation for instructions on creating a diskette from the disk image.

8 Change to the new HPFS partition by typing *`drive:`* (where *`drive`* is the drive letter of the partition you converted from FAT to HPFS).

9 From the root of the new HPFS partition, type `SYSINSTX` *`drive`*`:` (where *`drive`* is the drive letter of the partition you converted from FAT to HPFS).

10 Verify that HPFS.IFS is listed in the CONFIG.SYS file similar to the following:

```
IFS=C:\OS2\HPFS.IFS /CACHE:256 /CRECL:4 /AUTOCHECK:C
```

If this line is not present, add it, replacing **C:** and **:C** with the drive letter of the partition you just converted.

IMPORTANT! If you want to be able to boot to the command line using **<Alt+F1>**, make this change to all CONFIG.* files in \OS2\BOOT.

11 Verify that HPFS.IFS is present in the OS2 directory. If not, copy it from OS/2 Installation Disk 1.

Your HPFS partition is now bootable.

Converting FAT Partitions to NTFS

The Convert FAT to NTFS operation launches the Microsoft Convert utility to convert a FAT partition to NTFS. You must be running Windows NT/2000 to complete this conversion. This cannot be performed from the rescue diskette.

If you boot multiple OSs, you must be careful converting FAT to NTFS. NTFS is only accessible from Windows NT or Windows 2000; therefore, the data in this partition will not be accessible if you boot DOS or Windows 95/98/Me.

After clicking **OK**, if you have no operations pending and if Windows NT/2000 can lock the partition (no open files), the FAT partitionis converted. If you have operations pending, you must apply them first before converting from FAT to NTFS. If you do not apply the operations, a prompt appears asking if you want to apply the changes now before converting your FAT partition. Click **OK** to apply the changes and continue with the conversion.

If you have any open files a message appears indicating that the convert utility cannot gain exclusive access to the drive and asks if you want to schedule the conversion the next time the system restarts. If you type `Y`, the conversion takes place automatically the next time you reboot your computer. It is recommended that after typing `Y`, you close ServerMagic and manually reboot to convert the partition.

Converting FAT32 Partitions to FAT

To complete this conversion, the partition must have at least 300-400 MB of unused space because of how the FAT file system allocates disk space for file storage.

If the FAT menu option is dimmed, your FAT32 partition contains over 2 GB of data. If the partition size is over 2 GB but it contains less than 2 GB of data, you can convert the partition (without data loss), but the new partition will be 2039 MB.

During the conversion, ServerMagic may report too many root directory entries (the maximum number of entries in a FAT partition's root directory is limited, unlike a FAT32 partition's root directory). In this case, move or copy some of the files in the root directory to another location and then start the conversion again.

Converting FAT32 to NTFS

The Convert FAT32 to NTFS operation launches the Microsoft Convert utility to convert a FAT32 partition to NTFS. You must be running Windows 2000 to complete this conversion.

Be aware that data in an NTFS partition will not be accessible if you boot DOS or Windows 95/98/Me.

The steps for this process are listed on page 90.

After clicking **OK**, if you have no operations pending and if Windows 2000 can lock the partition (no open files), the FAT32 partition is converted. If you have operations pending, you must apply them first before converting from FAT32 to NTFS. If you do not apply the operations, a prompt appears asking if you want to apply the changes now before converting your FAT partition. Click **OK** to apply the changes and continue with the conversion.

If you have any open files a message appears indicating that the convert utility cannot gain exclusive access to the drive and asks if you want to schedule the conversion the next time the system restarts. If you type `Y`, the conversion takes place automatically the next time you reboot your computer. It is recommended that after typing `Y`, you close ServerMagic and manually reboot to convert the partition.

Converting NTFS Partitions to FAT or FAT32

Converting an NTFS partition to FAT allows you to view the contents of the partition from DOS, Windows 9x, or Windows Me, as well as Windows NT and Windows 2000.

Converting an NTFS partition to FAT32 allows you to view the contents of the partition from Windows 95b/98/Me/2000. However, a FAT32 partition will not be accessible to Windows NT.

IMPORTANT! You will lose file system-specific information when converting from NTFS to FAT. Refer to "NTFS Information Lost When Converting to FAT or FAT32" on page 95 for additional information.

If the conversion fails when you apply changes, refer to the bulleted list on page 95 for a list of possible reasons.

Restrictions on Converting NTFS Partitions to FAT or FAT32

NTFS is an advanced version of FAT and FAT32. Therefore, depending on the NTFS features used on the partition, the type of data, and partition size, you may or may not be allowed to complete the conversion.

If you receive an error message and the conversion stops, it is usually caused by one or more of the following:

- The file system for conversion is not allowed for the current partition size. A FAT32 partition should be greater than 256 MB, and a FAT partition must be less than 2 GB.
- The NTFS partition has data in memory that has not yet been written to the hard disk.
- The file system has errors, such as lost clusters and cross-linked files. You can fix these problems, then try the conversion again.
- There is not enough temporary space in the partition to do the conversion. The conversion will require the NTFS system and the FAT32 system files until the last step of the conversion. Also, there is data in NTFS File Replication Services that must be moved to external clusters and saved.

NTFS Information Lost When Converting to FAT or FAT32

If you can complete the conversion from NTFS to FAT or FAT32, you may receive a warning about the quality of data and feature loss, depending on the features used on the partition, the type of data, and the partition size.

Warning	Description
Error	The conversion is not allowed. Because the partition being converted is using advanced features in NTFS, you could experience unintended data and feature loss. You will receive an error in one or more of the following cases: • There is more than one data stream for any file. • Any links. • Any extended attributes. • Any user-defined attributes in any file. • Device entries. • There are sparse files on the volume. Any sparse files, except for the bad sector file, will stop the conversion.

Warning	Description
Warning	The conversion is allowed. Although a conversion warning is not as serious as an error, you may still experience the loss of NTFS-specific features that are not supported in FAT32. You will receive a conversion warning in one or more of the following cases: • Disk usage quotas - NTFS supports limiting the amount of disk space for a user. After conversion, all users will have full access to all free hard disk space. • Access control lists - This is a file attribute that lists all the users that can access a file. After conversion, all users will have full access to all files. • Index of access control lists - A list of all files that have specific access rights assigned to them. After conversion, all users will have full access to all files. • FAST index file - This file is sometimes created on Windows 2000 computers. After conversion, all indexing of keywords will be lost. • Old versions of files - NTFS has the ability to keep versions of files, however, only the current version of the file is converted and saved.
No Warning	The conversion is allowed. The most basic NTFS partition still gives files more features than are found in FAT or FAT32. When Windows NT 4.0 is used to copy files from an NTFS partition to a FAT partition, no warning is given about the features you are losing. Also, the conversion will not give you a warning about specific features that cannot be converted. These features include: • Standard journal file (only used internally by NTFS) - This file is a transaction log of changes to the NTFS file system. After conversion, the journal file will be lost.

Warning	Description
	• NTFS-specific file attributes - NTFS and FAT both have standard file attributes, such as Read-only, Archive, Hidden, and System. NTFS has additional file attributes that can be set. After conversion, however, these additional file attributes will be lost. • NTFS-specific file dates - The last edit date is converted to the FAT date. After conversion, the creation date, last access date, and last edit date (date change only) will be lost. • Reliable change journal - This journal file is new to Windows 2000. After conversion, this file will be lost.

Converting Partitions to Logical or Primary

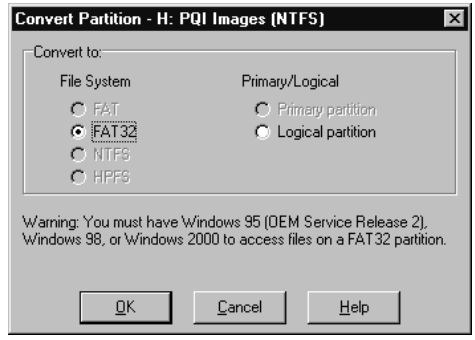
You might want to convert a primary partition to a logical partition if you have reached the limit of primary partitions on your hard disk. If you create a logical partition, ServerMagic will automatically place it in an extended partition. You can then create more logical partitions within that extended partition, expanding the maximum number of partitions on the disk.

You might want to convert a logical partition to a primary partition if you plan to install an operating system on it. The partition must be a primary partition to be bootable.

IMPORTANT! If you convert a primary active partition to logical (such as your Windows NT/2000 system partition), your computer will not boot from the hard drive.

1. From the **Disk** drop down list (located on the toolbar), select the disk containing the partition you wish to convert.
2. On the partition map, list, or tree view, select the partition you want to convert.
3. On the toolbar **Operations ➤ Convert**.

The **Convert Partition** dialog appears.



4 Click either **Primary** or **Logical**.

5 Click **OK**.

You cannot convert from primary to logical if another primary partition exists between the chosen partition and an existing logical partition.

You cannot convert from logical to primary if the conversion would result in more than four primary partitions or if the selected partition has one or more logical partitions to the left. For example, if you had a primary partition C: and logical partitions D:, E:, and F:, you could convert D: to primary, but you could not convert E: or F:.

CHAPTER 7

Automating Tasks

This chapter includes the following information:

- Wizard Overview

  Running Wizards

  Applying Changes

  Create New Partition Wizard

  Resize Partitions Wizard

  Redistribute Free Space Wizard

  Merge Partitions Wizard

  Hiding Wizard Icons
- Scripting

Wizard Overview

ServerMagic includes five wizards for common tasks. The wizards provide an alternative to performing the tasks manually using the commands on the **Operations** menu.

Running Wizards

There are two ways to run a wizard:

- Click **Wizards** on the menu bar, then click the wizard you want to run.
- Click the appropriate wizard icon in the ServerMagic main window.

Applying Changes

When you complete a wizard, the partition map and partition list in the main window reflect the changes you entered. However, the changes do not actually affect your system until you apply them.

You can apply (or discard) changes that you enter using wizards in three ways:

- Click  on the toolbar to apply the changes, or click  on the toolbar to undo the changes and start over.
- Click **General ➤ Apply Changes** (or **Discard All Changes** or **Undo Last Change**).
- Click the **Apply Changes** or **Undo Last** icon at the bottom of the main window.

After running a wizard, you can run other wizards or perform other partition operations and then apply or discard all the pending changes at once.

Create New Partition Wizard

The Create new partition wizard creates a new primary or logical partition.

You should be aware of the following considerations when creating a new partition:

- The file system you choose for the new partition will affect which operating systems can access the partition. The wizard dialogs will instruct you about the choices you make. For example, if you choose to create a FAT32 partition, the wizard will inform you that FAT32 partitions are used by Windows 95 OEM Service Release 2, and Windows 98/Me/2000 but that Windows 3.x and DOS cannot access them. Pay close attention to the information in the dialog boxes, or you may inadvertently make your data inaccessible.

- Before installing Windows NT, make sure that all the partitions that you want Windows NT to recognize end prior to cylinder 1024. Otherwise, Windows NT will not install and will report that all the partitions are corrupted. If you cannot resize and move all partitions, you must obtain updated drivers (Service Pack 5) from Microsoft before installing Windows NT.
- After you apply the changes, your computer may reboot if the wizard resized any existing partitions. Also, on recognized partition types, the wizard will make the drive letter assignments, not the operating system.

Resize Partitions Wizard

The Resize Partitions wizard helps you resize a partition and lets you specify how the resize will affect other partitions on the same disk. For example, if you have C: and D: partitions and you choose to enlarge C:, the wizard could take space from D: and allocate it to C:.

For information about resizing partitions without the wizard, see “Resizing and Moving Partitions” on page 42.

Redistribute Free Space Wizard

The Redistribute free space wizard spreads the free space on a hard disk evenly across partitions. Free space refers to unused space within partitions and space that is not allocated to any partition.

You can redistribute free space on one hard disk at a time. You cannot redistribute free space across several disks.

For information about redistributing free space without the wizard, see “Resizing and Moving Partitions” on page 42.

Merge Partitions Wizard

The Merge Partitions wizard helps you merge two adjacent FAT or FAT32 partitions. You choose two partitions, and the first will be expanded to include the second. The contents of the second partition are added as a folder inside the first partition.

Copy Partition Wizard

The Copy Partition wizard Helps you make an exact duplicate of a partition. The copy is the same size (or slightly different if copied to another physical disk with a different geometry) and file type and contains the same data as the original. When you copy a

partition, you specify the hard disk and the unallocated space where you want to place the copy. If necessary, the wizard will resize neighboring partitions to create sufficient space to perform the copy.

Hiding Wizard Icons

You can choose whether to display the wizard buttons near the bottom of the ServerMagic main window. Hiding the wizard buttons increases the display area of the partition list.

1 Click **View ➤ Wizard Buttons**.

A check mark displays by the menu command if the wizard buttons are displayed. Choose the command again to redisplay the buttons.

The setting you choose will remain in effect until you reset it.

Scripting

ServerMagic includes the ability to change the partitions on a computer by running a script that you create with ScriptBuilder. The script is an ASCII file with text statements that define the operations to take place. To run a script, you pass the script filename to the program on the command line.

For additional information about script processing, refer to the ServerMagic online help or the SMSCRIPT.PDF file on the ServerMagic CD.

CHAPTER 8

Remote Agent

This chapter includes the following information:

- Remote Agent Overview
- Creating Remote Agent Boot Disks
- Using the Remote Agent Boot Disk
- Accessing a Remote Server

Remote Agent Overview

Remote Agent (RA) is a DOS application that is executed on a server that ServerMagic can contact across the wire using a TCP/IP connection. Using Remote Agent, you can:

- Copy or move partitions between the remote server running the Remote Agent boot disk and the Windows NT/2000 server running ServerMagic
- Copy and consolidate a volume set on the Windows NT/2000 Server running ServerMagic to a new partition on the remote server running the Remote Agent boot disk
- Delete a remote partition
- Create a remote partition
- Check the integrity of a remote partition

You cannot copy or move partitions from one hard disk on the remote server to another hard disk using Remote Agent because it would cause too much network traffic. Instead, after you have copied or moved data to a remote server, you should reboot the server without using Remote Agent, start Windows NT, and use ServerMagic locally. You can also run ServerMagic locally to resize partitions and perform other operations that are not available with the Remote Agent. (This scenario assumes that you have ServerMagic licenses for both servers.)

Three-Step Process

Using the Connect Remote Agent involves three steps:

1. Create the remote agent boot disks using the Boot Disk Builder program. Refer to the Boot Disk Builder online Help file for instructions on creating the remote agent boot disks.

   You will use the disks to boot the remote server, so the NetWare or Windows NT/2000 server running ServerMagic can communicate with the remote server.

2. Boot the remote server using the Remote Agent boot disks you created in step 1.

3. Access the remote server (using the Connect Remote Agent option) from the Windows NT server running ServerMagic.

   You are ready to perform operations between the Windows NT/2000 server and the remote server.

   Partitions on the remote drive will appear in the tree view on the left side of the main window, so you can choose them like you would any local partition.

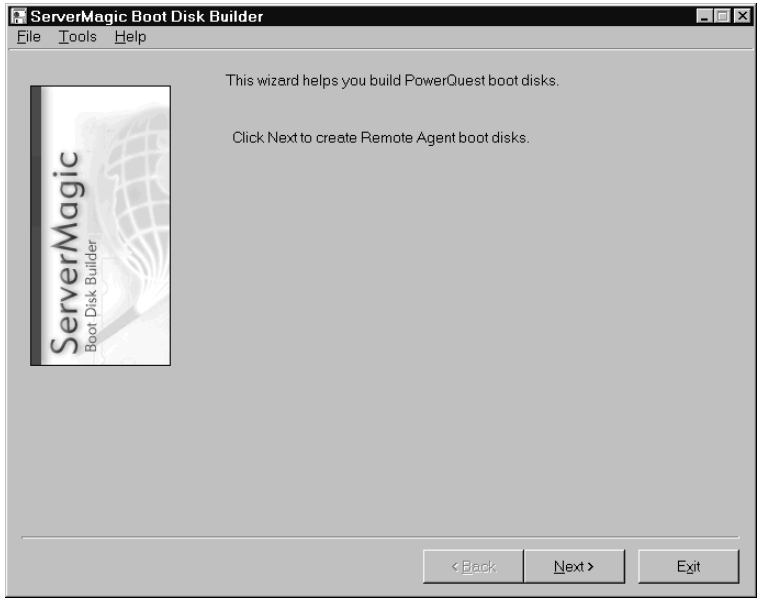
Creating Remote Agent Boot Disks

You must create Remote Agent boot disks to run Remote Agent. You can create the disks with Boot Disk Builder or with a DOS batch file.

Boot Disk Builder

Boot Disk Builder helps you build a boot disk to run Remote Agent. Boot Disk Builder is installed when you install ServerMagic.

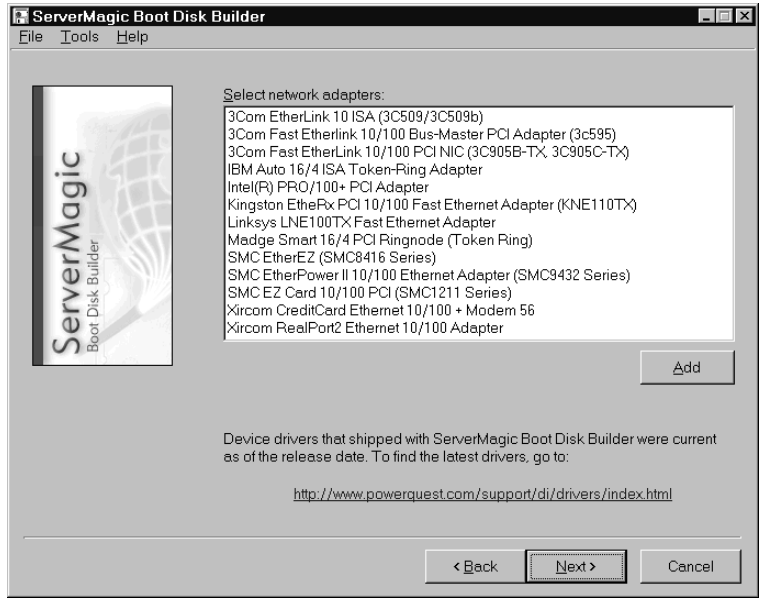
1 From the Windows taskbar, click **Start ➤ Program Files ➤ ServerMagic 4.0 ➤ Boot Disk Builder**.



2 From the Boot Disk Builder window, click **Next**.

To retrieve a configuration file, click **File ➤ Load Configuration** from the main Boot Disk Builder screen, choose the configuration file (*.BDC) you want, then click **Open**.

3 If your network adapter is listed, go to step 8. If your network adapter is not listed, click **Add**, specify the location of the driver information file (*.INF) for your network adapter, then click **Next**.



4 Choose one or more adapters from the list, then click **Next**.

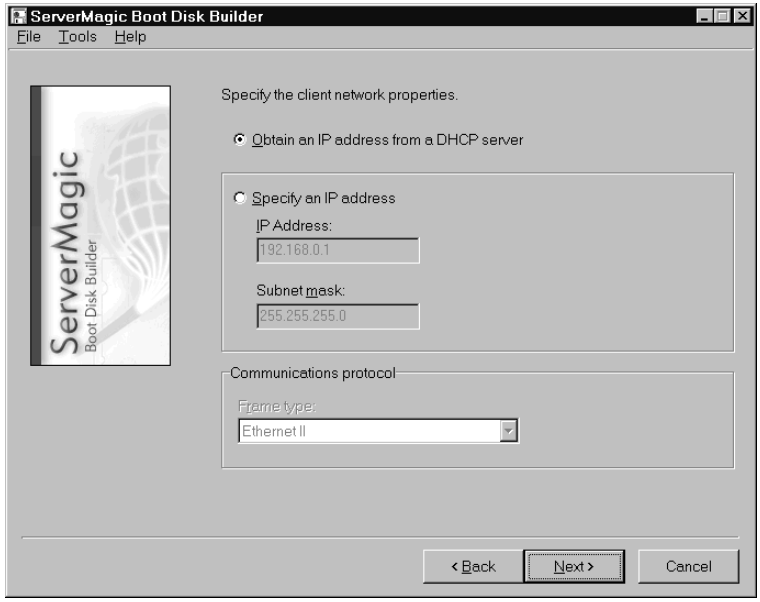
5 Specify the Novell NetWare DOS client driver file, then click **Next**.

6 Specify the Microsoft TCP/IP NDIS DOS driver file, then click **Next**.

7 Click **Finish**.

8 Select the network adapter you are using from the list box.

9 Click **Next**.

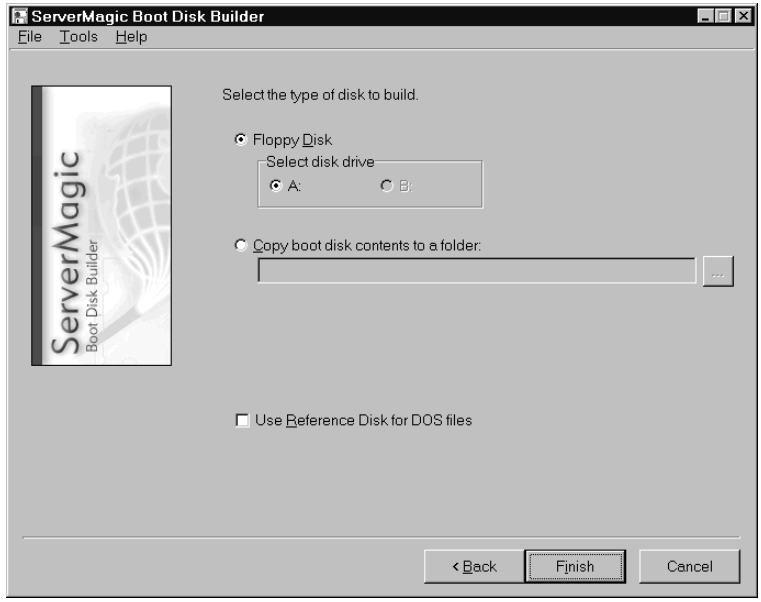


10 Click **Obtain an IP address from a DHCP server** if a DHCP server is used (the net mask and default gateway are automatically provided).

Or specify the IP address and subnet mask if there is no DHCP server.

Ethernet II will display as the frame type for your network.

11 Click **Next**.



12 Click the drive letter where you are creating the DOS boot diskette, or click **Copy boot disk contents to a folder** and specify the full path to the folder you want.

13 Insert a formatted diskette.

If you have a boot disk and you want to use your regular DOS files instead of the Caldera DOS files included with Boot Disk Builder, complete the following items:

a Insert your boot disk, then click **Tools ➤ Load DOS Reference Diskette ➤ From A:.** The files from your boot disk will be copied to a REFDISK directory where Boot Disk Builder is installed. If there are too many to incude along with the necessary files that Remote Agent needs, you can delete everything but CONFIG.SYS and any drivers started within the CONFIG.SYS file.

b Select **Use Reference Disk for DOS Files** at the bottom of the dialog box.

c Remove your original boot disk and insert a formatted disk that will become the Remote Agent boot disk. (If you do not remove your original disk, Boot Disk Builder will overwrite the files on it.)

14 If you want to save your choices for later use, click **File ➤ Save Configuration**, then name and save the file.

15 Click **Back** to make any changes, or click **Finish** to build the boot disk.

Depending on the network interface card selected, the network and Remote Agent files may require two diskettes. You will be prompted if a second diskette is needed.

After the boot disk has been created, you can create another boot disk.

When you use the boot disk, Remote Agent will start, and you can specify the IP address settings. You can then perform operations "across the wire."

Boot Disk Files

The Remote Agent boot disk will contain the following files:

- COMMAND.COM
- Device drivers for your network card
- AUTOEXEC.BAT
- LSL.COM
- MOUSE.COM
- NET.CFG
- RA.EXE
- WATTCP.CFG

If the remote server has a bootable partition, you can copy the files from the boot disk to that partition and run the Remote Agent from the hard disk.

Using the Remote Agent Boot Disk

1 Insert the RA boot disk into the floppy drive of the remote server, and boot the server.

The Remote Agent dialog box appears. Notice that it is waiting for a connection from ServerMagic on the Windows NT/2000 server.

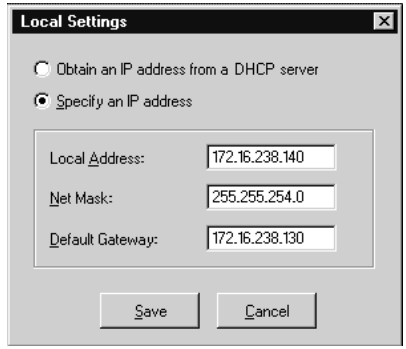
Specifying the IP Address of the Remote Server

The first time you run RA on the remote machine, you may need to specify network configuration settings.

1 From the **Remote Agent** dialog box, click **Settings**.

2 Click **Obtain an IP address from a DHCP server** if a DHCP server is used.

Or, click **Specify an IP address**, then enter a static local address, net mask, and default gateway.



3 Click **Save**.

The information you specify in the **Local Settings** dialog is saved in the WATTCP.CFG file on the boot disk.

Notice that the Remote Agent is now ready and waiting for a connection from ServerMagic on a Windows NT/2000 server. After a connection is established, you can send operations (such as copying a partition) from the Windows NT/2000 server to the remote server.

Accessing a Remote Server

After you have booted the remote server using the Remote Agent boot disk, you are ready to access the remote machine from ServerMagic on the Windows NT/2000 server.

1 From the Windows NT/2000 server machine, run ServerMagic.

2 Click **General ➤ Connect Remote Agent**, or click  on the toolbar.

3 Type the local IP address of the server running the Remote Agent.

4 Click **Connect**.

5 Choose the operations you want to perform on the remote machine.

Operations that are not available are dimmed on the menu.

CHAPTER 9

Creating a New Boot Drive

This chapter includes the following information:

- Installing a New Server Disk
- Reusing the Old Server Disk

Installing a New Server Disk

ServerMagic is particularly useful if you have a new, larger hard disk that you want to become the boot disk for your server. Not only does ServerMagic save you the time of reinstalling Windows NT, it also ensures that the new server disk contains exactly the same information as the old server disk.

To move your server installation from an old hard disk to a new hard disk:

1. Install any drivers you may need for the new drive onto the server operating system.

   Usually this step is required only if you are installing a new I/O card on your system and you did not install the drivers previously.

2. Shut down the server and turn off the power.

3. Install the new drive as a non-boot device.

   This step may require changes to the drive jumper, BIOS, or I/O card settings. Consult your hardware manuals for more information.

4. Power on the server and configure the drive.

   This step is necessary only if you are adding a new RAID system and need to set the RAID level before booting to the operating system.

5. Boot the server to the operating system.

6. Use ServerMagic to copy all partitions on the current drive to the new drive.

7. Resize the partitions as desired.

8. Designate the operating system partition on the new drive as the active partition.

9. Apply all your changes in ServerMagic.

   ServerMagic will reboot the server and apply all changes in boot-time mode.

10. Immediately after ServerMagic applies all the operations and reboots the server, turn off the power.

11. Remove the old drive from the server. Keep the drive unchanged until you confirm that the new disk boots properly.

12. Change the new drive to be the boot device.

This step may require changes to the drive jumper, BIOS, or I/O card settings. Consult your hardware manuals for more information.

13 Turn on the server.

The server should boot from the new disk. Make sure that all drive letters on your server match the drive letters previously assigned.

Windows NT/2000 will detect changes to the operating environment and may reassign drive letters on the new drive to a different order from what you had previously. The drive letters must be in the same order on your new drive for your server to function properly. If the Windows NT/2000 operating system partition drive letter is incorrect you may need to reboot your server more than once to return it back to the desired letter.

Reusing the Old Server Disk

After confirming that the new hard disk is working properly, you can reuse the old server hard disk.

1 Shut down the server and turn off the power.

2 Install the old drive as a non-boot device.

This step may require changes to the drive jumper, BIOS, or I/O card settings. Consult your hardware manuals for more information.

3 Boot the server to the operating system.

4 Use ServerMagic to delete all partitions and create new partitions on the old drive.

APPENDIX A

Using ServerMagic With Other Programs

This appendix includes the following information:

- Virus Protection Software
- Operating System Boot Utilities
- Compaq Insight Manager (CIM)

Virus Protection Software

Norton AntiVirus

Because Norton AntiVirus (NAV) interprets changes to partition tables and boot records as potential virus attacks, ServerMagic takes steps so that NAV automatically reinoculates. If NAV gives you the choice of repairing the changes, *do not* select **Repair**. Instead, inoculate after using ServerMagic.

Other Virus Protection Software

ServerMagic modifies the master boot record and partitions' boot sectors. Virus protection software should be able to detect that ServerMagic is changing partition tables and not boot code; however, virus protection programs could mistake ServerMagic's changes as attempts to install a virus. If this occurs, turn off the virus protection program while using ServerMagic and inform the virus protection software manufacturer of the problem.

Some motherboards contain virus protection software within the BIOS. If this causes a problem when you are running ServerMagic, disable the BIOS virus protection, then restart ServerMagic.

Operating System Boot Utilities

Both OS/2's Dual Boot and System Commander 2.0 accommodate boot sector changes made by ServerMagic. To install System Commander on drives that ServerMagic has modified, you may have to use System Commander 2.06 or later.

If you use System Commander, you must configure it so that it does not simultaneously unhide multiple primary partitions. Complete these steps for each operating system selection on the System Commander menu:

1. On the **Operating System Selection** menu, select an operating system.
2. Press <Alt+S>.
3. From the resulting menu, select the **Local Special Options** menu.
4. Click **Primary partitions accessible on drive 0**.

   A screen appears with three options: **ALL**, **AUTO**, and **NONE**. **AUTO** is the default. Select **NONE**.

   The other primary partitions will now be hidden when this operating system boots.

Compaq Insight Manager (CIM)

When you attempt to run ServerMagic on a Compaq server in which CIM Agents are installed and running, you may receive error 10,032. This error occurs because ServerMagic must access your drives at levels CIM Agents do not allow. To avoid this problem, you must stop all CIM Agents on the server and then run ServerMagic. (Refer to your CIM Agent documentation if you are unsure how to stop CIM Agents.) After ServerMagic has completed all operations, you can safely restart the CIM Agents.

APPENDIX B

Troubleshooting

This appendix includes the following information:

- General Troubleshooting

  Freeing Memory to Run ServerMagic under DOS

  Assigning a CD-ROM Drive Letter

  Using ServerMagic With a SCSI Hard Disk

  Resolving Check Errors

  Resolving Partition Table Errors

  Partition Tables and Viruses

  Partition Will Not Boot After Resizing
- Generating Diagnostic Reports with PartitionInfo
- Error Messages and Solutions

General Troubleshooting

This section addresses the following situations:

- Freeing Memory to Run ServerMagic under DOS
- Assigning a CD-ROM Drive Letter
- Using ServerMagic With a SCSI Hard Disk
- Resolving Check Errors
- Resolving Partition Table Errors
- Partition Tables and Viruses

Freeing Memory to Run ServerMagic under DOS

The DOS ServerMagic executable requires a minimum of 585 KB of memory in the first 640 K of the computer's address space (conventional memory). If you do not have sufficient conventional memory, there are several ways you can free additional memory.

Running MEMMAKER

MEMMAKER is a program that automatically configures your computer to save conventional memory (while still loading all of the device drivers and other programs you usually load when booting DOS). MEMMAKER frees conventional memory by moving as many programs as possible out of conventional memory into high memory. Run MEMMAKER by typing MEMMAKER at a DOS prompt. Follow the on-screen instructions.

MEMMAKER is only available in DOS 5.0 to 6.22. It is not available in Windows 95 or Windows 98 DOS mode.

Using the F8 Key to Keep Programs From Loading

Press <F8> immediately after booting your computer (while DOS is booting). As DOS reads the each command in the CONFIG.SYS and AUTOEXEC.BAT files, it asks if you want the command executed. When you see commands that load device drivers or TSR programs not needed to run ServerMagic, press **N** so that the software is not loaded into memory.

Deleting Operating System Compression Files

If you use DOS 6.22, Windows 95, or Windows 98 and your system does not have any compressed drives (using programs such as DriveSpace, DoubleSpace, and Stacker), you can delete the operating system compression files, DRVSPACE.BIN or DBLSPACE.BIN, from any boot diskette you create. This frees conventional memory because DOS 6.22, Windows 95, and Windows 98 load these files into memory, regardless of the contents of CONFIG.SYS and AUTOEXEC.BAT.

DRVSPACE.BIN and DBLSPACE.BIN are hidden system files. To delete them, complete the following:

1. Place your boot diskette in your diskette drive.

1. Go to a DOS prompt.
2. Type **A:** and press **<Enter>**. You should see **A:\>** on your screen.
3. Type `ATTRIB -R -H -S *.BIN`, and press **<Enter>**.
4. Type `DEL *.BIN` and press **<Enter>**.

Assigning a CD-ROM Drive Letter

ServerMagic does not allow you to assign drive letters to CD-ROM drives or other removable media drives. Use Disk Administrator to perform these operations.

Using ServerMagic With a SCSI Hard Disk

To use ServerMagic on a SCSI hard disk, you must have a SCSI controller card that supports software Interrupt 13. Most SCSI controller cards let you enable software Interrupt 13 support in the BIOS through the card. If your SCSI controller card does not, contact the manufacturer to determine if your adapter can support software Interrupt 13. As a general rule, if you are able to use FDISK to partition the disk, you will also be able to use ServerMagic.

Resolving Check Errors

ServerMagic checks the integrity of a partition thoroughly before making changes to it. The Check for Errors and Info operations perform the same checks and display error messages when they discover problems. For more information, see “Checking Partitions for Errors” on page 56 and “Getting Information About Partitions” on page 61. These checks are similar to those made by Windows NT CHKDSK.

ServerMagic also checks a partition after modifying it. While data loss is possible, it is not typical. The problem is usually a minor file system error that CHKDSK /F can correct without data loss. For more extensive errors, you may need to restore your files from a backup copy. If problems persist, report the problem to PowerQuest technical support.

If you receive an error message on any partition, back up your hard disk and then run CHKDSK on that partition; do not use the /F switch on the initial run. CHKDSK generally discovers the same problems as ServerMagic.

If CHKDSK does not show the same errors as the Check for Errors operation, contact PowerQuest technical support.

If CHKDSK and the Check for Errors operation detect the same errors, which is usually the case, run CHKDSK /F to fix the problems. Then run CHKDSK again without the /F switch to ensure that the partition is error free.

When CHKDSK reports no errors on the partition, run the Check for Errors operation. If ServerMagic still reports a problem, reformat the partition and restore your files from the backup copy.

Resolving Partition Table Errors

Partition table errors are errors in the 100 - 199 range. In most cases, you must resolve partition table errors by creating new, error-free partition tables. The general steps are: (1) ensure you have no viruses (see below), (2) back up the data on the affected partitions, (3) delete the partitions, (4) recreate them, and (5) restore their contents. You may need to use the FDISK program from a recent DOS version, as earlier versions may refuse to delete HPFS or hidden partitions, and the OS/2 FDISK program may recognize the partition's corruption and refuse to modify it.

In some cases, you can resolve partition table errors manually. Run PartitionInfo to determine the errors on your partitions. PowerQuest technical support can help resolve partition table errors if you e-mail the PartitionInfo report to **help@powerquest.com**. Refer to "Generating Diagnostic Reports with PartitionInfo" on page 123 for additional information about PartitionInfo.

Partition Tables and Viruses

If partition changes made under one operating system are not reflected under another, and vice versa, a master boot record (MBR) virus may be present.

Use a virus check utility that can detect the latest viruses. If a virus is found, data loss is likely. Before removing the virus, boot each operating system and use the Check for Errors operation to evaluate the integrity of the partition. Back up the files on any partition that

passes the Check for Errors operation. Then remove the virus and perform the Check for Errors operation on the partitions again. Delete and recreate any partitions that fail the check. Finally, reinstall the operating systems and restore the backup files as necessary.

Partition Will Not Boot After Resizing

Occasionally, resizing a FAT partition displaces the first few files on the partition (such as IO.SYS and MSDOS.SYS if the partition contains an operating system). If you resize a boot partition and then it fails to boot, run SYS.COM from DOS or from the ServerMagic rescue diskettes.

Generating Diagnostic Reports with PartitionInfo

PartitionInfo generates a report showing the contents of your hard disk partition table. This information is helpful in resolving various partitioning problems.

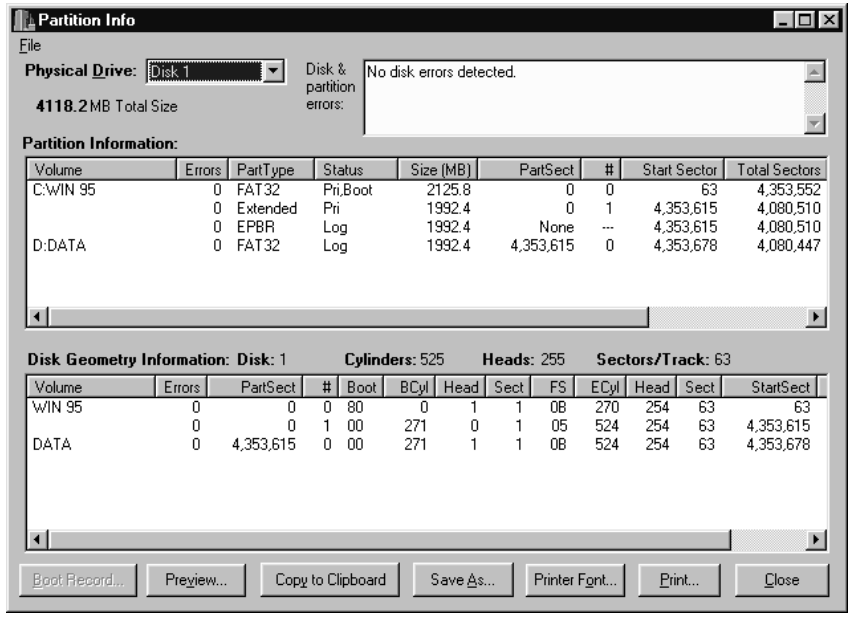
You can run PartitionInfo under Windows 95, Windows 98, Windows Me, Windows NT, and Windows 2000. Under DOS or Windows 3.x, run PARTINFO.EXE (see page 125).

Every time you run ServerMagic, it creates a snapshot file PQ_DEBUG.TXT that includes information about all the disks and partitions on your machine. The file is saved in the %SystemRoot%\system32 directory. The PQ_DEBUG.TXT file may be beneficial for PowerQuest technical support if you call PowerQuest for help resolving problems with ServerMagic.

1 Click **Start ➤ Program Files ➤ PowerQuest ServerMagic 4.0 ➤ PartitionInfo**.

  The PartitionInfo window appears, displaying partition and disk geometry information and disk and partition errors. Disk geometry information includes data from the master boot record and the extended partition boot records.

Only errors that display in the box near the top of the screen indicate problems. Do not be concerned with Warnings and Infos in the bottom two boxes.



2 From the **Physical Drive** drop-down list, select the disk for which you wish to view information.

3 You can save the PartitionInfo report as a file, or you can print it.

To do this:	Do this:
Save the report as a file	Click **Save As**. In the Filename box, type a name for the file. Click **Save**. (Columns of information are separated by tabs, so you can open the file in a word processor and easily format the report.)
To change the font for a printed report	Click **Printer Font**. Select the desired font, font style, size, and so forth. Click **OK**.
To change printer setup	Click **File ➤ Printer Setup**. We recommend that you set the page orientation to landscape to avoid text being cut off at the right margin.
To print a report	Click **Print**, then click **OK**.

4 To exit PartitionInfo, click **Close**.

Generating Diagnostic Reports with PARTINFO.EXE

You can also run PARTINFO.EXE from the first rescue disk to get partition information. The PARTINFO program provides essentially the same information as the PartitionInfo program but without the Windows interface.

1 Boot the computer to DOS.

2 Insert the first rescue diskette, and change to the drive the diskette is in.

3 You have several options for running PARTINFO.

To do this:	Do this:
To display partition information on your screen	Type `PARTINFO`, then press <Enter>.
To send a report directly to your printer	Type `PARTINFO >LPT1` or `PARTINFO >PRN`, then press <Enter>.
To save the report as a text file on a floppy disk	Type `PARTINFO >A:\PARTINFO.TXT`, then press <Enter>.

Error Messages and Solutions

ServerMagic error messages and possible solutions are listed below by number. The messages are also grouped in number ranges by error category.

If you encounter an error not mentioned in this appendix, visit PowerQuest's web site at *support.powerquest.com* and click **Master Error List** to display for a current listing. Error message information on the web site is available in English only.

Miscellaneous Errors (3–38)

#3 Not enough memory

This error can occur when you are resizing, moving, or copying an extremely large partition (60 GB) or when manipulating smaller partitions in DOS with EMM386 loaded. EMM386 limits the amount of memory the program can access. To solve the problem, modify your CONFIG.SYS file by commenting the EMM386 line. For more information about memory requirements, see "ServerMagic System Requirements" on page 16.

The DOS ServerMagic executable requires a minimum of 585 KB of memory in the first 640 KB of the computer's address space (conventional memory) and 8 MB of total memory. For possible solutions if you have insufficient conventional memory, see "Freeing Memory to Run ServerMagic under DOS" on page 120.

#8 Could not allocate/deallocate DOS real mode memory

The DOS ServerMagic executable running under DOS, Windows 3.x, Windows 95, and Windows 98 requires some memory in the first 1 MB of the computer's address space. (ServerMagic uses a DOS extender.) If not enough memory is available, ServerMagic cannot access the hard disk. For possible solutions, see "Freeing Memory to Run ServerMagic under DOS" on page 120.

#27 Cannot lock drive

Under multitasking operating systems such as Windows 95, ServerMagic must lock a partition before it can safely modify it. If the hard disk contains files that are in use by another process, ServerMagic cannot lock the partition.

#29 Cannot lock a locked drive

Verify that the partitions you are attempting to modify are not on a locked hard disk.

#34 The time has expired on this evaluation version

PowerQuest occasionally releases beta versions and evaluation versions of ServerMagic. Both versions are not as safe as release versions; therefore, PowerQuest builds an expiration date into each version. After a predetermined test period, the beta or evaluation version no longer functions.

Disk Access Errors (40–56)

Errors in the 40–56 number range indicate that accessing your disk is not possible, and often result from hardware problems. Some problems may have simple solutions; for others, the only solution may be replacing the hard disk. When possible, ServerMagic detects major errors before any changes have been made so you can back up your data before replacing the hard disk.

#45 CRC error in data

When ServerMagic or any other program reads information off of a hard disk, it checks the CRC (cyclic redundancy check) information contained in each sector. If it performs a CRC test and the result is different from the value stored on that sector, there is a CRC error. This usually means one of two things.

- The file being read has become corrupted by some other means.
- A sector used in the file's storage has become bad and corrupted that part of the stored file.

The solution is to do a surface test to make sure any bad sectors are marked as bad, then reinstall the software involved to ensure that files on the system are not corrupted. You may also want to try running ServerMagic with an /IRE switch.

#48 Sector not found

This error can be reported when a given sector cannot be read or written to. There are many possible causes.

If you are encountering this error, make sure that your BIOS supports the operating system and hard disk on the system. Also run a thorough ScanDisk on the drive to prevent data from being written to bad sectors.

#49 Write fault

#50 Read fault

(The following information applies to errors 49 and 50.)

ServerMagic is unable to write to/read from a specific sector on the hard disk. Possible causes include:

- If your PC beeps or displays a black box in the middle of the screen, virus protection is enabled in your computer's BIOS. Disable virus or boot sector protection in the BIOS.
- A virus protection application (which may be a TSR or DLL program) is in use. Disable the application before using ServerMagic.
- There is a bad sector on the hard disk (this is usually the case only with older hard disks). Run ScanDisk on the hard disk to perform a surface scan to verify the existence of bad sectors. If your drive has bad sectors, we recommend you replace it.
- You have set up disk mirroring with PC-Tools. Disable the disk mirroring option.

Miscellaneous Errors

#70 Changes to the drive cannot be made under Windows

If you are using Windows 3.x, you cannot run ServerMagic for Windows 95, Windows 98, or Windows NT Workstation. You must run ServerMagic for DOS from a DOS prompt.

#89 EZ-Drive has been detected on the drive but is not running
#90 EEZ-Drive has been detected on the drive but EZ-Drive is corrupt
#91 Disk Manager has been detected on the drive but is not running

These errors are "first head" errors. They can be resolved with assistance from PowerQuest technical support. Before calling technical support, please type the following at a DOS prompt: `wrprog /bak >x:head1.dat`, where *x:* is one of the drives on your machine.

The wrprog.exe file can be found in the Utility\DOS folder under your PowerQuest product folder. If you are running under Windows NT and do not have DOS available, you can use the DOS rescue diskettes you created for your PowerQuest software.

#98 Hibernate Windows 2000
#99 Hibernate Windows Me

Hibernation saves the system RAM to a file, then uses Advanced Power Management to shut the system down. When the machine is subsequently booted, the hibernation file is read into RAM, and execution begins where it left off.

A hibernated system assumes when it is booted that the system is in the same state as when hibernation occurred. Any changes made to the system's hardware (including disks and disk partitions) may cause unexpected results.

See Microsoft's Knowledge Base article #241354 for more information about making modifications to a system while in hibernation mode.

To avoid this error, shut down your machine normally and then restart.

Partition Table Errors (100–199)

Errors in the 100–199 number range are partition table errors. For general information about resolving these errors, see "Resolving Partition Table Errors" on page 122 and "Partition Tables and Viruses" on page 122.

#100 Partition table is bad

The master boot record (MBR) can contain, at most, one extended partition, and each extended partition boot record (EPBR) can contain, at most, one link to another EPBR. This error occurs when a partition table violates the foregoing rule. It can also occur if you have more than one active partition. Since any modifications ServerMagic makes may decrease the amount of data that is recoverable from the hard disk, ServerMagic does not recognize any of the hard disk's partitions. If you must create new, error-free partition tables to resolve your problem, see "Resolving Partition Table Errors" on page 122 for instructions.

#104 No sectors in partition

No partition should contain zero sectors. Delete the partition before using ServerMagic.

#105 Partition starts on wrong boundary

The hard-disk partition table contains erroneous values. ServerMagic expects partitions to begin and end on the correct cylinder boundaries. If they do not, the disk may be partially corrupted. In this circumstance, if ServerMagic were to make any modifications it might cause the loss of data. Therefore, ServerMagic refuses to recognize any of the hard disk's partitions. To resolve this problem, see the instructions in "Resolving Partition Table Errors" on page 122.

#106 Partition doesn't start with sector one

See error #105.

#107 Partition begins after end of disk

This error can occur if a partition erroneously extends beyond the physical end of the hard disk. This may happen if the hard disk has been used on a different computer or with a different hard-disk controller or if BIOS settings have been changed. Be advised that the physical geometry of the hard disk may differ from the logical geometry assigned to the hard disk by the operating system.

#108 Partition doesn't end at end of cylinder

See error #105.

#109 Partition ends after end of disk

See error #107.

#110 Partition table number of sectors is inconsistent

The hard-disk partition table contains two inconsistent descriptions of the number of sectors on the hard disk. This error is serious if both DOS and another operating system use the hard disk. Because DOS uses one description and other operating systems may use the other, data loss is likely once the partition is almost full. To resolve this error, see the instructions in "Resolving Partition Table Errors" on page 122.

#111 The order of entries in the EPBR is not correct.

An extended partition boot record (EPBR) is a sector on the hard disk that contains a partition table. The EPBR partition table is special because it generally only has two valid entries: one for the logical partition and one that is a pointer to

the next EPBR. The standard is for the logical partition's entry to be the first entry in the table and the second entry is the pointer to the next EPBR. The third and fourth entries are not used. For some utilities, such as IBM's Boot Manager, the order of these entries is important because the utilitiy expects the first entry to be the logical and the second entry to be the pointer to the next EPBR. If ServerMagic detects that the EPBR entries are out of order, you will be prompted to fix the error. If you choose to fix the error, ServerMagic will reorder the EPBR entries for you automatically.

#112 Logical partition ends outside Extended

See error #111.

#113 Partitions overlap

The hard-disk partition table contains erroneous values. If data partitions overlap, writing to one may destroy data in another.

This error is sometimes the result of an OS/2 FDISK bug. If free space exists within the extended partition, OS/2's FDISK program allows a primary partition to be created that overlaps the extended partition. A logical partition is subsequently created in the space occupied by the overlapping primary partition.

If a primary partition overlaps the end of the extended partition but does not overlap any logical partitions within the extended partition, the problem can be remedied by patching the partition table. **Only qualified individuals should attempt this repair! An incorrect patch could destroy all data on the hard disk!** In most instances, you should resolve the problem as explained in "Resolving Partition Table Errors" on page 122.

#116 Partition table Begin and Start inconsistent

The hard-disk partition table contains two inconsistent descriptions of the partition's starting sector. This error can occur if the operating system reports a hard-disk geometry that is different than the geometry in use when the partition table was written. Possible causes include: (1) different operating systems (for example, DOS and OS/2) report different hard-disk geometries, (2) you boot from a diskette that loads a different driver than is loaded when you boot from the hard disk, (3) upgrading the operating system (for example, from OS/2 2.x to OS/2 Warp) causes a different driver to be used, (4) the hard disk or controller has been changed, (5) the BIOS has been upgraded, (6) the BIOS LBA setting has been changed, or (7) there is a partition table virus present on the hard disk.

In most instances, you should resolve the problem as explained in "Resolving Partition Table Errors" on page 122. You can also use a virus scanning program to remove any partition table virus. Data loss is possible if the number of heads or sectors per track has changed since you first created your partitions.

#120 The logical drive chain is incompatible

This error occurs under some operating systems when logical partitions are not chained together in the expected order. DOS, OS/2, Windows 95, Windows 98, and Windows NT require that logical partitions be chained together in ascending order. Some other operating systems do not require this. For example, some versions of the Linux FDISK utility chain logical partitions together in the order they are created. This error message identifies a very dangerous situation; using the DOS FDISK in this situation can cause loss of one or more partitions.

For solutions to this problem, see the instructions in "Resolving Partition Table Errors" on page 122. If you decide to back up your data and recreate your partitions, you may have to use the same partitioning program that you used to create the partitions in order to delete them.

#121 The first sector of the drive cannot be read

The first sector of the hard disk (cylinder 0, head 0, sector 1) contains the master boot record (MBR) and the primary partition table. ServerMagic cannot make changes to this hard disk because an error occurred when it read the first sector. See error #50 for information on resolving this error.

#122 A bad sector was found in the current or new partition area

The partition cannot be moved safely because there is a bad sector in the new or current partition area. When you see this error message, the move operation is aborted before any corruption can occur. Try moving the partition to a different place. If your hard disk has bad sectors, we recommend that you replace the hard disk.

#140 Overlapping partitions found. No partitions can be undeleted.

Two or more deleted file systems were found in the unallocated space. However, each file system claims space that another file system also claims. There are no other partitions that can be undeleted.

Networking Errors (200-299)

#202 Network read failed
#203 Network write failed

Socket read or write was unable to read or write the requested amount of data. Be sure the network connection is working properly. If this error occurs during an operation, the destination partition and partition table may be corrupted. If this happens, you must delete the affected partition, repair the partition table, and redo the operation.

#215 The connection was aborted due to timeout or other failure

The established connection was locally aborted. Be sure that the network connection is working properly. If this error occurs during an operation, the destination partition and partition table may be corrupted. If this happens, you must delete the affected partition, repair the partition table, and redo the operation.

#217 Attempt to connect timed out without establishing a connection

The network connection timed out. Be sure that the network connection is working properly. If this error occurs during an operation, the destination partition and partition table may be corrupted. If this happens, you must delete the affected partition, repair the partition table, and redo the operation.

#218 The attempt to connect was forcibly rejected

The network connection was refused. No connection could be made because the target machine actively refused it. This error occurs when you attempt to connect to a remote machine from ServerMagic but there is already another server connected to it. You must wait until the other server has disconnected from the remote machine.

#220 The Link Support Layer (LSL) driver and supporting NIC driver are not loaded.

Ensure that the LSL driver and appropriate NIC driver are on the Remote Agent boot disk and are being loaded before you run Remote Agent.

#221 The connection was reset by peer executing a hard or abortive close

The connection was forcibly closed by the remote host. This error generally indicates that the peer application on the remote host was suddenly stopped or the host was rebooted. This error may also result if a connection is broken due to keep-alive activity detecting a failure while one or more operations are in progress. Operations that were in progress fail. If this error occurs during an

operation, the destination partition and partition table may be corrupted. If this happens, you must delete the affected partition, repair the partition table, and redo the operation.

#223 No buffers declared for Link Support Layer (LSL) driver in NET.CFG.

No buffers have been declared for the Link Support Layer (LSL) driver in NET.CFG on the Remote Agent boot disk. Edit the NET.CFG file to ensure that the link support section has buffers declared.

#224 Buffer size for Link Support Layer (LSL) driver in NET.CFG is too small

The buffer size for the Link Support Layer (LSL) driver in NET.CFG on the Remote Agent boot disk is too small. Edit the NET.CFG file, and ensure that the link support buffer size is at least 1600.

#225 The Link Support Layer (LSL) driver does not support ETHERNET_II frames

In NET.CFG on the Remote Agent boot disk, the Link Support Layer (LSL) driver does not support ETHERNET_II frames. Edit the NET.CFG file on the Remote Agent boot disk, and ensure that the link driver section specifies the ETHERNET_II frame type.

Check Errors (500–599)

Check errors occur when ServerMagic checks the integrity of a partition. For general information about resolving these errors, see “Resolving Check Errors” on page 121.

#500 Subdirectory is corrupted

This error message reveals the name of the corrupted subdirectory. Back up the contents of that directory and its subdirectories. You can then delete the corrupted subdirectory.

#501 Cross-linked files were found

Multiple files claim the same clusters. ServerMagic can fix this error when it occurs on an NTFS partition. For more information, see “Checking Partitions for Errors” on page 56. ServerMagic lets you fix this error by: (1) copying the shared clusters to each affected file, (2) deleting all affected files, or (3) keeping one file and deleting the other affected files.

#506 Not enough free space on partition to shrink

Some free space (which is dependent on the hard disk's current contents) is required to resize a partition smaller. Delete unneeded and duplicate files in the partition and then attempt the operation again.

#508 As specified, the operation does not change the partition

You have entered a value that is the same as or (when rounded to the required cylinder boundary) rounds to the same as the partition's present value. Enter a larger change.

#509 A bad sector was detected in the current or new FS area

In order to perform the resize operation that you requested, ServerMagic attempted to expand the file system area. However, the program found a bad sector in the new area. Try moving the partition before you resize it. No corruption occurs when you encounter this error.

#510 The version of the file system is not supported

An updated version of ServerMagic is required to operate on this new version of the file system. Visit *www.powerquest.com/updates* for information about updated versions of ServerMagic.

Batch Errors (600–633)

#600 Error trying to create batch file
#601 Error trying to write batch file
#602 Batch file not found

(The following information applies to errors 600–602.)

ServerMagic lets you specify a series of changes you want to make to your partitions, and then executes all the changes when you click **Apply**. At this point, ServerMagic writes out a command list file (called a "batch file") to disk in preparation for execution, and then reads the file upon execution (immediately if a lock can be secured on all impacted partitions, or in a special "reboot" mode after rebooting your computer if not all locks can be secured). In the Windows 95, Windows 98, and Windows NT Workstation versions of ServerMagic, the batch file is located in your Windows\System directory. In the DOS versions, it is located in the directory from which ServerMagic is running. The batch filename is PQ_SM40.PQB.

If the batch file cannot be created, cannot be written, or cannot be located when ServerMagic attempts to execute the command file, the above error messages appear. You should contact PowerQuest technical support. See *Appendix C* of this user guide for more information.

#603 Unknown batch operation

The batch file contained an operation unknown to ServerMagic. Contact PowerQuest technical support. See *Appendix C* of this user guide for more information.

#625 Changes cannot be applied

Generally error 625 only occurs when the system needs to go into boot-mode to execute your commands. A 625 error occurs when your disk geometry is seen differently in your native Windows version of ServerMagic than it is in the boot-mode version. For security reasons, ServerMagic cannot apply your changes without risking data loss.

One common configuration that will cause a 625 error is a system that has a hard disk (such as a SCSI or removable drive) that is visible in Windows but that cannot be seen in the boot-mode environment.

Some possible solutions include:

- Make sure the operation executes in native Windows mode (without resorting to boot-mode execution). ServerMagic will only go into boot-mode if it cannot lock a partition (that is, if there are any open files on the partition). Try to confine all operations to drives ServerMagic can lock before clicking the **Apply Changes** button.
- Change the configuration of the offending disk (most likely the SCSI or removable drive) by changing the BIOS setup for that disk. Doing so will ensure that the native and boot-mode environments detect identical hard disk configurations. If this does not work, you can try temporarily disabling the offending disk.

This error usually indicates that some other application has modified your disk configuration while you were running ServerMagic. Make sure no other applications are loaded while ServerMagic is running.

User Interaction Errors (950–999)

#950 Unable to detect any disk drives

No partitionable hard disks were found on your computer. Diskette drives and many removable media drives do not support partitioning. ServerMagic cannot perform operations on disks in such drives.

#951 An invalid value was entered

The value entered is outside the range or (when rounded to the required cylinder boundary) rounds to a value that is outside the range for the operation specified. Check the displayed range and reenter the value.

#952 Value entered is the same as the current value

See error #508.

#963 Selected operation is currently invalid

Not all ServerMagic operations can be performed on all partitions. For example, you cannot convert an HPFS partition to NTFS, and you cannot create a partition if there is not enough unallocated space on the hard disk.

Under Windows, options that are not available either do not appear on the menus or they appear dimmed. However, if you are running scripts with the DOS version, there are no menus so you cannot see which operations are available. Refer to the relevant information in this user guide or the online Help for restrictions that explain why an operation is not available.

#967 Could not perform operation to the value specified

This error occurs only when you run ServerMagic from a script. If the value specified on a resize or move operation is not between the minimum and maximum possible, script execution stops and this error displays.

#968 Incorrect Volume Label entered, Deletion not performed

To delete a partition, ServerMagic requires you to type `OK` to confirm that you want to delete the partition. If the volume label you enter does not match the volume label of the partition you want to delete, this error appears.

#969 Incorrect Volume Label entered, Unable to proceed.

To format an existing partition, ServerMagic requires you to type `OK` to confirm that you want to format the partition. If the volume label you enter does not match the volume label of the partition you are attempting to format, this error appears.

#970 Invalid Bad Sector Check value specified

This error occurs only in the enterprise version of ServerMagic from a running script. If the script command SET DEFAULT BAD SECTOR TEST STATE is not followed by either ON or OFF, this error appears.

#971 The label entered was too long

When you enter a volume label, the process that checks the validity of the label displays this message if the label is too long. The label must be no longer than 11 characters.

#972 Invalid characters in the label

When you enter a volume label, the process that checks the validity of the label displays this message if the label has characters that are invalid. Invalid characters include the following: [* ? : < > | + = ; \ / ” ,].

#973 Volume Label cannot have leading spaces

When you enter a volume label, the process that checks the validity of the label displays this message if you enter a label in which a space or spaces are the leading characters.

#974 Root size specified was not in the valid range

This error occurs only when you run ServerMagic from a script. If you use the Create, Format, or Resize Root operations, and the number of root entries specified is not within the acceptable range for that partition, this error appears. Generally, the valid range is from 64 to 1,024.

#975 The cluster size specified was invalid for this partition

This error message displays only in the enterprise version of ServerMagic from a running script. Many commands have a cluster size option. If a script command specifies an invalid cluster size (for the type and size of the partition), this error appears.

#976 Cannot create the file system specified in the current space

This error message displays only in the enterprise version from a running script. When you use the Create or Format commands, you must also choose a file system type. If the file system or partition type you specified cannot be created in the space available, this error appears.

#977 Partition selected is invalid

This error message displays only in the enterprise version of ServerMagic from a running script. If the partition selected from the Select Partition command is not a valid partition, this error appears.

#978 Unable to set to proper partition after last operation. Script halted.

This error message appears only in the enterprise version of ServerMagic from a running script. After each operation, ServerMagic ensures that the right partition is still selected. If ServerMagic is not able to select the proper partition, it ends script processing and displays this error.

#986 Unable to get information for the specified partition

ServerMagic reports this error most commonly when MS-DOS-based terminate-and-stay-resident programs (TSRs), are running in the background. These TSRs will be located in the CONFIG.SYS or AUTOEXEC.BAT files.

One such TSR is the SUBST command. The SUBST can be used to associate a path with a drive letter. This creates a "virtual drive" that can be accessed as an additional local drive. The SUBST command is classified as a "dirty" or "deadly" TSR, and cannot be loaded at the same time that ServerMagic is running.

To solve the problem, you must remark out the Config.sys or Autoexec.bat line that is loading the SUBST command. This command can be reinstated after running ServerMagic.

There are other “dirty” or “deadly” TSRs that may cause a problem. If you are experiencing this error and are not using the SUBST command, find and remark out any of the following commands: Join, Append, or Assign.

This error can also be reported if your C: drive is compressed. If the C: drive is compressed, you will need to either uncompress the drive, or run ServerMagic from the rescue diskettes.

This error can also be caused by multiple partition table errors. If any of the above solutions do not apply, run PartitionInfo and send the report to PowerQuest technical support. Refer to “Generating Diagnostic Reports with PartitionInfo” on page 123 for information about PartitionInfo and PARTINFO.

#996 Invalid password

If you forget your ServerMagic password, go to the directory that contains SMAGIC.EXE and delete PQMAGIC.PSW. Deleting this file removes the password protection from ServerMagic. You can then restart ServerMagic and, if you wish, set a new password.

NTFS Check Errors (1500–1699)

Errors 1500–1699 are NTFS-specific check errors, which can occur when ServerMagic checks the integrity of a partition. ServerMagic can fix certain errors when you perform the Check operation. For more information, see “Checking Partitions for Errors” on page 56 and “Resolving Check Errors” on page 121.

In this section, “attribute” does not mean read-only, hidden, system, etc. Rather, “attribute” means one of a file’s data streams.

#1501 Wrong version of NTFS

The partition was created using a version of the NTFS file format that ServerMagic cannot work with.

#1503 Bad NTFS cluster size

The NTFS cluster size must be 512, 1,024, 2,048, 4,096, 8,192, 16,384, 32,768, or 65,536 bytes.

#1512 Restart record mismatch

The two restart entries in the journal file are different. This may happen if Windows NT Workstation is not properly shut down. To fix this problem, restart Windows NT Workstation and shut it down using the Shut Down command.

#1516 Partition improperly dismounted

The partition dirty flag is set in a restart record in the journal file. This error may have been caused by a power failure or system crash while the Windows NT operating system was writing the partition. Reboot Windows NT and execute CHKDSK /F to repair the damage.

#1527 Bad update sequence number

A buffer contains mismatched update sequence numbers. This error may have been caused by a power failure or system crash while the Windows NT operating system was writing to the partition. Reboot Windows NT Workstation and execute CHKDSK /F to repair the damage.

#1529 Information mismatch in directory entry

A file attribute stored in a file record is different from the attribute stored in its directory entry. If this error is in a system file (file 0–10), Windows NT CHKDSK does not fix it, but Windows NT rebuilds the root directory on the partition the next time the operating system is started.

#1538 Can't find contiguous space to move

The partition does not contain enough contiguous free space to hold the new copy of a file that must be contiguous. You normally encounter this error when you use the Resize option to resize a partition smaller.

#1539 File size mismatch

The size of a system file (file 0–15) recorded in its file record does not match either the size recorded in its directory entry in the root directory or the size of its data stream.

#1544 External attribute list in external attribute

An external file record has an external attribute list.

#1545 File attributes out of order

The attributes in a file must appear in order of increasing numeric type.

#1546 Attribute neither resident nor nonresident

The attribute resident flag has a value other than resident or nonresident.

#1547 Wrong run limits

A run has more clusters than the difference between its highest and lowest cluster.

#1548 File table has fewer than 16 entries

The file table must have at least 16 entries.

#1549 File table has more than 4 billion entries

The file table must have fewer than 4 billion entries.

#1604 File's parent does not contain the file

The file's parent directory does not contain a reference to the file, or a file's size, date, or time information does not match the file's parent directory information. This error can be fixed when you perform the Check operation. For more information, see "Checking Partitions for Errors" on page 56. When you fix this error, ServerMagic updates the file's parent directory information.

#1609 Lost cluster(s)

The volume bitmap shows clusters as being used which are not used (no file claims them). This error can be fixed when you perform the Check operation. For more information, see "Checking Partitions for Errors" on page 56. ServerMagic

lets you fix this error by either deleting the lost clusters or by saving them in a file in the root directory. The filename is FILEXXXX.PQE, where XXXX is a number between 0000 and 9999.

#1630 Inconsistent sizes in attribute header

File size information is incorrect. This error can be fixed when you perform the Check operation. For more information, see "Checking Partitions for Errors" on page 56. When you fix this error, ServerMagic computes the correct file size information.

#1644 Bad system file sequence number

A system file has a bad sequence number. System files must have a sequence number from 1 to 15. A partition with this problem may pass Windows NT CHKDSK, but Windows NT does not mount the partition the next time the operating system is started.

#1647 Error in root directory index

There is an error in the root directory's index. Running Windows NT CHKDSK does not fix this problem, but Windows NT automatically rebuilds the root directory on the partition the next time it is started.

#1681 Data is compressed or sparse

The NTFS file system cannot be converted to FAT or FAT32 because a file has been compressed. The conversion cannot run unless all files are decompressed. (The FRS number for the compressed file is shown.)

#1687 An object index is present

A file with an object index created by Windows 2000 was found. For example, users may have been assigned disk space quotas. When converting a partition to FAT or FAT32, this information will not be saved, since FAT and FAT32 file systems do not support object indexes. (The FRS number for the compressed file found is shown.)

FAT Check Errors (2000–2099)

Check errors occur when ServerMagic checks the integrity of a partition. For general information about resolving these errors, see "Resolving Check Errors" on page 121.

#2001 FAT copies are not identical

Run ScanDisk to fix this error.

This problem may also be caused by a virus. Run a virus checker and remove the virus if possible.

#2002 There are invalid entries in the FAT

This error can generally be fixed by running a thorough ScanDisk on the partitions reporting the error.

#2003 File size does not match FAT allocation for file

Run ScanDisk or CHKDSK to fix this error.

#2005 One or more lost clusters are present

Run ScanDisk or CHKDSK to fix this error.

#2012 Formatted FAT file system too big for partition

This error can occur when:

- The number of sectors in the partition is larger than 65,536, and the bsHugeSects field of the boot sector ("Big total number of sectors" in Norton's DISKEDIT utility) shows that there are more sectors in the partition than the partition table shows.
- The number of sectors in the partition is less than 65,536, and the bsSects field of the boot sector ("Total sectors on disk" in Norton's DISKEDIT utility) shows that there are more sectors in the partition than the partition table shows.

This situation can result in data loss when the FAT file system tries to use space outside the partition that does not exist or that belongs to another partition. Since file data may exist outside the partition boundary, you cannot fix the problem by simply patching the boot sector.

To correct the error, back up all data on the partition, delete the partition, recreate the partition, and restore the data. Alternately, it has been reported that you can use Norton Disk Doctor to fix this problem.

#2013 A component of FAT geometry is bad

This error can occur when:

- The number of clusters on the hard disk is greater than the FAT limits allow. This can result from bad values in the boot sector for the number of sectors, FATs, root entries, reserved sectors, and sectors per cluster.
- The number of sectors in the FAT is not large enough to hold the number of clusters present on the hard disk.

A qualified consultant may be able to fix the hard disk by performing simple patches. Alternately, you can back up the data on the partition, delete the partition, recreate the partition, and restore the files.

#2024 The OS/2 Extended Attribute file is corrupt

This error only occurs if you are running OS/2 and a program mistakenly writes to or overwrites the OS/2 Extended Attribute file. If this error occurs, you should back up your data, delete the partition, recreate the partition, and restore your data.

#2027 Too many root entries in the FAT32 partition to convert it to FAT16

Long filenames may be causing this problem, since they use multiple entries per file. To fix this error, move some of the root directory entries into a subdirectory and defragment the disk.

#4002 Out of Memory

See error #3.

Operating System Errors (over 10,000)

Any number over 10,000 indicates an operating system error.

1. To determine the number of the operating system error, subtract 10,000. (For example, 10,032 - 10,000 = 32)
2. Open a command prompt window, and type `net helpmsg x`, where `x` is the error number you calculated in step 1. (For example, `net helpmsg 32`)
3. Consult your Windows NT system documentation or Microsoft's TechNet web site (*www.microsoft.com/technet/default.asp*) for information about resolving the error.

For additional information about error 10,032, see "Compaq Insight Manager (CIM)" on page 117.

APPENDIX C

PowerQuest Technical Support

This appendix includes the following information:

- Before Contacting Technical Support
- Term of Technical Support
- Contact Information

Before Contacting Technical Support

Before contacting PowerQuest, please try to resolve problems you encounter by using the online Help, the user guide, the README file, and PowerQuest's corporate web site.

Tips

- Your problem may be resolved by applying the most recent patch or upgrade of the software.
- PowerQuest technical support engineers may request information from the PartitionInfo utility program to help you resolve problems with PartitionMagic. See "Generating Diagnostic Reports with PartitionInfo" on page 123 for more information about PartitionInfo and PARTINFO. The PartitionInfo report is always required for errors 100-199, 986, and drive detection errors of any kind.
- Your product serial number is required to obtain technical support.
- If you received a demo or trial version of the product, you are not entitled to complimentary technical support.

Term of Technical Support

Technical support is available to all registered users throughout the life of the product, which began when PowerQuest released the software to manufacturing and ends six months after the release of the next version of the software or when PowerQuest discontinues its development.

Upon registration, PowerQuest provides 45 days of complimentary technical support from the day of your first call.

Contact Information

Corporate Web Site

The technical support web site, *support.powerquest.com*, includes an overview of support options, an e-mail support request form, a list of error messages and information to resolve problems you encounter, and answers to frequently asked questions about the product.

E-mail

Language	E-mail (for specific technical problems)
Dutch	eurots@powerquest.com
English	help@powerquest.com eurots@powerquest.com
French	france@powerquest.com
German	germany@powerquest.com
Italian	italian@powerquest.com
Portuguese	latina@powerquest.com
Spanish	spanish@powerquest.com

To obtain e-mail technical support for specific technical questions, you can fill out the form at *support.powerquest.com/emsupport.html* (available in English only).

E-mail on Demand

PowerQuest maintains an e-mail on demand system to resolve common problems. You can view a list of available documents at *support.powerquest.com*. To request one of the documents, send an e-mail message to **support@powerquest.com** with the index number of the document in the subject of the message. You can only request one document per e-mail message. E-mail on demand documents are available only in English.

Fax

Location	Number
U.S.A.	(801) 437-4218
Europe	+31 (0)20 581 9270

Fax a description of your problem to the technical support fax number. This service is available in the U.S., Canada, and Europe 24 hours a day, 7 days a week. PowerQuest technicians try to respond to all fax requests within 24 hours.

Telephone

Language	Location	Number
Dutch	Netherlands	+31 (0)20 581 3906
English	Netherlands	+31 (0)20 581 3907
English	UK	+44 (0)17 1341 5517
English	U.S.A.	(801) 226-6834
French	France	+33 (0)1 69 32 49 30
German	Germany	+49 (0)69 66 568 516
Italian	Italy	+39 (0)2 45 28 1312
Spanish	Spain	+34 (0)91 662 31 46
Spanish	U.S.A.	(801) 226-6834

The U.S.A. call center is open Monday through Friday from 7:00 a.m. to 6:00 p.m., MST/MDT. Our European call center, located in the Netherlands, is open Monday through Friday from 9:00 to 18:00, CET.

Postal Service Mail

U.S.A.	Europe
PowerQuest Corporation P.O. Box 1911 Orem, Utah 84059-1911 U.S.A.	PowerQuest Customer Service P.O. Box 58287 1040 HG Amsterdam, Netherlands

Include a detailed description of your problem and a return address, a daytime phone number, or other relevant contact information.

Index

D

E

F

H

I

K

L

M

N

O

P

R

S

T

U

V

W

Z