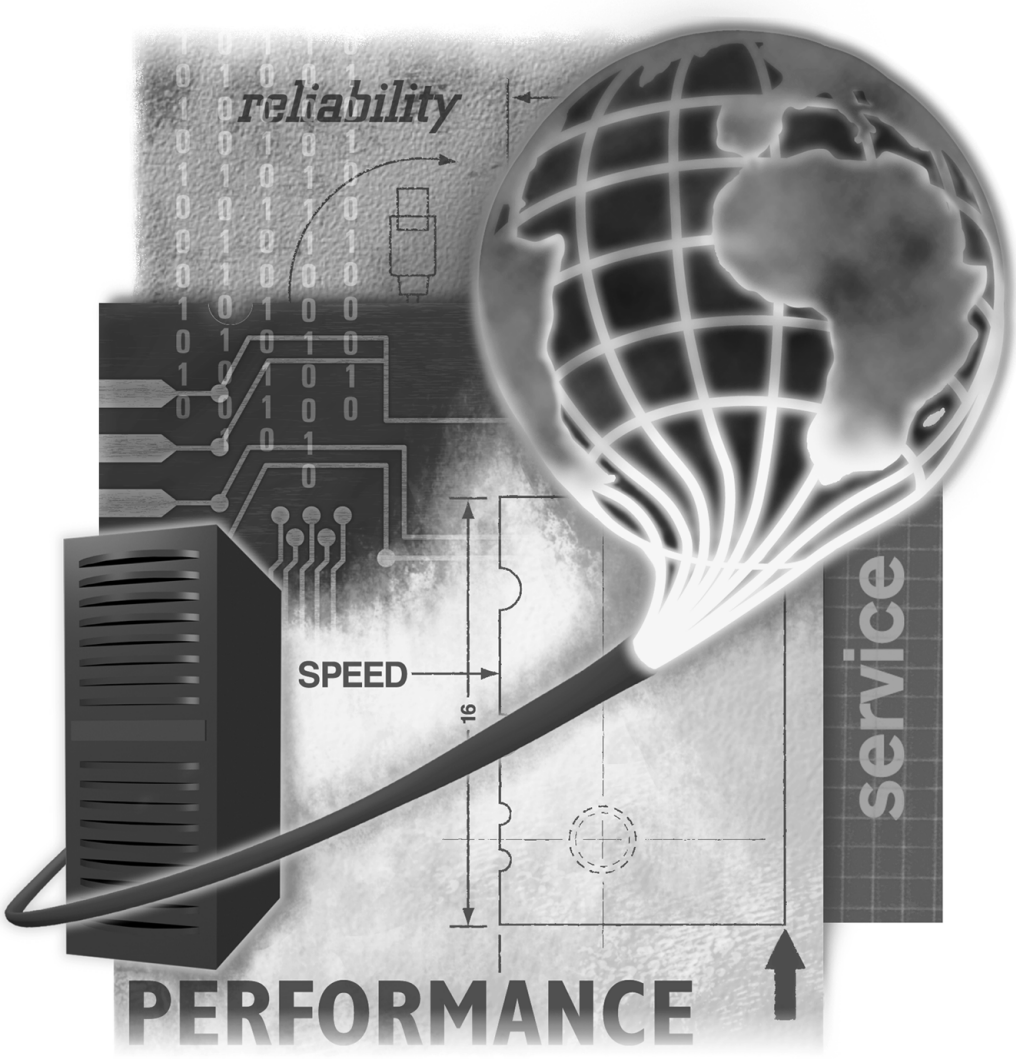
Server Image™ 1.1

for Windows NT®



User Guide

Server Image 1.1 for Windows NT

User Guide

Manual Version 1—October 2000

PowerQuest Corporation

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Introduction

What Is Server Image?

Server Image is a fast, inexpensive, and complete hard-disk imaging solution. Unlike file-by-file copying utilities, Server Image uses SmartSector® imaging to create an exact image of a hard disk or partition.

With Server Image, you can create and restore a compressed image file of an entire hard disk or individual partitions of a hard disk. Because Server Image uses SmartSector imaging, your Windows optimizations are preserved when you restore an image. Server Image provides SmartSector imaging support for FAT, FAT32, NTFS, HPFS, and Linux Ext2 and swap file systems.

IMPORTANT! Because of operating system conflicts that can result from different hardware configurations, Server Image was not intended to copy or image a hard drive that will be used in a system with different hardware configurations.

Server Image System Requirements

Hardware/Software	Minimum
Processor	Intel 386SX (486 or above recommended)
RAM	16 MB (32 MB required for FAT32 or NTFS); 32 MB recommended
3.5-inch diskette drive	None; 3.5-inch diskette drive recommended
CD-ROM drive	Any speed
Hard disk free space	8 MB
Operating System	Windows NT 4.0, Windows 2000, or DOS 5.0
Monitor	VGA; SVGA recommended
Pointing Device	None required; Microsoft mouse recommended

CHAPTER 1

Getting Started

This chapter includes the following information:

- Installing Server Image
- Before Running Server Image
- Running Server Image
- Uninstalling Server Image
- Getting Online Help

Installing Server Image

You can install Server Image from Windows NT Server 4.0 or Windows 2000 Server.

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

   Server Image is included on the ServerMagic CD.

   If CD auto-run is enabled, the installation program automatically launches when you place the ServerMagic CD in your CD-ROM drive.

2. If the CD auto-run is not enabled, insert the CD, click **Start ➤ Run**, then type `drive:\autorun` (where *drive* is the drive letter of your CD-ROM drive), then click **OK**.

3. Click **Install**.

   The **Installation Options** dialog appears.

4. Select **Server Image**, then click **Next**.

5. Follow the on-screen commands.

   Server Image runs under DOS, so the installation program creates a "virtual floppy" to run the program.

Creating Server Image Rescue Diskettes

At the end of the installation process, you will have an opportunity to create rescue diskettes.

To create rescue diskettes after the installation is complete:

1. Insert the ServerMagic CD.

2. At the browser, select **Technical Support**.

3. Click **Create Server Image Rescue Diskettes**.

PowerQuest recommends that you create rescue diskettes. Then if your hard disk becomes unbootable or you do not have access to a Windows server, you can boot your computer and run Server Image from the rescue disks.

You will need two blank diskettes to proceed (You need three diskettes if you are creating Server Image in a double-byte language.)

Limitations of Server Image Rescue Diskettes

Be aware that when you run Server Image from the rescue diskettes you cannot save images to the following partitions:

- FAT32 or NTFS partitions
- Any partition that crosses or exists past the 1024 cylinder boundary
- Any partition that resides in an extended partition that crosses or exists past the 1024 cylinder boundary

You can avoid these limitations by using a DOS 5.x or later boot floppy in place of the Server Image bootable diskette (diskette 1 of the 2-diskette set). Creating your own boot floppy will also enable you to access network drives, which you cannot do with the rescue disks or the product running from your hard disk after a typical installation.

Before Running Server Image

Before running Server Image, PowerQuest recommends that you:

- Run a disk utility such as CHKDSK /F on each partition of the source drives to check for file system errors.
- Create Server Image rescue diskettes.

Running Server Image

You can run Server Image from the rescue diskettes or from your hard disk.

Running Server Image from Rescue Diskettes

1. Insert a bootable diskette (such as Diskette 1 of the Server Image rescue diskettes).

   To create rescue diskettes, see “Creating Server Image Rescue Diskettes” on page 4.

2. Reboot your machine.

   DOS loads and displays a prompt to insert the second Server Image rescue diskette and press any key to continue.

3. Insert the Server Image program floppy (Diskette #2 of the Server Image rescue diskettes), and press <Enter>.

The boot diskette includes EMM386.EXE to help load network drivers in high memory. However, because this file limits extended memory to 32 MB, you may see error #3 when you run Server Image from the rescue disks and work with large FAT32 and NTFS partitions. If you do not need EMM386.EXE, you can delete it from the bootable floppy to avoid this error. If you delete the EMM386.EXE file, you must also REM or delete the following line in the CONFIG.SYS file on the boot floppy: `DEVICE=EMM386.EXE`.

Running Server Image from a Hard Disk

1 Click **Start ➤ Programs ➤ PowerQuest ➤ Server Image 1.1 ➤ Server Image 1.1**.

Uninstalling Server Image

1 Click **Start ➤ Programs ➤ PowerQuest ➤ Server Image 1.1 ➤ Uninstall Server Image**.

You can also click **Start ➤ Settings ➤ Control Panel ➤ Add/Remove Programs ➤ Server Image 1.1**.

2 Follow the instructions on the screen.

Getting Online Help

1 Click **Help ➤ Contents** to display general instructions for using Server Image Help, or press <F1> at any time to access the Help Index.

CHAPTER 2

Creating Image Files

This chapter includes the following information:

- Image Files and Hardware Configurations
- Copying Windows NT Partitions
- Using Server Image to Image Windows 2000 Server
- Before Running Server Image
- Creating an Image File
- Advanced Options

Image Files and Hardware Configurations

Because of operating system conflicts that can result from different hardware configurations, Server Image was not intended to copy or image a hard drive that will be used in a system with different hardware configurations.

If you create an image on one machine and restore the image on a machine with a different configuration (for example, a different motherboard or video card), the operating system may not boot correctly. Therefore, PowerQuest recommends imaging and restoring only to machines with identical hardware configurations.

Copying Windows NT Partitions

If you are using Server Image to copy Windows NT partitions (where Windows NT is installed), you may experience problems related to the Windows NT BOOT.INI. The Windows NT BOOT.INI includes information about the boot options for Windows NT's loader and the order of the Windows NT partition. If you have used Server Image to copy a Windows partition, and the partition order has changed from the original order, then the BOOT.INI may not be updated to reflect the new order of the Windows NT operating system files. Therefore, you will be unable to boot your NT Workstation partition.

PowerQuest has developed a solution (in English) that will allow you to update and edit the Windows NT BOOT.INI. The executable is NTFSINI.EXE. For additional information, see the PowerQuest web site *www.powerquest.com/support/pm/pm6076.html*.

Using Server Image to Image Windows 2000 Server

1. Follow the setup instructions to install Windows 2000 Server to the computer.
2. On the first boot-up that actually goes into Windows 2000 Server, you will have an option to set up the server in one of many ways. Do not select any option.
3. Close the server setup window.
4. *(Optional)* Use Microsoft's SysPrep to remove machine-specific entries to allow deployment to several identical computers.
5. Shut down the machine.
6. Reboot the computer using the Server Image rescue disks.

You may need to create and use your own boot floppy that will enable access to a data storage region large enough to store the image of the Windows 2000 Server system.

7 Image the Windows 2000 Server system.

When the system is restarted, the server setup screen reappears.

PowerQuest only supports the imaging of a Windows 2000 Server that has not had its server responsibilities set. If SysPrep has been applied to the system before the image is taken, then the image can be restored to other identical machines.

Be aware that when you run SysPrep, you are subject to Microsoft's technical restrictions on using SysPrep. For example, imaging to machines with different hardware is not directly supported by Microsoft.

Before Running Server Image

- Before running Server Image, use a disk utility program such as a thorough ScanDisk or Norton's Disk Doctor to identify and repair any errors on your hard disk.

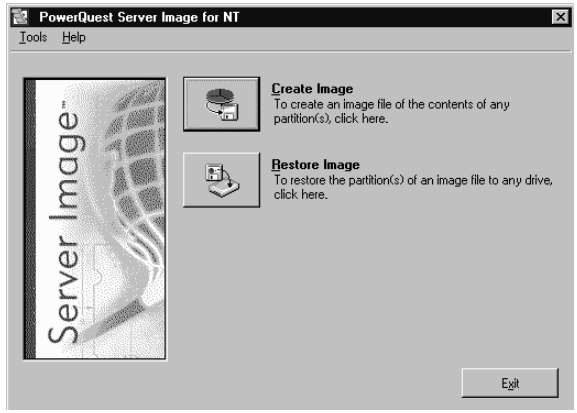
  Windows NT Workstation users should run CHKDSK /F.

- You must disable virus detection in the BIOS before creating an image file.

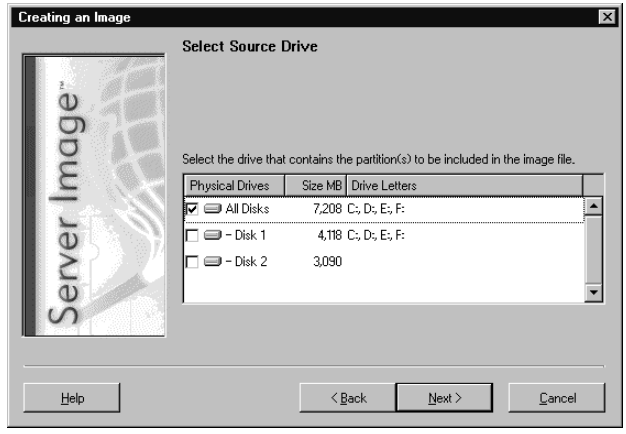
  If virus protection is enabled, Server Image may report an erroneous virus when your start up or Server Image may hang after you click **Finish**.

Creating an Image File

1 At the Server Image main screen, click **Create Image**.



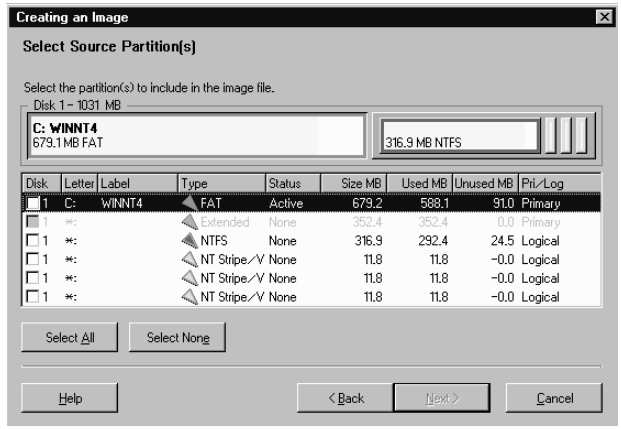
The **Select Source Drive** screen appears.



2 Select the disks that include the partitions you want to include in the image file.

You can click **All Disks** to select partitions from every hard disk on your machine.

The **Select Source Partition(s)** screen appears. It displays all the partitions on the disks that you selected. The partition map near the top of the screen is a graphic display of your hard disk. It includes a blue indicator for the 2 GB boot code boundary and a black indicator for the 1024 cylinder limit.

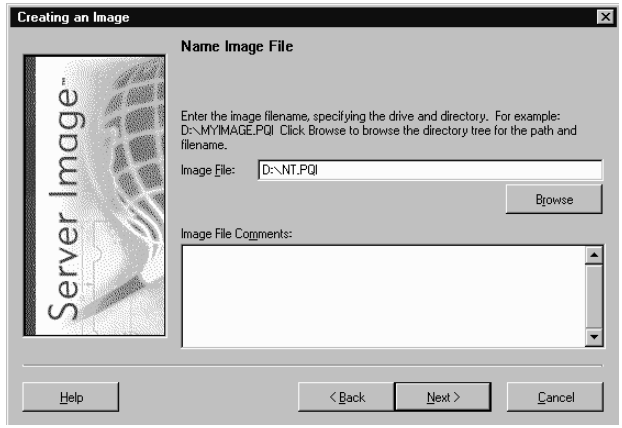


3 Select the partition you wish to include in the image file (the source partition) from the partition list, or click **Select All** to automatically select all partitions.

You may need to scroll to view all the partitions on your machine. Note that if you have more than one hard disk on your machine, the first column in the partition list shows the physical hard disk where the partition is located.

To deselect partitions, click again on a partition or click **Select None** to deselect all partitions at once.

4 Click **Next**.



5 Type the desired path and image filename in the **Image File** field (for example, `D:\MYIMAGE.PQI`).

You must save your image file to a partition that you are *not* including in your image file. You can click **Browse** to find the directory where you want to save the image file.

IMPORTANT! You can save your image file to any physical or logical drive that DOS has assigned a drive letter. You can save images to a local NTFS partition only if DOS has assigned it a drive letter. If you are running Server Image from rescue diskettes, be aware of the limitations listed on page 5.

IMPORTANT! Do not include spaces or extended characters (;+=[]',\"*\\<>/?:|) in the filename, or you may not be able to access the image file from Server Image or DOS.

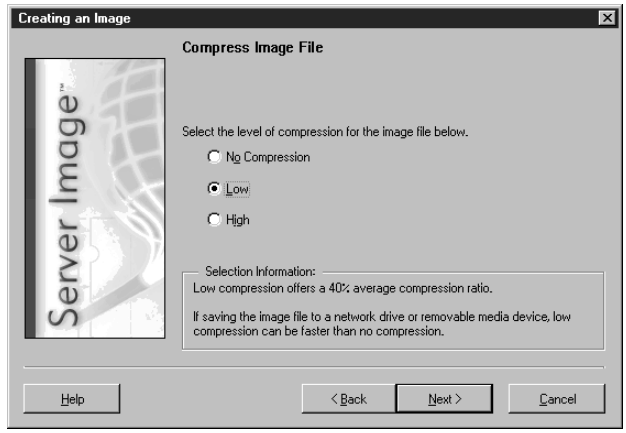
Make sure there is no existing file with the same name, unless you want the existing file to be overwritten. Server Image uses .PQI as the default image filename extension.

To save images to a network drive, you must boot from a floppy that includes network drivers. You can add network drivers to the first Server Image rescue disk, or boot your server from another floppy that includes the drivers.

6 *(Optional)* Type brief comments about your image file in the **Image File Comments** field.

Image file comments cannot exceed 300 characters.

7 Click **Next**.



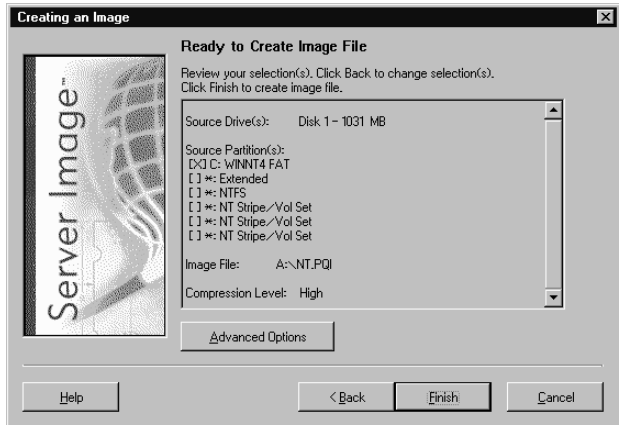
8 Select the desired compression level.

- **No Compression** is usually the fastest method for creating an image file and is useful if storage space is not an issue. However, if you are saving your image file to a busy network drive or to a relatively slow removable media device, high compression may be faster than no compression since there is less data to write to the file. Server Image selects **No Compression** by default.
- **Low** compression offers a 40% average compression ratio.
- **High** compression offers a 50% average compression ratio.

9 Click **Next**.

The **Ready to Create Image File** screen appears.

Server Image displays all the information you have entered to this point.



To modify any settings, click **Back**.

10 *(Optional)* Click **Advanced Options** to split an image file into multiple files (for removable media), to disable file system error-checking or SmartSector copying, to password protect your image file, or to verify disk writes.

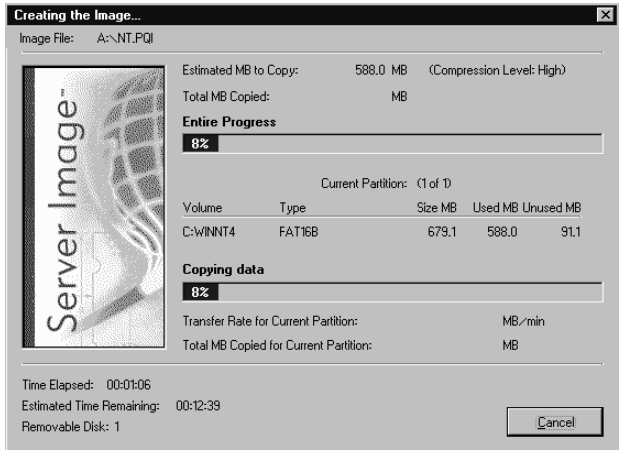
See “Advanced Options” on page 15 for additional information.

11 Click **Finish** to begin creating the image file.

If you entered a name of a current file (step 6), Server Image displays a message that <*path and filename*> already exists. You can replace the existing file or choose a new filename. **If you click Replace, the existing image file will be deleted immediately.**

If Server Image detects that you are saving your image file to a floppy drive or removable media, it enables a media-spanning feature that spreads the image file over a series of disks. You must have at least 100K of available space on each disk in the series. If you use the media-spanning feature, be sure to number the disks in order, since you must insert them in sequence when restoring the image file.

The **Creating the Image** dialog appears.



Upon completion, the following message appears: "Image was copied successfully to file: <*image filename*>."

12 Click **OK** to return to the Server Image main screen.

Advanced Options

The **Create Image Advanced Options** dialog appears when you click **Advanced Options** at the **Ready To Create Image File** screen.

Select this:	To do this:
Check for File System Errors	Clear the **Check for File System Errors** check box if you want to disable error checking. If you have already used a disk utility program such as ScanDisk to check your hard disk for errors, it is not necessary to have Server Image check for file system errors. Clearing **Check for File System Errors** saves time in copying the partitions. If you did not run a disk utility program before loading Server Image, leave the **Check for File System Errors** check box selected.

Select this:	To do this:
Disable SmartSector Copying	Server Image's SmartSector technology speeds up the copying process by only copying clusters and sectors that contain data. However, in some cases, such as high-security environments, it may be desirable to copy all clusters and sectors in their original layout, whether or not they contain data. If you wish to copy both used and unused clusters and sectors, click **Disable SmartSector Copying**. Disabling SmartSector Copying increases processing time.
Verify Disk Writes	Click this option to enable DOS disk write verification. If you choose this option, Server Image writes the data, then goes back and reads it to verify that is was written correctly. Disk write verification is not critical to safely create image files, but it reduces the chances that an image will be corrupted during the write process. Enabling disk write verification can slow image file creation dramatically.
Password Protect Image File	To password-protect your image file, click **Password Protect Image File** and type a password in the **Password** field. ***IMPORTANT!*** Store image file passwords in a safe place. If you forget the password, you cannot restore the file.
Split Image File Into Multiple Files	Sometimes it is useful to force Server Image to split a large image file into smaller files. To do so, click **Split Image File Into Multiple Files** and enter the maximum byte size for each file in the **File Size** (bytes) field. If you wish to save the files to CDs, specify a file size of 670,000,000 bytes (approximately 670 MB) or less.

CHAPTER 3

Restoring Image Files

This chapter includes the following information:

- Imaging Primary Domain Controllers
- Restoring an Image File
- Advanced Options

Imaging Primary Domain Controllers

Exercise caution when restoring an imaged Primary Domain Controller. Server Image for Windows NT will automatically convert a PDC (Primary Domain Controller) to a BDC (Backup Domain Controller) when you restore the image file. If you want the restored image to be the PDC, you must promote a BDC to a PDC before restoring the image. Then restore the image. The image will be restored as a BDC. Next, promote the restored image server to become the PDC; when you do so, the promoted PDC will be demoted back to a BDC.

Restoring an Image File

1. Disable virus detection in the BIOS.

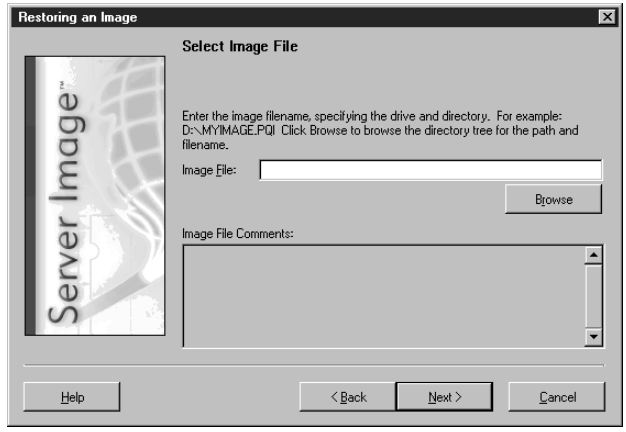
   If virus protection is enabled, Server Image may report an erroneous virus when you start up or Server Image may hang after you click **Finish** to restore an image file.

2. At the Server Image main screen, click **Restore Image**.

3. In the **Image File** field, type the path and filename of the image file you want to restore, or click **Browse** to select the path and image file.

   You can restore an image file from any physical or logical drive that DOS has assigned a drive letter, including floppy drives, secondary hard drives, network drives, and removable media storage devices. You may need to run Server Image from DOS boot diskettes to access network drives while running Server Image.

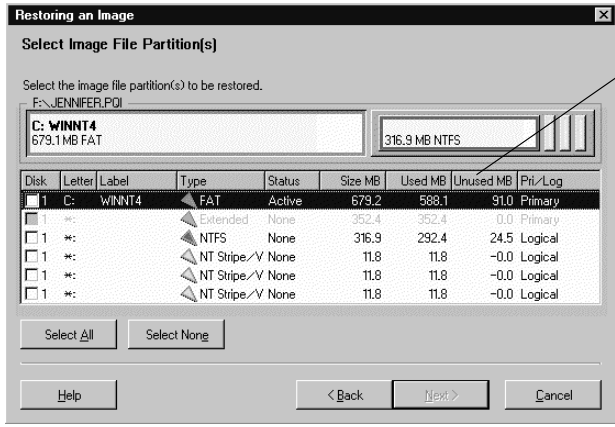
   If you are running Server Image from rescue diskettes, be aware of the limitations listed on page 5.



4 Click **Next**.

At any point prior to actual image file restore, you can click **Back** to return to the previous step and change your settings.

5 If there is more than one partition in the image file, you can select the partitions you want to restore. Click partitions to select them individually, or click **Select All**.



Drag column borders to resize columns. Display whether an image file has a password, is compressed, or is spanned by dragging the right border of the **Unused MB** column right to display additional information.

To deselect partitions, click again on a partition or click **Select None**.

6 Click **Next**.

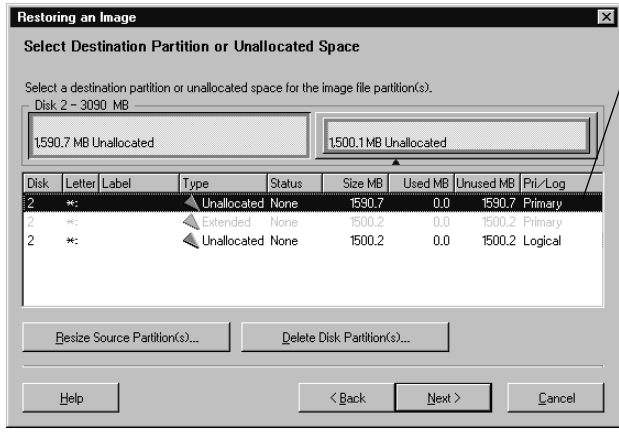
7 From the **Select Destination Drive** dialog, select the disk that includes the unallocated space or partitions where you want to restore the image file.

If you only have one hard disk, this step is omitted.

IMPORTANT! If you create an image on one machine and restore the image on a machine with a different configuration (for example, a different motherboard or video card), the operating system may not boot correctly. Therefore, PowerQuest recommends restoring only to machines with identical hardware configurations.

8 Select an existing partition or unallocated space where you want to restore the image.

The partition list includes all the partitions on your machine. If you have more than one hard disk, the first column in the partition list shows the disk on which a partition is located.



If you restored an image of a primary partition into the selected unallocated space, it could be bootable. If you restored a primary partition into the other unallocated space in this graphic, it would become an unbootable logical partition.

When you restore an image to unallocated space, Server Image creates a new partition for the image. The unallocated space where you restore an image must be at least as large as the used space required by the image. For example, if you created an image of a 500 MB FAT32 partition that included 300 MB of data, the unallocated space where you restore the image must be at least 300 MB.

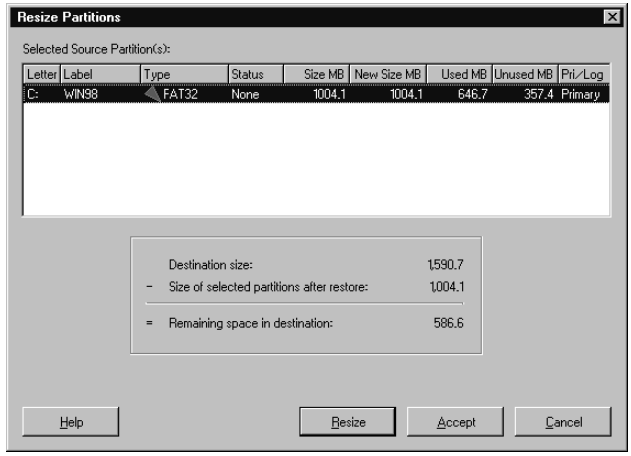
Be aware that if you restore an image of a primary partition into unallocated space inside an extended partition, Server Image will create a logical partition for the image. Consequently, the partition will not be bootable. If you need a bootable partition, ensure that the **Pri/Log** column for the unallocated space displays **Primary**.

If the destination partition or unallocated space is not large enough to accommodate the partitions you wish to restore, or if you are restoring the image file to a larger drive and want to set a specific size for partitions rather than use the proportional resize option, you may want to resize the partitions.

If you do not want to resize the partitions, go to step 14.

9 Click **Resize Source Partition(s)**.

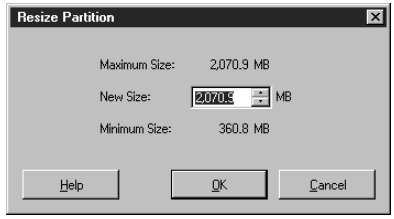
The **Resize Partitions** window displays.



The **Selected Source Partition(s)** group box displays the partitions you selected to restore.

10 Click **Resize**.

The **Resize Partition** window appears.



11 In the **New Size** field, enter the size for the new partition (in MB), then click **OK**.

The size you enter must be equal to or larger than the Minimum Size and less than or equal to the Maximum Size displayed in the dialog.

Since partitions must end on a cylinder boundary, Server Image rounds the new size up to the next cylinder boundary.

12 Click **Accept**.

When you restore the image file, Server Image will resize the partition.

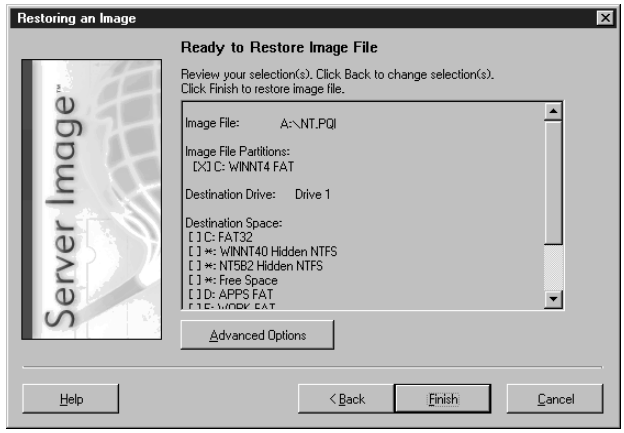
13 Click **Next**.

If you selected an existing partition as the destination, Server Image prompts you that the selected partition will be deleted before the image is restored. Server Image does not delete the partition until you click **Finish** on the **Ready to Restore Image File** screen.

14 If the unallocated space on the destination drive is greater than the space required to copy the selected partition, the **Resize Options** dialog appears. Click the option you want, then click **OK**.

Select this option:	To do this:
Automatically resize partitions proportionally to fit	Allow Server Image to automatically expand the partitions in equal proportions to occupy the destination drive's remaining unallocated space.
Leave remaining unused space	Leave any remaining unallocated space unused on the destination drive after the partitions are copied.
Resize partitions manually to fit	Display the **Resize Partition** window where you can manually set the size of the partitions to fit in the destination drive's remaining unallocated space. (See step 9 for additional information about the Resize Partition window.)

15 Server Image displays all the information you have entered to this point. To alter any settings, click **Back**.



16 *(Optional)* To check for file system errors, enable bad-sector checking, turn on DOS disk-write verification, or hide partitions after restore, click **Advanced Options**. For more information, see "Advanced Options" on page 24.

17 Click **Finish** to begin restoring the image file.

Restoring partitions can cause the drive letters of subsequent partitions to change. This may make the computer unbootable or cause applications to fail.

If you assigned a password to the image file when you created it, the **Get Image File Password** dialog appears. You must enter the password to restore the image file.

If Server Image detects that you are restoring your image file from a floppy drive or removable medium, it enables a media-spanning feature that is capable of reading the image file from a series of disks. As Server Image prompts you for each media, be careful to insert the disks sequentially.

The **Restoring the Image** dialog appears, tracking the progress of the image restore.

Upon completion, the following message appears: "Image was restored successfully."

18 Click **OK** to return to the Server Image main screen.

Advanced Options

The **Advanced Options** button is available on the **Ready to Restore Image File** screen.

Select this:	To do this:
Check for File System Errors	Clear the **Check for File System Errors** check box if you want to disable error checking. If you have already used a disk utility program such as ScanDisk to check your hard disk for errors, it is not necessary to have Server Image check for file system errors. Clearing **Check for File System Errors** saves time in copying the partitions. If you did not run a disk utility program before loading Server Image, leave the **Check for File System Errors** check box selected. Server Image cannot restore images with file system errors.
Skip Bad Sector Check	This is selected by default to save time in copying the partitions. Although most drives do not have bad sectors, the potential for problems increases during the lifetime of the hard drive. If you have an older hard drive, it is wise to enable bad-sector checking by clearing the **Skip Bad Sector Check** box.
Verify Disk Writes	Click **Verify Disk Writes** if you want to enable DOS disk write verification. Disk write verification is not critical to safely copy files. Enabling disk write verification can slow the copying process dramatically.

Select this:	To do this:
Hide Partition(s) After Restore	Most operating systems only allow one primary partition to be visible (bootable) at a time. If you are restoring a primary partition and you do not want to make that partition your bootable partition, the **Hide Partition(s) After Restore** box should be selected. If you are using your secondary hard drive as a complete backup of your primary drive, selecting **Hide Partition(s) After Restore** preserves all the secondary drive information without changing any drive letters. When the computer boots up, a drive letter will not be assigned to the hidden hard drive. For additional information about hiding partitions, see “Hiding Partitions” on page 31.

CHAPTER 4

Common Partition Management Tasks

This chapter includes the following information about the Tools menu:

- Displaying Drive Information
- Creating Extended Partitions
- Deleting Partitions
- Hiding Partitions
- Setting the Active Partition

The **Tools** drop-down menu on the Server Image main screen lets you manually perform some common partition-management tasks that Server Image automatically performs when it processes image files or when it copies partitions. The **Tools** menu gives you access to these useful features without requiring you to create or restore image files or copy partitions.

Displaying Drive Information

The **Display Drive Information** option lets you view information about the partitions on your current hard drive.

- Drive letters
- Volume (partition) labels
- Color-coded volume (partition) types
- Status (active partition)
- Partition size
- Used MB in partitions
- Free MB in partitions
- Primary or logical drive

1. At the Server Image main screen, click **Tools➤ Display Drive Information**.
2. Select the drive you want to view from the partition list. If you have more than one hard disk on your system, the first column in the partition list shows the physical disk where the partition is located.

Drive Information Displayed on the Screen (Partition Map)

Several Server Image dialog boxes include a partition map that shows the partitions on your hard disk. If the selected hard disk includes logical partitions, they are shown within an extended partition. Partitions are color coded to indicate the file system type each uses. For example, dark green indicates a FAT32 partition. In addition, each partition is shaded to show used and unused space within the partition.

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

There are triangle indicators on the partition map to mark the 2 GB boot code boundary and the 1024 cylinder limit. The boundary markers can help you as you restore image files or set a new partition active. If your operating system requires the boot code to be within the first 2 GB of the hard disk, for example, you can tell at a glance if the partition is located in a place that will make it bootable.

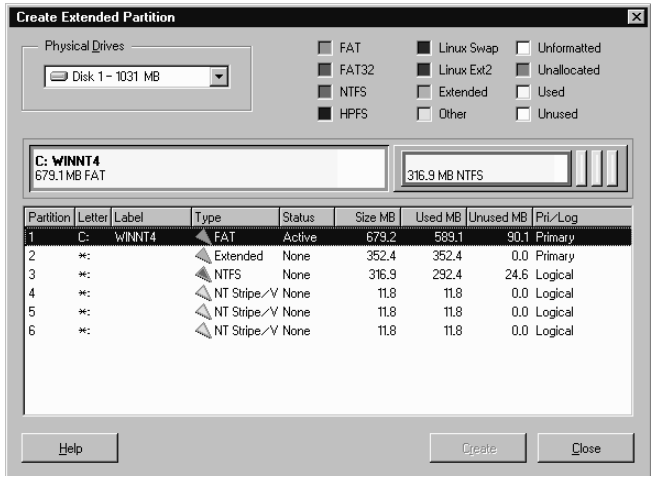
Creating Extended Partitions

If you create an image of a primary partition and want to restore it as a logical partition, you must first have an extended partition on your hard drive. For example, if you have two hard disks that each include a primary partition (a bootable C: and a data partition D:) and you are copying both partitions to a new hard disk that will be your master disk, you would want the D: partition copied to a logical partition to avoid having two primary partitions on the new hard disk. Primary partitions on the primary master drive should be reserved for operating systems only.

It is not necessary to manually create an extended partition when you restore an image of a logical partition. Server Image automatically creates an extended partition if one does not already exist.

1 At the Server Image main screen, click **Tools ➤ Create Extended Partition**.

The **Create Extended Partition** window appears.



2 Select an unallocated space from the partition list.

If there is no unallocated space on your computer, you must delete an existing partition to create unallocated space.

3 Click **Create**.

Server Image creates an extended partition in the selected free space.

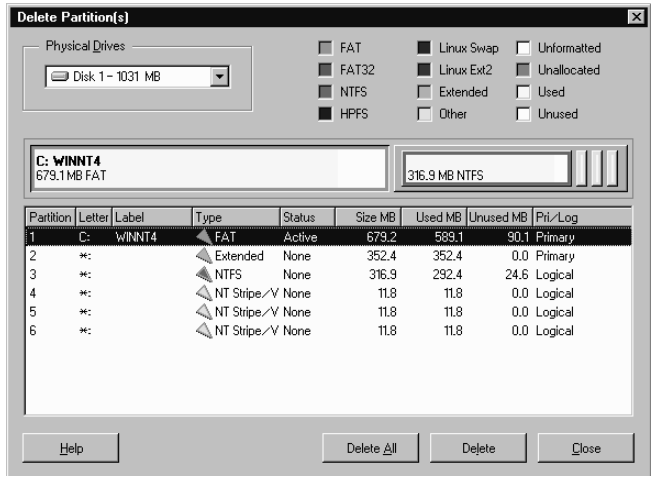
4 Click **Close** to return to the Server Image main screen.

Deleting Partitions

This feature deletes existing partitions to create unallocated space on your hard drive. Be aware that deleting existing partitions destroys any data they contain.

1 At the Server Image main screen, click **Tools ➤ Delete Disk Partition(s)**.

The **Delete Partition(s)** window appears.



2 Click the partition you wish to delete.

You may need to scroll to view all the partitions on your machine. Note that if you have more than one hard disk on your machine, the first column in the partition list shows the physical hard disk where the partition is located.

3 Click **Delete**, or to delete all partitions click **Delete All**.

The Delete Partition dialog appears, displaying the selected partition and its volume label.

4 Type the volume label exactly as it appears, then click **OK**.

Server Image deletes the partition and displays the message: “Volume <volume name> was deleted successfully.”

5 Click **Close** to return to the Server Image main screen.

Hiding Partitions

The **Hide/Unhide** feature allows you to protect partitions from unwanted user access. Hidden partitions are not accessible because they are not assigned drive letters when you boot your computer. If you unhide a partition, it is assigned a drive letter the next time you boot your computer and becomes accessible again.

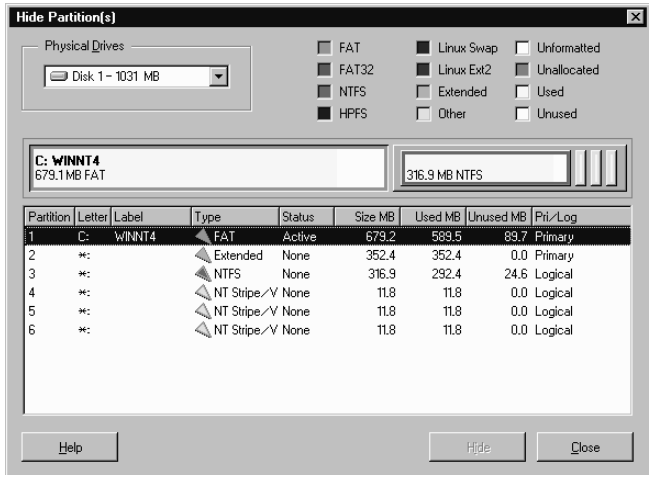
Before hiding and unhiding partitions, be aware of the following restrictions.

- Hiding or unhiding a partition can cause the drive letters of subsequent partitions to change. This may make the computer fail to boot or cause applications to fail. For information on why drive letters change and how to fix them, run Setup from the Server Image CD, then click **Documentation ➤ Basic Concepts**.
- If your hard drive contains more than one primary partition, only one is visible by default. When you use the **Set Active Partition** feature, Server Image unhides the selected primary partition and automatically hides all other primary partitions. See "Setting the Active Partition" on page 32.
- Because a hidden partition is not bootable or accessible, if you hide the partition where Server Image is installed, you must re-install Server Image on your new active (bootable) partition to run it again.

To hide/unhide a partition,

1 At the Server Image main screen, click **Tools ➤ Hide/Unhide Partition(s)**.

The **Hide Partition(s)** window appears.



2 Click the partition you want to hide.

Normally when you select a partition, the **Hide** button becomes available. If the button is not available, the partition can't be hidden.

3 Click **Hide** to hide the selected partition.

The partition status changes to "Hidden."

4 Click a hidden partition.

Normally when you select a partition, the Unhide button becomes available. If the button is not available, the partition can't be unhidden.

5 Click **Unhide** to unhide the selected partition.

The partition status changes to "None."

6 Click **Close** to return to the Server Image main screen.

7 Click **Exit** to exit Server Image.

8 Reboot your computer.

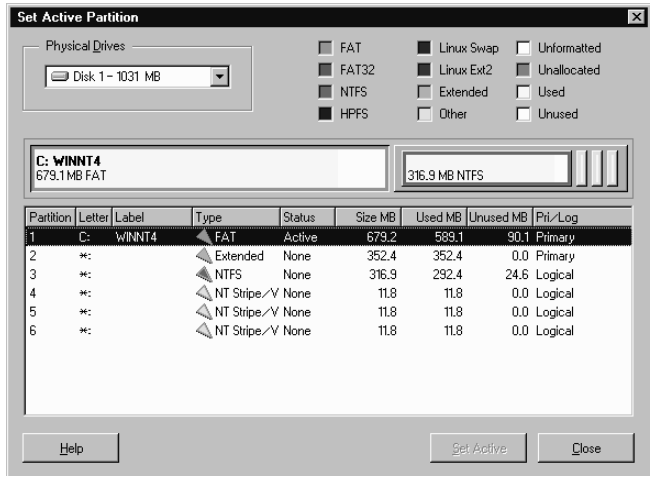
Setting the Active Partition

The Set Active Partition feature allows you to make a primary partition the active (bootable) partition. Only one primary partition can be active at a time. To be bootable under most operating systems, a primary partition must be located on the first (master) drive, and it must contain an operating system. When your computer boots, it scans the partition table of the first drive to find the active partition, then boots from that partition.

WARNING! Before you set an active partition, be sure it is bootable. If it is not bootable or if you are not sure, locate the boot disk you created when you installed Server Image. If you restart your computer and it does not boot normally, you must boot from the floppy disk, run Server Image from the program disk you created during Server Image install, and set a different partition active. Refer to "Drive Information Displayed on the Screen (Partition Map)" on page 28 for explanations of the Server Image screen that may also help you determine if your partition is bootable.

1 At the Server Image main screen, click **Tools ➤ Set Active Partition**.

The **Set Active Partition** window appears.



2 Select a primary partition that is not currently active.

3 Click **Set Active**.

The status of the selected partition changes to "Active."

4 Click **Close**.

5 Click **Exit** to exit Server Image.

6 Reboot your computer.

CHAPTER 5

Automating Server Image

This chapter includes the following information:

- Command Line Switches
- Script Files

Interactive Server Image vs. Scripting

Server Image may be run in one of two modes: interactive (the default) or scripting. Interactive mode requires user input at discrete intervals, resulting in greater control and efficiency when working with one or two servers.

Alternately, scripting is useful when loading image files onto a large number of servers. Batch mode automates the loading process, saving you time and effort by eliminating the need for repetitive user input.

Command Line Switches

Server Image uses a series of command line switches to run in batch mode. To use the these switches, type PQSINT */switch,* where *switch* is one or more of the following:

Command Line Parameter	**Description**
/?	Displays all available command line switches, their syntax, and a short description.
/IMG=<*imagefilename*>	Designates an image file.
/CMD=<*scriptfilename*>	Designates a script text file; the script file contains arguments that are passed to the program.
/LOG=<*logfilename*>	Designates a log file.
/ERR=<*errorfilename*>	Designates an error file.
/PWD=<*password*>	Designates a password that must be given to restore the partitions. The password may either be a number or a string.
/CAS	Causes all sectors within a partition to be saved and restored. This will include all information in a partition including the deleted files.
/CBS	Enables bad sector checking.
/CEC	Check for extra cylinder.
/DSK	Specify disk number for macro commands.

Command Line Parameter	Description
/IFC	Ignores file system checks. This allows a partition with a known file system error (for example, cross-linked files) to be stored in an image. Likewise, that same partition can be restored if this switch is used and if during the restore process the partition does not need to be resized.
/IPE	Disables partition table error checking. This switch allows drives with partition errors to be saved and restored.
/MFS=*nnnnn*	Designates the maximum file size used for creating multiple files to contain a PQI image. (*nnnnn* is the number of bytes in each file).
/NBS	Disables bad sector checking. By default, bad sector checking is disabled.
/NRB	No reboot after program exit.
/RAV	Causes each sector written to disk during the restore process to be read back and compared with the data just written as an extra security precaution. Using this parameter will significantly increase restore time.
/SCO	Syntax Check Only parameter; this switch causes the syntax of each command in the script file to be checked without executing the command.
/UEB	Forces the extended BIOS to be used for disk reads and writes.
/WFS	Wipe First Sector parameter; deletes the master boot record once all partitions are deleted with the script command DELETE ALL; only accessible using scripting.
/ZLB	Use ZLib compression.

Command Line Examples

Scenario 1: To specify SCRIPT.TXT as the script file, ERROR.TXT as the error file, and E:\IMAGES\DRIVE2.PQI as the image file:

```
PQSINT /CMD=SCRIPT.TXT /ERR=ERROR.TXT /IMG=E:\IMAGES\DRIVE2.PQI
```

Scenario 2: To specify a syntax check for the script file SCRIPT.TXT*:*

```
PQSINT /CMD=SCRIPT.TXT /SCO
```

Script Files

The script file designated in the command line contains arguments or instructions that are passed to the program, determining which operations are executed. The script file syntax is as follows:

Script Argument	Action
DELETE	Deletes the last partition selected.
DELETE ALL	Deletes all partitions on the drive.
DELETE EXTENDED	Deletes the extended partition; the extended partition can only be deleted if all the logical drives within it have already been deleted.
HIDE	Hides the last partition selected.
REBOOT	Reboots the computer; any commands following this command will not be executed.
RESIZE IMAGE {*proportional* | *no* | <*number*> | *max*}	Resizes the image to the specified size when restored; <*number*> is indicated in MB.
RESTORE	Restores all selected images and resizes them, if specified.
SECTOR CHECK {*on* | *off*}	Enables/Disables Bad Sector Checking for all restore operations following the command.
SELECT DRIVE {<*number*>}	Selects the drive with the specified number; the first drive is number 1.
SELECT FREESPACE {*first* | *last* | *next* | *largest*}	Selects the specified free space.
SELECT IMAGE {<*number*> | *all*}	Selects the specified image in the image file.
SELECT PARTITION {<*driveletter*> | <*volumelabel*> | <*number*> | *first* |*next* | *all*}	Selects the specified partitions.
SET ACTIVE	Sets active the last partition selected.

Script Argument	Action
STORE {*with compression* {*off* | *low* | *high*}}	Stores all selected partitions with the indicated compression level.
UNHIDE	Unhides the last partition selected.

Script File Examples

Scenario 1: To store all the partitions on drive 2 to the file, E:\IMAGES\DRIVE2.PQI:

```
PQSINT /CMD=SCRIPT.TXT /IMG=E:\IMAGES\DRIVE2.PQI
```

SCRIPT.TXT file contents:

```
SELECT DRIVE 2
SELECT PARTITION ALL
STORE
```

Scenario 2: To store partition 3 from drive 1, and partitions 1, 4, and 5 from drive 2 to the file, E:\IMAGES\DRIVE.PQI and have the image file split up into multiple files each 650 MB so each can be transferred to a CD-ROM:

```
PQSINT /CMD=SCRPT.TXT /IMG=E:\IMAGES\DRIVE.PQI /MFS=670000000
```

SCRPT.TXT file contents:

```
SELECT DRIVE 1
SELECT PARTITION 3
STORE
SELECT DRIVE 2
SELECT PARTITION 1
SELECT PARTITION 4
SELECT PARTITION 5
STORE
```

Scenario 3: To restore all the images in the file, E:\IMAGES\DRIVES.PQI, to the first free space on drive 2:

```
PQSINT /CMD=SCRIPT.TXT /IMG=E:\IMAGES\DRIVES.PQI
```

SCRIPT.TXT file contents:

```
SELECT DRIVE 2
SELECT FREESPACE FIRST
SELECT IMAGE ALL
RESTORE
```

Scenario 4: To restore the first two images in the file, E:\IMAGES\DRIVES.PQI, to the largest free space on drive 1, and resize them both proportionally:

```
PQSINT /CMD=SCRIPT.TXT /IMG=E:\IMAGES\DRIVES.PQI
```

SCRIPT.TXT file contents:

```
SELECT DRIVE 1
SELECT FREESPACE LARGEST
SELECT IMAGE 1
SELECT IMAGE 2
RESIZE IMAGE PROPORTIONAL
RESTORE
```

Scenario 5: To restore the first two images in the file, E:\IMAGES\DRIVE.PQI, to the last free space on drive 1, and resize them to 500 MB each (The image was encrypted using the password 12345678):

```
PQSINT /CMD=SCRPT.TXT /IMG=E:\IMAGES\DRIVE.PQI /PWD=12345678
```

SCRPT.TXT file contents:

```
SELECT DRIVE 1
SELECT FREESPACE LAST
SELECT IMAGE 1
RESIZE IMAGE 500
SELECT IMAGE 2
RESIZE IMAGE 500
RESTORE
```

Scenario 6: To delete all existing partitions on drive 2 and then restore all the images in file, E:\IMAGES\DRIVES.PQI, to the free space (The image was encrypted using the password HELLO):

```
PQSI /CMD=SCRIPT.TXT /IMG=E:\IMAGES\DRIVES.PQI /PWD=HELLO
```

SCRIPT.TXT file contents:

```
SELECT DRIVE 2
DELETE ALL
SELECT FREESPACE FIRST
SELECT IMAGE ALL
RESTORE
```

Scenario 7: To restore the first four images in the file, drive:\IMAGES\DRIVES.PQI, to the last free space on drive 1, and then resize the first image to 500 MB, keep the second the same size, and resize the third and fourth images to proportionally take up the remaining free space:

```
PQSI /CMD=SCRIPT.TXT /IMG=drive:\IMAGES\DRIVES.PQI
```

SCRIPT.TXT file contents:

```
SELECT DRIVE 1
SELECT FREESPACE LAST
SELECT IMAGE 1
RESIZE IMAGE 500
SELECT IMAGE 2
RESIZE IMAGE NO
SELECT IMAGE 3
SELECT IMAGE 4
RESIZE IMAGE PROPORTIONAL
RESTORE
```

For further Server Image scenarios, visit *www.powerquest.com*.

APPENDIX A

Additional Tasks

This appendix includes the following information:

- Using Server Image with SCSI Hard Disks
- Using International Keyboards
- Finding Jumper Settings

Using Server Image with SCSI Hard Disks

To use Server Image on a SCSI hard drive, you must have a SCSI controller card that supports software Interrupt 13. Most SCSI controller cards let the user enable software Interrupt 13 support in the BIOS through the card. If your SCSI controller card does not allow you to set it to use software Interrupt 13, Server Image will not work on drives attached to your SCSI adapter. Contact the manufacturer of the SCSI adapter to determine if your adapter can support software Interrupt 13. As a general rule, if FDISK can be used to partition the drive, you can use Server Image.

Using International Keyboards

When you use the Server Image rescue disks, you may lose the ability to use your keyboard the way you are accustomed to or to view extended characters properly. The Server Image rescue disks include the files you need to resolve these problems.

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

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

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

   xx = two-letter keyboard code (for example, US or FR)
   yyy = character set code page (for example, 437)

2. Save the AUTOEXE2.BAT file.

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

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

4. Save the CONFIG.SYS file.

5. Reboot from the first rescue disk.

Finding Jumper Settings

To find the jumper settings for hard disks, consult your hard disk installation guide or contact your hard disk manufacturer directly. In most cases, the hard disk manufacturer's web site will contain the information you need to install the hard disk correctly.

Another valuable resource is *www.thetechpage.com*. In addition to listing the most common hard disk manufacturers, this site provides the jumper settings for every hard disk ever made. Additional jumper information is available from OnTrack at *www.ontrack.com*. Please note that PowerQuest is not responsible for the content on these web sites and cannot guarantee that the web site addresses will not change.

APPENDIX B

Troubleshooting

This appendix gives solutions to problems that you may encounter while using Server Image. Included are the following:

- Accessing Your CD-ROM Drive
- Freeing Conventional Memory to Run Server Image
- Resolving Check Errors
- Resolving Check Errors
- Resolving Partition Table Errors
- Partition Tables and Viruses
- Generating Diagnostic Reports with PARTINFO
- Error Messages and Solutions

Accessing Your CD-ROM Drive

If you need to access your CD-ROM drive from Server Image, you will need to add the command in the CONFIG.SYS file to load your CD-ROM driver. You will also need to add the command in the AUTOEXEC.BAT file to load the CD-ROM extensions.

1. At the DOS prompt, change to the directory of the CONFIG.SYS you want to edit. For example, if you are editing the CONFIG.SYS on a boot diskette, type *drive*: (where *drive* is the drive letter of the boot diskette), then press <Enter>.

2. Type `EDIT CONFIG.SYS` and press <Enter> to start the DOS Editor and retrieve the CONFIG.SYS file.

3. Add either the DEVICE or DEVICEHIGH command. For example, type

   ```
   DEVICE=[drive:][path]filename [dd-parameters]
   ```

   or

   ```
   DEVICEHIGH=[drive:][path]filename [dd-parameters]
   ```

   where [*drive*:][*path*]*filename* specifies the location and name of the CD-ROM device driver and [dd-*parameters*] specifies any command-line information the device driver requires.

   You may want to use DEVICEHIGH if you need to conserve conventional memory. See "Freeing Conventional Memory to Run Server Image" on page 49.

   For more information on your device driver, consult the documentation that came with your CD-ROM.

4. Click **File ➤ Save** to save the file.

5. Click **File ➤ Open** and retrieve the AUTOEXEC.BAT file.

6. Add the command line MSCDEX.EXE.

7. Click **File ➤ Save** to save the file.

8. Click **File ➤ Exit** to exit the editor.

Freeing Conventional Memory to Run Server Image

The Server Image executable running under DOS requires a minimum of 400KB of memory in the first 640KB of the computer's address space (conventional memory). If you try to run Server Image from DOS and find you do not have enough free conventional memory, you can free enough additional memory in a number of ways.

Running MEMMAKER

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

MEMMAKER is only available with DOS versions prior to DOS 6.0. MEMMAKER is not available with Windows 95.

Using the F8 Key to Keep Programs From Loading

If running MEMMAKER does not free enough conventional memory, you can free more by pressing <F8> right after booting your computer (while DOS is booting). If you press <F8>, when DOS reads the commands from the CONFIG.SYS and AUTOEXEC.BAT files on your hard drive, DOS will ask you if you want it to execute each command. When you see commands that load device drivers or TSR programs that you will not need to run Server Image, answer N (no) to tell DOS not to execute that command (not load that software into memory). This will conserve conventional memory.

Creating an Operating System Boot Diskette

If running MEMMAKER and using <F8> does not free enough conventional memory, you can create a boot diskette that allows you to boot using a very minimal amount of conventional memory.

You can create a boot diskette for any version of DOS by performing the following:

1. Place in your diskette drive (A:) any diskette that does not contain information you want to keep.
2. Go to a DOS prompt, type `FORMAT drive: /S` (where *drive* is the drive letter of the diskette drive).
3. Press <Enter>.

After the diskette is formatted and the operating system files are transferred, you will be able to boot the computer from the diskette. If you restart your computer with the diskette in the diskette drive, your computer boots using a minimal amount of conventional memory. After you boot from the diskette, you can run Server Image from either the diskette or your hard drive.

If you want to create and restore images across a network, you will need to create a network boot diskette.

Creating a CONFIG.SYS File on the Boot Diskette

If making an ordinary boot diskette doesn't free enough conventional memory, you can create a customized boot diskette that will free even more conventional memory. (With the customized diskette, you will free more conventional memory by loading some of the DOS operating system into high memory.) To customize the diskette, you must create a CONFIG.SYS file in the root directory (A:\). To create a CONFIG.SYS in the root directory, perform the following:

1. At the DOS prompt, type `drive:` (where *drive* is the drive letter of the diskette drive), then press <Enter>.

   Verify that you have changed to the diskette drive (you see the drive:\> prompt).

2. Type `EDIT CONFIG.SYS` and press <Enter>.

   This starts the DOS editor. (You will see a blank screen if no CONFIG.SYS currently exists.)

3. In the editor, type the following:

   ```
   DEVICE=C:\DOS\HIMEM.SYS

   DEVICE=EMM386.EXE

   DOS=HIGH,UMB
   ```

   IMPORTANT! All lines must be entered in the order shown. Windows users: substitute DEVICE=C:\WINDOWS\HIMEM.SYS.

4. Click **File ➤ Save** to save the file.

5. Click **File ➤ Exit** to exit the editor.

You can now reboot your computer from the customized boot diskette. When DOS loads, much of it is loaded into high memory, saving a maximum amount of conventional memory.

Deleting Operating System Compression Files

If you use DOS 6.22 and your system doesn't have any compressed drives (for example, DriveSpace, DoubleSpace, or Stacker), you can free conventional memory by deleting the operating system compression files DRVSPACE.BIN or DBLSPACE.BIN from any boot diskette you create. To delete these hidden system files, perform the following:

1. From the DOS prompt, type `drive:` (where `drive` is the drive letter of the diskette drive).
2. Type `ATTRIB -R -H -S *.BIN`.
3. Type `DEL *.BIN`.

Resolving Check Errors

Server Image checks the integrity of a partition very thoroughly prior to creating an image file or copying a partition. These checks are substantially the same as those made by the operating system's CHKDSK, SCANDISK, or AUTOCHK utility.

If you receive a Check error message for any partition, after backing up your hard drive, run your operating system's CHKDSK program on that partition. CHKDSK usually shows the same problems as Server Image. (If you are using Windows NT CHKDSK, DO NOT use the /F switch on the initial run.)

The DOS CHKDSK program does not detect problems in Extended Attributes.

If CHKDSK (or SCANDISK) does not show the same errors that Server Image shows, contact PowerQuest at the numbers listed in *Appendix D*. If the CHKDSK (or SCANDISK) program and Server Image detect the same errors (which is usually the case), run CHKDSK with the /F switch to fix the problem.

After running CHKDSK /F, run CHKDSK without the /F switch to make sure the partition is free of errors. Under OS/2, you should perform this procedure twice before proceeding. If Server Image still reports a problem, reformat the partition and restore your files from the backup copy to correct the error.

Server Image also checks a partition after restoring it. If this check fails, report the problem to PowerQuest Technical Support. 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.

Resolving Partition Table Errors

In some cases, PowerQuest technical support can help you fix partition table errors without data loss. Check with them first before proceeding to the following steps.

To resolve some partition table errors, you must create new, error-free partition tables.

1. Make sure you have no viruses.

   See “Partition Tables and Viruses” on page 52.

2. Back up the data on the affected partitions.

3. Delete the partitions.

   You may need to use the FDISK program from a recent DOS version because earlier versions of DOS may refuse to delete HPFS or hidden partitions.

   If using OS/2, the OS/2 FDISK program may recognize the partition's corruption and refuse to modify it. In this case, use the FDISK program from a recent DOS version.

4. Recreate the partitions.

5. Restore the contents of the partitions.

Partition Tables and Viruses

If partition changes made under one operating system are not reflected under the other, and vice versa, it is possible that a master boot record (MBR) virus is present.

Use a virus check utility that can detect the latest viruses. If a virus is found, data loss is likely. If a virus is found, perform the following:

1. Before removing the virus, run ScanDisk or CHKDSK under each of the operating systems to evaluate the integrity of the partition.

2. Back up the files from any partition that passes the Check operation.

3. After backing up the files from all operating systems, remove the virus.

4. Run ScanDisk or CHKDSK under each of the operating systems again.

5. Delete and recreate any partitions which fail the check.

6. Reinstall the operating systems.

7 Restore the backup files as necessary.

Generating Diagnostic Reports with PARTINFO

PARTINFO, a PowerQuest utility program included on the Server Image CD, generates a report showing the contents of your hard disk partition table. This information is helpful in resolving various partitioning problems.

1 Boot the computer to DOS.

2 Change to the directory that includes PARTINFO.EXE.

3 You have several options for running PARTINFO.

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

PowerQuest support technicians may request a report from PARTINFO to help you resolve any problems that you experience with Server Image.

Error Messages and Solutions

For a list of error messages and solutions in English, you can also go to the PowerQuest Knowledge Base at *www.powerquest.com/support/er/err-0000.html*.

Miscellaneous Errors (3–38)

#3 Not enough memory

The DOS Server Image executable running under DOS requires a minimum of 400KB of memory in the first 640KB of the computer's address space (conventional memory) and 8MB of total memory. If you don't have enough conventional memory, see “Freeing Conventional Memory to Run Server Image” on page 49 for possible solutions.

The boot diskette (disk 1 of 2 Server Image rescue disks) includes EMM386.EXE to help load network drivers in high memory. However, because this file limits extended memory to 32 MB, you may see error #3 when you run Server Image from the rescue disks and work with large FAT32 and NTFS partitions. If you do not need EMM386.EXE, you can delete it from the bootable floppy to avoid this error. If you delete the EMM386.EXE file, you must also REM or delete the following line in the CONFIG.SYS file on the boot floppy: `DEVICE=EMM386.EXE`.

#8 Could not allocate/deallocate DOS real mode memory

The DOS Server Image executable running under DOS requires some memory in the first 1 MB of the computer's address space. (Server Image uses a DOS extender.) If not enough memory is available, Server Image cannot access the hard drive. If you don't have enough conventional memory, see “Freeing Conventional Memory to Run Server Image” on page 49 for possible solutions.

#23 Unsupported version of operating system

The operating system versions that are required to run Server Image are listed on page 1.

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

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

#36 DPMI Server error

Server Image DOS executables use a DOS extender. This error indicates a failure during a call made from Server Image 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 will ask 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 Server Image DOS extender, answer N (no) to tell DOS not to execute that command (not to load that software into memory). You will often be able to find a program configuration that will enable Server Image (the DOS extender) to run without error.

Disk Access Errors (40–56)

Errors 40-56 indicate that Server Image cannot access your hard disk; these errors are often reflect hardware problems. Some problems have simple solutions; for other problems, the only solution is to replace the hard drive. When possible, Server Image detects errors before any changes have been made, so you can back up your data before replacing the hard drive.

#49 Write fault
#50 Read fault

Server Image is unable to read or write from a specific sector on the hard drive. There are a number of possible causes of this error:

- 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 Server Image.
- There is a bad sector on the hard drive. (This is usually the case with only older hard drives.) Run a thorough ScanDisk on the hard drive to perform a surface scan to verify the existence of bad sectors. If your drive has bad sectors, we recommend you replace it. You may be able to use Server Image, or you may need to back up your files using another method.
- You have set up disk mirroring with PC-Tools. Disable disk mirroring.
- Your caching controller card is not set up properly.

Partition Table Errors (100–199)

Errors in the 100-199 number range are partition table errors. For general information about solving this type of error, see “Resolving Partition Table Errors” on page 52.

#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. Since any modifications Server Image makes may decrease the amount of data that is recoverable from the hard drive, Server Image will not recognize any of the hard drive's partitions. You must create new, error-free partition tables to resolve your problem. See “Partition Tables and Viruses” on page 52.

#104 No sectors in partition

No partition should contain zero sectors. Delete the partition before using Server Image.

#105 Partition starts on wrong boundary

The hard-disk partition table contains erroneous values. Server Image expects FAT, NTFS, and HPFS partitions to begin and end on the boundaries used by FDISK. If they do not, the disk may be partially corrupted. In this circumstance, if Server Image were to make any modifications it might cause the loss of data. Therefore, Server Image will refuse to recognize any of the hard drive's partitions. To resolve this problem, see “Resolving Partition Table Errors” on page 52.

#106 Partition doesn't start with sector one

See error #105.

#107 Partition begins after end of disk

This error can occur when you are running Server Image on a hard drive that uses more than 1,024 cylinders. Under DOS, Server Image is restricted by the BIOS 1,024 cylinder limit. If any partitions extend beyond the limit, Server Image cannot safely operate on the hard drive.

This error can also occur if a partition erroneously extends beyond the physical end of the hard drive. This may happen if the hard drive 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 drive may differ from the logical geometry assigned to the hard drive 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 drive. This error is serious if both DOS and another operating system use the hard drive. Because DOS uses one description and other

operating systems may use the other, data loss is likely once the partition is almost full. To resolve this error, see “Resolving Partition Table Errors” on page 52.

#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 “Resolving Partition Table Errors” on page 52.

#112 Logical partition ends outside Extended

See error #111.

#113 Partitions overlap

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

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

If a primary partition overlaps the end of the extended partition, but does not overlap any logical partitions within the extended partition, the problem can be remedied by patching the partition table. Only qualified individuals should attempt this repair! An incorrect patch could destroy all data on the hard drive! In most instances, you should resolve the problem as explained in “Resolving Partition Table Errors” on page 52.

#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 of the hard-disk geometry changing are:

- Different operating systems (for example, DOS and OS/2) report different hard-disk geometries.
- You boot from a diskette that loads a different driver than is loaded when you boot from the hard drive.
- Upgrading the operating system (for example, from OS/2 2.x to OS/2 Warp) causes a different driver to be used.
- The hard drive or controller has been changed.

- The BIOS has been upgraded.
- The BIOS LBA setting has been changed.
- There is a partition table virus present on the hard drive.

In most instances, you should resolve the problem as explained in "Resolving Partition Table Errors" on page 52. You can also use a virus scanning program to remove any partition table virus. Data loss is possible if the number of heads or sectors per track has changed since you first created your partitions.

#120 The logical drive chain is incompatible

This error occurs under some OSs when logical partitions are not chained together in the expected order. DOS, OS/2, Windows 95, and Windows NT require that logical partitions be chained together in ascending order. Some other operating systems do not require this. For example, some versions of the Linux FDISK utility chain logical partitions together in the order they are created.

WARNING! This error message identifies a dangerous situation; using the DOS FDISK in this situation can cause loss of one or more partitions.

For solutions to this problem, see the instructions in "Resolving Partition Table Errors" on page 52.

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 to delete them.

#121 The first sector of the drive cannot be read

The first sector of the hard drive (cylinder 0, head 0, sector 1) contains the master boot record (MBR) and the primary partition table. Server Image cannot make changes to this hard drive 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 will be aborted before any corruption can occur. Try moving the partition to a different place. If your hard drive has bad sectors, we recommend that you replace the hard drive.

Check Errors (500–599)

Check errors occur when Server Image checks the integrity of a partition. For useful general information about resolving these errors, see “Resolving Check Errors” on page 51.

#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

ScanDisk or CHKDSK should be able to find these errors and correct them.

#506 Not enough free space on partition to shrink

Some free space (which is dependent on the hard drive's current contents) is required to resize a partition smaller. Delete unneeded and duplicate files in the partition, 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, Server Image 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 will occur when you encounter this error.

#510 The version of the file system is not supported

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

HPFS Check Errors (1000–1500)

Check errors occur when Server Image checks the integrity of a partition. For useful general information about resolving these errors, see “Resolving Check Errors” on page 51.

#1015 System sector not marked unavailable

This error may indicate that there are open files on the hard drive. Shut down and restart OS/2, booting from diskettes. If this does not resolve the problem, run OS/2's CHKDSK program. This error message may also indicate that a file is listed with a file length of zero. OS/2's CHKDSK program will not fix this problem. As a last resort, delete the offending file.

#1027 Could not account for all sectors

This error may be resolved in one or more of the following ways:

- If you are working with an HPFS386 partition, check the technical support area of PowerQuest's web site (*www.powerquest.com/support*) for more information.
- If CHKDSK has created any FOUND.000 or *.CHK files, delete them.
- If the error message indicates the name of the offending file, delete it.
- Turn off the disk-mirroring option in PC-Tools.
- If none of the above solutions works, back up the partition, delete it, recreate it, and restore the data.

#1045 Stac volume detected delete—Stac volume before converting

This error message occurs when you attempt to convert a partition to HPFS, and the existing partition contains a STAC volume. Stacker cannot access a STAC volume that is on an HPFS partition. Delete the STAC volume from the partition before converting to HPFS.

NTFS Check Errors (1500–1699)

Errors 1500-1699 are NTFS-specific error messages. In this context, “attribute” does not mean read-only, hidden, system, and so on. Rather, “attribute” means one of a file’s data streams. Check errors occur when Server Image checks the integrity of a partition. For useful general information about resolving these errors, see “Resolving Check Errors” on page 51.

#1501 Wrong version of NTFS

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

#1503 Bad NTFS cluster size

The NTFS cluster size must be 512, 1,024, 2,048, or 4,096 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's CHKDSK program will not fix it, but Windows NT will rebuild 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 will 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 0-10) 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.

#1644 Bad system file sequence number

A system file has a bad sequence number. System files must have a sequence number from 0 to 10. A partition with this problem may pass a run of Windows NT's CHKDSK program, but Windows NT will 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's CHKDSK program will not fix this problem, but the Windows NT operating system will automatically rebuild the root directory on the partition the next time it is started.

#1654 File system smaller than partition

This is an informational message only that indicates there may be wasted space on your hard disk. However, your data is not in danger, and you do not need to do anything to correct the error.

Miscellaneous Server Image Error Messages

#1701 Err disk not empty

Used in scripting. The DELETE ALL command failed to delete all the partitions on the drive.

#1800 Err partition not open

Attempted operation on a partition in an improperly opened image file.

#1801 Err partition not found

Did not find requested partition in image file.

#1802 Err corrupt bundle

Image file header information is not valid.

#1803 Err bundle read only

Attempted to delete or write to a partition in the image file which was opened in Read Only mode.

#1804 Err no bitmap Image

File contains no partition bitmap.

#1805 Err write failed

Error encountered while writing image to file. This error usually occurs when Server Image runs out of space in the partition to which it is writing an image file.

#1806 Err out of memory

Out of Memory.

#1807 Err compression

Error encountered while compressing or decompressing image file data.

#1808 Err buffer too small

Buffer too small to read in partition bitmap.

#1809 Err no more free space

No more free space available to process remaining partitions.

#1810 Err open failed

Could not open image file.

#1811 Err read failed

Could not read from image file.

#1900 Err invalid drive number

Used in scripting. The script contains an invalid drive number.

FAT Check Errors (2000–2099)

Check errors occur when Server Image checks the integrity of a partition. For useful general information about resolving these errors, see “Resolving Check Errors” on page 51.

#2001 FAT copies are not identical

Run SCANDISK to fix this error. This problem may also be caused by a virus. Run a virus checker and remove the virus if possible.

#2005 One or more lost clusters were found

Run ScanDisk or CHKDSK to fix this error.

#2012 Formatted FAT file system too big for partition

This error can be caused by the following circumstances:

- 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 be caused by the following circumstances:

- The number of clusters on the hard drive 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 drive.

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

#2024 The OS/2 Extended Attribute file is corrupt

This error is caused by any program that mistakenly writes to or overwrites the OS/2 Extended Attribute file. If this error occurs, you should back up your data, delete the partition, recreate the partition, and restore your data.

APPENDIX C

PowerQuest Technical Support

This appendix includes the following information:

- Before Contacting Technical Support
- Term of Technical Support
- Contact Information

Before Contacting Technical Support

Before contacting PowerQuest, please try to resolve problems you encounter by using the online Help, the user guide, the README file, and PowerQuest's corporate web site.

Tips

- Your problem may be resolved by applying the most recent patch or upgrade of the software.
- Your product serial number is required to obtain technical support.
- If you received a demo or trial version of the product, you are not entitled to complimentary technical support.

Term of Technical Support

Technical support is available to all registered users throughout the life of the product, which began when PowerQuest released the software to manufacturing and ends six months after the release of the next version of the software or when PowerQuest discontinues its development.

Upon registration, PowerQuest provides 45 days of complimentary technical support from the day of your first call.

Contact Information

Corporate Web Site

The Technical support web site, *support.powerquest.com*, includes an overview of support options, an e-mail support request form, a list of error messages and information to resolve problems you encounter, and answers to frequently asked questions about the product.

E-mail

Language	E-mail (for specific technical problems)
Dutch	eurots@powerquest.com
English	help@powerquest.com eurots@powerquest.com
French	france@powerquest.com
German	germany@powerquest.com
Italian	italian@powerquest.com
Portuguese	latina@powerquest.com
Spanish	spanish@powerquest.com

To obtain e-mail technical support for specific technical questions, you can fill out the form at *www.powerquest.com/support/emsupport.html* (available in English only).

E-mail on Demand

PowerQuest maintains an e-mail on demand system to resolve common problems. You can view a list of available documents at *support.powerquest.com*. To request one of the documents, send an e-mail message to **support@powerquest.com** with the index number of the document in the subject of the message. You can only request one document per e-mail message. E-mail on demand documents are available only in English.

Fax

Location	Number
U.S.A.	(801) 437-4218
Europe	+31 (0)20 581 9270

Fax a description of your problem to the technical support fax number. This service is available in the U.S., Canada, and Europe 24 hours a day, 7 days a week. PowerQuest technicians try to respond to all fax requests within 24 hours.

Telephone

Language	Location	Number
Dutch	Netherlands	+31 (0)20 581 3906
English	Netherlands	+31 (0)20 581 3907
English	UK	+44 (0)17 1341 5517
English	U.S.A.	(801) 226-6834
French	France	+33 (0)1 69 32 49 30
German	Germany	+49 (0)69 66 568 516
Italian	Italy	+39 (0)2 45 28 1312
Spanish	Spain	+34 (0)91 662 31 46
Spanish	U.S.A.	(801) 226-6834

The U.S.A. call center is open Monday through Friday from 7 a.m. to 6 p.m., MST/MDT. Our European call center, located in the Netherlands, is open Monday through Friday from 9:00 to 18:00, CET.

Postal Service Mail

U.S.A.	Europe
PowerQuest Corporation P.O. Box 1911 Orem, Utah 84059-1911 U.S.A.	PowerQuest Customer Service P.O. Box 58287 1040 HG Amsterdam, Netherlands

Include a detailed description of your problem and a return address, a daytime phone number, or other relevant contact information.

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