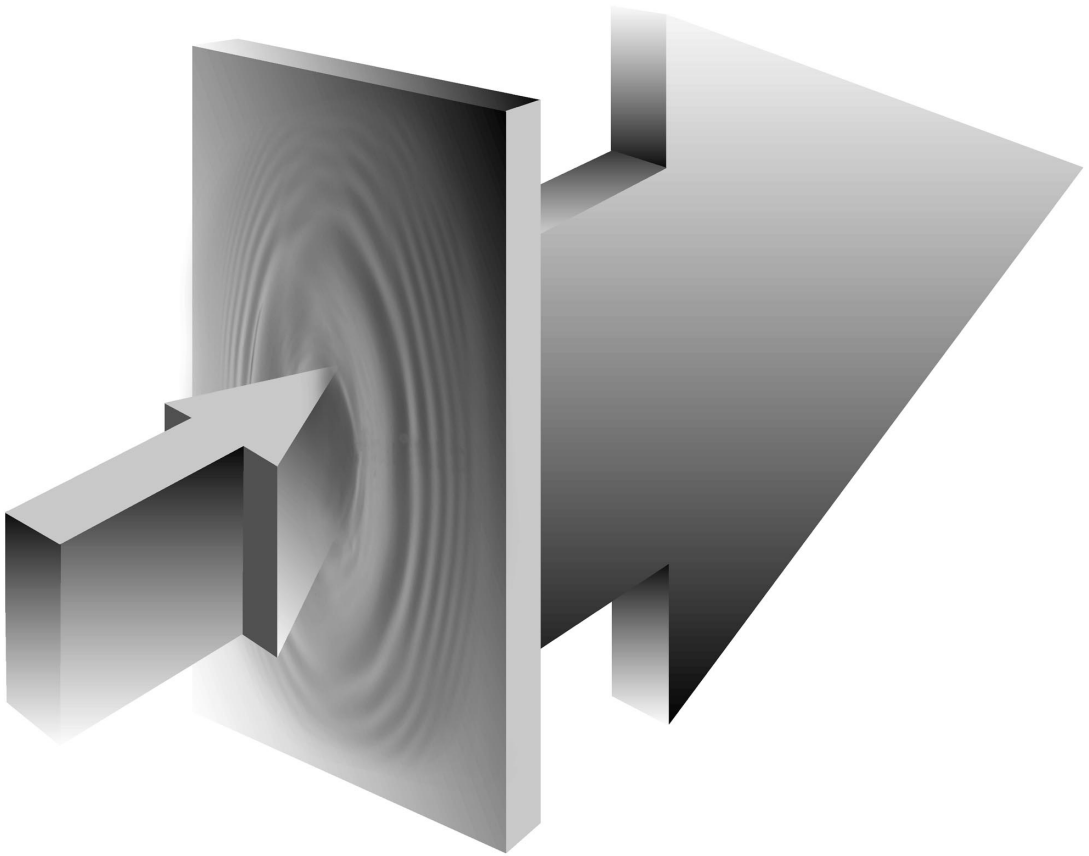


POWERQUEST®



User Guide for use on Windows NT Servers

POWERQUEST

ServerMagic™

ServerMagic 3.0 for Windows NT

User Guide

ServerMagic by PowerQuest

Manual Version 1

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Table of Contents

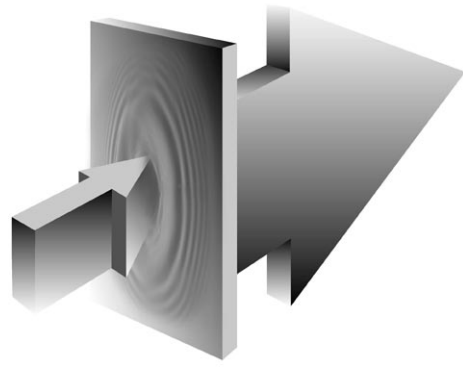
| | |
|--|----|
| Chapter 1: Getting Started | 1 |
| Features of ServerMagic 3.0 | 2 |
| System Requirements | 2 |
| Information for System Administrators | 3 |
| Working Offline | 4 |
| Native vs. Boot-Mode Execution | 4 |
| Working with RAID Systems | 4 |
| Working with Multiple Operating Systems | 5 |
| ServerMagic Integrity Checks | 6 |
| Bad Sector Checking | 6 |
| Filenames | 6 |
| Installing ServerMagic on an NT Server | 7 |
| Using ServerMagic on an OS/2 Server | 7 |
| Using ServerMagic on a Linux Server | 7 |
| Uninstalling ServerMagic | 8 |
| Chapter 2: ServerMagic Basics | 9 |
| Before Running ServerMagic | 10 |
| Starting ServerMagic | 10 |
| ServerMagic Main Window | 11 |
| Menu Bar | 11 |
| Toolbar | 13 |
| Partition Information | 14 |
| Types of Partitions | 15 |
| Overview of the Operations Process | 17 |
| Selecting a Hard Disk | 18 |
| Selecting a Partition | 18 |
| Selecting an Operation | 18 |
| Applying Changes to Your System | 19 |
| Discarding Changes | 20 |
| Partition Operations | 20 |
| Setting Preferences | 21 |
| System Supports FAT32 | 22 |
| Allow 64K FAT Clusters for Windows NT | 22 |
| Ignore OS/2 EA Errors on FAT | 22 |
| Skip Bad Sector Checks | 23 |
| Set as Read-Only for ServerMagic | 23 |

| | |
|--|-----------|
| Creating Rescue Diskettes to Run from DOS | 23 |
| Running the ServerMagic DOS Executable | 24 |
| Freeing Memory to Run ServerMagic From Rescue Diskette | 24 |
| Using Script Processing | 25 |
| Getting Help | 25 |
| Chapter 3: Completing Partition Operations | 27 |
| Resizing Partitions | 28 |
| Reducing the Size of a Partition | 28 |
| Enlarging a Partition | 28 |
| Resizing Partitions in Mirrored Sets | 29 |
| Moving Partitions | 29 |
| Steps to Resize and Move a Partition | 29 |
| Creating Partitions | 31 |
| Steps to Create a Partition | 31 |
| Creating Bootable Partitions | 34 |
| Deleting Partitions | 35 |
| Changing Partition Labels | 36 |
| Formatting Partitions | 36 |
| Copying Partitions | 38 |
| Reasons to Copy a Partition | 39 |
| Copying the Boot Partition | 39 |
| Chapter 4: Getting the Status of Partitions | 41 |
| Checking Partitions | 42 |
| Check Partition Results | 42 |
| Getting Information About Partitions | 44 |
| Disk Usage | 44 |
| Cluster Waste | 45 |
| Partition Info | 46 |
| File System-Specific Info Pages | 47 |
| Scanning a Disk for Errors | 50 |
| Generating Diagnostic Reports | 51 |
| Generating Diagnostic Reports with PARTINFO.EXE | 53 |
| Chapter 5: Converting Partitions | 55 |
| Converting the File Format in a Partition | 56 |
| Converting FAT to FAT32 | 56 |
| Converting FAT to HPFS | 57 |
| Converting FAT to NTFS | 59 |

| | |
|--|-----------|
| Converting FAT32 to FAT | 60 |
| Chapter 6: Completing Advanced Operations | 63 |
| Changing a Drive Letter | 64 |
| Retesting Bad Sectors | 64 |
| Procedure | 65 |
| Hiding and Unhiding Partitions | 66 |
| Procedure | 66 |
| Resizing the Root Directory | 67 |
| Setting an Active Partition | 68 |
| Resizing Clusters | 69 |
| Default Cluster Sizes | 70 |
| Chapter 7: Creating a New Boot Drive | 73 |
| Installing a New Server Disk | 74 |
| Reusing the Old Server Disk | 74 |
| Appendix A: Using ServerMagic with Other Programs | 77 |
| Virus Protection Software | 78 |
| Norton AntiVirus | 78 |
| Other Virus Protection Software | 78 |
| Operating System Boot Utilities | 78 |
| Compaq Insight Manager (CIM) | 79 |
| Appendix B: Troubleshooting | 81 |
| Assigning a CD-ROM Drive Letter | 82 |
| Using DOS ServerMagic With a SCSI Hard Disk | 82 |
| Resolving Check Errors | 82 |
| Resolving Partition Table Errors | 83 |
| Partition Tables and Viruses | 83 |
| Error Messages and Solutions | 83 |
| Miscellaneous Errors (3–38) | 83 |
| Disk Access Errors (40–56) | 84 |
| Partition Table Errors (100–199) | 85 |
| Check Errors (500–599) | 88 |
| Batch Errors (600–633) | 89 |
| User Interaction Errors (950–999) | 92 |
| NTFS Check Errors (1500–1699) | 93 |
| FAT Check Errors (2000–2099) | 95 |
| Operating System Errors (over 10,000) | 96 |

| | |
|---|-----|
| Appendix C: PowerQuest Technical Support | 99 |
| Before Contacting Technical Support | 100 |
| Tips | 100 |
| Term of Technical Support for ServerMagic 3.0 | 100 |
| Contact Information | 101 |
| E-mail | 101 |
| Corporate Web Site | 102 |
| Fax | 102 |
| Telephone | 102 |
| Postal Service Mail | 103 |

Index



Getting Started

This chapter includes the following information:

- Features of ServerMagic 3.0
- Information for System Administrators
- System Requirements
- Installing ServerMagic on an NT Server
- Uninstalling ServerMagic

Features of ServerMagic 3.0

- Create, resize, and move partitions with these file system formats: FAT, FAT32, NTFS, HPFS, Linux Ext2, and Linux Swap
- Perform multiple partitioning tasks and view the changes that will be made before applying them to your system
- Create FAT32 partitions over 8 GB
- Automatically handle the extended partition when creating, moving, and resizing logical and primary partitions
- Automatically detect and correct errors on NTFS partitions
- Run NT CheckDisk from ServerMagic
- Access improved and more extensive online Help
- Convert partitions, including: FAT to FAT32, FAT to HPFS, FAT to NTFS, and FAT32 to FAT
- Resize FAT clusters
- Hide and unhide partitions
- Expand the root directory to accommodate more long filenames
- Run extensive file system diagnostics
- Use Windows NT 64 KB FAT clusters
- Identify and organize partitions by creating labels (volume names)
- Create and run scripts to make unattended changes to partitions on a server

System Requirements

ServerMagic has lower system requirements than Windows NT Server 4.0, so any server running Windows NT Server 4.0 should easily be able to run ServerMagic.

The following table describes the minimum system requirements for ServerMagic.

| Hardware/ Software | Windows NT | DOS Mode |
|-------------------------------|---|---|
| Processor | Intel 486/DX or later (33 MHz) | Intel 486/DX or later (33 MHz) |
| RAM | 16 MB (32 MB recommended)* | 8 MB*** |
| Hard-disk space | 12 MB | 6 MB |
| Operating system | Windows NT 4.0 Server with Service Pack 4 applied** | MS-DOS 5.0 (6.2 or later recommended) or compatible |
| 3.5-inch diskette drive | High-density | High-density |
| CD-ROM drive | 4x | 4x |
| Monitor | VGA-compatible | VGA-compatible |

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

** ServerMagic 3.0 will be disabled on the retail version of Windows 2000 Server. When you upgrade your server, contact PowerQuest for the version of ServerMagic that is compatible with Windows 2000 Server.

***The DOS executable requires 16 MB of RAM to operate on NTFS partitions; 32 MB recommended to operate on FAT32 partitions.

IMPORTANT! ServerMagic does not generally support any partitions located on volume sets, stripe sets, or disk mirroring sets configured using Windows NT Disk Administrator. However, you can resize partitions that are part of a mirrored set. For instructions, refer to “Resizing Partitions in Mirrored Sets” on page 29.

Information for System Administrators

You should understand the following considerations before using ServerMagic with your server.

Working Offline

You should always run ServerMagic while the server is offline. If you perform an operation on a partition that has open files, ServerMagic reboots and makes the changes in a boot-time program. ServerMagic always reboots when you make changes to the Windows NT boot partition because it always has open files. Connected users are logged off when this occurs. While no data will be lost, it may be inconvenient for users.

You can usually make changes to most other partitions from within ServerMagic unless a connected client has an open file on that partition, in which case ServerMagic reboots.

Native vs. Boot-Mode Execution

ServerMagic for Windows NT is a full Win32 GUI application that will allow you to manipulate your partitions natively, with one exception: If you choose to move or resize a partition that cannot be locked (for example, one that has files open on it), ServerMagic stores the commands to be executed, reboots the computer, and applies the changes in a “boot-mode” text environment.

After ServerMagic has completed all batched operations in boot mode, the program pauses for 15 seconds and displays the message “Rebooting.” This pause allows any data cached in memory to be written to disk before rebooting the server.

ServerMagic removes the System and read-only file attributes from the BOOT.INI file whenever it must go into boot-mode to complete an operation. We recommend restoring these attributes after the system has booted.

If Windows NT puts the swap file on a partition other than the boot partition, ServerMagic will execute operations on that partition in boot-mode.

Canceling ServerMagic during boot-mode operation may cause Windows NT to report corruption to the system partition. This will trigger AUTOCHK to verify the system partition as Windows NT continues the boot process. You should not be alarmed at this message; Windows NT is just verifying system partition integrity.

Working with RAID Systems

IMPORTANT! ServerMagic does not support software-based RAID systems.

ServerMagic works transparently with a hardware-based RAID system, since such an array looks like a single hard drive to Windows NT. After using the software that comes with the RAID controller to add disks to an array and define the RAID level for the array, you can use ServerMagic to partition the array as if it were a single hard drive. If the RAID controller supports multiple arrays, ServerMagic treats each array as a separate hard disk.

ServerMagic can be particularly useful when you add drives to an array. Depending on the software for the RAID controller, the new drives may be added as free space that is not part of a partition. If this is the case, you can use ServerMagic to allocate the new space among existing partitions.

ServerMagic makes partitioning of an array easy, but it does not change the hardware limitations of the RAID controller. Most RAID controllers provide guidelines about the optimal number of drives that should be used for each RAID level the controller supports. Exceeding the optimal number of drives can reduce the performance of the array even though ServerMagic can still partition the enlarged array.

Using the ServerMagic Rescue Disks with a RAID System

Some RAID controllers do not have DOS drivers available. As a result, these controllers do not allow DOS applications, such as the rescue diskette version of ServerMagic and FDISK, to properly access large, logical RAID drives attached to the controller. Generally, such controllers will make approximately the first 8 GB visible to DOS. Under these circumstances, the rescue diskette version of ServerMagic can safely be used on any partition beginning and ending before the 1024 cylinder boundary. Partitions crossing over or starting after the 1024 cylinder boundary will not be accessible to the rescue diskette version of ServerMagic described in this scenario. However, if the RAID controller supports full access to large, logical RAID drives under DOS, or if a DOS driver is available to permit full access, then you can use the rescue diskette version of ServerMagic to manipulate all partitions on any large, logical RAID drives.

Working with Multiple Operating Systems

You can use ServerMagic to manage file systems that are hosted by operating systems other than Windows NT Server. For example, a machine that is configured to boot between Windows NT Server and Windows 98 might include a FAT32 file system. While Windows NT Server cannot see a FAT32 drive, you can make changes to FAT32 partitions with ServerMagic. Similarly, you can use ServerMagic to create, delete, and resize Linux Ext2 and HPFS partitions.

IMPORTANT! Windows NT assigns drive letters only to partitions it supports (FAT, NTFS) and to partitions it recognizes (FAT32, HPFS, unformatted). Drive letter assignments are dynamically assigned unless ServerMagic or Disk Administrator is used to statically assign a letter. Once a drive letter is statically assigned, it is stored in the Windows NT registry and only applies while the server is running Windows NT. Whenever you run ServerMagic from Windows NT, all drive letter assignments are statically assigned. Other operating systems will likely assign different drive letters.

For more information about file systems supported by ServerMagic, see “Types of Partitions” on page 15.

ServerMagic 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. Correct the disk problem, and then restart ServerMagic. For information on disk problems, see “Resolving Partition Table Errors” on page 83.

In addition to the integrity check at startup, ServerMagic performs the following 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).
- The second check validates your disk’s data after an operation is completed.

Bad Sector Checking

ServerMagic ships with bad sector checking turned on by default (in Preferences). Bad sector checking ensures that data is not moved or copied to bad disk sectors. However, it causes create, move, and resize operations to slow down considerably.

Bad sectors are rare on modern disks. Furthermore, most modern computers can determine when a sector is bad and avoid using it. If you feel confident that there are no bad sectors on your system, you can improve ServerMagic’s performance by turning off bad sector checking. See “Skip Bad Sector Checks” on page 23 for additional information.

Filenames

This release of ServerMagic handles ASCII filenames. ServerMagic does not yet handle double-byte character sets, such as Japanese, resulting in two known limitations:

- Converting a partition from FAT to HPFS can produce incorrectly translated filenames.

- Attempts to specify or set the volume label may fail.

Installing ServerMagic on an NT Server

- 1** Insert the ServerMagic CD into your CD-ROM drive.

If the installation program does not run automatically, run BROWSECD.EXE from your CD.

- 2** Click **Install ServerMagic**.

You can also choose to make a rescue diskette or read documentation.

- 3** Follow the prompts on your screen.

When you register your software, you are entitled to 45 days of technical support at no additional cost.

Registered users can contact PowerQuest Customer Service at (801) 437-8900 for special upgrade pricing when the next version of ServerMagic is released.

Using ServerMagic on an OS/2 Server

- 1** Open a DOS prompt.
- 2** Insert the ServerMagic CD into your CD-ROM drive.
- 3** Change to the DOS-OS2 directory on the CD, and run the MAKEDISK.BAT file.
- 4** Follow the prompts on your screen.

To run ServerMagic on an OS/2 server, place the first disk created in step 3 into your floppy drive and reboot your server.

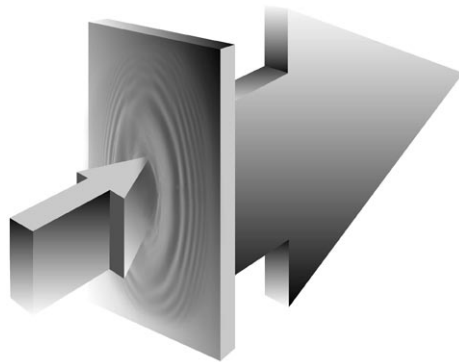
Using ServerMagic on a Linux Server

- 1** Insert the ServerMagic CD into your CD-ROM drive.
- 2** Change to the LINUX directory on the CD and view the README files.

The README files contain complete instructions on how to create ServerMagic diskettes and run them on your server.

Uninstalling ServerMagic

- 1** Exit ServerMagic.
- 2** On the Windows taskbar, click **Start ► Settings ► Control Panel**.
- 3** Double-click **Add/Remove Programs**.
- 4** Select **ServerMagic 3.0**.
- 5** Click **Add/Remove**.
- 6** Follow the on-screen instructions.



ServerMagic Basics

This chapter includes the following information:

- Before Running ServerMagic
- Starting ServerMagic
- ServerMagic Main Window
- Types of Partitions
- Overview of the Operations Process
- Partition Operations
- Setting Preferences
- Creating Rescue Diskettes to Run from DOS
- Using Script Processing
- Getting Help

Before Running ServerMagic

- **Back up your hard disk.** — 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.
- **Back up the BOOT.INI file before modifying the hard disk that contains the boot partition.** If the disk contains the boot partition, the BOOT.INI file may be changed.
- **Create a Windows NT boot disk that will allow you to boot Windows NT if your BOOT.INI file becomes corrupted.** For information about creating a boot disk, refer to the Microsoft knowledge base article Q119467, “Creating a Boot Disk for an NTFS or FAT partition.”
- **Run Operations ► Check on all partitions that you plan to manipulate.** Although ServerMagic checks partitions for errors and can repair minor problems, more serious errors cause ServerMagic to abruptly end an operation. Check can find and fix most common errors.

Check is not available on the NT boot partition because there are always open files. For this partition, you should run **Operations ► NT 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 increases the likelihood that ServerMagic will have to reboot the computer to perform an operation.
- **Shut down all applications.** You should not run ServerMagic with other applications, including virus scanners and server-based computing tools.

Starting ServerMagic

You must have administrative rights to the server to use ServerMagic.

- 1 Log on to the server with Administrator privileges.
- 2 Click **Start ► Programs ► PowerQuest ServerMagic 3.0**.

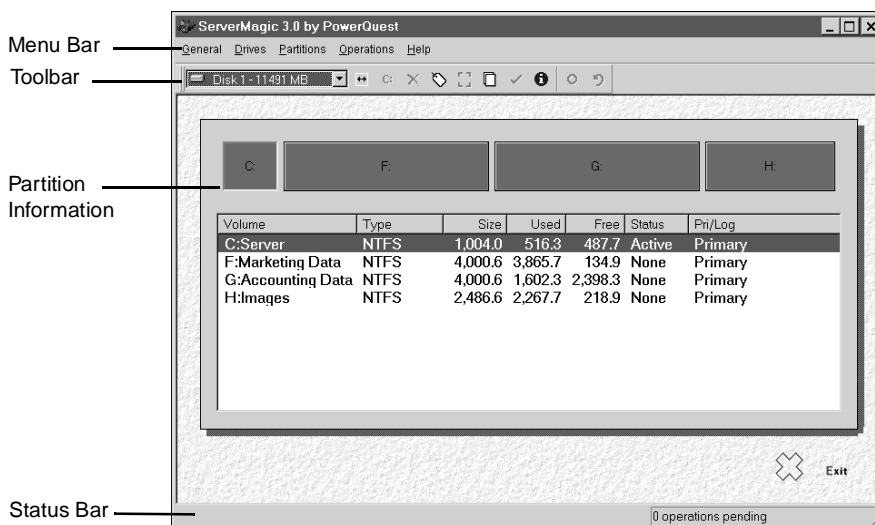
The program loads, and the ServerMagic main window appears.

If you create rescue diskettes, you can also run a DOS-based version of ServerMagic. See “Creating Rescue Diskettes to Run from DOS” on page 23 for additional information.

ServerMagic Main Window

The ServerMagic main window has the following areas:

- **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.



Menu Bar

ServerMagic has the following items available on its menu bar.






| Menu | Option | Function | Details in |
|---------|-----------------|--|------------|
| General | Apply Changes | Applies the changes currently in the operations queue | Chapter 3 |
| | Discard Changes | Discards the changes currently in the operations queue | Chapter 3 |

| Menu | Option | Function | Details in |
|-------------------|--|--|--------------|
| | Preferences | Sets defaults for the system | This chapter |
| | Create Rescue Diskettes | Creates two diskettes to run ServerMagic from DOS in case Windows NT becomes unavailable | This chapter |
| | Exit | Closes ServerMagic | This chapter |
| Drives | Shows all local hard disks (RAID arrays appear as single hard disks) | Selects the drive (does not appear if computer has only one drive) | This chapter |
| Partitions | Shows all partitions on selected drive | Selects the partition | This chapter |
| Operations | Resize/move | Increases or decreases the size of the partition and/or moves it to the left or right on the hard disk | Chapter 3 |
| | Create | Creates a new partition out of free space | Chapter 3 |
| | Delete | Deletes the partition and returns it to free space | Chapter 3 |
| | Label | Changes the name assigned to the partition | Chapter 3 |
| | Format | Formats the partition | Chapter 3 |
| | Copy | Makes a copy of the partition to free space on any drive in system | Chapter 3 |
| | Check | Checks the integrity of the data in a partition and alerts to errors | Chapter 4 |
| | Info | Provides information about the partition | Chapter 4 |
| | NT CheckDisk | Runs NT CHKDSK on the partition | Chapter 4 |

| Menu | Option | Function | Details in |
|-------------|----------|--|--------------|
| Help | Convert | Converts the file format for FAT and FAT32 partitions | Chapter 5 |
| | Advanced | Performs advanced functions on partitions (such as changing a drive letter or resizing the root directory) | Chapter 6 |
| | Contents | Accesses the table of contents for the Help file | This chapter |
| | Index | Accesses the index for the Help file | This chapter |
| | About | Provides information about your copy of ServerMagic | |

Toolbar

The toolbar gives you quick access to the most frequently needed functions in ServerMagic.

| Button | Function |
|---|--|
| Drives | Shows the currently selected drive and allows you to select a different drive. |
|  | Increases or decreases size of an existing partition. If there is adjacent free space available, you can also use this button to move a partition. |
|  | Creates a new partition from free space or unassigned space within an extended partition. |
|  | Deletes a partition and all data in it and returns the occupied space to free space. If part of an extended partition, returns the occupied space to unassigned space. |
|  | Changes the label assigned to a partition. |
|  | Formats the partition. |

| Button | Function |
|--------|----------|
|--------|----------|



Copies a partition to free space or unassigned space within an extended partition.



Checks the integrity of the data in a partition and alerts to errors.



Provides a variety of information about a partition depending on partition type.



Applies all of the operations in the operations queue.



Discards all of the operations in the operations queue.

Partition Information

The partition information area displays information about the selected hard disk's partitions.

| | | | | | | | |
|----------------|---------------|----------|---------|---------|-------|--------|---------|
| Partition Map | | | | | | | |
| | | | | | | | |
| Partition List | Volume | Type | Size | Used | Free | Status | Pri/Log |
| | CMS-DOS8 | FAT16B | 252.0 | 14.5 | 237.4 | Active | Primary |
| | *. D:WINNT | Extended | 2,145.9 | 2,145.9 | 0.0 | None | Primary |
| | G:ACCTG | NTFS | 1,145.8 | 233.5 | 912.3 | None | Logical |
| | *. Free Space | NTFS | 1,000.1 | 4.3 | 995.8 | None | Logical |
| | | | 693.0 | 0.0 | 0.0 | None | Primary |

The partition information area has two parts:

- **Partition map** — The partition map shows the partitions approximately to scale. 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.

- **Partition list** — displays the following information about each partition:

| Column | Information |
|----------------|---|
| Volume | Drive letter and name assigned to partition (indented for logical partitions). 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, free space. |
| Type | File format applied to the partition, extended, or free space. |
| Size | Total size of the partition in megabytes. |
| Used | Number of megabytes currently filled with data. |
| Free | Number of megabytes assigned but unfilled. |
| Status | Active — the boot partition Hidden — not visible to Windows NT |
| Pri/Log | Indicates whether the partition is a primary or logical partition. A hard disk can have up to four primary partitions. One of those partitions can be an extended partition, which can be subdivided into any number of logical partitions up to the limit supported by the operating system. |

Types of Partitions

IMPORTANT! ServerMagic does not generally support any partitions located on volume sets, stripe sets, or disk mirroring sets configured using Windows NT Disk Administrator. However, you can resize partitions that are part of a mirrored set. For instructions, refer to “Resizing Partitions in Mirrored Sets” on page 29.

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. |
| Extendedx | An extendedx partition functions like an extended partition but is not limited to the first 1024 cylinders on a drive. |
| 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 NT and OS/2. |
| FAT16x | FAT16x is a proprietary file system developed by Microsoft to enable FAT partitions beyond 1024 cylinders (~8GB). |
| FAT32 | <p>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.</p> <p>A FAT32 partition is only accessible by Windows 95 OSR2 (version 4.00.950B), Windows 98, and Windows 2000 Server, when available. DOS, Windows 3.x, Windows NT 3.51/4.0, earlier versions of Windows 95, and OS/2 don't recognize FAT32 and cannot use files on a FAT32 partition.</p> |
| FAT32x | FAT32x is a proprietary file system developed by Microsoft to enable FAT32 partitions beyond 1024 cylinders (~8GB). Windows 95 OSR2 and Windows 98 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. |

| Partition Type | Description |
|-----------------------|--|
| 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 128 MB. 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 | <p>The New Technology File System (NTFS) is accessible only by Windows NT. NTFS is not recommended for use on disks less than 400 MB because it uses a great deal of space for system structures.</p> <p>ServerMagic 3.0 can manipulate only NTFS partitions created by Windows NT 4.0 or earlier. Since it is possible that NTFS file structures in Windows 2000 Server might not be compatible with existing file structures, ServerMagic 3.0 is disabled on a Windows 2000 Server, and ServerMagic should not be used to manipulate NTFS partitions created by Windows 2000 Server. NTFS partitions created by ServerMagic 3.0, however, are accessible by Windows 2000 Server.</p> |
| Unformatted | Unformatted partitions reserve a portion of the disk but are not assigned a file structure. |
| Free space | Free space is the portion of a hard disk that is not currently assigned to any partition. |

Overview of the Operations Process

Each of the following steps is explained in further detail later in this section of the manual.

- 1 Select a hard disk.
- 2 Select a partition.
- 3 Select an operation.
- 4 Apply changes to your system.

Selecting a Hard Disk

The **Drive** option on the toolbar displays the currently selected hard disk or RAID array and its size in megabytes (MB).

To select a hard disk or RAID array, do one of the following:

- On the toolbar, click the arrow button to the right of the currently selected hard disk to open a drop-down list of all the hard disks on your system, then click the hard disk you want to select.
- On the menu bar, click **Drives** and then select a hard disk.

Drives does not appear on the menu bar if the computer has only one hard disk.

Selecting a Partition

The selected partition is highlighted in the partition list. To select a partition, do one of the following:

- Click the partition in the partition list or on the partition map.
- On the menu bar, click **Partitions** and then select a partition.

Selecting an Operation

After you have selected a disk and a partition, you can select an operation using the toolbar, the context menu, or the menu bar.

If an operation cannot be performed on the selected partition, the operation is dimmed.

To select an operation, do one of the following:

- On the toolbar, click the button for the operation.
The procedures in this manual always use toolbar buttons, when they are available.
- In the partition map or partition list, right-click the partition you want to change, and then click the operation from the context menu.
- On the menu bar, click **Operations**, then choose the operation.


ServerMagic performs status operations — **Check**, **Info**, and **NT CheckDisk** — immediately. All other operations are stored in a queue until you apply them.

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 tell when changes have been made but not yet applied to your system when the **Apply** option appears in the main window and the status box in the lower right corner of the main window indicates that operations are pending.

To apply changes to your system, do one of the following:

- Click **Apply** in the bottom part of the window.
- Click  on the toolbar.
- Click **General ► Apply changes** on the menu bar.
- Press <Ctrl+A>.

Progress bars that display when you apply changes are an estimation only and can pause for several minutes, even though ServerMagic is still working correctly. If you think your computer has locked up, be patient and ServerMagic will finish the operation.

IMPORTANT! After performing any operations that change the partitions on the server, you should create a new emergency repair disk using the Repair Disk utility (RDISK.EXE) in Windows NT. Refer to the Windows NT Server documentation for information about running this utility.

Applying Changes in Boot Mode


ServerMagic can make the changes from within the ServerMagic program if the changed partitions have no open files. If any of the partitions to be changed have open files, then ServerMagic reboots Windows NT and executes all of the queued operations in boot mode.

Since Windows NT always has some open files, any change to the partition containing the Windows NT operating system requires rebooting. You can reduce the chance that changes to other partitions will trigger rebooting by:

- Closing all application programs
- Logging off all users







Discarding Changes



To discard the changes and start over, do one of the following:

- Click  on the toolbar.
- Click **General ► Discard changes** on the menu bar.
- Press <Ctrl+D>.

Partition Operations

The following table shows the operations available in ServerMagic.

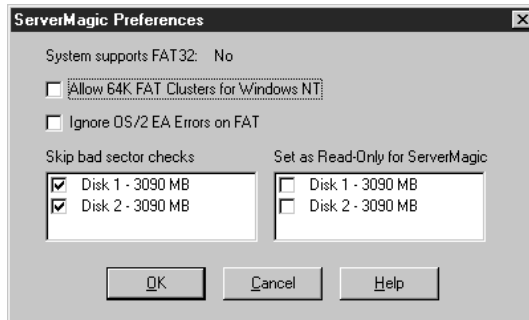
| Operation | Button | Function | Partition Types |
|--------------------|---|---|--|
| Resize/Move |  | Increases or decreases size of an existing partition. If adjacent free space available, can also move a partition. | All but free space |
| Create |  | Creates a new partition from free space or unassigned space within an extended partition. | Free space, Extended |
| Delete |  | Deletes a partition and all data in it. If a primary partition, returns the occupied space to free space. If a logical partition, returns the occupied space to free space within the extended partition. | All but free space |
| Label |  | Changes the name assigned to a partition. | FAT, FAT32, NTFS, HPFS, Linux Ext2 |
| Format |  | Reformats the partition using the current partition format. | FAT, FAT32, NTFS, HPFS, Linux Ext2, Linux Swap |
| Copy |  | Copies a partition to free space or unassigned space within an extended partition. | All but free space |

| Operation | Button | Function | Partition Types |
|---------------------|---|--|--|
| Check |  | Checks the integrity of the data in a partition and alerts to errors. | FAT, FAT32, NTFS, HPFS, Linux Ext2, Linux Swap |
| Info |  | Provides a variety of information about a partition depending on partition type. | All |
| NT CheckDisk | | Checks a partition using NT CheckDisk. | FAT, NTFS |
| Convert | | Converts FAT to FAT32, NTFS, or HPFS or converts FAT32 to FAT. | FAT, FAT32 |
| Advanced | | Changing a Drive Letter | FAT, NTFS |
| | | Retesting Bad Sectors | FAT, FAT32 |
| | | Hiding and Unhiding Partitions | FAT, FAT32, NTFS, HPFS |
| | | Resizing the Root Directory | FAT |
| | | Setting an Active Partition | FAT, NTFS, HPFS, Linux Ext2 |
| | | Resizing Clusters | FAT, FAT32 |

Setting Preferences

Preferences affect all drives and relevant partitions except for **bad sector checks** and **set as read-only for ServerMagic** options, which are set individually for each hard disk. Preferences remain in effect until changed.

To set preferences, click **General ► Preferences** on the menu bar. Each preference is a toggle and is either on (enabled) or off (disabled). A check mark next to a preference indicates it is enabled.



System Supports FAT32

System supports FAT32 indicates whether the current operating system supports FAT32 partitions. Windows 2000 Server will support FAT32 partitions; Windows NT 4.0 does not.

Allow 64K FAT Clusters for Windows NT

This preference lets you create FAT partitions with 64 KB clusters, which enables a FAT partition size up to 4 GB on Windows NT. When enabled, the 64 KB cluster size is available in the **Resize/Move Partition** and **Resize Clusters** dialogs.

IMPORTANT! If you are using multiple operating systems, you should not use 64 KB clusters, since other operating systems will not be able to access the information in the partition.

To prevent you from inadvertently creating partitions with 64 KB clusters, this preference is disabled every time you exit ServerMagic.

Ignore OS/2 EA Errors on FAT

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

IMPORTANT! 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.

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

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 can check the older disk and skip checks on 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.

IMPORTANT! You should create a backup of your BOOT.INI file before modifying the hard disk that contains the Windows NT boot partition. If the disk contains the Windows NT boot partition, ServerMagic may change some files, such as your BOOT.INI file.

Creating Rescue Diskettes to Run from DOS

If you cannot boot Windows NT for any reason, a rescue diskette makes it possible to boot your computer in MS-DOS and run a DOS-based version of ServerMagic.

- 1** Get two blank formatted diskettes.
- 2** Click **General ► Create Rescue Diskettes**.

This utility creates two diskettes:

- A DOS system disk containing the DOS-based version of ServerMagic
- ServerMagic help files and utilities that can help PowerQuest technical support

Running the ServerMagic DOS Executable

To run the DOS executable, boot your server from the ServerMagic rescue diskette. The DOS ServerMagic executable starts automatically when you boot from the rescue diskette.

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 GUI 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.

Freeing Memory to Run ServerMagic From Rescue Diskette

The DOS ServerMagic executable running under DOS requires a minimum of 585 KB of memory in the first 640 KB 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.

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.

Using Script Processing

You can use ServerMagic scripts to make unattended changes to partitions on a server. A script is an ASCII text file with text statements that define the operations you want to perform. You can create a script file with any text editor.

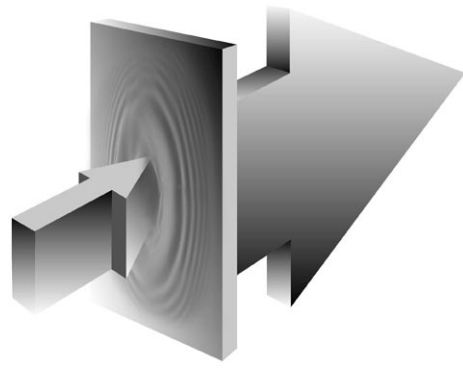
Scripting for Windows NT servers is available only when you run the DOS program SMAGICT. To run SMAGICT, you must boot your server in DOS. For your convenience, SMAGICT is installed into the \Program Files\PowerQuest\ServerMagic directory. The program is also located on the root directory of the ServerMagic CD.

For additional information about scripting, refer to the online user guide NTSCRIPT.PDF on the ServerMagic CD.

Getting Help

ServerMagic includes both comprehensive and context-sensitive online help.

- **Online Help** — ServerMagic's comprehensive online Help system provides in-depth information on ServerMagic's features as well as step-by-step instructions on performing specific tasks.
- **Context-Sensitive Help** — By clicking **Help** in the lower right corner of a dialog, you can open context-sensitive help for the dialog. You can also press <F1> from any dialog to open the context sensitive topic for that dialog.
- **README File** — README.TXT provides the most current information at the time the product shipped. It can include information that may have changed since this guide was written, corrections to the manual or help system, and information specific to installation or configuration issues.



Completing Partition Operations

This chapter includes the following information:

- Resizing Partitions
- Moving Partitions
- Creating Partitions
- Deleting Partitions
- Changing Partition Labels
- Formatting Partitions
- Copying Partitions

Resizing Partitions

The **Resize/Move** operation lets you change the size of a partition and move it to another location on a hard disk. During a **Resize/Move** operation, data is consolidated to the front of the partition, but no data compression takes place.

Resizing allows you to reduce or enlarge a partition. Refer to “Steps to Resize and Move a Partition” on page 29 instructions. The sections below provide information about resizing.

IMPORTANT! 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, move the displaced files back to the front of the disk.

Reducing the Size of a Partition

To reduce the size of a partition, the partition must contain unused space.

Resizing FAT and FAT32 partitions smaller can 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. If a smaller partition reduces the wasted space, the resulting partition will have additional unused space, which could be used for further reduction.

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

IMPORTANT! Exercise caution when reducing the size of a partition, especially a partition containing an operating system. Leave at least 50 MB of unused space in the partition beyond that required by the operating system. 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 “Steps to Create a Partition” on page 31.

Enlarging a Partition

There must be free space adjacent to a partition you plan to enlarge. If the hard disk has free space, but it is not adjacent to the partition you want to enlarge, move the other partitions on the hard disk until the free space is adjacent to the partition you want to enlarge.

If a FAT partition is almost full, you may not be able to enlarge it. If the larger partition requires a larger cluster size, there may not be enough space in the current partition to support the larger cluster size. To correct this situation, do one of the following:

- Make a small increase to the size of the partition that does not require a new cluster size. If this adds enough unused space to the partition to support the new cluster size, you can then enlarge the partition to the desired size.
- Increase the amount of unused space in the partition by deleting files or moving files to other partitions.

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 reestablish a mirror.

Moving Partitions

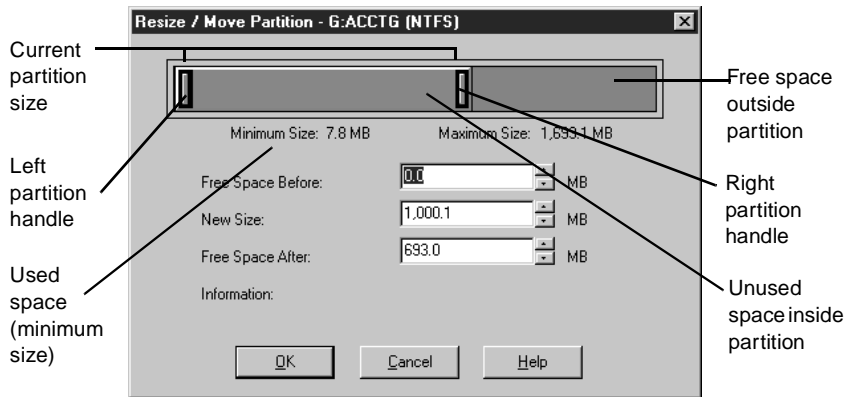
When you move a partition, the partition's data (and data on other partitions) is unaffected. The free space adjacent to a partition determines the distance you can move it; if there is no free space, you cannot move the partition. Additionally, you cannot move unknown partitions, partitions failing the **Check** operation, or free space.

IMPORTANT! Exercise caution when moving a bootable partition. Operating systems can become unbootable if moved beyond certain boundaries. For more information, see "Steps to Create a Partition" on page 31.

Steps to Resize and Move a Partition

- 1 On the toolbar, click .


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 and unused space within the partition and the free space surrounding the partition (if any exists). The minimum and maximum sizes to which you can resize the partition appear below the map.

- 2 To move a partition, place the pointer on the partition and drag it to the desired location.

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

The pointer changes to  when it is located over a partition.

- 3 To resize the partition, place the pointer on the left or right partition handle, and drag the handle to the desired size.

The pointer changes to  when it is positioned over a handle.


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.

- 4 For FAT or FAT32 partitions, click the **Cluster Size** drop-down list and select a new size if you don't want the default cluster size.

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

- 5 Click **OK**.

ServerMagic adds the operation to its queue.

You can add more operations to the queue or click  on the toolbar to execute the queue.

Creating Partitions

The **Create** operation lets you create primary partitions, extended partitions, and logical partitions. 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 additional subdivisions called logical partitions.

Generally, 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.

Steps to Create a Partition

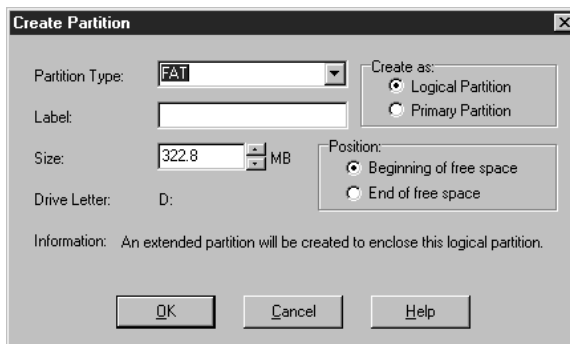
The steps outlined below are for a single hard disk, single partition system. If you have a different configuration, the exact process and available options may differ slightly.

If you plan to create a bootable partition, refer to “Creating Bootable Partitions” on page 34 before proceeding with the steps outlined below.

- 1 On the partition map or in the partition list, select a block of free space.

If there is no free space on the disk, you must resize or delete an existing partition to create free space.

- 2 On the toolbar, click .



- 3 In the **Create as** box, click **Logical Partition** or **Primary Partition**.

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 **Primary 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:

| Partition Type | Accessible from |
|------------------|---|
| FAT/FAT16x | DOS, Windows 3.x, Windows 95, Windows 98, Windows NT (all), OS/2 |
| FAT32/ FAT32x | Windows 95 (OSR2 only), Windows 98, Windows 2000 Server (when available) |
| NTFS | Windows NT (all) and all clients connected to server, even if they are not Windows NT |

| Partition Type | Accessible from |
|---------------------------|---|
| HPFS | OS/2, Windows NT Server 3.51, and Windows NT Server 4.0 if upgraded from Windows NT Server 3.51 |
| HPFS/386 | OS/2 |
| Linux Ext2 and Linux Swap | Linux |
| Extended/Extendedx | All (not an option if another extended partition exists) |
| Unformatted | All |

- 5** (Optional) Enter a label for the new partition.


FAT, FAT32, and HPFS partition labels can be up to 11 alphanumeric characters. NTFS labels can be up to 32 characters, and Linux Ext2 labels can be up to 16 characters.

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

ServerMagic 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 free space, you can position the partition at the beginning or end of the free space. Generally, it is best to position the partition at the beginning of the free space. In the **Position** box, click **Beginning of free space** or **End of free space**.

- 8** Click **OK** to add the operation to the ServerMagic queue.

You can add more operations to the queue or click  on the toolbar to execute the queue.

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 Type(s) | Boot Code Boundary | Minimum Space Required |
|----------------------|-------------------------------|-----------------------------|--------------------|------------------------|
| DOS 6.22 and earlier | Primary | FAT | 2 GB | 8 MB |
| Windows 95 | Primary | FAT or FAT32** | 8 GB | 90 MB |
| Windows 98 | Primary | FAT or FAT32** | 8 GB | 175 MB |
| Windows NT | Primary* | FAT, FAT32**, or NTFS | 2 GB | 117 MB |
| Linux | Either | Linux Ext2 | 8 GB | 250 MB |
| OS/2 | Either | FAT or HPFS | 4 GB | 110 MB |

* Windows NT must boot from a primary partition (the “NT system partition”) on the first drive. However, only a few Windows NT files must reside on that partition; the remaining files can reside on a logical partition, which can be located on any drive. The Windows NT system partition can be shared with another operating system. Additionally, Windows NT must be installed on a FAT partition. During the installation, you can convert the partition to NTFS.

**FAT32 is only supported by Windows 95, OS/2, Windows 98, and Windows 2000 Server.

Boot Code Boundary

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 1024 Cylinder Limit” and “Understanding the 64K Boot Code Boundary” in the *Basic Concepts* PDF manual on the ServerMagic CD.


ServerMagic displays a warning if you attempt to create, move, or resize a bootable partition outside of the 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 booting with the rescue diskette and then using ServerMagic to move the partition back within the boot code boundary.

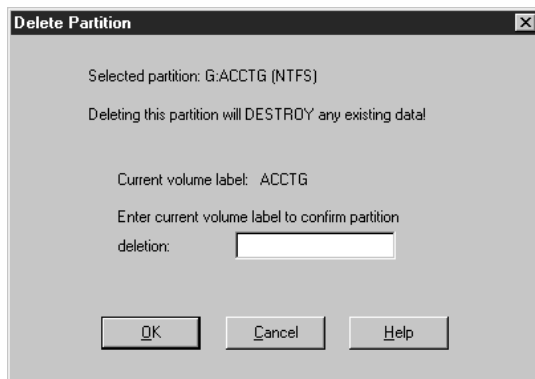
Deleting Partitions

The **Delete** operation deletes a partition and destroys all its data. To ensure that you do not accidentally delete a partition, you must first type the volume label. If you did not assign a volume label when you created the partition, you must type **NO NAME** to confirm the deletion.

To delete an extended partition, you must first delete all logical partitions within the extended partition.


IMPORTANT! Performing the following procedure will destroy all data on the selected partition.

- 1 On the toolbar, click .




- 2 Type the volume label to confirm the deletion.

The **Delete Partition** dialog displays the current volume label. In the graphic above, the volume label is ACCTG.

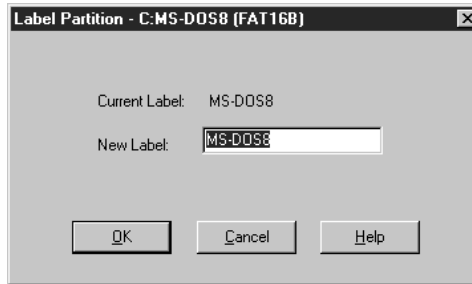
- 3 Click **OK** to add the operation to the ServerMagic queue.
- 4 Add more operations to the queue, or click  on the toolbar to execute the queue.

Changing Partition Labels

Use the **Label** operation to change a partition's volume label. Giving your partitions meaningful names makes managing them easier.

- 1 On the toolbar, click .

The **Label Partition** dialog appears.



- 2 In the **New Label** box, type the new label.


| Partition Type | Maximum Number of Alphanumeric Characters | Invalid Characters |
|--------------------|---|--------------------|
| FAT16, FAT32, HPFS | 11 | *?[]<> +=:;,.\/" |
| NTFS | 32 | None |
| Linux Ext2 | 16 | None |

- 3 Click **OK** to add the operation to the ServerMagic queue.
- 4 Add more operations to the queue, or click  on the toolbar to execute the queue.

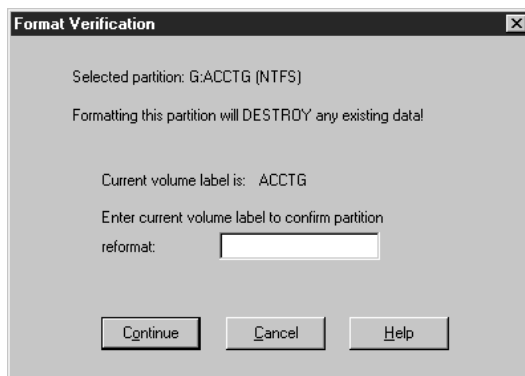
Formatting Partitions

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. To ensure that you do not accidentally format a partition, you must first type the volume label. If you did not assign a volume label when you created the partition, you must type **NO NAME** to confirm deletion.

ServerMagic has several conversion options that let you convert from one file system to another without destroying existing files in a partition. For more information, see “Converting Partitions” on page 55.

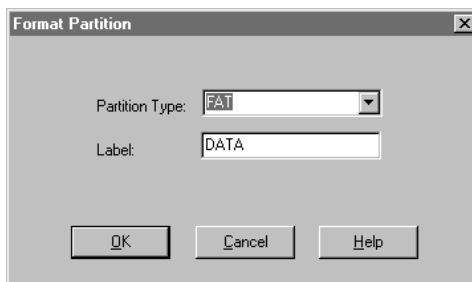
- 1 On the toolbar, click .

The **Format Verification** dialog appears.




- 2 Type the current volume label.
- 3 Click **Continue** to verify your intent to format the partition.

The **Format Partition** dialog appears.



- 4 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.
- 5 If you want, type a label for the partition.
- 6 Click **OK** to add the operation to the ServerMagic queue.

You can add more operations to the queue or click  on the toolbar to execute the queue.

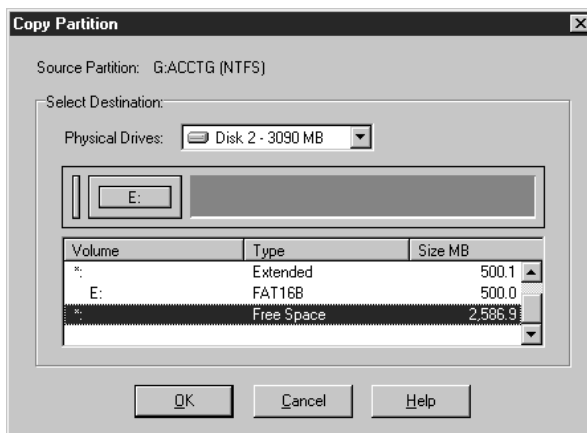
Copying Partitions

The **Copy** operation makes 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 partition type and contains the same data as the original. When you copy a partition, you specify the hard disk and the free space where you want to place the copy.

IMPORTANT! To copy a partition, you must have free space that is equal to or larger than the partition.

- 1 On the toolbar, click .

The **Copy Partition** dialog appears.



- 2 From the **Physical Drives** drop-down list, select the disk where you want to copy the partition.
- 3 In the partition list, select the free space where you want to copy the partition.

IMPORTANT! If you copy the NT boot partition to free space on the same or a different drive, and you want to run Windows NT from this newly copied partition, you must manually edit your BOOT.INI file to point to the new boot partition.

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

5 Add more operations to the queue, or click  on the toolbar to execute the queue.

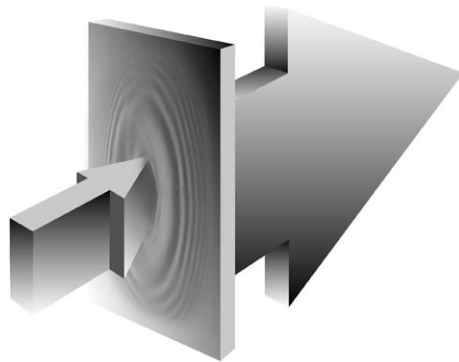
Reasons to Copy a Partition

- 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 make a primary partition a logical partition, or vice versa.
- To change the relative order of partitions.
- To back up a partition.

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.




Getting the Status of Partitions

This chapter includes the following information:

- Checking Partitions
- Getting Information About Partitions
- Scanning a Disk for Errors
- Generating Diagnostic Reports

Checking Partitions

The **Check** operation checks the integrity of a partition.

- 1 On the toolbar, click .

You can also click **Operations** ► **Check** on the menu bar or right-click the partition and click **Check** on the context menu.

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

Check 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** option. For details, see “Getting Information About Partitions” on page 44.

See “Check Partition Results” below for additional information about the Check Partition Results dialog.

If a Check operation fails, “Check Failed” appears in the **Used** and **Free** columns in the partition list.

- 2 To fix an error on an NTFS volume, select the problem and click **Fix**.

For more information about correcting errors, see “Resolving Check Errors” on page 82.

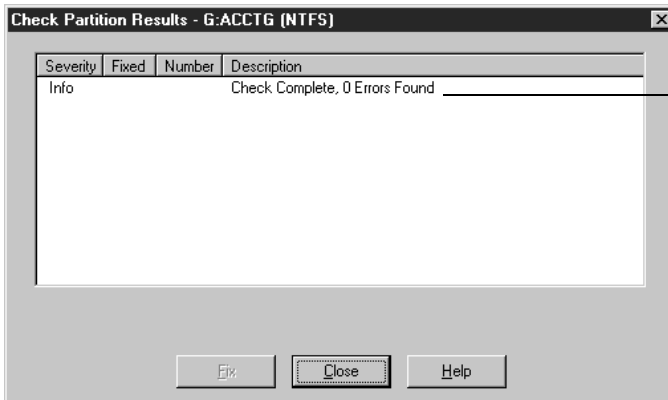
- 3 When you are finished viewing the check results and fixing NTFS errors, click **Close**.

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 “ServerMagic Integrity Checks” on page 6.

IMPORTANT! OS/2 users should not enable **Ignore OS/2 Errors on FAT**, as undetected errors could cause data loss.

Check Partition Results

When you select **Check**, the **Check Partition Results** dialog appears, displaying information about the status of the partition.



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

If **Check** 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** 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 partition. If available, click Fix to fix the error. If ServerMagic is unable to fix the error, run CHKDSK /F from the command prompt. (For FAT32, HPFS, and Linux partitions, you must run the disk check utility native to that type of partition.)

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 83.
- **Description** gives a brief description of the problem.

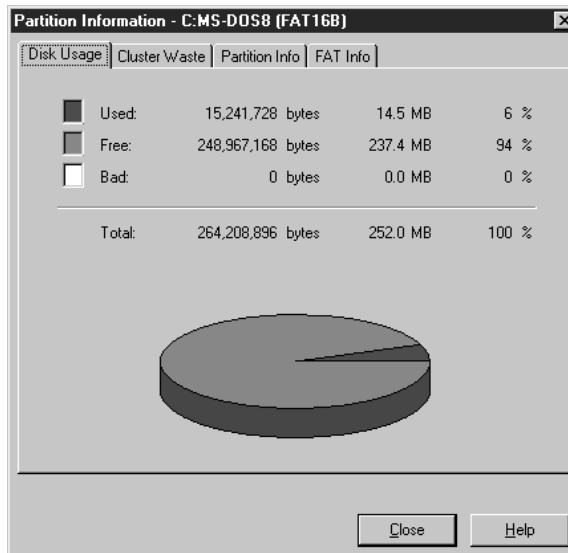
Getting Information About Partitions

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

- 1 On the toolbar, click .

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.



- 2 Click the tab for the page you want to view.

Each page is described in the following sections.

- 3 Click **Close** when you are finished viewing information.

Disk Usage

The **Disk 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:

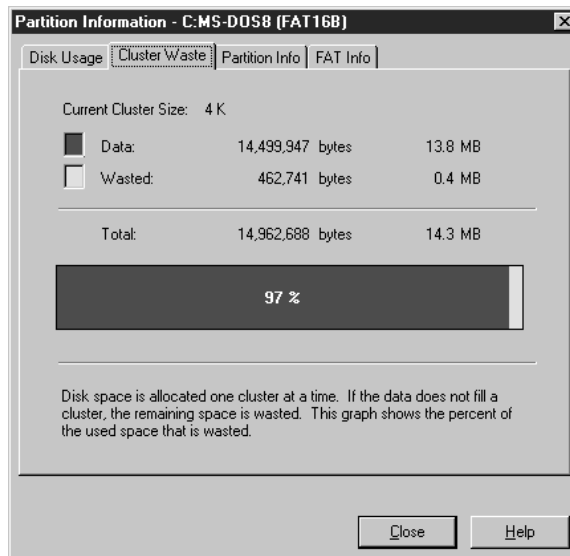
- **Used** space on the partition, including space wasted by clusters
- **Free** space on the partition

- **Bad** space on the partition
- **Total** space on the partition (the sum of Used, Free, 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.



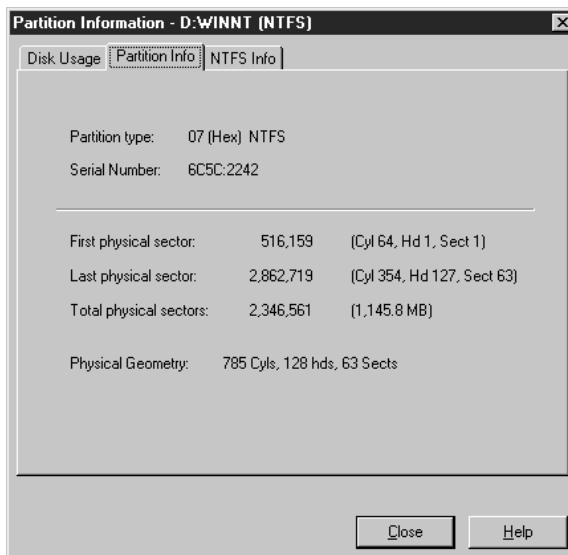
This page displays the following information:

- **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 and free space.



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:

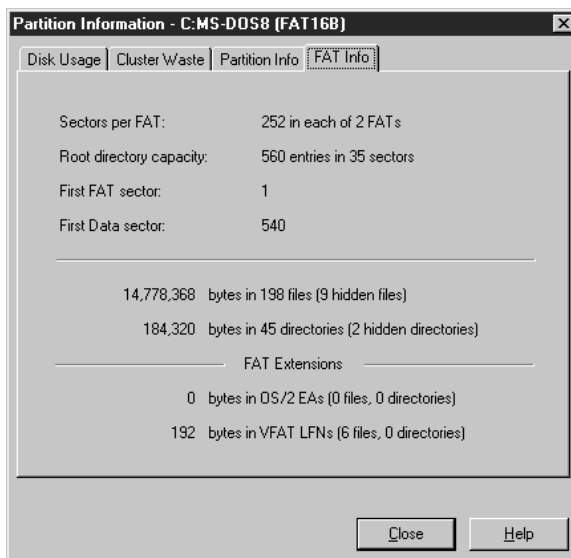
- **First physical sector** shows the logical number and the location (cylinder, head, and sector) where the partition begins.
- **Last physical sector** shows the logical number and the location (cylinder, head, and sector) where the partition ends.
- **Total physical sectors** displays the number of 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**.

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:

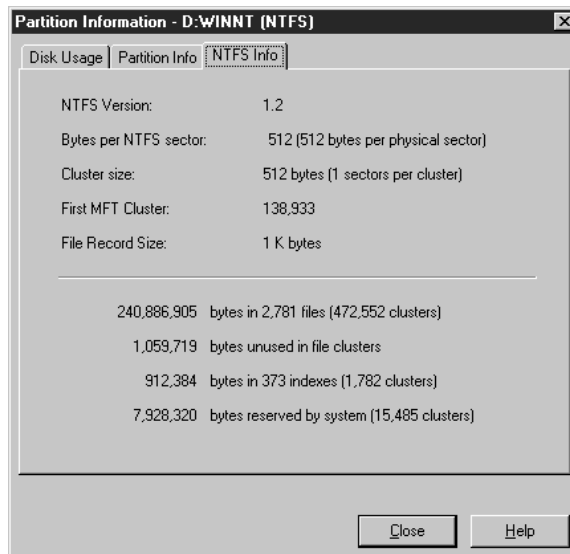
- The number of bytes in files on the partition, the number of files, and the number of those files that are hidden
- The number of bytes in directories on the partition, the number of directories, and the number of those directories that are hidden

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.



- **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 partition. (There are always 512 bytes in each physical sector.)

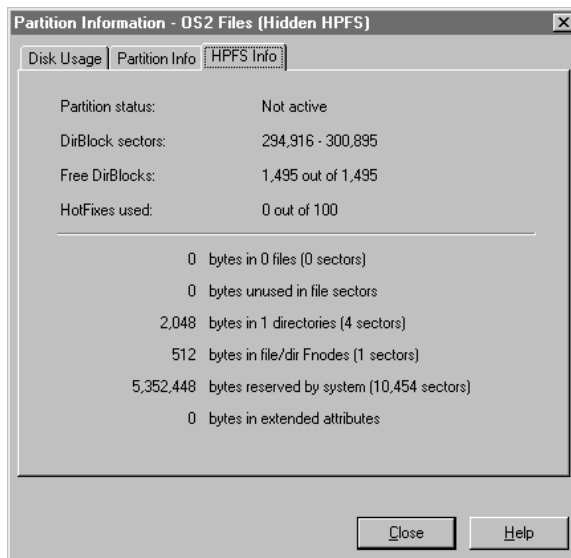
- **Cluster size** displays the size of each cluster and the number of sectors in each cluster on the selected partition.
- **First MFT Cluster** shows the logical number of the first cluster in the master file table (MFT).
- **File Record Size** gives the size of file records in the MFT.

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

- 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.



- **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

NT CheckDisk is a utility (CHKDSK.EXE) included with Windows NT that you can run from ServerMagic. CheckDisk scans a partition for errors.

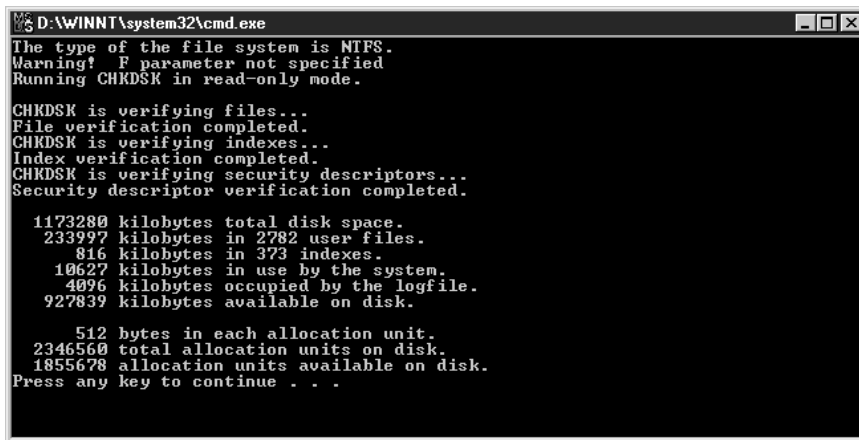
- 1 Click **Operations ► NT CheckDisk**.

A command window appears, and NT CheckDisk starts.

CheckDisk only scans partitions with assigned drive letters; it does not scan hidden partitions, extended partitions, free space, or partitions with file systems not supported by Windows NT.

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 partition errors, you should exit ServerMagic and run CHKDSK /F from a command window. For more information about NT CheckDisk, consult Windows NT Help.

- 2 When NT CheckDisk is finished, the results appear in the command window.



```
D:\WINNT\system32\cmd.exe
The type of the file system is NTFS.
Warning! F parameter not specified
Running CHKDSK in read-only mode.

CHKDSK is verifying files...
File verification completed.
CHKDSK is verifying indexes...
Index verification completed.
CHKDSK is verifying security descriptors...
Security descriptor verification completed.

 1173280 kilobytes total disk space.
 233997 kilobytes in 2782 user files.
   816 kilobytes in 373 indexes.
 10627 kilobytes in use by the system.
  4096 kilobytes occupied by the logfile.
 927839 kilobytes available on disk.

 512 bytes in each allocation unit.
2346560 total allocation units on disk.
1855678 allocation units available on disk.
Press any key to continue . . .
```

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

Generating Diagnostic Reports

When you install ServerMagic, the PartitionInfo program is also installed. With the PartitionInfo program, you can get a quick snapshot of the hard disks and partitions on your server. The PartitionInfo program also gives you the ability to print or save this information to disk or clipboard. PowerQuest technical support engineers use the information from the PartitionInfo (or PARTINFO.EXE) program to help you fix problems.

The first time you run ServerMagic on your machine, PartitionInfo creates a snapshot file PQ_ORIG.TXT that includes information about all the drives and partitions attached to the server. The file is saved in the %system root%\system32 directory. Every other time you run ServerMagic, another snapshot file, PQ_INFO.TXT, is created in the same directory. You can run PartitionInfo yourself to create additional snapshot files.

1 Click Start ► Program Files ► PowerQuest ServerMagic 3.0 ► 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.

The PartitionInfo window displays the following information:

File
Physical Drive: Disk 1
3090.9 MB Total Size
Disk & partition errors: No disk errors detected.

Partition Information:

| Volume | Errors | PartType | Status | Size (MB) | PartSect | # | Start Sector | Total Sectors | UsedSects | FreeSects |
|------------|--------|-------------|----------|-----------|-----------|-----|--------------|---------------|-----------|-----------|
| C:\MS-DOS8 | 0 | FAT16B | Pri.Boot | 252.0 | 0 | 0 | 63 | 516,033 | 29,764 | 486,269 |
| | 0 | Extended | Pri | 2145.9 | 0 | 1 | 516,096 | 4,394,880 | 4,394,880 | 0 |
| | 0 | EPBR | Log | 1145.8 | None | --- | 516,096 | 2,346,624 | 2,346,624 | 0 |
| D:\WINNT | 0 | NTFS | Log | 1145.8 | 516,096 | 0 | 516,159 | 2,346,561 | 492,150 | 1,854,411 |
| | 0 | EPBR | Log | 1000.1 | 516,096 | 1 | 2,862,720 | 2,048,256 | 2,048,256 | 0 |
| G:\ACCTG | 0 | NTFS | Log | 1000.1 | 2,862,720 | 0 | 2,862,783 | 2,048,193 | 8,871 | 2,039,322 |
| | 0 | Free Spa... | Pri | 693.0 | None | --- | 4,910,976 | 1,419,264 | 0 | 1,419,264 |

Disk Geometry Information: **Disk:** 1 **Cylinders:** 785 **Heads:** 128 **Sectors/Track:** 63

| Volume | Errors | PartSect | # | Boot | BCyl | Head | Sect | FS | ECyl | Head | Sect | StartSect | NumSects |
|---------|--------|-----------|---|------|------|------|------|----|------|------|------|-----------|-----------|
| MS-DOS8 | 0 | 0 | 0 | 80 | 0 | 1 | 1 | 06 | 63 | 127 | 63 | 63 | 516,033 |
| | 0 | 0 | 1 | 00 | 64 | 0 | 1 | 05 | 608 | 127 | 63 | 516,096 | 4,394,880 |
| | 0 | 516,096 | 0 | 00 | 64 | 1 | 1 | 07 | 354 | 127 | 63 | 516,159 | 2,346,561 |
| | 0 | 516,096 | 1 | 00 | 355 | 0 | 1 | 05 | 608 | 127 | 63 | 2,862,720 | 2,048,256 |
| | 0 | 2,862,720 | 0 | 00 | 355 | 1 | 1 | 07 | 608 | 127 | 63 | 2,862,783 | 2,048,193 |

Buttons: Copy to Clipboard, Save As..., Printer Font..., Print..., Close

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**.

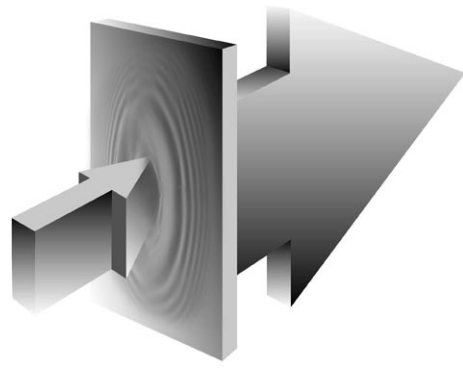
Generating Diagnostic Reports with PARTINFO.EXE

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

- 1** Boot the server to DOS.
- 2** Insert the second rescue diskette.
- 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, then press <Enter>. |
| To save the report as a text file on a floppy disk | Type PARTINFO >A:\PARTINFO.TXT, then press <Enter>. |

CHAPTER 5



Converting Partitions

This chapter includes the following information:

- Converting the File Format in a Partition
- Converting FAT to FAT32
- Converting FAT to HPFS
- Converting FAT to NTFS
- Converting FAT32 to FAT

Converting the File Format in a Partition

You can convert FAT partitions to the following file formats.

- FAT32
- NTFS
- HPFS

In addition, you can convert FAT32 partitions back to FAT partitions.

IMPORTANT! Converting the file format in a partition is a major step and should not be undertaken lightly. Since the conversion to NTFS or HPFS is irreversible, you should always back up the files in the partition before converting the file format.

Converting FAT to FAT32

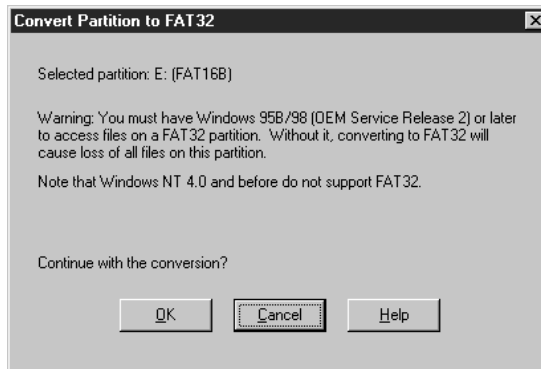
The **Convert FAT to FAT32** operation converts a FAT partition to FAT32. FAT32 partitions have less wasted disk space than FAT partitions and can support large partitions. However, you should be aware of these issues:

- You must have Windows 95 OEM Service Release 2, Windows 98, or Windows 2000 Server on your server to access files on a FAT32 partition.
- FAT32 partitions are inaccessible from Windows NT Server 4.0 and all other operating systems.
- The minimum size for a FAT32 partition is 256 MB.

To convert from FAT to FAT32:

- 1 Click **Operations ► Convert ► Convert FAT to FAT32** on the menu bar.

The **Convert Partition to FAT32** dialog appears.



- 2 To continue with the conversion, click **OK**.

ServerMagic adds the operation to its queue.

- 3 Add more operations to the queue, or click  on the toolbar to execute the queue.

Converting FAT to HPFS

The **Convert FAT to HPFS** operation converts a FAT partition to HPFS. During this operation, ServerMagic preserves data, long filenames (created by Microsoft Windows NT, Windows 95, and Windows 98), and Workplace shell long name Extended Attributes.

IMPORTANT! To access files on an HPFS partition, the server must be running OS/2 or a Windows NT Server 4.0 that was upgraded from Windows NT 3.51; otherwise, you will lose access to all files on the converted partition. Proceed with caution when performing this conversion, as it cannot be reversed.

- 1 Back up the data on your boot drive. Because the conversion cannot be reversed, we strongly recommend that you take this precautionary step.

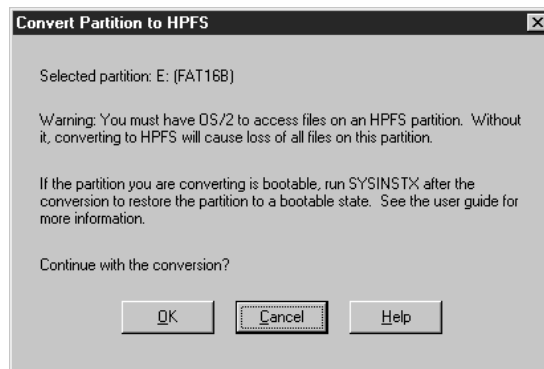
If a Corrective Service Facility (CSF) has been applied to your version of OS/2, you need to make new Install/Utility diskettes and use them in place of your original OS/2 diskettes.

- 2 Reboot your system (either 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 From the Disk drop-down list (located on the toolbar), select the disk containing the partition you want to convert.
- 5 On the partition map or in the partition list, right-click the partition you want to convert and then click **Convert ► Convert FAT to HPFS** on the context menu.

You can also select the partition and then click **Operations ► Convert ► Convert FAT to HPFS** on the menu bar.

The **Convert Partition to HPFS** dialog appears, displaying important information about the conversion.



- 6 To continue with the conversion, click **OK**.

ServerMagic adds the operation to its queue.

- 7 Add more operations to the queue, or click  on the toolbar to execute the queue.

If the partition you converted to HPFS contains OS/2

- 1 Boot the server from an OS/2 floppy disk. This ensures the new HPFS partition is assigned a drive letter.
- 2 Copy SYSINSTX.COM from the OS/2 Installation Disk to the root of the new HPFS partition.
- 3 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.)

- 4 Change to the new HPFS partition by typing ***drive:*** (where *drive* is the drive letter of the partition you converted from FAT to HPFS).
- 5 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).
- 6 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.
- 7 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 to NTFS

The **Convert FAT to NTFS** operation launches the Microsoft Convert utility to convert a FAT partition to NTFS.

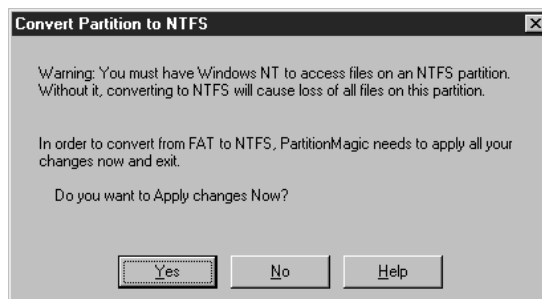
If you boot multiple OSs, you must be careful converting FAT to NTFS. An NTFS partition is only accessible with Windows NT. The data in this partition is not accessible if you boot any other operating system.

IMPORTANT! This is a one-way conversion; to revert back to FAT you must back up all your files, reformat the partition, and restore the files.

To convert a FAT partition to NTFS:

- 1 Click **Operations ► Convert ► Convert FAT to NTFS** on the menu bar.

The **Convert Partition to NTFS** dialog appears.



- 2 To continue with the conversion, click **Yes**. Because Windows NT performs the conversion, when you click **Yes**, ServerMagic automatically applies any pending changes and exits. The Convert utility is then started.

Converting FAT32 to FAT

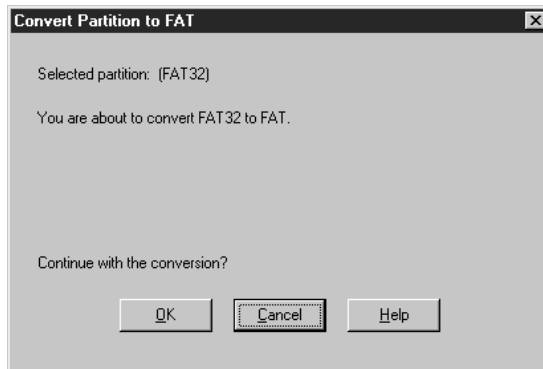
The **Convert FAT32 to FAT** operation converts a FAT32 partition to FAT. To complete this conversion, the partition must have at least 300-400 MB of unused space because of how the FAT file system allocates disk space for file storage.

To convert a FAT32 partition to FAT:

- 1 Click **Operations** ► **Convert** ► **Convert FAT32 to FAT** on the menu bar.

At this point, 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 some of the files in the root directory to another location and then start the conversion again. After completing the conversion, you can increase the number of files in the root directory and move the files back. Refer to "Resizing the Root Directory" on page 67 for more information.

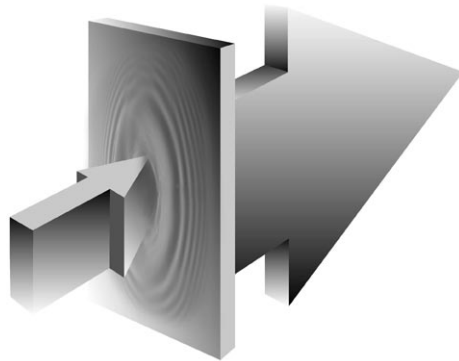
The **Convert Partition to FAT** dialog appears.



- 2** To continue with the conversion, click **OK**.

ServerMagic adds the operation to its queue.

- 3** Add more operations to the queue, or click  on the toolbar to execute the queue.



Completing Advanced 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

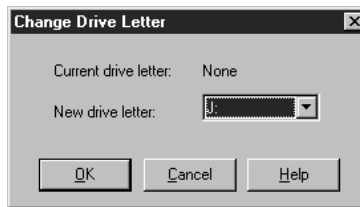
Changing a Drive Letter


This operation lets you change the drive letter assigned to any partition visible to and supported by Windows NT. Changes to the drive letter do not affect drive letter assignments when another operating system is running on the server.

IMPORTANT! Do not change the drive letter of the Windows NT boot partition. This can produce unexpected results.

- 1 On the partition map or in the partition list, right-click the partition whose drive letter you want to change.
- 2 Click **Advanced ► Change Drive Letter** on the context menu.

The **Change Drive Letter** dialog appears.



- 3 In the **New drive letter** box, type or select the available drive letter you want to assign to the partition.
- 4 Click **OK** to add the operation to the ServerMagic queue.
- 5 Add more operations to the queue, or click  on the toolbar to execute the queue.

Retesting Bad Sectors

The FAT file system allocates disk space for file storage in units called clusters, which are composed of a fixed number of sectors. Because the FAT 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.

When you move or resize a partition or increase its 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). Similarly, when you decrease the cluster size, ServerMagic divides bad clusters into multiple bad clusters.

If ServerMagic reports bad sectors after you complete these tasks, you can perform **Bad Sector Retest** and reclaim the good sectors that are no longer in clusters with bad sectors.

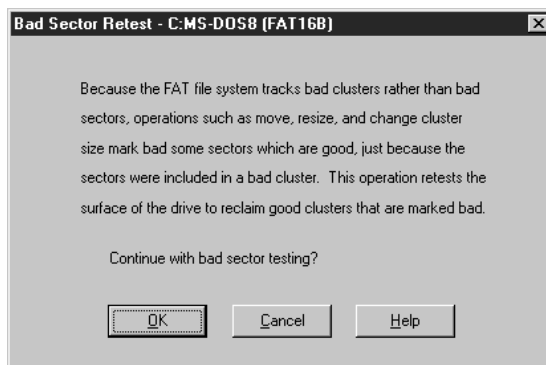
Use **Info** to discover whether a partition contains bad clusters. Most modern hard drives detect bad sectors and automatically remap the sector, so in general, you do not see bad sectors on modern hard drives. If you do get bad sector errors on a modern hard drive, you should replace the drive. For more information, see “Getting Information About Partitions” on page 44.

IMPORTANT! 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.

Procedure

- 1 On the partition map or in the partition list, right-click the partition you want to retest.
- 2 Click **Advanced ► Bad Sector Retest** on the context menu.

The **Bad Sector Retest** dialog appears.



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

ServerMagic adds the operation to its queue.

- 4 Add more operations to the queue, or click  on the toolbar to execute the queue.

Hiding and Unhiding Partitions

Windows NT allows more than one visible primary partition, so the only reason to hide a partition is to prevent unwanted user access. You can perform this operation on FAT, FAT32, NTFS, and HPFS partitions.

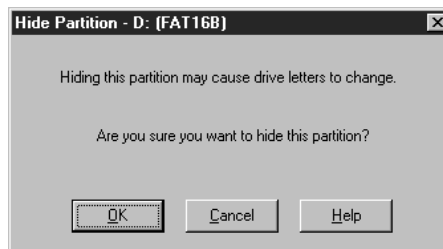
When a partition is hidden, Windows NT does not assign a drive letter to the partition at boot time, and the drive letter that had been assigned to the partition is freed for use by another partition.

When you unhide a partition, Windows NT assigns the lowest available drive letter to the partition at boot time. If this is not the drive letter you want, you can change it. To change the drive letter, see “Changing a Drive Letter” on page 64.

Procedure

- 1 On the partition map or in the partition list, right-click the partition you want to hide.
- 2 Click **Advanced ► Hide Partition** on the context menu.

The **Hide Partition** dialog appears, warning you that drive letters may change. Although Windows NT does not change drive letters explicitly assigned by the Administrator, it can change other drive letters.



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

ServerMagic adds the operation to its queue.

IMPORTANT! If you hide the Windows NT boot partition, you must manually edit your BOOT.INI file to point to a new Windows NT boot partition.

- 4 Add more operations to the queue, or click  on the toolbar to execute the queue.

To unhide a partition, follow the steps outlined above, except click **Advanced ► Unhide Partition** on the context menu.

Resizing the Root Directory

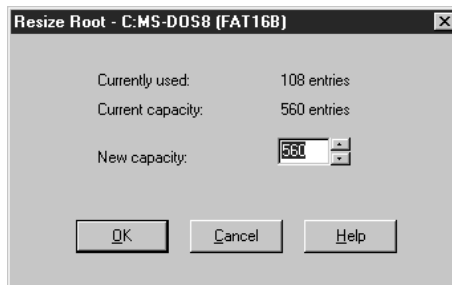
The **Resize Root** operation can change the maximum number of entries in the root directory of a FAT partition. In a FAT partition, the number of entries that can be placed in a root directory is defined when the partition is formatted. The number of entries does not increase as needed the way entries in subdirectories and FAT32 partitions do.

If you use Microsoft long filenames in the root directory, you may need to increase the number of entries in the root directory because long filenames use additional directory entries.

Changing the number of entries in the root directory does not affect the data within the partition.


- 1 Right-click the FAT partition whose root directory you want to resize.
- 2 Click **Advanced ► Resize Root** on the context menu.

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.

ServerMagic rounds the number to one supported by the current cluster size.

- 4 Click **OK** to add the operation to the ServerMagic queue.
- 5 Add more operations to the queue, or click  on the toolbar to execute the queue.

Enlarging the root directory sometimes 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 move the displaced files back to the front of the disk.

Setting an Active Partition

The **Set Active** operation designates a partition as the active partition, which is the partition the computer boots from. The computer can have only one active partition at a time, so setting a partition to active also sets the previous active partition to inactive.

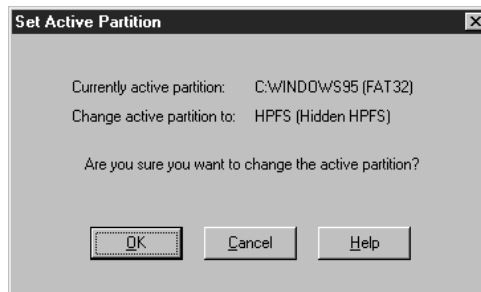
- 1 On the partition map or in the partition list, right-click the partition you want to make active.


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

In a configuration with mixed IDE and SCSI hard drives, Windows NT does not always see the boot drive as the first physical hard drive. ServerMagic displays drives in the order Windows NT reports them. As a result, you may see your boot device as Drive 1, 2, or so forth. This does not cause problems for ServerMagic except when you set a new active partition. ServerMagic may incorrectly report that there is no active partition on your system. To change your active partition, you must identify which drive is your boot drive. (With mixed IDE and SCSI hard drives, there is an increased chance that your BOOT.INI file may become corrupted. It is a good idea to have a boot disk available.)

- 2 Click **Advanced ► Set Active** on the context menu.

The **Set Active Partition** dialog appears.



- 3 Click **OK** to add the operation to the ServerMagic queue.
- 4 Add more operations to the queue, or click  on the toolbar to execute the queue.

When your computer boots, it reads the partition table of the first drive to find out which partition is active and boots from that partition. For a partition to be the boot partition, then, the following must be true:

- The partition must be on the first drive.

- The partition must contain an operating system.

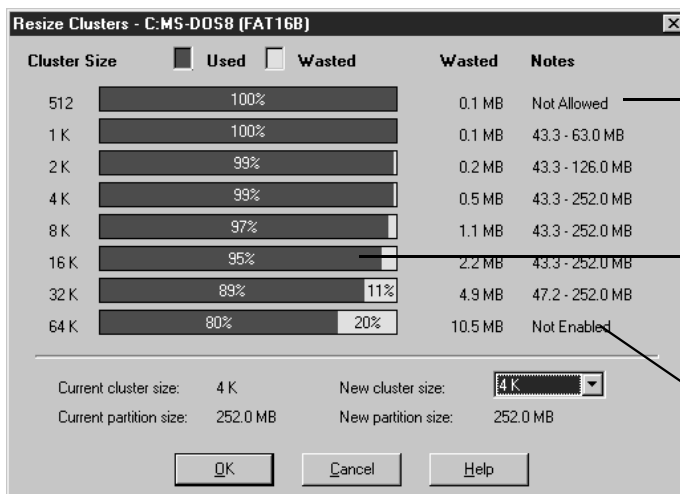
ServerMagic hides inactive FAT, NTFS, and HPFS primary partitions to prevent incompatibility with other operating systems. Hiding inactive primary partitions makes it easy to install multiple operating systems and choose the one you want to use with **Set Active**. For example, if you have Windows NT and want to install Linux in a separate partition, you can make the Windows NT partition smaller, create another primary partition, set it as the active partition, and then boot from the Linux installation diskettes.

Resizing Clusters

All files on FAT and FAT32 partitions are stored in allocation units called clusters. Each file is made up of a complete cluster, even though this usually results in wasted space, especially in clusters containing small files. The size of a partition determines the minimum cluster size. Larger partitions have larger clusters, and, therefore, more wasted space.

The **Resize Clusters** operation changes the cluster size on FAT and FAT32 partitions. Reducing cluster size can help you reclaim wasted space on your hard disk.

- 1** On the partition map or in the partition list, right-click the FAT or FAT32 partition where you want to resize clusters.
 - 2** Click **Advanced ► Resize Clusters** from the context menu.
- The **Resize Clusters** dialog displays the possible cluster sizes from 512 bytes to 64K.



If a cluster size is less than the minimum for the size of the partition, "Not allowed" appears.

Bar graphs show how much space will be used and wasted if you choose each available cluster size.

"Not Enabled" appears if "Allow 64K FAT Clusters for Windows NT" is disabled in preferences. You should enable the preference only if the partition size requires it.

- 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.

Choosing a smaller cluster size may resize the partition smaller, creating free space next to the partition.

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

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

- Add more operations to the queue, or click  on the toolbar to execute the queue.

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 KB |

DOS and Windows default FAT Cluster Sizes (Continued)

| Partition Size (MB) | FAT Type | Sectors Per Cluster | Cluster Size |
|---------------------|----------|---------------------|--------------|
| 128-255 | 16-bit | 8 | 4 KB |
| 256-511 | 16-bit | 16 | 8 KB |
| 512-1,023 | 16-bit | 32 | 16 KB |
| 1,024-2,047 | 16-bit | 64 | 32 KB |
| 2,048-4,096 | 16-bit | 128 | 64 KB* |

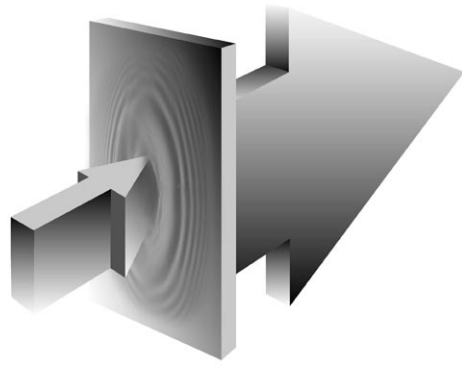
*Only available with Windows NT.

Windows 95/98, OS/2, Windows 2000 Server Default FAT32 Cluster Sizes

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

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.

For more information about cluster sizes, see “Making Efficient Use of Disk Space” in Help or in the *Basic Concepts* PDF file on the ServerMagic CD, which is accessible from the initial setup screen under the **Read Documentation** option.



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** Back up all partitions on the old hard disk.
- 2** Shut down the server and turn off the power.
- 3** Install the new hard disk as the primary drive, and set the old hard disk as the secondary drive.
- 4** Boot the server from the ServerMagic rescue diskette. To create a ServerMagic rescue diskette, see “Creating Rescue Diskettes to Run from DOS” on page 23.
- 5** Copy all partitions from the old hard disk to the new hard disk.
- 6** Resize the partitions as desired.
- 7** Designate the appropriate partition as the active partition.
- 8** Apply all changes.
- 9** Exit ServerMagic and remove the rescue diskette.
- 10** Shut down the server and turn off the power.
- 11** Remove the old hard drive from the server. Keep the old hard disk unchanged until you confirm that the new hard disk boots without a problem.
- 12** Turn the computer on and the computer boots from the new hard disk.
- 13** Ensure all drive letters on the new hard disk match the drive letters on the old hard disk.

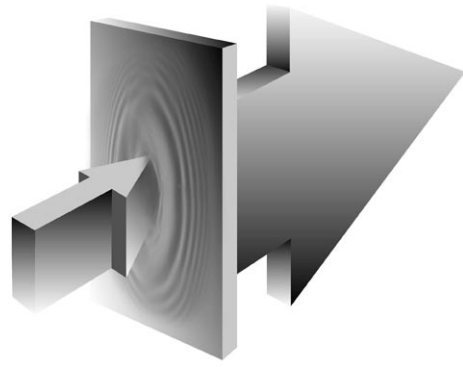
Reusing the Old Server Disk

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

- 1** Shut down the server and turn off the power.
- 2** Reinstall the old hard disk as the secondary drive.
- 3** Boot the server from the ServerMagic rescue diskette.
- 4** Delete all partitions from the old disk.
- 5** Exit ServerMagic and remove the rescue diskette.
- 6** Reboot the computer.
- 7** Use ServerMagic to create partitions on the old hard disk.

A P P E N D I X

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**.

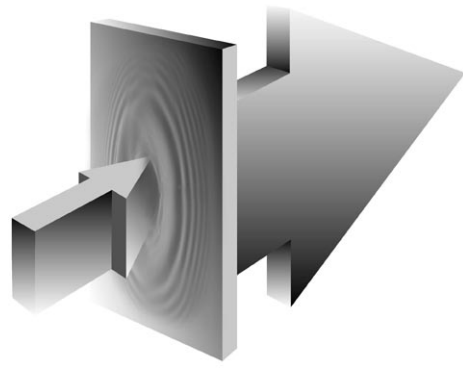
The other primary partitions will now be hidden when this operating system boots.

Compaq Insight Manager (CIM)

When you attempt to run ServerMagic on a Compaq server in which CIM Agents are installed and running, you will 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.

A P P E N D I X

B



Troubleshooting

This appendix includes the following information:

- Assigning a CD-ROM Drive Letter
- Using DOS ServerMagic With a SCSI Hard Disk
- Resolving Check Errors
- Resolving Partition Table Errors
- Partition Tables and Viruses
- Error Messages and Solutions

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 DOS ServerMagic With a SCSI Hard Disk

To use DOS 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.

Resolving Check Errors

ServerMagic checks the integrity of a partition thoroughly before making changes to it. The **Check** operation performs the same checks and displays error messages when it discovers problems. For more information, see “Checking Partitions” on page 42 and “Getting Information About Partitions” on page 44. These checks are similar to those made by NT’s CheckDisk utility.

ServerMagic also checks a partition after modifying it. If this check fails, report the problem to PowerQuest technical support. For more information, see “PowerQuest Technical Support” on page 99. 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 you receive a **Check** error message on any partition, back up your hard disk and then run your operating system’s CHKDSK program 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** operation, contact PowerQuest technical support. For more information, see “PowerQuest Technical Support” on page 99.

If CHKDSK and the **Check** operation detect the same errors, which is usually the case, run CHKDSK with the /F switch 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** operation. If ServerMagic still reports a problem, contact Technical Support.

Resolving Partition Table Errors

Unless instructions outlined later in this appendix specify otherwise, 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 Disk Administrator program to perform these actions.

Partition Tables and Viruses

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** operation to evaluate the integrity of the partition. Back up the files on any partition that passes the **Check** operation. Then remove the virus and perform the **Check** operation on the partitions again. Delete and recreate any partitions that fail the check. Finally, reinstall Windows NT and restore the backup files as necessary.

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 the PowerQuest website at <http://www.powerquest.com/support/ER/er0000.html> for a current listing.

Miscellaneous Errors (3–38)

#3 Not enough memory

This error can occur when you are resizing, moving, or copying an NTFS partition. For more information about memory requirements, see “System Requirements” on page 2.

#8 Could not allocate/deallocate DOS real mode memory

The DOS ServerMagic executable running under DOS requires some memory in the first 1 MB of the computer’s address space (ServerMagic uses a DOS extender). If enough memory is not available, ServerMagic cannot access the hard disk. For possible solutions, see “Freeing Memory to Run ServerMagic From Rescue Diskette” on page 24.

#23 Unsupported version of operating system

ServerMagic runs exclusively on Windows NT Server 4.0, with either SP1 or SP3 installed.

#34 This beta or evaluation version is no longer safe to use

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.

#36 DPMI Server error

ServerMagic DOS executables use a DOS extender. This error indicates a failure during a call made from ServerMagic through the DOS extender (to DOS or to the BIOS). The DOS extender may be in conflict with other programs that use extended memory. DOS would load the conflicting programs from your CONFIG.SYS or AUTOEXEC.BAT file during the normal boot sequence.

You may be able to resolve this problem by pressing <F8> while booting DOS. After DOS boots and starts to read the commands from your CONFIG.SYS and AUTOEXEC.BAT files, DOS asks you if you want to execute each command. When you see commands that load device drivers or TSR programs that you think might be conflicting with the ServerMagic DOS extender, answer **N** (no) to tell DOS not to execute that command (not to load that software into memory). You can often find a program configuration that enables ServerMagic (the DOS extender) to run without error.

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.

#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 NT CheckDisk 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.

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 83 and “Partition Tables and Viruses” on page 83.

#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 83 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 83.

#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, run PartitionInfo according to the instructions on page 51, then call PowerQuest Technical Support for assistance.

#111 Logical partition starts outside Extended

The hard-disk partition table contains erroneous values. All logical partitions must be totally contained within the extended partition. To resolve this error, see the instructions in "Resolving Partition Table Errors" on page 83.

#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.

Windows NT 4.0 can read HPFS files, so this problem may be caused by OS/2's FDISK program if you upgraded Windows NT 3.51 to Windows NT 4.0.

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 83.

#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 83. 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.

#118 Two partitions have the same serial number

ServerMagic may require all partitions on your system to have unique serial numbers. This is typically the case when a drive letter change has occurred as a result of loading a driver for disk compression or drive letter remapping.

You can use the SNUTIL utility included with ServerMagic to change the serial numbers of physical FAT partitions. You cannot use SNUTIL for HPFS partitions, network volumes, or other volumes that are not physical partitions.

#119 A drive has been formatted since starting ServerMagic

When you start ServerMagic, it reads information about each partition into memory. If you switch to another window and format a partition, you must exit ServerMagic and restart it to allow ServerMagic to recognize the change.

#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 and Windows NT require that logical partitions be chained together in ascending order.

For solutions to this problem, see the instructions in "Resolving Partition Table Errors" on page 83. 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.

#128 Invalid disk geometry

This error occurs when executing ServerMagic natively from Windows NT where a dynamic drive overlay (for example, EZDrive, MaxBlast, or DiskManager) is installed on at least one of the drives. The combination of running natively in Windows NT and the overlay program result in a hard disk geometry that is not recognizable to ServerMagic.

To solve the problem, determine if the overlay is necessary. If the system BIOS supports LBA translation mode, it generally does not require an overlay. You can uninstall the overlay using the installation setup disk provided by the overlay manufacturer. Note, however, that uninstalling a dynamic drive overlay usually destroys all data on the drive. If the overlay cannot be removed, ServerMagic cannot run natively from Windows NT; you must run ServerMagic from the rescue diskettes. For further information, see “Creating Rescue Diskettes to Run from DOS” on page 23.

Boot-Mode Errors (350-400)

Boot mode errors occur when ServerMagic encounters other programs scheduled to run in Windows NT boot-mode.

#356 Boot mode cannot run if unknown application scheduled

ServerMagic checks the registry for programs scheduled to run in boot-mode. If one or more unknown programs are found, error 356 is returned. For ServerMagic to run in boot-mode, these unknown programs must be temporarily removed from the following registry key:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session  
Manager
```

Locate the BootExecute entry in the right pane. Normally the following text string is found here:

```
autocheck autochk *
```

If anything else appears, it must be temporarily replaced with the text string shown above for ServerMagic to run in boot-mode. Once all boot-mode operations are complete, the BootExecute entry can be returned to its previous value.

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 82.

#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” on page 42. 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 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 to disk a command list file, or “batch file”. ServerMagic reads the batch file to execute the changes. This is true whether ServerMagic can perform the changes from within ServerMagic or must reboot the server because all partitions cannot be locked. The batch file is located in your WINNT\SYSTEM32 directory. The batch filename is PQ-SM20.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. See “PowerQuest Technical Support” on page 99 for more information.

#603 Unknown batch operation

The batch file contained an operation unknown to ServerMagic. Contact PowerQuest technical support. See “PowerQuest Technical Support” on page 99 for more information.

- #610 Error trying to parse Drive Mapper command**
- #611 Error trying to parse DiskConfig data**
- #612 Error trying to parse a batch Create command**
- #613 Error trying to parse a batch Delete command**
- #614 Error trying to parse a batch Adjust command**
- #615 Error trying to parse a batch FATAdjust command**
- #616 Error trying to parse a batch Set Label command**
- #617 Error trying to parse a batch Hide command**
- #618 Error trying to parse a batch SetActive command**
- #619 Error trying to parse a batch Format command**
- #620 Error trying to parse a batch Copy command**
- #621 Error trying to parse a batch Convert command**
- #622 Error trying to parse a batch BadSectorRetest command**
- #623 Error trying to parse a batch ChangeDriveLetter command**

(The following information applies to errors 610–623.)

An error occurred when ServerMagic attempted to read and parse a specified command in the batch file. This is an internal error indicating a format problem with the command structure. Contact PowerQuest technical support. See “PowerQuest Technical Support” on page 99 for more information.

#625 Can't execute any operation: disk configuration has changed since batch file was created

Generally, this error occurs when ServerMagic needs to execute your commands in boot mode and your drive geometry is seen differently in your native Windows NT version of ServerMagic than it is in the boot-mode version. ServerMagic cancels all changes to avoid possible data loss. This is usually a correctable condition.

A common hardware configuration that causes this error is a system with a hard disk (such as a SCSI or removable drive) that is visible in Windows NT but not in the Windows NT boot-mode environment. This type of configuration is much more likely to occur in Windows 95/98 than in Windows NT.)

Some possible solutions are:

- Take the server offline and close all applications except ServerMagic to reduce the likelihood an open file will require boot-mode execution. If ServerMagic can perform its operations from within its native Windows NT environment, this error does not occur.
- Change the configuration of the offending drive (most likely the SCSI or removable drive) by changing the BIOS setup for that drive. This ensures that both the native Windows NT and the boot-mode environments detect identical hard drive configurations.

- Temporarily disable the offending drive before running ServerMagic.

If these solutions don't fix your problem, contact technical support for additional information.

#630 Can't execute the operation: Wrong partition type

#631 Can't execute the operation: Can't find correct partition

#632 Can't execute the operation: Partition location, size, or type is different than anticipated

#633 Can't execute the Copy operation: Can't find correct Destination partition

(The following information applies to errors 630–633.)

For ServerMagic to execute the list of commands from the batch file, it must ensure that each command executes on the correct partition. In order to do this, it must correctly anticipate the partition's *current* location and size (not the *starting* location and size at the time ServerMagic was loaded) because the partition could have been moved, resized, relabeled, etc., during execution of prior commands.

If ServerMagic incorrectly anticipates the partition's current location, size, type, or label, one of these errors appears and the batch file stops execution (no data is lost and your disk is still in a valid configuration). However, since all of the commands may not have been performed, you should exit ServerMagic and then run it again and remake the rest of the changes that you want made to your disk.

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 User entered an invalid value

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.

#968 Incorrect Volume Label entered, Deletion not performed

To delete a partition, ServerMagic requires you to enter that partition's volume label. 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 enter that partition's volume label. If the volume label you enter does not match the volume label of the partition you are attempting to format, 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.

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” on page 42 and “Resolving Check Errors” on page 82.

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 is not properly shut down. To fix this problem, restart Windows NT 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 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 CheckDisk 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" on page 42. 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" on page 42. 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" on page 42. 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 CheckDisk, 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 CheckDisk does not fix this problem, but Windows NT automatically rebuilds the root directory on the partition the next time it is started.

#1650 Partition too fragmented to copy or resize

The NTFS partition contains too many fragmented files. The Master File Table (MFT) may also be too fragmented. Run a utility to defragment the partition (and the MFT, if necessary).

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 82.

#2001 FAT copies are not identical

Run NT CheckDisk to fix this error.

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

#2003 File size does not match FAT allocation for file

Run NT CheckDisk to fix this error.

#2005 One or more lost clusters were found

Run NT CheckDisk 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.

#2027 There are 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.

Operating System Errors (over 10,000)

Any number over 10,000 indicates an operating system error. To determine the error number and obtain its description, perform the following steps:

- 1** Subtract 10,000 from the error number. (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 above. (For example, `net helpmsg 32`)

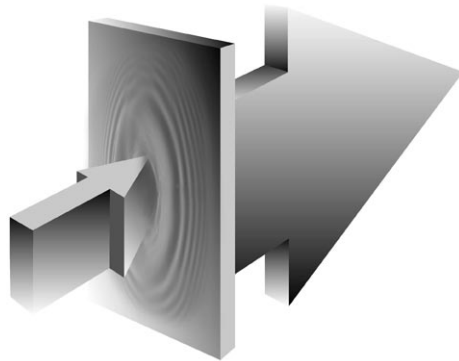
A brief description of the error message will be displayed.

- 3** Consult your Windows NT system documentation or Microsoft's TechNet web site (*technet.microsoft.com*) for information about resolving the error.

For information about error 10.032, refer to "Compaq Insight Manager (CIM)" on page 79.

A P P E N D I X

C



PowerQuest Technical Support

This appendix includes the following information:

- Before Contacting Technical Support
- Contact Information

Before Contacting Technical Support

PowerQuest is committed to providing you with comprehensive technical support. However, before contacting our technical support department, please try to resolve your problem by using this guide, ServerMagic Help, 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 ServerMagic. See “Generating Diagnostic Reports” on page 51 for more information about PartitionInfo and PARTINFO. The PartitionInfo report is always required for errors 100-199, 255, 986, and drive detection errors of any kind.
- Your product serial number is required to obtain technical support.

Term of Technical Support for ServerMagic 3.0

Technical support is available to all registered users throughout the life of the product, which began when PowerQuest released ServerMagic 3.0 to manufacturing and ends six months after the release of ServerMagic 4.0.

Upon registration, PowerQuest provides 45 days of complimentary technical support from the day of your first call. In addition, registered users are eligible for special upgrade pricing when PowerQuest releases a new version of ServerMagic. Contact PowerQuest Customer Service for additional information about upgrade pricing.

Contact Information

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 www.powerquest.com/support/emsupport.html. If you send the information from PartitionInfo or PARTINFO with your e-mail message, a PowerQuest technician will be able to assist you more easily. See “Generating Diagnostic Reports” on page 51 for more information about PartitionInfo and PARTINFO.

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 www.powerquest.com/support/demand.html. 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.

Corporate Web Site

The PowerQuest web site includes a wide array of information, including answers to frequently asked questions.

| Information | Web Site Address |
|-----------------------------|--|
| Overview of support options | www.powerquest.com/support/support.html |
| E-mail support request form | www.powerquest.com/support/emsupport.html |
| Error messages | www.powerquest.com/support/er/er0000.html |
| ServerMagic FAQs | www.powerquest.com/support/FAQs.html |

Fax

| Location | Number |
|-----------------|---------------------|
| USA | (801) 437-4218 |
| Europe | +31 (0) 20 582 9260 |

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) 0171 341 55 17 |
| English | USA | (801) 226-6834 |
| French | France | +33 (0) 1 69 32 49 30 |
| German | Germany | +49 (0) 069 66 568 516 |
| Italian | Italy | +39 (0) 02 45 28 1312 |
| Portuguese | USA | (801) 226-6834 |

| Language | Location | Number |
|-----------------|-----------------|---------------------|
| Spanish | Spain | +34 (0) 91 622 3146 |
| Spanish | USA | (801) 226-6834 |

The USA call center is open Monday through Friday, 7 a.m. to 6 p.m., MST/MDT. Our European call centers are open Monday through Friday, 9:00 to 18:00, CET.

If you have the information from PartitionInfo or PARTINFO ready when you call, a PowerQuest technician will be able to assist you more easily. See “Generating Diagnostic Reports” on page 51 for more information about PartitionInfo and PARTINFO.

Postal Service Mail

| USA | Europe |
|------------------------|-----------------|
| PowerQuest Corporation | PowerQuest |
| P.O. Box 1911 | Orlyplein 85 |
| Orem, Utah 84059-1911 | 1043 DS |
| U.S.A. | Amsterdam |
| | The Netherlands |

Please include the information from PartitionInfo with a description of your problem. Also include a return address, a daytime phone number, or other relevant contact information.

Index

Numerics

64K clusters, using 22

A

active partition, setting 68

administrators, information for 3

advanced operations 21

 resize clusters 69

 resize root 67

applying changes 19

 in boot mode 19

asterisk (*) in partition list 15

AUTOCHK triggered during boot-mode 4

B

bad sectors

 checking 6

 checks, skipping 23

 retesting 64

batch error messages 89

batch files (scripting) 25

boot code boundary 34

BOOT.INI file 10, 23

 changes during boot-mode execution 4

bootable partitions

 copying 39

 creating 34

 moving 29, 34

 reducing size of 28

 resizing 34

boot-mode execution 4, 19

 changes to BOOT.INI file 4

 possible corruption to system partition reported during 4

C

cancelling changes 20

changes

 applying 19

 discarding 20

changing Windows NT partition 4

check

 disk integrity 6

 error messages 88

 operation 21

 resolving errors 82

CHKDSK, run before using ServerMagic 10

CIM Agents and ServerMagic 79

clusters

 64K, using 22

 allowing 64K FAT 22

 bad 64

 default sizes 70

 FAT, required size 70

 resizing 69

 resizing FAT 69

 size 45, 49, 69

 waste 45

context-sensitive help 25

conventional memory, freeing to run ServerMagic 24

convert operation 21

converting

 FAT to FAT32 56

 FAT to HPFS 57

 FAT to NTFS 59

 FAT32 to FAT 60

 OS/2 partitions to HPFS 58

copy operation 20

copying 38

 boot partitions 39

 partitions, reasons to copy 39

create operation 20

creating partitions 31

 bootable 34

 free space required 31

creating rescue diskettes 23

D

data

 loss, causes of 22, 23, 42, 83, 86, 87, 96

 moving 50

delete operation 20

deleting

 extended partitions 35

 partitions 35

diagnostic reports 53

DirBlock 50

- discarding changes 20
- disk
 - determining wasted space on 45, 70
 - geometry, invalid 88
 - mirroring sets, partitions on 3, 15
 - selecting 18
 - usage 44
- disk access error messages 84
- DOS
 - boot disks, creating for ServerMagic 23
 - error messages 84
 - ServerMagic executable 24
- double-byte character sets, filenames and 6
- drive letter assignments 5
- drive, logical *See* logical partition
- Dual Boot compatibility with ServerMagic 78

E

- e-mail on demand technical support 101
- emergency diskettes 23
- enlarging FAT partition 29
- enlarging partitions 28
- error messages
 - batch 89
 - Check 88
 - disk access 84
 - DOS-specific 84
 - FAT 95
 - free space, regarding 89, 94
 - miscellaneous 83–84
 - NTFS-specific 93
 - partition table 85
 - user interaction 92
- errors, resolving
 - check 82
 - partition table 83
- executing changes 19
- Extended Attributes
 - errors involving 42
 - information about 48, 50
- extended partitions 15, 16
- extended partitions, deleting 35

F

- FAT file system 16
 - allowing 64K clusters for Windows NT 22
 - Check error messages 95
 - cluster size, changing 69

- cluster size, explained 69
- cluster waste 45
- converting from FAT32 60
- converting to FAT32 56
- converting to HPFS 57
- converting to NTFS 59
- ignoring OS/2 EA errors 22
- partitions, changing cluster size of 69
- partitions, hiding and unhiding 66
- partitions, information about 44, 46
- partitions, OS/2 Extended Attribute errors on 42
- partitions, resizing 28

FAT Info 47

FAT partition, enlarging 29

FAT32 file system

- FAT32 16
- partitions, converting to FAT 60
- partitions, hiding and unhiding 66
- partitions, information about 44
- wasted space 45

FAT32 partitions 22

features of ServerMagic 2

file record size 49

file systems, working with multiple 5

filenames supported by ServerMagic 6

first

- data sector 47
- FAT sector 47
- MFT cluster 49
- physical sector 46

Fnodes 50

format operation 20

format operation 36

formatting hard disks 36

free DirBlocks 50

free space 17

- displayed 44, 46
- error messages involving 89, 94
- required for enlarging partitions 28
- required to create a partition 31
- required to move a partition 29
- required to run ServerMagic 3

G

getting started 10

H

handle, partition 30

hard disk geometry 86, 87

hard disks

backing up 10

formatting 36

selecting 18

hardware requirements 3

help

context-sensitive 25

online 25

technical support 100

hibernating Windows 2000 Server 24

HPFS 16

converting from FAT 57

converting OS/2 partitions to 58

Fnodes 50

partitions, hiding and unhiding 66

partitions, information about 44, 46, 49

partitions, minimum size of 28

I

Info 44

cluster waste 45

disk usage 44

FAT Info 47

HPFS Info 49

info operation 21

NTFS 48

partition 46

installing

new server disk 74

ServerMagic 7

integrity checks

disk 6

partition 42

Internet technical support 102

L

label operation 20

labels, changing 36

last physical sector 46

letters, drive *See* drive letters

Linux 17

installing with Windows NT 69

Linux, using ServerMagic with 7

list, partition *See* partition list

logical partitions 15

long filenames 67

Windows, created by 57

M

main window

menu bar 11

partition information 14

ServerMagic 11

status bar 11

toolbar 13

master boot record 85, 88

master file table 49

menu bar 11

mirrored sets, using ServerMagic to resize 29

modifying unlocked partitions 4

moving bootable partitions 29, 34

moving data 50

moving partitions 29

MS ScanDisk 50

multiple operating systems 5, 22

multiple visible primary partitions 78

N

naming partitions 36

Norton AntiVirus, compatibility with ServerMagic 78

NT CheckDisk 21, 50

NT Server

offline 4, 10

with RAID systems 4

working with multiple operating systems 5

NTFS 17

Check error messages 93

partitions, checking 24

partitions, hiding and unhiding 66

partitions, information about 44, 46, 48

partitions, minimum size of 28

O

online help 25

open files 4

operating system boot utilities

Dual Boot 78

System Commander 78

operating system errors 96

operating system, creating partition for 34

operating systems, multiple 5, 22

operations

cancelling 20

copy 38

- create 31
 - delete 35
 - format 36
 - Info 44
 - move 29
 - MS ScanDisk 50
 - NT CheckDisk 50
 - process overview 17
 - resize 28
 - selecting 18
- OS/2
 - converting partitions to HPFS 58
 - Dual Boot compatibility with ServerMagic 78
 - FDISK, errors involving 85
 - ignore extended attribute errors 22
 - using ServerMagic with 7
- P**
- PARTINFO 53
- partition info 46
- partition list, asterisk (*) in 15
- partition map 14
- partition operations
 - advanced 21
 - check 21
 - convert 21
 - copy 20
 - create 20
 - delete 20
 - format 20
 - info 21
 - label 20
 - NT CheckDisk 21
 - resize/move 20
- partition table
 - error messages 85
 - resolving errors 83
- partition types
 - extended 16
 - FAT 16
 - FAT32 16
 - free space 17
 - HPFS 16
 - Linux 17
 - NTFS 17
 - unformatted 17
- partitions
 - applying changes to 19
 - bootable 34, 68
 - checking NTFS 24
 - copying 38
 - copying bootable 39
 - creating 31
 - deleting 35, 92
 - discarding changes to 20
 - enlarging 28
 - errors, fixing with CHKDSK 10
 - extended 15
 - extended, deleting 35
 - formatting 36, 92
 - information 14, 44
 - integrity check 42
 - labeling 36
 - logical 15
 - map 14
 - moving 29
 - moving bootable 29
 - multiple primary 78
 - primary 15
 - reducing size of bootable 28
 - resizing 28
 - scanning for errors 50
 - selecting 18, 18
 - serial number 46
 - setting active 68
 - type 46
 - types 15
 - unlockable, changing 4
- pause after boot-mode execution 4
- physical disk, selecting 18
- physical geometry 46
- PowerQuest web site 102
- preferences, ServerMagic
 - allowing 64K FAT clusters for Windows NT 22
 - ignoring OS/2 EA errors on FAT 22
 - set as read-only for ServerMagic 23
 - setting 21
 - skipping bad sector checks 23
 - system supports FAT32 22
- preparing to use ServerMagic 10
- primary partitions 15
- R**
- RAID systems 12, 18
 - using ServerMagic rescue diskettes with 5
 - working with 4
- README file 25
- read-only, set as for ServerMagic 23

- reclaiming wasted space 69
- reducing size of bootable partitions 28
- registering ServerMagic 100
- rescue diskettes 23, 23
 - running from 24
 - running PARTINFO from 53
 - running under Windows 2000 Server 24
 - using with RAID systems 5
- resize/move operation 20
- resizing
 - clusters manually 69
 - partitions in mirrored sets 29
 - root 67
- resizing partitions 28
- retesting bad sectors 64
- reusing old server disk 74
- root directory
 - FAT, capacity in 47
 - FAT, resizing in 67
 - index, error in 95
 - long filenames in 67
 - resizing 67

S

- ScanDisk 50
- scanning for errors 50
- scripting 25, *See also* online PDF manual
NTSCRIPT.PDF
- sectors, bad 85
- selecting
 - hard disk 18
 - operation 18
 - partitions 18
 - physical disks 18
- server disk
 - installing new 74
 - reusing old 74
- ServerMagic
 - benefits of registering 100
 - compatibility with virus protection software 78
 - features 2
 - installing 7
 - main window 11
 - preferences 21
 - system requirements 3
 - uninstalling 8
 - Windows 2000 Server 17
- Service Pack 4 required 3

- services not starting 39
- set as read-only for ServerMagic 23
- setting an active partition 68
- setting ServerMagic preferences 21
- skipping bad sector checks 23
- SMAGICT, running scripts with 25
- software requirements 3
- starting ServerMagic 10
- status bar 11
- stripe sets, partitions on 3, 15
- swap file 4
- system administrators, information for 3
- System Commander compatibility with ServerMagic 78
- system requirements 3

T

- technical support 100
 - duration 100
 - e-mail 103
 - e-mail on demand 101
 - fax 102
 - mail 103
 - registering for 100
 - telephone 102, 102
 - web site 102
- toolbar 13
- total physical sectors 46
- troubleshooting 81
 - can't boot Windows NT 23
 - CIM Agents and ServerMagic 79
 - disk geometry, invalid 88
 - DOS version of ServerMagic 24
 - operating system errors 96
 - pause after boot-mode execution 4
 - services not starting 39
 - Windows NT boot partition 39

U

- unattended changes 25
- unformatted partitions 17
- uninstallingServerMagic 8
- utilities, operating system
 - AUTOCHK 82
 - CHKDSK 42, 49, 82
 - NT CheckDisk 50
 - ScanDisk 50, 82

V

- virus protection software 78
- virus protection software compatibility with
 ServerMagic 78
- volume sets, partitions on 3, 15
- volumes, labeling 36

W

- wasted space 45
 - reclaiming 69
- Windows 2000 Server
 - rescue diskettes, running 24
 - ServerMagic does not run with 17
- Windows 95 long filenames 57
- Windows NT
 - 64K FAT clusters 22
 - BOOT.INI file 23
 - booting 34
 - CheckDisk 50
 - error messages, involving 93
 - long filenames 57
 - partition, changing 4