Intelligent Backup and Restore

Retrospect®

User's Guide

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Retrospect User's Guide, version 6.0 for Macintosh, first edition.

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GETTING STARTED

- OVERVIEW OF RETROSPECT
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This chapter defines the hardware and system requirements necessary to use Retrospect, then explains how to install or upgrade the Retrospect software. It also provides a basic overview of how to use Retrospect. Retrospect Client requirements and installation are described in Chapter 6 • Network Backup.

The Quick Start section walks you through two backups and a simple restore.

OVERVIEW OF RETROSPECT

Designed for use in small and mid-sized businesses, Retrospect Workgroup and Retrospect Server provide thorough, fast backups, and 100%-accurate restores of file servers, desktops, and notebook computers. Retrospect Desktop delivers the proven capabilities of Dantz's enterprise-class products to the home and small business user. The Retrospect product line protects against loss due to viruses, newly installed software, user error, damaged hardware, hardware upgrades, hackers, and lost or stolen computers. The industry leader in data protection for more than a decade, Dantz has received numerous awards and protects millions of computers worldwide.

Which Edition is Right for You?

There are three editions of Retrospect available. Depending on the needs of your organization, one of these editions is right for you. The following table lists some Retrospect features and shows which editions they are available with.

Feature		Retrospect Desktop	Retrospect Workgroup	Retrospect Server
Back up the Local Computer	A single computer running Mac OS X 10.1.5 or later, including Mac OS X Panther	x	x	x
	A single computer running Mac OS X Server 10.1.5 through Mac OS X Server 10.3 or later		x	x
Back up Networked Clients	Network client licenses included at no additional cost	2	20	100
	Mac OS 7.1 or later, Mac OS X 10.1.5 through Mac OS X Panther, Windows XP, Windows 2000 Professional, Windows NT 4.0 Workstation, Windows 95/98/Me	x	x	x
	Red Hat Linux (versions 6.2, 7.1, 7.2, 7.3, 8, and 9)	x	x	x
	Mac OS X Server 10.1.5 or later, including Mac OS X Server 10.3 or later			x
Backup Devices	Tape drives, hard drives, removable drives, CD/DVD, FTP server	x	x	x
	Tape autoloaders and libraries		x	x
Client	Additional client licenses (100, 50, 10, 5, 1)	Optional	Optional	Optional

REQUIREMENTS

In order to run and use Retrospect, there are certain minimum hardware, OS, and memory requirements. Requirements for client computers are detailed in Chapter 6 • Network Backup.

Backup Computer

The backup computer is the machine on which you install and run Retrospect. It must meet the following minimum requirements:

- Macintosh G3 or better.
- Mac OS X version 10.1.5 or later.
- Retrospect Desktop: A minimum of 128 MB RAM (256 MB recommended).
- Retrospect Workgroup and Server: A minimum of 256 MB RAM (512 MB recommended).
- Hard disk drive with a minimum of 200 MB free space.
- If you are going to use clients, you must have networking hardware and cabling, functioning with the TCP/IP protocol, connected or routed to the network on which the backup computer operates.

Backup Device

Retrospect requires a supported backup device to use as the destination for your backups. You can back up to a tape drive or library, CD/DVD disc drive, FireWire or USB hard disk, or a removable disk drive such as Zip, Jaz, SuperDisk, DVD-RAM, or MO.

NOTE: If you do not have a backup device, you can still back up to the Internet. However, you need the appropriate networking hardware and a valid TCP/IP configuration. You also need an account on an FTP server.

See Chapter 3 • Hardware for more information on backup devices.

INSTALLING RETROSPECT

To install Retrospect:

1. Save all unsaved documents in other running application programs.

2. Insert the Retrospect CD in the computer's CD/DVD drive and double-click Install Retrospect.

3. Enter an administrator level user name and password in the Authenticate window, then click OK.

4. Follow the installer program's instructions.

Upgrading from Previous Versions of Retrospect

If you already have Retrospect 4.0 or later installed on the backup computer, you may have to take some additional steps to maintain your preferences, scripts, and schedules.

NOTE: If you are using a version of Retrospect older than 4.0 you will have to recreate your scripts, schedules, etc.

If you installed Retrospect on a different backup computer and want to maintain your preferences, scripts and schedules, see "Moving Retrospect" on page 162.

NOTE: This version of Retrospect runs on Mac OS X only, whereas previous versions could run on Mac OS 9.

Upgrading from Retrospect 5.x

When you launch the current version of Retrospect, it automatically finds and uses your

old preferences, as long as they are in the default location.

NOTE: For Mac OS X, the default location is: /Library/Preferences/Retrospect. For Mac OS 9, the default location is: System Folder: Preferences:Retrospect.

Upgrading from Retrospect 4.x

When you launch the current version of Retrospect for the first time, and you provide the administrator login and password for authentication under Mac OS X, the configuration update dialog appears.

Click the Import button to copy your logged-in clients, custom selectors, old scripts, schedules, and preferences for use with the current version of Retrospect.

WARNING: If you click the Use Default button, you will not be able to access Retrospect 4.x's logged-in clients, custom selectors, preferences, scripts, schedules, subvolume definitions, and the like. You must then reconfigure these with the new version of Retrospect.

Removing Old Files After Upgrading

Once you have Retrospect up and running and you are confident with it, you can remove the old Retrospect application from your computer. Do not remove your backup set catalog files. It is a good idea to store your catalogs in the same folder as Retrospect.

Installing Retrospect Clients

Installation of Retrospect Clients is described in Chapter 6 • Network Backup, which starts on page 91.

USING RETROSPECT

The main way you interact with Retrospect is through the Retrospect Directory (see page 13). It includes tabs to navigate between different categories of commands, which you invoke by clicking buttons.

Starting Retrospect

To start Retrospect, double-click the Retrospect application icon.

Retrospect requires an administrator login and password in order to back up and restore all the files on the backup computer. When prompted, enter an administrator user name and password.

If you don't want to always require authentication, see "Security Preferences" on page 160.

The first time you run the program, Retrospect asks you to enter your name, organization, and license code. Enter this information, then click OK.

At the registration screen prompt, click one of the following buttons:

- **Already Registered**, if you have already registered your copy of Retrospect.
- **Register Now**, if you have not registered your copy of Retrospect and you would like to do so. Enter the pertinent data in the fields then click Print or E-mail. To e-mail your information to Dantz, your computer must be configured properly for Internet e-mail. If you cannot e-mail your registration, then print it out and send it by mail or fax.
- **Register Later**, if you want to go straight to Retrospect and start using the product.

Exiting Retrospect

To exit Retrospect choose Quit Retrospect from the Retrospect menu. If you created any scripts that are scheduled to run in Retrospect's look ahead time (12 hours by default), Retrospect displays details about the operation before quitting.

See "Schedule Preferences" on page 160 for more information on specifying the look ahead time.

The Retrospect Directory

When you start Retrospect, the program displays its main window, the Retrospect Directory.

You can access all areas of Retrospect by clicking the various tabs and buttons in the Directory.

Each tab includes a brief summary of its contents, along with buttons for performing specific tasks. Next to each button is a description of its function.

QUICK START

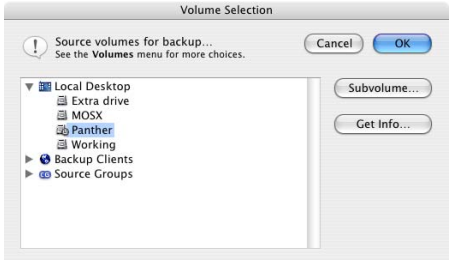
This section introduces you to Retrospect's basic backup and restore operations and walks you through two simple backups and a restore. Before you begin, make sure your computer is connected to a supported backup device and that you have storage media to use with the device.

Part I: Quick Backup

1. Start Retrospect.

2. Click the Immediate tab, then click the Backup button.

If this is your first backup, the Volume Selection window displays.



This window is used to select what you want to back up, i.e. the source volume. The window's scrolling area lists all the volumes available, including local volumes and logged in clients. For this Quick Start tutorial, you'll be backing up your local computer.

3. Click on the name of your startup disk to select it.

4. Click OK.

If this is your first backup, the Backup Set Creation window displays. If this is not your first backup, click the New button to bring up the Backup Set Creation window.

A backup set is Dantz's term for a group of one or more disks, tapes, CD/DVD discs, or a file or an FTP site that serve as the destination for a backup. Individual pieces of media (for

example, discs, disks, tapes, or cartridges) are *members* of a backup set.

5. Select the type of backup media you want to use for this backup set; either tapes, CD/DVD discs, or removable disks. If you have only a single hard disk rather than a dedicated backup device, choose File to create a file backup set.

NOTE: Do not choose the Internet backup set type, which requires more instruction than this Quick Start can provide.

6. Enter a name for the backup set in the Name field, or just leave the default name.

For this tutorial, you can ignore the security and data storage options.

NOTE: For tape backup sets, hardware data compression is allowed by default.

7. Click the New button.

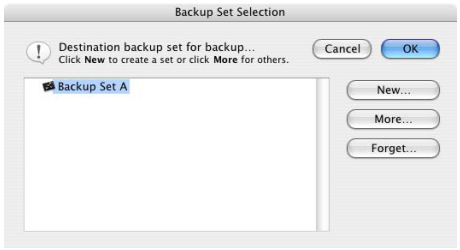
8. Choose a location to store the backup set catalog, then click Save.

The catalog is a file containing an index or table of contents of the files on the backup media of a backup set. The catalog lets you view the contents of a backup set without requiring access to the backup set media.

WARNING: Do not save the catalog on a removable cartridge disk that will be used as a backup destination. Retrospect needs to access the catalog on a readily accessible volume, preferably the local hard disk.

NOTE: With a file backup set, the file you save here serves as both the catalog and the repository of backed-up files. Save it on your designated backup drive.

Retrospect displays the Backup Set Selection window, which lists available backup sets. The new backup set is automatically highlighted, so you do not have to select it.



9. Click the OK button.

The Immediate Backup summary window displays.

Take a moment to look at the various parts of this window, including the source volume you chose and the destination backup set you created.

10. Click Preview to scan the source volume and display its files.

By default, all files and folders on the volume are marked for backup. You can also mark and unmark files and folders manually.

11. Close the Preview window.

The summary window now lists the number and total size of the files to be backed up.

The top of the window should say “Ready to Execute.” If it doesn’t, Retrospect indicates what else is needed before it can execute the backup.

12. Click the Backup button.

For tape, CD/DVD, and removable disk backup sets, the media request window displays.

The media request window for a tape backup set.

NOTE: This window does not appear for file backup sets, in which case Retrospect immediately begins the backup operation.

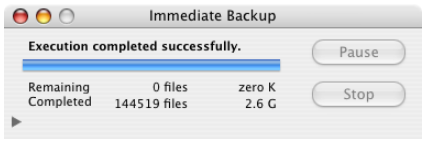
13. Choose a new piece of media for the backup.

WARNING: Use only a blank disk, tape, or CD/DVD disc, or one with unwanted data, because any files on it will be permanently removed.

If you do not have a new or erased disk, tape, or disc in the backup drive, put one in. Select it in the window and click Proceed.

Retrospect displays a progress window while it backs up your files. Depending on your backup device capacity and the size of the files being backed up, Retrospect may request more media.

When it is done, the following window displays.



Congratulations on completing your first backup!

Part II: Quick Backup of New and Changed Files

In the first part of the Quick Start tutorial, you backed up your entire hard disk. The files and folders on this disk are constantly changing however. New files get added and old ones get modified or deleted. In order to keep you backups current, you need to back up on a regular basis.

In the second part of this tutorial, you will create some new files and perform the same backup operation you performed in Part I. You’ll see how Retrospect intelligently copies only those files that are new or changed since the first backup. Dantz refers to this as Incremental-PLUS backup.

1. If you haven’t done so already, quit Retrospect.

2. Make duplicates of some files on your hard disk.

NOTE: Make sure the names are different from the originals.

3. Place these files in the Documents folder of the hard disk you just backed up.

4. Start Retrospect and click the Backup button.

Retrospect displays the immediate backup summary window because it already has the necessary information from your first backup.

5. Click Preview, then close the window that appears and look at the files chosen information.

Retrospect compares all the files on the source volume to all the files that already exist in the backup set (i.e., the files you backed up in Part I of this tutorial). If a file already exists in the backup set and has not changed, Retrospect does not need to copy it.

The number of files that you created or modified is listed to the right of "Need to copy."

6. Click Backup.

7. Close the execution window when the backup is complete.

Congratulations on your first IncrementalPLUS backup.

Part III: Quick Restore

The best reason to back up on a regular basis is so that you'll be able to restore files or an entire computer if files are lost or damaged. This part of the tutorial walks you through a simple restore. For more details on restoring, see "Restore" on page 51 and Chapter 7 • Disaster Recovery.

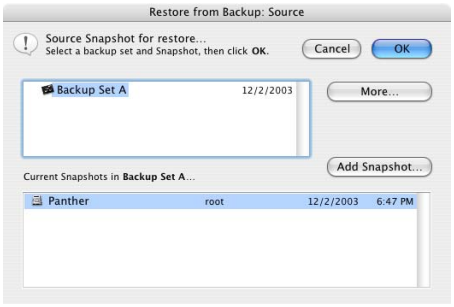
Before you begin delete some or all of the duplicate files you created in Part II of this tutorial.

1. Open Retrospect and click Restore.

2. Choose "Restore files from a backup" and click OK.

3. In the Restore from Backup window, click the backup set to which you backed up earlier.

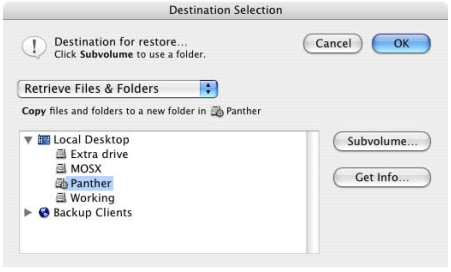
Retrospect automatically selects the first Snapshot in the bottom portion of the window.



Every time you run a backup, Retrospect creates a Snapshot, which is basically a list of all files and folders on the source volume at the time of the backup. Using Snapshots, you can restore files from any point in time.

4. Click OK.

The Destination Selection window displays.



5. Click on the name of your startup disk to select it as the volume to which you will restore.

Make sure the pop-up menu is set to Retrieve Files & Folders.

WARNING: Restoring may destroy data on the destination if you set this pop-up to Restore Entire Disk or Replace Corresponding Files.

6. Click OK.

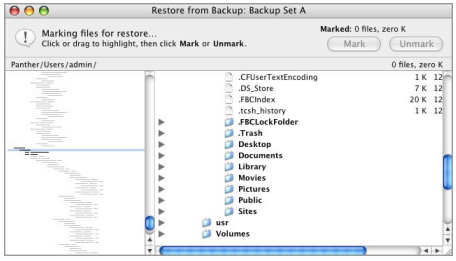
Retrospect matches your Snapshot to the files in your backup set, then displays the summary window.

Check over the various parts of this window. Make sure the destination volume is correct and you are copying files and folders to a new folder. Note that no files are currently selected, which is why the summary says the operation is "Not ready to execute."

7. Click Files Chosen.

8. To restore the files you deleted at the beginning of this tutorial, find these files and mark them for retrieval.

The files should be in the Documents folder. For each file, click its icon, then click the Mark button. (Or, as a shortcut, just double-click a file to mark it.) Marked files have check marks next to them.



The upper right corner of the window shows the number and size of the files you have marked.

9. When you have marked your files, close the window.

The Files Chosen section in the restore summary window includes information about the files you marked and the destination volume.

10. Click Restore.

11. Close the execution window when the restore is complete.

Browse your hard disk and you'll see that Retrospect made a new folder with the same name as your backup set. Inside that folder you will find the files you restored.

Congratulations on your first restore.

CHAPTER 2

FUNDAMENTALS

- HOW RETROSPECT WORKS
- INCREMENTALPLUS
- BACKUP SETS AND THEIR COMPONENTS
- BACKUP ACTIONS
- CATALOG FILES
- SNAPSHOTS
- RETROSPECT AND CLIENTS
- BACKUP SERVER

This chapter describes Retrospect's fundamental concepts. This manual and the program itself repeatedly refer to these basic ideas. Understanding these fundamentals is important and useful but not essential. Dantz designed Retrospect to be powerful and feature-packed, yet very easy to use for basic operations.

HOW RETROSPECT WORKS

Retrospect uses an archival method of backup that ensures backed up files are not deleted or written over until you request it. That way they stay on the disk, tape, CD/DVD disc, or wherever you stored them, indefinitely. This ensures that your files are available if you ever need to restore them.

This is an important benefit of Retrospect not found in "disk mirroring" software used for backups. For example, lets say you have been working on an important document every day for the past month and you discover you have been making terrible mistakes for the past week. If you have been backing up every day with Retrospect, you're not limited to restoring from the most recent backup, rather you can retrieve a version of the file from a week ago (or any point in time it was backed up).

Retrospect uses a catalog file (usually stored on your hard disk) to keep track of the different generations of modified files in a backup set. The catalog lets you quickly search for files without having to actually search the backup media itself.

Retrospect provides a number of ways to protect and restore your data. There are two basic categories of operations you can perform with Retrospect: immediate operations and automated operations.

For example, if you launch Retrospect, click the Immediate tab, then click Backup, you have taken the first steps in creating an immediate operation. If you make a script to do the same backup on a specific schedule, that is considered an automated operation.

Immediate Operations are discussed in detail in Chapter 4 • Immediate Operations. The process of creating scripts is described in Chapter 5 • Automated Operations.

All of the operations in Retrospect, whether immediate or scripted, require a source and a destination. For a backup, the source is generally a hard drive or a folder on a hard drive (Retrospect calls these volumes and subvolumes respectively). The destination is generally a backup set stored on backup media (disks, tapes, CDs, etc.).

Immediate/Automated Operation	Source	Destination
Backup	Volume(s)	Backup Set(s)
Duplicate	Volume	Volume
Archive	Volume(s)	Backup Set
Transfer	Backup Set(s)	Backup Set
Restore	Snapshot	Volume

Volumes, backup sets, Snapshots, and the various types of immediate and automated operations are all discussed in greater detail elsewhere.

INCREMENTALPLUS

Retrospect uses patented technology to perform IncrementalPLUS backups. IncrementalPLUS intelligently copies only files that are new or have changed since the previous backup to the same backup set. You don't have to specify whether you want a "full" or "incremental" backup. Retrospect, by default, copies only the files it hasn't already backed up to the destination backup set.

BACKUP SETS AND THEIR COMPONENTS

The basic building block of Retrospect is the *backup set,* which is a set of one or more disks, tapes, or discs, or a file or FTP site. Individual pieces of media (for example, discs, disks, tapes, or cartridges) are *members* of a backup set.

You can back up as many source volumes as you like to a single backup set. For example, you could have a single backup set as the backup destination for your computer's internal hard disk, your external hard disk, a file server, and a co-worker's hard disk on a computer with installed Retrospect Client software.

When a disk, tape, or CD/DVD fills with data, Retrospect asks for a new one. It uses any available (that is, in the drive) new or erased media. If the media has the name Retrospect is looking for, Retrospect will erase and re-use it. To reduce the danger of unintentionally destroying data, Retrospect will never automatically use a medium with the wrong name if it has data on it.

Retrospect uses a *catalog file*, an index of the files and folders contained in a backup set, to keep track of files and media, so you never have to think about which files are on which disks, tapes, or CD/DVDs. See "Catalog Files" on page 24 for more information.

Tape Backup Sets

A *tape backup set* uses tapes from a tape device such as a DAT drive, Travan drive, AIT drive, VXA drive, DLT drive, or LTO drive. Files are backed up to the tapes and the catalog is usually saved on the hard disk of the computer doing the backup. Chapter 3 • Hardware provides more detailed information on tape drives.

CD/DVD Backup Sets

A *CD/DVD backup set* uses recordable or rewritable discs with CD-R, CD-RW, DVD-R, DVD-RW, or DVD+RW drives. Files are backed up to the discs and the catalog is usually saved on the hard disk of the computer doing the backup. Chapter 3 • Hardware provides more detailed information on recordable disc drives.

Dantz uses the term "recordable disc," or simply "disc," to refer to a recordable or rewritable disc to be used in a CD-R, CD-RW, DVD-R, DVD-RW, or DVD+RW drive. These drives all work nearly the same with Retrospect, though they may use different media. The difference is that data on "R" discs cannot be erased, while "RW" discs can be erased in rewritable drives and reused by Retrospect. Rewritable discs are, of course, recordable, so they are included in the term "recordable discs."

NOTE: You cannot use a CD-ROM or DVD-ROM drive to restore from a CD/DVD backup set. Though the ability to write is not needed during restoring, a CD-ROM or DVD-ROM drive cannot recognize the Retrospect backup set format, which can only be read by a Retrospect-supported drive.

Removable Disk Backup Sets

A *removable disk backup set* uses ejectable media which appears on the Macintosh desktop, such as Zip, Jaz, SuperDisk, DVD-RAM, or MO, as well as USB and FireWire hard disks. Backups can span multiple removable disks or hard disks.

Files are backed up to the disks and the catalog is usually saved on the hard disk of the computer doing the backup. Chapter 3 • Hardware provides more detailed information on removable media drives.

File Backup Sets

A *file backup set* combines the catalog and backed-up files into a single file stored on a volume. This volume can be any volume that mounts on the Macintosh desktop, such as a hard disk, file server or shared disk, or removable cartridge.

Unlike the other types of backup sets, which require media dedicated only to backups, you can store a file backup set right alongside other files on a volume used for other purposes.

A file backup set can be no larger than the volume on which it is stored. You can decrease the amount of space used by a file backup set by using Retrospect's data compression option. The size of a file backup set is also limited by the file system, or the disk format.

Retrospect may, without notice, separate the catalog from a file backup set into a new file. It does this when a single file's resource fork is likely to exceed the operating system's 16 MB limit, which happens with a large number of files in the backup set.

You can also manually separate a file backup set catalog from the file by using the backup set configuration window. See "Configuring Backup Sets" on page 153.

NOTE: If a file backup set is split, keep the two files within the same folder and do not rename either file.

Internet Backup Sets

An *Internet backup set* uses space on an FTP site that is on your office's Intranet or on the Internet. Files are backed up using the available space on the host FTP server via TCP/IP and the catalog is usually saved on the hard disk of the computer doing the backup.

Internet backup sets offer a way to store data without tapes, disks, or discs, and also provide an easy way to store backups off-site. This provides additional protection in the event of theft, fire, or other disaster at your workplace.

In most respects, an Internet backup set is like any other type of backup set. To use an Internet backup set, you must have an account with write privileges on an FTP site, or its server must allow anonymous use. And, of course, you must have a connection to the FTP site, such as an Ethernet network or a modem.

WARNING: With an FTP site connected to the Internet, anyone with access privileges to your FTP site could copy or tamper with your backup set contents. For added security, consider using encryption to keep your backup set contents private.

The connection speed and the amount of space available to you on the FTP site will affect backups to Internet backup sets so you must plan accordingly. If you do not have enough time or space to back up all your files, you will have to make a smaller selection of files to back up. For example, the relatively slow speed of your Internet connection may limit you to backing up only critical files, whereas a faster network may allow you to completely back up your hard disk. Limited space on the FTP site may also limit you to backing up smaller files or fewer files, whereas unlimited space allows you to back up everything, even large files. Retrospect's soft-

ware compression is a useful option when connection speed or disk space is limited.

BACKUP ACTIONS

The main purpose of performing a backup is to copy files into a backup set. For backup operations, you can instruct Retrospect to copy files using one of three different types of backup actions. Each backup action has its own method for determining which files are backed up and controlling the backup set media on which they are stored.

Retrospect's default backup action, *normal,* performs efficient IncrementalPLUS backups without any extra effort on your part.

"Backup Strategies" on page 134, offers several backup strategies that use normal, recycle, and new media backup actions. Study these strategies to learn how to maximize backup safety and effectiveness by alternating among backup sets and rotating media off site.

Normal Backups

A *normal* backup, as its name suggests, is the best action to use in most situations. It is an IncrementalPLUS backup, which saves time and media space by not copying files that already exist in a backup set. A normal backup copies only files which are new or newly modified since the last backup to the same backup set.

During a normal backup, Retrospect compares the list of files selected to be backed up against the list of files in the destination backup set's catalog, then copies only those files that are not already present on the backup set's media. When a normal backup is done to a new backup set, there are no files in the backup set, so everything selected from the source is backed up.

Normal Backup Example

A user creates a new backup set and does a normal backup to it with a new or erased medium in the backup device. Because no files exist in the new, empty backup set, Retrospect copies all the selected files to it. The next day the user does another normal backup to the backup set. Retrospect compares the selected source files to the backup set's catalog file, then marks several new files and a few files that have changed since the previous day's backup. Only these new and changed files are added to the medium previously used with this backup set, or a new medium if the other fills to capacity.

Recycle Backups

When Retrospect performs a *recycle backup*, it first clears the catalog contents (if any) of the destination backup set, so it appears no files are backed up. Then it looks for the first media member of the backup set and erases it if it is available. If the first member is not available, Retrospect uses any available new or erased disk, tape, or CD/DVD appropriate for the backup set type. All selected files and folders from the source are backed up to the backup set.

Recycle Backup Example

The backup administrator decides that the backup set includes too many pieces of media after a week of normal backups to the backup set. She starts a recycle backup with the first media member in the backup device and Retrospect resets the catalog, erases the files on the media, and copies all the selected files.

New Media Backups

When Retrospect performs a *new media backup*, it creates a new destination backup set (with a name similar to the old one) using a new or erased disk, tape, of CD/DVD. This allows the original backup set and its catalog to remain intact for long-term storage in a safe place. The new backup set catalog and the new media member (or directory) are each named with a number in sequence, such as "Office Net [001]" and "1-Office Net [001]" respectively.

Retrospect updates references to the old backup set in scripts and schedules.

In the case of a new media backup to a file backup set, Retrospect creates a new file in the same folder.

In the case of a new media backup to an Internet backup set, Retrospect creates a new directory on the FTP server.

New Media Backup Example

The user wants to archive a backup set by taking it off site, so she starts a new media backup with a new or erased medium in the backup device. Retrospect creates a new backup set with a new catalog, and copies all the selected files to the media. The previous backup set remains intact and the user takes its media and a copy of its catalog file to a secure location off site.

New media backups are ideally used for rotating disks, tapes, or discs for off-site storage. For Internet backup sets, a new media backup creates a new directory at the same level in the hierarchy, which offers minimal protection from accidental erasure, but no protection if the FTP server experiences a hard disk crash, theft, fire, or similar disaster.

CATALOG FILES

Retrospect uses a separate *catalog file* (usually stored on your hard disk) to keep track of the all the files in a backup set. The catalog is an index or table of contents of the files on the backup media of a backup set. The catalog lets you view the contents of a backup set without requiring the media to be inserted in the backup device.

A catalog is required for all operations that copy files to and from a backup set. If a catalog is lost or damaged, Retrospect can rebuild it from the media.

SNAPSHOTS

Because Retrospect does IncrementalPLUS backups, it may have several versions of a file scattered among several backup sessions within a backup set. For example, you may update your "Weekly Status Report" document every week, and because each update modifies the file, Retrospect backs up each one to your backup set. A flat list of all versions of all the files in the backup set would be very confusing. For this reason, among others, every time you back up, Retrospect places a Snapshot of the source volume in the backup set.

A Snapshot is a list—you can think of it as a picture—of all files and folders on a volume when it is backed up. For each volume, one Snapshot is stored in the catalog and a copy of the same Snapshot is stored on the backup medium (disk, tape, disc, file, or Internet). Following each successful backup, or archive operation, the old catalog Snapshot is replaced with a new one. Old Snapshots on the backup medium remain untouched.

When you want to restore from a backup, you can tell Retrospect to use a Snapshot to restore the entire contents of a disk. Or, you can use a Snapshot as a guide to see the volume as it was at a given point in time, and then pick and choose individual files to restore. Snapshots allow you to perfectly restore each volume to its exact state at the time of any completed backup, without copying any extraneous files.

Snapshots help Retrospect keep track of the volumes to which a file belongs. When Retrospect first backs up a volume to a new backup set, it copies the selected files and saves a Snapshot. When it subsequently backs up other volumes, it does not copy files that exactly match files already in the backup set. However, they are still noted in each volume's Snapshot. This efficient storage method saves backup media by not redundantly copying exactly matching files.

You can retrieve Snapshots from media if you want to restore a volume, folder, or file as it was at any given backup.

Because a Snapshot represents a volume at a specific point in time, you cannot use a Snapshot to find multiple versions of a file throughout different backup sessions on different dates. However, Retrospect does provide an easy way of doing this, which is explained in "Restore by Search" on page 55.

RETROSPECT AND CLIENTS

The Retrospect application can back up any drive that mounts on the Macintosh desktop.

Retrospect Clients can extend the backup and restore capabilities of Retrospect to other computers on your network. A computer equipped with this software from Dantz is known as a Retrospect client computer, or simply a client. Retrospect can back up clients on the network without the need for installing file servers, starting file sharing, or mounting volumes.

BACKUP SERVER

Retrospect's Backup Server technology, which is explained in detail in Chapter 5 • Automated Operations, accommodates changing network and disk configurations.

Backup Server offers a special type of scripted backup. Rather than backing up source volumes on specified days and/or times to specified backup sets (like a traditional script), Backup Server scripts prioritize the volumes most in need of backup and copy their files to the available backup set containing the least current data.

Backup Server is ideal for environments in which computers and hard disks, such as mobile computers and removable disks, irregularly appear on the network. Volumes are backed up to the best available backup set media, so Backup Server scripts give you greater freedom to use the media of your choice. Retrospect client users can even initiate backups of their volumes. A Backup Server script is often best used in concert with regular backup scripts to produce a comprehensive backup strategy.

CHAPTER 3

HARDWARE

- HARDWARE OVERVIEW
- COMMUNICATION TECHNOLOGIES
- SEEING YOUR BACKUP DEVICE
- RECORDABLE AND REWRITABLE DISC DRIVES
- REMOVABLE DISK DRIVES
- HARD DISK DRIVES
- TAPE DRIVES
- TAPE LIBRARIES
- MEDIA LONGEVITY AND STORAGE
- HOW RETROSPECT WORKS WITH MULTIPLE BACKUP DEVICES

This chapter explains the device communication technologies used by Retrospect and describes how to use Retrospect with your backup device. If you are already familiar with SCSI, Fibre Channel, ATAPI, FireWire, and USB, you may skip the explanations and read the sections that apply to your particular hardware setup and backup device. If you plan to use the Internet instead of a backup device, you can skip this chapter entirely.

HARDWARE OVERVIEW

Retrospect uses hardware intensively. Its purpose is to transfer large amounts of data between a source volume, such as a hard disk, and a backup device, such as a tape drive, as efficiently as possible. If these hardware systems or their ancillary hardware (for example, cables) do not work correctly, Retrospect cannot do its job and cannot back up your data. For this reason you should understand how your hardware functions and how it relates to Retrospect.

Dantz maintains an extensive laboratory devoted to testing Retrospect with different backup devices. Nothing taxes storage devices more than backups, so if there is a problem, Dantz's intensive testing will most likely find it. Device manufacturers supply Dantz with pre-release versions of their devices so Dantz can identify problems before the devices are made available to the public. Refer to the Dantz Web site for the latest compatibility information and more specific details on supported devices.

If you have problems with Retrospect and your backup devices after you have confirmed you have a valid hardware and software installation, refer to Chapter 10 • Problems and Solutions.

COMMUNICATION TECHNOLOGIES

Retrospect communicates with hardware devices using a number of different methods. This section describes the most common methods and how they interact with Retrospect.

SCSI

SCSI (Small Computer System Interface) is a specification of mechanical, electrical, and functional standards that lets a computer connect and communicate with peripheral devices such as hard drives, recordable disc drives, tape drives, and scanners.

A single SCSI bus connects a Macintosh with peripherals by linking up to fifteen devices with SCSI cables plugged into SCSI ports. The devices are connected serially—one after the other—in a simple layout known as a daisy chain. Each device on a SCSI bus must have its own unique identifying SCSI address, or ID. (You set a device's ID number on the device itself.)

Both ends of a SCSI chain must be "terminated" to maintain the integrity of communication signals on the chain. This is done with a terminator, a device which plugs into an open SCSI port and acts as a kind of dead end of the chain. If you have an internally terminated or self-terminating SCSI device, it should be the last device of the SCSI chain (that is, at the end and the furthest device from the Macintosh). An in-line terminator plugs into a SCSI port, but the terminator itself also has a port that can have a cable plugged into it. To find out the termination requirements for your specific hardware setup, refer to your SCSI controller's user guide and the documentation that came with your peripheral device.

Setting up a SCSI chain on your Macintosh is easy. All you have to do is use the cables to connect the devices in the daisy chain fashion, give each device a unique SCSI ID number, and terminate the last device. You cannot have duplicate SCSI addresses on your SCSI chain. SCSI controllers reserve a single ID, often ID 7, for their control of SCSI operations, so no other device on the bus can use the reserved ID. The IDs on your chain do not have to be sequential or in a particular order; the SCSI chain is not affected by the order as long as no devices share the same number.

NOTE: To ensure proper operation of your SCSI devices, always turn on each SCSI device on your chain before you turn on the backup computer, and do not turn them off until after you shut down the computer.

Fibre Channel

Fibre Channel is a serial data transfer architecture designed for storage devices that require very high data transfer rates. Fibre Channel combines the best features from SCSI and IP network transfer protocols.

Retrospect supports fibre channel tape drives and tape libraries using three different topologies:

- Point-to-point: Connects the backup computer directly to the Fibre Channel tape library using a dedicated cable.
- Arbitrated loop (FC_AL): Connects up to 126 devices or nodes in a single, continuous loop or ring.
- Switched fabric: The most complex topology, switched fabric can be used to connect up to 16 million nodes.

NOTE: For FC_AL and switched fabric, Retrospect does not lock the device from other applications or share the device properly. It is the responsibility of the network administrator to ensure that only one copy of Retrospect has full access to the fibre channel tape library.

Device Status window for a fibre channel tape library.

ATAPI

ATAPI (ATA Packet Interface) is a standard for connecting peripheral devices such as recordable disc drives to a computer's IDE interface.

All ATAPI devices are connected internally on the IDE bus. There can be one or two devices per channel, numbered 0 and 1, known as the master device and the slave device, respectively. (ATAPI device numbers are set with jumpers or special cables.)

No additional software is required under to use ATAPI backup devices with Retrospect.

FireWire

FireWire is a specification of mechanical, electrical, and functional standards which lets a computer connect and communicate with storage devices, such as hard disks and removable disk drives, and other peripheral devices, such as scanners and video camcorders. FireWire is also known as i.LINK or 1394, from its official IEEE 1394 specification.

FireWire connects a computer with peripheral devices by linking as many as 63 devices with special FireWire cables plugged into FireWire ports. FireWire is hot-pluggable, so, in most cases, you do not have to shut down devices to add or remove them, nor do you have to restart the Macintosh. FireWire is capable of extremely fast transfer rates.

No additional software is required to use FireWire backup devices with Retrospect. Refer to your documentation for installation and configuration details.

USB

USB (Universal Serial Bus) is a specification of mechanical, electrical, and functional standards which lets a computer connect and communicate with input devices, such as keyboards and joysticks, and peripheral devices, such as removable disk drives and scanners.

USB connects a computer with peripheral devices by linking as many as 128 devices with special USB cables plugged into USB ports.

No additional software is required to use USB backup devices with Retrospect. Refer to your documentation for installation and configuration details.

SEEING YOUR BACKUP DEVICE

To see a list of the backup devices available to Retrospect, click Devices from the Configure tab. Retrospect displays connected recordable disc drives and tape drives, and connected removable disk drives with mounted media (disks or cartridges in the drives).

NOTE: Hard disk drives do not appear in this window, but can be used as backup devices. See "Hard Disk Drives" on page 36.

Click the Device Status button. Retrospect scans the computer and opens a new window displaying device ID numbers and their connected devices, if any.

For each ID, Retrospect lists the device vendor, its product name, and its firmware version number. In the case of a device for which Retrospect has a special, Retrospect-internal driver, the driver is also identified, in boldface.

In the example above, the Ecrix tape drive is shown as a recognized device on the SCSI bus. "Ecrix VXA DC (5.03)" indicates Retrospect's internal driver version for this drive.

If the device has been qualified by Dantz for use with Retrospect or the device is "recognized", the driver is identified in boldface. Recognized devices have not been put through Dantz's rigorous qualification tests, but will work fine with the listed driver under most circumstances.

To determine if your device is qualified, refer to the Support & Hardware section of www.dantz.com. You can also check the web site to see if Dantz has released a Retrospect Driver Update (RDU) for your device.

Retrospect does not have its own drivers for removable disk drives because it can already communicate with them through the operating system.

When You Can't See Your Backup Device

If you are backing up to removable disks or external hard disks, make sure you can see and access the drive in the Finder. If you cannot, refer to your drive's documentation for information on setting it up properly. When you can access it from the desktop, you should be able to see it in Retrospect.

For SCSI devices, make sure each device is turned on, the cables are securely connected, each device has a unique ID, and the SCSI chain is properly terminated. Do not rearrange devices on a SCSI chain unless each device and the computer itself are all turned off.

If your SCSI chain is not properly connected and terminated, or if there is an ID conflict, many different problems can result. The most harmless problem would be a device that does not appear in the device status list. A more serious—yet subtle—problem could be a communication failure between the backup computer and the backup device, leading to data loss. The most serious problem would be damage to your computer or SCSI devices on the chain.

A drive that does not appear in the storage devices window and device status window may

not be supported by Retrospect or may have special requirements. Refer to the Dantz web site for the latest compatibility information and more specific details on supported devices.

Chapter 10 • Problems and Solutions includes troubleshooting instructions on how to see your device with Retrospect. See "General Device Troubleshooting" on page 203.

Commands for Seeing Devices

The Device Status window has commands for seeing devices.

Ignore ID: If you select an ID and click Ignore ID, Retrospect will not scan that ID when Retrospect is next opened after you quit. This may be useful if you are not backing up to your CD/DVD drive and want to use it to play music while you are backing up. It is also a good way to ignore devices on a Fibre Channel network that you don't want the backup computer to see.

Don't Ignore: To make Retrospect recognize a previously ignored ID, select the ID and click Don't Ignore. Retrospect will scan that ID when Retrospect is next opened after you quit.

Rescan: Clicking this button makes Retrospect scan and display any device changes since the window was initially opened.

Configure: If you select a CD/DVD drive and click this button, you can create (or delete) a custom configuration for your CD/DVD drive. See "Configuring CD/DVD Drives" on page 33 for more information.

RECORDABLE AND REWRITABLE DISC DRIVES

With Retrospect, you can back up to and restore from recordable and rewritable disc drives. Dantz's hardware lab qualifies many, but not all, CD/DVD drives. For a list of qualified drives, see www.dantz.com.

If your drive is not qualified, Retrospect may still be able to support it. See "Configuring CD/DVD Drives" on page 33 for more information.

When Retrospect is executing a script unattended and requires a new disc, it will automatically use any disc in the drive that is erased or has the correct name.

New, blank CD-R, DVD-R, or DVD+R media is considered erased and will be used. New, blank CD-RW, DVD-RW, or DVD+RW media will be prepared by Retrospect and then used. Previously recorded CD-R, DVD-R, or DVD+R media cannot be erased and thus cannot be used by Retrospect.

Because a disc with any recorded data will not be used by Retrospect in unattended operations, it is a good idea to prepare rewritable media ahead of time by erasing CD-RW, DVD-RW, or DVD+RW discs containing unwanted data. See "Commands for Discs" on page 33.

WARNING: You cannot restore data unless you have a Retrospect-supported *rewritable* disc drive. Backups are not readable in a CD-ROM or DVD-ROM drive.

Recordable and Rewritable Media

CD-R, DVD-R, and DVD+R discs are write-once media which cannot be erased. Use care when choosing your CD/DVD backup set names and when deciding which files to back up.

CD-RW, DVD-RW, and DVD+RW discs are rewritable and can be recorded over and over like floppy disks or removable disks. There is a limit to the number of rewrites, but you are not likely to encounter it with Retrospect.

Dantz uses the term "recordable disc," or simply "disc," to refer to a recordable disc to be used in a CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, or DVD+RW drive. These drives all

work nearly the same with Retrospect, though they may use different media. The difference is that data on "R" discs cannot be erased, while "RW" discs can be erased in rewritable drives and reused by Retrospect. Rewritable discs are, of course, recordable, so they are included in the term "recordable discs."

Retrospect can use any media supported by a given drive. Different brands, speeds, and types of media vary greatly. For best results, use high-quality media. Some drive manufacturers recommend or require particular brands of media with their drives, while some do not support using high-speed media. Check with your drive manufacturer for media recommendations.

Formatting discs with other programs prior to backup is neither necessary nor recommended. Use only unformatted or erased discs. You can erase formatted rewritable discs with Retrospect as described below.

Viewing Disc Status

You can use Retrospect to view information about recordable discs that you want to use, or have used, for backups.

Before viewing disc information, make sure the device you want to use is listed in the Storage Devices window. If the device you want does not appear in the window, see "Seeing Your Backup Device" on page 30.

Retrospect requires the exclusive use of the recordable disc drive and it will first eject any loaded, previously recorded (finalized) CD-ROM or audio disc from the drive. The drive is then reserved for Retrospect's exclusive use until Retrospect quits.

TIP: If you have a CD/DVD drive that you don't want to use with Retrospect, select it in the Device Status window and click the Ignore ID button. The next time Retrospect is launched it will ignore this drive. See "Commands for Seeing Devices" on page 31.

To view disc status:

1. Insert the disc in the drive.

NOTE: When you insert a disc in a recordable disc drive, the operating system or other software may ask how you wish to prepare or format the disc. Always ignore formatting prompts and exit these windows, since you should not prepare backup discs with anything but Retrospect.

2. From the Retrospect Directory, click the Configure tab, then click the Devices button.

The Storage Devices window displays.

Once a disc is loaded, its status appears.

Ready indicates the disc contains Retrospect data.

Erased indicates an empty disc, ready for use by Retrospect.

Write Protected means the disc is locked.

Content Unrecognized means the disc is not empty, but does not contain valid Retrospect data. (See "Content Unrecognized" on page 217.)

Wrong Version may mean the drive's firmware is not supported. Or, it may mean the inserted disc was written to by Retrospect for Windows. Retrospect for Macintosh cannot read such discs.

Hardware Error indicates a device error has occurred.

Damaged Disc indicates that the disc was damaged during the previous backup. You may not be able to append to this disc.

Running and Busy indicate the drive is busy.

No Media indicates there is no disc in the drive.

Commands for Discs

The Devices menu includes a number of commands for working with discs.

Eject unloads the selected disc from its drive.

Erase erases the contents of the selected rewritable disc. It is not available with recordable-only discs.

Set Write Speed is available from the Devices menu. Choose this command to set a write speed other than the default for the selected CD/DVD drive.

Select a write speed, then click OK.

NOTE: You should only change the write speed if Retrospect is unable to write to the drive using the default setting.

Configuring CD/DVD Drives

Retrospect includes built-in recognition for many CD/DVD drives. For drives that are not recognized, you can create a custom configuration.

NOTE: Custom configurations are not qualified through Dantz's rigorous Hardware Certification process, but successful configurations are supported.

During the custom configuration process, Retrospect asks you to insert a blank disc. This disc is used to run a series of tests. Make sure to insert the type of disc (CD-RW, DVD+RW, etc.) that you want to use for backups. After Retrospect finishes configuring the drive for one type of disc, you will have the opportunity to run the tests again with additional media types.

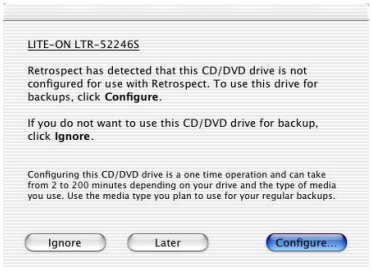
NOTE: It is only necessary to configure the drive with the type of media that will be used for backup.

After creating a custom configuration, you should perform a backup with verification turned on to ensure that Retrospect works properly with the device.

TIP: Save a copy of the custom configuration .rdi file to a location on your network, or back it up to a backup set other than a CD/DVD backup set. If the .rdi files gets lost or damaged, you can move (or restore) the saved copy to the appropriate location instead of reconfiguring the drive. The .rdi file is saved in Library/Preferences/Retrospect.

Automatic configuration

When you have an unrecognized CD/DVD drive connected to the backup computer, the CD/DVD configuration dialog automatically appears when you click the Devices button on the Retrospect Directory's Configure tab (or perform another operation that requires a bus scan).



- To create a custom configuration for the drive, click Configure and follow the on-screen prompts.
- To skip configuration and prevent the dialog from appearing again, click Ignore.
- To skip configuration now, but allow the dialog to appear again next time, click Later.

Manual configuration

In some rare cases, you may want to create a custom configuration that overrides Retrospect's built-in recognition. You should use this procedure only if you are experiencing difficulty backing up to a CD/DVD drive, or if you are directed to do so by Dantz Technical Support.

NOTE: While customization may improve communication between Retrospect and the drive, it may not.

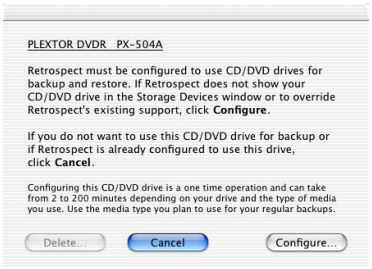
To manually launch CD/DVD Custom Configuration:

1. From the Retrospect Directory, click the Configure tab, then click the Devices button.

2. Click the Device Status button.

The Device Status window displays.

3. Select the CD/DVD drive for which you want to create a custom configuration, then click Configure.



4. To create a custom configuration for the drive, click Configure and follow the on-screen prompts.

Deleting a custom configuration

If you created a custom configuration for a CD/DVD drive and you continue to have problems, or your problems get worse, delete the custom configuration.

To delete a custom configuration:

1. From the Retrospect Directory, click the Configure tab, then click the Devices button.

2. Click the Device Status button, select the CD/DVD drive for which you want to delete the custom configuration, and click Configure.

3. Click Delete to remove the device's custom configuration and use Retrospect's built-in support, if available.

NOTE: The Delete button is only available if you have previously created a custom configuration.

4. Click OK to confirm deletion.

WARNING: Retrospect cannot back up to a CD/DVD drive for which it is has *no* configuration (custom or built-in).

Custom configuration and the bootable CD

You cannot create a custom configuration for a CD/DVD drive when your computer is booted from the Retrospect Mac OS X bootable CD.

This means that, in order to restore a computer from a CD/DVD backup set that was written using a custom configuration, you must follow the

instructions in “Restoring the Backup Computer Without the Bootable CD” on page 120

REMOVABLE DISK DRIVES

Though Retrospect is often used with discs or tapes, it is just as effective when used with drives with removable media which mount as volumes on the Macintosh desktop.

For the purposes of this software, a removable disk drive is a device that uses media that can be mounted and ejected with the Finder. This includes Zip, Jaz, SuperDisk, DVD-RAM, and MO. Mac OS X supports some removable disk drives but requires add-on drivers to support others. (The drive vendors include these drivers with the devices.)

NOTE: Retrospect can use external USB and FireWire hard disks as members of removable disk backup sets. See “Hard Disk Drives” on page 36.

Disks must be mounted as volumes on the Macintosh desktop for Retrospect to recognize them. When a volume is mounted its icon appears on the Macintosh desktop.

Some drives are mounted at startup while others require you to use software to manually mount volumes. Most removable disk drives include software to automatically mount volumes when you are swapping disks or cartridges. Often, this software is a system extension that must be loaded at startup to later mount disks.

NOTE: Before using Retrospect to back up to a removable disk drive you should be familiar with the procedures to insert, format, erase, and eject cartridges.

When Retrospect is executing a script unattended and requires a new piece of media, it will automatically use any appropriate media that is erased or has the correct name. It is a good idea to prepare disks for use ahead of time by erasing or reformatting them.

NOTE: For removable disks such as Zip, Jaz, SuperDisk, DVD-RAM, or MO, format with the software that came with your drive.

Choosing the Backup Set Type

A removable disk drive can be the destination for both file backup sets and removable disk backup sets. There are some important differences between these two types of backup set:

- A removable disk backup set can grow continuously by spanning multiple removable disks or cartridges, just as a CD/DVD backup set can span multiple discs. A file backup set cannot grow beyond the available space of its single disk or cartridge.
- Removable disks used as part of a removable disk backup set must be erased before you can use them. Removable disks used as part of a file backup set do not have to be erased, and the disk can store and access files other than the backup set data files.

Viewing Removable Disk Status

You can use Retrospect to view information about removable disks that you want to use, or have used, for backups.

Before viewing disk information, make sure the device you want to use is listed in the Storage Devices window. If the device you want does not appear in the window, see “Seeing Your Backup Device” on page 30.

To view disk status:

1. Insert a disk into the drive.

2. From the Retrospect Directory, click the Configure tab, then click the Devices button.

The Storage Devices window displays.

Once a disk is loaded, its status appears.

Ready indicates the disk contains Retrospect data.

Erased indicates an empty disk.

Content Unrecognized means the disk is not empty, but does not contain valid Retrospect data. With a removable disk, the unrecognized content likely is other files, which you may not want to lose. (See “Content Unrecognized” on page 217.)

WARNING: When a removable disk shows as Content Unrecognized, use caution. Any files on a disk are permanently removed when Retrospect uses the disk for backup. Be especially careful not to use a hard disk which has been formatted to appear as a removable disk; the unrecognized content may be your valuable data.

Unloaded usually means a disk is in the drive but must be ejected and reinserted to be used.

Running and Busy indicate the drive is busy.

No Media indicates there is no disk in the drive.

Formatting Removable Disks

Before you use an unformatted removable cartridge or similar disk with Retrospect, you must first format the disk with a formatting utility or the operating system. You must format all disks as Mac OS Extended (HFS+) to be supported.

TIP: When you have a choice of multiple file systems, such as with DVD-RAM, use only HFS or HFS+.

Commands for Removable Disks

The Devices menu includes a number of commands for working with removable disks.

Eject unloads the selected medium from its drive.

Erase erases the contents of the selected disk.

HARD DISK DRIVES

Retrospect supports hard disk drives as a backup destination. This includes internal and external hard disks directly connected to the backup computer, and hard disks served over the network. To use a hard disk with Retrospect, it must be accessible through the Finder, since Retrospect uses the file system, not custom drivers, to communicate with hard disk drives.

Hard disk drives are generally not listed in the storage devices window. To see the hard disks available for use with Retrospect, click the Configure tab, then click Volumes.

The main drawback of using a fixed hard disk as a backup device is that the fixed disk does not have removable media for off-site storage and media rotation. (“Backup Strategies” in Chapter 8 describes these important aspects of safe and secure backups.) “Hot-swapable” or external drives are more flexible in these respects.

Choosing the Backup Set Type

A hard disk drive can be the destination for both file backup sets and removable disk backup sets.

NOTE: You must set Retrospect’s Media Handling preferences to use FireWire and USB hard drives as removable disks. See “Media Handling Preferences” on page 159.

There is one major difference between using hard disks with file backup sets and removable disk backup sets:

- A removable disk backup set that uses hard drives as the destination can grow continuously by spanning multiple hard disk. A file backup set cannot grow beyond the available space on a single hard disk.

Duplicating to a Hard Disk

You can also use Retrospect to duplicate one hard disk to another. See “Duplicate” on page 58. However, because a duplicate is just a mirror of the source volume, not a managed backup, a duplicate lacks the flexibility and benefits of Retrospect’s backup operation. The main advantage of a duplicate is that the files on the backup volume can be opened, copied, or otherwise used directly with the Finder, whereas with backups, you must first restore the files with Retrospect.

TAPE DRIVES

Retrospect supports most tape drives without requiring the installation of additional software. For a list of supported tape drives, see www.dantz.com.

Unlike random access devices such as hard drives, removable disk drives, and CD/DVD drives, tape drives are sequential access devices. Since the data reading mechanism cannot immediately go to the correct data position on the media, a tape drive accesses data more slowly than a disk drive (or similar random access device). It is just like fast-forwarding a music cassette to find your favorite song.

Sequential access media is relatively inexpensive, has large capacity, and has a good sustained data transfer rate. Thus, tapes are particularly well suited for backups.

When you use Retrospect to back up a volume to a tape, the data is written sequentially from the beginning of the tape to the end. When you add backups to the tape, the data is appended where the previous data ends, until the tape runs out.

Neither the backup computer nor Retrospect will mount a tape when you put it in the drive, so do not expect the tape to appear on your Macintosh desktop. You cannot see it in the Finder to drag files to and from the tape like a disk volume. This is not bad because a sequential access device is not optimal for the type of file management you are likely to do with a mounted volume in the Finder. Though the technology exists to let you mount a tape as a volume and use it like a disk, you probably would not want to do this for regular backups because of the performance issues discussed previously. Retrospect’s system for backing up and restoring files to and from tapes is far more powerful, efficient, and reliable.

Tape Capacity

The actual amount of data that will fit on a given tape will vary due to many factors. A tape’s capacity can be greatly influenced by the relative speeds of the backup computer and the tape drive.

If you back up a slow source (for example, a slow Macintosh or a shared volume on a network) to a fast tape drive, the tape capacity is reduced by the source’s inability to supply a steady flow of data to the tape drive. (This is like dictating to an audio cassette recorder; you can record more words if you speak quickly without pauses, but when you take a breath you are wasting tape because the recorder is still going, recording silence.) When the tape drive runs out of data while backing up, it must stop writing data, reposition the tape, and resume writing at the correct section of the tape. Each reposition reduces the capacity of the tape, and excessive repositioning can lead to accelerated device wear.

Do not be surprised if your tapes end up with less than their advertised capacities. Some tape drives are represented as being capable of high-

er capacities than the drives normally achieve in day to day use. The representations refer to the amount of data *before* it gets compressed by a tape drive with hardware compression capability—and they often assume generous compression rates.

Compression

Compression, which can be done by Retrospect (software data compression) or a capable tape drive (hardware data compression), conserves space on media by reducing the size of the data being stored. Compression does not actually increase the media capacity—a given tape can only hold a certain amount of data. Compression squeezes the original data to a more compact size before the data is put on the tape, allowing you to fit more of your files on a given tape.

Hardware data compression is extremely common on tape drives. Retrospect uses a drive's hardware compression whenever possible, automatically turning off Retrospect's software compression option if necessary.

TIP: It is much faster to let the tape drive compress the data than to have Retrospect compress it.

The amount of compression achieved varies depending on the type of data being backed up. Text files generally compress well, while applications and system files do not. Compression can reduce data to half its original size.

Retrospect disables hardware compression when you use encryption because encrypted data compresses poorly. If you need to use encryption and compression together, use Retrospect's software compression option. Retrospect then compresses the data before encrypting it, which is not possible when hardware compression is used.

Tape Drive Mechanisms

Though you may buy your tape drive from one of many companies, the drive is actually built around a mechanism from one of several manufacturers. Typically, companies purchase bare mechanisms from manufacturers, put them in their own cases and packaging, and support the products with their own staffs.

Popular types of tape mechanisms available are ADR, AIT, AME, DAT, DLT, DTF, Exabyte, Travan, Ultrium, LTO, and VXA. Robotic tape libraries are available for several types of these drive mechanisms.

High speed, large capacity tape drives such as AIT, AME, DLT, DTF, and Ultrium require a high performance environment. Best speed and capacity results are achieved with a fast computer processor. The most important performance factor is the speed of the source volume. If the source is too slow, the drive must frequently stop to reposition the tape while waiting for additional data. If the drive repositions too often, copy performance will decrease dramatically.

TIP: High performance SCSI adapters can help to improve overall performance when using tape drives.

DAT

DAT drives span the gap between entry-level tape drives such as Travan and higher-end products such as DLT and AIT. Each compact DAT cartridge, containing a length of 4 mm wide tape, holds about 2 GB (DDS-1), 4 GB (DDS-2), 12 GB (DDS-3), 20 GB (DDS-4), 36 GB (DAT 72), or more depending on how much your files are compressed. Speeds range from 6 MB per minute with older DDS-1 drives to 150 MB per minute with newer DAT 72 drives.

AIT/AME

Eight millimeter drives using Advanced Intelligent Tapes (AIT, AIT-2, and AIT-3) or Advanced Metal Evaporated (AME) tapes are among the fastest tape drives available. Their mechanisms can store 12 to 100 GB of uncompressed data at very high speed when used under optimal conditions.

ADR

ADR tapes can store 15, 25, 30, and 60 GB of uncompressed data.

VXA

VXA drives provide tape technology that is reliable and relatively inexpensive for small- to medium-sized environments. VXA formats data in packets, operates at variable speed, and can read data multiple times in a single pass of the tape. A VXA-1 tape can store 33 GB of uncompressed data. A VXA-2 tape can store 80 GB of uncompressed data.

DLT

DLT and Super DLT drives are among the fastest tape drives available. Their mechanisms offer exceptional performance and 2.6 GB to 300 GB uncompressed capacity when used under optimal conditions.

DTF

Digital Tape Format (DTF) drives store 12 to 200 GB of uncompressed data. They are among the fastest and largest capacity tape drives available when used under optimal conditions.

Travan

These tape drives have uncompressed capacities of 1.5, 2, 4, 10, or 20 GB, depending on the tape cartridge used. Travan "NS" (Network Series) drives include hardware compression.

Ultrium/LTO

Ultrium tape drives are among the fastest and largest capacity tape drives available. The Ultrium format was created by the LTO (Linear Tape Open) Consortium. Ultrium-1 tapes offer an uncompressed capacity of 100 GB. Ultrium-2 tapes offer an uncompressed capacity of 200 GB.

Cleaning Your Tape Drive

Regular cleaning of your tape drive is essential for reliable performance. Dirty drive heads are a major cause of tape drive problems and reported media failures (error –206).

Cleaning most tape drives is as simple as inserting a special tape cleaning cartridge and letting the drive clean itself. Refer to your drive's documentation for its manufacturer's cleaning recommendations.

For tape libraries, you can drag and drop a cleaning tape from its storage slot to the drive to initiate a cleaning operation. When the cleaning operation is complete, Retrospect returns the tape to its slot.

Retrospect's tape cleaning reminder preference (page 159) can remind you to clean your drive at the interval you specify.

Viewing Tape Status

You can use Retrospect to view information about tapes that you want to use, or have used, for backups.

Before viewing tape information, make sure the device you want to use is listed in the Storage Devices window. If the device you want does not appear in the window, see "Seeing Your Backup Device" on page 30.

To view tape status:

1. From the Retrospect Directory, click the Configure tab, then click the Devices button.

The Storage Devices window displays.

2. If there is not already a tape in the drive, insert one.

Once a tape is loaded, its status appears.

Ready indicates the medium contains Retrospect data.

Erased indicates an empty medium.

Content Unrecognized means the tape is not empty, but does not contain valid Retrospect data. Often, this happens when a compressed tape is inserted in a drive without hardware compression abilities. It also happens when you insert a tape written to by other backup software. (See "Content Unrecognized" on page 217.)

Wrong Version usually means the inserted tape was written to by Retrospect for Windows. Retrospect for Macintosh cannot read such tapes. It can also mean the drive's firmware version is not supported by Retrospect.

Write Protected means the tape is locked.

Hardware Error indicates a device error has occurred.

Unloaded usually means a tape is in the drive but is rewound and must be ejected and reinserted to be used.

Running and Busy indicates the drive is busy.

No Media indicates there is no tape in the drive.

Commands for Tape Drives

The Devices menu and the Storage Devices buttons include a number of commands for working with tape drives.

Eject unloads the selected tape from its drive.

Retension winds the selected tape forward to the end and back to even out the tension and alignment with tape mechanisms which require retensioning. (Most types of tapes are retensioned automatically during execution, and cannot be retensioned manually with this command.) You should retension tapes if they have not been used in a long time or if the temperature or humidity of their storage environment has changed significantly.

Erase erases the contents of the selected tape, and—in the case of some tape drive mechanisms—conditions media to be reused.

Format completely reformats the selected tape and is more time-consuming than Erase. It is only supported by certain tape drives.

Additional commands are available for tape libraries. See "Commands for Tape Libraries" on page 42.

TAPE LIBRARIES

A tape library (sometimes called a loader, autochanger, or autoloader) is a hardware unit that mechanically moves tapes in and out of its drive mechanism(s) from a magazine or fixed storage slots holding several tape cartridges. Tapes can be arranged in any order and Retrospect will determine which tape it needs to perform an unattended backup. Tape libraries are useful for large-scale network backups because they automatically change tapes when one fills up, limiting downtime. Many tape libraries are available, each using one or more of the many available tape drive mechanisms. For more information, refer to the library's manual and the

Support & Hardware section of www.dantz.com.

NOTE: Tape library support is only available with Retrospect Workgroup and Retrospect Server.

Retrospect supports barcode-reading libraries and multiple import-export slots to move cartridges within and to and from the library. Import-Export slots appear in the Storage Devices window. You can drag and drop tapes to and from the import-export slots.

How Retrospect Works with Tape Libraries

Retrospect works differently with tape libraries depending on whether or not the library supports barcode reading.

Retrospect supports barcode-reading libraries and manages tape cartridges based on their barcode identification. It displays a tape's barcode in addition to its member name (if any) in media requests, backup set properties, and the Storage Devices window. In addition, Retrospect recognizes CLN-coded cleaning cartridges. Barcode support enables Retrospect to quickly scan the storage slots in a library to determine their contents.

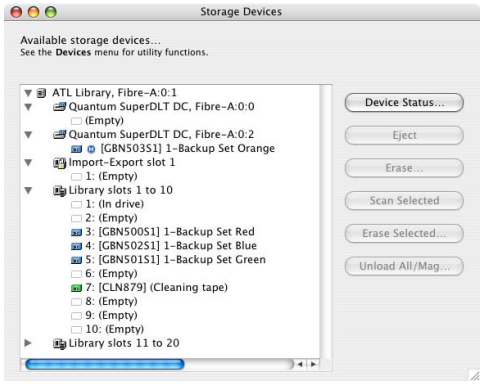
If your library does not support barcode reading, Retrospect must scan the library to get the name of each tape. The library inserts each tape in the tape drive, and Retrospect keeps track of the tape names and locations.

For libraries without barcode support, Retrospect uses a unique feature called "storage slot memory" that speeds up subsequent scans of the library. Each time you exit Retrospect, it records the state of each slot and drive in the library and saves this information as one of ten tables in its configuration file. (The ten tables reflect the ten most recent library scans.)

You can think of saved library tables as a kind of educated guess in the hunt for the correct tape. This method greatly increases the odds of finding a tape on the first attempt if the locations of the tapes in the library's magazine remain relatively constant. Otherwise, Retrospect rescans the library to update the current inventory.

Viewing Tape Library Status

To view a tape library's status, insert a loaded magazine (if applicable) and click Configure>Devices to display the Storage Devices window. Notice how the library, tape drives, and slots (including import-export slots) appear in the window.



Retrospect displays information about the library, tape drives, and each of the storage slots, including status, location, and barcode. Icons and additional status information indicate the contents of each slot.

Icon	Status or Tape Name	Comments
	(Empty)	The slot has no tape.
	(In drive)	The slot has no tape because it was moved into the drive. This is certain because the library always knows from which slot it has moved a tape into the drive.

Icon	Status or Tape Name	Comments
	(Unknown)	The slot has never been scanned by Retrospect.
	(Cleaning tape)	The slot has been designated as a cleaning tape slot by Retrospect.
	Name	The named tape was in the slot when Retrospect last scanned for tapes, but the status is unverified because the slot's content may have changed since then.
	[*Barcode*] Name	The named tape was in the slot when Retrospect last scanned for tapes, and is verified because the slot's content could not have changed since then.

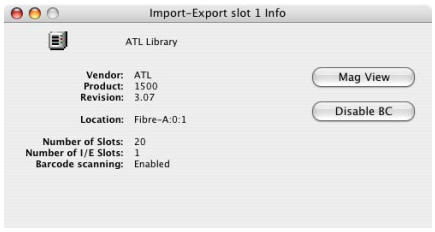
Working with Tape Libraries

From the Storage Devices window, you can move tapes by dragging and dropping their icons. Position the pointer over a tape icon. When the pointer turns into a hand, you can click and drag a tape from slot to slot, slot to drive, or drive to slot. For slot to slot moves, you can selected multiple tapes to move at one time.

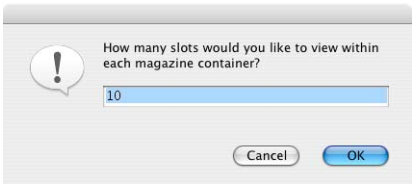
Retrospect lets you organize a tape library's storage slots so that the way they appear in the Storage Devices window matches the library's actual magazine structure.

To organize storage slots:

1. In the Storage Devices window, select your tape drive, then choose Get Info from the File menu.



2. Click the Mag View button.



3. Enter the number of slots each magazine in the tape library includes.

Retrospect creates a Library slots container for each group of slots.

Commands for Tape Libraries

The Devices menu and the Storage Devices buttons include a number of commands for working with tapes and tape drives.

For tapes in a drive:

Eject moves the selected tape from the drive to its slot.

Erase erases and lets you name the selected tape.

For slots in the library:

Scan Selected cycles through the selected storage slots in the library, moving each tape from slot to drive to learn the name of the tape. You do not need to use this command if your tape drive supports barcodes.

Erase Selected erases each tape in the selected storage slots of the library.

Move Selected to Drive moves the selected tape to the drive. (This command is only available from the Devices menu).

Unload All/Mag unloads tapes from the library's drive(s) and returns them to their slots. Then, for capable libraries, ejects the library's magazines.

Cleaning Slot designates the selected slot as a cleaning slot. Retrospect will not scan the cleaning slot when it searches for media. If your

library supports barcode reading, Retrospect automatically recognizes a CLN-coded cleaning tape and reserves its slot for cleaning purposes. See “Cleaning Your Tape Drive” on page 39 for more information. (This command is only available from the Devices menu).

Retrospect does not have a function for automatically cleaning drives in libraries, but it does have a tape cleaning reminder feature. See “Maintenance Preference” on page 159. Refer to your library’s documentation for the manufacturer’s cleaning recommendations.

Initialize Elements sends the Initialize Elements Status command to the library, which forces the library to update the status of all elements. Use this command if you encounter a situation in which the information reported in the Storage Devices window does not match the actual state of the library. (This command is only available from the Devices menu).

Import-Export Support

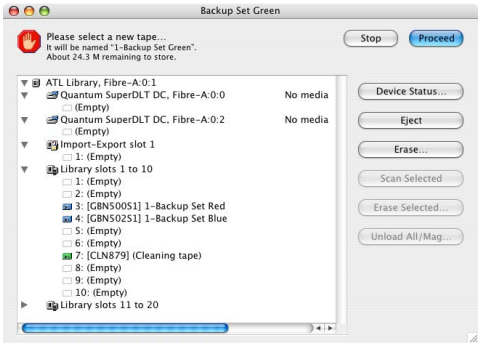
Some libraries come with separate ports that are used to load single tapes into and out of the library without opening the door. Retrospect uses the term “import-export slot” for this feature, which is also known as “Mail Slot,” “I/E element,” and “Call Slot.” If the import-export slots are present and enabled in a library, Retrospect displays them as separate slots at the top of the list of slots. You can drag and drop tapes from the source drive or any slot onto the import-export slot and the library will move the selected tape to the port. When you place a tape into the port, Retrospect displays “Media Available” next to the import-export slot and you can move it by dragging it to any slot or drive in the library.

Retrospect does not scan import-export slots during media requests. Do not place a tape in the import-export slot if you want to use the tape in an immediate or automated operation.

Tape Library Media Requests

During immediate and automated operations, Retrospect scans the library, searching for the appropriate media, and loads whichever tape is required. If a new or erased tape is required, Retrospect will load and use the first one available.

If it cannot find an appropriate tape to use, Retrospect displays the media request window. The operation cannot continue until you insert media.



NOTE: Retrospect does not scan import-export slots during media requests.

MEDIA LONGEVITY AND STORAGE

Media life depends largely upon how the media is stored and maintained. Proper storage avoids moisture, heat, and particulate contamination, which cause media deterioration, leading to loss of media integrity or loss of data itself.

Magnetic media's worst enemy is moisture. Optical media's worst enemy is heat, which causes distortion, and particulate matter, which causes scratches. Keep media out of direct sunlight and away from heaters. Avoid extreme temperature changes. Airborne particulates such as dust and cigarette smoke can also harm media.

Tapes are unique in that they use lubricant. The tape media is lubricated, and after many passes over the drive's heads, tapes tend to fail because the lubricant has dissipated. You should be able to get a few thousand passes from a tape, but remember that each tape operation involves several passes.

A fire-proof safe in a climate-controlled building is an ideal media storage location. At the very least, keep the media in its original containers inside a cabinet or desk.

HOW RETROSPECT WORKS WITH MULTIPLE BACKUP DEVICES

During an operation, Retrospect searches available backup devices for the appropriate medium. If the medium fills or Retrospect needs another medium for any reason, it searches available drives. This is useful, for example, to have one drive with the tape Retrospect expects and another drive with an empty tape for when the first tape fills during the night. The drives must use similar mechanisms, such as two DAT drives.

Retrospect for Macintosh cannot simultaneously write to multiple devices.

CHAPTER 4

IMMEDIATE OPERATIONS

- BACKUP
- ARCHIVE
- RESTORE
- DUPLICATE
- TRANSFER

Immediate operations are ones that you initiate manually and that execute immediately. Types of immediate operations are: backup, archive, restore, duplicate, and transfer. This section describes each of these operations in detail.

If you are a casual user needing only occasional backups, you may be satisfied performing only immediate operations. However, if you are a network administrator who frequently backs up multiple volumes, you are better off automating these tasks with scripts. Whether you plan to do immediate or scripted operations, this section is a good introduction to Retrospect.

Scripts are described in Chapter 5 • Automated Operations.

BACKUP

This section describes how to perform an immediate backup with Retrospect. The backup procedures described here include all the information you need to know to effectively back up all of your files.

There are three basic stages in backing up:

- Choosing the source volumes to back up
- Choosing the backup set in which to store the files (or creating a new backup set)
- Executing the backup

The first time you back up the contents of a source volume, Retrospect backs up all selected files. In subsequent backups (unless you indicate otherwise), Retrospect backs up only those files that are new or have changed since the last backup to that particular backup set. Dantz calls this IncrementalPLUS Backup. This means that if you back up frequently, fewer files need to be copied in each backup session and backups will require less time and media.

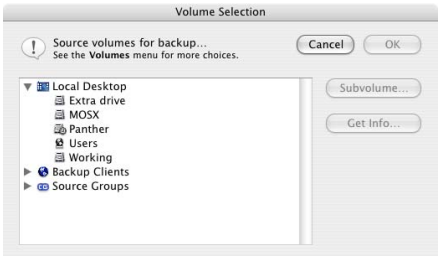
Preparing to Back Up

Before you attempt to back up files with Retrospect, ensure that your backup device is properly connected to the backup computer and that your storage media (tape, disk, or disc) does not contain valuable data that should not be overwritten.

To begin an Immediate Backup, click the Immediate tab, then click the Backup button. If you have backed up before, the Immediate Backup summary window appears. This is so you can easily initiate backups with only a few clicks. If you have not backed up before, Retrospect displays the Volume Selection window.

Choosing Source Volumes

In the Immediate Backup summary window, click the Sources button to display the Volume Selection window.



It lists all volumes currently available to be backed up, including your internal hard disk, any connected removable disk drives or hard disks, any mounted shared volumes, and any logged-in client volumes on the network.

The volume list works much like a volume or folder window in the Finder viewed as a list. It is organized hierarchically by Local Desktop, Backup Clients, and Source Groups. Click on the ▶ icon to expose the contents indented under an item and click on the ▼ icon to hide the contents. All aspects of the volume selection window, including navigating, organizing, selecting, and subvolumes are fully explained in "Working with Volumes" in Chapter 9.

In the volume list, click a volume to select it. To back up more than one volume, Shift-click or Command-click other volumes.

NOTE: Do not select a source volume that is on a removable disk drive unless you are going to back up to a different drive.

When you have made your volume selection, click OK to continue setting up the immediate backup. The volume selection window closes and Retrospect returns to the Immediate Backup window.

Choosing the Destination Backup Set

In the Immediate Backup window, click the Destination button to display the Backup Set Selection window, which lists available backup sets.

Select a destination backup set and click OK to continue setting up the backup. If no backup sets are listed in the Backup Set Selection window, or if you do not wish to use any of those listed, you can create a new backup set.

Creating a New Backup Set

If no backup sets are listed in the backup set selection window, or if you do not wish to use any of those listed, click the New button to make a new backup set.

Use the Backup Set Creation window to set the attributes of the backup set. *You cannot change the attributes of a backup set after it is created.*

Backup Set Type The most important item in the window is the backup set type, which specifies the type of media the backup set uses for this and future backups. Use the pop-up menu to choose a backup set type that corresponds to your backup device media—CD/DVD discs, removable disks, tapes, file, or the Internet. See "Backup Sets and Their Components" on page 21 for more information on the different types of backup set.

Security Security lets you specify a password for accessing the backup set, with optional data encryption. By default, new backup sets do not have a password or use encryption.

Click the Secure button to set the security options for the backup set.

NOTE: Using encryption increases backup time. DES encryption is slower than SimpleCrypt, which provides adequate security for most needs.

- *Password Only* prevents access to your backup set without a password. Stored data is not encrypted.
- *SimpleCrypt* provides password protection and encrypts backup set data using Dantz's proprietary encryption format.
- *DES* provides password protection and encrypts backup set data using the United States government Data Encryption Standard.

WARNING: If you forget your password you cannot access your data. There is no "magic key" or "back door" to circumvent the encryption. Not even Dantz Technical Support can help you.

Data Storage (tape backup sets only) When the Allow hardware data compression checkbox is checked, Retrospect uses the tape drive to compress data in the backup set, provided that the tape drive supports data compression. This option cannot be selected if the backup set is encrypted.

NOTE: If you need to use both encryption and compression for a tape backup set, specify an

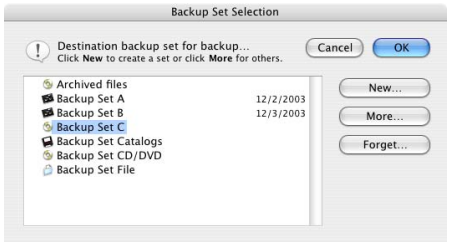
encryption option in the security dialog and use Retrospect's software compression option. See "Backup Options" on page 143 for more on software data compression. Software data compression is available for all backup set types.

Name In the Name field, enter a unique and descriptive name for the backup set. For example, "Monday Complete Backup," "Accounting Backup," or "Friday Clients Backup." Retrospect uses this name to identify both the catalog file and the backup set media. Name backup sets carefully because they cannot be renamed. File backup sets are the exception and they can be renamed in the Finder.

When the backup set description is complete, click New to create the backup set.

- For tape, CD/DVD, and removable disk backup sets, a dialog appears, prompting you for a location to save the catalog file that keeps track of the contents of the backup set. Specify a location for the catalog (your hard disk is best) and click Save.
- For file backup sets, a dialog appears, prompting you for a location to save the backup set file. Specify a location for the file backup set (on the destination volume) and click Save.
- For Internet backup sets, a dialog appears, prompting you for FTP connection information. Enter the information as described in "For Internet backup sets:" and click OK.

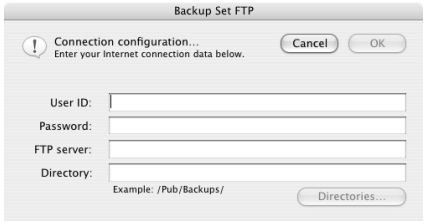
Once the new backup set is created, Retrospect displays the Backup Set Selection window with the new backup set listed as available for backup.



When the backup set you want to use is listed in the Backup Set Selection window, select it and click OK to continue setting up the backup.

For Internet backup sets:

For Internet backup sets, you need to configure the connection to the FTP server.



Enter your FTP user ID, password, and server name (or IP address). In the directory field, give the path (not including the host server itself) to the directory in which you want to store this Internet backup set, or click Directories to navigate the path to your desired directory and select it.

NOTE: Clicking the Directories button may not be helpful with some FTP servers because some folders may not appear in the dialog's list. In this event, cancel the dialog and type the path into the Directory field of the connection configuration window.

When you use an Internet backup set, Retrospect creates a new directory in the directory you specified. Retrospect uses this directory as the Internet backup set. Do not modify, delete, or rename files in an Internet backup set directory by using a third party FTP utility or by working directly on the FTP server.

When you click OK in the Internet backup set connection configuration window Retrospect tests the connection. Retrospect reports an error if it cannot establish a connection with the FTP server.

After you click OK in the connection configuration window and Retrospect tests the connection, a dialog appears, prompting you for a location to save the catalog file that keeps track of the contents of the backup set. Specify a location for the catalog (your hard disk is best) and click Save.

Setting Additional Backup Options

After you have specified the source volume to back up and the destination backup set to which it will be copied, use the Immediate Backup window to verify your choices and set additional options.

To makes changes, click the appropriate button.

Sources lets you add or remove source volumes.

Destination lets you choose a different backup set as a destination.

Selecting lets you choose a selector, a kind of filter for selecting the files and folders to back up. (Selectors are explained in detail starting on page 177.) The default selector is “All Files”, which marks all files on the source for backup.

Preview scans the source volume (or volumes) and determines which files need to be backed up by comparing the source files against the list of files in the backup set catalog. When the scan is complete, Retrospect opens a browser window to display a list of the files on the source volume marked for backup. You can use it to mark and unmark individual files and folders to be backed up.

Browsers are explained in “Browsing” on page 172. When you close the browser, the summary window displays summary information about the selected files.

Options displays the basic options window in which you can specify the backup action (normal or recycle), and turn on or off verification and software data compression.

Click the More Choices button to access other options.

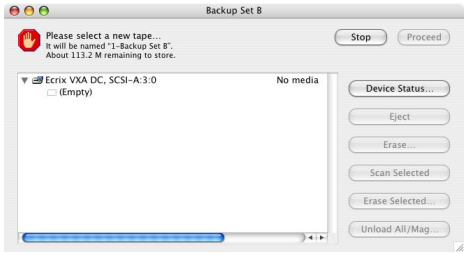
Backup actions are explained in “Backup Actions” on page 23, and other options are explained in “Backup Options,” which starts on page 143.

Executing the Backup

If Retrospect has the information it needs, it says “Ready to Execute” at the top of the immediate backup summary window. If the information is incomplete, it says “Not Ready to Execute” and you must make changes as described at the top of the window. When you are ready, click Backup.

If you are backing up to an Internet backup set, Retrospect connects to the FTP server and performs the backup.

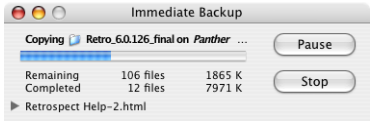
If this is the first time you are backing up to disks, tapes or discs, or if there is no medium in the backup device, Retrospect displays a media request window with options for choosing the disk, tape, or disc for storing the files to be backed up. The window varies slightly depending on the type of backup set you are using.



The media request window for a tape backup set.

Insert a blank tape, removable disk, or CD/DVD, or one with unwanted data, because any files on it will be permanently removed. Select the new media in the window, then click Proceed.

Retrospect performs the backup, displaying the progress of the operation and the names of files as they are copied to the backup set. The execution status window has Pause and Stop buttons for suspending or cancelling the backup.



The execution status window for an immediate backup.

When the execution is complete, Retrospect informs you in the status window. Close it to return to the Retrospect Directory.

If any errors occurred you can get more information in the browser that appears, or see error details in the Operations Log. This log is accessible by choosing Log from the Window menu and is described in "Viewing the Operations Log" on page 140.

Planning Subsequent Backups

For subsequent backups, you can repeat the basic backup procedure as often as you want and even switch among multiple backup sets to maintain extra backups.

By default, Retrospect only backs up those files that have changed since the previous backup to a particular backup set.

Scripting a Backup

If you want to automate your backups so they can be performed while the backup computer is unattended (e.g., at night), you can use Retrospect's scripting feature to set up and schedule backups.

From the immediate backup summary window, choose Schedule from the Script menu to save the immediate backup information and settings as a script. You can then use the script to accomplish automatic, unattended backup operations.

See Chapter 5 • Automated Operations.

ARCHIVE

Archiving lets you move files from a source volume to a destination backup set for off-line storage. To set up an archive operation, first click the Tools tab from the Retrospect Directory, then click Copy.

In the next dialog, select Archive and click OK.

From this point on, the archive operation is set up just like a backup, as described starting on page 46. The only difference in preparation is the additional option of whether to move files, as described on page 144, which deletes the original files from the source after copying them to the destination. This frees space on the source volume.

TIP: Before you use the Move files option, first archive to a different backup set by copying without moving. This provides an extra measure of safety should one backup set become unusable.

Archiving, by default, does not match source and destination. That is, Retrospect does not compare source files to files in the destination backup set. This means Retrospect copies all selected files to the destination backup set, even if they already exist there. In this case, Retrospect is foregoing ultimate efficiency for the sake of archive integrity.

Make sure to read "Archiving Tips" below for other important information.

Scripting an Archive

When an archive summary window is active, you can choose Schedule from the Script menu to save the archive information and settings as a script.

See Chapter 5 • Automated Operations.

Archiving Tips

Media: Plan for the long term. Archive to two or more backup sets and maintain an off-site copy of your archived data. Always store media according to manufacturer's guidelines. See "Media Longevity and Storage" on page 43 for further information.

Periodically transfer your data to new media to ensure storage integrity. Do not use device-specific options such as hardware compression, because your next backup device may not support features of an older model.

Planning: Define an archiving system and follow it every time. Only archive files in specific folders, having defined labels, or modified within a specific date range. When archiving from a server, force users to make a decision on what is to be archived by moving data to a specific location. Never archive data without telling users what was removed from the server.

Before you use the Move files (delete after copy) option, first archive to a different backup set by copying without moving. This provides an extra measure of safety should one backup set become unusable. If you have only a single archive medium and it is lost or damaged, you will have lost all of your data. Be sure not to recycle, lose, or damage your archive media.

Verification: Always use verification. If you do not use verification and hardware problems occur when archiving, your data may not be correctly copied to the media.

On-line Archiving: To archive documents in place, compress them in a file backup set that you store on your hard disk. This way they take up less room, but are still on-line.

RESTORE

Retrospect allows you to restore an entire volume or restore selected files and folders from the most recent backup or any previous backup session within a backup set. You can either restore using a volume Snapshot from a backup set, or by searching through one or more backup sets by file name or other criteria. You can restore individual files, multiple files, or entire volumes.

This section focuses on two of the different methods of restoring files with Retrospect. If you have experienced disastrous data loss in

which the computing environment required to restore that data is not available, see Chapter 7 • Disaster Recovery, which includes an overview of different situations and provides disaster recovery instructions.

Snapshots

Retrospect's Snapshots make it easy to restore a volume to its exact state as of a given backup. A Snapshot is like a picture of the contents of a volume. It contains a list of all of the files and folders on a volume and the sessions during which they were backed up. Each time you back up a volume, its Snapshot is updated in the backup set catalog and the new Snapshot is added to the backup medium.

To restore an entire volume, simply choose the Snapshot you want to restore—you do not have to manually locate and retrieve files from different sessions. A Snapshot allows Retrospect to get the files from a backup set in a single pass through the media, rather than inefficiently going back and forth on the media, even if the backup set contains multiple backup sessions.

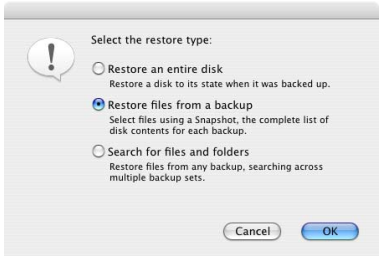
You can also restore individual files from a Snapshot. This is the easiest way to retrieve files that you know were on a volume during a given backup. If no Snapshot is available, you must define search criteria to choose which files to restore.

You can retrieve Snapshots from media if you want to restore a volume, folder, or file as it was at any given backup.

Restore by Snapshot

The process of setting up Retrospect for an immediate restore operation is done in much the same manner as setting up an immediate backup.

From the Retrospect Directory, click the Immediate tab, then click Restore. A dialog asks you to choose the restore type.



Select the type of restore that suits your needs.

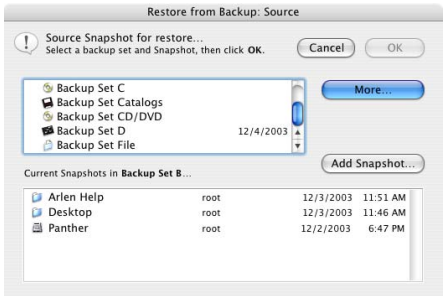
Restore an entire disk restores all files present on a volume at the time of a given backup. By default, this option replaces the entire contents of the destination volume and effectively recreates the source volume in its backed up state. Use this option to restore a complete disk.

Restore files from a backup restores one or more selected files present on a volume at the time of a given backup. By default, this option restores the selected files and folders to a new folder on the destination volume, leaving the rest of the destination volume unchanged.

NOTE: This section explains the functions of "Restore an entire disk" and "Restore files from a backup", which use Snapshots to restore. To search entire backup sets for particular files, see "Restore by Search" on page 55 for an explanation of that method.

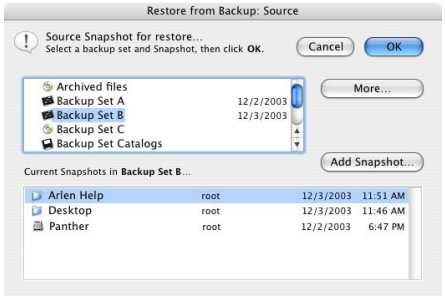
After selecting a restore method, click OK.

Selecting the Source



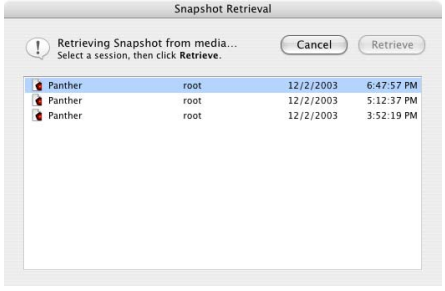
In source selection window's top list, select the backup set from which to restore. You can use the More button if your desired set is not listed.

In the window's bottom list, select a volume Snapshot. The date and time when the volume was last backed up are listed to the right of the volume's name.



If the Snapshot you want to use is not listed, click the Add Snapshot button to select it from a list of all Snapshots in the backup set.

TIP: To restore files from a backup other than the most recent one you will most likely need to use Add Snapshot.

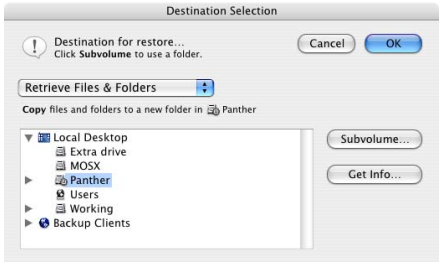


When you select a Snapshot and click Retrieve Retrospect obtains the older Snapshot from the backup set media (which may require you to insert media) and adds it to the list in the restore source window.

NOTE: The Retrieve button is disabled when you select a Snapshot that is already available.

With your desired Snapshot selected in the source selection window, click OK.

Selecting the Destination



Select the volume on which you want Retrospect to place the restored files. This volume does not have to be the original volume from which the files were backed up; it can be a folder defined as a subvolume (see "Subvolumes" on page 171) or any volume mounted on your local desktop or belonging to a client on the network. Navigate through the Local Desktop and Backup Clients outlines as detailed under "Containers" on page 169.

Choosing the Method to Restore Files

Set the pop-up menu to determine how Retrospect restores the files to the destination.

Restore entire disk makes the destination disk exactly like your selected Snapshot. It *deletes all files and folders* on the destination which do not match those marked for restore in the Snapshot, leaving files untouched if they are identical to files marked for restore. It then copies remaining files and folders from the backup set, preserving the folder hierarchy. This is the default options if you chose "Restore an entire disk". This method restores Mac OS X privileges.

Replace corresponding files copies the marked files to the destination volume into the same folders. Corresponding files are overwritten, *even if they are newer.* Retrospect leaves files untouched if they are identical to files marked for restore or if the file names do not match those marked for restore. This method restores Mac OS X privileges.

WARNING: Using this option to replace an active Windows folder will crash a Windows client.

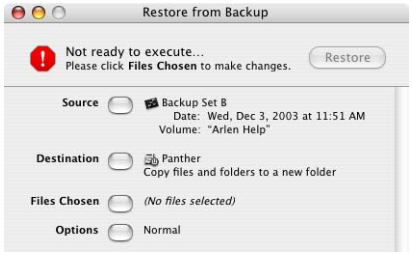
Retrieve files & folders creates a new folder on the destination volume (giving the folder the name of the backup set), then copies files into this folder, preserving the folder hierarchy. Nothing is replaced or overwritten. This is the default option if you chose "Restore files from a backup". This method does not restore the backed-up Mac OS X privileges of files and folders; it assigns them the privileges of the currently logged-in user (or root if no user is logged in).

Retrieve just files creates a new folder on the destination volume (giving the folder the name of the backup set), then copies only the files into this folder. The folder hierarchy is not preserved. Nothing is replaced or overwritten. (Do not use this option to retrieve a large number of files or a whole volume.) This method does not restore the backed-up Mac OS X privileges of files; it assigns them the privileges of the currently logged-in user (or root if no user is logged in).

WARNING: Before restoring to a volume other than the current system volume under Mac OS X, use the Finder's Get Info command on the volume. Choose Privileges from the info window's menu then turn off the "Ignore privileges on this volume" option.

After setting the destination restore method with the pop-up menu, click OK to continue. Depending on the restore type and method, Retrospect may scan the destination volume and match files from the selected Snapshot. Then the restore summary window appears.

Summarizing the Restore Operation



Verify your choices for the Source, Destination, Files Chosen, and Options. To change information, click the appropriate button.

Source is the backup set and volume Snapshot from which you want to restore files. Click this button to change the source.

Destination is the volume to which you want to restore files. Click this button to change the destination volume or restore method.

Files Chosen are the files you want to restore from the backup set. If you chose "Restore an entire disk", all files from the source Snapshot are chosen by default. If you chose "Restore files from a backup", no files are selected by default. Click this button to use a browser to mark and unmark individual files and folders to be restored. Browsers are explained in detail under "Browsing" on page 172.

Options let you reposition icons and update the modification dates of restored files. Click this button, then click More choices to change these options. See "Execution Options," which starts on page 142, for more information on these options.

Executing the Restore

When Retrospect has the information it needs to do the restore, it says "Ready to Execute" at the top of the immediate restore summary window. If the information is incomplete, it says "Not Ready to Execute" and you must change one or

more parts of the information you gave it. When you are ready, click Restore.

WARNING: Restoring may destroy data on the destination. Be sure it is acceptable to erase or replace files on the destination volume.

Make sure the correct backup set media is in the backup device. If Retrospect cannot access the required media, it asks you for it.

Retrospect performs the restore, displaying the progress of the operation and listing the names of files as they are copied from the backup set media to the destination. The Execution Status window has Pause and Stop buttons for suspending the restore.

When the execution is complete, Retrospect informs you in the status window. Close it to return to the Retrospect Directory. If any errors occurred you can get more information in the browser that appears, or see error details in the Operations Log.

This log is accessible from the Window menu and is described in “Viewing the Operations Log” on page 140.

When you leave Retrospect and go to the Finder, you can see the destination volume is changed to reflect the restored files. The degree of change can vary from a new folder on the volume or a completely restructured volume, depending on the destination restore method and options.

Scripting a Restore

When a restore summary window is active, you can choose Schedule from the Script menu to save the immediate restore information and settings as a script. You can then use the script to accomplish restore operations.

See Chapter 5 • Automated Operations.

Restore by Search

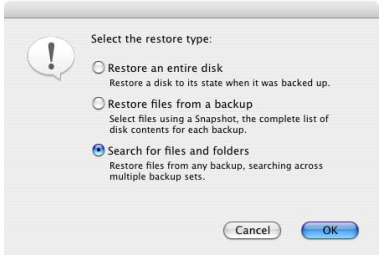
While restoring by Snapshot lets you restore files from a given backup, restoring by search lets you retrieve one or more files regardless of when they were backed up. Restoring by search lets you search multiple backup sets at once, which is useful if you’re not sure which backup set contains the files you want to restore.

Searching works best when you know specific attributes of the files you want, for example it’s name or type. If you want to see all backed up versions of a particular file, search on its name, and then restore exactly the version you want.

The process of setting up Retrospect for a restore by search is done in much the same manner as restoring by Snapshot.

Searching for Files

From the Retrospect Directory, click the Immediate tab, then click Restore. A dialog asks you to choose the restore type.



Click the “Search for files and folders” radio button and click OK.

The next window asks you to select the backup sets to search. Select one or more backup sets. Click the More button if your desired set is not listed.

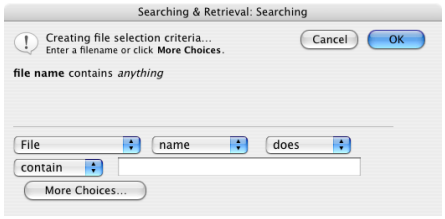
Once you have selected the source backup set(s), click OK to continue. The Destination Selection window displays.

Select the volume on which you want Retrospect to place the restored files, and specify the restore method from the pop-up menu (see page 53),.

NOTE: When restoring by searching, the methods “Restore entire disk” and “Replace corresponding files” work differently than when restoring from a Snapshot. “Restore entire disk” erases the destination volume before restoring files. “Replace corresponding files” replaces files with the same names as those being restored.

WARNING: Before restoring to a volume other than the current system volume under Mac OS X, use the Finder’s Get Info command on the volume. Choose Privileges from the info window’s menu then turn off the “Ignore privileges on this volume” option.

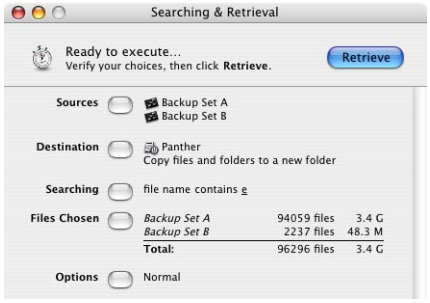
After setting the destination restore method with the pop-up menu, click OK to continue. Retrospect displays a window for defining file selection criteria.



If you want to restore all files from all sources, leave this blank and click OK.

Otherwise, use the controls and enter text to define the search criteria on file or folder names, or click More Choices to make a custom selector with other search criteria. This window is described in detail in “Finding Files” on page 175. Selectors are described in “Using Selectors” on page 177.

When you have defined the search criteria, click OK. Retrospect searches each backup set catalog before displaying the summary window.



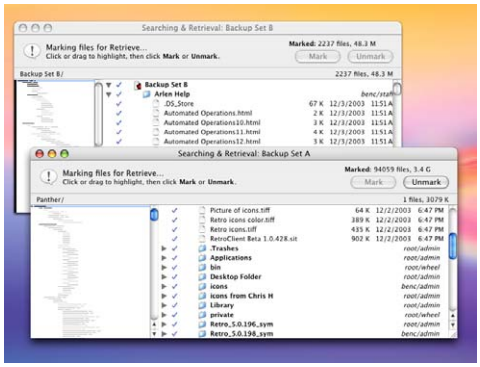
Your file selection criteria are summarized next to Searching. Next to Files Chosen is a brief quantity and size inventory of the files found by Retrospect in the source backup sets.

Choosing Files

Click Files Chosen to open a browser which lists the found files. Retrospect displays one browser window for each backup set in which files are found. You can manually unmark and mark these files for retrieval. See “Marking Files and Folders” on page 174 for more infor-

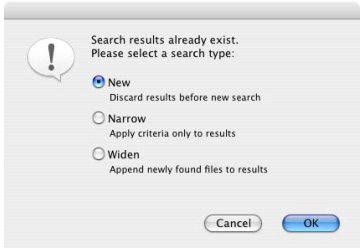
mation. Files with check marks will be retrieved when the operation is executed.

Depending on your search criteria, your browser or browsers may list more than one version of a particular file. For example, a given file may have been modified daily and backed up every day over a certain period of time. Use the backed up or modified dates to determine which version you want to restore.



Additional Searching

If the browser does not display the files you want, you can close it and return to the summary window to redefine the search criteria by clicking the Searching button. If you change the search criteria, Retrospect displays a dialog asking whether you want to do a new search, narrow the existing search, or widen the existing search.



New replaces the results of the previous search with the results of the new search.

Narrow uses the new criteria to further restrict the selection.

Widen uses the new criteria to add files to the current selection.

Select a search type, then click OK to return to the summary window and repeat the process until you are satisfied with the chosen files.

Executing the Restore

If Retrospect has the information it needs, it says “Ready to Execute” at the top of the searching and retrieval summary window. If the information is incomplete, it says “Not Ready to Execute” and you must change one or more parts of the information you gave it.

When you are ready, click Retrieve.

WARNING: Restoring may destroy data on the destination volume. Be sure it is acceptable to replace the destination volume or files with the source files.

Make sure the correct backup set media is in the backup device. If Retrospect cannot find the media it asks you for it in a media request window.

Retrospect performs the restore, displaying the progress of the operation in the execution status window, which includes buttons to pause or stop its execution.

When the execution is complete, Retrospect informs you in the status window. Close it to return to the Retrospect Directory. If any errors occurred you can get more information in the browser which appears, or view error details in the Operations Log.

This log is accessible from the Window menu and is described under “Viewing the Operations Log” on page 140.

When you leave Retrospect and go to the Finder, you can see the destination volume is changed to reflect the restored files.

DUPLICATE

Retrospect allows you to duplicate files on a volume or among volumes. Retrospect optimizes the duplication process by copying only your selected files and by copying only those files which do not already exist on the destination.

Files and folders are copied without compression, in the standard file system format, which is useful when transporting data to other computers. Encrypted files remain encrypted.

The duplicate feature is useful, for example, for creating a bootable Mac OS X backup or a user-accessible backup of a server or database on a hard disk.

TIP: Subvolumes are useful tools for duplicates. For example, a network administrator can define an application folder on a server as a subvolume and duplicate it for quick installation on a user's workstation. See "Subvolumes" on page 171.

NOTE: You cannot duplicate a subvolume on a client to another subvolume on the same client.

Duplicating

Click the Immediate tab on the Retrospect Directory, then click the Duplicate button. The Volume Selection window displays.

Select the source volume from which to copy files and click OK. For details on using the Volume Selection window, see "Working with Volumes" on page 168.

The Destination Selection window displays.

Select a destination volume and choose a method from the pop-up menu.

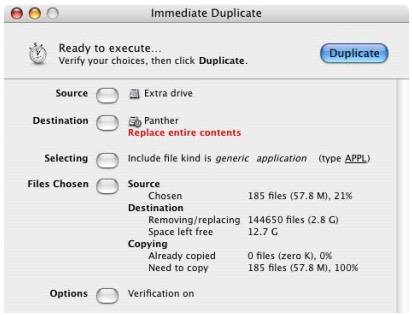
Replace Entire Disk *replaces the entire contents* of the destination volume with the selected files and folders from the source volume. Identical files already present on the destination are not duplicated.

Replace Corresponding Files *overwrites any matching files* existing on the destination volume that correspond to the selected files on the source, *even if the destination files are newer.* Retrospect leaves files untouched if their names and locations do not correspond to those files marked for duplication.

WARNING: Before duplicating to a volume other than the current system volume under Mac OS X, use the Finder's Get Info command on the volume. Choose Privileges from the info window's menu then turn off the "Ignore privileges on this volume" option.

When you have selected the volume and set the pop-up menu click OK. Retrospect displays the immediate duplicate summary window.

This window lists the source, destination, selection criteria, files chosen preview, and options associated with the duplicate operation. Each item has a button you can click to change the information. You can use the various features for a highly specific duplicate operation.



To makes changes, click the appropriate button.

Source lets you changes the source volume.

Destination lets you choose a different volume as a destination.

Selecting lets you choose a selector, a kind of filter for selecting the files and folders to duplicate. (Selectors are explained in detail starting on page 177.) The default selector is "All Files", which marks all files on the source for duplication.

Files Chosen compares the files on the source volume to those on the destination volume then opens a browser window. The browser window lists the files on the source which do not already exist on the destination. These files are marked for duplication. You can also manually unmark and mark files. See "Marking Files and Folders" on page 174 for more information. Files with check marks will be duplicated when the operation is executed.

Options displays the basic options window in which you can specify whether or not to update the backup report, move files, and turn on or off verification.

These options are described in "Duplicate Options," which starts on page 144. Click the More Choices button to access other options, which are described in "Execution Options," which starts on page 142.

Executing the Duplicate

If Retrospect has the information it needs, it says "Ready to Execute" at the top of the immediate duplicate summary window. If the information is incomplete, it says "Not Ready to Execute" and you must change one or more parts of the information you gave it.

When you are ready, click Duplicate.

WARNING: Duplicating may destroy data on the destination. Be sure it is acceptable to erase or replace files on the destination volume.

An execution window shows the progress of the duplicate operation and includes buttons to pause or stop its execution. When the execution is complete, Retrospect informs you in the status window. Close it to return to the Retrospect Directory. If any errors occurred, you can view

more information in the browser that appears, or see error details in the Operations Log.

This log is accessible from the Window menu and is described on page 140.

Scripting a Duplicate

When a duplicate summary window is active, you can choose Schedule from the Script menu to save the immediate duplicate information and settings as a script. You can then use the script to accomplish duplicate operations.

See Chapter 5 • Automated Operations.

TRANSFER

Retrospect's transfer function copies one or more files from one or more backup sets to a single backup set. One possible use is to copy all files from a removable disk backup set to a CD/DVD backup set. Another possible use is to copy a few selected files from your backup set to a new, encrypted backup set for your business partner.

Because transferring does not match files, you cannot transfer incrementally from one backup set to another. All files that meet the selection criteria will be copied by Retrospect, regardless of whether they already exist in the destination backup set.

The transfer function does not have a preview feature. You must rely on selectors instead of picking and choosing files by hand.

To copy files between backup sets, you must have a separate backup device for each backup set, even if both backup sets are on the same type of media. In the case of file backup sets, the need for separate backup devices does not apply.

TIP: If you do not have separate drives for each backup set, you can first copy files temporarily to a file backup set on a hard disk and then copy them from the file backup set to the destination backup set.

Transferring Files

To copy files between backup sets, first click the Tools tab from the Retrospect Directory, then click Copy. In the next dialog, select Transfer.

Click OK The source Backup Set Selection window displays.

Select one or more source backup sets, and click OK. The destination Backup Set Selection window displays. Select a destination backup set and click OK.

In the next window, choose the file selection criteria.

Specify search criteria and click OK. (For details on using selectors, see "Using Selectors"

on page 177.) The Backup Set Transfer summary window displays.

Check that the summarized information is correct.

Setting Transfer Options

If you want to change the default transfer settings, click the Options button in the summary window.

The Copy Snapshots option transfers all of the source backup set's Snapshots to the destination catalog and media. This option is on by default. See "Backup Set Transfer Options," which starts on page 145 for more information about this and other transfer options. Click the More Choices button to access additional options, which are described in "Execution Options," which starts on page 142.

Executing a Transfer

If Retrospect has the information it needs, it says "Ready to Execute" at the top of the duplicate summary window. If the information is incomplete, it says "Not Ready to Execute" and you must change one or more parts of the information you gave it.

When you are ready, click Transfer. An execution window shows the progress of the operation and includes buttons to pause or stop its execution.

When the execution is complete, Retrospect informs you in the status window. Close it to return to the Retrospect Directory. If any errors occurred, you can view more information in the browser that appears, or see error details in the Operations Log.

This log is accessible from the Window menu and is described on page 140.

CHAPTER 5

AUTOMATED OPERATIONS

- OVERVIEW OF SCRIPTS
- CREATING SCRIPTS
- SCRIPTED BACKUP
- SCRIPTED DUPLICATE
- SCRIPTED ARCHIVE
- SCRIPTED RESTORE
- SCHEDULING SCRIPTS
- SAVING SCRIPTS
- TESTING SCRIPTS
- EXECUTING SCRIPTS
- CONTROLLING SCRIPTS
- BACKUP SERVER SCRIPTS

You learned how to set up and execute Retrospect's immediate backup, archive, restore, duplicate, and transfer operations in Chapter 4 • Immediate Operations. This chapter shows you how to automate the process by using scripts, including Retrospect's unique Backup Server scripts.

OVERVIEW OF SCRIPTS

One of the advantages of Retrospect is its ability to automate repetitive tasks. By creating scripts, you can automate all of the operations (except Transfer) described in Chapter 4 • Immediate Operations, namely:

- Backing up
- Archiving
- Duplicating
- Restoring

In addition, Retrospect's Backup Server technology allows you to create intelligent scripts that continually reprioritize which computers get backed up next, based on criteria you specify. See "Backup Server Scripts" on page 79 for more information.

Scripts are an important part of developing a backup strategy. For more information on developing an effective backup strategy, see "Backup Strategies" on page 134.

Automated operations include all of the same information as immediate operations: a source, destination, file selection criteria, and other options. Scripts also include a scheduling component that controls when these automated operations are executed.

Retrospect allows you to schedule scripts to run automatically and unattended, so you can choose operating times that are most convenient for you and for other users. Scheduling scripted backups ensures data is backed up consistently—all you have to do is make sure the backup computer is turned on and the proper media is in the backup device. When it is time for a script to execute, Retrospect automatically launches and executes the operation. If there are no other scripts scheduled to run in Retrospect's look ahead time, and you selected "Shut down" in the Unattended Preferences, Retrospect shuts down when the operation is complete.

Automated Operations covers creating scripts, scheduling scripts, executing scripts, and working with Backup Server scripts. For information on managing and maintaining scripts, see "Maintaining Scripts" on page 155.

CREATING SCRIPTS

There are three ways to create scripts in Retrospect:

- Using the EasyScript Wizard
- Scheduling an Immediate Operation
- Using the Automate>Scripts Command

The latter two methods can create any type of script, including backup, duplicate, archive, and restore. The EasyScript Wizard can only create backup scripts.

NOTE: Backup Server scripts are discussed separately. See "Backup Server Scripts" on page 79 for more information.

Using the EasyScript Wizard

The EasyScript Wizard poses a series of questions that simplify the process of creating a backup script. The wizard helps you create a backup set and schedule your backup script with an easy-to-use interface.

Before you use EasyScript, you may want to familiarize yourself with Retrospect's immediate backup (page 46) to better understand the EasyScript steps. Just doing the quick backup (page 13) is a good start.

NOTE: The EasyScript wizard uses the same name for all the scripts it creates. If you want to make two or more scripts using the wizard, rename the first script before creating a new one. To learn how to rename a script, see page 156.

To Use EasyScript:

1. Start Retrospect.

2. In the Retrospect Directory, click the Automate tab, then click the EasyScript button.

3. Read the introduction screen, then click Next.

4. Specify the backup source: local computer only; or local computer, plus clients.

Click on one of the radio buttons to make your selection, then click Next.

NOTE: Backing up networked computers requires Retrospect Client software on those computers and appropriate license codes for Retrospect.

5. If you chose to back up other computers on your network, currently logged in clients are displayed in a list.

All clients logged in to Retrospect *when the script executes* are backed up by Retrospect. Therefore, after creating a script you can log in new clients and be assured they will be backed up by the script.

Click Next to accept your selection and continue.

6. Specify the type of media to which you want to back up. Click on one of the radio buttons to make your selection, then click Next.

7. If you selected an Internet backup set you are required to provide additional information:

- Enter login information (see "For Internet backup sets:" on page 48) and click Next.
- EasyScript recommends encrypting Internet backup set data. Enter and confirm a password and click Next to proceed.
- EasyScript automatically applies the Documents Folder & Hot items selector (see "Built-in Selectors" on page 178 for more information). Click Next to proceed.

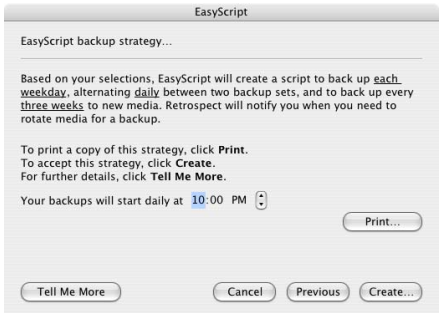
8. Specify the backup frequency.

Click on one of the radio buttons to make your selection, then click Next.

9. Specify a media rotation schedule.

Media rotation, lets you move media off-site for safekeeping and gives you more chances to recover data if one piece of media fails. It requires more media than no rotation, so be sure to have a steady supply of disks, tapes, or CD/DVDs if you choose to rotate media. Click Next to continue.

10. Specify the start time for backups.



If you chose to back up every weekday or once a week, set the time of day, and select the day of the week (if necessary) to execute the backup script.

11. Click Create.

12. Enter a name for each backup set created by the EasyScript Wizard, then click New.

13. Specify a location to save the catalog files associated with each new backup set and click Save.

Retrospect creates a script named EasyScript Backup. You can view a summary of and

modify this script by clicking the Open Script button.

For detailed explanations of all the items listed in the summary window, see "Scripted Backup" which follows.

Scheduling an Immediate Operation

You can choose Schedule from the Script menu when viewing most immediate operation summary windows (Backup, Duplicate, Archive, or Restore). This allows you to create a script based on that operation.

See Chapter 4 • Immediate Operations for more information on immediate operations.

To Schedule an Immediate Operation:

1. With an immediate operation summary window active, choose Schedule from the Script menu.

2. Enter a name for the script and click New.

3. Verify or modify the information in the script summary window.

4. Click the Schedule button and schedule the script as described in "Scheduling Scripts" on page 73.

5. When all the information in the script summary window is correct, close the window.

Using the Automate>Scripts Command

You can use the Automate>Scripts command to create a new script or to modify the settings of an existing script.

For more information on how to modify existing scripts, see "Maintaining Scripts" in Chapter 8. For information on creating new scripts, see the following sections:

- Scripted Backup
- Scripted Duplicate
- Scripted Archive
- Scripted Restore

SCRIPTED BACKUP

This section takes you through the steps of defining a backup script:

- Creating a Backup Script
- Setting the Backup Source
- Setting the Backup Destination
- Selecting Files to Back Up
- Setting Backup Execution Options

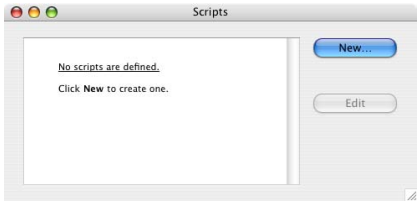
The steps for scheduling and saving are the same for all script types:

- See "Scheduling Scripts" on page 73.
- See "Saving Scripts" on page 77.

Creating a Backup Script

1. From the Retrospect Directory, click the Automate tab, then click Scripts.

The Scripts window displays.



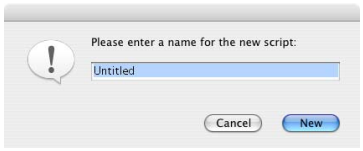
2. Click the New button to create a new script.

NOTE: If no scripts are defined, Retrospect first asks whether you want to use EasyScript. (See "Using the EasyScript Wizard" on page 64.) Click No to continue.

The script selection window displays.

3. Select Backup from the list and click OK.

The script naming dialog displays.



4. Enter a name and click New.

The script appears in its own window.

This script window is very similar to the immediate backup summary window, with information for the source volumes, destination backup sets, file selection criteria, and options. Since this is a script, it also includes schedule information.

5. To change information, click the appropriate button.

Sources lets you add or remove source volumes.

Destinations lets you choose one or more backup sets.

Selecting lets you choose a selector, a kind of filter for selecting files and folders to be backed up.

Options displays the options window in which you can toggle verification, data compression, and other options.

Schedule lets you set the script to run at a specific time or at regular intervals.

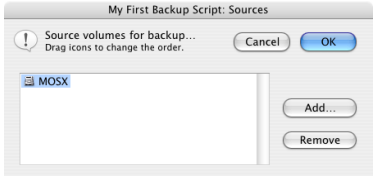
Setting the Backup Source

The first step in defining a script is setting the source(s).

1. Click the Sources button.

The Volume Selection window displays.

2. Select a source volume (or volumes), then click OK.



3. Click Add to select additional source, or select a source and click Remove to remove it from the list. When the list of sources is complete, click OK.

NOTE: If there are multiple sources, they are backed up in the order listed. Click and drag to rearrange the list order.

Setting the Backup Destination

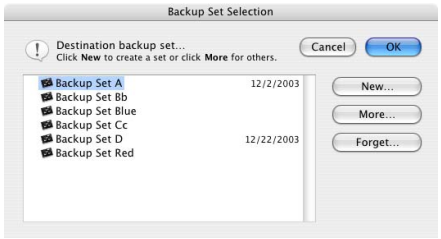
After specifying the source(s) to back up, you must specify the destination backup set(s) for the data.

1. Click the Destinations button.

If there are no defined backup sets, the Backup Set Creation window displays.

Create a new backup set, as described in “Creating a New Backup Set” on page 47. Once the new backup set is created, it appears in the Backup Set Selection window.

If there are defined backup sets, the Backup Set Selection window displays.



You can click New or More to create new backup sets or access additional ones.

2. Select one or more backup sets, then click OK.

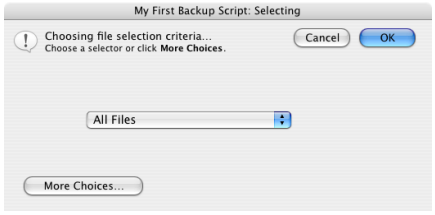
NOTE: With multiple destination backup sets, you can rotate among the sets for more safe and effective backups.

3. Click Add to select additional destinations, or select a backup set and click Remove to remove it from the list. When the list of destinations is complete, click OK.

Selecting Files to Back Up

By default, Retrospect selects all files on the source(s). You can choose a different pre-defined selector or create a custom selector to select a subset of all files.

1. Click the Selecting button.



2. Choose a selector, then click OK.

You can also click More Choices to use Retrospect’s file selection criteria to create a custom selector. Selectors are explained in detail in “Using Selectors,” which starts on page 177.

NOTE: Selectors are used to determine which files are *considered* for backup, not which files actually get copied. For example, if you choose All Files, Retrospect compares all the source files with the files already in the destination backup set, then copies *only* those files that are new or changed.

Unlike an immediate backup, a script has no “preview” information with which you can manually mark and unmark files. This is because the script executes later and the volume contents can change between now and then.

Setting Backup Execution Options

Click the Options button to display the options window in which you can toggle verification, data compression, and other options which are explained in detail in “Execution Options,” which starts on page 142.

SCRIPTED DUPLICATE

Duplicate scripts are great for unattended copying of hard disks, folders, or files from one volume to another. For example, you could use a duplicate script to automatically copy a local folder to a shared file server at the end of every week.

The steps to create a duplicate script are:

- Creating a Duplicate Script
- Setting the Duplicate Source
- Setting the Duplicate Destination
- Selecting Files to Duplicate
- Setting Duplicate Execution Options

The steps for scheduling and saving are the same for all script types:

• See “Scheduling Scripts” on page 73.
• See “Saving Scripts” on page 77.

Creating a Duplicate Script

1. From the Retrospect Directory, click the Automate tab, then click Scripts.

The Scripts window displays.

2. Click the New button to create a new script.

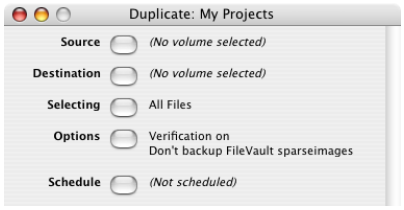
The script selection window displays.

3. Select Duplicate from the list and click OK.

The script naming window displays.

4. Enter a name and click New.

The script appears in its own window.



This script window is very similar to the immediate duplicate summary window, with information for the source volume, destination volume, file selection criteria, and options. Since this is a script, it also includes schedule information.

5. To change information, click the appropriate button.

Source lets you select a source volume.

Destination lets you select a destination volume

Selecting lets you choose a selector, a kind of filter for selecting files and folders to be duplicated.

Options displays the options window in which you can toggle verification and set other options.

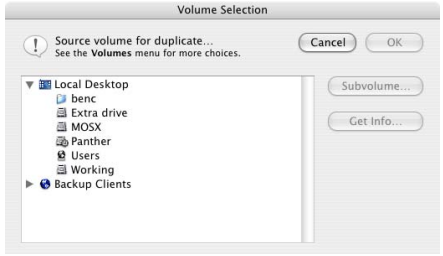
Schedule lets you set the script to run at a specific time or at regular intervals.

Setting the Duplicate Source

Because this is a new script, Retrospect says “No volume selected” for the source.

1. Click the Source button.

The Volume Selection window displays.



2. Select the source volume and click OK.

For details on using the Volume Selection window, see “Working with Volumes,” which starts on page 168.

Setting the Duplicate Destination

For duplicate operations, the destination is not a backup set, but a volume (other than the source volume).

1. Click the Destination button.

The Destination Selection window displays.

2. Select the destination volume to which you want the files copied.

3. Make a selection from the pop-up menu to specify what happens to the existing contents of the destination drive.

Replace Entire Disk *deletes all files and folders* on the destination which do not match those marked for duplication, leaving files

untouched if they are identical to files marked. It then duplicates remaining files and folders from the source, preserving the folder hierarchy.

Replace Corresponding Files copies the marked files to the destination volume into the same folders. Corresponding files are overwritten, *even if they are newer.* Retrospect leaves files untouched if they are identical to files marked for duplication or if the file names do not match those marked.

WARNING: Duplicate operations can destroy your files. Destination items are replaced by those duplicated from the source, or deleted entirely. Verify this is acceptable before continuing.

Before duplicating to a volume other than the current system volume under Mac OS X, use the Finder's Get Info command on the volume. Choose Privileges from the info window's menu then turn off the "Ignore privileges on this volume" option.

4. Click OK to accept your destination choice

Selecting Files to Duplicate

By default, Retrospect selects all files on the source. You can choose a different pre-defined selector or create a custom selector to select a subset of all files.

1. Click the Selecting button.
2. Choose a selector, then click OK.

You can also click More Choices to use Retrospect's file selection criteria to create a custom selector. Selectors are explained in detail in "Using Selectors," which starts on page 177.

NOTE: Selectors are used to determine which files are *considered* for duplication, not which files actually get copied. For example, if you choose All Files, Retrospect compares all the files on the source volume with the files already on the destination volume. Matching files are not copied from the source volume to the destination volume.

Setting Duplicate Execution Options

Click the Options button to display the options window in which you can set the verification, update backup report, and other options which are explained in detail in "Execution Options," which starts on page 142. One such option is to move—rather than just copy—files from the source to the destination.

SCRIPTED ARCHIVE

Archiving allows you to remove seldom-used files from a hard disk while maintaining a copy of those files on your storage media.

The process of creating and using an archive script is almost identical to that of a backup script.

See "Scripted Backup," which starts on page 66, for more information.

This section explains the differences between an archive script and a backup script.

An archive script is just like a backup script, with three main differences:

- Backup scripts support multiple destination backup sets, while archive scripts support a single destination backup set.
- Archive scripts have an additional option not available for backup scripts. For archive scripts, you can choose to move—rather than just copy—files from the source to the destination (thereby *deleting* the files from the source). See "Archiving Options" on page 144 for details on the Move Files option.
- Archive scripts, by default, copy (or move) *all* selected files from the source to the destination. Backup scripts, by default, copy only those files which are not already

present on the destination or have been modified since the last time they were copied.

NOTE: In both cases, the default can be modified by changing the matching options. See “Matching Options” on page 146 for more information.

Be sure to read “Archiving Tips” on page 51 for other important information about archiving.

SCRIPTED RESTORE

Usually, you don’t know in advance when you’re going to need to restore files, but there are some situations in which restore scripts are useful. You might want to create a restore script for use in a student computer lab environment, for example, in which the hard disks are restored from a common source every night.

The steps to define a restore script are:

- Creating a Restore Script
- Setting the Restore Source
- Setting the Restore Destination
- Selecting Files to Restore
- Setting Restore Execution Options

The steps for scheduling and saving are the same for all script types:

- See “Scheduling Scripts” on page 73.
- See “Saving Scripts” on page 77.

Creating a Restore Script

1. From the Retrospect Directory, click the Automate tab then click Scripts.

The Scripts window displays.

2. Click the New button to create a new script.

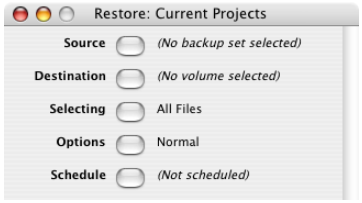
The script selection window displays.

3. Select Restore from the list and click OK.

The script naming window displays.

4. Enter a name and click New.

The script appears in its own window.



This script window is very similar to the immediate restore summary window, with information for the source backup set, destination volume, file selection criteria, and options. Since this is a script, it also includes schedule information

5. To change information, click the appropriate button.

Source lets you choose a backup set and associated Snapshot from which to restore.

Destination lets you choose the destination volume.

Selecting lets you choose a selector, a kind of filter for selecting files and folders to be restored.

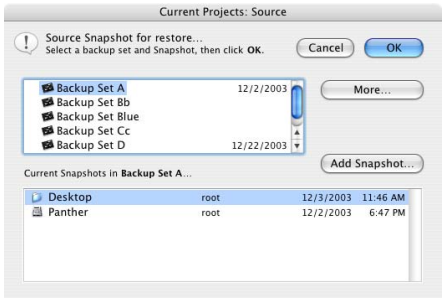
Options displays the options window in which you can specify whether to recompute icon positions or update modify dates of files.

Schedule lets you set the script to run at a specific time or at regular intervals.

Setting the Restore Source

Because this is a new script, Retrospect says “No backup set selected” in the script summary window.

1. Click the Source button to display a window listing backup sets and their Snapshots.



2. In the top-half of the window, select the backup set containing the Snapshot from which you want to restore.

NOTE: If the backup set you are looking for is not listed, click the More button to access additional backup sets by opening or recreating their catalog files.

3. In the bottom-half of the window, select the Snapshot.

The date and time of each Snapshot is listed.

NOTE: If the Snapshot you are looking for is not listed, click the Add Snapshot button to retrieve additional Snapshots from the storage media.

4. Click OK to continue.

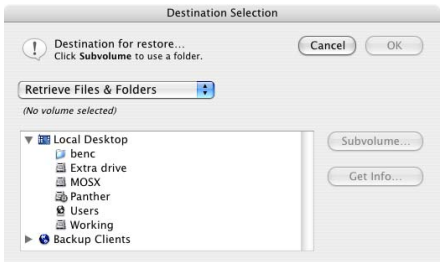
The backup set and Snapshot date, time, and volume name are listed in the script window.

Setting the Restore Destination

Because this is a new script, Retrospect says "No volume selected" in the script window.

1. Click the Destination button.

The Destination Selection window displays.



2. Select the destination volume to which you want the files restored.

3. Make a selection from the pop-up menu to specify what happens to the existing contents of the destination drive.

WARNING: Before restoring to a volume other than the current system volume under Mac OS X, use the Finder's Get Info command on the volume. Choose Privileges from the info window's menu then turn off the "Ignore privileges on this volume" option.

Restore Entire Disk effectively erases the destination volume before restoring files. During restore operation, Retrospect copies files and folders from the backup set, preserving the folder hierarchy. This method restores Mac OS X privileges.

Replace Corresponding Files copies the marked files to the destination volume into the same folders. Corresponding files are overwritten, *even if they are newer*. Retrospect leaves files untouched if they are identical to files marked for restore or if the file names do not match those marked for restore. This method restores Mac OS X privileges.

WARNING: Using this option to replace an active Windows folder will crash a Windows client.

Retrieve Files & Folders creates a new folder on the destination volume (giving the folder the name of the backup set), then copies files into this folder, preserving the folder hierarchy. Nothing is replaced or overwritten. This method does not restore the backed-up Mac OS X privileges of files and folders; it assigns them the privileges of the currently logged-in user (or root if no user is logged in).

Retrieve Just Files creates a new folder on the destination volume (giving the folder the name of the backup set), then copies only the files into this folder. The folder hierarchy is not preserved. Nothing is replaced or overwritten. (Do not use this option to retrieve a large

number of files or a whole volume.) This method does not restore the backed-up Mac OS X privileges of files; it assigns them the privileges of the currently logged-in user (or root if no user is logged in).

WARNING: The Restore Entire Disk and Replace Corresponding Files methods may destroy data on the destination. If you choose one of these, be sure it is acceptable to erase or replace files on the destination volume.

4. Click OK.

Selecting Files to Restore

By default, Retrospect selects all files from the source backup set. You can choose a different pre-defined selector or create a custom selector to select a subset of all files.

1. Click the Selecting button.
2. Choose a selector, then click OK.

You can also click More Choices to use Retrospect's file selection criteria to create a custom selector. Selectors are explained in detail in "Using Selectors," which starts on page 177.

NOTE: Selectors are used to determine which files are *considered* for restoring, not which files actually get restored. For example, if you choose All Files, Retrospect compares all the files in the source backup set with the files already on the destination volume. Matching files are not copied from the source to the destination.

Setting Restore Execution Options

Click the Options button to display the options window. Click More Choices to specify a number of options that are explained in detail in "Execution Options," which starts on page 142.

The Update modification dates option is only available for restore operations. See "File Copying Options" on page 144 for more information.

SCHEDULING SCRIPTS

Although you can manually execute a script at any time, scripts are designed to run unattended. In order to accomplish this, you need to create a schedule to specify when and how often to run the script.

NOTE: If you want to execute the script only upon your command and in your presence, see "Manual Script Execution" on page 78.

You can schedule a script to run automatically on specified days or on a repeating schedule, such as every two weeks. You can define multiple schedules for the same script and specify the kind of backup you want for each scheduled execution.

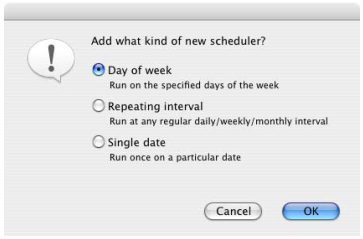
For more information about using scripts as part of an overall backup strategy, see "Backup Strategies" in Chapter 8.

To schedule a script:

1. In the script summary window, click the Schedule button.

The Schedule window displays.

2. Click the Add button.



3. Specify the type of scheduler you'd like to add, then click OK.

Day of week lets you define a schedule for one or more days of the week and specify a weekly repeating interval. For example, you could schedule a script to run on Monday and Wednesday, every other week. Keep in mind that *a week starts on the Sunday of the week of the start date.*

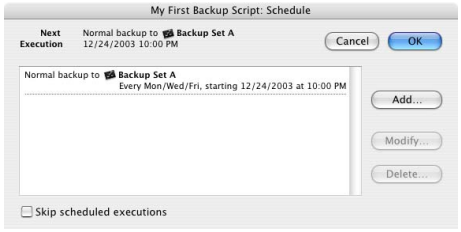
Repeating interval lets you define a schedule that is repeated after a specified interval. For example, the last Friday of every month.

Single date lets you define a schedule for a single date and time. For example, April 19, 2003 at 6:00 A.M.

NOTE: A script can contain any combination of one or more of these schedulers.

4. Create the scheduler as described in "Creating a Script Scheduler," which starts on page 74 then click OK.

The Schedule window displays.



5. Click Add to create additional schedulers; click Modify to change the selected scheduler; or click Delete to remove the selected scheduler.

6. Click OK when you're done scheduling the script.

The script summary window displays.

It lists the next six scheduled executions based on the scheduler(s) you created.

Creating a Script Scheduler

There are three types of schedulers available in Retrospect:

- Day of week
- Repeating interval
- Single date

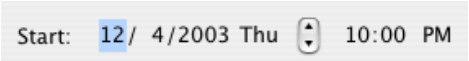
While these schedulers have some common elements, the process for creating each type is somewhat unique.

Common Scheduler Elements

All scheduler types have a few common controls and settings. They are:

- Start Date and Time: This determines the earliest time at which the script is permitted to execute.
- Backup Action Type and Destination: If you are creating a scheduler for a backup script, you can also specify a backup action. If your script has multiple destination backup sets, you must specify one backup set as the destination for each scheduler you create.

Start Date and Time This determines the earliest time at which the script is permitted to execute. To change the start date and time, click on any individual part of the date or time. When the item is selected, type the new information or click the arrows to change the information. (You can also press the up and down arrows on your keyboard.) Press the Tab key to move the selection among the different elements.



NOTE: For Day of week schedulers, specifying a start date does not mean a script will execute on that date, or even in the same week. Check the summary at the top of the window to see the actual date the script will first execute.

Backup Action Type and Destination If you are creating a scheduler for a backup script, you can also specify a backup action. From the Action pop-up menu, choose Normal Backup, Recycle Backup, or New Media Backup.

- **Normal Backup** is a typical IncrementalPLUS backup. It marks for backup only files which are new, newly-modified, or new to the backup set.
- **Recycle Backup** clears the catalog contents (if any) of a backup set so it appears no files are backed up. Then it looks for the first media member of the backup set and erases it if it is available. If the first member is not available, Retrospect uses any available new or erased medium. Everything selected from the source is backed up to the destination backup set.
- **New Media Backup** makes a new backup set (named similarly to the old one) using a new or erased medium. The original backup set and its catalog remain intact for long-term storage in a safe place. The new backup set catalog and the new media member are each named with a number in sequence.

Retrospect allows you to have more than one backup set for a script so you can rotate media as part of your backup strategy. If the script has multiple backup set destinations, use the "To" pop-up menu to choose the backup set to be used for the scheduled execution.

NOTE: The pop-up menu is not displayed if only one backup set is specified in the script.

Using the Day of Week Scheduler

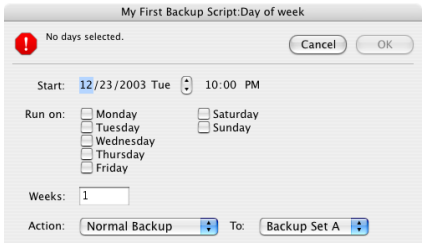
If you want to run a script on specified days of the week, use a the Day of week scheduler.

To create a Day of week scheduler:

1. Select the Day of week radio button in the Scheduler dialog box.

2. Click OK.

The Day of Week scheduler window displays.



3. Set the start date and time as described in "Common Scheduler Elements" on page 74.

NOTE: Retrospect's Schedule preference (page 160) defines the time period during which scripts are allowed to execute. Scripts scheduled to execute outside this period will not run.

If necessary specify the backup action and destination backup set.

4. Click the checkboxes for the days of the week you want the script to execute.

5. Enter a number to use as the repeating interval for the weeks.

For example, if you enter two, the script executes every other week (or every two weeks).

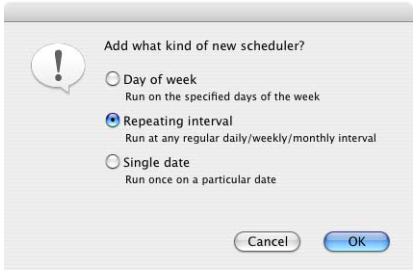
6. When all of the settings in the scheduler window are correct, click OK.

Using the Repeating Interval Scheduler

If you want a script to run at a specified daily, weekly, or monthly interval, use a Repeating interval scheduler.

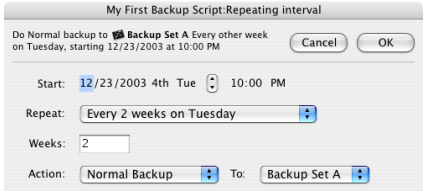
To create a Repeating interval scheduler:

1. Select the Repeating interval radio button in the Scheduler dialog box.



2. Click OK.

The Repeating interval scheduler window displays.



3. Set the start date and time as described in "Common Scheduler Elements" on page 74.

NOTE: Retrospect's Schedule preference (page 160) defines the time period during which scripts are allowed to execute. Scripts scheduled to execute outside this period will not run.

If necessary specify the backup action and destination backup set.

4. In the Repeat pop-up menu, select the time unit (days, weeks, or months) for the repeating interval.

5. Type a repeat interval in the Weeks, Months, or Days field.

The Repeat pop-up menu changes to reflect the Repeat Interval you enter.

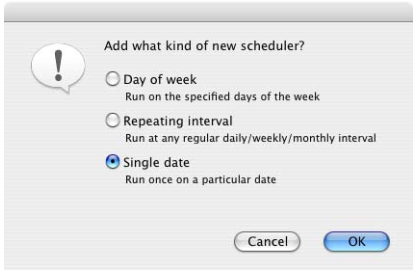
6. When all of the settings in the scheduler window are correct, click OK.

Using the Single Date Scheduler

If you want a script to run once at a specified date and time, use the Single date scheduler.

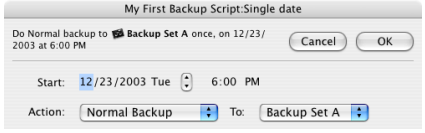
To create a Single date scheduler:

1. Select the Single date radio button in the Scheduler dialog box.



2. Click OK.

The Single date scheduler window displays.



3. Set the start date and time as described in "Common Scheduler Elements" on page 74.

NOTE: Retrospect's Schedule preference (page 160) defines the time period during which scripts are allowed to execute. Scripts scheduled to execute outside this period will not run.

If necessary specify the backup action and destination backup set.

4. When all of the settings in the scheduler window are correct, click OK.

SAVING SCRIPTS

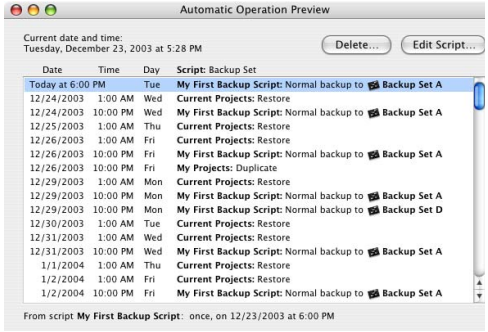
After you've specified all the script settings, you need to save the script. There are three options for saving:

- Save: From the Script menu, choose Save to save the script using the name you created it with.
- Save As: From the Script menu, choose Save As to save the script using a new name. You can save a script once, modify the settings, then use Save As to create a new script.
- Save and Run: From the Script menu, choose Save and Run to save the script and display the manual script execution window. You can then choose to execute the script immediately, or create a "run document" to run the script manually.

For more information on executing saved scripts, see "Executing Scripts," which starts on page 78.

Scheduled Executions

Retrospect keeps track of all of your scheduled scripts and automatically executes them at the time you specified. To view a list of scheduled scripts, click the Automate tab in the Retrospect Directory, then click Preview.



NOTE: Retrospect's Schedule preference (page 161) defines the time period during which scripts are allowed to execute. Scripts scheduled to execute outside this period will not run.

Retrospect is ever-vigilant about scheduled script executions. If a script is scheduled for automatic execution within the look ahead time (normally twelve hours), Retrospect will not automatically quit (or shut down or restart, depending on a preference setting described on page 162). It instead remains open and waits to execute the script.

TESTING SCRIPTS

You can check the validity of a script any time the script summary window is open. Retrospect lets you know if the script is missing any required information or if it's ready to run. If the script requires storage media, you can also check to make sure it's ready and available.

To test a script:

1. From the Retrospect Directory, click the Automate tab, then click Check.

2. In the Script Selection window, select the script you want to test and click OK.

Retrospect displays a dialog reporting on the validity of the script, as well as the next time the script is scheduled to run.

If the script is invalid, Retrospect provides information on what is wrong with the script.

3. If the script is valid, and it requires media, you can click the Check Media button to make sure the backup device is ready with the required media.

4. Click OK to return to the script summary window.

EXECUTING SCRIPTS

Retrospect provides several ways to execute scripts.

For information on interacting with and controlling scripts, see "Controlling Scripts," which starts on page 79.

Automatic Script Execution

"Scheduling Scripts," which starts on page 73, describes how to schedule times for Retrospect to automatically execute a script. Retrospect keeps track of all your scheduled scripts and automatically executes them at the times you specify. The Preview window (described in "Viewing Scheduled Scripts" on page 157) shows upcoming scheduled events.

Manual Script Execution

To initiate a script manually, you can:

- Execute the script immediately from within Retrospect.
- Make a "run document" file that enables you to run the script at any time, upon your command, from your desktop (or wherever the file is saved). You can also execute a run document script from an AppleScript.

Use the manual script execution dialog to specify the method you want. There are three ways to access the manual script execution dialog:

- With an active script summary window, choose Save and Run from the Scripts menu.
- Choose the script from Retrospect's Run menu.
- Click the Immediate tab, then click Run. Select a script and click OK.

To execute the script immediately:

1. Select the Execute now radio button.

If the script being run is a backup script, use the Action pop-up menu to set the backup type. See "Backup Actions" on page 23.

If the backup script has multiple destinations, use the other pop-up menu to specify the destination backup set.

2. Click Execute.

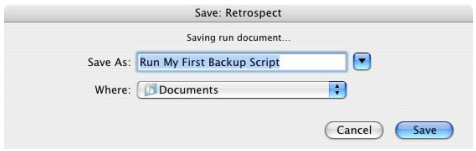
To make a run document:

1. Select the "Make a run document" radio button.

If the script being run is a backup script, use the Action pop-up menu to set the backup type. See "Backup Actions" on page 23.

If the backup script has multiple destinations, use the other pop-up menu to specify the destination backup set.

2. Click Save.



3. Browse to a location to save the run document, enter a file name, then click Save.

4. To execute the script, locate the saved run document on your hard drive and double-click it.

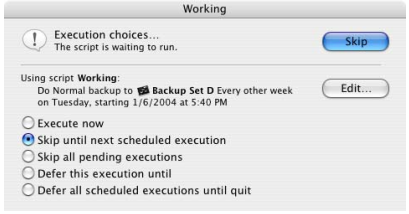
To run several scripts sequentially, select the run documents in the Finder and choose Open from the File menu. When you open several run documents at once, the scripts associated with them will run in alphabetical order by script name, regardless of the run documents' file names.

TIP: You can create more than one run document for the same script, each specifying a different backup action and destination backup set.

You can get creative with run documents. For example, you can add them to your Startup Items (in System Preferences>Accounts) for automatic execution when you start your Macintosh, or you can execute them using AppleScript.

CONTROLLING SCRIPTS

When a scheduled script prepares to run automatically, it counts down to execution. To intercept it before it actually begins operating, click the Stop button in the countdown window. The execution choices window appears.



- To execute the script, select "Execute now" then click Execute.
- To cancel this execution of the script, select "Skip until next scheduled execution" then click Skip. This option shows as "Skip this execution" when there are no future executions scheduled.
- To cancel execution of all pending scripts, select "Skip all pending executions" then click Skip.
- To delay execution of the script until a future date, select "Defer this execution until" then set the date and time and click Defer. You should defer a script when you do not want it to run now but you do want it to run after a certain time.
- To delay execution of the script (and all other scripts) until after you quit Retrospect, select "Defer all scheduled executions until Quit" then click the Defer button. You should defer a script when you do not want it to run while you are using Retrospect but you do want it to run after you quit.

To edit the script, click the Edit button.

Once a script begins executing, you can control the operation in much the same way that you control immediate operations. See "Controlling Executions" on page 149 for more information on the execution status window and media requests.

There are a number of preferences that are specific to scripts that must be set correctly. Scripts are designed to run unattended, even after you've quit Retrospect and gone home for the night. Make sure that you have set Retrospect's Notification preferences to allow the application to automatically launch to run scripts. See "Notification Preferences" on page 160 for more information.

Retrospect's Unattended preferences (see "Unattended Preferences" on page 162) determine what Retrospect does when it has auto-launched and is finished executing the script. By default, Retrospect quits, unless Backup Server is running or another script is scheduled to run in the application's look ahead time. See "Schedule Preferences" on page 160 for more information.

BACKUP SERVER SCRIPTS

Backup scripts are powerful and versatile, but in backup environments which change regularly,

another kind of script—Backup Server scripts—may be better suited to your needs. A regular backup script copies specific volumes in a certain order to a designated backup set. If the backup environment changes and volumes or media become unavailable, the backup will not happen until its next scheduled time, if ever. This is why Retrospect includes Backup Server technology.

Backup Server Benefits

Retrospect's Backup Server technology accommodates changing network and disk configurations. Whereas a regular backup script follows a rigid schedule for its clearly defined source volumes and destination backup sets, a Backup Server script is driven by the availability of those resources and their need for backup. Source volumes are backed up in order, according to need—that which was backed up least recently is first to be backed up. The volumes are copied to the best available backup set media, so Backup Server scripts give you greater freedom to use the media of your choice.

Backup Server scripts are ideal for environments in which computers and volumes appear irregularly on the network. For example, in an office that has ejectable disks and mobile computers that appear on the network at unpredictable times, Backup Server recognizes the new volumes when they become available and backs them up. Client users can even initiate backups of their volumes.

Though Backup Server scripts can be used independently, it is often best to use them in concert with regular backup scripts to produce a comprehensive backup strategy.

How Backup Server Works

You start with a Backup Server script, which is similar to other Retrospect scripts. The backup computer running the script becomes a "Backup Server" during its scheduled time of operation and is idle during its scheduled period of inactivity. You may want to dedicate a computer to Backup Server operations during periods of activity and avoid running other programs while Backup Server is active.

Backup Server makes a queue based on the most recent backups of the source volumes. The least recently backed up volume is moved to the head of the queue and other volumes are arranged in descending order according to the priority of need. Then Backup Server examines the local computer and polls the network, looking for the volumes.

NOTE: Polling the network does not adversely affect network performance.

Backup Server starts at the top of the volumes queue, determining the availability of each source volume and, if there is a choice, backing up each to its most suitable backup set. Retrospect moves the most recently backed up volumes to the bottom of the queue as it goes along. When it is satisfied that all available source volumes are backed up for the current backup interval, Backup Server periodically polls clients on the network. Polling involves checking for volumes that have recently appeared, and checking whether any client users have requested backups of their volumes. This process ensures a volume in need of backing up gets it.

If allowed by the backup administrator and Backup Server, a client user can, at any time, request to be backed up as soon as possible. When Retrospect next polls the client, it will recognize the ASAP request and back up the client.

When the Backup Server script's wrap up time is reached, Retrospect continues the current volume backup but will not start any new backups. When the script's stop time is reached, Retrospect halts the backup in progress, if any, and will not start any new backups until the script's next scheduled start time.

NOTE: Backup Server uses only the normal backup action because recycle and new media backups are inappropriate for use with a Backup Server script.

When to Use Backup Server

The table below includes information comparing standard backup scripts to Backup Server scripts.

See "Network Backup Strategies" on page 135 for descriptions of situations which are suited to Backup Server scripts and for instructions on implementing a strategy based on Backup Server.

Managing Resources

With abundant resources (large storage capacity, fast network, and powerful backup computer with plenty of time to operate) and relatively few source volumes, Backup Server can completely back up all volumes during its window of opportunity. However, with limited resources (small storage capacity, slow network, slow backup computer with little time to operate) and relatively many source volumes, Backup Server is not likely to completely back up each volume during its given time period. Fortunately, Retrospect's Backup Server effectively manages limited backup resources so that it eventually completes all of its backups.

Trust Backup Server to Do Its Job

Whether your setup is resource-constrained or resource-abundant, Backup Server always backs up the volumes in order starting with those which need it most. For example, if you need to back up 100 client computers but you can do backups only during an eight hour period each night, chances are Retrospect will be unable to back up all 100 clients the first night before the script's eight hours are up. Leftover volumes will be backed up the next night, and so on, until all 100 volumes are backed up. After the initial backups, Backup Server will move more quickly through the queue as it performs subsequent IncrementalPLUS backups.

As the backup administrator, you do not have to separate the clients into different groups for different days based on your estimation of backup times. Backup Server distributes the load over the scheduled time period.

The main thing to remember about Backup Server is that all of the source volumes eventually are backed up with no additional effort on your part. In the worst case, the period of time

Feature	Backup Script	Backup Server Script
Destination Backup Sets	Copies to a single backup set as specified in the schedule or at execution. Fails if media is unavailable. Media rotation is scripted.	Copies to the most ideal available backup set in the destinations list. Automatic media rotation among multiple available backup sets.
Source Volumes	Backs up volumes in the order of the source list. If a backup fails, the next backup does not occur until the next time the script runs.	Backs up volumes in the priority order of their most recent backup dates. After each backup, the queue is re-evaluated, including previously unavailable volumes.
Schedule	Starts backup at a specific time and stops when the last source is completed. Optionally ends at a specific time.	Runs between start and stop times. Backups of available volumes occur as necessary.
Execution	One script runs at a time. Conflicting scripts run one after the other.	All Backup Server scripts run concurrently. Other scripts run as scheduled, but not while Backup Server backs up a volume.
User Requested Backups	No.	Yes.

between backups of a given volume will be too long for comfort and you must allot more resources.

If you want your volumes to be backed up more often than they are, you must allocate more resources to the Backup Server script. Increase the script's operating time, use selectors to limit the files to back up, use a faster backup computer, or speed up your network. Setting up a second backup computer with Backup Server handling half of your clients effectively divides the load in half for each backup computer.

Monitoring Progress

Periodically view the Backup Report (see page 137) to see which volumes were backed up by Backup Server and the intervals between backups. Of particular interest is the "Elapsed Days" column which shows how many days have passed since each volume's previous backup.

NOTE: The interval between backups will tend to be smaller when Backup Server is performing IncrementalPLUS backups after the first full backup of each volume. IncrementalPLUS backups require far less time for most volumes and thus can occur more often.

Deleting a backup event from the Backup Report causes Backup Server to not consider that backup when it evaluates the priority of volumes to be queued for backup. Consequently, that volume is given a backup priority higher than its previous priority.

Interaction with Other Scripts

You can use multiple Backup Server scripts operating simultaneously to manage limited backup resources. You can use separate scripts with different schedules to give some volumes a higher backup priority.

For example, one script could run eighteen hours in a day, backing up volumes from the sales department. Another script could run six hours in a day, backing up volumes from the accounting department. The sales department would be more likely to get completely backed up, whereas the accounting department script may not complete all its volumes in a single six hour period. Still, these volumes would eventually get backed up, because volumes in greatest need of backup are backed up before volumes which have more recent backups.

As another example, consider volumes which are available intermittently, such as removable disks and notebook computers. Another script could back them up twenty-four hours a day, because they are available at random times during the day.

For further discussion of Backup Server strategies, see "Backup Strategies," which starts on page 134.

Other, non-Backup Server scripts scheduled for execution during the active operating time of Backup Server scripts can run without conflict. When a regular script wants to run while Backup Server is backing up a volume, Backup Server completes the backup in progress, then allows the other script to execute. When the regular script finishes, Backup Server resumes where it left off. When a regular script is scheduled to run while Backup Server is idle, it executes immediately.

Backup Server Tips and Techniques

To get the most out of Backup Server, you should follow a few simple guidelines.

Choose the Right Backup Server Computer

The computer you use for Backup Server is important. Backup Server scripts work best on a dedicated backup computer that is not an active file server. Backup Server runs best on a backup computer with a powerful processor.

Backup Server does not quit or shut down the backup computer when it is finished; rather, it waits idle until the next scheduled start time.

Use Containers as Sources

Use containers (see page 169) to specify sources in your Backup Server scripts, not individual volumes, especially when you back up clients. When you use containers, any new volumes added to a client are automatically included in backups.

Also, using containers avoids a potential problem when backing up Mac OS clients under certain conditions. When you select multiple volumes from a Mac OS client that is set to wait at shutdown and the script's client system option is set to shut down clients after backups, Retrospect will shut down the client after backing up its first volume. This prevents backups of the client's other selected volumes until the client is restarted.

Rotate Among Backup Sets

Create multiple backup sets and use them all as destinations in your Backup Server script. Rotate through the sets by inserting different media in the backup device each day. Backup Server uses whatever media you inserted (as long as it is specified as a destination).

Introduce New Media

Periodically do new media backups to introduce new media. Store old media off-site after each new media backup. Between new media backups, periodically do recycle backups to avoid catalogs becoming cumbersome and to ensure fast restore operations should they be necessary.

When you want to rotate or introduce new media, do recycle or new media backups by executing regular backup scripts using the same backup sets used by your Backup Server scripts. You can schedule these, execute them from Retrospect's Run menu, or save them as run documents and execute them.

To manually set a backup set for a recycle or new media backup, configure the backup set and set the media action. (See "The Options Tab" on page 154).

Monitor Media Availability

Because Backup Server does not initially put up media request windows, you have to monitor media from the Backup Server status window. This status window displays whenever Backup Server is running.

When Retrospect needs media it displays "media" in the status column when the pop-up menu is set to either Sources or Backup Sets. Choose Backup Sets from the status window's pop-up menu so the window shows which destination backup sets have media available and which do not. Insert media as needed.

If a backup set needs a new or erased medium and you have to erase one, stop Backup Server, erase the medium, then start Backup Server again.

Use Other Scripts to Complement Backup Server

Retrospect can have multiple Backup Server scripts running concurrently, and it will manage the sources and destinations.

Other, non-Backup Server scripts can execute while Backup Server is running. You can schedule them or run them at will using run documents. Other scripts can complement Backup Server scripts by starting recycle and new media backups, and by forcibly backing up volumes that do not get backed up by Backup Server.

Use Tape Libraries

An automatic tape loading device with Backup Server is a powerful combination. All tapes in the library's magazine are available as backup set destinations. Backup Server rotates between sets with no additional effort from you. It uses blank or erased tapes when a backup spans over

two tapes, or when you set up a new media backup with Retrospect's media control options.

Allow Early Backups

By default, Backup Server scripts allow early backups. These occur when Backup Server is polling through the list of possible sources and finds a client that has requested to be backed up as soon as possible. When a client user selects this option in his or her Retrospect Client control panel, the client software does *not* send a message to Retrospect on the backup computer. Rather, Retrospect contacts clients as Backup Server polls, which it does when it is not actually performing backups during its scheduled active time.

If many clients are due for backup, a client with a current backup may wait a long time before Backup Server gets to it. Regardless of the client user's desire for backup ASAP, Retrospect backs up other clients which do not have current backups. Retrospect always polls starting with clients that need backups the most.

For more information, see "Backup Server Options" on page 142.

Manage User Deferments

When a client user repeatedly defers his or her backups (as indicated in the Operations Log), you should make future backups occur at a time which is more convenient for the user, such as when he or she is not using the computer. Or, create a script with the countdown time option at zero to prevent the user from deferring execution.

Set Priority by Volumes

If certain critical volumes are not getting backed up as often as you would like, consider using multiple scripts with different schedules to give some volumes higher backup priority than others. Schedule the higher-priority volumes script to run for a longer duration than the lower-priority volumes script. With more time allotted to the higher-priority volumes, they are more likely to get completely backed up.

Set Priority by Files

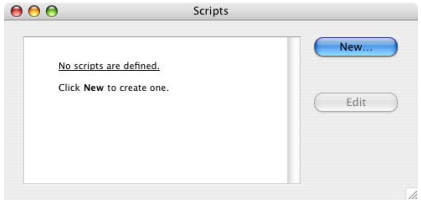
If you find Backup Server is not completely backing up all its sources, another way to set the backup priority is by files rather than volumes, though you can also do both. Use multiple scripts with different selectors to give some files or folders higher backup priority than others. For example, a higher-priority selector would include documents modified in the last seven days, and a lower-priority selector would include all files. Schedule the higher-priority script to run for a longer duration than the lower-priority script.

Creating Backup Server Scripts

This section takes you through the steps of creating a Backup Server script. The process is very similar to creating a regular backup script, although Backup Server scripts are scheduled differently.

1. From the Retrospect Directory, click the Automate tab, then click Scripts.

The script editing window displays.



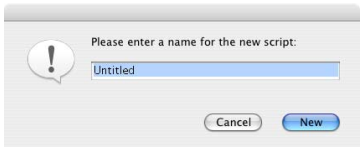
2. Click the New button to create a new script.

NOTE: If no scripts are defined, Retrospect first asks whether you want to use EasyScript (See "Using the EasyScript Wizard" on page 64.). Click No to continue.

The script selection window displays.

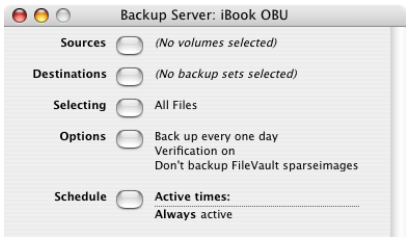
3. Select Backup Server from the list and click OK.

The script naming dialog displays.



4. Enter a name and click New.

The script appears in its own window.



This script window is very similar to a regular backup script summary window, with information for the source volumes, destination backup sets, file selection criteria, options, and schedule information.

5. To change information, click the appropriate button.

Sources lets you add or remove source volumes.

Destinations lets you choose one or more destination backup sets.

Selecting lets you choose a selector—a kind of filter for selecting files and folders to be backed up.

Options displays the options window in which you can toggle verification, data compression, and other options.

Schedule lets you set the script to run all the time or only on specific days at specific times.

Setting the Backup Server Sources

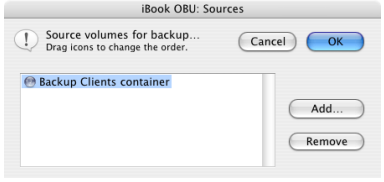
The first step in defining a Backup Server script is setting the sources.

1. Click the Sources button.

The Volume Selection window displays.

2. Select a source volume (or volumes), then click OK.

NOTE: Backup Server scripts are especially well-suited for backing up laptop client volumes, or other volumes that appear irregularly on the network.



3. Click Add to select additional sources, or select a source and click Remove to remove it from the list. When the list of sources is complete, click OK.

NOTE: If your script includes multiple sources, they are backed up according to need and availability.

Setting the Backup Server Destinations

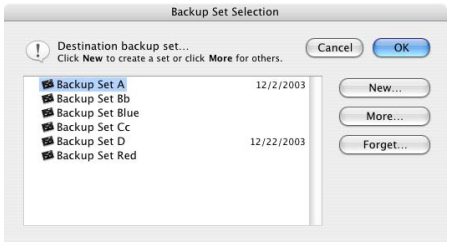
After specifying the source(s) to back up, you must specify the destination backup set(s) for the data.

1. Click the Destinations button.

If there are no defined backup sets, the Backup Set Creation window displays.

Create a new backup set, as described in "Creating a New Backup Set" on page 47. Once the new backup set is created, it appears in the Backup Set Selection window.

If there are defined backup sets, the Backup Set Selection window displays.



You can click New or More to create new backup sets or access additional ones.

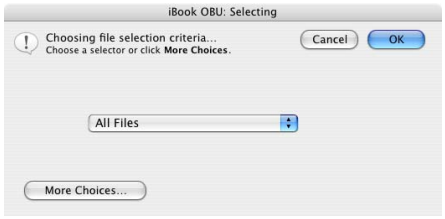
2. Select one or more backup sets, then click OK.

3. Click Add to select additional destinations, or select a backup set and click Remove to remove it from the list. When the list of destinations is complete, click OK.

Selecting Files for Backup Server

By default, Retrospect selects all files on the source(s). You can choose a different pre-defined selector or create a custom selector to select a subset of all files.

1. Click the Selecting button.



2. Choose a selector, then click OK.

You can also click More Choices to use Retrospect's file selection criteria to create a custom selector. Selectors are explained in detail in "Using Selectors," which starts on page 177.

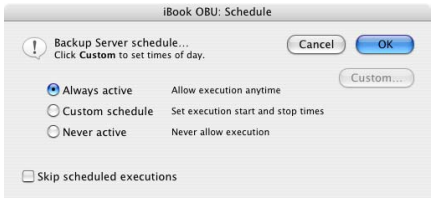
NOTE: Selectors are used to determine which files are *considered* for backup, not which files actually get copied. For example, if you choose All Files, Retrospect compares all the source files with the files already in the destination backup set, then copies *only* those files that are new or changed.

Setting Backup Server Options

Click the Options button to display the options window in which you can specify how often to back up source volumes and whether or not to allow early backup. Click More Choices to see all of the available options categories and notice that many categories parallel those of regular backup scripts. Categories specific to Backup Server scripts are Backup Server, Client Countdown, and Polling. These options are explained in detail in "Execution Options," which starts on page 142.

Scheduling Backup Server Scripts

A Backup Server script's schedule is one of the major differences between it and a regular backup script. From the script summary window, click the Schedule button.



Select a schedule:

- **Always active** makes Retrospect run the script twenty-four hours a day, seven days a week.
- **Custom schedule** brings up another window in which you can customize the script schedule. This is described below.
- **Never active** prevents Retrospect from running the script.

The **Skip scheduled executions** checkbox prevents Backup Server from running until the time you specify.

Customizing the Schedule

By default, Backup Server scripts are active 24 hours a day, 7 days a week. If you want to specify different hours or days for a script to be active, you can create a custom schedule.

When you select Custom schedule and click the Custom button, Retrospect displays the custom schedule window. Although it looks quite similar to Retrospect's Schedule preferences window, it is specific to this Backup Server script rather than global to all Retrospect executions.

If the schedule was previously Always Active, all twenty-four hours of each of the seven days of the week are selected.

To select a day of the week, click on it. Click and drag to select contiguous days of the week. Use the Shift or Command key and click or drag to select days without de-selecting the previous selection.

To change a time, click on it and type or use the control.

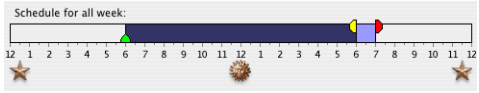
Start is the time at which the script begins.

Wrap up is the period of time (in hours and minutes) before the stop time, during which Retrospect should complete the current backup but not begin new backups.

Stop is the time at which Retrospect absolutely must halt this script's backups (until the next start time).

TIP: You can also set times by dragging the icons on the hourly schedule bar, but you should first experiment by typing the times to see how these controls work.

When a time is changed, the hourly schedule bar changes accordingly to graphically represent the start, wrap up, and stop times of the script.



Each selected day has a scaled-down hourly schedule bar, though it does not have controls.

You can revert a customized schedule with the Always and Never buttons.

Using Backup Server

There are a number of ways to control Backup Server and Backup Server scripts, both from the Retrospect application and from Retrospect clients.

NOTE: Backup Server is not affected by Retrospect's Unattended preference. For example, Retrospect will not quit when a Backup Server script is done.

Automatic Starting

When you save a Backup Server script, Backup Server is enabled after the backup computer is idle (that is, no mouse movement, clicks, or keystrokes) for ten minutes. Retrospect starts Backup Server when a script's scheduled start time arrives. If Retrospect is not open at the start time, it will open automatically.

Run Menu

After you have saved at least one Backup Server script, Retrospect's Run menu includes two previously unavailable items: Start Backup Server and Disable Backup Server. Choose Start Backup Server to manually enable Backup Server, which will then run Backup Server scripts at their scheduled times of execution.

Choose Disable Backup Server from the Run menu to prevent any scheduled Backup Server scripts from executing until you choose Start Backup Server or Enable Backup Server to re-enable Backup Server.

Control Menu

When Backup Server is running, Retrospect has a Control menu on its menu bar. Following is a list of its items and descriptions of their functions.

Show Log displays the Operations Log.

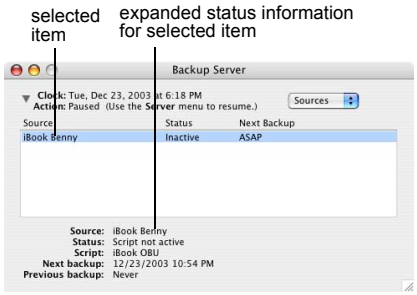
Stop on Errors makes Backup Server halt when it encounters any error, rather than just logging the error and continuing.

Just Log Errors ensures Backup Server continues operating when it encounters an error, rather than halting execution. You can find any errors which occur by viewing the Operations Log.

The Backup Server Control menu items parallel their counterparts of the Control menu available when regular scripts are running.

Status Window

When Backup Server is running, the status window shows you what it is doing. Click the triangle icon to expand the window for more information.



Use the pop-up menu to choose a status category.

Sources shows the source volumes from all running scripts.

Backup Sets shows the backup sets from all running scripts.

Scripts shows all Backup Server scripts.

Retrospect lists the status of each item under the status heading.

Blank means Backup Server has yet to connect with the item.

Active means the script is functioning.

ASAP means the source will be backed up as soon as possible. This may be either because the client user initiated the backup or the client's

most recent backup is older than the script's backup interval.

Backed up means the source volume has been backed up within the specified interval.

Deferred means the client user has intercepted and postponed the backup. Such user deferments are entered in the Operations Log.

Inactive means the script was deactivated or its schedule does not currently permit it to run.

Media means Backup Server cannot find the proper media for the destination backup set.

Ready means a source is currently being backed up or is about to be. It also means a backup set is ready as a backup destination.

Retry means Backup Server failed to back up the source and will try again.

Scheduled means the source has never been backed up, but the administrator has scheduled a pending backup.

Source means Backup Server cannot find the source volume.

Wrap up means a Backup Server script is in its wrap up period.

Click on an item to see more status information in the lower part of the expanded status window.

Closing the Status Window

Click the Backup Server status window's close box to stop all scripts in progress. When one or more scripts are scheduled, Retrospect waits a period of time, then Backup Server starts and executes scheduled Backup Server scripts. The wait period is ten minutes if you are still using Retrospect, or one hour if you quit Retrospect.

Deactivating a Script

Retrospect allows you to temporarily deactivate a Backup Server script so its sources are not included in Backup Server's routine operations. When Backup Server is stopped and later started, the script will be active.

To prevent a Backup Server script from executing, first choose Scripts from the Backup Server status window's pop-up menu. Then select the script from the list and choose Deactivate Script from the Server menu.

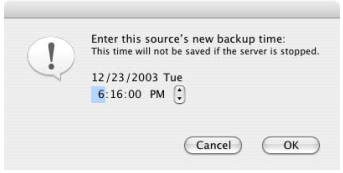
Reactivating a Script

To allow a deactivated Backup Server script to execute and include its sources in Backup Server's routine operations, follow the same steps as deactivating but choose Activate Script from the Server menu.

Scheduling a Backup of a Source

Retrospect allows you to schedule a backup of a source from a running Backup Server script. This lets you set a definite time for Backup Server to back up the source, rather than wait for Backup Server to back it up at its convenience. This is useful, for example, when the backup administrator knows a salesperson will be leaving the office with her iBook. The administrator can schedule that client for backup immediately.

To schedule a backup of a source, first choose Sources from the Backup Server status window's pop-up menu. Then select the source from the list and choose Schedule Backup from the Server menu (or double-click on the source), which brings up the following dialog.



Use the controls to set the date and time to back up the source, then click OK. Retrospect changes the priority of the source in the Backup Server queue according to your scheduled time.

A backup scheduled this way is not remembered by Retrospect when Backup Server is stopped.

Resuming the Paused Backup Server

When you use the backup computer's mouse or keyboard while Retrospect is the active application, Retrospect pauses Backup Server in anticipation of you issuing commands. Backup Server automatically resumes after two minutes of mouse or keyboard inactivity.

To resume the paused Backup Server before the two minutes have passed, choose Resume Server from the Server menu.

Backup Server Runs Continuously

Unlike other scripts, when Backup Server scripts finish they do not take the action specified by the Unattended preference. For example, a Backup Server script will not quit when done. If you quit Retrospect, Backup Server will automatically launch Retrospect when the next script is scheduled to start.

CHAPTER 6

NETWORK BACKUP

- NETWORK BACKUP OVERVIEW
- INSTALLING CLIENTS
- WORKING WITH CLIENTS
- UPDATING CLIENTS
- UNINSTALLING A CLIENT AND ITS SOFTWARE
- ADVANCED NETWORKING
- CLIENT USER PREFERENCES
- BACKING UP CLIENTS
- WORKING WITH WINDOWS CLIENTS
- WORKING WITH LINUX CLIENTS
- FILE SYSTEM CONVERSIONS
- NETWORK BACKUP GUIDELINES

This chapter provides instructions on installing, configuring, and otherwise administering the client software that allows you to access networked Retrospect client computers from the backup computer. It also describes the options and controls available to Retrospect clients. In addition, this chapter explains how to back up these clients and includes information and worksheets for setting up efficient workgroup backups.

NETWORK BACKUP OVERVIEW

Retrospect allows you to use a single computer with a storage device to back up networked Macintosh, Windows, and Linux computers equipped with Retrospect Client software.

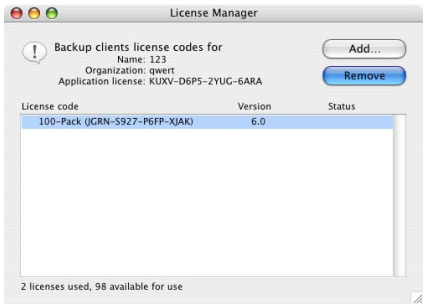
To back up clients, first install the Retrospect Client software on each of the client computers. Then use the Retrospect application to log in clients for use by the backup computer. After configuring the clients, you can create and schedule scripts using client volumes as sources, as if the volumes were connected directly to the backup computer.

Client Licenses

Retrospect will work with as many clients as you have licensed. You can add licenses to support more clients.

Retrospect's license manager keeps track of your client licenses with the license codes you enter. Client license codes are included as part of all Retrospect for Macintosh products and are also available separately in Retrospect Clients. You get additional codes when you purchase additional licenses.

- To view current licenses, click Licenses from the Special tab, or choose License Manager from the Window menu. The license manager summarizes the quantities of used and available clients and lists client licenses you have added.



- To add a client license, click the Add button and enter your new license code in the dialog that follows.

Security

Clients connected to the Internet are at risk, however slight, of unauthorized access. The Retrospect Client installer program requires you to assign passwords to clients to prevent access by Internet users who have Retrospect.

Network Interfaces

If your backup computer has multiple network interfaces, the Retrospect application and Retrospect Client software automatically switch to the next available network interface if the primary interface is not available.

Mac OS X's Network System Preferences allow you to specify the order in which you want to try different network interfaces when connecting to a network.

INSTALLING CLIENTS

All client computers that you want to back up must have Retrospect Client software installed. The following topics include system requirements and installation instructions for Macintosh, Windows, and Linux clients.

NOTE: If you already have Retrospect clients with older software installed, see "Updating Clients" on page 100.

System Requirements for Macintosh Client Computers

Macintosh client computers require:

- PowerPC or better processor
- Mac OS 7.1 or later with Open Transport 1.1 or later; Mac OS X 10.1.5 or later
- TCP/IP networking

NOTE: Older versions of Retrospect could access older Macintosh client computers using

either AppleTalk or TCP/IP network protocols. Retrospect 5.0 and later can access clients using only TCP/IP. If you are upgrading from a version of Retrospect that supported AppleTalk clients, you must uninstall and reinstall Retrospect Client software on all AppleTalk client computers.

Installing Retrospect Client Software on Macintosh Computers

Use the following procedures to install the client software on each Macintosh computer you want to back up over the network.

TIP: For installing many clients on a network, or for installing on computers without CD-ROM drives, you can put the Retrospect Clients installer on a shared folder on a server. Copy the installer to client computers from that folder instead of from the CD.

To Install Retrospect Client Software on a Macintosh Computer:

1. Save all unsaved documents and quit other running application programs.

2. Under Mac OS X, log in to the client computer so that you have administrator privileges.

3. Insert the Retrospect CD in the client computer's CD-ROM drive.

4. Double-click the appropriate installer icon for the client computer's OS.

For OS X 10.1.5 and higher, double-click Install OS X Client.

For OS 7.5 to OS 9.2, double-click Install Classic Client.

5. Follow the instructions of the installer program to place the client software on the startup disk.

6. Create and enter a password to prevent unauthorized access to the client; do not forget this password.

NOTE: Use only basic alphanumeric characters (low-bit ASCII) in passwords for clients. Macintosh high-bit characters do not correspond to Windows high-bit characters. For example, Luf$Luf00 is OK but Lüf•Lüføø will cause problems.

7. Restart the computer, if requested.

After Installation

When the computer starts up, it automatically loads the client software. The client is now ready to be accessed from the backup computer, as described in "Working with Clients" on page 95.

System Requirements for Windows Client Computers

Windows client computers require:

- Intel Pentium class or better processor
- Windows 95/98/Me, Windows NT 4.0 Workstation, Windows 2000 Professional, or Windows XP
- TCP/IP networking
- Winsock 2.0 for Windows 95

You can install TCP/IP networking software from the Windows installation software. Windows 95 requires the Winsock 2.0 Update from Microsoft. It is available free from Microsoft at: http://www.microsoft.com/windows95/

Installing Retrospect Client Software on Windows Computers

Use the following procedures to install the client software on each Windows computer you want to back up over the network.

TIP: For installing many clients on a network, put the Retrospect Client installer on a shared folder on a file server. Copy the installer to the client from that folder instead of from the CD.

To Install Retrospect Client Software on a Windows Computer:

1. Save all unsaved documents in other running application programs.

2. Under Windows NT/2000/XP, log in to the client computer so that you have Administrator privileges.

3. Insert the Retrospect or Retrospect Clients CD in the client computer's CD-ROM drive.

4. Click the Install Client button.

5. Follow the instructions of the Setup program to place the client software on the startup disk. Create and enter a password to prevent unauthorized access to the client; do not forget this password.

NOTE: Use only basic alphanumeric characters (low-bit ASCII) in passwords for clients. Macintosh high-bit characters do not correspond to Windows high-bit characters. For example, Luf$Luf00 is OK but Lüf•Lüføø will cause problems.

6. Restart the computer, if requested.

After Installation

When the computer starts up it automatically loads the client software. The client is now ready to be accessed from the backup computer, as detailed in "Working with Clients" on page 95.

Cloning Installations

You may wish to use disk cloning software to clone a client installation. After installing client software on a computer, you can use the computer as the master from which to create other cloned computers. Do not use Retrospect to access the newly-installed client before using it as the clone master. You must clone the master before you access it with Retrospect.

Registry Backup Manager (NT/2000/XP Only)

Use the Registry Backup Manager on your Windows clients (NT/2000/XP only) to copy the clients' registry information so that Retrospect running on a Macintosh backup computer can back it up. Windows backup computers automatically back up client registry information.

With the Registry Backup Manager you can restore the copy from the backup and replace the registry. Use the Registry Backup Manager instead of Microsoft's RegBack to automatically copy the system's registry information according to a schedule.

NOTE: The Windows 95/98/Me registry is automatically backed up by Retrospect, so this utility is for use only with Windows NT/2000/XP.

To launch the Registry Backup Manager, you should already be logged in to the client computer with Administrator privileges. Go to the default installation path Program Files/Dantz/Client and double-click regcopy.exe.

Enable daily, unattended saving of the registry by clicking On and Apply. Click the Help tab for more information.

System Requirements for Linux Client Computers

Linux client computers require:

- x86-based system running Red Hat Linux 6.2, 7.1, 7.2, 7.3, 8.0, or 9.0
- glibc version 2 or later
- TCP/IP networking

In order to use the graphical user interface (GUI) to change options and preferences, the following is also required:

- Java version 1.2 or later

Installing Retrospect Client Software on Linux Computers

Use the following procedures to install the client software on each Linux computer you want to back up over the network. Choose your preferred method of installation; rpm or tar.

To Install Retrospect Client Software on a Linux Computer:

1. Insert the Retrospect CD into a disc drive connected to your Macintosh computer.

2. Open the Install Retrospect Client folder and browse to the location of the Retrospect Client for Linux installer files (retroclient-65.rpm or retroclient65.tar).

3. Copy the appropriate file to a location on the network.

4. Then copy the file to the Linux computer on which you want to install the client software.

5. Save all unsaved documents in other running application programs.

6. Enter the following commands, depending on your operating system and your preferred installer.

rpm $rpm -i retroclient-65.rpm

tar $tar -xf retroclient-65.tar, $.Install.sh

7. Create and enter a password to prevent unauthorized access to the client; do not forget this password.

NOTE: Use only basic alphanumeric characters (low-bit ASCII) in passwords for clients. Macintosh high-bit characters do not correspond to Windows high-bit characters. For example, Luf$Luf00 is OK but Lüf•Lüføø will cause problems.

The client software runs automatically upon completion of installation.

After Installation

The client is now ready to be accessed from the backup computer, as described in "Working with Clients" below.

WORKING WITH CLIENTS

Once a client computer is installed with Retrospect Client software, you can add it to the Backup Client Database from the backup computer and start using it in immediate and automated operations.

Important information about working with clients:

- Retrospect Desktop does not search for clients outside the local subnet. If you want to access clients outside the backup computer's subnet, upgrade to Retrospect Workgroup or Retrospect Server, which include advanced networking features. These features are described in "Advanced Networking," which starts on page 102.
- Retrospect Desktop and Retrospect Workgroup cannot back up Retrospect clients that are file servers. If you want to access servers as Retrospect clients, upgrade to Retrospect Server.

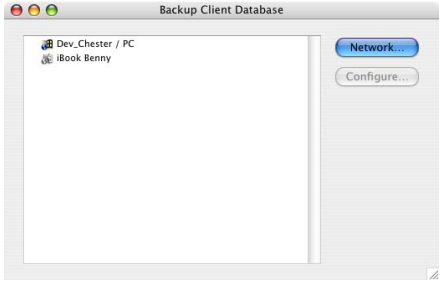
Adding Clients

Before you can back up a client computer, you need to add it to Retrospect's client database.

NOTE: When you add a client, Retrospect's License Manager decrements the available pool of client licenses.

To Add a Client:

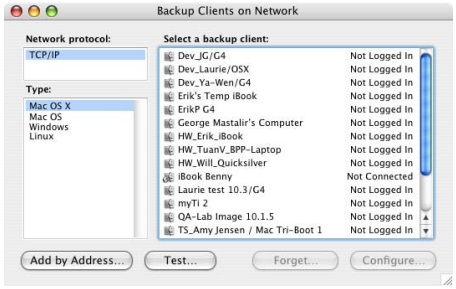
1. From the Retrospect Directory, click the Configure tab, then click the Clients button.



The Backup Client Database displays a scrolling list of all the client computers currently logged in for use with Retrospect, if any.

Macintosh clients are represented by the icon. Linux clients use the icon. Windows clients use the icon.

2. Click Network to display a list of Retrospect clients.



The Backup Clients on Network window lists all the computers on a specific network that have Retrospect Client software installed. By default, Retrospect uses its Piton multicast method of searching for clients in the local subnet.

NOTE: A subnet is a group of local computers physically networked together without a router or gateway, though they may use a gateway to connect to other networks.

3. Click to select a type of client to add.

Available types are: Mac OS X, Mac OS (7/8/9), Windows, or Linux.

To the right of each client name, Retrospect lists its status. "Not Logged In" means the client has not been logged in for use with Retrospect. "Responding" means the client is logged in and ready for backups or other uses.

4. Select a client and click Log in.

5. Enter the client's password, then click OK.

The client configuration window displays. See "Configuring Clients" on page 96 for information about client properties.

Testing Network Addresses

You can use the Test button in the Backup Clients on Network window to test for a responding client at a known IP address or DNS name.

To Test an Address:

1. From the Retrospect Directory, click Configure>Clients.

2. Click the Network button to display the Backup Clients on Network window.

3. Click the Test button.

4. Enter an IP address or DNS name and click Test.

If Retrospect Client software is found at the specified address, Retrospect reports its client name and software version.

If a computer is found at the specified address, but it is not running Retrospect Client software, or if no computer is found at the address, Retrospect reports an error.

Configuring Clients

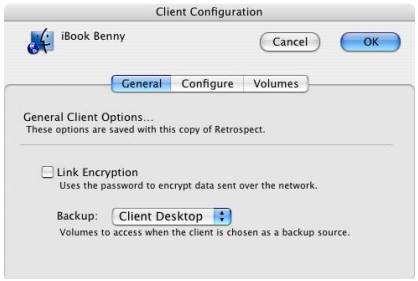
After you have logged in a client, you need to configure it. If a client is installed but not logged in, you can select it in the Backup Clients on Network window and click the Log in button to log in and configure the client. If the client is logged in but you need to reconfigure its settings, you can select it in the Backup Client Database window and click Configure.

The client configuration window displays the client name and includes three tabs. Each tab

represents a category of configuration options: General, Configure, and Volumes.

General Tab

The General tab has an option to protect data over the network and options for specifying which volumes on the client computer are accessible to Retrospect over the network.



Link Encryption: The link encryption option, which is off by default, is only available if this client uses a password. When the Link Encryption checkbox is checked Retrospect protects against network eavesdropping by encrypting data transferred over the network then decrypting it before writing it in the backup set. (Client link encryption is distinctly different from backup set encryption.)

Volumes to Access: The setting of the pop-up menu affects how Retrospect resolves client containers during operations. Usually you do not need to change it from its Client Desktop default.

- **Client Desktop** resolves to all volumes local to the client computer, except for floppy disks, shared volumes (such as file servers), read-only volumes (such as CD-ROMs), and empty volumes.
- **Startup Volume** resolves to the volume from which the client computer booted.
- **Selected Volumes** resolves to all volumes selected in the Volumes tab of the client configuration window.

The following table uses the example of a client computer with several mounted volumes. It shows the volumes to which the client container resolves, depending on to the Volumes to Access settings.

These volumes mounted on a client computer…	…with this Volumes to Access configuration…	…resolves to these volumes.
	Back up: Client Desktop	MOSX Startup Extra HD
	Back up: Startup Volume	MOSX Startup
	Back up: Selected Volumes	Extra HD (assuming Extra HD is the only volume selected in the Volumes tab).

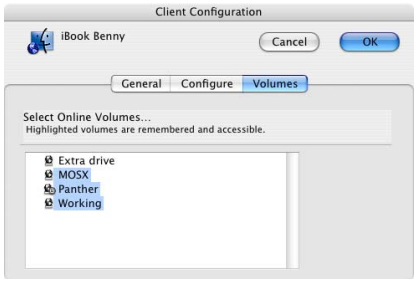
Configure Tab

The Configure tab lists the client name, whether it has a password, its clock offset (the time difference between the client computer clock and the clock of the backup computer), and the version number of the client software.

- To change the client name, click Rename. A dialog then asks you to enter the new name.
- To add, change, or remove the password, click Change. A series of dialogs then asks you to enter and confirm the new password.
- To change the time of the client computer to match that of the backup computer, click Sync Clock, which is not available when the client allows read access only (page 106).
- To update the software version of the client click Update. A file selection dialog then asks you to locate the Retrospect Client software from which to update. See "To Update an Individual Client Computer" on page 101 for detailed instructions.

Volumes Tab

The Volumes tab lets you specify which volumes on the client computer are accessible to Retrospect over the network.



You can select any, all, or none of the client computer's volumes from the list. Your selection determines which volumes appear in a Volume Selection window (used to specify a backup script's sources among other things).

It also determines the volumes to which the client container resolves when the General tab's pop-up menu is set to Selected Volumes. See "General Tab" on page 97 for further information.

Forgetting a Client

After a client has been logged in, there may come a time when you no longer need it in the Backup Client Database (e.g. if the client computer is removed from the network.). In this case, you can tell Retrospect to forget it, which is the opposite of logging it in.

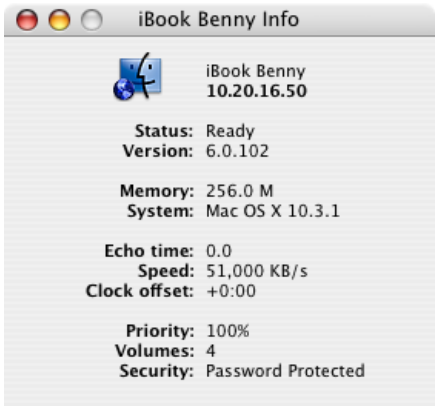
In the Backup Client Database window, select the client and choose Forget from the Clients menu. Or, in the Backup Clients on Network window, select the client and click Forget.

In both cases, Retrospect asks you to confirm the operation. By clicking OK, you are removing the client volumes from scripts and other lists in Retrospect. This only affects Retrospect on the backup computer in use at the time. It does not affect other copies of Retrospect running on other computers on the network, which remain logged in to the client as usual. Forgetting a client does not affect that client's existing backups.

Forgetting a client makes one more client license available in the License Manager (page 92).

Getting Information About a Client

From the backup computer, you can use the Get Info command in the File menu to see status and other information about any client that appears in the Backup Client Database window, or any logged in client in the Backup Clients on Network window.



The client info window includes the client's name and IP address, as well as the following information:

Status indicates the client's availability for backups and other operations.

- *Ready* means the client is ready and available.
- *Shutdown wait* means the user has given the Shut Down command to the Mac OS 7/8/9 client computer and the Retrospect Client software is waiting for a Retrospect backup computer.
- *Locked* means the user at this client workstation has checked the "Read Only" access preference in the client control panel. (The client can be backed up, but you cannot restore to it or delete files from it.)
- *Busy* means the client is currently being accessed by a different copy of Retrospect on the network.
- *Turned Off* means the user at this client clicked the "Off" radio button in the client control panel. A client that is turned off is unavailable for operations until it is turned on manually or the client computer is restarted.

Version is the version number of the client software installed on the client computer.

Machine (Windows clients only) shows the type of CPU in the client computer.

Memory (Macintosh and Windows clients only) is the total amount of RAM in the client computer.

Type (Windows clients only) Shows the client type, i.e., Windows backup client.

System (Macintosh and Linux clients only) lists the operating system used by the client computer.

OT Version (Mac OS 7/8/9 clients only) is the version of Open Transport running on the client Macintosh.

Application (Mac OS 7/8/9 clients only) is the active application or program.

Idle time (Mac OS 7/8/9 clients only) is the amount of time since the keyboard or mouse on the client Macintosh were last used.

Echo time is the time delay, in seconds, experienced in communicating with this client (usually 0.0 to 0.2). If the network or client is busy, or you are using routers, the echo time could easily be higher without indicating a problem.

Speed is the transfer rate of the network connection between the backup computer and the client computer.

Clock offset is the difference in hours:minutes:seconds between the internal clocks of the client computer and the backup computer.

Priority is the priority setting the user has chosen in the client control panel. A 20% priority means the user has set the slider all the way to "User," giving other applications and tasks some of the computer's processing time that would otherwise be used for Retrospect tasks. A 100% priority means the client's priority slider is set all the way to "Backup," giving client tasks (namely, transferring files) all of the client software's processing time allotted by its operating system.

Volumes displays the number of volumes the backup computer knows about for this client.

Security summarizes the data security specified for this client computer.

- *No Password* means no security code was installed. Anyone using Retrospect on the network can log into this client.
- *Password Protected* means a security code must be entered in order to log in to this client.
- *Link Encrypted* means that the administrator has selected the "Link Encryption" option for this client. This means data from this client is being encrypted before being copied over the network.

UPDATING CLIENTS

There may come a time when you need to update older client software to take advantage of improvements in a newer version. At that time, you can update clients either from the backup computer, or from individual clients.

NOTE: You must update all Mac OS X clients to use the Retrospect 6.0 Client software. Retrospect 6.0 does not support pre-6.0 client software for OS X clients.

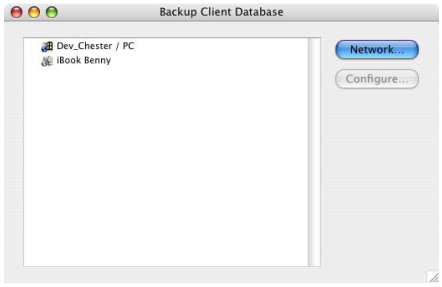
Updating Clients from the Backup Computer

You can update individual clients as needed, or update all clients of a given type. When you update a client, it retains all of its current settings.

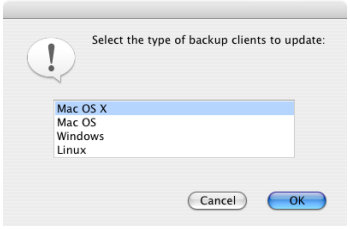
NOTE: It is a good idea to update all clients even if you know some of them are turned off. You can later repeat this operation without affecting the clients that are already updated.

To Update All Clients of a Given Type

From the Retrospect Directory's Configure tab, click the Clients button. The Backup Client Database window appears, listing all client computers currently logged in for use with Retrospect.



Choose Update All from the Clients menu.

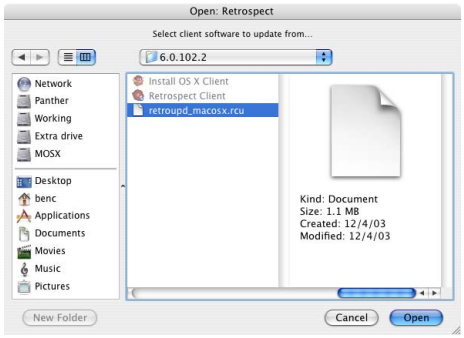


Select the type of clients you want to update (Mac OS X, Mac OS, Windows, or Linux.) and click OK.

In the next dialog, click OK to confirm the updating of the client software.

Browse to the location of the Retrospect Client update file.There are four different client update

files: one each for Mac OS X, Mac OS 7/8/9, Windows, and Linux. Different client update files may be available from different places such as the Retrospect CD and the Dantz web site.



Select the appropriate client update file and click Open. Retrospect begins updating the client software on the client computers.

NOTE: If a client computer has virus protection software installed, it may require confirmation at the client computer before allowing the update to continue.

When the update is complete, Retrospect reports the results in a dialog and the Operations Log. Click OK.

To confirm the status of each client update, open the Operations Log. (To do this click the Reports tab then click the Log button, or choose Log from the Window menu.)

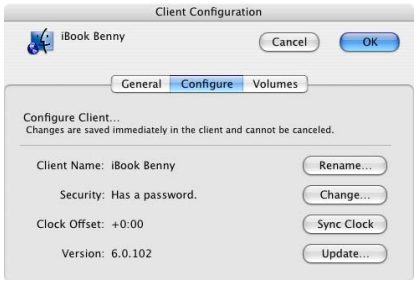
The update does not take effect under Mac OS 7/8/9 or Windows NT/2000 until the client computer is restarted. For Red Hat Linux 6.2 clients, you must manually restart Retrospect Client on each computer with the command:

$/usr/local/dantz/client/rcl start

To Update an Individual Client Computer

From the Retrospect Directory's Configure tab, click the Clients button. The Backup Client Database window appears, listing all client computers currently logged in for use with Retrospect.

Select the client you want to update, then click the Configure button (or double-click the client). In the client configuration window that appears, click the Configure tab.



Click the Update button. A dialog appears, prompting you to specify the location of the Retrospect Client update (.rcu) file.

Select the appropriate client update file, and click Open. When the update is complete, another dialog appears, telling you the update completed. Click OK.

The update does not take effect under Mac OS 7/8/9 or Windows NT/2000 until the client computer is restarted. For Red Hat Linux 6.2 clients, you must manually restart Retrospect Client on each computer with the command:

$/usr/local/dantz/client/rcl start

Updating Clients from the Client Computer

If you do not want to update clients from the backup computer as described above, you can update clients directly from the individual client computers. This is done with the Setup application (Windows), Client Installer application (Mac OS), or rpm or tar installers (Linux), which can also update clients.

Follow the installation instructions, which start on page 92, appropriate for the computer's operating system.

UNINSTALLING A CLIENT AND ITS SOFTWARE

If you want to remove the client software from a computer, forget the client as described on page 98, then take the following steps.

Mac OS X

1. Open the client installer application.

2. Choose Uninstall from the pop-up menu and select the volume from which to uninstall Retrospect Client software.

3. Click the Uninstall button to remove the client software from the computer, then exit when you are done.

Mac OS 7/8/9

Remove the Retrospect Client control panel from the computer by placing the file in the Trash.

Windows

1. From the Start menu, choose Settings>Control Panel.

2. Double-click Add or Remove Programs.

3. In the window that appears, select the Retrospect Client software and click Change/Remove.

4. Click OK to close the window.

NOTE: Under NT/2000/XP you may have to log in with administrator privileges.

Linux

The process for uninstalling the Linux client varies depending on how the client software was installed.

For **rpm**, type the command: $rpm -e retroclient

For **tar**, manually remove the client software files installed by tar.

ADVANCED NETWORKING

The features described in this section are available only with Retrospect Workgroup and Retrospect Server.

Retrospect normally uses its multicast access method to find backup clients directly connected to the local network segment or local subnet, and display them in the Backup Clients on Network window. You will need to use Retrospect's more sophisticated techniques of accessing clients if your network has routers between the backup computer and its clients, or if your backup computer has multiple network cards connected to different physical networks.

Access Methods

Retrospect can either use the standard DNS and WINS directory services, or its own Piton Name Service based on TCP/IP.

Adding a client to the Retrospect client database also stores its access information for later use. When Retrospect tries to connect to the client for a backup, it resolves the access information into its current IP address using the original access method.

On each client computer, Retrospect Client software waits for queries from Retrospect on the backup computer. Just exactly how Retrospect gets in touch with the clients depends on the access method Retrospect is using.

Multicast

When you first open the Backup Clients on Network window, the default access method is multicast. With this method, Retrospect sends out a multicast request to the listening client computers, asking them to respond with their identities. After you have added a client with this method, when Retrospect later tries to con-

nect to the client for a backup, it handles IP address changes automatically by sending out another request to update its client database and connect with the proper client.

If you use a network analyzer to monitor the packets it sends with the multicast method, you will see Retrospect uses well-known port 497 for its communications. The packet format conforms to the proprietary Dantz protocol Piton (for PIpelined TransactiONs), which gives Retrospect much of its network speed and reliability. Multicast Piton Name Service uses the assigned address 224.1.0.38, which allows Piton to direct its queries only to those computers running Retrospect Client software.

Multicast access is simple, requiring no configuration, but does not operate across routers. It works only in the local subnet.

Subnet Broadcast

The subnet broadcast access method allows you to access clients through virtually any network topology, including the Internet.

According to TCP/IP standards, every subnet has both a network address and a subnet mask, such as 192.168.6.0 and 255.255.255.0. Routers use these to identify the physical network to which computers are connected. Routers also support queries to all the computers on a particular subnet. Retrospect takes advantage of this ability for its subnet broadcast access method, using the same Piton protocol as for multicast access.

With Retrospect's subnet access method, you must define the address and mask of each subnet you wish to use, and update these configurations if your network changes.

Direct Access

You can use the direct client access method to add a specific backup client to Retrospect's client database. This method requires you to know the IP address or DNS or WINS name of each backup client. Do not use a numeric IP address for computers which get a dynamic IP address from a DHCP server, because Retrospect has no way to know when the address changes.

Adding clients by direct access is most useful for a few clients; adding many might be tedious. One of the other methods would probably be better for adding numerous clients.

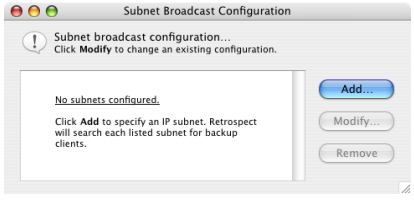
Configuring Access Methods

The first time you open the Backup Clients on Network window Retrospect searches for clients in the local subnet using its multicast access method.

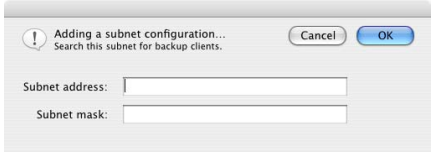
Subnet Broadcast Access Method

You can define subnets other than the local subnet in which you want Retrospect to search for clients.

Choose Configure Subnet Broadcast from the TCP/IP menu to configure a new subnet to search. The first time you use this feature, no subnets are configured so none appear in the configuration window.

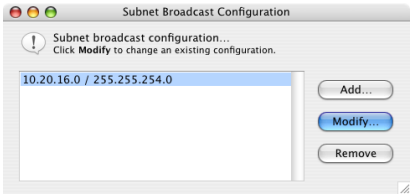


Click Add to configure a new subnet to search.



Enter an IP address within the subnet and enter its subnet mask. Then click OK.

The IP subnet you defined appears in the subnet configuration window.



Later you can add, modify, or remove subnets as needed.

Click OK to return to the Backup Clients on Network window and view the backup clients Retrospect found using the subnet broadcast access method.

When you add a client with the subnet broadcast access method, Retrospect knows to look for that client in your defined subnets.

Each subnet you configure will be accessed by Retrospect when it searches for clients. This includes not only when this window is open, but also when Retrospect searches for a client in an operation.

Direct Access Method

In the Backup Clients on Network window, click the Add by Address button.

Enter the IP address or DNS or WINS name of a client and click Add. When a client is found at the specified address, Retrospect asks you for its password before logging it into the client database.

NOTE: If Retrospect fails to connect to a client at the specified IP address, see "Troubleshooting" on page 196.

After you enter the correct password, Retrospect displays the client's properties window (described in "Configuring Clients," which starts on page 96).

CLIENT USER PREFERENCES

After the client software has been installed, users of client computers can control some aspects of network backup operations with the Retrospect Client control panel.

You do not need to change any of the settings to perform backups. In most cases, the existing settings are the ones you will want to use. To open the Retrospect Client control panel, do the following:

Mac OS X: From the Applications folder, open Retrospect Client.

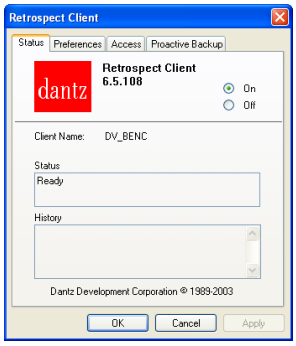
Mac OS 7/8/9: From the Apple menu, choose Control Panels, then open °Retrospect Client.

Windows: From the Start menu, choose Settings>Control Panel, then open Retrospect Client.

Linux: Run RetroClient.sh from the installed client folder.

The Retrospect Client control panel displays information about the client computer on which it is installed, including the user or computer name, the access status of the client, and a report about the last several backups.

The Mac OS X client application. (The Mac OS 7/8/9 client control panel is similar.)



The Windows client control panel, showing the Status tab.(The Linux client control panel is similar.)

In addition to the Java-based graphical user interface, Linux clients can also be controlled through the command line. To see the command line arguments, enter the following:

$retrocpl --help

Access Master Control

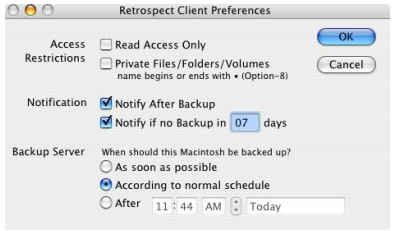
The On and Off radio buttons let you allow or deny network access to your client by the backup computer. When you install the client software and each time the client computer starts up, the control is on to allow access. When the control is turned off, the data on the client computer cannot be accessed over the network by Retrospect.

TIP: To permanently prevent access to the client computer, uninstall the Retrospect client software as described on page 102.

General Preferences

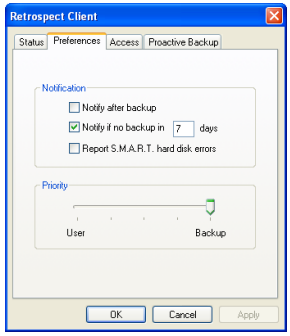
The Retrospect Client control panel has additional user preferences for managing client operations. Getting to the preferences is done differently under Mac OS and Windows/Linux.

Mac OS: Click the Preferences button.



The Mac OS X Retrospect Client control panel's preferences.

Windows/Linux: Click the Preferences tab from the Client control panel.



The Windows Retrospect Client control panel's preferences.

Execution Preferences

The execution preference settings allow client users to control how Retrospect interacts with the client computer.

NOTE: These preferences are only available with Mac OS 7/8/9 clients.

Wait at Shutdown determines what happens when a client user chooses Shut Down from the Finder's Special menu. When this option is selected and Shut Down is chosen, the "waiting for backup" dialog is displayed until the backup takes place. By default, this preference is selected.

When this dialog is on the client Macintosh screen, the client user may click Restart to restart the client Macintosh, click Shut Down to shut it down, or click nothing and leave it for unattended operation. When the client computer is not used for thirty seconds, a screen saver appears until the user presses a key or moves the mouse to return to the dialog. When the backup computer finishes its operation with this client, it shuts down the client Macintosh.

Run in Background allows the backup computer to operate at the same time the client user is using the client Macintosh. If the checkbox is not checked, a dialog appears on the client during network operations. This preference is on by default.

When the dialog appears, the user of the client Macintosh can cancel the network operation to continue working or wait until the operation is finished. When "Run in Background" is checked, the dialog does not appear during backups, and the client user can set priority levels for local and network operations. See below for details.

Priority Preference

The priority preference allows the client user to make the client computer favor either the user's task at hand or the operation requested by the backup computer. Under Mac OS 7/8/9, this applies only when the "Run in Background" execution preference is on.

NOTE: This preference is not available or necessary for the Mac OS X client.

Drag the slider and set it to somewhere in the range between "User" and "Backup." When the slider is set all the way to "User," the computer devotes more of its attention to its user, slowing Retrospect client operations slightly. When the slider is set all the way to "Backup," the client operation is given priority and the client computer is slightly less responsive to its user.

This setting has no effect until the client is actively communicating with the backup computer.

Under Mac OS 7/8/9, the Priority setting is ignored if the client Macintosh is displaying the "waiting for backup" dialog.

Access Restrictions Preferences

These preferences allow the client user to control access to the files and folders on his or her computer.

Read Access Only allows the client computer to be backed up across the network, but prevents writing by the backup computer. This means the backup computer cannot restore, move, or delete files on the client computer, nor can Retrospect be used to rename volumes. The options "Set Volume Backup Date," "Move Files," and "Synchronize Clock" cannot be used on the client. This setting is off by default.

Private Files/Folders/Volumes makes any files, folders, or volumes designated as private unavailable to the backup computer. This preference is off by default. Select the checkbox and designate private items as described below.

To designate an item as private under Windows or Linux, click the Add button, browse to select the item, then click OK or Exclude. Click Add again to exclude more volumes, folders, or individual files. The privacy feature uses the literal pathnames you specify. If you move or rename a file or folder it may no longer be private. If you mount a volume to a different location, its files and folders may no longer be private.

To designate an item as private under Mac OS, type a bullet ("•", Option-8) at the beginning or end of its name (placing it at the end will preserve its sort order in the Finder). For example, you could designate the folder "Personal" as private by renaming it "Personal•".

Notification Preferences

These two preferences allow client users to specify how they are informed about Retrospect network operations.

Notify after Backup directs the client to display a message after the completion of a backup or other operation. The client user can click OK to dismiss the message. By default, this preference is selected.

Notify if no Backup in *n* days directs the client to display a message after 9:01 A.M. if the client has not been backed up within the number of days specified in the entry box. By default, this preference is selected and the number of days is seven.

Report S.M.A.R.T. hard disk errors (Windows client only) requests an immediate backup from Proactive Backup (known as Backup Server in Retrospect for Mac) when Retrospect learns of errors on the client's S.M.A.R.T. hard drive volumes. By default, this preference is turned on.

Controlling Backup Server Scripts

There are two ways to control Backup Server scripts from the client computer:

- Scheduling from a Client
- Deferring Execution

Scheduling from a Client

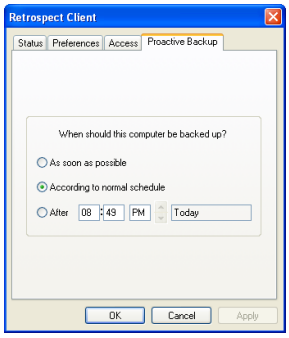
If a client is included in a Backup Server script, you can use the client control panel to influence when the client gets backed up.

NOTE: Backup Server is known as Proactive Backup in Windows and Linux client software.

Mac OS X: The Backup Server preferences appear in the Retrospect Client preferences window.

Mac OS 7/8/9: Click the Schedule button to bring up the Backup Server control dialog.

Windows/Linux: Click the Proactive Backup tab to bring its controls to the front.



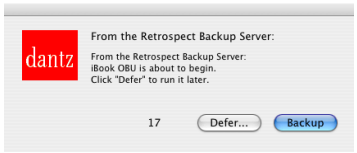
These controls let the user determine when the client computer can be backed up by the backup computer (using a Backup Server script). The user would normally use it to initiate a backup or defer a backup, but the user can also revert the Backup Server back to its normal schedule for this client. The Backup Server options are:

- **As soon as possible** makes the backup computer back up the client computer as soon as Backup Server is available to do so.
- **According to normal schedule** makes the backup computer back up the client computer at its regularly scheduled time in the Backup Server script. (This is the default.)
- **After _____** prevents the backup computer from backing up the client computer before the specified time and date, up to one week from the present time. (Click on the time and date and type or click the arrows to change them.)

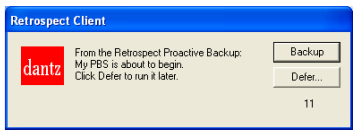
Click OK to accept the settings.

Deferring Execution

When Backup Server is about to back up a client, a dialog appears on the screen of the client computer.



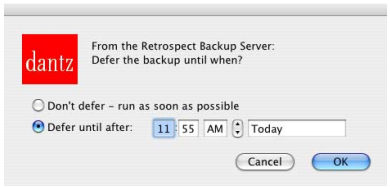
Macintosh client Backup Server countdown.



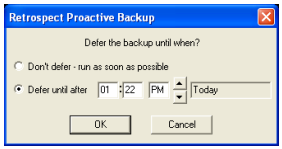
Windows/Linux client Proactive Backup countdown.

The dialog gives the client user three ways to control the execution of the impending Backup Server operation:

- Waiting for the countdown to reach zero allows the Backup Server script to execute.
- Clicking **Backup** executes the backup immediately.
- Clicking **Defer** lets the user set a later time for the backup to operate.



Deferring the Backup Server script from a Macintosh client.



Deferring the Proactive Backup script from a Windows or Linux client.

When a user defers, Retrospect makes an entry in the backup computer's Operations Log.

BACKING UP CLIENTS

You back up a client volume the same way that you would back up a volume directly connected to the backup computer.

When you set up an immediate or scripted backup, the volume selection window for the source lists available clients under the Backup Clients container and available client volumes under the individual client containers. See "Containers" on page 169 for more information.

When you set up an immediate backup or make a backup script you have a few different ways of selecting clients and client volumes in the volume selection window for the sources. You can select a client container, one or more specific volumes, or the Backup Clients container. Dantz recommends using client containers or the Backup Clients container. Following are advantages of each method.

- Selecting the Backup Clients container selects all individual client containers (described below) logged in at the time of the backup, including new clients you add later.
- Selecting a client container selects volumes determined by a client general configuration setting, which is explained in detail on page 97. Using a client container is simple and maintenance-free. Volumes which are renamed, replaced, or partitioned continue to be backed up with no administrator intervention.

- Selecting individual volumes selects only those specific volumes, unlike containers. Retrospect continues to select volumes which are renamed but does not automatically adjust for new, replaced, or partitioned volumes. When the client configuration changes you may need to modify scripts that use these volumes. This way of selecting volumes is useful, for example, when you do not want to back up all volumes on a particular client.
- Selecting folders or groups in your script selects whatever volumes and client containers are placed in the folder or group. This method simplifies script management by allowing you to control your sources in a single place, the Volumes Database window. Using folders in the Backup Clients container lets you better organize a large number of clients. Using groups lets you build lists of volumes and clients which should be backed up together.

For detailed instructions on selecting volumes, see under "Working with Volumes" in Chapter 9.

WORKING WITH WINDOWS CLIENTS

This section includes tips on using the Windows client, as well as information on its limitations. If you plan to back up Windows 95 clients, there are certain steps you must take in order to do so.

Fixing Microsoft Windows 95

Two different bugs in Microsoft's network software can cause Retrospect to report networking errors with Windows 95 clients. Microsoft has resolved both problems and free fixes are available for Windows 95. We strongly urge you to update your Windows 95 systems.

NOTE: Windows 98, Windows Me, Windows NT 4.0, Windows 2000, and Windows XP do not require any updates.

Windows 95 TCP/IP Fix

The hot fix for Windows 95 is installed by the client software Setup program. After installation, choose Run from the Start menu, then type:

`C:\Program Files\Dantz\Client\VTCPUPD` (or your installation path, if different)

Click OK. Follow the instructions in Microsoft's installer, then restart to complete the fix. Repeat for each Windows 95 client computer to be used with Retrospect.

Windows 95 Winsock Update

Microsoft's Winsock 2.0 update fixes another networking problem present in Windows 95 only. It is available free from Microsoft at:

http://www.microsoft.com/windows95/downloads/contents/wuadmintools/s_wunetworkingtools/w95sockets2/default.asp

Windows NT/2000/XP Registry Backup

To fully restore a Windows NT/2000/XP computer, you must back up its registry. The registry changes as programs are installed and removed, control panel settings are changed, and application preferences are changed, so you must back it up regularly to keep up with its changes. Because Retrospect cannot directly back up the NT/2000/XP registry for clients, Dantz supplies the Registry Backup Manager, a tool that automates and simplifies registry backup.

The client software Setup program installs the Registry Backup Manager application to the client software path (C:\Program Files\Dantz\Client by default). Start and automate the Registry Backup Manager as detailed on page 109. For detailed instructions on using the Registry Backup Manager, click its Help tab.

Windows 95/98/Me Registry Backup

Retrospect backs up the Windows 95/98/Me registry when the Windows folder is included in the file selection criteria. You do not need to take any extra steps to preserve its registry, other than doing your normal backups of computers.

NTFS Security

Retrospect for Macintosh does not back up or restore NTFS security permissions. If you need to back up Windows workstations where NTFS security is important, you must use Retrospect for Windows.

Windows NT/2000 Servers

Retrospect for Macintosh does not support backing up Windows NT or 2000 Servers. Because Retrospect for Macintosh does not back up or restore NTFS security permissions, multiple data stream files, or Active Directory, it cannot restore a Windows server back to an operable state. You can, however, use Retrospect for Macintosh to back up user data from a Windows server, with some exceptions, noted below.

Services for Macintosh

Because Retrospect for Macintosh does not back up or restore multiple data streams or permissions from NTFS volumes, Services for Macintosh data cannot be backed up to a Macintosh using Retrospect Clients. If you try this, you get a warning in the log.

We recommend you use a server-level edition of Retrospect for Windows to back up Windows NT or 2000 servers.

If you wish to use Retrospect for Macintosh to back up Services for Macintosh data from a Windows NT or 2000 Server, you must back up the data as a mounted AFP volume. To do this, mount the volume on your Macintosh desktop. Then add it to your backup scripts as a local source. You can configure Retrospect to automatically mount the volume during execution. To do this, highlight the volume and choose Configure from Retrospect's Volumes menu.

Excluded Files

Retrospect excludes certain files from backups and does not show these files in Browsers because they cannot or should not be backed up or restored. The files are active virtual memory swap files (.Swp or .Par and Pagefile.Sys), some client software files, and the Windows NT/2000/XP registry (when active).

Netware Volumes Under NT/2000/XP

Under Windows NT/2000/XP, the Retrospect client software is running as a service and it cannot recognize Netware volumes.

Selecting Files

You can use a Browser to manually select files to back up, or you can automate file selection with a Selector. Some Selectors and Selector conditions do not function with Windows clients as they do with Mac OS clients. The differences are detailed under "Using Selectors" on page 177.

Case-Sensitive File Systems

Some file systems used with Windows clients are case-sensitive with file names. On a Windows client volume, multiple files with names identical except for case (for example, Foo, foo, and FOO,) will confuse Retrospect. For example, if during a backup it encounters a directory containing multiple file names differing in case only, it backs up only one of the files.

Hard Links

When it encounters a hard link to a file on a POSIX-compliant Windows client volume, Retrospect treats the link as a separate file.

HPFS Attributes

Retrospect does not support HPFS volumes of Windows clients.

Screen Savers

For best performance during a backup, do not use a processing-intensive screen saver on a client computer.

Copying Mac OS Files to a Windows Client

When copying files back and forth between Mac OS and Windows computers, it is important to be aware of the certain differences between Mac OS and Windows files and how Retrospect handles those differences.

Data and Resource Fork Files

Unlike files on Windows volumes, many Macintosh files are made up of two parts, called forks: one fork includes data and the other includes resources. When Retrospect copies a dual-fork Macintosh file to a Windows client volume, it takes the following steps to separate the forks into different files.

- It stores the data fork in a new file, which has the same name as the original file.
- It creates a new folder named Resource.Frk, which is hidden and resides in the same folder path as the data fork file.
- It stores the resource fork in a new file, which resides in the Resource.Frk folder and has the same name as the original file.
- It tracks fork-separated files in a hidden file named Finder.Dat, which resides in the same folder path as the data fork file.

If you move one of these Macintosh files on a Windows computer, it is unusable unless you also move the other files and folder. When you use a Retrospect Browser to view a Windows client volume containing these split Macintosh files, only a single file appears. When viewed from Windows, the extra files appear (unless Windows is set to hide hidden files). When you back up the files to a backup set or duplicate them to a Macintosh volume, Retrospect integrates them into the single original file.

Illegal Characters in File Names

Mac OS file names can include several characters that Windows does not allow in its file names. These illegal characters are /, \, :, *, ", <, and >. When restoring or duplicating Macintosh files to a Windows volume, Retrospect replaces each of these illegal characters with a hyphen (-). Retrospect tracks renamed files in a file named Finder.Dat. When copying the files back to a Macintosh, Retrospect replaces the hyphens with the original characters.

If you move one of these Macintosh files on a Windows computer, also move the Finder.Dat file with it, or the hyphens become permanent.

WORKING WITH LINUX CLIENTS

This section includes tips on using the Linux client, as well as information on its limitations. If you plan to back up Linux clients, you should be aware of these limitations.

Excluded Files

Retrospect excludes certain Linux client files from backups and does not show these files in browsers, because they cannot or should not be backed up or restored.

The following types of files are excluded from backup:

- character device crw-------
- block device brw-------
- socket files srw-------
- fifos prw-------
- doors drw-------

File Naming

Linux has case-sensitive filenames, which means “myfile” and “Myfile” are considered distinct files. However, Windows and Mac OS have non-case sensitive filenames so “myfile” and “Myfile” are interpreted as the same filename.

WARNING: If these two files are duplicated from a Linux client to a Windows or Mac OS volume, the second file that gets copied will overwrite the first one.

FILE SYSTEM CONVERSIONS

Retrospect allows you to restore and duplicate data between computers that use different operating systems and file systems. Because no two file systems support identical attributes and file formats, copying files from one file system to another sometimes results in the loss of information.

Retrospect supports the following file system conversions with no loss of data:

- FAT (Windows) to HFS (Macintosh)
- FAT to NTFS (Windows)
- HFS to NTFS
- FAT to Linux file systems
- Linux to HFS (Mac OS X only)

Retrospect supports the following file system conversions with loss of extended information and/or data, as noted:

- HFS to FAT: Data fork of HFS files is copied; attributes, privileges, and resource fork are not.
- NTFS to FAT: First data stream is copied, but all permissions and other NTFS data are not.
- NTFS to HFS: Services for Macintosh data on an NTFS volume restores or duplicates without loss to Macintosh HFS volumes. When copying Windows NTFS data to HFS the first data stream is copied, but all permissions and other NTFS data are not.
- NTFS to Linux: Lose permissions and other NTFS data.
- Linux to HFS (Mac OS 9.x): Lose Linux file permissions, owner and group attributes, and special file attributes (e.g. hard links).
- Linux to FAT: Lose Linux file permissions, owner and group attributes, and special file attributes (e.g. hard links).

NETWORK BACKUP GUIDELINES

This section provides information, advice, and worksheets to help you set up a workgroup backup using Retrospect.

In general, the same principles that apply to individual backups also apply to network backups of client computers. The major difference between an individual backup and a network backup is the amount of data, which may overwhelm storage limitations. As a consequence of the sheer amount of data and the often slower speed of network backups, time may also impose limitations. If you cannot back up the entire network in a single night, you may want to consider splitting the backup over several nights, backing up only documents, or using Backup Server scripts.

Although the information in this section can be applied to any local area network, the examples assume a basic Ethernet network installation. Most calculations will still apply if your network contains inter-network devices (such as routers or gateways), unless one or more members of the backup workgroup are separated from the rest by an inter-network device. Running backups through routers or gateways increases the time it takes to complete a backup.

Choosing the Backup Device

The capacity of the backup device is usually the most important consideration for automatic, unattended workgroup backups. There is no such thing as too much capacity for network backups. More capacity almost always means you can back up more files from more volumes from

more client computers, broaden the criteria for selecting files to be backed up, increase the amount of time between media changes, and increase the number of backup sessions per piece of media.

If your backup device is not large enough, you will not be able to complete an automatic, unattended backup because you will have to change the media before the backup is finished.

Choosing the Backup Computer

This section offers some advice on how to select the correct backup device and backup computer to suit your planned network backups.

You do not to use a file server as the backup computer. Table 6-1 below lists various advantages of using a desktop computer or a server as the backup computer.

Although the backup computer can be virtually any Mac OS X machine, consider using a Macintosh with adequate power to perform your network backups. For example, if you are backing up a small number of client computers with small to medium capacity hard disks, you can get by with a computer with less processing power than you would need if are backing up large file servers and several client computers with thousands of files. Following are some additional considerations.

- The performance of the backup computer often determines the performance of the entire system. Generally, a higher performance computer supports a network backup of more data from a larger number of client computers.
- Software compression and encryption increase CPU use significantly. If you are considering using either of these features, choose a computer with a more powerful CPU and more memory.
- Make sure the backup computer has enough RAM to handle the network volume that contains the most files. The more files you have, the more RAM you need.
- If the backup computer is not completing backups in its scheduled time periods or if you want volumes to be backed up more often than they are, you may need a faster backup computer, a faster backup device, or both. A faster network interface card may speed network backups and a faster SCSI controller may increase throughput with the backup device.

See “Managing Resources,” which starts on page 81 for more information.

Advantages of Desktop	Advantages of Server
• You can use the computer closest to you for easy access to the backup device and Retrospect. • Avoids expense of a dedicated server. • You can select the computer best suited in terms of memory and speed. Retrospect can be run at night or on weekends, allowing normal use of the computer during work hours. • Allows your server to run at full speed for those who are accessing it while the backup is running.	• Optimizes your backup speed since servers are often a high performance model. • Takes advantage of the server’s inactivity during the nights and weekends. • Gains added security for your backup sets if your server is located in a secure area. • Backs up large server disks using faster local transfer rates, rather than the slower network transfer rates.

Table 6-1: Advantages of using a desktop computer or a server as the backup computer.

Encryption and Compression

Retrospect provides an encryption feature that lets you protect your data from unauthorized access as it is being backed up, and a compression feature that saves space on the backup device by compressing stored data. The decision to use one or both of these features can affect the type of backup device you choose. Keep in mind that Retrospect's encryption and software compression can slow a backup, especially when using a computer with a slow CPU. A tape drive that supports compression will perform the task of compression itself, because it compresses data faster than Retrospect.

Use the following table to determine whether to use compression and encryption and whether a compression tape drive is appropriate to use as the backup device.

Feature	Description	Procedure	Implementation
Compression	Allows the backup device to store more files on its media.	Finds patterns in the data; the more patterns, the greater the compression.	If you have a compression drive, Retrospect leaves the task of compression to the hardware since it compresses data faster than Retrospect.
Encryption	Adds security to your backup.	Randomizes the appearance of data to prevent unauthorized access.	Retrospect always manages encryption.
Compression with encryption	Allows the backup device to store more files on its media and adds security to your backup.	Compression must take place before encryption.	You must use Retrospect's software compression option in this case. Retrospect automatically disables hardware compression when you use encryption.

Device Capacity Worksheet

Use this worksheet to estimate the minimum required capacity of a backup device for your workgroup. The number you come up with for *G* is the minimum backup device media capacity for completing an unattended backup without having to change the media.

Item	Description	Amount
A. Total disk capacity *user-defined*	On a separate page, list your workgroup's computers and the disk size (in megabytes) of each. Work out the sum and enter it for *A*.	$A =$
B. Estimated data redundancy *user-defined*	Estimate how much data is redundant, which Retrospect backs up only once. If everyone in your workgroup uses the same applications, dictionaries, fonts, and so on, you might have as much as 60% (0.6) redundancy. If your network is average, enter 0.3 for 30%. Enter your estimate of the redundancy percentage *B*, expressed in decimal form.	$B =$
C. Reduction factor $C = 1 - B$	Subtract the amount *B* from 1 to get the data reduction factor. For example, if *B* is 0.3 the reduction factor is 0.7 (because 1 – 0.3 = 0.7). Work out the difference and enter it for *C*.	$C =$
D. Reduced data $D = A * C$	To estimate the actual amount of data you need to back up (before any compression) multiply the total disk capacity *(A)* and the reduction factor *(C)*. Work out the product and enter it for *D*.	$D =$
E. Estimated compression *user-defined*	The compression rate depends on the files. Text files compress well; application files do not. The most compression you can hope for is 50% (0.5). Average compression to expect for network backups is 30% (0.3). If you do not plan on using compression, enter 0. Enter your estimate of the compression percentage *E*, expressed in decimal form.	$E =$
F. Compression factor $F = 1 - E$	Subtract the estimated compression *(E)* from 1. For example, if *E* is 0.35 (35%) then *F* is 0.65 (because 1 – 0.35 = 0.65). Work out the difference and enter it for *F*.	$F =$
G. Required backup capacity $G = D * F$	To get the minimum required backup device capacity multiply the reduced data amount *(D)* by the compression factor *(F)*. Work out the product and enter it for *G*.	$G =$

Backup Duration Worksheet

Once you have determined the size of your backup device, use the worksheet below to determine the number of hours your network backup requires. If the total number of hours is less than twelve, a recycle backup is likely able to complete in a single night. If the total number of hours is more than twelve, you may need to examine alternative strategies, such as performing recycle backups only on weekends or backing up only documents and preferences.

Alternative strategies are suggested in "Backup Strategies" in Chapter 8.

Item	Description	Amount
H. Backup capacity requirement $H = D$	For *H,* enter the total reduced data requirement from item *D* in the Device Capacity Worksheet.	$H =$
I. Verification multiplier *user-defined*	If you do not plan to use verification enter 1. Otherwise, start with 1.5, but if you are using software compression or encryption, increase it by 0.1 to 0.5; the slower the backup computer, the higher the number. Enter your verification multiplier for *I.*	$I =$
J. Total transmission $J = H * I$	To get the total amount of data transmitted across the network multiply the backup capacity requirement *(H)* by the verification multiplier *(I).* Work out the product and enter it for *J.*	$J =$
K. Network throughput *user-defined*	Throughput rates vary according to the network cabling method. For 10BaseT, use 1200 MB per hour; for 100BaseT, use 2400 MB per hour. Enter the number of megabytes per hour for *K.*	$K =$
L. Adjusted network throughput $L = K\,(1 - .05n)$	Backing up through routers typically reduces performance so subtract 5% for each router. (Use *n* as the number of routers.) Work out the difference and enter it for *L.* If you are not using routers or bridges assign the *K* value to *L.*	$L =$
M. Hours required $M = \frac{J}{L}$	To determine the total number of hours required for the backup to complete divide the total transmission *(J)* by the adjusted network throughput *(L).* Work out the result and enter it for *M.*	$M =$

CHAPTER 7

DISASTER RECOVERY

- OVERVIEW OF DISASTER RECOVERY
- RESTORING THE BACKUP COMPUTER WITH THE BOOTABLE CD
- RESTORING THE BACKUP COMPUTER WITHOUT THE BOOTABLE CD
- RESTORING A MAC OS CLIENT
- RESTORING A MAC OS SERVER CLIENT
- RESTORING A WINDOWS CLIENT
- RESTORING A LINUX CLIENT

This chapter tells you how to restore the backup computer and client computers when disaster strikes and the computing environment required to restore your data is not available.

OVERVIEW OF DISASTER RECOVERY

Retrospect has tools and features to help you recover from a disastrous data loss in which the computing environment required to restore that data is not available. If you can boot your computer and start Retrospect, you can use the application's restore function as described in "Restore," which starts on page 51.

Retrospect provides a bootable disaster recovery CD that can be used to start up and restore the backup computer in the event of a disaster.

RESTORING THE BACKUP COMPUTER WITH THE BOOTABLE CD

The Retrospect CD can boot a Macintosh into OS X for disaster recovery.

NOTE: This CD is only included in the retail version of Retrospect. If you got Retrospect as part of an OEM drive bundle or other distribution, your CD includes a CD image file— Retrospect OS X Bootable CD.dmg— that you can use to create a bootable CD.

If you do not have the Retrospect CD, use the disaster recovery instructions in "Restoring the Backup Computer Without the Bootable CD" on page 120.

Limitations

Since the bootable CD runs a limited OS, it cannot be used to restore from Internet backup sets or from File backup sets stored on the network.

- To restore from these types of backup sets, follow the instructions in "Restoring the Backup Computer Without the Bootable CD" on page 120.

If your backup device requires special drivers or extensions, or if you used Retrospect to create a custom configuration for your CD/DVD drive, you cannot use it when your computer has started from Retrospect's bootable CD.

- To restore in these circumstances, follow the instructions in "Restoring the Backup Computer Without the Bootable CD" on page 120.

Restoring Using the Bootable CD

These instructions assume your Macintosh has encountered a disastrous data loss in which the computing environment required to restore that data is not available. If you can boot your computer and start Retrospect, you can use the application's Restore function as described in "Restore," which starts on page 51.

The following instructions will help you get the computer back in working order using Retrospect and the bootable CD.

1. Restart Using the Bootable CD

Insert the Retrospect CD, which can start any computer that can run Mac OS X, and restart the backup computer. Press and hold the "C" key during startup to force the computer to boot from the CD. Retrospect launches automatically.

NOTE: If your Macintosh will not start from this CD, see "Restoring the Backup Computer Without the Bootable CD" on page 120.

2. Open or Rebuild the Catalog File

From the Immediate tab, click Restore.

Select "Restore an entire disk" and click OK.

Since your Macintosh is booted off the CD, there are no backup sets available until you rebuild or browse to a catalog file.

- If the partition on your hard drive containing catalog files is accessible, click Open.
- If you cannot access the catalog files on your hard drive, click Rebuild.

To open a catalog file:

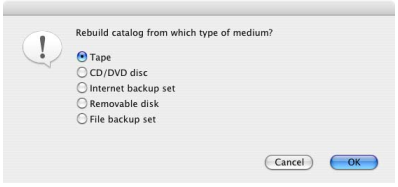
1. Click Open.

2. Browse to the location of the catalog file for a backup set containing the most recent backup of the backup computer.

3. Select the catalog file and click Open.

To rebuild a catalog file:

1. Click Rebuild.



2. Select the media type containing the most recent backup set data for the backup computer and click OK.

NOTE: Since your computer is booted into a limited system, you cannot access Internet backup sets or File backup sets that are stored on the network.

3. Load the media containing your backup set data, select it in the Media Selection window, and click OK.

4. Specify a location to save the catalog file and click Save.

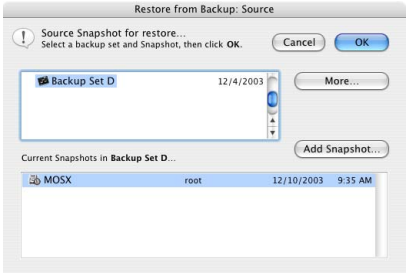
Retrospect recatalogs the backup set, informing you of its progress in the execution status window. When Retrospect is finished with a particular member of a backup set, it asks whether there are any more members.

5. If there are no more members, click No. If there are more members, click Yes.

Retrospect continues to ask for more members until you click No.

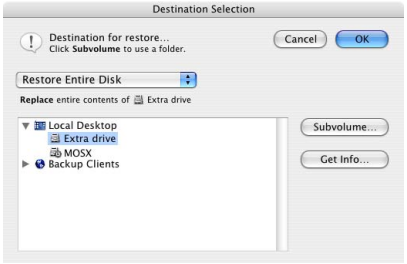
3. Restore from Backup

A window appears for you to select the source from which to restore backed-up files.



In the top part of the window, select the backup set that includes the most recent backup of the backup computer's hard disk. In the bottom portion, select the most recent Snapshot of that hard disk. Click OK to proceed.

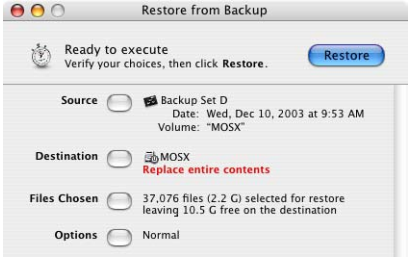
A window appears for you to select the destination for the restored files.



Because your entire hard disk was wiped out and needs to be completely restored, select it and leave the pop-up menu set to "Restore Entire Disk."

NOTE: If the backup from which you are restoring is not a full backup of the hard disk you are restoring, choose "Restore Corresponding Files" from the pop-up menu instead.

Click OK to proceed. Confirm the operation by clicking Replace (for "Restore Entire Disk" only). Retrospect compares the source and destination and displays the restore summary window.



Put the first disc, tape, or disk from the backup set in your backup device and click Restore.

4. Restart

When the restore is complete, quit Retrospect to restart the computer.

Your computer is now ready to use.

NOTE: If you restored from a partial backup, your restored hard disk will reflect this. For example, if you restored from a "Documents only" backup, you will have to reinstall your applications manually.

RESTORING THE BACKUP COMPUTER WITHOUT THE BOOTABLE CD

These instructions assume your Macintosh has encountered a disastrous data loss in which the computing environment required to restore that data is not available.

- If you can boot your computer and start Retrospect, you can use the application's Restore function as described in "Restore," which starts on page 51.
- If you can boot your computer using Retrospect's bootable CD, see "Restoring the Backup Computer with the Bootable CD" on page 118.

Restoring Without the Bootable CD

The following steps will help you get your computer back in working order when it won't boot on its own or with Retrospect's bootable CD.

1. Restart and Try to Repair the Disk

Insert your Mac OS X CD into the backup computer's CD/DVD drive and restart the computer. Press and hold the "C" key during startup to force the computer to boot from the CD-ROM. Choose Open Disk Utility from the Installer menu then click the First Aid tab. Use Disk First Aid to examine your hard disk for problems and repair them, if possible. (You should also try other disk repair utilities if you have them. Use the low-level verification or test function of the Drive Setup utility or your disk formatter to examine the hard disk for defects that other utilities will not find.)

2. Assess the Current State of the Hard Disk

If you are able to repair all damage and no low-level problems are found, stop here! You do not need to restore or reformat your hard disk.

If you could not make any repairs with the disk utilities, or if the hard disk still does not mount on the desktop, you probably need to reformat your hard disk. Go on to step 4.

If you were able to repair some damage, but problems remain with the hard disk, you may need to reformat it. But first you must safeguard your data as described below in step 3.

3. Make New Backups Before Reformatting

Now is a good time to back up your repaired hard disk, so restart from the hard disk and open Retrospect. You may want to make two new backups (with the verification option on) to new backup sets. (Do not do a recycle backup to an existing backup set, as the damaged drive might not have all of your files on it and you don't want to erase your previous backups.) Once you are sure you have redundant backups of your data, copy your backup set catalogs to an external disk or server.

4. Reformat the Disk

If the disk repair utility can not fix the disk, you may have to erase or reformat the disk in order to prepare it for restoration.

WARNING: Erasing or formatting a hard disk destroys all data stored on the disk. If you are not sure whether you should erase or format your hard disk, contact its vendor for assistance.

If the disk is beyond repair, use Disk Utility to select the damaged volume, click the Erase tab, choose a format, supply a name, and click Erase.

5. Re-install Software

Restart your Macintosh from the Mac OS X CD, pressing and holding the "C" key during startup to force the computer to boot from the CD.

Install new Mac OS system software on your newly-formatted hard disk.

WARNING: You must install the same exact version number of Mac OS X as the version of Mac OS X you will restore. For example, if the backed up computer was previously running version 10.1.5, you must install Mac OS X 10.1.5.

Eject any CDs and restart from the new system on the hard disk. If you used Internet backup sets, configure TCP/IP networking. Use the Date & Time control panel or system preference to set your local time and time zone, and, if necessary, change the Daylight Saving setting.

Install Retrospect according to the instructions in "Installing Retrospect" on page 11. If you copied your configuration file and catalog files to floppy or removable disks, copy them back to your hard disk.

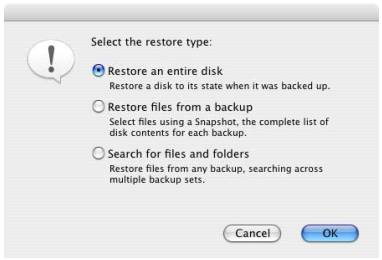
Start the Retrospect application. If you did not make copies or backups of your catalog files, rebuild the catalog or catalogs from your backup media. (To do this, click Repair from the Tools tab, then choose the rebuild option that matches your media, as described on page 188.)

If you copied your catalog files from disc or removable disks you must get Retrospect to recognize them. From the Configure tab, click Backup Sets, then click More and Open to add the catalogs to the list of available backup sets.

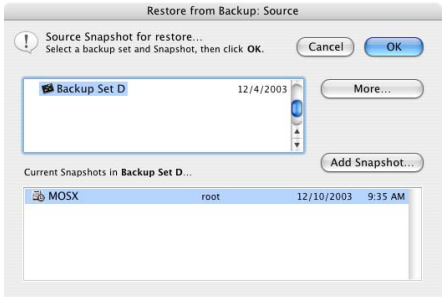
NOTE: You may also need to install third-party drivers in order to access backup devices.

6. Restore from Backup

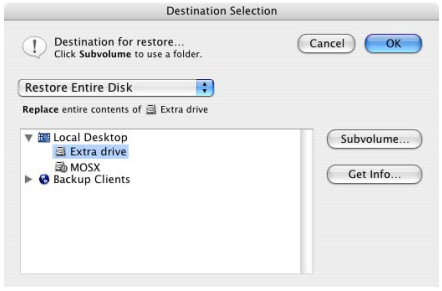
Now that your hard disk is working again and Retrospect is available along with your backup set catalogs, you can restore your hard disk. From the Immediate tab, click Restore.



Select "Restore an entire disk" and click OK. A window appears for you to select the source from which to restore backed-up files.



In the top part of the window, select the backup set that has your most recent backup of the backup computer's hard disk. In the bottom portion, select the most recent Snapshot of that hard disk. Click OK to proceed. A window appears for you to select the destination to which to restore files.

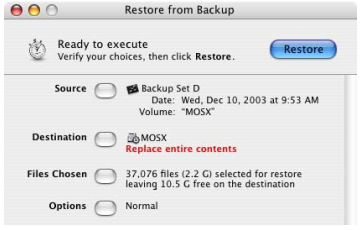


Because your whole hard disk was wiped out and needs to be completely restored, select it and leave the pop-up menu set to "Restore Entire Disk."

NOTE: If the backup from which you are restoring is not a full backup of the hard disk you are restoring, choose "Restore Corresponding Files" from the pop-up menu instead. For example, you may have been backing up "Documents only" to an Internet backup set because of limited FTP space and limited connection speed.

WARNING: Before restoring to a volume other than the current system volume under Mac OS X, use the Finder's Get Info command on the volume. Choose Ownership & Permissions from the info window's menu then turn off the "Ignore ownership on this volume" option.

Click OK to proceed. Confirm the operation by clicking Replace (for "Restore Entire Disk" only). Retrospect compares the source and destination and displays the restore summary window.



Put the first disc, tape, or disk from the backup set in your backup device and click Restore.

7. Restart

Restart the computer. Your computer is now ready to use.

NOTE: If you restored from a partial backup, your restored hard disk will reflect this. For example, if you restored from a "Documents only" backup, you will have to reinstall your applications manually.

RESTORING A MAC OS CLIENT

The following instructions tell how to restore an entire volume on a Mac OS client over the network.

You must first get the client computer operating with the network before performing the actual restore operation from the backup computer.

The steps below, which should be taken only in the event of serious trouble, involve completely replacing the contents of a client computer's hard drive with a previous backup in which you backed up "all files."

NOTE: The steps below are not for a Macintosh that serves data via file sharing. To restore a server, see "Restoring a Mac OS Server Client" on page 125.

1. Restart and Try to Repair the Disk

Insert the Mac OS 9 or Mac OS X CD into the Macintosh client computer's CD/DVD drive and restart the computer. Press and hold the "C" key during startup to force the computer to boot from the CD. Under Mac OS 9, open the Disk First Aid utility application from the CD. Under Mac OS X, choose Open Disk Utility from the Installer menu then click the First Aid tab. Use Disk First Aid to examine the hard disk for problems and repair them, if possible. (You should also try other disk repair utilities if you have them.) Use the low-level verification or test function of the Drive Setup utility or your disk formatter to examine the hard disk for defects that other utilities will not find.

2. Assess the Current State of the Hard Disk

If you are able to repair all damage and no low-level problems are found, stop here! You do not need to restore or reformat your hard disk.

If you could not make any repairs with the disk utilities, or if the hard disk still does not mount on the Desktop, you probably need to reformat your hard disk. Go on to step 4.

If you were able to repair some damage, but problems remain with the hard disk, you may need to reformat it. But first you must safeguard your data as described below in step 3.

3. Make New Backups Before Reformatting

Now is a good time to back up the repaired hard disk. You may want to make two new backups (with the verification option on) to new backup sets. (Do not do a recycle backup to an existing backup set, as the damaged drive might not have all of your files on it and you don't want to erase your previous backups.)

4. Reformat the Disk

If the disk repair utilities could not fix the disk, you may have to erase or reformat the disk in order to prepare it for restoration.

WARNING: Erasing or formatting a hard disk destroys all data stored on the disk. If you are not sure whether you should erase or format your hard disk, contact its vendor for assistance.

If the disk is beyond repair under Mac OS 9, use the Finder to select the damaged volume and choose Erase Disk from the Special menu. If the disk is beyond repair under Mac OS X, use Disk Utility to select the damaged volume, click the Erase tab, choose a format, supply a name, and click Erase. If erasing is unsuccessful from the Mac OS 9 Finder, you need to reformat the disk. To do this, start the Drive Setup application from the Disk Tools disk or CD, or the formatting software that came with the hard disk, and use it to format the hard disk.

5. Install System Software

Install new Mac OS system software on the newly-formatted hard disk. Restart the Macintosh from the Mac OS 9 or Mac OS X CD, pressing and holding the "C" key during startup to force the computer to boot from the CD.

Install new Mac OS system software on the newly-formatted hard disk. You must install the same exact version number of Mac OS X as the version of Mac OS X you will restore. For example, if the backed up client was running version 10.2.4, you must install Mac OS X 10.2.4.

Eject any CDs and restart from the new system on the hard disk. Use the Date & Time control panel or system preference to set your local time and time zone, and, if necessary, change the Daylight Saving setting. Under Mac OS 9, rename the System Folder to "temp."

6. Configure TCP/IP

Make sure the client computer is properly set up for use with TCP/IP networking. (If you need help configuring TCP/IP see your network administrator.)

7. Install Temporary Client Control Panel

Install Retrospect Client software according to the instructions in "Installing Retrospect Client Software on Macintosh Computers" on page 93. Remember the password.

Restart the client computer. After restarting, when the computer starts up it automatically loads the client software. Log this client into Retrospect from the backup computer as described in "Adding Clients" on page 95.

8. Prepare the Client Macintosh for Restore

Open the Retrospect client control panel (under Mac OS 9) or Retrospect Client application (Mac OS X) and verify the client software is turned on and is waiting for first access.

For ideal restoring conditions under Mac OS 9, shut down the client Macintosh so the Retrospect client shutdown dialog appears.

Leave the client Macintosh with this dialog; do not shut down or restart.

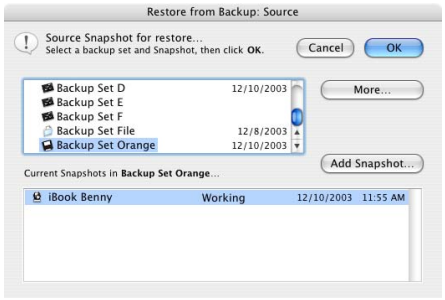
Before restoring to a volume other than the current system volume under Mac OS X, use the Finder's Get Info command on the volume. Choose Ownership & Permissions from the info window's menu then turn off the "Ignore ownership on this volume" option.

For ideal restoring conditions under Mac OS X, log out so the login window appears. Leave the client Macintosh at this window; do not log in, shut down, or restart.

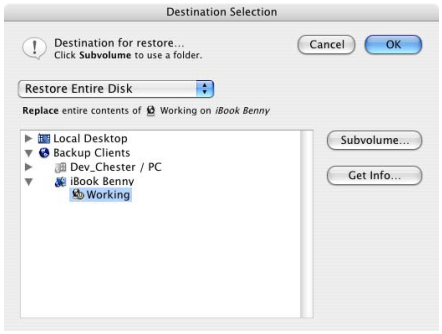
9. Restore Files

Now that the hard disk is working again, you can restore the client from the backup computer. From Retrospect's Immediate tab, click Restore.

Select "Restore an entire disk" and click OK. A window appears for you to select the source from which to restore backed-up files.

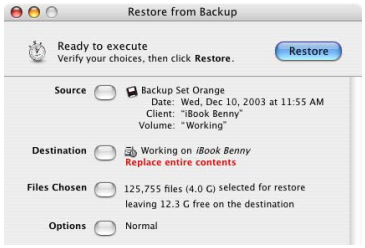


In the top part of the window, select the backup set that has your most recent backup of the client hard disk. In the bottom portion, select the most recent Snapshot of that hard disk. Click OK to proceed. A window appears for you to select the destination to which to restore files.



Because the whole client hard disk was wiped out and needs to be completely restored, select it and leave the pop-up menu set to "Restore Entire Disk."

Click OK to proceed and confirm when Retrospect asks whether to replace the entire contents. Retrospect compares the source and destination and displays the restore summary window.



Put the first disc, tape, or disk from the backup set in your backup device and click Restore.

10. Restart, Rebuild, and Discard

When the restore is completed, for Mac OS X clients, restart the client computer. For Mac OS 9 clients, restart the client computer and rebuild its desktop by pressing and holding both the Command and Option keys while the computer starts (until the Macintosh asks you to confirm rebuilding the desktop). After it starts and rebuilds the desktop, place the "temp" System Folder in the Trash and empty the Trash.

Your computer is now ready to use.

RESTORING A MAC OS SERVER CLIENT

This section describes how to use Retrospect to restore volumes shared by Mac OS file sharing. These operations require special procedures to ensure access privileges are intact after the volume is restored.

Server access privileges are restored only if file sharing was active when the backup was made *and* if file sharing is active during the restore operation.

If your server is undamaged and you need to restore only some of the files and folders from a backup (for instance, because somebody accidentally deleted some folders from the server), just follow one of the sets of instructions in "Restore" on page 51.

If you need to restore an entire server, use the following procedure.

1. Restart and Try to Repair the Disk

Find your Mac OS X Server or Mac OS 9 CD-ROM, restart your Macintosh, and put in the CD/DVD drive. Press and hold the "C" key during startup to force the computer to boot from the CD-ROM. Under Mac OS X, choose Open Disk Utility from the Installer menu then click the First Aid tab. Under Mac OS 9, open the Disk First Aid utility from the CD. Use Disk First Aid to examine your hard disk for problems and repair them, if possible. (You should also try other disk repair utilities if you have them.) Use the low-level verification or test function of the Drive Setup utility or your disk formatter to examine the hard disk for defects that other utilities will not find.

2. Assess the Current State of the Hard Disk

If you were able to repair all damage and no low-level problems are found, stop here! You do not need to restore or reformat your hard disk.

If you could not make any repairs with the disk utilities, or if the hard disk still does not mount on the Desktop, you probably need to reformat your hard disk. Go on to step 4.

If you were able to repair some damage, but problems remain with the hard disk, you may need to reformat it. But first you must safeguard your data as described below in step 3.

3. Make New Backups Before Reformatting

Now is a good time to back up the repaired hard disk. You may want to make two new backups (with the verification option on) to new backup sets. (Do not do a recycle backup to an existing backup set, as the damaged drive might not have all of your files on it and you don't want to erase your previous backups.) Once you are sure you have redundant backups of your data, copy your backup set catalogs to a floppy disk, removable disk, or another server.

4. Reformat the Disk

If the disk repair utility cannot fix the disk, you may have to erase or reformat the disk in order to prepare it for restoration.

WARNING: Erasing or formatting a hard disk destroys all data stored on the disk. If you are not sure whether you should erase or format your hard disk, contact its vendor for assistance.

If the disk is beyond repair under Mac OS X, use Disk Utility to select the damaged volume, click the Erase tab, choose a format, supply a name, and click Erase. If the disk is beyond repair under Mac OS 9, use the Finder to select the damaged volume and choose Erase Disk from the Special menu.

If erasing is unsuccessful from the Mac OS 9 Finder, you need to reformat the disk. To do this, start the Drive Setup application from the Disk Tools disk or CD, or use the formatting software that came with your hard disk.

5. Install System Software

Restart the Macintosh from the Mac OS X Server CD-ROM, pressing and holding the "C" key during startup to force the computer to boot from the CD.

Install new Mac OS system software on the newly-formatted hard disk. You must install the same exact version number of Mac OS X as the version of Mac OS X you will restore. For example, if the backed up server was running version 10.2.4, you must install Mac OS X 10.2.4.

Eject any CDs and restart from the new system on the hard disk. Use the Date & Time control panel or system preference to set your local time and time zone, and, if necessary, change the Daylight Saving setting. Under Mac OS 9, rename the System Folder to "temp".

6. Configure TCP/IP

Make sure the computer is properly set up for use with TCP/IP networking. (If you need help configuring TCP/IP see your network administrator.)

7. Install Temporary Client Control Panel

Install Retrospect client software on the Macintosh and restart it. Log this client into Retrospect and name it Temp Client.

8. Prepare the Client Macintosh for Restore

Open the Retrospect Client application (Mac OS X) or Retrospect Client control panel (Mac OS 9) and verify the client software is turned on and is waiting for first access. For ideal restoring conditions under OS 9, shut down the client Macintosh so the Retrospect client shutdown dialog appears.

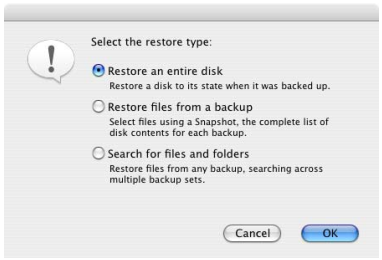
Leave the client with this dialog; do not shut down or restart.

Before restoring to a volume other than the current system volume under OS X, use the Finder's Get Info command on the volume. Choose Ownership & Permissions from the info window's menu then turn off the "Ignore ownership on this volume" option.

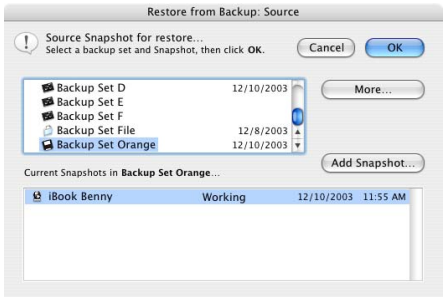
For ideal restoring conditions under OS X, log out so the login window appears. Leave the client Macintosh at this window; do not log in, shut down, or restart.

9. First Restore for Files

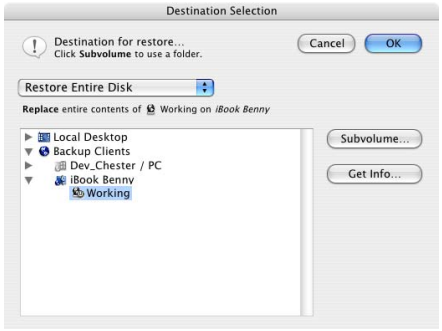
Now that the hard disk is working again, you can restore the server from the backup computer. From the Immediate tab, click Restore.



Select "Restore an entire disk" and click OK. A window appears for you to select the source from which to restore backed-up files.

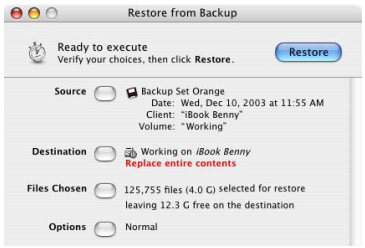


In the top part of the window, select the backup set that has your most recent backup of the server hard disk. In the bottom portion, select the most recent Snapshot of that hard disk. Click OK to proceed. A window appears for you to select the destination to which to restore files.



Because the entire server hard disk was wiped out and needs to be completely restored, select it and leave the pop-up menu set to "Restore Entire Disk."

Click OK to proceed and confirm when Retrospect asks whether to replace the entire contents. Retrospect compares the source and destination and displays the restore summary window.



Put the first disc, tape, or disk from the backup set in your backup device and click Restore.

For OS 9, restart the computer, then put the "temp" System Folder in the Trash can and empty the trash.

Forget the Temp Client and log in the original client.

10. Second Restore for Privileges

If you are using Mac OS file sharing, start file sharing. Choose the volumes or folders you wish to share, then select the appropriate Owner and Group for root access privileges and set your desired options.

With sharing on, perform another restore operation with the same Backup Set, again using the "Restore an entire disk" method. Retrospect performs a "smart" restore, copying only a few files (or none if no files have changed), and then sets the access privileges. Retrospect may report sharing violation errors but they are not significant and you should ignore them.

Restart the server, and rebuild the Desktop by holding down the Command and Option keys until a confirming dialog appears.

11. Extra steps for Mac OS X 10.1.x

After restarting the computer, share points may be missing or replaced with improper share points. Using Server Admin, take the following steps to correct these problems:

- Remove invalid share points.
- Re-establish desired share points.
- Reset the Home Directory Defaults for any affected users and groups lists (or NetInfo domains).

NOTE: These extra steps are not required for Mac OS X Server 10.2 and later.

RESTORING A WINDOWS CLIENT

The following instructions tell how to restore an entire volume on a Windows client over the network.

You must first get the client computer operating with the network before performing the actual restore operation from the backup computer.

The steps below, which should be taken only in the event of serious trouble, involve completely replacing the contents of a client computer's hard drive with a previous backup in which you backed up "all files."

Follow these steps to restore a Windows client:

1. Restart and Try to Repair the Disk

Find the system CD or the emergency recovery disk included with your Windows client computer. Restart your computer, and put in the disk or CD. When your computer has started from this disk or CD, run ScanDisk to examine your hard disk for problems. (You should also try other disk repair utilities if you have them.)

2. Assess the Current State of the Hard Disk

If you were able to repair all damage and no low-level problems are found, stop here! You

do not need to restore or reformat your hard disk.

If you could not make any repairs with the disk utilities, or if the hard disk still is not accessible from Windows Explorer, you probably need to reformat your hard disk. Go on to step 3.

3. Reformat the Disk

If the disk repair utility cannot fix the disk, you may have to erase or reformat the disk in order to prepare it for restoration.

WARNING: Erasing or formatting a hard disk destroys all data stored on the disk. If you are not sure whether you should erase or format your hard disk, contact its vendor for assistance.

4. Re-install System Software

Windows 95/98/Me/NT Install the new operating system software on the repaired or newly-formatted hard disk in a folder named WINTEMP.

Windows 2000/XP Install the new operating system software on the repaired or newly-formatted hard disk. After the installer copies temporary files and restarts from the hard disk, boot from the system CD again. Follow the installation steps until the installer cautions you that a WINNT folder already exists. Choose to install to a different folder, named WINTEMP, then finish the installation. Assign a unique identifying computer name; do not use the same computer name as the client you are restoring.

5. Configure TCP/IP

Make sure the computer is properly set up for use with TCP/IP networking. (If you need help configuring TCP/IP see your network administrator.)

6. Install Client Software

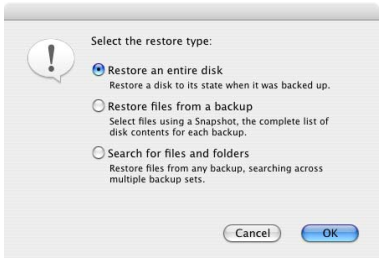
Install the client software as instructed under “Installing Retrospect Client Software on Windows Computers” on page 93, but do not use the default path. Instead, install to the newly-created WINTEMP folder.

7. Prepare Client Database

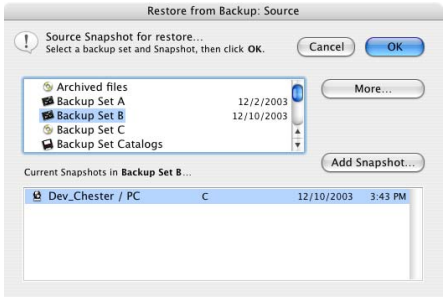
From the backup computer, log in the new client using a temporary name.

8. Restore Files

Restore the client from the backup computer. From Retrospect’s Immediate tab, click Restore.



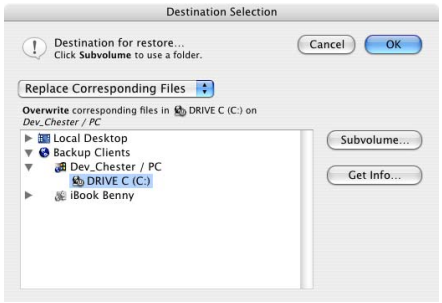
Select “Restore an entire disk” and click OK. A window appears for you to select the source from which to restore backed-up files.



In the top part of the window, select the backup set that has the most recent backup of the hard disk you have recently repaired. In the bottom portion, select the most recent Snapshot of that hard disk. Click OK to proceed.

A window appears for you to select the destination to which to restore files. Select the Windows client’s hard disk and set the pop-up menu to Replace Corresponding Files.

WARNING: Do *not* use Restore Entire Disk.



Click OK to proceed. Retrospect compares the source and destination and displays the restore summary window. Verify your choices for the Source, Destination, Files Chosen, and Options.

Put the first disc, tape, or disk from the backup set in your backup device and click Restore.

WARNING: After restoring the files, do not restart Windows NT/2000/XP clients before restoring the registry information, as described below.

9. Restore NT/2000/XP Registry

From the client computer, restore the Windows NT/2000/XP registry with the Registry Backup Manager (page 109). Start the Registry Backup Manager and click its Replace tab.

Click the top Browse button and specify the source folder, which you just restored. Click the bottom Browse button to change the destination folder; specify the restored Windows system folder. Click Replace Now to replace the current registry with the backup.

NOTE: The Windows 95/98/Me registry is restored by Retrospect when you restore all files, so you do not need to use the Registry Backup Manager.

10. Restart and Clean Up

Restart the client computer. Delete the temporary folder WINTEMP. Forget the temporary client from Retrospect's client database.

RESTORING A LINUX CLIENT

The following instructions describe how to restore an entire volume on a Linux client over the network.

You must first get the client computer operating with the network before performing the actual restore operation from the backup computer.

The steps below, which should be taken only in the event of serious trouble, involve completely replacing the contents of a client computer's hard drive with a previous backup in which you backed up "all files."

1. Restart and Try to Repair the Disk

If you have a boot disk for your system, restart the client computer, and put in the disk. When the computer has started from this disk, follow the instructions to repair your disk.

Alternatively, you can boot the system and run a file system check (fsck or equivalent). If this does not result in a bootable system, you have two options, depending on your expertise with the operating system. For the experienced administrator, boot to single-user mode from your OS installation media and repair the boot sector, replace the kernal, etc. If you have less experience, or do not feel comfortable with the above steps, you should re-install the OS, after replacing the hard disk (if necessary).

2. Assess the Current State of the Hard Disk

If you were able to repair all damage and no low-level problems are found, stop here! You do not need to restore or reformat the hard disk.

If you could not make any repairs with the boot disk, or if the hard disk still is not accessible, you probably need to reformat the hard disk. Go on to step 4.

If you were able to repair some damage, but problems remain with the hard disk, you may need to reformat it. But first you must safeguard your data as described below in step 3.

3. Make New Backups Before Reformatting

Now is a good time to back up the repaired hard disk. You may want to make two new backups (with the verification option on) to new backup sets. (Do not do a recycle backup to an existing backup set, since the damaged drive might not have all files on it and you do not want to erase previous backups.) Once you are sure you have redundant backups of your data, copy your backup set catalogs to a removable disk or server.

4. Reformat the Disk

If the boot disk cannot fix the hard disk, you may have to erase or reformat the hard disk in order to prepare it for restoration.

WARNING: Erasing or formatting a hard disk destroys all data stored on the disk. If you are not sure whether you should erase or format your hard disk, contact its vendor for assistance.

5. Re-install Software

Install Linux operating system software on the newly-formatted hard disk, making sure to create the same mount points as the original system. Restart from this volume.

6. Install Client Software

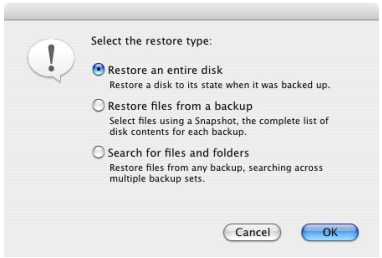
Install the client software as described in “Installing Retrospect Client Software on Linux Computers” on page 94.

7. Prepare Client Database

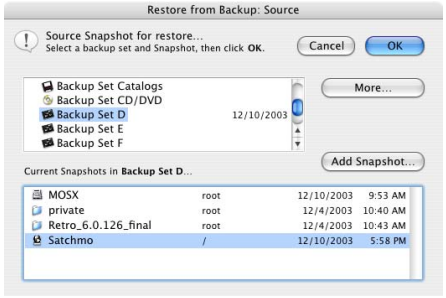
From the backup computer, forget the old client and log in the new client.

8. Restore Files

Restore the client from the backup computer. From Retrospect’s Immediate tab, click Restore.

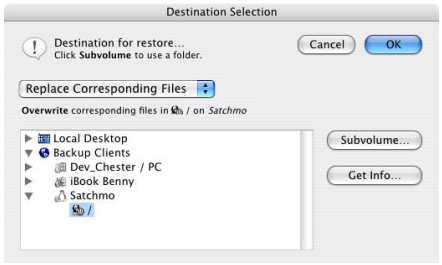


Select “Restore an entire disk” and click OK. A window appears for you to select the source from which to restore backed-up files.



In the top part of the window, select the backup set that has your most recent backup of the hard disk you have recently repaired. In the bottom portion, select the most recent Snapshot of that hard disk. Click OK to proceed. A window appears for you to select the destination to which to restore files. Select the Linux client’s hard disk and set the pop-up menu to Replace Corresponding Files.

WARNING: Do *not* use Restore Entire Disk.



Click OK to proceed. Click Replace to confirm the operation. Retrospect matches files from the Snapshot then scans the destination and displays the restore summary window. Verify your choices for the Source, Destination, Files Chosen, and Options.

Put the first medium from the backup set in your backup device and click Restore.

9. Clean Up

Restart the client computer.

CHAPTER 8

MANAGEMENT

- BACKUP STRATEGIES
- LOGS AND REPORTS
- EXECUTION OPTIONS
- CONTROLLING EXECUTIONS
- MANAGING BACKUP SETS
- MAINTAINING SCRIPTS
- RETROSPECT PREFERENCES
- MOVING RETROSPECT
- CATALOG AND CONFIGURATION BACKUPS
- WORKING WITH MACINTOSH FILE SERVERS
- WORKING WITH OTHER SOFTWARE

This chapter describes how to perform various tasks, such as managing backup sets, viewing reports, and maintaining scripts. It also offers advice on using Retrospect and describes techniques for more effective backups, including tips on using Retrospect with other software.

BACKUP STRATEGIES

This section suggests several strategies for backing up your backup computer or your entire network. Review each strategy and decide which will work best for your situation. Perhaps you will need to slightly modify a strategy to better fit your needs. Perhaps you will devise your own strategy which bears no relation to these suggestions. Realize these are but a few suggested strategies, and Retrospect's features allow an unlimited number of different strategies. Just remember the basic backup rules when you go about creating a backup strategy of your own.

The different backup actions available with Retrospect are integral to developing successful strategies. They are described in "Backup Actions" on page 23.

Basic Backup Rules

While Retrospect is a powerful tool for safeguarding your data, it is most effective when you follow some basic backup rules:

- Back up often because you cannot restore what is not backed up. For example, if your hard disk malfunctions today but you most recently backed it up a week ago, you have lost the data you have accumulated over the week. Retrospect is most effective when you back up everything and back up often, which you can ensure by setting up scripts to automate backups.
- Keep multiple backups of your data. Rotate among different backup sets. Using more backup sets makes you less likely to lose data if you misplace or damage media.
- Retire old media on a regular schedule. Regularly introduce new media using new media backups, because having all of your backups on one media set leaves you too vulnerable. A benefit of new media in your backup strategy is that it is faster to restore from a few media members than to restore from a set that has many members and backup sessions.
- Always store at least one backup set off-site to guard against fire, theft, and natural disaster.
- Back up the backup computer. You probably have put more time and energy than you realize into your Retrospect configuration and catalogs.
- Take care of your backup media, which can easily be damaged by the environment. Media can also wear out. See "Media Longevity and Storage" on page 43 for further information.
- Leave the Verification option on so Retrospect can confirm the backup data matches the original data.
- Periodically verify your backups are working properly. Retrospect provides options and tools that allow you to compare data and verify media to ensure valid backups. It also creates logs and reports that detail backup successes and failures.

Individual Backup Strategies

The four following strategies are useful for backing up a single computer. If you need to back up more than one computer, see "Network Backup Strategies".

Individual Strategy 1—Run Documents

Create a backup script and make one recycle backup run document and one normal backup run document. Information on how to make a run document appears in "Manual Script Execution," which starts on page 78.

Execute the normal backup run document daily or whenever you please, and every few weeks execute the recycle backup run document to keep your backup sets from becoming large and cumbersome.

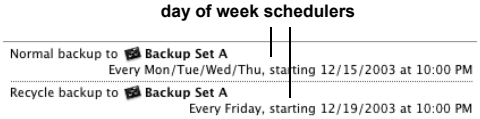
To introduce new media for rotation with other sets or off-site storage, periodically configure

the backup set to use new media, as described in “The Options Tab” on page 154.

Individual Strategy 2—Scheduled Script

Create a backup script and schedule it to run automatically. Add one day of week scheduler doing normal backups Monday through Thursday and another doing a recycle backup every Friday.

The two schedulers look like this:



To introduce new media for rotation with other sets or off-site storage, periodically configure the backup set to use new media, as described in “The Options Tab” on page 154.

Individual Strategy 3—EasyScript

Use Retrospect’s EasyScript Wizard, to set up a strategy. EasyScript has different strategies optimized for the type of backup set you choose. Its removable disk strategy tends to conserve media, compared to its strategies for tapes and discs. Its Internet strategy is biased toward conserving space on the FTP server.

See “Using the EasyScript Wizard” on page 64.

Individual Strategy 4—EasyScript Local and Off-site

Use Retrospect’s EasyScript Wizard to create two scripts. Create the first script, then rename it “Local Backups.” Use EasyScript again, this time for an Internet backup set. Rename the created script “Off-site Backups.” Together these two scripts give you far more protection than either one alone.

See “Duplicating, Renaming, or Deleting a Script” on page 156 for information on renaming scripts.

Network Backup Strategies

When you need to back up a network of client computers, you must decide which kind of backup scripts to use. The table below lists situations which are suited to Backup Server scripts or regular backup scripts.

Situations Suiting Backup Server Scripts	Situations Suiting Regular Backup Scripts
You have a backup computer dedicated solely to that purpose.	Your backup computer has other duties at other times.
You have too many clients with too much data to be entirely backed up in a single night.	Your scheduled backups are completed before the client computers are used in the mornings.
You find yourself trying to catch up with your backups, making special scripts and immediate backups for certain clients that are not completely backed up by your regular backup script.	Your scheduled backups are completed before the client computers are used in the mornings and unsuccessful backups are rare.
You have mobile clients and portable drive volumes that appear on the network at random times.	Your network includes only desktop computers, no removable disks or notebook computers.
You want Retrospect to back up to whatever media is in the backup device.	You always insert the correct media beforehand for unattended backups.

If you choose to use a strategy that includes Backup Server, skip ahead to Network Strategy 5 on page 137.

Network Strategy 1—EasyScript

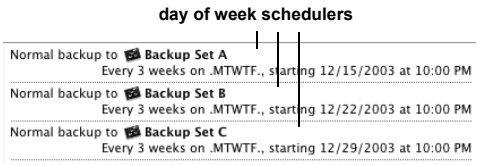
Use Retrospect's EasyScript Wizard set up a strategy based on your needs. With the EasyScript Wizard, you can specify that you want to back up computers on the network.

See "Using the EasyScript Wizard" on page 64.

Network Strategy 2—Scheduled Script

Create a backup script. Set the destination to use three backup sets. Add a day of week scheduler to run the script daily to a particular backup set, every three weeks. Add a similar scheduler to run the script daily to the second backup set, every three weeks starting one week after the first scheduler. Add a similar scheduler to run the script daily to the third backup set, every three weeks starting one week after the second scheduler.

The three schedulers look like this:

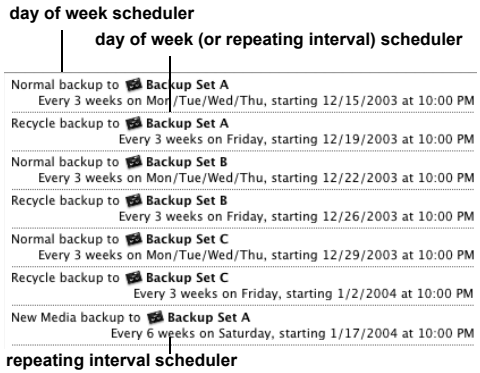


This strategy does not include scheduled recycle and new media backup actions, so you should manually configure the backup sets for recycle and new media backups at appropriate times. See "The Options Tab" on page 154.

Network Strategy 3—Scheduled Script with Recycle and New Media Rotation

Create a backup script. Set the script destination to use three backup sets. Add a day of week scheduler to run a normal backup Monday through Thursday to the first backup set, every three weeks. Add a day of week scheduler to do a recycle backup to the first backup set on Friday, every three weeks. Add similar schedulers for the second and third backup sets, but set their starting dates one and two weeks later, respectively. Finally, add a repeating interval scheduler to do a new media backup to one of the backup sets every six weeks. (After a new media backup take the old backup set media off site for safe keeping.)

The schedulers look like this:



Network Strategy 4—Scheduled Script with Rotating Daily Backup Sets

Make a script with five backup set destinations, named Monday through Friday. Add five day of week schedulers to back up to each respective backup set. Add five repeating interval schedulers to stagger recycle backups every four weeks to each respective backup set, starting with Monday the first week, Tuesday the second week, and so on. But for Friday, make the repeating interval the last Friday of the month, doing a new media backup to the Friday backup set. (Take the old backup set media off site for safe keeping.)

The schedulers look like this:

NOTE: When you schedule the new media backup, make sure it occurs at the same time as the scheduled Friday normal backups. When Retrospect encounters the new media backup scheduled for the same execution time as the normal backup, it executes only the new media backup. If you were to schedule them at different times, both backups would execute.

Network Strategy 5—Basic Backup Server

Create a Backup Server script backing up all client sources. Schedule it to work from 7:00 P.M. to 7:00 A.M. during the work week, so as not to interfere with the users during their workdays, and all the time during weekends. Set the backup interval so Retrospect backs up every twelve hours.

Network Strategy 6—Basic Backup Server Including Mobile Computers

Duplicate the basic Backup Server script described in Network Strategy 5. Make mobile clients its only sources. Remove these volumes from the original script. Schedule the new script to run twenty-four hours a day, with a backup interval of eighteen hours.

TIP: If you implement a strategy that includes Backup Server, read "Backup Server Tips and Techniques" on page 82. It includes information to help you devise a more effective strategy.

Network Strategy 7—On-Demand Backup Server

Create a Backup Server script backing up all client sources. Leave the schedule always active so it works twenty-four hours a day. Set the backup interval option so Retrospect backs up every ninety-nine days. Leave on the script option to allow early backup. Except for the initial backups when this strategy is first implemented, and every ninety-nine days thereafter, clients are not backed up unless they request it from their control panels. This strategy requires that you clearly communicate the responsibility to the users and, ideally, is supplemented with a regular backup script.

LOGS AND REPORTS

Retrospect's reporting abilities let you monitor backup execution history and error messages by viewing logs and reports. You may need to examine these to find out why an operation was unsuccessful in order to diagnose problems.

- The Backup Report shows a detailed account of backup operations for each local and networked volume.
- The Operations Log shows a record of each Retrospect operation, transaction, and event, and any errors that occurred.
- The Contents Report shows the files that were actually backed up in a specific backup session.

To view any of these reports, first click the Reports tab in the Retrospect Directory.

Viewing the Backup Report

Click the Report button from the Reports tab to view the Backup Report. An example of a Backup Report is shown below.

Unlike the Operations Log, to which Retrospect repeatedly appends new information, the Backup Report is completely updated each time a backup is performed. It allows you, as the backup administrator, to see, on a volume-by-volume basis, any problems with recent backups.

Understanding the Backup Report

The Backup Report can be viewed in two formats: Standard Format and Performance Data Format. See "Customizing the Backup Report" which follows, for information on how to switch between formats.

Both formats include the following information:

User/Volume is the source volume name. Client computer names are also listed.

Backup Set (Script) lists the names of the destination backup set and the script of the most recent successful backup.

NOTE: If you performed an immediate operation, such as an immediate backup, the script name reflects this, e.g., "Immediate Backup".

A *Standard Format* Backup Report contains the following information, in addition to User/Volume and Backup Set (Script):

Elapsed Days is the number of days since the backup.

Errors indicates any errors that occurred for each backup. (Use the Find in Log button to locate an error in the Operations Log.)

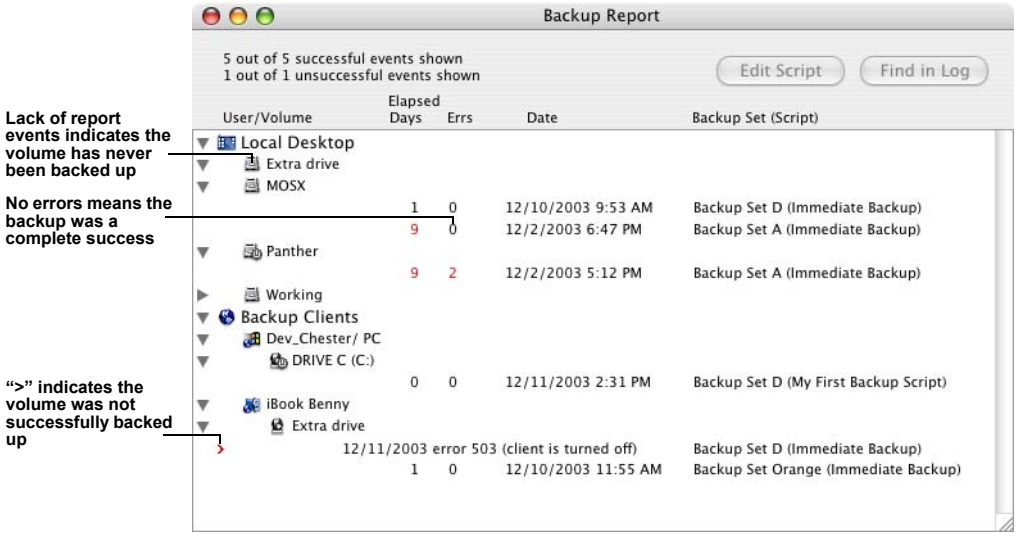
Date is the date of the most recent backup of the volume.

A *Performance Data Format* Backup Report contains the following information, in addition to User/Volume and Backup Set (Script):

Duration shows the time duration of the backup, in hours and minutes. Large numbers may indicate sources with heavy backup needs.

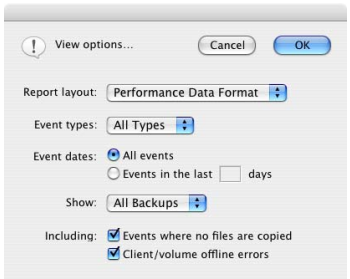
MB is the amount of data, in megabytes, backed up from the volume.

MB/min is the speed, measured in megabytes per minute, of the source's backup. Abnormally slow performance may indicate problems with the network, backup device, or other hardware.



Customizing the Backup Report

You can use the View Options dialog to display the Backup Report in Standard Format or Performance Data Format, specify the event types or event dates to include in the report, and various other options. Choose View Options from the Report menu to bring up a dialog in which you can make changes.



Use the options to customize the Backup Report.

Working with the Backup Report

The Backup Report is a database of backup events. Each time Retrospect completes a backup it adds a new backup event to its database. For each combination of source, destination and script, it saves all unsuccessful backup attempts and the latest successful backup.

When you forget a script, source, or backup set, Retrospect removes that item's backup events from the Backup Report database.

Forgetting Events

To remove events from the Backup Report, choose Forget Events from the Report menu. This brings up a dialog with which you can remove the following execution events from the report:

- All but the most recent successful backup
- All successful backups
- All unsuccessful attempts
- Events older than one week
- All execution events
- All Backup Server events

NOTE: The only one of these options that affects Backup Server events is "All Backup Server events."

You can also select any single event listed in the report and forget it by choosing Clear from the Edit menu or by pressing the Delete key. If you forget an event, that information is removed from the report. This may cause a volume to appear as if it was never backed up.

WARNING: Backup Server relies upon the Backup Report to determine when a volume was most recently backed up. If you delete an event from the Backup Report and the associated volume is a source in an active Backup Server script, Backup Server assigns a higher priority to that volume and will attempt to back it up sooner.

Finding Events in the Operations Log

Select a line from the Backup Report and click Find in Log to open the Operations Log with the corresponding action selected.

Editing an Event Script

Select a line from the Backup Report and click Edit Script to open the script summary window for the script which executed and created the event.

NOTE: If you backed up a volume using an immediate operation, the Backup Report indicates that in the Backup Set (Script) column (e.g. "Immediate Backup").

Printing or Exporting the Backup Report

To print the Backup Report, view it then choose Print from the File menu. If you have only a portion of the report selected, only that portion will print. If you have nothing selected, the entire report will print. To export the Backup Report to a text file, view it then choose Export from the File menu.

TIP: You can set a preference option, described on page 158, to have Retrospect automatically export the Backup Report.

Viewing the Operations Log

Retrospect's Operations Log lets you monitor backup execution history and error messages. The log stores any messages that are generated during an operation. You may need to examine the log to find out why an operation was unsuccessful in order to diagnose problems.

To view the Operations Log click the Log button or choose Log from the Window menu.

The example below shows how information appears in the Operations Log.

The log shows the following information for each successful operation.

Completed indicates the number and size of the files that were copied. If you used Retrospect's data compression feature, the log also shows compression achieved for this session.

Performance indicates the number of megabytes of information copied per minute. If the Verification option is turned on, additional performance figures are listed for comparing.

Duration shows the total time required to complete the operation. If you clicked Pause during the operation or there were delays while you inserted media, the waiting time is shown separately. The waiting figure includes time spent during tape drive locate functions and other required functions.

Finding Items in the Log

Retrospect has commands for finding items in the Operations Log. When the Operations Log window is active, Retrospect adds a Log menu to the menu bar.

Find Choose Find from the Log menu, which brings up a dialog. Enter the text you want to search for, then click OK. Retrospect searches for the text, top down from the current selection. When the specified text is not found, Retrospect beeps. When the text is found, Retrospect selects the entire line in which the text appears.

Find Again After you have used the Find or Find Backwards command, this command continues the search from the current selection

Log size

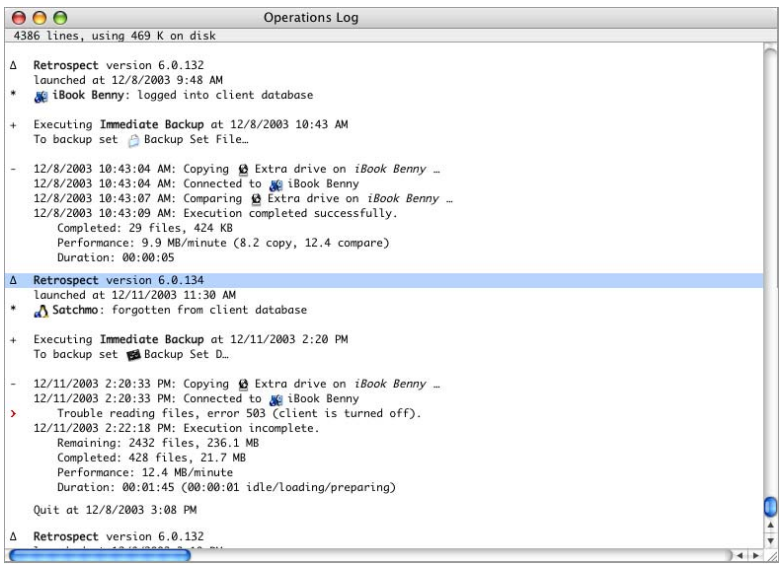
Δ Retrospect started

***client logged in**

+execution began

–operation began on this volume

>error occurred



forward, or down. Upon reaching the end of the log, it continues searching from the beginning.

Find Backwards This command works like the Find command, except it searches bottom-up instead of top-down.

Find Again Backwards After you have used the Find or Find Backwards command, this command continues the search from the current selection backward, or up. Upon reaching the log's beginning, it continues searching backward from the end.

Clearing the Log

To delete the contents of the Operations Log, view it then choose Clear from the Edit menu. Click OK to confirm the operation.

NOTE: You do not have to manually clear the log, because Retrospect removes old log entries when the log fills to its capacity, determined by the log size limit preference (page 158).

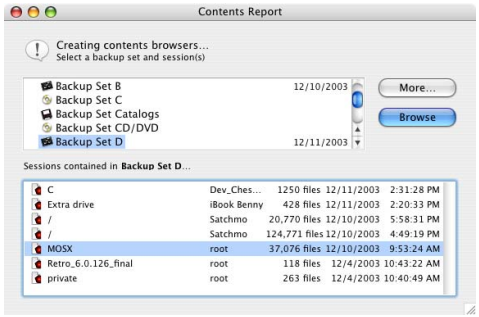
Printing the Log

To print the Operations Log, view it then choose Print from the File menu. If you have only a portion of the log selected, only that portion will print. If nothing is selected, the entire log will print.

Viewing Backup Set Contents

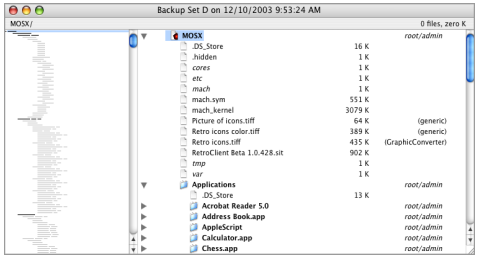
Retrospect can report which files were copied to a backup set during a specific backup or archive session.

To view the contents of a backup set, first click the Reports tab from the Retrospect Directory, then click Contents.



In the upper list box, select the backup set you want information about. (Click More to access more backup sets.) After you select a backup set the lower list box displays the backup sessions contained within the selected backup set. In the lower list box, select the backup session or sessions you want to review.

At this point, you can choose Export from the File menu to export the list to a text file, or click Browse. When you do the latter, a browser window appears listing the files and folders that were backed up during the session or sessions you selected.



You can print the file list, export it to a text file, search for specific files, get information about a specific file, or change the view format in the browser window. You can view browser windows for multiple sessions at the same time by performing the same steps and selecting multiple sessions. When exporting, Retrospect exports the fields in the following order, regardless of the view format: file name, size, create date, create time, modify date, modify time,

backup date, backup time, type, creator, backup set (if any), and path.

For information about using the browser window and menus, see “Browsing” on page 172.

EXECUTION OPTIONS

Retrospect has many options you can set to determine how your backup, duplicate, archive, transfer, and restore operations (immediate and scripted) are executed. For example, you could set a backup script to turn on software data compression and synchronize client computer clocks. You can set options while setting up an immediate operation or while editing a script. Execution options are local rather than global, so they apply only to the current operation or script, not to all operations and scripts.

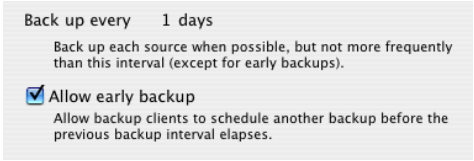
Retrospect also has global program preferences that affect all executions. See “Retrospect Preferences” on page 158 for more information.

To set options for an immediate operation or a script, click the Options button in the summary window, then click More Choices to view a complete list of available options grouped by category. You can display the options for each category by clicking the category name in the list.

To turn an option on or off, click its checkbox or radio button. Some options use time and date controls, and others let you enter numbers or text. If any options in a category have been changed from their default settings, the category name is shown in boldface. Clicking Use Default reverts all visible options to their default states. Clicking Fewer Choices returns you to the basic Options window.

Backup Server Options

These options are available only with Backup Server scripts.

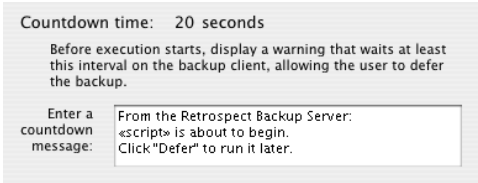


Back up every: *n* days/hours: This time interval, which is one day by default, specifies the minimum time between backups. Each source is backed up when possible, according to the priority of need, but not more often than this interval unless the Allow Early Backup option is on and a client user initiates a backup.

Allow Early Backup: When this option is on, which is the default, client users may initiate backups from their Retrospect Client control panels, overriding the backup interval. A request for an early backup does not necessarily move the user’s volume to the top of the priority list, depending on the priority of other volumes listed as sources in the script. Retrospect begins a user-requested early backup only after the Backup Server has current backups of its other source volumes.

Client Countdown Options

These options are available only with Backup Server scripts.



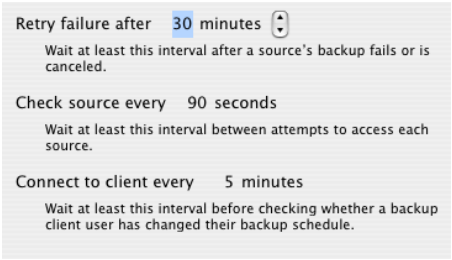
Countdown time: n seconds/minutes: Retrospect gives client users advance notice of when a backup is about to begin, counting down the time specified here. The default time is twenty seconds. (Enter zero to make Retrospect skip the countdown). When it is going to back up a source from a client computer, Retrospect puts up a dialog on the client. This dialog displays the countdown message (see below) and

offers buttons to defer the backup to a later time or bypass the countdown and immediately begin backing up. If the client user does not take any action Retrospect backs up when the countdown reaches zero.

Countdown message: The text in this box is shown to a client user when a backup is about to begin, according to the countdown time option. Retrospect will replace the text "«script»" with the name of the script it is executing.

Polling Options

These options are available only with Backup Server scripts.



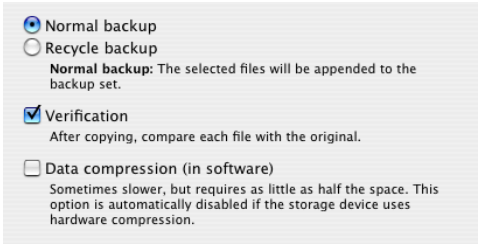
Retry failure after: *n* minutes/hours: After a backup has failed or was canceled, Retrospect waits at least this long, thirty minutes by default, before trying to back up a source again.

Check source every: *n* seconds/minutes: Retrospect uses this time interval, which is ninety seconds by default, to access a source just to check whether it is available for backup. Retrospect does not check sources while a backup is in progress.

Connect to client every: *n* minutes/seconds: Retrospect uses this time interval, which is five minutes by default, to access a client to check whether the user has changed the backup schedule for the client. Retrospect does not connect to clients while a backup is in progress.

Backup Options

These options are available with backup operations and Backup Server scripts.



Normal Backup: Only available with immediate backups, this option makes Retrospect perform a normal (IncrementalPLUS) backup, as described in "Normal Backups" on page 23.

Recycle Backup: Only available with immediate backups, this option makes Retrospect perform a recycle backup, as described in "Recycle Backups" on page 23.

NOTE: For scripted backups, you can select a normal or recycle backup when you schedule the script. See "Common Scheduler Elements" on page 74 for more information.

Verification: Verification ensures files are copied correctly by comparing files in the backup set with the original source files after the backup is performed. If the backup set spans multiple tapes, discs, or disks in a session done with verification, you must reinsert all media to which data has been written. Although verification increases the time it takes for a backup to complete, it ensures that information is correctly written to the backup set. This option is on by default.

Data Compression (in software): Data compression saves space in the backup set by compressing files before copying them into the backup set. Files are automatically decompressed back to their original state when restored. Compression savings achieved during an operation are reported in the status window

and the Operations Log. The amount of compression savings you can expect depends on the types of files you are compressing. Text files compress substantially; application and system files do not. Backups using data compression are slower than those without, as are restores.

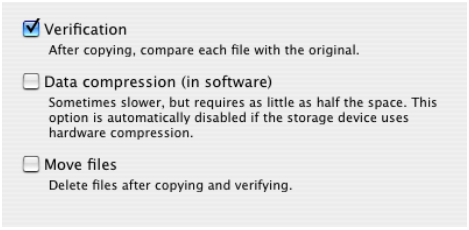
When copying to a tape device that has built-in compression, Retrospect automatically turns off software compression in favor of the faster hardware compression.

Retrospect uses its built-in compression filter selector to identify files that are already compressed (such as those compressed with a utility such as StuffIt) so it will not attempt to re-compress them with software data compression. See "Compression Options" on page 146 for more information.

The Data Compression option is off by default.

Archiving Options

These options are available only with archiving operations.



The archiving options include Verification and Data Compression, as described in "Backup Options" and Move Files.

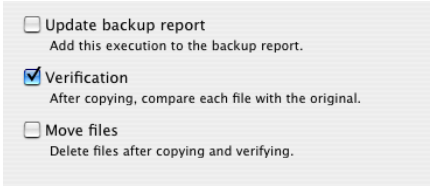
Move files: This option deletes files from the source volume after they have been copied. If verification is turned on and the files do not match exactly, the originals will not be deleted. Do not turn on the move files option without also turning on the verification option. You should perform at least one additional verified archive, backup, or duplicate before deleting files from the source. Retrospect cannot move files from a client computer if its Retrospect Client control panel has been set to allow read access only. By default, this option is off.

TIP: Before you use the Move files option, first archive to a different backup set by copying without moving. This provides an extra measure of safety should one backup set become unusable.

A related option is described in "Source Options" on page 147.

Duplicate Options

These options are available only with duplicate operations.



Update Backup Report: When this option is checked, Retrospect adds or changes information in the backup report. By default, duplicate operations are not listed in the Backup Report.

Verification: This is the same option described in "Backup Options".

Move files: This is the same option described in "Archiving Options".

A related option is described in "Source Options" on page 147.

File Copying Options

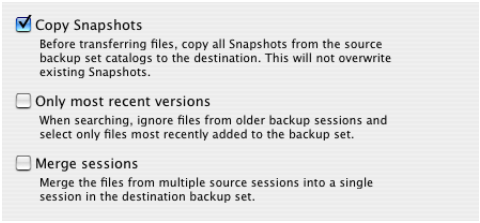
These options are only available with duplicate and restore operations.

Recompute Icon Positions: To prevent overlapping, this option manipulates the positions of file and folder icons copied to a Mac OS destination. By default, this option is off.

Update Modify Dates: This option is only available for restore operations. It causes Retrospect to set the modification date and time of restored files to the date and time of the operation. By default, this option is off.

Backup Set Transfer Options

These options are available only with transfer operations initiated with the Copy command from the Tools tab.



Copy Snapshots: This option transfers a backup set's current Snapshots to the destination catalog before copying files. Snapshots are not copied to the destination backup set's media. Snapshots which exist in the destination backup set are not replaced. This option is on by default.

Only most recent versions: Of files which match the search criteria, Retrospect transfers only the most recent version of each file. It ignores older versions of the same files from other sessions. By default, this option is off.

Merge sessions: This option merges the files from multiple sessions of the source backup set to a single session in the destination backup set, as if they were all backed up at once. With the option off, which is the default, files transferred from several different sources are listed separately by session in the destination backup set.

Retrieval Options

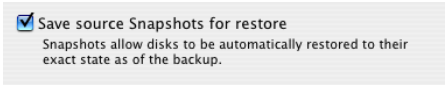
These options are only available during an immediate restore by searching.

Only most recent versions: Of files which match the search criteria, Retrospect restores only the most recent version of each file. It ignores older versions of the same files from other sessions. By default, this option is off, which makes Retrospect restore matching files from older *and* current sessions.

Minimal folder structure: Restores files to their original folders, in the minimum required hierarchy. Empty folders are not restored. This option is off by default.

Catalog Options

This option is available with all types of operations except duplicate and restore.

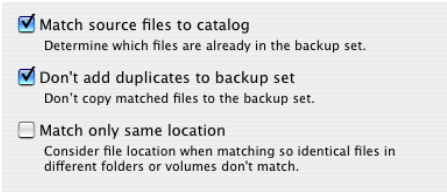


Save source Snapshot for restore: This option directs Retrospect to save a volume Snapshot to the catalog replacing the old Snapshot, if any, and to save another copy of the Snapshot onto the backup media. By default, this option is on.

Snapshots make it easy to restore a volume to its exact state as of a given backup, or retrieve files that you know were on a volume during a given backup. Empty folders are only backed up in Snapshots. If you deselect this option, no Snapshot is saved to the catalog. Should you need to restore files, you will have to use a selector (and/or browser) to choose which files to restore—a time-consuming process.

Matching Options

These options are available with all types of operations except duplicate and restore.



Match source files to catalog: This option directs Retrospect to identify previously backed up files during normal backups. Retrospect compares the files on the source volume to file information in the catalog for the selected destination backup set.

- The Mac OS file matching criteria are name, size, type, creator, creation date, and modify date.
- The Windows file matching criteria are name, size, creation date, and modify date.
- The Linux file matching criteria are name, size, and modify date.

Retrospect considers a file already backed up if all of these criteria match. When you view the preview browser while setting up an immediate backup, files that have already been backed up are preceded by a diamond symbol.

NOTE: Archive operations have the matching option off by default, which results in archiving all selected files, regardless of whether they are already in the backup set. Unless you turn on the Move files option, matching is the only difference between archive and backup scripts.

Don't add duplicates to backup set: This option works with the "Match source files to catalog" option to prevent previously backed up files from being added to the backup set again. Select both of these options when you want to perform a standard IncrementalPLUS backup; that is, you only want new or modified files copied to the backup set. If this option is deselected, Retrospect adds all files, including previously backed up files, to the backup set every time a Normal Backup is performed. By default, this option is on and you should keep it that way unless you have a specific need to change it.

Match only same location: This option is only available if "Match source files to catalog" is selected. It makes Retrospect more strictly match otherwise "identical" files from a source to a destination. (Normally, files are considered identical files when they have the same criteria described above in "Match source files to Catalog File".) When this option is selected, Retrospect uses the unique (and hidden) Mac OS file identification number as an additional part of the matching criteria. This causes separate copies of otherwise-identical files to not match. (And unmatched files get backed up, so your backups are larger and slower.)

By default, this option is off and you should keep it that way unless you have a specific need to change it.

Compression Options

This option is available with all types of operations except duplicate and restore.

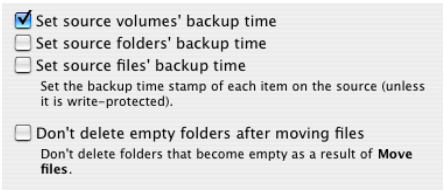
Selector: This option, which is available only when the Data Compression (see "Backup Options" on page 143) option is on, lets you determine the selector used to filter files when compressing. By default, Retrospect uses its built-in Compression filter selector to identify and avoid compressing files that are already compressed. You are not likely to need to change this option.

If you want to use a different selector to tell Retrospect which files to compress, you can modify the Compression filter selector or create

your own selector. See “Using Selectors” on page 177.

Source Options

This options category is available with all types of operations except restore.



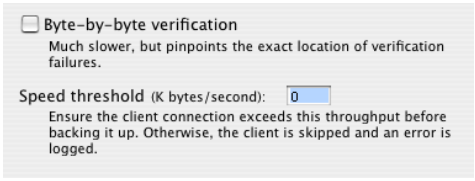
Set source (volume’s/folders’/files’) backup time: These options, not available with duplicate operations, record a backup time for each source volume, folder, or file. (The Mac OS keeps track of the creation date, modification date, and backup date for each file, folder, and volume.) Using these options allows you to create selectors based on the “backup time,” which is the moment execution begins. Retrospect cannot set the source backup time on a client computer if its Retrospect Client control panel has been set to allow read access only. By default, the volume option is on and files and folders options are off.

NOTE: When matching files for IncrementalPLUS backups, Retrospect does not use the backup time stamp. It uses more sophisticated and flexible criteria, as described in “How Retrospect Works” in Chapter 2.

Don’t delete empty folders after moving files: This option is only available for archive and duplicate scripts and operations. It keeps folders that become empty as a result of the move instead of automatically deleting them. By default, this option is off.

Client Execution Options

These options are available with all types of operations except restore, and these options apply only when backing up Retrospect client computers.



Byte-by-byte file comparison: This option overrides Retrospect’s fast client compare, verifying files the same way Retrospect does for local backups. When this option is turned off, Retrospect uses a faster, checksum-based technique to verify copied files. Both methods reliably compare backed-up data to the original files. By default, this option is off and, in most cases, you should keep it off.

Speed threshold: This option, which is available only with scripts, is useful for preventing backups from becoming too slow. The number you enter here determines the minimum acceptable rate at which the client computer can be accessed. If, upon testing the network connection to the client prior to the operation, Retrospect finds the network or client is not working fast enough it will skip the client and log an error.

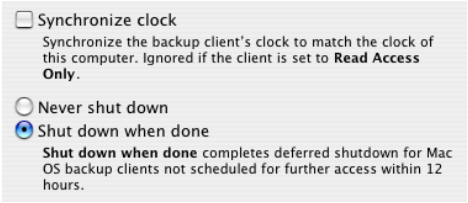
This option is useful, for example, for preventing the Backup Server from trying to back up a notebook computer volume when its user connects using a dial-up connection.

Retrospect checks the client connection speed only once, as an operation starts.

TIP: To determine a working speed threshold, use the Get Info command on several different clients from the Backup Client Database window. For about a minute, observe the speed of each client.

Client System Options

These options are available with all types of operations except restore, and these options apply only to Retrospect client computers.



Synchronize clock: This option sets the date and time on each client computer to match the clock on the backup computer. This is useful to get times and dates to agree and is especially useful when changing to and from daylight savings time. Retrospect cannot synchronize a client computer's clock if its Retrospect Client control panel has been set to allow read access only. By default, the synchronize option is off.

Never shut down/Shut down when done: This option specifies how Retrospect handles the Finder's Shut Down process on a Mac OS 7/8/9 client after Retrospect is done with its operation.

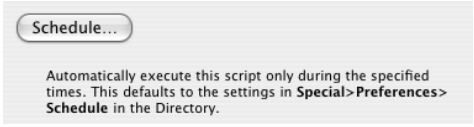
NOTE: The desired behavior only happens when the client Macintosh is waiting for backup as described in "Execution Preferences" on page 105.

- Shut down when done completes shut down unless the client is scheduled for another operation within the look-ahead time period (see "Schedule Preferences" on page 160).
- Never shut down prevents the operation for which this option is selected from shutting down the client.

By default, this option is set to Shut down when done.

Schedule Option

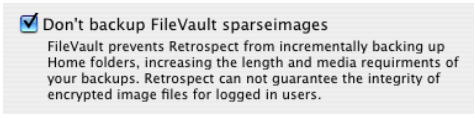
This option is only available for scripts (not including Backup Server scripts).



Click Schedule to define a time period during which this script may execute. The default schedule reflects the global schedule preference, described in "Schedule Preferences" on page 160.

FileVault Option

This option is only available for backup operations.



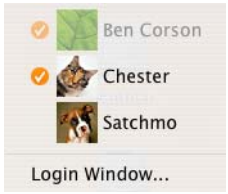
Mac OS X 10.3 includes a new feature called FileVault. When FileVault is enabled, the entire contents of your Home folder is encrypted and decrypted into a sparseimage file on the fly. This option tells Retrospect not to back up FileVault sparseimages. There are a number of good reasons for this.

The sparseimage files change constantly and therefore will always get backed up by an IncrementalPLUS backup. Because of this and because the files can get quite large and under most circumstances cannot be restored properly, Dantz recommends against enabling FileVault on the backup computer and client computers.

If you must enable FileVault there are a few steps you must take to ensure that all user data is backed up and available for restore:

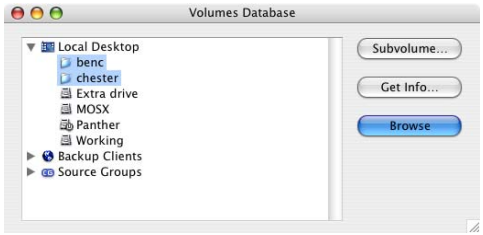
- Make sure all FileVault users are logged in
- Choose their volumes as backup sources

If a local or client computer has multiple accounts for users that have FileVault enabled, all those users must be logged in.



In the example above, users with checkmarks next to their names are logged in.

When they are logged in, their user folders appear in Retrospect's Volume Selection window as separate volumes (in either the Local Desktop container or as a client volume). For example, if the FileVault user Chester is logged in, a new volume named "Chester" is listed in Retrospect's Volume Selection window.



In the example above, benc and chester are FileVault users on the local computer.

In order to ensure that user data is backed up, the FileVault users' volumes must be selected as sources. Selecting the startup disk volume will not back up the users' data correctly. Selecting the Local Desktop container, Backup Clients container, or a specific client will also select the FileVault volumes it includes.

CONTROLLING EXECUTIONS

Retrospect gives you many options to control operations in progress. For example, you can pause or stop an operation, view additional volume and performance details, and switch between interactive and unattended modes. These options are available once execution of an operation begins.

You can use any one of following methods to begin an operation:

- Initiate a backup, restore, or duplicate from the Immediate tab.
- Initiate an archive or backup set transfer from the Tools tab.
- Run a script immediately using the Run menu or the Immediate tab.
- Open a run document in the Finder.
- Wait until a scheduled script begins automatic execution.

When an operation is in progress, Retrospect displays the execution status window and the Control menu. When it cannot find a backup set member, Retrospect displays the media request window.

Controlling Backup Server Executions

Though many of the features described in this section apply to both regular scripts and Backup Server scripts, this section is intended for use with regular scripts. Backup Server scripts have their own, unique features for controlling executions, which are described in "Using Backup Server" on page 88.

Execution Status Window

The execution status window is available during all file transfer operations and contains the following features:

- The Pause button temporarily suspends the current operation. Click Continue to resume the operation.
- The Stop button halts the current operation, bringing it to a premature end.

- The drop arrow expands the window to display more detail about the execution in progress. This includes the source and destination names, source and script start times, source and overall execution speed, and (when software data compression is being used) source and overall compression.

The execution status window (in its expanded state).

Control Menu

The Control menu is available during all file transfer operations and contains the following command items.

Show Log displays the Operations Log. See "Viewing the Operations Log" on page 140.

Run Interactively switches the execution to interactive mode. In this mode, the "When Done" options in the Control menu are dimmed and Retrospect always remains open after execution. The interactive mode cursor is a pair of rotating gears. All Immediate and Tools operations default to interactive mode.

TIP: You do not have to wait for the Control menu to appear (while scanning a volume, for example) to switch between interactive and unattended modes. At any time, you can use the keyboard shortcut Command-Option-A, twice in quick succession.

Run Unattended switches the execution to unattended mode. During executions in this mode, the "When Done" options in the Control menu are available and determine what Retrospect does after execution. The unattended mode cursor is an animated grid. All automatic executions, run documents, and scripts launched from the Run menu default to unattended mode.

Stop on Errors tells Retrospect to report errors by pausing execution and displaying a dialog. Retrospect will resume execution if possible after the OK button is clicked.

Just Log Errors tells Retrospect to report errors to the Operations Log, but continue execution if possible. The Run Control general preference determines the default for this menu option. See "Run Control Preferences" on page 160.

When Done determines what Retrospect will do when completing the current operation in unattended mode: Wait, Quit, Restart, or Shut Down. These commands are not available in interactive mode. The Unattended general preference determines the default for this menu option.

Retrospect will not quit, restart, or shut down (depending on the preference setting described on page 162) if another script is scheduled for automatic execution within the look-ahead time (see "Schedule Preferences" on page 160). Retrospect remains open and waits for the script to execute.

Media Requests

When necessary for disks, tapes, or CD/DVD backup sets, Retrospect prompts you to insert media by displaying the media request window. In most cases, Retrospect continues with the operation when you insert correctly named or erased media and click Proceed. Because file backup sets and Internet backup sets do not use media, Retrospect never makes media requests when operating with file backup sets and Internet backup sets.

You can avoid this prompt if you insert the correct medium before you execute the backup. So it does not overwrite valuable data, Retrospect is very particular about media—it must be blank

or erased, or the name must exactly match the requested name in order for Retrospect to proceed without prompting you. When performing new media backups or recycle backups, consider erasing the media beforehand to be sure Retrospect will proceed automatically without your attention.

The media request window has a Stop button which halts execution of the currently running operation. It also has an Eject button which unloads the selected medium from the backup device. (Some devices require you to manually eject their cartridges.) Additional commands are available for tape libraries. See “Commands for Tape Libraries” on page 42.

Whenever the media request window is active, Retrospect adds the Devices menu to the menu bar. The items on this menu are as follows.

Device Status scans the communications bus and lists the ID numbers and their corresponding devices.

Eject unloads the selected disk, tape, or disc from its drive. (Some devices require you to manually eject their cartridges.)

Retension runs the selected tape forward and backward to even out the tension and alignment. Retensioning applies only to some types of drive mechanisms.

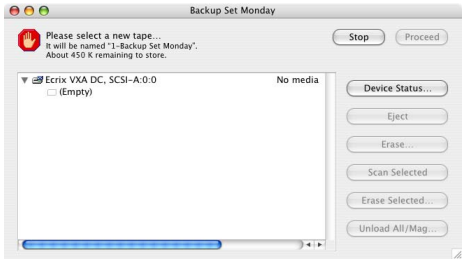
Erase erases the contents of the selected tape, removable disk, or rewritable disc.

Additional commands are available for tape libraries. See “Commands for Tape Libraries” on page 42.

If the media request window does not show your backup device, refer to “Seeing Your Backup Device” on page 30.

New Media Request

When Retrospect says, “Please select a new” medium, it wants a blank medium or one it can erase.



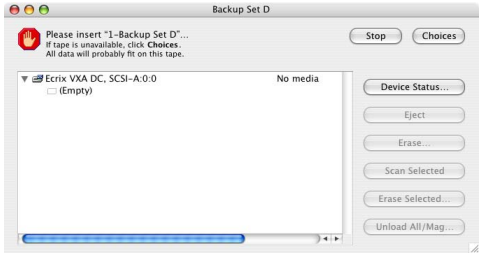
When there is a medium in the drive and you click the Proceed button, Retrospect erases and names the media then continues with the operation using that medium.

NOTE: Retrospect will not let you erase a medium that belongs to another backup set.

Click Stop or Cancel in the media request window to halt the operation.

Specific Member Request

When Retrospect says, “Please insert” or “Please select” a specific medium, it wants a named member of the destination backup set.



Insert or select the requested medium, then click Proceed to continue the operation, or click Stop or Cancel to halt the operation.

If the requested media is unavailable, click the Choices button. The media choices dialog displays.

Choose one of the following options:

Missing tells Retrospect to designate the requested backup set member as permanently unavailable. Retrospect will ask for a new piece of media and copy all the selected source files to it (treating data copied to the missing member as lost).

NOTE: Select Missing only when you have permanently lost or damaged the requested member. It is not appropriate for other situations.

Skip tells Retrospect to skip the requested member and ask for a new member. Data on the skipped member remains intact. Effectively, you are saying, "Stop copying to this member and start copying to a new one." This is useful when a member is nearly full and you think it may not make it through a complete unattended backup before Retrospect fills it and asks for a new medium.

WARNING: Do not select Skip when you have lost or damaged the requested disk, tape, or disc; select Missing instead. Selecting Missing lets Retrospect know that the data on the lost or damaged media needs to be backed up again, since it is no longer accessible.

For more information on media requests, see "Retrospect refuses to use the inserted disk, tape, or disc." on page 199.

MANAGING BACKUP SETS

Retrospect allows you to create and configure backup sets for later use and to perform maintenance operations on backup sets that already exist.

Viewing the Backup Set List

To view a list of the backup sets currently in use by Retrospect, click the Configure tab, then click Backup Sets. The Backup Sets window displays.

You can modify the list by:

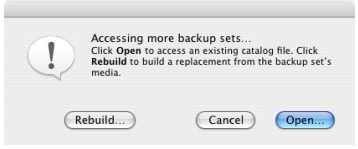
- Creating New Backup Sets
- Recreating Old Backup Sets
- Forgetting Backup Sets

Creating New Backup Sets

To create a new backup set, click New. The process of creating a new backup set is described in "Creating a New Backup Set" on page 47.

Recreating Old Backup Sets

If your backup set does not appear in the Backup Sets window, you can add it to the list using its catalog file. To start, click More.



From this window you can:

- Open an existing catalog file: If you know the location of the backup set's catalog file,

click the Open button. Browse to the location where the catalog file is stored, select the file, then click Open.

- Rebuild the catalog file from the storage media: Click the Rebuild button. Rebuild the catalog file as described in "Rebuilding a Catalog," which starts on page 188.

After you open or recreate the catalog file, its associated backup set appears in the list.

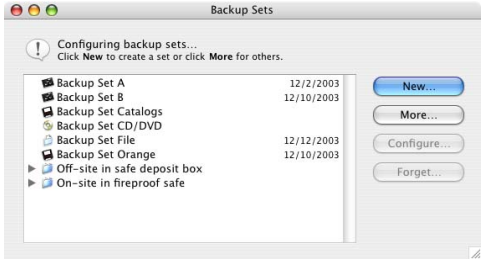
Forgetting Backup Sets

You can remove a backup set from the backup set list by selecting it and clicking the Forget button or pressing the Delete key. Click OK when prompted to remove the backup set. Forgetting a backup set does not affect the contents of the backup set, nor does it delete its catalog file. However, it does remove the backup set from any scripts that use it.

As long as you don't delete the catalog file and erase the media on which the backup set is stored, you can always add the backup set back to the list later. This process is described in "Recreating Old Backup Sets".

Organizing the Backup Set List

When you have to manage a large number of backup sets, you can use folders to help organize them. For example, you might want to create folders for inactive backup sets that you have moved to an off-site safe deposit box.



NOTE: The folders you create in the Backup Sets window are for organizational purposes only and do not exist outside of Retrospect.

To create and populate a folder:

1. From the Backup Sets window, choose New Folder from the Backup Sets menu.

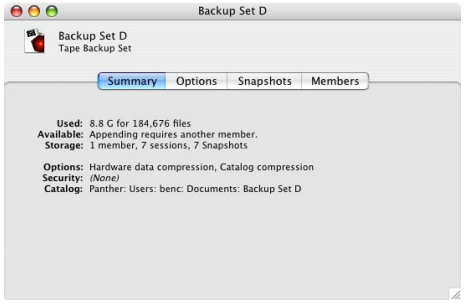
2. Enter a name for the folder and click Create.

3. Drag and drop the backup set(s) you want to move into the folder.

Configuring Backup Sets

You can view and modify the properties of existing backup sets at any time. Click the Configure tab, then click Backup Sets to view a list of current backup sets. Double-click the backup set you want to configure.

The Backup Set properties window displays.



The window is divided into tabs:

- The Summary Tab
- The Options Tab
- The Snapshots Tab
- The Members Tab (Tape, CD/DVD, and Removable Disk backup sets only)
- The Internet Tab (Internet backup sets only)

The Summary Tab

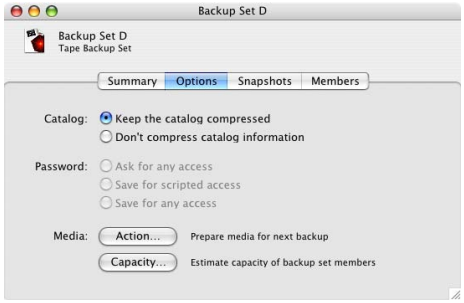
The Summary tab displays general information about the backup set.

- **Used** shows the number of files in the backup set and their aggregate size.
- **Available** shows how much space remains on the current backup set member.

- **Storage** summarizes the number of media members and sessions in the backup set and the number of Snapshots in its catalog.
- **Options** summarizes the options specified on The Options Tab.
- **Security** shows the backup set's level of password protection.
- **Catalog** shows the path to the location where the backup set's catalog is stored.

The Options Tab

The Options tab has controls for catalog compression, catalog separation, configuring password access, controlling future media for this backup set, and estimating capacity of the set's members.



The Options tab for a tape backup set.

The Catalog compression radio buttons give you the option of compressing the catalog file, saving space on your hard disk, but possibly slowing catalog manipulation such as matching files.

The Catalog Separate button, available only with file backup sets, allows you to split a combined file set into separate files for the data and the catalog. See page 22 for more information.

The Password radio buttons allow you to choose the level of password protection for secure backup sets. Password options are not available if you did not specify encryption or password protection when you created the backup set.

The Media Action button displays the media control manual override dialog, which allows you to specify how the storage media will be handled the next time you perform a backup to this backup set.

- Normal continues to append data to the current backup set and media.
- Recycle erases the backup set data and catalog and reuses the media. This is also known as resetting the backup set.
- New Media creates a new backup set that requires new, blank media.
- Skip requests a new member to add to the current backup set the next time it is used as a destination. Skip is useful when the current member (CD/DVD, tape, or disk) is almost full and you wish to get a complete, unattended execution without changing media.

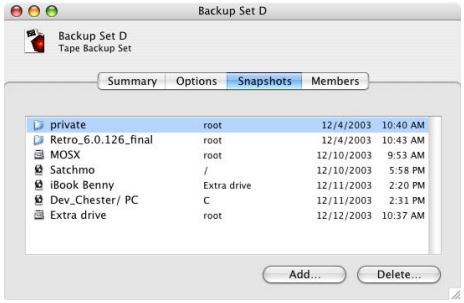
The Media Capacity button, available only with CD/DVD and tape backup sets, allows you to change Retrospect's estimate of your tape or disc capacity. The capacity estimates are used for display purposes only and do not affect how much data Retrospect will copy to a medium because it uses all the space it can.

Leave the default (Automatic) to let Retrospect estimate the capacity, unless your media consistently get higher capacity than Retrospect estimates. To see the actual capacity, click the

Members tab for a few of your backup sets that have full tapes or discs.

The Snapshots Tab

The Snapshots tab shows the most recent volume Snapshots in the backup set catalog and provides basic information about each Snapshot.



- For each Snapshot, Retrospect lists the volume name, and creation date and time.
- Click Add to retrieve older Snapshots from the storage media. In the Snapshot Retrieval window, select a session, then click Retrieve.
- Select a Snapshot and click Delete to remove the Snapshot from the catalog file. A deleted Snapshot will be replaced with a new Snapshot when the volume is next backed up.

The Members Tab

The Members tab lists all the media members of a backup set. For example, if your backup set has grown to span three tapes, all three are listed here.

NOTE: This tab is not available for file and Internet backup sets.

If a member of a backup set gets lost or damaged, you can designate it as missing. This lets Retrospect know that the files previously saved to that member are no longer available. Select the missing or damaged member, then click Set Missing. Missing members are marked with the poof icon .

During the next backup or archive operation, Retrospect copies the files that were on the missing member to a new backup set member, ensuring that you have a complete backup.

The Internet Tab

The Internet tab includes FTP login information and the location of the Internet backup set. You can change this information if your FTP settings change after you have created the backup set.

See page 48 for more information on Internet backup sets.

MAINTAINING SCRIPTS

This section provides instructions for various tasks you may need to perform in maintaining the scripts you have created. Maintenance tasks include:

- Checking Scripts
- Modifying Script Settings
- Duplicating, Renaming, or Deleting a Script
- Viewing Scheduled Scripts
- Skipping Script Execution

To perform any of these tasks, first click the Automate tab in the Retrospect Directory.

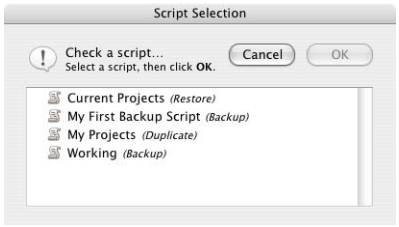
Checking Scripts

Before quitting Retrospect to run a script unattended, it is a good idea to confirm the script is ready for unattended operation. You can check the validity of a script and also make sure the required media is available in the backup device.

To check a script

1. Click Check from the Retrospect Directory's Automate tab.

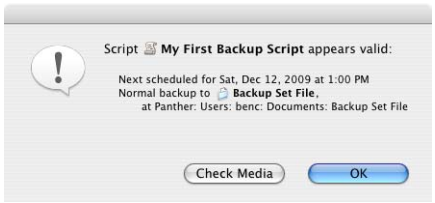
The Script Selection window displays a list of scripts.



2. Select the script you want to test and click OK.

Retrospect checks the script definition to make sure that a Source and Destination have been properly defined. A message informs you if the script is missing necessary information. Click Edit to modify the script.

If the script is complete, a message appears telling you the script is ready.



NOTE: The information in this dialog depends on the type of backup set and the media currently loaded in the backup device.

3. Click OK to return to the Retrospect Directory, or click Check Media to have Retrospect check whether the required backup set member is available.

NOTE: When you exit Retrospect, it automatically prompts you to check media for the next scheduled valid script. See “Quit Action Preference” on page 160 for more information.

Modifying Script Settings

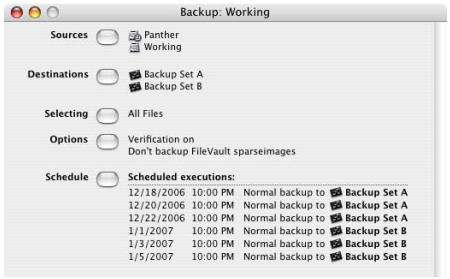
At any time, you can modify the settings you specified when creating a script—you can choose different source volumes or destination backup sets, change the file selection criteria, the options, or the schedule. You modify scripts from the script summary window.

To modify script settings:

1. In the Retrospect Directory, click the Automate tab, then click Scripts.

A list of scripts displays.

2. Select the script to modify and click Edit.



3. Modifying the script is the same as creating it. See Chapter 5 • Automated Operations.

4. Choose Save from the Script menu to save the modified script.

Duplicating, Renaming, or Deleting a Script

You can base a new script on an existing one by duplicating a script and then modifying the settings of the duplicate copy. Existing scripts can also be renamed or permanently deleted.

To duplicate, rename, or delete a script

1. Click the Automate tab in the Retrospect Directory.

2. Click Scripts to display a list of scripts.

3. Select the script to duplicate, rename or delete.

4. To duplicate the script, choose Duplicate from the Scripts menu.

Enter a name for the new script and click New. Then modify and save the new script.

5. To rename the script, choose Rename from the Scripts menu.

Enter a new name for the script and click Rename.

NOTE: You can also rename a script when its script summary window is active.

6. To delete a script, choose Forget from the Scripts menu.

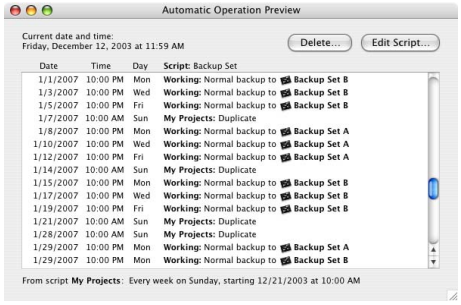
Click OK to confirm deletion. The script is removed from the list and its scheduled executions are eliminated.

TIP: If you do not want to receive a confirmation message when you delete scripts, press and hold the Option key as you issue the Forget command.

Viewing Scheduled Scripts

Retrospect maintains a list of upcoming scripts. You can view this list to see which scripts are scheduled to run and when. You can also modify the execution schedule by deleting scheduled events or by editing a script and changing its schedule.

Click Preview from the Automate tab to view the execution schedule for all scheduled scripts.



The Automatic Operation Preview window displays the date, time, and day of the week that upcoming scripts are scheduled to run. It also lists the script name, backup action, and destination.

Deleting a Scheduled Event

To delete a scheduled event *and all prior events* for its scheduler, click the event to select it, then click Delete. Click OK to confirm deletion. The event and all prior events for its scheduler are removed.

Editing Scheduled Scripts

To edit the script associated with an event listed in this window, click the event to select it, then click Edit Script. The script summary window appears, and you can click the Schedule button to modify the schedule or any other component of the script.

For details on modifying schedules, see "Scheduling Scripts" on page 73.

Skipping Script Execution

If you do not want a script to run for a period of time, you can turn the script schedule off and specify when to turn it on again. This is useful, for example, if your office closes a week for holidays and nobody will be there to change media in the backup device.

To skip script execution:

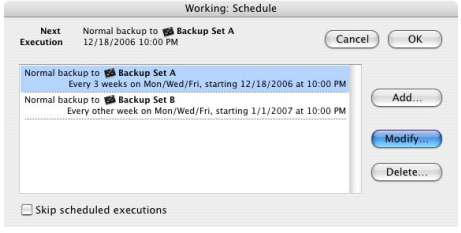
1. Click Scripts from the Automate tab to display the list of scripts.

2. Select a script then click Edit.

The script summary window displays.

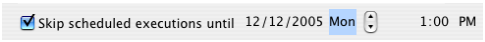
3. Click Schedule.

Retrospect lists the currently scheduled dates and times for this script.



4. Click the Skip scheduled executions checkbox at the bottom of the window.

A date and time field appears at the bottom of the window.



5. Set the date and time for the script to start executing again, then click OK.

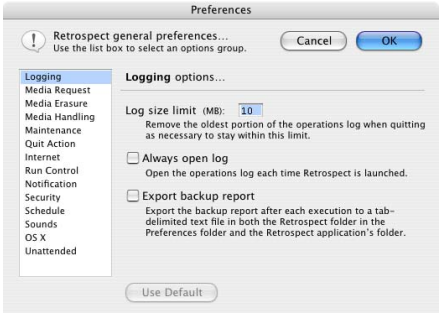
Retrospect ignores execution events prior to this date and time.

NOTE: When multiple schedulers are shown in the script schedule window, the selected scheduler is not the only one skipped by this feature. It skips *all* the scheduled executions for this script.

RETROSPECT PREFERENCES

You can adjust Retrospect preferences to modify the application's behavior to best meet your needs. Retrospect preferences are global, that is, they affect all operations performed by Retrospect.

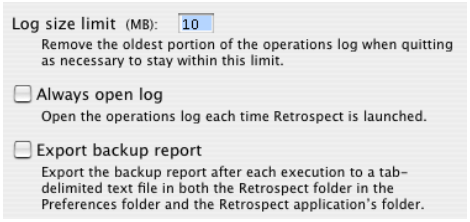
To access Retrospect preferences, click the Special tab in the Retrospect Directory, then click the Preferences button. The Preferences window displays.



On the left is a list of the different categories of options. The options for the selected category appear on the right. Set the options, then click OK to save your selections.

NOTE: If you change the default setting for an option, the category name appears in bold in the list. To restore the default settings, select the category name and click Use Default.

Logging Preferences



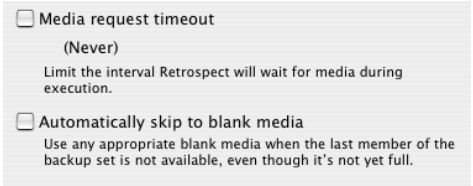
Log size limit (MB) maintains the Operations Log size within the limit you set in the field provided. You can set the limit anywhere between 1 MB and 100 MB. When the log reaches the limit, the oldest portion of the log is deleted to keep its size within the limit. The bigger the log is, the longer it will take to open. The default size is 10 MB.

Always open log automatically opens the Operations Log each time you start Retrospect. By default, this preference is turned off.

Export backup report produces or updates two identical files after each execution. (One Backup Report file is in the folder with the Retrospect application and the other is in the Retrospect preferences folder.) The tab-delimited text files contain all the information from the Backup Report.

See "Viewing the Backup Report" on page 137 for more information on how to export it manually.

Media Request Preferences

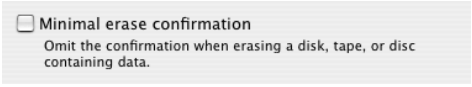


Media request timeout specifies a period of time for Retrospect to wait for media during execution. When the times elapses, the execution stops and Retrospect proceeds according to the

next scheduled event. This preference is off by default, so it never times out.

Automatic skip to blank media makes Retrospect use an erased tape, disc, or disk for subsequent normal backups when the current member of the tape, CD/DVD, or removable disk backup set is not available. For example, you can select this option and leave an erased tape in the drive when the current tape of the backup set is almost full. Then you need not wait for the old tape to fill and be prompted to change tapes. When this option is not selected, Retrospect always prompts for the most recent member of the backup set until it becomes full. By default, this preference is turned off.

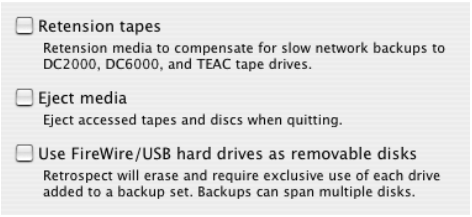
Media Erasure Preferences



Minimal erase confirmation skips the confirmation message that normally appears when you proceed with a backup operation and Retrospect needs to erase the media. By default, this preference is turned off.

For example, let's say you do a normal backup to a tape member backup set named "1-Backup Set A", but the only member loaded in your tape drive has a different name. Retrospect displays the media request window in which you can select the currently loaded tape. If the minimal erase option is checked and you select the tape and click Proceed, Retrospect will erase and use the tape. If the minimal erase option is unchecked, Retrospect displays a warning dialog asking if you really want to erase the tape.

Media Handling Preferences



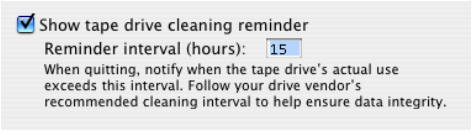
Retension tapes winds a tape forward to the end and back to even out the tension and alignment. (This applies only to some drives.) By default, this preference is turned off.

Eject media ejects tapes and discs when you quit Retrospect. By default, this preference is turned off.

Use FireWire/USB hard drives as removable disks allows you to use FireWire and USB hard drives in removable disk backup sets. Backups can span multiple hard drives.

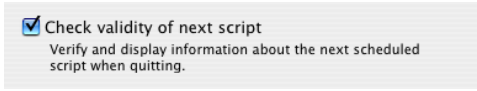
WARNING: Retrospect requires exclusive use of each hard drive added to a removable disk backup set. In addition, any data on the drive at the time it is added will be deleted.

Maintenance Preference



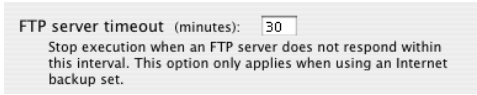
Show tape drive cleaning reminder does so at the specified interval of hours of tape drive use. The reminder appears as a note in the log and as a notification dialog in the Finder after you quit Retrospect. If you never quit you will never get a reminder. By default, this preference is on, with an interval of fifteen hours. Use your drive vendor's recommended cleaning interval.

Quit Action Preference



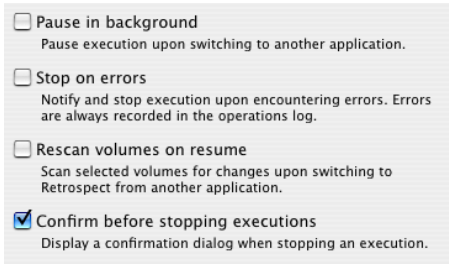
Check validity of next script does so when you quit Retrospect. It automatically verifies and displays information about the next script scheduled to execute. By default, this preference is turned on.

Internet Preference



FTP server timeout is the number of minutes Retrospect waits for a response from an FTP server during an operation with an Internet backup set. If the time passes without a response from the server, Retrospect disconnects and terminates the operation. This preference is thirty minutes by default.

Run Control Preferences



Pause in background automatically pauses any operation Retrospect is performing when the Retrospect application is moved to the background. By default, this preference is turned off.

Stop on errors automatically stops a Retrospect operation and displays an alert message if any error occurs. By default, this preference is turned off.

Rescan volumes on resume rescans selected volumes for changes when you switch to Retrospect from another application. By default this preference is off.

Confirm before stopping executions displays a confirmation dialog whenever you stop an execution (Backup, Restore, etc.). If you want to stop executions without receiving the confirmation dialog, deselect the checkbox. By default this preference is on.

Notification Preferences

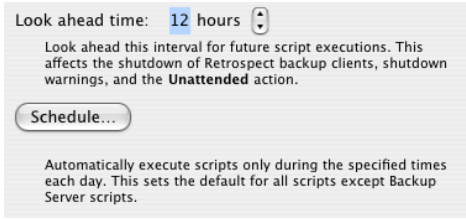
Automatically launch Retrospect automatically starts Retrospect when a scheduled script is waiting to execute. By default, this preference is turned on.

Animate Dock icon causes the Retrospect icon in the Mac OS X Dock to bounce when Retrospect is requesting media.

Security Preferences

Always require authentication causes Retrospect to prompt the user to supply an administrator login and password each time the application is opened by a user under Mac OS X.

Schedule Preferences



Look ahead time: *n* hours/days defines the number of hours or days Retrospect looks ahead for scheduled script executions. This affects what happens when you begin to shut down the backup computer or a client, and what Retrospect does when it completes an unattended operation. The default preference is twelve hours.

For more information, see “Notification Preferences” on page 160, “Client System Options” on page 147, and “Unattended Preferences” on page 162, respectively.

Schedule lets you define a window during which scripts are allowed to execute. This preference affects all scripts, except Backup Server scripts. The default window during which scripts are allowed to run is twenty-four hours a day, seven days a week.

NOTE: You can also define a window for specific individual scripts. See “Schedule Option” on page 148 for more information.

To customize the schedule:

1. Click Schedule.

The Weekly Schedule window displays.

By default, all twenty-four hours of each of the seven days of the week are selected.

2. To select a day of the week, click it. Click and drag to select contiguous days of the week. Use the Shift or Command key and click or drag to select days without deselecting the previous selection.

To change a time, click on it and type or use the controls.

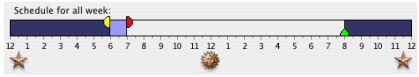
Start is the earliest time at which scheduled executions may begin.

Wrap Up is the period of time (in hours and minutes) before the stop time, during which Retrospect should complete the current operation but not begin new operations.

Stop is the time at which Retrospect absolutely must halt scripted operations (until the next start time).

NOTE: You can also set times by dragging the icons on the hourly schedule bar, but you should first experiment by typing the times to see how these controls work.

When a time is changed, the hourly schedule bar changes accordingly to graphically represent the start, wrap-up, and stop times.

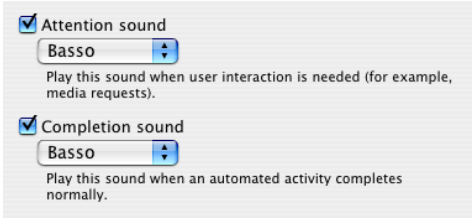


Each selected day has a scaled-down hourly schedule bar, though it does not have controls.

The Always and Never buttons set the daily operating time to twenty-four hours and none, respectively.

3. Click OK when done.

Sounds Preferences



Attention sound lets you choose one of the available system sounds to use when Retrospect

requires user interaction, such as during a media request.

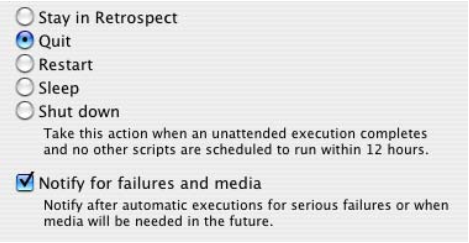
Completion sound lets you choose one of the available system sounds to use when Retrospect completes an operation.

OS X Preference

Privileges Warning displays an alert message if a volume you are working with is set to ignore privileges under Mac OS X. By default, this preference is turned on.

This option is important, because in order to properly restore to or duplicate to a volume other than the current system volume under Mac OS X you must turn off "Ignore privileges on this volume" for the volume.

Unattended Preferences



Stay in Retrospect, Quit, Restart, Sleep, and Shut down determine what Retrospect does when a script is completed and no additional scripts are scheduled in the specified look ahead time. (See "Schedule Preferences" on page 160.) By default, this preference is set to Quit.

Notify for failures and media displays an alert message if errors occur during the automatic execution of a script. It also displays an alert message when CD/DVDs, tapes, or disks will be needed in the future. This option is only available if you have selected the Quit, Restart, Sleep, or Shut Down preferences described above. By default, this preference is turned on.

MOVING RETROSPECT

If you ever decide to switch backup computers, you must do more than just install Retrospect and your backup device on the new machine. You must move some other files to the new backup computer in order to keep Retrospect's preferences, clients, catalogs, scripts, and schedules intact.

To move Retrospect to a new backup computer:

1. Install Retrospect on the new computer.

2. Copy the catalog files from the old backup computer to the new computer.

NOTE: The default location that catalog files are saved is Users/*username*/Documents.

3. Copy the preferences from the old backup computer to the new computer.

Preferences are saved in Library/Preferences/Retrospect. Copy the entire Retrospect folder into the same location on the new backup computer, replacing any existing Retrospect folder there.

4. Next, you must force Retrospect (on the new backup computer) to recognize the catalog files you just moved.

The easiest way to do this is to select all of the catalogs in the Finder, and double-click one to open all of them. Retrospect opens a backup set configuration window for each catalog, causing it to recognize the catalogs.

5. If you previously backed up both the old and the new backup computer and you want to continue to do so, you must perform a few extra steps because their status has changed:

- If the new backup computer was previously backed up as a client, that is no longer necessary since its volumes are now local. Forget the client. Edit the sources in any

Retrospect scripts that used client volumes from the new computer and add the volumes which are now local.

- If you still want to back up the old backup computer you must install Retrospect Client software on that machine to access its volumes with Retrospect from the new backup computer. After installing and configuring the client, add its volumes to your scripts. Click the Volumes button on the Configure tab and choose Forget from the Volumes menu to remove the previously local volumes. Forgetting volumes removes them from the volumes database and any scripts which use them.

CATALOG AND CONFIGURATION BACKUPS

Part of your backup strategy should be to back up the backup computer. The simplest way to do this is to include the computer in your backup scripts. The most important files to back up are Retrospect's backup configuration file (Retro.Config (6.0)) and your catalog files.

You can use the Finder or Retrospect to back up these files. Periodically copy them to another volume, such as a removable disk or file server, to help you recover from a disaster more quickly. Or, set up a Retrospect duplicate script to automatically copy the files to a folder on another volume. Use the Retrospect Files selector to select appropriate files, and schedule the script to run daily, when your other backups are complete.

If you back up your backup computer to multiple backup sets, your catalogs and configuration are automatically covered in case of a disaster. Each backup set contains backups of the other backup sets' catalogs. Alternatively, if you have several large catalogs, consider backing them up to their own dedicated backup set to help recover from a disaster or lost catalog more quickly.

Catalog Backups

Catalog files are important adjuncts to backup sets, but face the same risks as your files since they often share the same hard disk. If you lose your catalog files, Retrospect cannot restore any files until the catalogs are rebuilt from the media, which can be a lengthy process. For this reason, back up your catalog files as well as your regular files.

The default location that catalog files are saved is Users/*username*/Documents.

Configuration Backups

Retrospect's configuration file contains your client database, scripts, schedules, preferences, custom selectors, and other important information.

Retrospect uses the configuration file, named Retro.Config (6.0), located in the following folder:

Library/Preferences/Retrospect

WORKING WITH MACINTOSH FILE SERVERS

This section describes how to use Retrospect to back up volumes shared by Mac OS file sharing. These operations require special procedures to ensure access privileges are intact after the volume is restored.

Restoring servers is detailed in "Restoring a Mac OS Server Client" on page 125.

Shared volumes maintain access privileges that determine which users and groups of users can see and change files and folders. These privileges are active only when the server is running and the volume is shared.

To retain access privileges for a server, file sharing must be on during the backup. During a subsequent restore operation, Retrospect reassigns privileges to the same users and groups that were active during the backup. Otherwise, any privileges for the restored and retrieved folders revert to the volume owner or server administrator.

There are two ways to back up Mac OS file sharing servers and Mac OS X Servers. The methods are:

- Local Mac File Server Backup
- Client Mac File Server Backup

WARNING: Do not back up Mac files servers as mounted volumes. Retrospect will not preserve privileges using this method.

Local Mac File Server Backup

Local backup of a server involves running Retrospect Workgroup or Retrospect Server on the backup computer with a backup device connected and file sharing activated. This is the fastest way to back up a server.

Client Mac File Server Backup

Client backup of a server uses the Retrospect client software on the server computer. Retrospect runs on another computer and backs up the server without using file sharing.

NOTE: You must have Retrospect Server to back up a server as a client.

Backing Up a Server to Move its Contents

If you are going to back up a server to move its contents (for example, you have a more powerful Macintosh to be the new server) you should make two separate verified backups. Verification, which is on by default, ensures the integrity of the data; having two backups will not leave you stranded if one fails for some reason.

WORKING WITH OTHER SOFTWARE

No program is an island. Among the thousands of other software programs available for the Macintosh, there are but a few which can cause problems with Retrospect or which require special attention. These programs are described below.

Read the contents of the "read me" file installed by the Retrospect installer program. It may contain late-breaking information on software which requires special attention for use with Retrospect.

Disk Images and DOS Partitions

DOS partition files, which are created by DOS and Windows software emulators, are backed up as large files. Each time you use the PC emulator, the partition file is modified (and, accordingly, needs to be backed up). Disk images have similar issues, i.e., they can be very large and are modified often.

To avoid huge IncrementalPLUS backups of these types of files, exclude them from your daily backups to save time and space, but schedule a separate, regular backup of these files, so they can be restored.

Databases

Most database applications (such as 4D Server and FileMaker) cache data in memory, periodically writing to disk. Even if all users are logged off you cannot be sure all of the most recent modifications have been saved to disk. Because of this, we recommend that you use one of the following two options for backing up a database application.

- Quit the database application before starting your Retrospect backup. This guarantees a backup of all the data. You can use AppleScript and/or a macro program like QuicKeys to quit and start your database as needed.

- Use the database's built-in backup module (if available) in combination with Retrospect. Use Retrospect to back up the non-active data file created by the database.

CHAPTER 9

TOOLS

- WORKING WITH VOLUMES
- BROWSING
- USING SELECTORS
- MAINTENANCE AND REPAIR
- APPLESCRIPT SUPPORT
- E-MAILING BACKUP REPORTS

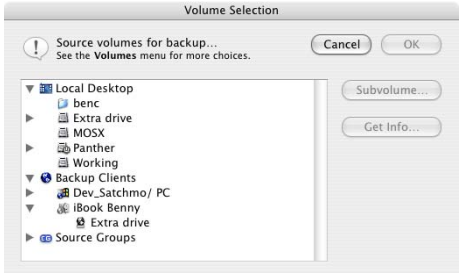
Retrospect has a number of features which go above and beyond the basics required for backup and restore operations. Your knowledge of these features is not essential to use Retrospect, but knowing them allows you to work with the program faster and more efficiently.

WORKING WITH VOLUMES

A volume is the operating system's representation of a random-access storage device, such as a hard disk drive or partition, removable disk, or CD-ROM. It can also be a file server on the network. A volume is the basic storage unit containing files and folders. Retrospect uses volumes as sources for backups and other operations and helps keep track of files with volume Snapshots.

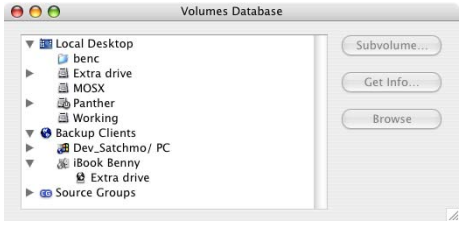
Volume List Windows

Retrospect has two volume list windows. Many Retrospect operations use the Volume Selection window for you to select one or more volumes for the operation at hand.



The Volume Selection window for an immediate backup.

A similar window, the Volumes Database window, can be used to manage volumes. The Volumes Database window has some additional features that are not available from the volume selection windows. For example, the Volumes Database window allows you to browse a volume to view its contents.



The Volumes Database window.

Using either window is fairly straightforward; you click on the volumes you want, then click a button or choose a menu item to proceed or act on the selected volume.

To practice the techniques described here, open the Volumes Database window by clicking the Retrospect Directory's Configure tab, then clicking the Volumes button.

The volumes listed in the scroll box are organized in an outline format similar to that of the Finder's "view by name" list view.

Displaying Volumes

In a volume list window, the triangle icons on the left work just like those in the Finder. Click on a ▶ icon to show the contents of its container or folder. Click on a ▼ icon to hide the contents of its container or folder. A volume does not have this control unless it has one or more defined subvolumes

Selecting Volumes

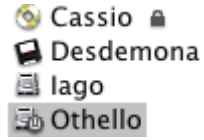
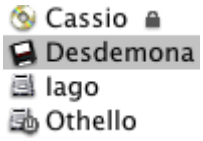
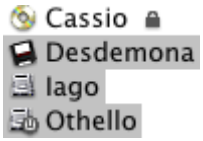
In a volume list window, you click on a volume to select it. This deselects any other selected volumes.

Press and hold the Command key and click a volume to select it without deselecting any currently selected volumes. You can make a multiple non-contiguous or contiguous selection this way.

Press and hold the Shift key and click a volume to select all volumes listed from the current selection to the Shift-clicked volume. This is called a contiguous multiple selection.

NOTE: Some operations do not allow multiple selections. (For example, you cannot restore to multiple volumes.)

Following are examples of these selection methods.

Original selection 	After clicking on Desdemona 
After Command-clicking on Desdemona 	After Shift-clicking on Desdemona 

These methods of making individual and multiple selections work throughout Retrospect, not just in the volume lists.

Browsing Volumes

The Volumes Database window has a Browse button which is not found in the Volume Selection window. To view and work with the contents of a volume, select the volume and click the Browse button to open a browser. Browsing a volume is explained in detail in “Browsing” on page 172.

Containers

In a volume lists, volumes, clients, and groups are organized under the containers Local Desktop, Backup Clients, and Source Groups.

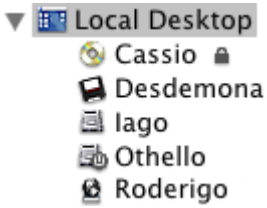
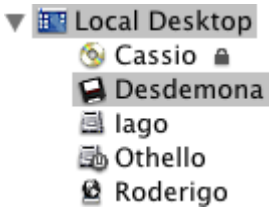
Selecting one of these top-level containers selects everything in that container. For example, you could back up every hard disk and removable disk attached to the backup computer, and every client logged into Retrospect, simply by selecting the Local Desktop and Backup Clients containers as sources.

Local Desktop

The Local Desktop container holds volumes mounted on the backup Macintosh desktop. This includes the internal hard disk, an inserted removable disk, external drives, and FileVault volumes for logged in users.

When you select the Local Desktop container itself, you are instructing Retrospect to select all such volumes on the backup computer, except floppy disks, network volumes, and read-only volumes (such as CD-ROMs).

The following table shows some examples of Local Desktop container selections and the volumes to which they resolve. (For example, if the selection were used in a backup operation, the resolved volumes would be backed up.)

Using this selection…	…resolves to these volumes.
	Iago Othello
	Desdemona Iago Othello

Backup Clients

The Backup Clients container holds client computers that are logged in to Retrospect. Clients themselves contain one or more volumes, which are made available according to how they are configured with the General tab of the client configuration window. For details, see Chapter 6 • Network Backup.

When you select the Backup Clients container itself, you are instructing Retrospect to select all clients contained within it (i.e., all currently logged in clients).

Source Groups

The Source Groups container holds volumes grouped together for better organization. Groups, which you define, do not contain the actual volumes themselves, but aliases which point to actual volumes (which are in Local Desktop or Backup Clients).

For example, you could make an Accounting group containing the volumes from the accounting department. Later when you are creating a backup script, instead of tediously selecting each individual accounting volume, you can just select the Accounting group and Retrospect knows you mean all of the volumes within that group.

NOTE: Source Groups are not available in volume lists of duplicate and restore operations.

Creating Groups: To create a new group, choose Make Group from the Volumes menu. After you enter its name in the dialog, the new group appears under the Source Groups container. Any items that were highlighted when the group was created will belong to the new group.

Adding Volumes to Groups: You can drag any volume from the Local Desktop and the Backup Clients containers into a group.

Arranging Group Items: You can drag any volume out of one group and into another group. You can drag a volume to a different location within its group to rearrange the order of the group.

Removing Groups: You can remove an unwanted group or item by selecting it and choosing Forget from the Volumes menu or pressing the Delete key.

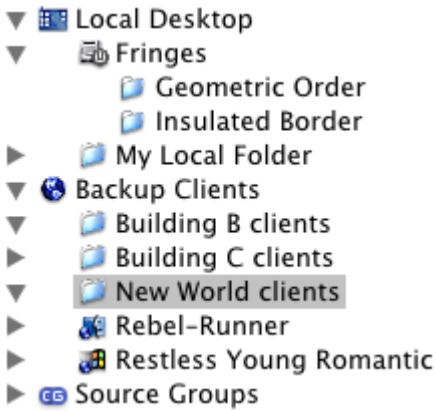
Folders

You can make folders to help organize the information which appears in the volume list window. For example, while setting up a backup you can select a folder as a backup source and Retrospect will back up all the volumes in the folder.

NOTE: These folders are specific to Retrospect and do not appear outside the program.

Creating Folders

To create a folder, choose New Folder from the Volumes menu. Retrospect asks which type of folder you want, which determines whether it is created in the Local Desktop container or the Backup Clients container. After you make your choice and give the folder a name, it appears in the volumes list represented by the  icon.



Arranging Folders

You can drag any volume into or out of a folder to better organize the list of volumes. Just like folders on a hard disk, folders are useful for hiding numerous items to avoid cluttering your work space.

For example, if you are administering a large number of clients, you can arrange them in a logical order by placing the individual volumes into their respective department folders, such as Accounting, Engineering, and Manufacturing.

You can then select a folder in a volume selection window and Retrospect selects all the volumes within the folder.

Removing Folders

You can remove an unused folder by selecting it and choosing Forget from the Volumes menu or pressing the Delete key. However, you must move the contents (if any) out of the folder before you forget it.

Subvolumes

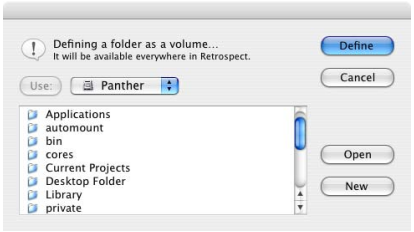
A subvolume is a folder on a volume you define to work like a volume for use within Retrospect. After a folder is designated as a subvolume it can be specified as a source or destination for Retrospect operations. Subvolumes have no function outside Retrospect and their mere existence does not affect a volume's files and folders in any way.

If you only want to back up files in a single folder, specifying a subvolume (instead of specifying a volume and using a custom selector) reduces the file scanning time, minimizes the number of files displayed in a browser, and reduces the amount of memory needed.

Retrospect treats a subvolume as another volume on your system. Once a folder has been defined as a subvolume, you can rename the folder in the Finder and Retrospect will continue to recognize it—with its new name—as a subvolume. However, if you remove the folder, Retrospect will not be able to locate the subvolume, even if you put a new or different folder with the same name in its place.

Specifying Subvolumes

In a volume list, select a volume, then choose Make Subvolume from the Volumes menu or click the Subvolume button in the window. A dialog appears, listing folders at the top level of the selected volume.



You can specify any folder in the selected volume as a subvolume, including folders nested deep within the folder hierarchy. Select the folder you want to specify as a subvolume and click Define. (To define the folder name currently displayed in the pop-up menu as a subvolume, click Use.) The subvolume folder, identified by the icon, then appears with the volumes in the volume list.

NOTE: If you specify both a subvolume and its parent volume as Sources, they will be treated as separate objects. However, operations involving the parent volume will include the contents of the folder designated as a subvolume.

To discard a defined Subvolume:

1. In the Volumes Database window, select the subvolume.

2. Choose Forget from the Volumes menu or press the Delete key.

Forgetting a subvolume does not affect the contents of the original folder or any file you may have already backed up from it.

Volume Utilities

The Volumes menu has commands for defining and forgetting subvolumes and for renaming,

ejecting, putting away, and erasing listed volumes.

Make Subvolume

To define a folder as subvolume, select its parent volume and choose Make Subvolume from the Volumes menu. Use the dialog as described in "Specifying Subvolumes".

Configure

To configure a client, select the client or one of its volumes from the list and choose Configure from the Volumes menu. The client configuration window appears.

For details on how to use this window, see "Configuring Clients" on page 96.

The Configure command can also be used to enable Retrospect to automatically mount a shared volume when it is needed—typically, while executing a backup script—and unmount it when Retrospect is done with it.

To configure a shared volume, first log in to mount the volume on the desktop. Select the volume in the Volumes Database list and choose Configure from the Volumes menu. The password configuration dialog appears, listing the server, volume, and user names. In the space provided, enter the password for the displayed user name, then click OK. Unmount the volume from the desktop before adding the volume to your scripts.

When it needs to access the volume, Retrospect will mount the volume on the desktop, access it, and then unmount it when done.

Rename

To change the name of a volume or subvolume, select it and choose Rename from the Volumes menu. Enter a new name in the dialog that displays, then click the Rename button.

Eject

To eject removable media from a drive, select its volume name and choose Eject from the Volumes menu.

Put Away

To unmount a mounted volume (such as a server), select its volume name and choose Put Away from the Volumes menu.

Forget

To remove a volume or subvolume from the list, select it and choose Forget from the Volumes menu. Currently mounted volumes, such as removable disks and shared volumes, cannot be forgotten. Forgetting a server forgets its databases and defined subvolumes.

Erase

To erase the contents of a volume, select it and choose Erase from the Volumes menu. Be careful; this command permanently removes all files from the volume.

BROWSING

Browsers are Retrospect's powerful tools for viewing, selecting, and manipulating files and folders on your source and destination volumes. From within Retrospect, browser windows provide file management facilities similar to those in the Finder, and include other features not available in the Finder.

Browsers "unfold" the contents of a volume so you can work with all of its contents all at once. This lets you easily select multiple files within different folders. You can also view browsers in a flat-file structure, without the folder hierarchy.

Browsers allow you to see the files chosen for backup, restore, duplicate, and copy operations. You can also use browsers in a "stand-alone" manner to view and manage the contents of volumes. In backup, restore, duplicate, and copy

operations, browsers show you which files have been chosen by the selector you designated and allow you to mark and unmark files.

You can open any number of browser windows, including different browsers for the same volume. You can also leave browser windows open while performing other Retrospect operations and switch back and forth between browser windows and other Retrospect windows.

When a browser window is active, Retrospect adds a Browser menu to the menu bar. It has commands for finding, selecting, and managing folders and files in the browser listing.

Viewing a Stand-alone Browser

To view a stand-alone browser of a volume, go to the Retrospect Directory's Configure tab and click Volumes. The Volumes Database window appears, listing the names of available volumes. Select a volume, then click Browse. Retrospect scans the selected volume, then displays a browser window listing all the folders and files contained in the selected volume.

To view a stand-alone browser of a backup set, see "Viewing Backup Set Contents" on page 141.

Viewing a Browser from an Operation

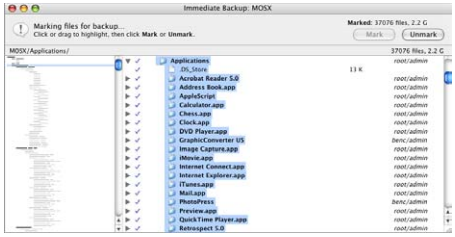
To view a browser within an immediate backup, restore, duplicate, or copy operation, click the summary window button named either Files Chosen or Preview. Retrospect displays a browser window for each source.

Browsers and Scripts

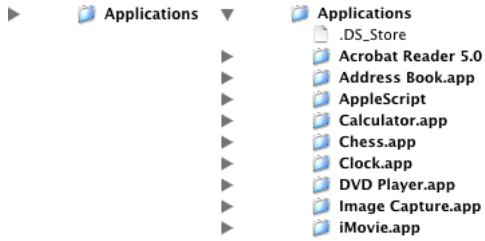
You cannot use a browser within a script because scripts are meant for unattended execution at a later time. Using a browser would not be useful because a volume's contents are likely to change between the time you edit the script and the time the script is executed.

About Browsers

A browser window displays a hierarchical file list of folders and files in the selected volume.



At the top of the list (and at the highest level of the hierarchy) is the name of the volume. Folders have triangle icons to their left; click a triangle to show the contents of the folder. Click the triangle icon again to hide the contents of the folder. Open folders have triangles pointing downward rather than to the right.



Folder contents hidden. *Folder contents showing.*

The scrolling folder index on the left of the window provides a thumbnail view of the folders on the volume. Click on the folder index to display the associated file list on the right side of the window. The pathname of the current selection is shown above the index. Tick marks in the folder index indicate the location of selected items in the file list. Index lines appear grey for unopened folders or black for open folders.

A highlight count in the upper right corner of the window indicates how many files are highlighted and shows their total size.

Selecting Files and Folders

In a browser window, you select files and folders on which to perform operations. Select files by clicking on entries in the file list. Drag through the list or Shift-click to select a range of files or folders. Command-click to select or deselect non-contiguous items. Select all items by choosing Select All from the Edit menu. Double-clicking a file both selects (highlights) and marks it. Marking is described below, under "Marking Files and Folders."

Getting Additional Information

Retrospect provides a Get Info command you can use to view information about the selected files and folders.

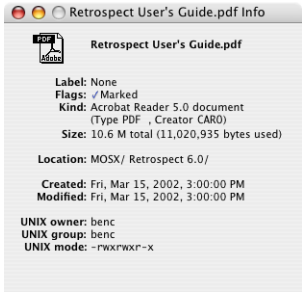
Get Info provides information such as the file/folder location, size, dates of creation and modification, and Linux permissions.

To View Information About Files or Folders:

1. From a browser, select the files or folders for which you want more information.

2. Choose Get Info from the File menu.

An Info window appears for each selected file or folder, displaying additional information.



Marking Files and Folders

A marked file or folder is one that is designated to be used in some way (for example, backed up, archived, duplicated, or restored). When performing operations, Retrospect marks files according to the rules of the selectors in the search criteria, but you have no way of knowing which files are marked unless you use browsers. In addition to simply viewing a list, you can manually mark and unmark files and folders within a browser.

Marked files indicate the files you want Retrospect to evaluate when performing an operation. Not all the marked files will be backed up (or duplicated, restored etc.). For example, during a backup using Retrospect's default settings, only new and modified files will be backed up, regardless of which files you mark. Retrospect displays a diamond icon in the browser list next to source files that already exist on the destination. These files will not be copied to the destination again, saving time and media space.

You mark files and folders in a browser by selecting them and clicking the Mark button. A check mark appears to the left of a file or folder when it is marked. Click Unmark to remove marks. You can also mark and unmark files and folders by double-clicking them.

To mark or unmark an item without affecting the highlighting of other items, press and hold the Command key while double-clicking.

By marking or unmarking a folder you perform the same operations on all the files (and folders) contained within that folder. For example, to specify a single folder for backup, you would double-click on the volume name at the top of the file list to unmark all of the files, then scroll to the folder you want to back up and double-click the folder icon to mark it and its contents.

The Browser menu provides additional commands for highlighting and marking in the window.

Skip Next: scrolls the list forward to display the next highlighted file.

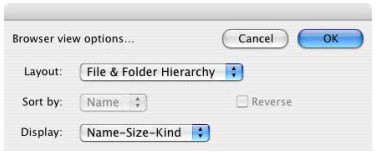
Highlight Marks: highlights marked files. If you click or double-click an item without hold-

ing the Command key you may end up unhighlighting marked items. This command is useful for rehighlighting them.

Cross Reference: allows you to locate files in the same hard disk or session that are related to a specified file. Specifically, Cross Reference finds duplicate files, older versions of the same file, and even files that have been renamed but were originally from the same file. This command highlights, but does not mark, cross-referenced files.

Selecting View Formats

Choose the View Options command from the Browser menu to specify how you want to view the contents of a volume.



The Layout pop-up menu provides two different layouts for displaying the contents of a volume.

- **File & Folder Hierarchy** displays files and folders in the same hierarchical structure in which they are stored on the volume. This is the default layout that Retrospect uses when you first open a browser window.
- **Sorted Files—No Folders** displays all files stored in the selected volume as a single "flat file" list, discarding any folder designations.

For both types of browser layouts, the Display pop-up menu allows you to specify the type of file information displayed in the browser window. You can choose from Name-Size-Kind, Name-Size-Label, Name-Size-Modify Date, Name-Size-Backup Date, and Name-Size-UNIX.

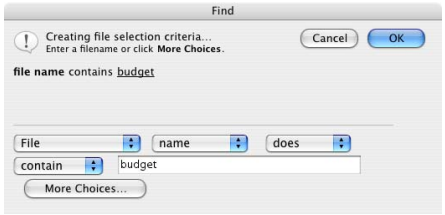
When the Sorted Files layout is specified, the Sort By pop-up menu becomes available, allowing you to choose one of six sorting options for displaying files in the flat file format: Name, Size, Kind, Label, Modify Date, and Backup Date.

When you choose a sorting option, Retrospect normally sorts the files in ascending order. For example, if sorting by size is specified, the browser lists the smallest files at the top of the list and largest files at the bottom. You can specify a descending order for the current sorting option by selecting the Reverse checkbox.

When you specify layout and display options for the current browser window and click OK, Retrospect re-displays the files using the specified options.

Finding Files

The Browser menu has a Find item that you can use to locate specific files or folders (but not empty folders) on the volume.



The Find window (showing Fewer Choices).

In the text entry field, type the text for which you are searching.

NOTE: This feature is not case-sensitive. It makes no difference whether you use lower or upper case letters.

The window also provides pop-up menus for specifying the type of search you want to perform.

File lets you specify which items you want to find, using one of three search variations: File matches the name of the file, Folder matches the name of the folder and selects the files immedi-

ately inside the folder, and Enclosing Folder matches the name of the folder and selects all files within the folder, including files nested in other folders.

Name specifies whether you are looking for the search text in the name of a file or folder, or in a path name. Path names always begin with the volume name and list the hierarchy of folders, separating folder names with colons (Mac OS 9) or forward slashes (Mac OS X). When you use "path name" and "End With" or "Match" (see below) to find a folder, you must type a colon or slash at the end of the path name. For example, "Startup Drive:Documentation:" and "Reports/TPS/".

Does specifies inclusive or exclusive searches. For example, if you choose "does not," and perform a search on file names, Retrospect selects all the files and folders whose names do not contain the search text.

Contain specifies where the search text is positioned within the name. You can specify that the search text be located at the beginning (Start With) or end (End With) of the name, or contained somewhere within a name (Contain). Or you can specify that the name exactly match the search text and no additional text (Match).

Click More Choices to build a custom selector to use in searches for a file or folder. The window that appears is identical to the selector details window you use to build Retrospect selectors.

For more information on using the Find window to build search conditions, see "Using Selectors" on page 177.

To perform a search, choose Find from the Browser menu. Edit the search criteria in the Find window and click OK. Retrospect highlights all files and folders that meet the search criteria. You can mark the highlighted files by clicking the Mark button in the browser window.

Printing or Exporting a File List

Any time a browser window is active, you can print the contents of the file list or export it to a file. To print, choose Print from the File menu. If you use Page Setup to reduce the printing size, Retrospect will print a browser in more than one column to save pages. To export to a text file, choose Export from the File menu. Retrospect exports the fields in the following order, regardless of the view format: file name, size, create date, create time, modify date, modify time, backup date, backup time, type, creator, backup set (if any), and path.

Copying and Pasting Selections

You can copy selections between browser windows or into the Scrapbook for temporary storage. When you copy a selection, only the file and pathname information is copied, not the files themselves. This feature is useful for copying selections from a stand-alone browser window into a browser window opened during a Retrospect operation such as restore.

NOTE: You can only paste a copied selection into a browser window or the Scrapbook. You cannot paste a copied selection into any other applications or documents.

To Copy Selections Between Browser Windows:

1. Make your file and folder selection then choose Copy from the Edit menu.

2. Open (or bring to the front) the appropriate browser window for the same volume.

3. Choose Paste from the Edit menu.

Retrospect pastes the selection into the new browser window, highlighting only the same files and folders (in the same folder hierarchy) which were selected and copied in the other browser window.

Saving Selections as a Selector

You can also save file and folder selections as a selector that you can use to reselect files for future Retrospect operations on the same volume, including backups and restores.

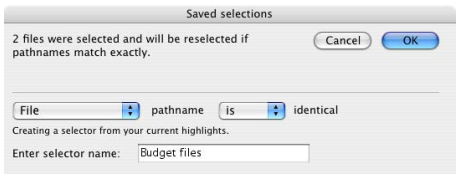
NOTE: Before you save a selection as a selector, consider creating a custom selector as described in "Using Selectors" on page 177. You can easily review and modify custom selectors at any time. A selector created with a browser's Save Highlights command cannot be reviewed or modified once it has been defined.

To Save Selections as a Selector:

1. Select the files/folders you want to apply to a selector.

2. Choose Save Highlights from the Browser menu.

The window that appears tells you how many files and/or were selected and will be reselected (or excluded) by this selector if pathnames match exactly.



3. Use the "is" pop-up menu to specify whether the saved selector is inclusive or exclusive.

This window also includes file and folder options similar to those in the find window, as described in "Finding Files" on page 175.

4. Enter a selector name then click OK.

Retrospect creates the new selector, which is now available for other Retrospect operations.

Rescanning a Volume

You can update the contents of the browser window by choosing Rescan from the Browser menu. This is useful, for example, if you make changes to the volume (for example, in the Finder or another browser window) while the volume's browser window is open.

The Rescan command appears in the Browser menu only when Retrospect is working with a volume directly. For example, you can not rescan a volume when you are Browsing a backup set.

Deleting Files

Retrospect browsers have a Delete from Disk command to remove files from a volume, which is like placing a file in the Finder's Trash can and emptying the trash.

NOTE: The Delete from Disk command is only available when Retrospect is working with a volume directly. For example, you can not delete a file when you are browsing a backup set.

To Delete Files:

1. Select the file or files you want to delete in the file list.

2. Choose Delete from Disk from the Browser menu.

A dialog appears, asking you to specify whether you want to remove the selected files only or remove the selected files and any empty folders that may result from the file deletions.

3. Make your choice, then click OK.

Retrospect permanently deletes the selected files from the volume.

WARNING: A delete command may not be undone with the Undo command, nor may a file be pulled from the Trash can. When a file is deleted, it is gone.

USING SELECTORS

You can use selectors with immediate and automated operations to specify the types of files and folders you want the operation to include. Using selectors to intelligently select certain

files and folders you can limit the amount of time and media required for an operation.

Selectors let you choose files based on almost any criteria, including name, date, type, or size. Retrospect includes a number of built-in selectors, and you can also create custom selectors. For example, you can create a selector that will choose AppleWorks document files modified after October 17, 2003.

A file that is marked by a selector will not necessarily be copied to the destination. All copying operations (such as backups) using selectors are "smart," because of Retrospect's matching feature. For each selector, there is the implied meaning of "select this file, but do not copy it if it already exists in the destination."

NOTE: Retrospect's selectors do not select empty folders.

The Selectors Window

You create and modify selectors through Retrospect's selectors window.

To display the selectors window, click the Special tab in the Retrospect Directory, then click Selectors. The selectors window lists all of the predefined and user-defined selectors.

The selectors window has two buttons for working with the selectors.

New creates a new selector.

Edit allows you to add new conditions or modify existing conditions for a selector.

When the selectors window is open, Retrospect adds a Selectors menu to the menu bar. It includes the following commands:

New Folder makes a folder container for organizing selectors.

Duplicate makes a copy of the currently highlighted selector.

Rename lets you change the name of the currently highlighted selector.

Forget removes the currently highlighted selector.

Built-in Selectors

Retrospect includes twelve built-in selectors, with predefined conditions for selecting files.

Some selectors and selector conditions function differently with Mac OS, Windows, and Linux volumes. Examine a selector's details for more information.

Retrospect's built-in selectors are:

All Files marks all files on the source, including the system folder. This is the default selector.

All Files Except Cache Files marks all files on the source, except cache files used by certain applications, such as web browsers. These cache files, which are often large, are not needed for restoring.

Applications marks only applications except those which are selected by the System Folder selector. On Windows clients, this marks file names using the extensions .COM, .EXE, and .DLL.

Documents marks files which are not selected by the System Folder or Applications selectors. On Windows clients, this marks all files outside the current Windows folder except .COM,

.EXE, and .DLL files. (It does not mark NT profiles, because they are stored in the Windows folder.)

Documents Folder marks the contents of any folder named “My Documents” or “Documents”.

Documents Folder & Hot Items marks the contents of any folder named “My Documents” or “Documents” and files and folders bearing the Mac OX Panther red-colored label or the Mac OS 9 Hot label. (The label name may be something other than Hot; Retrospect uses any name you redefine in the second menu position.)

Exclude Cool Items marks everything except files and folders with the Mac OS 9 Cool label. (The label name may be something other than Cool; Retrospect uses any name you redefine in the fourth menu position.)

Hot Items marks only files and folders bearing the Mac OS 9 Hot label. (The label name may be something other than Hot; Retrospect uses any name you redefine in the second menu position.)

Movies copies the contents of all users’ Movies folder (i.e, any folder named “Movies”) and additional files outside the Movies folder with common movie file extensions (e.g., .mov, .avi, .mpg, .wmv, etc.).

Music copies the contents of all users’ Music folder (i.e., any folder named “Music”) and additional files outside the Music folder with common music file extensions (e.g., .aac, .mps, .ogg, .wma, etc.).

Music, Movies, Pictures is a combination of the Music, Movies, and Pictures selectors.

Pictures copies the contents of all users’ Pictures folder (i.e., any folder named “Pictures”) and additional files outside the Pictures folder with common picture file extensions (e.g., .jpg, .jpeg, .tiff, .tif, .bmp, .psd, .png, .gif, etc.).

Retrospect Files marks files having the “Pery” creator code used by the Retrospect Backup family.

System Folder marks only the contents of the Mac OS 9 system folder or the Mac OS X core operating system folders. On Windows clients, this marks the current Windows folder.

Users Folder and Prefs (OS X) copies the Mac OS X Users folder containing all users data and the Library>Preferences folder where some applications (including Retrospect) store preferences information. By default, this selector excludes browser cache files.

Compression filter is used by Retrospect to determine which files to compress when using its software compression option. It is not for use in script criteria. (For me information, see “Compression Options” on page 146 and the Data compression option in “Backup Options” on page 143)

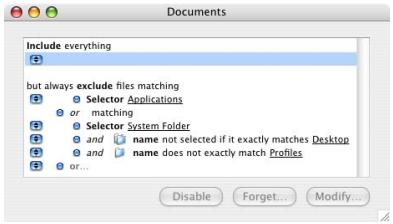
This selector tells Retrospect which files have already been compressed so they are not compressed again. You do not need to modify this selector unless you use a compression program that Retrospect does not know about.

No Files does not back up any files. Use the No Files selector when you are creating a script for the purpose of shutting down client computers on nights when they will not be backed up. For more information, see “How can I prevent the “waiting for backup” dialog from appearing on Mac OS 7/8/9 clients on nights when no operation is scheduled?” on page 210.

All Files is the default selector used for immediate operations and scripts. You should use this selector to ensure complete backups.

You can easily incorporate selectors into your own scripts. You can view selectors to better understand them, and you can even modify them to suit your needs. Do not modify the built-in selectors until you have some experience creating your own. In fact, it's better to duplicate a predefined selector and modify the copy.

To view a built-in selector, click on it to select it in the selectors window and click Edit (or just double-click the selector), which brings up a window with the selector's condition details.

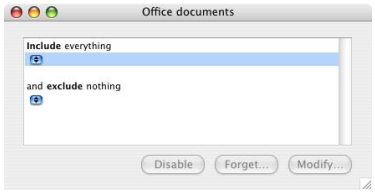


In addition to viewing the selector, this window also lets you modify it to make your own custom selector.

Selector Conditions

You build a selector by adding conditions for including or excluding files or folders that meet the selection criteria. As you build the selector you can add and relate multiple conditions, and even use logical operators to create sophisticated criteria for file selection.

To view or modify selector conditions, select a selector in the selectors window, then click Edit. The selector details window appears, displaying two distinct areas for adding conditions; one for conditions which include files or folders for an operation, and one for conditions which exclude files or folders.



The arrow buttons underneath the Include and Exclude headings are pop-up menus of condition types.

The conditions pop-up menu in the selector details window.

You can build your own selectors using the following conditions.

Date

The Date condition uses creation, modification, or backup dates as conditions. Windows operating systems do not implement a true backup date for files; they instead use an archive attribute. When the archive attribute is on, one is to assume the file has changed since its last backup and needs to be backed up.

Retrospect uses the archive attribute when it evaluates the backup date condition with files from a Windows client volume. When a file's archive attribute is off Retrospect assumes its backup date is one second after its modification date. When a file's archive attribute is on Retrospect assumes its backup date is in the year 1904.

Retrospect's interpretation of the archive attribute lets you use a selector condition such as "modification date is on or after file backup"

with both Windows and Macintosh clients achieving the same functionality.

NOTE: You do not have to use backup dates to perform IncrementalPLUS backups; Retrospect does IncrementalPLUS backups by default.

File Kind

The File Kind condition uses file creator and type as conditions. The Mac OS uses type and creator codes to identify files, but the Windows operating systems use three-character name extensions following files. Retrospect maps some extensions into type and creator codes.

TIP: To select by file kind on Windows clients, use the name condition to select file names ending with a period and the three-character extension.

Flags

The Flags condition uses file attributes, such as file marked, matched, busy, locked, invisible, alias, name locked, stationery, or custom icon as the conditions. The following flags, when used with files from Windows clients, behave differently than when they are used by Mac OS files. The behavior is as follows:

- **Marked**
- **Matched**
- **File Busy** is not useful.
- **Locked** indicates a file which allows read access only.
- **Invisible** indicates a hidden file.
- **Alias** is not useful.
- **Name Locked** indicates a system file.
- **Stationery** is not useful.
- **Custom Icon** is not useful.
- **Has bundle**

Label (Icon Color)

The Label condition uses a file or folder's label as a condition. The Label menu or submenu in the Finder contains seven labels (and colors, if your monitor displays colors or shades of gray) and the "None" option. Each checkbox in this window corresponds to a specific item position in the Label menu and not to the actual color or label name. This condition is not useful with Windows clients.

Name (Backup Client)

The Backup Client name condition uses the name from Retrospect's client database as the condition.

Name (File/Folder)

The File/Folder name condition uses the name of the file or folder as the condition. The File pop-up menu has three options: "File" matches the name of the file, "Folder" matches the name of the folder and selects the files immediately inside the folder, and "Enclosing Folder" matches the name of the folder and selects all files within the folder, including files nested in other folders.

Name (Sharing)

The Sharing name condition uses file sharing owner, group, or login names as the condition. This condition is not useful with Windows clients.

Name (Volume)

The Volume name condition uses the name of the volume as the condition. For Windows clients, this is the drive label, such as C:, not its volume label shown in its properties.

Selector

The Selector condition uses another selector as the condition.

Size (File/Folder)

The File/Folder size condition lets you specify file or folder size as the condition.

Special Folders

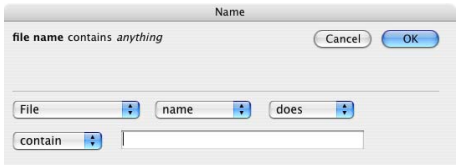
The Special Folders condition uses certain system-defined folders, such as Volume Root, Desktop Folder, and Control Panels, as the conditions to be used with local and client volumes. The only part of this condition useful with Windows clients is System Folder, which selects the active Windows folder.

UNIX

The UNIX conditions work with Linux file systems. You can specify file and directory permissions, as well as the state of Set-User-ID, Set-Group-ID, and the sticky bit.

Working with Conditions

Each condition type has its own controls for entering and specifying details for the condition. For example, the Name (File/Folder) condition window is as follows.

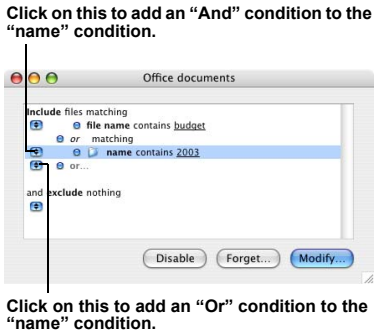


When you add or change a condition it appears in the selector detail window.

You can add multiple conditions to a selector by choosing other conditions from a pop-up menu. The location of the pop-up menu determines the relationship between the conditions; it may add a condition with the And operator or may add a condition with the Or operator. Each pop-up menu has its operator type as its first item (though it is grayed out because you may not choose it) so you know whether you are And-ing or Or-ing a new condition.

The And operator allows you to combine conditions so that a file or folder must meet the combined conditions before it is selected. Each condition uses an And operator, except each final condition of the Include and Exclude areas.

The Or operator allows you to build conditions where a file or folder must meet at least one condition—but not necessarily all conditions—before it is selected. The last condition under each Include and Exclude area always uses an Or operator.



To gain a better understanding of how this works, see "Creating a Custom Selector" on page 183 and experiment with conditions on your own.

Condition Examples

The table below shows an example of a custom selector and its effect when applied to some files.

Condition Rules

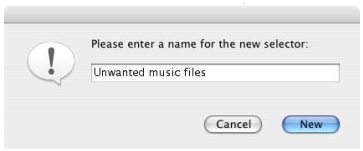
Exclude statements always take precedence over Include statements when Retrospect applies the selector. For example, if a selector has a statement which includes the Preferences folder and a statement which excludes the System Folder, the files in the Preferences folder will not be marked.

Creating a Custom Selector

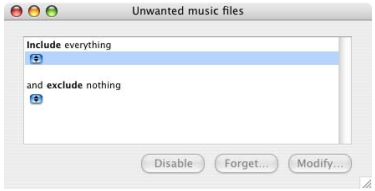
Retrospect allows you to quickly build selectors that can perform sophisticated file and folder selection. The best way to learn about custom selectors is to create one. In the following example, you create a custom selector that excludes music files from backup.

Creating a New Selector

From the Retrospect Directory's Special tab, click the Selectors button, then click New. Retrospect prompts you to name the new selector. This example uses "Unwanted music files" but you can enter a name of your own.



After typing the name, click New. Retrospect displays a selector details window for the new selector. Notice the window name is the selector name.



By default, new selectors include everything and exclude nothing, until you add conditions.

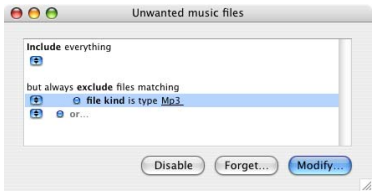
Excluding Files

Use the arrow pop-up menu beneath the exclude heading to choose the File kind condition. Retrospect displays the following window.

Using this Selector	On these Files	Marks these Files
Include files matching **file name** contains something *or* matching **file name** contains nothing	nothing can survive in a vacuum some things I'd like to say something for nothing something more to give	nothing can survive in a vacuum something for nothing something more to give
Include files matching **file name** contains something *and* **file name** contains nothing	nothing noble in your fate something breaks the silence something for nothing	something for nothing

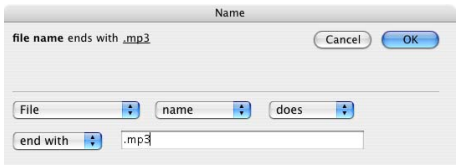
Table 9-1: Examples of custom selector conditions and their effects.

This window lets you specify a file type and/or creator as a condition. Select the "Mp3" type only, which is likely associated with QuickTime Player, then click OK. The selector details window now reflects our new condition.



At this point, the selector excludes some MP3 files on some systems. We are ready to add a second condition to exclude more MP3 files.

Use the lowest arrow pop-up beneath the Exclude heading again and choose the Name (File/Folder) condition type. The Name (File/Folder) window appears. Change the menus so it says, "File name does end with," then enter ".mp3" in the box.



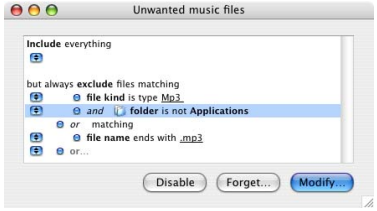
Click OK to return to the selector details window. At this point, the selector excludes some MP3 files on some systems or files ending with ".mp3".

Because we chose this condition from the lowest arrow pop-up, Retrospect added the condition to the selector with the Or operator. Or and And operators are explained on page 182.

We are ready to add a third condition. Use the arrow pop-up alongside the file kind condition to choose the Special folders condition.

By using this pop-up, Retrospect adds the new condition with the And operator. The Special folders condition details window appears.

Change the menus so it says, "Enclosing folder is not Applications," then click OK. The selector details window appears with the now-finished selector.



The multiple conditions work together in the finished selector to exclude all files ending in ".mp3" and exclude files having the Mac OS type "Mp3" which are not in the Applications folder. You may now use it in scripts or immediate operations, including browsing. You may later edit it to add conditions which further exclude unwanted MP3 music files.

Selector Menu

When a selector details window is active, Retrospect adds a Selector menu to the menu bar. The Selector menu has the following commands:

Save: This saves the selector using its current name, replacing what was last saved.

Save As: This lets you save the selector using a different name. Enter the new name in the dialog which follows, then click Save. The original selector remains as it was when it was last saved.

Revert: Lets you discard your current changes to a selector and revert it back to its last saved state.

Rename: Lets you change the name of the selector. Enter the new name in the dialog which follows, then click Rename.

Check Selector: This lets you test your selector by applying it to a volume. Retrospect asks you to select a volume for browsing with your selector. Do so and it opens a browser window with the files that match the selector criteria marked with checks.

If the correct files are marked, the selector is working correctly and you can begin using it for immediate operations or in scripts.

If the files that are marked are not the correct ones, you need to modify your selector and check it again. You may need to add conditions, delete conditions, or modify the conditions. Pay close attention to the And and Or operators which affect the results of your selector. When you have finished modifying your selector, save it and check it again to see if the correct files are now marked. Repeat this process as needed until your selector is working correctly.

Using a Selector

You can easily incorporate built-in or custom selectors into your own scripts or immediate operations. Here's how:

1. Follow the normal steps to create your script or immediate operation.

2. In the summary window, click Selecting to bring up the selecting window.

3. Choose a selector from the pop-up menu, then click OK to return to the summary window.

4. Close and save your script or execute the immediate operation.

The selector will be applied when the operation is executed.

Printing a Selector

You can print the contents of selector details windows to keep for reference. To print a selector window, edit the selector and choose Print from the File menu.

Modifying a Selector

Any condition that appears in a selector details window can be modified. After you modify a condition, Retrospect returns to the selector details window, where you can add new conditions or modify existing conditions.

To open a selector from the selectors window, click on the selector you want to modify then click Edit (or just double-click the selector). Retrospect opens the details window for the selector.

To edit a selector's existing condition, select it and click Modify, or just double-click the condition line. When a condition is reopened, you can modify its options. Click OK to save the changes to the condition.

To add a new condition, choose the type of condition you want to add from an arrow pop-up menu. A condition window appears, providing

options for specifying the type of condition you chose. Make the appropriate choices and settings in the window then click OK to add it to the selector. The condition window closes and the selector window now displays the new condition.

Disabling Conditions

At any time, you can disable a condition within a selector. When a condition is disabled, it has no effect on file selection and will remain inactive until it is enabled. This feature is useful when a selector becomes very complex and you want to resolve problems by testing parts of it.

To disable a condition open a selector and select the condition you want to disable. Click Disable and Retrospect disables the selected condition, displaying it in grayed out text to identify it as inactive.

You can restore a disabled condition by selecting the condition and clicking Enable.

Moving Conditions

Within a selector details window, you can move a condition by dragging the  button next to the condition description and dropping it at a new location within the window's scroll box.

You can drag any condition to a new location, either in the same group or another group or heading. For example, if you added "file kind" as a condition for inclusion under the Include heading, you can change the same condition to an exclusionary condition by dragging it beneath the Exclude heading.

When you move a condition, its outline follows the hand cursor, indicating the new location for the condition. Release the mouse button when a new outline appears in your desired destination. After you drop it, Retrospect moves the condition to the new location, inserting it before the outlined destination condition.

To copy the condition, press and hold the Option key while dragging. Dragging an "or matching" heading moves the entire group. Option-dragging an "or matching" heading copies the group.

NOTE: Pay attention to the operator type (And or Or) of what you are dragging; moving it may change the operator.

Removing Conditions

At any time, you can remove a condition from within a selector.

To delete a condition, open a selector and select the condition you want to remove. Click Forget and then OK to remove the selected condition from the window.

Deleting a Selector

If you no longer need a selector you can delete it through the selectors window.

To delete a selector, click on it to select it, then choose Forget from the Selector menu or press the Delete key. A dialog appears, asking you to confirm the deletion; click OK. Retrospect deletes the selector.

Duplicating a Selector

Sometimes, you will want to duplicate a selector so that you can make slight modifications to fit your needs. For example, you may want to modify a copy of one of Retrospect's built-in selectors but leave the original untouched. You can make a duplicate through the selectors window.

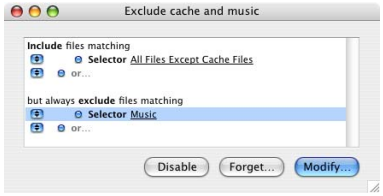
To duplicate a selector, click on the selector to select it, then choose Duplicate from the Selector menu. A dialog appears, providing a field for entering a new selector name. Type a new name and click New. Retrospect creates an exact copy of the selector, using the name you provided in the dialog.

Selector Examples

Following are examples of selectors and explanations of each.

Backup Selector

This selector excludes cache files and music files to save space on the backup media.



A backup selector that excludes cache and music files.

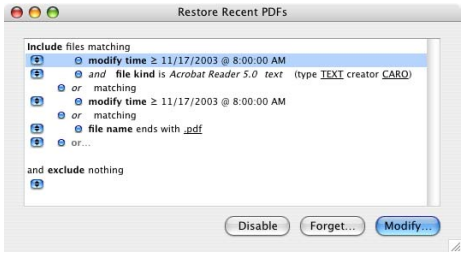
Network Backup selector

This selector marks all user data on Leslie's client computer to be backed up, except for her music files. In this example, the backup administrator knows that Leslie has a lot of music files that take up too much space on the backup. This selector excludes the music files from getting backed up.

A network backup selector that excludes music files on a specific client computer.

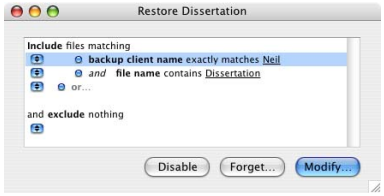
Restore Searching Selector

This selector searches for PDF documents modified after the year 2001. This selector is a good example of how and/or logic works and shows how you often must use multiple conditions to select files from different operating systems. This example also shows how you can define often-used search criteria in a selector so you do not have to define the criteria each time you want to restore by searching.



Client Restore Searching Selector

This selector searches for a named file that was created on a particular client user's computer. In this case, the name of the file is "Dissertation" and client's name is "Neil." This selector could be used during an immediate restore operation.



MAINTENANCE AND REPAIR

This section provides instructions for maintaining and repairing catalogs and media by performing the following tasks:

- Updating catalogs that are out-of-date or "out of sync".
- Rebuilding catalogs that are missing or damaged. (If it produces "chunk checksum" errors, it is damaged.)
- Repairing damaged file backup sets.
- Verifying backup set media integrity to confirm that all files are readable.

To perform these tasks, first click the Tools tab from the Retrospect Directory.

Updating a Catalog

You should update a backup set's catalog when Retrospect reports a "catalog out of sync" error while operating with the backup set. You must

update the catalog to synchronize it with the media or you will be unable to use the backup set.

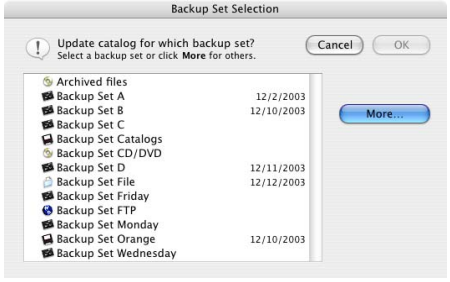
A "catalog out of sync" error indicates Retrospect was unable to update the catalog the last time it copied data to this backup set—possibly because of a crash or power failure. This error may also be caused by error –34 (volume full) or error –108 (out of application memory).

NOTE: If, after updating a catalog, you continue to get "out of sync" errors when using the backup set, do not attempt to repair the catalog again. You must skip to new media, reset with a recycle or new media backup, or create a new backup set. See page 217 for more information on the error message.

To Update a Catalog:

1. Click Repair from the Retrospect Directory's Tools tab.

2. Select Update existing catalog file then click OK.



3. Select the backup set to update then click OK.

4. If Retrospect cannot find the most recent member, it displays a media request window.

5. Insert the requested media.

Retrospect recatalogs the backup set, informing you of its progress with the execution status window. When Retrospect is finished with a particular member of a backup set it asks whether there are any more members.

6. If there are no more members because you have already given Retrospect the final medium in the backup set, click No to complete the update.

If there are more members in the backup set, click Yes.

7. Retrospect continues to ask you for additional backup set members until you click No or Done.

The execution status window informs you whether the update was successful. If the operation was not successful, refer to the Operations Log for additional information.

Rebuilding a Catalog

You cannot use a backup set unless it has a catalog file, so you should rebuild the catalog whenever the original catalog file is lost or damaged. Retrospect can rebuild a catalog by reading the backup set media. Rebuilding may take a long time, depending on the amount of data in the backup set.

To rebuild a catalog:

1. Click Repair from the Retrospect Directory's Tools tab.

2. Select one of the rebuild functions then click OK.

For a tapes, removable disks, or CD/DVD backup set, the Media Selection window displays.

3. In the Media Selection window, select the most recent member of the backup set.

If you do not have the first member, insert any other member of the backup set to be recataloged.

4. Click OK

If you are recreating a catalog for a backup set that is still known by Retrospect, it asks whether you want it to recognize the rebuilt backup set instead of the known backup set. Click OK to replace the known backup set.

5. If the backup set is encrypted, Retrospect asks for its password. Enter the password and click OK.

6. Specify a location to save the rebuilt catalog file and click Save.

Retrospect recatalogs the backup set, informing you of its progress in the execution status window. When Retrospect finishes recataloging a particular member of a tape, disk, or CD/DVD backup set it asks whether there are any more members to recatalog.

7. If there are no more members because you have already given Retrospect the final medium in the backup set, click No to complete the recataloging.

If there are more members in the backup set, *even if one or more members are lost or damaged,* click Yes.

8. Insert the requested member of the backup set, or if you do not have it, click Choices.

A dialog asks you what happened to the member.

If you have already given Retrospect the final medium in the backup set, click Done. If you do not have the requested backup set member, or if it is damaged, click Missing.

9. Retrospect continues to ask you for additional backup set members until you click No or Done.

The execution status window informs you whether the recreation was successful. If the operation was not successful, refer to the Operations Log for additional information.

NOTE: After Retrospect informs you the recataloging was successful, you should edit the scripts that used the backup set and add the newly recognized, rebuilt backup set as the destination within each script.

Repairing a File Backup Set

The Catalog File for a file backup set is stored in the same file as the backup set data. In order

to repair a file backup set catalog, you must have access to the backup set.

To repair a file backup set:

1. Click Repair from the Tools tab in the Retrospect Directory.

2. Select Repair file backup set and click OK.

3. Browse to the location of the file backup set's catalog file and click Open.

A message asks you to confirm the backup set repair.

4. Click Yes to repair the backup set.

5. If the backup set is encrypted, Retrospect asks for its password. Enter the password and click OK.

Retrospect recatalogs the backup set, informing you of its progress in the execution status window. If the repair was not successful, the execution status window reports any errors. You can find more information about the errors in the Operations Log.

Incomplete Catalog Repair

Any time you stop a cataloging operation while Retrospect is working with the second or subsequent member, the following dialog appears.

Revert stops recataloging and allows you to continue updating the catalog from the current medium later. (To continue later, use the Update existing catalog function.)

Save should be used when you do not wish to try to catalog any more data from the current medium. All data cataloged so far should be retrievable. (To continue later, use the Update existing catalog file function.) Recataloging will resume with the next medium if there is one. If you back up more data to the backup set after using this option, Retrospect will ask for a new medium, treating this one as full.

NOTE: If you stop Retrospect before it completes recataloging an Internet backup set, you must later start over to ensure all files are intact. (Do not use the "Update existing catalog file" repair function.)

Verifying Media Integrity

Retrospect can check all files on your backup set media to make sure that they are readable, then report files lost or damaged by media failure. For example, if Retrospect informs you that the file you just retrieved is damaged, you may want to verify the backup set media to ensure that other files are intact.

Verifying media does not mean Retrospect compares the files on the media with the original files. It only verifies that the files on the backup set media are readable.

To verify media integrity:

1. Click Verify from the Tools tab.

Retrospect displays the Backup Set Selection window.

2. Select the backup set to verify and click OK.

Retrospect verifies the backup set media, informing you of its progress in the execution status window.

If the backup set uses recordable discs, removables disks, or tapes, Retrospect asks you to insert each backup set member as it is needed.

If you do not have the requested backup set member, but have other members of the backup set to verify, click Choices, then OK, and insert the next requested piece of media.

After verifying the last available member of the backup set, Retrospect displays the number of files verified. If there are errors, a browser displays the files that could not be verified. You should examine the Operations Log for additional information.

NOTE: Consider backing up unverified files to a new backup set.

APPLESCRIPT SUPPORT

This section assumes a knowledge of AppleScript. It is intended only for advanced users who wish to further automate Retrospect with AppleScript. If you want to learn AppleScript, read a tutorial book and study the sample scripts included with Apple system software.

Due to the complex nature of AppleScript, Dantz Development offers only minimal support for these features.

Installing Apple Event Support for Retrospect

When you install Retrospect, a folder named AppleScript Utilities is put in the same folder as the Retrospect application. This folder contains the Retrospect Event Handler script application and sample AppleScript scripts you can use or examine to help you start scripting Retrospect on your own.

NOTE: When updating from an older version of Retrospect, you must also update the Retrospect Event Handler.

To activate script triggering, you must copy the Retrospect Event Handler script application to Retrospect's preferences folder. The path is:

/Library/Preferences/Retrospect/

If you only want to control Retrospect with Apple events, you do not need to activate script triggering.

Installing AppleScript Support for Retrospect Client

Retrospect clients running under Mac OS X do not support AppleScript.

Under Mac OS 9 and earlier systems running AppleScript, the Retrospect client installer places the Retrospect Client Commands file in the Scripting Additions folder in the System Folder. (If AppleScript was not running when you installed, you can rerun the installer and custom install these AppleScript items.)

You can Custom Install the Retrospect Client AppleScripts folder. It contains sample AppleScript scripts you can use or examine to help you start scripting the Retrospect Client control panel on your own.

Further Automation with AppleScripts

In addition to its built-in scripting and scheduling features, you can also use Retrospect and the Retrospect Client control panel with scripts created with the AppleScript Script Editor, UserLand Frontier, and other Apple event scripting utilities. There are three ways to use Apple events to script Retrospect and the Retrospect Client control panel:

- Retrospect is scriptable, so you can send events to Retrospect to initiate various operations. For example, you can use an AppleScript script to back up a volume, start a prepared Restore script, or poll Retrospect to see if it is busy.
- Retrospect is attachable, meaning Retrospect can trigger scripts to run. For instance, Retrospect can run a script that quits your database application before a backup and starts it again when the backup completes. Or it can run a script that sends a message to your text pager warning you that

the wrong media is in the backup device. This is accomplished with the Retrospect Event Handler.

- With the Retrospect Client Commands scripting addition installed, the Retrospect Client for Mac OS 7/8/9 is scriptable. You can use scripts to set the preferences and scheduling features of the Retrospect Client control panel. For example, you can use an AppleScript script to adjust the Backup Priority during certain hours or to request a backup ASAP from Backup Server.

NOTE: When saving scripts, use the syntax-checking option in your script editor to help avoid errors.

Sending Apple Events to Retrospect

You can use Apple events to perform a variety of operations, including starting Retrospect scripts, finding out what script is running, and spontaneously running backups. Following is a sample AppleScript script to back up your hard disk to a backup set:

```
tell application "Retrospect"
    activate
    back up "Local Desktop:Macintosh HD" to
"Backup Set A"
end tell
```

Nearly everything you need to know to control Retrospect with Apple events is in Retrospect's dictionary and in the sample scripts. (To view the dictionary, choose Open Dictionary from the Apple Script Editor's File menu and open Retrospect.) Refer to the Read Me file in the AppleScript Utilities folder for more information about scripting Retrospect and about the example scripts.

NOTE: When you use AppleScript to send a script name to Retrospect, the capitalization of the name must match that of the name as it appears in Retrospect.

NOTE: When you refer to a volume or subvolume in Retrospect, you must use the hierarchy that appears in the volume configuration window. For example, to refer to a subvolume named "Reports" on the local hard disk "Macintosh HD" you would use "Local Desktop:Macintosh HD:Reports".

Using Retrospect to Trigger Scripts

Some events cause Retrospect to send messages to the Retrospect Event Handler script application, "triggering" it to run one of its handlers. The default handlers are surrounded by comment marks so Retrospect's messages are ignored. If you remove the comment marks, the handlers will display a dialog as each event occurs, naming the event and in some cases listing information about the event. These handlers are included only as examples to help you with your own scripts.

To make Retrospect trigger your own scripts, first copy the handler representing the event that triggers your script. Paste it at the top of the script, outside the comment marks. (Leave the original handler in place, in case you need it later while debugging your own scripts.) Then place your own AppleScript code between the handler's "on" and "end" statements.

NOTE: If you save a copy of the Retrospect Event Handler script application by choosing Save As from Apple Script Editor's File menu, select both the Stay Open and Never Show Startup Screen checkboxes.

The following example AppleScript script quits FileMaker Server when Retrospect starts a script that backs up the database, and then opens the server again when the backup is completed.

```
on scriptStart given scriptName: theScript,
startDate: theDate
    if theScript is "Back Up Database" then
        tell application "FileMaker Server"
            force quit
        end tell
```

```
    end if
end scriptStart

on scriptEnd given scriptName: theScript, ¬
    scriptErrorMessage: theError, errorCount:
theErrorCount
    if theScript is "Back Up Database" then
        tell application "FileMaker Server"
            activate
        end tell
    end if
end scriptEnd
```

Sending Apple Events to the Mac OS 7/8/9 Retrospect Client Control Panel

NOTE: Retrospect clients running under Mac OS X do not support AppleScript.

You can use Apple events to perform a variety of operations, including setting your client preferences and examining the status of your client to determine if a backup is in progress. Following is an example AppleScript script to turn on your client's Wait At Shutdown preference only on Fridays:

```
on run
    set thePreferences to Retrospect Client
preferences
    if "Friday" is in ((current date) as string) then
        set wait at shutdown of thePreferences to
true
    else
        set wait at shutdown of thePreferences to
false
    end if
    set Retrospect Client preferences to
thePreferences
end run
```

Nearly everything you need to know to control the Retrospect Client control panel with Apple events is in the Retrospect Client Commands dictionary and in the example scripts. (To view the dictionary, choose Open Dictionary from the Apple Script Editor's File menu and open Retrospect Client Commands.) Refer to the Read Me file in the Retrospect Client AppleScripts folder for more information about scripting the Retrospect Client control panel and about the example scripts.

E-MAILING BACKUP REPORTS

Retrospect includes AppleScript applications which enable Retrospect to send backup reports via e-mail. These Retrospect Event Handler applications are for Microsoft Entourage, Eudora 6, and Mac OS X's Mail application.

Requirements

The scripts require access to an SMTP/POP mail system through a permanent connection to the Internet or via your organization's intranet.

These setup instructions assume that you have already set up the backup Macintosh's TCP/IP software, and that you have access to a DNS (Domain Name System) server and an SMTP/POP mail server on your local area network.

Installation

Retrospect's installer places the AppleScript Utilities folder in the Retrospect folder. Within it are additional folders for e-mail applications. Open the folder appropriate for your e-mail application and copy the Retrospect Event Handler into the Retrospect preferences folder. The default path is:

/Library/Preferences/Retrospect/

Double-click to run the Retrospect Event Handler and point it to the location of your e-mail application on your hard drive, then quit. The Retrospect Event Handler launches every time Retrospect launches.

Configuring Your Retrospect Event Handler

There are four groups of recipients to which the Retrospect Event Handler sends e-mail.

- The Success Group receives mail on successful backups.
- The Error Group receives mail if there is an error.
- The Media Request Group is sent mail when Retrospect requires a new member to add to a backup set and when a media request times out.
- The Main Group is sent mail on successful backups, any error, any media request, Backup Server starts and stops, and script starts. It is a superset of the other groups.

Edit the Retrospect Event Handler in Retrospect's preferences folder. Either use your favorite script editor, or run the Retrospect Event Handler and choose Edit Script from the Edit menu. Scroll down to the first property definition and add one or more e-mail addresses to each group if desired. Be sure to enclose the recipient's e-mail address in quote marks and separate multiple recipients using commas.

A simple configuration would be to put one user account in the main group only as follows:

```
property kMainGroup :
{"yourname@yourcompany.com"}
property kSuccessGroup : {}
property kErrorGroup : {}
property kMediaRequestGroup : {}
```

To add two recipients to one group, separate with commas:

```
property kSuccessGroup :
{"yourname@yourcompany.com",
"yourboss@yourcompany.com"}
```

You can subscribe to all groups, but that's the same as subscribing to the Main Group. When you have finished, save the script.

To receive messages when scripts or the Backup Server starts, change the property sendMailOnStart to true.

Notes on Operation

Backup, archive, duplicate, and restore scripts generate one summary message at the end of each script. (Immediate operations do not generate e-mails.) When all volumes in the script are completed successfully, a summary is sent to the Success and Main Groups. If any errors occurred, the summary is sent to the Error and Main Groups.

While Backup Server is running, the Retrospect Event Handler sends a summary e-mail every twelve hours. (If you prefer a different time interval, open the script and change the property kSendBackupServerReport value to the desired number of hours.) This summary e-mail contains the error and success messages for each volume in the Backup Server script. It also contains the error and success messages for regular scripts that run while Backup Server is running.

NOTE: When you stop Backup Server, the events which occurred after the last summary e-mail are not included in an e-mail.

When you have specified a media request timeout in Retrospect, the Retrospect Event Handler sends a reminder e-mail after the media request timeout period has expired. (If you did not specify a timeout the Retrospect Event Handler will not send an e-mail.) Also, simultaneously, it renews the media request timeout period once. Adjust the media request timeout value to give you enough time to give Retrospect the media it wants, and to avoid sending an e-mail if you are already sitting in front of the backup Macintosh waiting to give Retrospect its media. These messages are sent to the Main and Media Request Groups.

CHAPTER 10

PROBLEMS AND SOLUTIONS

- TROUBLESHOOTING
- COMMON QUESTIONS
- RETROSPECT ERROR MESSAGES
- ERROR NUMBERS
- RETROSPECT CLIENT ERRORS
- RETROSPECT SUPPORT

This section offers solutions to problems you may encounter with Retrospect and its clients. It includes general troubleshooting help, answers frequently asked questions, and introduces you to the same troubleshooting techniques Dantz Technical Support uses to solve problems.

"Troubleshooting" includes common problems encountered during installation and backup and restore operations and offers explanations and solutions. "Common Questions" presents frequently asked questions. These questions do not involve error messages and are more general than the troubleshooting problems. "Retrospect Error Messages" provides a numerically ordered list of error numbers with detailed explanations. "Retrospect Support" offers troubleshooting techniques and procedures for getting help.

TROUBLESHOOTING

Most problems encountered while using Retrospect fall into a few general categories. Dantz Technical Support follows some basic troubleshooting procedures for each of these categories. With a little effort, you can learn how to troubleshoot many problems on your own. This section outlines those procedures and shows you the most common problems and their treatments.

We recommend that you keep notes of your troubleshooting efforts. Even if you are unable to resolve a problem right away, your notes can establish a pattern of behavior to help us both understand the problem. If, after reading this section, you find you are still unable to solve a problem, try using some of the other Retrospect support resources. See see "Retrospect Support" on page 232.

Troubleshooting Road Map

The first step in troubleshooting a problem is to isolate the problem by identifying exactly when and where it occurs. Knowing when an error occurs gives you a fixed point of reference to help you solve a problem. Retrospect has different phases of operation. For example, a backup typically includes scanning, matching, copying, and verification phases in that order. If you can determine the problem happens while matching, you are on your way toward solving it. The situations described over the next several pages are listed in the likely order in which they would occur.

Client Configuration Issues

A TCP/IP client in the local subnet or in another Retrospect-configured subnet does not appear in Retrospect's clients on network window, or appears intermittently.

Use the Test button in the Backup Clients on Network window to see if the client is on the network.

Open the Retrospect Client control panel on the client computer and check whether the client software was loaded at startup and whether it is turned on. Check that its status field says "Ready" or "Waiting for first access." If it is a Mac OS client check that it is actually a TCP/IP client and that it does not say "AppleTalk" next to its version number.

Make sure the client database window does not show a client with exactly the same name as the client you are looking for. If it does, select this client and choose Forget from the Clients menu.

Make sure the client computer is connected to the network and its network settings are correct.

Should these measures not work, see "Pinging to Verify TCP/IP Communication" on page 206. If the backup computer and client ping successfully yet the client still does not appear, your network may not fully support TCP/IP and UDP. Passive networking hardware, such as hubs and bridges, may not forward network information Retrospect needs to work with TCP/IP clients.

After taking the appropriate measure you may log in the client.

A TCP/IP client outside the local subnet does not appear in Retrospect's clients on network window.

The clients on network window lists only clients in the same physical subnet as the backup computer and in other subnets you have configured Retrospect to search.

To configure Retrospect Workgroup or Retrospect Server to search for clients outside the local subnet, choose Configure Subnet Broadcast from the TCP/IP menu (page 103).

To add a single client from another subnet to the list with Retrospect Workgroup or Retrospect Server, click the Add by Address button (page 104) then enter its IP address or name.

The Add by Address button fails to connect with the client at the specified IP address or name.

Make sure the client computer is connected to the network and its network settings are correct.

Open the Retrospect Client control panel on the client computer and check whether the client software was loaded at startup and whether it is turned on. Check that its status field says "Ready" or "Waiting for first access."

Make sure the IP address you are using is current. If the client is using dynamic IP addressing its IP address may have changed. It is not a good idea to use Add by Address with a dynamic address unless it has a long-term lease. Use the Subnet Broadcast method instead.

If you are using the client's IP name try using its IP address.

Ping the computers to check whether they are correctly communicating with TCP/IP. See "Pinging to Verify TCP/IP Communication" on page 206.

There may be a "firewall" between the client's network and the backup computer's network, restricting outside access. Contact the network administrator.

The Add by Address button added the wrong client.

Make sure the IP address you are using is current. If the client is using dynamic IP addressing (for example, DHCP) its IP address may have changed. Use the Subnet Broadcast method instead. Also see "Common Questions" on page 207.

Mac OS clients have conflicting IP addresses because they don't renew DHCP leases while waiting for shutdown.

When a Mac OS Retrospect client has a DHCP-supplied IP address and its lease expires while the client is waiting for shutdown, the Mac does not renew its IP lease and continues using its old IP address. This can lead to a conflict when the DHCP server, thinking the IP address is now available, leases the IP address to a different computer.

There are two possible workarounds: leave DHCP-served Mac OS computers idle in the Finder instead of in the Retrospect client "Wait at Shutdown" mode and uncheck "Load Only When Needed" in the TCP/IP control panel; or, lengthen your DHCP server's lease period. The likelihood of encountering this problem decreases as the length of DHCP leases increases.

Backup Issues

Immediate backups and scripted backups differ in the way they are started and what they do when they are done. Otherwise, both follow the same procedure after starting: scanning, matching, requesting media, copying, comparing, and then closing.

Retrospect fails to automatically launch to execute a scheduled script.

There are a few reasons why this can happen:

- **Confusion About Start Date**: The date you expect a script to run may not be its actual start date. See "Common Scheduler Elements" on page 74.
- **Incorrectly Scheduled Script**: Check the list of future scripted operations to confirm that Retrospect has the same schedule you expect your scripts to run. To do this, click Preview from the Retrospect Directory's Automate tab. Check that you have not set a limited schedule of possible execution times with the Schedule preference (page 161).
- **Autolaunch Preference Not On**: Check that the Notification preference to automatically launch Retrospect (page 160) is turned on.

Retrospect crashes while it is being launched.

The Retro.Config file may be damaged. Move the Retrospect folder out of the Library/Preferences folder. Try launching again. If this solves the problem, place that suspect Retrospect folder in the Trash after pulling out the Operations Log file so you can retain the history. (Retrospect creates a new folder and uses the default settings.) If you have a recent backup of this drive and you do not want to recreate your scripts and settings and log in clients again, try restoring an earlier version of the Retro.Config file from a backup.

Retrospect reports an error during scanning or matching.

There may be a problem with the volume being scanned. In this case, Retrospect reports a specific error in the Operations Log.

Look up the error number under "Retrospect Error Messages" on page 217.

In a normal backup Retrospect marks every file for copying, though not all have changed.

This happens on HFS+ (Mac OS extended format) volumes for one of two reasons.

When the local time zone is changed in the Date & Time control panel, the Mac OS shifts the local creation and modification times of files on HFS+ volumes. This affects Retrospect's normal backups when it scans the volumes for files which need to be backed up. Because file date/time stamps are different, Retrospect marks every file for backup. Retrospect is simply performing an IncrementalPLUS backup as it usually would; the only abnormality is that every file appears to have been modified. As a workaround, you can change the time zone back.

This happens with servers backed up as mounted volumes when the system clocks of the server and the backup Macintosh are not synchronized within a certain range, the server compares the two system clock times and performs a time translation based on the differences. This affects Retrospect as described above. Synchronize both the backup Macintosh's clock and the server's clock with their respective appropriate control panels, to within the acceptable margin.

Retrospect does not see the backup device.

If your device is a removable disk drive (such as Zip, Jaz, SuperDisk, DVD-RAM, or MO), check that the media is fully inserted and that the volume is mounted on the Macintosh desktop. Retrospect may not recognize a DVD-RAM drive unless it is loaded with writable media.

If you are using a FireWire or USB hard disk as part of a removable disk backup set, make sure to turn on the preference to enable this. See "Media Handling Preferences" on page 159.

See "General Device Troubleshooting" on page 203 and the bus-specific device troubleshooting sections which follow it.

A tape or CD/DVD drive does not appear in the storage devices window or media request window.

Check Device Status (from Configure> Devices). If a non-Retrospect driver appears installed for your tape drive, some other software loaded its driver inappropriately. Determine which other device driver is loading and disable it.

All devices should be connected before launching Retrospect. Verify the drive is properly connected and terminated then make sure it is turned on. If other devices on the communications bus are off, turn them on and restart.

If you have a new drive model, it may not be supported by the version of Retrospect you are using. To find out if a newer version of

Retrospect is required for this drive, refer to the Dantz web site.

See "General Device Troubleshooting" on page 203 and the bus-specific device troubleshooting sections which follow it.

Retrospect can't use the inserted disk, tape, or disc because it is "busy."

There are several possible causes.

- You saved the removable disk backup set catalog on a disk that is a backup set member. Catalogs must be saved on different volumes. Move the catalog to your hard disk and double-click on it from the Finder to force Retrospect to recognize it.
- You are using the disk as both a source and destination, which is illogical and not allowed. For example, you are trying to back up the 2-Dunsinane volume to the Dunsinane backup set, of which 2-Dunsinane is a member.
- Some other software may be creating or using files (which may be invisible) on your backup disk. Likely suspects are compression programs and file sharing; see the Retrospect "read me" file for conflicts and workarounds.
- The drive may be malfunctioning. Contact the drive vendor for assistance.
- The disk, tape, or disc may be damaged. Designate it as missing and use a new medium.

Retrospect refuses to use the inserted disk, tape, or disc.

Retrospect has a system for recognizing tapes, discs, and disks and for adding them to backup sets. If Retrospect is not automatically using the medium you think it should, carefully read the text that appears in the media request window. It explains what media Retrospect needs.

You may not have inserted the exact disk, tape, or disc required by Retrospect. Check that the name of the medium you are inserting exactly matches the requested name. If the name is the same and Retrospect does not proceed with the operation when you insert the medium, you probably have two pieces of media with the same name and are inserting the wrong one. This can happen if you switch disks, tapes, or discs when you perform a recycle backup to a particular backup set.

Retrospect may require new media. Insert the medium you want Retrospect to use, wait for it to appear in the window, and then click Proceed. Retrospect will not use media that is part of a known backup set, as detailed below. It will automatically use any media that is erased or correctly named.

Retrospect asks for a new disk, tape, or disc, but then complains "You can't use '1-Birnam Wood', it already belongs to a backup set!"

This is a feature designed to prevent accidental erasure. If you are sure you want to erase this disk, tape, or disc and use it for the current backup, choose Erase from the Devices menu, then click Proceed if necessary. Erasing the medium removes the entry for this disk, tape, or disc from the backup set it previously belonged to.

Retrospect asks for a particular disk, tape, or disc, but then reports "'2-Dunsinane' is not a member of this backup set. Although it is named correctly, it has a different creation date."

This means you have more than one disk, tape, or disc with the same name. This can happen if you run a recycle backup to new media and later try to do a normal backup with older disks, tapes, or discs. If possible, locate the proper medium for the restore.

Try other disks, tapes, or discs to see if any match the catalog you are using.

If you are sure this disk, tape, or disc has the files you want, rebuild its catalog. Go to the

Tools tab, click Repair, and select the appropriate repair function to rebuild the catalog (see "Rebuilding a Catalog" on page 188).

Retrospect asks for a particular disk, tape, or disc, but you do not have it.

If you know where it is, but it is not available right now and you must back up, follow these instructions. Click Choices, then click Skip. Retrospect treats the requested member as if it were full and backs up to a new piece of media. Files previously backed up to the requested member are not backed up again. Future backups will require the new member and you will need to use both members later if you need to restore.

Once you click Skip, you will not be able to take advantage of the remaining free space (if any) on the skipped member.

If you know it is lost, damaged, or erased, follow these instructions. If this is the first member of the backup set, it is easiest to start a new backup set or run a recycle backup to this backup set. Either way, Retrospect asks for a new disk, tape, or disc, which becomes the new first backup set member. If this is not the first member and you wish to continue backing up to the members you do have, click the Choices button, then click Missing. Retrospect will start backing up to a new disk, tape, or disc. Files that were backed up to the missing member will be backed up again, if possible, during your next IncrementalPLUS backup.

Retrospect reports a catalog out of sync error at start of backup.

Update your catalog from the media.

See "Updating a Catalog" on page 187.

Retrospect reports a chunk checksum error.

If the error occurs only with a particular backup set, repair its catalog and try again.

See "Updating a Catalog" on page 187.

Retrospect reports verification errors.

If Retrospect reports "different modify date/time…" for a particular file, the most likely explanation is that the file was modified during the backup. In this case, no action is required. When you next back up, Retrospect will re-copy the file.

Errors such as "File … didn't compare at data offset…" or "File … didn't compare at resource offset…" usually indicate a device communication problem. Back up again to re-copy the file.

Note, however, that these "offset" error messages usually point to serious data corruption problems you should not ignore. If the error occurs with many or all sources, including clients, or with a source connected to the backup computer itself, troubleshoot its communications bus and device connections. If the error occurs only on a particular source being backed up over the network, troubleshoot the communications bus of that computer and possibly the network connection to that computer.

See "General Device Troubleshooting" on page 203 and "Network Troubleshooting Techniques" on page 206. Consider using diagnostic software on affected volumes.

When it has finished executing an operation, Retrospect does not quit, restart, or shut down according to the Unattended preference.

Retrospect quits, restarts, or shuts down when it finishes only if it is executing an operation in unattended mode and no additional operations are scheduled within the look-ahead period (page 160).

Retrospect automatically enters interactive mode when you start an immediate operation and unattended mode when you start a script. While Retrospect is copying, use the Control menu to switch between modes.

A Mac OS 9 client does not shut down after the backup.

Retrospect shuts down Mac OS 9 client computers when all three of the following conditions are met.

- The Shutdown when Done option is enabled in the client options of your script. (This is the default.)
- The client is displaying the "waiting for backup" dialog.
- The client Macintosh is not scheduled for another backup within the Look Ahead Time (page 160).

Retrospect is not backing up a particular client volume.

Check that your backup script includes the volume as a source.

Make sure the client volume is not designated as private (page 106).

Make sure the client's volume is mounted for use with the client computer. (Under Mac OS, the volume icon is on the desktop; under Windows, the drive letter is accessible.)

Use the client container as the source, rather than specific client volumes, to select all volumes connected to the client. Then go to Configure>Clients, configure the client in question, and choose Client Desktop from the pop-up menu.

For more information about using client containers see "Configuring Clients" on page 96.

The client crashes during the backup.

Failing network hardware, a virus, or a software conflict may be causing the client to crash. Use diagnostic utilities to look for viruses and hard disk problems. If it is a Mac OS 9.x or prior client, refer to the system extensions troubleshooting techniques on page 207. Use the latest network software which matches your network hardware.

Backup Server Issues

Backup Server indicates "media," but there is a medium in the drive.

Backup Server is reporting it needs a specific media member to back up a source. To determine which backup set needs more media, choose backup sets from the pop-up menu in the Backup Server status window and look for any with a status showing "media."

If you have never backed up to the backup set that needs media, Retrospect accepts any new or erased medium. Stop the Backup Server, use Configure>Devices to erase the disk, tape, or disc you want to use, then start the Backup Server again.

If you still cannot determine why Backup Server isn't accepting your medium, start a backup to that backup set using Immediate>Backup. Retrospect displays a window naming the medium being requested.

Retrospect does not quit when Backup Server completes its backups.

Backup Server is optimized to run continuously. If you have other kinds of scripts, they will start at their scheduled times even though Backup Server is still running.

If you schedule the Backup Server to run only part of the time (for example, from 7:00 A.M. until 7:00 P.M. each day), you can quit Retrospect after the Stop time without affecting the Backup Server. Retrospect will automatically launch when the next script is scheduled to start.

The Retrospect Client control panel's Backup Server Schedule was set to "As soon as possible" but the client was not immediately backed up.

The "As soon as possible" preference waits for the Backup Server to poll the client; the client does not initiate contact itself. Meanwhile, Backup Server may be busy backing up other

sources or polling other clients; it may even be inactive, according to its schedule. When Retrospect gets around to polling the client set to ASAP, it backs it up.

See "Allow Early Backups" on page 84.

Restore Issues

When you start a restore, you first select the backup set from which you are restoring. Retrospect then goes through the following stages: selecting a volume (specifying where the files are going), matching or selecting files, requesting media, copying, and setting privileges if necessary.

You have problems selecting a backup set.

If your backup set is not in the list, click the More button. Click Open if the catalog for your backup set is available, or click Rebuild to rebuild it from the media.

If Retrospect reports a chunk checksum error after selecting a backup set, see "–24201 (chunk checksum failed)" on page 222.

You have a disk, tape, or disc that you want to restore from, but you do not see its backup set in the selection window.

Use the Finder to look for the backup set catalog file on your hard drive. It will have the same name as the disk, tape, or disc in Retrospect's storage devices window. For example, if the medium is named "1-Macduff" look for a catalog file named "Macduff". Double-click the catalog file to show Retrospect where it is.

If you cannot find the catalog file on your hard drive, go to the Tools tab, click Repair, and select the appropriate function to rebuild it (page 188).

You cannot find the files you want to restore.

If you are using "Restore files from a backup," be sure the Snapshot you select is for the right volume. By default, the chosen files preview browser shows your files and folders in alphabetical order, organized as they were on the backed-up hard disk. Once you find the file you want, double-click it to mark it for retrieval. If you cannot find your file, select Find from the Browser menu to search by name or other attributes. A file with a  poof icon indicates the file is on a missing member of the backup set.

If you are restoring older versions of files, use "Search for files and folders." Click Searching to tell Retrospect to look for a particular file or folder name, and if necessary click More Choices to use Retrospect's selector interface for finding files.

See "Restore" in Chapter 4 and "Using Selectors" in Chapter 9.

While retrieving an older Snapshot from media, Retrospect says no Snapshot is available.

There are three possible causes:

- You cancelled the backup before it was completed. Retrospect does not save a Snapshot for a volume until the backup is finished.
- You turned off the "Save Source Snapshot for Restore" option (page 145).
- You are trying to retrieve a Snapshot from a backup set created by a backup set transfer. Transferred backup sets have no Snapshots on the media.

Retrospect refuses to use the inserted disk, tape, or disc, reporting it is named correctly but has a different creation date.

This means that you have more than one disk, tape, or disc with the same name. This can happen if you run a recycle backup to new media and then try to restore with older disks, tapes, or discs. If possible, locate the proper medium for the restore.

Try other media to see if any match the catalog you are using.

If you are sure this disk, tape, or disc has the files you want, rebuild its catalog. Go to the Tools tab, click Repair, and select the appropriate repair function to recreate the catalog. (See "Rebuilding a Catalog" on page 188.)

Your Macintosh hangs or crashes while copying during restore.

This is the same as hanging or crashing while copying during backup. Repeat the operation with system extensions turned off or minimized to determine if the problem is a software or hardware problem, then refer to "Troubleshooting Mac OS Clients" on page 207 and "General Device Troubleshooting" on page 203.

Retrospect reports error –34 (disk full) while copying.

This error means the volume you are restoring to does not have enough space for the files you are restoring. You will need to manage your disk space by moving or deleting files, or avoid the problem by marking fewer files to restore. If you are restoring a volume that was using a compression utility, you may need to restore your files in batches and use your compression utility between restores to make room for the next batch of files.

After restoring, Mac OS file sharing privileges are not set.

Retrospect will only set the privileges for the server if sharing is active. (Note that sharing also had to be on during backup.) Turn on sharing and restore again. (See "Restoring a Mac OS Server Client" on page 125.)

After restoring a Mac OS 9.x or prior computer, documents have generic icons in the Finder.

The Macintosh Desktop needs to be updated after a large restore. Restart the Macintosh while holding down the Command and Option keys to rebuild the Desktop.

After restoring a backup to a new Macintosh hard disk, the volume icon on the Finder Desktop is no longer custom. It is now generic.

Restart the computer.

You can't retrieve or restore data to a client.

Take the following steps:

1. Attempt to access the client. From the client database, select the client and select Get Info from the File menu to check whether the client can be accessed. Make sure the client status is not locked.

2. Go to Configure>Volumes, select the volume to which you wish to restore data, and choose Get Info from the File menu. Make sure the volume has enough free space to accommodate the files you want to restore, and that there is no lock symbol on the Attributes line. (If there is no Attributes line it is not locked.)

If you are sure that the volume to which you are restoring data is both unlocked and has free space but you still experience difficulty restoring, refer to Chapter 7 • Disaster Recovery for general assistance.

Recreating an Internet Backup Set

When you rebuild an Internet backup set catalog Retrospect may immediately show "resynchronizing (slow)" in the execution status window. This is because the backup set is encrypted and when you began the repair operation one of the following was true:

- You neglected to tell Retrospect the backup set is encrypted.
- You gave Retrospect an incorrect password for the encrypted backup set.

General Device Troubleshooting

Check with your drive vendor to make sure you have the necessary firmware for your device. Retrospect lists a drive's firmware version in its

Device Status window (from Configure>Devices). If there is a known problem with a firmware version, it will be listed on the Dantz web site.

- Completely uninstall any other backup software that may be on your machine, including any drivers other software may have loaded for the device.
- Verify the device cables are solidly connected to their proper ports.
- Make sure the drive's power switch is turned on and its power cables are plugged in.
- If other devices on the communications bus are off, turn them on and restart.
- Use a new piece of media to see if the problem is related to a faulty or damaged medium.
- Check to make sure you are using the correct type, length, speed, or capacity media. Follow your drive manufacturer's list of supported media.
- Use a different brand of media because the drive may be particular about the brand. Follow your drive manufacturer's recommended list of media brands.
- If you are using a tape drive, clean the heads with a cleaning cartridge. Follow your drive manufacturer's recommended cleaning instructions.
- Replace the cable that connects the device to the computer.

If none of these general suggestions solves your problem, troubleshoot your drive with the specific FireWire, USB, ATAPI/IDE, or SCSI suggestions which follow.

FireWire and USB Device Troubleshooting

If you're having problems with FireWire or USB devices it could be due to a number of issues.

Hardware Issues

- Isolate the device. Another device on the chain may be interfering with the backup device's communication. If your backup device is connected to your computer through a hub or another FireWire/USB device, unplug it and connect it directly to a port on the computer. If it is already connected directly to the computer, try changing ports. If the problem persists, do not reconnect the other devices, and continue down the checklist.
- You may have a bad cable. Replace the cable that connects the device to the computer.
- The system board or FireWire/USB adapter in the computer may be having a problem. Install Retrospect on another computer, if available, and try the device there as the only device.

Media Issues

- Try a new piece of media to see if the problem is related to a faulty or damaged medium. If applicable, try using a different brand of media. Often drives are picky regarding the brand of media. Follow the manufacturer's recommended list of brands.
- If you are using a tape drive, clean the heads with a cleaning cartridge.

Firmware/Software Issues

- Check to make sure you have the latest USB or FireWire firmware update for your computer. Hardware vendors often release firmware updates that may help to resolve USB or FireWire issues. Search the vendor web site for Updates. Retrospect lists the current firmware of the drive that you are using in the version column of the Device Status (or Environment) window. If there is a known problem with a firmware version, this will be listed on the Dantz web site.
- Update or reinstall the FireWire and USB adapter drivers. Corrupt drivers can cause

issues that may not be otherwise detectable. Check the manufacturer's or vendor's web site for updated drivers.

- Completely uninstall any other third-party backup software that may be on your machine, including any drivers that software may have loaded for the device.

If you have investigated all the issues listed about and still get failures on new media, then the backup device itself may be defective. Contact your drive vendor for further diagnostics, tests, or to inquire about repair or replacement.

ATAPI/IDE Device Troubleshooting

For an internally connected device, make sure the cable is firmly connected and it is correctly set as either the master or slave device.

SCSI Device Troubleshooting

If the SCSI chain is not set up properly, communication errors may cause data corruption or system failures during copy operations. The following information is designed to give you guidance when you encounter SCSI problems.

See also "SCSI" in Chapter 3, your SCSI card's user guide, and the manual that came with your hardware device.

These sample errors can indicate communication errors on a SCSI bus:

- File "Home" didn't compare at resource offset 10,750
- File "Tech Note" didn't compare at data offset 3,253
- Trouble reading: "1-Office Backup 2" (0), error 102 (trouble communicating)
- Trouble writing: "1-Macbeth" (0), error 205 (lost access to storage medium)

These errors can usually be traced to a failure in the SCSI configuration. The most common cause of SCSI bus communication problems is card or driver incompatibility. See the Dantz web site for more information on compatible SCSI cards.

Other common causes of SCSI bus communication problems are improper termination and/or bad SCSI cables. Try changing terminators, using a powered terminator, changing cables, isolating the device on the SCSI chain, and moving the device to a different computer. If it is a tape drive, clean its heads and if cleaning does not work, try different kinds of tapes.

Termination

The general rule for termination is to use only two terminators on the SCSI bus; one at the beginning and one at the end. If you have only a single device on the SCSI bus, then only one terminator is needed because your SCSI card should have built-in termination. Some SCSI peripherals come with internal termination built in, and must be placed at the end of a SCSI chain.

Consult your computer's user guide for its specific termination requirements.

SCSI Cables

Communication problems can be caused by bad or loose-fitting SCSI cables. Check all cables to ensure they are properly seated in each connector. The entire length of your SCSI bus should not exceed 20 feet. Whenever possible, try to use short (12 to 36 inches) cables and avoid cables over six feet in length.

Device Order and Device Conflicts

To avoid problems caused by device order or device conflicts, make sure that each device has a unique SCSI address. To see the SCSI address of every device, go to the Configure tab and click Devices. Then choose Device Status from the Devices menu to view all of your SCSI devices. You may print this window for future reference. If problems occur (for example, a device does not appear that you know is turned on and connected), try changing the order of SCSI

devices or temporarily removing unneeded devices. Recheck that each device has a unique SCSI ID.

Some devices, such as scanners and removable disk drives, can cause communication failures on the SCSI bus, especially if they are turned off. If you are experiencing SCSI communication problems, make sure all of your SCSI devices are turned on when you use your computer. Even if you are not experiencing SCSI problems, we highly recommend you turn on all SCSI peripherals before starting the computer. Do not turn them off until after you shut down the computer.

When All Else Fails

If you have taken all of the preceding general and SCSI-specific troubleshooting steps but you still get failures or errors, then the backup device may be defective. Contact your drive vendor for further diagnosis and tests, or to arrange repair or replacement.

Network Troubleshooting Techniques

Pinging to Verify TCP/IP Communication

Use the Test button in the Backup Clients on Network window to see if Retrospect can connect to a computer on the network via TCP/IP and communicate with the client software.

Click Test and enter an IP address or DNS name. If Retrospect reports error 541, it connected to a computer at that address, but no client software responded. If it reports error, -1028, Retrospect could not even connect to the computer. Other errors may indicate network and TCP/IP configuration trouble and you should "ping" the backup computer and client computer from other computers to check whether they are communication with TCP/IP.

On Mac OS X, click the Ping tab on the Network Utility (located in /Applications/Utilities).

Windows computers configured for TCP/IP have built-in ping commands. From a TCP/IP Windows computer on your network, go to the MS-DOS command prompt and type "ping" followed by a space and the IP address.

Mac OS 9.x and prior does not include a ping utility, but you can obtain a ping-capable utility from the Internet. Such utilities include iNetTools (www.wildpackets.com), IPNetMonitor (www.sustworks.com), Interarchy (www.interarchy.com), OTTool (www.neon.com), and WhatRoute (homepages.ihug.co.nz/~bryanc).

NOTE: TCP/IP must be loaded when you ping a Mac OS 9 computer. To ensure it is loaded, open the TCP/IP control panel, un-check the option "Load only when needed" (available only in Advanced and Administrator modes) and restart.

Using an IP pinging utility on the troublesome client computer or FTP server, first ping the IP address of the backup computer. A reply tells you the pinged computer's TCP/IP setup is operational. If it times out or reports it as unreachable there is a problem with the TCP/IP setup, the network interface hardware, or the network itself.

If pinging the backup computer is successful, use it or another computer to ping the IP address of the troublesome client computer or FTP server.

Selecting the Appropriate Network Driver

Windows client computers should be using 32-bit network drivers for best network performance and compatibility. Windows NT, 2000, and XP use 32-bit network drivers by default. For Windows 95/98/Me, open the Network control panel and select the computer's network interface adapter. Click the Properties button, select Enhanced mode, and click OK. You may need to get updated software from your network adapter vendor.

Verifying Open Transport Version

To work with TCP/IP, Mac OS 9.x and prior clients must have Open Transport version 1.1 or later. Each computer's TCP/IP control panel should be set to always load, as described previously.

NOTE: Mac OS X clients do not require Open transport.

Troubleshooting Networks

When you have network problems with Retrospect or clients, start by identifying a pattern of failure. If the problem occurs on a single client, begin your troubleshooting by examining that particular computer. If the problem occurs on multiple client computers, find out if those computers share a common hub, router, bridge, or gateway. You may be able to identify a faulty network component that should be repaired or replaced. If you encounter failures on multiple client computers but cannot identify a pattern, troubleshoot the networking hardware on the backup computer.

Troubleshooting Mac OS Clients

When troubleshooting an individual Macintosh, the first step is to determine whether the problem lies with the Macintosh's software or its network hardware. The following information describes how to troubleshoot Mac OS 9.x and prior clients.

For detailed information on troubleshooting Mac OS X clients, read "I can't see an OS X client on my network. What can I do?" in the Dantz Web site Knowledgebase.

Start by limiting extensions and control panels on the client Macintosh to the Retrospect Client control panel, needed networking software, and minimal default Apple system software. Do this with the Extensions Manager.

If the client continues to experience the problem, there may be an incompatibility with networking software. If the client has a third party networking card, update to the latest version of its software. If the client uses its built-in Ethernet, get the latest version of Apple's network software installer or Open Transport, available from the Apple Software Update web site.

If the client continues to experience the problem, exchange the network hardware with that of another client Macintosh. Whether it uses built-in Ethernet or an Ethernet adapter card, it is sufficient to exchange all components external to the Macintosh. If the Macintosh has an internal network card, you will need to exchange the card as well. Make sure to exchange the cables along with the other components. After exchanging the network hardware, try an operation with both clients. If the error moves to the other client, then the problem lies in the network hardware.

If the problems persist after minimizing extensions and exchanging network hardware, performing a clean installation of the System software.

COMMON QUESTIONS

This section answers common questions about setting up and configuring Retrospect Clients, backing up files locally and over the network, backup sets, catalogs, devices, and media.

Client Configuration Questions

How do I find out the IP address of a client so I can log it in with Add by Address?

It depends on the operating system and how the client computer is configured. If the client has a static IP address you can use it in the Add by Address dialog. However, if the client automatically obtains a dynamic IP address from a DHCP server you probably should not be using the Add by Address button. Dynamic IP addresses may change later and Retrospect may

find a different machine at that address if you used Add by Address with a dynamic IP address.

Here's how to determine a computer's IP address and whether it is static or dynamic.

Mac OS: Open the TCP/IP control panel (OS 9.x or prior) or Network preferences (Mac OS X) on the client. It shows the "IP Address" the computer is currently using. Above the IP address is the Configure pop-up menu. If it shows "Using DHCP Server" it is a dynamic address. If it shows "manually" it is a static address.

Windows 95/98/Me: From the Run dialog or the DOS prompt, enter WinIPcfg, which shows some configuration information in a window. Click its More Info button to see the full configuration.

Windows NT/2000/XP: Open the DOS prompt and enter "IPconfig -All", which lists the full IP configuration.

All Windows Systems: The IP configuration information shows the IP address the computer is currently using. It shows whether the computer is using a DHCP server and, if so, shows the lease dates of the automatically obtained IP address. If it does not show DHCP server and lease information, the IP address was specified manually (that is, it is static).

How do I change the name of a client?

The client is named when the client is first logged in from the backup computer.

If a client has already been installed and you want to change its name, go to Configure>Clients, double-click the client to be renamed, then click the Configure tab in the client configuration window. Click the Rename button then enter a new name and click Rename.

The name change will not affect previously backed up files—they are still stored under the old client name. New files and Snapshots will be stored under the new name.

How do I log in a client when I forgot its password?

You must uninstall the client and install new client software with a new password. Next, restart the client. From the backup computer, go to the client database window, click Network, log in the client, and enter the password. Then edit any existing scripts that include this client.

How can I get back a client volume after accidentally using Forget?

If you forget a client's volume, you can put it back into Retrospect's volume lists by configuring the client (page 96). Remember to add the volume to the appropriate scripts, if necessary.

Backup Questions

How do I back up to a hard disk drive?

Use a file backup set on the hard disk or set Retrospects preferences to allow FireWire and USB hard drives in removable disk backup sets. See "Backup Sets and Their Components" on page 21 and "Hard Disk Drives" on page 36.

How do I back up to a Mac OS X server? How do I use it as a backup device?

Retrospect can back up to a file backup set stored on a mounted AFP (AppleShare/Mac OS X server) volume.

To create a file backup set on a mounted AFP volume:

1. Log into the Mac OS X backup computer as root.

For information on how to log in as root under OS X, please read Apple Computer's Knowledgebase articles #106290, "Mac OS X: About the root User and How to Enable it."and #125136 "Mac OS X 10.3: Enabling the Root User".

2. Mount the AFP volume on the desktop in the Finder.

3. Launch Retrospect.

4. Configure Retrospect to automatically mount the AFP volume.

See "Configure" on page 172 for more information on auto-mounting an AFP volume.

5. Create a file backup set and save it to the AFP volume.

6. Quit Retrospect.

7. Login to the backup computer as a normal user (not as root).

8. Launch Retrospect.

9. Edit your backup script to include the new file backup set as a destination.

10. Run the backup script with a schedule, run document, or from the Run menu.

It cannot be run as an immediate backup.

When saving data to a mounted AFP volume, you are likely experience to experience a server limit for file sizes.

The maximum destination file size is 2GB on older Macintosh servers and NAS servers and 4GB for Windows 2000 Server destinations. AFP 3.1 or later servers, which include Mac OS X Server 10.3 and later, support larger than 4 GB files when used with an AFP 3.1 and later client, including Mac OS X 10.3 and later.

How do I back up only files that have changed?

Retrospect does this automatically. The first time you back up, Retrospect copies all selected files. On subsequent normal backups, it copies only the selected files that are new or changed.

How do I specify complete (full) or IncrementalPLUS backups?

By default, Retrospect does IncrementalPLUS backups; i.e. it backs up only new or changed files. You can modify this behavior by setting the backup action to recycle or new media. See "Backup Actions" on page 23 for more information.

There are many ways to do this:

- When executing an immediate backup, by changing the backup options (page 143).
- When running a script by selecting an item from the manual execution dialog's pop-up menu (page 78).
- When creating a script scheduler (page 74).
- By configuring the Backup Set and clicking the Media Action button (page 154).

How do I back up multiple volumes to the same disk, tape, or CD/DVD?

Use the same destination backup set. To back them up at the same time, select each volume you want to back up in the volume selection window. You can make a non-contiguous selection using the Command key or select a range of volumes using the Shift key. When you execute the backup, Retrospect backs up each of the selected volumes, one after another.

You can later do normal backups of other volumes to the same backup set and Retrospect will add them to the medium until it is filled.

How do I run an operation from the Finder?

First create a script in Retrospect and save a run document (page 78) from it. Use the run document to start that script directly from the Finder.

How do I include or exclude files with particular attributes?

You can specify which files Retrospect backs up by using selectors. These allow you to include or exclude files by their size, kind, dates, and many other attributes. See "Using Selectors" on page 177.

Does Retrospect back up hard links and symbolic links under Mac OS X?

Yes.

Network Backup Questions

How do I see what was backed up last night? How can I tell if everyone has been backed up by Backup Server?

The Backup Report shows a summary of the backup operations for each volume. To view the report, click Report from the Retrospect Directory's Reports tab. See page 137.

The Operations Log shows by date and time which volumes were backed up, how much data was copied, and whether the backup completed successfully. To view the log, click Log from the Retrospect Directory's Reports tab. The log also lists any errors which occurred. See page 140.

To view files backed up during the most recent backup, choose Reports in the Retrospect Directory and click Contents. Select the appropriate backup set from the top list in the contents report window, select one or more sessions from the bottom list, and click Browse. A browser appears, listing the files in the order they were backed up. See "Viewing Backup Set Contents" on page 141

How can I prevent the "waiting for backup" dialog from appearing on Mac OS 7/8/9 clients on nights when no operation is scheduled?

Under Mac OS 9 and earlier, the Retrospect Client control panel has no way of knowing when an operation is scheduled to occur, so it always waits at shutdown if this option is turned on in the Retrospect Client control panel preferences dialog. There are several ways to get around this if you do not perform operations every night.

Make a script using the No Files selector then schedule it to run on nights when no backups are scheduled. Retrospect shuts down the script's Macintosh sources.

Tell users which days they should click the Shut Down button in the "waiting for backup" dialog when they leave for the day.

Turn off the Wait at Shutdown preference in the Retrospect Client control panel on each user's Macintosh. Tell the users which nights to leave their Macintosh computers on. Remind them to turn down the monitor brightness or turn off its power to prevent screen burn-in.

Set up an AppleScript (page 191) to enable the Wait at Shutdown option only on certain days.

Can Retrospect shut down a Windows client computer when it is done with its backup?

No. Retrospect does not have an option to shut down Windows clients, as it does for pre-Mac OS X clients.

How do I back up a Services for Macintosh volume located on my NT Server?

Use Retrospect Server for Windows to back up Windows NT or 2000 servers.

How do I avoid -37 (invalid name) errors when I backup my NT Server that contains Services for Macintosh directories?

Use Retrospect Server for Windows to back up Windows NT or 2000 servers.

Why do my network backups take too long?

For a discussion of backup performance, including guidelines for estimating your backup speed, see "Network Backup Guidelines" on page 112, and "Choosing the Backup Computer" on page 113.

If you notice that your backups have suddenly become much slower, or if one particular client backs up more slowly than others with a similar configuration, you may be experiencing a problem. Potential problems may lie with the following:

• The amount of activity on the backup and

client computers during the backup. Other applications (anti-virus software and screen savers, for example) running on either computer draw processing power away from Retrospect. Try a backup with Retrospect as the only application running on the backup computer and the client in the "waiting for backup" mode (with its screensaver off) for optimal performance.

• **The amount of data being copied.** Recycle backups tend to show higher performance figures than IncrementalPLUS backups. For each backup, Retrospect must spend time examining the entire volume to determine which files need to be backed up, regardless of the amount of data that needs to be backed up. The ratio of this overhead time to total backup time will be higher for a small amount of data (IncrementalPLUS backup), as compared to a large amount of data (for a recycle backup or when an empty backup set is first used in a normal backup). Backups of small amounts of data may therefore report slower performance times than backups of large amounts.

Table 10-1 below shows sample data from several backups. Performance figures for the recycle backup are much higher than for subsequent backups of the same client due to the lower proportion of overhead time to the amount of data actually backed up.

• **The total number of sessions for which a backup set has been used.** The greater the number of sessions created, the longer Retrospect takes to match sessions to determine what files need to be backed up. Periodically resetting your backup set with a recycle backup or adding new media to your rotation using a new media backup will limit the number of sessions in your backup set, thereby speeding up both your backup and restore operations.

• **File sharing.** Mac OS file sharing slows copying on both clients and the backup computer. Turning off file sharing when it is not needed can help optimize network performance.

• **Backing up across network segments.** The backup computer and a client may reside on two physically different networks connected by a bridge or router that may slow the progress of data from one machine to the other. Backup performance may also suffer if the two networks vary greatly in terms of their relative network activity or performance. You can confirm the speed of the connection between the backup computer and the client by using Get Info from Configure>Clients. If the echo time seems higher than under normal circumstances (for example, consistently above 0.3) or the KB/second performance figure seems lower than normal, a network problem may be affecting your backup speed. Use Get Info to view and print the performance figures for various client

Backup Action (iteration)	Number of Files	Megabytes Copied	Time (mm:ss)	MB per minute
Initial Backup	8345	719.6	24:00	30
IncrementalPLUS (1)	51	5.7	00:22	15.4
IncrementalPLUS (2)	360	19.7	01:26	13.8
IncrementalPLUS (3)	43	5.7	00:25	13.5
IncrementalPLUS (4)	53	6.1	00:30	12.6

Table 10-1: Sample values for client backups over an Ethernet network.

computers and compare them to determine current levels of network performance.

• **The performance of the backup and/or client computer.** Problems with either machine affect the speed of your backup. Specifically, you should check for hard drive fragmentation, problems on the SCSI bus, and network problems (see page 206).

• **The speed of the backup computer.** Different Macintosh models feature various central processing units that determine how quickly they perform tasks. The performance of similar CPUs also varies based on their clock cycles (as expressed in megahertz). Finally, if your Macintosh has a SCSI buss, its speed can vary across Macintosh models, influencing how fast each Macintosh can transfer data across its SCSI bus. For optimal backup performance, assign a relatively fast Macintosh to run Retrospect.

• **Using encryption or software compression.** If possible, avoid using encryption on the backup media or link encryption for client computers. Encryption requires additional processing power the backup Macintosh would otherwise use to increase backup performance. Whenever possible, use hardware compression (if your tape drive includes hardware compression capabilities), since hardware compression works faster than software compression. Because backup speed influences tape capacity, hardware compression also allows more data to fit on a tape.

Can more than one backup computer run on the same network at the same time?

Yes, you can run multiple backup computers at the same time on the same network with no problems, though when they transfer data at the same time both backups will probably slow. If you run backups in different physical network segments, traffic on one segment will not affect other segments.

How many client computers can I back up from a single backup computer?

There is no fixed limit to the number of clients you can access from one backup computer. It is not a question of numbers, but more a question of resources. You can back up more clients with a faster backup computer, a faster backup device with higher capacity media, and simply more time to do the backups.

If the backup computer is not completing backups in its scheduled time periods or if you want volumes to be backed up more often than they are, you may need a faster backup computer or a faster backup device, if not both.

I want to make a computer on a different network segment the backup computer. What should I do?

Moving to a new backup computer is explained in detail in "Moving Retrospect," which starts on page 162.

Will Retrospect wake a sleeping PowerBook Mac OS client to back it up?

Retrospect cannot wake a PowerBook in sleep mode. Set your PowerBook to not sleep while it is plugged in.

What is Retrospect's network port number?

Retrospect uses a well-known port, 497, assigned by the Internet Assigned Number Authority (IANA), for both TCP and UDP.

Do I have to upgrade my clients to the latest version?

Yes. Retrospect 6.0 requires Mac OS X clients to be installed with Retrospect 6.0 or later client software. Other clients should also use the latest version of their client software.

Restore Questions

I thought I just restored some files. Where are they? Where did they go?

Look on the root level of the destination volume for a folder with the same name as the backup set from which you restored.

How do I restore just one file when I am not sure of its name?

If you know part of the file's name, Retrospect can help you find it. Set up a searching restore as described in "Restore by Search" on page 55.

If you specify just part of the file's name in the searching window, Retrospect will probably find the file you are looking for, but may also find others.

After Retrospect searches, click the Files Chosen button in the summary window. In the browser window that appears, use the Browser menu to find files in the list.

Make sure only the files to be retrieved are marked, then close the browser window. Click Retrieve in the summary window to start restoring.

How do I restore an earlier version of a file?

To restore any version of the file in the backup set, set up a searching restore as described in "Restore by Search" on page 55. In the searching window, type the name (or portion thereof) of the file you want.

After Retrospect searches, click the Files Chosen button in the summary window to display a browser of the files found, then click Unmark. The files are listed with their backup dates. To see a file's creation and modification dates, select it and choose Get Info from the File menu. Mark the file or files to be restored, close the browser, and click Retrieve.

Does Retrospect restore empty folders?

Yes. Empty folders are restored when you do an immediate restore from a Snapshot using Restore an entire disk, the top option in the restore dialog. Set the destination window's pop-up menu to replace corresponding files or retrieve files and folders if you do not want to restore over the whole disk.

How do I restore empty folders without restoring the entire hard disk?

Go to Immediate>Restore and in the dialog which follows, select "Restore an entire disk" (the top radio button). Then select the source backup set and Snapshot. At the destination window, select your target volume and, from the pop-up menu, choose any restore method other than "Retrieve just files."

In the files chosen browser, double-click either the root of the source volume or an entire enclosing folder which contains empty folders. Empty folders will be highlighted but not marked. When you execute the restore, all the enclosed empty folders will be restored. No other combination of restore types or file selection will restore any empty folders.

WARNING: Be very careful when restoring. If you choose Restore entire or Replace corresponding files in the restore method pop-up menu, Retrospect will replace and/or delete files on the destination volume.

I backed up multiple volumes using a single backup script. How do I restore all of the volumes at once?

Create and schedule a restore script for the first Snapshot you wish to restore. Duplicate this script. Edit the copy of the first script, changing the source and destination to reflect the next Snapshot to restore. Repeat this process for each volume you wish to restore. Retrospect runs each script, one after the other, alphabetically by script name, starting at the time you specified.

Backup Set and Catalog Questions

What if I forget my catalog?

If you forget a backup set catalog from within Retrospect, its file remains on your hard disk until you drag it to the Trash. If you have mistakenly told Retrospect to forget a catalog, you can open the catalog file from within Retrospect or from the Finder. After forgetting a catalog, you must add the backup set to your scripts again because Retrospect removes them when you forget the catalog.

What if I lose my catalog?

If you lose your backup set catalog (perhaps because it was deleted, corrupted, or lost), you can have Retrospect rebuild the catalog by scanning all of the disks, tapes, or discs in the backup set. See "Rebuilding a Catalog" on page 188.

It may take several hours to rebuild a catalog if there is a large amount of data in the backup set.

Can I delete files from a backup set?

No, you cannot delete files from a backup set because most types of storage devices do not allow it. If you want to keep only selected files from a backup set, you can copy these files to a different backup set using Retrospect's backup set transfer operation. See "Transfer" on page 60.

Can I rename a backup set?

No. Make sure you name your backup sets correctly when you create them. If you need a backup set with a different name, create a new one and transfer the data from the old backup set to the new one. See "Transfer" on page 60.

Can I put more than one backup set on a disk, tape, or CD/DVD?

You cannot have more than one backup set on a tape or CD/DVD but you can have multiple file backup sets on a disk. When you add a medium to a backup set, Retrospect reserves the entire medium for that backup set.

You can back up as many volumes as you want to a single backup set.

What is the best way to manage catalog files?

Catalogs typically contain about 200K for each thousand files that you back up. Keep your often-used catalogs on your hard disk. If you do not have enough room on your hard disk, here are a few alternatives:

- Store infrequently used catalogs on a file server.
- Archive old catalogs to their own backup set.
- Compress the catalogs. See "Configuring Backup Sets" on page 153.

I back up by moving a backup device from computer to computer. What is the best way to do this?

It is easier to leave your backup devices connected to the backup computer and back up other computers as clients. The client software allows Retrospect to back up Mac OS, Windows, and Linux computers over a network without moving the backup device. All versions of Retrospect include some client licenses and you can always purchase more to make sure all your computers get backed up.

NOTE: This method assumes all of the computers you want to back up are connected by a network.

If you want to move the backup device from computer to computer, it is not necessary to create a separate backup set for each computer unless you plan to use a different set of disks, tapes, or CD/DVDs for each workstation. If you use a single backup set for the computers, do not do a recycle backup of each workstation; use normal backup only, and new media backup when you need to rotate media.

After each backup, copy your backup set catalog to a server or removable disk and then, once

you move to the next computer, copy the catalog to its hard disk. You may want to use Retrospect's catalog compression option (page 154) to keep the catalog as small as possible.

Devices and Media Questions

Why is Retrospect requesting more media? Why are my disks, tapes, or CD/DVDs filling up sooner than I expected?

Retrospect requests a new medium for one of three reasons:

- The drive reports the current medium is full.
- An error occurred while writing to the medium. Open the log to see if an error occurred.
- You selected Skip or Missing while configuring a backup set, or you are performing a new media backup.

A 74-minute CD-R disc has a nominal capacity of 650 megabytes. For everyday use this means you will typically achieve capacities around 600MB.

For typical everyday use, when your tape is full, it may store up to 30% less data than its ideal maximum capacity.

You can effectively increase the capacity of your media by using compression, either Retrospect's data compression option (page 143) with a removable disk drive or CD/DVD drive, or the hardware compression of an equipped tape drive (page 38).

The benefits of compression depend largely upon how well the data you are copying compresses. Text compresses well, for example, but applications do not.

How much space is left on my medium?

Click Backup Sets from the Retrospect Directory's Configure tab. In the backup set selection window, select your backup set and click Configure. The window that appears lists the available space on that backup set's current member.

This estimate is only to help you gauge when Retrospect will request new media. Regardless of the estimated available space, Retrospect uses a member until the drive reports the medium is full.

What do I do when I know my medium is going to fill up during tonight's backup?

If you think there is not enough space for the next backup on the current disk, tape, or CD/DVD of your backup set, you can tell Retrospect to ask for a new one.

To skip to a new member, set the backup set's Media Action to "Skip". The Media Action button is described in "The Options Tab" on page 154. The next time Retrospect adds files to that backup set it will ask for a new medium, in effect skipping past the current member's remaining space.

If this situation arises frequently, consider using Retrospect's Automatic Skip to blank media preference. When this preference is on, Retrospect automatically uses any erased media if the current member is not available.

You might also consider purchasing a tape library, a backup device which holds a magazine of many tapes. When one tape fills, Retrospect uses an empty tape from the magazine.

When I try to erase a tape, CD/DVD, or removable disk. Retrospect asks for the catalog file, but I no longer have it. How can I erase the medium?

When you erase a disk, tape, or CD/DVD, Retrospect tries to remove the member's contents from the catalog for that backup set. If it is missing, Retrospect asks you for it. You need to tell Retrospect to forget the catalog because it is gone, which will then allow you to erase the medium. Click Backup Sets from the Configure tab

and forget the backup set then click Devices from the Configure tab and erase your medium.

If I have two tape drives, will Retrospect use them both when performing unattended backups?

Yes it will if the devices are similar, with the same kind of mechanism. When it fills up a tape, Retrospect looks in any available drive for any tape that is new or erased, or has the correct name.

How do I start over at the beginning of the disk, tape, or disc?

To start over on a removable disk, tape, or CD/DVD, you must reset the entire backup set. One way to do this is to do a recycle backup to the backup set. Another way is to manually set the backup set Media Action to Recycle. (See "The Options Tab" on page 154).

NOTE: You cannot do this with CD-R or DVD-R discs because they cannot be erased.

How do I recycle disks, tapes, or discs from old backup sets?

To reuse a removable disk, tape, or CD/DVD from a backup set you no longer need, insert the disk, tape, or CD/DVD, choose Configure in the Directory, then click Devices. The window that appears shows you the name of the medium. Select the disk, tape, or CD/DVD and choose Erase from the Devices menu. The next time Retrospect requests a new member for a backup set, it will automatically use this or any other erased medium in the backup device.

You should also remove the old backup set's catalog. Click Backup Sets from the Retrospect Directory's Configure tab. In the backup set selection window that appears, select the old backup set and choose Forget from the backup sets window. In the Finder, drag the old backup set catalog file to the Trash.

NOTE: You cannot do this with CD-R or DVD-R discs because they cannot be erased.

How do I determine the name of a certain disk, tape, or CD/DVD?

To view the name of a medium, click Devices from the Retrospect Directory's Configure tab. Retrospect scans for available storage devices. The devices window appears, listing each drive, its type and status, and the name of the inserted medium. Insert the disk, tape, or CD/DVD if you have not done so.

Miscellaneous Questions

How do I get rid of a backup set I don't need anymore?

Click Backup Sets from the Retrospect Directory's Configure tab. In the backup set selection window, select the backup set to be removed and choose Forget from the Backup Sets menu. This removes the backup set from the destination lists of all your scripts. To remove a backup set completely, you must also use the Finder to drag the backup set's catalog file to the Trash. The catalog file is usually kept in the same folder as your Retrospect application.

How do I get rid of a volume that no longer exists?

Click Volumes from the Retrospect Directory's Configure tab. In the volume selection window, select the volume to be removed and choose Forget from the Volumes menu. This removes the volume from the source lists of all your scripts.

When I quit Retrospect, how can I prevent the message that tells me the next time Retrospect will execute?

Click Preferences from the Retrospect Directory's Special tab. Select the Quit Action preferences category and turn off Check Validity of Next Script.

Where are my scripts stored?

Your Retrospect scripts are stored in the Retro.Config file in the Library: Preferences:

Retrospect folder. Many other customizations you make to Retrospect are stored there as well.

RETROSPECT ERROR MESSAGES

When Retrospect detects compare errors while backing up, write errors while retrieving, or read errors while retrieving or verifying, it opens a browser displaying the files involved. The execution errors browser may be printed for reference, or copied and pasted into another browser for easy re-selection. Look in the Operations Log for the error message associated with each file and act appropriately.

When Retrospect is performing operations over the network, either the client or the backup computer can generate errors, which are then reported by Retrospect on the backup computer. In general, errors that are reported at the client occur when the Retrospect client software surveys the system and determines that Retrospect will not be able to use it over the network.

Catalog out of sync

Retrospect was unable to update the catalog the last time it copied data to this backup set.

This may have been due to equipment failure or power failure, or was caused by a full disk (error –34).

Try to update the catalog. See "Updating a Catalog" on page 187.

If updating the catalog does not eliminate the "catalog out of sync" error Retrospect cannot add files to that medium. You have three options:

- Perform a recycle backup, which resets the catalog and erases the media, removing its existing backup files. (This is not an option for CD-R or DVD-R.)
- Skip to a new medium using the Media Action button (page 154), forcing Retrospect to use a new piece of media for the next backup.
- Create a new backup set and do a backup to new media.

Bad backup set header

Retrospect encountered a missing or damaged file header, which contains information such as the file's name and size.

This error can indicate communication problems. See "General Device Troubleshooting" on page 203 and the bus-specific device troubleshooting sections which follow it.

Content Unrecognized

Retrospect can see data on the medium, but the data is not recognized as data formatted by Retrospect. With a removable disk, the unrecognized content most likely is other files, which you may not want to lose.

WARNING: When a medium other than a CD/DVD or tape shows as Content Unrecognized, use caution. Any files on a disk are permanently removed when Retrospect uses the disk in an operation with a removable disks backup set. Be especially vigilant for hard disks which may be formatted to appear as removable disks.

For CD/DVDs, only a few common formats are recognized, though they may have data readable with other software or under other operating systems. Make sure the CD/DVD you are inserting is compatible with your mechanism because not all drives support all recordable media. Refer to the drive's documentation for information on which media it supports.

For tapes this usually means that the tape was damaged, used by an incompatible backup program, or used with an incompatible drive. This often results with tapes used with hardware compression drives then used with drives which

do not support the same hardware compression. Do the following to troubleshoot:

- Make sure the tape you are inserting is compatible with your tape drive. For example, DDS-4 150 meter tapes cannot be read by DDS-1, -2, or -3 drives. Refer to the drive's documentation for information on which tapes it supports.
- Clean your tape drive and continue to clean it according to your drive vendor's recommendations. Tape drives need to be cleaned regularly with special cleaning cartridges (page 39).
- Check if other tapes also show as content unrecognized. If only one tape does then either it is damaged, it has been written to by other backup software, or it was created in a different, incompatible tape drive. If all tapes are unrecognized, then they were either all created in a different tape drive, there is a problem with your communications bus, or your tape drive may be broken. See "SCSI Device Troubleshooting" on page 205 for detailed instructions on troubleshooting a SCSI bus.
- If possible, try your tape or tapes in a compatible tape drive. If tapes are recognized in one drive but not another of the same type, it is possible that one drive needs repair. Contact your drive vendor for advice before assuming a drive needs repair.

Content Damaged

You or someone changed the name of a disk that is a member of a removable disk backup set.

To preserve this data, rename the disk to the original name it was given by Retrospect. The original disk name uses the format *1-The Name*. If you do not want to save the data and instead want to use the disk for a new media backup or other purposes, erase the disk.

Media too different

Retrospect reports that your media is too different in two cases:

- You are trying to append to a tape backup set that is damaged. If you crashed or experienced a power failure while last writing to your tape and are now getting this error when trying to append, your backup set is damaged. You will not be able to append to this backup set, but you can retrieve all files from it. Create a new set, or do a recycle backup to this set if you wish to start over. The media is not damaged, but the backup set is damaged such that Retrospect cannot append to it.
- You are trying to append to a tape backup set using a drive with a different kind of mechanism. Use similar drives when creating mixed drive backup sets.

System Clock and Tick Timer

Retrospect has internal checks to warn you if something strange or unexpected happens with your computer's clock. These warnings are entered in the Operations Log.

When the system clock appears to have changed, it usually means you changed your computer's clock while Retrospect was open.

When the tick timer appears inconsistent with the system clock, something may have stopped CPU activity, such as a modal dialog or the use of a debugger.

Verification Errors

The following messages indicate a verification error:

- File "Home.html": different modify date/time
- File "Bore Dimensions": didn't compare at data offset 263,078

• File “port flow specs”: didn’t compare at resource offset 731,429

A verification error occurs during verifying when Retrospect determines a file it copied to the destination is not identical to the file copied from the source. The file in question is not considered valid in the destination. If this happened during a backup, for example, Retrospect would try to copy the file again during the next normal backup to this backup set.

When you know the file was in use at the time the copying was done, a verification error is usually nothing to worry about. It simply means the file changed between backup and verification. Verification errors that mention data or resource offsets usually indicate SCSI communication problems. See “SCSI Device Troubleshooting” on page 205.

If you have a G3 upgrade card in an older Macintosh, it may be the cause of errors mentioning an offset. See Dantz Technical Note #408 (available on the Dantz web site) and contact your G3 card vendor for a software update.

Internet Backup Set Error Messages

The following error messages may occur with Internet backup sets. Error numbers 220 through 234 also may occur with Internet backup sets.

The backup set could not be completely cleared.

While attempting a recycle backup or manually resetting the backup set for a recycle backup, Retrospect could not completely clear the backup set directory because it contains non-Retrospect data.

Verify the path to the backup set directory in the connection configuration window. Retrospect’s incomplete clearing deletes only Retrospect data, leaving the non-Retrospect data untouched. Delete the other data yourself (using an FTP utility such as Fetch) and repeat the recycle backup or manual reset. Unless you personally placed the non-Retrospect files in the backup set directory you must contact your FTP server administrator to find the owner of the files and change write privileges so this does not happen again.

The folder Backup Set A in /FTPtop/Users/Mongo/ cannot be used because it already contains data.

While attempting to create the backup set folder at the specified path, Retrospect discovered an existing directory of the same name but it cannot use the directory because it contains data.

Delete the data from the directory on the FTP server (using an FTP utility such as Fetch) or create a new backup set with a different name.

Internal Consistency Check Error

This error indicates that Retrospect experienced a major problem not due to normal errors or circumstances. When this happens, Retrospect creates an error log in the Retrospect preferences folder named “Retrospect.error.log.*n*” where *n* is a number.

Retrospect does internal consistency checks to ensure internal operations are fine. If you get this error, restart the computer and do what you were doing when the error occurred. If the error recurs, Retrospect most likely detected that an internal file in use for backup has been corrupted. Often the context of the error is most important.

If the error occurs during backup, archive, or restore, when Retrospect accesses the backup set’s catalog file, this may indicate the catalog is corrupt. The solution to a corrupt catalog is to rebuild it from the media using Tools>Repair>Rebuild.

If the error occurs when you open Retrospect or when you are merely clicking tabs and buttons as you navigate the program, this may indicate the configuration file is corrupt. Test for a cor-

rupted configuration by moving the Retro.Config file and the Retro.Icons files from their default location (in the Library/Preferences/Retrospect folder) to another location, such as the desktop. Relaunch Retrospect, provide the requested password or authentication if asked, then enter your application license code. Retrospect then creates new configuration and icon files. Try to reproduce the error. If you can reproduce the error, your original configuration files were not the cause, so return them to the Retrospect preferences folder to regain your scripts and preferences. If you cannot reproduce the error, it was probably caused by a corrupt configuration and you will have to use the new configuration. The side effect is that your scripts and preferences are gone and you must create new scripts and set new preferences.

If these suggestions do not help, see the Dantz web site for a technical note on internal consistency check troubleshooting.

ERROR NUMBERS

If Retrospect or the operating system is unable to complete an operation, it will display an alert with an error number and/or log the error in the Operations Log. This section explains some common error numbers in greater detail.

Generally, errors with negative numbers (e.g. error –34) are Mac OS errors, while errors with positive numbers (e.g. error 102) are Retrospect errors.

–34 (volume full)

A volume has little or no available storage space. There are several possible causes of this error:

- You are restoring or duplicating more files than will fit on the destination volume.
- Retrospect is updating a backup set catalog and the volume on which it is saved runs out of room.
- You are backing up to a file backup set and the destination volume runs out of free space.

Go to the Finder and make more space on the full hard disk by removing unnecessary files and emptying the Trash. Try marking fewer files to restore or duplicate, or select a larger destination volume. Use catalog compression to make your catalogs use less space.

–35 (volume doesn't exist) and –53 (volume off-line)

Retrospect cannot find a certain volume. Make sure the volume is actually connected to the client or backup computer and it is mounted on the desktop.

If the volume is mounted, Configure>Volumes to browse it. If Retrospect is able to scan the volume, the original error will probably not occur again. If the scan encounters the same error, Configure>Volumes again, Forget the client's volumes, then Configure>Clients and put the client volumes back into Retrospect's volume lists. Remember to add the volume to the appropriate scripts, if necessary. You may avoid this error with clients by using client containers.

–36 (I/O errors)

A media problem occurred on a source volume.

Try verifying your source volume using a disk utility or the formatting program that came with your hard drive.

–37 (invalid name)

This is usually caused by backing up a Services for Macintosh folder on a Windows NT Server. See "Services for Macintosh" on page 110.

If a volume contains NT Services for Macintosh folders, you must back up these folders via file sharing. Using the "Private files/folders/volumes" option within the Retrospect client, exclude all the Services for Macintosh folders. Mount the Services for Macintosh folders as

volumes on the backup computer desktop to back up the folders.

We recommend you use Retrospect Server for Windows to back up Windows NT or 2000 servers.

–39 (unexpected end of file)

A file may be corrupt or damaged. Use a disk repair utility to scan the volume for problems.

–43 (file not found)

Retrospect cannot find a file.

This usually means you or someone moved or deleted one or more files and folders while an operation was in progress.

Try backing up again. If this error continues to occur, run Apple's Disk First Aid, or a third party disk checking utility to check for possible directory corruption.

–49 (file busy)

The file cannot be accessed because it is in use.

This may happen with a Windows client. Close all applications open on the client.

–53 (volume off-line)

Effectively the same as error –35.

–54 (file busy/locked)

The file cannot be accessed because it is in use. There are two causes of this error:

- You are trying to back up System files from a shared volume while using Mac OS file sharing or AppleShare.
- Another application, such as FileMaker or 4th Dimension, had the files open, preventing Retrospect from accessing them.

Back up the busy files from the local Macintosh, quit the application that owns the busy file, or use Retrospect client software to back up your server instead of mounting it on the desktop.

–108 (out of application memory)

There is not enough memory available to Retrospect for it to continue the operation. Retrospect may report error –108 when other applications are using most of the memory or your Macintosh does not have enough RAM installed.

Try quitting your other applications to make more memory available to Retrospect. Repeat the operation which brought about the error.

–1028 (not visible on network)

Retrospect cannot find the client computer on the network. Make sure the client computer is connected to the network and turned on and that it is not powered off by energy saving software. Also, make sure Mac OS X's built-in firewall (off by default) is not enabled.

If it is a mobile computer make sure it has not been "suspended" or put into "sleep" mode. (Restart a suspended Windows computer to let Retrospect see it.) Make sure the client has the most recent version of the Retrospect client software and that the client software loads at startup.

If not, follow the suggestions provided for the error "Retrospect Client not loaded at system startup" on page 228 or "Client service not loaded at system startup" on page 230.

Test the connection between the backup computer and the client by using Get Info from Configure>Volumes. If it can connect with the client, Retrospect displays its measured transfer rate in kilobytes per second.Try pinging it. (See "Pinging to Verify TCP/IP Communication" on page 206.)

If this error occurs with a Windows 95 client it may be caused by a bug in the operating system. Microsoft's Winsock 2.0 update fixes the problem. It is available free from Microsoft at: http://www.microsoft.com/windows95/

downloads/contents/wuadmintools/s_wunetworkingtools/w95sockets2/default.asp

–1277 (can't open connection)

The client is registered on the network but does not respond to the backup computer's attempts to communicate. This may mean:

- The client has crashed or otherwise failed.
- The client is occupied with a computation-intensive or communication-intensive operation, such as running game software.
- The client is running an older version of security software that is incompatible. Security software known to cause problems include old versions of DiskLock and Empower.

–3205 (TCP/IP closed down)

Open Transport closed down the TCP/IP connection. This may result from a serious problem such as another computer using the same IP address as the backup computer.

Verify TCP/IP is properly configured or refer to Open Transport documentation.

–24004 (media request timeout)

Retrospect could not find a requested disk, tape, or disc before the Media Request Timeout period elapsed.

Turn off the Media Request Timeout preference (page 158) so Retrospect waits indefinitely for the requested media.

–24201 (chunk checksum failed)

One of Retrospect's files, likely a catalog, is corrupt.

If the error occurs during a backup or archive, you need to rebuild the catalog (page 188) of the destination backup set.

If the error occurs when you launch Retrospect, see "Retrospect crashes while it is being launched." on page 198.

–25040 (Catalog invalid or damaged)

Effectively the same as error –24201.

–25048 (Snapshot not found)

Retrospect could not find the requested Snapshot on the medium. For more information, see page 202.

100 (device rejected command)

This means that a command sent by Retrospect to your backup device was rejected by the device. Following are possible causes and their solutions.

- Your backup drive may not be supported by Retrospect. Check the Dantz web site to make sure your device is supported.
- Other software may conflict with Retrospect. Try running a backup without other third party software running.
- The media may not be supported by the backup device. Try different brands of media, if applicable. Check with the drive manufacturer to see if they have specific recommendations.

If Retrospect continues to report this error, see the device troubleshooting steps appropriate to your device and interface ("General Device Troubleshooting" on page 203 and either "FireWire and USB Device Troubleshooting" on page 204 or "SCSI Device Troubleshooting" on page 205).

102 (trouble communicating)

The backup computer lost contact with the backup device. Following are common causes of this error:

- You are using a file backup set (for example, backing up to a hard disk) and it has exceeded the maximum file size allowed on the volume. Perform a new backup or a recycle backup (page 23).

- The SCSI chain is not properly terminated. See "SCSI Device Troubleshooting" on page 205.

If Retrospect reports this error with a FireWire or USB device, quit Retrospect and restart the Macintosh. Also see "General Device Troubleshooting" on page 203 and "FireWire and USB Device Troubleshooting" on page 204.

106 (data overwrite attempt)

For tape drives, errors 106 and 212 indicate a media failure.

If you see this error on a tape drive, run the Verify operation from the Tools tab to check the extent of the failure on the tape.

203 (hardware failure)

The backup device is having problems because of a bad medium, a device communication problem, or a mechanical error.

If the error occurs only when you use a particular medium, that medium is probably damaged. Try using a new medium. If the error occurs when you use any medium, you may have a problem with your communications bus or device. Try quitting Retrospect, turning off the backup device and computer for two minutes, and then turning them back on again before opening Retrospect.

See "FireWire and USB Device Troubleshooting" on page 204 or "SCSI Device Troubleshooting" on page 205.

204 (device busy)

There is something else preventing Retrospect from accessing your backup device. Here are some possibilities:

- You stored the catalog for a removable disk backup set on a disk used as a member of that backup set. Keep the catalog on your hard disk.
- Retrospect is prevented by the operating system from erasing the disk. Turn File Sharing off.
- Retrospect may be trying to use a disk both as a source *and* destination at the same time. Choose only your local hard drive as the source instead of the Local Desktop Container.

If these do not apply, then this error is a sign of media, device or communication problems. See hardware troubleshooting information for your device and interface.

205 (lost access to storage media)

Usually indicates the communication bus was reset during a backup, causing Retrospect to lose contact with the media.

This error usually indicates a communications bus problem and may be accompanied by an error 102 (trouble communicating). If error 102 accompanies error 205, see "FireWire and USB Device Troubleshooting" on page 204 and "SCSI Device Troubleshooting" on page 205.

If error 102 does not accompany error 205 and communication problems have been ruled out, the next step is to check for media failure on the source volume.

Some hard drives reset the bus when they sense they are experiencing a media failure. Try testing the hard drive with the software that was originally used to format it.

206 (media failure)

There is trouble reading from or writing to the backup set medium. This error is always generated by the backup device, and is usually due to one of the following causes.

- The media is physically defective and needs to be replaced. Try using a different medium.
- The heads on the tape drive are dirty and need to be cleaned. Consult the manual that came with your tape drive or contact the

drive manufacturer for cleaning recommendations.

- Another device is causing interference. If you have a drive immediately next to another electronic device, try moving the devices further apart. Try removing one or more devices temporarily to see if there is some other device conflict. Try using your backup device on another computer to see if interference is caused by your monitor or other nearby electronic devices. Also see "General Device Troubleshooting" on page 203 and "FireWire and USB Device Troubleshooting" on page 204 or "SCSI Device Troubleshooting" on page 205.
- Retrospect can also report error 206 when a crash or power failure interrupts the backup computer or tape drive. Some tape drives require an end of data (EOD) marker on a tape to append data. If a tape does not have an EOD marker Retrospect may report error 206 when it next tries to append to the tape. Tape drives are responsible for writing EOD markers, but a drive may not get the chance if you shut down or restart the backup computer or the power is interrupted. Lacking an EOD, the tape will later produce error 206 when you try to append (write data) to it with Retrospect.

  To avoid problems, take the following precautions: do not disable the "Verification" option in scripts and immediate operations; let the tape drive fully rewind or eject the tape before you power off or restart the computer; and if the computer crashes, try to eject the tape (using the drive's eject button) before restarting or turning off the computer.

  When Retrospect reports error 206 on a tape because it lacks an EOD marker, that tape is unusable for future appends until you erase it, though it is not physically damaged and you can use it to restore. The tape cannot be repaired with Retrospect's repair tool. To use the tape for additional backups or archives, you must first either reset the tape's backup set from Configure>Backup Sets or erase the tape from Configure>Devices.

When the error persists on multiple media and you have eliminated the above possibilities, the device may be failing. Contact the vendor.

212 (media erased)

Retrospect thinks the content of the medium has been erased. If you suspect that is untrue, try the media in another drive to test for device or communication problems with the original drive. Check for device and communication integrity based on the hardware troubleshooting steps for your device and interface. If it reports the same error in all drives, then the media itself is damaged.

With a tape drive, this error may indicate a possible problem with the drive. See error 106 (data overwrite attempt).

220 (server is not responding)

The FTP server did not respond to Retrospect.

Verify the FTP server name (including domain) or IP address is correct. There are many possible causes: the server may not exist, the domain may not exist, the name may not be used by a domain name server, the server may not be an FTP server, the IP address may not be found, the network may not be operating, or the backup computer's TCP/IP connection may not be operating.

221 (user name or password incorrect)

Retrospect could not log in because the FTP server rejected the user name or password.

Verify both are correct. Often, they are case-sensitive.

222 (server name lookup failed)

Retrospect could not log in to the FTP server because either the host name (server and domain)

is incorrect or the domain name server (DNS) is not functioning.

Verify the host name (the "FTP Server" field of Retrospect's connection configuration window). If the name is correct, your computer is not working with the DNS it uses to look up domain names and IP addresses. Contact your FTP server administrator or DNS administrator to troubleshoot your computer and/or the DNS.

223 (backup set not found)

Retrospect could not find the backup set folder in the specified path.

Verify the path and server are correct. This error can mean your Internet backup set directory has been moved or deleted from the FTP server. Contact your FTP server administrator.

224 (backup set is damaged)

Retrospect determined some backup set internals are unsound. It cannot use the backup set until it is repaired.

Go to Tools>Repair and choose "Rebuild Internet backup set."

225 (no write privileges, bad name, or disk full)

This error has three possible causes:

- Your user account on the FTP server does not have server privileges to write data in the directory or on the server.
- You supplied an invalid name for a new folder.
- The FTP server volume on which the backup set resides is full.

The solutions, respectfully, are:

- Verify the path to the backup set directory. Contact your FTP server administrator to verify your user account information, including write privileges.
- Verify the new folder or backup set name; it may contain characters not allowed by the FTP server. (Some servers allow only the letters A through Z in names.)
- Contact your FTP server administrator to make more space available on the FTP server volume. You can do this in part yourself by deleting unwanted files from your user directory.

226 (backup set segment is missing)

The backup set is damaged; a data segment is missing from the backup set directory on the FTP server.

You or somebody with write privileges to the backup set directory moved or deleted one or more Retrospect data files (e.g., "0-data," "1-data," etc.) from the directory. Contact your FTP server administrator.

227 (bad name or no write privileges)

This error has two possible causes:

- Your user account on the FTP server does not have server privileges to write data in the directory or on the server.
- You supplied an invalid name for a new folder.

The solutions, respectfully, are:

- Verify the path to the backup set directory. Contact your FTP server administrator to verify your user account information, including write privileges.
- Verify the new folder or backup set name; it may contain characters not allowed by the FTP server. (Some servers allow only the letters A through Z in names.)

228 (folder is not a backup set)

Retrospect cannot find the Internet backup set directory at the specified path.

Verify the path to the backup set directory in the connection configuration window. Contact your FTP server administrator.

229 (backup set name/creation date do not match)

The given backup set is not the one Retrospect expected. It has the same name but different internal information.

Locate the correct backup set and enter its directory path in Configure>Backup Sets. If you cannot find the correct backup set, you can repair the backup set in question: go to Tools>Repair and choose "Rebuild Internet backup set."

230 (pathname exceeds 255 characters)

The pathname to the backup set contains 255 or more characters.

Retrospect limits FTP server pathnames (including the backup set name) to 255 characters. Rename directories so the pathname is 254 characters or less.

231 (server disconnected or disk full)

The FTP server deliberately disconnected Retrospect.

This often happens when the server volume is full. Check the FTP server's volume and determine whether it is full. If it is full, you must make space for future backups. If it is not full, look for signs of network trouble which might cause the FTP server to drop connected users. Check the physical connection to the server, making sure the modem or network cabling plugs are fully seated. Use a TCP/IP or FTP utility such as WhatRoute or Fetch to try to connect to your server. You may need to contact your Internet Service Provider to check its connections.

Further attempts to add to the Internet backup set will likely produce "catalog out of sync" errors. After checking the server volume, and—if necessary—making space available on it, update the backup set from Tools>Repair.

232 (directory not found)

The FTP server does not have the specified backup set directory at the specified path.

Go to Configure>Backup Sets to verify the path to the backup set in the connection configuration window.

233 (connection timed out)

Retrospect terminated the operation because it failed to receive a response from the FTP server within the time specified in Retrospect's FTP server timeout preference. (The default is 30 minutes.)

If this happens repeatedly, check the physical connection to the server, making sure the modem or network cabling plugs are fully seated. Use a TCP/IP or FTP utility such as WhatRoute or Fetch to try to connect to your server. You may need to contact your Internet Service Provider or FTP server administrator.

234 (server disconnected or timed out)

The connection between the FTP server and the backup computer failed.

Check the physical connection to the server, making sure the modem or network cabling plugs are fully seated. Use a TCP/IP or FTP utility such as WhatRoute or Fetch to try to connect to your server. You may need to contact your Internet Service Provider or FTP server administrator to check its connections and/or determine its connection timeout setting. (Some providers limit how long users can stay connected.)

Further attempts to add to the Internet backup set will likely produce "catalog out of sync" errors. Rebuild the backup set from Tools>Repair.

503 (client turned off)

The client was turned off by the user at the client computer before the operation started. The Retrospect Client control panel will automatically turn on when that client is restarted.

505 (client reserved)

The client is in use by another backup computer. A client may be used by only one backup Macintosh at a time.

This can also happen when the backup computer or client computer crash during an operation. Restart both computers.

506 (duplicate activator code)

Update the client software to version 5.1 or later (Mac OS) or 6.5 or later (Windows).

507 (incorrect password)

Make sure you are properly typing the password. It is case sensitive, so you must type the password's proper upper case and lower case letters.

If you cannot remember the password for a client, you must reinstall the Retrospect Client control panel.

508 (access terminated)

The client user has turned off the Retrospect Client control panel during the operation. When this occurs, the backup Macintosh logs the error and moves on to the next client.

515 (piton protocol violation)

Retrospect sees its data is becoming corrupt while being transferred over the network. It is usually caused by a hardware failure.

Look for a pattern to these errors. If the problem occurs only on one client, it is likely that there is a problem with the client's network connector or its connection to the network. If the problem happens on several clients with no coherent pattern, the problem may be with the backup computer's network card or connection, or with a gateway/router common to all network transactions. See page 206 for more information.

519 (network communication failed)

The backup and client computers ceased to communicate, a situation which has many causes and solutions, as detailed below.

A user shuts down a client during the backup, or the client fails or is disconnected from the network during a backup. Determine why the client is failing or what part of the network communication link is failing (for example, a router, bridge, hub, or individual network connector). See the next item for help in determining if the problem is due to a software conflict.

A user is using too many applications on the client during the backup, or an application takes up most of the computer's processing power. Schedule backups for periods when the client is idle.

A network communication problem caused by hardware or software is making transactions unreliable. A failed network connector on a client will cause errors on that client. To determine whether a failed network connector is causing the problem, try switching connectors with a nearby computer that is not experiencing problems. See "Network Troubleshooting Techniques" on page 206.

A bad or failing hard disk is hanging the client computer. If the hard disk read light on the client is stuck "on," and not blinking, and the client must be restarted before it will work, the client has a failing hard disk or a bug in the hard disk's firmware or software. For the hard disk that is hanging, update its driver to the latest version from its vendor. Then try running a disk-checking program.

Your network software is incompatible with your network hardware. Use the latest network software which matches your network hardware because older software might have problems.

Mac OS 7/8/9: An extension or some other software on the Macintosh has broken the network connection. Make sure you are not using software applications which prevent communication, such as older versions of security or compression programs that are active during a backup. Try starting up the Macintosh with the Retrospect Client control panel turned on, but all non-Apple extensions turned off.

This error may be caused by a problem with built-in Ethernet on all non-G3/G4 PCI-based Mac OS computers. It tends to occur during large data transfers on a busy network. One solution is to upgrade to Mac OS 8.6, which has a new extension that fixes the problem. Another solution is to install and use third-party Ethernet cards. For more information, use the knowledgebase on the Dantz web site to search for "PCI networking."

Windows: Two different bugs in the Windows 95 operating system can cause the client to lose contact with Retrospect. Make sure the appropriate TCP/IP patch has been installed on Windows clients using these operating systems and Winsock 2.0 has been installed on Windows 95 clients. See "Working with Windows Clients" on page 109.

525 (name/login conflict)

Usually this error appears when a client has been uninstalled and re-installed or replaced by client software which is not logged in.

On the backup computer, go to Configure>Clients, select the client experiencing the problem, then Forget the client. Click Add to go to the live network window and add the client of the same name. Add the client to your scripts.

527 (client was renamed)

Another backup administrator has renamed a client from another backup computer. Simply configure the client again to update the name in your own client database.

541 (client not installed or not running)

The backup computer can see the client computer at the IP address but no client software is operational.

Make sure the client computer is turned on and that it is not powered off by energy saving software. If it is a mobile computer make sure it has not been "suspended" or put into "sleep" mode.

Open the Retrospect Client control panel and examine its Status field for an error message about why the client software is not working. Consult the appropriate error message or troubleshooting problem in this chapter. You may need to reinstall the client software.

RETROSPECT CLIENT ERRORS

When backing up clients, you can also get error messages on the client side. The errors appear in the client control panel on the client computer.

Mac OS Client Control Panel Errors

When everything is set up normally, and no errors have occurred, the Retrospect Client control panel should say "Ready" or "Waiting for first access" in the Status field. Below the status is the History area with information about the most recent operation or error messages.

Retrospect Client not loaded at system startup

If the message "Retrospect Client not loaded at system startup" is followed by one of the explanations in Table 10-2, proceed as indicated.

Message	Action/Comment
ROM or System Version too old	The Macintosh appears to be an antique, hopelessly incapable of running the modern networking software required for use as a client of Retrospect Backup for Windows. It is not even able to run the long-obsolete networking software required for use as a client of a ten-year-old version of Retrospect for Macintosh.
AppleTalk version too old	The Macintosh is trying to use AppleTalk, not TCP/IP. Verify that it meets the system requirements then install Open Transport and set up TCP/IP networking.
AppleTalk turned off	The Macintosh is trying to use AppleTalk, not TCP/IP. Verify that it meets the system requirements then install Open Transport and set up TCP/IP networking.
ADSP not installed	The Macintosh is trying to use AppleTalk, not TCP/IP. Verify that it meets the system requirements then install Open Transport and set up TCP/IP networking.
No computer name or owner name specified in file sharing settings	For System 7.*x,* open the Sharing Setup control panel. For System 8 or later, open the File Sharing control panel. Enter computer and owner names then restart.
Network Name conflict: “Name”	Another client on the network is already installed with this Owner Name. Trash the Retrospect Client control panel and install a fresh copy.
Open Transport TCP/IP not installed	Install Open Transport and set up TCP/IP networking.
Mouse button held down	Holding down the mouse button during startup inactivates the control panel.
Doesn’t run under A/UX	The Retrospect Client control panel cannot be used on a Macintosh running under A/UX.
Your activator code conflicts with John Doe (123.45.67.8). Please tell your backup administrator.	Forget one of the clients, trash its Retrospect Client control panel, then install Retrospect client software version 4.2 or later. Upgrade all older clients to prevent recurring errors.

Table 10-2: Macintosh client control panel startup errors.

If this message appears by itself in the Status area, there are several possible causes.

- The °Retrospect Client control panel file is not in its proper location. Place it in the Control Panels folder within the System Folder.
- You have not restarted the client after installing the Retrospect client software. Restart the client.
- You held down the Shift key when you restarted the client Macintosh, which prevented extensions from loading. Restart without holding down Shift.
- You have an extensions manager program that specifies that the Retrospect Client control panel not be loaded. Open the extensions manager and ensure the Retrospect Client control panel gets loaded at startup.
- Another control panel or system extension is conflicting with the Retrospect Client control panel. Test for a conflict by temporarily removing several system extensions and control panels from the System Folder, leaving the Retrospect Client control panel and standard Apple extensions then restarting the client Macintosh. After restarting, open the

Retrospect Client control panel. If you see the message “Ready” or “Waiting for first access,” you know one of the items you removed prevented the Retrospect Client control panel from loading. You may avoid the conflict by making the Retrospect Client control panel load first on startup by replacing the ° symbol in its name with a space.

Windows Client Control Panel Errors

When everything is set up normally and no errors have occurred, the control panel’s Status tab should say “Ready” or “Waiting for first access” in the Status field. Below the status is the History area with information about the most recent operation or error messages.

Client service not loaded at system startup

If the status shows this error message, examine the history field for one of the messages from Table 10-3, then proceed as indicated.

There are a few possible reasons (in addition to those in the table) why the client software may not load at startup.

- The client software files are not in their proper location. The client software must be in the location you specified during the installation. Put it back in place or run the Setup program to reinstall the software. Log in as the administrator or another user with full access privileges when you install.
- You have not restarted the computer after installing the client software. The client software loads when the system boots. Restart the client computer.
- The client’s service was terminated. This is unusual. You may be able to run Retroclient.exe to get the service operating, but because you do not know what terminated the service in the first place, it is best to restart the client computer.

Message	Action/Comment
Retrospect Client startup error: Winsock initialization failed.	There is a problem with the Winsock network interface. The file WINSOCK.DLL or WSOCK32.DLL may be an incorrect version (e.g., a non-standard Winsock). Re-install the DLL from the Microsoft Windows installation media.
Retrospect Client startup error: Protocol initialization failed. Make sure protocol is working.	Make sure the computer is using a valid IP address.
Retrospect Client startup error: Initialization failed. Make sure IP protocol is installed.	Install the TCP/IP network protocol from the Microsoft Windows installation media.

Table 10-3: Windows client control panel startup errors.

Linux Client Control Panel Errors

When everything is set up normally and no errors have occurred, the control panel's Status tab should say "Ready" or "Waiting for first access" in the Status field. Below the status is the History area with information about the most recent operation or error messages.

Message	Action/Comment
"*JAVA_HOME* is set to an invalid location" *JAVA_HOME* represents the path to JAVA_HOME.	A symbolic link to /usr/bin/java does not exist or the JAVA_HOME variable in RetroClient.sh is not set to the correct location. Install Java if it is not installed. If Java is installed then follow the steps below. The RetroClient.sh file assumes that there is a symbolic link to the Java executable from the /usr/bin/folder. If this link does not exist, there are two ways of correcting the problem: 1) Create it: su to root cd /usr/bin ln –s /usr/jdk1.3/bin/java java Make sure that "/usr/jdk1.3/bin/java" reflects the path to the java executable where it was installed on your machine. 2) Change the line "JAVA_HOME=/usr/bin" to point at the "bin" folder of your Java installation folder.
"Either *RETROSPECT_HOME* or *DISPLAY* is not set!" *RETROSPECT_HOME* represents the path to RETROSPECT_HOME. *DISPLAY* represents the DISPLAY value.	During installation, RETROSPECT_HOME should have been set to the location of the installation, typically /usr/local/dantz/client. If this is defined and exported in /etc/profile then the user can just load the file with "./etc/profile" from the terminal where they want to start the Client Control Panel.
"Critical file missing."	Critical files missing from RETROSPECT_HOME path (either retrocpl or retrospect.jar). If these files have been moved, move them back to the RETROSPECT_HOME path. If these files are not present, reinstall the client.
"Error obtaining network status."	Indicates that the client is not running. The Client Control Panel cannot display client information until the client is started. Start the client.

Table 10-4: Linux client control panel errors.

RETROSPECT SUPPORT

Retrospect provides built-in access to a number of useful resources. From the Retrospect Help menu, you can access:

- **Online help contents page**. Fully-searchable and indexed guide to using Retrospect.
- **Retrospect Read Me**. Tips, late-breaking information, known issues, and workarounds.
- **Dantz Web Site**. Dantz's home on the Internet. To access Dantz's Web site directly, go to www.dantz.com.
- **Online Knowledgebase**. Searchable database containing answers to frequently asked questions about Retrospect-related terms, error messages, and troubleshooting techniques. To access the Knowledgebase directly go to www.dantz.com/knowledgebase.
- **Supported Devices**. Searchable backup hardware compatibility database provides information of which devices Retrospect supports. To access supported devices information directly, go to www.dantz.com/hardware.
- **Retrospect Updates**. Product downloads for Mac OS and Windows products, upgrades, and updates. To access Retrospect updates directly, go to www.dantz.com/updates.
- **Dantz Support**. Support section of the Dantz Web site. Includes links to tutorials, user forums, etc. To access the support section directly, go to www.dantz.com/support.

All of these resources are available for free and can help you solve problems quickly and effectively to get the most out of Retrospect.

If you experience problems that you cannot solve using these resources, Dantz Technical Support is available to help. To learn more about available support options, check Dantz's support matrix at:

www.dantz.com/support_matrix.

For information about contacting Technical Support in the U.S. and Canada, as well as internationally, see www.dantz.com/contactsupport.

APPENDICES

- A : RETROSPECT SYMBOLS
- B : RETROSPECT FILES
- C : GLOSSARY OF TERMS

APPENDIX A • RETROSPECT SYMBOLS

General Symbols


Button to change the information for a script or operation.


Drop arrow indicating a closed item. Click to open and show its contents.


Drop arrow indicating an open item. Click to close and hide its contents.


Local Desktop container.


Backup Clients container.


Groups container or an individual group.


Startup disk volume of the backup computer.


Disk volume (other than the startup volume).


CD-ROM volume.


Folder (file system, Retrospect container, or Retrospect subvolume).


Shared disk volume, such as a file server or client volume.


Startup disk volume of a client computer.


CD-ROM volume from a client computer.


Subvolume on a client computer.


Mac OS client. When dimmed, it indicates Retrospect has *not* recently communicated with it.


Windows client. When dimmed, it indicates Retrospect has *not* recently communicated with it.


Removable disk backup set.


CD/DVD backup set.


Tape backup set.


File backup set.


Internet backup set.


Script.


The item is locked, allowing only read access.


Session.

Media Symbols


This medium is a member of a known backup set.


This medium is not a member of a known backup set, but its name matches that of a known backup set.


This member of the backup set is intact.


This member of the backup set is missing.

Cursor Symbols


Cursor when Retrospect is running in unattended mode.


Cursor when Retrospect is busy, such as when it is scanning, matching, copying, or communicating with a client computer.


Cursor when the user has complete control of Retrospect.

Selector Symbols


Selector.


Pop-up menu for choosing selector conditions.

Condition handle used to move or copy the conditions.

Condition set to select folders *and any files in the top level of those folders* that match the given criteria.

Condition set to select folders *and all items enclosed in those folders* that match the given criteria.

Browser Symbols

Completely marked item. If the item contains other items, it means all the items within it are marked.

Partially marked item. One or more items—but not all—within the item are marked.

Matched file that exists in or on the destination and will not be copied in an operation.

Missing item that exists in a missing backup set member.

Snapshot.

Folder.

Document.

Application.

Report Symbols

Δ Retrospect Express opened.

\+ Start of script, operation, event, or module.

– Start of operation with a volume.

! User-initiated action.

* Other action.

› Error.

Files Created by the Retrospect Installer or Retrospect

Retrospect

The Retrospect application program.

Read Me-Retrospect.htm

This hypertext document contains late-breaking news about Retrospect. It also includes tips, compatibility notes, and information on conflicts and workarounds.

Retrospect User's Guide.PDF

This is the manual you are presently reading, in PDF format. It is best viewed and navigated with Acrobat or Acrobat Reader, but you can open it with other applications, such as Mac OS X's Preview.

Retrospect Preferences Folder

This folder, which is created the first time you start Retrospect, is stored in the system's Preferences folder. It contains many of the files listed in this appendix. The default location for the folder is:

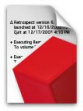
/Library/Preferences/Retrospect/

Retro.Config

Created automatically by Retrospect and placed in its preferences folder. It contains most of your customized settings, including scripts and their schedules, passwords, preferences, known backup sets, defined subvolumes, selectors, client login names, and recent choices.

Retro.Icons

Created automatically by Retrospect and placed in its preferences folder. It stores information on all of the file types and icons encountered.



Operations Log

This text file is created automatically by Retrospect and placed in its preferences folder. It keeps a record of each Retrospect activity and can be opened and edited by any text editing application or viewed from within Retrospect. Formatting codes that start with "$[" are visible when the Log is opened in a text editing application. These codes are used by Retrospect to display symbols, as well as bold and underline font styles.

Retrospect Plug-in Extension

Updates to the main application come in the form of these plug-in files. For instance, Dantz adds support for new tape and recordable disc drives by periodically releasing Retrospect Driver Update plug-in files. (You may even have an RDU included with Retrospect right now.) When circumstances permit, Dantz includes the latest driver update with Retrospect and it is automatically installed when you install Retrospect. (To reinstall the driver update, reinstall Retrospect.) As soon as a new driver update is available, it is posted on the Dantz web site for you to download.

retrorunfile, LaunchRetroHlper

Under Mac OS X, these files work together to compare the system clock with the next scheduled script event and automatically launch Retrospect when required. They are created by the Retrospect application when you schedule executions and it creates new files if it discovers the files are missing.

AppleScript Utilities folder

This folder contains utilities to script Apple events, as described under "AppleScript Support" in Chapter 9.

Update Files

These files may be included on the Retrospect CD or you may download them from the Dantz web site.

Retrospect Client Update File

Updates to Retrospect client software come in the form of a client update file. You can use it from Retrospect to update client computers individually, or update a group of client computers with a single command from the backup computer. Retrospect client update files for Macintosh and Windows are on the Retrospect CD and on the Retrospect Clients CD. As soon as new client software is available, Dantz posts a client update file on the Dantz web site for you to download.

Files Created by the User

Run Document

These files are created when you create a run document. You can save a run document file on any disk, and double-click the file whenever you want to run the script without having to first start Retrospect manually. When you save a run document, you can give it any name you want.

Catalog for Removable Disks Backup Set

This is a catalog file for a removable disks backup set. It is created when you first make a new backup set and it bears the name of that backup set. To do any kind of operation with the corresponding backup set, such as back up or restore, you must have this catalog file. If you lose or damage the catalog, you can have Retrospect rebuild it from the backup set disks.

Catalog for Tapes Backup Set

This is a catalog file for a tapes backup set. It is created when you first make a new backup set and it bears the name of that backup set. To do any kind of operation with the corresponding backup set, such as back up or restore, you must have this catalog file. If you lose or damage the catalog, you can have Retrospect rebuild it from the backup set tapes.

Catalog for CD/DVD Discs Backup Set

This is a catalog file for a recordable compact discs backup set. It is created when you first make a new backup set and it bears the name of that backup set. To do any kind of operation with the corresponding backup set, such as back up or restore, you must have this catalog file. If you lose or damage the catalog, you can have Retrospect rebuild it from the backup set discs.

Catalog for Internet Backup Set

This is a catalog file for an Internet backup set. It is created when you first make a new backup set and it bears the name of that backup set. To do any kind of operation with the corresponding backup set, such as back up or restore, you must have this catalog file. If you lose or damage the catalog, you can have Retrospect rebuild it from the FTP site's directory in which the backup set resides.

File backup set combined data and catalog

A file backup set combines both the catalog (the index for the backup set) and the data being backed up into a single file stored on a single volume.

File backup set catalog only

This file is the catalog separated from a file backup set.

File backup set data only

This file is the data separated from a file backup set.

APPENDIX C • GLOSSARY OF TERMS

access privileges – The privileges given to (or withheld from) users to see folders, see files, and make changes to shared volumes.

append – To write additional data to a backup set. In a normal backup, Retrospect appends file data to the current backup set member.

archive (verb) – To copy files from a volume to a backup set. For example, "Let's archive these QuickTime movies." Archiving may, optionally, involve removing the copied files from the source. Also see **back up**.

archive (noun) – 1. An operation in which files are archived. For example, "The archive was successful last night." 2. An entity of backup materials. For example, "Retrieve the 2001 accounts from the archive." In this respect, a backup set is an archive. Also see **backup set**.

back up (verb) – To copy files from a volume to a backup set (such as recordable discs). You should back up regularly in case something happens to your hard disk or any files.

backup (noun) – 1. An operation in which files are backed up. For example, "I just did today's backup." 2. An entity of backup materials. For example, "Fortunately, we can get the backup from the safe and restore the files." In this respect, a backup set is a backup. Also see **back up** and **backup set**.

backup action – See **recycle backup, new media backup,** and **normal backup**.

Backup Clients – The Backup Clients container holds client computers which are logged in to Retrospect.

backup computer – The computer on which you are using Retrospect with a backup device. In a networked environment, it is the computer used to back up client computers.

backup date – The most recent date and time a file, folder, or volume was copied to a backup set. Retrospect sets this date for volumes, folders, and/or files *only* when you check the appropriate boxes under Options in the Execution window. Also see **creation date** and **modification date**.

Backup Report – Displays all known volumes with information about when they were last backed up.

Backup Server – 1. Retrospect's technology allowing flexible, resource-driven or user-initiated backups. 2. A backup computer running a Backup Server script.

backup set – A set of storage media and catalog file. Retrospect stores all files in backup sets. There are different types of backup sets for different media and devices: Internet backup sets for FTP servers, removable disk backup sets for multiple ejectable volumes or external hard disks, file backup sets for a single volume, tapes backup sets for tape cartridges, and CD/DVD backup sets for recordable and rewritable disc drives.

boot – To start a computer's operating system. A Macintosh boots when you turn on its power or when you or software restarts it.

browser – Retrospect's tool that allows you to view the folder and file structure of a volume or contents of a backup set. You can also use a browser to see the files and folders in a backup set. The browser allows you to manipulate files and mark them to be used in an operation such as a backup.

catalog – Retrospect's index of the files and folders contained in a backup set. The catalog file allows you to mark files for restore or retrieval without having to load or insert your backup set media.

CD/DVD disc backup set – For use with supported recordable disc drives (CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, or DVD+RW). Also see **backup set**.

client – A network Macintosh, Windows, or Linux computer running Retrospect client software whose volumes are available for backup by the backup computer. Also see **backup computer**.

compression – Reduces the size of the data being copied to the backup set media in a backup or archive. Retrospect can do it with software compression, or a capable tape drive can do it with hardware compression.

condition – In Retrospect's file selectors, a distinguishing criterion relating to file or folder characteristics. You can choose multiple conditions to make your own custom selectors. Also see **selector**.

container – An item for organizing other items such as volumes or clients in certain Retrospect windows. Also see **Local Desktop** and **Backup Clients**.

configured subnet – A **subnet** that Retrospect has been configured to search for clients.

Contents Report – A Retrospect report that shows a single backup set in terms of the sessions it contains. A list of all sessions is displayed for each backup set. Double-clicking a session displays a browser of all files in that session.

creation date – The time and date a file, folder or volume was created. A file's creation date is set when the file is first saved or made. A folder's creation date is set when you select New Folder. A volume's creation date is set any time the volume is formatted or erased. Also see **backup date** and **modification date**.

creator code – The four-letter code that represents the creator of a file. For example, documents created by SimpleText have a creator code of ttxt. Retrospect lets you select files according to creator code.

day of week scheduler – A type of scheduler that lets you schedule a script to run every week on specified days of the week (for example, every Monday, Wednesday, and Friday).

destination – The storage medium to which files are being moved, copied, or otherwise transferred. When backing up or archiving, the destination is a backup set. When restoring or duplicating, the destination is a volume.

device – Any piece of peripheral equipment connected to your Macintosh, such as a hard disk drive, removable disk drive, or CD/DVD drive. In this manual, the term "backup device" refers to any device that accepts backup set media, such as a CD-RW drive or removable disk drive. When using Internet backup sets, think of the **FTP server** as the device.

directory – A hierarchical structure on a volume that may contain files or more directories. The Mac OS refers to these as folders.

disc – A CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, or DVD+RW **medium**, Compare to **disk**.

disk – A general term for a storage medium. It may refer to a hard disk or a Zip, Jaz, SuperDisk, DVD-RAM, MO, or other removable disk. This manual uses the term disk in two contexts: 1. as a desktop-mountable volume, whether fixed or removable; and 2. as a medium for use in a removable disks backup set. Compare to **disc**.

disk backup set – See **removable disk backup set**.

EasyScript – An interactive scripting assistant that creates and implements a scripted backup strategy based on your replies to a few simple questions.

encryption – A way of encoding data so that it cannot be used by others without the password.

file header information – A file's name, size, type, creator, and dates (creation date, modification date, and backup date). This information is part of every file, and is also indexed in a backup set's catalog.

file server – A computer running file server software, which allows users to share information over a network.

file backup set – This type of backup set combines the catalog and the data in a single file. The backup set media must be a single volume that appears on the Macintosh desktop, such as a file server or hard disk. Also see **backup set**.

FireWire – A specification of mechanical, electrical, and functional standards which lets a computer connect and communicate with storage devices, such as hard disks and removable disk drives, and other peripheral devices, such as scanners and video camcorders. FireWire connectivity is built-in to most Macintosh computers and allows you to easily attach additional devices to your computer.

folder – 1. A directory on a volume. 2. A Retrospect container for organizing items such as scripts, volumes, or clients.

Forget – The Forget menu item allows you to remove an item from certain windows. Use Forget to clear listings for volumes, subvolumes, clients, or backup sets you no longer wish to use. Note that "forgetting" a backup source volume does not affect any of the backup sets it has been backed up to; its files may be restored at any time as long as the backup set media is intact.

FTP – File Transfer Protocol, an Internet communication standard for accessing, storing, and retrieving files on an **FTP server**. FTP itself uses another protocol, **TCP/IP**.

FTP server – A computer running **FTP** file server software, which allows users to share files over a network using the File Transfer Protocol.

group – A Retrospect container for organizing items such as volumes and clients.

IncrementalPLUS backup – A **backup** operation that intelligently copies only files that are new or have changed since the previous backup to a given **backup set**. Files from the **source volume** are compared to those in the backup set, and any file without an exact match is backed up. IncrementalPLUS backups avoid redundantly copying files, saving time and conserving **media**, while being more reliable than traditional backup methods. Retrospect's **normal backup** action performs an IncrementalPLUS backup. See also **matching**.

interactive mode – Retrospect's mode of operation when you perform an immediate operation. Interactive mode assumes you are at the backup computer and available to respond to prompts. See also **unattended mode**.

Internet backup set – For use with **FTP servers** on the Internet or your local Intranet. Also see **backup set**.

Local Desktop – A container which holds certain volumes mounted on the backup computer desktop.

local subnet – The **subnet** in which the backup computer resides.

marking – Selecting files in the browser to be backed up or restored. Files can be marked (or unmarked) manually, or they can be marked according to various criteria using file selectors.

In the **browser**, a check mark appears next to any marked file. Files that are highlighted in the browser are not necessarily marked.

matching – The scheme for comparing file attributes to determine whether files are identical, which then allows intelligent copying to avoid redundancy. Also see **IncrementalPLUS backup**.

medium – Any hard drive, tape, recordable disc, or removable disk to which files can be copied. In this manual, media usually refers to the removable media of a backup set. When using Internet backup sets, think of the **FTP server** as the media.

member – An individual **medium** used in a backup set.

modification date – The time and date a file was last changed. This date is automatically attached to the file by the Macintosh. A file's modification date is reset any time you make changes and save the file (see "backup date" and "creation date"). A folder's modification date is updated any time a folder or file is added, changed or removed from it.

new media backup – Allows you to periodically introduce new media into your backups, keeping the original backup set media and catalog intact for archival purposes. A new media backup copies all selected files to a new backup set of the same name as the old, with the addition of a generation number, such as "Backup Set A [001]."

normal backup – Retrospect's usual backup action, performing an **IncrementalPLUS backup** to copy new or changed files.

Operations Log – A Retrospect report that tracks all actions by Retrospect. The Operations Log documents all start-ups, executions, errors, and completions, as well as information on the number of files copied, duration of backup, and backup performance.

recycle backup – A recycle backup is useful to periodically reset a backup set so that it does not grow to use too many members. A recycle backup completely erases the backup set and catalog before copying all selected files to the backup set. All previous data in the backup set is lost.

removable disk backup set – For use with removable disk such as Zip, Jaz, SuperDisk, DVD-RAM, or MO disks. You can also use FireWire and USB hard disks with removable disk backup sets. Also see **backup set**.

repeating interval scheduler – A type of scheduler that lets you schedule a script to repeat automatically at a specified interval of time, such as once every three weeks.

restore – An operation which copies files from a backup set to a volume.

Retro.Config file – The file containing your customized settings, including scripts and their schedules, passwords, preferences, known backup sets, defined subvolumes, selectors, and client login names, and recent choices. This file is automatically created the first time you start Retrospect, and is used while Retrospect is open. If you delete this file, all of your custom information will be lost and the default configurations will be used.

Retro.Icons file – The file containing the type and creator database, and the creator and type codes for all scanned volumes. This file is created and updated automatically during operations.

Retrospect preferences folder – A folder automatically created within your system's Preferences folder that contains Retro.Config, Operations Log, and other important files used

by Retrospect. By default, this folder is located at:

/Library/Preferences/Retrospect.

root – 1. The highest level of folders in a data structure. When you double-click a Macintosh desktop volume icon in the Finder, you see the root folders and files. 2. The highest level user account under Mac OS X, the "superuser" with complete and absolute privileges and control.

run document – A file that automatically starts a Retrospect script when opened. A run document allows you to run predefined Retrospect scripts by double-clicking on the run document file.

script – A saved backup procedure that you can schedule to run at some future date and time or on a repeating schedule, such as daily. You can create as many scripts as you want.

SCSI (Small Computer System Interface) – A specification of mechanical, electrical, and functional standards for connecting peripheral devices (hard drives, tape drives, printers) to a computer. SCSI allows you to easily attach additional devices to your computer. Older Macintosh computers had SCSI built-in, but newer ones require an add-on SCSI card to connect to SCSI devices.

SCSI chain – The means of connecting multiple SCSI devices to a single computer. SCSI devices are serially attached to each other and to the computer by SCSI peripheral cables. Macintosh SCSI allows up to seven devices on a single chain. Each device must have its own unique SCSI ID number.

SCSI terminator – A device used on a SCSI chain to maintain the integrity of signals on the chain.

selector – A feature that lets you search for or filter files which match certain conditions. You can use Retrospect's standard selectors, or create your own custom selectors. Also see **browser**.

session – A group of files from a single operation stored within a backup set.

single date scheduler – A type of scheduler that lets you schedule a script to automatically run at a specific date and time.

Snapshot – A Retrospect Snapshot is created during a backup operation to depict a volume's state (that is, all its files and the folder paths to them). It makes it easy to restore a hard disk to its exact state as of a given backup.

source – In a backup, duplicate, or archive operation, the volume from which files are copied. In a restore, the backup set from which files are copied.

subnet – A group of local computers physically networked together without a router or gateway, though they may use a gateway to connect to other networks. Also see **configured subnet** and **local subnet**.

subvolume – A folder you designate as an independent volume for use within Retrospect.

tape backup set – For use with tape drives. Also see **backup set**.

TCP/IP – The standard network protocol of the Internet, web servers, and **FTP servers**. TCP/IP is used to connect to Retrospect clients.

unattended mode – Retrospect's mode of operation when you run a script. Unattended mode assumes no one is currently at the backup computer, and therefore Retrospect must make assumptions about media use. See also **interactive mode**.

USB (Universal Serial Bus) – A specification of mechanical, electrical, and functional standards for connecting peripheral devices

(keyboards, storage drives, printers) to the USB-capable computers. USB is a built-in part of most Macintosh computers and allows you to easily attach additional devices to your computer.

volume – A hard or floppy disk, partition of a hard disk, subvolume, file server, or any data storage medium that is logically recognized by both Retrospect and the backup computer as a file and folder storage location.

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