

Symantec™ Ghost Recovery Kit



Symantec™ Ghost Solution Suite Recovery Kit User guide

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When you contact Technical Support, please have the following information available:

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- Hardware information

- Available memory, disk space, and NIC information
- Operating system
- Version and patch level
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- Router, gateway, and IP address information
- Problem description:
 - Error messages and log files
 - Troubleshooting that was performed before contacting Symantec
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- General product information (features, language availability, local dealers)
- Latest information about product updates and upgrades
- Information about upgrade assurance and support contracts
- Information about the Symantec Buying Programs
- Advice about Symantec's technical support options
- Nontechnical presales questions
- Issues that are related to CD-ROMs, DVDs, or manuals

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Asia-Pacific and Japan	customercare_apj@symantec.com
Europe, Middle-East, and Africa	semea@symantec.com
North America and Latin America	supportsolutions@symantec.com

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Introducing Symantec Ghost Recovery Kit

This chapter includes the following topics:

- [About Symantec Ghost Recovery Kit](#)
- [Minimum skill set](#)
- [Components of Symantec Ghost Recovery Kit](#)
- [How the Symantec Ghost Solution Suite Recovery Kit works](#)

About Symantec Ghost Recovery Kit

Symantec Ghost Recovery Kit is a suite of tools designed for original equipment manufacturers (OEMs) and value-added resellers (VARs). It adds tools and functionality to the applications included in Symantec Ghost Solution Suite.

Symantec Ghost Recovery Kit includes the following tools:

- GhostOEM (DOS version)
- GhostOEM32
- PQIDeploy (DOS version)
- PQIDeploy32
- SRFixMbr

Used in conjunction with the Recovery Kit, Symantec Ghost Solution Suite can provide a fully automated PC management solution for your network environment.

Minimum skill set

Symantec Ghost Recovery Kit is designed to be used by a skilled configuration engineer or a user with a similar skill set.

To work with the examples in this guide, you must be capable of the following tasks:

- Using basic DOS tools, batch files, and boot files
For example, edit, Autoexec.bat, and Config.sys.
- Working with basic disk geometry and partition types
- Working with partition and disk configuration tools for creating, deleting, hiding, and activating partitions
For example, FDisk, Format, and GDisk.
- Creating and booting a boot floppy disk.
- Creating and booting a hard disk partition.

The following skills are required if you intend to customize Symantec Ghost Recovery Kit:

- Knowledge of master boot sector and basic computer start process
- Ability to work with XML

Components of Symantec Ghost Recovery Kit

The following table describes the products and utilities in the Recovery Kit.

Table 1-1 Recovery Kit components

Components	Description
GhostOEM	GhostOEM is a read-only version of the Symantec Ghost DOS executable designed specifically for use as a disaster-recovery or image-restore solution for end-users. GhostOEM is a compliment to the full-featured version of Ghost used to create images in manufacturing, and it includes the ability to customize functionality and the user interface to meet your specific needs.
GhostOEM32	GhostOEM32 is a Win32 version of GhostOEM and is designed to run on Microsoft Windows Preinstallation Environment (WinPE).

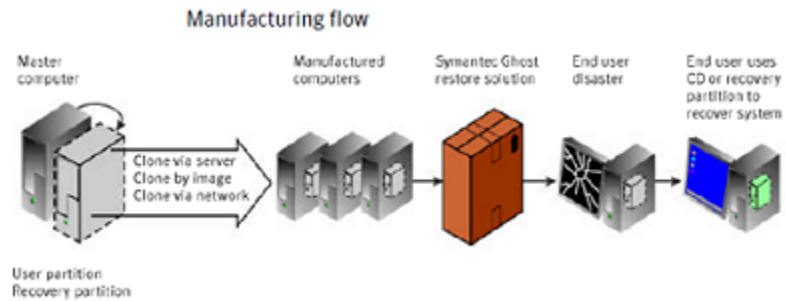
Table 1-1 Recovery Kit components (*continued*)

Components	Description
PQIDeploy	PQIDeploy is an OEM version of Symantec ImageCenter that provides restore-only capabilities. It contains the full scripting capabilities that are included in ImageCenter. It does not include any graphical user interface (GUI). All commands are specified in a script command file.
PQIDeploy32	PQIDeploy32 is a Win32 version of PQIDeploy that is designed to run on Microsoft Windows Preinstallation Environment (WinPE). It provides restore-only capabilities.
System Recovery Fix MBR (SRFixMBR)	<p>The System Recovery Fix MBR executable installs the Boot Partition Selector in the Master Boot Record (MBR).</p> <p>The Boot Partition Selector requests which partition the end user wants to launch when the computer is booted from the primary hard drive. If no response is made within the timeout interval, then the user partition is launched. Alternatively, the end user can launch the recovery partition. The end user can access the recovery partition only through the Boot Partition Selector.</p>

How the Symantec Ghost Solution Suite Recovery Kit works

Using the Recovery Kit you can create a recovery system that lets an end user quickly and simply recover a system or individual files. The recovery system can be accessed from either the hard disk or from CD/DVD.

The following figure illustrates the flow of the manufacturing process incorporating the recovery system.

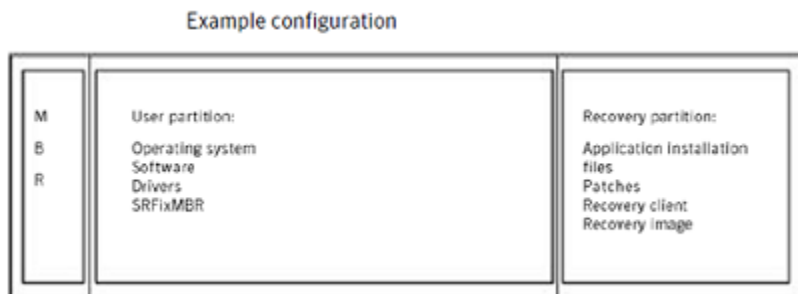


About hard disk-based recovery

Using a hard disk-based recovery system, the recovery image file is stored in a hidden recovery partition. This lets the end user recover a computer without a boot disk, CD, or DVD. The following overview explains the process.

- Two partitions are created on the master computer, a user partition and a hidden recovery partition. The operating system and all application software are installed in the user partition.
- A recovery image file is created of the user partition.
- The Ghost recovery executable, recovery image file, and application installation files are set up in the recovery partition.
- The master computer is cloned to the manufactured computers.
- If an end user experiences system failure, the computer can be started in the recovery partition and the factory settings can be restored from the recovery image.

The following figure illustrates an example of the configuration of a manufactured computer including the recovery system.



About CD/DVD-based recovery

Using a CD/DVD-based recovery system, the recovery image file is stored on a CD or DVD. The following overview explains the process.

- The operating system and all application software is installed on the master computer.
- A recovery image file is created of the user partition using spanning to split the image so that it can be saved to a CD or DVD.
- The recovery client and the recovery image file are saved to a CD or DVD.
- The master computer is cloned to the manufactured computers.
- If an end user experiences system failure, the computer can be started from the CD or DVD and the factory settings restored from the recovery image file.

What you can do with Symantec Ghost Recovery Kit

Symantec Ghost Solution Suite Recovery Kit has the following usage:

- As a hard disk- or CD/DVD-based restore solution designed to accompany a new (OEM) computer.
- As a restore option for remote corporate employees.
- As a Microsoft-endorsed means to restore a computer to its original configuration using BIOS_locking.

Symantec Ghost Solution Suite Recovery Kit lets you do the following:

- Create a recovery system using file-by-file cloning technology.
- Store the recovery system on a hard disk or CD.
- Customize the recovery system on a hard disk.

Where to find more information about Symantec Ghost Solution Suite

The following table lists where you can find further detail, technical specification, and procedural information to help when creating a recovery system:

Table 1-2 Further documentation

Component	Documentation title
PQI Deploy	<i>Symantec DeployCenter User Guide</i>
Symantec Ghost Solution Suite	<i>Symantec Ghost Solution Suite User guide</i>

Creating an image-restore solution

This chapter includes the following topics:

- [About creating an image-restore solution](#)
- [About creating an image-restore solution with PQIDeploy](#)
- [About creating an image-restore solution with GhostOEM](#)

About creating an image-restore solution

The Recovery Kit includes read-only executables designed specifically for use as a disaster-recovery or image-restore solution. The executables compliment the full-featured versions of Symantec Ghost and Symantec ImageCenter.

The read-only executables included in the Recovery Kit are as follows:

GhostOEM.exe	DOS version of Ghost Recovery
GhostOEM32.exe	Windows version of Ghost Recovery
PQIDplyD.exe	DOS version of Symantec ImageCenter
PQIDeploy.exe	Windows version of Symantec ImageCenter

About creating an image-restore solution with PQIDeploy

PQIDeploy is command-line driven and is only able to restore .pqi files. The Recovery Kit includes the executable file and the encrypted .rtc file which is not customizable.

The minimum system requirements for using PQIDeploy are listed in the *Symantec DeployCenter User Guide*.

The Symantec imaging tool, PQIDeploy, is a special version of ImageCenter (formerly Drive Image Pro) designed to work in a configuration center or system builder production line. It contains the full ImageCenter scripting capability. It does not include any graphical user interface (GUI). All commands are specified in a script command file. Log and error files can be produced to verify correct operation.

This scripted mode is especially useful where many computers are being configured, as it automates the process and saves time by eliminating the need for user intervention.

The PQIDeploy system consists of the following programs:

- PQIDplyD.exe (for DOS)
- PQIDeploy.exe (for Windows PE)

PQIDeploy scripting has been enhanced so that you can run the same scripts in ImageCenter or PQIDeploy without making modifications.

Use of PQIDeploy is not documented in this guide. For more information on using PQIDeploy, see the *Symantec DeployCenter User Guide*.

About creating an image-restore solution with GhostOEM

The preparation of an image-restore solution has many steps and requires validation along the way. This overview lists the steps required to prepare an image-restore solution.

The system requirements for using Symantec Ghost are listed in the *Symantec Ghost Solution Suite User guide*.

Note: All documentation for GhostOEM applies to GhostOEM32 unless noted otherwise.

When distributing Ghost ensure the following:

- Distribute GhostOEM.exe, not Ghost.exe which is used to create images.
- The GhostOEM.exe program on the master is not ready for distribution as received. It needs to be registered, customized and renamed before duplication.

To create an image-restore solution with GhostOEM

- 1 Create an image of the target computer with Symantec Ghost 11 (Ghost.exe supplied in Symantec Ghost Solution Suite - not GhostOEM.exe), locking the image to your computer (if using the image as Microsoft OEM Media).
- 2 Register GhostOEM.
 You do not have to register the Win32 version of GhostOEM.
- 3 Customize GhostOEM as desired.
- 4 Rename GhostOEM.
 For example, Restore.exe.
- 5 Create a DOS batch file to guide the user through restore functions.
- 6 Copy your image, the modified and renamed GhostOEM executable, and the batch file to the target destination (hard drive or CD).

About creating a Ghost image

To create an image, use Ghost.exe from Symantec Ghost 11, available in Symantec Ghost Solution Suite. The Ghost executable has many command line parameters to assist you in automating the creation of disk or partition images.

For information on creating Ghost images, refer to the Symantec Ghost Solution Suite documentation.

BIOS Locking GhostOEM to your computers

If you are a computer manufacturer and want to use the Ghost image as CD-based Windows recovery media, Ghost fully supports BIOS locking as required by Microsoft.

Until recently, computer manufacturers have been required to bundle the Microsoft Media Pack with all systems that include a Microsoft Operating System. In an effort to reduce piracy, while providing more flexibility to its OEM partners, Microsoft has changed this requirement. With this change, Original Equipment Manufacturers (OEMs) now have the choice of the following options:

- Ship recovery media on CD, as long as the recovery media includes a "BIOS-Lock" utility that ensures that the software can only be restored to a specific PC.

- Ship hard-drive based recovery solutions.
- Do not ship a recovery media

In January 2000, Microsoft published the Windows Operating System and OEM Custom Recovery Resource Guide. By April 2000, all OEMs were required to ship with either a CD or hard drive based solution.

Symantec Ghost has been listed within the Resource Guide as a provider of both CD and hard drive based recovery solutions. The following solutions are available:

Hard drive solution	Symantec Ghost OEM allows the recovery image to be placed in a visible or hidden partition on the hard drive, thus eliminating the need for a recovery CD.
CD-Based solution	Symantec Ghost provides an image-lock solution that lets an OEM add the ability to lock an image to a specific computer, product type, or product line. By using this feature, OEMs can comply with the new Microsoft regulations without a significant impact on the current manufacturing or support process.

This overview lists the steps in a CD-based Image-Lock solution.

To execute the CD-based Image-Lock solution

- 1 The user inserts the recovery media and restarts the computer.
- 2 The Image-Lock solution checks to see if the pre-defined strings are correct.
- 3 One of the following options is executed:

If the strings match	Setup.exe and other recovery programs are launched. The user can proceed with the system recovery and can launch recovery applications.
If the strings do not match	A message is displayed indicating that the media will not function on that computer.

Locking the image

When Ghost locks an image, it obtains a string corresponding to the specified lock type. Ghost then generates a unique number based on the string and stores this in the image file along with the lock type.

Creating an image-restore solution About creating an image-restore solution with GhostOEM 18 When restoring the image, Ghost sees that the image has been locked, obtains the string matching the stored lock type, generates the unique number and compares it with the number stored in the image. If the numbers are equal, Ghost restores the image, if they are not equal, Ghost exits.

Lock strings are obtained from the system BIOS and Pentium chip, if present.

The following table lists the supported lock types, additional types can be added on request:

Table 2-1 Supported lock types

Type	Based on
M	System Management BIOS System Information Structure (Type 1) Manufacturer field.
P	System Management BIOS System Information Structure (Type 1) Product Name field.
V	System Management BIOS System Information Structure (Type 1) Version field.
S	System Management BIOS System Information Structure (Type 1) Serial Number field.
U	System Management BIOS System Information Structure (Type 1) Hex dump of UUID field.
C	Strings from type M and P concatenated
I	Hex dump of the Pentium 3 processor Id if it is available.

There are several steps in the process of locking a Ghost image to a set of computers.

To lock a Ghost image

- 1 Set up the template computer to be imaged.

The template computer must be one of the set of computers to which the image is to be locked.

- 2 On the template computer, at the command line, type the following and press **Enter**:

```
ghost.exe -lockinfo
```

The -lockinfo switch displays information stored in the BIOS, or the Pentium 3 processor ID if it is available, and the corresponding type code.

- 3 Select a locktype parameter.

To define a set of computers, choose a lock type such that all target computers will have the same value as the template computer for that lock type chosen. For example, to define a set of computers to be all of those with the value "XYZ Manufacturer" in the manufacturer key of the BIOS, choose lock type M.

See [Table 2-1](#) on page 18.

- 4 From the command line, type:

```
ghost.exe -locktype=type, where type is the lock type.
```

For example, the following command line locks any images created to the set of computers that have the same product name as the template computer:

```
ghost.exe -locktype=P
```

Note: The -locktype switch is valid only for that session when the executable is run. Run Ghost with the -locktype switch each time that a locked image is to be created.

- 5 Once you have locked the image to a computer test the restore functionality on a targeted set of computers to ensure the locking is working correctly.

Registering GhostOEM.exe

When you run GhostOEM the first time, you will be prompted for registration information. You do not have to register GhostOEM32. This information is used to personalize GhostOEM and will appear in the Splash and About screens. Once this information is entered, it is written into the executable and cannot be changed. If you make a mistake, or wish to change this information, repeat the process below.

To register GhostOEM.exe

- 1 Copy GhostOEM.exe from the distribution disk to a folder on your local disk.
- 2 At the command line, type the following to remove the read-only attribute from GhostOEM.exe:

```
Attrib.exe -r/s
```

- 3 At the command line, to start Ghost, type `GhostOEM.exe`
- 4 The first time that you run Ghost you are prompted to complete the following fields:

Name	Type the name of an authorized user
Company	Type the name of your company.
Licenses	Type 1.

- 5 Press **Enter**.

This creates Ghost.env, the Symantec Ghost environment file.

Customizing GhostOEM

GhostOEM can be branded and customized extensively. Menus and title bars can be changed, Symantec logos can be removed and your logo can be added.

All of the changes can be performed through a configuration file, Ghost.oem, or command line switches. The simplest way is to create the configuration file.

Note: Ghost.oem and Ghost.bmp should not be distributed, all changes are contained in the renamed executable.

To customize GhostOEM using a configuration file

- 1 In a text editor create a plain text file to reflect your branding preferences and save it as Ghost.oem.

See [the section called "Example of a Ghost.oem file"](#) on page 23.

- 2 If required, create a logo and save it as Ghost.BMP.

See [the section called "Logo bitmap specification"](#) on page 21.

- 3 Save Ghost.oem and Ghost.bmp in the same location as GhostOEM.exe

4 At the command line, type `GhostOEM.exe -oemfile` to add the branding information and logo.

The following message displays:

OEM data successfully imported

Ghost successfully registered

5 Do one of the following:

Revise the branding details

Repeat steps 1 through 4.

Undo the branding details

At the command line, type `GhostOEM.exe -oemdefault`.

Save the branding details to the restore executable.

Rename GhostOEM.exe

For example, Restore.exe.

The rename must be done to prevent a user from modifying the executables.

Logo bitmap specification

The bitmap image must conform to the following specifications:

Maximum height	30 pixels
Maximum width	128 pixels
Color depth	8-bit (256 colors only)

Ghost.BMP must be saved as an 8-bit BMP file however you can only use the 16 colors defined by the Ghost palette.

The following table lists the Ghost palette.

Table 2-2 Ghost palette

Color	RGB
1	0,0,0
2	57,57,57
3	98,98,98
4	116,116,116
5	132,132,132

Table 2-2 Ghost palette (continued)

Color	RGB
6	149,149,149
7	0,0,255
Color 7 is the Ghost transparent color, it won't be displayed.	
8	206,206,206
9	255,255,255
10	255,169,151
11	59,103,162
12	0,134,255
13	176,0,4
14	176,160,144
15	255,255,0
16	182,182,182

Insert Next Media Bitmap Specifications

OEM manufacturers delivering the Ghost recovery solution to the DBCS markets can find it useful to run executable in the quiet mode. Since GhostOEM cannot be localized for those markets, running it in the quiet mode is useful for it only displays the progress bar on the screen with no options. The only intervention that might be required from the user is to insert the next media if the image they are creating or restoring is spanned.

To cater for this situation, -oemspan switch has been provided in GhostOEM.exe. This switch allows OEM manufacturers to display localized DBCS text by providing the bitmap of the **Insert next media** dialog box.

Bitmap image must conform to the following specifications:

Height	100 pixels
Width	350 pixels
Color depth	8

The following must be applied to the bitmap:

- You must name the bitmap span.bmp and save it in the same location as Ghost.
- You can edit the existing span.bmp image supplied in the OEM kit and, using programs like Microsoft Paint, provide the appropriate title, message text and button options.
- You can modify the provided span.bmp with the button borders left untouched. The button on the right is "Cancel" and the button on the left is "OK".

Unlike OEM logo bitmap which gets appended to the executable, span.bmp is too large to be incorporated in the executable. To have a customized Insert next media dialog box displayed when running the GhostOEM executable, GhostOEM.exe must be run with -oemspan switch and the modified span.bmp bitmap must be present in the same folder as GhostOEM.exe when the executable is run.

Customizing GhostOEM32

When customizing GhostOEM32 you must use the switch -envexe in conjunction with other OEM customization switches.

The syntax for this switch is as follows:

```
-envexe=fullpath
```

where fullpath is the full path of a copy of GhostOEM32.exe that is not currently running. GhostOEM32.exe has to be the last part in the named file path.

For example:

```
GhostOEM32 -envexe=c:\folder\GhostOEM32.exe -oemfile
```

Example of a Ghost.oem file

This is the content of the sample Ghost.oem file included on the Symantec Ghost Solution Suite CD.

ProductName	XYZ Company Backup Tool
Copyright	Copyright ©) XYZ & Symantec Corp. 2000.
Version	1.0.1.
Vendor	XYZ Company
CompanyName	:XYZ Company
E-mail	http://www.xyz-company.com
Support	Toll-free 0110-0000-0000 between 9-17h CET
ErrorFilename	XYZCOMP.ERR

DisplayOEMLogo	Y
RemoveLogo	NONE
DisplaySpanWindow	N
LockMsg	This image is only valid for XYZ computers.

When creating or modifying a Ghost.oem file, have at least one space or tab character, colon and another space character placed between the setting variable and its value.

You can specify just certain values by removing the rest of the settings from the file. The following specifies just the product name, version, and a custom logo:

ProductName	XYZ Company Backup Tool
Version	1.0.1
DisplayOEMLogo	Y

Applying OEM changes to Ghost

You can apply the information supplied in the Ghost.oem configuration file to the GhostOEM executable in the following ways.

Use the command line	GhostOEM.exe -oemfile
Apply specific information on a one-by-one basis using the designated command-line switches	GhostOEM.exe -oemname="XYZ Company Backup Tool" -oemlogo -oemver=1.0.1
Apply selected changes through a combination of Ghost.oem file settings and command-line parameters	GhostOEM.exe -oemfile -oemlogo -oemver=1.0.1

To undo the changes that were made applying the -oemdefault switch which resets the GUI to the standard Ghost settings:

```
GhostOEM.exe -oemdefault
```

Customization switches

The following table lists the switches that can be used on the command line or in the Ghost.oem configuration file. These switches are only valid for GhostOEM.exe and will have no effect after renaming the file.

Table 2-3 Customization switches

Switch	Ghost.oem	Description of switch/setting	Maximum Text Length
oempname	ProductName	Product name displayed in the Title bar 24 and About box For example: -oempname="XYZ Company Backup Tool	24
oemcprght	Copyright	Copyright information displayed in the 60 Title bar and About box For example: -oemcprght="Copyright_XYZ_Corp._2000."	60
oemver	Version	Version number displayed appended to 24 the product name in the Title bar For example: -oemver=1.0.1	24
oemvendor	Vendor	Vendor name displayed as Manufacturer in the About box For example: -oemvendor="XYZ Company	28
oemcomp	CompanyName	Company name - displayed on Menu For example: -oemcomp="XYZ Company	18
oememail	E-mail	E-mail address or web page displayed 32 in selected error message dialog boxes. For example: -oememail= http://www.xyz-company.com	32

Table 2-3 Customization switches (*continued*)

Switch	Ghost.oem	Description of switch/setting	Maximum Text Length
oemsupprt	Support	Customer support information, typically a phone number. Displayed in selected error message dialog boxes. For example: -oemsupprt=Toll-free 0110-0000-0000	50
oemerrf	ErrorFilename	Name of error file created when program generates an error. If not changed, the default name GHOST.ERR is be used. For example: -oemerrf=xyz.err	12
oemremove	RemoveLogo	Removes one or more logos in the GUI. Valid parameters for this switch are: -oemremove=none None of the existing logos (Symantec, Ghost, animations) are removed -oemremove=all Removes all existing logos (Symantec, Ghost, animations) -oemremove=sym Removes the Symantec logo -oemremove=ghost Removes the Ghost logo -oemremove=anim Removes animations (during connection hold ups) -oemremove=oem Removes the OEM logo, and restores all the standard Ghost graphics	

Table 2-3 Customization switches (*continued*)

Switch	Ghost.oem	Description of switch/setting	Maximum Text Length
oemlogo	DisplayOEMLogo	Compiles Ghost.bmp into an executable and display. Displayed on main program background	
oemdefault		Reverts ghostoem to standard unbranded state.	
oemfile		Reads the settings from the Ghost.oem file.	
oemspan	DisplaySpanWindow	Displays customized Insert next media dialog box.	
oemlockmsg	LockMsg	<p>Message displayed when an attempt is made to restore a BIOS-locked image on an invalid machine</p> <p>For example:</p> <p>-oemlockmsg="This image is can only be restored on XYZ machines"</p>	200

If you want spaces in your displayed text strings when entering information at the command line, text must either be enclosed in quotes, or use an underscore character in place of the space. This is not a requirement for text used in the Ghost.oem configuration file.

The following examples both produce the same result:

- Ghostoem.exe -oempname="XYZ Company Backup Tool"
- Ghostoem.exe -oempname=XYZ_Company_Backup_Tool

Note: E-mail and Support settings information appear only on a few error message dialog boxes (not on all of them), so you should provide this information in one of the settings that appear on the about box.

Restoring with command line switches

After you have customized and renamed GhostOEM.exe, it can be used to restore Ghost image files. There are many command line options to automate the restore process; just a few are discussed below. For a complete list, refer to the *Symantec Ghost Solution Suite User guide*.

The essential command is -clone. The following table lists several parameters that must be used with -clone

Table 2-4 Clone command parameters

Syntax	Description
mode=restore (or prestore)	The mode parameter tells Ghost to either restore the whole image (restore) or a selected partition of the image (prestore)
src=filename.img (:#)	The src (source) parameter tells Ghost where the file is to restore. You can name your image files with any extension, however the Ghost UI recognizes only .gho file by default. The optional :# parameter indicates the source partition number in a multi partition image file.
dst=1 (or 1:1, etc.)	The dst (destination) parameter tells Ghost where to restore the image or partition. The first number is the disk number (beginning with 1), the second number is the partition number (beginning with 1).

The following table lists other useful commands

Table 2-5 Clone command optional switches

Switch	Description
-batch	Suppresses error and abort messages in the UI waiting for user acknowledgment.
-chkimg	Checks the integrity of the image file indicated by file name.
-h	Display help on switches.
-quiet	Displays only the Progress indicator in the UI. Suppresses the Statistics and Details display.

Table 2-5 Clone command optional switches (*continued*)

Switch	Description
-rb	Forces automatic reboot after completion in batch mode
-sure	Used in conjunction with -clone to avoid the final proceed prompt. Not needed when using the -batch command.

The following table lists some examples of command-line operations. In these examples, d GhostOEM.exe has been renamed to Restore.exe and the image file is named Filename.img on the CD drive mapped to E:

Table 2-6 Command-line operations

Command line	Description
Restore.exe -chkimg, e:\filename.img	The command checks the integrity of the disk image file on drive E:
Restore.exe -clone, mode=restore, src=e:\filename.img, dst=1 -sure -rb	The command restores the disk image file from drive E: onto drive one on the local computer. It does not prompt if OK to proceed, but displays error dialogs, statistics and details in the user interface. The computer is rebooted when the operation complete
Restore.exe -clone, pmode=restore, src=e:\filename.img:1, dst=1:1	The command restores the first partition of the multi-partition disk image file from drive E: onto the first partition of drive one on the local computer. It provides full user interaction and error dialogs.
Restore.exe -clone, pmode=restore, src=e:\filename.img, dst=1 -batch -quiet	The command restores the disk image file from drive E: onto drive one on the local computer. The program does not display errors or the statistics and details information. Use this command-line in a batch file that traps errors and prompts the user to reboot.

Creating a DOS batch file

Your Ghost-based OEM image-restore solution may include a DOS batch file. This file is usually run from a floppy boot disk that restores the factory image from CD or a hidden partition on the hard drive.

There are a number of reasons for using a batch file as follows:

- To present appropriate warnings that the hard drive will be overwritten.
- To check the integrity of the image before restoring.
- To insulate the end user from the Ghost UI.
- To automatically launch a restore menu from a bootable floppy or CD.

When used as a disaster or hard drive recovery tool, GhostOEM is best run out of one or more batch files. This insulates the end-user from the UI and reduces the chance of error.

A restore batch file can be simple or complex, ranging from launching the program with parameters to a colorful ANSI menuing system. The following example provides the user with a simple menu and checks the integrity of the image file before restoring.

```
@echo off

cls

echo.

echo. XYZ Company Backup Tool, version 1.0.1

echo. Copyright ©) 2005 XYZ Company and Symantec Corp.

echo.

echo.

echo.

echo.

echo.

echo.

echo.

echo.

echo Please choose

an option below:

echo.

echo 1. Restore

hard drive

echo 2. Exit
```

```

program
Choice /c:12

if errorlevel 2 goto
exit_program

cls

echo.

echo. XYZ Company Backup Tool, version 1.0.1
echo. Copyright ©) 2000 XYZ Company and Symantec Corp.
echo.

echo. -----===Warning! =====
echo. Restoring the hard drive image will
echo. erase all data on the entire drive.
echo. Proceed only if you have saved all
echo. recoverable personal data.
echo.
echo.

echo Please choose an option below:
echo.

echo 1. Continue to restore hard drive
echo 2. Exit program
Choice /c:12

if errorlevel 2 goto exit_program
restore -chkimg,filename.img -batch -quiet >null
if errorlevel 1 goto failed

echo XYZ Company Backup Tool, version 1.0.1 status:
echo.

echo The image integrity check was successful. Now restoring factory image...
restore.exe -clone,mode=prestore,src=filename.img:1,dst=1:1 -batch -quiet >null
if errorlevel 1 goto problem

echo XYZ Company Backup Tool, version 1.0.1 status:

```

```
echo.  
echo Drive restore was successful. Please remove your CD and reboot your system.  
goto exit_program  
:failed  
echo.  
echo.  
echo -----===Warning! ===-----  
echo The image integrity check failed,  
echo Contact XYZ Company Product Support Services at (800) 555-1212 goto  
exit_program  
:problem  
echo.  
echo.  
echo -----===Warning! ===-----  
echo A problem was encountered restoring the factory drive image.  
echo Contact XYZ Company Product Support Services at (800) 555-1212  
goto exit_program  
:exit_program  
echo.
```


Installing the Boot Partition Selector using SRFixMBR

This chapter includes the following topics:

- [About the Boot Partition Selector and SRFixMBR](#)
- [Files included with SRFixMBR](#)
- [System requirements](#)
- [Using SRFixMBR](#)
- [About customizing the user interface](#)

About the Boot Partition Selector and SRFixMBR

The Boot Partition Selector is an application that is installed using SRFixMBR. The Boot Partition Selector requests which partition the end user wants to launch when the computer is booted from the primary hard drive. If no response is made within the timeout interval, then the user partition is launched. Alternatively, the end user can launch the recovery partition. The end user can access the recovery partition only through the Boot Partition Selector.

The Boot Partition Selector can be customized. Any modifications to the example Boot Partition Selector must fit in the MBR of the manufactured computer.

Files included with SRFixMBR

The following files are included with SRFixMBR:

- SRFixMBR.exe
System Recovery Fix MBR executable (Win32-based)

- SRFixMBR.xml
Sample XML file for System Recovery Fix MBR

These files must be copied to the user partition. The root directory is C:\Program Files\OEM\SRFixMBR, or another location that is suitable for your configuration.

System requirements

SRFixMBR can be executed from the following operating systems:

- Microsoft Windows 2000
- Microsoft Windows XP (all service packs)
- Microsoft Windows 2003 Server (all service packs)
- Microsoft WinPE
- Microsoft Vista Windows Business/Enterprise/Ultimate

SRFixMBR can designate user and recovery partitions on the following operating systems:

- PC DOS
- MSDOS
- Microsoft WinPE
- Microsoft Vista/XP/2003 Server/2000

Note: SRFixMBR may or may not work with the latest Microsoft Operating system.

Using SRFixMBR

SRFixMBR is a command-line driven tool. Type the command name at the command line with some arguments following:

For example: SRFixMBR /[arguments] Arguments are preceded by either a slash (/) or a hyphen (-).

These arguments may be as follows:

- Application commands with parameters. These parameters may be categorized as required or optional.
- Specified no matter what the application command is.

Arguments and parameters may have more than one name. These other names are called aliases.

SRFixMBR commands

The following command line text provides an overview of the use of SRFixMBR command-line:

```
SRFixMBR

SRFixMBR /help [/command]

SRFixMBR /version

SRFixMBR /batch
```

SRFixMBR restores the Master Boot Record to its as-shipped state.

Use SRFixMBR /help with a command to provide short help on the arguments for that command.

The following table lists the SRFixMBR command and parameters.

Table 3-1 SRFixMBR command parameters

Command	Description
SRFixMBR	The SRFixMBR command writes the Boot Partition Selector into the Master Boot Record (MBR). The disk signature, partition table, and active partition are not changed. Use an application such as FDisk or GDisk to change the active partition.
Version	The SRFixMBR /version command displays the current version number of the application. For example: SRFixMBR /version Copyright ©) 1998-2006 Symantec Corp. All rights reserved. Version: 11.0.0.1470
Batch	The SRFixMBR /batch command can be used with other commands to run SRFixMBR from a batch file. If specified, each prompt will be answered with a default response, such as Y or N. No user input is needed.

About customizing the user interface

Using XML files, you can customize SRFixMBR.

The following settings can be customized:

- The user interface
- Command line
- Error messages
- Information messages
- Function settings
- Application features available to the end user

Format of SRFixMBR.xml

This is the basic format of SRFixMBR.xml.

See [“Tags and attributes for SRFixMBR.xml”](#) on page 38.

```
<srfixmbr>
<abort-server>
<messages>
<message>
</message>
</messages>
</abort-server>
<command-line>
<messages>
<message>
</message>
</messages>
</command-line>
<console-input>
...
<settings>
<setting id="yes-keys" value="Yy"/>
<setting id="no-keys" value="Nn"/>
</settings>
```

```
</console-input>

<console>

<messages>

<message id="some-unique-id">
Some text for this message
</message>
</messages>
</console>

<cmd-line-arguments>
<cmd-line name="help">
<optional name = "version"/>
<help>Displays some help</help>
<usage> /help [/command] </usage>
</cmd-line>

<cmd-line-alias name="help" alias= "?"/>
<common-arguments>
<optional name="batch"/>
</common-arguments>
</cmd-line-arguments>

<restore-mbr>

<messages>

<message>
</message>
</messages>

<settings>
<!--Timeout -->
<setting id="timeout" value="182"/>
...
</settings>
```

```
</restore-mbr>  
</srfixmbr>
```

Tags and attributes for SRFixMBR.xml

The table in the section Possible attribute values for SRFixMBR.xml lists the tags and attributes for SRFixMBR.xml. For each attribute, a list of possible values is provided.

Listed attributes are required unless indicated otherwise.

See [“Possible attribute values for SRFixMBR.xml”](#) on page 40.

Example SRFixMBR.xml

This is an example of the <restore-mbr> section of SRFixMBR.xml.

```
<restore-mbr>  
  <messages>  
    <message id="confirm">  
      <p>Are you sure that you wish to restore the Master Boot Record?</p>  
    </message>  
    <message id="cmd-line-confirm"><!--  
      -->Master Boot Record is about to be overwritten. Are you sure (Y/N)?  
    </message>  
    <message id="success"><!--  
      -->Master Boot Record has been successfully restored.  
    </message>  
    <message id="no-changes-have-been-made"><!--  
      -->No changes have been made to the Master Boot Record.  
    </message>  
    <message id="disk-access-denied"><!--  
      -->Disk access has been denied in the current context.  
    </message>  
    <message id="invalid-target-disk-id"><!--  
      -->Error restoring Master Boot Record: Invalid target disk number.
```

```
</message>

<!-- invalid-xml-default %0 is replaced by a setting id eg. timeout
-->

<message id="invalid-xml-defaults"><!--
-->Invalid XML Master Boot Record default setting: %0.
</message>

<!-- Invalid method for identifying recovery partition -->

<message id="invalid-recovery-partition-identification-scheme"><!--
-->You can specify only either a combination of
"partition-identity-type" and "partition-boot-type" or a combination
of "recovery-partition-index" and "user-partition-index".
</message>

<!-- invalid-partition-index -->

<message id="invalid-partition-index"><!--
-->%0 can only be between 1 and 4 inclusive.
</message>

<!-- error-same-value -->

<message id="error-same-value"><!--
-->%0 cannot be the same as %1.
</message>

<!-- no-partition-settings -->

<message id="no-partition-settings"><!--
-->The recovery partition has not been specified. Use either a
combination of "partition-identity-type" and "partition-boot-type"
or a combination of "recovery-partition-index" and
"user-partition-index".
</message>

<!-- no-partition-settings -->

<message id="prompt-length-exceeded"><!--
-->Prompt length for the specified recovery scheme
cannot exceed %0 bytes.
```

```
</message>

</messages>

<settings>

<!-- Timeout - note: clock ticks approx 18 times/sec.
- 18.2 == 1 sec. -->

<setting id="timeout" value="182"/>

<!-- Diagnostic partition index - from 1 to 4 (decimal) -->

<setting id="recovery-partition-index" value="2"/>

<!-- User partition index - from 1 to 4 (decimal)
NOTE: Should not be same as diagnostic -->

<setting id="user-partition-index" value="1"/>

<!-- Partition boot type - the diagnostic partition type
when it is being activated-->

<setting id="partition-boot-type" value="12"/>

<!-- Partition identity type - the normal diagnostic
partition type when it is not activated-->

<setting id="partition-identity-type" value="28"/>

<!-- Prompt (max 70 bytes) -->

<setting id="prompt" value="Press F3 to boot into
recovery mode..." />

<!-- Activation key (decimal) eg. F2 == 60 -->

<setting id="activation-key" value="61"/>

<!-- Target disk id (first disk == 1) -->

<setting id="target-disk-id" value="1"/>

</settings>

</restore-mbr>
```

Possible attribute values for SRFixMBR.xml

The following table lists the possible values for attributes.

Table 3-2 SRFixMBR.xml tags and attributes

Tag	Attributes	Usage	Description
srfixmbr	None	<pre><srfixmbr > ... (all tags) </srfixmbr ></pre>	This tag is the root node that contains all the tags that are interpreted by and that relate to the SRFixMBR application.
abort-server	None	<pre><abort-server> <messages> <message ...> ... </message> </messages> </abort-server></pre>	This tag contains a list of <message> tags for messages relating to error conditions.
console-messages	None	<pre><console> <messages> <message ... > ... </message> </messages> </console></pre>	This tag contains the full list of messages that are intended for display in the console. These messages are defined by a list of <message> tags.

Table 3-2 SRFixMBR.xml tags and attributes (*continued*)

Tag	Attributes	Usage	Description
message	id	<pre> <message id="arguments"> Arguments: </message> <message id= "no-action-specified">!-- -->No action was specified on the command line </message> <message id= "missing-cmdline- parameter"> Missing parameter for command line argument: %0(=_missing_) </message> </pre>	<p>This tag consists of text only. All markup is ignored except for hard breaks. To remove unwanted white space, use commenting. The <code><message id></code> tag identifies each message and must be unique. In an XML file, these tags are grouped according to function. For example: "Messages relating to errors during command line parsing" and "Messages relating Restore MBR use case." The parameters %0 and %1 can be passed by the SRFixMBR application parameter. %2 corresponds to the name of the XML file (SRFixMBR.xml).</p>
console-input	None	<pre> <console-input> <messages> <message> </message> </messages> <settings> <setting .../> </settings> </console-input> </pre>	<p>This tag defines the console input configuration.</p>

Table 3-2 SRFixMBR.xml tags and attributes (*continued*)

Tag	Attributes	Usage	Description
cmd-line-arguments	None	<pre> <cmd-line-arguments> <cmd-line ...> ... </cmd-line> <argument ...> ... </argument> </cmd-line-arguments> </pre>	This tag contains other tags that pertain to the command line arguments, help text, and expected parameters and options. These are either <cmd-line> tags or <argument> tags.
cmd-line	name parameter (optional)	<pre> <cmd-line name="description" parameter="required"> <help> ... </help> </cmd-line> </pre>	This tag defines the argument that is passed to a particular command that has already been defined in a <cmd-line> tag. It may contain a <help> tag.
cmd-line-alias	name alias	<pre> <cmd-line-alias name="source" alias="s"/> </pre>	This tag lets shorter aliases be used for <command-line> names.
restore-mbr	None	<pre> <restore-mbr> <messages> <message ...> ... </message> </messages> <settings> <setting ... /> </settings> </restore-mbr> </pre>	This tag contains a list of <message> tags for messages relating to the Restore MBR functionality. It lets MBR default settings be defined within <setting> tags.

Table 3-2 SRFixMBR.xml tags and attributes (*continued*)

Tag	Attributes	Usage	Description
setting	id value	<pre><setting id="timeout" value="182"/> <setting id="target-disk-id" value="1"/></pre>	This tag sets values for particular ids.

The following table lists the possible values for attributes.

Table 3-3 SRFixMBR.xml attribute values

Attribute	Possible value
abort-server message ids	<p>use-case-error</p> <p>Expects parameters %0 (use-case error message), %1 (application name), and %2 (error file name).</p> <p>fatal-error</p> <p>Expects parameters %0 (application name), and %1 (error file name).</p>

Table 3-3 SRFixMBR.xml attribute values (continued)

Attribute	Possible value
	invalid-argument Expects parameter %0 (replaced by the name of the argument).
	empty-argument missing-argument Expects parameter %0 (required argument name).
	invalid-parameter Expects parameters %0 (replaced with the name of the argument) and %1, (replaced by the parameter text, including an equal [=]sign).
	missing-parameter Expects parameter %0 (replaced by the name of the argument).
	missing-parameter-value Expects parameter %0 (replaced by the name of the argument).
	missing-cmd-line-arguments Expects parameter %2 (replaced by the name of the XML file).
	missing-argument-alias-name Expects parameters %2 (replaced by the name of the XML file), and %0 (replaced by the alias name).
	invalid-parameter-config Expects parameters %0 (replaced by the argument name), %1 (replaced by the erroneous text in the parameter attribute) and %2 (replaced by the name of the XML file).
console-input message ids	echo-yes-response echo-no-response

Table 3-3 SRFixMBR.xml attribute values (*continued*)

Attribute	Possible value
console-input settings ids	“yes-keys” value “Yy” Key presses that indicates a yes or affirmative action. “no-keys” value “Nn” Key presses that indicate a no or negative action.
console message ids	usage-header usage-common command-usage Expects parameter %0 (command help) arguments version Expects parameters %0 (copyright notice) and %1 (version number).
cmd-line-arguments	help version batch
restore-mbr message ids	confirm cmd-line-confirm success no-changes-have-been-made invalid-target-disk-id invalid-xml-defaults Expects parameter %0 (replaced with a setting id, for example, timeout). disk-access-denied

Table 3-3 SRFixMBR.xml attribute values (*continued*)

Attribute	Possible value
restore-mbr setting ids	<p>"timeout" value="182"</p> <p>Timeout. The clock ticks approximately 18 times per second: $18.2 = 1$ sec.</p> <p>"recovery-partition-index" value="1"</p> <p>Recovery partition index (decimal 1 through 4) "</p> <p>user-partition-index" value="2"</p> <p>User partition index (decimal 1 through 4)</p> <p>"partition-identity-type" value="28"</p> <p>Partition identity type. The normal diagnostic partition type when it is not activated.</p> <p>"partition-boot-type" value="12" Partition boot type. The diagnostic partition type when it is being activated.</p> <p>"prompt" value="F2:"</p> <p>Prompt. This has a maximum of 70 bytes.</p> <p>"activation-key" value="60"</p> <p>Activation key (decimal). For example, F2 = 60. This is the scan code of the key that was pressed on the keyboard. Do not set to the Enter key (0x1c=28 decimal) as the Enter key boots the user partition by default, if pressed.</p> <p>"target-disk-id" value="1"</p> <p>Target disk id (first disk = 1).</p> <p>For more information on partition types and setting ids see the following site:</p> <p>http://www.win.tue.nl/~aeb/partitions/partition_types-1.html</p>