

IBM[®] Rapid Restore
Ultra Version 4.0



User's Guide

IBM[®] Rapid Restore
Ultra Version 4.0



User's Guide

Notice:

Before using this information and the product it supports, be sure to read “Notices and Trademarks,” on page 25.

First Edition (December 2003)

Before using this information and the product it supports, be sure to read “Notices and Trademarks,” on page 25.

© Copyright International Business Machines Corporation 2003. All rights reserved.

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

Preface	v
Who should read this guide	v
How to use this guide	v
Additional information	v
Chapter 1. Introduction to Rapid Restore Ultra	1
Supported operating systems and devices	2
Rapid Restore Ultra components	2
Backup considerations	3
Managing backups	4
Managed backup and recovery for the enterprise	4
Advantages of multiple backups	5
Chapter 2. Using Rapid Restore Ultra to back up your hard drive	7
Developing a backup strategy	7
Multiple backups	7
Additional protection	7
Best practices for backup operations	8
Preparing your hard drive for the base backup	8
Scheduling backup operations	8
Backing up encrypted files	8
Setting preferences	9
Other features	9
Backing up now	10
Scheduling your backups	11
Setting your backup schedule	11
Scheduling a backup	11
Disabling scheduled backup operations	12
Copying backups from the hard drive	12
Setting your preferences	13
The Set Preferences - Summary screen	14
Chapter 3. Using Rapid Restore Ultra to complete a restore operation	15
Restoring your system through the Windows interface	15
Restoring your system through the IBM Rescue and Recovery environment	15
Restoring individual files and folders	16
Rescuing or restoring encrypted files	17
Backup and restore operations	17
Rescuing encrypted files from a backup	17
Rescuing encrypted files from outside of a backup	17
Rescuing encrypted files using the Rescue and Recovery workspace	18
Creating and using startable recovery media	18
Creating your startable recovery media	18
Using your startable recovery media	18
Chapter 4. Troubleshooting	21
General troubleshooting information	21
Backup troubleshooting information	21
Backup operation is slow	21
Scheduling dates on the 29th, 30th, or 31st	21
Unable to select the Copy backups from hard drive function	21
Restore troubleshooting information	22
User cannot log on after a restore operation	22

Installation troubleshooting information	22
Unable to install Rapid Restore Ultra	22
Multiple SCSI drives	22
Uninstalling the software	22
Power management troubleshooting information.	23
Encryption troubleshooting information	23
Restoring from a backup that contains encrypted files	23
Restoring individual, encrypted files and folders from a backup	23
Rescuing (copying) encrypted files that are not in a backup	23
Additional information	24
Boot Manager troubleshooting information	24
Startup-interrupt prompt does not display	24
Appendix. Notices and Trademarks	25
Notices	25
Trademarks	26

Preface

This guide contains information on setting up and using IBM® Rapid Restore™ Ultra to protect valuable computer data.

This guide is organized as follows:

Chapter 1, “Introduction to Rapid Restore Ultra” contains a listing of Rapid Restore Ultra components and system requirements, and an overview of Rapid Restore Ultra concepts.

Chapter 2, “Using Rapid Restore Ultra to back up your hard drive” contains information about backup strategies and best practices, and instructions on how to initiate a backup operation, schedule backup operations, copy backups from the hard drive, and set preferences.

Chapter 3, “Using Rapid Restore Ultra to complete a restore operation” contains instructions on how to restore your system and restore single files using Rapid Restore Ultra.

Chapter 4, “Troubleshooting” contains information that might be helpful if you encounter trouble using Rapid Restore Ultra.

“Notices and Trademarks” contains notice and trademark information.

Who should read this guide

This guide is intended for anyone who is interested in using Rapid Restore Ultra to back up their valuable computer data.

How to use this guide

Use this guide to design, set up, and implement a backup and restore strategy for your computer.

Additional information

You can obtain additional information and download this publication from the <http://www-3.ibm.com/pc/support/site.wss/MIGR-4Q2QAK.html> Web site.

Chapter 1. Introduction to Rapid Restore Ultra

IBM® Rapid Restore™ Ultra is a simple managed-recovery utility that protects computers from software-related system failures. In the event of a system failure, you can use IBM Rapid Restore Ultra to restore the contents of the primary hard disk to a previously saved state.

Rapid Restore Ultra enables you to perform the following functions:

- **Schedule daily, weekly, or monthly backups.** Rapid Restore Ultra enables you to schedule backup operations so that your valuable data is automatically protected. For information on how to perform this function, see “Scheduling backup operations” on page 8.
- **Save backup files to a hidden, protected folder.** Rapid Restore Ultra stores the backup files in a hidden, protected folder on the local hard disk, thereby minimizing the use of network bandwidth during a backup and restore operation.
- **Restore files to any number of backed-up states.** Rapid Restore Ultra can save a number of backup images in the protected folder. Users can decide how many backups to store on the local drive. Five incremental backups will be stored on the local drive by default, if size permits. For information on how to perform this function, see Chapter 3, “Using Rapid Restore Ultra to complete a restore operation,” on page 15.
- **Restore files after an operating-system failure.** Under normal circumstances, you can use Rapid Restore Ultra from the Microsoft® Windows® interface. However, if an operating-system failure prevents you from accessing the Windows interface, you can use Rapid Restore Ultra from the IBM Rescue and Recovery™ environment to perform a full system-recovery operation.
- **Protect the entire software image, including user data.** Rapid Restore Ultra 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.
- **Copy backups to a CD drive, DVD drive, USB hard disk drive, or network drive.** If your computer has access to a network drive, USB hard disk drive, or a recordable DVD or CD drive, Rapid Restore Ultra enables you to copy backup files to these devices, thus providing an additional level of protection. These devices can then be used to restore the contents of the hard disk in the event of a hard disk drive failure. For information on how to perform this function, see “Copying backups from the hard drive” on page 12.
- **Back up directly to a CD drive, DVD drive, USB hard disk drive, or network drive.** If your computer has access to a network drive, a USB hard disk drive, or a recordable DVD or CD drive, Rapid Restore Ultra enables you to copy backup files to these devices, thus providing an additional level of protection. These devices can then be used to restore the contents of the hard disk in the event of a hard disk drive failure. For information on how to perform this function, see “Backing up now” on page 10.

Note: Backup files that are backed up directly to CD or DVD can be restored using the IBM Rescue and Recovery environment. Backup files that are copied to CD or DVD can be restored directly from the Windows interface.

- **Support enterprise-wide recovery and backup policies.** Rapid Restore Ultra supports a command-line interface, which can be used with systems-management tools to integrate enterprise-wide recovery and backup policies. For information about installation and deployment options, see the *IBM Rapid Restore Ultra Deployment Guide*.

- **Restore single files or folders.** Rapid Restore Ultra enables you to view, select, and recover one or more individual files or folders from a backup image.
- **Exclude specific files or folders from a backup.** IBM Rapid Restore enables you to exclude specific files or folders from a backup operation. Excluding files and folders reduces the size of the backup and enables the backup operation to be performed more quickly. For information on how to perform this function, see “Setting preferences” on page 9.
- **Save backups to the IBM Portable 40 GB USB 2.0 Hard Drive with Rapid Restore Ultra (optional).** IBM Rapid Restore can save backups to a second hard disk drive. The IBM Portable 40 GB USB 2.0 Hard Drive with Rapid Restore Ultra is a portable, lightweight, high-speed USB hard disk drive that is compatible with the USB 2.0 standard. This optional drive can be used with mobile or desktop computers and is compatible with USB 1.0 and USB 1.1 connections. This feature requires the IBM Portable 40 GB USB 2.0 Hard Drive with Rapid Restore Ultra.

Supported operating systems and devices

The IBM Rapid Restore Ultra program supports IBM ThinkCentre and ThinkPad computers, and is compatible with the following non-server based operating systems:

- Microsoft Windows XP Home
- Microsoft Windows XP Professional
- Microsoft Windows 2000 Professional

The following optional devices are also supported:

- USB hard drive
- Second hard drive
- Internal CD-ROM/DVD-ROM drive
- USB CD-ROM/DVD-ROM drive
- Internal CD-RW drive
- USB CD-RW drive
- Internal DVD-RW drive
- Ethernet NIC
- Network attached storage as a Windows mapped drive

Rapid Restore Ultra components

IBM Rapid Restore Ultra provides valuable functionality in both the IBM Rescue and Recovery Environment and the Windows environments. The IBM Rescue and Recovery Environment provides the workspace from which Rapid Restore Ultra is launched if the Windows operating system is disabled.

IBM Rapid Restore Ultra includes the following main components:

- **Scheduler.** The IBM Rapid Restore Ultra Scheduler is responsible for invoking the backup process on a periodic basis. The periods supported are: daily (at a specified time), weekly (on a particular day of the week at a specified time), and monthly (on a particular day of the month at a specified time). The Scheduler runs as a Windows service, so that it functions even when no one is logged onto the computer.
- **Windows interface.** IBM Rapid Restore Ultra includes a Windows interface that enables the end user to customize its behavior. From this interface, the user can

define a backup schedule, initiate a backup now, copy backups onto removable media, restore the system from a backup, and select individual files to restore. Large enterprise administrators can restrict this interface to enforce a company-wide policy. The policy settings are defined in a text file as part of the installation operation. For more information about installation and deployment options, see the *IBM Rapid Restore Ultra Deployment Guide*.

- **IBM Rescue and Recovery environment.** The IBM Rescue and Recovery environment is designed to provide valuable rescue and recovery functionality in a pre-boot environment. Press Enter during startup to start the IBM Rescue and Recovery workspace.

The pre-Windows environment can be booted from the local hard drive, a USB hard disk drive, a CD-ROM drive, or from a network.

- **IBM Rapid Restore Ultra engine.** The IBM Rapid Restore Ultra engine performs backup and restore operations.
- **Command-line interface.** The Windows command-line interface provides an interface for automated scripting, which enables custom image deployment and enterprise management functionality.
- **On-screen help.** A Rapid Restore Ultra help file is provided. This file documents the Rapid Restore Ultra Windows interface.

Backup considerations

IBM Rapid Restore Ultra enables you to create and manage numerous backups on multiple devices. By default, IBM Rapid Restore Ultra enables you to store a base backup and five incremental backups locally on your hard disk drive, over a network, on removable media (such as a USB hard disk drive, DVD drive, or CD drive), or on any combination of these drives. It is important to think through your backup strategy before changing your backup storage selections.

When you initiate a manual backup operation or schedule a backup operation, IBM Rapid Restore Ultra enables you to choose where you want to save your backup files. These selections are saved and become the default settings for any ensuing backup operations. However, it is important to understand how IBM Rapid Restore Ultra will respond when these selections are changed.

When you perform or schedule a backup operation you must think through the following considerations:

- **Where you want to save your backup files.** The *Choose where you want to save your backups* area of the provided interface enables you to select from the available devices installed on your computer. Place a check in the check box for each device that you want to save backups to. When a new device is selected, IBM Rapid Restore Ultra creates a duplicate backup on each device that is selected. By default, copies of the base backup and five incremental backups can be stored on each device.
- **How to archive old backup files.** The *Choose where you want to save your backups* area of the provided interface also enables you to uncheck previously selected devices. When you uncheck the check box for a device, IBM Rapid Restore Ultra will no longer save backups to that device, and a dialog box will display that asks if you want to delete the backups that are stored on that device. If you do not want to delete the stored backups, it is best to copy them to a removable media such as CD or DVD, because if the unchecked device is later selected again, any backups contained on the device will be overwritten by any new backup operation.

- **Whether to delete old backup files.** IBM Rapid Restore Ultra enables users to delete backup files from any of their attached devices simply by unchecking the appropriate check boxes when selecting where to save backups. After a previously selected device is unchecked on this interface, a dialog box is displayed that asks if you would like to delete the backups on the devices that were unchecked.

Note: If you want to retain previous backups on devices that you later uncheck, it is best to archive them to removable media, such as CD or DVD. If these devices are re-selected at a later time, the new backup operation will delete all previous backups.

- **Whether to delete all backup files.** IBM Rapid Restore Ultra enables users to delete all backup files from all attached devices simply by unchecking all of the check boxes when selecting where to save backups. After all previously selected devices are unchecked on the provided interface, a dialog box is displayed that informs you that this selection will result in all backups being deleted when the next backup operation is performed.

To reset the base backup and delete all previous backups, simply uncheck all devices and initiate a new backup operation. All backups will be deleted.

Managing backups

The IBM Rapid Restore Ultra program enables you to manage how often the hard disk is backed up by enabling you to schedule backups at a customized time and frequency. If you prefer to perform backup operations manually, or you need to perform a backup operation between scheduled backups, you can use the Backup function to perform an on-demand backup operation.

Managed backup and recovery for the enterprise

The IBM Rapid Restore Ultra program integrates with corporate business continuity plans to extend business recovery policies across a global work environment, from branch and regional offices to mobile or remote locations. Through a command-line interface, IT administrators can manage the recovery image for each system, no matter where it is located.

The IBM Rapid Restore Ultra program includes the following system-management features:

- **Command-line interface.** The command-line interface provides an interface for automated scripting, which enables custom image deployment and enterprise management functionality. The Rapid Restore Ultra command-line interface can be used in a Windows environment and can be automated with systems-management tools including IBM Director, IBM LANClient Control Manager, Tivoli TME, or Microsoft SMS.
- **Customizable installation options.** IT administrators can personalize Rapid Restore Ultra by setting policy. The following options are available:
 - Hide the Windows interface
 - Set the backup schedule
 - Modify the amount of storage space allocated for Rapid Restore Ultra

Please see the *IBM Rapid Restore Ultra Deployment Guide* for more details about the command-line interface and custom deployment options.

By default, the Rapid Restore Ultra program backs up the primary partition and any extended partitions on the primary hard disk and stores the backups in a hidden,

protected folder on the hard drive. During the installation process, you have the option to initiate a complete system backup. Ideally, this base backup should not be taken until your computer has all necessary software installed and configured.

Additional incremental backups are automatically created by subsequent backup operations. By default, five incremental backups will be stored on the local drive.

The ability to save multiple images enables an IT administrator to create, store, and manage multiple backup images in an enterprise. Users can also manage additional levels of backups while the operating system is running, enabling them to protect their own data by storing it separately from the backup images.

Advantages of multiple backups

The IBM Rapid Restore Ultra program enables users to manage multiple backups. The advantages of using multiple backup images include:

- **Increased performance during the creation of an incremental backup image.** All files that are on your hard disk during the initial installation and setup of IBM Rapid Restore Ultra, including the operating system, program files, and personal settings, are copied into the base backup image. Because these files are saved in this base backup image, they are not saved again during subsequent backup operations unless they have been modified.
- **Choice of recovery level.** You can choose to recover your computer from the base backup image or from any available incremental backup image. Each backup reflects the state of your hard disk at a different point in time. This backup protection is enhanced even further when you copy backups to an external device, such as a USB hard disk drive, or a network.

Chapter 2. Using Rapid Restore Ultra to back up your hard drive

IBM Rapid Restore Ultra can save a number of backup images in a hidden, protected folder. Users can decide how many backups to store on the local drive. Five incremental backups will be stored on the local drive by default, if size permits.

Developing a backup strategy

The IBM Rapid Restore Ultra program enables you to restore your system to a number of backed-up states, thereby granting you multiple levels of protection. IBM Rapid Restore Ultra default settings establish a basic level of protection; however, your specific backup strategy and schedule should be customized to your own needs.

Multiple backups

The IBM Rapid Restore Ultra program stores multiple backup images on your hard drive. Each backup image reflects the state of your hard disk at the time of its creation, as follows:

- **The base backup image.** This compressed, complete file-based backup file is created when you perform your initial backup following installation of Rapid Restore Ultra. This file reflects the state of your hard disk at the time that Rapid Restore Ultra is installed. All files on your hard disk at that time are saved in the base backup image. This backup image cannot be updated.
- **Incremental backup images.** The incremental backup files archive the files that have changed since the last incremental backup was taken. New backups should be initiated whenever your system software is updated or a database or application is added. Only new files and those that do not match those in the base backup image are saved in an incremental backup file. Incremental backup operations can be performed on a pre-set schedule, or can be initiated manually.

Additional protection

Additional protection can be achieved using the following techniques:

- **By copying your data to removable media or a network.** By copying your incremental backup images, you ensure that you can restore your hard drive to any of your saved states. This expands your recovery options in the event of a system failure. The IBM Rapid Restore Ultra program enables you to copy your backups to a CD drive, DVD drive, USB hard drive, or a network. Each archived backup provides an additional level of protection against application and data loss. For more information on this feature, see “Copying backups from the hard drive” on page 12.
- **By backing up directly to a network or to a USB hard disk drive.** IBM Rapid Restore can save backups to a network or a second hard disk drive. By backing up directly to remote storage locations, you add redundant protection to your backup strategy.
- **By backing up directly to the IBM Portable 40 GB USB 2.0 Hard Drive with Rapid Restore Ultra.** The IBM Portable 40 GB USB 2.0 Hard Drive with Rapid Restore Ultra is a portable, lightweight, high-speed USB hard disk drive that is compatible with the USB 2.0 standard. This optional drive can be used with mobile or desktop computers and is compatible with USB 1.0 and USB 1.1 connections. This feature requires the IBM Portable 40 GB USB 2.0 Hard Drive with Rapid Restore Ultra.

Best practices for backup operations

The IBM Rapid Restore Ultra program enables you to complete a vast number of tasks. For example, you can schedule or manually initiate a back up your system; you can restore your system from the Microsoft Windows operating system or the IBM Rescue and Recovery environment; you can save backups to and restore from a variety of devices, including CD, DVD, USB hard drive, and a network; backups can be scheduled, password-protected, and encrypted; you can exclude specific file types and restore individual files. All of this functionality gives IBM Rapid Restore Ultra a great degree of flexibility. Due to this flexibility, however, it is very important to think through your individual needs before you use IBM Rapid Restore Ultra.

Preparing your hard drive for the base backup

The IBM Rapid Restore Ultra program stores *images* of the state of your hard drive in a protected folder. These images contain a compressed copy of the operating system, applications, settings, data files and personal files on your computer. Consequently, make sure you set up your computer completely before initiating your first backup operation.

Before you begin your initial backup operation, it is best to complete the following tasks:

- Load all applications
- Configure and set up all printers
- Configure and set up all network connections
- Run a virus scan

Scheduling backup operations

The IBM Rapid Restore Ultra program enables you to schedule backups according to a daily, weekly, or monthly schedule. Scheduling your backups provides systematic protection against data loss.

Backing up encrypted files

IBM Rapid Restore Ultra Version 4.0 provides support for the following encryption methods:

- Windows Encrypting File System (EFS)
- IBM File and Folder Encryption (FFE)

Note: Previous versions of Rapid Restore Ultra or Rapid Restore PC are **not** compatible with these encryption techniques.

During a backup operation, IBM Rapid Restore Ultra Version 4.0 ensures that both Windows EFS and IBM FFE files are backed up in their encrypted format. During a full-restore operation (using the Restore your system option), the IBM Rapid Restore Ultra program ensures that both Windows EFS and IBM FFE files are restored to their original location in their encrypted format. All Rapid Restore Ultra operations involving a full or incremental backup or a full restore of the hard disk ensure that both encryption formats are handled correctly.

IBM Rapid Restore Ultra also enables users to restore individual, encrypted files and folders from a backup with the following limitations:

- **Windows EFS files.** Individual files encrypted by Windows EFS can only be restored using Rapid Restore Ultra from the Windows operating system. These files cannot be restored using Rapid Restore Ultra from the IBM Rescue and Recovery preboot environment.
- **IBM FFE-encrypted files.** Individual files encrypted by IBM FFE can only be restored using Rapid Restore Ultra from the IBM Rescue and Recovery preboot environment. Furthermore, these files must be restored to their original location to be successfully restored.

Setting preferences

How you should set your IBM Rapid Restore Ultra preferences depends on a number of variables. Use the following information to determine what settings might best suit your needs. Most users fall into one of the following categories:

- **Large enterprise users.** Large enterprise users have system administrators who manage the settings of IBM Rapid Restore Ultra. These settings are set for the enterprise and enforced remotely.
- **Small business users.** Small business users that do not have system administrator support should set their preferences mindful of their business needs and the limitations of their workstation. Depending upon the available space available on their hard drive, network considerations, and their sensitivity to data loss, small business users should establish a strategy that includes scheduled backups and systematic copying of saved backup files. Backup features such as backup encryption and password protection should also be considered.
- **Storage sensitive users.** Computer users that are forced to conserve space on their hard drives should set their backup preferences to preserve hard disk space. Storage-sensitive users can reduce the default number of backups stored on the local hard disk, or they can store their backups directly to a remote device, such as a USB hard disk drive or a network location. If this is not possible, remote users can systematically copy their backup files to a removable medium, such as a CD drive or DVD drive.
- **Mobile computer users.** Mobile computer users should set their backup preferences mindful of the possibility of data theft and data loss. Consequently, mobile computer users should use the backup encryption and password protection features, and should copy their backups for safe keeping. Mobile computer users might consider keeping set of backup CDs or DVDs with their computer.

Other features

The IBM Rapid Restore Ultra program has other features that are useful and convenient to many users. The following functions can help reduce backup size, save user time, and provide additional protection from data loss. Additional IBM Rapid Restore features include:

- **The exclude function.** The IBM Rapid Restore Ultra program enables you to exclude selected files and folders from a backup. Excluding files or folders can help backup operations to complete more quickly, and help reduces overall backup size. Common folders to be excluded might include a folder containing temporary files, or a folder containing copies of server mail files.

When excluding files from a backup, make sure that the excluded files are not necessary for the continued operation of the computer. Otherwise, if this backup is used in a restore procedure, the computer will not function properly.

- **The wake from suspend function.** The IBM Rapid Restore Ultra program enables you to set the computer to wake from a suspended state. This enables

backup operations to be scheduled while users are away-- even if the computer is in suspend mode. This function might not be appropriate for some mobile computer users.

Backing up now

The IBM Rapid Restore Ultra program uses a hidden, protected folder on the local hard disk to save your backup files. It also backs up and protects the entire contents of the hard disk, including the Microsoft Windows operating system, software applications, registry settings, network settings, fix packs, desktop settings, and unique data files.

The Back up now screen enables you to initiate a backup procedure. This screen also provides a pie chart that illustrates the amount of free space available on your hard drive.

To initiate a manual backup operation, complete the following procedure:

1. From the IBM Rapid Restore Ultra main window, click **Backup** and select **Back up now** from the drop-down list.
2. Name the backup files by typing a name in the Save as field. This step is optional, but is very useful when differentiating between saved backup files. All backup files will be stamped with the date and time of their creation.
3. Select the device or devices to save the backup to by choosing the appropriate Save to radio button. Radio button selections include:
 - Local hard drive, a second hard drive, a USB hard drive, or a network drive
 - CD drive or DVD drive
4. Select the device or devices that you want to save the scheduled backup to. When you select the Local hard drive, a second hard drive, a USB hard drive, or a network drive radio button, and then select the Network check box and click **OK** to continue, a Map Network Drive dialog box opens. Use this dialog to specify a network location to store your backups. After selecting a location, click **OK** to return to the Back up now screen.

Note: A Browse dialog box is displayed when storing backups on a local hard drive that has multiple partitions.

5. Establish a storage threshold for Rapid Restore Ultra to monitor, if desired, using the Warn when the backup storage space exceeds X MB check box. This option enables you to specify the amount of storage space in the hidden, protected folder. Valid options range from 1 GB to the maximum available space on your hard drive. This option does not reserve any space on the hard drive, rather it sets a trigger that will notify you when the selected storage threshold is reached.
6. Add a password to your backup files, if desired, by checking the Password-protect backups check box. This option enables you to protect your backup with a password. Users will be required to provide the password before a restore procedure can be initiated. IBM Rapid Restore Ultra and the IBM Rescue and Recovery environment share use the same password. When a backup is password protected through the IBM Rapid Restore Ultra interface, it becomes necessary to provide this password to access the IBM Rescue and Recovery environment. Likewise, if a password is set for the IBM Rescue and Recovery environment, that password is required to restore a backup using IBM Rapid Restore Ultra. Password protection is disabled by default.

7. Click **OK** to initiate the backup operation.

Note: Selections made on this screen will apply to both manual and scheduled backups. Existing selections will be overwritten.

Important: Make sure that your system is connected to an ac power supply before initiating a backup, restore, or archive procedure. Failure to do so can result in data loss, or an irretrievable system failure.

Scheduling your backups

Establishing a schedule for your backup operations ensures that your valuable files will be systematically protected.

Setting your backup schedule

Use the Schedule your backups feature to schedule automatic backup operations to take place on a daily, weekly, or monthly basis at a day and time of your choosing. If you prefer not to have backup operations take place automatically, you can use the Schedule your backups feature to disable scheduled backup operations.

By default, backup operations are not scheduled. Depending on how critical your data is or how often it changes, you might want to enable the scheduled backup feature so that backup operations take place according to a pre-set schedule and your data is automatically backed up.

Note: If the computer has been shut down or is in suspend mode (standby) when a backup operation is scheduled to take place, the backup operation will not take place at the scheduled time unless the Launch backup when in suspend mode function has been enabled. If this feature is not enabled, when the computer is started or awakened from the sleep mode, Rapid Restore Ultra displays a message asking if you want to perform a backup operation at that time.

For information about scheduling automatic backup operations, see Scheduling your backups. For information about disabling scheduled backup operations, see Disabling scheduled backup operations.

Scheduling a backup

To set or change a backup schedule, complete the following procedure:

1. From the IBM Rapid Restore Ultra main window, click **Backup** and select **Schedule your backups** from the drop-down list.
2. Select the Schedule: On radio button.
3. Select the frequency, time, and day of your scheduled backups.

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

4. Select the Launch backup when in suspend mode check box, as desired.
5. Click **OK**.
6. Select the device or devices that you want to save the scheduled backup to. Options include the local hard drive, a second hard drive, a USB hard drive, or a network. You can select more than one device.

7. Establish a storage threshold for Rapid Restore Ultra to monitor, if desired, using the Warn when the backup storage space exceeds X MB check box.
This option enables you to specify the amount of storage space in the hidden, protected folder. Valid options range from 1 GB to the maximum available space on your hard drive. This option does not reserve any space on the hard drive, rather it sets a trigger that will notify you when the selected storage threshold is reached.
8. Add a password to your backup files, if desired, by checking the Password-protect backups check box.
This option enables you to protect your backup with a password. Users will be required to provide the password before a restore procedure can be initiated.
IBM Rapid Restore Ultra and the IBM Rescue and Recovery environment share use the same password. When a backup is password protected through the IBM Rapid Restore Ultra interface, it becomes necessary to provide this password to access the IBM Rescue and Recovery environment. Likewise, if a password is set for the IBM Rescue and Recovery environment, that password is required to restore a backup using IBM Rapid Restore Ultra. Password protection is disabled by default.
9. Click **OK** to initiate the backup operation.

Note: Selections made on this screen will apply to both manual and scheduled backups. Existing selections will be overwritten.

Important: Make sure that your system is connected to an ac power supply before initiating a backup, restore, or archive procedure. Failure to do so can result in data loss, or an irretrievable system failure.

Disabling scheduled backup operations

To disable scheduled backup operations, complete the following procedure:

1. From the Rapid Restore Ultra main window, click **Backup**.
2. Click **Schedule your backups**.
3. Select the Schedule: Off radio button.
4. Click **OK**.

No further automatic backup operations will occur unless you reset the schedule. You can perform backup operations manually by selecting **Backup now** under the Backup menu on the Rapid Restore main window. For additional information about performing a manual backup operation, see Backing up now.

Copying backups from the hard drive

The IBM Rapid Restore Ultra program enables you to use removable media (USB hard disk drive, DVD drive, or CD drive) to restore the contents of the hard disk in the event of a hard disk drive failure. Copying your backup files to removable media enhances backup protection and enables you to restore your system from any of your archived backup files.

To archive your backups, complete the following procedure:

1. From the IBM Rapid Restore Ultra main window, click Backup and select Copy backups from hard drive from the drop-down list.
2. Select the medium you want to save your backup files to by clicking the appropriate radio button.

- The backup files that will be copied are listed on the user interface.
3. Click **OK** to continue.

You will need blank removable media when copying backups from the hard drive to CD or DVD. Make sure that you label each disc as it is created, and that you store them together in a safe place.

Setting your preferences

The Set your preferences screen lets you customize IBM Rapid Restore Ultra backup functionality by enabling users to select which partitions, files, and folders to include or exclude.

To set your preferences, complete the following procedure:

1. Choose one of the following partition backup options:
 - **Back up all partitions.** This option backs up all partitions on the local hard drive. Use this preference when you want to back up all files and folders on all partitions of your local hard drive. This option provides the most backup protection and ensures that you have every file backed up. This is the default setting.
 - **Include only selected partitions.** This option enables you to select specific partitions to include in your backup. Use this preference when you do not want to back up all partitions, but want to select specific partitions to back up. This selection enables you to select between the partitions on your local hard drive.

When you select the Include only selected partitions radio button and click Next, a screen displays all of the partitions on your local hard drive. Only the partitions you select will be backed up.

2. Choose one of the following file and folder backup options:
 - **Back up all files and folders.** This option backs up all files and folders on the selected partitions of the local hard drive. This option provides complete backup protection for the selected partitions. This is the default setting.
 - **Exclude specified files and folders.** This option enables you to select specific files or folders to exclude from your backup. Use this preference when you do not want all files or folders to be backed up.

When you select the Exclude specified files and folders radio button and click Next, a screen displays that enables you to browse the selected partitions and select files and folders to be excluded from future backups. Only the files and folders that you select will be excluded from subsequent backups.

Note: Some files and folders on the selected partitions might not be available for exclusion. The Exclude specified files and folders option does not enable users to exclude files or folders that are essential to the operating system or the system-restore process.

3. Click **Next**.
4. Select the partitions on your local hard drive that you want to back up, if necessary, and click **Next**.
5. Select the files and folders on the selected partitions that you want to exclude, if necessary, and click **Next**.

After you have set your preferences, the Set Preferences - Summary screen is displayed.

The Set Preferences - Summary screen

The Set Preferences - Summary screen summarizes the choices that you have made. It displays the partitions that will be included in subsequent backups and the files and folders that will be excluded from subsequent backups. Use this screen to review your choices before continuing with any further backup operations. Click **Finish** to accept your selections or click **Back** to change your preferences.

Chapter 3. Using Rapid Restore Ultra to complete a restore operation

You can use the IBM Rapid Restore program to restore your system, or to restore individual files or folders. Performing a system-restore operation restores the contents of your hard disk to a previously known state. This includes the operating system, software applications, registry settings, network settings, fix packs, desktop settings, and data files.

Restoring your system through the Windows interface

The IBM Rapid Restore Ultra program enables you to restore files to any number of backed-up states. Each backup is differentiated by its creation time and date. The Restore your system screen enables users to select the backup they want to use to restore their system. IBM Rapid Restore Ultra can restore your system from a backup stored in any of the following locations: the local hard drive, CD-R drive, DVD drive, USB hard drive, or a network drive.

To restore your system, complete the following procedure:

1. From the IBM Rapid Restore Ultra interface, click **Restore** and then click the radio button for the drive location of the backup you want to use.

The backups stored on the selected drive will be displayed. If the system is not able to find a backup in the specified location, a message displays asking you to select a new location. If this occurs, you might also want to check the connection to the specified device.

2. Click the radio button for the backup that you want to use.
3. Click **OK** to continue.

A message is displayed that reminds you that all data created since the selected backup will be lost.

4. Click **OK** to proceed with the restoration operation.

The computer restarts and a progress bar displays. When the restoration is complete, the computer will reboot to the Windows environment.

Notes:

1. When performing a restore operation, all data created since the selected backup is erased from your computer.
2. Make sure that your system is connected to an ac power supply before initiating a backup, restore, or archive procedure. Failure to do so can result in data loss, or an irretrievable system failure.

Restoring your system through the IBM Rescue and Recovery environment

In the event of a complete operating-system failure, or if you are unable to start IBM Rapid Restore Ultra through the Microsoft Windows interface, you can use the IBM Rescue and Recovery Environment to initiate a restore operation.

To use the IBM Rescue and Recovery environment, complete the following procedure:

1. Turn on your computer and press the Enter key during system startup.

Note: On some models, an Enter prompt appears during startup to indicate when you should press the Enter key. On other models, you might not see a prompt. If you do not see a prompt, press and hold the Enter key and then turn on the computer. Release the Enter key when the IBM Rescue and Recovery environment opens.

2. When the IBM Rescue and Recovery environment opens, click **Restore from backup**. The Restore your system screen is displayed. This screen enables you to restore your system to a previously known state.
3. Select the appropriate drive from the **Restore from** drop-down list.
4. Select the appropriate backup from the list, and then click **OK**.

Restoring individual files and folders

Copying files and folders to an external medium provides valuable redundancy protection for your data. The Restore Files and Folders screen enables you to copy files and folders from your hard drive to the following types of external media:

- Diskette (through an integrated diskette drive or USB diskette drive)
- USB hard disk drive
- A network drive

To restore one or more individual files, complete the following procedure:

1. From the IBM Rapid Restore Ultra interface, click **Restore** and select **Restore files**.

A message is displayed reminding users that want to save files or folders to a USB device to plug in the device and restart the computer now.

2. Choose the location for the files to be copied:
 - **Entire hard drive contents:** Enables you to browse the hard disk drive to find the file, or files, that you want to rescue.
 - **Backed up files only:** Enables you to browse and rescue only files that were backed up using the IBM Rapid Restore Ultra program.
 - **Non-backed up files only:** Enables you to browse and rescue only those files on your hard disk that were created or changed since the last time a backup operation was performed by the IBM Rapid Restore Ultra program.
 - **My Recent Documents only:** This selection is available only if you choose to view Non-backed up files only. It enables you to limit your non-backed-up files view to show only recent documents saved in your Windows environment. Use the drop-down menu to select the appropriate user account that contains the recent documents you want to rescue.
3. Choose the Destination for the files to be restored from the drop-down menu. The amount of free and used space for the selected medium is displayed.

Note: Only mapped network drives are displayed in the provided interface. If you want to use a network drive, you must map the drive before continuing with the procedure. After mapping a network drive, you might need to click the **Refresh** button before the drive is displayed in the provided interface.

4. Select the files that you want to restore from the provided interface, and then click **Copy**. A message is displayed indicating that the files that you selected will now be transferred.
5. Select the files you want to restore by expanding the file menu and placing a check mark in the check box next to each file, folder, or drive you want to rescue.

Note: Marking a folder or drive letter will result in restoring all files and folders contained within that directory structure. As each check box is marked, the amount of free and used space shown for the destination medium is updated.

6. Click **Copy** and then **OK**. The file transfer begins.
7. If Rapid Restore Ultra determines that there is not enough space on your destination medium to accommodate the files you want to restore, a message is displayed indicating that there is insufficient space. To delete unneeded files from the destination medium, expand the file menu under **Delete unneeded files to increase free space** and mark the check box next to each item you want to delete. Then, click **Delete**.

When you have cleared sufficient space, click **Copy** to start the file-transfer process again.

8. When the file-transfer process is complete, click **OK**. Then, click **Exit** to close window.

Rescuing or restoring encrypted files

IBM Rapid Restore Ultra Version 4.0 provides support for the following encryption methods:

- Windows Encrypting File System (EFS)
- IBM File and Folder Encryption (FFE)

Note: Previous versions of Rapid Restore Ultra or Rapid Restore PC are **not** compatible with these encryption techniques.

Backup and restore operations

During a backup operation, IBM Rapid Restore Ultra Version 4.0 ensures that both Windows EFS and IBM FFE files are backed up in their encrypted format. During a full-restore operation (using the Restore your system option), the IBM Rapid Restore Ultra program ensures that both Windows EFS and IBM FFE files are restored to their original location in their encrypted format. All Rapid Restore Ultra operations involving a full or incremental backup or a full restore of the hard disk ensure that both encryption formats are handled correctly.

Rescuing encrypted files from a backup

If you are working in the Windows environment and attempt to rescue one or more individual files or folders from a Rapid Restore Ultra backup using the Restore files option, you must take some precautions if you have any files in your backup that are encrypted through either the Windows EFS or IBM FFE encryption methods.

- **IBM FFE-encrypted files:** You can use the IBM Rapid Restore Ultra program to rescue IBM FFE-encrypted files and folders from a Rapid Restore Ultra backup, provided they are rescued to their original location. The destination drive must be the same drive from which the files or folders were backed up.
- **Windows EFS-encrypted files:** You can use the IBM Rapid Restore Ultra program to rescue Windows EFS-encrypted files from a Rapid Restore backup, provided they are rescued to an NTFS-formatted drive.

Rescuing encrypted files from outside of a backup

Neither IBM FFE nor Windows EFS-encrypted files that reside outside of a backup can be rescued. If you attempt to rescue or copy an encrypted file from outside of the backup, it will not be usable under any conditions.

Rescuing encrypted files using the Rescue and Recovery workspace

If you are working in the Rescue and Recovery workspace and attempt to rescue one or more individual files or folders from a Rapid Restore Ultra backup, you must take some precautions if you have any files in your backup that are encrypted through either the Windows EFS or IBM FFE encryption methods.

- **IBM FFE-encrypted files:** You can use Rescue Files function to rescue IBM FFE-encrypted files and folders from a Rapid Restore Ultra backup, provided they are rescued to their original location. The destination drive must be the same drive from which the files or folders were originally backed up.
- **Windows EFS-encrypted files:** The Rescue files function cannot be used to rescue EFS-encrypted files from a Rapid Restore backup, nor can the Restore from backup function be used to selectively restore EFS-encrypted files. However, you can use the Restore from backup function to perform a full restore, which will restore all files, including EFS-encrypted files to the selected destination drive.

Creating and using startable recovery media

IBM Rapid Restore Ultra works with the IBM Rescue and Recovery workspace to enable you to use a USB hard disk drive, or to create a CD that you can use, to help recover from failures that prevent you from gaining access to the Windows environment or the Rescue and Recovery workspace on your hard disk. Although such problems are rare, it is a good idea to be prepared and make your startup recovery media as soon as possible, before a problem occurs.

You can perform the following tasks using the Rescue and Recovery workspace from your startup recovery media:

- Recover files, folders, or your entire hard disk contents from a backup using the IBM Rapid Restore Ultra program
- View key information about your computer and an event history
- Troubleshoot problems by using information and diagnostics
- Transfer files from your computer or network to other media
- Access the Internet and link to the IBM support site

Creating your startable recovery media

To create your startup recovery media now, complete the following procedure:

1. Select the radio button for the type of startup media you want to create.
2. Click **OK**.
3. Follow the instructions on the screen.

If you do not want to make startup media now, click **Cancel**.

Using your startable recovery media

To use your startup recovery media, complete one of the following procedures:

- Insert the startup CD into your CD or DVD drive, then restart your computer.
- Attach your USB hard disk drive to one of the USB connectors on your computer; then, turn on your computer.

When the startup recovery media starts, the IBM Rescue and Recovery workspace opens. Help for each feature is available from the Rescue and Recovery workspace.

Note: If your startup media fails to start, you might not have your startup device (CD drive, DVD drive, or USB device) set correctly in your BIOS startup sequence. Refer to the documentation that came with your computer for information about gaining access to the BIOS configuration utility.

Chapter 4. Troubleshooting

The following information might be helpful if you encounter trouble using the IBM Rapid Restore Ultra application.

General troubleshooting information

When new Microsoft Windows users are created, the system must be rebooted before the new users can be backed up.

Do not use the IBM Rapid Restore Ultra program in conjunction with any other 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.

Backup troubleshooting information

The following information might be helpful if you encounter trouble while attempting a backup operation using IBM Rapid Restore Ultra software.

- You can only backup files to mapped network drives. If you want to use a network drive, you can map the drive during the backup procedure. After mapping a network drive, you might need to click the **Refresh** button before the drive is displayed in the provided interface.
- 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 IBM Rapid Restore Ultra interface is closed while performing a Windows incremental backup, IBM Rapid Restore Ultra will continue to backup files in the background.

Backup operation is slow

Backup performance depends upon the size and type of operation being performed. Backup operation performance can be optimized by performing frequent backups.

Running another program, such as an anti-virus program, while creating a backup image will adversely affect backup performance. Do not run any programs while creating a backup image.

Run anti-virus programs before or after performing a backup operation.

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

Rapid Restore Ultra 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 end of the month.

Unable to select the Copy backups from hard drive function

If the Copy backups from hard drive option is not available, the user does not have an external device attached to the computer. Attach a CD, DVD, or USB hard drive to the computer and try again.

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

In order to perform a CD-R archive, the hard drive must have at least 700MB of free space.

Restore troubleshooting information

The following information might be helpful if you encounter trouble while attempting a restore operation using IBM Rapid Restore Ultra software.

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

User cannot log on after a restore operation

This problem will occur on multi-user systems when a new user is added and a backup operation takes place before the new 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 log on before the next backup operation.

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

Installation troubleshooting information

The following information might be helpful if you encounter trouble while attempting to install or uninstall the IBM Rapid Restore Ultra software.

Unable to install Rapid Restore Ultra

Rapid Restore Ultra cannot be reinstalled over certain previous versions. The earlier version must be uninstalled prior to installing the newer version.

Rapid Restore Ultra must be installed on the C: drive. Furthermore, if you are using SCSI hard disk drives, the C: drive must be installed on the lowest SCSI ID on all the local drives.

Multiple SCSI drives

Windows 2000 assigns drive letters based on SCSI IDs. On computers with multiple SCSI drives, Rapid Restore Ultra must be installed on HD0. Make sure that the drive containing the operating system is set to the lowest SCSI ID.

Uninstalling the software

To uninstall Rapid Restore Ultra from a computer running Windows 2000 Professional or Windows XP, you must log onto the computer with administrator rights. For more information on user accounts, see the help system provided with the operating system.

When a non-administrator tries to uninstall Rapid Restore Ultra, an error message will appear indicating that Rapid Restore files are corrupt when no files are actually corrupt. If an administrator uninstalls Rapid Restore, this message will not be displayed and Rapid Restore Ultra will uninstall correctly.

Power management troubleshooting information

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

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

- **When a Microsoft Windows backup or CD-R Archive is in progress.** When a Microsoft Windows backup or CD-R Archive is in progress and the system requests to enter standby/hibernate, the IBM Rapid Restore Ultra program 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 Microsoft Windows restore is in progress.** When a Microsoft Windows restore is in progress, the power request will be rejected and the restore will continue.
- **When an IBM Rescue and Recovery environment backup is in progress.** When an IBM Rescue and Recovery environment backup is in progress, the power request will occur, and the user will have to reinitiate the backup.
- **When an IBM Rescue and Recovery environment restore is in progress.** When an IBM Rescue and Recovery environment restore is in progress, the power request will occur, and the user will have to initiate a new IBM Rescue and Recovery environment 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 the IBM Rapid Restore Ultra program with encrypted files.

Restoring from a backup that contains encrypted files

IBM Rapid Restore Ultra base and incremental backup operations capture Windows(TM) Encrypting File System (EFS) files and IBM Client Security Software File and Folder Encryption (FFE)-encrypted files. Full restore operations from a base or incremental backup will successfully restore both EFS- and FFE-encrypted files. The encrypted files introduce no limitations to a full restore operation.

Restoring individual, encrypted files and folders from a backup

IBM Rapid Restore Ultra enables users to restore individual, encrypted files and folders from a backup with the following limitations:

- **Windows EFS files.** Individual files encrypted by Windows EFS can only be restored using Rapid Restore Ultra from the Windows operating system. These files cannot be restored using Rapid Restore Ultra from the IBM Rescue and Recovery(TM) preboot environment.
- **IBM FFE-encrypted files.** Individual files encrypted by IBM FFE can only be restored using Rapid Restore Ultra from the IBM Rescue and Recovery(TM) preboot environment. Furthermore, these files must be restored to their original location to be successfully restored.

Rescuing (copying) encrypted files that are not in a backup

Support for rescuing or copying encrypted files that are not in a backup is as follows:

- **From within the Windows operating system.** Users can copy encrypted files that are not in a backup from within the Windows operating system as follows:

- **Windows EFS-encrypted files.** Individual files encrypted by Windows EFS can only be rescued using the Windows Explorer utility. Use Windows Explorer to copy the encrypted files to removable media before initiating the restore process.
- **IBM FFE-encrypted files.** IBM FFE-encrypted files that are not in a backup cannot be rescued or copied from within the Windows operating system.
- **From within the IBM Rescue and Recovery environment.** Individual, encrypted files cannot be rescued or copied from within the IBM Rescue and Recovery preboot environment.

Additional information

Other considerations and helpful information can be found on the <http://www.pc.ibm.com/support> IBM Web site.

Note: Full hard disk encryption programs generally do not work with Rapid Restore Ultra because they require a master boot record program in order to operate.

Versions of IBM Rapid Restore Ultra prior to Version 4.0 do **not** support Microsoft Windows encrypted files (EFS) or IBM FFE-encrypted files.

Boot Manager troubleshooting information

The following information might be helpful if you encounter trouble while using the IBM Rapid Restore Ultra Boot Manager.

Startup-interrupt prompt does not display

If you do not see the startup-interrupt prompt during startup, it might be that the prompt displayed too quickly. If this occurs and you want to interrupt the startup process and access the IBM Rescue and Recovery environment, press and hold the Enter key and then turn on the computer. Release the Enter key when the IBM Rescue and Recovery environment opens.

Appendix. Notices and Trademarks

This appendix gives legal notice for IBM products as well as trademark information.

Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other 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.

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:

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 states 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.

Licensees of this program who wish to have information about it for the purpose of enabling: (1) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact IBM Corporation, Department 80D, P.O. Box 12195, 3039 Cornwallis, Research Triangle Park, NC 27709, U.S.A. Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Trademarks

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

- DB2
- IBM
- LANClient Control Manager
- Rapid Restore
- Rescue and Recovery
- ThinkCentre
- ThinkPad
- TME
- Wake on LAN

Tivoli is a trademark of Tivoli Systems Inc. in the United States, other countries, or both.

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

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



Printed in USA