Portable USB 2.0 Hard Drive with Rapid Restore

User's Guide

Portable USB 2.0 Hard Drive with Rapid Restore

User's Guide

Note: Before using this information and the product it supports, read the information in Appendix C, "Warranty information", on page 95 and Appendix D, "Notices", on page 105.

Third Edition (February 2003)

© Copyright International Business Machines Corporation 2002. All rights reserved.
US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

© Copyright IBM Corp. 2002

Preface

This manual provides information on the IBM® Portable USB 2.0 Hard Drive with Rapid Restore. This manual is written for the installer and user of this equipment and contains the following information:

- Chapter 1, “Hardware User’s Guide” contains instructions for installing and using the IBM Portable USB 2.0 Hard Drive with Rapid Restore.
- Chapter 2, “Introduction to Rapid Restore” contains a listing of Rapid Restore PC features, system requirements, new features incorporated into the latest release, and upgrade options.
- Chapter 3, “Before you install Rapid Restore” contains information on how to incorporate a USB drive within your backup strategy using IBM Portable USB 2.0 Hard Drive with Rapid Restore.
- Chapter 4, “Installing Rapid Restore” contains install, uninstall, and update instructions.
- Chapter 5, “Windows user interface overview” contains instructions for common procedures such as accessing and exiting Rapid Restore.
- Chapter 6, “Managing backups” contains instructions on how to backup your data.
- Chapter 7, “Migrating to a larger hard disk” contains instructions on how to migrate your data to a larger hard disk.
- Chapter 8, “Restoring your system” contains instructions on how to restore your data.
- Appendix A, “Troubleshooting” contains information that might be helpful if you encounter problems using Rapid Restore.
- Appendix B, “Glossary” contains definitions of industry terms to assist you in understanding some of the concepts discussed in this guide.
- Appendix C, “Warranty information” provides warranty information.
- Appendix D, “Notices” contains trademarks and legal notices.

Registering your option

Thank you for purchasing this IBM product. Please take a few moments to register your product and provide us with information that will help IBM to better serve you in the future. Your feedback is valuable to us in developing products and services that are important to you, as well as in developing better ways to communicate with you. Register your option on the http://www.ibm.com/pc/register IBM Web site.

IBM will send you information and updates on your registered product unless you indicate on the Web site questionnaire that you do not want to receive further information.

© Copyright IBM Corp. 2002

Before you begin

Be sure to review the following information before installing and using the IBM Portable USB 2.0 Hard Drive with Rapid Restore.

Attention
Only use the cables that come with this option. You might damage the drive if you use a cable not included with the option package. Do not attach an ac adapter to this device.

- To avoid damaging your USB Hard Drive, handle with care. When transporting the drive or when it is not in use, place it in the carrying case that comes with the option. For more information on correctly handling your USB Hard Drive, see "Maintaining the drive" on page 3.
- The primary USB cable must be connected to a USB high power port. If you experience problems, try connecting the primary USB cable to another USB port on the rear of the system.
- When using your USB Hard Drive on a mobile computer with a USB 2.0 PCMCIA card, the primary USB cable must be inserted into the PCMCIA card high power port. You must also connect the auxiliary power cable to the USB port on the rear of the mobile computer to provide adequate power.

Attention
IBM does not support this product with a third party disk-utility that reorders or sorts the partition table.

Rapid Restore Requirements

System Configurations

IBM Portable USB 2.0 Hard Drive with Rapid Restore supports the following system configurations:

- Single hard disk using one of the following technologies: ATA (EIDE) UDMA 33, ATA 66/100, SCSI (1, 2, 3, Fast, UW, LVD, and 160).
- Single IBM USB drive.

Note: The USB drive is used to store a copy of the primary hard disk's service partition. The USB drive can be configured as a dedicated backup storage device. In addition, the USB drive can be configured for "mixed mode", allowing the USB drive to store backup data while simultaneously storing user data (in a maximum of three additional partitions).

Hardware

- 128 MB RAM
- 50 MB of free disk space available for installation of Rapid Restore
- Intel Pentium® II and above, MMX™, Celeron, AMD Athlon, Duron, and K6 II and above

© Copyright IBM Corp. 2002

Software

- No other third party boot managers can be installed
  Rapid Restore installs its own boot manager enabling the pre-operating system interface (using the **F11** key) to the One Button Restore Manager. Therefore, any pre-existing boot manager is overwritten during the installation process.
- Internet Explorer 5.0 or higher

Operating Systems

Non-Server

Rapid Restore is compatible with the following non-server based operating systems:

- Windows® XP Professional—Fat16, Fat32, or NTFS
- Windows XP Home—Fat16, Fat32, or NTFS
- Windows 2000 Professional, Service Pack 2 or higher—Fat32 or NTFS

Online Help

Rapid Restore's integrated Online Help pane is an invaluable source of information. The Help pane contains information that dynamically updates as you access different Rapid Restore components.

In addition, you can access Rapid Restore's Online Help System by performing the steps below.

1. Access Rapid Restore's main console. For detailed instructions, see "Opening the main console" on page 45.
2. Click the **Help** button.

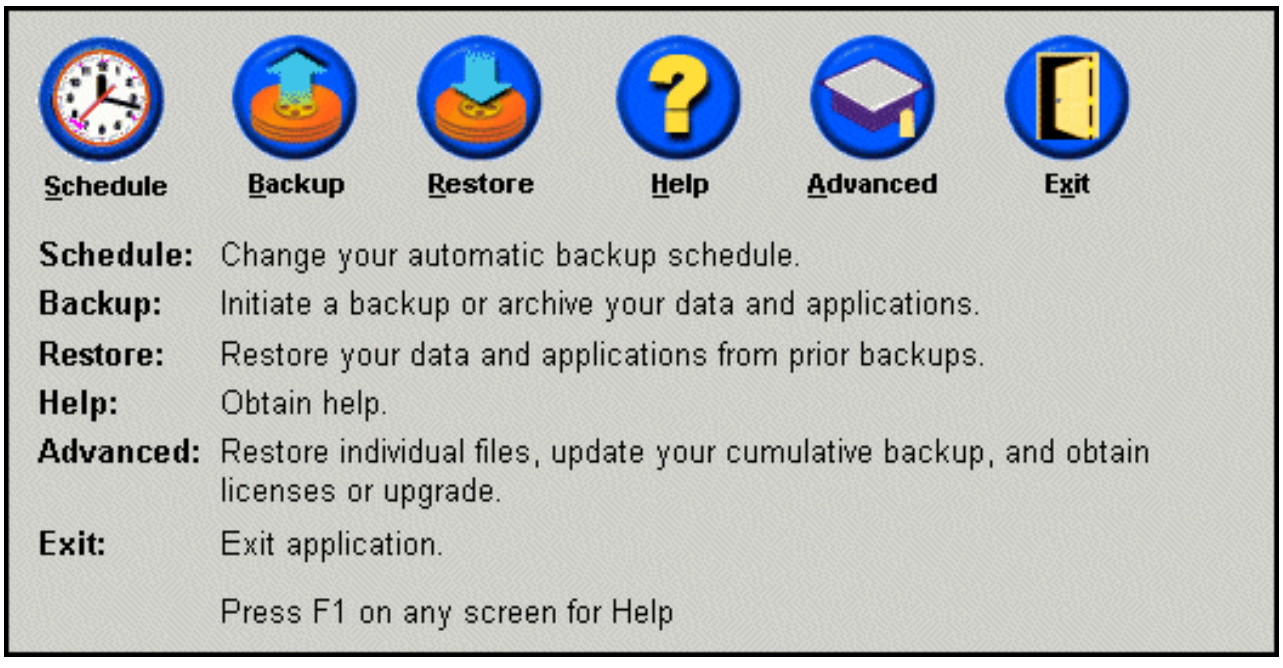


Figure 1. Help button

Chapter 1. Hardware User's Guide

This chapter contains instructions for installing and using the IBM Portable USB 2.0 Hard Drive with Rapid Restore.

Note: Before you install and use the IBM Portable USB 2.0 Hard Drive with Rapid Restore, be sure to read "Before you begin" on page vii.

Product description

The IBM Portable USB 2.0 Hard Drive with Rapid Restore is a portable, lightweight, high-speed USB hard disk drive that is compatible with the USB 2.0 standard that enables data transfers that are up to 40 times faster than through existing USB 1.1 connections. The drive can be used with mobile or desktop computers and is compatible with USB 1.0 and USB 1.1 connections. After you install the drive, it operates as a plug-and-play device and is hot-swappable.

The option package includes:

- IBM Portable USB 2.0 Hard Drive with Rapid Restore
- Primary USB cable (USB ″A″ to ″mini B″ connection)
- Auxiliary power cable
- *User's Guide and Software CD* that includes the Rapid Restore software and this online *User's Guide*
- Warranty supplement
- Carrying case

Hardware and software requirements

You must have the following hardware installed on your computer:

- Minimum 200Mz Intel Pentium microprocessor
- 64 MB Random Access Memory (RAM)
- CD-ROM or DVD-ROM drive to install the software on the included CD
- USB 1.1 or 2.0 ports

Your computer must have Microsoft® Windows 2000 Professional or Microsoft Windows XP installed to use the IBM Portable USB 2.0 Hard Drive with Rapid Restore.

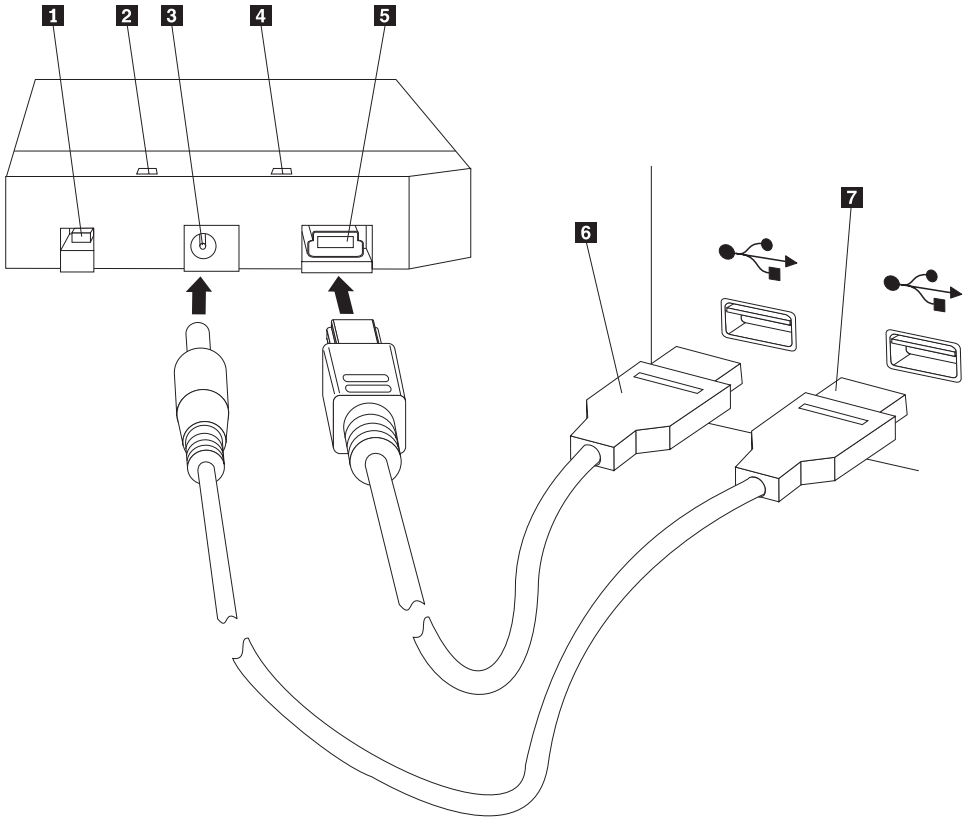
Installing the drive

This section provides instructions for installing the drive.

To install the drive, do the following:

© Copyright IBM Corp. 2002

1. Attach the primary USB cable to the USB port **5**, as shown.



1 Power switch
2 Drive activity LED
3 Auxiliary power port
4 Power LED
5 USB port
6 Primary USB cable
7 Auxiliary power cable

2. Connect the other end of the primary USB cable **6** to an available USB port on your computer.
3. Attach the auxiliary power cable to the auxiliary power port **3** on the drive.
4. Attach the other end of the auxiliary power cable **7** to an available USB port on your computer.
5. Turn the switch **1** to the on position.

Attention

Only use the cables that come with this option. You might damage the drive if you use a cable not included with the option package. Do not attach an ac adapter to this device.

Windows will automatically detect the drive. The first time you perform these steps, a welcome window will open with the option to install Rapid Restore.

If you intend to use the included Rapid Restore software, be sure to read the general introductory information on Rapid Restore, in Chapter 2, “Introduction to Rapid Restore”, on page 5. For information as to how to incorporate a USB drive within your backup strategy using IBM Portable USB 2.0 Hard Drive with Rapid Restore, see Chapter 3, “Before you install Rapid Restore”, on page 7. To install Rapid Restore, see Chapter 4, “Installing Rapid Restore”, on page 15.

If you do not intend to use the included Rapid Restore software, then your drive is ready to use, no software install is required. To disable the autolaunch, click **Do not show this again** in the lower-left hand corner of the browser window, disconnect the drive, and then reconnect the drive.

Note: Rapid Restore creates a service partition on the primary hard drive of your computer and backs up its contents during installation. Consequently, installing Rapid Restore requires a substantial amount of uninterrupted time. For example, a 20 GB hard drive that contains 12 GB of data would take approximately two hours to complete. Generally, a conservative estimate is that 1 GB of data is backed up every 10 minutes. Interrupting a Rapid Restore installation might result in data loss.

Making your drive bootable

Your drive can be configured to be bootable on systems that have boot-to-USB BIOS support. Typically, the BIOS will detect the drive as ″HDD-1″ or ″IBM-(USB).″ To add the IBM Portable USB 2.0 Hard Drive with Rapid Restore to your computer startup sequence, you will need to use your computer BIOS setup utility. For information on using the BIOS setup utility, refer to the documentation that came with your computer.

If you are having a problem, be sure to check the latest BIOS available for your computer. For a list of computers that support booting through BIOS to USB storage devices, refer to the http://www.ibm.com/pc/support/ IBM support Web site.

Disconnecting the drive from your computer

To disconnect the drive in Windows, do the following:

1. Click the **Safely Remove Hardware** icon in the system tray.
2. Click the **USB Mass Storage Device** icon to stop the device.
3. Turn the switch to the off position.
4. Disconnect the cables.

Maintaining the drive

Use the following maintenance guidelines for your drive.

- Do not drop or shock the drive.
- Use the drive power switch to turn off the drive when you are not using it.
- Do not operate or store the drive near strong magnetic fields.
- Do not expose the drive to liquids, extreme temperatures, or humidity.
- Do not use any power cables or adapters that are not included in this option package.

Chapter 2. Introduction to Rapid Restore

Product Features

Rapid Restore is an easy to use Managed Recovery solution that protects systems from software-related failures including:

- User-induced system failures
- Software application corruptions
- Operating system corruptions
- Virus activity
- Service pack update corruptions
- Hardware limitations (for example, hard disk storage space)
- Hardware component failures (IBM Portable USB 2.0 Hard Drive with Rapid Restore)

If you experience a system failure, you can use Rapid Restore to quickly restore the contents of your hard disk to a previously saved state.

Rapid Restore enables you to:

- **Save files to a local service partition** - Rapid Restore uses a hidden, locked partition on your local hard disk, thereby minimizing the use of network bandwidth during a backup and restore operation. This partition is called the service partition. In addition, IBM Portable USB 2.0 Hard Drive with Rapid Restore uses a hidden, locked partition on your USB drive to accomplish the same results.
- **Restore files to any of three backed-up states** - Rapid Restore stores up to three backups in the service partition: the base image, the cumulative backup, and the most recent backup. For a detailed explanation of these backups, see Chapter 6, “Managing backups”, on page 51.
- **Restore files after an operating-system failure** - Under normal circumstances, you can access Rapid Restore from within the Windows operating system. However, if an operating-system failure prevents you from booting to Windows, you can use the One Button Restore Manager’s pre-operating system interface to perform a full system-recovery operation.
- **Protect the entire software image, including user data** - Rapid Restore protects the entire contents of the hard disk, including the Windows operating system, software applications, registry settings, network settings, fix packs, desktop settings, and unique data files.
- **Archive backups to CD-R** - Rapid Restore enables you to archive backups to CD-R, providing an additional level of protection. When combined with the backups stored in the service partition, these archived backups add an additional level of protection.
- **Create startable recovery CDs** - You can create a set of recovery CDs that can restore the contents of your hard disk in the event of a hard disk replacement.
- **Restore single files** - Rapid Restore enables you to view, select, and recover one or more individual files from a backup. Only files found in the file-based backups (cumulative backup and most recent backup) can be restored individually. This option cannot restore any files that are in-use, active, or open. For details on using this feature, see “Restoring a Single File” on page 77.

© Copyright IBM Corp. 2002

Understanding the boot process

To fully understand how Rapid Restore works, you need to understand your system's normal boot process.

Master Boot Record (MBR)

The first sector of your hard disk is know as the Master Boot Record (MBR). The MBR, also known as the "partition sector" or the "master partition table," identifies how and where an operating system is located so it can boot. The MBR contains two important pieces of information:

- A partition table defining the partitions on your hard disk
- A small program that transfers operating system-level control to the first sector of a partition. This first sector is called the boot sector.

The partition table can store a maximum of four entries, each entry containing the following partition-specific information:

- Where the partition begins and ends
- The active (or bootable) partition
- The type of file system used by the partition.

When the small program within the MBR obtains control of your system, it analyzes your partitions to determine which one is marked, or flagged, as active. Then, it loads the boot sector of that partition and transfers control of your system to the code on the boot sector.

Boot sectors are operating (for example, Windows 2000 or Windows XP) and specific to file systems such as FAT32 or NTFS. In addition, the space for the boot sector's code is limited and only includes instructions to locate and analyze a certain file and then transfer control of your system to that file.

Rapid Restore's One Button Restore Manager

Rapid Restore's One Button Restore Manager includes a pre-operating system interface that enables you to redirect your system to boot from an MBR stored in a hidden service partition on your hard disk. Therefore, even if your system will not boot into Windows, you can still access Rapid Restore to perform a restoration.

Service partition

Your service partition (created by Rapid Restore if one is not detected on your hard disk at the time of installation) contains a backup or backups of your hard disk so that you can restore your system to a known point in time. Ultimately, this partition stores the base image or images, the cumulative backup, and the most recent backup. For more information about backup and image types, see "Supported image and backup types" on page 51.

Since your system is unaware of this service partition's existence, the information stored in this partition is protected from system-level issues such as viruses or malicious destruction of data. Depending on your backup and restore strategy, you can store up to five backups, each containing information about your system at a specific point in time (three base images and two cumulative backups).

Chapter 3. Before you install Rapid Restore

Introduction

The Flexible One Button Restore Manager extends the functionality of Rapid Restore to include the ability to backup and restore your computer from a USB drive. The Flexible One Button Restore Manager supports three configuration options, enabling you to select the backup method that best suits your needs.

Note: IBM Portable USB 2.0 Hard Drive with Rapid Restore includes the Flexible One Button Restore Manager.

Features

The Flexible One Button Restore Manager includes the following features:

- **Service partition security**
  The USB drive service partition is hidden and inaccessible to users. In addition, since the operating system is unaware of the service partition's existence, the information stored in this partition is protected from system-level problems such as viruses or malicious destruction of data.
- **Mixed mode support**
  Mixed mode support allows the USB drive to contain a hidden service partition for backup storage purposes while simultaneously supporting up to three additional partitions. These additional partitions can be used for standard hard drive storage purposes (for example, documents or programs).
- **Signature mapping**
  Signature mapping of the USB drive and its host computer ensures backups can only be restored to the original host. In addition, if the USB drive is attached to a computer other than the host computer, you are notified that the USB drive contains backup data generated by a different computer. This ensures backup data is protected from being overwritten by a non-host machine backup data. In addition, this enables you to share data when your USB drive is configured for "mixed mode".

  Note: A bare metal restore from a USB drive is the only exception to this rule.
- **Bare metal restore support**
  You can perform a bare metal restore from the USB drive to a machine other than the host machine. For example, if the host machine is no longer available (for example, if the host machine was stolen or damaged beyond repair), you can use the USB drive with a new machine to restore your system.
- **Restore host machine in pre-operating system environment**
  If a machine cannot boot to Windows, you can boot directly to your USB drive to initiate a restoration.
- **Synchronization**
  When you select the **Backup to Both Drives** option and the USB drive is missing at the time a backup is performed, the service partition on the USB drive is automatically synchronized, or updated, with the primary hard disk service partition the next time the USB drive is reattached to the host machine.

© Copyright IBM Corp. 2002

Configuration options

When installing or upgrading to a Rapid Restore product containing the Flexible One Button Restore Manager, you can select from the following configuration options:

- Backup to Primary Hard Drive Only
- Backup to Both Drives
- Backup to USB Drive Only

A brief overview of each configuration option is discussed below.

Backup to Primary Hard Drive Only

The **Backup to Primary Hard Drive Only** option configures Rapid Restore to store backup data on your primary hard drive. This enables the recovery of the primary hard disk from its own service partition. While this configuration does not include using your USB drive, you can reconfigure your backup strategy using the **Backup to Both Drives** or the **Backup to USB Drive Only** option at a later time. For more information on reconfiguring your backup strategy to include your USB drive, go to "Enabling USB Drive support" on page 9.

For additional information regarding this backup configuration option, see "Installing with the Backup to Primary Hard Drive Only Configuration" on page 19.

Backup to Both Drives

The **Backup to Both Drives** option configures Rapid Restore to store backup data on your primary hard disk and on your USB drive. This enables the recovery of the primary hard disk from its own service partition as well as the USB drive service partition. In addition, Rapid Restore ensures the backup data on your USB drive remains up to date by automatically synchronizing, or updating, your USB drive service partition with the primary hard disk service partition after every backup is performed. If your USB drive is not attached at the time a backup is initiated, it is automatically synchronized the next time your USB drive is attached.

For additional information regarding this backup configuration option, see "Installing with the Backup to Both Drives Configuration" on page 27.

Backup to USB Drive Only Option

Selecting the **Backup to USB Drive Only** option configures Rapid Restore to store backup data on your USB drive. This enables you to recover your primary hard disk from the USB drive service partition. The **USB Drive Only** option is useful in scenarios where there is not enough space on your primary hard disk to store backup data. Instead of creating a standard service partition, the **Backup to USB Drive Only** option creates a thin bootable service partition on the primary hard disk. This thin partition stores all the necessary pre-operating system programs and data files but offloads the storage of backup data to your USB drive. Therefore, the size of the primary hard disk thin service partition is a fraction of the size of a standard service partition.

For additional information regarding this backup configuration option, see "Installing with the Backup to USB Drive Only Configuration" on page 36.

Enabling USB Drive support

The Enable USB Support tool enables you to change your backup configuration from **Backup to Primary Hard Drive Only** to **Backup to USB Drive Only** or **Backup to Both Drives**.

Note: You cannot use this tool if you selected **Backup to USB Drive Only** or **Backup to Both Drives** during the installation of Rapid Restore.

To use the Enable USB Support tool, follow the instructions below:

1. Use the **Start - Programs - IBM Rapid Restore - Enable USB Support** menu sequence.

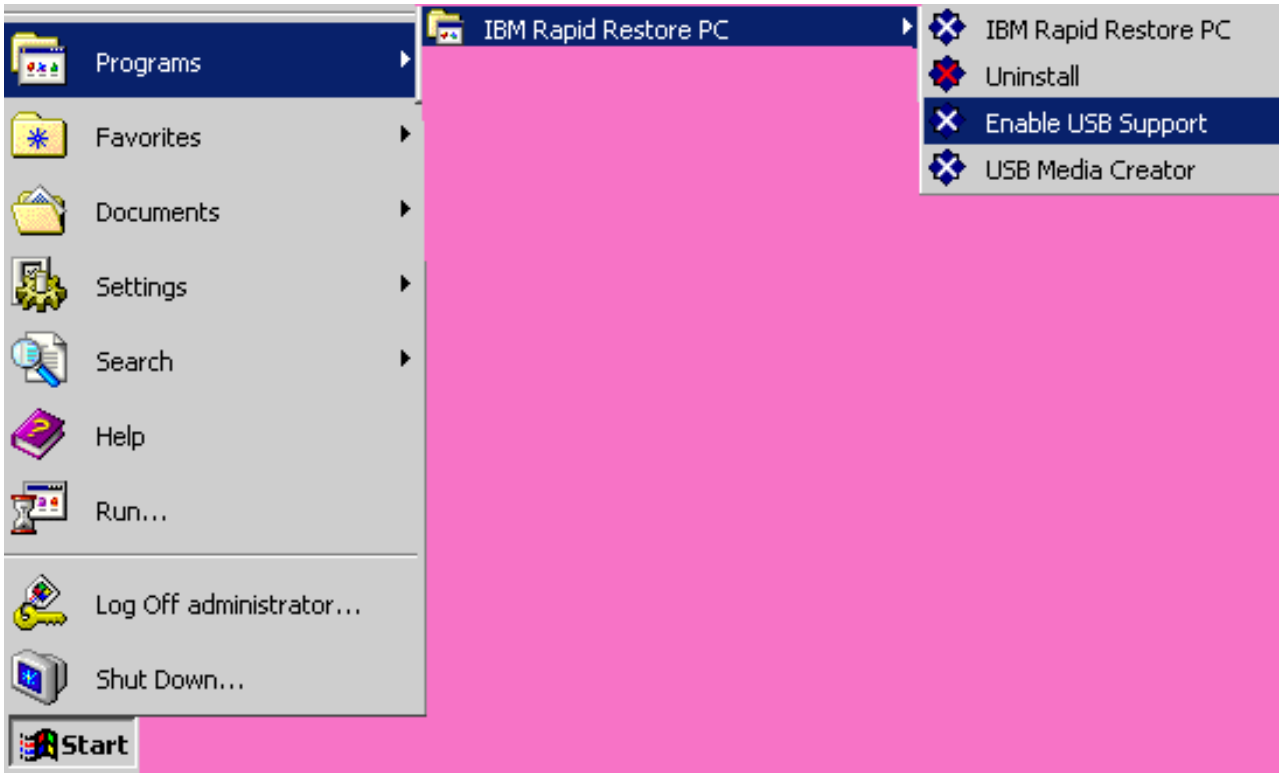


Figure 2. Rapid Restore program group

2. A brief overview of IBM Portable USB 2.0 Hard Drive with Rapid Restore is provided. Read this information and click **Next**.

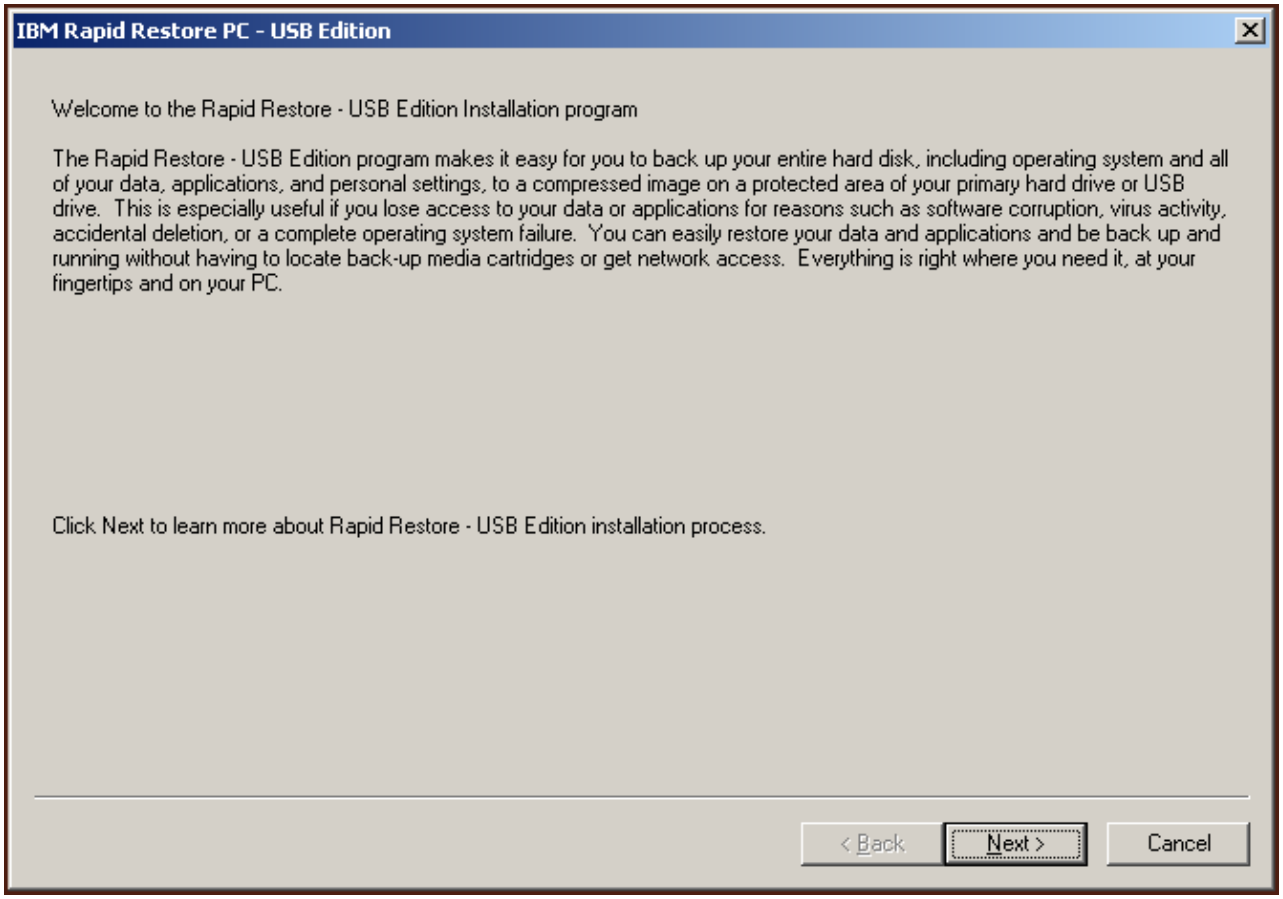


Figure 3. Welcome screen

3. Read the License Agreement and, if you agree to the terms, select **I Agree** and click **Next**.

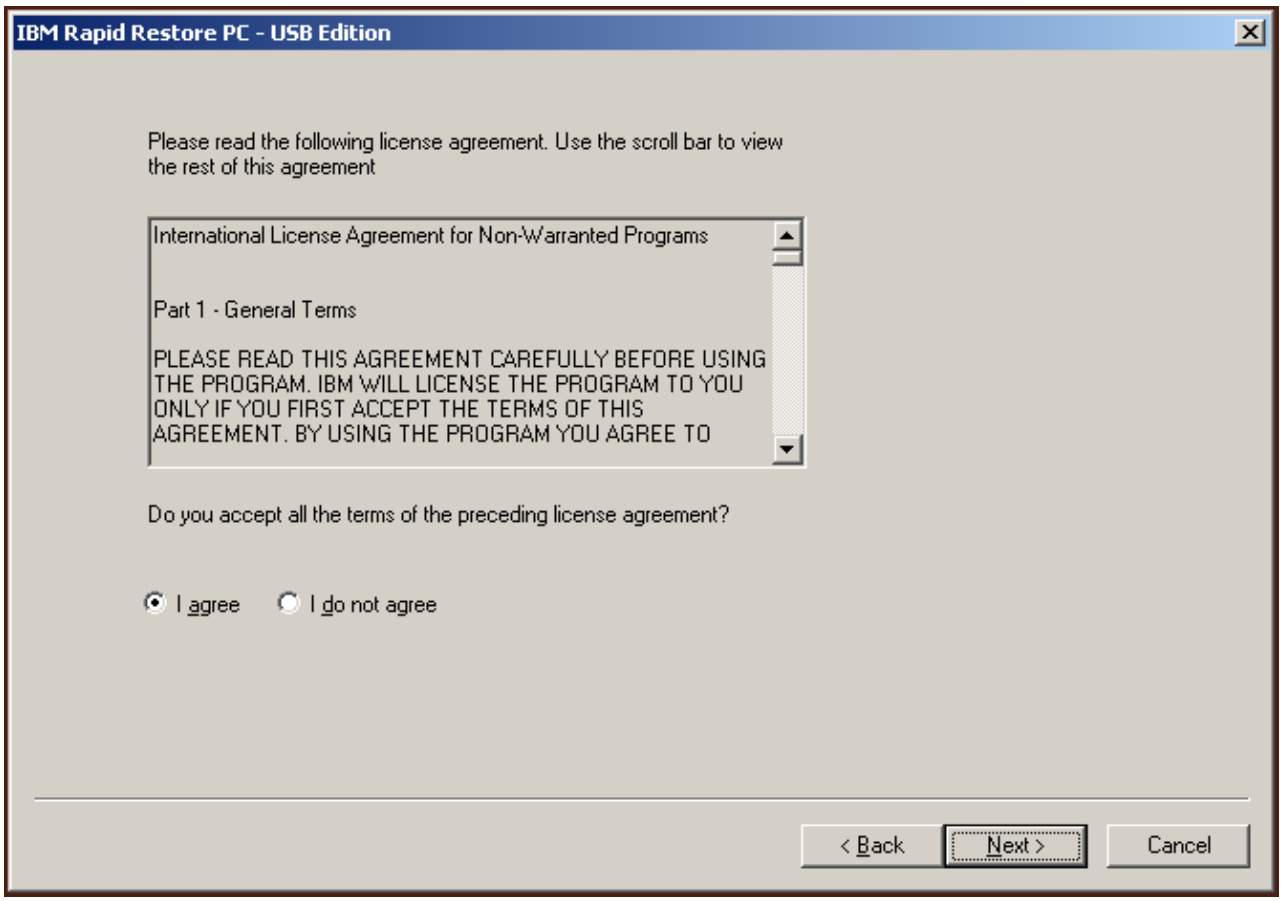


Figure 4. License Agreement screen

4. Continue with Step 6 in "Installing from the IBM Portable USB 2.0 Hard Drive" on page 15.

USB Media Creator

To perform a bare metal restore from your USB drive, Rapid Restore must be able to access your USB drive from a pre-operating system environment.

Note: If your primary hard disk is physically damaged to the point where it no longer functions, you must replace the hard drive prior to performing a bare metal restore from the USB drive.

There are two methods in which you can boot to your USB drive:

- **Boot from USB Drive**
  The service partition created on the USB drive is configured as a bootable partition. However, booting from this partition is possible only if your system BIOS supports booting from a USB drive. Before restoring from the USB drive, you must modify the startup sequence accessible from within your system BIOS configuration interface.
- **Boot from Diskette**
  If you have a diskette drive and would like to create a boot diskette to recover your system from your USB drive, you can use the USB Boot Media Creator to create a bootable diskette. To create a bootable diskette, go to "Creating a USB Drive Boot Diskette" on page 12.

Creating a USB Drive Boot Diskette

You can create a USB drive boot diskette by following the instructions below.

1. Use the **Start - Programs - IBM Rapid Restore - USB Media Creator** menu sequence.

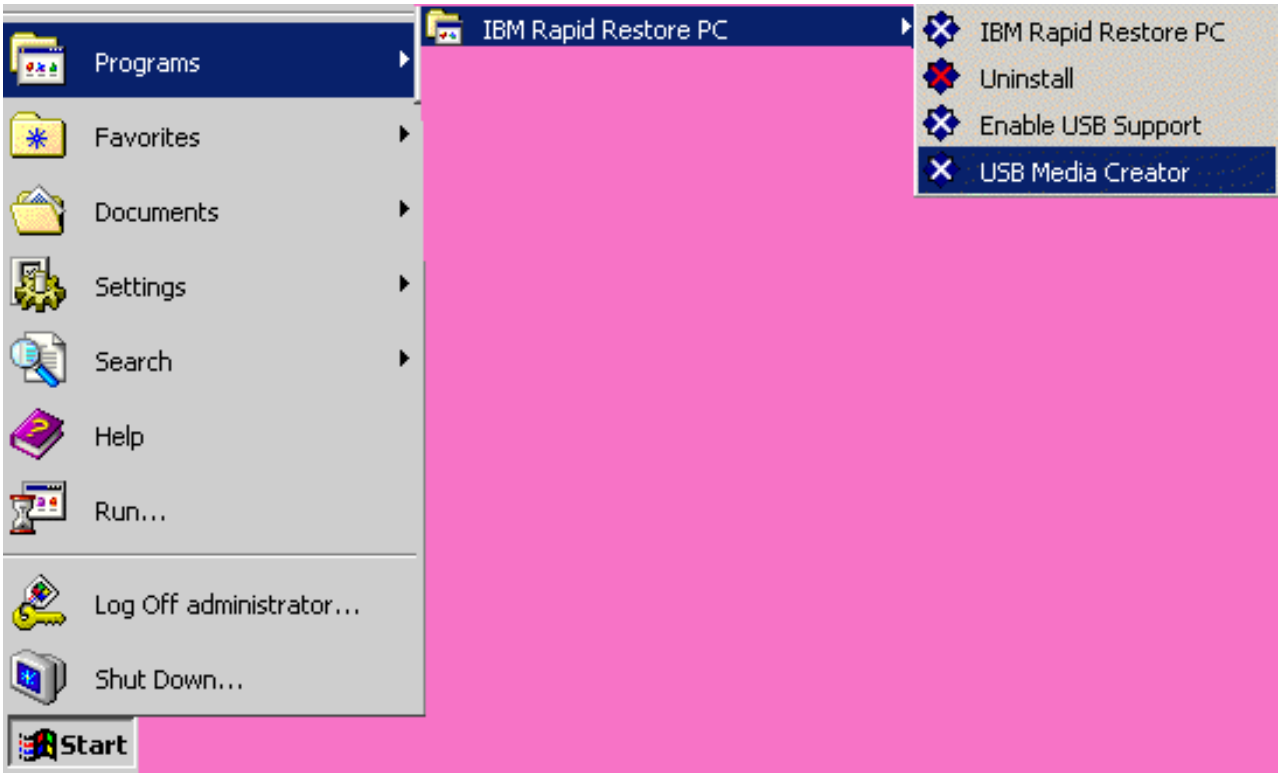


Figure 5. Rapid Restore program group

2. Click the **Boot From Diskette** tab.

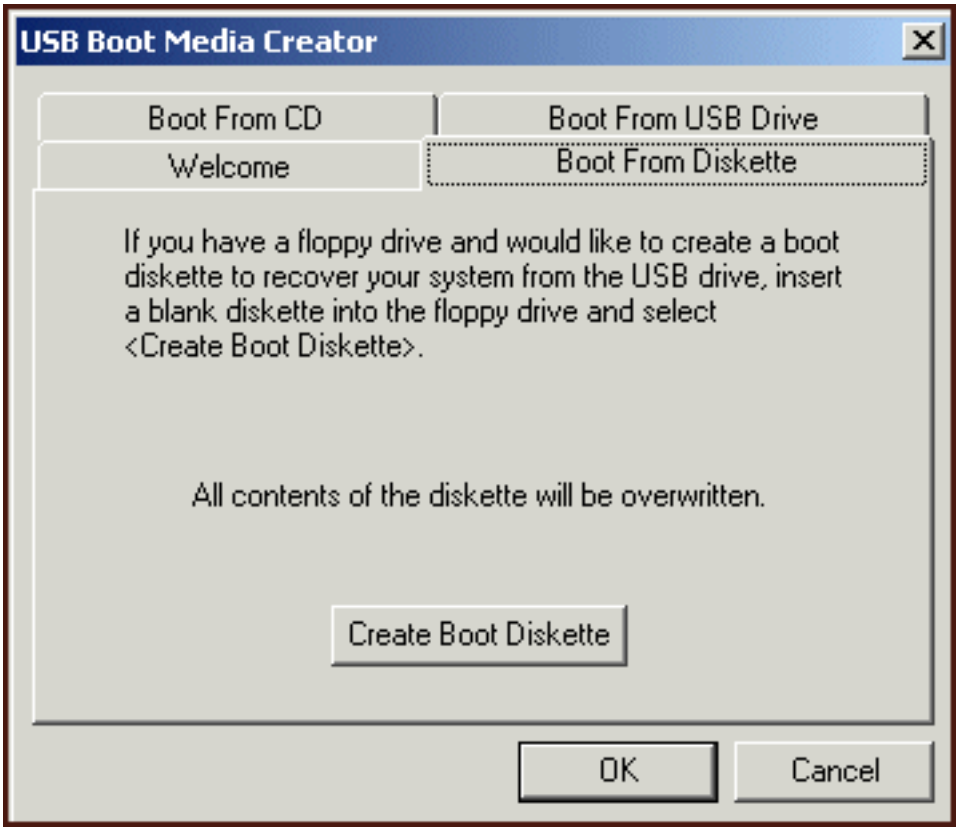


Figure 6. USB Boot Media Creator

3. Insert a blank, formatted diskette into your diskette drive.
4. Click **Create Boot Diskette**.
5. You are informed when the boot diskette is created. Click **OK**.

Figure 7. Successful USB boot diskette message

6. Click **OK** to close the USB Boot Media Creator.

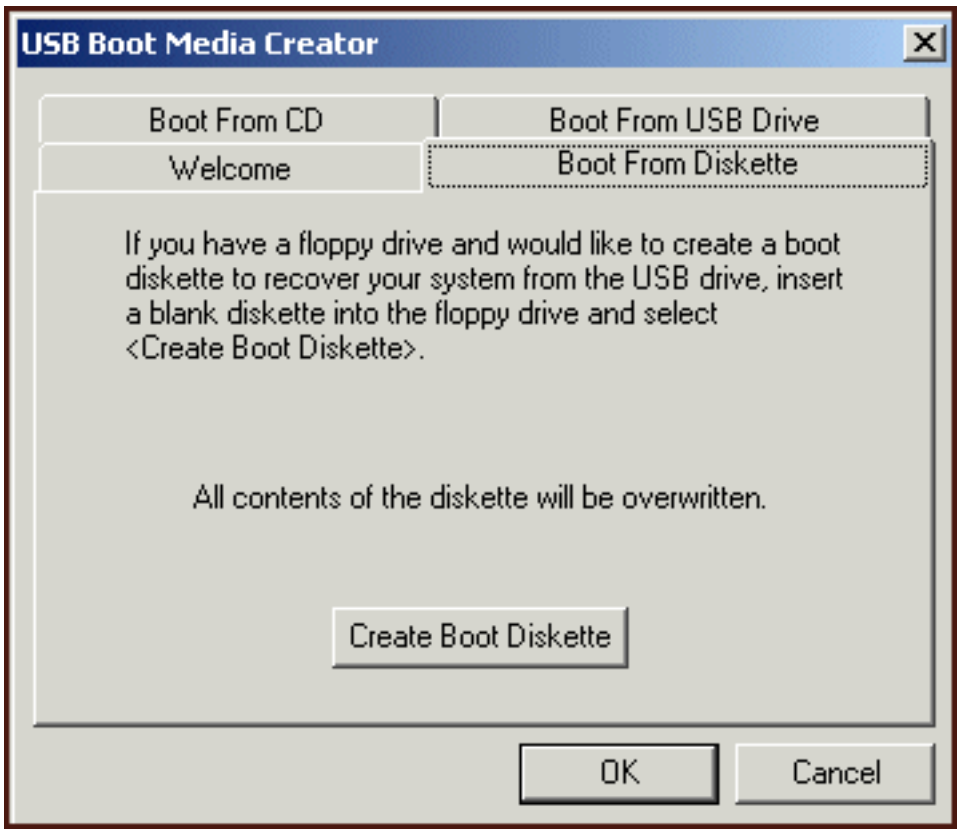


Figure 8. USB Boot Media Creator

Be sure to label the boot diskette for future use and store it in a safe place.

Sharing your USB Drive

Using your USB drive for backup purposes does not preclude you from taking advantage of the portability inherent with your USB drive. Therefore, you can use your USB drive for backup purposes while continuing to share your USB drive with others without the risk of overwriting your backup data or exposing the contents of your backup to other users.

When your USB drive is used as a backup device, it is associated with your computer. This relationship prevents your backup data from being overwritten by a backup generated by another computer using Rapid Restore. Consider the following scenario in which Computer1 with USB Drive1 and Computer2 with USB Drive2 both have Rapid Restore installed. USB Drive1 is attached to Computer2 so that some documents can be copied from the USB drive to the computer. While the USB drive is attached, a scheduled backup on Computer2 is initiated. Rapid Restore detects the USB drive is not Computer2's associated USB drive and informs the user that the attached USB drive is not associated with the computer to which it is attached and therefore, backups will not be performed to this USB drive.

A similar process is implemented for restore functionality. The only exception to this rule is when performing a bare metal restore. Therefore, if your computer is lost or stolen, you can use the USB drive with a new machine to restore your system using Rapid Restore's bare metal restore functionality.

Chapter 4. Installing Rapid Restore

Overview

This chapter contains installation instructions for installing IBM Portable USB 2.0 Hard Drive with Rapid Restore. There are three ways to install Rapid Restore: from the Web, the *User's Guide and Software CD*, and the IBM Portable USB 2.0 Hard Drive.

Installing from the Web

If you purchased an IBM computer manufactured after 10/1999, you are entitled to download and install Rapid Restore from the IBM web site. To download and install Rapid Restore from the IBM web site, you must first download the installation package and then execute the installation program.

To install Rapid Restore from the Web, complete the following procedure:

1. Use your browser and navigate to http://www.ibm.com.
2. Use the IBM web search tool to search for "Rapid Restore PC." Select the link corresponding to the IBM Rapid Restore PC download page.
3. Download the appropriate readme file (for example, rrpc25us.txt) and save it to your desktop. Read this documentation prior to installing Rapid Restore as it contains important late-breaking installation and product information.
4. Download the appropriate installation file (for example, rrpc25us.exe) and save it to your desktop.
5. Launch the rrpc25us.exe file.
6. Continue with Step 5 on page 16.

Installing from the CD

To install Rapid Restore from the *User's Guide and Software CD*, complete the following procedure:

1. Insert the *User's Guide and Software CD* into the CD or DVD drive.
2. If the CD does not start automatically, click **Start**, and then click **Run**.
3. Type e:\engage.bat where e is the drive letter of the CD or DVD drive.
4. Click **OK**. The CD browser window opens.
5. Launch the Rapid Restore Installation program.
6. Continue with Step 5 on page 16.

Installing from the IBM Portable USB 2.0 Hard Drive

The IBM Portable USB 2.0 Hard Drive with Rapid Restore is a solution that consists of an IBM USB 2.0 hard drive and a special edition of Rapid Restore that supports USB technology.

The following instructions assume you are installing Rapid Restore on a primary hard disk with an existing IBM service partition. If your primary hard disk does not contain a service partition, one is created during the Rapid Restore installation. If you are prompted to create a service partition during the installation process, simply follow the onscreen instructions.

© Copyright IBM Corp. 2002

To install Rapid Restore from the IBM Portable USB 2.0 Hard Drive, complete the following procedure:

Important
You must attach your USB drive to your computer prior to installing Rapid Restore.

1. Close all open applications and disable any virus detection programs.
2. Plug the drive into an available USB port.
3. Turn the power switch to the on (|) position. Windows will self-install the device driver.
4. In My Computer, double-click the drive letter that corresponds to the USB 2.0 Hard Drive. The HTML interface will launch automatically.
5. A brief overview of IBM Portable USB 2.0 Hard Drive with Rapid Restore is provided. Read this information and click the Next button.

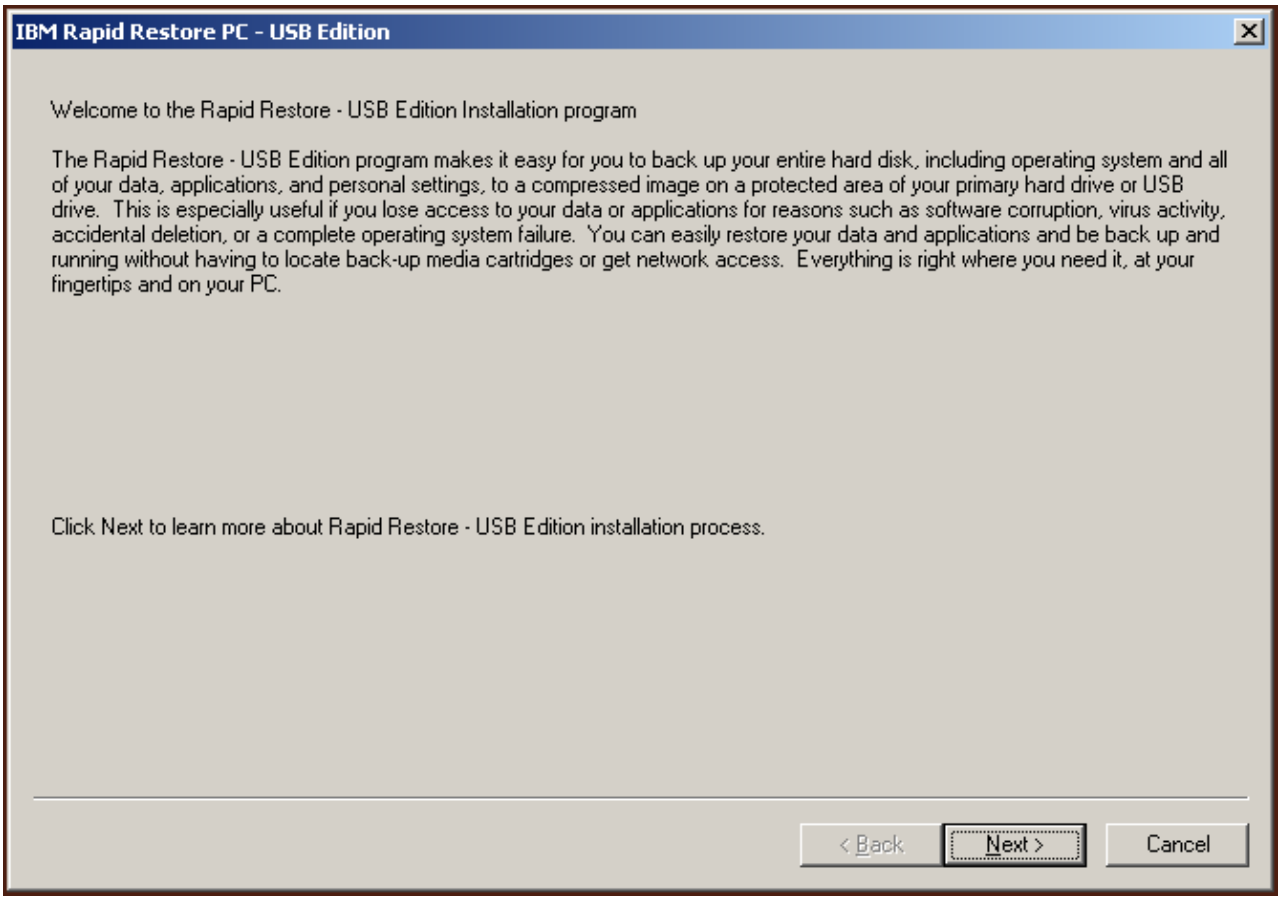


Figure 9. Welcome screen

6. Additional product information is provided. Read this information and click the Next button.

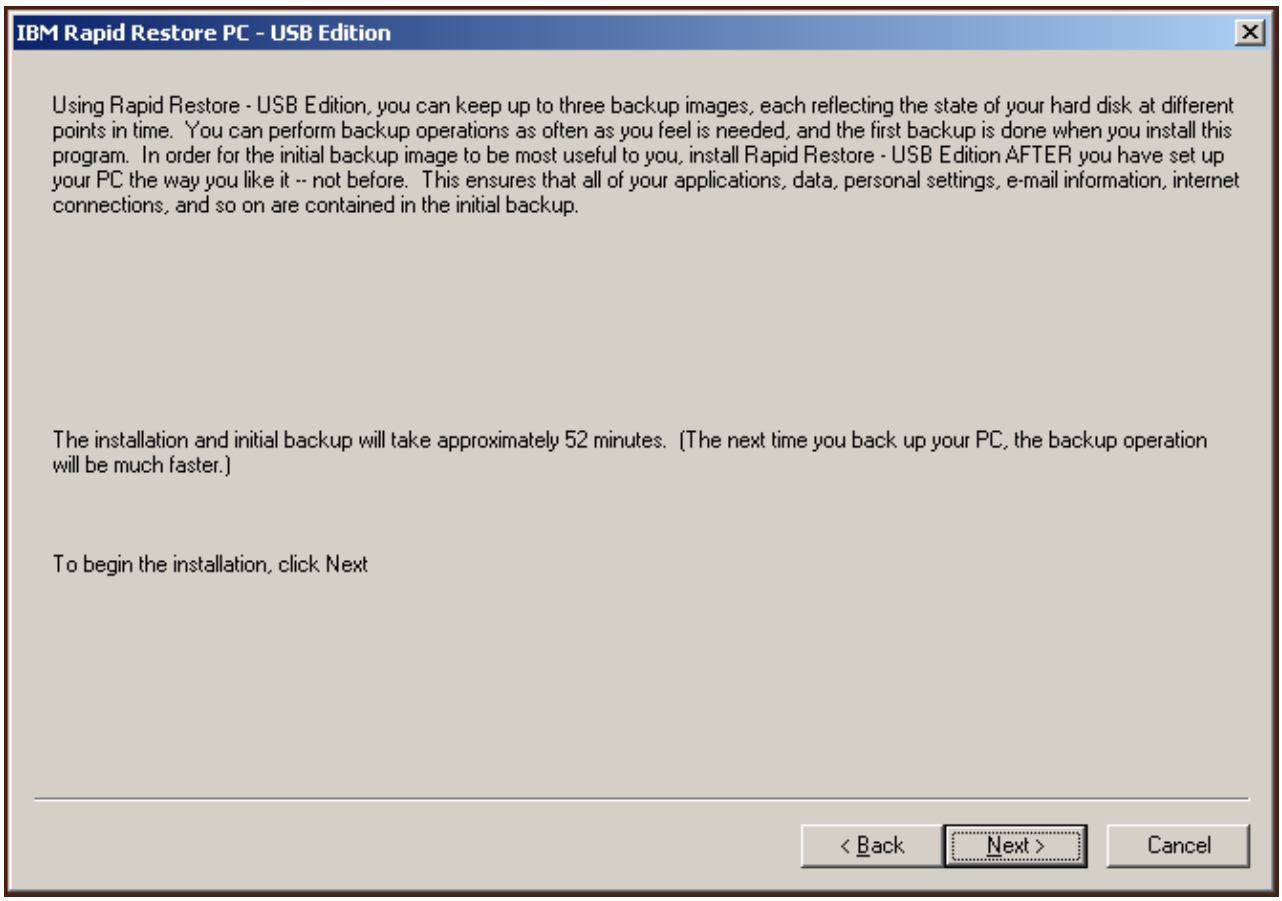


Figure 10. Backup information screen

7. Read the License Agreement and, if you agree to the terms, select the I Agree option and click the Next button.

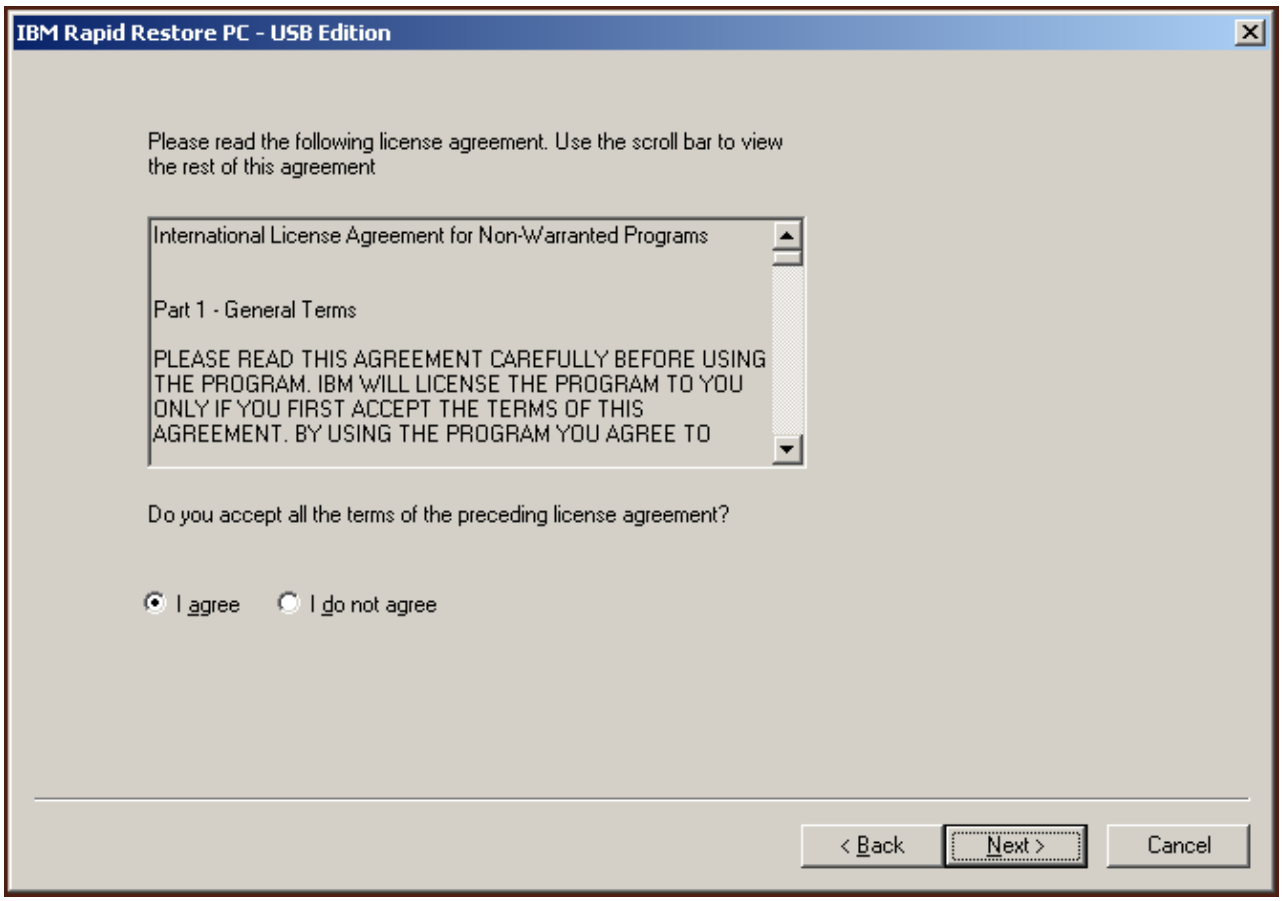


Figure 11. License Agreement screen

8. The next screen allows you to determine the manner in which Rapid Restore protects your hard disk. Each backup option is described briefly below.

   a. **Backup to Primary Hard Drive Only**

      The "Backup to Primary Hard Drive Only" option configures Rapid Restore to store backup data on your primary hard drive. This enables the recovery of the primary hard disk from its own service partition. While this configuration does not include using your USB drive, you can reconfigure your backup strategy using the "Backup to Both Drives" or "Backup to USB Drive Only" option at a later time. To select this backup configuration, select the "Backup to Primary Hard Drive Only" option, click the **Next** button and continue with the instructions included in "Installing with the Backup to Primary Hard Drive Only Configuration" on page 19.

   b. **Backup to Both Drives**

      The "Backup to Both Drives" option configures Rapid Restore to store backup data on your primary hard disk as well as your USB drive. This enables the recovery of the primary hard disk from its own service partition as well as the USB drive's service partition. In addition, Rapid Restore ensures the backup data on the USB drive remains up to date by copying the primary hard disk's service partition to your USB drive each time a backup is generated. In the event your USB drive is not attached to the host machine at the time a backup is initiated, it is automatically synchronized the next time the USB drive is attached.

      There are several reasons you may want to incorporate two storage devices in your backup strategy. One reason for doing so is the added protection

included with a redundant backup strategy. Therefore, if one of your backup devices is not available (e.g., broken, stolen, etc.), you can still restore from the other storage device. For example, in the event your primary hard disk is physically damaged, you can attach a new primary hard disk and restore your system directly from your USB drive. Or, in the event that your USB drive is misplaced or stolen, you can restore directly from your primary hard disk.

To select this backup configuration, continue with the instructions included in "Installing with the Backup to Both Drives Configuration" on page 27.

c. **Backup to USB Drive Only**

Selecting the "Backup to USB Drive Only" option configures Rapid Restore to store backup data on your USB drive and enables you to recover your primary hard disk from the USB drive. The "USB Drive Only" option is useful in scenarios where there is not enough space on your primary hard disk to store backup data. Instead of creating a standard service partition on the primary hard disk, the "Backup to USB Drive Only" option creates a thin bootable service partition. This thin partition stores all the necessary pre-operating system programs and data files but off-loads the storage of backup data to your USB drive. Therefore, the size of the primary hard disk's thin service partition is a fraction of the size of a standard service partition.

To select this backup configuration, continue with the instructions included in "Installing with the Backup to USB Drive Only Configuration" on page 36.

Note: These instructions assume you are performing a fresh installation of Rapid Restore. If you are performing an upgrade (Rapid Restore Version 2.04—Builds 6224.2 and above), the onscreen instructions may differ slightly.

Installing with the Backup to Primary Hard Drive Only Configuration

After completing the instructions in "Installing from the IBM Portable USB 2.0 Hard Drive" on page 15, follow the instructions below to complete the installation of Rapid Restore PC with the "Backup to Primary Hard Drive Only" configuration.

1. Select the **Backup to Primary Hard Drive Only** option and click the **Next** button.

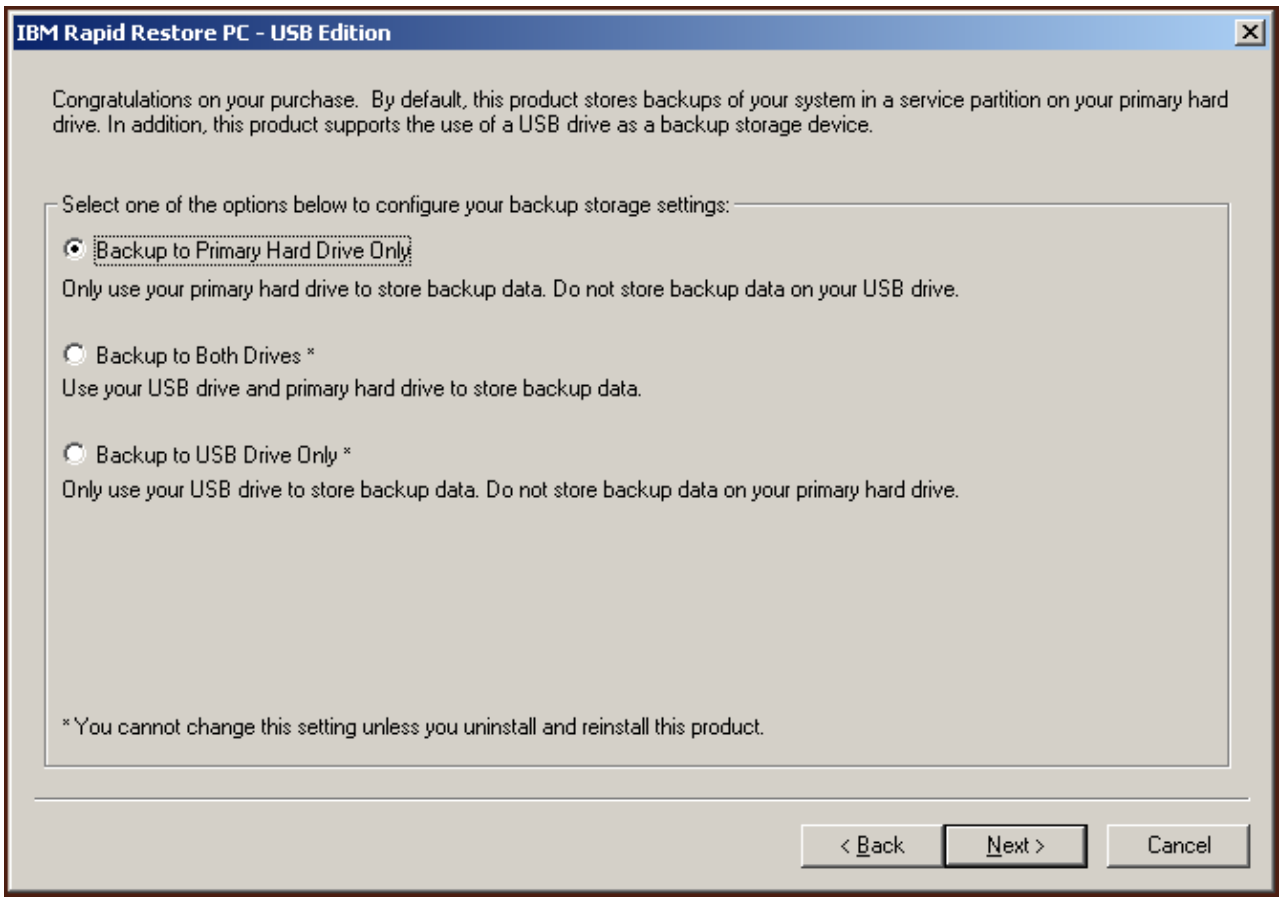


Figure 12. Backup configuration screen

2. The next screen allows you to determine the manner in which IBM Rapid Restore PC protects your hard disk. IBM Rapid Restore PC provides two backup options, each described in detail below.

   a. **Ongoing protection**

      The "Ongoing protection" option creates a sector-based backup reflecting the state of your hard disk at the time Rapid Restore is installed. In addition, this option allows you to create additional file-based backups as the state of your hard disk changes. The result is a flexible backup strategy that supports multiple restore points, each reflecting the state of your hard disk at a specific point in time.

      When selecting the "Ongoing protection" option, you must specify the amount of space you want to allocate for backup storage. If, in the future, Rapid Restore requires additional backup storage space, it will resize its service partition to accommodate the additional backup data. After making your selections, click the **Next** button.

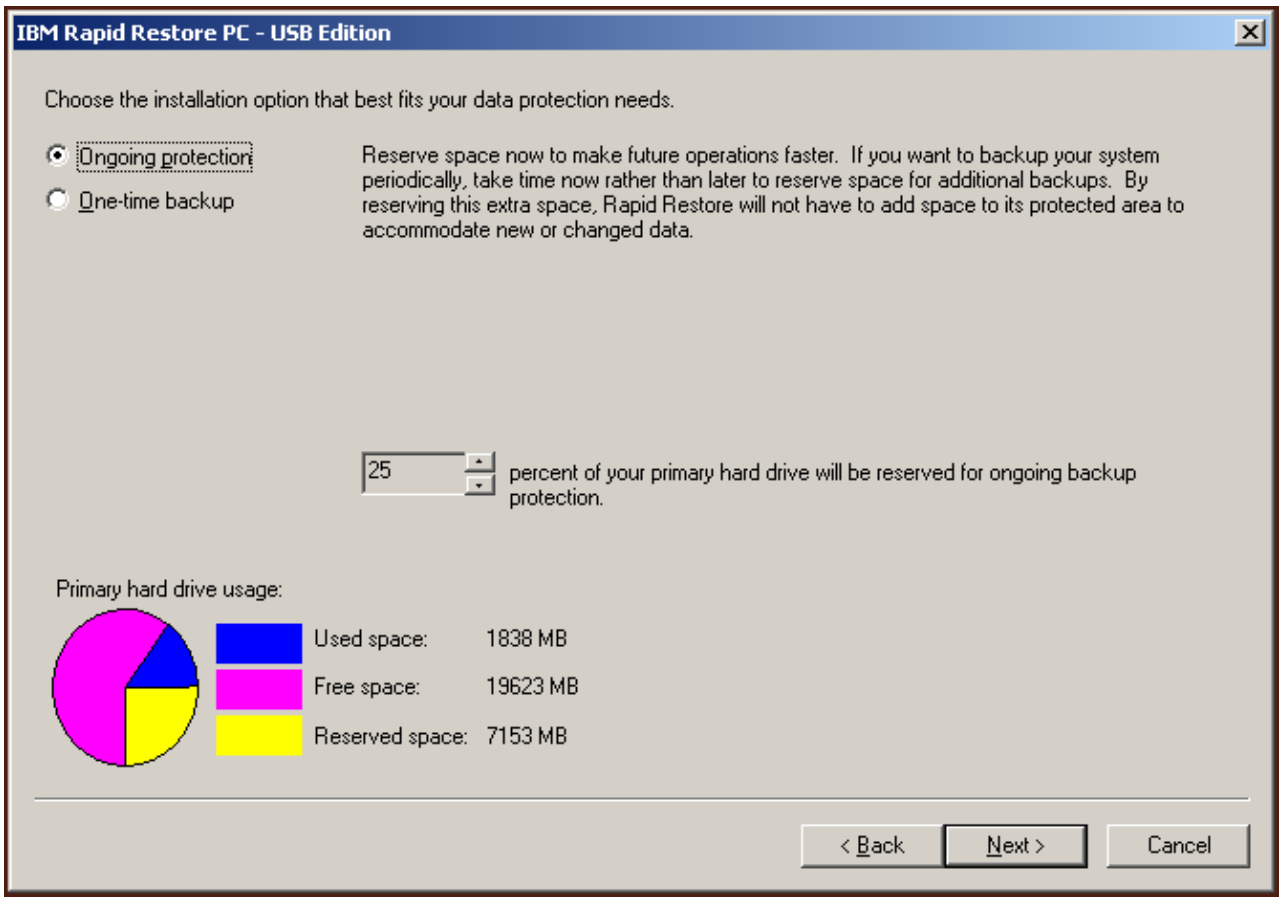


Figure 13. Backup configuration screen

b. **One-time protection**

The "One-time protection" option creates a sector-based backup reflecting the state of your hard disk at the time Rapid Restore is installed. This options does not allow you to create additional file-based backups as the state of your hard disk changes. The result is a backup strategy that supports a single restore point.

When selecting the "One-time protection" option, Rapid Restore determines the amount of hard disk space required to store the backup. After making your selection, click the **Next** button.

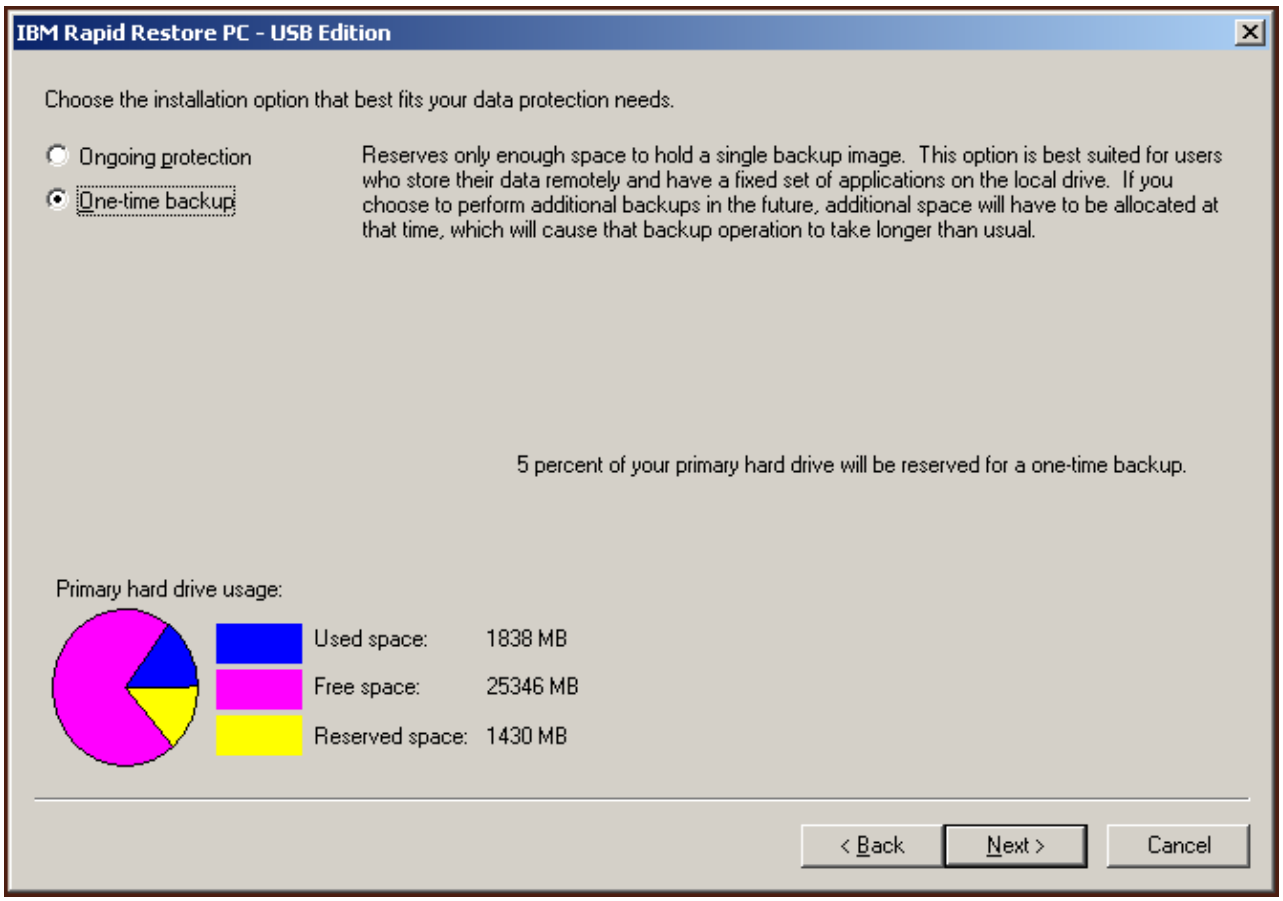


Figure 14. Backup configuration screen

3. Click the **Next** button.

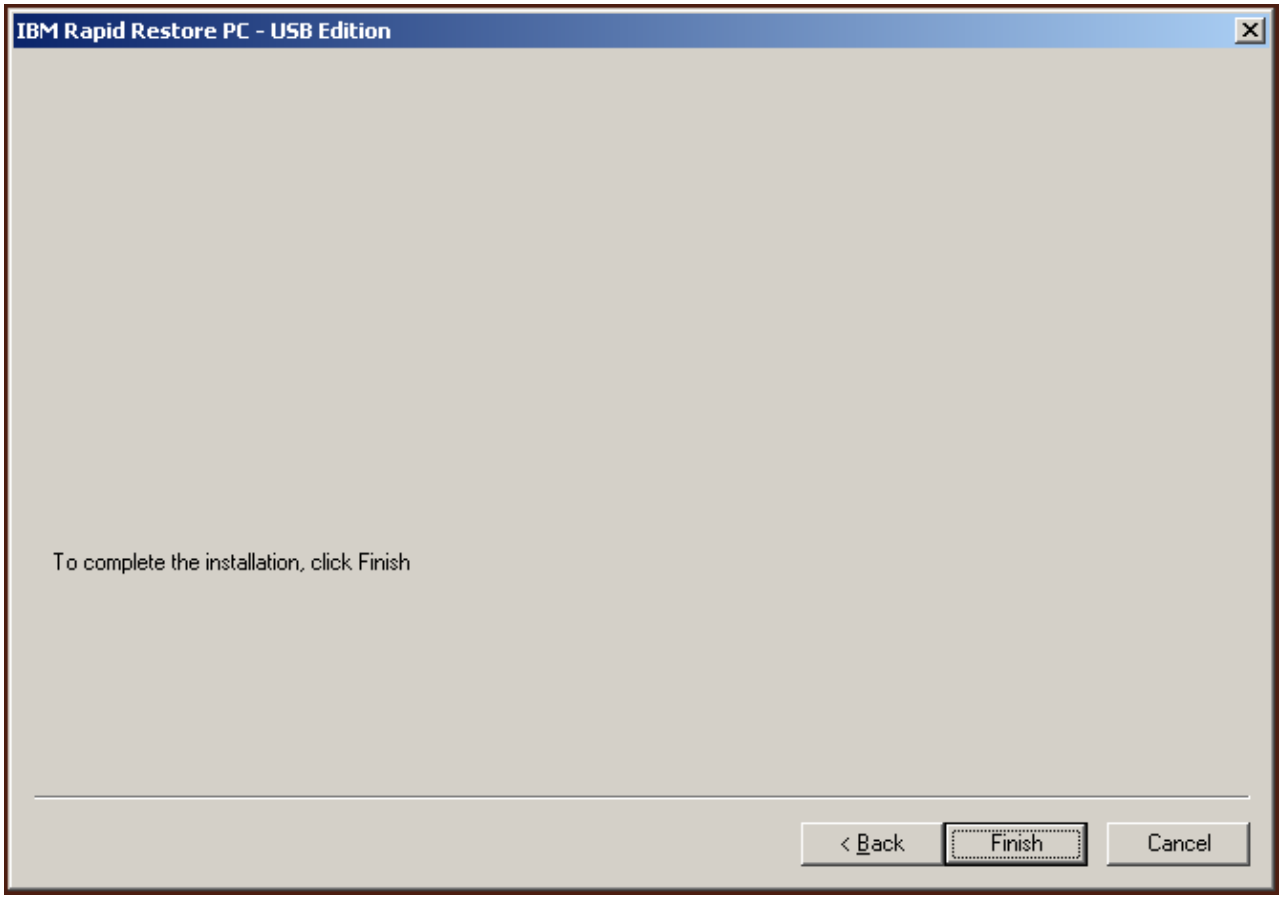


Figure 15. Finish installation screen

4. You are informed the program was properly installed on your machine. Click the **OK** button to create your initial backup image.

   Note: Although Rapid Restore is installed on your computer, a base backup is still required before you can perform a restore (or additional backups).

> **Important**
> The installation and initial backup will take approximately 52 minutes. (The next time you back up your PC, the backup operation will be much faster.)

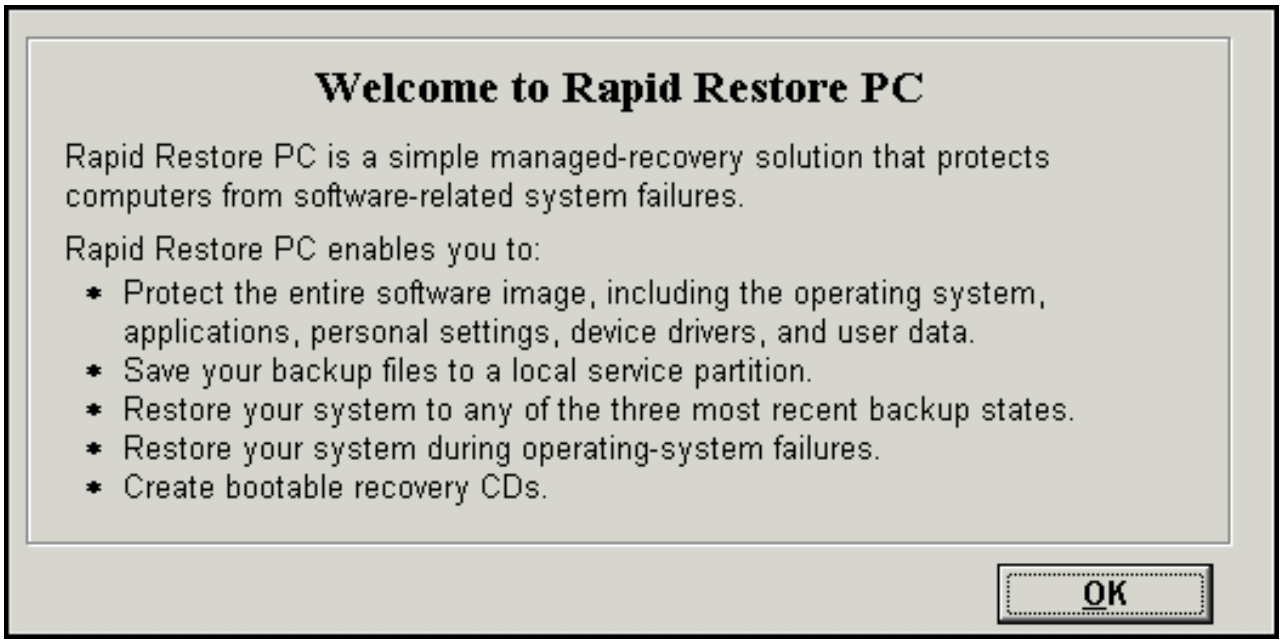


Figure 16. Welcome screen

5. You are prompted to restart your machine to unhide your service partition. Click the **OK** button.

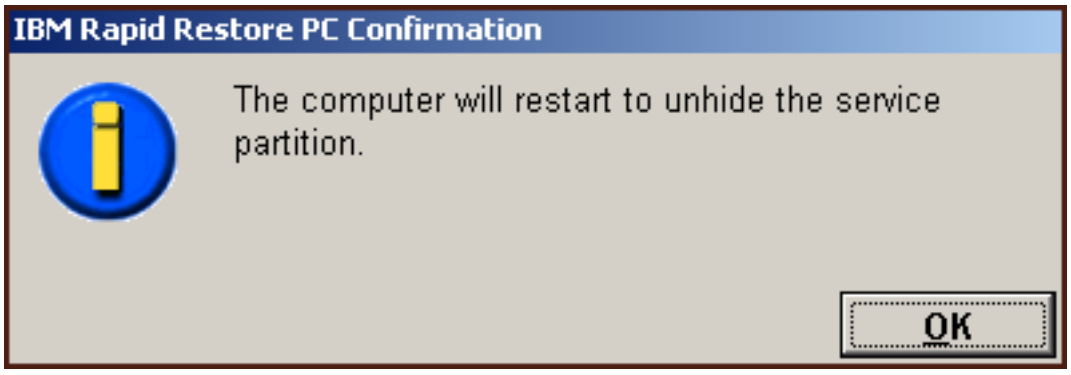


Figure 17. Unhide service partition message

6. Click the **OK** button.

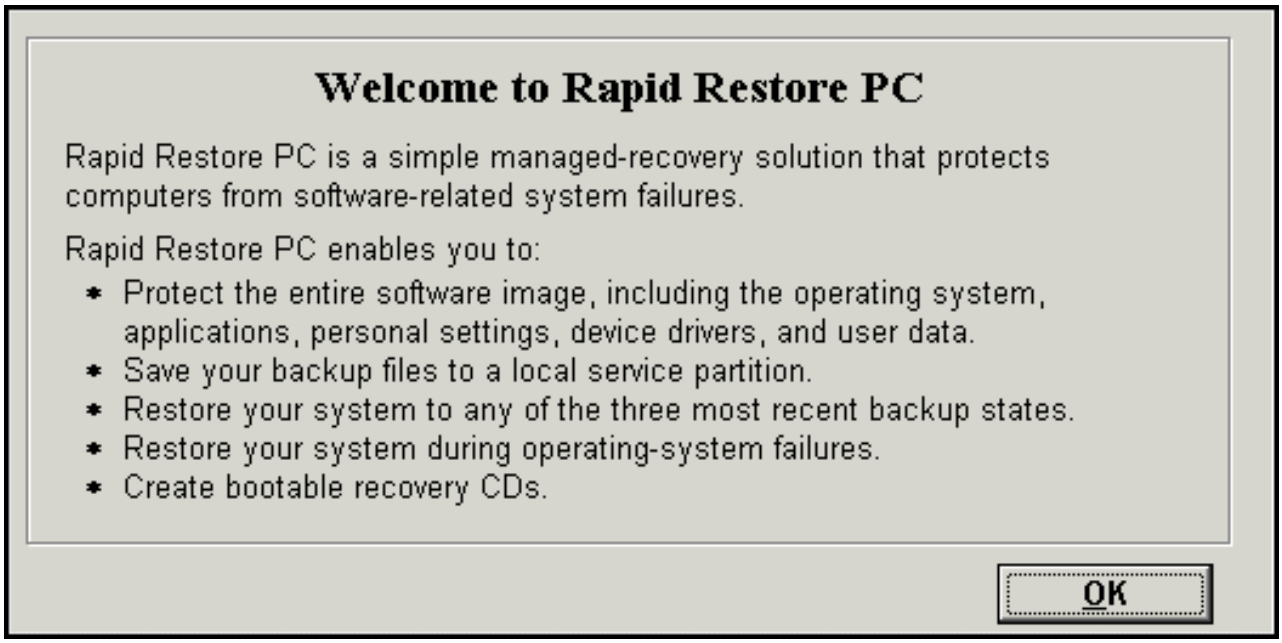


Figure 18. Welcome screen

7. You are prompted to restart your machine to recreate your service partition. Click the **OK** button.

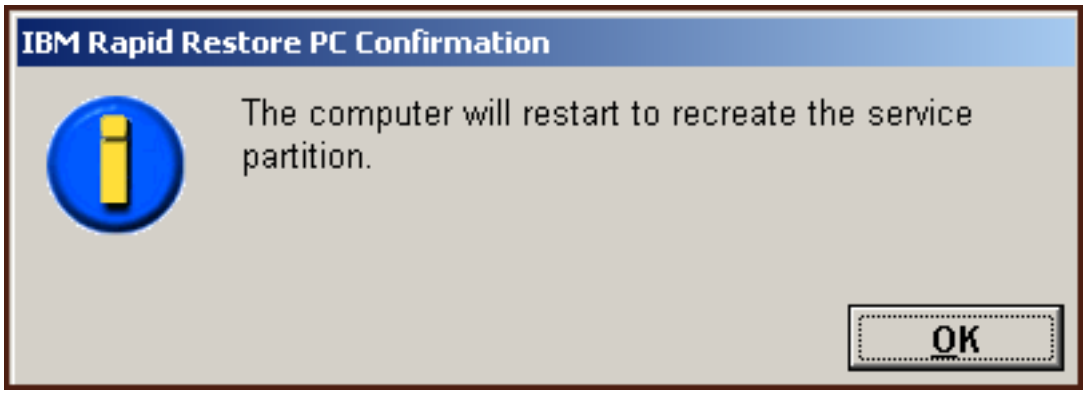


Figure 19. Recreate service partition message

8. The computer shuts down and restarts. Upon restarting, IBM Rapid Restore PC prepares the service partition for the storage of backup data. This process may include analyzing and resizing the service partition, depending on the configuration option selected in Step 2 as well as state of the service partition prior to the installation.

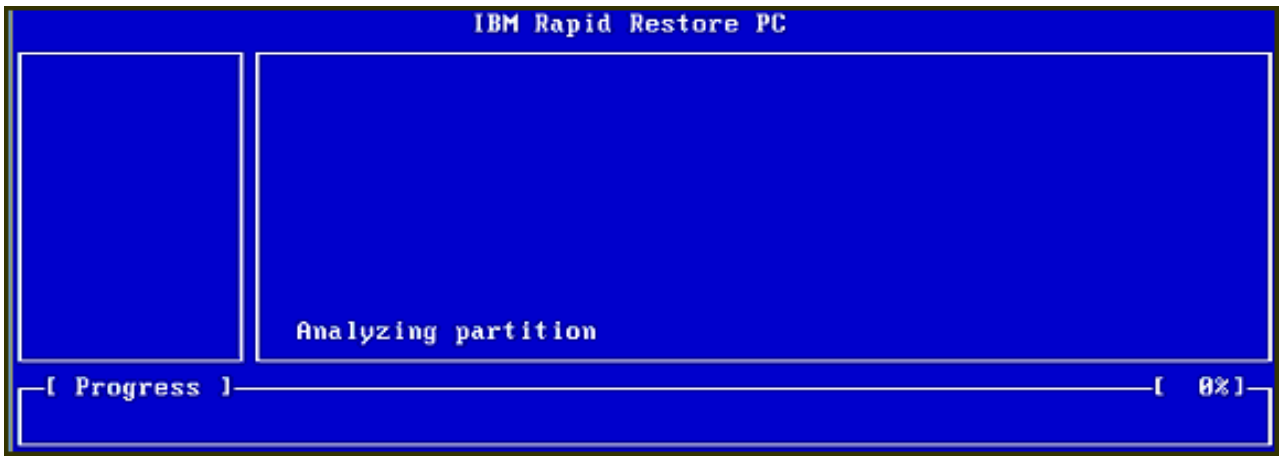


Figure 20. Preparation of service partition screens

9. Upon completing the preparation of the service partition, the sector-based backup is created.

Figure 21. Create backup screen

10. Upon rebooting, the backup database is created.

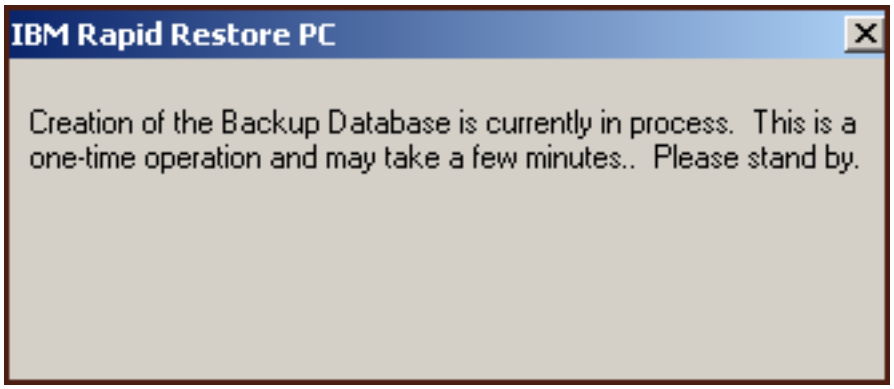


Figure 22. Create backup database screen

11. You are informed when the installation process is complete. Click the **OK** button.

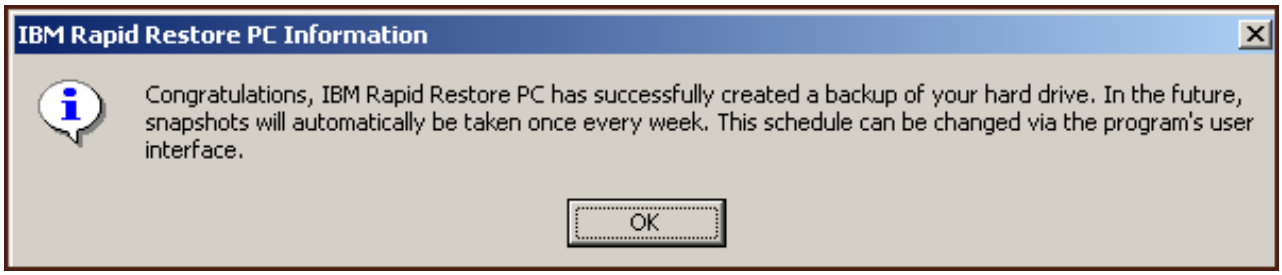


Figure 23. Successful hard disk backup message

Congratulations! You just completed installing Rapid Restore.

By default, Rapid Restore is configured to perform automated backups once a week. You can customize your backup configuration through Rapid Restore's main console. For more information, see "Scheduling automated backups" on page 58.

Installing with the Backup to Both Drives Configuration

The method in which the "Backup to Both Drives" option is installed depends on the current state of your primary hard disk. Each scenario is described below.

- **Upgrading from Rapid Restore Version 2.04—Builds 6224.2 and above**
  The installation preserves the existing service partition and configuration settings, creates a service partition at the end of the USB drive, and copies the primary hard disk's backup data to the USB drive's service partition. All future backups are created in the primary hard disk's service partition and then copied to the USB drive's service partition.
- **IBM service partition is detected on the primary hard disk but no backup data exists**
  The installation modifies the existing service partition to support the storage of backup data and a exact replica of the primary hard disk's service partition is copied to the USB drive's service partition. This process includes all service partition files and backup data as well as any additional data in the primary hard disk's service partition (e.g., IBM Recovery, ImageUltra, etc.).
- **No service partition is detected on the primary hard disk**
  A new service partition is created on the primary hard disk and copied to the USB drive.

After completing the instructions in “Installing from the IBM Portable USB 2.0 Hard Drive” on page 15, follow the instructions below to complete the installation of Rapid Restore PC with the “Backup to Both Drives” configuration.

1. Select the **Backup to Both Drives** option and click the **Next** button.

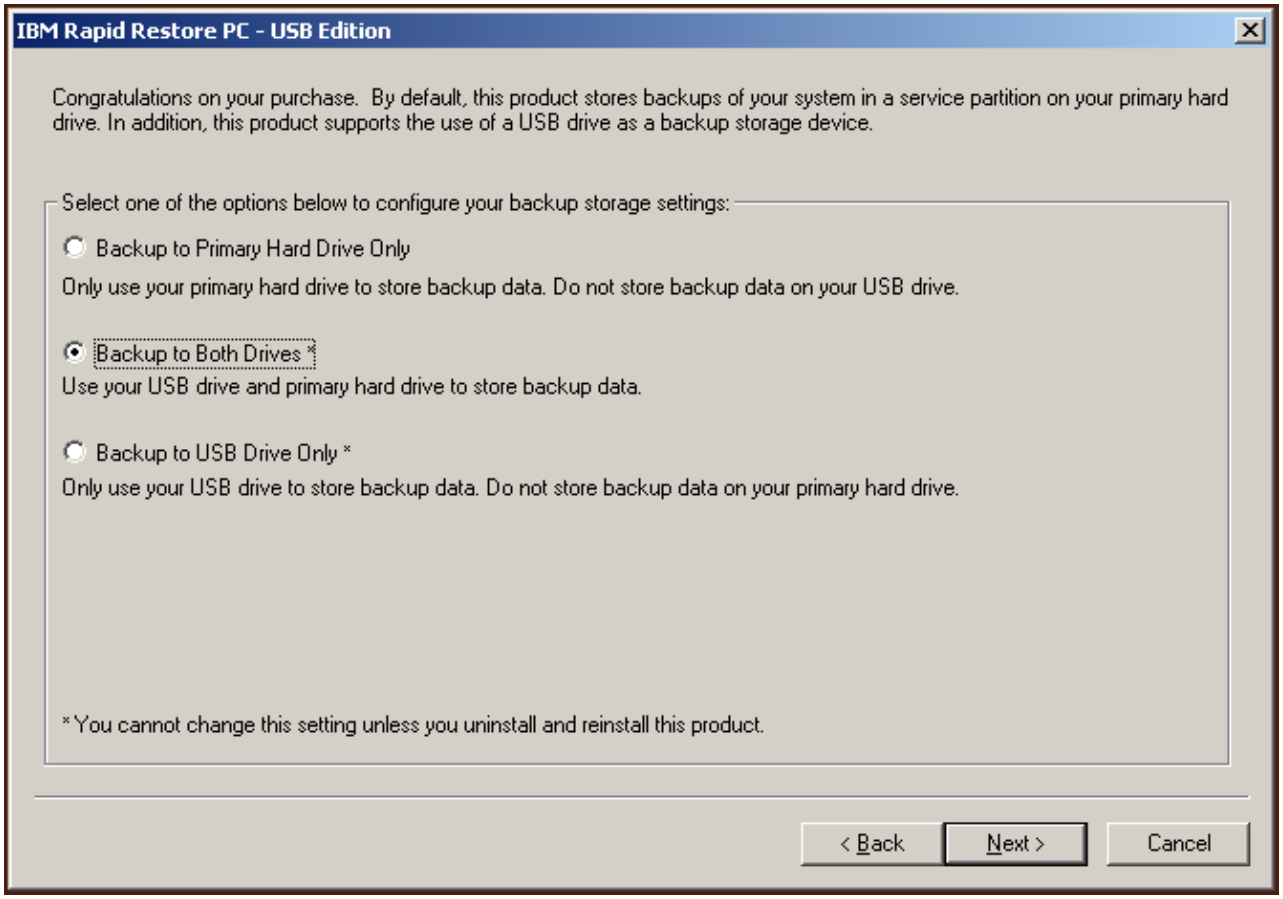


Figure 24. Backup configuration screen

2. If the installation detects one or more partitions already exist on your USB drive, you can configure your USB drive for “mixed mode.” Mixed mode is a feature that allows your USB drive to store primary hard disk backup data while simultaneously supporting up to three additional partitions. These additional partitions can be used for standard hard drive storage purposes (e.g., documents, programs, etc.) allowing you to maximize the use of your USB drive. Or, you can choose to remove the existing partitions and dedicate the USB drive as a backup storage device.
   Select a USB drive configuration that meets your backup needs and click the **Next** button.

   If your USB drive does not have an existing partition, you can skip this step and continue with Step 4.

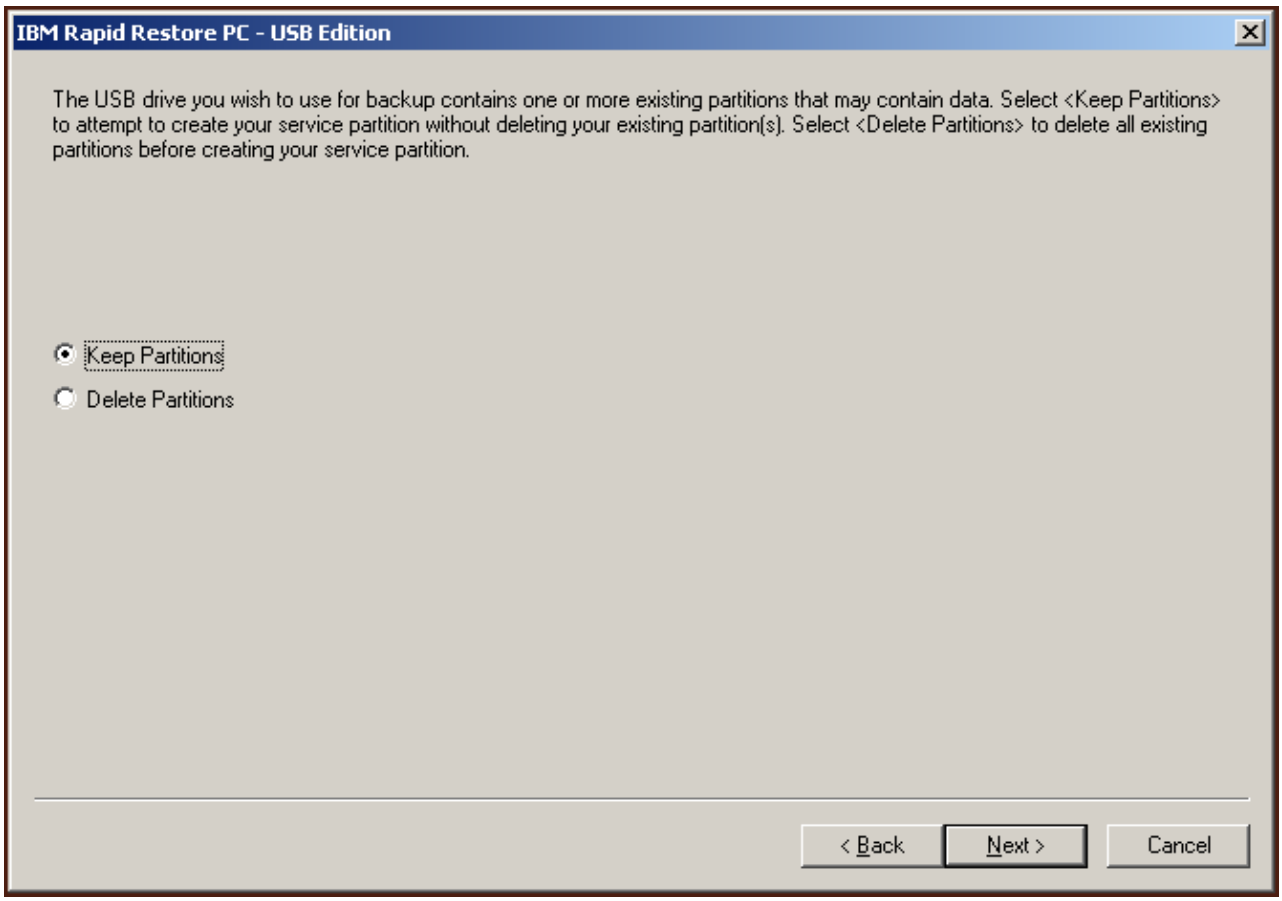


Figure 25. Partition detected on USB drive screen

3. You are informed that free space from the end of the last partition on the USB drive will be used to create a service partition. This process does not destroy exiting data residing on your USB drive. Click the **OK** button to continue.

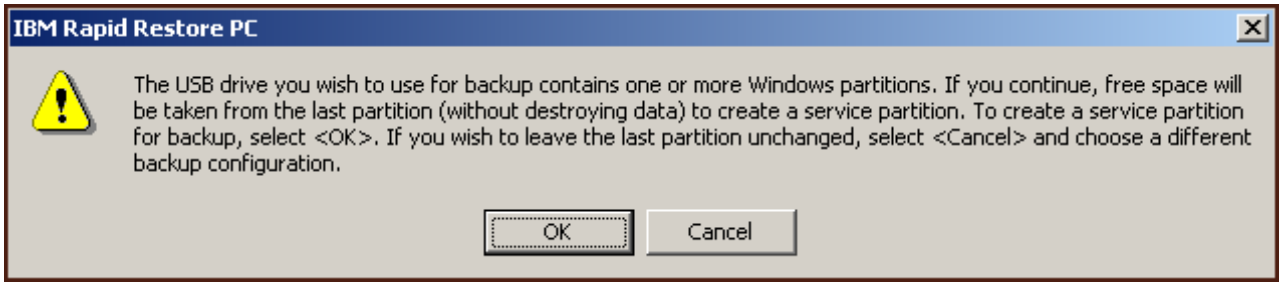


Figure 26. Create partition on USB drive message

4. The next screen allows you to determine the manner in which IBM Rapid Restore PC protects your hard disk. IBM Rapid Restore PC provides two backup options, each described in detail below.
   a. **Ongoing protection**
      The "Ongoing protection" option creates a sector-based backup reflecting the state of your hard disk at the time Rapid Restore is installed. This backup is stored in the service partition of the primary hard disk and a copy of the backup is stored in the service partition of the USB drive. In addition, this option allows you to create additional file-based backups

reflecting the state of your hard disk at specific points in time and store these backups in the service partition of the primary and USB drives. The result is a flexible backup strategy that supports multiple redundant restore points, each reflecting the state of your hard disk at a specific point in time.

When selecting the "Ongoing protection" option, you must specify the amount of space you want to allocate for backup storage on your primary hard disk. If, in the future, Rapid Restore requires additional backup storage space on the primary hard disk, it will resize its service partition to accommodate the additional backup data.

Important

Rapid Restore will not resize a service partition residing on a USB drive.

After making your selections, click the **Next** button.

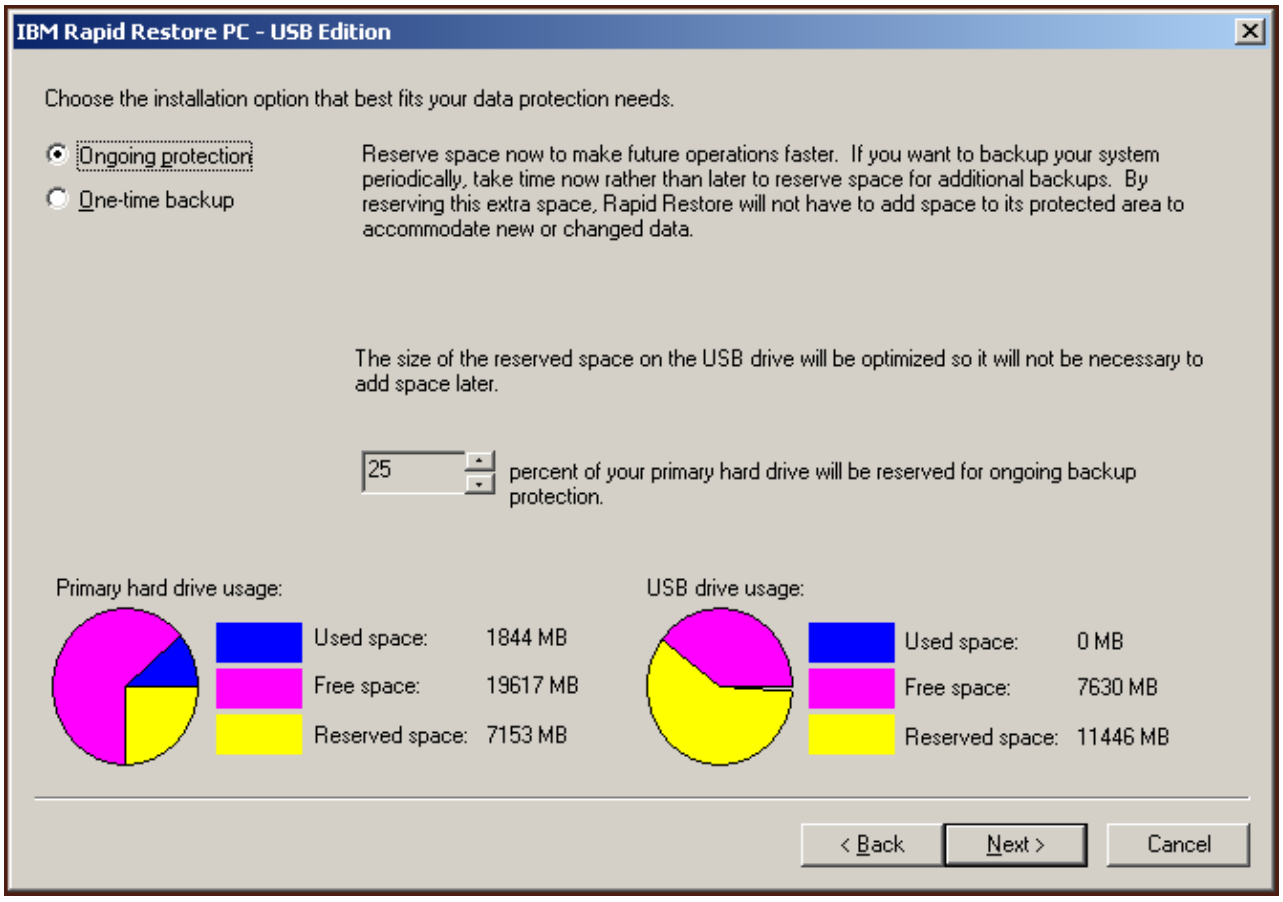


Figure 27. Backup configuration screen

b. **One-time protection**
The "One-time protection" option creates a sector-based backup reflecting the state of your hard disk at the time Rapid Restore is installed. This backup is stored in the service partition of the primary hard disk and a copy of the backup is stored in the service partition of the USB drive. This options does not allow you to create additional file-based backups as the

state of your hard disk changes. The result is a backup strategy that supports backup data redundancy for a single restore point.

When selecting the "One-time protection" option, Rapid Restore determines the amount of hard disk space required to store the backup. After making your selection, click the **Next** button.

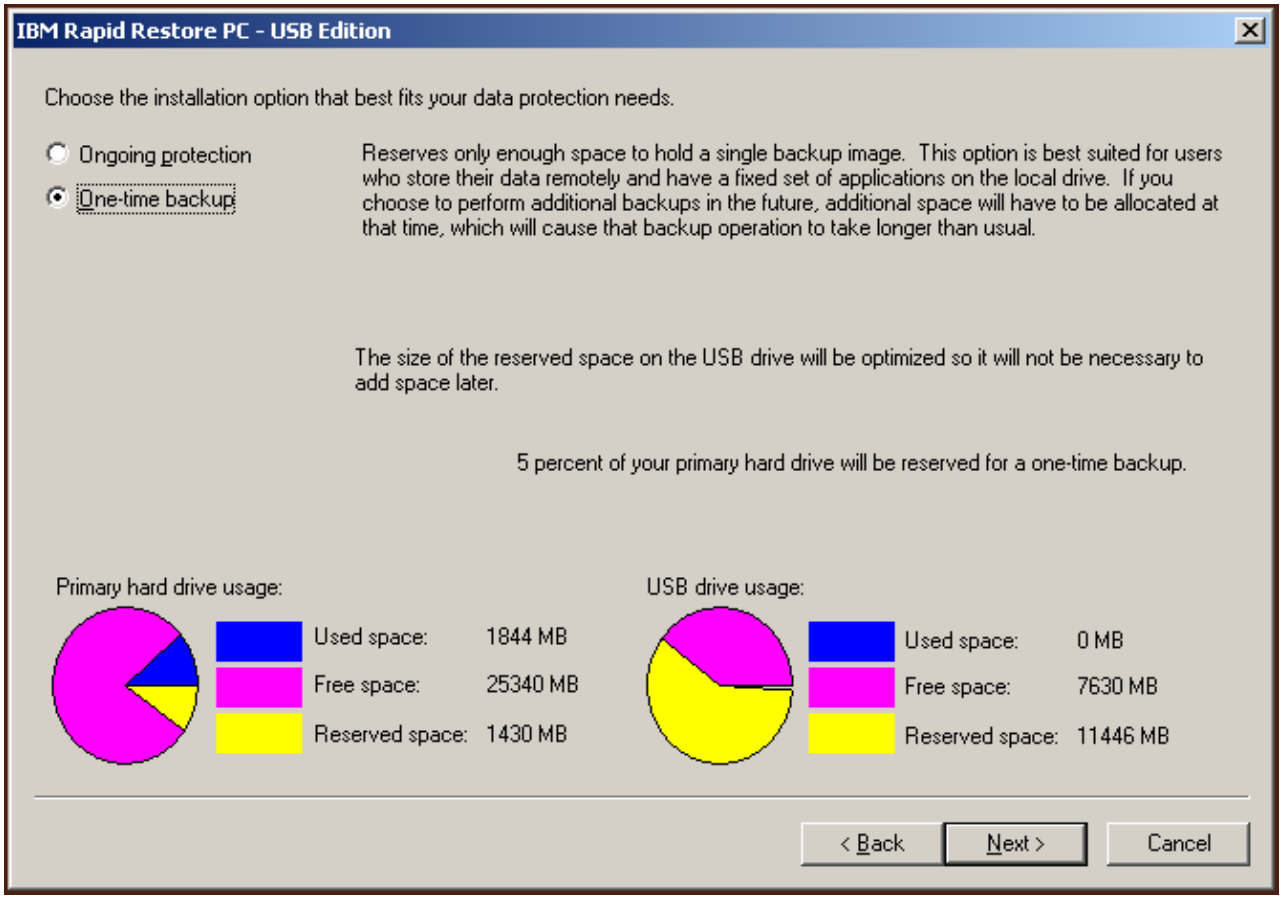


Figure 28. Backup configuration screen

5. Click the **Next** button.

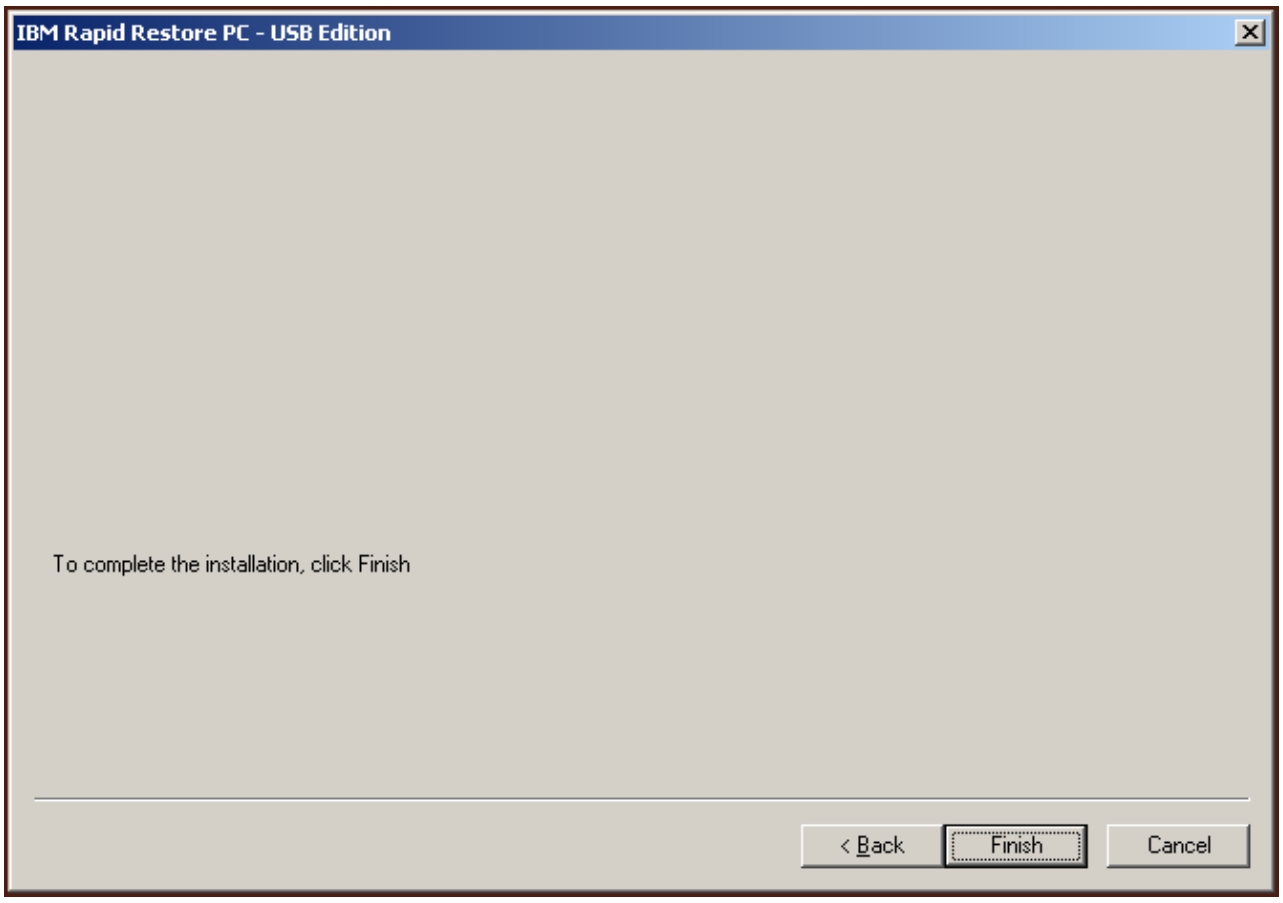


Figure 29. Finish installation screen

6. You are informed the program was properly installed on your machine. Click the **OK** button to create your initial backup image.

   Note: Although Rapid Restore is installed on your computer, a base backup is still required before you can perform a restore (or additional backups).

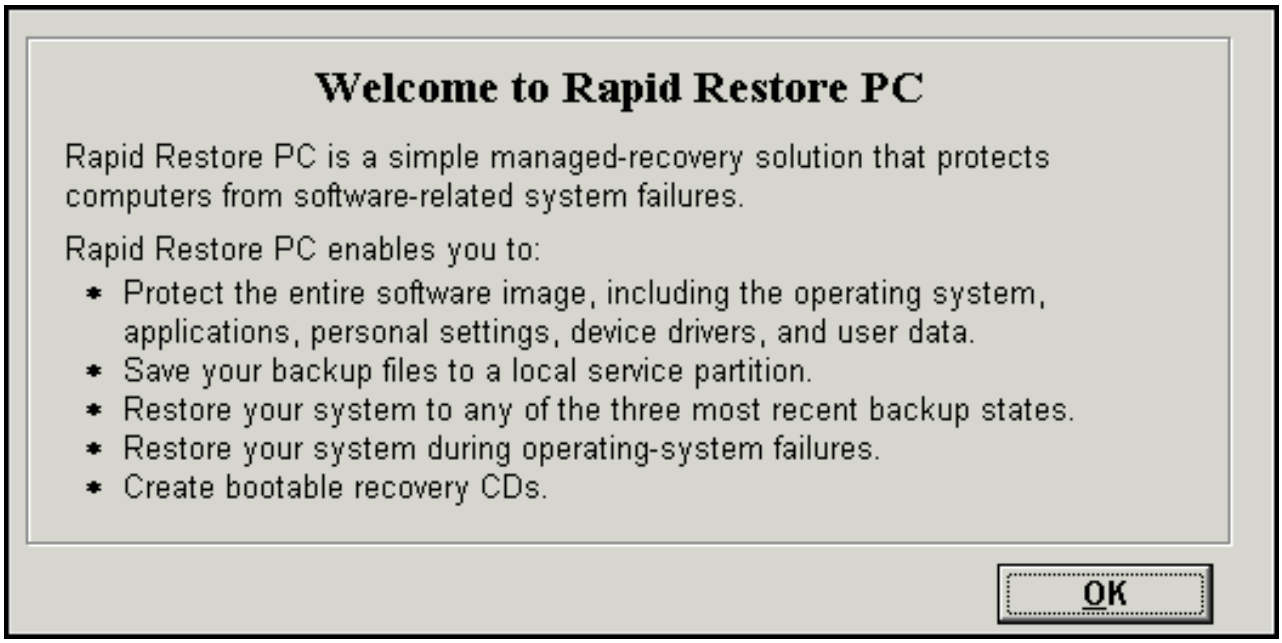


Figure 30. Welcome screen

7. You are prompted to restart your machine to unhide your service partition. Click the **OK** button.

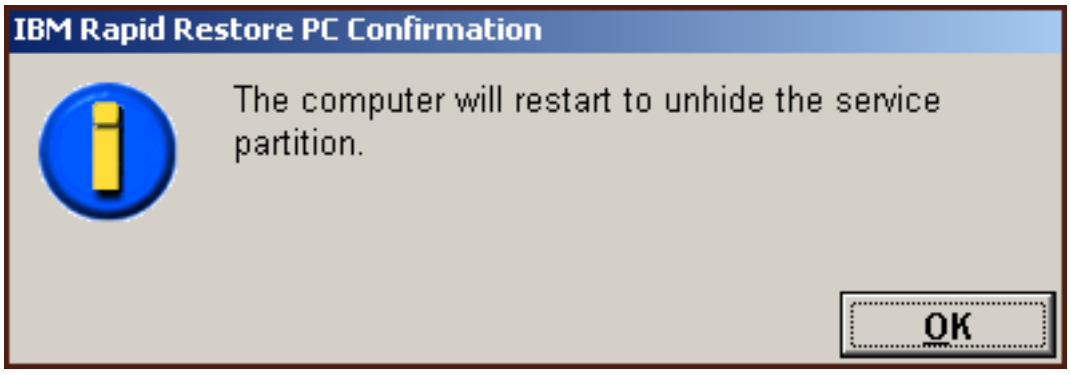


Figure 31. Unhide service partition message

8. Click the **OK** button.

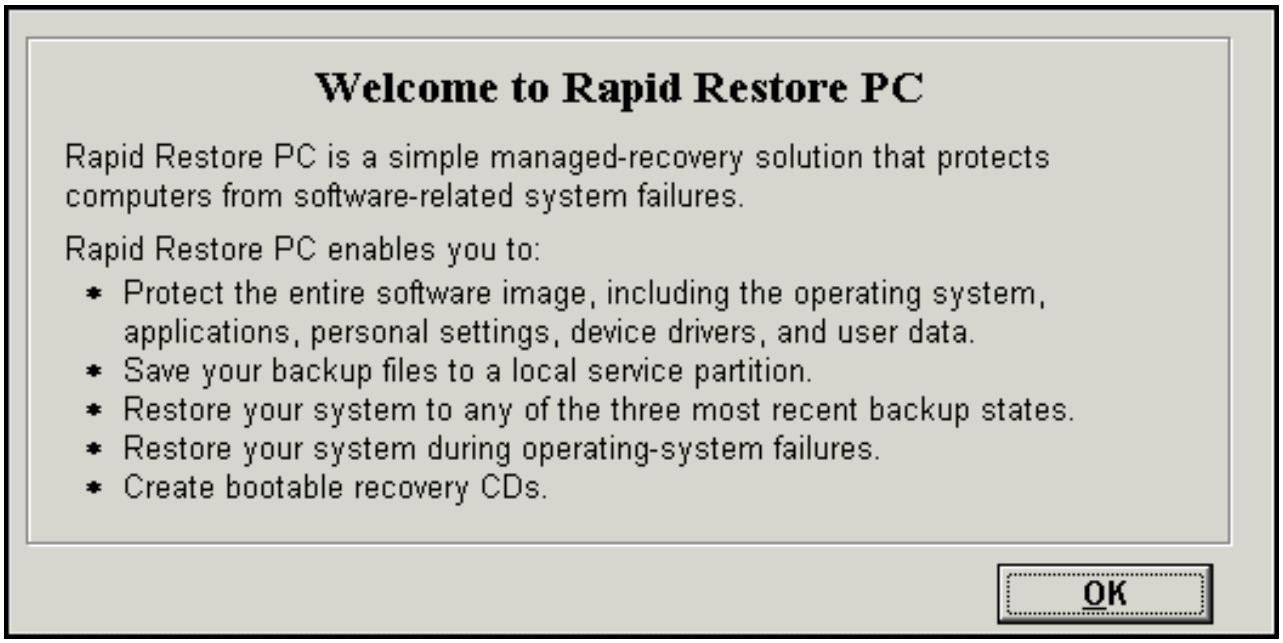


Figure 32. Welcome screen

9. You are prompted to restart your machine to recreate your service partition. Click the **OK** button.

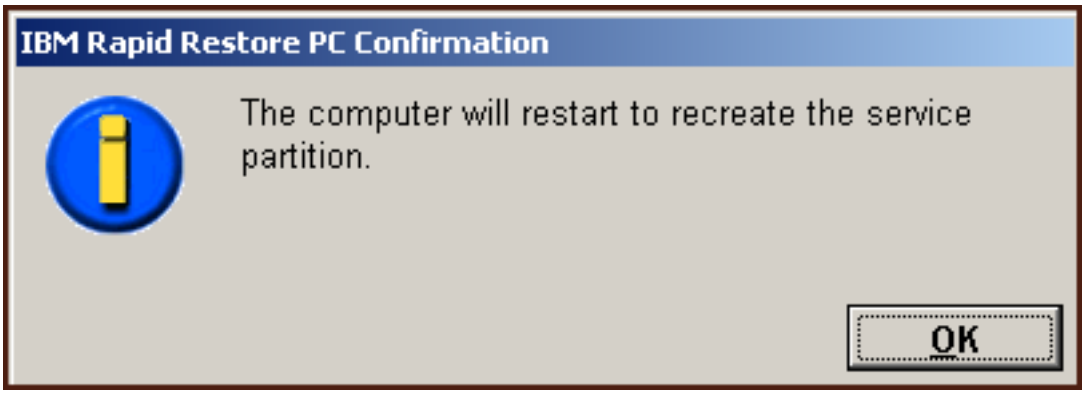


Figure 33. Recreate service partition message

10. The computer shuts down and restarts. Upon restarting, IBM Rapid Restore PC prepares the service partition for the storage of backup data. This process may include creating, analyzing, and/or resizing the service partition, depending on the configuration option selected in Step 2 as well as state of the service partition prior to the installation.

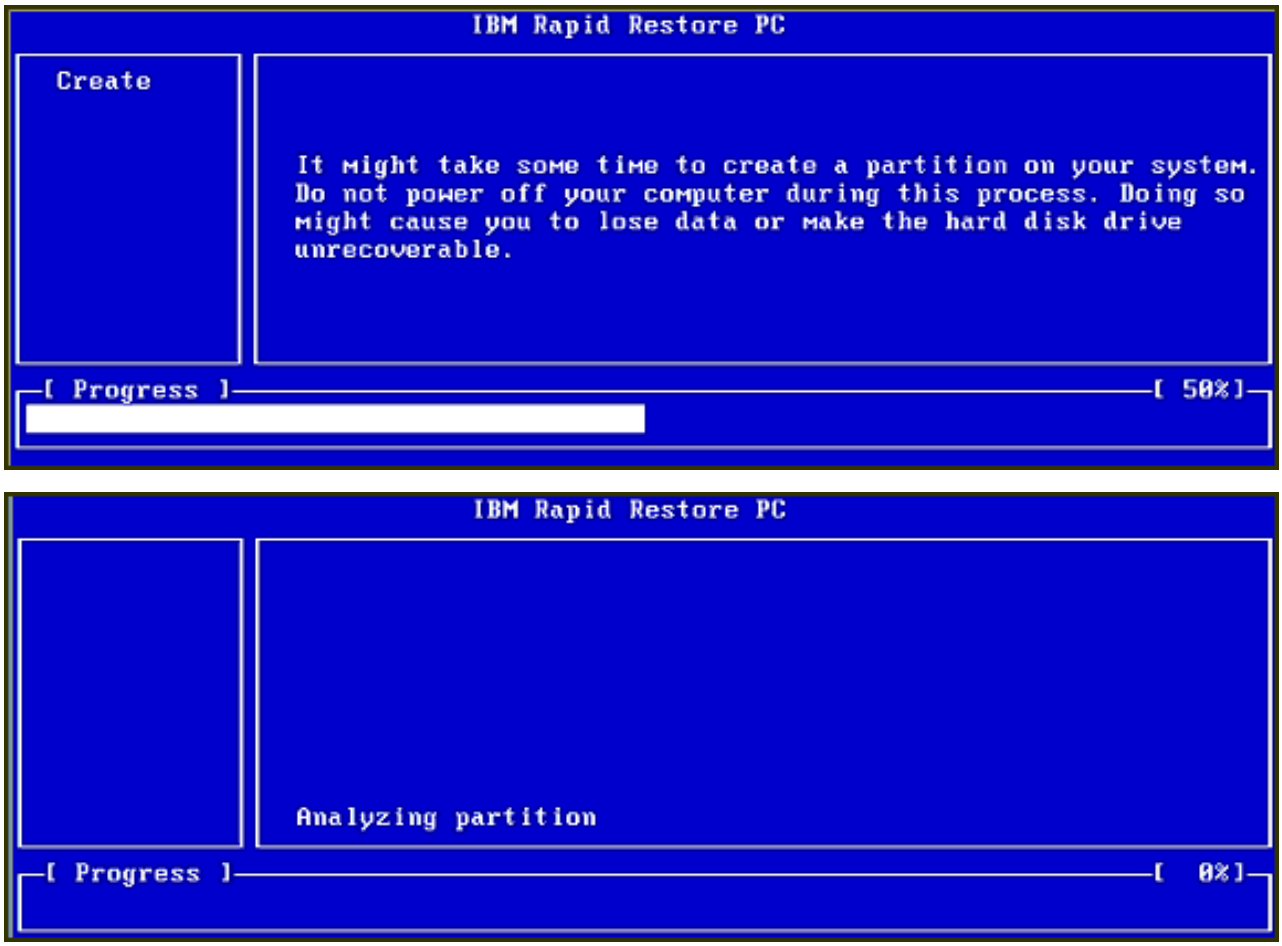


Figure 34. Preparation of service partition screens

11. Upon completing the preparation of the service partition, the sector-based backup is created.

Figure 35. Create backup screen

12. Upon rebooting, the backup database is created.

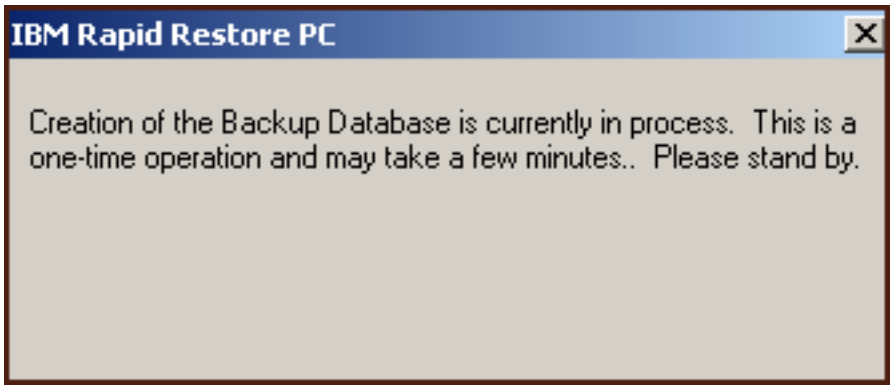


Figure 36. Create backup database screen

13. You are informed when the installation process is complete. Click the **OK** button.

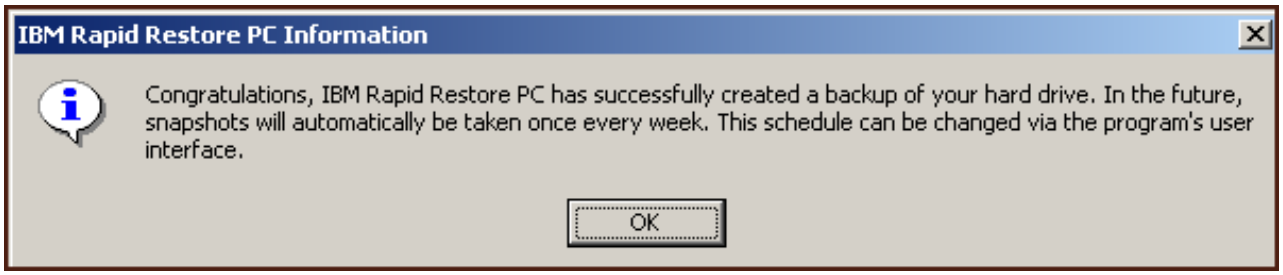


Figure 37. Congratulations screen

Congratulations! You just completed installing Rapid Restore.

By default, Rapid Restore is configured to perform automated backups once a week. You can customize your backup configuration through Rapid Restore's main console. For more information, see "Scheduling automated backups" on page 58.

Installing with the Backup to USB Drive Only Configuration

The method in which the "Backup to USB Drive" option is installed depends on the current state of your primary hard disk. Each scenario is described below.

- **Upgrading from Rapid Restore Version 2.04—Builds 6224.2 and above**
  The installation preserves the existing configuration settings, creates a thin service partition at the end of the primary hard disk, and creates a service partition at the end of the USB drive.
- **IBM service partition is detected on the primary hard disk**
  The installation migrates the contents of the primary hard disk's service partition (including backup data, IBM Recovery, ImageUltra, etc.) to the USB drive's service partition. Then, the primary hard disk's service partition is converted into a thin partition and the remaining free hard disk space is reclaimed by the adjacent partition.
- **No service partition is detected on the primary hard disk**
  The installation creates a thin service partition on the primary hard disk (320 MB) and a service partition at the end of the USB drive.

After completing the instructions in “Installing from the IBM Portable USB 2.0 Hard Drive” on page 15, follow the instructions below to complete the installation of Rapid Restore PC with the “Backup to USB Drive Only” configuration.

1. Select the **Backup to USB Drive Only** option and click the **Next** button.

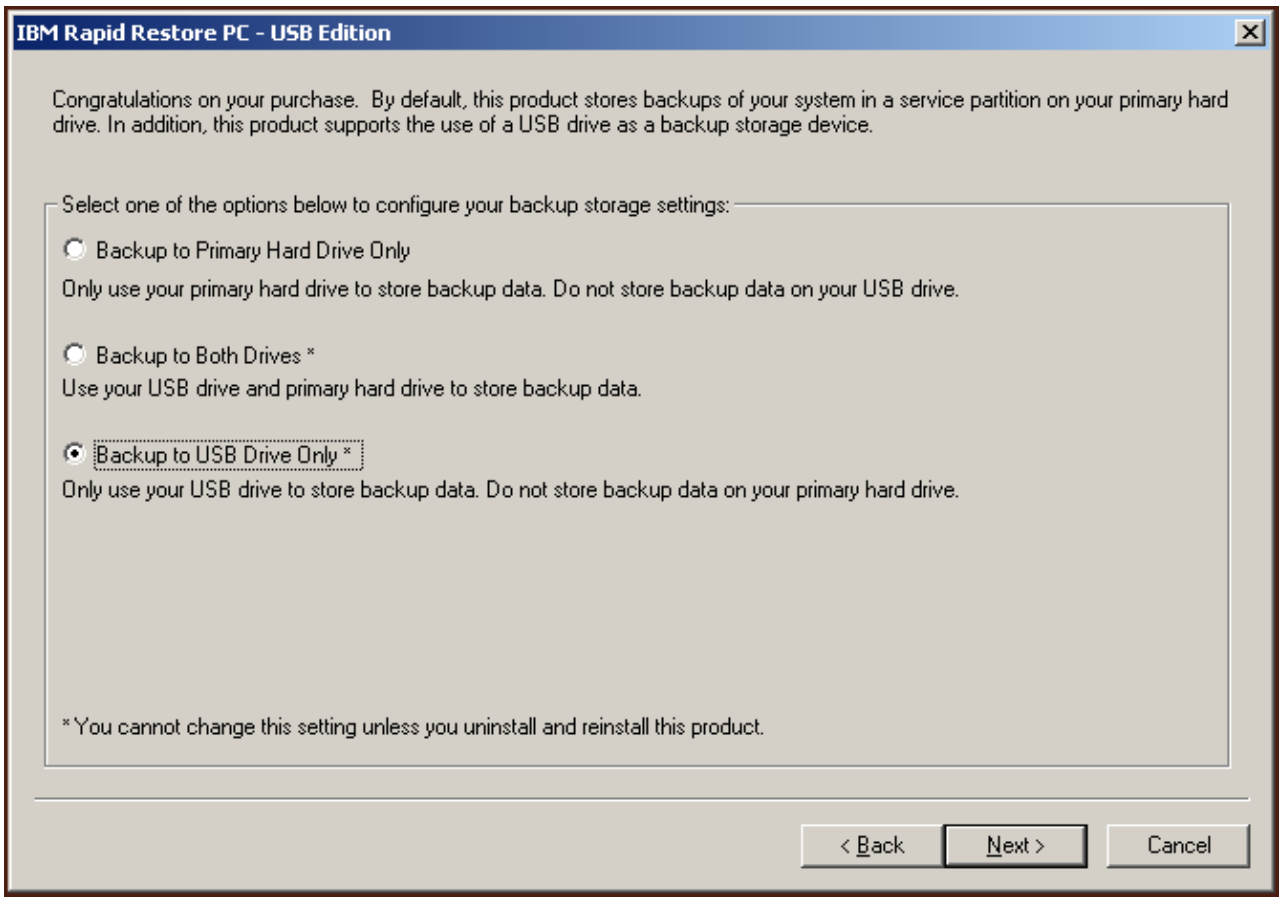


Figure 38. Backup configuration screen

2. If the installation detects one or more partitions already exist on your USB drive, you can configure your USB drive for “mixed mode.” Mixed mode is a feature that allows your USB drive to store primary hard disk backup data while simultaneously supporting up to three additional partitions. These additional partitions can be used for standard hard drive storage purposes (e.g., documents, programs, etc.) allowing you to maximize the use of your USB drive. Or, you can choose to remove the existing partitions and dedicate the USB drive as a backup storage device.
   Select a USB drive configuration that meets your backup needs and click the **Next** button.

   If your USB drive does not have an existing partition, you can skip this step and continue with Step 4.

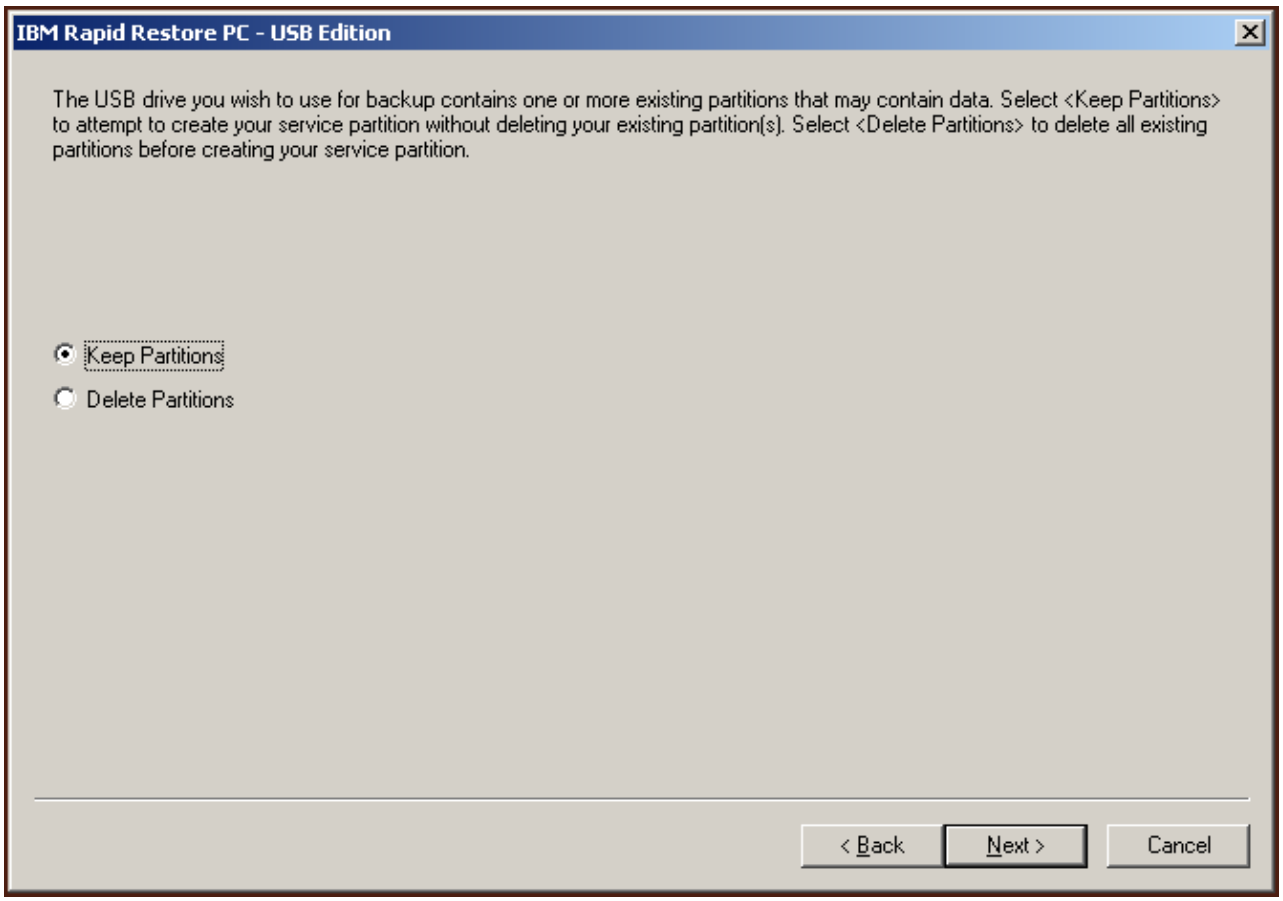


Figure 39. Partition detected on USB drive screen

3. You are informed that free space from the end of the last partition on the USB drive will be used to create a service partition. This process does not destroy exiting data residing on your USB drive. Click the **OK** button to continue.

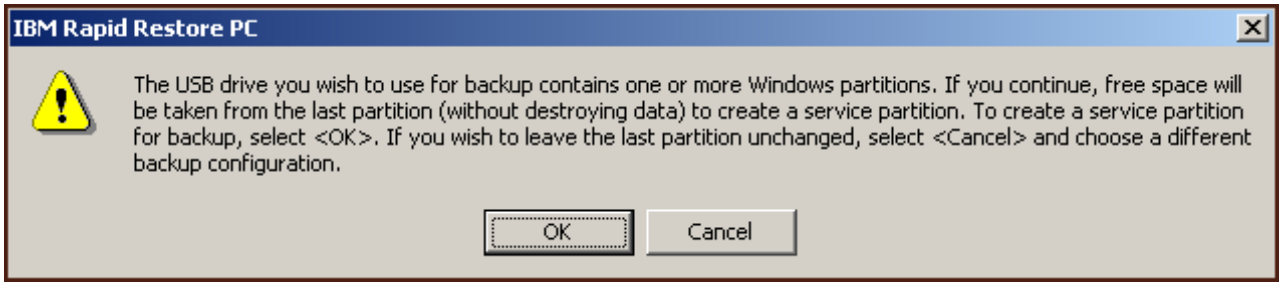


Figure 40. Create partition on USB drive message

4. Specify the amount of space you want to allocate, or reserve, for backup storage on the USB hard disk and click the **Next** button.

Important

Rapid Restore will not resize a service partition residing on a USB drive. Therefore, it is important that you reserve the appropriate amount of space on your USB drive during the installation process. In the event you require additional backup storage space on your USB drive, you will need to uninstall and reinstall Rapid Restore with a larger service partition.

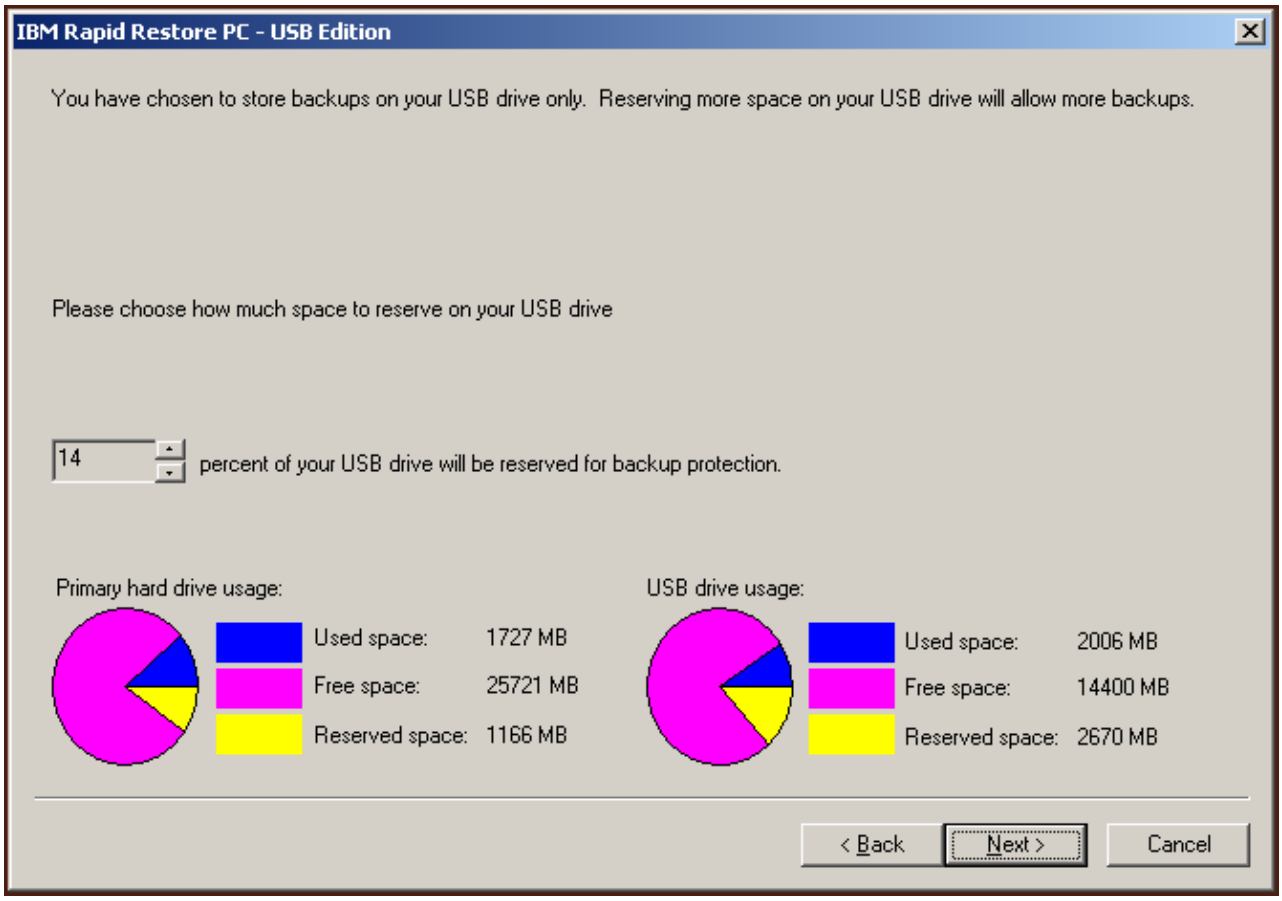


Figure 41. Reserving space for backup data screen

5. Click the **Next** button.

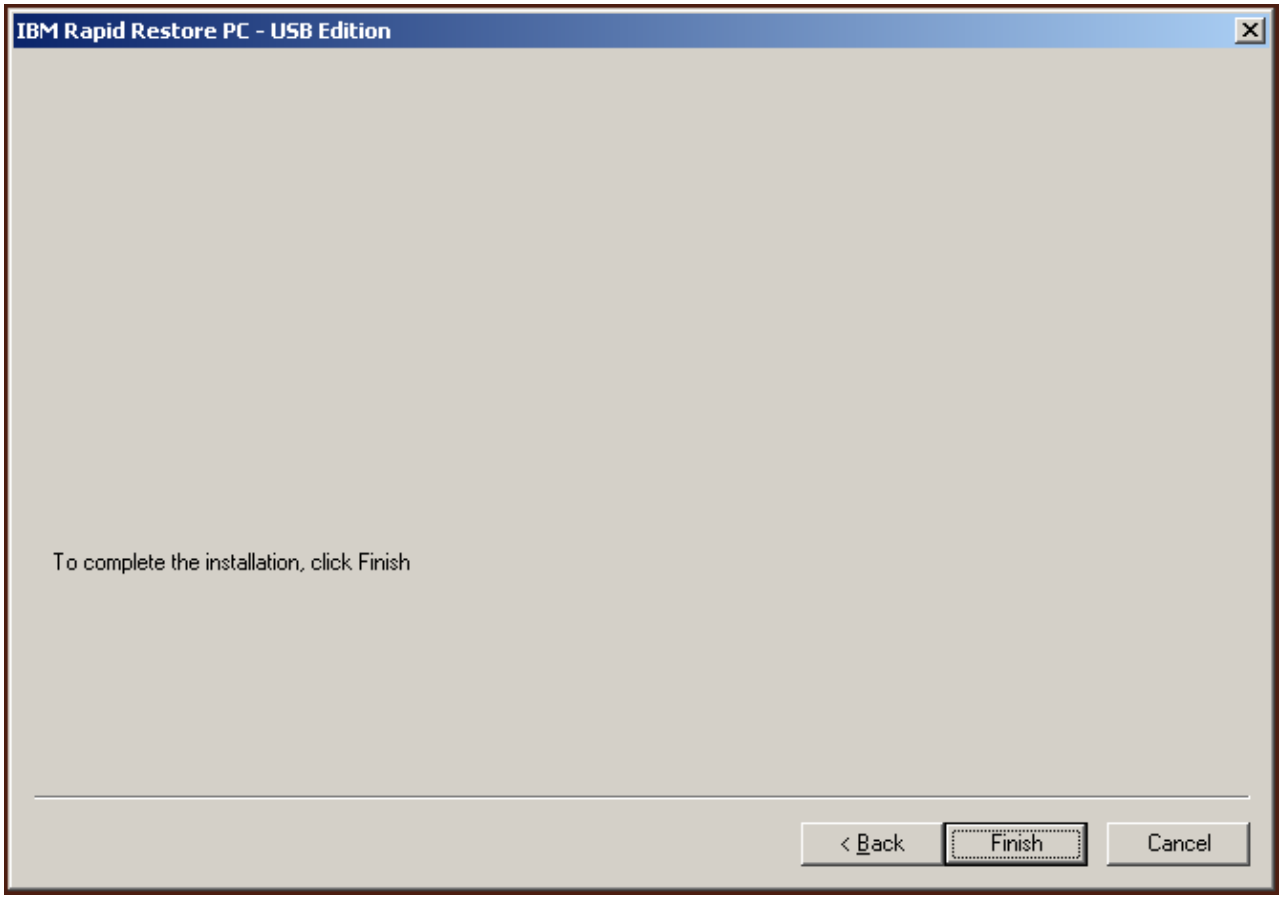


Figure 42. Finish installation screen

6. You are informed the program was properly installed on your machine. Click the **OK** button to create your initial backup image.

   Note: Although Rapid Restore is installed on your computer, a base backup is still required before you can perform a restore (or additional backups).

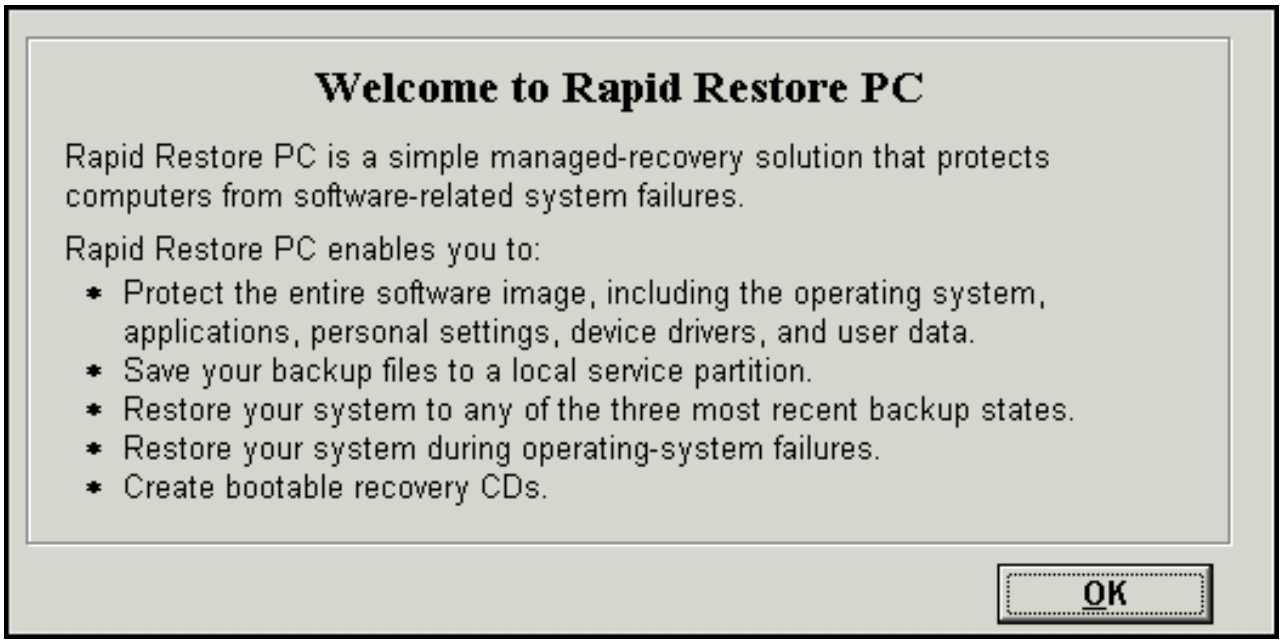


Figure 43. Welcome screen

7. You are prompted to restart your machine to unhide your service partition. Click the **OK** button.

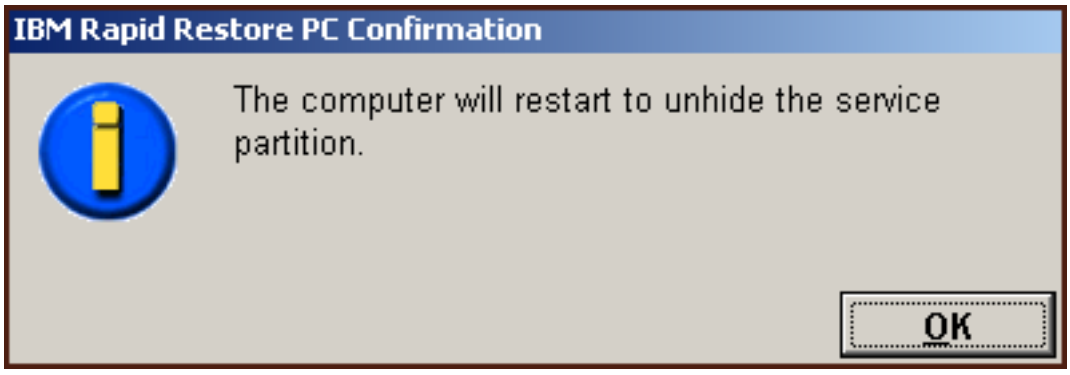


Figure 44. Unhide service partition message

8. Click the **OK** button.

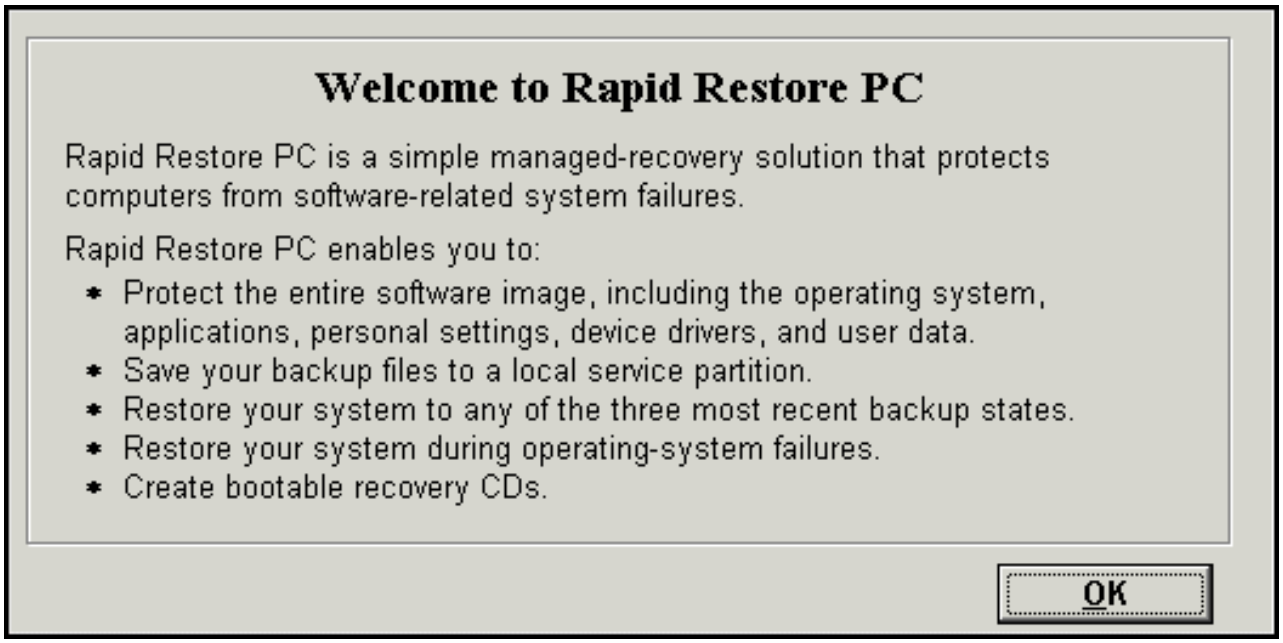


Figure 45. Welcome screen

9. You are prompted to restart your machine to recreate your service partition. Click the **OK** button.

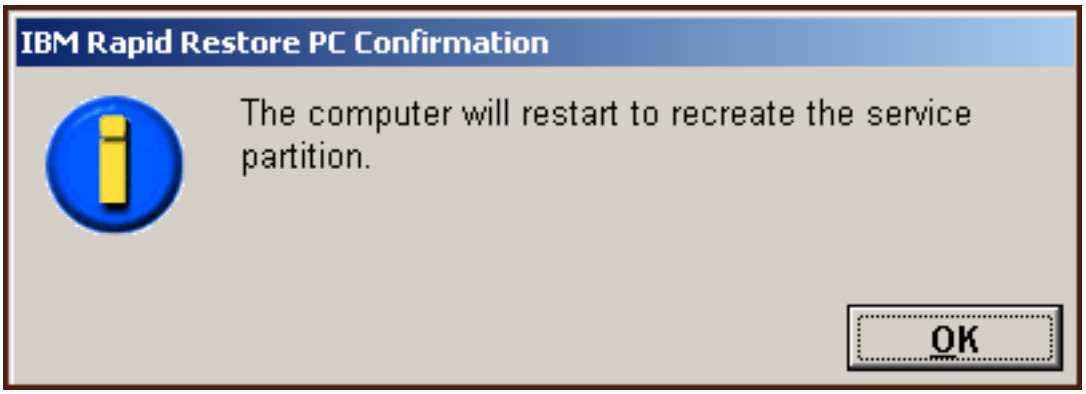


Figure 46. Recreate service partition message

10. The computer shuts down and restarts. Upon restarting, Rapid Restore validates the USB drive for the first time and creates the service partition on the USB drive.

Figure 47. Create service partition screen

11. Upon completing the preparation of the service partition, the sector-based backup is created.

Figure 48. Create backup screen

12. Upon rebooting, the backup database is created.

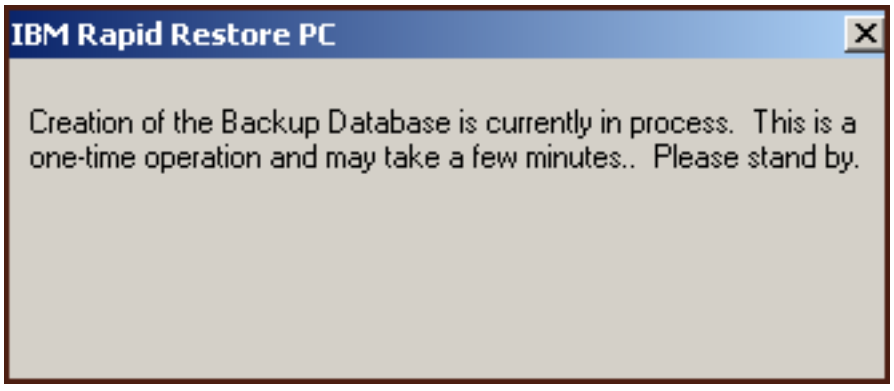


Figure 49. Create backup database screen

13. You are informed when the installation process is complete. Click the **OK** button.

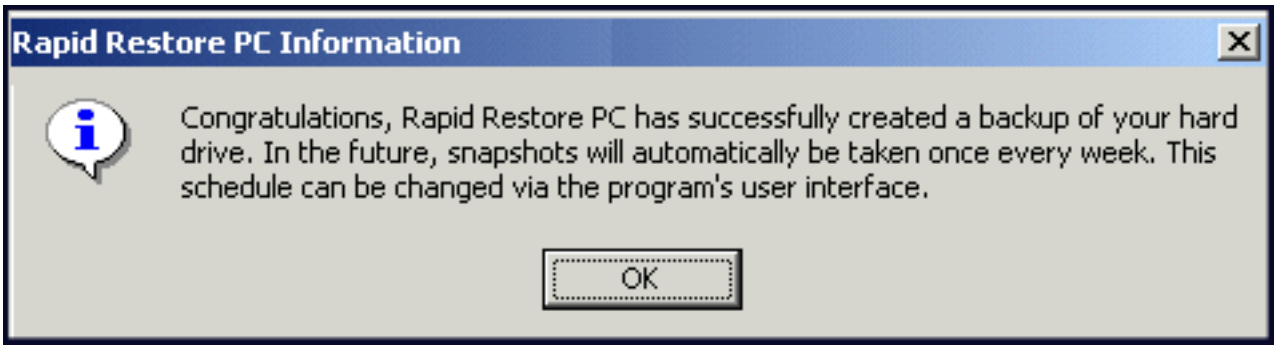


Figure 50. Successful hard disk backup message

Congratulations! You just completed installing Rapid Restore.

By default, Rapid Restore is configured to perform automated backups once a week. You can customize your backup configuration through Rapid Restore's main console. For more information, see "Scheduling automated backups" on page 58.

Uninstalling Rapid Restore

There are two methods of uninstalling Rapid Restore. Regardless of the method used, the uninstall process removes the program and all the backup sets, then removes the backup service partition and returns the additional hard disk space to the adjacent partition.

Note: Rapid Restore's uninstall detects if your machine contains an IBM service partition and, if one is detected, returns the IBM service partition to its original state.

Uninstalling from the Windows Control Panel

To uninstall Rapid Restore from the Windows Control panel, follow the instructions below

1. Use the **Start - Settings - Control Panel - Add/Remove Programs** menu sequence.
2. Select **IBM Rapid Restore** and click the **Remove** button.

Uninstalling from the Rapid Restore Program Group

1. Use the **Start - Programs - IBM Rapid Restore - Uninstall** menu sequence.
2. You are prompted to confirm the uninstallation.
3. Click the **OK** button.

Chapter 5. Windows user interface overview

This section provides an overview of the Windows user interface for Rapid Restore.

Opening the main console

Rapid Restore automatically loads in your taskbar each time you start your machine. The program uses minimal computer resource because it remains in "sleep" mode until an automated backup begins or you access Rapid Restore's main console.

You can access the Rapid Restore console using one of the following methods.

Accessing Rapid Restore from the Start menu

Use the **Start - Programs - Rapid Restore** menu sequence.

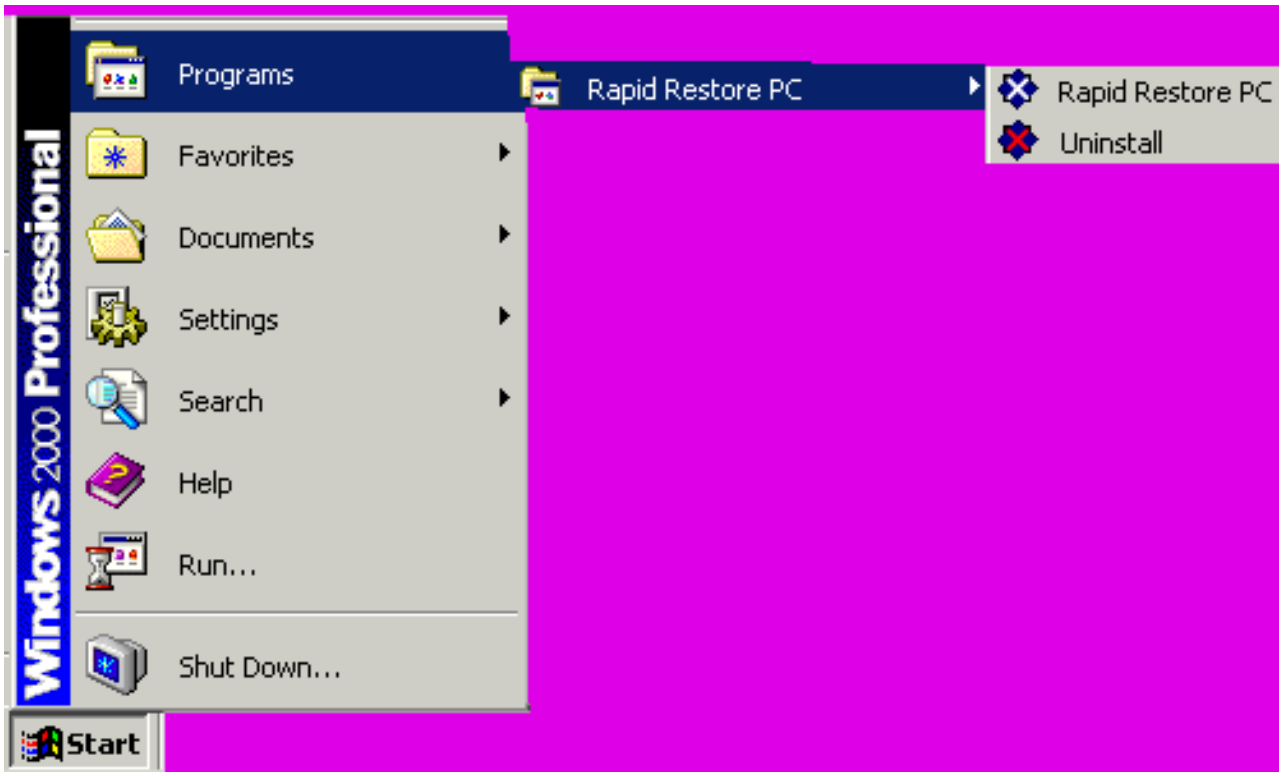


Figure 51. Rapid Restore program group

Accessing Rapid Restore from the taskbar

Right-click the **Rapid Restore** icon in the Windows taskbar and select **Rapid Restore** from the shortcut menu.

© Copyright IBM Corp. 2002

Notification of locked files

Rapid Restore users can choose to receive an onscreen notification when a file is in use and cannot be properly backed up.

To enable the notification of locked files, follow the instructions below.

1. Access Rapid Restore main console. For detailed instructions, go to "Opening the main console" on page 45.
2. Click **Advanced**.

Figure 52. Main console screen

3. Select the **Prompt user when locked file found** check box.

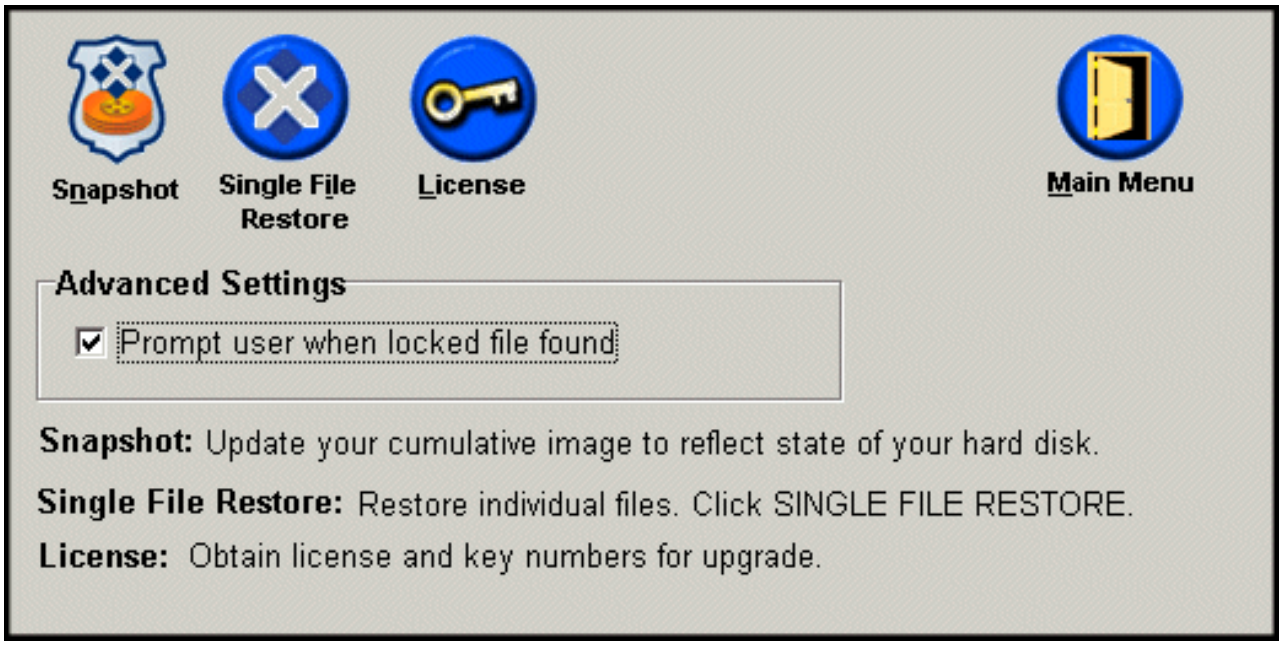


Figure 53. Advanced screen

4. Click **Main Menu**.

Note: Enabling the notification of locked files instructs Rapid Restore to prompt you if a locked file is detected. The backup will not proceed until you retry or ignore the locked file.

Accessing license information

You can easily view, update, or upgrade your license information by accessing the License window. Follow the steps below to access the License window.

1. Access Rapid Restore's main console. For detailed instructions, see "Opening the main console" on page 45.
2. Click **Advanced**.

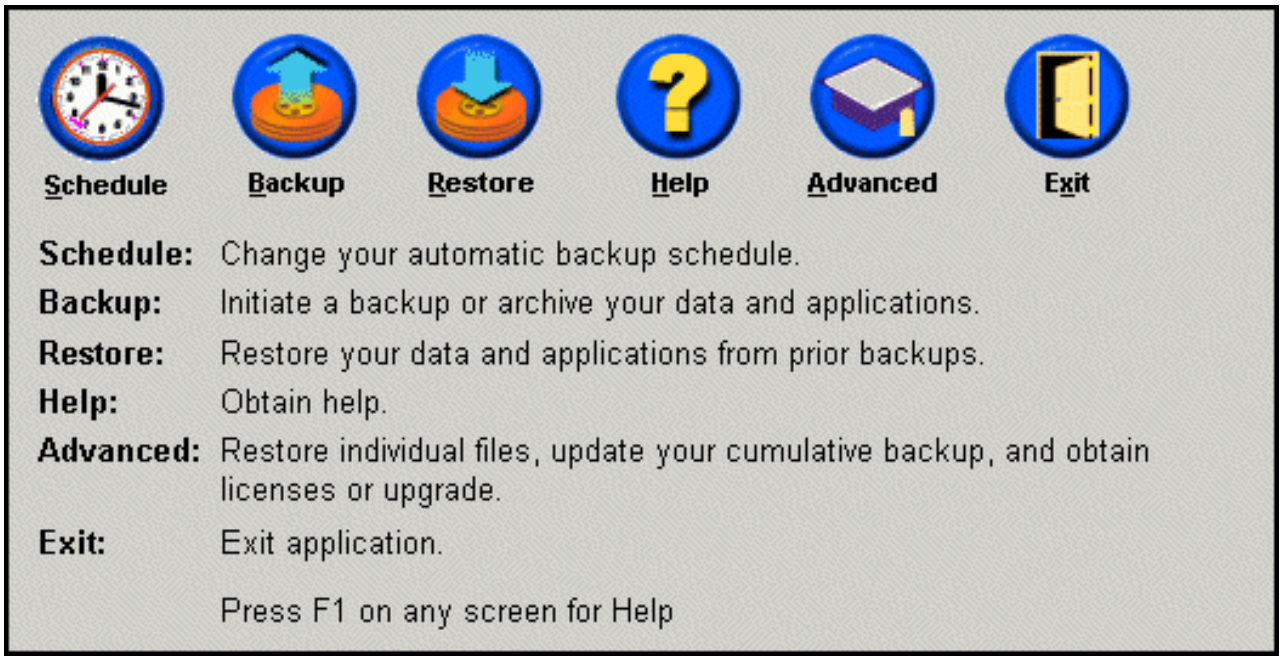


Figure 54. Main console screen

3. Click **License**.

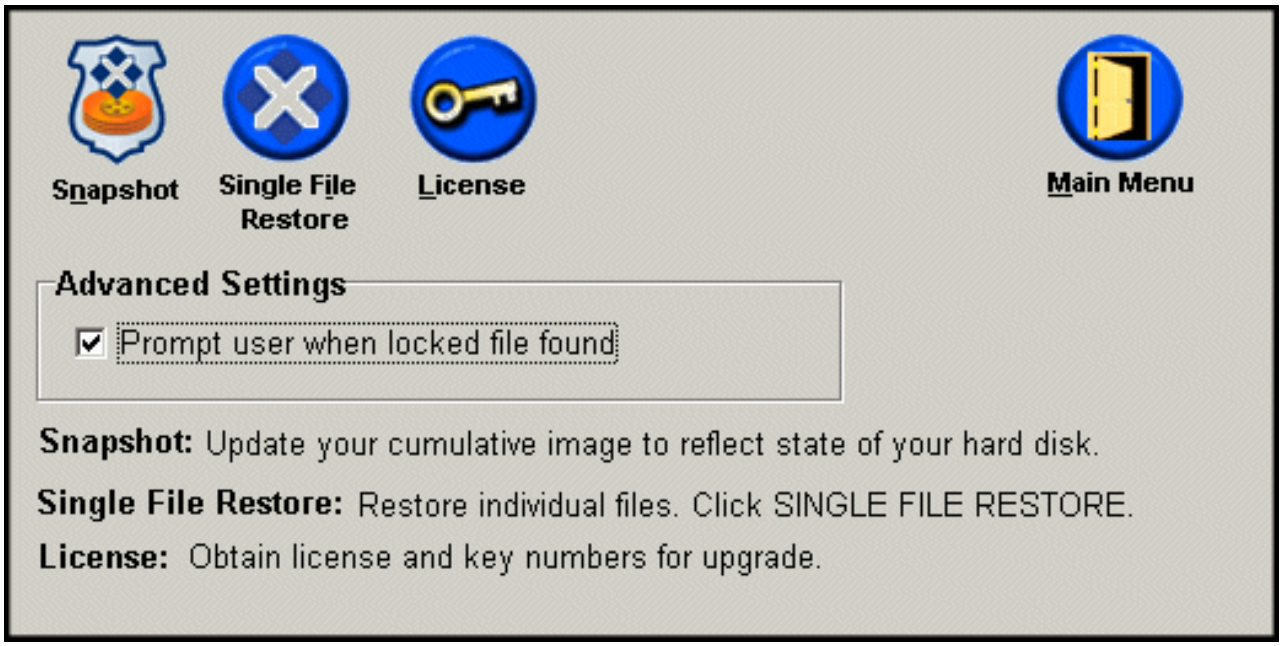


Figure 55. Advanced screen

4. You can view or enter your Rapid Restore license and key in the **License Number** and **Key Number** boxes, respectively, and click **OK**. Be sure to close all open applications before entering or modifying this information.

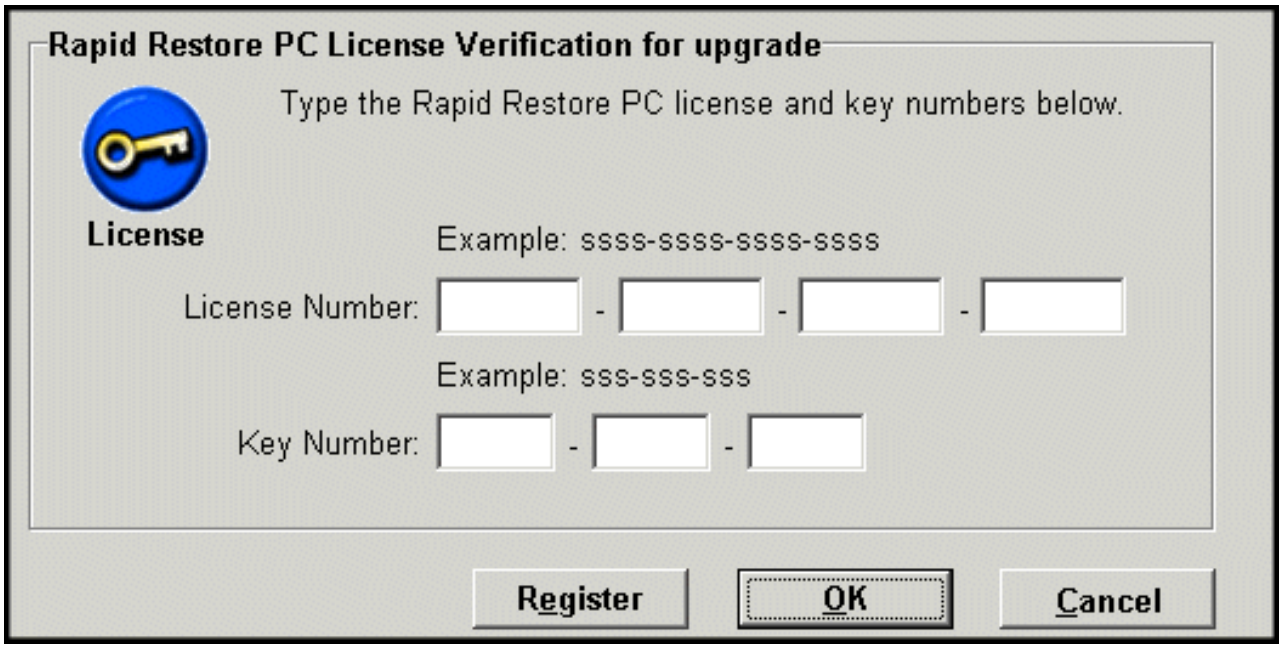


Figure 56. License screen

Exiting the Rapid Restore console

You can exit the Rapid Restore console by clicking **Exit**.

Important:
Exiting Rapid Restore's user interface does not preclude Rapid Restore from performing automatic backups. Rather, Rapid Restore remains in "sleep" mode until a scheduled (automated) backup is initiated.

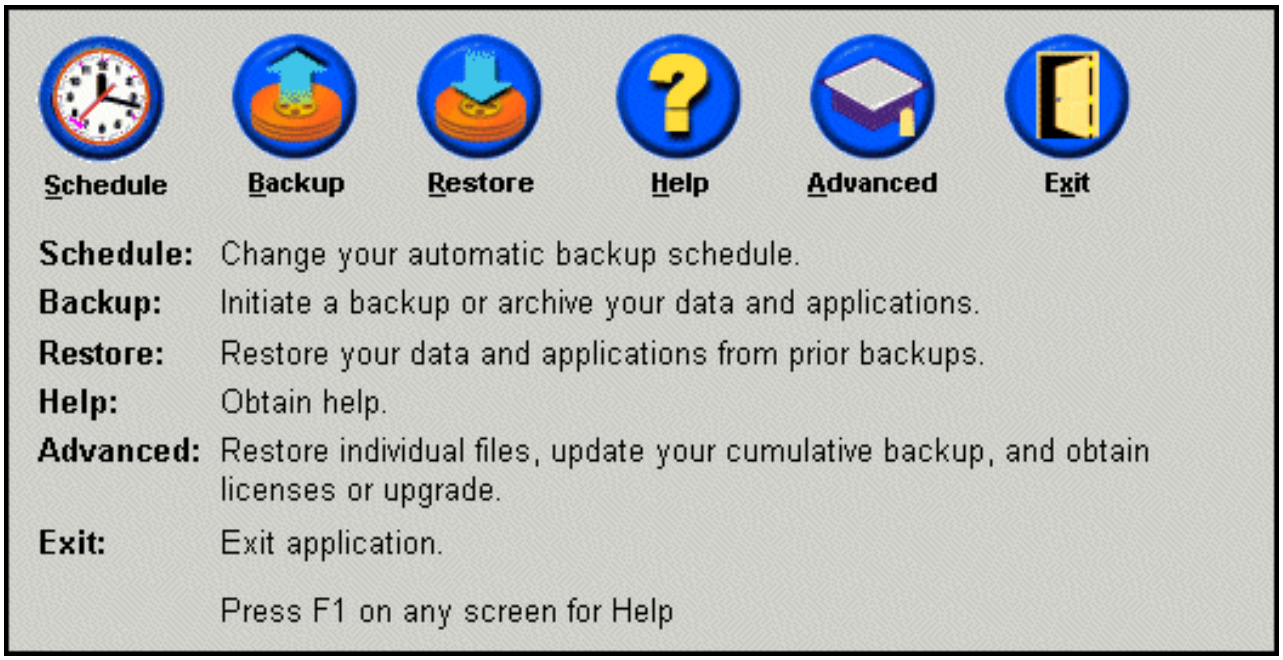


Figure 57. Main console screen

Chapter 6. Managing backups

Introduction

You can configure Rapid Restore to specify how often your hard disk is backed up. After installing Rapid Restore, automatic backups occur by default so that protection is ensured. You can change the predefined schedule to a customized time and frequency, or disable scheduled backup operations. In addition, you can use Rapid Restore's "on demand" backup feature if you prefer to perform backups manually, or if you need to perform a backup operation between scheduled backups.

Note: Rapid Restore is pre-configured to include automated protection; however, your specific backup strategy and schedule should be customized to your own needs.

Supported image and backup types

Rapid Restore stores three types of backups, each reflecting the state of your hard disk at the time of their creation.

- **Base backup image** - Original sector-based backup image of the primary hard disk created in the DOS operating system. This image is compressed to save hard disk space and reflects the state of your hard disk at the time Rapid Restore completes its initial backup. The base backup is the foundation upon which the cumulative and most recent backups are created. In addition, base backups cannot be updated.

  Note: For typical user files, compression rates average approximately 50%. For example, a 20 GB hard disk with 2 GB of content will generate a 1 GB backup.

- **Cumulative backup** - The first Windows-based incremental backup that, upon creation, stores the difference between the state of the hard disk as the time of the base backup image and the cumulative backup (e.g., data that was deleted, added, or modified). Cumulative backups are compressed to save hard disk space.

  Then, when the most recent backup is updated, the cumulative backup stores additional incremental information tracking the difference between the previous most recent backup and the current most recent backup.

  You should perform snapshots of your cumulative backup whenever your system software is updated, a new database or application is installed, or whenever a significant change occurs within your system. For more information, see "Snapshot backup" on page 52.

- **Most recent backup** - A Windows-based incremental backup file reflecting the state of a hard disk at the time the backup is performed. Only files not matching those in the cumulative backup are stored in the most recent backup file. This backup is compressed and stores only incremental information defining the differences between the cumulative backup and the most recent backup. Each subsequent most recent backup replaces the previous most recent backup. In addition, the most recent backup process includes updating the cumulative backup so that it stores the incremental information lost when the most recent backup is replaced. Most recent backups can be created automatically (using the Schedule feature) and manually.

© Copyright IBM Corp. 2002

Figure 58. Supported backup types

Optimizing backup functionality

Snapshot backup

A snapshot backup replaces your existing cumulative backup with optimized cumulative backup data. This optimized backup consolidates all incremental backup data (cumulative and most recent) into one cumulative backup. In addition, the snapshot process deletes the most recent backup. Therefore, the next most recent backup created only includes differential information as it relates to the recently created cumulative backup. Snapshot backups eliminate unnecessary cumulative data, reducing the amount of hard disk space used by the backup. In addition, by consolidating differential data, snapshot backups increase the speed of future most recent backups.

Snapshot backups should be performed at significant checkpoints such as before and after the installation of a new application, creation of a new database, etc.

Figure 59. Snapshot backup

CD-R archive backups

Additional levels of protection are available through the archiving of your data to CD-R. By systematically archiving your cumulative backup after each update, you expand your recovery options in the event of a system failure. Each archived backup provides an additional level of protection against application and data loss, and enables you to update your backups without losing any recovery options. For more information on this feature, see “CD-R archive backups”.

Advantages of multiple backups

Rapid Restore uses a base backup image and two sets of incremental backup files, making a total of three backup options available: the base image, the cumulative backup, and the most recent backup. The advantages of using multiple backups include:

- **Increased speed and performance creating the most recent backup** - With the exception of the base backup image, Rapid Restore stores incremental backup information within the most recent backups. This reduces the amount of hard disk space, CPU utilization, and time required to complete the backup because only files that changed are included in the backup.
- **Select from multiple recovery levels** - You can choose to recover the base backup image, the cumulative backup, or the most recent backup. Each of these backups represent the state of your hard disk at different points in time. Multiple backups provide you with the flexibility to restore your hard disk to different previously known states. This is useful when the most recent backup contains a known defect and you want to restore the hard disk to a state that existed before that defect was introduced.

  For example, if your system becomes corrupted soon after a most recent backup is created, you can recover the base backup or the cumulative backup to ensure that, upon recovery, the corrupted files are eliminated from your system. When you restore the cumulative or most recent backup, you are actually restoring the base image plus incremental changes. You can also use the Snapshot feature to update the cumulative backup. See “Snapshot backup” on page 52 for more information.

Backing up your system

Rapid Restore’s scheduling functionality enables you to perform backup operations on an automated basis. If you want to perform a backup between scheduled backup operations, you must initiate the backup manually.

Whether performing a manual or automated backup, running ancillary programs (e.g., anti-virus program) during the backup process will adversely affect the speed at which the backup occurs. Therefore, it is recommended that you do not run any programs while performing a backup operation. In addition, it is recommended that you run an anti-virus program before or after performing a backup or restore.

Rapid Restore requires you close all programs using a Windows Explorer window (e.g., Windows Explorer, Control Panel, Network Neighborhood, Recycle Bin, etc.) prior to performing a backup. If a Windows Explorer window is open during the backup process, you are prompted with a message as illustrated in Figure 102. The backup process will continue once the Windows Explorer window is closed.

Figure 60. Locked file notification message

Manual backups

If you want to perform a backup between scheduled backup operations, you can do so by completing the following procedure.

1. Access Rapid Restore’s main console. For detailed instructions, see “Opening the main console” on page 45.

2. Click **Backup**.

Figure 61. Main console screen

3. Click **Backup**.

Important:
Do not power off your computer or interrupt the backup until the operation is complete.

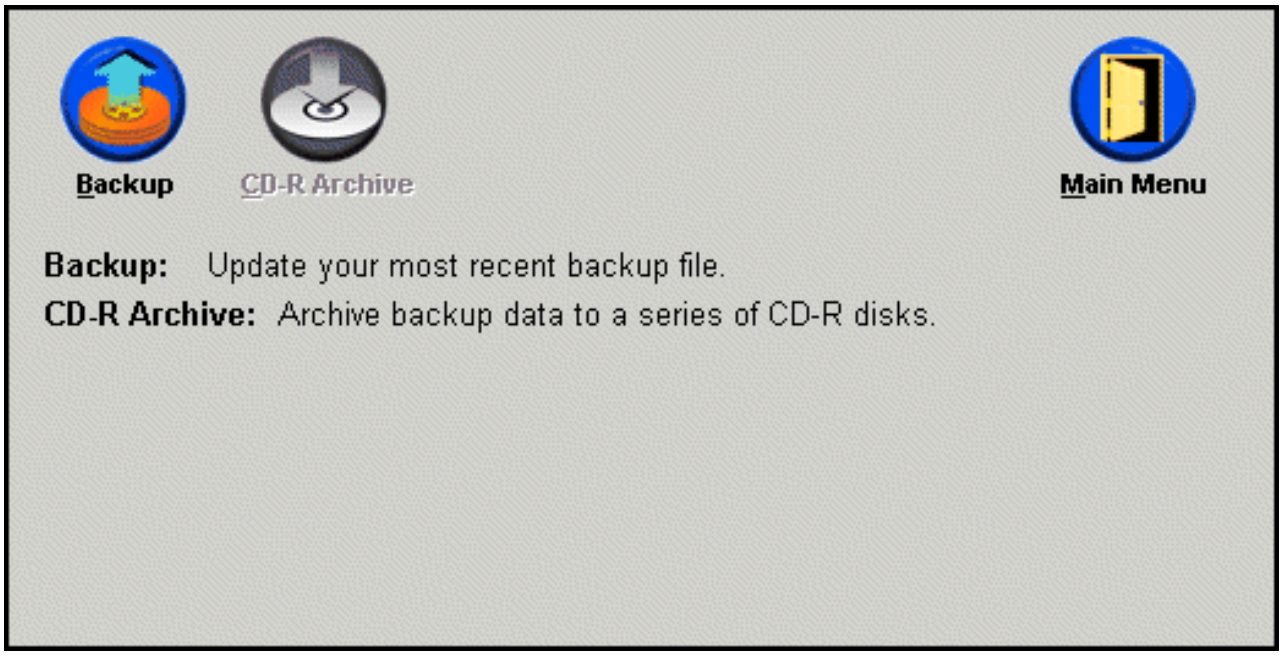


Figure 62. Backup screen

If your hard disk runs out of storage space during the backup process, you are notified that backup storage space is full and are prompted to cancel the backup operation or add storage space by increasing the size of the service partition. If you add storage space, a new base backup is created.

Archiving data to CD-R

If your system has a CD-R(W) drive, Rapid Restore enables you to create a set of recovery CDs that you can use to restore the contents of the hard disk in the event of a hard disk replacement. In addition, archiving your files to recovery CDs enhances backup protection and enables you to restore your system from any of your archived backup files (i.e., base, cumulative, and most recent).

Note: Although Rapid Restore supports CD-R and CD-RW drives, only CD-R media is supported. Therefore, if you want to incorporate data archiving within your backup and restore strategy, you must use CD-R (not CD-RW) media in conjunction with your CD-R(W) drive.

The CD-R Archive button is enabled only if a CD-R(W) drive is installed and configured correctly. If you cannot select the CD-R Archive button but are able to write CD-Rs using other software, the ASPI device driver required by Rapid Restore might not be installed on your computer.

The ASPI device driver is pre-installed on computers with IBM factory-installed CD-R(W) drives, but may not be provided by other CD-R(W) drive manufacturers. For additional information, contact your CD-R(W) drive manufacturer.

CD-R media is required when creating a CD-R archive set. Label each CD-R as it is created, and store the CDs together in a safe place. To archive your data to CD-R, follow the instructions below.

1. Access Rapid Restore's main console. For detailed instructions, see "Opening the main console" on page 45.

2. Click **Backup**.

Figure 63. Main console screen

3. Click **CD-R Archive**.

   Note: If the CD-R Archive icon is disabled, see "Unable to select the CD-R archive button" on page 85.

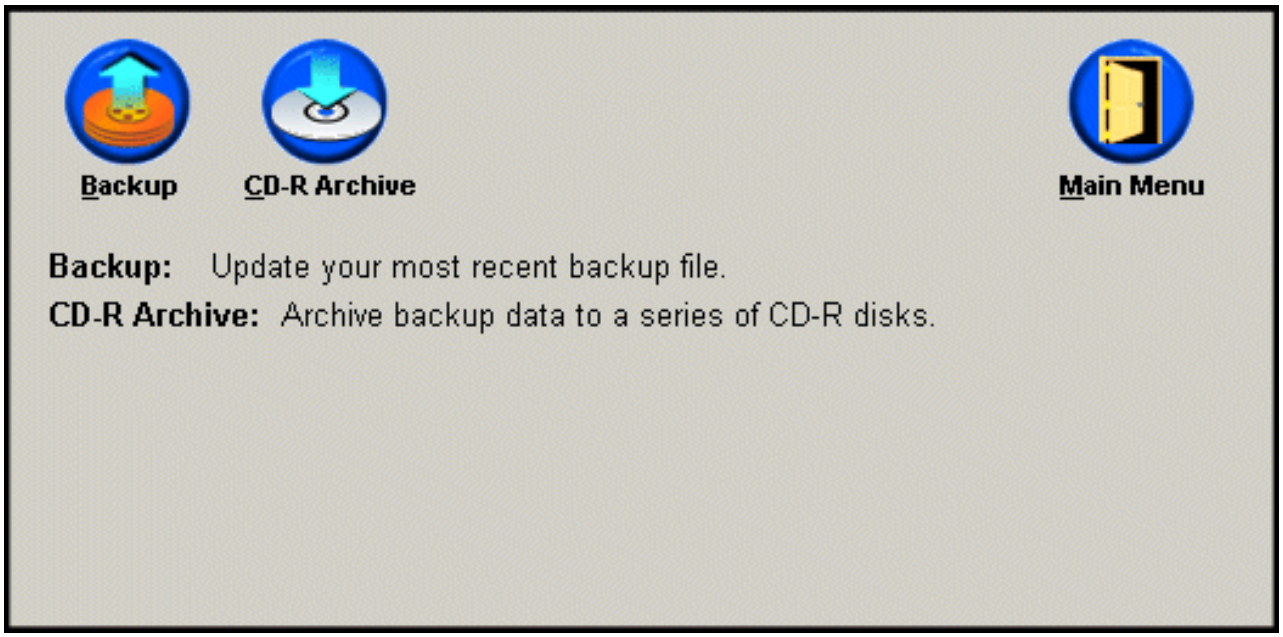


Figure 64. CR-R Archive screen

4. You are prompted to insert a blank CD-R into your CD-R(W) drive. After inserting the CD-R, click **OK**.

Figure 65. Insert blank disk message

5. Select **Start** to begin creating a copy of the service partition.

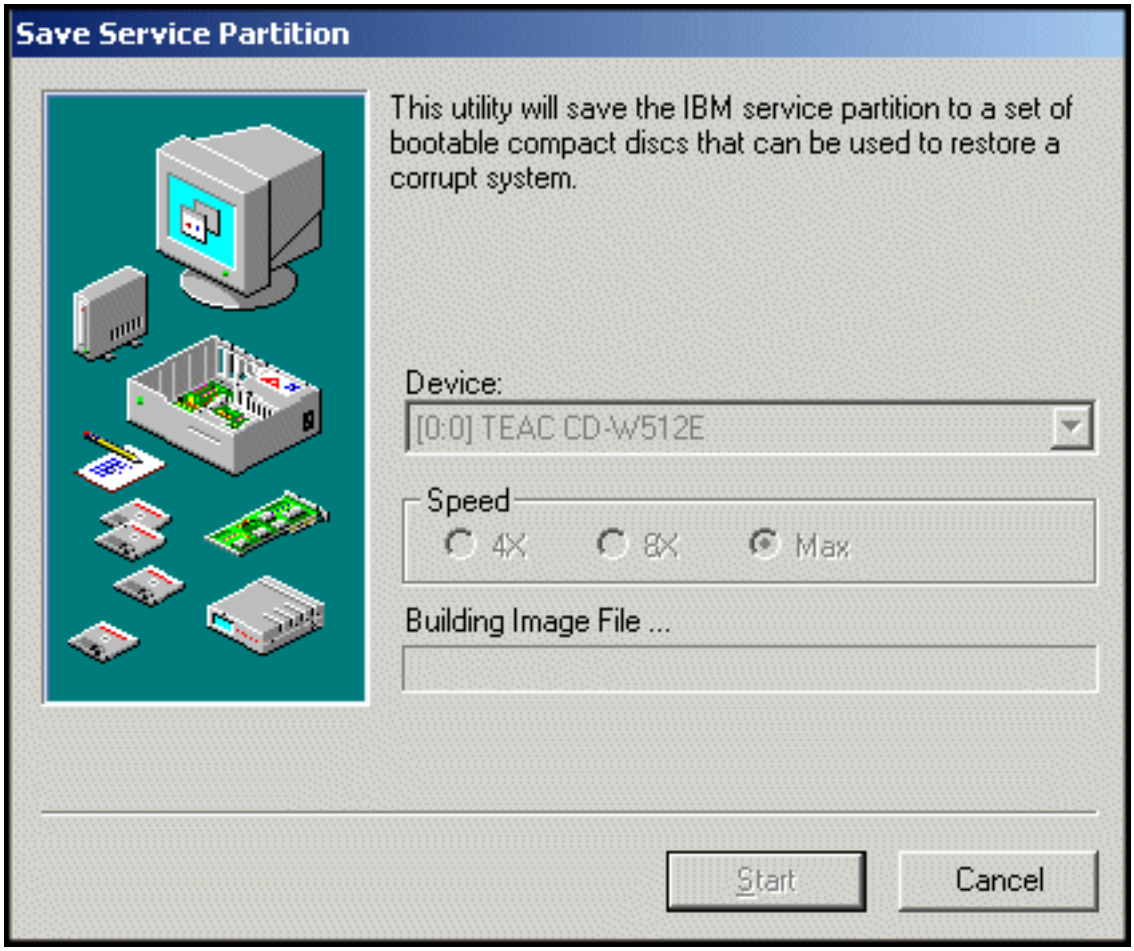


Figure 66. CD-R Save Service Partition screen

6. You can view the progress of copying the service partition to the CD-R by viewing the onscreen progress bar.

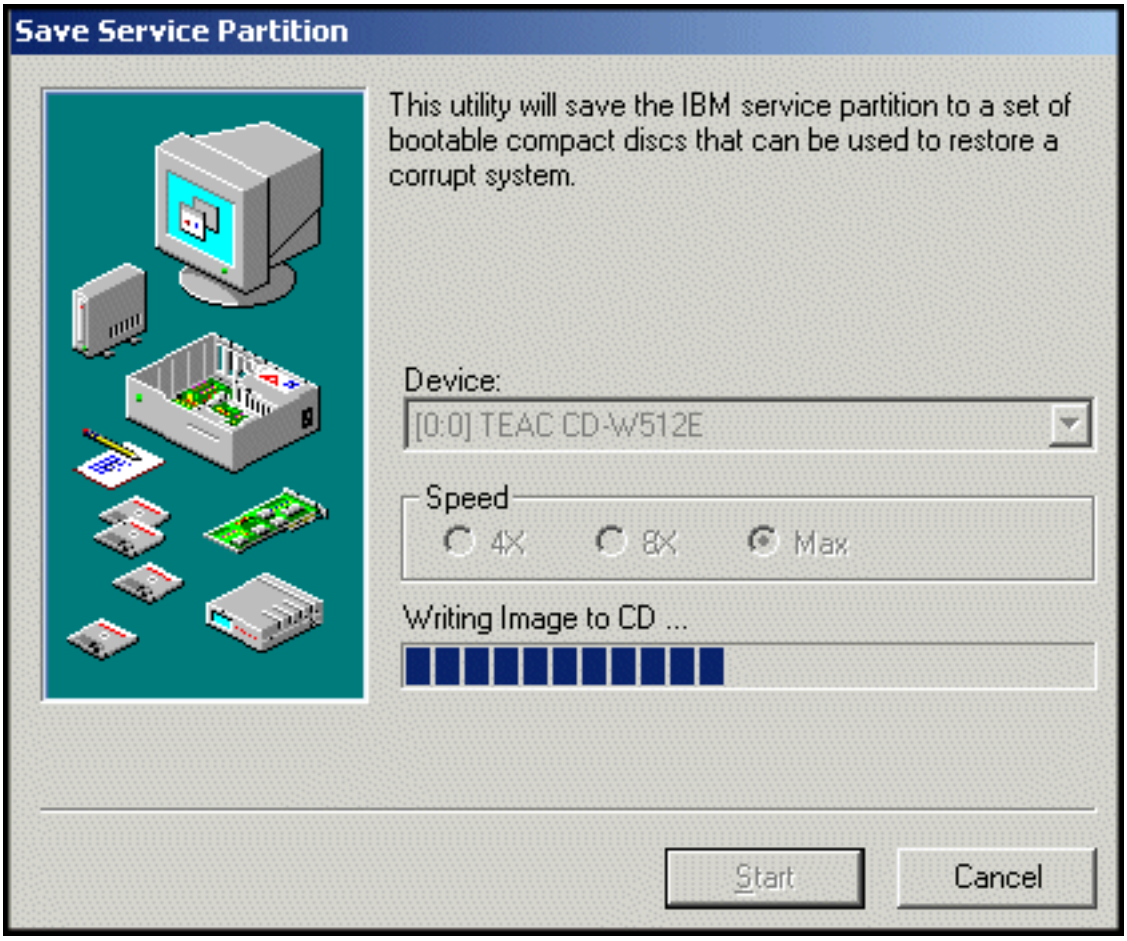


Figure 67. CD-R progress bar

Scheduling automated backups

The Schedule feature enables automated backups to take place on a daily, weekly, or monthly basis at a day and time of your choosing. In addition, you can disable the Schedule feature so that backups will only take place when you initiate the process manually. For more information on performing manual backups, see "Manual backups" on page 53.

By default, backup operations are scheduled to take place every Monday at 12:00 am. Depending on how critical your data is or how often it changes, you might want to change the schedule so that backup operations take place more or less often.

Important:
A backup will not take place if your computer is powered off (shut down) or is in sleep mode (standby) when a backup operation is scheduled to take place. Rather, when you start/awake your computer, Rapid Restore prompts you to begin the missed backup operation at that time.

Scheduling backups

To set or modify a backup schedule, follow the instructions below.

1. Access Rapid Restore's main console. For detailed instructions, see "Opening the main console" on page 45.
2. Click **Schedule**.

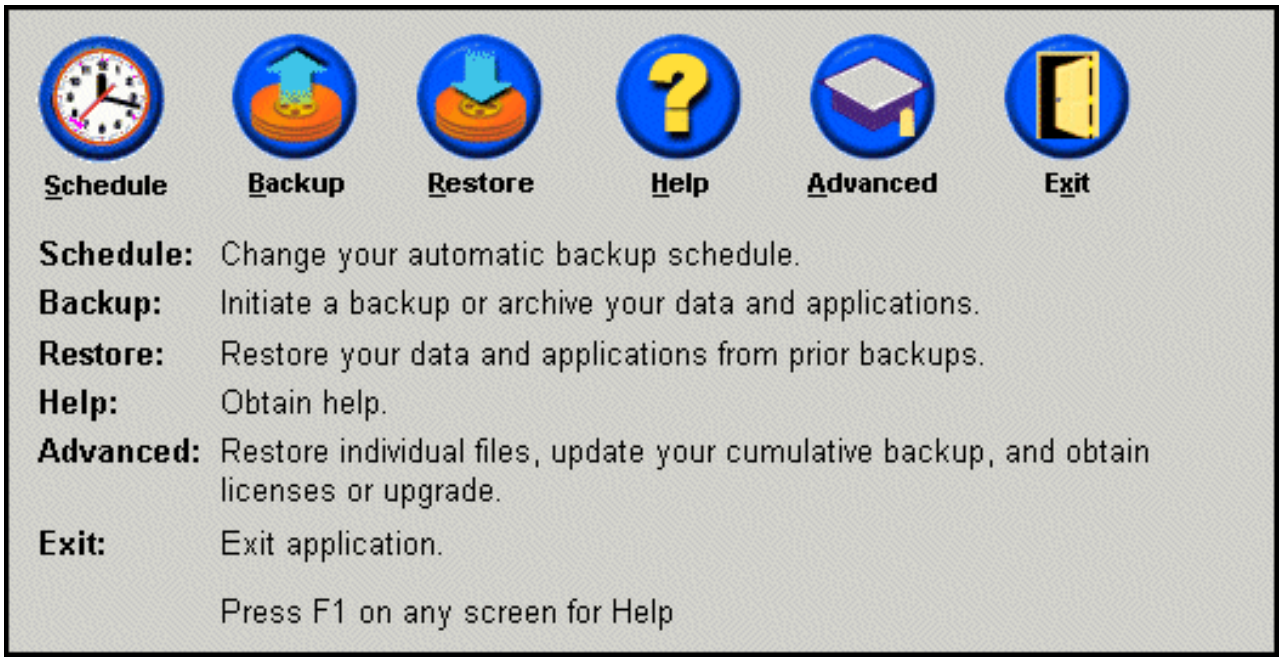


Figure 68. Main console screen

3. Select the **Schedule** option.

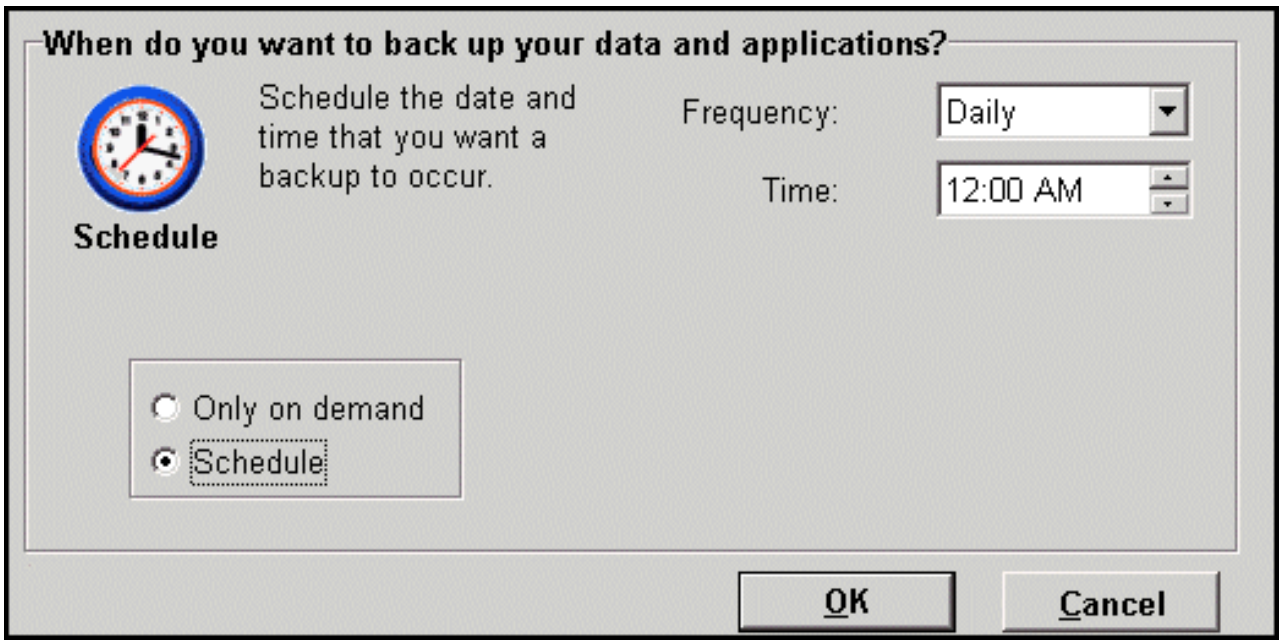


Figure 69. Schedule backup screen

4. Select how often you want to perform a backup by selecting the appropriate option from the **Frequency** drop-down menu. Depending on the frequency option selected, additional information may be required (e.g., time, day of week, etc.).

   Note: Rapid Restore does not allow you to specify a scheduled monthly backup to take place on the 29th, 30th, or 31st day of the month. However, you can schedule the backup operation to take place on the last day of the month.

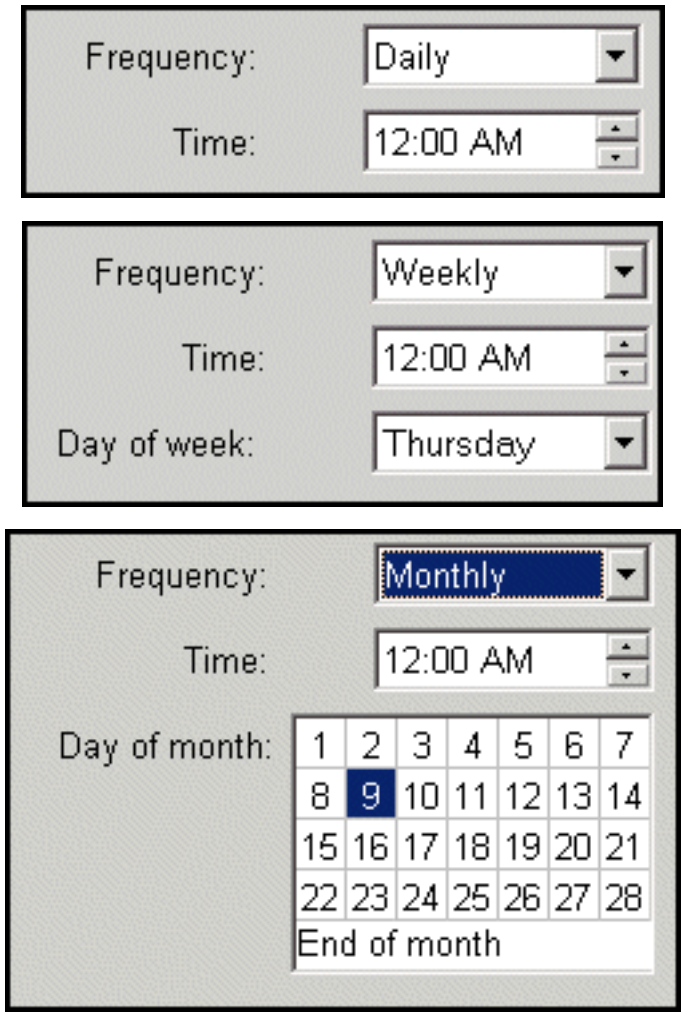


Figure 70. Scheduled backup frequency options

5. After selecting the appropriate scheduling settings, click **OK**.

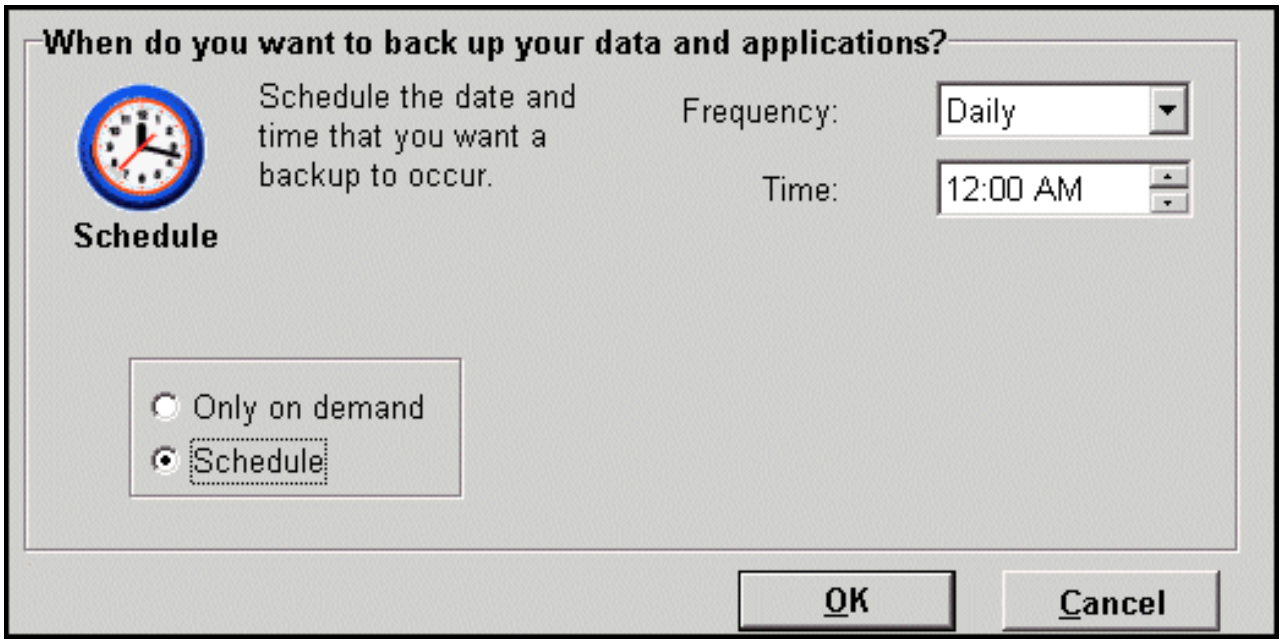


Figure 71. Schedule backup panel

Disabling scheduled backups

You can disable scheduled backups so that backups are only performed when initiated through the Rapid Restore console. Automatic backup operations cease until you re-enable the Schedule feature. For additional information about performing a manual backup, see "Manual backups" on page 53.

To disable scheduled backup operations, complete the following steps.

1. Access Rapid Restore's main console. For detailed instructions, see "Opening the main console" on page 45.
2. Click **Schedule**.

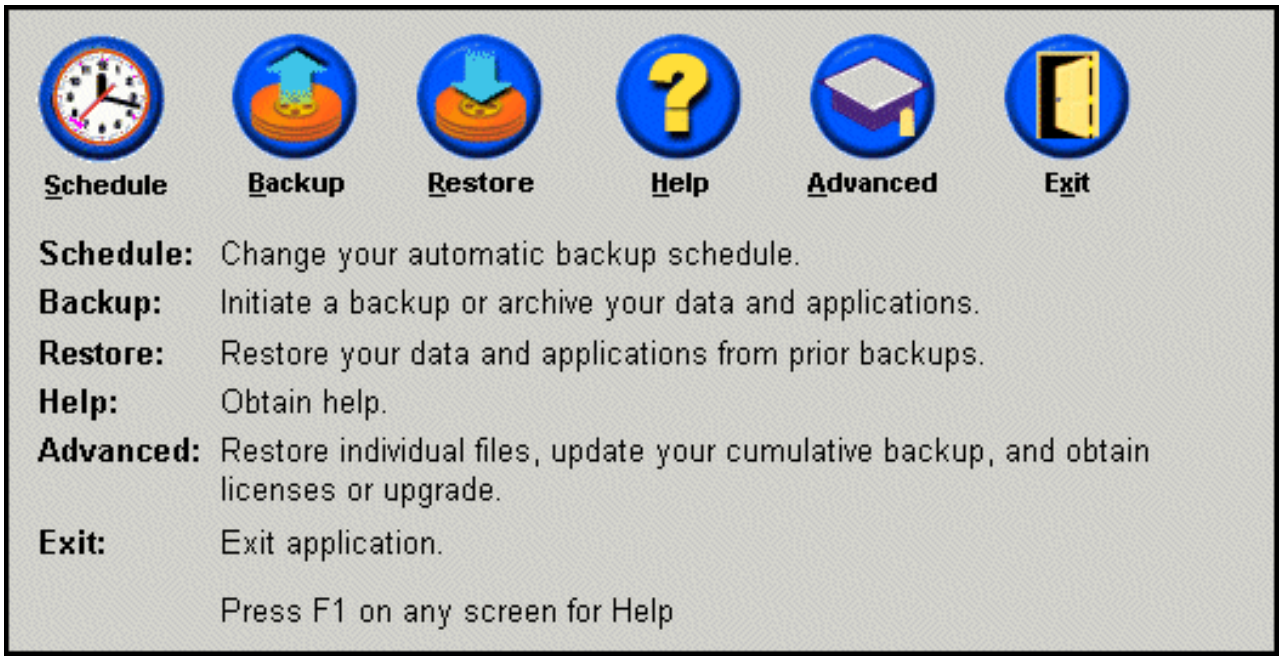


Figure 72. Main console screen

3. Select the **Only on demand** option.
4. Click **OK**.

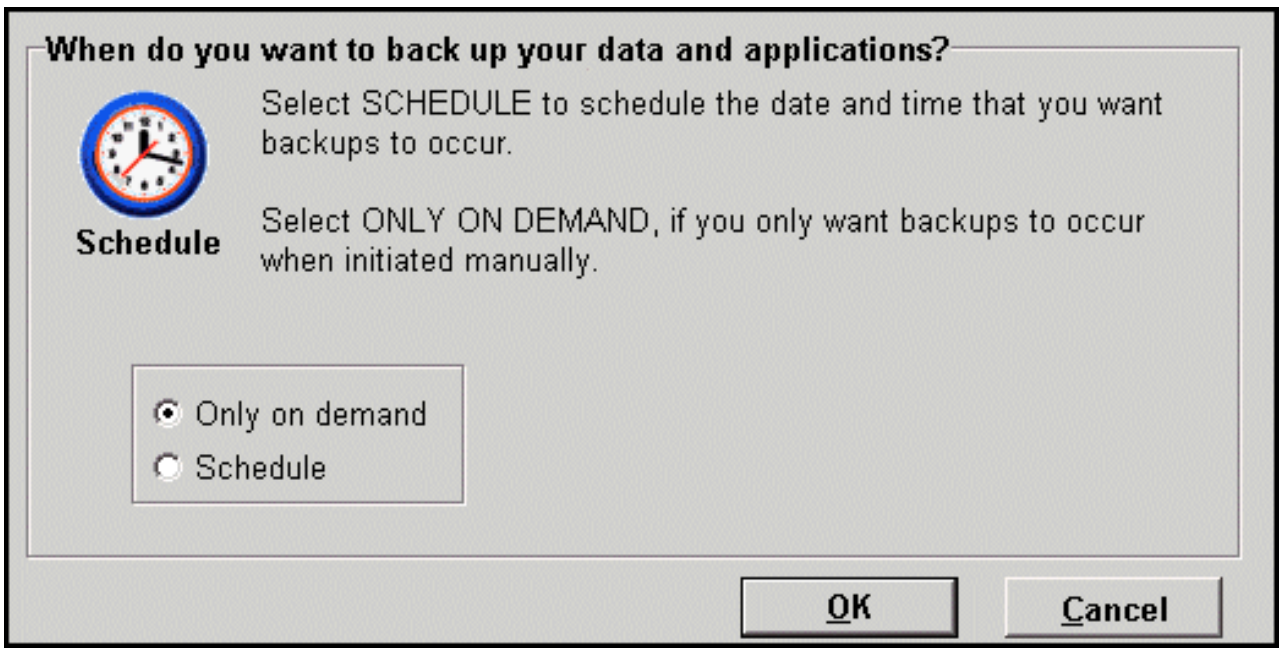


Figure 73. Schedule backup screen

Chapter 7. Migrating to a larger hard disk

One Button Migration

Rapid Restore's One Button Migration (OBM) enables you to move your existing disk image to a new, larger hard disk. OBM accomplishes this by copying your primary hard disk's service partition and boot manager onto your secondary hard disk. Then, through the One Button Restore Manager's pre-OS interface, you can restore your disk image from your new hard disk's service partition.

The most common reason for migrating to a new hard disk include hard disk error messages as well as the need for additional storage space. The main obstacles most people encounter when performing a disk migration include the lack of IT knowledge required to successfully complete the process and the decreased productivity resulting from the downtime directly related to the migration process.

OBM's "smart" migration technology eliminates these barriers so you can effectively and efficiently migrate your entire disk image (including data) without compromising your uptime or data integrity. In addition, OBM handles all the complex decision-making so you don't need to be an IT expert to properly migrate to a new hard disk.

Migrating to a New Hard Disk

Rapid Restore adapts to changes in your computer's hardware configuration, automatically notifying you upon the discovery of a second hard disk. This auto-discovery intelligence translates to increased flexibility as you can install a secondary hard disk on an "as needed" basis.

During the migration process, OBM deletes all existing partitions and data on your secondary hard disk. Therefore, if your secondary hard disk contains files you want to access in the future, make sure to make copies of these files prior to commencing the migration process.

Important

One Button Migration requires the secondary hard disk's capacity to be equal to or greater than that of the primary hard disk.

© Copyright IBM Corp. 2002

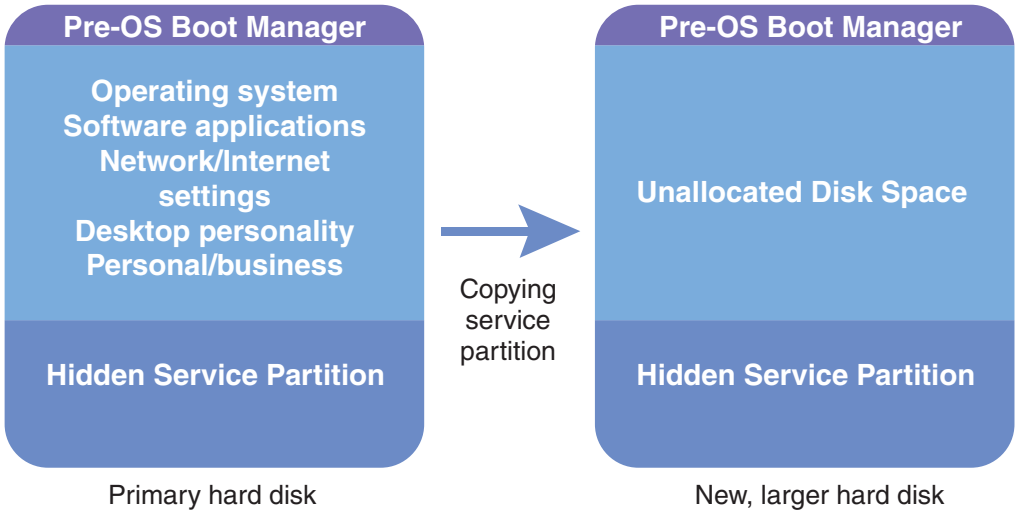


Figure 74. One Button Migration process

The instructions below assume Rapid Restore and the secondary hard disk are already installed.

1. Access Rapid Restore's main console. For detailed instructions, see "Opening the main console" on page 45.
2. Rapid Restore automatically discovers the secondary hard disk and prompts you as illustrated below. Select the **Data Migration to a Larger Drive** option and click the **OK** button to begin the migration process.

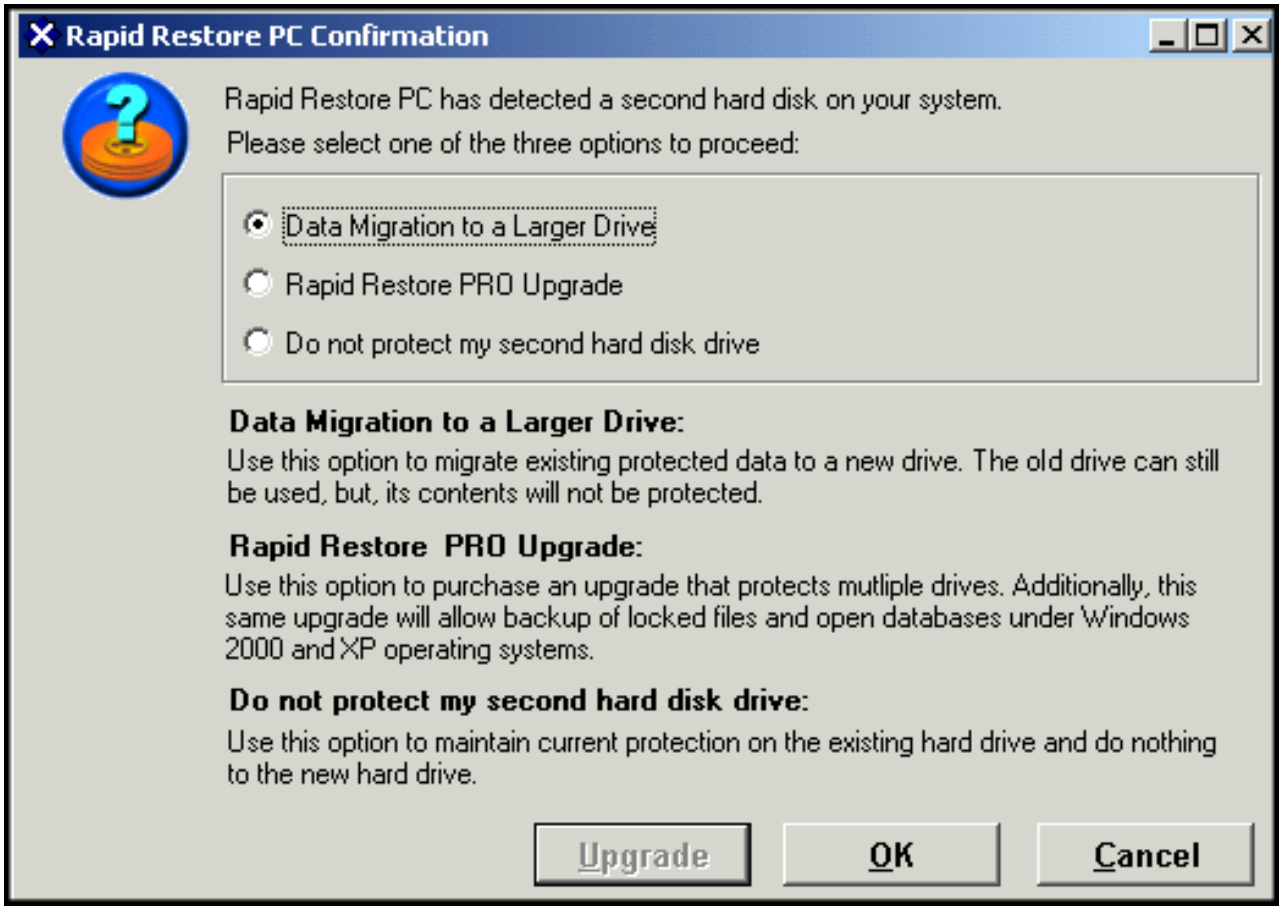


Figure 75. Data migration screen

3. Rapid Restore displays a confirmation screen containing important instructions you will need to perform upon completion of the migration process. Read the instructions and click the **OK** button to initiate the migration process.

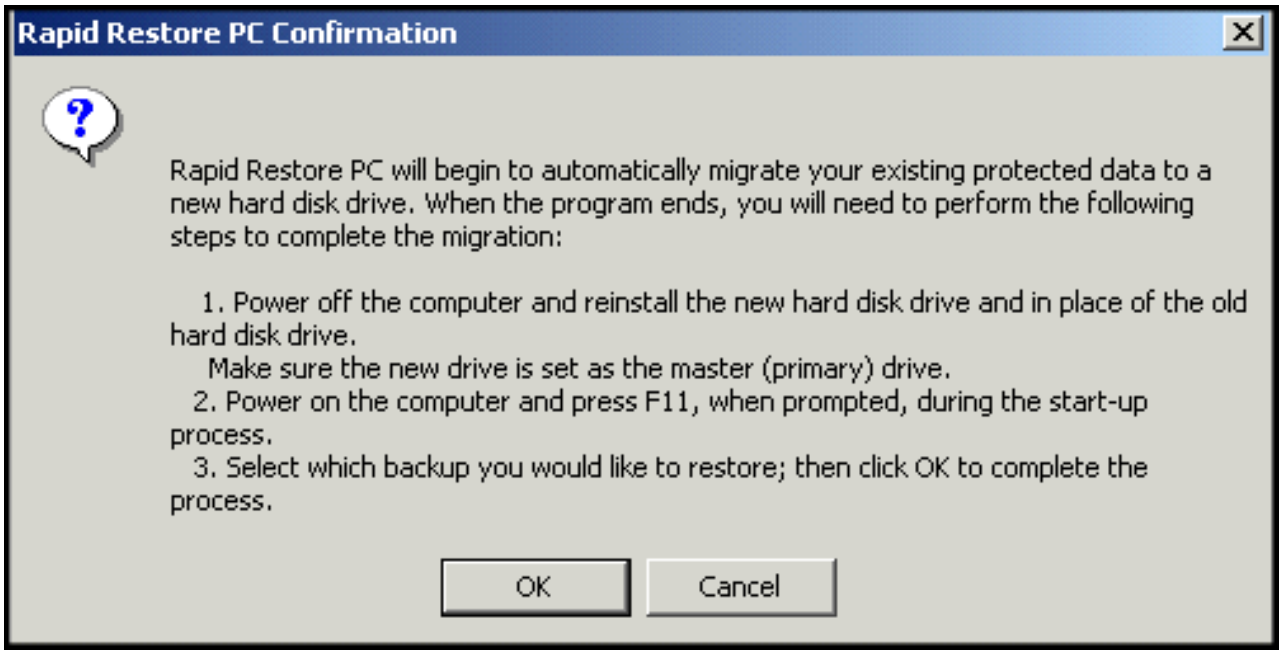


Figure 76. Migration confirmation screen

4. Rapid Restore performs a backup of your primary hard disk's Boot Manager and service partition and then copies these onto your secondary hard disk. You can monitor the progress of the backup and data migration processes by viewing the onscreen Backup and Copy Service Partition progress bars, respectively.

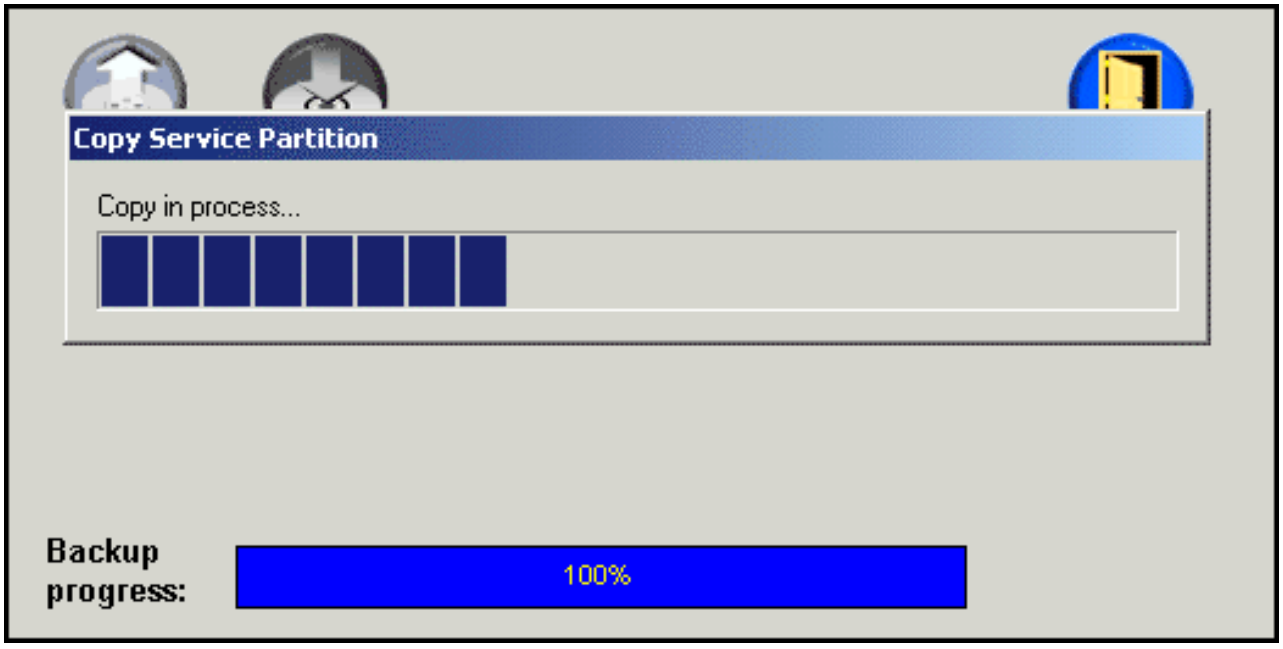


Figure 77. Copy Service Partition progress bar

5. When the migration is completed, shut down your machine, swap out your primary hard disk, and move your secondary hard disk (the disk containing the migrated data) into the primary hard disk's channel.

Figure 78. SCSI and IDE hard disk interfaces

6. Boot your machine and press the F11 key before the Windows operating system commences to access the One Button Restore Manager's pre-OS interface.

   Note: The OBRM's pre-OS prompt (F11) is available for approximately 3-4 seconds.

Figure 79. One Button Restore Manager (F11) prompt

7. Perform a restoration as discussed in "Before Windows Starts (Pre-Operating System Interface)".

"Before Windows Starts (Pre-Operating System Interface)". Congratulations, you have successfully completed migrating to a new hard disk! The discarded hard disk can be formatted and then used in another machine.

Chapter 8. Restoring your system

Introduction

Restoring your system is the process of "rolling back," or reverting, to a previously known hard disk state. Rapid Restore's One Button Restore Manager enables you to restore your system to any of three backed-up states (base image, cumulative backup, and most recent backup). In addition, Rapid Restore's C D-R integration capabilities allow you to archive additional backups to CD-R (CD-Recordable) and then use these CDs to restore your system.

The One Button Restore Manager (OBRM)

The One-Button Restore Manager (OBRM) is the "central nervous system" of Rapid Restore. The OBRM restores your hard disk from a protected, hidden service partition stored on your hard disk. The result is an "intelligent" diskette-less restoration containing everything—your operating system, software applications, registry settings, network settings, fix packs, desktop settings, data files, recycle bin, and so on—in the exact state as when you created the backup.

The OBRM is extremely powerful allowing you to easily restore the contents of your hard disk to one of three previously known states. In addition, the OBRM integrates with several Rapid Restore components enabling you to restore your entire disk image from the following entry points:

Windows Graphical User Interface (Windows Interface)

In the event of the deletion of essential data, computer virus, or any other catastrophe requiring you to revert to a previous version of your hard disk, you can use the graphical user interface to initiate a full or single file restoration.

Before Windows Starts (Pre-Operating System Interface)

In the event of a complete operating system failure, or if you are unable to start the application through the Windows interface, you can use the pre-operating system mode of the OBRM to initiate a full restoration.

The pre-OS interface is assessable during the time period after the boot process begins and before the Windows operating system initializes. During this time frame, an onscreen display informs you that pressing the F11 key will access the OBRM's system recovery menu.

Figure 80. One Button Restore Manager (F11) prompt

Note: If other software such as ImageUltra or IBM Product Recovery are installed on your machine, pressing F11 may access an intermediary window prompting you to select an application. If this occurs, select Rapid Restore to access the OBRM.

© Copyright IBM Corp. 2002

Large enterprise IT Administrators may prefer to hide the instructions for accessing the OBRM's pre-OS interface from the end user. This can be performed by modifying the BIOS settings (on certain models) or using Rapid Restore's command-line interface. Refer to your PC's documentation for instructions on modifying the BIOS settings.

When accessed, the OBRM's pre-OS interface provides a list of backup sets from which your system can be restored.

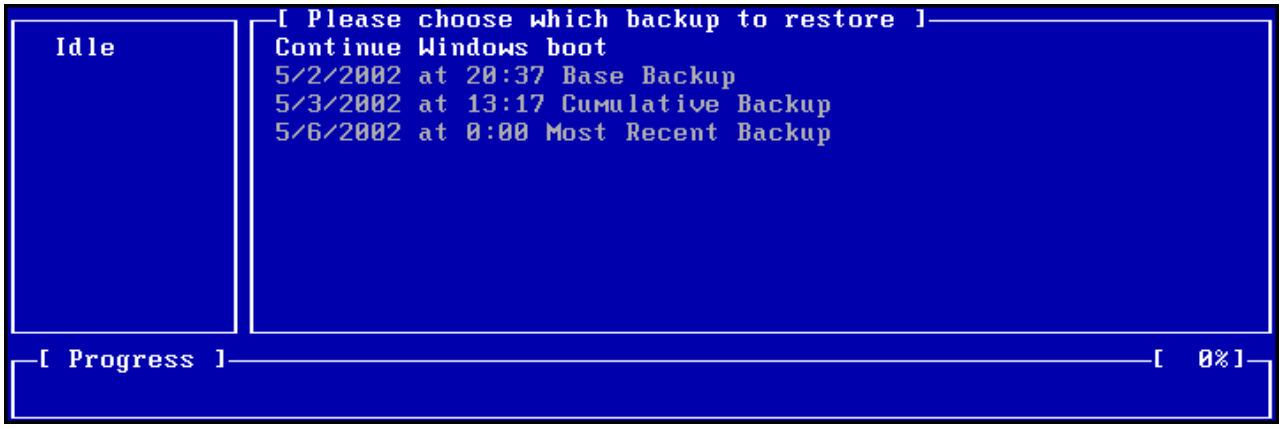


Figure 81. One Button Restore Manager's System Recovery menu

Restoring in Windows Mode

To restore the entire contents of your hard disk from the Windows interface, follow the steps below.

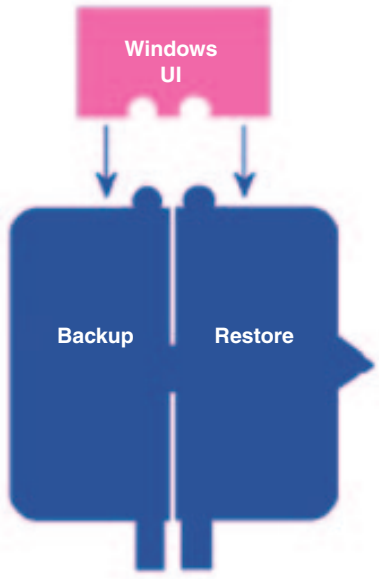


Figure 82. One Button Restore Manager's Windows interface

1. Close all open application programs.
2. Access Rapid Restore's main console. For detailed instructions, see "Opening the main console" on page 45.

3. Click the **Restore** button.

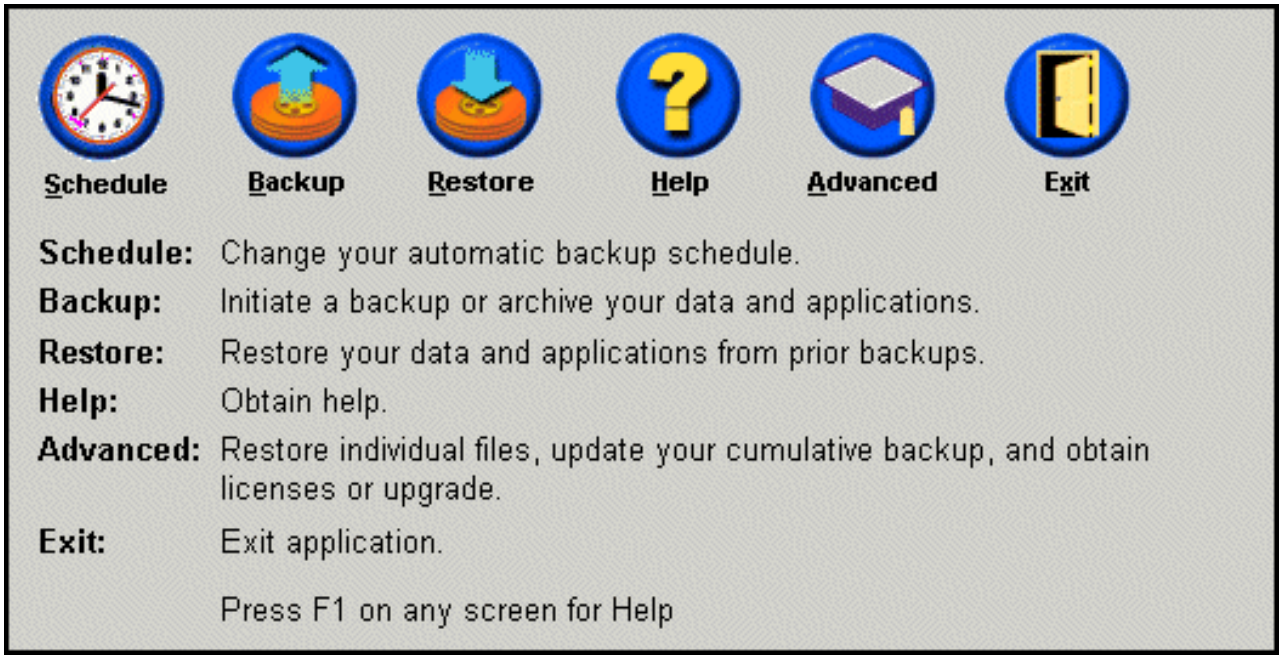


Figure 83. Main console screen

4. Click the **Restore** button.

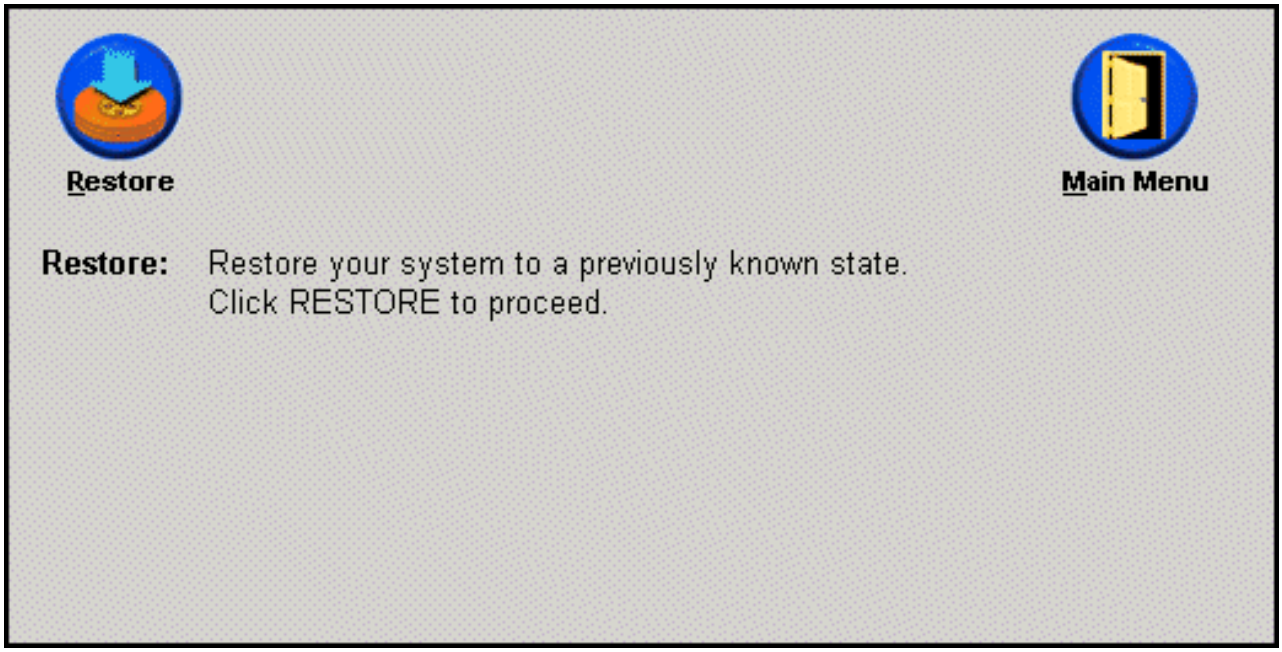


Figure 84. Restore screen

5. You are prompted that the restoration may involve several reboots. Click the **OK** button to continue.

Figure 85. Warning message

6. Select one of the following backup options and click the **Restore** button.
   - **Base Backup** - This option restores your hard disk to the state it was in when Rapid Restore was installed and will always be the oldest available backup image.
   - **Cumulative Backup** - This option restores your hard disk to the state it was in on the date indicated.
   - **Most Recent Backup** - This option restores your hard disk to the state it was in on the date indicated and will always be the most recent backup.

Important

Do not power off your computer or interrupt the restoration until the operation is complete.

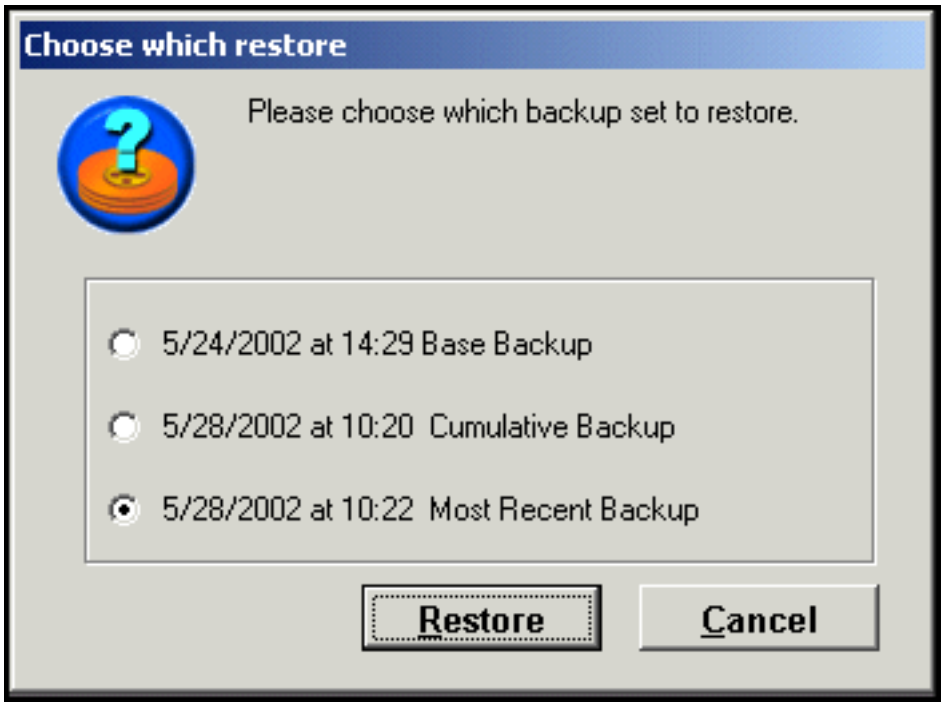


Figure 86. Restore options

7. You are prompted that your computer is about to reboot. Click the **OK** button to continue.

Figure 87. Reboot confirmation message

8. Upon rebooting, Rapid Restore begins the restoration process. You can view the restoration's completion percentage by viewing the onscreen progress bar.

   Note: Your machine may reboot multiple times before the restoration process is complete.

Restoring in Pre-Operating System Mode

In the event of a complete operating system failure, or if you are unable to start Rapid Restore through its Windows interface, you can use the OBRM's pre-operating system interface to perform a restoration.

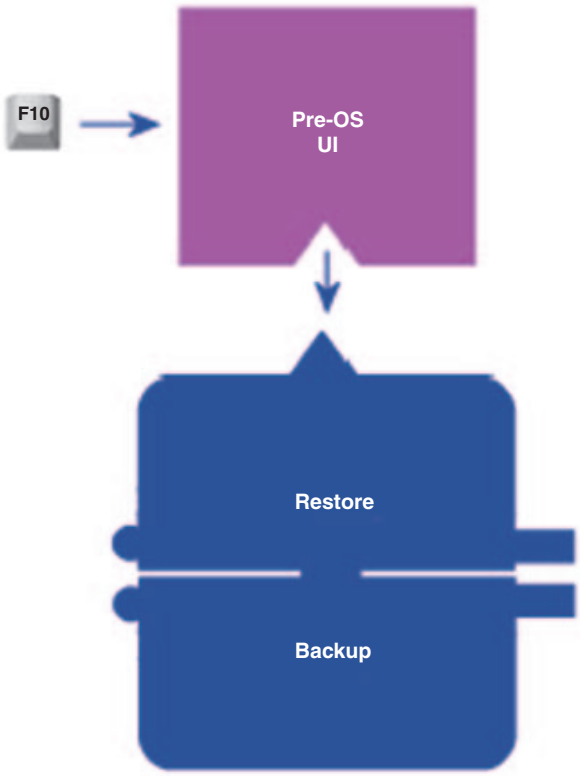


Figure 88. One Button Restore Manager's pre-OS interface

To access the OBRM's pre-operating system interface, follow the steps below.

1. Turn on your computer (or reboot your machine if it is already running) and press the F11 key during system startup.

   Note: Depending on the manufacturer of your PC, the system recovery message indicating when to press the F11 key during the boot process may not be present. If you do not see the system recovery prompt, press and hold the F11 key and then turn on your PC. Then, release the F11 key once the OBRM's System Recovery menu displays.

Figure 89. One Button Restore Manager (F11) prompt

2. When the OBRM's System Recovery menu displays, use your arrow keys to highlight the desired recovery option and press the **Enter** key.

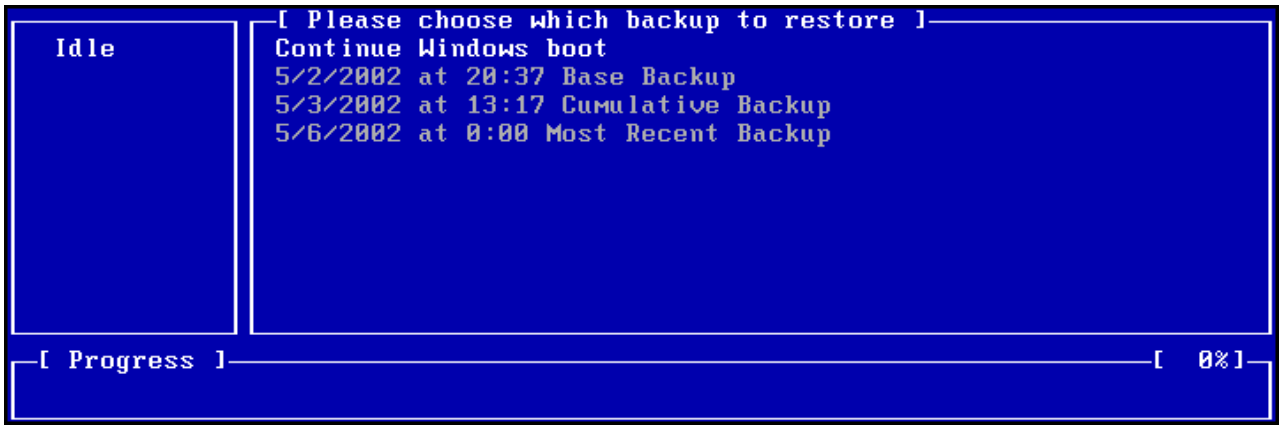


Figure 90. One Button Restore Manager's System Recovery menu

3. A confirmation screen displays the backup from which your system will be restored. Press the Yes option to begin the restoration process.

   Note: You can abort the restoration by pressing the No option.

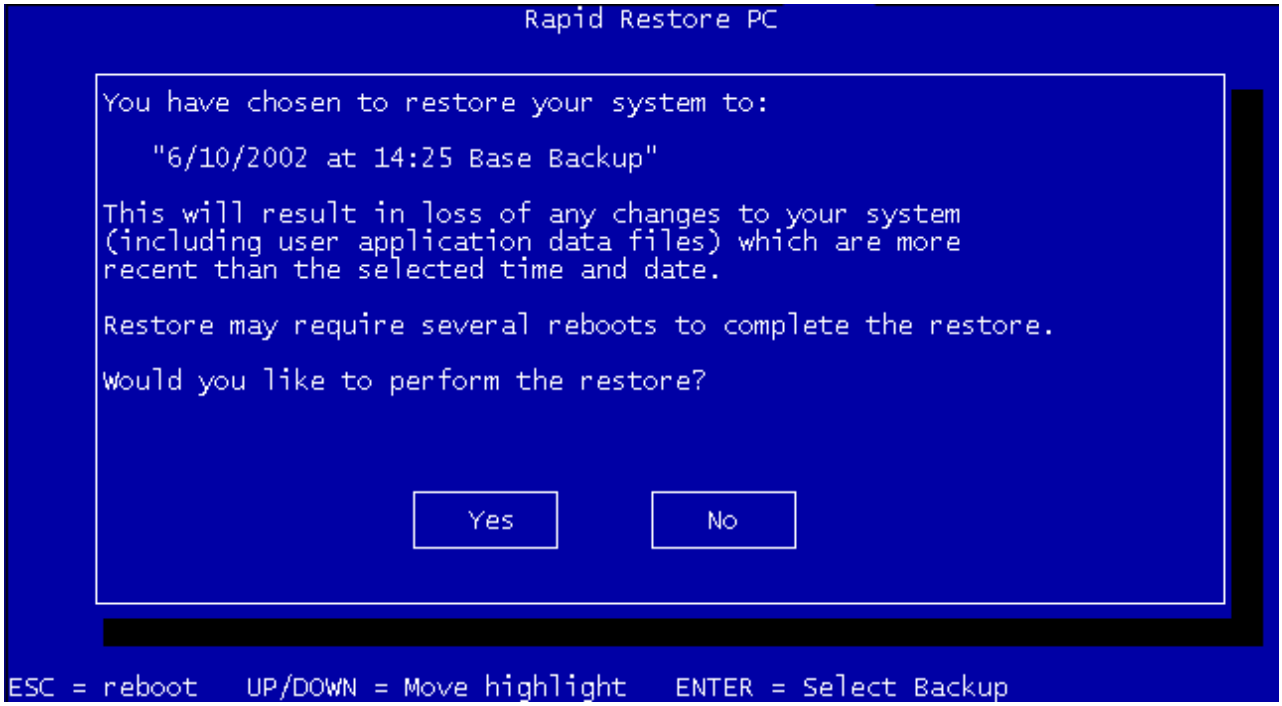


Figure 91. One Button Restore Manager's confirmation screen

4. Rapid Restore begins the restoration process. You can view the restoration's completion percentage by viewing the onscreen progress bar.

   Note: Your machine may reboot multiple times before the restoration process is complete.

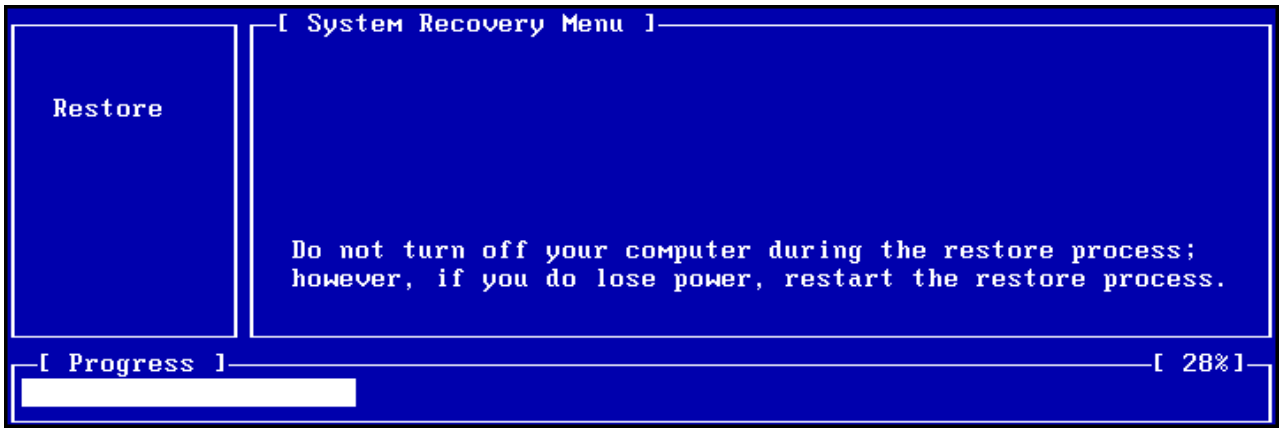


Figure 92. One Button Restore Manager's pre-OS progress bar

Restoring from a CD-R Archive

Rapid Restore enables you to recover your system from a CD-R containing a copy of your service partition (created by Rapid Restore's CD-R archiving utility). While the restoration process is slightly different than restoring from the service partition on your hard disk, the result is the same—a complete recovery of your system to a known point in time. To restore from a CD-R, follow the instructions below.

1. Close all open applications and insert your archive CD-R (Volume 1) in your CD-R(W) drive.
2. Reboot your machine.
3. You are prompted to continue with the restoration process. Press the Y key to continue.

Note: If your machine does not recognize the CD-R prior to booting into Windows, you must change your BIOS settings to detect the CD-R(W) drive before booting into Windows. Refer to your PC's documentation for instructions on modifying the BIOS settings.

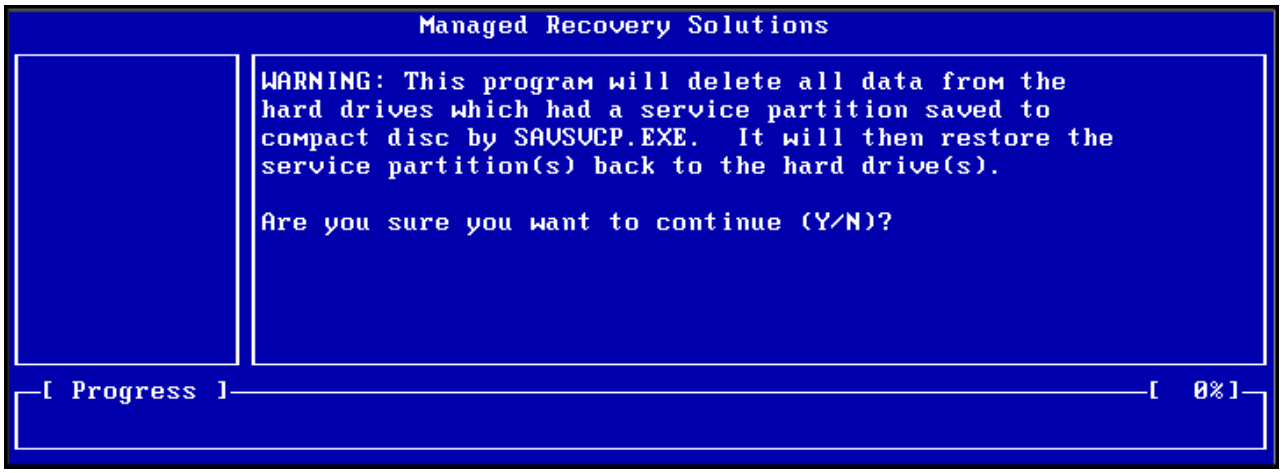


Figure 93. CD-R recovery confirmation message

4. You are reminded that restoring your system includes deleting all existing data and you are prompted to confirm the initiation of the restoration process. Press the Y key to continue.

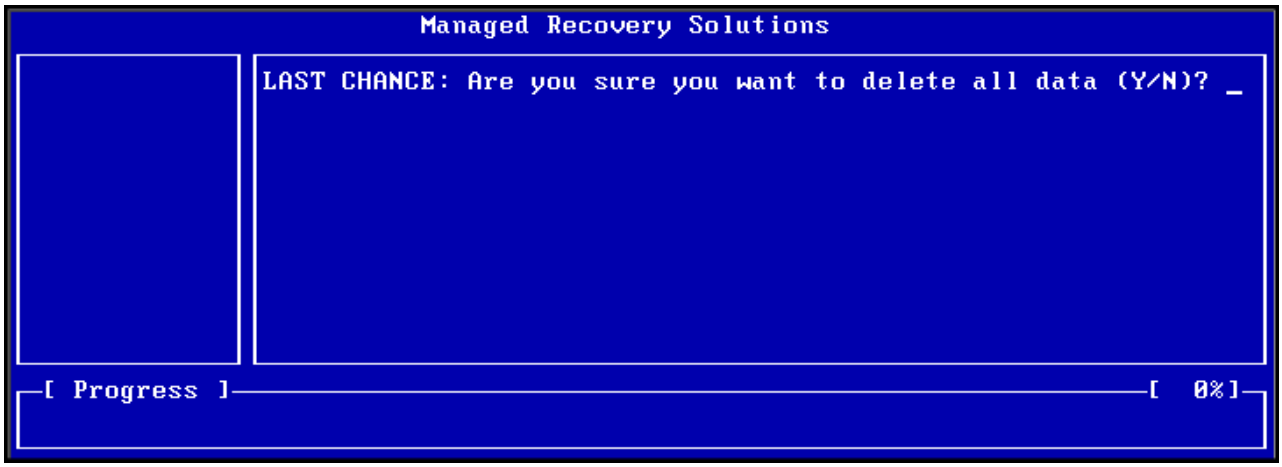


Figure 94. Final CD-R recovery confirmation message

5. You can view the restoration's completion percentage by viewing the onscreen progress bar. Depending on the size of your service partition archive, you may, at some point during the restoration process, be prompted to insert CD Volume 2, CD Volume 3, etc.

   Note: Your machine may reboot multiple times before the restoration process is complete.

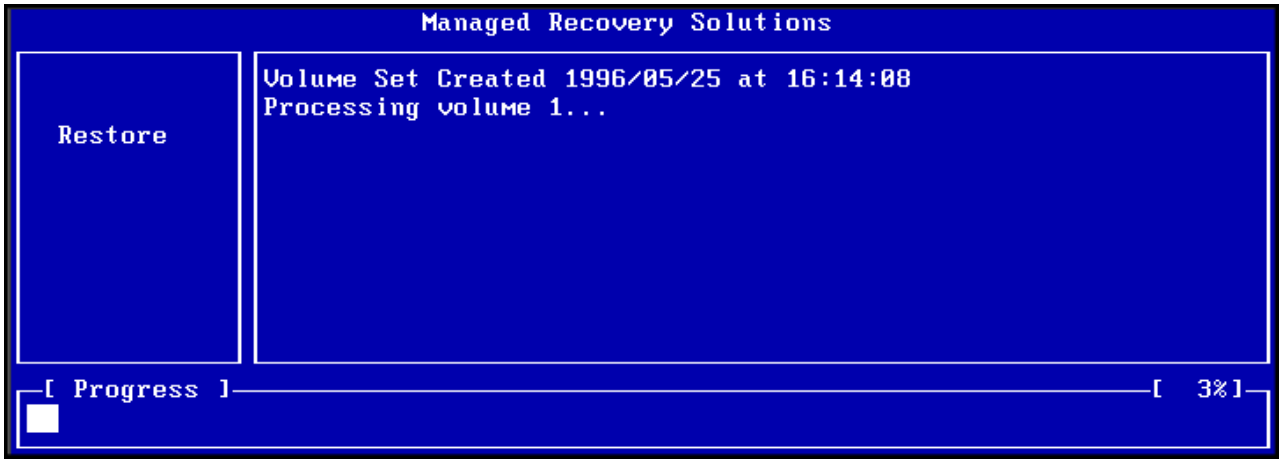


Figure 95. CD-R recovery onscreen progress bar

Restoring a Single File

Rapid Restore enables you to easily recover individual files from your cumulative and most recent backups. This feature is extremely useful if you accidentally overwrite a critical file, or if you accidentally delete a file and empty the Windows Recycle Bin before realizing you deleted the file.

To recover one or more individual files, follow the steps below.

1. Access Rapid Restore's main console. For detailed instructions, see "Opening the main console" on page 45.
2. Click the **Advanced** button.

Figure 96. Main console screen

3. Click the **Single File Restore** button to open the single file folder within Windows Explorer.

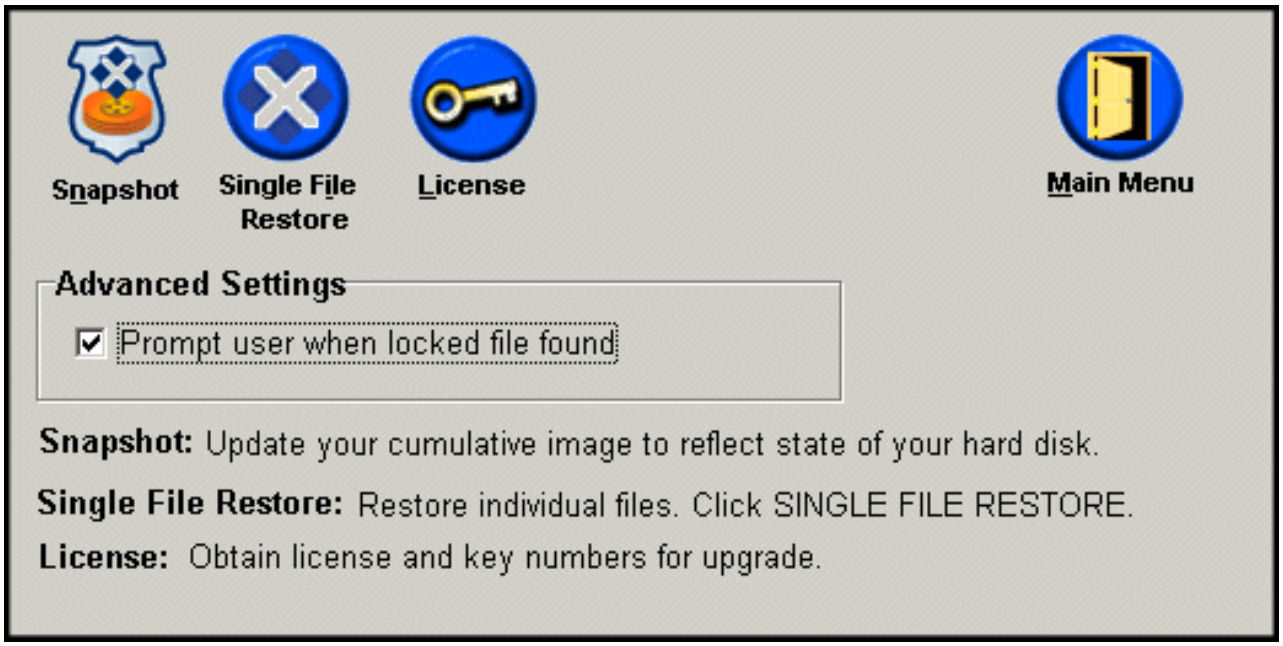


Figure 97. Advanced screen

4. Open the **Single File Restore** folder. Within the folder there are two subfolders:

- Drive[C]_Cumulative_Backup_date_at_time (where date and time refer to the date and time of the backup, respectively)
- Drive[C]_Most_Recent_Backup_date_at_time (where date and time refer to the date and time of the backup, respectively)

  The structure of these folders is similar to the structure of your hard disk. You might need to open additional subfolders beneath the root single file restore folder to locate the file you want to restore.

  Note: Only files created or modified since Rapid Restore was installed are listed in the single file restore folders. If the file you want to restore is not in either folder, you cannot restore it using this method; you will have to perform a complete recovery.

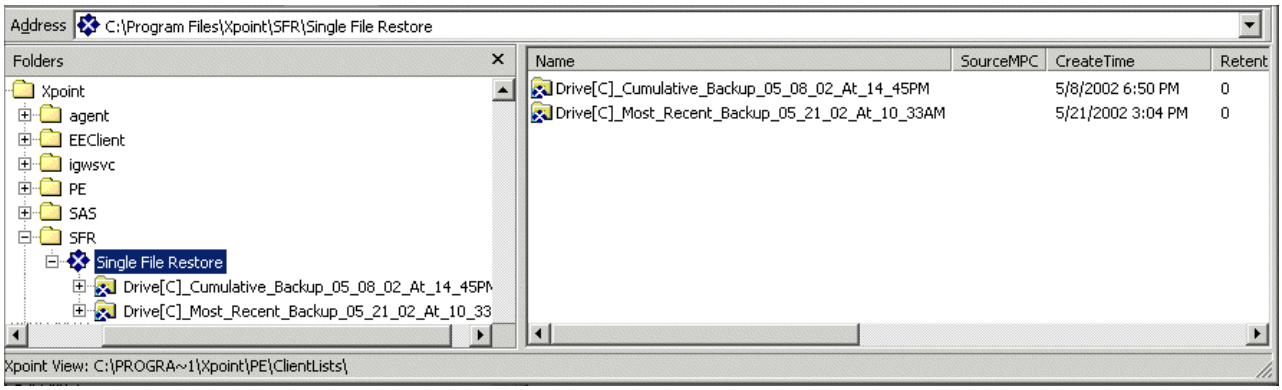


Figure 98. Single file restore explorer window

5. When you locate the file, either double-click or right-click the file to access the single file restore shortcut menu and select one of the following options:
   - **Restore** - Restores file to its original location
   - **Restore to** - Enables you to specify the folder to which you want to restore the file.

   Note: The single file restore feature does not support drag-and-drop operations.

Figure 99. Single File Restore shortcut menu

6. A message confirms the successful completion of the file's restoration. Click the **OK** button.

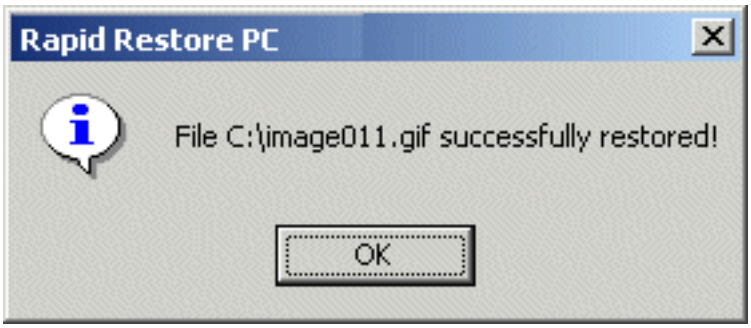


Figure 100. Single File Restore confirmation message

Appendix A. Troubleshooting

The following information provides helpful information in the event that you encounter problems using Rapid Restore.

General troubleshooting information

The following information might be helpful if you encounter trouble using the Rapid Restore software.

- When running Rapid Restore in a Windows 2000 or Windows XP environment, you must log in with administrative privileges to access all files required during the backup process. You must also log in as an administrator to open the GUI or uninstall the software.
- After you install Rapid Restore on an IBM computer that has a disk-to-disk recovery file, you can access the original preload recovery file by pressing F11 during startup, and then pressing F5 on the Rapid Restore screen.
- When new Windows users are created, the system must be rebooted before the new users can be backed up.
- Do not use Rapid Restore in conjunction with any other backup or utility software that modifies the master boot record. Software that modifies the master boot record of your hard disk might render your backups inaccessible. Such software includes, but is not limited to, Roxio GoBack, System Commander, and PowerQuest BootMagic.
- If the Rapid Restore boot record is overwritten by another program and you need to restore the boot record, do the following:
  1. Go to a command prompt and change the directory to
     `C:\PROGRAM FILES\XPOINT\PE\DIAG`
  2. Run "..\pcrecsa bmgr /Fmgr.dat /D1"

  Note: If another program modified the boot record, restoring it to the Rapid Restore boot record might cause the other program to function improperly.
- Norton Antivirus 5.0 might not be able to read the boot record of the hard drive.

Alert messages

Rapid Restore provides advance alert messages for hard disk drives when performance parameters indicate that a hard disk partition might run out of storage space. An error message might display if a drive is failing or a partition is completely out of space. When you receive an alert message, follow the instructions on the screen.

Troubleshooting installation problems

This section provides troubleshooting information for installation problems.

Installing on Windows XP

When you install Rapid Restore on computers running Windows XP, fast user switching, auto logon, and the Windows XP Welcome screen will be disabled. These features cannot be re-enabled after installation. Uninstalling the program will

© Copyright IBM Corp. 2002

not resolve this issue. However, a registry file can be provided that, when imported, will enable fast user switching and the Windows XP Welcome screen.

You are prompted for a Rapid Restore license

To use Rapid Restore, you must enter a valid license. If a valid license is not detected, you are prompted to retry entering this information. For more information, see "Accessing license information" on page 47.

Partitions are not assigned drive letters

Neither Windows nor Rapid Restore assign drive letters to hidden partitions (for example, partition types 06, 07, 0B, 0C, and 0E are hidden by changing their partition type to 16, 17, 1B, 1C, and 1E, respectively).

To unhide these partitions (change 1x to 0x), you must use a partitioning utility program or Debug commands.

Problems after adding or changing drive letters

Rapid Restore must be uninstalled and then reinstalled should a drive letter change. For more information, see Chapter 4, "Installing Rapid Restore", on page 15.

Icons do not display properly

If the Rapid Restore icons do not display properly, make sure the following display properties are set to the following:

- 16-bit color, or higher
- 640 x 480 pixel resolution, or higher
- Large or small fonts

Multiple SCSI drives

Windows 2000 assigns drive letters based on SCSI IDs. For computers with multiple SCSI drives, Rapid Restore must be installed on your primary hard disk (HD0). In addition, make sure that the hard disk containing the operating system is set to the lowest SCSI ID.

Service partition cannot be created

If the service partition cannot be created during the installation of Rapid Restore or while Rapid Restore is attempting to increase the size of an existing service partition, you receive a message indicating the service partition could not be created due to insufficient space on the hard disk.

This message might be caused by any of the following conditions:

- Insufficient space available on your hard disk. Try deleting unneeded files. Or, install a larger second hard disk and let Rapid Restore migrate the contents of your primary hard disk to the new, larger hard disk. For more information on migrating data, see "One Button Migration" on page 63.
- Insufficient space in a primary partition adjacent to an existing service partition. Try deleting unneeded files. Or, install a larger second hard disk and let Rapid Restore migrate the contents of your current hard disk to the new, larger hard disk. For more information on migrating data, see "One Button Migration" on page 63.

- An extended partition is adjacent to an existing service partition. Rapid Restore cannot resize extended partitions. Consider converting the extended partition to a primary partition.

Unable to install Rapid Restore

Rapid Restore must be installed on the C: drive. Furthermore, if you are using SCSI hard disks, the C: drive must be installed on the lowest SCSI ID.

Uninstalling Rapid Restore

To uninstall Rapid Restore from a computer running Windows 2000 or Windows XP, you must logon to the computer with administrator rights. For more information on user accounts, refer to the documentation or online help that comes with the operating system.

When uninstalling Rapid Restore, you are prompted to retain or remove the backup files. The ability to recover your base backup depends on how you uninstall Rapid Restore:

- If you decide to retain the backup files, the recovery partition and boot manager are not deleted or removed. The original, or base, backup image is still recoverable from the recovery partition after you reinstall Rapid Restore.
- If you decide to remove the backup files, the recovery partition and boot manager are deleted as well. Therefore, if you remove the backup files, you cannot recover any backup information and must create a new base backup image after you reinstall Rapid Restore.

Partition troubleshooting information

Keep the following information in mind when working with Rapid Restore and drive partitions:

- Rapid Restore can only resize primary partitions.
- A service partition cannot be created on hard disk drives containing four primary partitions or an extended partition.
- If new partitions are added to a drive, Rapid Restore must be reinstalled. Previous backups will be lost.
- You can only create a service partition on the first hard disk in the system. Backing up to a different hard disk, or to a network is only supported on Rapid Restore Professional Edition, which is available for purchase at http://www.xpointdirect.com.

  IBM does not provide support on the Rapid Restore Professional Edition. Users who have upgraded will receive support from Xpoint, Inc. and should contact them for assistance when using Rapid Restore Professional Edition.
- When attempting to write an image to your hard disk using an IBM recovery program or a third party image utility after Rapid Restore has been installed, a message might be displayed stating that an error was found on your disk due to differing LBA and CHS values. If prompted to allow a fix of this error, your Rapid Restore backups and service partition might not be accessible.
- The following error messages might appear during the installation of Rapid Restore or while the program is trying to resize an existing service partition:
  - `The IBM service partition could not be created.`
  - `There is insufficient space on the hard disk.`

To resolve these messages attempt to clear some space on your hard disk, install a second hard disk drive, or upgrade your system to Rapid Restore Professional Edition. Rapid Restore Professional Edition will provide the option to migrate all of your data from the first disk drive to the second drive so you can then remove the first drive. During data migration, the new hard drive must be on the same IDE channel as the old hard drive. The fee-based upgrade of Rapid Restore is available at the http://www.xpointdirect.com Web site.

- Some disk utilities, such as Partition Magic, are not be compatible with Rapid Restore because Rapid Restore locks the IBM service partition, making the partition inaccessible to applications, including Partition Magic.

Troubleshooting backup problems

When running Rapid Restore in a Windows 2000 or Windows XP environment, you must log in with administrative privileges to access all files required during the backup process.

Rapid Restore cannot backup files that are greater than 2GB in size.

User accounts are included in backup and restore operations. Therefore, if you restore your system to a time when a user did not exist or had a different password, that user will not be able to log in.

If the Rapid Restore interface is closed while performing a Windows incremental backup, Rapid Restore will continue to backup files in the background.

Troubleshooting restore problems

User accounts are included in backup and restore operations. Therefore, if you restore your system to a time when a user did not exist or had a different password, that user will not be able to log in.

To restore a backup set from a CD, your CD drive must be a supported boot option for the computer you are restoring.

Backup or restore is slow

Backup and restore performance is directly related to the size (that is, the amount of data) and type of operation (for example, single file restore, snapshot backup, or most recent backup) performed. Below are some tips to improve overall backup and restore performance.

- Perform frequent backups.
- Do not run any programs while creating or restoring a backup. Running another program, such as an anti-virus program, while creating or restoring a backup will adversely affect backup performance. Be sure that you run anti-virus programs before or after performing a backup or restore operation.

  Note: To prevent possible database corruption, close all applications and services before performing a backup or restore.

Emptying the Recycle Bin or running FDISK

An error message might display if you attempt to empty the Recycle Bin or run FDISK while running Rapid Restore. If you receive this error message, close Rapid Restore and then empty the Recycle Bin or run FDISK.

Scheduling dates on the 29th, 30th, or 31st

Rapid Restore does not allow you to specify a scheduled backup on the 29th, 30th, or 31st day of the month, but you can schedule a backup for the last day of the month.

Unable to select the CD-R archive button

The CD-R Archive button is enabled only if a CD-RW drive is installed and configured correctly. If you cannot select the CD-R Archive button but are able to write CD-Rs using other software, the ASPI device driver required by Rapid Restore might not be installed on your computer.

Note: The ASPI device driver is pre-installed on computers with IBM factory-installed CD-RW drives, but might not be provided by other CD-RW drive manufacturers.

Restore issues

See "Troubleshooting backup problems" on page 84.

User cannot logon after a restore operation

This problem can occur on multi-user systems when a new user is added and a backup operation occurs before that user logs on for the first time. To remedy this problem, the IT Administrator must add the new user again and either restart the computer or have the new user logon before the next backup operation.

To prevent this problem in the future, restart the computer after adding a new user or ensure that the new user logs on before the next backup operation.

Power management troubleshooting information

The following information might be helpful if you encounter trouble while using the Rapid Restore due to power management issues, such as standby, hibernate, and power loss.

Rapid Restore will respond to a system request in the following manner:

- **When a Windows backup or CD-R Archive is in progress.** When a Windows backup or CD-R Archive is in progress and the system requests to enter standby/hibernate, Rapid Restore will stop the backup in progress and allow the power request to proceed. Upon resume, it will record the backup as failed and query the user to run the backup again.
- **When a Windows restore is in progress.** When a Windows restore is in progress, the power request will be rejected and the restore will continue.
- **When a DOS backup is in progress.** When a DOS backup is in progress, the power request will occur, and the user will have to reinitiate the backup.
- **When a DOS restore is in progress.** When a DOS restore is in progress, the power request will occur, and the user will have to initiate an F11 restore to return the machine to a stable configuration.

Encryption troubleshooting information

The following information might be helpful if you encounter trouble while using the Rapid Restore with encrypted files.

When user encrypted files are restored from an incremental backup, their files are encrypted with the administrator's keys, which make them unreadable from the user's account. The user must request the administrator to decrypt each encrypted file, and then the user can re-encrypt them.

Other users' encrypted files must be skipped during a Windows incremental backup. However, encrypted files belonging to a single user might be backed up in a Windows backup because the base backup will capture encrypted files from all users.

F11 Recovery Manager troubleshooting information

The following information might be helpful if you encounter trouble while using the Rapid Restore F11 Recovery Manager.

F11 Recovery Manager is not available

The Rapid Restore F11 Recovery Manager becomes available after an original backup image is created. If the F11 prompt does not display during startup, one of the following conditions might apply:

- **An original backup image has not been created.** Use Rapid Restore to create an original backup image.
- **The F11 prompt displayed too quickly.** Press and hold the F11 key and then turn on the computer. Release the F11 key when the System Recovery menu opens.

Troubleshooting One-Button Restore Manager (OBRM) problems

This section provides troubleshooting information for One-Button Restore Manager (OBRM) problems.

OBRM's pre-operating system component not accessible

The pre-operating system component is not available until a base backup image is created. If you already created a base backup image and the OBRM (**F11** key) prompt does not display during startup, one of the following conditions might apply:

- An full base backup image has not been created. Use Rapid Restore to create a base backup image. In this scenario, opening the Rapid Restore main console will prompt you to create a base backup. For instructions on accessing the Rapid Restore console, see "Opening the main console" on page 45.
- The OBRM (**F11** key) prompt displayed too quickly. Press and hold the **F11** key and then restart your computer. Release the **F11** key when the OBRM System Recovery menu displays.

Troubleshooting operating system issues

This section provides troubleshooting information for operating system problems.

Multi-Operating system/dual boot environment

Rapid Restore only supports machines running one operating system. See "Operating Systems" on page viii for a list of supported operating systems.

Appendix B. Glossary

Backup

Backup is the process of copying disk information so that it is preserved in case of equipment failures or software and operating system corruptions.

Base backup image

Original sector-based backup image of the primary hard disk created during the Rapid Restore installation process. This image is the foundation upon which cumulative and most recent backups are created.

Boot

Refers to the initial startup of a computer, such as when you power on or restart a computer.

Boot-time

The time during which a computer boots—when a computer starts up but the operating system has not yet taken over control of the computer. It is during this time that the OBRM's pre-operating system interface is accessible to the user.

Boot Manager

A software program stored in the master boot record that reads the boot sector record of the partition containing the operating system to be booted into RAM. In turn, that record contains a program that loads the rest of the operating system into RAM

Byte

A group of eight bits, which can represent a number from zero through 255, a letter of the alphabet, or a variety of other things.

CD-R

CD-R (for compact disc, recordable) is a type of write once, read many (worm) compact disc (CD) format that allows one-time recording on a disc.

CD-RW

CD-RW (for compact disc, re-writable) is a compact disc (CD) format that allows repeated recording on a disc.

CD-ROM

Compact Disk Read-Only Memory. An electronic media commonly used within the software industry to store information. As the name implies, the original contents of a CD-ROM cannot be modified.

Controller

© Copyright IBM Corp. 2002

A specialized electronic circuit that serves as an interface between a device, such as a hard disk, and a computer. IDE and SCSI are examples of hard disk controllers.

Cumulative backup

A compressed incremental backup. The cumulative backup stores differential, or incremental, information as it relates to the base image and most recent backup.

Data

Information processed by a computer. Examples of data include database files, word processing documents, and html pages.

Database

A collection of related information about a subject, organized in a useful manner that provides a base or foundation for procedures such as retrieving information, drawing conclusions, and making decisions.

Data Migration Manager

The Data Migration Manager (DMM) enables users to move their existing disk image to a new, larger hard drive. The most common reason for migrating to another hard drive is the need for additional storage space. The two main obstacles most people encounter when performing a disk migration include the lack of IT knowledge required to successfully complete the process and the decreased productivity resulting from the downtime directly related to the migration process.

The Data Migration Manager's "One Button Migration" feature eliminates these barriers so users can effectively and efficiently migrate their disk image and data without compromising their uptime or data integrity. In addition, Rapid Restore's built-in migration technology handles all the complex decision-making so users don't need to be IT experts to properly migrate their disk image and data to a new hard disk.

Disk drive

A type of storage device used by computers.

Diskette

Removable storage medium.

Disk Image

A disk image is a file containing an exact and complete sector-based image of your hard disk. The image contains everything on your hard disk including disk format and structure (for example, FAT), boot sector, directories, operating system, software, registry settings, network settings, and data. The benefit of creating disk images is that users can quickly restore their entire system without needing to reinstall their operating system, applications, etc.

Drive letter

In Windows and MS-DOS operating systems, the naming convention for hard disks, consisting of a letter, followed by a colon (for example, C: or D:).

Extended partition

A type of partition that overcomes the limitation of four partitions per disk drive as one or more logical drives may be created within an extended partition.

FAT

See "File Allocation Table (FAT)" on page 91.

FAT file system

The file system used by MS-DOS and adapted for Windows to store information on hard disks, which makes use of a file allocation table. There are three types of FAT file systems including FAT12, FAT16, and FAT32.

File Allocation Table (FAT)

A table or list maintained by certain operating systems to keep track of how files are stored on a hard disk.

File system

The method used by an operating system to name, access, and organize files and directories on a disk (for example, FAT32 or NTFS).

Graphical user interface (GUI)

A user interface, as used in the Windows operating systems, which uses a mouse and graphic displays to interact with the user. The goal of a GUI is to make the program easier to use than a text-based application or operating system such as MS-DOS.

GUI

See "Graphical user interface (GUI)" on page 91.

Hard Disk

A specific type of disk drive comprised of one or more rigid metal platters.

IDE (Integrated Device Electronics)

A interface technology used to integrate a disk drive and a computer. Hard disks using IDE technology have their controller built directly into the disk drive eliminating the need for a separate controller card in the computer.

Interface

The connection and interaction between hardware, software, or the user.

Locked File

Files currently in use by your system and traditionally unavailable to other applications, including backup operations. Examples of applications that create locked files include Oracle databases, SQL servers, Lotus Notes®, and e-mail servers.

Logical drive

A portion of a hard disk that is considered to be a single unit. In this context, logical means “conceptual” because there is no direct relationship between the name and a physical object.

Master Boot Record

The information in the first sector of any hard disk or diskette that identifies how and where an operating system is located so that it can be booted (loaded) into the computer’s main storage or random access memory. The master boot record is also sometimes called the “partition sector” or the “master partition table” because it includes a table that locates the hard disk’s partitions. In addition to this table, the master boot record also includes a program, known as the boot manager, that reads the boot sector record of the partition containing the operating system to be booted into RAM. In turn, that record contains a program that loads the rest of the operating system into RAM.

Master file table (MFT)

On an NTFS volume, the master file table is a file containing information about all other files in that volume. This includes the name of each file, its physical location on the disk, and other information.

MFT

See “Master file table (MFT)” on page 92.

Most Recent backup

A compressed incremental backup file reflecting the state of a hard disk at the time the backup is performed. Only files not matching those in the cumulative backup are stored in the most recent backup file. Most recent backups can be automated using Rapid Restore’s Schedule feature or performed manually.

One-Button Restore Manager (OBRM)

The One-Button Restore Manager is the backbone of Rapid Restore’s image and backup management capabilities. The OBRM is extremely powerful and integrates with several other Rapid Restore components so that users can easily restore the contents of their hard disk to a previously known state. The One-Button Restore Manager is easily accessible from several entry points including:

- Before Windows Runs (Pre-Operating System Mode)
- Windows Graphical User Interface (Windows Mode)
- Over the Network (Remote Management Mode)

Partition

A subdivision of the space on a disk drive that is treated as though it were a separate physical unit. A computer with only one hard disk drive can have a single partition, often called drive C:, or it can have several partitions, such as drive C:, drive D:, and drive E.

Peripheral device

A device located on the outside of a computer (for example a tape drive or a USB hard disk).

Permission

The ability of a user to access or modify files, especially those not created by that user. Permissions exist for security reasons including the prevention of unauthorized access to sensitive information.

Pre-operating system mode

The time between when a computer boots (starts up) and the operating system has not yet taken over control of the computer.

Primary partition

In Windows and MS-DOS operating systems, a hard disk can be divided into a maximum of four primary partitions; or three primary partitions plus an extended partition, which in turn can contain one or more logical drives.

RAID

See "Redundant Array of Independent Disks (RAID)" on page 93.

Redundant Array of Independent Disks (RAID)

A method of combining several hard disks to make one large volume. RAID configurations are typically used on a network file server to achieve faster access, greater protection against disk failure, or both.

Restore

The process of using an image or backup to revert to a previous hard disk state.

SCSI (Small Computer System Interface)

An interface technology used to integrate a disk drive and a computer.

Service partition

A hidden, locked partition on the local hard disk used for backup and restore operation. Service partitions are tightly compressed to save disk space and comprise the base image, cumulative backup, and most recent backup.

Site License Key

IT Administrators looking to access Rapid Restore's enterprise-level functionality can do so by registering for a Site License Key. A Site License Key enables IT Administrators to efficiently configure, deploy, and manage Rapid Restore in an enterprise environment.

Snapshot

A snapshot backup replaces your existing cumulative backup with optimized cumulative backup data. This optimized backup consolidates all incremental

backup data (cumulative and most recent) into one cumulative backup. In addition, the snapshot process deletes the most recent backup.

Snapshot backups should be performed at significant checkpoints such as after the installation of a new application, creation of a new database, etc.

USB Drive

USB (Universal Serial Bus) drive is a plug-and-play hard drive that connects to your computer through a USB interface.

Utility

A program that provides basic services or functions.

Volume

A subdivision of the space on a hard disk that is treated as though it were a separate physical unit, or a combination of physical disks treated as a single unit. A computer with only one hard disk can have a single volume, often called drive C:, or it can have several volumes, such as drive C:, drive D:, and drive E:.

Volume set

A single logical drive composed of up to 32 areas of free space on one or more hard disks. Volume sets can be used to combine small areas of free space on one or more hard disks into a larger logical drive.

Appendix C. Warranty information

This section contains the warranty period for your product, information about obtaining warranty service and support, and the IBM Statement of Limited Warranty.

Warranty period

Contact your place of purchase for warranty service information.

Machine - IBM Portable USB 2.0 Hard Drive with Rapid Restore

Warranty period	Service delivery method
Parts: 3 years, labor: 3 years	(CCE) Customer carry-in/mail-in

Service and support

The following information describes the technical support that is available for your product, during the warranty period or throughout the life of the product. Refer to your IBM Statement of Limited Warranty for a full explanation of IBM warranty terms.

Warranty information on the World Wide Web

The IBM Machine Warranties Web site at http://www.ibm.com/servers/support/machine_warranties/ contains a worldwide overview of the IBM Limited Warranty for IBM Machines, a glossary of terms used in the Statement of Limited Warranty, Frequently Asked Questions (FAQ), and links to Product Support Web pages. The IBM Statement of Limited Warranty is available from this Web site in 29 languages in Portable Document Format (PDF).

Online technical support

Online technical support is available during the life of your product through the Personal Computing Support Web site at http://www.ibm.com/pc/support/.

During the warranty period, assistance for replacement or exchange of defective components is available. In addition, if your IBM option is installed in an IBM computer, you might be entitled to service at your location. Your technical support representative can help you determine the best alternative.

Telephone technical support

Installation and configuration support through the IBM HelpCenter® will be withdrawn or made available for a fee, at IBM's discretion, 90 days after the option has been withdrawn from marketing. Additional support offerings, including step-by-step installation assistance, are available for a nominal fee.

To assist the technical support representative, have available as much of the following information as possible:

- Option name
- Option number

© Copyright IBM Corp. 2002

- Proof of purchase
- Computer manufacturer, model, serial number (if IBM), and manual
- Exact wording of the error message (if any)
- Description of the problem
- Hardware and software configuration information for your system

If possible, be at your computer. Your technical support representative might want to walk you through the problem during the call.

For the support telephone number and support hours by country, refer to the following table. If the number for your country or region is not listed, contact your IBM reseller or IBM marketing representative. Response time may vary depending on the number and nature of the calls received.

Support 24 hours a day, 7 days a week	
Canada (Toronto only)	416-383-3344
Canada (all other)	1-800-565-3344
U.S.A. and Puerto Rico	1-800-772-2227
All other countries and regions	Go to http://www.ibm.com/pc/support/, and click **Support Phone List**.

IBM Statement of Limited Warranty Z125-4753-06 8/2000

Part 1 - General Terms

This Statement of Limited Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. The terms of Part 2 replace or modify those of Part 1. The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Limited Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

The IBM Warranty for Machines: IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications ("Specifications"). The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation unless IBM or your reseller informs you otherwise.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded.

Extent of Warranty: The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty: IBM does not warrant uninterrupted or error-free operation of a Machine. Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service: To obtain warranty service for a Machine, contact IBM or your reseller. If you do not register your Machine with IBM, you may be required to present proof of purchase.

During the warranty period, IBM or your reseller, if approved by IBM to provide warranty service, provides without charge certain types of repair and exchange service to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. At its discretion, IBM or your reseller will 1) either repair or exchange the failing Machine and 2) provide the service either at your location or a service center. IBM or your reseller will also manage and install selected engineering changes that apply to the Machine.

Some parts of IBM Machines are designated as Customer Replaceable Units (called "CRUs"), e.g., keyboards, memory, or hard disk drives. IBM ships CRUs to you for replacement by you. You must return all defective CRUs to IBM within 30 days of your receipt of the replacement CRU. You are responsible for downloading designated Machine Code and Licensed Internal Code updates from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided:
   a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides;
   b. secure all programs, data, and funds contained in a Machine;
   c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations; and
   d. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Limitation of Liability: Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other

contract or tort claim), except for any liability that cannot be waived or limited by applicable laws, IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the charges (if recurring, 12 months' charges apply) for the Machine that is subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code.

   This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES, LOST PROFITS OR LOST SAVINGS, EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Governing Law

Governing Law: Both you and IBM consent to the application of the laws of the country in which you acquired the Machine to govern, interpret, and enforce all of your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Agreement, without regard to conflict of law principles.

Part 2 - Country-unique Terms

AMERICAS

BRAZIL

Governing Law: *The following is added after the first sentence:*Any litigation arising from this Agreement will be settled exclusively by the court of Rio de Janeiro.

NORTH AMERICA

Warranty Service: *The following is added to this Section:* To obtain warranty service from IBM in Canada or the United States, call 1-800-IBM-SERV (426-7378).

CANADA

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:* laws in the Province of Ontario.

UNITED STATES

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:* laws of the State of New York.

ASIA PACIFIC

AUSTRALIA

The IBM Warranty for Machines: *The following paragraph is added to this Section:* The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other similar legislation and are only limited to the extent permitted by the applicable legislation.

Limitation of Liability: *The following is added to this Section:* Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974 or other similar legislation, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:* laws of the State or Territory.

CAMBODIA, LAOS, AND VIETNAM

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*laws of the State of New York.

The following is added to this Section: Disputes and differences arising out of or in connection with this Agreement shall be finally settled by arbitration which shall be held in Singapore in accordance with the rules of the International Chamber of Commerce (ICC). The arbitrator or arbitrators designated in conformity with those rules shall have the power to rule on their own competence and on the validity of the Agreement to submit to arbitration. The arbitration award shall be final and binding for the parties without appeal and the arbitral award shall be in writing and set forth the findings of fact and the conclusions of law.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator.

The two arbitrators appointed by the parties shall appoint a third arbitrator before proceeding upon the reference. The third arbitrator shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the ICC. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

The English language version of this Agreement prevails over any other language version.

HONG KONG AND MACAU

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:* laws of Hong Kong Special Administrative Region.

INDIA

Limitation of Liability: *The following replaces items 1 and 2 of this Section:*

1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence;
2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Limited Warranty, IBM's liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

JAPAN

Governing Law: *The following sentence is added to this Section:*Any doubts concerning this Agreement will be initially resolved between us in good faith and in accordance with the principle of mutual trust.

NEW ZEALAND

The IBM Warranty for Machines: *The following paragraph is added to this Section:* The warranties specified in this Section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

Limitation of Liability: *The following is added to this Section:* Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this Section are subject to the limitations in that Act.

PEOPLE'S REPUBLIC OF CHINA (PRC)

Governing Law: *The following replaces this Section:* Both you and IBM consent to the application of the laws of the State of New York (except when local law requires otherwise) to govern, interpret, and enforce all your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Agreement, without regard to conflict of law principles.

Any disputes arising from or in connection with this Agreement will first be resolved by friendly negotiations, failing which either of us has the right to submit the dispute to the China International Economic and Trade Arbitration Commission in Beijing, the PRC, for arbitration in accordance with its arbitration rules in force at the time. The arbitration tribunal will consist of three arbitrators. The language to be used therein will be English and Chinese. An arbitral award will be final and binding on all the parties, and will be enforceable under the Convention on the Recognition and Enforcement of Foreign Arbitral Awards (1958).

The arbitration fee will be borne by the losing party unless otherwise determined by the arbitral award.

During the course of arbitration, this Agreement will continue to be performed except for the part which the parties are disputing and which is undergoing arbitration.

EUROPE, MIDDLE EAST, AFRICA (EMEA)

THE FOLLOWING TERMS APPLY TO ALL EMEA COUNTRIES: The terms of this Statement of Limited Warranty apply to Machines purchased from IBM or an IBM reseller.

Warranty Service: If you purchase an IBM Machine in Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland or United Kingdom, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM. If you purchase an IBM Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kirghizia, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchase an IBM Machine in a Middle Eastern or African country, you may obtain warranty service for that Machine from the IBM entity within the country of purchase, if that IBM entity provides warranty service in that country, or from an IBM reseller, approved by IBM to perform warranty service on that Machine in that country. Warranty service in Africa is available within 50 kilometers of an IBM authorized service provider. You are responsible for transportation costs for Machines located outside 50 kilometers of an IBM authorized service provider.

Governing Law: The applicable laws that govern, interpret and enforce rights, duties, and obligations of each of us arising from, or relating in any manner to, the subject matter of this Statement, without regard to conflict of laws principles, as well as Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided, except that in 1) Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Hungary, Former Yugoslav Republic of Macedonia, Romania, Slovakia, Slovenia, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan, the laws of Austria apply; 2) Estonia, Latvia, and Lithuania, the laws of Finland apply; 3) Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Djibouti, Democratic Republic of Congo, Equatorial Guinea, France, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Mali, Mauritania, Morocco, Niger, Senegal, Togo, and Tunisia, this Agreement will be construed and the legal relations between the parties will be determined in accordance with the French laws and all disputes arising out of this Agreement or related to its violation or execution, including summary proceedings, will be settled exclusively by the Commercial Court of Paris; 4) Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, United Kingdom, West Bank/Gaza, Yemen, Zambia, and Zimbabwe, this Agreement will be governed by English Law and disputes relating to it will be submitted to the exclusive jurisdiction of the English courts; and 5) in Greece, Israel, Italy, Portugal, and Spain any legal claim arising out of this Statement will be brought before, and finally settled by, the competent court of Athens, Tel Aviv, Milan, Lisbon, and Madrid, respectively.

THE FOLLOWING TERMS APPLY TO THE COUNTRY SPECIFIED:

AUSTRIA AND GERMANY

The IBM Warranty for Machines: *The following replaces the first sentence of the first paragraph of this Section:* The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this Section:

The minimum warranty period for Machines is six months. In case IBM or your reseller is unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

Extent of Warranty: *The second paragraph does not apply.*

Warranty Service: *The following is added to this Section:* During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

Limitation of Liability: *The following paragraph is added to this Section:* The limitations and exclusions specified in the Statement of Limited Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

The following sentence is added to the end of item 2: IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

EGYPT

Limitation of Liability: *The following replaces item 2 in this Section:* as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code.

Applicability of suppliers and resellers (unchanged).

FRANCE

Limitation of Liability: *The following replaces the second sentence of the first paragraph of this Section:*In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: *(items 1 and 2 unchanged)*.

IRELAND

Extent of Warranty: *The following is added to this Section:* Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

Limitation of Liability: *The following replaces items one and two of the first paragraph of this Section:*1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; and 2. the amount of any other actual direct damages, up to 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

Applicability of suppliers and resellers (unchanged).

The following paragraph is added at the end of this Section: IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

ITALY

Limitation of Liability: *The following replaces the second sentence in the first paragraph:*In each such instance unless otherwise provided by mandatory law, IBM is liable for no more than: 1. *(unchanged)* 2. as to any other actual damage arising in all situations involving nonperformance by IBM pursuant to, or in any way related to the subject matter of this Statement of Warranty, IBM's liability, will be limited to the total amount you paid for the Machine that is the subject of the claim. *Applicability of suppliers and resellers (unchanged).*

The following replaces the third paragraph of this Section: Unless otherwise provided by mandatory law, IBM and your reseller are not liable for any of the following: *(items 1 and 2 unchanged)* 3) indirect damages, even if IBM or your reseller is informed of their possibility.

SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND

Limitation of Liability: *The following is added to this Section:* IBM's entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

UNITED KINGDOM

Limitation of Liability: *The following replaces items 1 and 2 of the first paragraph of this Section:*

1. death or personal injury or physical damage to your real property solely caused by IBM's negligence;
2. the amount of any other actual direct damages or loss, up to 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim;

The following item is added to this paragraph: 3. breach of IBM's obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982.

Applicability of suppliers and resellers (unchanged).

The following is added to the end of this Section: IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

Appendix D. Notices

IBM may not offer the products, services, or features discussed in this document in all countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change IBM product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of IBM or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product, and use of those Web sites is at your own risk.

Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may

© Copyright IBM Corp. 2002

vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Trademarks

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

IBM
IBM logo
HelpCenter

Lotus Notes ia a trademark of Lotus Development Corporation and/or IBM Corporation in the United States, other countries, or both.

Microsoft and Windows are trademarks of Microsoft Corporation in the United States, other countries, or both.

Intel, MMX, Celeron, and Pentium are trademarks of Intel Corporation in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.

Electronic emission notices

Machine - IBM Portable USB 2.0 Hard Drive with Rapid Restore

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible party:
International Business Machines Corporation
New Orchard Road
Armonk, NY 10504
Telephone: 1-919-543-2193

Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

Industry Canada Class B emission compliance statement

This Class B digital apparatus complies with Canadian ICES-003.

Avis de conformite a la reglementation d'Industrie Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Deutsche EMV-Direktive (electromagnetische Verträglichkeit)

Zulassungbescheinigunglaut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995 (bzw. der EMC EG Richtlinie 89/336):

Dieses Gerät ist berechtigt in Übereinstimmungmit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen. Verantwortlich für die Konformitätserklärung nach Paragraph 5 des EMVG ist die:

IBM Deutschland Informationssysteme GmbH, 70548 Stuttgart.

Informationen in Hinsicht EMVG Paragraph 3 Abs. (2) 2:

Das Gerät erfüllt die Schutzanforderungen nach EN 50082-1 und EN 55022 Klasse B.

EN 50082-1 Hinweis:

"Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 50082-2 festgetlegt), dann kann es dabei eventuell gestört werden. In solch einem FA11 ist der Abstand bzw. die Abschirmungzu der industriellen Störquelle zu vergrö*ß*ern."

Anmerkung:

Um die Einhaltung des EMVG sicherzustellen sind die Geräte, wie in den IBM Handbüchern angegeben, zu installieren und zu betreiben.

European Union - emission directive

This product is in conformity with the protection requirements of EU Council Directive 89/336/ECC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

IBM can not accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

Union Européenne - Directive Conformité électromagnétique

Ce produit est conforme aux exigences de protection de la Directive 89/336/EEC du Conseil de l'UE sur le rapprochement des lois des États membres en matière de compatibilité électromagnétique.

IBM ne peut accepter aucune responsabilité pour le manquement aux exigences de protection résultant d'une modification non recommandée du produit, y compris l'installation de cartes autres que les cartes IBM.

Ce produit a été testé et il satisfait les conditions de l'équipement informatique de Classe B en vertu de Standard européen EN 55022. Les conditions pour l'équipement de Classe B ont été définies en fonction d'un contexte résidentiel ordinaire afin de fournir une protection raisonnable contre l'interférence d'appareils de communication autorisés.

Unione Europea - Directiva EMC (Conformidad électromagnética)

Este producto satisface los requisitos de protección del Consejo de la UE, Directiva 89/336/CEE en lo que a la legislatura de los Estados Miembros sobre compatibilidad electromagnética se refiere.

IBM no puede aceptar responsabilidad alguna si este producto deja de satisfacer dichos requisitos de protección como resultado de una modificación no recomendada del producto, incluyendo el ajuste de tarjetas de opción que no sean IBM.

Este producto ha sido probado y satisface los límites para Equipos Informáticos Clase B de conformidad con el Estándar Europeo EN 55022. Los límites para los equipos de Clase B se han establecido para entornos residenciales típicos a fin de proporcionar una protección razonable contra las interferencias con dispositivos de comunicación licenciados.

Union Europea - Normativa EMC

Questo prodotto è conforme alle normative di protezione ai sensi della Direttiva del Consiglio dell'Unione Europea 89/336/CEE sull'armonizzazione legislativa degli stati membri in materia di compatibilità elettromagnetica.

IBM non accetta responsabilità alcuna per la mancata conformità alle normative di protezione dovuta a modifiche non consigliate al prodotto, compresa l'installazione di schede e componenti di marca diversa da IBM.

Le prove effettuate sul presente prodotto hanno accertato che esso rientra nei limiti stabiliti per le le apparecchiature di informatica Classe B ai sensi del Norma Europea EN 55022. I limiti delle apparecchiature della Classe B sono stati stabiliti al fine di fornire ragionevole protezione da interferenze mediante dispositivi di comunicazione in concessione in ambienti residenziali tipici.

이 기기는 가정용으로 전자파 적합등록을 한 기기로서

주거지역에서는 물론 모든 지역에서 사용할 수 있습니다.

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

Japanese statement of compliance for products less than or equal to 20 A per phase

高調波ガイドライン適合品

Part Number: 09N4247

Printed in U.S.A.

(1P) P/N: 09N4247