

EMC Retrospect 6.1 for Macintosh Reviewer's Guide

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OVERVIEW

This Reviewer's Guide provides all the information necessary to understand and evaluate EMC Retrospect® 6.1 for Macintosh. The guide is divided into three sections:

- Section One describes EMC Retrospect
- Section Two describes issues to consider when setting up a test environment
- Section Three provides hands-on exercises that demonstrate Retrospect's powerful and easy-to-use features.

SECTION ONE: INTRODUCING EMC RETROSPECT

EMC Retrospect 6.1 for Macintosh backup and recovery software was designed for use in small and midsize businesses (SMBs) and home office. These environments require fast, reliable data protection, but do not have the extensive IT resources or training required to run traditional, complex backup and recovery software. To solve this problem, EMC Retrospect delivers an elegantly engineered application designed to manage every aspect of computer data backup quickly, efficiently, and safely.

For more than two decades, Retrospect has protected thousands of businesses and millions of computers across the globe from data loss and system failure. Based in innovative technology, Retrospect has won numerous awards and broad industry acclaim for its ease of use, speed, accuracy, and high reliability.

Retrospect Technology

Retrospect is built on two innovative technologies that have been awarded U.S. patents: Progressive Backup and Backup Server. These technologies solve two major problems in backup and recovery.

- The need to perform full backups to ensure accurate restores that do not return previously deleted, moved, and renamed files.
- The problem of computers' being starved for backup, either because the time required for nightly backups exceeds the backup window or because computers (notebook in particular) are often offline when backups are performed.

Progressive Backup

Retrospect performs a special type of file-based backup called a *Progressive Backup*. Progressive Backup compares file attributes to a database of known backed up files and backs up only files that haven't already been backed up, saving time and backup media. After writing files to the backup media, Retrospect reads and verifies the files byte-for-byte against the original. This method ensures that no files are missed, that only unique files are backed up, and that all the copied files are restorable.

A *Backup Set* is Retrospect's unique method for storing and tracking backup data. Each Backup Set is tracked independently and contains all the files needed to completely restore any hard disk that was backed up. Backup Sets are self-healing, allowing Retrospect to recover if media is lost or damaged. On the next backup, Retrospect automatically copies all files required to bring the backup set up to date for the missing media. Other backup software would require full backups to provide this level of safety. Retrospect performs single instance storage, copying identical files only once per Backup Set, which drastically reduces the time and bandwidth needed to perform network backups.

Each Backup Set has its own *Catalog File* to track all data stored in the Backup Sets. Because the Catalog Files are stored on the backup computer's hard disk, it is fast and easy to search for any backed up file because no media insertions are required. The catalog is also stored on the Backup Set media. If the Catalog File is lost from the hard disk, it can easily be recreated from the media in a minimum amount of time.

Media rotation is simple, because Retrospect tracks files in each Backup Set independently. A Progressive Backup to any set gives that set all the files it needs to provide a complete restore later, taking the guesswork out of media rotation. Retrospect's advanced Backup Set management technology makes complex backup strategies (for example, Grandfather, Father, Son) obsolete.

Retrospect enables fast, reliable restores of individual files, directories, or entire file systems with unparalleled accuracy. During each backup, Retrospect compiles a complete list of files and folders protected. In the event of a restore, Retrospect scans each list to select only the exact data needed to restore the computer to a particular point in time. Other software will restore an entire full backup and then overlay data from incremental backups, thereby incorrectly returning files or folders previously deleted, renamed, or moved. With Retrospect, you recover the exact data that's needed, avoiding user confusion and potential costly mistakes.

Backup Server

Retrospect's unique Backup Server technology uses guidelines established by the administrator to dynamically and intelligently adjust backup operations. Backup Server determines which backup media is available and which computers need backup. The least recently backed up computer with the highest priority is moved to the top of the queue and other computers are arranged in descending order according to the priority of their backup needs.

Retrospect recognizes computers when they connect to the network and automatically prioritizes them for backup. This process ensures that Retrospect backs up computers in greater need before proceeding to computers with lesser need, ensuring that no computer is starved for backup. Backup administrators no longer have to waste time reviewing logs and writing backup scripts to catch a missed computer. Backup Server is ideal for environments in which computers appear on the network at indeterminate intervals. For example, notebook computers typically appear on the network at unpredictable times.

Backup Server effectively manages limited backup resources so that all available computers are backed up. If all computers cannot be backed up during the initial backup window, during the next available backup window Backup Server continues the backup where it left off. After the first full backup is complete, faster incremental backups allow more computers to be protected during the backup window.

Backup Server always tries to back up the computers that are most in need based on the administrator requirements. Although Retrospect might not be able to back up all computers during the initial backup, it protects the remaining computers during successive backups until all the computers are eventually backed up with no additional effort.

Retrospect Editions

Retrospect for Macintosh runs on a Macintosh backup computer and protects networked servers, desktops, and notebooks running the latest Macintosh operating systems including Mac OS X Tiger, as well as desktops and notebooks running Windows and Red Hat Linux.

EMC has designed three editions of Retrospect for Macintosh:

- **Retrospect Server Edition** protects 100 networked servers, desktops, and notebooks. Licenses can be purchased to protect additional networked computers.
- **Retrospect Workgroup Edition** protects a backup server and 20 networked desktops and notebooks. Licenses can be purchased to protect additional networked desktops and notebooks.
- **Retrospect Desktop Edition** protects three networked desktops and notebooks. Licenses can be purchased to protect additional networked desktops and notebooks.

SECTION TWO: TESTING BACKUP SOFTWARE

When you test backup software, you also test the hardware, software, and other variables in your environment. In order to test backup software effectively, it's important to minimize the impact of the other variables.

Setting up the Hardware

Backup software tests many hardware components, including the CPU, device bus, hard disk, backup device, backup media, network cabling, and network connections.

Computer Hardware

Select a recent model computer with only the hard disk(s) and backup device connected to a clean data bus. If you plan to run a network backup test, make sure the network hardware is functioning properly. Make sure the topology reflects the real world and is not oversimplified.

Backup Device

Most people back up to tape devices or hard disk drives (either direct- or network-attached). Smaller capacity devices are not recommended for server and network backups. They are more costly per gigabyte of capacity and have too little capacity to meet today's backup requirements. Because hard disk drives do not include compression hardware, consider testing software compression. If testing with tape drives, decide between hardware, software, or no data compression for your tests.

Tape Libraries

For larger data sets, consider testing with tape libraries. Ideally, the backup software should treat the tapes in the library as individual pieces of media that can be combined into larger sets. Some software treats the device as if it were one tape (no rotation between multiple sets of media), while other software spreads data over multiple tapes (striping), increasing the backup speed but reducing the reliability of the backup system.

Backup Media

Using a new set of backup media for each of your tests is recommended. If new media is not available, make sure all the media is in the same relative condition—the more defects in a piece of media, the worse the performance. Also, make sure the media is in the same state: erased via software, bulk erased, or brand new. (Not all media can be bulk erased, so follow the manufacturer guidelines.)

Reality Check

EMC has several benchmark test results with different CPU and backup device combinations. EMC is happy to verify your results or help troubleshoot performance problems you might have.

Setting up the Software Environment

Standardize on a logical set of system software and installed applications for each machine in the test. While some testers may require test environments that use mixed operating systems, be careful not to work with too many variables at once. Also, be

careful with screen savers: If one system is running a screen saver and another is not, you will notice a large difference in performance between the two.

Other Variables

Other variables to consider include disk fragmentation, network traffic, printers turned on or off, etc. Your best bet is to test everything on an isolated network so you can control traffic issues.

Benchmark Disk Data

Get realistic files for benchmarking backup. If possible, gather real files from peoples' hard disks. Using too few or too many files, or a huge single file, for example a video, will distort performance if you are not specifically testing for that type of usage.

Build in some data redundancy. Most workgroups have anywhere from 30 to 60 percent redundant data on their hard disks, including system files, fonts, applications, databases, spreadsheets, dictionaries, and presentations.

Try to minimize hard disk fragmentation. Ideally, use a freshly restored data set on a newly formatted hard disk. Otherwise, you must ensure the same type and degree of fragmentation for each of your tests.

Installing and Using Retrospect

Retrospect installs quickly and is easy to set up. Different backup utilities use different terms to mean the same thing. Here are some key areas to check.

Data Verification

If there are any problems in the backup system, the best way to catch them is with real verification. Make sure verification is on for your tests, since that's what the review will most likely recommend.

But not all verification is the same. Retrospect's verification is the safest, since Retrospect reads back all the files from the media and compares them to the files that were originally backed up.

Some backup utilities simply scan the file headers on the media by default and do not check to make sure the files were actually copied correctly. That can skew benchmark results—simply scanning the tape header is faster, but it's a lot less reliable. If the backup software has more than one type of verification, make sure the settings are comparable. Otherwise, note the missing feature and disable Retrospect's verification for performance comparisons.

Performance Reports

Retrospect accurately reports performance. We've noticed that other backup software solutions sometimes misreport their performance by 20 percent or more. Use a stopwatch and known data quantities for all performance tests, and be consistent as to when you start the timer.

Incremental Backups

You should also test incremental backup performance. Different software uses different criteria for incremental backups. Retrospect copies everything it needs to perform a restore based on your backup criteria. Other software might just copy files since the last backup of any kind—and therefore only copy a fraction of the files needed to complete the Backup Set.

In the real world, people tend to use simple backup strategies, for example full backups on Friday and incremental backups Monday through Thursday, daily rotation between five different sets, or occasional rotation (keep performing incremental backups until the tape fills). Some people use grandfather-father-son (GFS) or Tower of Hanoi strategies, but unfortunately these strategies require multiple restore steps and can be complicated to set up and follow.

It is important to have your tests reflect real world usage and include at least four or five different incremental backups to the same media set. Try to have your incremental backups reflect everyday use. Some files change daily, others change infrequently, and most don't change at all. Some files are moved without getting changed, and some folders are added, renamed, or deleted.

Archive Bits

Retrospect does not utilize archive bits. Therefore, simply changing the archive bits on files might not give the desired results. Because Retrospect does not reset archive attributes, evaluating Retrospect does not affect backups with other backup software.

Media Rotation

Most people have several different copies of their data—just in case. Use these copies to test media rotation. The most common backup strategies either rotate tapes weekly or daily. Can you do a complete restore from each set of media or after time-saving incremental backups?

Testing Restores

Test real world restores. Data loss is not a planned event—it often occurs when least expected. Any backup software can perform a full backup followed by a disaster recovery procedure, but that doesn't stress the backup system or IT staff. What does it take to do a complete hard disk restore after five or six days of new-and-changed-file backups? What if someone has been rotating media? What would happen if a user is doing a local backup and the network administrator is doing a network backup?

Make sure the program restores drives, folders, and files to their exact state at the time of the last backup. Retrospect provides accurate point-in-time restores from new-and-changed-file backups that save time, network bandwidth, and storage media.

SECTION THREE: HANDS-ON EXERCISES

The following scenarios explore Retrospect's capabilities through real-world examples. The best test of any backup system is to use it either in a simulated production environment or in a true production environment. If you are testing in a true production environment, make sure that alternate data protection is in place. The following examples demonstrate Retrospect's capabilities without requiring a great deal of time from the evaluator.

EasyScript – A Simple Scenario (8 Steps)

To create a full backup schedule using EasyScript

1. In the top row of the Retrospect Directory, click the **Automate** tab. Then click the **EasyScript** button. If you are performing a backup for the first time, a welcome page will appear. Click **Next**.
2. Select **No, I only want to back up this Macintosh**.
3. Select **File backup set (hard disk)**.
4. Select **Every day, for maximum safety**.
5. Choose the time you want your daily backups to execute. Click **Create...**
6. Backups are stored in a Backup Set. Retrospect assigns a name to the Backup Set. If you want, you can type a new name for the Backup Set. Click **New...**
7. Choose the location for the Backup Set. Click **Save**.
8. You will see a confirmation window. Click **Done**.

To run this (or any) script immediately, select **Run** from the menu bar and select **EasyScript Backup**. Make some additions, moves, and deletions and run it again.

Restore – A Simple Scenario (13 steps)

To restore a folder

1. In the Finder, create a test folder that contains a number of subfolders and files.
2. Back up the computer.
3. Delete one of the folders.
4. Open Retrospect.
5. In the top row of the Retrospect Directory, click the **Immediate** tab. Then click **Restore**.
6. Select **Restore files from a backup**.
7. Select the Backup Set from which you wish to perform the restore operation.
8. To restore to a particular point in time, review the available snapshots for the Backup Set. A snapshot contains a list of the files and folders that existed on a computer when a particular backup was performed. Click **More Snapshots** to view older snapshots, and then select a snapshot.
9. Select a destination for your restored files.
10. Select **Retrieve files and folders** to return the missing files and folders without deleting other files or folders in the destination folder.
11. After Retrospect scans the hard drive of the computer and the contents of the Backup Set, click **Files Chosen** to choose the exact files you want to restore.
12. Mark the folder that was just deleted using the **Mark** button. If more files or folders are selected, the restore will take the same amount of time, because Retrospect moves only what is needed from the Backup Set to the restore destination. Close the file selection window. Click **Restore**.

13. Open the Finder and browse to the appropriate folder. The folder is back.

Backup – Protect an Entire Network of Computers

With Retrospect 6.1 for Macintosh you can easily set up a backup strategy as simple as protecting a single home computer or as sophisticated as backing up a network of servers, desktops, and notebooks at an SMB.

Retrospect gives you the option of creating multiple Backup Sets. With two Backup Sets, Retrospect can implement an onsite/offsite data protection strategy by using each Backup Set for a week. If you select a day of the week for rotating your media, Retrospect prompts you to rotate the Backup Sets on that day. Later, the backup strategy can be changed, for example by adding computers to the backup schedule or by starting a new Backup Set.

Retrospect Backup Sets are media independent. They can be placed on tapes, CD/DVDs, or disks. The contents of one Backup Set can be transferred to other Backup Sets, even if they reside on different types of backup media. For example, the contents of a disk Backup Set can be transferred to a tape Backup Set so the tapes can be sent offsite for safety.

To use Retrospect to protect an entire network of computers, simply complete three easy procedures:

1. Install the Retrospect clients
2. Configure the clients
3. Create a backup script.

To install the Retrospect clients

1. Copy the Retrospect clients to a network server to make it easier to install clients on each networked computer. Locate the clients for each type of computer you want to protect by opening the Retrospect installation CD or visiting the Support section of the EMC Insignia Web site at <http://www.emcinsignia.com/en/support/updates.shtml>.
2. Install the Retrospect client on each of the networked computers you want to back up. You must physically go to each computer to perform the initial installation of the Retrospect client software. This is a one time event. Thereafter the clients can be managed from the Retrospect backup server.
3. Assign a password to each client when you install it. The Retrospect backup server uses the password when setting up a backup session with each client.
4. Follow the prompts of the Retrospect Client installation program to complete the installation. Repeat this process on each networked client computer.

To configure the Retrospect clients

1. At the backup server, open Retrospect. Select the **Configure** tab from the top for the Retrospect Directory and then click the **Clients** button.
2. Initially, the Retrospect backup server does not have any networked client computers entered into its database. Select **Network...** Retrospect will then automatically discover all of the client computers.
3. Choose a client computer from the list and select **Configure...** You will be prompted for the password you established when you installed the Retrospect client software. Repeat this process to check in each networked client.

4. After each networked client is checked in, they will show up in the Retrospect backup server dialog. Checking in clients is a one time event. Thereafter, Retrospect remembers each client and its password. Close the Backup Client Database window.

To create a Retrospect backup script

1. At the top of the Retrospect Directory, click the **Automate** tab and click **Scripts**. Then click **New...** to create a new script.
2. Choose **Backup**.
3. Name the script and click **New**.
4. Click the button next to **Sources** and click **Add...**
5. Select as many clients as you want to back up. The networked clients will all be under the **Backup Clients** container.
6. Click the button next to **Destinations**. Click **New...**
7. Select **File** under the **Backup set type**. Name it *Backup Week 1*. Click **New...**
8. To guard against media failure, create more than one Backup Set by repeating steps 6 and 7. Name the second backup set *Backup Week 2*.
9. Select both Backup Sets.
10. Click the button next to **Schedule**. Click **Add...** Each Backup Set is independent of the other, containing a full backup and subsequent incremental backups. If one set of backup media fails, the other can be used to perform restores. A Backup Set can be retired to long term offsite storage, and the media can be erased and recycled with a full backup.
11. Select **Day of Week**.
12. Select the check boxes for Monday through Friday with a 2 week interval. Select a **Normal Backup** to Backup Week 1.
13. Repeat steps 11-12, but select the following Monday through Friday, and select a **Normal Backup** to Backup Week 2.

As seen in **Automate→Preview**, backups will be performed to Backup Week 1 for a week, then to Backup Week 2 for a week, etc. The user is prompted for the correct Backup Set. One Backup Set will be stored in a safe offsite location. Using this strategy, an SMB or remote site of an enterprise can implement easy-to-manage enterprise-class data protection even if few IT resources are available for backup operations.

Back Up with Backup Server

Retrospect's Backup Server automatically adjusts backup operations to respond to changes in the backup environment, ensuring that no computers are starved for backup. This is especially useful for recognizing notebook computers when they appear, or juggling the backups of large servers in a limited backup window. In this scenario, you create two Backup Server scripts: one backs up notebooks 24/7, one backs up servers at night and on weekends.

To organize your computers into groups

1. View a list of all logged in notebook clients by clicking **Configure→Clients**. Then close the Backup Clients Database dialog.
2. Go to **Configure→Volumes**.
3. Selecting **Groups** from the **Volumes** menu.
4. Create two new groups. Name one "Notebooks," and name the other "Desktops and Servers."

5. Drag one or more of the client icons into the Notebooks group. Then drag the remainder of your clients into the Desktops and Servers group.
6. Close the Volumes Database window.

To create the Notebooks backup script

1. Go to **Automate→Scripts**
2. Create a new **Backup Server** script and name it *Notebooks*.
3. For this script's source, select the Notebooks group that you created earlier, and select one or more Backup Sets as destinations.

If more than one Backup Set is available, Retrospect will alternate between them automatically, adding a level of redundancy and safety by maintaining multiple, complete copies of your backups. Unlike regular backup scripts, which have a scheduled start time and run until the task is complete, Backup Server scripts have active times, during which Retrospect continues looking for computers in need of a backup. The default **Schedule** option is **Always Active**, which is what you want for your Notebooks script.

To create the Desktops and Servers backup script

1. Go to **Automate→Scripts**
2. Create a new **Backup Server** script and name it *Desktops and Servers*.
3. For this script's source, select the Desktops and Servers group and select the same Backup Sets used in step 3 in the **To create the Notebooks backup script** procedure
4. This script is currently active at all times. To set it to run on nights and weekends, click the **Schedule** button, select **Custom Schedule**, and click the **Custom** button to bring up the Weekly Schedule window.
5. To modify the schedule for weekdays, click on **Mon** and drag through **Fri**, highlighting those days. Enter a Start time of 7:00 PM and a Stop time of 7:00 AM.

The window now shows a graphic representation for all-day weekend and nightly weekday operations.

Anytime you need to add a new computer to the backups, simply add the client to the *Notebooks* or *Desktops and Servers* group, and Retrospect automatically includes that computer in the backups.

This basic strategy easily protects all business-critical data on the network with minimal intervention from IT staff and without requiring backups on a fixed or user-initiated schedule. After the initial backed, Retrospect backs up only new and changed files daily, greatly reducing the amount of time need to perform backups. Computers that are most in need are prioritized for backup, so that no data remains unprotected.

Because Backup Server scripts run concurrently, you can create as many groups and schedules as necessary. For example, one script might look for notebooks 24-hours a day and back them up every 8 hours. Another might back up the engineering team's workstations nightly to an encrypted Backup Set. A third might back up documents only from the marketing department. The flexibility of Retrospect's Backup Server can meet the demands of almost any backup strategy.

About Retrospect

EMC Retrospect is part of the EMC Insignia line of software and hardware products, which enables small and medium businesses (SMBs) to store, protect, manage, and share vital business information. To learn more about EMC Insignia, contact your authorized EMC Velocity SMB channel partner or visit www.emcinsignia.com.

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