

User's Guide and Technical Reference

NovaNET®

NovaStor Corporation

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Before You Begin

The *NovaNET User's Guide and Technical Reference* provides all of the information necessary to effectively implement and use all of NovaNET's advanced features. However, we ask you to refer to the *NovaNET Installation Guide* to install NovaNET. It includes system requirements as well as step-by-step instructions.

NovaNET Documentation

The following documentation is included with NovaNET to help you install and use all of NovaNET's features and options.

Note In the following sections, <**dir**> represents the platform-specific directory on the NovaNET CD-ROM, for example, **win** (Windows), **dos** (DOS), **lin** (Linux) and **net** (NetWare).

Note In the following sections, <**lng**> represents eng (English), **fre** (French), **ger** (German), **ita** (Italian), **jpn** (Japanese) or **spa** (Spanish).

Printed Documentation

The `/doc/<lng>/acrobat` directory on the NovaNET CD-ROM contains the following printed documentation:

- *NovaNET Installation Guide* (**install.pdf**): Contains installation information for each supported platform.
- *NovaNET User's Guide and Technical Reference* (**usersgd>.pdf**): Contains information for configuring and using NovaNET.
- *NovaNET Error Code Reference* (**errcodes.pdf**): Lists all NovaNET error codes along with possible remedies.

- *NovaNET Addendum (addendum.pdf)*: Contains information on additional features (English only).

Note You can also download these documents from the NovaNET website.

If you require extra copies of these manuals, you can print the PDF file. They were designed to be printed one-sided, with a margin for placing them in a binder. For consistency with this manual, the page numbers, page layout, table of contents and index are the same (except that the PDF file does not have facing pages or odd/even headers).

To view or print this documentation, Adobe Acrobat Reader (version 4.0 or higher) must be installed on your Windows or X Window (Linux/FreeBSD) computer. If not currently installed, you can install it from the Adobe Acrobat Reader website at <http://www.adobe.com/products/acrobat/readstep2.html>.

Note Adobe Acrobat Reader does not offer versions for DOS or NetWare systems. Therefore, you can only view or print the NovaNET documentation on Windows or X Window (Linux/FreeBSD) systems.

To print the documentation, open the appropriate file into Adobe Acrobat Reader. Choose **Page Setup...** from the **File** menu and set the proper options for your printer. If your printer supports it, select the **Larger Print Area** option. Then choose **Print...** from the **File** menu and print the document.

(You can also purchase additional printed and bound copies of this manual. Contact us at the numbers listed below for additional information.)

Release Notes

Release notes are included with every service pack. Before installing NovaNET, please read and print the release notes for additional information. The release notes are available in both HTML (`<dir>/read_<lng>.htm`) and text (`<dir>/read_<lng>.txt`) formats, depending on platform. Access the release notes from the directory for your platform on the NovaNET CD-ROM.

Online Help

Windows

To get online help while using NovaNET, select **Help Topics** from the **Help** menu.

For context-sensitive help while using NovaNET:



Help
button

- Click on the **Help** button and then click on the part of the object you want help with.
- Right-click an object and select **What's this?**
- Use the **Tab** key to select an area in the NovaNET window and press **F1**.

Non-Windows

You can access online help from most NovaNET screens by pressing **F1**.

HTML Help

You can install the HTML help version of our online help system. Then you can access it with a web browser. Please note that NovaNET will not access HTML help topics.

Note You can also download the HTML help system from the NovaNET website.

To install HTML help:

- **Windows:** Copy **htmlhelp.zip** from the `\doc\<lng>\htmlhelp` subdirectory on the NovaNET CD-ROM. Use WinZip or some other file extraction software to unpack it onto your computer.
- **X Window (Linux/FreeBSD):** Copy **htmlhelp.tgz** from the `\doc\<lng>\htmlhelp` subdirectory on the NovaNET CD-ROM. Use **tar/gzip** or some other file extraction software to unpack it onto your computer.

Note The HTML help system requires the Java Plug-in. Internet Explorer users must enable it. Netscape offers to install the plug-in if it is not installed.

Note For best results on X Window (Linux/FreeBSD) computers, we recommend Netscape v6.x.

To launch HTML help, use your browser to open `index.htm`.

Customer Support

You can get customer support for NovaNET in one of three ways:

- Visit our website at www.NovaStor.com and fill out an Online Customer Support Form. (For a quick connection, select **Web Page** from the **Help** menu.)
- Fax us at (805) 579-6710.
- Phone us at (805) 579-6700. Visit our website at www.NovaStor.com for our customer support hours.

Chapter 1 — NovaNET Overview

NovaNET provides a powerful, yet cost effective and easy to use, management tool for protecting data on network file servers and workstations. NovaNET provides users with the capacity to back up and restore data across a network and the ability to administer a comprehensive backup plan.

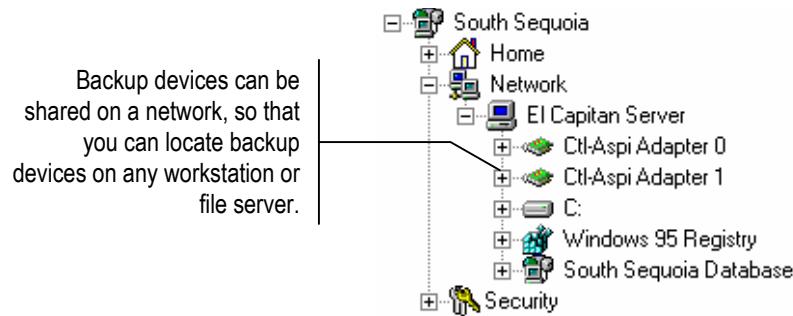
A complete network backup system consists of three parts: physical peripherals, storage management database and backup management program.

Physical Peripherals

NovaNET works with your existing computer network. A network connects workstations and file servers together in order to allow various users to work together on projects and with common files. Networks also allow users to share peripherals, such as disk drives, printers, fax machines and modems. Sharing peripherals across a network makes economic sense, since multiple workstations can use a single peripheral. Backup devices, such as tape drives, which back up or copy files onto tapes or other media, may also be shared.

For more information about backup device LAN location, see *Strategies for Faster Jobs* in Chapter 10 — *Tips, Techniques and Strategies*.

Sharing a backup device or tape drive makes operational as well as economic sense. Rather than back up each workstation individually, a shared backup device on a network can back up every workstation and file server on the network. This lowers costs and makes it possible to centralize backup operations for the network. Further, a single user, such as the network administrator, can have primary responsibility for backing up all the file servers and workstations on a network.



Although sharing a backup device or tape drive on a network makes economic and practical sense, it also poses several problems.

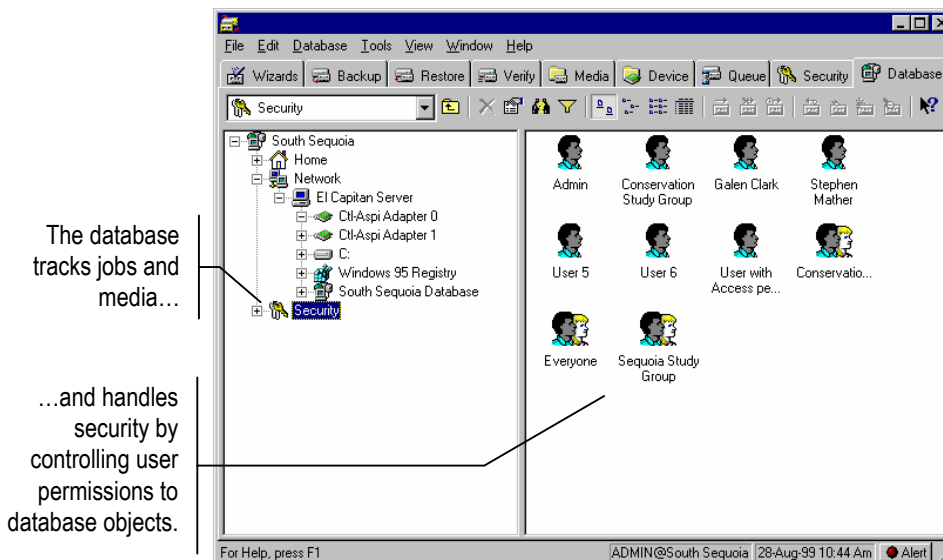
- First, security is an issue. Most networks have elaborate security systems that prevent sensitive or confidential data from being accessed by unauthorized users. However, unless protective measures are taken, once these files are backed up onto a tape or other media, any user in physical possession of the media can gain access to those files. Although it is possible to physically store the media in a secure location, a complete network backup system will prevent unauthorized viewers from accessing confidential or classified information.
- Second, tracking the location of backed up files is a further issue. While a single user may be able to find a file backed up onto a floppy disk by manually searching through a stack of disks, this approach is unworkable for large networks. Without the appropriate software, locating a given occurrence of a file may be impossible, since there may be hundreds of thousands of files backed up on hundreds of tapes created over weeks or months.

Storage Management Database

For more information, see *Managing the Storage Management Database* in Chapter 10 — *Tips, Techniques and Strategies*.

To solve the problems of security and tracking files, NovaNET creates and manages a **storage management database**. The NovaNET database keeps track of each tape or other media and each file that is on that tape. For each tape, the storage management database contains detailed information about the tape, such as when it was created and who created it and about the files on the tapes, such as when they were backed up and on which tape the file is stored. This is true as well for other media.

The storage management database also addresses the security complication. Included in the database is information about which users can use or view which files. The storage management database prevents unauthorized users from accessing files for which they have no security clearance. It tracks each user and ensures that only approved users have access to files stored on the backup media.



Backup Management Program

Writing files to the backup media and managing the storage management database requires an application program, such as NovaNET. Two of the most important functions of NovaNET are *managing the storage management database* and *creating and running jobs*. NovaNET manages the storage management database to keep track of files and to ensure security. NovaNET also creates and runs jobs, such as backup and restore jobs, which transfer files back and forth between backup devices (such as tape drives) and file servers and workstations.

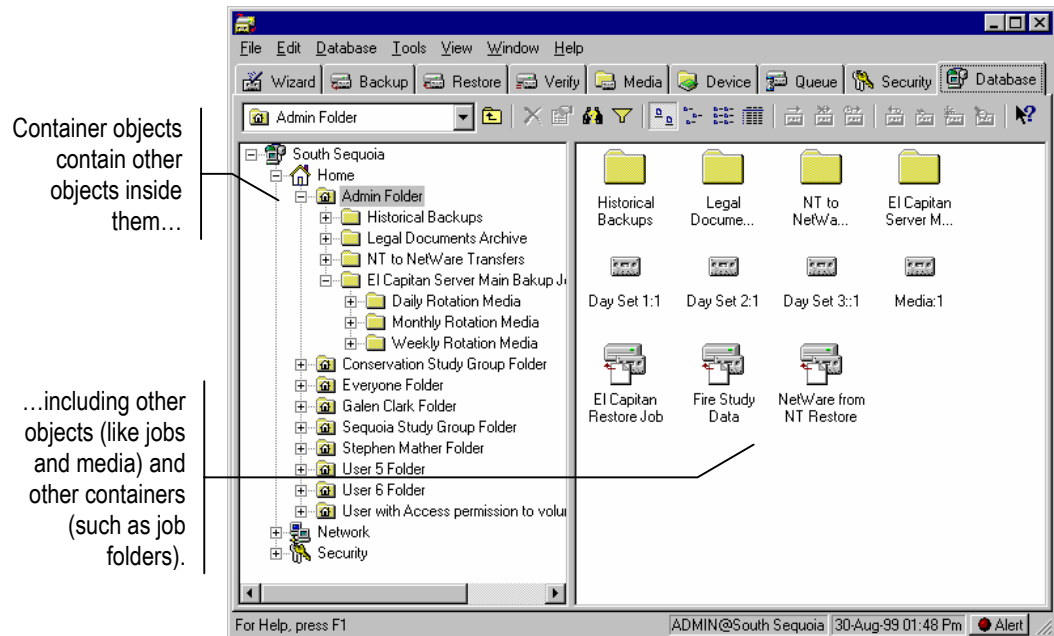
Managing the Storage Management Database

Much of the power and usefulness of NovaNET comes from its extensive capabilities to manage the storage management database. There are three important concepts associated with the database: *objects*, *properties* and *storage management zones*.

Objects

The storage management database collects and organizes information about **objects**. An object is any file, machine, tape or user about which NovaNET needs to store data. Examples of objects which NovaNET tracks in its database include tapes, tape drives, network servers, occurrences of files, backup jobs, users and so forth.

Objects that contain other objects within them are referred to as **containers**. A simple example of a container is a folder. It contains other objects within it, including objects that are not containers, such as jobs and files and objects that are containers, such as other folders.



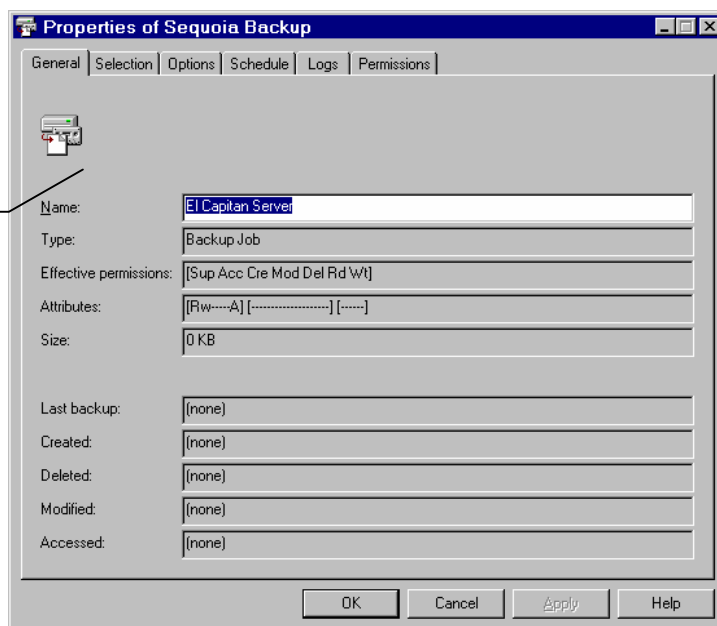
Properties

For more information on property sheets, see *Chapter 12 — Objects and Properties Reference*.

The information about each object that NovaNET stores in its database are called **properties**. The properties of each object include important information about that object, such as what kind of object it is, who has security clearance to use it and its relationship to other objects.

For example, an individual backup tape is an object in the NovaNET database. Some of the properties of that tape stored in the storage management database include the name of the tape, when it was created, who has clearance to use the tape and whether or not the tape can be erased.

Use property sheets, such as this property sheet of a backup job, to set, modify and view the properties of an object.



Working with NovaNET objects and properties is easy. Even though when you work with NovaNET you work primarily with objects and properties, extensive knowledge about objects and properties is not necessary. If you know how to use Windows Explorer, you already know most of what you need to use NovaNET.

Storage Management Zones

NovaNET is not limited to just one database. On a large network, it may be useful to have multiple storage management databases, each addressing different storage needs. For example, there may be a separate database for each work group or department, even though they are all on the same network.

If your network has multiple NovaNET databases, then you choose which database you wish to use by selecting a **storage management zone** when you log on to NovaNET. Choosing a storage management zone is simply a way to select which database you wish to use.

Each NovaNET storage management zone is overseen by a **NovaNET administrator**. It is the NovaNET administrator's job to manage the security and integrity of the files in his or her storage management zone.

Storage Management Zones and Security

For more information, see *Chapter 11 — Permissions and Security Reference*.

Storage management zones also help ensure network security. NovaNET uses storage management zones to promote security in two ways: first, by preventing users from working with more than one storage management zone at a time and, second, by allowing file servers and workstations to be the member of *only* one storage management zone.

Note the following about machines, users and storage management zones:

- Workstations or file servers (called a *machine container*) can only be the member of one—and only one—storage management zone. Because these machines belong to only one database, their peripherals, such as disk drives and backup devices, can belong to only one storage management database.
- Tapes or other media created in one storage management zone cannot be used in another storage management zone without following special procedures. This ensures that there is no improper access to secure files and data.
- Each storage management zone must have at least one backup device, such as a tape drive. Further, that backup device can only belong to one storage management zone: it cannot be shared among multiple zones. (However, a storage management zone could have multiple backup devices.)
- From one workstation, a user can work in other storage management zones besides the zone his or her workstation belongs to. This means they can remotely administer jobs for other storage management zones besides the zone their workstation belongs to. They cannot, however, work in multiple storage management zones at the same time.
- A user can work from other machines with other storage management zones besides the one to which their machine belongs. Their machine, along with its drives, peripherals and accompanying data, however, always remain in a single storage management zone. This helps to prevent the unauthorized sharing of data between storage management zones. Thus while users can work outside of their database, the workstations and file servers they use always stay within their home zone.

Creating and Running Jobs

NovaNET creates backup tapes and restores files with **jobs**. Working with backup devices and a network, NovaNET jobs either back up network file servers and workstations onto media or restore files from media onto file servers or workstations. When you want NovaNET to back up or restore a file, you create and run a job.

There are three kinds of jobs: backup, restore and verify. Every kind of job you create and run has six components: *creating the job, permissions, selection, options, scheduling and running*.

Creating the Job You begin by creating a job, either a backup, verify or restore job. Refer to *Chapter 3 — Creating NovaNET Jobs* for more information.

Permissions In order to create a job, you must have permissions to the objects that job will work with. For example, to create a backup job, you must have permissions to the tape drive, the tape and the files you will back up. If you wish to backup files on another workstation, you must have permissions to that workstation and to the files on that workstation. Individual users are assigned permissions by the NovaNET administrator, who is responsible for ensuring the security and integrity of the backup system. Refer to *Chapter 4 — Permissions* for more information.

Selection Once you have permissions to a file, you must select it to be included in your job. You might select all files, only a few files or perhaps only a single file. You select files first by selecting them in the selection window and second by having NovaNET ‘sort’ them with **filters**, which apply additional selection criteria, such as date modified, type of file and so forth. Refer to *Chapter 5 — Selecting Files and Instances* for more information.

Scheduling After selecting files, the job is scheduled to be run. A job may be scheduled to run later or to run immediately. It can be scheduled to run regularly or only once. Refer to *Chapter 6 — Scheduling Jobs* for more information.

Options After scheduling the job, you specify the job’s option parameters. Some of the options you can specify include what backup device to use, what media to use, whether to automatically format the media and so forth. Refer to *Chapter 7 — Job Options* for more information.

Running Finally, the job is run. Many scheduled jobs are run automatically by NovaNET, but you can manually run a job at any time. Refer to *Chapter 8 — Running Jobs* for more information.

Every time you create a job in NovaNET, your job must include these six components. You begin by specifying a *type of job*. Before you can proceed further however, you must be certain that you have *permissions* to the objects, such as files and tape drives, that you wish to use. Your NovaNET administrator will work with you to determine which type of permissions you require. Then you *select* the files for your job, specify the *option* parameters and finally *schedule* the job to run.

Chapter 2 — NovaNET Workplace

NovaNET is designed to be easy to use. This chapter will familiarize you with all you need to know in order to use most of NovaNET's features, including keyboard shortcuts and mouse conventions.

Note This manual deals specifically with the graphical user interface available on Windows systems and Linux and FreeBSD systems running X Window. The console interface operates basically the same way on DOS, NetWare, Linux and FreeBSD systems.

In This Chapter

- Starting NovaNET
- Logon Window
- Main NovaNET Object Window
- Property Sheets
- Menus
- Reports
- Working with the NovaNET Wizard

Starting NovaNET

After you have installed NovaNET, you start it like any other program.

Windows

To start NovaNET in Windows, double-click the **NovaNET Administrator** icon on the desktop.

You can also click the **Start** button and select **NovaNET** from the **Programs** (or **All Programs**) submenu. Then select **NovaNET Administrator**.

NetWare

To start NovaNET on a NetWare machine, access the server console. Then type **NNAdmin**. It is not necessary to specify a search path. For example:

SERVER: **NNAdmin**

DOS

To start NovaNET on a DOS machine, access the directory where you installed NovaNET. Then type **NNAdmin**. For example:

C:\>**NNAdmin**

Linux/FreeBSD

To start NovaNET on a Linux or FreeBSD machine, open a terminal window. Then access the directory where you installed NovaNET. Type **./nnadmin**. For example:

[root /usr/local/novanet]# **./nnadmin**

Linux/FreeBSD (X Window)

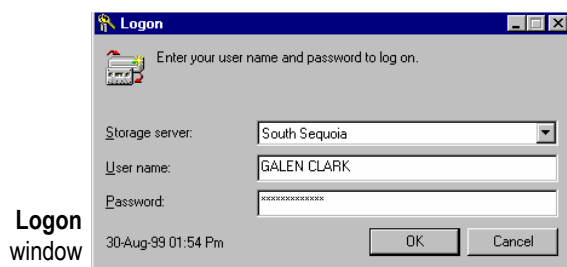
To start NovaNET on a Linux or FreeBSD machine running X Window, open a terminal window. Then access the directory where you installed NovaNET. Type **./nnxadmin**. For example:

[root /usr/local/novanet]# **./nnxadmin**

On Linux systems, you can create a shortcut on your KDE or GNOME desktop. On FreeBSD systems, you can create a shortcut on your CDE desktop. (See the *NovaNET Installation Guide* for more information.)

Logon Window

Each time you start NovaNET, you are shown the **NovaNET Logon** window.



To log on, you must select a storage management server, enter your user name and enter your password.

Selecting a Storage Management Zone

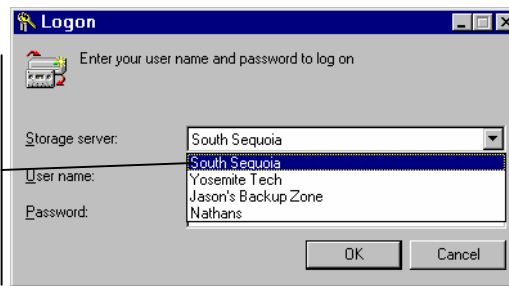
When your NovaNET administrator set up NovaNET to run on your network, he assigned your workstation to a storage management zone. Your workstation, along with its drives and peripherals, can only be the member of one database zone. The name of this zone is the *default* name that appears in the **Storage server** list box.

Normally, you should leave the default name in the list box unchanged. This is because you will typically want to work with the storage management zone your workstation belongs to.

Occasionally, however, you may wish to work in a different zone. You might be asked by a co-worker or your NovaNET administrator, for example, to run a NovaNET job in a different storage management zone.

To select a storage management zone other than the default zone, first click the arrow next to the **Storage server** list box. You will see a list of possible storage management zones. Select the storage management zone you wish to use.

To select a storage management zone, click on the **Storage server** list box and select the storage management server you wish to use.



Note Although you can log on to different storage management servers, you can only create and run jobs within a single storage management zone. Further, you can only access files and devices in a single storage management zone. This means, for example, that you will be unable to restore files backed up from workstations in one storage management zone to workstations in another storage management zone. (If you need to share data from one storage management zone to a different storage management zone, see *Import Media* in *Chapter 9 — The Media, Device and Database Tabs*.)

User Name and Password

After selecting a storage management zone, type in your **User name** and **Password**.

If you type your name or password wrong, you will be asked to re-enter your name and password.

In order to log on, your NovaNET administrator must first assign you a user name and a password. If you are having difficulty logging on, ask your system administrator to specify again the exact spelling of the user name and password assigned to you.

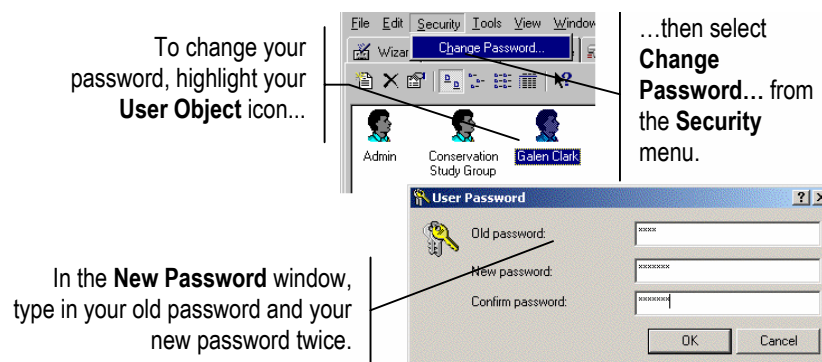
Note Passwords are not case-sensitive, e.g., USER1 is the same as user1.

Changing Your Password

It is a good idea to regularly change your password, particularly if you are working with sensitive and important data.

To Change Your Password

1. Click on the **Security** menu to make it active.
2. Click on your **User Object** icon.
3. Open the **User Password** window by either
 - Selecting **Change Password...** from the **Security** menu, or
 - Right-clicking the user object and selecting **Change Password...** from the shortcut menu.
4. Type in your old password and then your new password, unless you are logged in as the NovaNET administrator.
5. Confirm your new password and then click **OK**.



When selecting a password, remember that some passwords are notoriously easy to break. For example, because many people use their birth date or the name of their spouse, these are not good choices for passwords.

Tip The NovaNET administrator can change a user's password without knowing the user's current password. NovaNET does not even ask you to enter the old password. This is useful when the user has forgotten his or her password.

Logging on the First Time

The default user name for the NovaNET administrator is **ADMIN**. There is no default password required for this user to log on.

Warning NovaNET administrators have unlimited access to all of the objects in the database. Any user who logs on as the NovaNET administrator will have complete access to all of the files and machines on the database.

Your first security step should be to change the NovaNET administrator's password. Click on the **Security** tab. Select the **Admin** user object. Select **Change Password...** from the **Security** menu. Type in the new administrator's password, enter it again to confirm and click **OK**. Do not continue until you have changed this password.

Grace Logons

Your NovaNET administrator may have set up your password to expire after a set period of time. For example, your password may expire after 60 days. This forces you to change your password regularly.

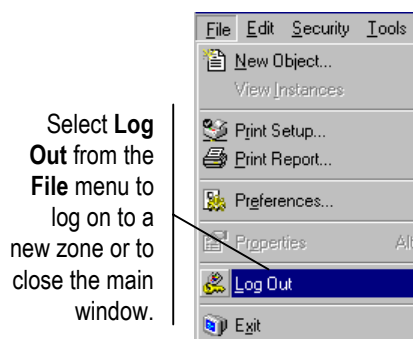
If your password has expired, NovaNET will prompt you to change your password. If you choose not to change your password, NovaNET may still let you log on, even with an expired password. Logging on with an expired password is called a **grace logon**. Your NovaNET administrator will determine how many grace logons you are allowed.

When your password has expired and you have used all of your grace logons, NovaNET will ask you to change your password when you log on.

Logging Out

On occasions you may want to change the storage management zone you are using or want to log on as a different user. Although you could quit NovaNET and restart the program, it is quicker and faster to log on again without quitting NovaNET.

To log on again, choose **Log Out** from the **File** menu. You will be presented with the **NovaNET Logon** window and asked to log on again.



Logging Out and Running Scheduled Jobs

For more information, see *Running Scheduled Jobs* in Chapter 8 — *Running Jobs*.

NovaNET can run scheduled jobs even when no one is logged on. (Only *scheduled* jobs can be performed when no one is logged on to NovaNET.)

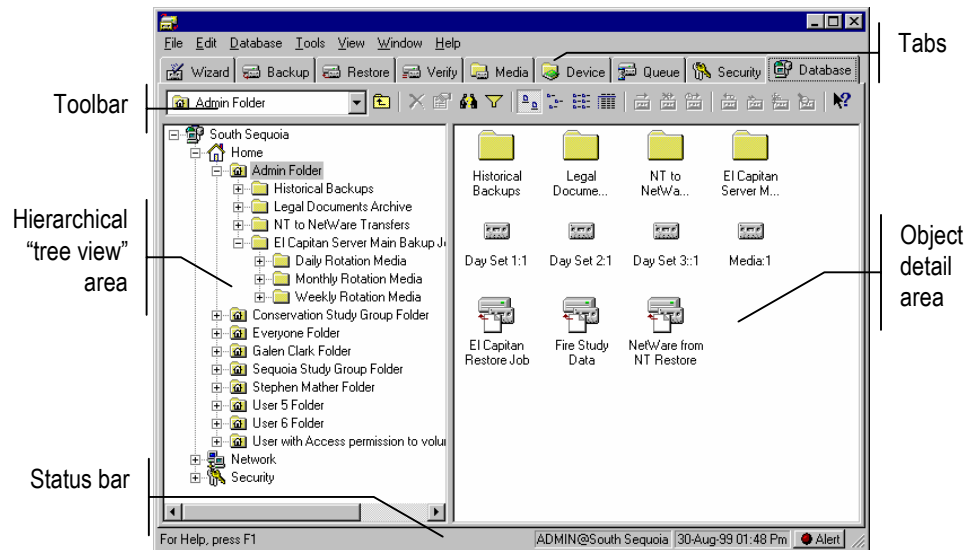
When you leave your workstation, you may need to leave NovaNET open. In order to not let any other users have unauthorized access to the network, log out of NovaNET before leaving your workstation. Any scheduled jobs will still run, but no unauthorized users will be able to work with NovaNET unless they can log on.

Note If the NovaNET service is installed and running, you can close NovaNET and your scheduled jobs will still run (see *Appendix E — NovaNET Service* in the *NovaNET Installation Guide* for more information).

Main NovaNET Object Window

You use the main NovaNET object window to view, create and manipulate NovaNET objects, such as jobs and tapes.

In addition to the menu bar, the NovaNET window has the following parts: tabs, toolbar, the hierarchical or “tree” view area, the object detail area and the status bar.

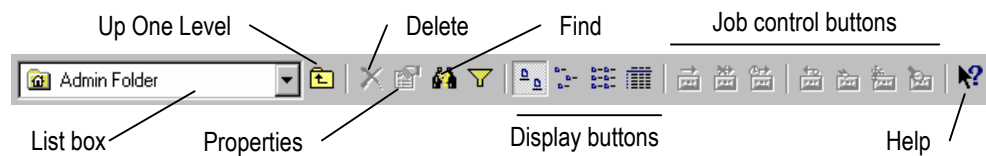


Tabs

At the top of the window are eight **tabs** which help to group and organize similar sets of objects. For example, you use the **Backup** tab to display and work with backup jobs, the **Restore** tab to display and work with restore jobs and so forth. To display a different tab, click on the tab you wish to view. You can also display a different tab by using the **View** menu.

Toolbar

The toolbar has a list box and several buttons. Not all buttons are on all tabs and some buttons on a tab may be unavailable. When a button is grayed out, it is not available because no object that it can work with is currently selected.



- The **List box** contains the name of the folder (or container) currently displayed in the object detail area.
- The **Up One Level** button changes the currently displayed folder (or container) to the next higher container in the hierarchy, that is, the container that contains the current container.
- The **Properties** button displays the properties of any object you have selected in the object view area.

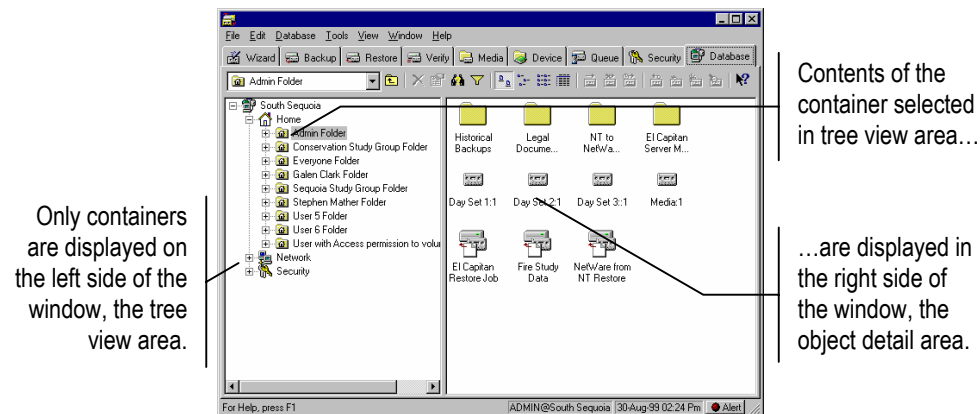
- The **Delete** button lets you delete any object you have selected in the object view area.
- The **Find** button lets you search for an object in either the left or right window pane.
- The **Display buttons** determine how objects are displayed in the object detail area.
- The **Job control buttons** let you start, stop and pause a job. You can also perform a variety of tape-specific tasks.

You can use the **View** menu to either hide or show the toolbar.

Object View Areas

The left window pane displays containers, such as folders. Examples of other container objects include networks, workstations and drives. These are displayed in hierarchical or “tree” view. This portion of the window is referred to as the **tree view area**.

The right window pane is referred to as the **object detail area**. It displays the contents of the container currently selected in the tree view area. If you select an object in the tree view area, you will see its contents displayed in the object detail area on the right side of the window.



The object view area is designed to be easy to use and if you have worked with Windows Explorer, you probably already know all you need to work with it. If you are new to working with objects presented like this, keep the following in mind:

- The left window pane, the tree view area, only displays *containers*, that is, objects that hold other objects. Objects that do not contain other objects are displayed only in the right window pane, the object detail area.
- To display the objects in a folder or other container, open it by clicking on it in the tree view area.



Expand tree icon

- To view the folders within a folder, expand the “tree” by clicking on the expand tree icon next to the folder. Alternatively, you can double-click the folder and it will both expand and display its contents in the object detail area.



Collapse tree icon

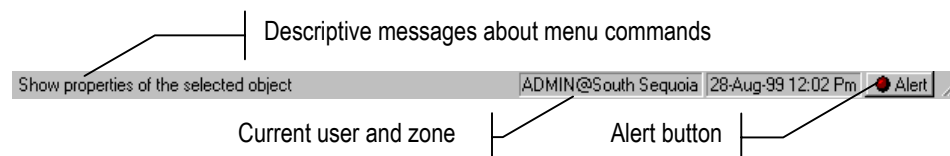
- To close a folder, click the collapse tree icon next to the folder. Alternatively, you can double-click the open folder and it will close.

Note You can instruct NovaNET to only show the expand tree icons when a container contains other containers within it. Select **Preferences...** from the **File** menu and check the **Smart expandable indicators** check box. Before displaying the expand tree icon, NovaNET will check to see if that container contains other containers in it. If it doesn't, the expand tree icon will not be displayed.

There are numerous keyboard shortcuts available that make it easier to work with objects in NovaNET. For more information, see *Keyboard Shortcuts* later in this chapter.

Status Bar

The status bar displays short descriptive messages about the menu commands on its left side. The middle of the status bar displays the current user's name and the database zone they are currently logged on to.



The **Alert** button is on the right. This button flashes whenever there is a problem that requires your attention. For example, NovaNET might not be able to locate a backup device you specified for a job and so it will send an alert to the **Alert** window notifying you of the problem. When you click on the **Alert** button, NovaNET brings up the **Alert** window so you can view any pending alerts.

You can use the **View** menu to either hide or show the **Status Bar**.

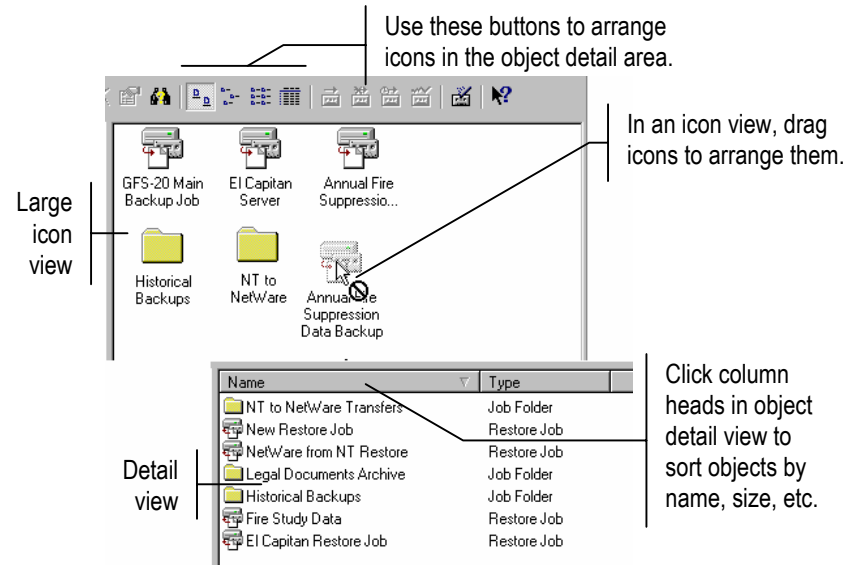
Working with Objects in the Main NovaNET Window

You can easily change how objects are displayed in the main NovaNET object window. This will assist you in working more effectively and quickly.

Arranging Objects

In the object detail area, you can arrange the objects in several different ways using either buttons on the toolbar or the **Arrange Icons** submenu on the **View** menu. Depending on the tab, you can sort the objects by name, date or type. You can also

- Drag the icons to arrange them when working with either large or small icons; and,
- Use the column head at the top of the object detail area to change how the objects are displayed when working in detail view.



Keyboard Shortcuts

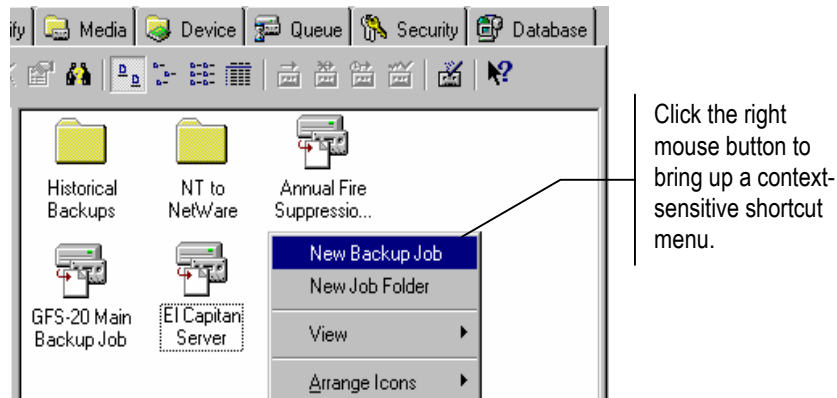
Although you may find using the mouse to be the most intuitive way to work with objects in the main NovaNET window, there are several keyboard shortcuts that will help speed up your work. The next time you work with NovaNET, try these keyboard shortcuts.

- The TAB key will move the active or highlighted area to a different area of the window.
- The PLUS SIGN (+) on the numeric keypad or the RIGHT ARROW key *expands* the tree in the tree view area.
- The MINUS SIGN (-) on the numeric keypad or the LEFT ARROW key *collapses* the tree in the tree view area.

- The ASTERISK key (*) on the numeric keypad will *expand* the tree as far as possible.
- The ARROW keys also select objects in the tree view area and in the object detail area, as well as change the active tab.

Shortcut Menus

When you right-click in most windows, the shortcut menu appears. The shortcut menu list commands that pertain to the particular portion of the screen you clicked on. This is often the fastest and easiest way to create new objects and modify existing objects.



Find Button



Find button

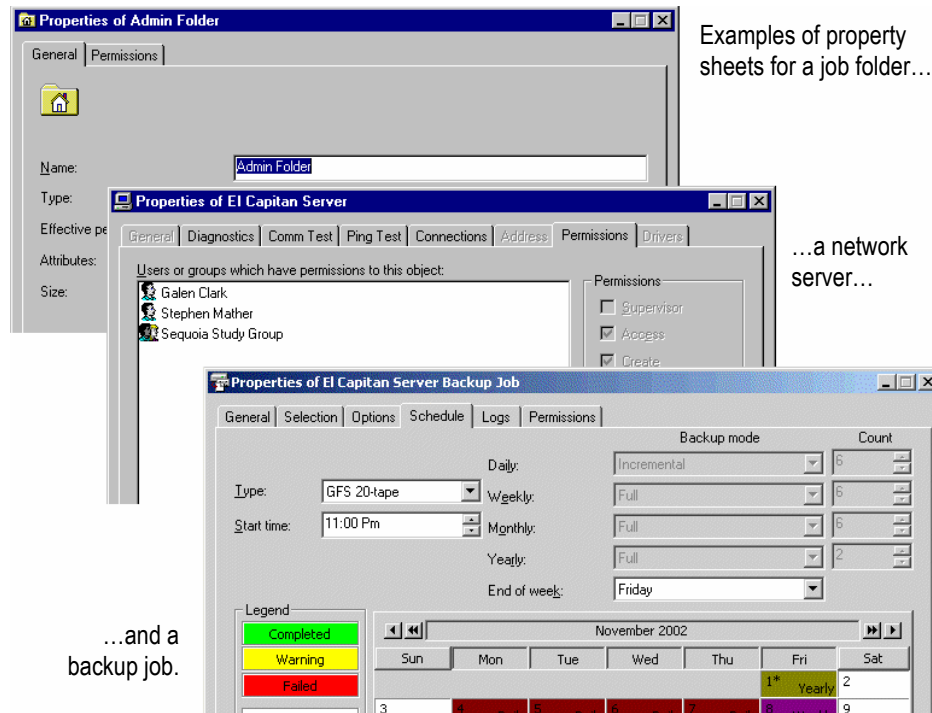
The **Find** button lets you locate objects in the database quickly without searching through multiple volumes and directories.

To use the **Find** command, click on the **Find** button, select **Find...** from the **Edit** menu or press CTRL+F. In the **Find** window, type in the name of the object you wish to find. NovaNET will search through the database, attempting to locate that object. When the object is found, it will be displayed and highlighted.

Note that the **Find** command is not case-sensitive; additionally, you may use the wildcard characters ? and *.

Property Sheets

Every object in the NovaNET database has a **property sheet** associated with it. Each property sheet has two or more tabbed pages on it that display the properties of that object.



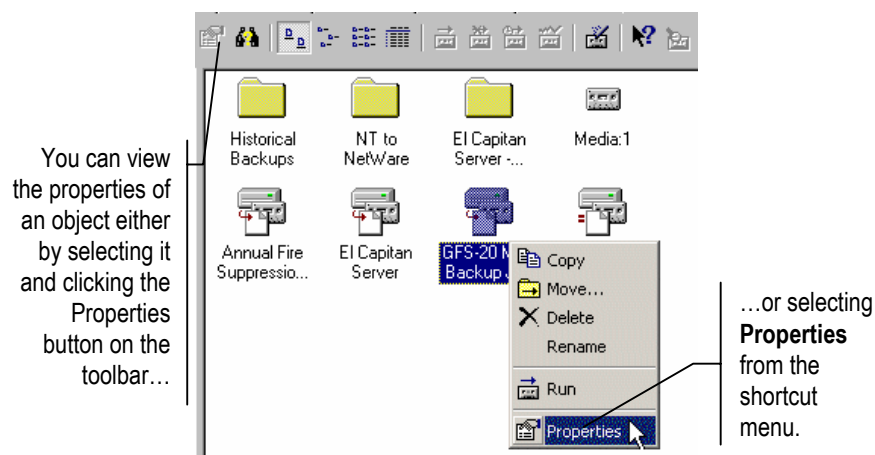
Opening Property Sheets



Properties
button

You can display the property sheet of an object in one of three ways:

- Select the object with the mouse or keyboard and then click the **Properties** button on the toolbar.
- Right-click the object to display a shortcut menu, then select **Properties**.
- Select the object and press ALT+ENTER.



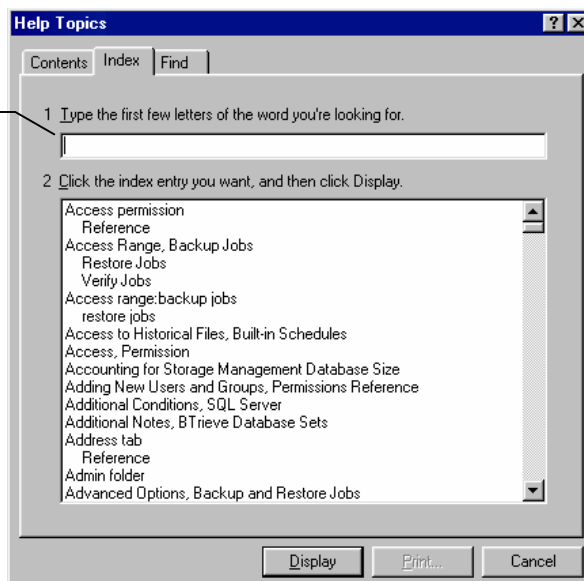
Note Property sheets work just like other windows, except that their size cannot be changed. You can leave them open when you return to working in the main NovaNET object window and you can have multiple property sheets open at once.

Menus

You will find the menus easy and intuitive to use. Most of the menu commands are discussed in some detail in later chapters of this book.

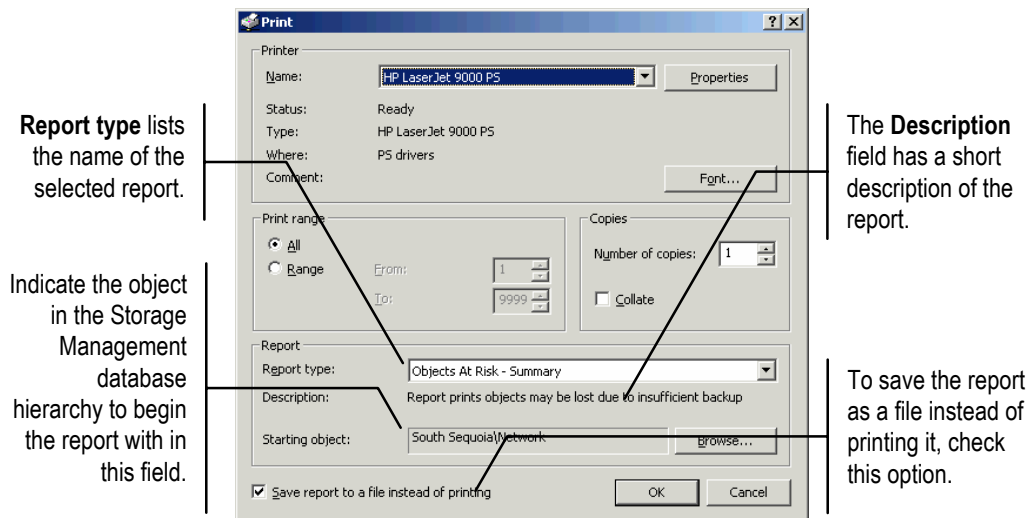
If you are having difficulty with a particular command, look in the index of this manual under the name of the menu. The **Status Bar** also displays a short description of the highlighted menu command. Alternatively, select **Help Topics** from the **Help** menu. Then type the name of the command with which you are having difficulty in the list box on the **Index** tab of the **NovaNET Help** window.

You can get help on any menu command by typing the name of the command on **Index** tab of the **Help Topics** window.



Reports

NovaNET has a series of helpful diagnostic and summary reports available. To run a report, select **Print report** from the **File** menu. In the **Report type** list box, you will see a list of the reports available. When you select a report, a short description appears in the **Description** field.



Before printing a report, specify which objects you want the report to cover by selecting a **Starting object**. The report will generate information for all of the objects in the NovaNET hierarchy that are below the object specified in the **Starting object** field. You can change the starting object by clicking on the **Browse** button and selecting a new object.

You can also specify the font the report will be printed in by clicking on the **Font...** button.

Note These reports can output many hundreds of pages. Therefore, we recommend that you select the **Save report to a file instead of printing** option. Then you can use a text editor to print the appropriate report information.

You can print the following reports:

Objects At Risk The **Summary** and **Detail** versions of this report lists the files, directories and volumes that have not been sufficiently backed up. Therefore, they are at risk unless additional backups are performed.

Media Information The **Summary** report lists general information about the media, including read and write statistics. The **Detail** report lists the summary as well as the files, directories and volumes that have been backed up to the media.

Database Listing The **Summary** and **Detail** reports list all objects in the storage management database. Select a different **Starting object** to only list data for particular objects, such as users or media. For example, to list database information about Users and Groups, set **Starting object** to the **Security** folder.

Diagnostics This report lists diagnostic information about each device.

Printer Test This sample report lets you verify operation of a specific printer.

Additional Report Capabilities

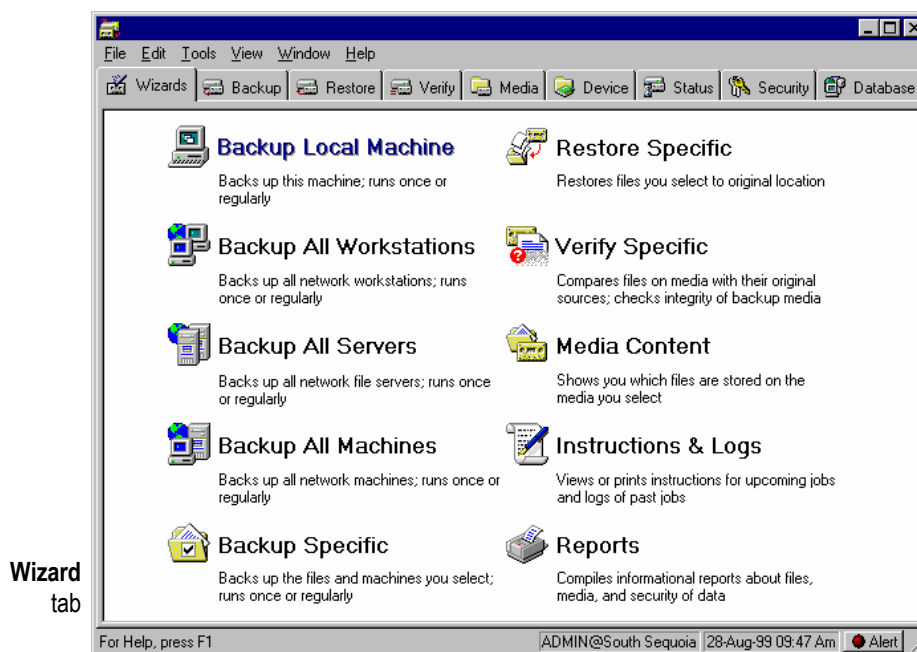
Besides its reporting capabilities, NovaNET has several advanced features to help you track and compile necessary information.

- The **Instructions** command on the **Tools** menu lets you check to see which media and devices are required for the scheduled jobs. See *Viewing and Printing Scheduled Job Instructions* in *Chapter 8 — Running Jobs* for more details.
- The **Email** (SMTP or MAPI) option allows you to email the logs of jobs to any valid email address. For more information, see *Email Support for Job Logs* in *Chapter 8 — Running Jobs*.

- You can also create *audit logs* for files, directories and volumes in order to monitor the backup and restore activity for these objects. See *Audit Logs* in *Chapter 8 — Running Jobs* for additional information.

Working with the NovaNET Wizard

The NovaNET Wizard gives you a fast and quick way to perform most tasks. You can use the NovaNET Wizard to create and schedule backup jobs, restore jobs and verify jobs. You can also create and edit reports from the **Wizard** tab. The NovaNET Wizard will guide you through each step necessary to create and run a job or create a report.



The name of each NovaNET Wizard option indicates what task that wizard helps you perform. The descriptions are self-explanatory. The backup, restore and verify options create jobs; for additional information about creating these jobs without the NovaNET Wizard or about the jobs the NovaNET Wizard created, consult chapters 3 through 8 of this manual. The **Media Content** wizard is a specialized implementation of the **Query Filters** window, discussed in greater detail at the end of chapter 9 and in chapter 12. The **Instructions and Logs** wizard tells you which media and devices are required for scheduled jobs and results of previously executed jobs; for additional information, consult *Viewing and Printing Scheduled Job Instructions* in *Chapter 8 — Running Jobs*.

If an option is not listed on a screen, e.g., **Disaster Recovery** on the **Wizards** tab or **SQL Connector** on the **Tools | Configurations** submenu, it may be caused by one of the following:

- The option has not been installed. For example, you must install the Disaster Recovery option for it to appear.
- The option is not available due to your license agreement. For example, you must purchase a license to back up more than one file server.
- An error occurred when starting NovaNET. Examine the `nntrace.txt` file located in your NovaNET directory.

Chapter 3 — Creating NovaNET Jobs

To transfer files back and forth from backup devices, such as tape drives, to network workstations and file servers, you create and run **jobs**. You organize and store these jobs in **folders** you create on **job tabs** in the main NovaNET administrator window.

In This Chapter

- Backup, Restore and Verify Jobs
- Creating New Jobs
- Renaming, Deleting and Moving Jobs
- Organizing Jobs with Folders

Overview

You use backup jobs in order to protect against loss of data due to disasters or equipment malfunction, to archive important files and to create permanent historical records. Restore jobs allow you to transfer stored files on media back to file servers and workstations. Verify jobs compare the version of a file stored on media, such as tapes, with current versions of the file stored on machines on a network.

You can create folders to store these jobs in on one of the job tabs. These folders and the jobs stored within them can be renamed, deleted and moved to new locations.

Backup, Restore and Verify Jobs

NovaNET can create and run three types of jobs: backup jobs, restore jobs and verify jobs.

Backup Jobs

Backup jobs copy selected files *from* workstations and file servers *to* various media, such as tapes. This media can then be stored, preserving a copy of the file for future use. You might create and run a backup job for one of the following reasons:

- *To ensure the integrity of data should a disk drive on a workstation or file server fail.*

This is perhaps the most common type of backup job. Its purpose is to protect valuable information in case of a disastrous data loss. This type of backup allows a company or organization to return to work quickly, even after the failure of a main file server. To be effective, these backup jobs must be run regularly (normally daily) *without exception* in order that recent changes to files can be safely restored. This type of backup job is for *disaster protection*.

- *To remove files from a workstation or file server that are infrequently used.*

Some files are important to keep, but are never or rarely used. For example, you may wish to keep a copy of correspondence from last year for legal reasons, but have no regular need to access these files under normal circumstances. By backing up the files onto a tape or other media, you safely store the media, preserving a copy of the file and then delete the file from the workstation or file server. NovaNET will keep track of which files you have backed up and which tape they are located on. As long as the media is undamaged and safely stored, you will be able to retrieve the file if necessary. This type of backup job is called an *archive job*.

- *To store a copy of a particular historical version of a file.*

Sometimes you may wish to keep a permanent record of a particular version of a file. For example, you may need to preserve a copy of company records as they exist on a certain date or before they are converted for use in a new program. You can store a copy of the file as it exists on a certain date and instruct NovaNET to make certain that this file and media it is on are not overwritten with other data. NovaNET will keep track of the file and the media in its database and you will be able to retrieve it if necessary. Unlike an archive job, the file that was backed up is not deleted from the file server or workstation. This type of backup job is sometimes called a *historical backup*.

Restore Jobs

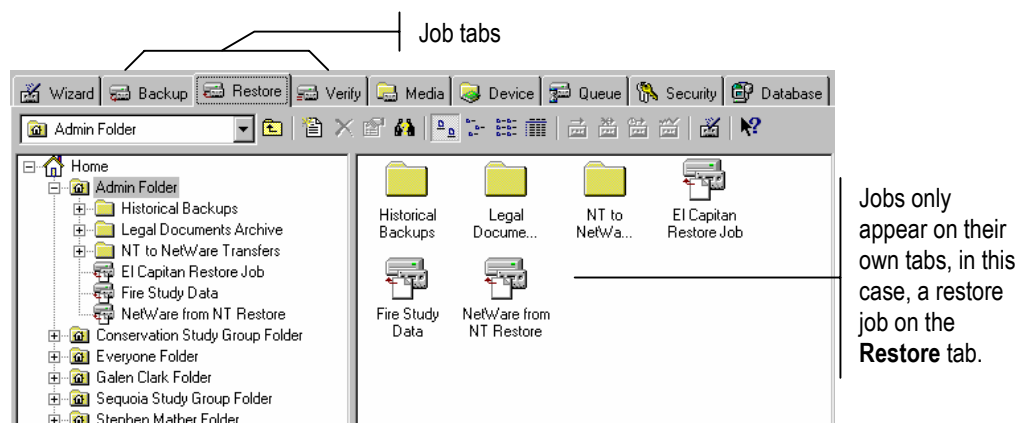
Restore jobs copy files *from* backup devices *to* workstations and file servers. You might create and run a restore job when files on a workstation or file server have been lost because of a disk crash, when you need to view a file that has been archived (backed up onto a tape and then deleted) or when you need data from a particular historical version of a file.

Verify Jobs

Verify jobs compare a file on some media, such as a tape, with a file at a workstation or file server. These jobs *verify* that the two files are in fact the same file. A verify job is useful when you wish to make sure a particular file, such as a program file, has not been corrupted or modified.

Job and Database Tabs

The three different job types each have their own tab. You create, modify and run backup jobs with the **Backup** tab selected, restore jobs with the **Restore** tab selected and verify jobs with the **Verify** tab selected.



Note that a job only appears on its own type of job tab. For example, backup jobs are displayed on the **Backup** tab, but not on the **Restore** or **Verify** tabs.

However, you can also view all three types of jobs on the **Database** tab. But because the **Database** tab keeps track of all of the objects in the NovaNET database, it may appear very cluttered. Normally, when working with jobs, make the appropriate job tab active.

Creating New Jobs

There are three ways to create new jobs: with the wizard, from the job tab and by copying old jobs.

Creating Jobs with the Wizard

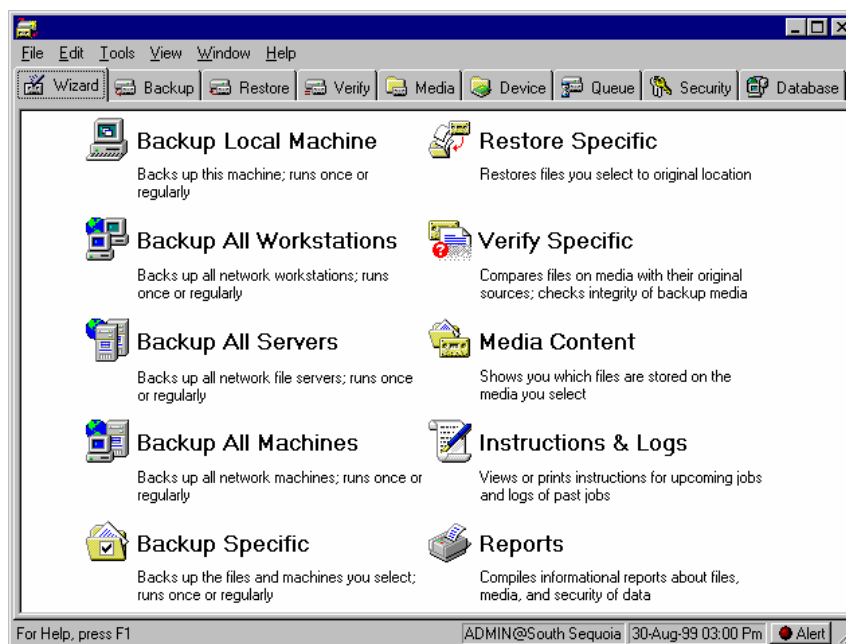


Wizard button

The NovaNET wizard will help guide you through all of the steps necessary to create and run a backup, restore or verify job. This is often the fastest way to create a new job, especially when you are inexperienced using NovaNET. After you answer a few questions, the NovaNET wizard will create the job for you. You can then work with this job in the database just like any other job.

The fastest way to activate the NovaNET wizard is to click on the **Wizard** tab. Then click on the appropriate button to create either a new backup, restore or verify job. You can also create reports from the **Wizard** tab which will help you monitor how jobs have run and the backup status of various files and databases.

Use the
Wizard tab
to create
new backup,
restore and
verify jobs.



You can also create a new job with the NovaNET wizard by either

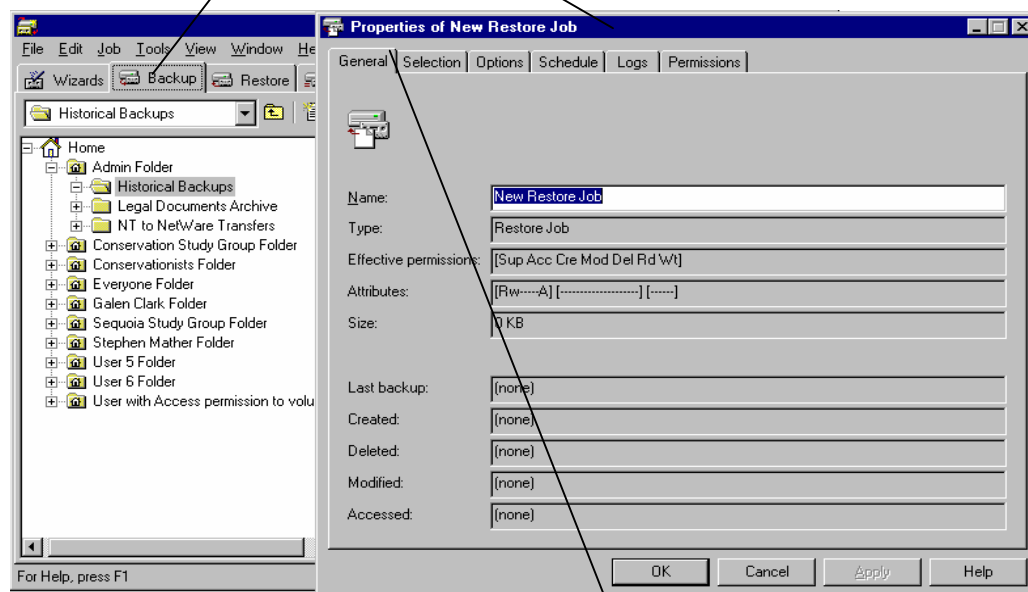
- Selecting **Wizard...** from the **Job** menu,

- Typing CTRL+W, or
- Clicking the **Wizard** button on the toolbar.

Creating New Jobs from a Job Tab

Commonly, you will create jobs while working with one of the three job tabs (**Backup**, **Restore**, **Verify**) in the main NovaNET object window. When you create a job this way, NovaNET opens the property sheet of the new job so you can name the job, select files and schedule it to run. Selecting files and scheduling a job to run is covered in detail in chapters 5 through 7.

The type of job created depends on which job tab is active.



When you create a new job, its property sheet automatically opens.

Which type of job you create depends on which job tab is active. Where NovaNET keeps track of the job depends on which folder is open in the tree display area.

For example, if the **Backup** tab is active, NovaNET will create a new backup job. If a personal or workgroup folder is open, NovaNET stores the job in the open folder.

To Create a New Job from a Job Tab

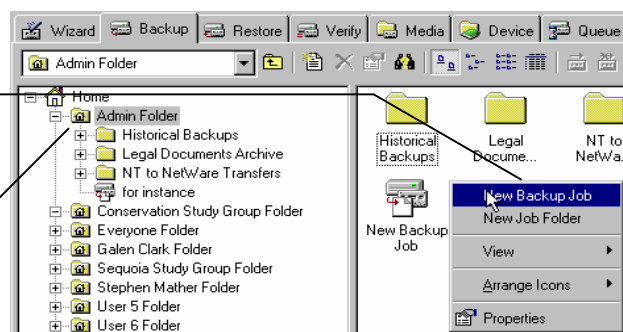
1. Make either the **Backup**, **Restore** or **Verify** tab active by clicking on it. This determines what type of job NovaNET will create.
2. Open the folder in the tree view area where you want to store the job. The contents of that folder are displayed in the object detail area. NovaNET will store your new job here.
3. Create the new job by either
 - Selecting **New Object...** from the **File** menu and then selecting the appropriate job from the **New Object** window, or
 - Right-clicking in the NovaNET object detail area and selecting **New...Job** from the shortcut menu, or
 - Clicking the **New Object** button on the toolbar and selecting the appropriate job from the **New Object** window.
4. Type in the name of the new job in the **Name** box.



New Object
button

To create a new job, right click the mouse and select **New...Job** from the shortcut menu.

New jobs are stored in the folder open in the tree view area.



Creating New Jobs by Copying

Creating a new job by copying an existing job is sometimes a useful method of creating a job. In particular, copying an existing job is appropriate when you want your new job to be like the old job in every way except for a few minor changes.

To Create a New Job by Copying an Existing Job

1. Copy the existing job you wish to duplicate by either
 - Holding down the CTRL key as you drag the existing job to a new location, then skip to step 4 below, or
 - Selecting the existing job (with the mouse or keyboard) and pressing CTRL+C, or

- Right-clicking the existing job and selecting **Copy** from the shortcut menu, or
 - Selecting **Copy** from the **Edit** menu.
2. Open the folder you want the new job to be stored in by selecting it in the tree view area. (To store the job in the same folder as the existing job, skip this step.)
 3. Right-click the folder where you want the new job to be pasted and select **Paste** from the shortcut menu. Alternatively, highlight the location where you want the job pasted; then select **Paste** from the **Edit** menu or press CTRL+V.
 4. Change the name of the new job.

Note NovaNET copies all job properties, including job logs, to the new job.

Renaming, Deleting and Moving Jobs



Delete button

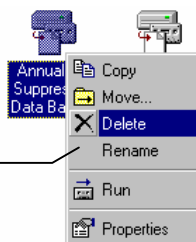
You can change the names of jobs or move them to new folders. Or, if you don't plan to use a job again in the future, you can delete it.

You rename, delete and move jobs by either

- Selecting the appropriate command from the **Edit** menu, or
- Right-clicking the job and selecting the appropriate command from the shortcut menu.

To move a job, drag it to a new location. You can also use the DELETE key and the **Delete** button to delete jobs.

Right-click an object to display the shortcut menu to **Copy**, **Move**, **Delete** and **Rename** objects.



Note When you run a backup job, NovaNET uses its storage management database to keep track of the files you have backed up and the name of the tape on which they are stored. Deleting a job does not affect how the storage management database tracks files and tapes. NovaNET continues to track these files and tapes even after the job that created them has been deleted.

Organizing Jobs with Folders

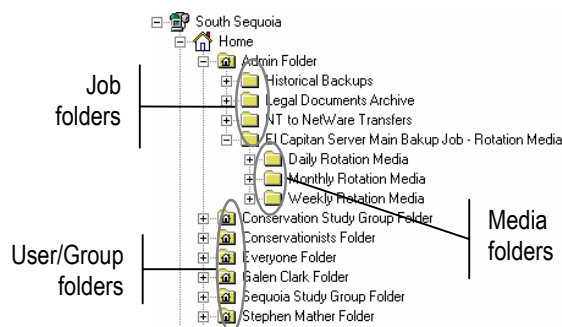
Every backup, restore and verify job is stored by NovaNET inside a folder. You can create new folders to help organize your jobs or you can use existing folders.

When the NovaNET administrator added you as a user, NovaNET created a personal folder for your use. Generally, because there may be many users in your NovaNET storage management zone, it is a good idea to store your personal jobs in your personal folder. Alternatively, you can store workgroup jobs in the appropriate group folder.

Types of Folders

There are three types of folders: **User/Group folders**, **Job folders** and **Media folders**. Each of these folders is a container, that is, they store other objects within them. They differ from each other according to the type of object that can be stored within them.

- *User/Group folders* can only be stored in a special folder, called the **Home** folder. These folders can have either Job folders or Media folders within them; additionally, you can store jobs or media “loose” in these folders.
- *Job folders* can only be stored in User/Group folders or in other Job folders. These folders usually have jobs stored within them, although you can also store additional job folders within them.
- *Media folders* can only be stored in User/Group folders or in other Media folders. These folders usually have media stored within them, although you can also store additional Media folders within them. Media folders are discussed further in *Chapter 9 — The Media, Device and Database Tabs*.

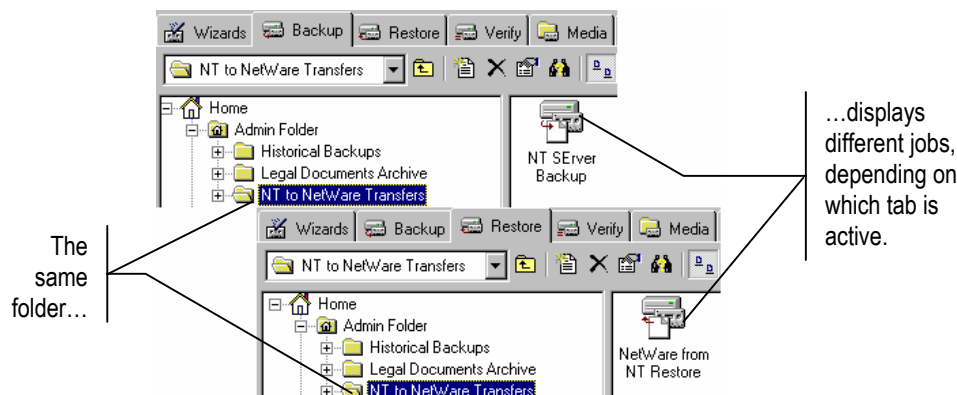


Folders and Job Tabs

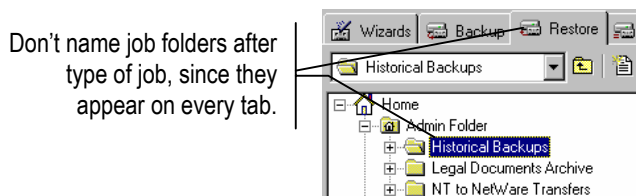
Job folders are unlike jobs in one important way: Job folders appear on all the job tabs and on the database tab. Jobs, on the other hand, only appear on one tab (backup jobs on the **Backup** tab and so forth) and on the **Database** tab. When you create a new job folder, that folder appears on all the job tabs and on the database tab.

Similarly, User/Group folders appear on every job tab, as well as the **Media** tab and the **Database** tab.

Media folders, however, only appear on the **Media** and **Database** tabs.

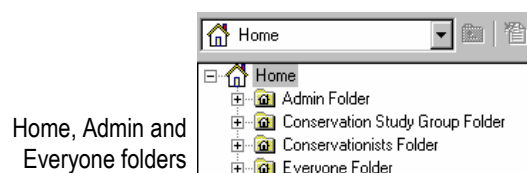


Because every folder is seen on every job tab, you may not need or want to have separate folders for different types of jobs. For example, a folder that stores only backup jobs will appear on all three job tabs, including the **Restore** tab and **Verify** tab. For this reason, it is better to name the folder after your workgroup or yourself, than by the type of job stored in it. Again, a single folder can store all of your personal or workgroup jobs.



Home, Admin and Everyone Folders

Three folders play a special role in every database: the **Home** folder, the **Admin Folder** and the **Everyone Folder**.



The **Home** folder is the folder that stores all of the User/Group folders within it. It is always at the top of the hierarchy in the tree view area of a job tab. You are not allowed to store jobs “loose” in the **Home** folder, only inside other folders.

The **Admin Folder** is a special folder used by the NovaNET administrator. Normally, only the NovaNET administrator has permissions to the **Admin Folder**. If you don't see it inside your **Home** folder, this is because the NovaNET administrator has not given you permissions to view it.

The **Everyone Folder** is a folder to which every NovaNET user has permission. Your NovaNET administrator may place jobs in this folder to which he wants everyone to have access.

Everyone Folder and Permissions

For more information, see *Chapter 4 — Permissions*.

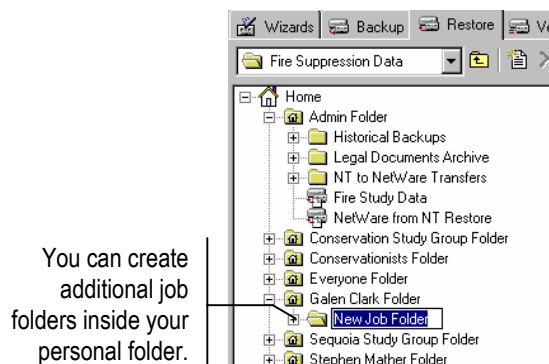
Because of the way NovaNET assigns permissions to new objects, if you create a new object inside the **Everyone Folder**, normally everyone will have at least some permissions to it. For example, if you create a new backup job and store it in the **Everyone Folder**, it is likely that every NovaNET user will have permissions to that folder and thus to the job.

To restrict the permissions of other NovaNET users to a job or folder, the best strategy is to use a folder to which only you or your workgroup have permission. Granting permissions are covered in detail in the *Chapter 4 — Permissions*.

Creating Job Folders

Usually, the best strategy for organizing your personal jobs or the jobs of your workgroup is to create a special folder in which to store them. This is particularly true because it makes it easier and quicker to manage permissions to those jobs.

When the NovaNET administrator adds a user or group, NovaNET creates a personal folder for that user or group. If you have the proper permissions, you can also create as many additional new job folders as you need and organize them in whatever way is convenient. You can create additional job folders either inside your personal or workgroup folder or inside the **Everyone Folder**.



To Create a New Folder

1. Select the existing folder in which you want to store the new job folder. (It cannot be the **Home** folder.)
2. Create the new folder by either
 - Selecting **New Object...** from the **File** menu and then selecting **New Job Folder** from the **New Object** window, or
 - Right-clicking in either the tree view or object detail area and selecting **New Job Folder** from the shortcut menu, or
 - Clicking the **New Object** button and selecting **New Job Folder** from the **New Object** window.



New Object
button

NovaNET creates the new folder inside the selected folder.

3. Type in the name of the new folder on its property sheet.

Tip After creating a new folder, be certain to specify which users have permissions to it. This is the simplest and fastest way to assign permissions to multiple objects stored in the folder.

Moving, Renaming and Deleting Folders

You can move, rename or delete a folder just like you can any other NovaNET objects, such as jobs; however, you cannot copy folders. When moving, deleting or renaming folders, keep the following in mind:

Moving Folders Contents of a folder move with the folder to the new location. This may change the permissions of the objects stored in that folder.

Renaming Folders Only the name of the folder is changed. NovaNET still treats that folder and any objects associated with it in the same manner.

Deleting Folders Deleting folders also deletes their contents, including any other folders or jobs contained in that folder. Before deleting a folder, be certain that you wish to delete all of its contents.

Warning Once a folder has been deleted, its contents cannot be recovered. Be certain either that the folder is empty or that you no longer need the contents of the folder before deleting it.

Modifying Folders

You can rename, delete and move folders using one of these methods:

- Selecting the appropriate command from the **Edit** menu, or
- Right-clicking the job and selecting the appropriate command from the shortcut menu, or
- Clicking and dragging the folder to a new location.

Chapter 4 — Permissions

Security is an important issue when managing a network. One of the most important functions of the NovaNET storage management database is to handle security. The storage management database prevents unauthorized users from working with objects to which they have not been granted security clearance. To ensure only authorized users can access sensitive data, NovaNET tracks the **permissions** of each user. The NovaNET administrator can grant different types of permissions to various users to ensure the security and integrity of the network data while efficiently implementing a productive backup program.

In This Chapter

- Overview
- Users and Groups
- Effective Permissions
- Types of Permission
- Two Examples of Permissions
- Granting Permissions to Other Users

Overview

Before you can work with any object (directory, file, user, etc.) in the NovaNET storage management database, you must have **effective permissions** to that object.

Different types of permissions restrict what type of operations can be performed on an object. For example, some permissions allow users to *write* to an object (such as a file, a tape or a workstation) or *create* new objects (such as folders or jobs). Sometimes a user is granted unlimited permissions to an object or all objects. Usually, however, to protect the integrity of the data and for security reasons, most users have only limited effective permissions to some (not all) of the objects in the NovaNET database.

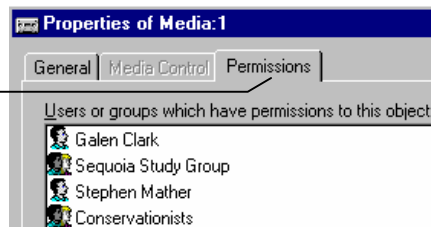
Maintaining the security of data on a network is the primary responsibility of the NovaNET administrator. Because of this, this chapter is only an overview of security and permissions. This chapter will help the typical user understand how NovaNET handles security and permissions so that you can work efficiently with your NovaNET administrator. More detailed information on permissions is covered in *Chapter 11 — Advanced Permissions and Security*.

Users and Groups

For more information on setting up users and groups, see *Adding New Users and Groups* in *Chapter 11 — Permissions and Security Reference*.

The NovaNET administrator grants permissions to objects in the NovaNET database to either a **user** or to a **group**. Individual NovaNET users have effective permission to an object either as a user or as the member of a group. A group is a set of users that are all granted permissions in the same way and at the same time. For example, the NovaNET administrator may grant permission to read the files on a tape to users individually, to a group of users or both to users and to groups.

Users and groups can be granted permissions to any object, in this case a tape.



Individual NovaNET users can be the member of more than one group or of every group, depending on how the NovaNET administrator arranges the storage management database security. The number of groups the NovaNET administrator creates and the assignment of members to those groups depends on the security needs of your particular network.

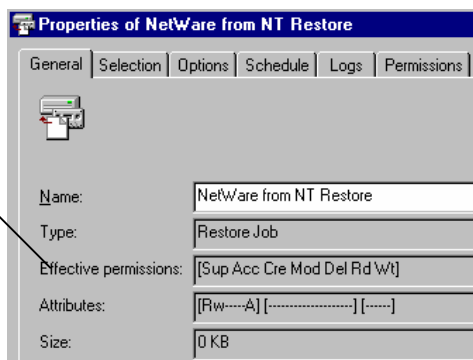
Everyone Group

Normally most NovaNET users are a member of a special group, the **Everyone** group. Whenever a new user is added to a NovaNET storage management zone, NovaNET automatically assigns that user to the **Everyone** group. Typically, only limited permissions are granted to the **Everyone** group, although users can be granted more extensive permissions either individually or as members of other groups.

Effective Permissions

The permissions you have to an object in the NovaNET storage management database are called your **Effective permissions**. You can view your effective permissions to an object on the **General** tab of that object.

The current user's effective permissions to an object are shown on the **General** tab of that object.



Determining Effective Permissions

A user is assigned effective permissions to an object through by **direct permissions** or **inherited permissions**.

A user has *direct permissions* to an object if they are listed on the **Permissions** tab of the object, if they are equivalent to a user who has direct permissions to the object or if they are a member of a group that is listed on the **Permissions** tab of that object.

A user has *inherited permissions* to an object if they do not have direct permission, but they have effective permissions to the container that contains the object. If you do not have direct permissions to an object, you must have effective permissions to the container in which the object is stored.

Note Your effective permissions to a container object can be either direct or inherited. All that matters is that you have effective permissions to the container.

When determining a user's effective permissions to an object, NovaNET checks if the user has direct permission; if not, NovaNET checks if they have inherited permission.

For example, if a user has the **Read** direct permission, but the group has the **Access** permission, the user's effective permission is **Access**.

Examples of Determining Effective Permissions

The following two examples illustrate how NovaNET determines the effective permissions a user has to an object.

Effective Permissions Example #1

In this example, a user named Galen Clark has direct permissions only to the User/Group folder named **Galen Clark's Folder**.

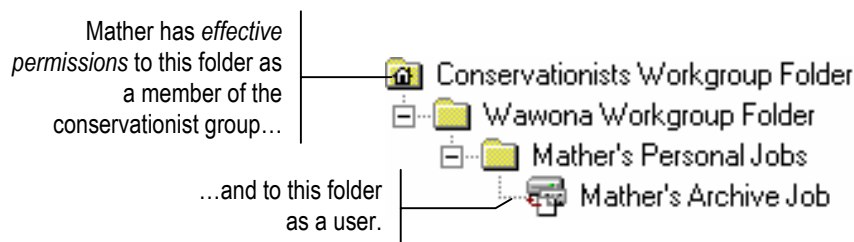


When determining the effective permissions Clark has to **Galen Clark's Folder**, NovaNET first looks to see if he has direct permission to the folder. Because Clark is listed as a user on the **Permissions** tab of the folder's property sheet, Clark has direct permission to the folder. NovaNET uses this information to determine Clark's effective rights. NovaNET does NOT look to see if there are any inherited permissions to the folder.

When determining the effective permissions Clark has to the backup job named **Clark's Personal Backup Job** stored in **Galen Clark's Folder**, NovaNET first looks to see if he has direct permission to the job. Because Clark does not have direct permissions, NovaNET checks to see if Clark has effective permissions to the container that contains the job. In this case, NovaNET checks to see if Clark has effective permissions to **Galen Clark's Folder**; because Clark has effective permission to this folder, NovaNET uses this information to calculate the effective permissions Clark has to the job.

Effective Permissions Example #2

In this example, a user named Stephen Mather has direct permission to the User/Group folder named **Conservationist Workgroup Folder** *as a member of the Conservationist Workgroup* and to the Job folder named **Mather's Personal Jobs** *as a user*.



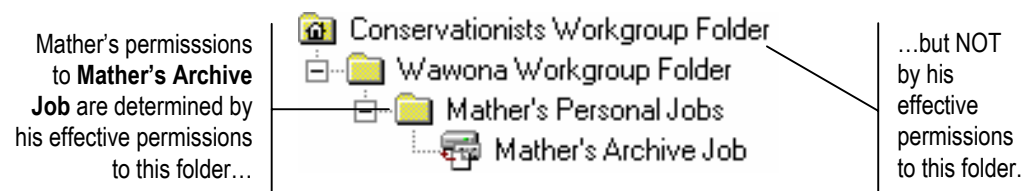
When determining the effective permissions Mather has to the **Conservationist Workgroup Folder**, NovaNET first looks to see if he has direct permission to the folder. Because Mather is a member of the **Conservationist Workgroup** which has direct permissions to the folder, Mather also has direct permissions to the folder. NovaNET uses this information to determine Mather's effective permissions. NovaNET does NOT look to see if there are any inherited permissions to the folder.

When determining the effective permissions Mather has to the Job folder named **Wawona Workgroup Folder** stored in the **Conservationist Workgroup Folder**, NovaNET first looks to see if he has direct permission to the folder. Because no users or groups have direct permissions to this folder, NovaNET checks to see if Mather has effective permissions to the container that contains this folder. In this case, NovaNET checks to see if Mather has effective permissions to the **Conservationist Workgroup Folder**; because Mather has effective permission to this folder, NovaNET uses this information to calculate the effective permissions Mather has to the **Wawona Workgroup Folder**.

Similarly, NovaNET determines the effective permissions Mather has to the folder named **Mather's Personal Jobs** by the direct permissions Mather has to that folder. Note that when determining the effective permissions to this folder, it makes no difference that Mather also has effective permissions to the **Wawona Workgroup Folder** which contains this folder.

When determining the effective permissions Mather has to the job **Mather's Archive Job** contained in the **Mather's Personal Jobs** folder, NovaNET checks to see if Mather has direct permissions. Because he does not, NovaNET checks to see if Mather has effective permissions to the container that contains the job. Because Mather has effective permissions to the **Mather's Personal Jobs** folder, NovaNET uses these effective permissions to determine his effective permissions to **Mather's Archive Job**.

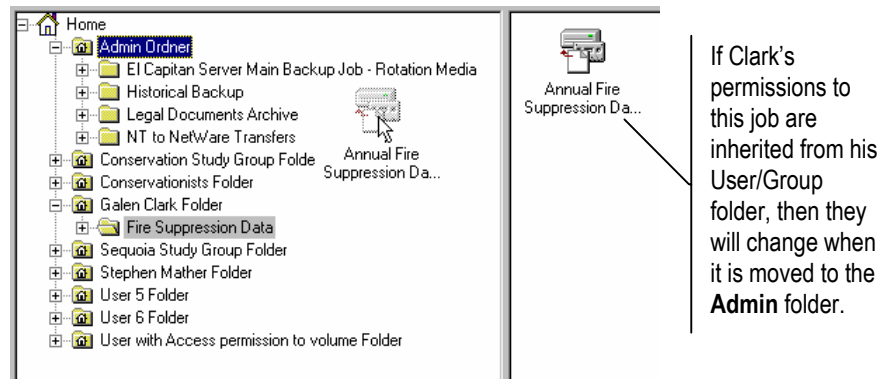
Note especially that the effective permissions Mather has to **Mather's Archive Job** are determined ONLY by Mather's effective permissions to the **Mather's Personal Jobs** folder—and NOT by his effective permissions to the **Conservationist Workgroup Folder** or the **Wawona Workgroup Folder**.



How Moving Objects Affects Permissions

When an object is moved from one container to another, NovaNET determines the effective permissions of the object based on its new location.

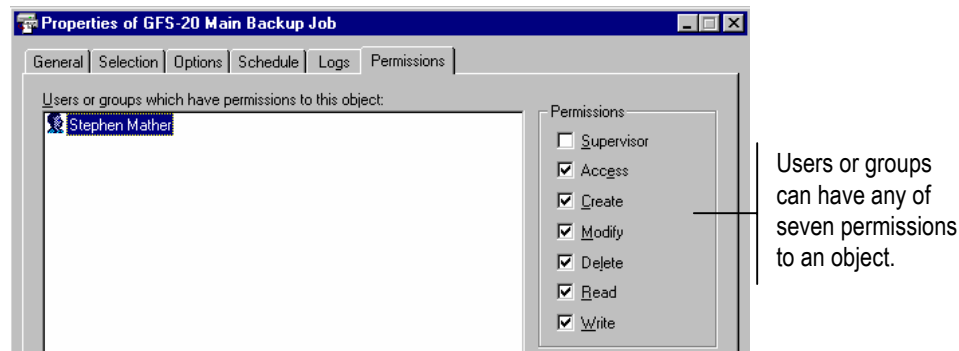
For example, suppose a user has effective permissions to a job because that job is stored in his or her User/Group folder, a container to which the user has been granted direct permission. If the job is moved from that folder to a new folder, the user's effective permissions to the job may change. If the job were moved to the **Admin** folder, the user would lose permission to it because he or she does not have permission to the **Admin** folder. On the other hand, if the job were moved to the **Everyone** folder, the user will still be able to access the job, although the effective permissions might be different.



Types of Permission

NovaNET controls access to objects in its database with seven different types of permission. The type of permission determines what actions a user can perform on an object. Users and groups can be granted all seven types of permission, only some of the permissions or none of the permissions.

The seven types of permission are **Supervisor**, **Access**, **Create**, **Modify**, **Delete**, **Read** and **Write**.



Supervisor

This is the most powerful permission. Supervisor permission grants the user three specific abilities:

- First, a user with supervisor permission to an object is automatically granted the other six permissions to that object;
- Second, a user with supervisor permission to an object automatically has effective permission to all the objects in the storage management database below that object; and
- Third, a user with supervisor permission to an object cannot be denied any of the seven permissions to any object in the storage management database below that object.

The NovaNET administrator is automatically granted supervisor permission to the highest container in the NovaNET storage management database hierarchy (called the **System Container**). This means that the NovaNET administrator has full permissions to all the objects in the NovaNET database and that none of these permissions can be denied.

Often, only the NovaNET administrator will be assigned supervisor permission.

Access

A user with **Access** permission to an object can grant other users and groups permissions to that object. For example, if you wish to grant a co-worker permissions to a tape you have created, you must have **Access** permission to that tape.

Access permission can be very powerful, since it allows a single user the ability to grant all other users in the NovaNET database extensive permissions to an object. For this reason, your NovaNET administrator may not grant you **Access** permission to objects even though you have other permissions to them. For example, your NovaNET administrator may grant you permission to read and write from a particular tape. Without **Access** permission however, you will not be able to grant other users or groups that same ability.

You can only grant permissions to other users or groups if you have **Access** permission. If you want other users to have permissions to an object, such as a job or tape, and do not have **Access** permission to that object, ask your NovaNET administrator to grant the permissions for you.

Create

This permission allows a user to create new objects within a container object. For example, to create a new job within a folder, a user must have **Create** permission to the folder. Note that the **Create** permission applies *to the folder*, not to the job: it grants the user permission to create new objects *within* that folder.

If you want to create new folders or jobs, your NovaNET administrator must grant you **Create** permission. Your permission to create new jobs or folders might be limited to a single folder. For example, you may have **Create** permission only to the **Everyone** folder or to a personal folder that your NovaNET administrator has created for you or your workgroup.

If you can't create a new job or folder, first make sure you have selected a folder in the tree view area to which you have **Create** rights. If you still cannot create a new job or folder, ask your NovaNET administrator to grant you **Create** permission to a folder.

Modify

This permission allows a user to change the name and location of an object, such as a job, in the NovaNET storage management database. **Modify** permission also allows a user to change or modify the property sheets of an object. If you have this permission, you will be able to move, rename and change the property sheets of objects. For example, to change the name of job, a user must have **Modify** permission to that job. You must also have **Modify** permission to move a job from one folder to another.

Delete, Read and Write

These three permissions control user access to objects, such as tapes, devices and files, that are read, deleted or written to. These permissions are necessary in order to run backup, restore and verify jobs as specified below.




- *To complete a backup job*, a user must be granted **Read** permission to the files to be backed up and **Write** permission to both the media and the backup device. If the backup job will *overwrite* the media with the new data (as opposed to merely *appending* the new data), the user must also have **Delete** permission to the media.
- *To complete a restore job*, a user must be granted **Write** permission to the volumes (disk drives) on which the files are going to be restored and **Read** permission to the media and backup device. If the restore job will *overwrite* or *replace* old files, the user must have **Delete** permission to those files.
- *To complete a verify job*, a user must be granted **Read** permission to the files on the workstation or file server to be verified, to the media and to the backup device.

Examples of Permissions

The following two examples illustrate how the permissions work with each other.

Permissions Example #1

In this example, a user named Galen Clark has effective permissions to a folder named **Clark's Jobs**, to a drive (or volume) named **Clark's 2 Gig Drive** and to a tape named **Clark's Personal Backup Tape**.

Database Object	Effective Permissions
 <i>Clark's Jobs</i> (Job folder)	[--CMDRW]
 <i>Clark's 2 Gig Drive</i> (Volume)	[-----R-]
 <i>Clark's Personal Backup Tape</i> (Media)	[-----R-]

These permissions allow Clark to do the following:

- Because Clark has **Create** permission to the **Clark's Jobs** folder, he will be able to create new job folders within that folder and to create backup, restore and verify jobs inside that folder. The **Modify** permission allows him to move these jobs between folders, to change the name of the job and to change the property sheets of these jobs. The **Delete** permission allows him to delete any jobs or folders inside this folder. Clark also has **Read** and **Write** permissions to the **Clark's Jobs** folder and will have these same permissions to any object stored in that folder.




- Because Clark also has **Read** permission to the volume named **Clark's 2 Gig Drive**, he will be able to select files from that drive for backup. He will also be able to select files for restoring.
- Because Clark has **Read** permission to both the tape and to the volume, he will be able to create and run verify jobs—if he also has **Read** permission to the backup device.

These permissions do NOT allow Clark to do the following:

- Although Clark will be able to create a backup job, he will not be able to run the backup job because he does not have **Write** permission to the tape. The job must be run by the NovaNET administrator or some other user the NovaNET administrator grants **Write** permission to the tape.
- Similarly, although Clark will be able to create a restore job, he will not be able to run the restore job because he does not have **Write** permission to the disk drive. If Clark wants to run the restore job, he must ask the NovaNET administrator to run it for him or to grant him the permissions necessary to run it.
- Clark is prevented from granting permission to other users to his folder, to his drive and to his tape because he lacks **Access** permission to these objects.

Permissions Example #2

In this example, a user named Stephen Mather has effective permissions to a drive named **Mather's 1 Gig Drive** and to a tape named **Mather's Personal Backup Tape**. He is also a member of the **Conservationist** group which has effective permissions to a folder named **Conservationist Workgroup Jobs**.

Database Object	Effective Permissions
 <i>Mather's 1 Gig Drive</i> (Volume)	Mather: [-----R-]
 <i>Mather's Personal Backup Tape</i> (Media)	Mather: [-----RW]
 <i>Conservationist Workgroup Jobs</i> (Folder)	Conservationists: [--CMDRW]

These permissions allow Mather to do the following:

- Because he is a member of the **Conservationist** group, Mather will be able to create jobs and folders within the **Conservationist Workgroup Jobs** folder. He will also be able to modify and delete any jobs or folders in that folder.

- Because Mather has **Modify** permission to the folder and **Read** permission to the drive named **Mather's 1 Gig Drive**, he will be able to select files from that drive to backup. Similarly, Mather will be able to select files for restoring because he has **Read** permission to the tape named **Mather's Personal Backup Tape**.
- Unlike Clark, Mather will be able to run backup jobs because he has **Write** permission to the tape. (This assumes he also has **Write** permission to a tape drive.)
- Mather will also be able to create and run **Verify** jobs.

These permissions do NOT allow Mather to do the following:

- Although Mather will be able to create and run *backup* jobs, he will not be allowed to *restore* files from those tapes onto his drive because he has not been granted **Write** permission to his disk drive.
- When Mather runs a backup job, he will be prevented from overwriting old files on the tape with new files because he does not have **Delete** permissions to the tape. Thus the backup jobs he creates and runs must all be append jobs.
- Mather, like Clark, is prevented from granting permission to other users to either his drive or his tape because he lacks **Access** permission.

Other members of the **Conservationist** group also have some permissions to the jobs and folders inside the **Conservationist Workgroup Folder**, including those created by Mather. This affects them in the following ways:

- They will be able to view the folders and jobs Mather creates in the **Conservationist Workgroup Folder**. Because they have **Modify** permission, members of the **Conservationist** group will be able to modify the properties of any jobs or folders Mather creates inside the **Conservationist Workgroup Folder**.
- Because members of this group lack **Read** permission to Mather's drive and tape, they will be unable to change the files Mather selected for backing up or restoring—even if they have **Modify** permission to a job Mather created.
- No other members of this group can run one of Mather's jobs unless the NovaNET administrator grants them the appropriate **Read** and **Write** permissions.

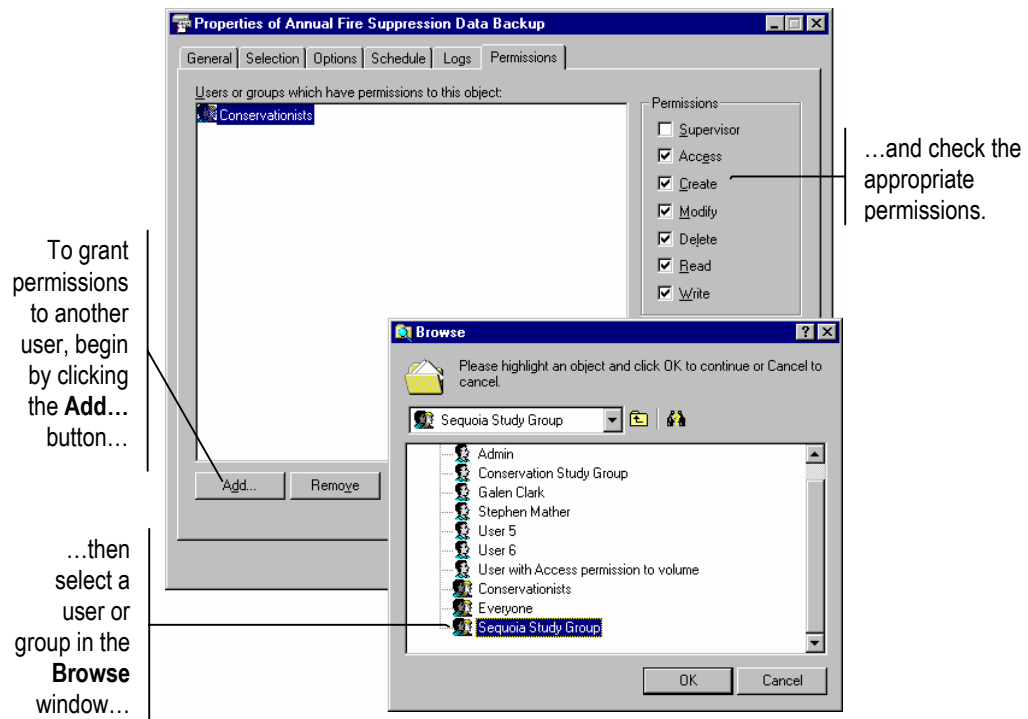
Granting Permissions to Other NovaNET Users

If your NovaNET administrator has given you **Access** permission to an object, you will be able to grant other users and groups permissions to that object. Generally your NovaNET administrator will only grant you **Access** permission to objects in the NovaNET database when he or she wants you to be able to share this data with other users.

For example, if your NovaNET administrator has given you **Access** permission to an archive tape, you will be able to grant other users **Read** permission to the tape. This would allow other users to restore files from this tape to any drive they have **Write** permission to.

To Grant Permission to Other NovaNET Users

1. Open the properties window of the object to which you wish to grant users or groups permission.
2. Click on the **Permissions** tab. (If you don't have **Access** permission to an object, the **Permissions** tab will not appear on the object's property sheet.)
3. Click the **Add...** button.
4. Select a user or group to add in the **Browse** window and then click **OK**.
5. Select the appropriate **Permissions** check boxes at the right of the window.

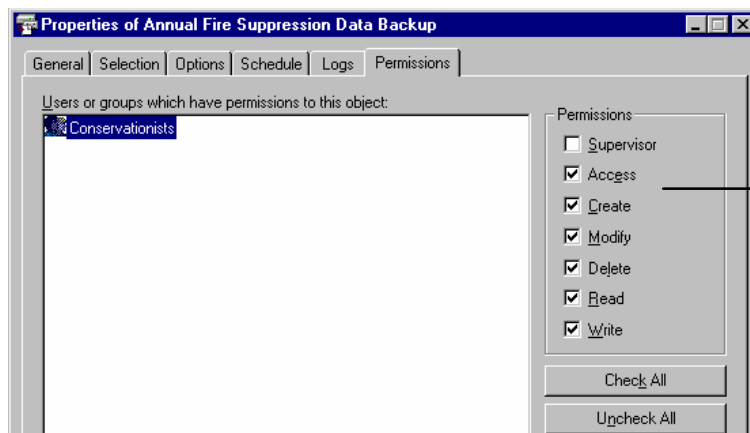


Restricting User Permissions

In most cases you can restrict the permissions a user has to an object in the same way you grant permissions—by clearing the appropriate check boxes on the **Permissions** tab of that object. If the user or group is not listed on the **Permissions** tab of the object, you must first add that user or group to the list of users or groups that have direct permissions to that object.

To Restrict Permissions of Other NovaNET Users

1. Open the properties window of the object to which you wish to restrict user or group permissions.
2. Click on the **Permissions** tab. (If you don't have **Access** permission to an object, the **Permissions** tab will not appear on the object's property sheet.)
3. If the user is not listed on the **Permissions** tab, first add the user or group by clicking the **Add...** button and then selecting a user or group to add in the **Browse** window.
4. Select the user or group to whom you wish to deny permissions on the **Permissions** tab.
5. Clear the appropriate **Permissions** check boxes at the right of the window.



To deny a user permissions to an object, add that user to the object's **Permissions** tab and clear all of the **Permissions** check boxes.

When you restrict a user's direct permissions to a container, you also change that user's effective permissions to objects within that container—but only when the user's effective permissions to those objects are *inherited* from that container's effective permissions. For example, if you deny a user direct **Modify** permission to a job folder by clearing the **Modify** check box under that user's name, you also deny that user effective **Modify** permission to jobs stored in that folder—unless that user has direct permissions to those jobs.

Normally, your NovaNET administrator will have arranged the security of your storage management zone to prevent unauthorized permission to files and tapes. However, if you believe another user's permission to an object should be restricted and you cannot restrict it yourself, notify your NovaNET administrator.

Chapter 5 — Selecting Files and Instances

You use the **Selection** tab of a job's property sheet to select files for backing up, restoring and verifying. NovaNET's powerful selection filters allow you to select exactly the files you want and to automatically update your selection before the job is run.

In This Chapter

- Overview
- Backup Selection Concepts
- Selecting Files for Backup Jobs
- Restore Selection Concepts
- Selecting Files for Restore Jobs
- Restoring Files with New Names and Locations
- Verify Selection Concepts
- Selecting Files for Verify Jobs

Overview

When you select files for a job, you want to select only those files which are necessary for your job and not any others. However, you also want your selection criteria to be flexible enough to automatically select new files that meet your criteria.

NovaNET allows files to be selected in several ways: by directly selecting volumes, folders and files; by using filters to sort through selected files; and by additional automated filters used by NovaNET when your job is run. For restore jobs, you can also specify which **instance** or version of a file you wish to restore, what name that new file will have and what folder or directory the file will be restored to.

By specifying your selection criteria carefully, when NovaNET automatically updates the selected file list each time your job is run, you can be certain that the job will work with those files you intended to select.

This chapter discusses how to select files for separately each type of job: backup jobs, restore jobs and verify jobs. For each type of job, there is a discussion of concepts you'll need to correctly and carefully select files. Be certain to read this section before proceeding.

Backup Selection Concepts

You use the **Selection** tab of a job to select files for that job.

Files are selected for backup in three steps. In the first step, the appropriate files are selected by marking them with a check. In the second step, these marked files are sorted through using filter selection criteria. This step is optional. In the last step, as the job is run, NovaNET checks to see if it will back up all the files or only those files that have changed since the last backup job.

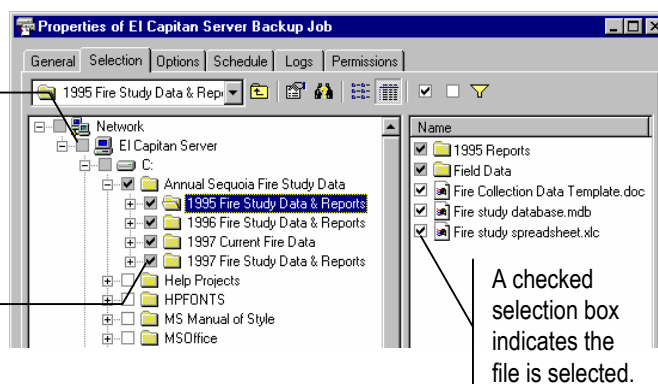
Marking Files for Backup

A file is selected for backup when the selection box next to the file is checked.

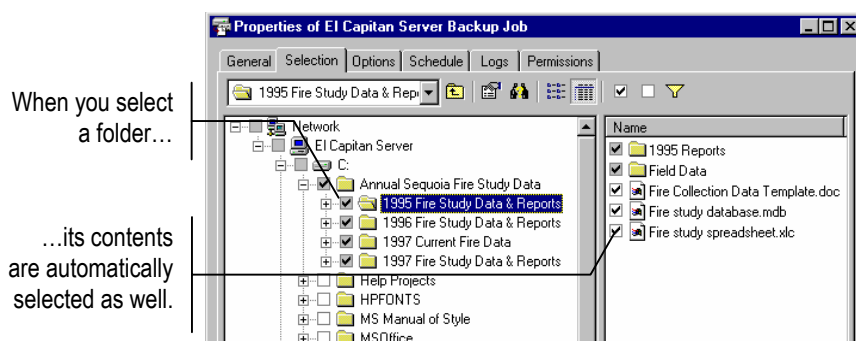
When the box next to a folder or other container is gray, it means that this folder or container contains selected files, even though it is not selected itself. When the box next to a folder or other container is *grayed and checked*, the folder itself is selected and may also contain selected files within it.

Grayed selection boxes without checks mean that there are selected objects in the container.

Grayed selection boxes with checks mean that the container itself is selected and may also contain selected objects within it.



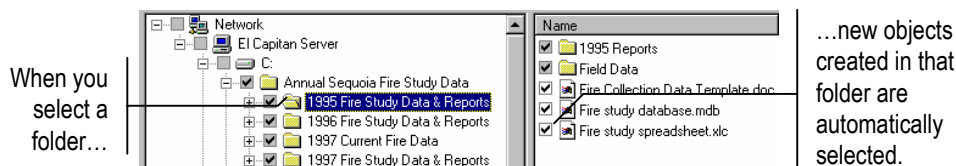
You can select or deselect a file for backup by checking or clearing the selection box next to the file. You can also select the folder that contains the file and not the file itself. Notice that when you mark a container, such as a folder or volume, all of its contents, including all the folders and containers it contains, are also marked.



Selecting Folders vs. Selecting Files

You can select the contents of the folder in one of two ways: either by individually marking the selection box of each object in that folder one-by-one or by marking the selection box of the folder itself. Which method you choose is important because it affects which files NovaNET includes in the selection list *after changes have been made to that folder*.

If you select the contents of the folder individually, when new objects such as files are added to the folder, NovaNET does not select them for backup. However, if you select the folder *itself*, when new items are created in that folder, NovaNET also selects these files for backing up.

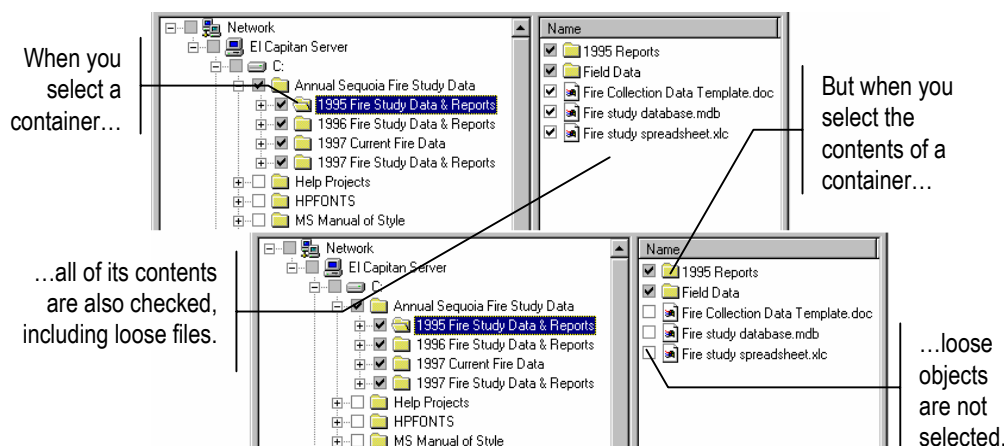


In general, when selecting files for backup, especially for jobs designed for disaster protection, begin by selecting containers at the top of the NovaNET hierarchy. Then deselect containers or files lower in the hierarchy that you do not need to back up.

For example, you could begin by selecting the network container icon at the top of the hierarchy. This will automatically select all of the machines on the network and all of the volumes on those machines. If there are machines, volumes or folders you do not want backed up, unselect them by clearing their selection box. When new machines or volumes are added to the network (that is to the current storage management zone), NovaNET will automatically select these machines and volumes.

There is an additional reason to select containers rather than the objects in the containers: to ensure that you don't miss any files stored loose in the container.

For example, suppose you want to back up a folder named **1995 Fire Study Data & Reports** and the folder named **1995 Reports** that is in it, but not the folder named **Field Data**. If you check only the **1995 Reports** folder, your job will not back up any files in the **1995 Fire Study Data & Reports** folder that are not in the **1995 Reports** folder. Instead, check the **1995 Fire Study Data & Reports** folder and then clear the **Field Data** folder. This selects all files in both the **1995 Fire Study Data & Reports** and **1995 Reports** folders.



Selecting Files with Filters



Selection
Filters button

Selection filters let you identify specific volumes, folders and files to exclude from the backup, restore or verify job. Click the **Selection Filters** button on the toolbar. Then specify the filter criteria for the job.

Note The selection filters you specify are applied to all of the volumes, folders and files that have been marked for the job. You cannot apply different filters to different folders or volumes in the same job.

How Selection Filters Work

By default, NovaNET backs up all volumes, folders and files that have been marked for the job. Selection filters let you identify specific criteria for excluding one or more of these marked objects. NovaNET applies these filter criteria at runtime, in effect unmarking any objects that do not meet the criteria.

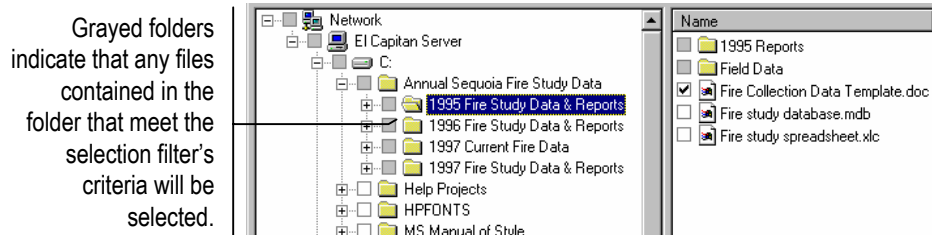
For example, suppose you want to exclude all files that were created before 2002. Access the **Date Range** window for the **Create range** field. Select **On or after** for the **Range type**. Enter **1-Jan-2002** for the **Starting date**. When you run the job, NovaNET temporarily deselects all files with a creation date before 2002. They will be excluded from the backup.

You can change the filter criteria at any time. You can also mark or unmark objects before running the job. NovaNET does not apply the filter criteria to any marked object until it runs the job.

Note You cannot use selection filters to add unmarked objects to the job set. Selection filters are only used to exclude marked objects from the job set.

Filters and Grayed Folders

When you apply a filter to a marked folder, this may result in no files from that folder being selected. Although no files in that folder are selected, the folder will still appear with a grayed selection box next to it. The grayed selection box indicates that if any new files which meet the filter criteria are created in that folder, they will be selected for the job.



Selecting Changed Files Only

When you run a job repeatedly, particularly backup jobs designed for disaster protection, many times you only want to back up files that have changed since the last time you ran a backup job. NovaNET handles this with the backup mode setting.

If you want to back up all selected files, use the **Full** backup mode setting; NovaNET does not deselect any selected files.

If you only want to back up files that have changed since the last *full* backup, use the **Differential** backup mode setting; NovaNET automatically deselects all the files that have not changed since the last *full* backup.

If you only want to back up files that have changed since the last backup, use the **Incremental** backup mode setting; NovaNET automatically deselects all the files that have not changed since the last backup.

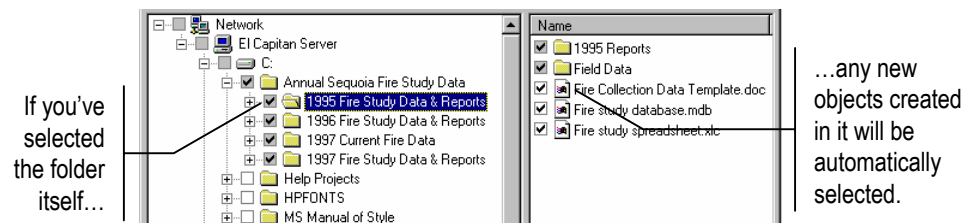
The job then runs with this updated selected file list.

Automatically Selecting New Files for Backup

When you set up a job to run repeatedly, you want that job to adjust to changes made to any of the directories on your computer or any machine in your storage management zone. Sometimes these changes include the addition of new files and directories that were not originally selected when the job was created. It may even include the addition of new machines on the network or any volumes on these machines that were not previously selected for backup.

If your selection criteria was carefully specified, NovaNET will also select these new files, folders, volumes and machines for backup. In general, a new file or container is selected for backup if (1) it is in a container selected for backup and (2) it meets the selection filter criteria.

For example, a new folder will be included in the backup selection list if it is in a selected container. If you create a new folder at the root level on a volume, that folder will be selected for backup if the volume was marked for backup. The files in that folder that pass through the selection filter criteria will be included in the backup job. However, if the volume itself was not selected, the new folder will not be selected.



If you want to see what files will be backed up, open up the **Selection** tab on the job's property sheet. Whenever this tab is opened, NovaNET recalculates which files should be selected for backup. Check the display to see that the files you intended to be backed up are selected.

Note The **Selection** tab shows all files that will be backed up by a full backup job. It does NOT indicate which files will not be backed up by a differential or incremental backup.

Selecting Files for Backup Jobs

To select files for backup jobs

1. Open the property sheet of the backup job and click on the **Selection** tab.
2. Check the selection boxes next to the files, folders or other containers you wish to include in the job.
3. Click on the **Selection Filters** button on the toolbar and specify filter selection criteria. (You can skip this step if you don't wish to apply any selection filters.)
4. Examine the tree view and object detail areas on the **Selection** tab to see that the files you intended to select are marked for backup.



Selection
Filters button

Applying Filter Criteria



Selection
Filters button

When you click on the **Selection Filters** button, the **Selection Filters** window appears. This window has multiple selection filters you can apply to the files you have selected.

**Selection
Filters**
window for
backup jobs

Note Each filter criterion works independently. To be selected for backup, each file must pass every filter criterion specified. For example, if you specify that every file selected must have been created after January 1, 2002 and must have .doc as its extension, NovaNET will only select files which meet *both* selection criteria.

Filter Selection Criteria

This section contains a brief description of each selection filter NovaNET applies to the files and folders marked for backup.

Note that some of the selection criteria are operating system-specific. Your storage management zone may include multiple machines working with files created by different operating systems. If you select a filter criterion that is operating system-specific, files from other operating systems will be automatically excluded from the backup. This affects, in particular, the **Required attributes** and **Exclude attributes** filters.

Note NovaNET figures the century dates using the following algorithm: if the year is 70 or smaller, the century is set to 20 (21st century); if the year is 71 or greater, the century is set to 19 (20th century). For example, if you set the date to 01-Jun-33, NovaNET calculates the date as June 1, 2033. If the date is set to 05-Apr-81, NovaNET calculates the date as April 5, 1981.

Backup Range

The **backup date** is the date a file or other object was last backed up. Each time a file is backed up, NovaNET changes the backup date to match the current date. Each file has exactly one backup date. You can use this filter for files that have been backed up on specific dates. More often, however, you would use this filter to filter out files that have been recently backed up.



Filter Change
button

To select files that have specific backup dates, click on the **Filter Change** button next to the **Backup range** field. In the **Date Range** window that appears, select the appropriate range type and the starting and ending dates and times.

Date Range
window

Modify Range

Each time a file is modified, its modified date is updated. You can use this filter to backup files whose modified date matches your criteria. NovaNET checks the directory information on the volume to see if the file should be included for backup. For example, you can select only those files that were modified *after* a certain date and time or, alternatively, those that were modified *before* a certain date and time.



Filter Change
button

To select files that have specific modify dates, click on the **Filter Change** button next to the **Modify range** field. In the **Date Range** window that appears, select the appropriate range type and the starting and ending dates and times.

Create Range

When a file is first created, it is assigned a create date. You can use this filter to select only those files that match your criteria. NovaNET checks the created date for each file stored in the directory of the volume and uses this to select files for backing up.



Filter Change
button

To select files that have specific creation dates, click on the **Filter Change** button next to the **Create range** field. In the **Date Range** window that appears, select the appropriate range type and the starting and ending dates and times.

Note Since DOS does not support create dates, NovaNET ignores this filter on DOS volumes.

Access Range

Each time a file is read, whether or not it is modified, its access date is updated. You can use this information to select files for backup. For example, you might want to back up only those files which have been accessed (opened or read) in the past two months. Alternatively, you could back up only those files which have *not* been accessed in the past two months.



Filter Change
button

To select files that have specific access dates, click on the **Filter Change** button next to the **Access range** field. In the **Date Range** window that appears, select the appropriate range type and the starting and ending dates and times.

Note Since DOS does not support access dates, NovaNET ignores this filter on DOS volumes.

Size Range

This filter lets you select files for backup according to their sizes. You might want to select only smaller files, larger files or files between two sizes.



Filter Change
button

To specify a filter that sorts files according to their sizes, click on the **Filter Change** button next to the **Size range** field and then select the appropriate criteria in the **Size Range** window that appears.

Size Range
window

Instance Range

Each time NovaNET backs up a file, it creates a new *instance* of that file. For example, a file named **Expense Account Reporting Form** may have been backed up several times during the previous months and years. Typically, each instance of the file is stored on the backup media of a different job. NovaNET tracks each instance of a file separately in its storage management database.

You can use this filter to instruct NovaNET to not back up files for which you already have multiple instances. For example, you may not want any more than three instances of a particular file backed up. When you set the **Range type** to **At most** and **Maximum instances** to **3**, NovaNET only backs up those files with less than three instances.

Note, however, that having multiple instances of a file does not ensure that the instances you have reflect the latest changes to the file. It may have been modified after the last time you backed it up. If so, your latest instance may not match the file's current form.



Filter Change
button

To specify a filter that selects files according to their number of instances, click on the **Filter Change** button next to the **Instance range** field and then select the appropriate criteria in the **Instances Range** window that appears.

Instances Range
window

Wildcard Type

Select which wildcard format you wish to use from the list box. You can use any of the following formats:

- **DOS:** Uses the 11-character name format with the eight-character primary name and the three-character extension, e.g., filename.txt.
- **Long:** Uses the 256-character name format with a long primary name and an extension with multiple characters, e.g., Monday_backup.txt.
- **UNIX:** Uses Unix search expression format, e.g., [Mm]onday.

Must Match

NovaNET lets you use wildcard matches to include files. Only files that match the wildcard indicated in the **Must match** field are included in the backup set. For example, if you enter *.exe, NovaNET will only back up those files with the .exe file extension.

You can specify multiple wildcards by separating each with a semicolon (no spaces). For example, if you enter *.exe;*.doc in the **Must match** field, NovaNET selects all files that have *either* the .exe extension *or* the .doc extension.

Cannot Match

This wildcard field works just like the **Must match** field except that it *excludes* any files that match the wildcards. You can specify multiple wildcards by separating them with a semicolon (no spaces); if you specify multiple wildcards, NovaNET excludes any file that matches any one of the wildcards you specify.

Required Attributes

Operating systems track certain features of files called *attributes* that they use to manage these files. You can use these same attributes as a selection filter. In the **Required attributes** field, if an attribute is checked, NovaNET only selects those files which have these attributes. For example, if you check **Hidden**, NovaNET only selects those files which the operating system has assigned the **Hidden** attribute.

You can select multiple attributes. In this case, NovaNET only selects those files that meet *all* of the required attributes.

Note that some of these attributes are only supported by certain operating systems. If you specify an attribute that is specific to a particular operating system, then only files created under that operating system will be selected for backup.

Exclude Attributes

This field works like the **Required attributes** field except that NovaNET excludes files that match these attributes. For example, if you have checked the **Execute Only** box, NovaNET will exclude from the backup job any files with the **Execute Only** attribute.

You can select multiple attributes. A file that has any one of these attributes will be excluded. For example, if you mark the **Hidden** and **System** attributes, any file that has *either* attribute will be excluded.

Parents

When this option is checked, NovaNET backs up the directory information for the parent along with the file. This option must be checked in order for folders and other directory data to be backed up. When this option is not checked, NovaNET will not back up any parent information for any file backed up.

Children

When this option is checked, NovaNET backs up the selected files. If you want only to back up the marked directories, however, you can clear this option. When the **Children** box is unchecked and the **Parents** box is checked, NovaNET backs up the directory structure, but not the files stored in the directories (that is, in the folders).

This option can be useful for replicating a complex directory structure. Begin by marking the directory structure you wish to duplicate. Then clear the **Children** option. NovaNET will back up only the directory structure. You can then replicate that directory structure to any volume by restoring the directory to that volume.

Media

NovaNET tracks instances of files and the media on which those instances are stored. You can use this information to sort files according to the media on which they appear. Only files with instances on the media in the **Media** field will be selected for the backup job. For example, if you select media named "Daily Set:1," NovaNET will only include files in the backup job which have a valid instance on the media named "Daily Set:1."

To sort files according to the media on which they appear, click the **Add...** button and select the media from the **Browse** window. Note that you must select a Media object, not a Media folder or User/Group folder. If there are multiple media shown in the **Media** filter field, only files which have a valid instance on *all* the media listed will be selected.

This filter has limited applications for backup jobs. One way to use it, however, would be in the case of media you know is corrupt or damaged. To back up a new instance of every file on that damaged media, begin by creating a new job and then selecting the appropriate Network or Machine object on the **Selection** tab. Then open the **Selection Filters** window by clicking on the **Selection Filters** button. Add the damaged media to the **Media** field. Then set the **Backup mode** on the job's **Options** tab to **Snapshot**. When NovaNET runs the job, it will only back up files which had an instance on the damaged media shown in the **Media** field.

Restore Selection Concepts

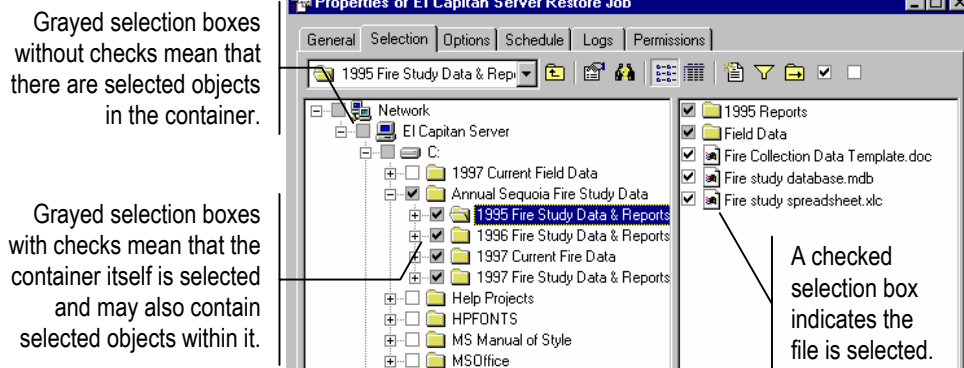
You select files for restoring the same way you select files for backing up; however besides selecting which files you wish to restore, you can also change the name of the restored file, restore it to a new location and create a new folder in which to restore the file. Additionally, when you select a file for restoring, you must specify which instance of the file you wish to restore.

Files are selected for restoring in four steps. In the first step, you modify the file tree to look the way you want it to appear when you restore the files. For example, you might make a new folder to store the restored files in. Second, the appropriate files are selected by marking them with a check and selecting the appropriate instance. In the third step, these files are filtered using multiple selection criteria. In the last step, you can specify new names and locations for the restored files.

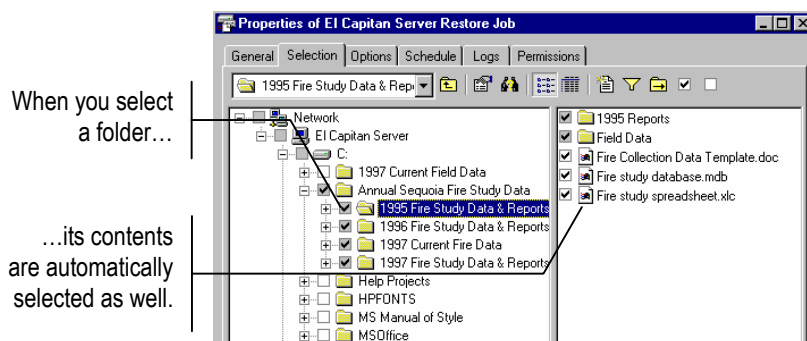
Selecting Files for Restoring

A file is selected for restoring when a check mark appears in the selection box next to the file.

When the box next to a folder or other container is gray, it means that this folder or container contains selected files, even though it is not selected itself. When the box next to a folder or other container is *grayed and checked*, the folder itself is selected and may also contain selected files within it.



You can select or deselect a file for restoring by checking or clearing the selection box next to the file. You can also select the folder that contains the file and not the file itself. Notice that when you mark a container, such as a folder or volume, all of its contents, including all the folders and containers it contains, are also marked.

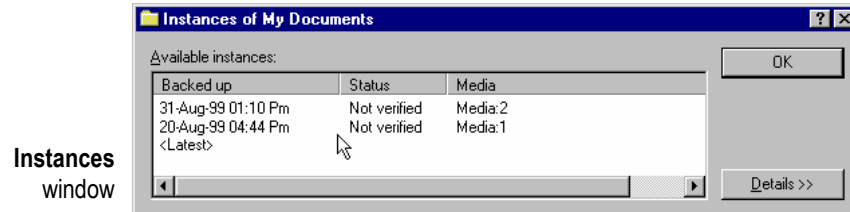


Note The tree view and object detail areas are different for restore jobs than for backup jobs. For restore jobs, the files displayed in the tree view and object detail areas are the files for which NovaNET has instances in its storage management database. For backup jobs, on the other hand, the files displayed are those currently present on the file servers and workstations in the current database zone.

Selecting Instances of Files

Each time a file is backed up, an *instance* of that file is created. There may be multiple instances of files stored on different media created by different backup jobs. NovaNET keeps track of all the instances of each file in its storage management database and the media on which each instance is stored. When media is overwritten or deleted, NovaNET deletes those instances from its storage management database as well.

When you select a file for restoring, NovaNET automatically selects the **<Latest>** instance. If you want to select an instance other than the latest instance of a file backed up, you must select that instance in the **Instances of...** window. When you open the **Instances of...** window, the **Available instances** field shows a list of the instances of the file and the media on which those instances are stored. Select which instance you want to restore by highlighting it. For more information about a particular instance of a file, click on the **Details** button. NovaNET displays various details it uses to manage the file in its storage management database, including its backup date and its modify date.



If you select the **<Latest>** parameter, NovaNET will restore the most recent instance of that file or folder.

In general, if you want to restore a specific instance of the file, you must select that file directly and specify which instance you wish to restore in the **Instances of...** window.

Note that when you specify an instance date for a container, such as a folder or a volume, only those files which have matching instance dates will be selected. If a file does not have an instance date that matches the date of the container, it will not be selected. On the other hand, if you want only certain files to be restored, you can specify the instance date of a container to only select those files with matching instance dates.

Selecting Instances of Folders

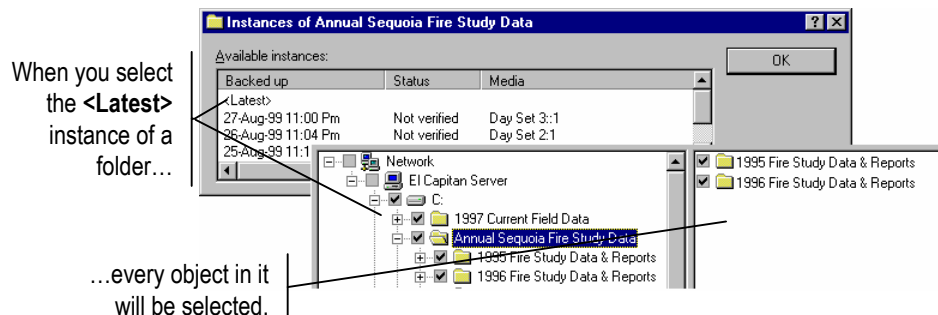
When you select a folder, NovaNET automatically selects the **<Latest>** instance for that folder and for every file within that folder. If you wish to specify another instance, open the **Instances of...** window and highlight the instance date to select it.

NovaNET uses the instance you specified when you selected the folder to also select files contained within that folder. Specifically, a file is selected for restoring only if an instance matches the folder instance.

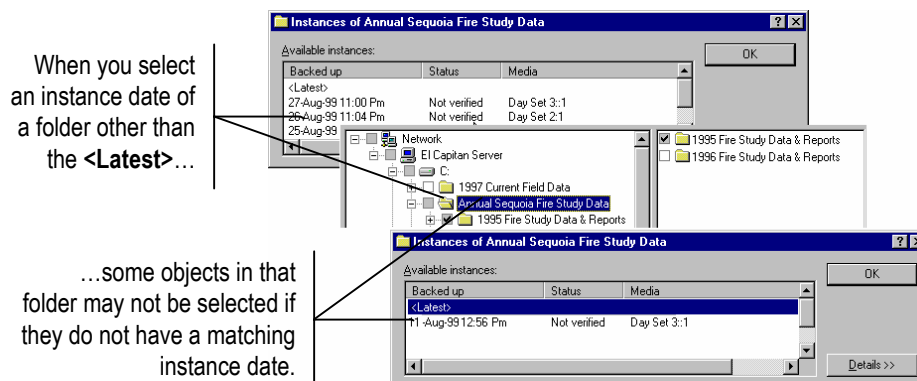
Note When you specify an instance date for a folder, volume or other container, files stored in that container are *only selected when they have an instance date that matches the instance date of the container*. Many times, files will not have instance dates that match the dates of the containers they are stored in, for example, when you select an instance date from an incremental or differential backup job. To be sure you select all of the files inside a container, select the **<Latest>** instance for that container.

Consider these two examples:

In the first example, by selecting the <Latest> instance of the folder, all of the files contained within the folder are selected because each of these files has a <Latest> instance. Note that *these instances may be from different dates and different backup jobs*, but because each file has a <Latest> instance, each one will be restored.



In the second example, another instance besides the <Latest> instance was selected. In order for the files within the folder to be selected for restoring, they must have an instance date that matches that selected for the folder. In this example, some files are not selected for restoring because they do not have an available instance which matches the instance date selected for the folder.



In general, if you want to restore a specific instance of the file, you must select that file directly and specify which instance you wish to restore in the **Instances of...** window.

Selecting Folders vs. Selecting Files

You can select the contents of the folder in one of two ways: either by individually marking the selection box of each object in that folder one-by-one or by marking the selection box of the folder itself. Which method you choose is important because it affects which files NovaNET includes in the selection list *after changes have been made to that folder*.

For example, if you select a folder for restoring by marking its selection box, all of the contents of that folder are restored. If a new backup job is run before the restore job is run, NovaNET selects files for restoring using the new folder's contents. So, for example, if a new file is created in that folder, NovaNET will also restore that file. Additionally, if you have selected the <Latest> instance of the folder, NovaNET will use the latest instance of each file in its storage management database. These files may be newer than the files you originally selected.

Instances and Filters

You cannot use filters for selecting instances. The **Selection Filters** window can be used to sort through the instances you have otherwise specified in the **Instances of...** window, but filters will not change the selected instance date.

Selecting Files with Filters



Selection
Filters button

Selection filters let you identify specific volumes, folders and files to exclude from the restore job. Click the **Selection Filters** button on the toolbar. Then specify the filter criteria for the restore job.

Note The selection filters you specify are applied to all of the volumes, folders and files that have been marked for restore. You cannot apply different filters to different folders or volumes in the same job.

How Selection Filters Work

By default, NovaNET restores all volumes, folders and files that have been marked for restore. Selection filters let you identify specific criteria for excluding one or more of these marked objects. NovaNET applies these filter criteria at runtime, in effect unmarking any objects that do not fit the criteria.

For example, suppose you want to exclude all files that were created before 2002. Access the **Date Range** window for the **Create range** field. Select **On or after** for the **Range type**. Enter **1-Jan-2002** for the **Starting date**. When you run the job, NovaNET temporarily deselects all files with a creation date before 2002. They will be excluded from the restore.

You can change the filter criteria at any time. You can also mark or unmark objects before running the job. NovaNET does not apply the filter criteria to any marked object until it runs the job.

Note You cannot use selection filters to add unmarked objects to the restore set. Selection filters are only used to exclude marked objects from the restore set.

Changing the Name and Location of Restored Files

When you restore a file, you may wish to restore the file with a new name or in a new location. If you restore a file to its original location using its original name, if that file currently exists there, NovaNET overwrites the current file with the restored file.

You can avoid overwriting current files by giving the file a new name or by restoring the file to a new directory. For example, to avoid replacing the current file named **Project List** with a previous, older instance of the file, you can rename the file before restoring it or restore it to a different folder.

You can either select a different folder or, alternatively, NovaNET lets you create a new folder in which to restore the files.

Selecting Instances of Files for Restore Jobs

Each time you mark a selection box of a file or folder for restoring, NovaNET automatically selects the **<Latest>** instance. If you want to specify a different instance, use the **Instances of...** window to select which instance of the file you wish to restore.



Select Instance
button

You can also specify a particular instance of a file or folder by highlighting it in the tree view or object detail areas and then clicking the **Select Instance** button on the toolbar. NovaNET will show you the **Instances of...** window with a list of the available instances for that file.

Be certain to specify carefully which instance of a file you wish to restore. A single NovaNET restore job can restore files backed up over a period of months or years on media created by many different backup jobs. You can easily restore all of the latest instances of the files by selecting **<Latest>** in the **Instances of...** window. However, if you want instances of files that were created on different dates, you must select each instance of each file individually.

Note that you cannot restore multiple instances of the same file in a single restore job. If you want to restore more than one instance of a file, you must create and run a separate job for each instance.

To select instances of files for restore jobs

1. Open the **Properties** sheet of the restore job and click on the **Selection** tab.
2. Check the selection boxes next to the files, folders or other containers you wish to include in the job.

Select Instance
button

3. To select a specific instance of the objects you selected, highlight the folder or file and click the **Select Instance** button. In the **Instances of...** window that appears, select the appropriate date of the instance you wish to restore. If you want to include all of the files in a folder or on a volume, select **<Latest>**.

Selection
Filters
button

4. Click on the **Selection Filters** button on the toolbar and specify filter selection criteria. (You can skip this step if you don't wish to apply any selection filters.)
5. Examine the tree view and object detail areas on the **Selection** tab to check that the files you intended are marked for restoring.

Additionally, you can change the names of the files and store them in new locations. This is discussed in *Restoring Files with New Names and Locations* later in this chapter.

Applying Filter Criteria

Selection
Filters
button

When you click on the **Selection Filters** button, the **Selection Filters** window appears. This window has multiple selection filters you can use to sort through the files you have selected for restoring.

**Selection
Filters**
window for
restore jobs

Note Each filter criterion works independently. To be selected for restoring, each file must pass every filter criterion specified. For example, if you specify that every file selected for restoring must have been created after January 1, 2002 and must have .doc as its extension, NovaNET will only select files which meet *both* selection criteria.

Filter Selection Criteria

This section contains a brief description of each selection filter NovaNET applies to the files and folders marked for restoring.

Note that the **Selection Filters** window for restore jobs is similar to the **Selection Filters** window for backup jobs. This allows you to use the same filters to select the files for restoring that you used for selecting files for backing up previously. This allows you to create a restore job that selects the same files as a backup job, no matter how widely distributed over the network these files may be.

Note NovaNET figures the century dates using the following algorithm: if the year is 70 or smaller, the century is set to 20 (21st century); if the year is 71 or greater, the century is set to 19 (20th century). For example, if you set the date to 01-Jun-33, NovaNET calculates the date as June 1, 2033. If the date is set to 05-Apr-81, NovaNET calculates the date as April 5, 1981.

Backup Range

When a file is backed up, NovaNET stores in its storage management database the date the file was backed up. This is called the backup date. Each time you back up a file, NovaNET changes the backup date to the date of the backup. (You can view this information for all of the available instances in the **Instances of...** window in the **Backed up** field list.) You can use this information to filter files for restore jobs.



Filter Change
button

To select files that have specific backup dates, click on the **Filter Change** button next to the **Backup range** field. In the **Date Range** window that appears, select the appropriate range type and the starting and ending dates and times.

Date Range
window

Modify Range

Each time a file is modified, its modified date is updated. You can use this filter to restore files whose modified date matches your criteria. NovaNET checks the directory information on the volume to see if the file should be included in the restore job. For example, you can select only those files that were modified *after* a certain date and time or, alternatively, those that were modified *before* a certain date and time.



Filter Change
button

To select files that have specific modify dates, click on the **Filter Change** button next to the **Modify range** field. In the **Date Range** window that appears, select the appropriate range type and the starting and ending dates and times.

Create Range

When a file is first created, it is assigned a create date. You can use this filter to select only those files that match your criteria. NovaNET checks the created date for each file stored in the directory of the volume and uses this to select files for restoring.



Filter Change
button

To select files that have specific creation dates, click on the **Filter Change** button next to the **Create range** field. In the **Date Range** window that appears, select the appropriate range type and the starting and ending dates and times.

Note Since DOS does not support create dates, NovaNET ignores this filter on DOS volumes.

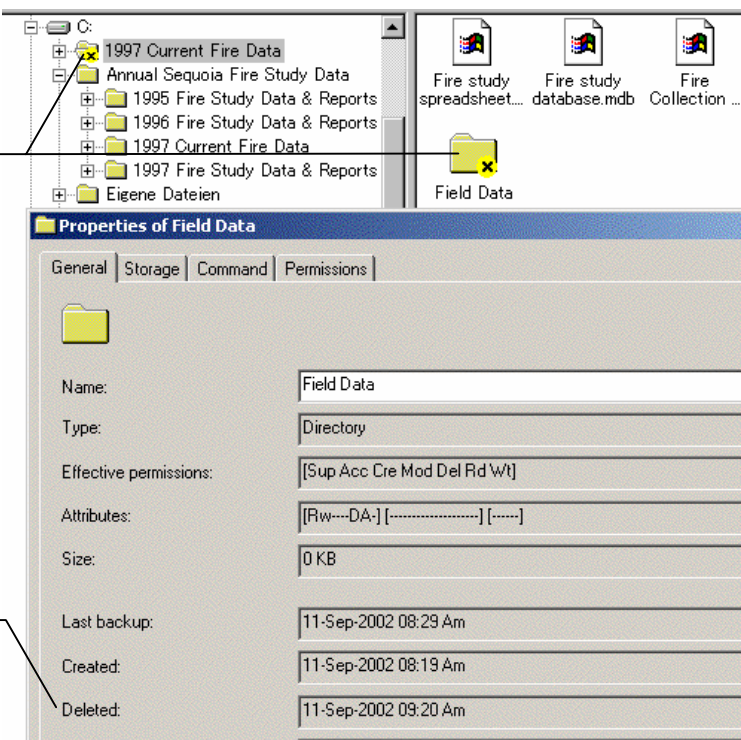
Delete Range

This filter gives you an easy way to select files to restore that have been deleted from the volume, but for which NovaNET has valid instances stored in its storage management database and on valid media.

When files that have once been backed up are later deleted, NovaNET marks these files with a special icon, indicating that they have been deleted. In addition, NovaNET assigns the file a delete date, which you can view on the **General** tab of that file's property sheet.

Files that have been backed up and then deleted show special icons on the **Selection** tab of a restore job.

Any object that has been backed up and then is deleted will show a **Deleted** date on its **General** tab.



This filter instructs NovaNET to only restore files which have a delete date that matches the criteria you have set. Note that if a file has not been deleted from the volume, it will be excluded by this filter and thus will not be selected for restoring.



Filter Change button

You can easily select every file deleted for restoring by first marking the selection box of the volume and selecting the **<Latest>** instance. This will cause all of the files to be selected initially. Then, click on the **Filter Change** button next to the **Delete range** field and then select **On or before** from the **Range type** list box. Next select a random future date, for example, February 6, 2106. NovaNET will exclude all of the files that have not been deleted from the set of files to be restored. When you return to the **Selection** tab, only those files that have been deleted will be checked.

On the other hand, you can also *not* restore files that have been deleted. In this case, set the **Delete range** filter to **On or before** some random early date, such as January 1, 1980. Any file that has been deleted will be filtered out by this filter, so that no deleted files will be restored. This can be useful if you don't want to unnecessarily restore files that were properly deleted in the first place.

Access Range

Each time a file is read, whether or not it is modified, its access date is updated. You can use this information to select files for restoring. For example, you might want to restore only those files which have been accessed (opened or read) in the past two months. Alternatively, you could restore only those files which have *not* been accessed in the past two months.



Filter Change button

To select files that have specific access dates, click on the **Filter Change** button next to the **Access range** field. In the **Date Range** window that appears, select the appropriate range type and the starting and ending dates and times.

Note Since DOS does not support access dates, NovaNET ignores this filter on DOS volumes.

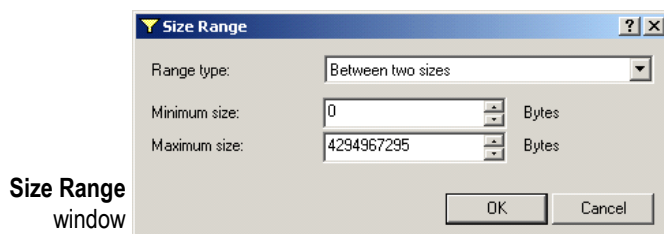
Size Range

This filter lets you select files to restore according to their sizes. You might want to select only smaller files, larger files or files between two sizes.



Filter Change button

To specify a filter that sorts files according to their sizes, click on the **Filter Change** button next to the **Size range** field and then select the appropriate criteria in the **Size Range** window that appears.



Instance Range

Each time NovaNET backs up a file, it creates a new *instance* of that file. For example, a file named **Expense Account Reporting Form** may have been backed up several times during the previous months and years. Typically, each instance of the file is stored on the backup media of a different job. NovaNET tracks each instance of a file separately in its storage management database.

You can use this filter to instruct NovaNET to select files according to the number of instances that exist in the database. You might, for example, instruct NovaNET to restore all of the files for which there is only one instance. When you set **Range type** to **At most** and **Maximum instances** to **1**, NovaNET only restores those files with a single instance.

Note, however, that having multiple instances of a file does not ensure that the selected instances reflect the latest changes to the file. If it was modified after the last time you backed it up, your latest instance may not match the file's current form.



Filter Change
button

To specify a filter that sorts files according to their number of instances, click on the **Filter Change** button next to the **Instance range** field and then select the appropriate criteria in the **Instances Range** window that appears.

**Instances
Range
window**

Wildcard Type

Select which wildcard format you wish to use from the list box. You can use any of the following formats:

- **DOS:** Uses the 11-character name format with the eight-character primary name and the three-character extension, e.g., filename.txt.
- **Long:** Uses the 256-character name format with a long primary name and an extension with multiple characters, e.g., Monday_backup.txt.
- **UNIX:** Uses Unix search expression format, e.g., [Mm]onday.

Must Match

NovaNET lets you use wildcard matches to include files. Only files that match the wildcard indicated in the **Must match** field are included in the restore set. For example, if you enter ***.exe**, NovaNET will only restore those files with the .exe file extension.

You can specify multiple wildcards by separating each with a semicolon (no spaces). For example, if you enter ***.exe;*.doc** in the **Must match** field, NovaNET selects all files that have *either* the .exe extension *or* the .doc extension.

Cannot Match

This wildcard field works just like the **Must match** field except that it *excludes* any files that match the wildcards. You can specify multiple wildcards by separating them with a semicolon (no spaces); if you specify multiple wildcards, NovaNET excludes any file that matches any one of the wildcards you specify.

Required Attributes

Operating systems track certain features of files called *attributes* that they use to manage these files. You can use these same attributes as a selection filter. In the **Required attributes** field, if an attribute is checked, NovaNET only selects those files which have these attributes. For example, if you check **Hidden**, NovaNET only selects those files which the operating system has assigned the **Hidden** attribute.

You can select multiple attributes. In this case, NovaNET only selects those files that meet *all* of the required attributes.

Note Some attributes are only supported by certain operating systems. If you specify an attribute that is specific to a particular operating system, then only files created under that operating system will be selected for restore.

Exclude Attributes

This field works like the **Required attributes** field except that NovaNET excludes files that match these attributes. For example, if you have checked the **Execute Only** box, NovaNET will exclude from the restore job any files with the **Execute Only** attribute.

You can select multiple attributes. A file that has any one of these attributes will be excluded. For example, if you mark the **Hidden** and **System** attributes, any file that has *either* attribute will be excluded.

Parents

When this option is checked, NovaNET restores directory information for any selected folder or volume. For example, if you have marked a folder, NovaNET will restore that folder only if this option is checked. When this option is not checked, directory information about folders and volumes is not restored.

Children

When this option is checked, NovaNET restores files. When this option is unchecked, NovaNET does not restore files. This is useful if you want to restore a complex directory structure, but not the files in that directory. To restore a directory structure, but not the files (children) stored in the directories, begin by marking the directory for restoring. Then clear the **Children** option. NovaNET will restore only the directory structure to the volume you specify.

Media

NovaNET tracks instances of files and the media on which those instances are stored. You can use this information to sort files according to the media on which they appear. Only files with instances on the media in the **Media** field will be selected for the restore job. For example, if you select media named “Daily Set:1,” NovaNET will only include files in the restore job which have a valid instance on the media named “Daily Set:1.”

To sort files according to the media on which they appear, click the **Add...** button and select the media from the **Browse** window. Note that you must select a Media object, not a Media folder or User/Group folder. If there are multiple media shown in the **Media** filter field, only files which have a valid instance on *all* the media listed will be selected.

For more information, see *Import Media* in Chapter 9 — *The Media, Device and Database Tabs*.

This filter can be useful for restore jobs if you want to restore files only from a particular media. For example, you may have imported media from another storage management zone and may wish to limit the files restored to those on that particular media. In this case, you can ensure that only files on that media are selected by adding that media to the **Media** field.

Note, however, that under ordinary circumstances, you should let NovaNET track the instances of particular files and restore files *not according to the media on which they appear*, but rather *according to their instance date*. For example, if you want to restore the most recent version of a file, simply select the file. NovaNET will automatically select that file and identify the proper media on which that instance is stored. NovaNET will then prompt you for the correct media when the job is run.

Restoring Files with New Names and Locations

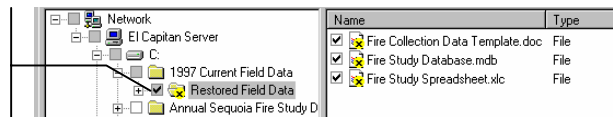
You can change the name and location (folder) of a file when it is restored. You can also create a new folder in which to store the file.

Restoring a File with a New Name

After a file has been selected for restoring, you can rename the file. When you rename the file, NovaNET restores the file with the new name. This can be useful for not overwriting versions of the file that currently exist on disk.

To rename a file, right-click the file name, select **Rename** from the shortcut menu and type the new name. You can also click its name again and type the new name.

To restore a file with a new name, select it, click it again and type the new name.

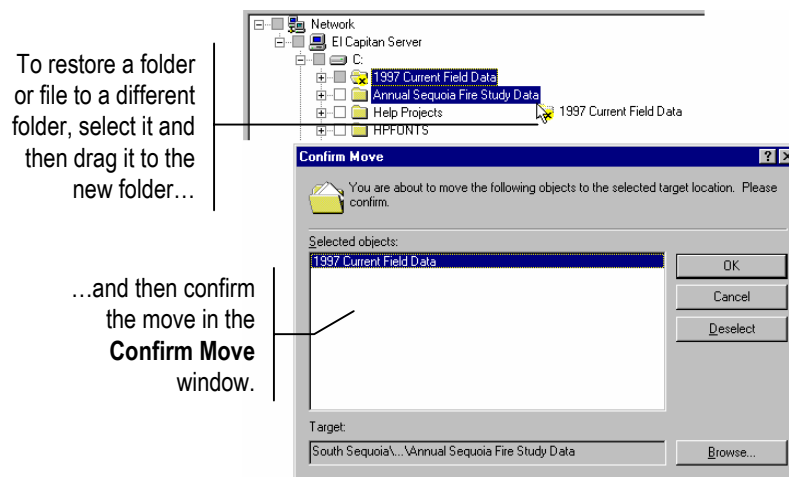


Note that when you rename an instance, you are *only* renaming that file for the purposes of restoring it with this particular restore job. *Only the current restore job will assign the new name to that file.* When you create a new restore job, you will see the file displayed with its original name. Similarly, the **Database** tab always displays files with the names they had when they were backed up.

Restoring Files to a Different Folder

You can also restore files to different folders. When NovaNET restores the file, it creates a new file in the new location. Similarly, you can restore folders in new locations as well. This is useful in order to prevent overwriting files and folders that currently exist on disk.

To restore a file to a different folder, drag the file in the tree view area to the new folder. Alternatively, right-click the file name and select **Move...** from the shortcut menu. In the **Confirm Move** window, select a target location. NovaNET will move the file to the location you specify in the **Target** field.



You can also restore folders and volumes in new locations. The contents of these containers move with them and are restored, along with the folder or volume, in the new location.

Note that when you move an instance on the **Selection** tab of a restore job, the changes you make are only recorded for that restore job. Only the current restore job will assign the file or folder the new location. When you create a new restore job, you will see the files and folders in their original locations. Likewise, the **Database** tab will continue to display files in their original locations.

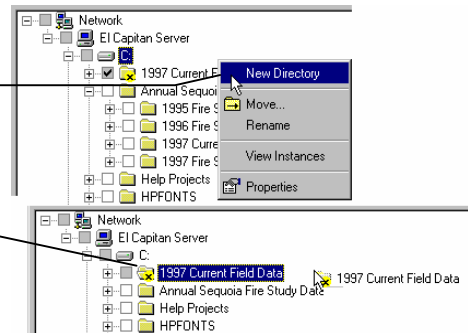
Restoring Files to a New Folder

You can also create a new folder and restore files to that new folder. When NovaNET restores the files, it creates the new folder and restores the files you specified to that new location. Similarly, you can restore folders and their contents in new folders you create.

To create a new folder in which to restore the file or folder, first highlight the location you want to create the new folder in the tree view area. Then click on the **New Object** button on the **Selection** tab's toolbar. You can also right-click the container and select **New Directory** from the shortcut menu. NovaNET creates the new folder in the specified location. Give the folder a new name and then drag the files and folders to restore into the new folder.

To restore a file or folder to a new folder, right-click the container in which you want to create the new folder and select **New Directory** from the shortcut menu.

Next, drag the folder or file you want to restore to the new folder you created.



Note that any new folder you create on the **Selection** tab of the restore job is only created in the restore job currently opened. Only the current job will show this new folder. When you create a new restore job or open another restore job, the new folder you created in the current job will not be displayed. Likewise, the new folder you created will not be displayed on the **Database** tab either.

Verify Selection Concepts

You select files for verifying the same way you select files for backing up or restoring, including selecting which instance to verify.

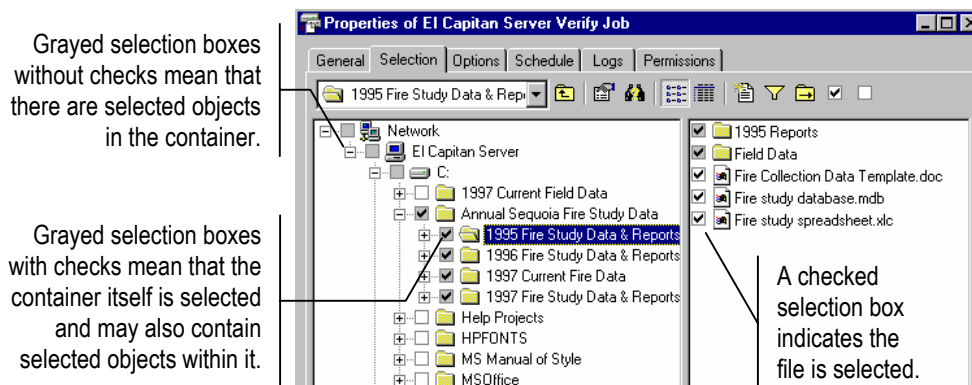
Files are selected for verifying in two steps. In the first step, the appropriate files are selected by marking them with a check and selecting the appropriate instance. In the second step, these files are filtered using multiple selection criteria.

Tip You can quickly check to see if a file was verified when it was backed up by opening the **Instances of...** window for that file. The **Status** field will show either **Verify complete**, **Verify failed** or **Not verified** depending on whether or not that file was successfully verified or not when the job was run.

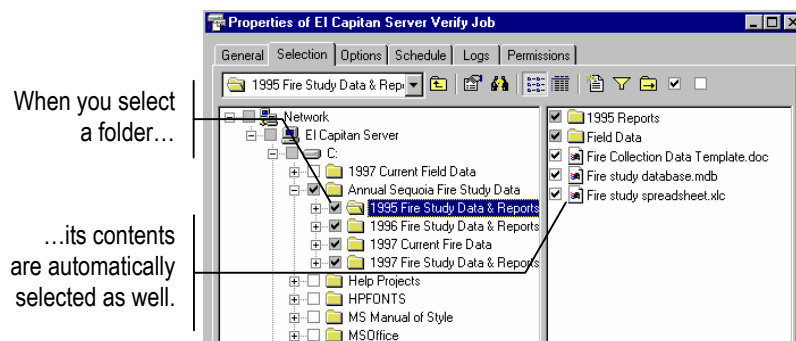
Selecting Files for Verifying

A file is selected for verifying when a check mark appears in the selection box next to the file.

When the box next to a folder or other container is gray, it means that this folder or container contains selected files, even though it is not selected itself. When the box next to a folder or other container is *grayed and checked*, the folder itself is selected and may also contain selected files within it.



You can select or deselect a file for verifying by checking or clearing the selection box next to the file. You can also select the folder that contains the file and not the file itself. Notice that when you mark a container, such as a folder or volume, all of its contents, including all the folders and containers it contains, are also marked.

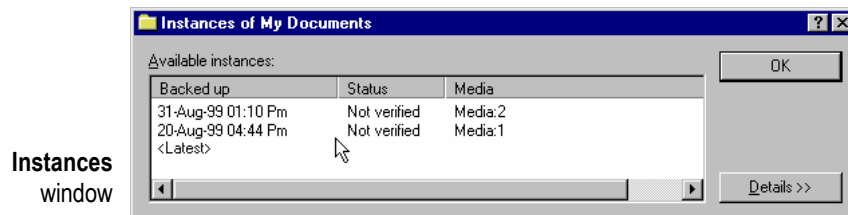


Note The tree view and object detail areas are different for verify jobs than for backup jobs. For verify jobs, the files displayed in the tree view and object detail areas are the files for which NovaNET has instances in its storage management database. For backup jobs, on the other hand, the files displayed are those currently present on the file servers and workstations in the current database zone.

Selecting Instances of Files

Each time a file is backed up, an *instance* of that file is created. There may be multiple instances of files stored on different media created by different backup jobs. NovaNET keeps track of all the instances of each file in its storage management database and the media on which each instance is stored. When media is overwritten or deleted, NovaNET deletes those instances from its storage management database as well.

When you select a file for verifying, NovaNET automatically selects the **<Latest>** instance. If you want to select an instance other than the latest instance of a file backed up, you must select that instance in the **Instances of...** window. When you open the **Instances of...** window, the **Available instances** field shows a list of the instances of the file and the media on which those instances are stored. Select which instance you want to verify by highlighting it. For more information about a particular instance of a file, click on the **Details** button. NovaNET displays various details it uses to manage the file in its storage management database, including its backup date and its modify date.



If you select the **<Latest>** parameter, NovaNET will verify the most recent instance of that file or folder.

In general, if you want to verify a specific instance of the file, you must select that file directly and specify which instance you wish to verify in the **Instances of...** window.

Note that when you specify an instance date for a container, such as a folder or a volume, only those files which have matching instance dates will be selected. If a file does not have an instance date that matches the date of the container, it will not be selected. On the other hand, if you want only certain files to be verified, you can specify the instance date of a container to only select those files with matching instance dates.

Selecting Folders vs. Selecting Files

You can select the contents of the folder in one of two ways: either by individually marking the selection box of each object in that folder one-by-one or by marking the selection box of the folder itself. Which method you choose is important because it affects which files NovaNET includes in the selection list *after changes have been made to that folder*.

For example, if you select a folder for verifying by marking its selection box, all of the contents of that folder are verified. If a new backup job is run before the verify job is run, NovaNET selects files for verifying using the new folder's contents. So, for example, if a new file is created in that folder, NovaNET will also verify that file. Additionally, if you have selected the <Latest> instance of the folder, NovaNET will use the latest instance of each file in its storage management database. These files may be newer than the files you originally selected.

Selecting Files with Filters



Selection
Filters button

Selection filters let you identify specific volumes, folders and files to exclude from the verify job. Click the **Selection Filters** button on the toolbar. Then specify the filter criteria for the verify job.

Note The selection filters you specify are applied to all of the volumes, folders and files that have been marked for verify. You cannot apply different filters to different folders or volumes in the same job.

How Selection Filters Work

By default, NovaNET verifies all volumes, folders and files that have been marked for verification. Selection filters let you identify specific criteria for excluding one or more of these marked objects. NovaNET applies these filter criteria at runtime, in effect unmarking any objects that do not fit the criteria.

For example, suppose you want to exclude all files that were created before 2002. Access the **Date Range** window for the **Create range** field. Select **On or after** for the **Range type**. Enter **1-Jan-2002** for the **Starting date**. When you run the job, NovaNET temporarily deselects all files with a creation date before 2002. They will be excluded from the verify.

You can change the filter criteria at any time. You can also mark or unmark objects before running the job. NovaNET does not apply the filter criteria to any marked object until it runs the job.

Note You cannot use selection filters to add unmarked objects to the verify set. Selection filters are only used to exclude marked objects from the verify set.

Selecting Instances of Files for Verify Jobs

Each time you mark a selection box of a file or folder for verifying, NovaNET automatically selects the **<Latest>** instance. If you want to specify a different instance, use the **Instances of...** window to select which instance of the file you wish to verify.



Select Instance
button

You can also specify a particular instance of a file or folder by highlighting it in the tree view or object detail areas and then clicking the **Select Instance** button on the toolbar. NovaNET will show you the **Instances of...** window with a list of the available instances for that file.

Be certain to specify carefully which instance of a file you wish to verify. A single NovaNET verify job can verify files backed up over a period of months or years on media created by many different backup jobs. You can easily verify all of the latest instances of the files by selecting **<Latest>** in the **Instances of...** window. However, if you want instances of files that were created on different dates, you must select each instance of each file individually.

Note that you cannot verify multiple instances of the same file in a single verify job. If you want to verify more than one instance of a file, you must create and run a separate job for each instance.

To select instances of files for verify jobs

1. Open the property sheet of the verify job and click on the **Selection** tab.
2. Check the selection boxes next to the files, folders or other containers you wish to include in the job.
3. To select a specific instance of the objects you selected, highlight the folder or file and click the **Select Instance** button. In the **Instances of...** window that appears, select the appropriate date of the instance you wish to verify. If you want to include all of the files in a folder or on a volume, select **<Latest>**.
4. Click on the **Selection Filters** button on the toolbar and specify filter selection criteria. (You can skip this step if you don't wish to apply any selection filters.)
5. Examine the tree view and object detail areas on the **Selection** tab to check that the files you intended to select are marked for verifying.



Select Instance
button



Selection
Filters button

Applying Filter Criteria



Selection
Filters button

When you click on the **Selection Filters** button, the **Selection Filters** window appears. This window has multiple selection filters you can use to sort through the files you have selected for verifying.

**Selection
Filters window
for verify jobs**

Note that each filter criterion works independent of every other. In order to be selected for verifying, each file must pass every filter criterion specified. For example, if you specify that every file selected for verifying must have been created after January 1, 2002 and must have .doc as its extension, NovaNET will only select files which meet *both* selection criteria.

Filter Selection Criteria

This section contains a brief description of each selection filter NovaNET applies to the files and folders marked for verifying.

Note that the **Selection Filters** window for verify jobs is similar to the **Selection Filters** window for backup jobs. This allows you to use the same filters to select the files for verifying that you used for selecting files for backing up previously. This allows you to create a verify job that selects the same files as a backup job, no matter how widely distributed over the network these files may be.

Note NovaNET figures the century dates using the following algorithm: if the year is 70 or smaller, the century is set to 20 (21st century); if the year is 71 or greater, the century is set to 19 (20th century). For example, if you set the date to 01-Jun-33, NovaNET calculates the date as June 1, 2033. If the date is set to 05-Apr-81, NovaNET calculates the date as April 5, 1981.

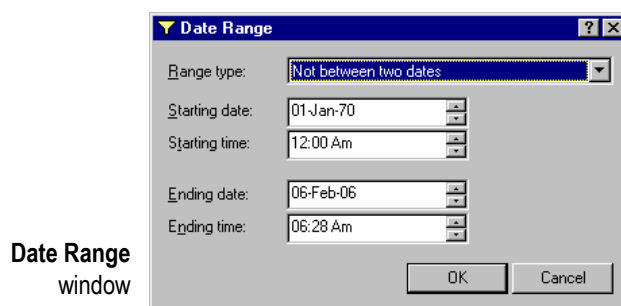
Backup Range

When a file is backed up, NovaNET stores in its storage management database the date the file was backed up. This is called the backup date. Each time you back up a file, NovaNET changes the backup date to the date of the backup. (You can view this information for all of the available instances in the **Instances of...** window in the **Backed up** field list.) You can use this information to filter files for verify jobs.



Filter Change
button

To select files that have specific backup dates, click on the **Filter Change** button next to the **Backup range** field. In the **Date Range** window that appears, select the appropriate range type and the starting and ending dates and times.



Date Range
window

Modify Range

Each time a file is modified, its modified date is updated. You can use this filter to verify files with a modify date that matches your criteria. NovaNET checks the directory information on the volume to see if the file should be included in the verify job. For example, you can select only those files that were modified *after* a certain date and time or, alternatively, those that were modified *before* a certain date and time.



Filter Change
button

To select files that have specific modify dates, click on the **Filter Change** button next to the **Modify range** field. In the **Date Range** window that appears, select the appropriate range type and the starting and ending dates and times.

Create Range

When a file is first created, it is assigned a create date. You can use this filter to select only those files that match your criteria. NovaNET checks the created date for each file stored in the directory of the volume and uses this to select files for verifying.



Filter Change
button

To select files that have specific creation dates, click on the **Filter Change** button next to the **Create range** field. In the **Date Range** window that appears, select the appropriate range type and the starting and ending dates and times.

Note Since DOS does not support create dates, NovaNET ignores this filter on DOS volumes.

Access Range

Each time a file is read, whether or not it is modified, its access date is updated. You can use this information to select files for verifying. For example, you might want to verify only those files which have been accessed (opened or read) in the past two months. Alternatively, you could verify only those files which have *not* been accessed in the past two months.



Filter Change
button

To select files that have specific access dates, click on the **Filter Change** button next to the **Access range** field. In the **Date Range** window that appears, select the appropriate range type and the starting and ending dates and times.

Note Since DOS does not support access dates, NovaNET ignores this filter on DOS volumes.

Size Range

This filter lets you select files for verifying according to their sizes. You might want to select only smaller files, larger files or files between two sizes.



Filter Change
button

To specify a filter that sorts files according to their sizes, click on the **Filter Change** button next to the **Size range** field and then select the appropriate criteria in the **Size Range** window that appears.

Size Range
window

Size Range

Range type: Between two sizes

Minimum size: 0 Bytes

Maximum size: 4294967295 Bytes

OK Cancel

Instance Range

Each time NovaNET backs up a file, it creates a new *instance* of that file. For example, a file named **Expense Account Reporting Form** may have been backed up several times during the previous months and years. Typically, each instance of the file is stored on the backup media of a different job. NovaNET tracks each instance of a file separately in its storage management database.

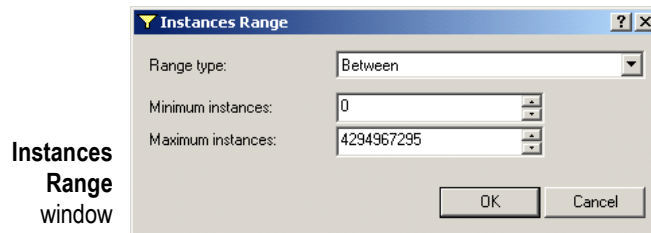
You can use this filter to instruct NovaNET to select files according to the number of instances that exist in the database. You might, for example, instruct NovaNET to verify all of the files for which there is only one instance. When you set **Range type** to **At most** and **Maximum instances** to **1**, NovaNET only verifies those files with a single instance.

Note, however, that having multiple instances of a file does not ensure that the instances you have reflect the latest changes to the file. It may have been modified after the last time you backed it up. So your latest instance may not match the file's current form.



Filter Change
button

To specify a filter that sorts files according to their number of instances, click on the **Filter Change** button next to the **Instance range** field and then select the appropriate criteria in the **Instances Range** window that appears.



Wildcard Type

Select which wildcard format you wish to use from the list box. You can use any of the following formats:

- **DOS:** Uses the 11-character name format with the eight-character primary name and the three-character extension, e.g., filename.txt.
- **Long:** Uses the 256-character name format with a long primary name and an extension with multiple characters, e.g., Monday_backup.txt.
- **UNIX:** Uses Unix search expression format, e.g., [Mm]onday.

Must Match

NovaNET lets you use wildcard matches to include files. Only files that match the wildcard indicated in the **Must match** field are included in the verify set. For example, if you enter ***.exe**, NovaNET will only verify those files with the .exe file extension.

You can specify multiple wildcards by separating each with a semicolon (no spaces). For example, if you enter ***.exe;*.doc** in the **Must match** field, NovaNET selects all files that *either* have the .exe extension *or* the .doc extension.

Cannot Match

This wildcard field works just like the **Must match** field except that it *excludes* any files that match the wildcards. You can specify multiple wildcards by separating them with a semicolon (no spaces); if you specify multiple wildcards, NovaNET excludes any file that matches any one of the wildcards you specify.

Required Attributes

Operating systems track certain features of files called attributes that they use to manage these files. You can use these same attributes as a selection filter. In the **Required attributes field**, if an attribute is checked, NovaNET only selects those files which have these attributes. For example, if you check **Hidden**, NovaNET only selects those files which the operating system has assigned the **Hidden** attribute.

You can select multiple attributes. In this case, only files which have all of the specified attributes will be selected.

Note that some of these attributes are only supported by certain operating systems. If you specify an attribute that is specific to a particular operating system, then only files created under that operating system will be selected for verifying.

Exclude Attributes

This field works like the **Required attributes** field except that NovaNET excludes files that match these attributes. For example, if you have checked the **Execute Only** box, NovaNET will exclude from the verify job any files with the **Execute Only** attribute.

You can select multiple attributes. A file that has any one of these attributes will be excluded. For example, if you mark the **Hidden** and **System** attributes, any file that has *either* attribute will be excluded.

Parents

When this option is checked, NovaNET verifies the directory information for any selected folder or volume. For example, if you have marked a folder, NovaNET will verify that folder only if this option is checked. When this option is not checked, directory information about folders and volumes is not verified.

Children

When this option is checked, NovaNET verifies files. When this option is unchecked, NovaNET does not verify files. This is useful if you want to verify a complex directory structure, but not the files in that directory. To verify a directory structure, but not the files (children) stored in the directories, begin by marking the directory for verifying. Then clear the **Children** option. NovaNET will verify only the directory structure on the volume you specify.

Media

NovaNET tracks instances of files and the media on which those instances are stored. You can use this information to sort files according to the media on which they appear. Only files with instances on the media in the **Media** field will be selected for the verify job. For example, if you select media named “Daily Set:1,” NovaNET will only include files in the verify job which have a valid instance on the media named “Daily Set:1.”

To sort files according to the media on which they appear, click the **Add...** button and select the media from the **Browse** window. Note that you must select a Media object, not a Media folder or User/Group folder. If there are multiple media shown in the **Media** filter field, only files which have a valid instance on *all* the media listed will be selected.

Chapter 6 — Scheduling Jobs

NovaNET offers flexible job scheduling. For ease of use and maximum security, you can use one of NovaNET's built-in job schedules. Or, alternatively, you can customize a job's schedule to efficiently meet your specific needs.

In This Chapter

- Overview
- Backup Job Scheduling Concepts
- Selecting a Backup Schedule
- Customizing Schedules
- Manual Backup Jobs
- Scheduling Restore Jobs
- Scheduling Verify Jobs

Overview

This chapter covers the **Schedule** tab of a NovaNET job, which controls when and how often a job is run.

Although the **Schedule** tab is relevant to all job types, the **Schedule** tab is especially important for backup jobs. The **Schedule** tab allows you to set up a comprehensive backup program many years into the future or, alternatively, to run a job just once or occasionally.

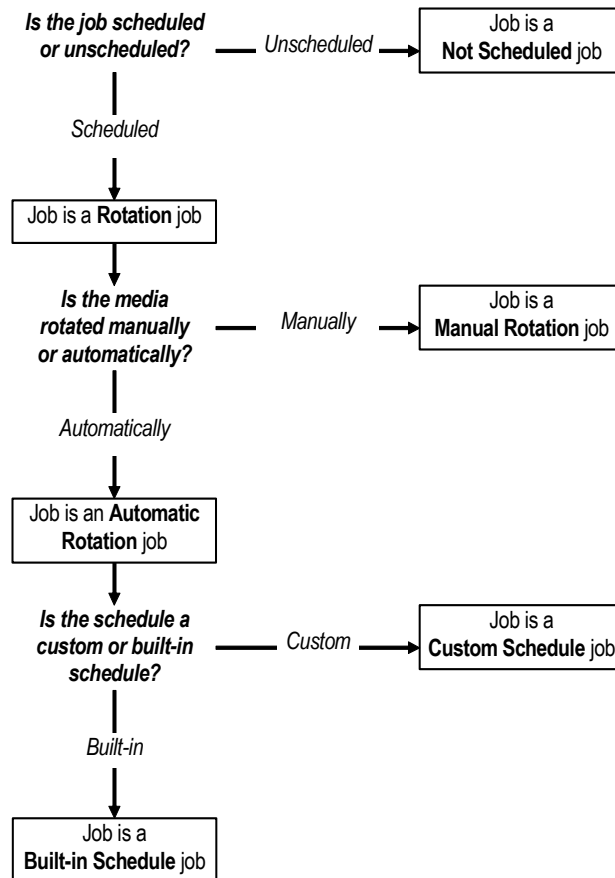
The first part of this chapter reviews scheduling concepts for backup jobs, while the second part explains how to create and modify backup job schedules. The final part of this chapter reviews these concepts for restore and verify jobs.

Backup Job Scheduling Concepts

This section explains some concepts and terminology helpful for choosing and selecting backup job schedules. It reviews media rotation, backup mode and backup job type.

Backup Job Schedule Type

NovaNET jobs can be scheduled in four distinct ways, either as *Not Scheduled*, *Manual Rotation*, *Automatic Rotation with Built-in Schedule* or *Automatic Rotation with Custom Schedule*. This flow chart compares the different types of schedules:



The four schedules differ from one another in the following ways:

- *Is the job scheduled or unscheduled?*

Backup jobs are either **not scheduled** or **scheduled**. Some jobs, such as archive or historical backups, may run once or only occasionally. These jobs are **not scheduled** because they only run when you instruct them to do so.

Scheduled jobs are also called **rotation jobs**. These backup jobs are generally designed for disaster protection and differ from not scheduled jobs in two ways. First, backup jobs for disaster protection are run routinely, normally daily, and thus are scheduled. Second, these jobs rotate media, while unscheduled jobs typically do not.

- *If scheduled, is the media rotated manually or automatically?*

Rotation jobs fall into two categories: **manual rotation** and **automatic rotation**. For manual rotation jobs, the user is responsible for creating the rotation sets and for selecting media for rotation (overwriting); for automatic jobs, NovaNET handles these functions by using predefined rotation sets and rotation algorithms.

For example, to create a five-day manual rotation, you add a new backup job for each day of the week, assigning a different media set to each job. NovaNET backs up to the appropriate media set on its scheduled backup day, overwriting the data from the previous week.

Generally, most jobs designed for disaster protection use automatic rotation. Manual rotation capability increases the flexibility of NovaNET and is useful in special circumstances. Normally, however, if you wish to create and run rotation jobs, choose an automatic rotation schedule.

- *If automatic rotation, is the schedule a custom schedule or a built-in schedule?*

Automatic rotation jobs divide into two categories: **custom schedule** or **built-in schedule**.

The difference between a custom schedule job and a built-in schedule job is whether the user or NovaNET controls the backup mode and the set count. With a custom scheduled job, the user specifies the backup mode and set count; with a built-in schedule job, NovaNET handles these functions using predetermined, “built-in” schedules.

Backup Mode

Backup jobs differ according to whether they back up all files or only changed files. Whether a job backs up all the files or only changed files is referred to as the **backup mode**.

NovaNET runs backup jobs in one of four backup modes: *full*, *differential*, *incremental* or *snapshot*. A job run in *full* backup mode backs up all selected files. A *differential* job backs up all selected files that have changed since the *last full* backup. An *incremental* job backs up all selected files that have changed since the *last* backup. A *snapshot* job backs up all selected files, but has no effect on any future scheduled jobs. Full backup jobs are the largest and usually take the longest to run, while incremental and differential jobs are shorter and usually take less time to run.

Note The snapshot backup mode is only available with Manual jobs.

Normally, all media in a set will be created with the same backup mode. For example, all media in the **Weekly** set will be created from jobs run in full backup mode. The **Daily** set, on the other hand, is created in incremental backup mode.

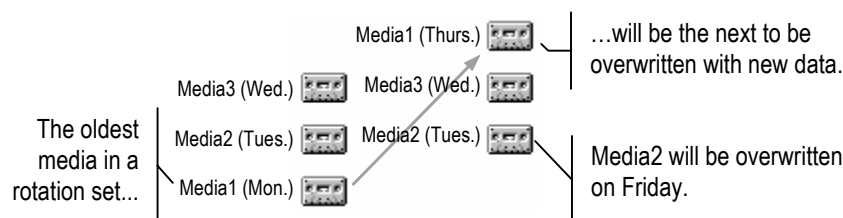
Media Rotation

Backup jobs performed for disaster protection are often run daily. Rather than use new media each time a job is run, NovaNET recycles or reuses the oldest media. This is efficient because it keeps costs down by limiting the amount of media needed and still provides for data security.

Note Media rotation only applies to custom and built-in schedules.

The process of recycling or reusing media is referred to as **media rotation**. When NovaNET rotates media, it recycles the oldest media by overwriting it with new data.

For example, suppose three backup jobs were run on Monday, Tuesday and Wednesday. On Thursday, it overwrites the oldest media (Media1), which contains Monday's backup. On Friday, NovaNET overwrites Tuesday's backup (Media2), which is now the oldest.



Rotation Set A rotating media set is referred to as a **rotation set**. Each job group (**Daily**, **Weekly**, **Monthly**, **Yearly**) can contain one or more media sets, each of which can contain one or more media. When NovaNET runs a job, it overwrites the oldest media set in the job group. As a result, it becomes the newest media set with the most recent backup.

Media Set Count Each job group requires a certain number of media sets to provide full data recovery and historical snapshots. When you configure your backup schedule, you identify the **Count** of media sets for each group. For example, the **Yearly** group might consist of two media sets, whereas the **Daily** group might consist of eight media sets.

General Selection Options Schedule Logs Permissions

Backup mode Count

Type: Custom Weekly Start time: 11:00 Pm Monthly Yearly End of week: Friday

Incremental Full Full Full Full

8 8 7 2

Legend

Completed Warning Failed

None Daily Weekly Monthly Yearly

November 2002

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1* Yearly	2
3	4 Daily	5 Daily	6 Daily	7 Daily	8 Weekly	9
10	11 Daily	12 Daily	13 Daily	14 Daily	15 Weekly	16
17	18 Daily	19 Daily	20 Daily	21 Daily	22 Weekly	23
24	25 Daily	26 Daily	27 Daily	28 Daily	29 Monthly	30

To schedule: Drag legend to calendar or right mouse click on calendar.

Each job group can contain one or more media sets.

The **Count** is the number of rotating media sets specified for each job group. Each media set can contain more than one media.

Selecting a Backup Job Schedule

Whether or not you schedule a job and the type of schedule you select depends on several factors. Before proceeding, consider the following questions:

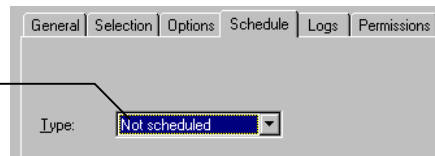
- What is the purpose of this job—to protect from disasters, to archive files or to make a historical record?
- What degree of risk to the data on the network is reasonably allowable?
- Will the amount of traffic on the network require that backup jobs be scheduled to run during non-peak periods? Are there certain days of the week when running lengthy jobs will interfere with other uses of the network?
- Are there times when the tape drive will be unavailable?
- Will someone monitor the job as it runs?
- How large will a full backup job be?
- How much data does the media hold? How much media does my budget allow me? Or, alternatively, how many tapes does my autoloader hold?

Not Scheduled Backup Jobs

Some jobs, such as archive or historical backups, may run once or only occasionally. These jobs are not regular, so they are considered to be **not scheduled**. They only run when you instruct them to do so.

By default, backup jobs are not scheduled. To specify that a job is not scheduled, be certain that **Not Scheduled** is selected in the **Type** box on the job's **Schedule** tab.

When you want a job to run only once or occasionally, select **Not scheduled** in the **Type** box on the job's **Schedule** tab.



Caution Backup jobs designed to protect data from disaster should always be scheduled. This is the most effective way of insuring that your data will be safely stored on media with regular backups.

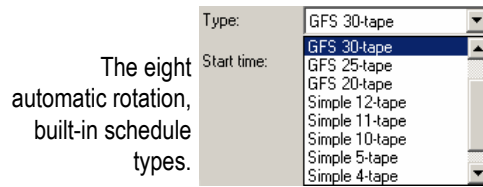
Built-In Schedules for Backup Jobs

Backup jobs designed for disaster protection are run routinely, normally daily. NovaNET has several types of built-in schedules. Each of these built-in schedules will ensure the security of your data, that is, disaster protection, the ability to recover and reconstruct data after some catastrophic loss.

The built-in schedules also provide some archive and historical backup functions, although you may design separate backup programs for these purposes. The built-in schedules vary from each other according to the number of tapes each uses and how far back historical and archival copies of files are kept. For example, some schedules use as few as four tapes, while others use as many as 30. Some schedules keep copies of some historical files available for as long as two years, while others only provide access to files from the past couple of days.

Which Built-In Schedule to Select

There are eight built-in schedules. The schedules vary in three ways: the number of days for which full data recovery is available, the level of access to historical files provided and the minimum number of tapes or other media needed.



Full Data Recovery Period

All the built-in schedules provide for full data recovery in case of disaster. The full data recovery period is the number of days prior to the data loss for which any and every file backed up can be recovered. You will also be able to reconstruct the data for any particular day during that period.

Different schedules provide full data recovery periods for varying numbers of days prior to the last backup. For example, a **GFS 30-tape** job can reconstruct the data from any day of the past three weeks, while a **Simple 4-tape** job only provides for reconstruction of the past two days.

Access to Historical Files

Jobs also vary according to how much access to historical files they provide. Historical files are “snapshots” of the data at particular times such as the end of the week or the end of the month.

Because they are only “snapshots,” not all files from previous weeks and months may be available. For example, you may have a historical “snapshot” of your data at the end of April 2002 and May 2002. Files that were created *and* deleted during May will not be available on either one of these historical tapes.

Different schedules will give you different levels of historical access to previous weeks, months and years. For example, a **GFS 30-tape** job has eight weekly tapes, seven monthly tapes and two yearly tapes. This provides the user with historical snapshots of *at least* the end of the week for the past eight weeks, the end of the month for the past seven months and the end of the year for the past two years. On the other hand, a **Simple 4-tape** job only provides end-of-week snapshots of the last two weeks.

While these historical tapes cannot replace true historical backups, they do provide for some level of available access to historical data. Consider, for example, the yearly tapes. Each of the three GFS built-in schedules has two yearly backup tapes. The first time you run one of these jobs, you create a yearly tape. The next yearly tape is made at the end of the current calendar year. The following year, the first tape is recycled, that is, its data is overwritten with the new data and information about the files backed up is deleted from the storage management database. This process continues with the second tape being recycled the following year and so forth.

Note Yearly tapes only provide you with access to files present at the time the files were backed up. No copy exists for files that were created after the oldest yearly backup and then deleted before the most recent yearly backup. To preserve a copy of these files, you must archive them before deleting them.

Minimum Number of Tapes or Media

The name of each built-in schedule indicates the minimum number of tapes or other media needed for that schedule type.

Note that the actual number of tapes needed may be more, depending on the amount of data to be backed up during a full backup and the size of your tape. If the total size of a full backup is larger than the capacity of the tape, additional tapes are required. For example, if a tape holds 1 GB, two tapes are required to back up more than 1 GB of data, three tapes to back up more than 2 GB and so forth.

Because incremental and differential backup jobs usually back up fewer selected files than full backup jobs, additional tapes may not be required. Your historical usage is the best guide to determining how many tapes these jobs will require.

If you wish to run jobs with no one monitoring the tape drive and you are not using an autoloader, be certain that you are using tapes with a capacity that is larger than the total size of the files selected for backup.

Built-In Schedules Compared

The following table compares the historical files and full data recovery capabilities of each of the built-in jobs. (This table assumes that no job uses more than one tape.)

Built-In Backup Job Type	Full Data Recovery Available for Previous...	Historical “Snapshots” Available for Previous...
GFS 30-tape	three 5-day weeks or two 7-day weeks (15 business days)	eight end-of-weeks eight end-of-months two end-of-years
GFS 25-tape	two 5-day weeks (10 business days)	eight end-of-weeks seven end-of-months two end-of-years
GFS 20-tape	one 7-day week (7 business days)	six end-of-weeks six end-of-months two end-of-years
Simple 12-tape	five days	four end-of-weeks four end-of-months
Simple 11-tape	five days	four end-of-weeks three end-of-months
Simple 10-tape	five days	four end-of-weeks two end-of-months
Simple 5-tape	five days	one end-of-week
Simple 4-tape	two days	two end-of-weeks

Scheduling Backup Jobs with Built-In Schedules

To use the built-in schedules, you must select a schedule and then specify a start time, select which days of the week the job will run and which day is the end of the week.

To schedule a job with a built-in schedule

1. Select a built-in schedule by selecting it from the **Type** list on **Schedule** tab of the backup job’s property sheet.
2. Specify a time for the job to begin running in the **Start time** box. NovaNET will attempt to run the job at this time.
3. Select which days of the week you wish the job to run by clicking on the day of the week buttons at the top of the calendar on the **Schedule** tab.

4. Specify which day is the final day of the week by selecting it from the **End of week** list. On this day, NovaNET schedules **Weekly** backups.

The screenshot shows the 'Schedule' tab of the NovaNET configuration window. It includes a 'Type' dropdown set to 'GFS 20-tape', a 'Start time' of '11:00 Pm', and a 'Backup mode' section with 'Incremental', 'Full', and 'Full' options. The 'End of week' is set to 'Friday'. A calendar for November 2002 shows the 'Weekly' backup schedule. A legend on the left indicates 'Completed', 'Warning', 'Failed', 'None', 'Daily', 'Weekly', 'Monthly', and 'Yearly' statuses. Annotations point to the 'Type' list box, the 'Start time' box, the 'End of week' list box, and the 'Weekly' button on the calendar.

To schedule a job with a built-in schedule, begin by selecting the appropriate schedule in the **Type** list box.

Specify when you want the job to run in the **Start time** box.

Specify which day you want to run weekly backups in the **End of week** list box.

Select which days you wish the job to run by selecting the appropriate weekday buttons.

Note that you can have a backup job run as frequently as every day or only once per week. To best protect your data, select every day of the week in which new and important data is generated (that is, every business day).

Customizing Schedules

You can also create customized schedules to meet your unique backup needs. To create a customized scheduled, you can modify built-in schedules or, if needed, create an entirely new backup schedule.

It is strongly recommended that you use the built-in schedules for disaster protection backup. These schedules are specially designed to secure your data against catastrophic loss. If you need a custom schedule, try making a few modifications to a built-in schedule, rather than creating an entirely new schedule.

Creating Custom Schedules

You can customize the schedule of a job in one of three ways: by modifying a built-in schedule, by modifying the **Custom** schedule or by using the **Manual** schedule. This section covers how to modify built-in schedules and the Custom schedule; working with the **Manual** schedule is covered in *Manual Backup Jobs* later in this chapter.

Both modified built-in schedules and the **Custom** schedule allow you to change when monthly and weekly backups are made. However, only the **Custom** schedule will allow you to specify the set count and the backup mode, that is, the number of tapes belonging to each type of tape (**Daily** tapes, **Weekly** tapes and so forth) and whether those jobs are **Incremental**, **Differential** or **Full** backups.

Only the **Custom** schedule lets you change the Backup mode of each rotation set and the set Count.

Rotation Set	Backup mode	Count
Daily	Incremental	8
Weekly	Full	8
Monthly	Full	7
Yearly	Full	2

Modifying Built-In Schedules

You can change when **Daily**, **Weekly**, **Monthly** and **Yearly** jobs are run. This is helpful when the standard schedules do not fit your particular business needs or when a job fails to run because of a network problem or malfunction.

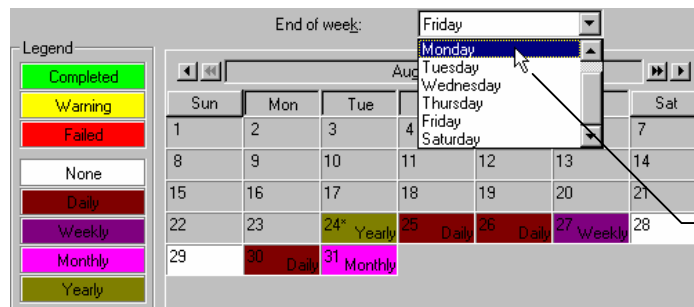
For example, you may wish to change the date when the **Monthly** backup is run from the last business day to the last calendar day of the month. In the following example, the **Monthly** backup was changed from the last business day of the month to the last calendar day.

To change the day the **Monthly** job is run, click and drag the **Monthly** calendar tile to the appropriate date...

...or click the right mouse button on appropriate date and select **Monthly** from the shortcut menu.

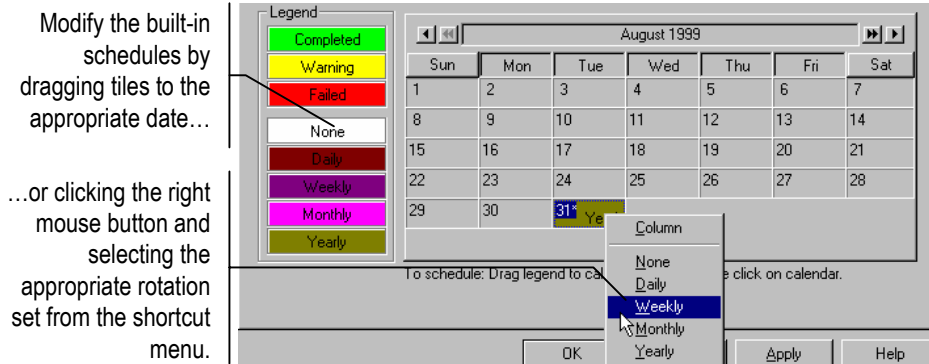
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24* Yearly	25 Daily	26 Daily	27 Weekly	28
29	30	31 Monthly				

In another example, a **Weekly** backup job for some reason has failed to run when scheduled. It is important that this job be run as soon as possible or else full data recovery may not be possible. In the following example, the **Weekly** backup job that was scheduled to run on Saturday is rescheduled to run on Monday by changing Monday from a **Daily** backup to a **Weekly** backup.



You can change the day of the week that weekly backup jobs are run by changing the day name in the **End of week** list box.

You modify the built-in schedules by changing the color-coded tiles on the **Schedule** tab. Drag the color coded tiles from the **Legend** to the appropriate calendar date or right-click the calendar and select the appropriate backup type from the shortcut menu.



Modifying the Custom Schedule

When you select **Custom** from the **Type** list on the **Schedule** tab, NovaNET sets the calendar to the **GFS 25-tape** built-in schedule. However, unlike the **GFS 25-tape** built-in schedule, the **Custom** schedule allows the user to indicate the backup mode of the **Daily**, **Weekly**, **Monthly** and **Yearly** jobs and the number (**Count**) of each type of media or tape.

Changing the Tape Count

The **Custom** schedule is particularly useful when you wish to change either the length of the full data recovery period or the level of access to historical “snapshots.” By modifying the tape count, you can lengthen or shorten the period in which full data recovery is available or the period of time for which historical “snapshots” are available.

For example, you may wish to increase the number of yearly historical tapes available from two to three or more. To do so, change the number in the **Yearly Count** box on the **Schedule** tab to the desired number of historical backups.

		Backup mode	Count
Type:	Custom	Incremental	8
Start time:	11:00 Pm	Full	8
	Monthly:	Full	7
	Yearly:	Full	8

With the **Custom** schedule, you can modify the **Yearly** rotation set **Count** in order to increase the number of historical tapes.

Alternatively, you may wish to expand the full data recovery period, while limiting the number of historical backups. In the following example, the full data recovery period has been expanded to four five-day weeks (20 business days), with only limited monthly and yearly historical tapes.

		Backup mode	Count
Daily:	Incremental	Full	16
Weekly:	Full	Full	8
Monthly:	Full	Full	7
Yearly:	Full	Full	2

In this example, the full data recovery period has been extended to 20 business days with limited historical jobs: four incremental and one weekly for each week.

Changing the Backup Mode

NovaNET runs backup jobs in one of four backup modes: *full*, *differential*, *incremental* or *snapshot*. A job run in full backup mode backs up all selected files. A *differential* job backs up all files changed since the last *full* backup. An *incremental* job backs up files changed since the *last* backup. A *snapshot* job backs up all selected files, but does not affect any future scheduled jobs. Full backup jobs are the largest and take the longest to run, while incremental and differential jobs are shorter and take less time to run.

To change the backup mode, select the new backup mode from the appropriate **Backup mode** list box on the **Schedule** tab of the job.

Determining the Length of the Full Data Recovery Period

Full reconstruction of data can be accomplished in two ways. The first method requires the most recent full backup tape and all of the incremental backup tapes since the full backup tape. The second method requires the most recent full backup tape and a differential job from the previous day.

For example, to reconstruct the data for a Wednesday, you will require one of two sets of tapes: *either*, the full backup tape from the previous end of week and all of the incremental tapes from that week (that is, Monday's, Tuesday's and Wednesday's); *or*, the full backup tape from the previous end of week and the differential tape from Wednesday. (In some circumstances, the preceding full backup tape will be a monthly or yearly job and not a weekly job.) As long as none of these tapes have been overwritten, full data recovery is possible.

The length of the data recovery period is determined both by the number of daily incremental or differential tapes and the number and frequency of full backup jobs (usually weekly jobs).

Incremental Jobs and Full Data Recovery

Incremental jobs are the shortest and smallest jobs to run, but they do pose some risk to full data recovery. The difference between an incremental and a differential backup is important because full data recovery is always available from a differential backup tape and a full backup tape, even when the differential tapes are being rotated (overwritten). However, when incremental tapes are overwritten or recycled, there is the possibility of data loss. Full data recovery cannot be guaranteed with incremental jobs.

Using incremental backup jobs to ensure full data recovery after a disaster is not recommended, *unless you are using a built-in schedule*. However, if your particular network needs to limit the amount of time available to run backup jobs, you can safely work with incremental jobs if you are careful to follow these guidelines:

- Have at least as many incremental tapes as there are days between full or differential backup jobs. For example, if you run full backup jobs every five days, have at least four incremental tapes; if you run full backup jobs every seven days, have at least six incremental tapes.
- Never recycle incremental tapes between differential or full backup jobs. If you wish to run more than one incremental job in a row, be certain to not recycle any of the tapes used during this string of incremental jobs.

Manual Backup Jobs

Manual rotation jobs differ from unscheduled jobs because they can be scheduled. However, unlike automatic rotation jobs, the schedule does not specify the backup mode or set count.

Automatic rotation jobs allow the user to specify *in the schedule* the number of media in a set, which set is being used and the mode of the set. For manual jobs, however, these features of the backup plan are the responsibility of the user. The user must keep track of the media sets and what media are to be overwritten. Furthermore, the user must specify the backup mode on the **Options** tab of the job.

The **Manual** schedule is provided for specialized uses; do not select this option for backup jobs intended for disaster protection.

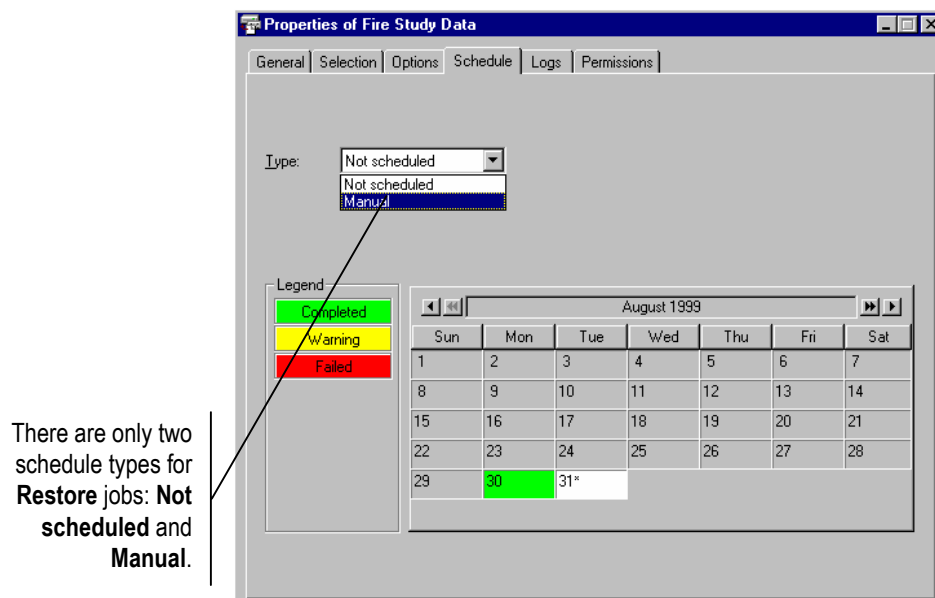
Because the user is responsible for rotating the media, the **Manual** schedule should be used only for special purposes—not disaster protection.

The screenshot shows the 'Schedule' tab of a backup software interface. At the top, there are tabs for 'General', 'Selection', 'Options', 'Schedule', 'Logs', and 'Permissions'. The 'Schedule' tab is active. Below the tabs, there are two dropdown menus: 'Type:' set to 'Manual' and 'Start time:' set to '11:00 Pm'. Below these is a 'Legend' section with five color-coded boxes: 'Completed' (green), 'Warning' (yellow), 'Failed' (red), 'None' (white), and 'Daily' (dark red). To the right of the legend is a calendar for 'August 1999'. The calendar has columns for days of the week (Sun to Sat) and rows for dates. The date '31' is highlighted in dark red and labeled 'Daily'. Below the calendar, there is a note: 'To schedule: Drag legend to calendar or right mouse click on calendar.'

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31 st Daily				

Scheduling Restore Jobs

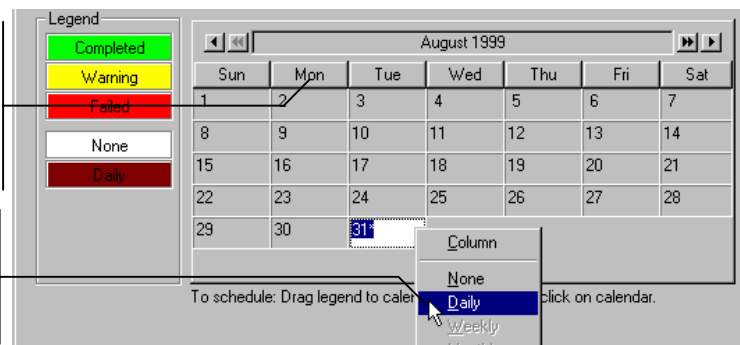
Restore jobs are either unscheduled or scheduled with the **Manual** schedule. In general, if you want to schedule a job to run, even if it is only once, select **Manual**. If you only want your job to run when you instruct it to run, select **Not scheduled**.



If you want to run a restore job on regular occasions, select **Manual** schedule. You can specify which days it is to run by modifying the calendar. For example, you can turn off certain days of the week by clicking on the day of the week buttons on the top of the calendar. To turn a particular day off or on, right-click it and select either **None** or **Daily** from the shortcut menu.

To modify the **Manual** schedule of a restore job, begin by turning the day of week tiles on or off...

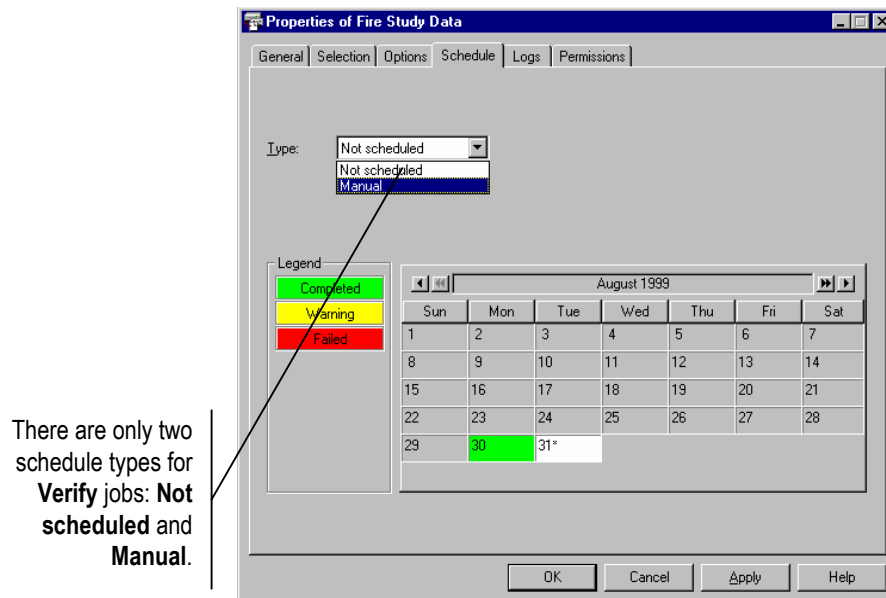
...and then use the **Shortcut** menu to turn particular days on or off.



If you want a job to run only once, but need to schedule it to run during non-peak hours, try this method. Turn off all of the days of the week by clicking on the day of week name tiles. The calendar will be all white. Then right-click the day to run the job and select **Daily**. This will be the only day the job runs. Be certain to adjust the time you want the job to run in the **Start Time** box.

Scheduling Verify Jobs

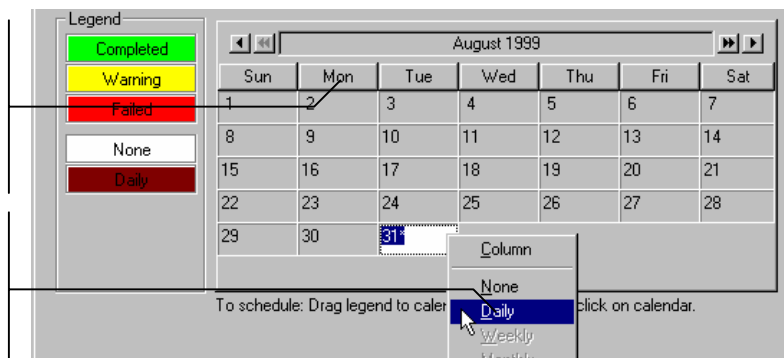
Verify jobs are either unscheduled or scheduled with the **Manual** schedule. These are the only two types of schedules available for verify jobs. In general, if you want to schedule a verify job to run, even if it is only once, select **Manual**. If you only need your job to run when you instruct it to run, select **Not scheduled**.



If you want to run a verify job on regular occasions, select **Manual** schedule. You can specify which days it is to run by modifying the calendar. For example, you can turn off certain days of the week by clicking on the day of the week buttons on the top of the calendar. To turn a particular day off or on, right-click it and select either **None** or **Daily** from the shortcut menu.

To modify the **Manual** schedule of a verify job, begin by turning the day of week tiles on or off...

...and then use the shortcut menu to turn particular days on or off.



If you want a job to run only once, but need to schedule it to run during non-peak hours, try this method. Turn off all of the days of the week by clicking on the day of week name tiles. The calendar will be all white. Then right-click the day to run the job and select **Daily**. This will be the only day the job runs. Be certain to adjust the time you want the job to run in the **Start Time** box.

Chapter 7 — Job Options

NovaNET uses parameters on a job's **Options** tab to control various features necessary for running a job. NovaNET's default values are designed to be easy and secure to use, but you can modify the job option parameters to meet your particular needs.

In This Chapter

- Overview
- Backup Job Options
- Advanced Options
- Restore Job Options
- Verify Job Options

Overview

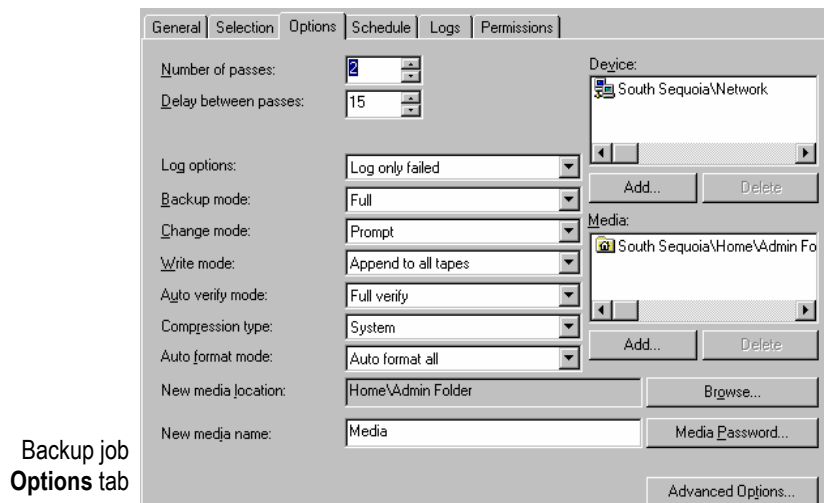
This chapter covers an important tab on the property sheet of a NovaNET job: the **Options** tab. This tab controls various features of the job, such as what media is used, what backup device is used, whether files can be overwritten and how alerts are handled.

Although this tab is relevant to all job types, the **Options** tab is especially important for backup jobs. Some types of backup schedules, such as automatic rotation jobs, treat certain job option parameters differently than do others, such as manual rotation jobs.

The first part of this chapter focuses on backup job options, while the second part explains the advanced options parameters used by backup and verify jobs. Finally, these concepts are reviewed for both restore and verify jobs.

Backup Job Options

The **Options** tab on the property sheet of each backup job controls various parameters important to how NovaNET runs a backup job. Although there are numerous choices, the default values have been chosen to provide the maximum degree of security and ease of use. Use the default values unless your particular backup needs require different settings.

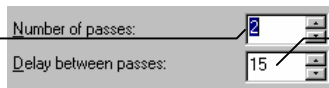


The following section describes each option parameter and some of the possible ways each might be used.

Number of Passes

This parameter determines how many times NovaNET will try to open a file for backup before it skips it and continues with the next file. The default is **3**.

The **Number of passes** is the number of times an attempt will be made to access a file that may be in use by another user.



The **Delay between passes** is the number of seconds between each of these attempts.

Sometimes when NovaNET is trying to back up a file, the file may already be open, that is, in use by another user, a software program or the operating system. Because the file could change, NovaNET waits until the file is not in use. Each attempt to open a file is called a **pass**. When NovaNET cannot back up a file on the first pass, it tries to back up the file on subsequent passes.

On the last pass, NovaNET opens the file in *shared* mode and backs it up. If the user changes the file between backup and verification, NovaNET indicates a file backup failure. If the file did not change, NovaNET indicates a file backup complete.

For example, suppose the number of passes is set to five. On the first pass, NovaNET tries to back up all of the files in the file selection list. If, on the first pass, it encounters any open files, it skips them and tries to back them up on the second pass. If, on the second pass, these files are still open, NovaNET schedules them for the third pass and so forth until the final pass. On the final pass, in this case the fifth pass, any file not previously backed up is opened in shared mode, regardless if it is currently being used by other users. As long as the file has not changed, it will be backed up successfully.

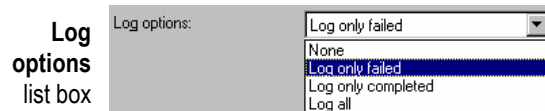
If your historical usage shows that many files are open during backup, or if the backup job will run when other users are likely to be working with the files to be backed up, set the value to a higher number. This will increase the number of times NovaNET attempts to open a file and may result in fewer files being opened in shared mode during the final pass.

Delay Between Passes

This determines how many seconds NovaNET waits before trying the next pass. If your historical usage suggests that many files are being opened on the last pass, consider increasing this parameter to a higher number.

Log Options

The **Log options** is either **None**, **Log only failed**, **Log only completed** or **Log all**.



NovaNET keeps a log of which files are backed up while running a job. After a job is run, you can view or print the log to see which files were successfully or unsuccessfully backed up. The default value is **Log only failed**, which writes in the log any files which were not successfully backed up. This is particularly useful for locating any problems with running the backup job.

None This parameter instructs NovaNET to not keep a log of the backup job as it runs.

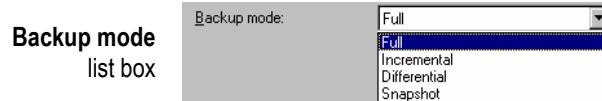
Log only failed This parameter instructs NovaNET to log the name of any selected file that was not backed up. Use this option to check if a backup job is running correctly.

Log only completed This parameter instructs NovaNET to log the name of any file selected for backup and successfully backed up. You might use this option to produce a list of files backed up for archive purposes.

Log all This parameter instructs NovaNET to log the name of every file selected for backup and whether or not that file was successfully backed up. You can use this option to be certain that a backup job is running correctly as you planned.

Backup Mode

The **Backup mode** is either **Full**, **Incremental**, **Differential** or **Snapshot**. For scheduled automatic rotation jobs, NovaNET uses the backup mode for each backup set as indicated on the **Schedule** tab; for unscheduled or manual jobs, NovaNET uses the parameters set by the user. For more information, see *Backup Options Automatically Updated* later in this chapter.



Full This parameter instructs NovaNET to back up all selected files. For each file, NovaNET resets the incremental bit in the storage management database and the archive bit on disk.

Differential This parameter instructs NovaNET to back up all selected files that have changed since the *last full* backup. When a file changes, its differential bit has been set. NovaNET does not reset any bits.

Incremental This parameter instructs NovaNET to back up all selected files that have changed since the *last* backup. For each file, NovaNET resets the incremental bit in the storage management database and the archive bit on disk.

Snapshot This parameter instructs NovaNET to back up *all* selected files, but it has no effect on any future scheduled job. (A snapshot backup job does not reset the archive bit after backing up all the selected files.) Use this option when you wish to make a record of files or systems at a particular time, but do not wish to disrupt the normal backup schedule.

For more information on the differences between incremental and differential backup jobs and the importance between them for data recovery, see *Chapter 6 — Scheduling Jobs*.

Change Mode

The **Change mode** is either **Skip device**, **Force to append** or **Prompt**. This option determines what action NovaNET will perform when it fails to find the media it was expecting to use for a job. When NovaNET runs a job, if the job uses specific media, NovaNET scans the network for devices with that media. If it does not find the media it expects, its response is determined by the **Change mode** parameter.

**Change
mode list box**

Change mode:	Prompt
	Skip device
	Force to append
	Prompt

Skip device This parameter instructs NovaNET to skip the designated device when it does not find the proper media, e.g., if the wrong media is loaded or the device has malfunctioned. NovaNET looks for the proper media on other devices on the network. NovaNET will not continue the job until it finds the correct media. As a result, the job may never run if the correct media is not found.

Force to append This parameter instructs NovaNET to append data to whatever media it finds in the designated backup device, as long as the media is in the storage management database. If it cannot find the correct media, NovaNET appends data to whatever media is available. This option will ensure that the job runs, if the media contains enough room to complete the job.

Prompt This parameter instructs NovaNET to continue to scan for the expected media and to send an alert warning that the proper media has not been found. This option will not allow a job to run with any other media except with the expected media. Additionally, this option will not search for another device that might contain the proper media.

Write Mode

The **Write mode** is either **Append to all tapes**, **Append to 1st tape, overwrite others** or **Overwrite all tapes**. For scheduled automatic rotation jobs, NovaNET defaults to **Overwrite all tapes**; for unscheduled and manual jobs, NovaNET uses the parameters set by the user. For more information, see *Backup Options Automatically Updated* later in this chapter.

**Write mode
list box**

Write mode:	Append to all tapes
	Append to all tapes
	Append to 1st tape, overwrite others
	Overwrite all tapes

This mode determines whether the old data on the media is *overwritten* with new data or whether the new data is *appended* to the end of the old data. When media is overwritten, all of the data previously stored on it is lost. Appending data will preserve the old data.

Unless the media is meant to be stored permanently, select **Overwrite all tapes**. This is because when tapes or media are rotated (reused), NovaNET overwrites it. If you have appended data to the media, overwriting will result in the loss of not just the oldest material, but all of the data on the media, including the most recent. For this reason, use **Overwrite all tapes** for media you wish to reuse through rotation, such as tapes that are part of a set of daily incremental backups, and **Append to all tapes** or **Append to 1st tape, overwrite others** for media meant for permanent storage.

Appending is useful if the number of tapes is limited or if the tapes are several times larger than the size of the job. For example, a one gigabyte tape could hold the contents of four jobs that are less than 250 Mbytes if these jobs were appended. However, if overwrite mode is selected, only one job will be stored on a tape at once. Similar comments apply to other types of media.

Append to all tapes This parameter instructs NovaNET to append all data to the end of the media. No data is overwritten. Select this parameter for permanent storage.

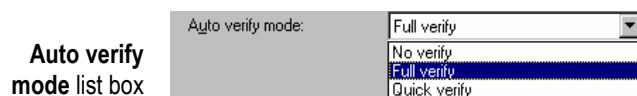
Append to 1st tape, overwrite others This parameter instructs NovaNET to append data to the end of the first media, but to overwrite all media that follows. For example, NovaNET will not overwrite the first tape inserted, but will overwrite the second, third and later tapes. This parameter is useful if you have a set of media with old data you no longer need. By selecting this option, NovaNET preserves your most recent data on the first media, but overwrites older, unneeded media.

Overwrite all tapes This parameter instructs NovaNET to overwrite all media. All data on media that is overwritten is lost. Use this option for tapes that are going to be recycled.

Auto Verify Mode

The **Auto verify mode** is either **No verify**, **Full verify** or **Quick verify**.

After NovaNET backs up a file onto a tape, it can verify that the file was backed up correctly. NovaNET reads the file from the tape and compares it to the original file (**Full verify** mode). If any discrepancies between the two files are found, the file is considered to have failed the backup.



It is strongly recommended that the **Auto verify mode** be set to **Full verify**. Verification that data has been correctly written to the tape is an essential part of a comprehensive backup program. Also, verifying the files ensures that the tape and the tape drive are working correctly. Restoring data after a disaster is no time to discover that the data was incorrectly stored to begin with.

No verify This parameter instructs NovaNET to skip the verification step. It is not recommended.

Full verify This parameter instructs NovaNET to compare every selected file stored on the media with the original file from the workstation or file server. This default option is strongly recommended.

Quick verify This parameter instructs NovaNET to be certain that every file backed up onto the media is in readable condition. It does not verify that the data is correct, only that the data stored on the media (incorrect or not) can be read. While selecting this option can save time, it is nonetheless not recommended.

Compression Type

The **Compression type** is either **None**, **Standard**, **System** or **Both**.

Compression type list box

Compression type:	System
	None
	Standard
	System
	Both

This parameter controls how NovaNET compresses or maintains the compression of files and directories.

None This parameter instructs NovaNET to write all data to the tape in a decompressed format. If the file is stored on disk in a compressed format, the file will be decompressed before writing. This option is useful if the device supports hardware data compression and the files are to be restored to a different operating system.

Standard This parameter instructs NovaNET to write all data to tape in the NovaNET compression format. If the file is stored on disk in a compressed format, the file will be decompressed before being re-compressed by NovaNET. This option is useful if the tape device does not support hardware data compression and the files are to be restored to a different operating system.

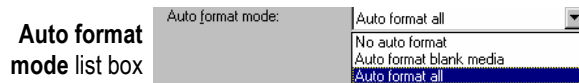
System This parameter instructs NovaNET to write all data to tape in the same mode it is stored on disk. If the file is stored on disk in compressed format, NovaNET will write the data in the host's compressed format. If the file is not compressed on disk, NovaNET will store the file on tape in a non-compressed format. This option is useful if the hardware supports data compression and the files are to be restored to the same operating system. This option also gives better performance.

Note If the backup device supports hardware compression, be sure to select the **System** option. Then enable **Hardware compression** on the **Advanced Options** window.

Both This parameter instructs NovaNET to write all compressed data in its compressed format. Any uncompressed files will be stored in the NovaNET compression format. This option is useful if the hardware does not support data compression and the files are to be restored to the same operating system.

Auto Format Mode

The **Auto format mode** is either **No auto format**, **Auto format blank media** or **Auto format all**.



This mode determines whether or not NovaNET will format the tape automatically. Before data can be written to a media, the media must be formatted. When a media is formatted, any data on it is lost. Tapes and other media are formatted when NovaNET does not recognize the media, that is, when it has no information in its storage management database about that particular media. This will occur when the media is blank, it has been erased, it is first used or it has been deleted from the storage management database.

Auto formatting speeds up jobs and allows jobs to be run with no one attending them. On the other hand, disabling auto format can help ensure that no data is lost by accidentally formatting a tape.

No auto format When this parameter is selected, if NovaNET encounters media that needs to be formatted (either blank or unrecognized media), it sends an alert to the alert window. While waiting for a user reply, NovaNET scans the network for devices with the media it was expecting. When this parameter is selected, NovaNET waits for a reply to the alert before formatting unrecognized media.

Auto format blank media This parameter instructs NovaNET to automatically format all new or blank media. However, if NovaNET encounters unrecognized media, it sends an alert to the alert window and then scans the network for the media it was expecting. This parameter can help prevent data from being accidentally destroyed by formatting, while not needlessly querying the user before formatting a blank media. Under almost all circumstances, setting the **Auto format mode** to this parameter is sufficient protection against data loss and is preferable to **No auto format**.

Auto format all This parameter instructs NovaNET to automatically format all of the media inserted into the tape drive which require formatting. With this parameter selected, NovaNET will automatically format all new (or blank) media and all unrecognized media. Select this option to create a job that will run unattended with media whose data can be erased.

Note NovaNET only formats media automatically if it can be overwritten, that is, if you selected **Append to 1st tape, overwrite others** or **Overwrite all tapes** for the **Write mode**. Otherwise, it appends the new data to the end of the media.

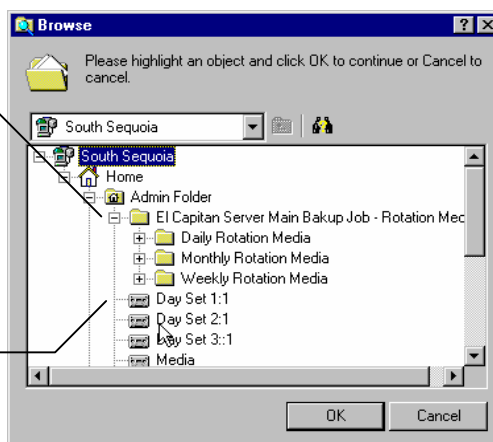
New Media Location

The **New media location** is the folder in which NovaNET will store any new media created while the job is running. By default, NovaNET stores media in the current User/Group folder; the media will appear there on the **Media** and **Database** tabs. You can also store the media in a separate media folder inside the User/Group folder.

Select the folder in which to store any new media by clicking the **Browse...** button. Then select the folder from the **Browse** window. If the folder does not exist, use the **Media** tab to create it first. Then you can select the **New media location**.

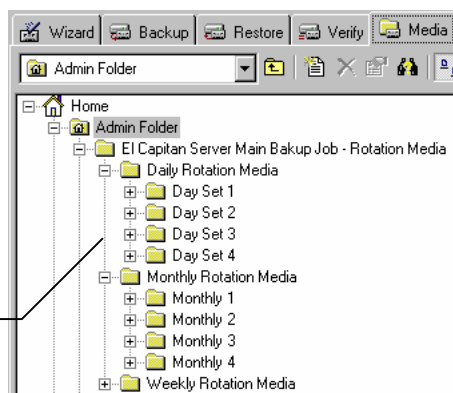
By default, any new media is created in the current user/group folder...

...but you can use the **Browse** window to select a different location.



When NovaNET runs any scheduled automatic rotation job, it automatically creates new media folders for the job. The folders are organized by the name of the job and the various rotation sets in that job. There is no reason to create these folders manually. NovaNET will automatically create these folders for you.

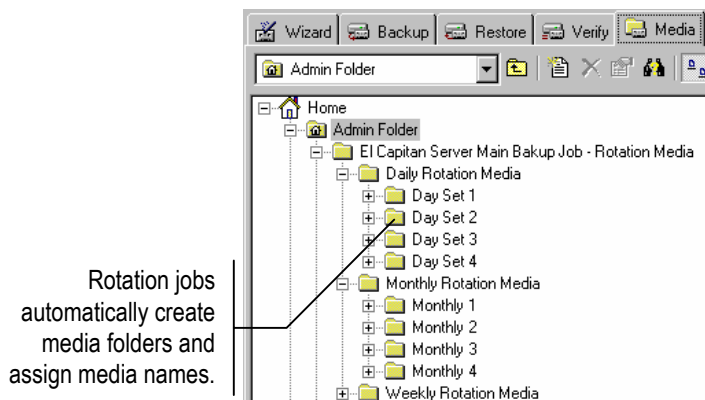
All media and media folders are automatically created when you select an automatic rotation job.



Note NovaNET does not automatically create new media folders for manual jobs.

New Media Name

The **New media name** is the name NovaNET gives to any new media it creates while running the job. For scheduled automatic rotation jobs, NovaNET automatically updates this parameter to match the media's place in the rotation schedule. For example, if the media is the first media in the yearly rotation set, NovaNET names it "Year Set 1:1". (This means the media was used with a yearly backup job and that it was the first tape in the first set.)

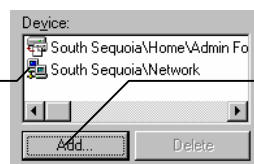


For manual rotation and unscheduled jobs, NovaNET assigns any new media it creates the name listed in this field. This is also true for automatic rotation jobs that are "forced" to run. For more information, see *Backup Options Automatically Updated* later in this chapter.

Device

The **Device** option specifies which tape drive or other removable media device NovaNET will use to run the backup job.

By default, the **Device** option is set to the **Network** container and will use any devices available on the network.



You can specify a particular device to use by adding it to the **Device** list.

By default, NovaNET sets this parameter to the network container. When running the job, NovaNET will use whatever devices it finds on the network. If there is only one device in your storage management zone or if you only have permissions to one device, there is no reason to change this parameter.

However, if there are several devices on your network and you need to select a specific device, specify which device the job should use by selecting it from the **Device** list. (If a machine has only one device, you can just select the machine and not the device.)

For more information on using multiple streams, see *Maintaining the Flow of Data* in Chapter 10 — *Tips, Techniques and Strategies*.

Note that NovaNET automatically tries to use multiple devices whenever there are multiple backup streams. Using multiple devices can speed up a backup job tremendously. NovaNET can send up to eight backup streams to a single device. If you have multiple devices, NovaNET sends the first eight streams to the first device, then the next eight streams to the second and so on.

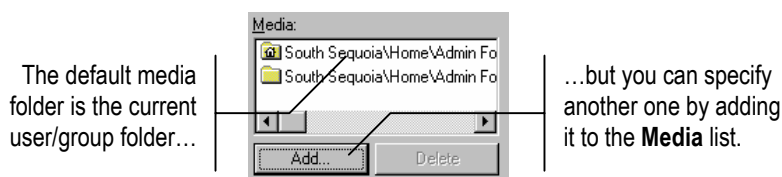
If you want a job to use a specific device or exclude a particular backup device, use the **Device** list to specify the devices a job should use.

Note If you are using an autoloader, the physical machine will have two or more drivers associated with it: the device drivers and the autoloader driver. You may specify either in the **Device** list. To use all devices associated with an autoloader, select the autoloader. NovaNET automatically backs up to all autoloader devices, depending on number of backup streams. To use a single device in the autoloader, select the device itself. NovaNET only backs up to the select device. Note that you must manually load and unload media when using a single device.

To use a device that is not shown in the **Device** list, click the **Add...** button and select the new device from the **Browse** window. Then select the undesired network container from the **Device** list, click **Delete** and confirm the deletion.

Media

The **Media** option specifies the folder in which the tape or other removable media are stored. NovaNET will look here for media to use with this job.



The default folder is the current User/Group folder. If you wish to use media from another folder, specify the folder by selecting it from the **Media** list.

To use a folder that is not shown in the **Media** list, click the **Add...** button and select the new folder from the **Browse** window. Then select the undesired default folder from the **Media** list, click **Delete** and confirm the deletion.

Media Password...

When a job creates new media, you can assign that media a password. A password prevents the media from being imported into another NovaNET storage management database and can be an important part of your overall security plan.

To have the job assign a password to the new media, click the **Media Password...** button and type and confirm your password.

**Media
password
window**



The 'Media Password' dialog box has a title bar with a question mark and close button. It contains a key icon and the text 'Please enter the password for the new media.' Below this are two text input fields labeled 'Password:' and 'Confirm password:'. At the bottom are 'OK' and 'Cancel' buttons.

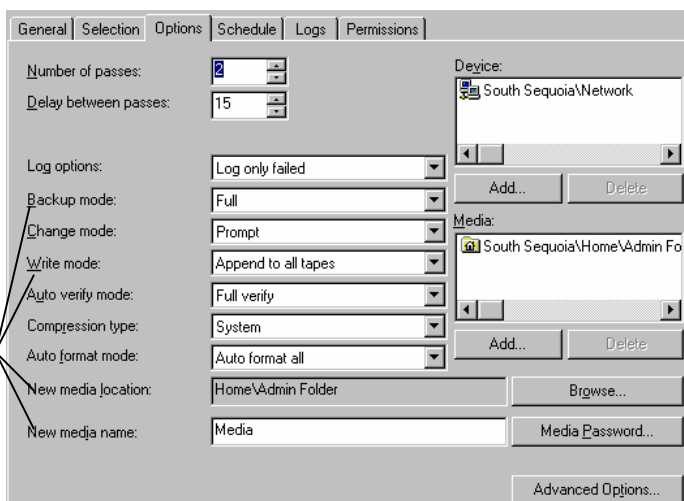
Note that passwords can only be assigned when media is formatted. Additionally, media passwords are only required when importing media.

Backup Options Automatically Updated

For more information, see *Forcing Scheduled Jobs to Run in Chapter 8 — Running Jobs.*

The parameters shown on the **Options** tab fall into two categories: first, parameters that are updated automatically when NovaNET runs a scheduled *automatic rotation* job (built-in or custom), but specified manually in *unscheduled* and *manual rotation* jobs; and second, parameters that are always specified manually by the user.

When a scheduled rotation job is run, the **Backup mode, Write mode, New media location, New media name and Media** parameters are updated automatically.



The 'Options' tab of the configuration window shows various settings. On the left, a list of parameters is shown with arrows pointing to their corresponding controls on the right. The parameters listed are: Number of passes (set to 2), Delay between passes (set to 15), Log options (set to Log only failed), Backup mode (set to Full), Change mode (set to Prompt), Write mode (set to Append to all tapes), Auto verify mode (set to Full verify), Compression type (set to System), Auto format mode (set to Auto format all), New media location (set to Home\Admin Folder), and New media name (set to Media). On the right, there are sections for 'Device' (South Sequoia\Network) and 'Media' (South Sequoia\Home\Admin Fo), each with 'Add...' and 'Delete' buttons. At the bottom right, there are 'Browse...' and 'Media Password...' buttons, and an 'Advanced Options...' button at the very bottom.

For more information, see *Backup Job Scheduling Concepts in Chapter 6 — Scheduling Jobs.*

Recall from the previous chapter that NovaNET jobs can be scheduled in four distinct ways, either as Not Scheduled, Manual Rotation, Automatic Rotation with Built-in Schedule or Automatic Rotation with Custom Schedule.

When an automatic rotation job is scheduled, the job appears on the **Queue** tab with an indication of the date and time the job is scheduled to run. When NovaNET runs these scheduled jobs on the **Queue** tab, it automatically updates *five* of the parameters on the **Options** tab: **Backup mode, Write mode, New media location, New media name and Media.**

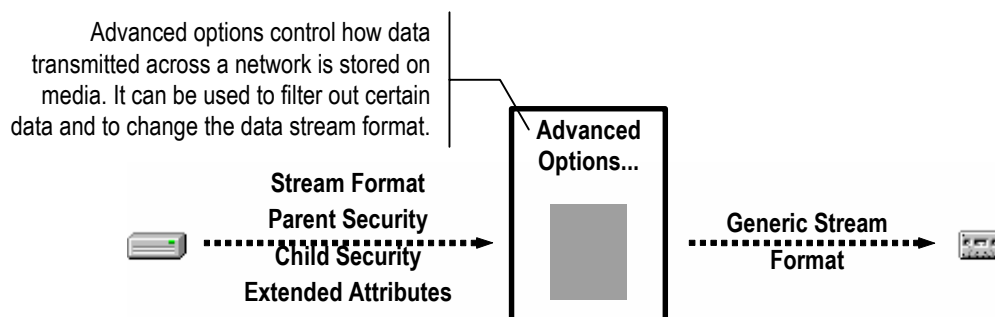
For more information on the **Queue** tab, see *Queue Tab* in *Chapter 8 — Running Jobs*.

Note that NovaNET does NOT automatically update these five parameters when you manually “force” a scheduled job to run. For example, when NovaNET automatically runs a scheduled backup job on a Monday, it changes (updates) the **Backup Mode** from **Full** to **Incremental**, but does not automatically update these parameters.

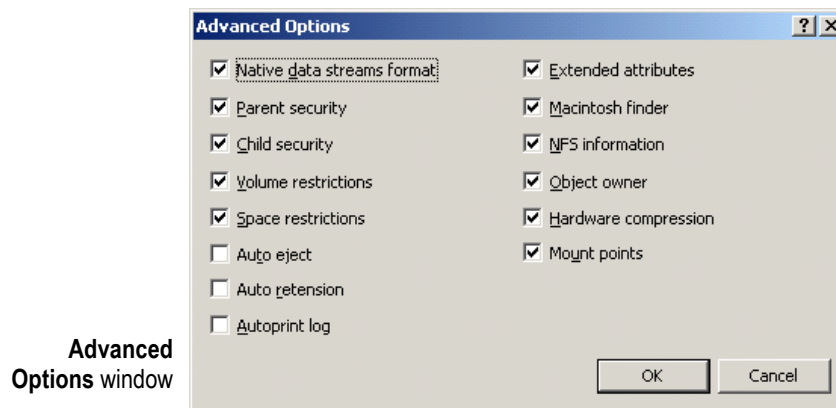
When you run an unscheduled or manual rotation job, NovaNET always uses the parameters selected by the user.

Advanced Options

The **Advanced Options...** button on the **Options** tab allows the user to specify certain parameters controlling how files are stored on media. In particular, these options specify whether the data on the media is stored in the same form as it was transmitted across the network. NovaNET can either store the data in a format specific to a particular network platform or in a generic format. Similarly, NovaNET can store all of the data it receives or filter out some of the data used by particular network platforms or operating systems.



In general, the default values should be used. These options are provided only for advanced users who need to customize their backup jobs for unique circumstances. These options might be used in one of two circumstances: when transferring data from one network platform or operating system to another; or when demands on network traffic require that a backup job be run as quickly as possible. *Unless you have specific needs that require changes to the advanced options, leave the default values unchanged.*



These options are applicable to both *backup* and *restore* jobs. Note that both job types can filter out certain data, such as security information. However, restore jobs cannot *add* data that was not originally stored on the media.

Native Data Streams Format

Different network software transmits data across the network to NovaNET in different formats. In particular, Windows, NetWare, Linux and FreeBSD use different data stream formats. If you are going to share data from one network platform to another, the data should be stored on media in a common data format, *not* in the native data streams format.

Check this option when you do not plan to share data between different network platforms. When this option is checked, NovaNET generally runs backup jobs more quickly.

Clear this option when you plan to share data between different network platforms, such as from a Windows server to a NetWare server.

Warning Security is an issue to consider when checking this option. When this option is checked, NovaNET backs up all security information that network software includes in the data stream. If the option is unchecked, NovaNET uses a generic format that removes security information.

Parent Security

When checked, NovaNET includes Windows, NetWare, Linux and FreeBSD parent security information, that is, the access control list and trustee information that controls who can see and modify the *directories*. If this option is unchecked, NovaNET filters out the parent security information that it receives from the network during a backup job and that it would transmit across the network during a restore job.

Child Security

When checked, NovaNET includes Windows, NetWare, Linux and FreeBSD child security information, that is, the access control list and trustee information that controls who can see and modify the *files*. If this option is unchecked, NovaNET filters out the child security information that it receives from the network during a backup job and that it would transmit across the network during a restore job.

Volume Restrictions

NetWare controls the maximum amount of space a user can use on a volume. When this option is checked, NovaNET includes this information about the volume in the backup media. If this option is unchecked, NovaNET filters out the volume restrictions that it receives from the network during a backup job and that it would transmit across the network during a restore job.

Space Restrictions

NetWare controls the maximum amount of space a directory can use on a volume. When this option is checked, NovaNET includes this information about the directories in the backup media. If this option is unchecked, NovaNET filters out the space restrictions that it receives from the network during a backup job and that it would transmit across the network during a restore job.

Auto Eject

When this option is checked, NovaNET automatically ejects the tape at the end of the backup job. This feature only works on devices that support software eject.

Auto Retension

When this option is checked, NovaNET automatically retensions the tape at the beginning of the backup job. This feature winds the tape cartridge end-to-end, applying equal tension to the entire tape for maximum tape life and data integrity. Your device must support auto retension to use this feature.

Autoprint Log

When this option is checked, NovaNET automatically prints the log as soon as the backup job is finished. This option is only available on Windows NT (or later) systems and Linux and FreeBSD systems running X Window. For information on configuring this feature, see *Autoprint Log* in *Chapter 8 — Running Jobs*.

Extended Attributes

When this option is checked, NovaNET includes the extended attributes for objects on workstations or servers running operating systems that use extended attributes. Since many operating systems use extended attributes, this option can affect backups from servers and workstations running different operating systems. If this option is unchecked, NovaNET filters out the extended attributes during a backup job. As a result, these attributes will not be available during a restore job.

Macintosh Finder

When this option is checked, NovaNET includes the Finder information for files and directories on workstations or file servers that are using the Macintosh file system. If this option is unchecked, NovaNET filters out the Finder information that it receives from the network during a backup job and that it would transmit across the network during a restore job.

NFS Information

When this option is checked, NovaNET includes NFS information for files and directories on workstations or file servers running a FreeBSD version of NFS. If this option is unchecked, NovaNET filters out the NFS information that it receives from the network during a backup job and that it would transmit across the network during a restore job.

Object Owner

When this option is checked, NovaNET includes the object owner information for files and directories on workstations or file servers running NetWare. If this option is unchecked, NovaNET filters out the object owner information that it receives from the network during a backup job and that it would transmit across the network during a restore job.

Hardware Compression

When this option is checked, NovaNET enables hardware compression. This feature only works on devices that support software control of hardware compression.

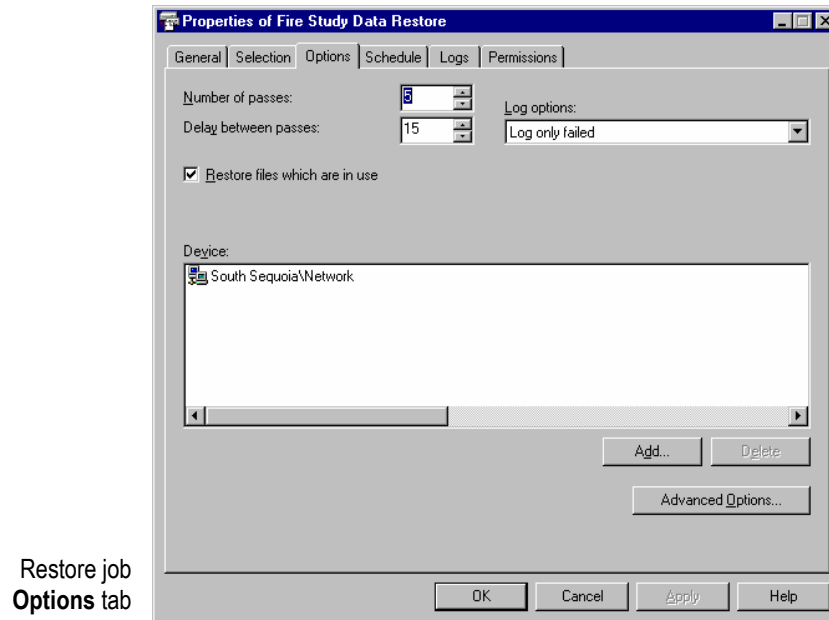
Note We recommend that you select **System** for **Compression type** on the **Options** tab.

Mount Points

When checked, NovaNET includes the mount point information in the backup. If this option is not checked, NovaNET filters out the mount point information from the backup job.

Restore Job Options

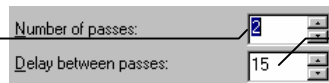
There are fewer and simpler options for restore jobs. In general, these options are similar to options for backup jobs.



Number of Passes

This parameter determines how many times NovaNET will try to open a file for restore before it skips it and continues with the next file. The default is 3.

The **Number of passes** is the number of times an attempt will be made to access a file that may be in use by another user.



The **Delay between passes** is the number of seconds between each of these attempts.

Sometimes when NovaNET is trying to restore a file, the file may already be open, that is, in use by another user, a software program or the operating system. Because the file could change, NovaNET waits until the file is not in use. Each attempt to open a file is called a **pass**. When NovaNET cannot restore a file on the first pass, it tries to restore the file on subsequent passes, up to the **Number of passes**. When it cannot be opened on the last pass, the file fails the restore job.

If your historical usage shows that many files are open during a restore job, set the value to a higher number. This will increase the number of times NovaNET attempts to open a file and may result in fewer files failing to be restored.

Delay Between Passes

This determines how many seconds NovaNET waits before trying the next pass. If your historical usage suggests that many files are being opened on the last pass, consider increasing this parameter to a higher number.

Restore Files in Use

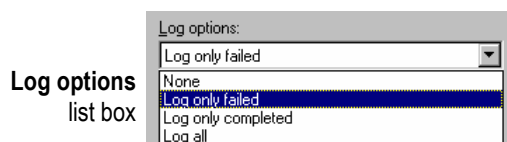
The **Restore files which are in use** option tells NovaNET what to do when files to be restored are in use.

Select this option to restore the backup copy of the open file. (Under Windows, you can access the restored file after reboot.) If you select this option, the restored file will replace your open file. As a result, your current changes may be lost.

Deselect this option to skip over all selected files that are in use. This is useful if the open files are more current than the backed up files.

Log Options

The **Log options** are either **None**, **Log only failed**, **Log only completed** or **Log all**.



NovaNET keeps a log of which files are restored while running a restore job. After a job is run, you can view or print the log to see if the job was completed successfully. The default value is **Log only failed**, which writes in the log any files which were not successfully restored. This information can be vital for checking to see if your job ran successfully.

None This parameter instructs NovaNET to not keep a log of the job as it runs.

Log only failed This parameter instructs NovaNET to log the name of any selected file that was not restored. Use this option to check if a job is running correctly.

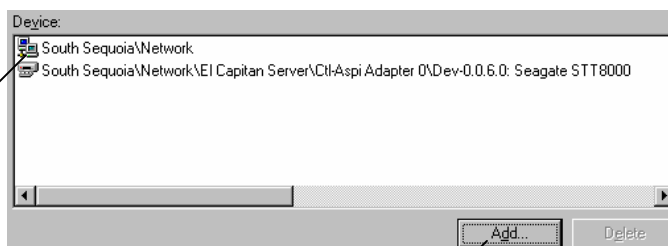
Log only completed This parameter instructs NovaNET to log the name of any file selected that was successfully restored.

Log all This parameter instructs NovaNET to log the name of every file selected and whether or not that file was successfully restored. You can use this option to be certain that a job is running correctly as you planned.

Device

The **Device** option specifies which tape drive or other removable media device NovaNET will use to run the job.

By default, the **Device** option is set to the **Network** container and will use any devices available on the network.



You can specify a particular device to use by adding it to the **Device** list.

By default, NovaNET sets this parameter to the network container. When running the job, NovaNET will use whatever device it finds on the network. If there is only one device in your storage management zone or if you only have permissions to one device, there is no reason to change this parameter.

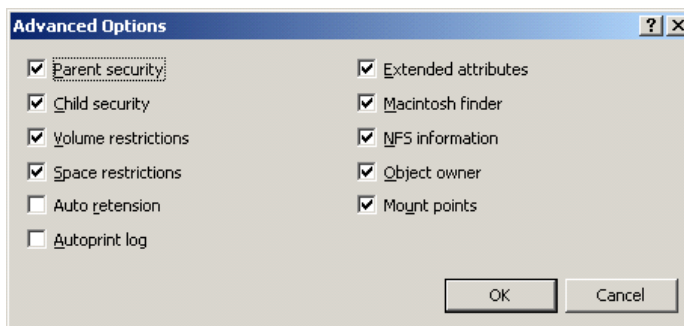
However, if there are several devices on your network and you need to select a specific device, specify which device the job should use by selecting it from the **Device** list. (If a machine has only one device, you can just select the machine and not the device.)

To use a device that is not shown in the **Device** list, click the **Add...** button and select the new device from the **Browse** window. Then select the undesired network container from the **Device** list, click **Delete** and confirm the deletion.

Advanced Options

For restore jobs, you may also specify advanced options. Generally, these options work just like they do for backup jobs, that is, as filters that exclude certain types of data.

Advanced
Options window



Note The **Native data streams format** only appears on the **Advanced Options** window for backup jobs. The format that you selected for the backup job determines whether you can restore the data across platforms. NovaNET does not change the data stream format from its stored format. For more information, see *Native Data Streams Format* earlier in this chapter.

Note Data filters, such as security information and directory attributes, cannot restore data that was not originally backed up to the media. For example, if you did not select **Volume restrictions** for the backup job, NovaNET cannot restore this information because it was never stored on the media.

Parent Security

When checked, NovaNET restores Windows, NetWare, Linux and FreeBSD parent security information, that is, the access control list and trustee information that controls who can see and modify the *directories*. If this option is unchecked, NovaNET filters out the parent security information during the restore.

Child Security

When checked, NovaNET restores Windows, NetWare, Linux and FreeBSD child security information, that is, the access control list and trustee information that controls who can see and modify the *files*. If this option is unchecked, NovaNET filters out the child security information during the restore.

Volume Restrictions

NetWare controls the maximum amount of space a user can use on a volume. When this option is checked, NovaNET restores this information about the volume from the backup media. If this option is unchecked, NovaNET filters out the volume restrictions during the restore.

Space Restrictions

NetWare controls the maximum amount of space a directory can use on a volume. When this option is checked, NovaNET restores this information about the directories from the backup media. If this option is unchecked, NovaNET filters out the space restrictions during the restore.

Auto Retension

When this option is checked, NovaNET automatically retensions the tape at the beginning of the restore job. This feature winds the tape cartridge end-to-end, applying equal tension to the entire tape for maximum tape life and data integrity. Your device must support auto retension to use this feature.

Autoprint Log

When this option is checked, NovaNET automatically prints the log as soon as the restore job is finished. This option is only available on Windows NT (or later) systems and Linux and FreeBSD systems running X Window. For information on configuring this feature, see *Autoprint Log* in *Chapter 8 — Running Jobs*.

Extended Attributes

When this option is checked, NovaNET restores the extended attributes for objects on workstations or servers running operating systems that use extended attributes. Since many operating systems use extended attributes, this option can affect backups from servers and workstations running different operating systems. If this option is unchecked, NovaNET filters out the extended attributes during a restore job. As a result, these attributes are not available with the restored objects.

Macintosh Finder

When this option is checked, NovaNET restores the Finder information for files and directories on workstations or file servers that are using the Macintosh file system. If this option is unchecked, NovaNET filters out the Finder information during the restore.

NFS Information

When this option is checked, NovaNET restores NFS information for files and directories on workstations or file servers running a FreeBSD version of NFS. If this option is unchecked, NovaNET filters out the NFS information during the restore.

Object Owner

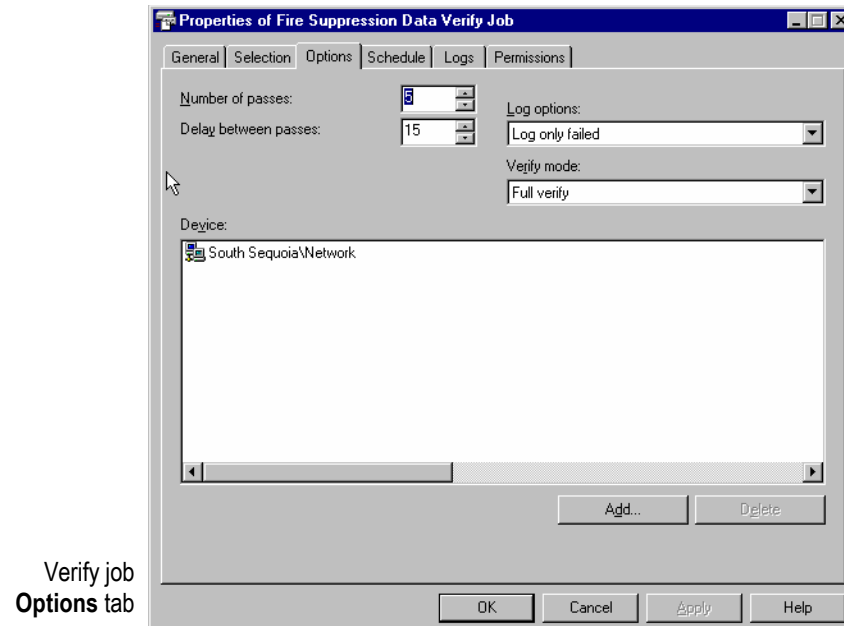
When this option is checked, NovaNET restores the object owner information for files and directories on workstations or file servers running NetWare. If this option is unchecked, NovaNET filters out the object owner information during the restore.

Mount Points

When checked, NovaNET restores the mount point information from the backup. If this option is not checked, NovaNET filters out the mount point information.

Verify Job Options

There are fewer and simpler options for verify jobs. In general, these options are similar to options for restore jobs.



Number of Passes

This parameter determines how many times NovaNET will try to open a file for verify before it skips it and continues with the next file. The default is 3.

The **Number of passes** is the number of times an attempt will be made to access a file that may be in use by another user.

The **Delay between passes** is the number of seconds between each of these attempts.

Sometimes when NovaNET is trying to verify a file, the file may already be open, that is, in use by another user, a software program or the operating system. Because the file could change, NovaNET waits until the file is not in use. Each attempt to open a file is called a **pass**. When NovaNET cannot verify a file on the first pass, it tries to verify the file on subsequent passes, up to the **Number of passes**. When it cannot be opened on the last pass, the file fails the verify job.

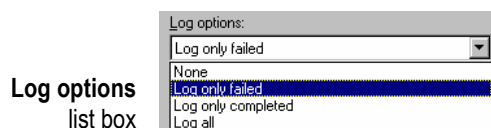
If your historical usage shows that many files are open during a verify job, set the value to a higher number. This will increase the number of times NovaNET attempts to open a file and may result in fewer files failing to be verified.

Delay Between Passes

This determines how many seconds NovaNET waits before trying the next pass. If your historical usage suggests that many files are being opened on the last pass, consider increasing this parameter to a higher number.

Log Options

The **Log options** are either **None**, **Log only failed**, **Log only completed** or **Log all**.



NovaNET keeps a log of which files are verified while running a verify job. After a job is run, you can view or print the log to see if the job was completed successfully. The default value is **Log only failed**, which writes in the log any files which were not successfully verified. This information can be vital for checking to see if your job ran successfully.

None This parameter instructs NovaNET to not keep a log of the job as it runs.

Log only failed This parameter instructs NovaNET to log the name of any selected file that was not verified. Use this option to check if a job is running correctly.

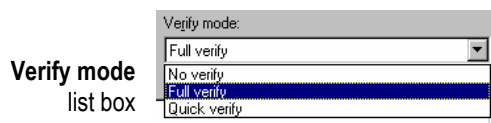
Log only completed This parameter instructs NovaNET to log the name of any file selected that was successfully verified.

Log all This parameter instructs NovaNET to log the name of every file selected and whether or not that file was successfully verified. You can use this option to be certain that a job is running correctly as you planned.

Verify Mode

The **Verify mode** is either **No verify**, **Full verify** or **Quick verify**.

When NovaNET runs a verify job, it checks to see if the data on the media is readable and whether or not it matches data from the original source (that is, from the workstation or file server).



No verify This parameter instructs NovaNET to skip the verification step. If you select this step, the verify job will not run.

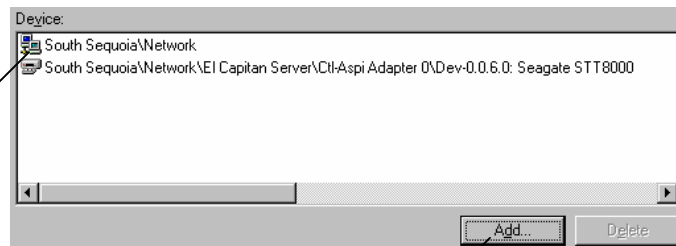
Full verify This parameter instructs NovaNET to compare every selected file stored on the media with the original file from the workstation or file server. This default option is strongly recommended.

Quick verify This parameter instructs NovaNET to be certain that every file backed up onto the media is in readable condition. It does not verify that the data is correct, only that the data stored on the media (incorrect or not) can be read. While selecting this option can save time, it is nonetheless not recommended.

Device

The **Device** option specifies which tape drive or other removable media device NovaNET will use to run the job.

By default, the **Device** option is set to the **Network** container and will use any devices available on the network.



You can specify a particular device to use by adding it to the **Device** list.

By default, NovaNET sets this parameter to the network container. When running the job, NovaNET will use whatever device it finds on the network. If there is only one device in your storage management zone or if you only have permissions to one device, there is no reason to change this parameter.

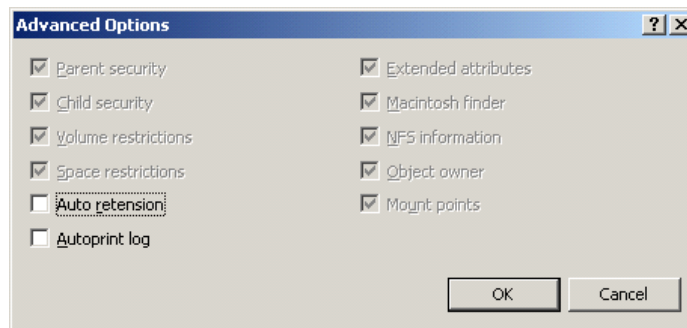
However, if there are several devices on your network and you need to select a specific device, specify which device the job should use by selecting it from the **Device** list. (If a machine has only one device, you can just select the machine and not the device.)

To use a device that is not shown in the **Device** list, click the **Add...** button and select the new device from the **Browse** window. Then select the undesired network container from the **Device** list, click **Delete** and confirm the deletion.

Advanced Options

For verify jobs, you may also specify advanced options. Generally, these options work just like they do for backup and restore jobs.

**Advanced
Options window**



Auto Retension

When this option is checked, NovaNET automatically retensions the tape at the beginning of the verify job. This feature winds the tape cartridge end-to-end, applying equal tension to the entire tape for maximum tape life and data integrity. Your device must support auto retension to use this feature.

Autoprint Log

When this option is checked, NovaNET automatically prints the log as soon as the verify job is finished. This option is only available on Windows NT (or later) systems and Linux and FreeBSD systems running X Window. For information on configuring this feature, see *Autoprint Log* in *Chapter 8 — Running Jobs*.

Chapter 8 — Running Jobs

NovaNET will automatically run jobs that are scheduled. You can view jobs scheduled to be run on the **Queue** tab and you can track the progress of a job as it runs from the job's **Status** window.

In This Chapter

- Overview
- Queue Tab
- Running Scheduled Jobs
- Running Unscheduled Jobs
- Job Status Window
- Job Logs
- Audit Logs

Overview

For jobs that are not scheduled, NovaNET will only run the job when you instruct it to do so. Scheduled jobs run automatically as scheduled. You can view what jobs are scheduled to run on the **Queue** tab, which indicates when a job is scheduled to run and provides a short summary of a job's progress as it runs. When NovaNET automatically runs a scheduled job from the **Queue** tab, it updates the option parameters for that job before running it.

You can also “force” scheduled jobs to run before they are scheduled. When a scheduled job is forced to run, NovaNET does not automatically update parameters on the job's **Option** tab. Forcing a job to run can also affect the permissions NovaNET uses when it runs the job. Be certain to read *Forcing Scheduled Jobs to Run* later in this chapter for more information on how forcing a scheduled job to run affects the parameters NovaNET uses to run the job.

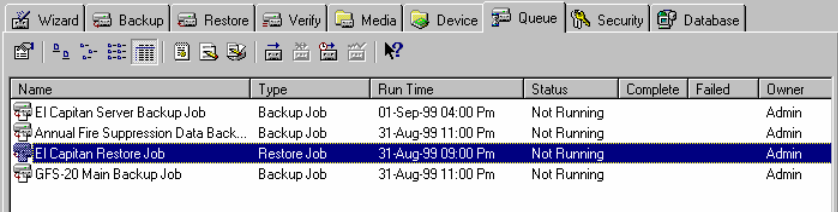
The **Status** window provides detailed information about the progress and status of jobs as they run. You can use this window to see that a job is running properly. After a job has completed running, you can view and print the **Job Log** to check what files were successfully or unsuccessfully backed up, verified or restored.

Queue Tab

After a job has been scheduled to run, NovaNET displays the job and information about it on the **Queue** tab. This tab shows all of the jobs that are scheduled to run. As new jobs are created and scheduled, they are listed on the **Queue** tab. Each scheduled job is listed only once using information for the next scheduled time that job is to run.

Unscheduled jobs that NovaNET has been instructed to run also appear on the **Queue** tab, but only after you have manually instructed them to run.

Details view
of the **Queue** tab



Name	Type	Run Time	Status	Complete	Failed	Owner
El Capitan Server Backup Job	Backup Job	01-Sep-99 04:00 Pm	Not Running			Admin
Annual Fire Suppression Data Back...	Backup Job	31-Aug-99 11:00 Pm	Not Running			Admin
El Capitan Restore Job	Restore Job	31-Aug-99 09:00 Pm	Not Running			Admin
GFS-20 Main Backup Job	Backup Job	31-Aug-99 11:00 Pm	Not Running			Admin

Queue Tab Details View



Details button

The **Details** view on the **Queue** tab provides the most useful and important information about scheduled and currently running jobs.

The **Name** and **Type** fields show the name of the job and whether it is a backup, restore or verify job. The **Run Time** field indicates the date and time the job is next scheduled to run. The **Schedule Type** field indicates what type of schedule that job has, such as **GFS-30** or **Custom**.

The **Status**, **Complete** and **Failed** fields provide a short summary of a job's current status. The **Status** field indicates if the job is currently running and if so, what procedure is currently being performed. The **Complete** and **Failed** fields indicate what percentages of the files selected have been successfully or unsuccessfully backed up, restored or verified.

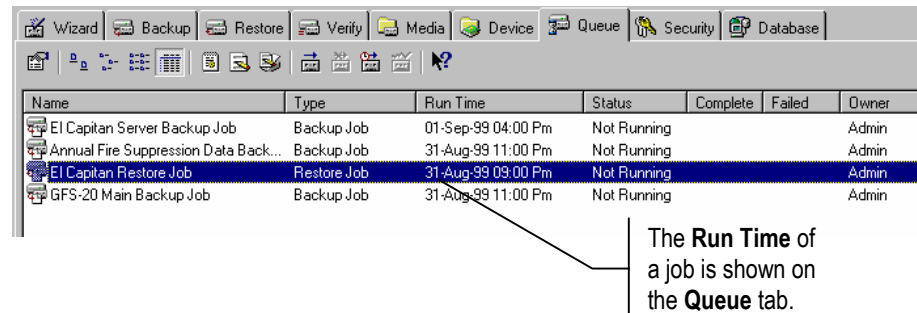
The **Owner** field indicates what user permissions information NovaNET will use to calculate the permissions for the job when it is run.

Running Scheduled Jobs

Scheduled jobs are normally run automatically by NovaNET, but you can also “force” a scheduled job to run.

Automatically Running Scheduled Jobs

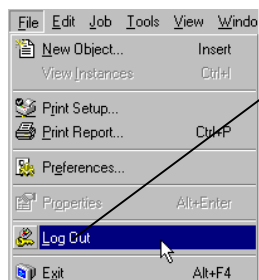
When you close the property sheet of a job, NovaNET calculates the next time the job is scheduled to run and places the job on the **Queue** tab. The **Run Time** field in the **Details** view on the **Queue** tab shows the date and time the job is scheduled to run. This is true for jobs scheduled with automatic or manual rotation schedules.



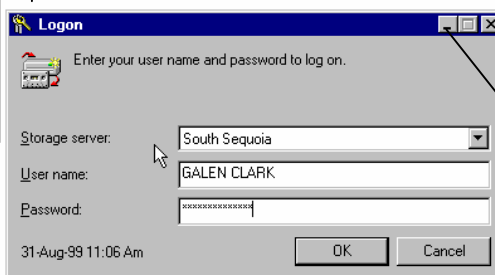
These jobs will run automatically if NovaNET is open at the scheduled date and time. It is not necessary for a user to be logged on to NovaNET for the job to run. NovaNET will run scheduled jobs even if the user who created the job has logged out.

For example, suppose you have scheduled a job to run at 11:00 p.m. tonight. When you leave your workstation, log out of NovaNET. *Do not exit or close NovaNET.* When the **NovaNET Logon** window appears, click the minimize button to close the window. Although no user will be logged on, NovaNET will still be open and will execute the job at the scheduled time.

Tip You can install NovaNET as a service on machines running Windows, Linux and FreeBSD. When installed as a service, NovaNET will start automatically whenever the system starts up and run in the background without any user interface. If you want to make sure that scheduled jobs always run, install NovaNET as a service. For more information, see *Appendix E — NovaNET Service* in the *NovaNET Installation Guide*.



If you want scheduled jobs to run, don't close NovaNET. Instead, select **Log Out** from the **File** menu...



...then minimize the **Logon** window to ensure no unauthorized access to the network. Another alternative is to install NovaNET as a service.

Note If the storage management server is turned off when a job is scheduled, the job will run when that machine is started again. Jobs scheduled to run will begin running five minutes after you start NovaNET. (If NovaNET is run as a service, this will be five minutes after startup.) This five-minute lag allows you to modify, update or cancel any pending jobs before they run.

Security and Scheduled Jobs

Scheduled jobs will run whether you log out or not, as long as NovaNET is open or the NovaNET service is running. If you have not logged out, however, unauthorized users will be able work with your security clearance. For this reason, be certain to log out or exit NovaNET before leaving your workstation. This is the only way to ensure that no unauthorized users gain access to sensitive data.

Warning Do not leave the main NovaNET window open when you are not at your workstation. Doing so allows users without security clearance unauthorized access to the network. Be certain to log out of NovaNET before leaving your workstation. If you have jobs scheduled to run, either log out instead of exiting NovaNET or make sure the NovaNET service is running.

Forcing Scheduled Jobs to Run



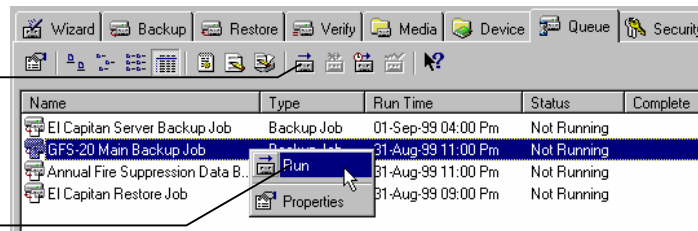
Run button

You can “force” scheduled jobs to run prior to their scheduled time by selecting the job and clicking the **Run** button on the toolbar. Alternatively, you can select **Run** from the **Job** menu, the **Queue** menu or the shortcut (right-click) menu. NovaNET will execute the job immediately.

Note that forcing a job that is scheduled for the same day marks the job as complete for that day. NovaNET resets the job on the next day so it will run as scheduled. As a result, if you force a job to run on the same day that it is scheduled to run, it only runs once on that day.

You can force a scheduled job to run by selecting it and clicking the **Run** button...

...or clicking the job with the right mouse button and selecting **Run**.



How Forcing Jobs to Run Affects Job Parameters

When you force a scheduled job to run before its scheduled time, NovaNET does not automatically update certain parameters on the **Options** tab of the job. Recall that when a scheduled job *with an automatic rotation* is run, NovaNET updates the **Backup mode**, **Write mode**, **New media location**, **New media name** and **Media** parameters on the **Options** tab of the job to reflect that job's place in the rotation schedule. However, when a job is forced to run before its scheduled time, NovaNET does not update these option parameters.

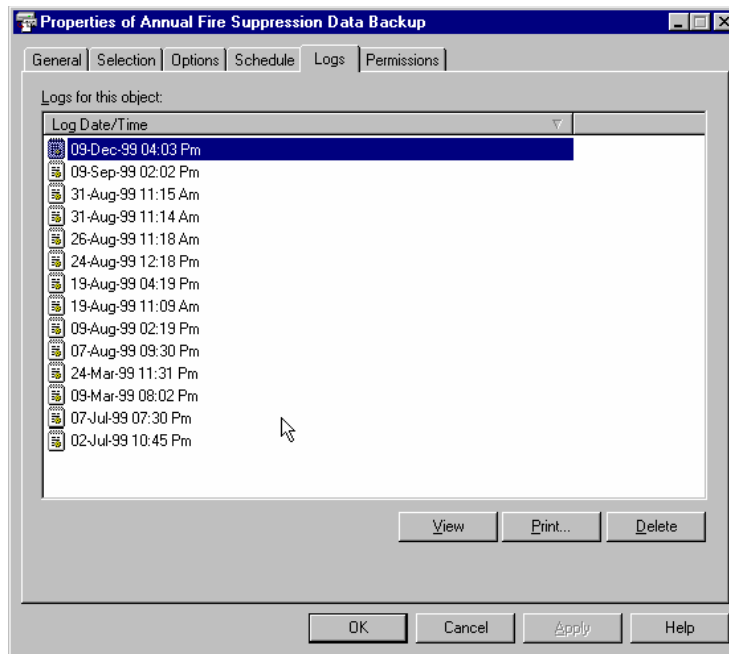
For example, suppose that a backup job is scheduled to run as an incremental job in the evening. If it is forced to run before its scheduled time, NovaNET will not update the **Backup Mode** parameter. In this case, if the last time the job was run, it was as a full backup job, the **Backup Mode** parameter on the job's **Option** tab will still be set to **Full**. As a result, when you force the job to run, it will be run as a full backup job, even though it is next scheduled to run as an incremental job.

When you force a scheduled job to run, the **Backup mode**, **Write mode**, **New media location** and **New media name** are not updated.

You must manually set the **Backup mode** and other options before forcing a scheduled job to run.

Forcing a job to run can be useful when a job failed to run for some reason. For example, suppose a full backup job is scheduled for a Saturday, but a network equipment malfunction prevented the job from being run as scheduled. It is important that another *full* backup job be run before the next *incremental* job. This is the only way to ensure that the full data recovery period is not compromised. On Monday, you can force the failed backup job to run again after the network connections are restored. Before you run the job, open the job's property sheet and make sure the proper job type and media are selected.

Before forcing a scheduled job to run, you should always check the **Options** tab of the job to see that the option parameters are set correctly. If you are forcing the job to run because an earlier job failed to run properly, you can look at the log of the failed job to see what parameters the job would have used.



Logs tab

How Forcing Jobs to Run Affects Permissions

When a job is run, NovaNET will check for the appropriate permissions to the device, files, media and so forth. NovaNET calculates these permissions by using the permissions of the job's **Owner**. The owner of a job is the user who either scheduled the job or forced the job to be run. After a job is run, the job owner is reset to the last user who changed the job properties; forcing a job to run does not permanently change the job owner.

File Edit Queue Tools View Window Help						
Wizard Backup Restore Verify Media Device Queue Security Database						
Name	Type	Run Time	Status	Complete	Failed	Owner
El Capitan Server Backup Job	Backup Job	10-Sep-99 04:00 Pm	Not Running			Admin
GFS-20 Main Backup Job	Backup Job	31-Aug-99 11:00 Pm	Scanning fo...	0%	0%	Admin
Annual Fire Suppression Data B...	Backup Job	01-Sep-99 11:00 Pm	Not Running			Admin
NetWare from NT Restore	Restore Job	31-Aug-99 11:00 Pm	Not Running			Admin
El Capitan Server Verify Job	Verify Job	31-Aug-99 11:00 Pm	Not Running			Admin

When a scheduled job is run, the job's **Owner** is used to calculate what permissions are necessary for the job to run. If you force a job to run, the job's **Owner** becomes whoever forced the job to run.

When the NovaNET administrator creates and schedules a job, the owner of the job is the administrator. NovaNET will use the NovaNET administrator's permissions when running the job. Similarly, if another user creates and schedules a job, that user will be the job's owner and NovaNET will calculate the job's permissions using that user's permissions.

However, if a scheduled job is forced to run, the person who forces the job to run becomes the job's new owner. So, for example, if the NovaNET administrator forces a job to run that another user has created, the NovaNET administrator becomes the job's new temporary owner and NovaNET calculates the permissions using the NovaNET administrator's permissions.

Changing the job's owner can be useful for managing security. A user can create and schedule a job, even though that user lacks the proper permissions to run that job. Another user, such as the NovaNET administrator, can then force that job to run with their own permissions.

Viewing and Printing Scheduled Job Instructions

Whenever a job is scheduled and placed on the **Queue** tab, NovaNET creates a set of *instructions* for that job. Included in a job's instructions is information about which media set must be available to be used and which backup devices it may be inserted into. For example, when running an automatic rotation job, the instructions for that job include the name of the media NovaNET is expecting to use when that job runs next, such as "Daily Set 1" or "Yearly Set 2". The instructions also include the name of the backup devices which NovaNET expects to be available when the job runs.

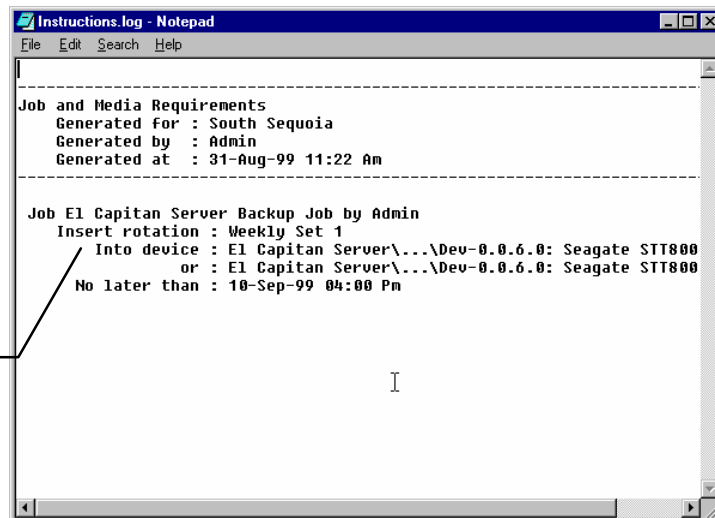
Tip You can use the instructions in order to ensure that all of your jobs run correctly by planning ahead to see that each job has the media it requires before it runs. For example, you can print the instructions and then assign a co-worker the task of inserting the proper media into various backup devices by the required time.



View
Instructions
button

You can view the **Instructions** for the jobs currently scheduled on the **Queue** tab by clicking the **View Instructions** button on the toolbar of the **Queue** tab or by selecting **Instructions** from the **Tools** menu. NovaNET will open the **Instructions** in a window of an external text editor, such as Windows Notepad. You can also print the **Instructions** by clicking on the **Print Instructions** button or from the **Tools** menu. (To change the external text editor with which you wish to view and print the **Instructions**, select **Preferences** from the **File** menu.)

You can print or view the instructions for all of the jobs scheduled on the **Queue** tab. Use the instructions to insure that the proper media and backup devices are available before a job is scheduled to run.



```
Instructions.log - Notepad
File Edit Search Help

-----
Job and Media Requirements
Generated for : South Sequoia
Generated by  : Admin
Generated at  : 31-Aug-99 11:22 Am
-----

Job El Capitan Server Backup Job by Admin
Insert rotation : Weekly Set 1
Into device    : El Capitan Server\\...\\Dev-0.0.6.0: Seagate STT800
or             : El Capitan Server\\...\\Dev-0.0.6.0: Seagate STT800
No later than  : 10-Sep-99 04:00 Pm

I
```

Running Unscheduled Jobs

If you did not schedule the job, then you must manually instruct NovaNET to run the job when you want it to run. To run the job, select the job and then click the **Run** button on the toolbar, select **Run** from the **Job**, **Queue** or shortcut (right-click) menu, or double-click on the job. NovaNET asks you to confirm and then executes the job immediately.

Unscheduled Job Parameters and Permissions

When an unscheduled (or manual rotation) job is run, NovaNET uses the current parameters on the job's **Options** tab.

Similarly, the owner of the job is the person that instructed NovaNET to run the job. NovaNET calculates the permissions of the job using this user's permissions, that is, the permissions of the job's owner. Note that the creator of a job and its owner are not necessarily the same user.

Job Status Window



Status button

Each time NovaNET runs a job, it goes through a predetermined series of steps. Many of these steps are indicated in the **Status** window of the job. If you have run the job manually, NovaNET will automatically show the **Status** window. If the **Status** window of a job that is running is not displayed, you can open it by selecting the job and clicking on the **Status** button or by selecting **Status** from the **Job**, **Queue** or shortcut (right-click) menu.

Summary
view of the job
Status window

	Selected:	Completed:	Warnings:
Objects:	0	0%	0
Size:	0 KB	0%	0 KB

You can change what information is displayed in the **Status** window by selecting an option from the **Display** list box. This allows the user to inspect how various components of the backup job are running and locate potential problems. Many of the fields in the display box are self-explanatory; if you require additional help, use the context-sensitive help. To see a short description of the different fields, right-click the field to view the **What's this?** window. Or, alternatively, press **F1** to display context-sensitive help for the targeted area.

The **Display** list
box shows the
different **Job**
Status window
views available.

Job Status Messages

As jobs are run, NovaNET displays messages in the **Status** message box indicating the progress of the job. These messages are also displayed in the job's **Status** field on the **Queue** tab. Which messages are displayed depends on the type of job being run. The following short descriptions indicate what procedures NovaNET is performing as each message is displayed.

Building...Selection List The first step is to create a list of files to be backed up, verified or restored. For backup jobs, NovaNET uses the selection criteria and the backup job type (whether full, incremental or differential) to create a list of files to be backed up. The number of files and the total size of the selected files are indicated in the **Objects** and **Size** fields under **Selected**.

Objects and Size fields	Selected:	
	Objects:	3362
	Size:	248933 KB

Mounting Media NovaNET displays this message as it mounts the media. During this step, NovaNET reads identification information stored on the tape. NovaNET then checks to see if the media already exists in the storage management database and whether or not the current job can be run using this media.

If NovaNET can use the mounted media with the current job, it proceeds to the next step.

If the mounted media cannot be used for this current job, the next step is determined by the settings specified on the **Options** tab for the job. For example, NovaNET only formats a blank tape if that option is selected.

Scanning for Device This message is displayed when NovaNET is looking for a device to use with the current job. This message might be displayed when the current media cannot be used with this job or when NovaNET cannot find a device on the network.

Note Many times this message will be accompanied by an alert. You can view any current alerts by clicking the **Alert** button on the **Status** bar.

Formatting Media If the media is already formatted, NovaNET proceeds to the next step. Otherwise, NovaNET formats the media according to the **Auto format mode** setting on the **Options** tab for the job.

Opening Device Once the media is mounted and formatted, NovaNET readies the media and device for the job.

Running After opening the device, NovaNET runs the job. As the job is run, the **Status** window automatically displays current information about the job, including which files are being backed up, restored or verified, which streams are active and the rate (or **throughput**) at which files are being written to media or volumes. You can use the **Display** list box to check the progress of individual streams or the throughput of a specific device.

Waiting for Next Pass If some files were not backed up, restored or verified during the first pass, such as when they are being used by other users, NovaNET attempts to access these files on subsequent passes. This message is displayed while NovaNET waits for the number of seconds specified in the **Delay between passes** field on the **Options** tab of the job.

Closing Device When NovaNET closes a device, it displays this message.

Building Logs and Audit Trails After closing the device, NovaNET updates the storage management database with new information from the job, such as which files were backed up, and creates a log of the job. The specific log contents depend on the **Log options** setting on the **Options** tab for the job. For more information, see *Audit Logs* later in this chapter.

Merging Groups After a backup job has run, NovaNET updates the storage management database to reflect any changes to media or files created by the current job. Prior to running a restore or verify job, NovaNET sorts all the selected files into the order in which they appear on the media and displays this message.

Completed This message is displayed after the job is finished.

Terminated When a job is forced to quit, NovaNET displays this message.

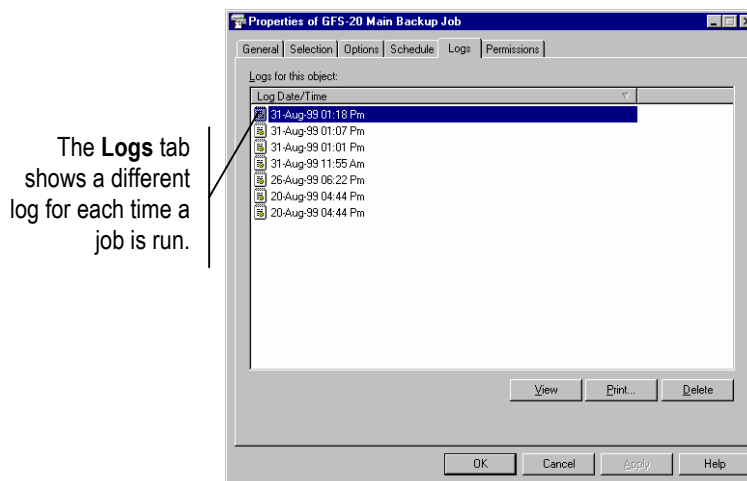
Job Logs

Each time a job is run, NovaNET creates a new log for that job. You can use this information to check if a job is running as you intended and to keep a permanent record of that job. After a job finishes, you can view or print the log, print the log automatically or have NovaNET email it to one or more addresses.

You can specify what information NovaNET should write to the log on the **Options** tab of the job in the **Log options** field. The log always includes summary information about the job, which includes useful information about which option parameters the job used when it ran. Depending on what **Log options** parameter you selected, NovaNET will also include information about which files were successfully or unsuccessfully restored, verified or backed up.

Viewing Job Logs

You can view the logs for a job on the job's **Logs** tab. Note that there is a separate log for each time a job is run.



Note You can also view all the available job logs from the **Instructions and Logs** option on the **Wizards** tab.

For more information on selecting a text editor, see *Preferences Window* in *Chapter 12 — Object and Property Reference*.

To view the log of a particular job, open the **Logs** tab of the job. Select the appropriate log in the **Log Date/Time** box. When you click the **View** button, NovaNET opens the log in a text editor. Specify the text editor to use in the **Preferences** window (see *Preferences Window* in *Chapter 12 — Objects and Properties Reference*).

To print a particular log, select it and then click the **Print** button. Note that some logs can be very long; check the length of the document before printing it.

If you run a job repeatedly, you may want to delete old logs. Simply select the job log and then click **Delete**. You can also select multiple logs to delete. Use the CTRL and SHIFT keys or drag the mouse over the logs.

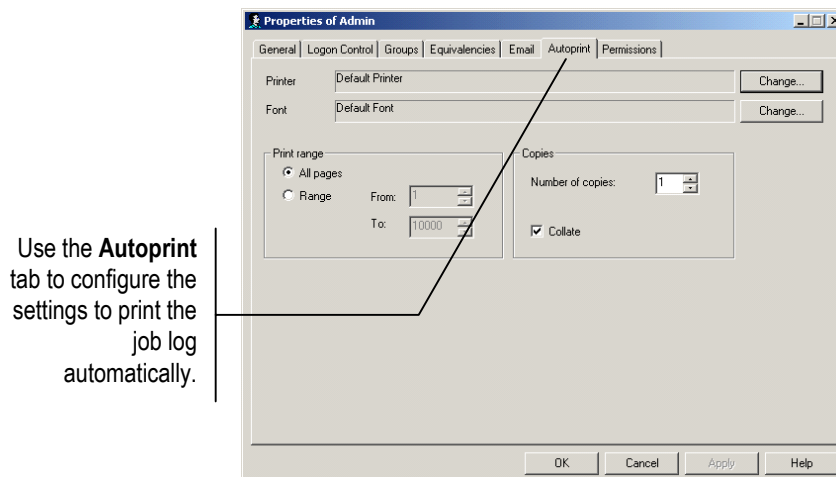
Note The maximum number of logs per job is 64. NovaNET will overwrite the oldest log when you reach this maximum.

Autoprinting Job Logs

NovaNET provides a convenient method for you to print the job log automatically. This way you don't have to manually print a copy of each job log.

Note To print from a Windows NT (or later) system to a network printer, you must configure the NovaNET service to log on to the printer (see *Appendix G — Configuring Autoprint for Windows* in the *NovaNET Installation Guide*).

The **Autoprint** tab appears on the property sheet of each user object. You can select a specific printer, font, print range and number of copies. NovaNET prints the job log automatically as soon as the job finishes, according to the autoprint settings of the job owner.



To configure this feature, access the group or user from the **Security** tab. Then click the **Autoprint** tab. Update your settings and click **OK**.

Note You must also select the **Autoprint log** option on the **Advanced Options** window to automatically print the job log. For more information, see *Autoprint Log* in *Chapter 7 — Job Options*.

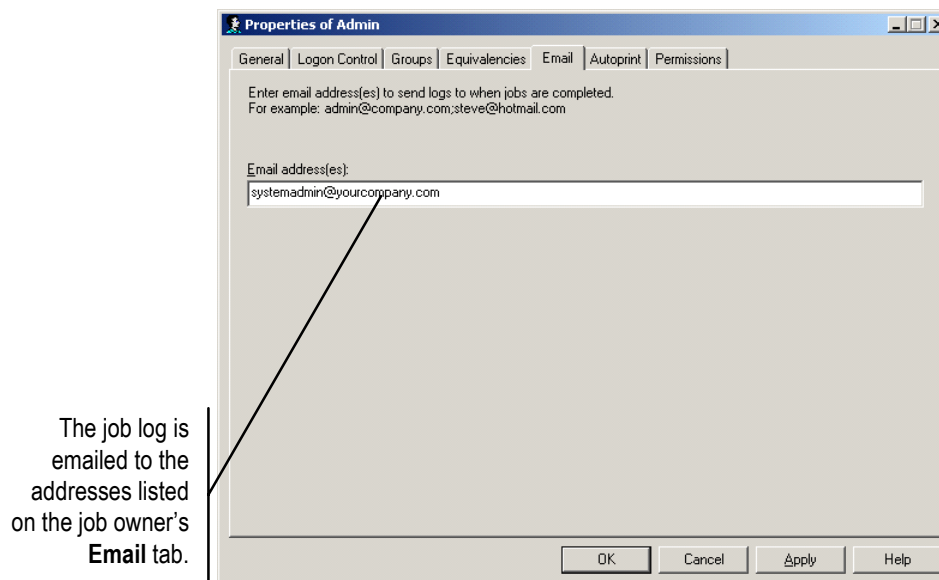
Emailing Job Logs

NovaNET can send you an email automatically when a job has completed. This way you can know for certain that a job has run successfully or the reason why a job has failed to run correctly. If you can retrieve your email remotely, you can monitor your jobs, even if you are away from the office.

Note If a job fail before it can generate a log, NovaNET cannot email you the job log.

To use this feature, you must install and configure the email support option (see *Appendix C — Configuring Email Options* in the *NovaNET Installation Guide*).

When the email support option is installed, the **Email** tab appears on the property sheet of each user object. To use this option, access the group or user from the **Security** tab. Then click the **Email** tab.



You must enter valid email addresses for each job log recipient. Then click **OK**. Upon job completion, NovaNET emails the job log to the addresses listed on the **Email** tab for the job owner.

For more information on the job owner, see *How Forcing Jobs to Run Affects Permissions* earlier in this chapter.

The job owner is generally the person who scheduled the job. If a different user forces a scheduled job to run, that user becomes the job's temporary new owner. After the forced job has run, NovaNET resets the job owner to the last person who changed the job's properties. You can confirm who owns a job by checking the **Owner** field on the **Queue** tab.

The job log is sent to whatever addresses are listed on the **Email** tab. To specify multiple addresses on the **Email** tab, separate each address with a semicolon (no spaces). Additionally, you can enter the same address on each user's **Email** tab, which would send a copy of *every* job log to the same user. For example, you might send the NovaNET administrator the log of every job that runs. Alternatively, consider setting up a separate email account for the sole purpose of receiving job logs.

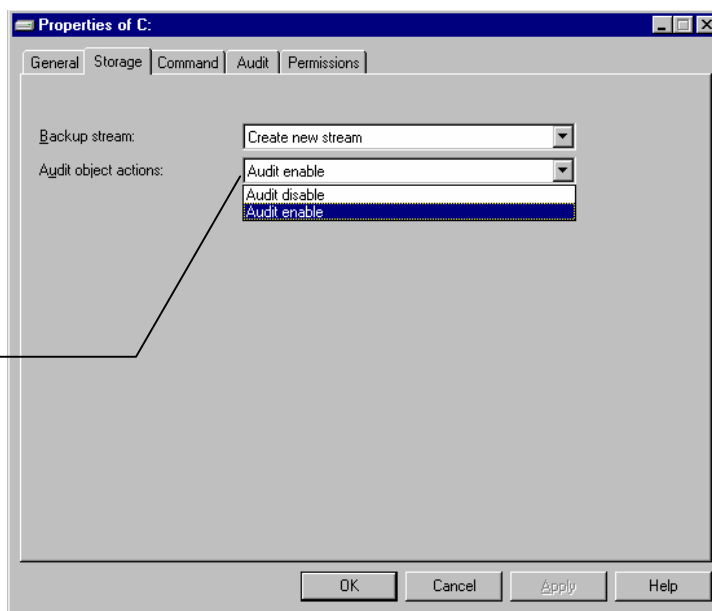
Audit Logs

Some files, such as databases, are mission critical and regular backups of these files are essential. It is also essential that system administrators be able to verify that these files have been regularly backed up. NovaNET's *audit trails* allows you to collect, store and print such information about selected files and databases.

You can use NovaNET's auditing feature to track how often and when a file, folder, volume or database is backed up, verified and restored. NovaNET will create an *audit trail* for each object which is *audit enabled*. Each time an action is performed on this object, the audit trail or log is updated with data about when that object was backed up, restored and so forth. The audit log also includes information about the media on which instances of a file are stored.

To create an audit log for an object, you must enable the audit storage property. To do this, open the property sheet for the object and click on the **Storage** tab. Change the **Audit object actions** setting to **Audit enable**. (You can only create an audit trail for objects that have a **Storage** tab, including only files, directories and volumes.)

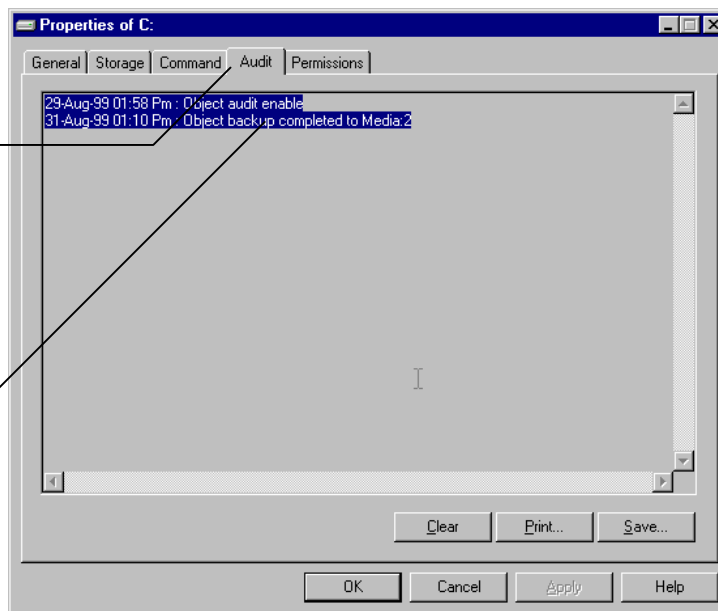
To create an audit log for a file, directory, or volume, set the **Audit object actions** setting on the object's **Storage** tab to **Audit enable**.



When an object has been audit enabled, a new tab appears on its property sheet, the **Audit** tab. Click on this tab to view the audit trail of that object. You can also print the audit log or save it to a file.

When an object's audit property has been enabled, the **Audit** tab appears on its property sheet.

The audit log of an object tracks when that object has been backed up and the media on which instances of it are stored.



Clear Click to erase all audit log entries.

Print Click to print the audit log. Note that some logs can be quite long; check the length of the document before printing it.

Save Click to save the audit log as a text file.

Chapter 9 —Media, Device and Database Tabs

Using the **Media** tab, you can create media folders and media in the NovaNET database and delete them from the storage management database as well. The **Device** tab allows you to perform physical operations with the backup device, such as erasing, formatting and ejecting media. The **Database** tab displays all of the objects in the NovaNET storage management database on a single tab. Many commands can also be executed from this tab.

In This Chapter

- Overview
- Media Tab
- Device Tab
- Database Tab

Overview

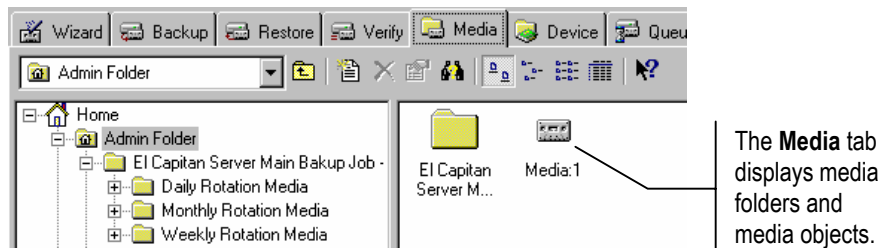
The **Media** tab displays media folders and media objects. You can use this tab to work with these storage management database objects. For example, you can create and delete media folders, as well as create and delete media objects, such as tapes. The **Device** tab, on the other hand, is used to perform physical operations with the backup device. For example, media can be erased and formatted from the **Device** tab.

The difference between the **Media** tab and the **Device** tab is significant: the **Media** tab is used to make changes to the storage management *database* while the **Device** tab is used to perform operations using the physical devices themselves (both media and drives). When you want to make changes to the storage management database, use the **Media** tab. When you want to work with the physical media or with the device itself, use the **Device** tab. For example, if you want to change the name of a tape, you make that change on the **Media** tab because you are making a change to the NovaNET database. However, if you want to identify a tape by reading its header, you must use the **Device** tab.

The **Database** tab displays all of the objects in the current storage management database. This may be useful, on the one hand, because you will be able to see and work with all the database objects at once. On the other hand, because all of the objects are displayed, it may be difficult to work with this tab efficiently.

Media Tab

The **Media** tab displays media folders and media objects in the NovaNET storage management database. You can use this tab to work with these database objects. For example, you can create new media folders and media objects on this tab, as well as delete media folders and media.

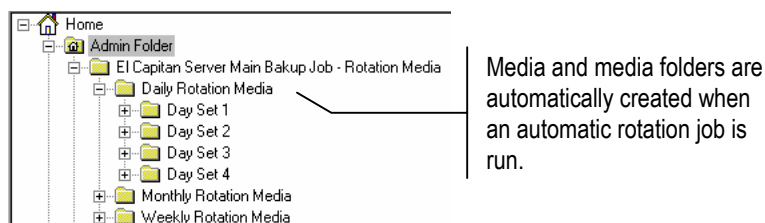


Although you can manipulate media and media folders on the **Media** tab, many of these operations are normally handled automatically by NovaNET. For example, when you run a scheduled (rotation) job, NovaNET will automatically create any new media and media folders needed for that job. As tapes and other media are overwritten and deleted from the storage management database, these changes are automatically reflected on the **Media** tab as well.

Creating Media Folders

For more information on automatically creating media folders, see *Backup Options* Automatically Updated in Chapter 7 — Job Options.

You might wish to create a media folder in which to store media before you create and run a backup job. Note that NovaNET automatically creates new media folders when it runs either a built-in or custom scheduled job. NovaNET will create a media folder in the User/Group folder and give it the name of the scheduled backup job. However, if you run a manual job that is not scheduled, you may want to create a new media folder in which to store the new media for that job.



To Create a New Media Folder

1. Select the existing folder in which you want to store the new **Media** folder. (It cannot be the **Home** folder.)
2. Create the new media folder by either
 - Selecting **New Object...** from the **File** menu and then selecting **Media Folder** from the **New Object** window, or
 - Right-clicking in the NovaNET object detail area and selecting **New Media Folder** from the shortcut menu, or
 - Clicking the **New Object** button on the toolbar and then selecting **Media Folder** from the **New Object** window.
3. Type in the name of the new folder in the tree view area.



New Object
button

Tip After creating a new folder, be certain to specify which users have permissions to it. This is the simplest and fastest way to assign permissions to multiple objects stored in the folder.

Deleting Media Folders



Delete button

When you delete a media folder, you also delete all of the objects contained within it, including any media folders and media. You might want to delete media folders that were used by jobs you no longer plan to run and that contain media that are no longer in use.

To delete media folders, select the folder and then select **Delete** from either the **Edit** menu or the shortcut (right-click) menu. Alternatively, you can click on the **Delete** button on the toolbar.

Before deleting any media folders, you might want to move any media stored in those folders to another folder. For example, you might create a new folder named **Old Media** and move any currently unused media to this folder before deleting the media folders.

Creating New Media

NovaNET automatically creates new media when it runs backup jobs that use blank media or any overwrite setting. However, there may be occasions where you may want to manually create new media prior to running the job. For example, you might be recycling old tapes you no longer use. To be certain that the tapes are labeled correctly and that no tapes are inadvertently overwritten, you might want to manually create new media before running the job.

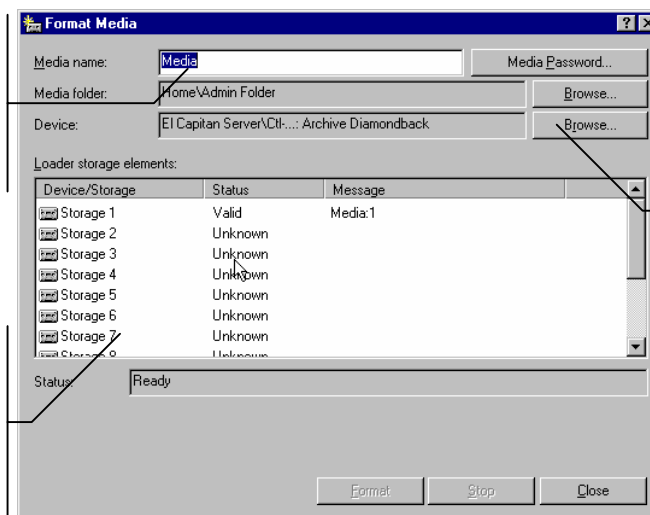
Note, however, that for built-in schedule jobs, NovaNET looks for media with specific names in specific folders. If it does not find the precise media it is looking for, NovaNET will display an alert. For this reason, it is best to let NovaNET automatically create its own media for automatic rotation jobs than to manually create the media in advance.

When you create new media, NovaNET (1) creates a new database object and (2) physically formats the current media in the device. This will cause any current data on that media to be erased. When you create new media, be certain that the media NovaNET will format is no longer needed.

When you format the new media, NovaNET opens the **Format Media** window. Use this window to name the media and select a media folder in which to store the media. You must also select a device. NovaNET will format the media currently loaded in the device you select. If you select an autoloader, select the storage slot that holds the media you want to use.

When you format new media, type the name of the new media in the **Media name** field.

If you are using an autoloader, select the storage slot that stores the media to be formatted.



Use the **Browse** button to select the device you want to use to format the new media.

When you format media, you can also assign the media password. See *Media Passwords* later in this chapter for more information.

To Create a New Media

1. Select the existing folder in which you want to store the new **Media**.
2. Create the new media by either
 - Selecting **New Object...** from the **File** menu and then selecting **Media** from the **New Object** window, or
 - Right-clicking in the NovaNET object detail area and selecting **New Media** from the shortcut menu, or



New Object
button

- Clicking the **New Object** button on the toolbar and selecting **Media** from the **New Object** window.
3. Type in the name of the new media in the **Media name** field of the **Format Media** window.
 4. If the device you want to use is not displayed in the **Device** field, click the **Browse...** button and select the proper device from the **Browse** window.
 5. If you are using an autoloader, select the loader and the storage slot that holds the media you want to use.
 6. If you want to assign a password to the media, click the **Media Password** button and then enter and confirm the password in the **Media Password** window.
 7. Click the **Format** button. NovaNET formats the specified media.

Media Passwords

Whenever you format media, you can assign that media a password. By default, there is no password.

Media passwords are only required on one occasion: when media is *imported* from one storage management database to another database. For example, you might import media from an earlier version of NovaNET to the latest version of NovaNET. Or, alternatively, you might want to transfer data from one storage management zone to another storage management zone. To prevent unauthorized transferring of tapes between secure storage management zones, NovaNET lets you assign a password to any media you create. That password will be required before that media can be imported into a new storage management database.

Note Media passwords are the only security measure that prevents tapes from being imported into another storage management database. For sensitive data, be certain that every media is assigned a password.

Whether or not you assign media a password depends on your particular security needs. Media that has no password can be easily imported into any storage management database. If you do not assign the media a password, mere possession of the tape or media is enough to compromise the security of your data.

Note Early versions of NovaNET automatically assigned **PASSWORD** as the default media password. If you are having trouble importing media created with an early version of NovaNET, try using **PASSWORD** when prompted for the media password.

Deleting Media

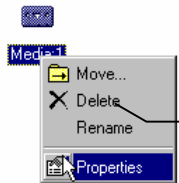
When you delete media, NovaNET deletes information about that media from its storage management database. This includes any instances of files stored on that tape, which are also deleted from the storage management database.

Note however that deleting media does not physically erase the media. The media remains unchanged; only the database is changed. This means that you can still import that tape to another storage management database or, if you wish, back into the original storage management database.



Delete button

To delete media, select the media you wish to delete and then select **Delete...** from the **Edit** menu or the shortcut (right-click) menu. Alternatively, you can click the **Delete** button on the toolbar.



When you delete media, you only remove it from the database. Deleting media does not erase the media.

Media Content

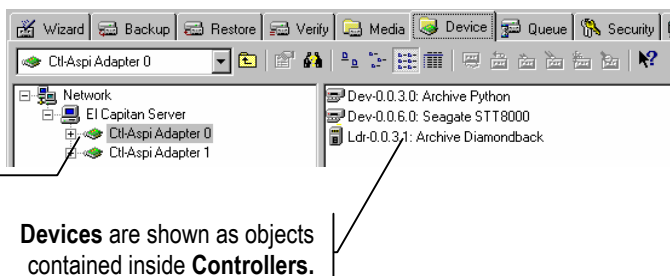
At any time, you can display the contents of any media in the storage management database. Perform one of the following:

- Double-click the media on the **Media** tab. The **Wizard – Media Content** screen appears.
- Click **Media Content** on the **Wizard** tab and follow the on-screen directions.

Device Tab

You can use the **Device** tab to perform physical operations on any backup device in the current storage management zone.

Controllers are usually the adapters to which devices are attached. They act like containers in the storage management database.



Devices are shown as objects contained inside **Controllers**.

Any backup device in the current storage management zone can be displayed in the object detail area. Note that this tab displays two separate types of objects: **Controllers** and **Devices**. Controllers are usually the physical adapters in your machine that connect NovaNET to your physical devices; devices are the actual physical devices. In the NovaNET storage management database, controllers work like containers in which multiple devices are stored.

When you work with devices on the **Device** tab, you can select the *device* in either the object detail area or the tree view area.

Note that autoloaders have two or more drivers associated with them: the **Loader** driver and one or more **Device** drivers. In general, many commands on the **Device** tab can be performed with any one of the drivers selected. (Models and manufacturers vary.) However, if your autoloader supports multiple devices (for example, it has more than one tape read/write device) and you want to use a specific device, you must select that **Device** driver to use it. If you select the **Loader** driver, NovaNET will use the first available device in the autoloader it finds.

Restarting Failed Devices

Sometimes you will need to restart a device that has, for some reason, failed to initialize properly. A device may have stopped for any number of reasons, such as a power failure or a connecting cable malfunction.

When a device is not initialized, it appears with a yellow warning icon. Some devices may take some time to initialize, during which the warning icon will continue to appear. If a device shows the warning icon after it is initialized, press **F5** to refresh the device display.

Devices show a yellow warning icon when they are not initialized.



If there is some other problem with the device or the controller, the warning icon will not disappear. You must identify and correct the problem yourself. Then you must close *both* NovaNET and the NovaNET service.

When you restart NovaNET, it will initialize the device driver again. Check the **Device** tab to see that the devices are now properly working and that they no longer display the warning icon.

Device Tab Commands

After you have selected a device in the object detail area, you can perform physical operations with this device. Some of these operations affect the device itself, while others affect the current media in the device.

The following commands can be found on the **Device** menu. Many of them also have buttons on the toolbar or are available from the shortcut (right-click) menu.

Note Check your hardware documentation to determine which of the following commands are supported by your device. If the command is not available, it will not appear on the shortcut (right-click) menu.

Eject Media

You can use this command to eject media from the selected device. If this command is missing, either your device does not support this command or no device is selected.

Eject Magazine

You can use this command to eject media magazines from the selected autoloader. If this command is missing, your device does not support this command.

Rewind



Rewind button

You can use this command to manually rewind tapes in the selected device. If this command is missing, your device does not support this command.

Retension



Retension button

The **Retension** command winds the tape cartridge end-to-end, applying equal tension to the entire tape for maximum tape life and data integrity. When the tape is fast forwarded and rewound in short amounts, different tension develops and the drive may not report the correct location on the tape.

NovaNET also lets you automatically retension a tape at the beginning of a backup, restore or verify job. If your tape drive supports this option, refer to *Advanced Options* in *Chapter 7 — Job Options*.

Sometimes retensioning can make an otherwise unusable tape operational again.

Note If you need to retension tapes regularly to use them, you may need to service your tape drive or replace your tapes.

Quick Erase and Secure Erase

These commands erase the media currently loaded in the selected device.



Quick Erase
button

The **Quick Erase** command erases the first block and then writes an END OF DATA marker to that first block. The other blocks of the tape are not erased, but when that tape is read, NovaNET treats it as if it were blank because it encounters the END OF DATA marker in the first block.



Secure Erase
button

The **Secure Erase** command erases every block of the tape. This operation can be very time consuming, lasting several hours. However, it will physically erase every block of the tape. If you are attempting to destroy sensitive data, you may want to use the **Secure Erase** command.

Not all devices support both commands. Some support only one of the two erase commands. If a command is missing, the selected device does not support that command.

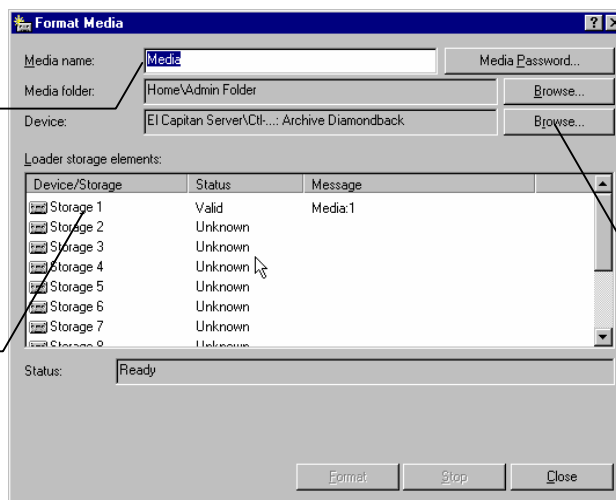
Format Media

You can use this command to format media currently loaded in the selected device.

When you format new media, NovaNET opens the **Format Media** window. Use this window to name the media and select a media folder in which to store the media. NovaNET will format the media currently loaded in the device you select. If you select an autoloader, select the storage slot that holds the media you want to use.

When you format new media, type the name of the new media in the **Media name** field.

If you are using an autoloader, select the storage slot that stores the media to be formatted.



Use the **Browse** button to select the device you want to use to format the new media.

When you format media, you can also assign the media a password. See *Media Passwords* earlier in this chapter for more information.

To Format Media



Format Media
button

1. Select the device with the media to format.
2. Format the new media by either
 - Right-clicking the device and selecting **Format** from the shortcut menu, or
 - Selecting **Format Media** from the **Device** menu, or
 - Clicking the **Format Media** button on the toolbar.
3. Type in the name of the new media in the **Media name** field.
4. If the media folder in which you want to store the media is not displayed in the **Media folder** field, click the **Browse...** button and select the proper media folder from the **Browse** window.
5. If the device you want to use is not displayed in the **Device** field, click the **Browse...** button and select the proper device from the **Browse** window.
6. If you are using an autoloader, select the autoloader and the storage slot that holds the media you want to format.
7. If you want to assign a password to the media, click the **Media Password** button and then enter and confirm the password in the **Media Password** window.
8. Click the **Format** button. NovaNET formats the specified media.

Import Media

This command allows you to use data on media that was created in another storage management zone or by another software program. To use media that was not created in the current storage management database, you must import that media into the current database.

You might import media in one of four situations:

- When you want to use media created by an earlier version of NovaNET.
- When you want to use media created in a different NovaNET storage management zone.
- When you want to use media created by another backup program.
- When you want to use media accidentally deleted from the storage management database.

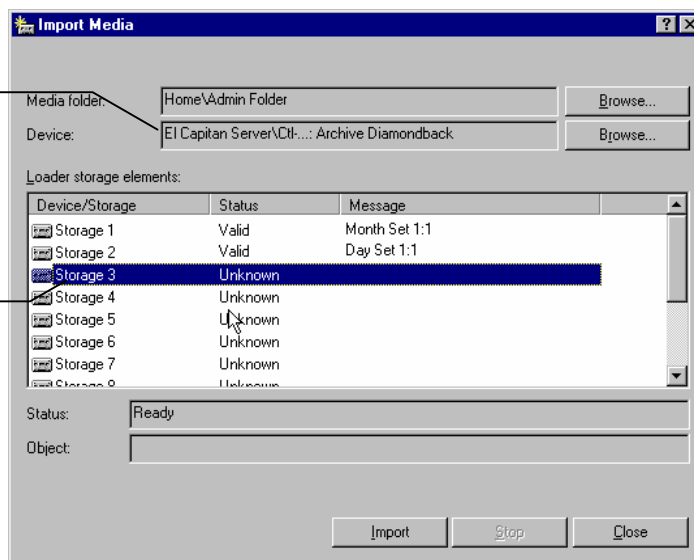
When you import media, you must supply the media password. No password is required if the media has no password.

Note Early versions of NovaNET automatically assigned **PASSWORD** as the default media password. If you are having trouble importing media created with an early version of NovaNET, try using **PASSWORD** when prompted for the media password.

NovaNET will not perform any other operations while it is importing media. Additionally, the process may last several hours. Before you import media, be certain that there is sufficient time to complete this lengthy process. Additionally, you will want to be available to log out of NovaNET when the import is complete, in order that the security of the network is not compromised.

When you import media, select the device you want to use to read the imported media.

If you are using an autoloader, select the storage slot that holds the media you want to import.



To Import Media

1. Insert the media to import into your device.
2. Select **Import Media** from the **Device** menu or the shortcut (right-click) menu. The **Import Media** window appears.
3. The **Media Folder** field displays the folder in which NovaNET will store the imported media. If this is not the folder in which you want to store the media, click the **Browse...** button and select the proper media folder from the **Browse** window.
4. The **Device** field displays the device from which NovaNET will import the media. If the device you want to use is not displayed, click the **Browse...** button and select the proper device from the **Browse** window.

5. If you are using an autoloader, select the storage slot that holds the media you want to import.
6. Click the **Import** button.
7. When the confirmation window appears, click **Yes**.
8. In the **Import Password** window, enter the password for the media you are importing. If the media has no password, leave the field blank.
9. Click **OK**.

Restore Database

The **Restore Database...** command provides a quick method of restoring your current storage management database, e.g., in case it has been lost or corrupted. Use this command only when your current set of media is intact. For example, you might use this command if the storage management server has crashed.

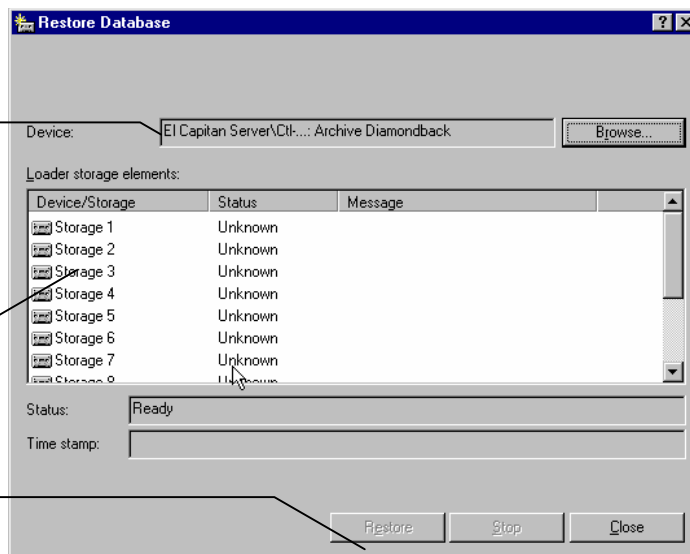
The **Restore Database...** command differs significantly from the **Import Media...** command. The **Restore Database...** command *replaces* the current storage management database with the last known good database on that media. The **Import Media...** command, on the other hand, *does not replace* the current storage management database; it only adds additional data to it.

The advantage of the **Restore Database...** command is that it provides a quick and easy way to replace a lost or corrupted NovaNET storage management database. (You could use the **Import Media...** command to restore a corrupted database, but this process is very time consuming and, if you have multiple tapes, might require many hours or even days.)

To restore a corrupted or lost database, select the device you wish to use on the **Device** tab and select **Restore Database...** from the **Device** menu.

If you are using an autoloader, select the proper storage element...

...and then click **Restore**. After the command completes, quit and restart.



Note All current information in the current NovaNET storage management database will be lost when you use the **Restore Database...** command. This command *does not* append data to the current storage management database; it replaces the current storage management database with the database on that media.

To Restore a Storage Management Database

1. Locate the media on which you have backed up the storage management database you wish to restore. Normally, this is the last backup job run.

Note If you printed the log from the last backup job, you can identify the media which contains the database. To make certain the database is regularly backed up, check the **Selection** tab of the backup job to verify that the database for your zone is checked.

2. Insert the media into the appropriate backup device and then select it in the object detail area of the **Device** tab.
3. Select **Restore Database...** from the **Device** menu or the shortcut (right-click) menu.
4. The **Device** field displays the device from which NovaNET will restore the database. If the device you want to use is not displayed, click the **Browse...** button and select the proper device from the **Browse** window.
5. If you are using an autoloader, select the correct storage slot from the **Device/Storage** field.

6. Click **Restore**.
7. Exit NovaNET to finish the database restore process.
8. If the NovaNET service is running, stop and restart the service (see *Appendix E — NovaNET Service* in the *NovaNET Installation Guide*).

When you restart NovaNET, the database will be restored.

Clean Device

For more information on setting up a cleaning cartridge on an autoloader, see *Status Tab* in *Chapter 12 — Object and Property Reference*.

The **Clean Device...** command will run the backup device through a cleaning cycle.

This command is supported only by autoloaders. If a device in an autoloader provides notification that it needs cleaning and the autoloader has a cleaning cartridge available, a cleaning cycle will be performed automatically at the start of a backup job. If you are using a device that is not an autoloader, you must manually clean the device at the manufacturer's suggested intervals.

To clean a device in an autoloader, highlight the device and select **Clean Device...** from the **Device** menu. NovaNET will check to see if one of the slots holds a cleaning cartridge. If it does, the cleaning cycle will be performed in the background; if not, an error message is shown.

If the **Clean Device...** command is missing, it is not available for your backup device. In this case, a cleaning cycle can often be performed by manually inserting a cleaning cartridge into the backup device.

Identify Media



Identify Media button

Use this command to get the name of the media currently loaded in the device. NovaNET tries to identify the tape or other media that is currently loaded in the device. If NovaNET cannot identify the media, it reads the media header, a process that may take up to several minutes. When NovaNET has learned the name of the media currently loaded, it displays that name in the **Properties of...** window.

Database Tab

All of the objects in the current NovaNET storage management zone are displayed on the **Database** tab. (Like other tabs, of course, you will only be able to see those objects to which you have permissions.)

Many commands can be performed from the **Database** tab, including all of the commands on the **Device** tab and the **Queue** tab. These commands include running jobs, stopping jobs, formatting media and so forth. Note however that you cannot create new objects on the **Database** tab.

The advantage of the **Database** tab is that it can display all of the objects in the storage management database at once. This is also its disadvantage, that so many objects are displayed that it may be cluttered and difficult to work with.



Query button

You can use the **Query** window, however, to limit what files and objects are displayed on this tab. The **Query** window works similar to the **Selection Filters** window for jobs. It sorts through database objects and only displays those which meet the specified criteria.

You can use the **Query** window to 'sort' through the objects in the database in order to only display those objects that match your specified criteria.

For example, you might want to only display files that have not been backed up or only those files that have been deleted. By setting the appropriate filters, you can control which objects are displayed on the **Database** tab. For additional information on how each query filter works, see *Query Window* in *Chapter 12 — Object and Property Reference*.

Chapter 10 — Tips, Techniques and Strategies

This chapter contains information you can use to work more efficiently with NovaNET. The first sections explore managing the storage management database and running jobs faster. The last sections of the chapter cover practical techniques for working with jobs.

In This Chapter

- Managing the Storage Management Database
- Strategies for Faster Jobs
- Working with Permissions
- Working with Scheduled Jobs
- Selecting Files for Jobs
- Restoring Tips
- Other Tips

Managing the Storage Management Database

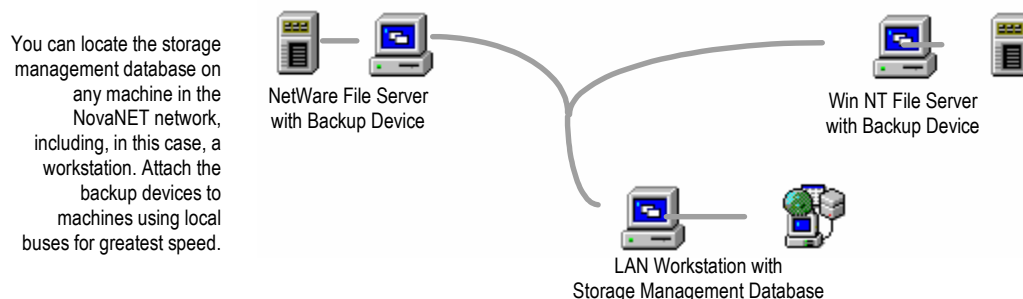
An important decision when planning a comprehensive backup strategy is where to locate the NovaNET storage management database. This section explores some considerations you should review before making this decision.

Where to Locate the Storage Management Database

Consider locating the database on a workstation or file server other than the main file server.

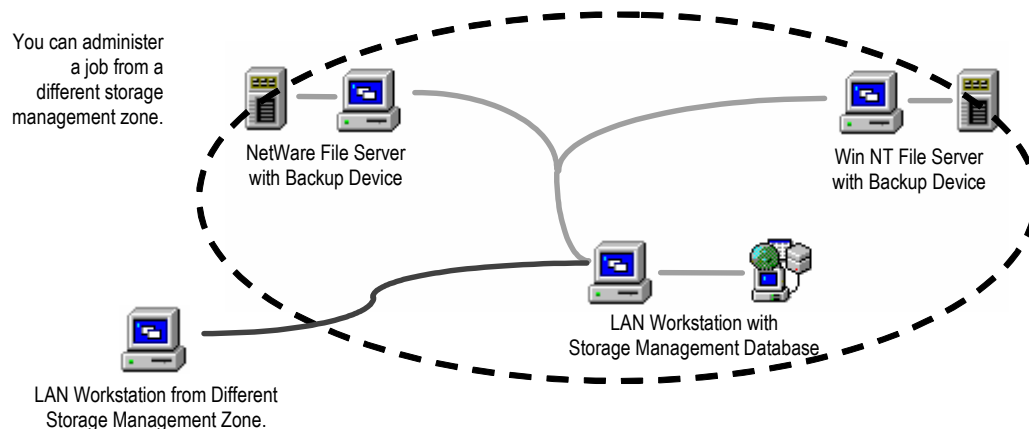
Recall that NovaNET keeps track of objects and properties in a storage management database that it creates and manages. Where should you store this database? That is, on what volume and machine should be storage management server?

NovaNET lets you locate the storage management database on any machine (workstation or file server) or volume in the storage management zone. Note that the storage management database does not have to be on the same machine as the backup device. It could be placed on any volume of any machine that is a member of the storage management zone.



For example, suppose you have a file server with a large RAID device attached. Backup jobs using this RAID device will run fastest when the backup device is placed on the same machine as the RAID device. On the other hand, the storage management database may be best located on another machine other than the file server. This is because if the file server were to become inoperable (for example, the drive were to crash), you would still be able to use the storage management database to restore the file server volumes. Had the storage management database been located on the file server, however, the database must first be restored before other files could be restored. This can be a lengthy, time-consuming process.

A good strategy to consider is to place the backup device on the file server for maximum speed, but to locate the storage management database on a separate machine. Consider this example. Two file servers are connected on an Ethernet network. Each file server has its own backup device, which helps the jobs run faster and more efficiently. The storage management server for all three machines is located on a separate machine, which can be called a “storage management server.” Jobs can be run from this storage management server; additionally, they can also be run from any other machine on the network as well.



Note The backup device could have been placed just as easily on any other machine in the network. NovaNET does not require that the backup device be physically attached to a file server. Additionally, while the term “storage management server” is a convenient label, in fact, NovaNET does not require that this machine be a network server. It could just as well be a client machine or workstation.

This arrangement offers several advantages:

1. Jobs run quickly because most of the data is transferred over local buses, instead of over the network. In this arrangement, NovaNET will automatically route data from each of the file servers over local buses to its own backup device. Whenever there is a choice, NovaNET automatically routes data over local connections rather than network connections.
2. Administering jobs is uncomplicated. Jobs can be created and run from any machine on the network. Note that jobs can also be administered from a machine that is a member of a *different* storage management zone. The NovaNET administrator or other user can log on to this storage management database from another database zone and then create and run jobs in that zone.
3. Suppose a disaster occurs and the RAID device of one of the file servers needs to be replaced. Because the storage management database is located on another machine, recovery is quick and easy. The storage management database contains all of the information necessary to restore the lost data. Had the database been stored on the file server, recovery would have been much more difficult. Note that the backup device on the other file server can be used to help restore the file server that failed.

For more information on restoring a corrupted storage management database, see *Restore Database in Chapter 9 — Media, Device and Database Tabs*.

4. Suppose the storage management server fails and the NovaNET storage management database is lost. While the loss of the storage management server is significant, the file servers are not impacted and they can continue to perform their tasks. Backups can still be run from another machine on the network or, if need be, from the file servers themselves. Since the storage management database was lost, it will have to be imported from existing tapes. This step, however, is not crucial and can be run when convenient, as long as careful backup procedures are followed (that is, no important tapes are overwritten and a full backup job is run immediately).

The advantages of this arrangement extend to any backup strategy or network arrangement. In general, consider placing the NovaNET storage management database on a machine separate from the most important data. At the very least, consider locating the database on a separate volume.

Accounting for Storage Management Database Size

Before deciding where to locate the database, consider how large the NovaNET database might eventually become.

The size of the storage management database is primarily a function of the number of tapes in the backup set, the number of files backed up and the number of instances of each file on valid media. To a lesser extent, the number of objects in a storage management database and the properties of those objects affect the size of the database.

In its storage management database, NovaNET assigns

- 40 bytes for each instance of a file,
- 128 bytes for each database object, and
- 1024 bytes for the properties associated with objects.

You can use these figures to estimate the size of the storage management database. Files are by far the most numerous of the objects in the database, so much so that the size of the other objects (such as users and jobs) is negligible. Each file that is backed up is assigned 128 bytes and is made part of the storage management database. While this figure can be significant, the *number of instances* for that file in the storage management database is more important when predicting the size of the database. This is because there might be as many as 20 or 30 instances of a particular file in the storage management database. (Files only have properties associated with them when they are assigned permissions or storage streams, but generally, since most files inherit their permissions from other objects, the 1024 bytes assigned for properties can be ignored.)

Consider the following example. Suppose a file server which holds 100,000 files is regularly backed up using the GFS-25 automatic rotation schedule. Because there are 25 tapes in this backup set, there are potentially 25 instances of each of these files (although in practice, there will be fewer instances since most of the jobs are incremental). You can predict the size of the storage management database as follows:

$$[(\# \text{ of files}) * (128 \text{ bytes})] + [(\# \text{ of instances}) * (\# \text{ of files}) * (40 \text{ bytes})], \text{ or} \\ [(100,000) * (128 \text{ bytes})] + [(25) * (100,000) * (40 \text{ bytes})] = \sim 108 \text{ MB.}$$

Storage Management Server and Machine Platforms

Finally, consider both the operating system and the hardware of the machine that will contain the storage management server. For multi-user network installations, we recommend placing the database on a high-speed, high-capacity server. For example, in a Windows environment, place the database on a Windows NT (or later) server that has a fairly current CPU and adequate RAM instead of an older machine running Windows 98/Me.

For single machine installations, NovaNET runs adequately under Windows, NetWare, Linux, FreeBSD and DOS. However, it runs less efficiently under DOS and Windows 98/Me than under the other platforms.

Strategies for Faster Jobs

NovaNET is designed to run jobs quickly and efficiently on various network platforms and arrangements. This section will help you plan your backup strategy and network installation to maximize NovaNET's speed and efficiency.

What Slows Down Tape Drives?

Tape drives work most efficiently when they are “streaming,” that is, when the tape itself is constantly moving forward and a steady flow of data is being written to the tape as it passes the write head. In general, tape drives will “stream” if there is a constant flow of data available to write to the tape.

Whenever there is an interruption in the data and the drive must wait for the data, the “stream” breaks off and the tape stops. Additionally, after the tape stops, the drive must reposition the write head and regain the velocity of the tape. To do so, the drive will back up the tape prior to where it stopped writing and then restart the tape forward again. This can be a time-consuming process, especially if it occurs repeatedly.

For this reason, it is important to keep data constantly flowing to the tape drive. The performance of your job will be maximized when the tape drive constantly has data available to it.

Maintaining the Flow of Data

There are several steps you can take to make sure that data is constantly available to the backup device.

Prefer Local Buses to Network Connections In general, data is transmitted more efficiently over a local bus than over a network connection. Thus, for example, performance increases if the backup device is connected to the file server rather than to a different machine on the network, although either arrangement is possible.

Note that the storage management database need not be placed on the same machine as the backup device. The location of the storage management database does not affect the rate of data transmission. (Other job tasks, such as building backup selection lists and opening and closing files, create network traffic and require CPU calculations. While the location of the storage management database will affect these parts of the job, the advantages of a remote location of the database often outweigh any speed loss.)

Add a Second Device Controller A backup device and volume may be on the same machine with a local connection between them. If the backup device and the volume share the same device controller, this limits the speed of data transmission and may cause a NovaNET error. Therefore, you should add a second device controller specifically for the backup device. This can effectively double the rate of data transmission and enhance NovaNET operation. At the least, you should connect the backup device to a different SCSI chain or IDE channel.

Use a Wider Data Stream For both network and local connections, the width of the data stream affects the rate at which data can be transferred. Many tape drives are capable of writing data much faster than can be transferred over older device controllers and network connections. By upgrading to more recent technology with wider data streams, there will be fewer interruptions in the stream of data to the backup device. For example, consider using a Wide or Ultra Wide SCSI controller for the backup device. Additionally, for network connections, consider upgrading from 10Base-T Ethernet to 100Base-TX.

Consult your manufacturer's documentation to see if your backup device would benefit from a wider data stream.

Use the Proper Number of Data Streams NovaNET is capable of controlling up to eight data streams per backup device simultaneously. This feature can greatly increase your job speed since multiple devices can simultaneously send data. For example, four backup devices can support up to 32 simultaneous data streams.

You control the data streams of a volume, directory or file from its **Storage** tab.

Normally, the **Backup stream** field on the **Storage** tab of a *volume* is set to **Create new stream**, while the **Backup stream** of a *directory* or file is set to **Use existing stream**. By changing these options, you can change the number of backup streams, thereby affecting the speed at which the job runs. Assigning the proper number of data streams can help speed up the data transmission rate.

In general, you should assign data streams according to the number of streams the *physical* device (e.g., the disk drive) is capable of handling. Usually this number is equal to the number of spindles the drive has. Under most circumstances, you should use this number to determine the number of data streams.

One exception to this general rule is when you are working with very large files. You can increase performance by creating an additional stream for each of these very large files. For example, if you have a very large file with 1.0 GB or more, create a separate stream for this file. Then NovaNET will be able to send the file to the tape drive at a higher rate that allows for “streaming.”

Consider these three examples:

1. A RAID device is capable of sustaining multiple data streams at once. By assigning various directories on the RAID device to additional streams, you can increase the rate of data transmission. To do so, assign large directories to their own streams by changing the **Backup stream** field of each directory’s **Storage** tab to **Create new stream**. Don’t add any more streams than the RAID device can sustain.

Use the **Storage** tab to create new streams for large files and directories on RAID devices.



2. On the other hand, a single physical device may have multiple logical volumes. If each volume is assigned a separate stream, this will not result in faster data transmission and may, in fact, result in slower data transmission if it creates additional seeks by the disk drive. To turn off one of the data streams, change the **Backup stream** field on the volume’s **Storage** tab to **Use existing stream**.
3. Some file servers may have large database files on them, perhaps 1.0 GB or larger. These files should be assigned to their own streams. To do so, change the **Backup stream** field on the file’s **Storage** tab to **Create new stream**.

In general, when creating or modifying data streams, first use the capacity of the *physical* device to determine the optimum number of data streams and then create separate streams for very large files. Too few or too many data streams will impede maximum performance.

You may experience problems with data streams if you have not dedicated any streams to specific volumes or files. Problems may also occur if you exceed your hardware or operating system capacity.

Other Factors that Affect Job Speed

Additional factors that affect job speed include:

File Compression Whether or not files are compressed by the backup unit affects how fast jobs run. When a backup device compresses files, e.g., at a ratio of 2:1, a proportionately greater amount of data needs to be sent to the backup device for it to stream. However, when files are sent across the network already compressed, as NetWare does, further compression by the backup device will be negligible.

Note Compression ratios vary among devices.

Minimize Small File Size Large files transfer and are written to the backup device more efficiently than are small files. If you can limit the number of small files you back up, especially those smaller than 64K, your job will run more quickly.

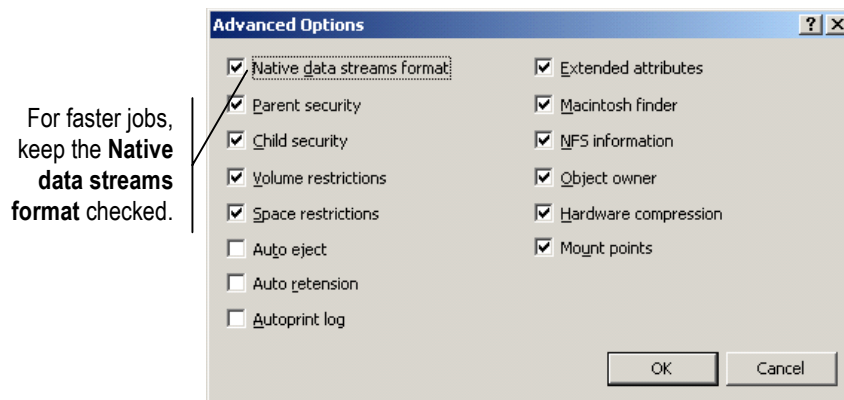
CPU Speed In general, a faster CPU results in faster backups. Take the speed of the CPU into account when deciding where to place the backup device and to locate the storage management database.

RAM In general, additional memory results in faster backups. By default, NovaNET allocates 25% of physical memory, up to 32MB per device, for buffering. If you have four devices on one machine, you should install 512MB of memory (32MB x 4 devices x 4) in that machine. If you have eight devices on one machine, install 1GB of memory (32MB x 8 devices x 4) in that machine.

Note Use this as a guideline when attaching devices to each machine.

Enable Native data streams format By default, NovaNET stores files in the format of the source platform or the network format. For example, it uses the Windows data format on Windows platforms and the NetWare data format on NetWare platforms. In general, jobs run faster when this default setting is selected.

However, if you plan to share data from one network platform to another, you should clear this option. This option is in the **Advanced Options** window.



Warning Security is an issue to consider when checking this option. When this option is checked, NovaNET backs up all security information that network software includes in the data stream. If the option is unchecked, NovaNET uses a generic format that removes security information.

Working with Permissions

This section provides useful tips for assigning permissions.

Checking the Effective Permissions of a User

Log on as the user.

On complex installations with multiple users and groups and varying levels of security, a particular user's effective permissions can be difficult to identify. The easiest way to identify a user's effective permissions is to log on as that user.

If you have not yet assigned the user a password, simply log on as the user. Browse the various **General** tabs of the objects in the storage management database. Verify that the displayed effective permissions match your intended security measures.

If the user has a password and you do not know it, create an "alias" user and make it equivalent to the user whose permissions you wish to check. Then log on as the alias user. Be certain to delete both the alias user and its folder after verifying the effective permissions.

Using Groups to Handle Complex Security Needs

Set up groups and then make users members of them.

Some security arrangements can be very complex, with multiple users possessing differing levels of effective permissions to different storage management database objects. Setting up each user's permissions separately and individually can be a complex and time consuming process.

You can use groups to speed up this process. Consider the following simplified example. Suppose you want some users to have full permissions to a tape drive (that is, the ability to create new tapes, to overwrite old tapes, to write backup tapes and read tapes for restore jobs), but want other users to have limited permissions to the tape drive, for example, only the ability to write to backup tapes, but not overwrite them.

Begin by creating two new groups. Name one group *Users with Full Permission to Tape* and assign this group **Create, Modify, Delete, Write** and **Read** permissions to the tape drive. Name the other group *Users with Write Permission to Tape* and assign this group **Write** permission to the tape drive. Next, delete the corresponding User/Group folders that appear on the job tabs.

Then when you create new users, rather than individually assigning each user permissions to the tape drive, make them members of the appropriate group.

You create as many groups as necessary, with varying levels of access to storage management database objects such as media, machines, volumes and directories. For example, you might create a group named Backup Permission to Volume and another named Backup and Restore Permission to Volume, assigning to each the appropriate permissions.

Working with Scheduled Jobs

This section provides useful tips for running scheduled jobs.

Running a Failed Rotation Job Again

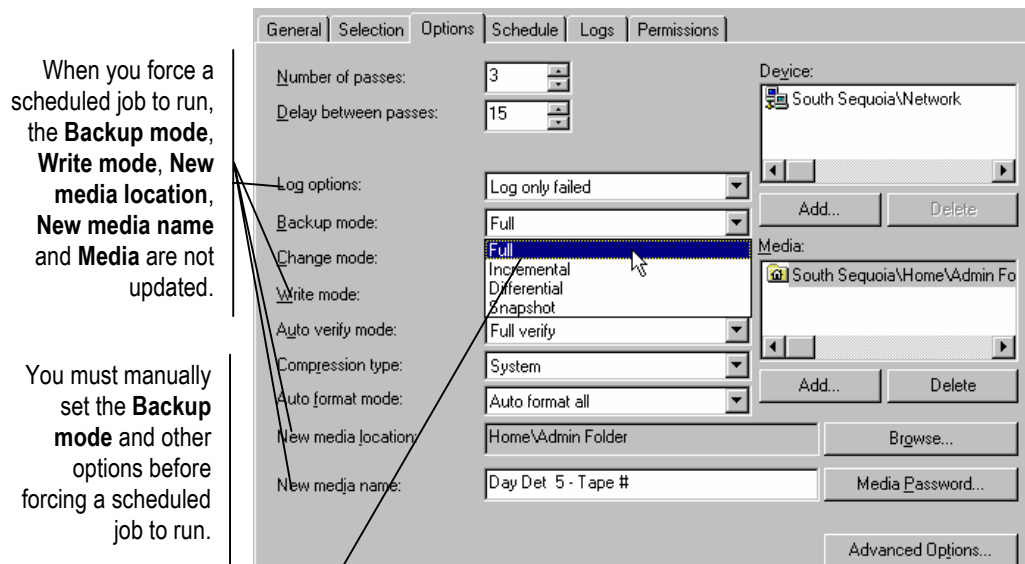
Manually set the correct options and "force" the job to run again.

Suppose a scheduled job has failed to run correctly. In order to ensure the integrity of the data, the job must be run again.

Consider this example. Suppose it is discovered on Monday morning that a full backup job has failed to run as scheduled on Friday evening. If a full backup job is not run before the next incremental job, the ability to fully reconstruct data will be compromised. It is vital that the full backup job be run soon.

However, you cannot merely “force” the job to run again. Recall that when NovaNET runs a scheduled job, it automatically updates four parameters on the **Options** tab of the job: **Backup mode**, **Write mode**, **New media location**, **New media name** and **Media**.

Note that NovaNET does NOT automatically update these fields when you manually “force” a scheduled job to run. For example, when NovaNET automatically runs a scheduled backup job on a Monday, it changes (updates) the **Backup Mode** from **Full** to **Incremental**. But when this job is “forced” to run before its scheduled time, NovaNET does not automatically update these fields.



Before forcing a failed job to run again, open the job log of the failed job, noting the appropriate options. If needed, print the job log. Next, open the **Options** tab of the failed job. Set the parameters on the options tab to match those of the failed job. In particular, check the **Backup mode**, **Write mode**, **New media location**, **New media name** and **Media**.

You will also want to select the appropriate media in the **Media** field. Use the **Browse** button to select the same media as the failed job was to use. When the options of the job match the options the failed job would have used, run the job.

If you have changed the **Media** field, be certain that this field is set back to its original specification so that scheduled jobs will automatically select the proper media.

An alternative method would be to copy the failed job, change the schedule type to **Not Scheduled** and then set the options parameters to match the failed job. Manually “force” the job to run and delete it after it has successfully completed.

Scheduling a Job to Run Once Only

*Turn off all the dates on the **Manual** schedule except the desired date.*

When you want to run a job only once, you should set the **Type** field on the **Schedule** tab to **Not scheduled**. Then you can run the job from the **Backup**, **Restore** or **Verify** tabs at any time.

But what if you only need to run a job once during off-peak hours?

1. Create a new backup job.
2. When the **General** tab appears, give it a name, such as **One-Time Backup**.
3. Click the **Selection** tab and select the objects (directories, files, and so on) to back up. Many people select either the **Network** or computer name check boxes to back up all data on the computer.
4. Select **Manual** in the **Type** field on the **Schedule** tab.
5. Set the **Start time** for the job.
6. De-select the day name tiles, located at the top of the calendar, to turn them all off. The dates in the calendar from today forward will turn white. (Past days turn gray.)
7. Right-click the day of the week on which to run the job.
8. When the popup menu appears, select **Daily**. The job will only run on that day.
9. Click **OK** to close the backup job properties window. The job will run once on the selected day at the selected start time.

Scheduling Simple Backup Jobs

Many computer users do not need the power of one of NovaNET's built-in schedules. They can manage their backups best with a simplified backup plan, such as the simple daily backup or the simple five-day rotation described below.

Simple Daily Backup

Create a **Manual** schedule to run a full backup every day of the week at the same time.

If an autoloader is not installed, you can create the following simple daily backup plan. It does not require different media for different days, though you can rotate your media if desired. It also does not require a lot of your attention. You can set it up quickly and let it run.

1. Create a new backup job.
2. When the **General** tab appears, give it a name such as **Daily Backup**.
3. Click the **Selection** tab and select the objects (directories, files, and so on) to back up. Many people select either the **Network** or computer name check boxes to back up all data on the computer.
4. Click the **Options** tab. The **Backup mode** should be set to **Full** by default.

Note Always select **Full** from the **Backup mode** list for this job. Otherwise, the backup job will not copy all of your data.

5. Select **Overwrite all tapes** from the **Write mode** drop-down list.
6. If your backup device does not support compression, select **Standard** from the **Compression type** drop-down list.
7. If your backup device supports automatic eject, you can configure the job to eject the media after the job finishes. Click **Advanced Options**. When the **Advanced Options** window appears, select **Auto eject** and click **OK**.
8. Click the **Schedule** tab.
9. Select **Manual** from the **Type** field.
10. Set the **Start time** for the job.
11. Select the day name tiles, located at the top of the calendar, for the backup days. Selected dates turn red. De-select the tiles to not run the backup on those days. De-selected dates turn white. (Past days turn gray.)
12. Click **OK** to close the backup job properties window. The job will run at the selected time on each selected day.

Simple Five-Day Rotation

Create separate media folders and backup jobs for each day of the week.

If an autoloader with five or more slots is installed, you can create the following simple five-day rotation plan. It requires separate media for each day of the week, one in each autoloader slot. You can set it up quickly and let it run. You can also use different tape magazines to create separate sets of backups for different weeks. For example, set A for the first week of the month, set B for the second week and so on.

1. Create separate media folders for each day of the week:
 - a. Click the **Media** tab.
 - b. Right-click the **Admin Folder** in the left window pane.
 - c. Select **New Media Folder** from the popup menu.
 - d. Enter **Monday**.
 - e. Repeat steps b through d for **Tuesday**, **Wednesday**, **Thursday** and **Friday**.
2. Create new backup jobs for each day of the week:
 - a. Click the **Backup** tab.
 - b. Right-click the **Admin Folder** in the left window pane.
 - c. Select **New Backup Job** from the popup menu.
 - d. When the **General** tab appears, enter **Monday**.
 - e. Click the **Selection** tab and select the objects (directories, files, and so on) to back up. Many people select either the **Network** or computer name check boxes to back up all data on the computer.
 - f. Click the **Options** tab. The **Backup mode** should be set to **Full** by default.

Note Always select **Full** from the **Backup mode** list for this job. Otherwise, the backup job will not copy all of your data.

- g. Select **Overwrite all tapes** from the **Write mode** drop-down list.
- h. If your backup device does not support compression, select **Standard** from the **Compression type** drop-down list.
- i. Select the existing **Home\Admin Folder** in the **Media** pane.
- j. Click the **Delete** button under the **Media** pane and click **OK**.
- k. Browse to **Home\Admin Folder\Monday** and click **OK**.

- l. Click the **Browse** button next to **New media location**.
- m. Browse to **Home\Admin Folder\Monday** and click **OK**.
- n. Click the **Schedule** tab.
- o. Select **Manual** from the **Type** field.
- p. Set the **Start time** for the job.
- q. De-select the tiles for each day except Monday. De-selected dates turn white. (Past days turn gray.)
- r. Click **OK** to close the backup job properties window. The job will run at the selected time on the selected days.
- s. Repeat steps a through r for **Tuesday, Wednesday, Thursday** and **Friday**.

Selecting Files for Jobs

This section provides useful tips for selecting files.

Selecting Files not Previously Backed Up

*Set the **Instance Range** filter to **At most 0**.*

Suppose you want to run a backup job that only selects files that have not been backed up previously. You can use the **Instance Range** filter to “filter out” any files that have been previously backed up.

Each time NovaNET backs up a file, it creates a new instance of that file. If a file has not been backed up, NovaNET has no instances recorded in the database for that file.



Selection
Filters button

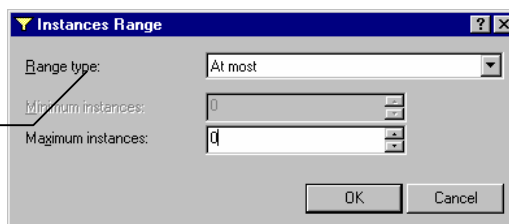
To select only files that have not been previously backed up, begin by clicking the **Selection Filters** button on the toolbar of the **Selection** tab. The **Selection Filters** window will appear.



Filter Change
button

Click on the **Filter Change** button next to the **Instance Range** field. Set the **Range Type** to **At most** and then set the **Maximum instances** field to **0**. NovaNET will only select those files with no instances.

To select only files that have not been previously backed up, set the **Instance Range** filter to **At most 0**.



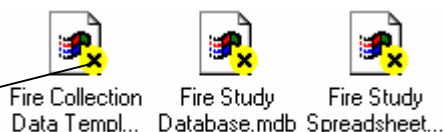
Note that this method does not ensure that you have the latest instance of every file. Having an instance of a file does not ensure that the instance you have reflects the latest changes to the file. It may have been modified after the last time you backed it up and so your latest instance may not match the file's current form.

Selecting Deleted Files for Restoring

Set the **Delete range** filter to **On or before** some random future date.

When a file has been deleted from a file server or workstation and an instance of that file exists on valid media, NovaNET marks that file in its storage management database as having been deleted and assigns it a delete date. Additionally, these files appear with a special icon in the object detail area of the **Selection** tab.

Files that have been deleted, but for which there are valid instances in the database, are marked with a special yellow "x" icon.



Selection
Filters button

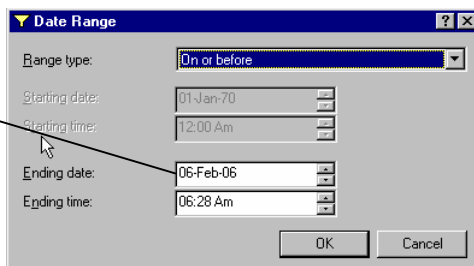


Filter Change
button

You can use the **Delete range** filter to select only those files for restoring that have been deleted. Begin by clicking the **Selection Filters** button on the toolbar of the restore job's **Selection** tab. The **Selection Filters** window will appear.

Click on the **Filter Change** button next to the **Delete range** field and then select **On or before** from the **Range type** list box. Next select a random future date, for example, Jan. 1, 2020. NovaNET will exclude all of the files that have not been deleted from the set of files to be restored. When you return to the **Selection** tab, all and only those files that have been deleted will be checked.

To select files that have been deleted, set the **Delete range** filter to **On or before** some future date.



Selecting Instances from a Specific Job

Select the appropriate instance date for a container object.

When a file is backed up, NovaNET creates an instance. Each instance of a file has a unique instance date and every file backed up during the same job has the same instance date. (You can view this information for all of the available instances in the **Instances...** window.)

Remember that when you specify the instance date for a container, such as a volume or folder, objects in that container are only selected when they have the same instance date.



Select Instance
button

If you want to select only those files backed up during a particular job, begin by checking a container high in the tree hierarchy, such as the machine or network icon. This will cause all of the files below this object to be initially selected. Then open the **Instances...** window by clicking on the **Select Instance** button. Select the appropriate date and time instance for the job. Now only those files with a matching instance date will be selected.

Selecting Instances from Specific Media

*Add the media to the **Media** filter.*

Suppose you want to restore only those files that appear on specific media or want only to verify files from specific media. You can use the **Media** filter on the **Selection Filters** window to only select files that have valid instances on the media you specify.



Selection
Filters button

To do so, open the **Selection Filters** window by clicking on the **Selection Filters** button on the toolbar of the **Selection** tab of the job. Then click the **Add...** button to open the **Browse** window. When you add media to the **Media** field, NovaNET checks to see if the file selected has a valid instance on that **Media**. If so, that file is included in the job. (If you add multiple media to the **Media** field, only files with instances on all the selected media will be included in the job.)

Restoring Tips

This section provides tips for restoring files and volumes.

Restoring Volumes for the Latest Date

If you have used a built-in schedule and have run backup jobs as scheduled, you can easily and simply restore files as they appeared the last time a backup job was run. Simply select the volumes or files you wish to restore on the **Selection** tab of a restore job. The <Latest> instance of each file will be automatically restored to the volume. NovaNET will prompt you for whatever tapes are needed to complete the restore job.

Restoring Volumes for a Specific Date

You can restore volumes and directories as they appeared on a particular date as long as that date is within the full data recovery period. Recall that the full data recovery period is the number of days prior to the data loss for which any and every file backed up can be recovered. (To restore volumes to the last backup date, refer to *Restoring Volumes for the Latest Date* above.)

Different schedules provide full data recovery periods for varying numbers of days prior to the last backup. For example, a GFS 30-tape job can reconstruct the data for any day of the past three weeks, while a simple 4-tape backup only provides for reconstruction of the past two days.

You can reconstruct the data for any particular day during the full data recovery period. Consider this example. Suppose you want to restore a particular volume as it appeared on Wednesday morning. Providing the date falls within the full data recovery period, there are three possible scenarios for restoring the volume as it appeared at the beginning of business on Wednesday: either (1) restore from a full backup tape; (2) restore from a full backup tape and the most recent *differential* tape; or (3) restore from a full backup tape and all of the *incremental* tapes from the previous full backup and the date in question.

Example 1 assumes a full backup job was run the Tuesday evening before the Wednesday for which you want to restore data.

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Example 2 assumes a differential job was run on the Tuesday before the Wednesday and a full backup job on the previous Friday.

Example 3 assumes incremental jobs were run on the Monday and Tuesday before the Wednesday and a full backup job on the previous Friday.



Filter Change button

1. *If you ran a full backup job the previous evening, you can run one restore job.* Begin by creating a new restore job and selecting the appropriate volume on the selection tab of the restore job. Initially, the <Latest> instance of these files will be selected. You must select the instances according to the desired date, in this case the Tuesday before the Wednesday. To do so, set the **Backup range** filter to the desired date. Begin by clicking the **Selection Filters** button on the toolbar of the restore job's **Selection** tab. The **Selection Filters** window will appear. Then click on the **Filter Change** button next to the **Backup Range** field. Specify Tuesday's date in the **Date Range** window.
2. *If you ran a differential job the previous evening, you need only run two restore jobs.* The first restore job must restore all of the files from the previous full backup job; the second restore job must restore files from the previous evening's differential job.

Suppose in this example that the last full backup was done on Friday evening and that a differential job was run on Tuesday evening. To restore files as they appeared on Wednesday morning, follow these steps.

First, create a restore job, select the appropriate volume and then set the **Backup range** on the **Selection Filters** window to match Friday's date. Name the job with an appropriately identifying name, such as *Restore from Friday's Full Backup*.

Second, copy the first restore job, rename it with an identifying name and change the **Backup range** date to match Tuesday's date.

Run the two jobs, being certain to run them in the proper order.

3. *If you ran an incremental job the previous evening, you will need to run two or more restore jobs.* The first job must restore all of the files from the previous full backup job; the other jobs must restore all of the files from all of the previous incremental jobs between the full backup and the date in question.

Suppose in this example that the last full backup was done on Friday evening and that incremental jobs were run on Monday and Tuesday evenings. To restore the volume as it appeared on Wednesday morning, follow these steps.

First, create a restore job, give it an identifying name, select the appropriate volume and then set the **Backup range** to Friday's date.

Second, copy the first restore job, rename it with an identifying name and change the **Backup range date** to match *Monday's* date. Repeat this step, changing the **Backup range date** of this third job to *Tuesday's* date.

Run the three jobs, being certain to run them in the correct order.

Copying a Directory Structure

*Clear the **Children** check box in the **Selection Filters** window.*

Suppose you have set up a complex directory that you want to replicate in a new location, for example, on a new workstation or file server. NovaNET provides you an easy way to do this.



Selection
Filters button

If you have not previously backed up the directory, create a backup job that does so. Select the appropriate volume. Then, open the **Selection Filters** window. Clear the **Children** check box, being certain that the **Parents** box is checked. (The job will run faster when the **Children** box is cleared, however it is not necessary to clear this option. You can restore the directory by itself, even when you have previously backed up both the directory and the files in it.)

To copy the directory structure to a new location, create a restore job, selecting the appropriate directory and restore location. Then, open the **Selection Filters** window. Clear the **Children** check box, being certain that the **Parents** box is checked. The job will “copy” that directory to the new location.

Restoring Files to a New or Different Folder

*On the **Selection** tab, drag the files to a different folder.*

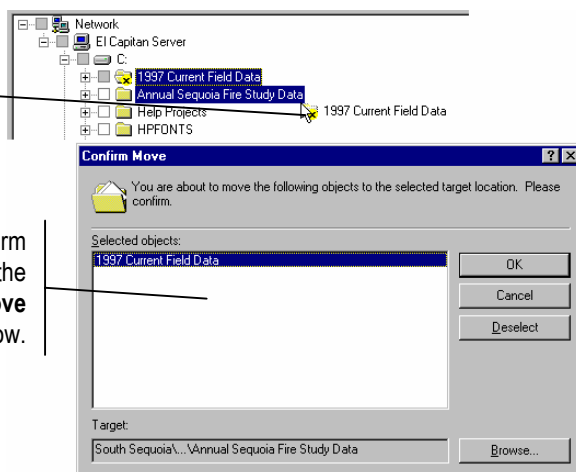
Suppose you want to restore files or folders, but do not want to overwrite files and folders currently existing on the volume. To avoid overwriting (replacing) current files or folders with the instances you are restoring, restore the files or folders to a new or different location.

When you instruct NovaNET to restore files and folders in new locations, NovaNET creates new files and folders in the specified location.

To restore a file to a different folder, drag the file in the tree view area on the **Selection** tab of the restore job to the new folder. (If the target folder does not exist, you must create it first.) In the **Confirm Move** window, select a target location. NovaNET will move the file to the location you specify in the **Target** field.

To restore a folder or file to a different folder, select it, drag it to the new folder...

...and then confirm the move in the **Confirm Move** window.

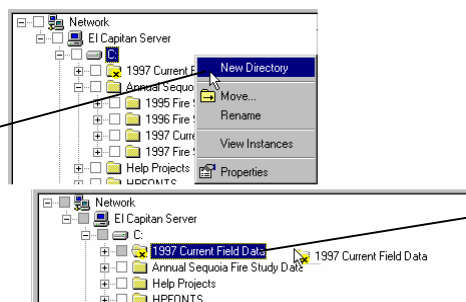


You can also restore folders and volumes in new locations. The contents of these containers move with them and are restored, along with the folder or volume, in the new location.

Additionally, you can create a new folder and restore files to that new folder. When NovaNET restores the files, it creates the new folder and restores the files you specified to that new location. Similarly, you can restore folders and their contents in new folders you create.

To create a new folder in which to restore the file or folder, first highlight the location where you want to create the new folder in the tree view area. Then click on the **New Object** button on the **Selection** tab's toolbar. Or use the shortcut (right-click) menu and select **New Directory**. NovaNET will create the new folder in the location you specified. Give the folder a new name and then drag into that folder the files and folders you want restored in it.

To restore a file or folder to a new folder, first highlight the container in which you want to create the new folder and then select **New Directory** from the shortcut menu.



Next, drag the folder or file you want to restore to the new folder you created.

Note that when you move an instance on the **Selection** tab of a restore job, the changes you make are only reflected in the current restore job. Only the current restore job will assign the file or folder the new location. When you create a new restore job, you will see the files and folders in their original locations. Likewise, the **Database** tab will continue to display files in their original locations.

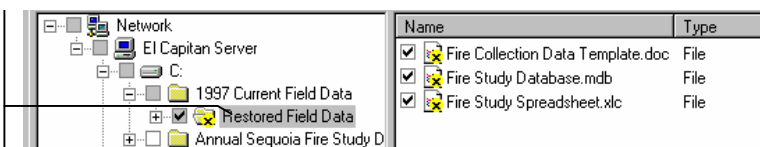
Restoring Files with New Names

*Rename the file on the **Selection** tab of the restore job.*

Suppose you want to restore a file with a different name. To do so, you rename the file after you select it. When you rename the file, NovaNET restores the file with the new name. This can be useful for not overwriting versions of the file that currently exist on disk.

To rename a file, right-click the file name and select **Rename** from the shortcut menu. You can also rename a file by selecting its name again after it has been highlighted.

To restore a file with a new name, highlight it and then select it again. Then type the new name.



Note that when you rename an instance, you are only renaming that file for the purposes of restoring it with this particular restore job. Only the current restore job will assign that file the new name. When you create a new restore job, you will see the file displayed with its original name. Similarly, the **Database** tab always displays files with the names they had when they were backed up.

Other Tips

Here are two additional tips for transferring files between operating systems and for setting up an autoloader for cleaning.

Moving Data Between Operating Systems

*Clear the **Native data streams** check box in the **Advanced Options** window.*

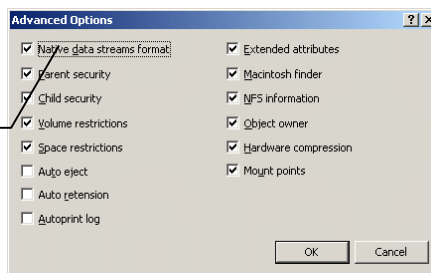
Suppose you want to transfer data (files and folders) from one operating system to another, such as from a NetWare platform to a Windows platform. To do so, you need to backup and restore the data in a generic format.

For more information on native data streams, see *Native Data Streams Format* in *Chapter 7 — Job Options*.

Different networks transmit data to NovaNET in different formats. In particular, Windows, NetWare, Linux and FreeBSD all use different data stream formats. If you are going to share data from one network platform with another, the data should be stored on media in a common data format, not in the native data streams format.

To back up data in a generic format, first create a new backup job and select the data you want to transfer between operating systems. Then open the **Advanced Options** window and clear the **Native data streams format** check box. When NovaNET backs up this data, it will convert it to a generic format before writing it to the media.

To transfer files between operating systems, clear the **Native data streams format** option on the backup job.



Warning Security is an issue to consider when checking this option. When this option is checked, NovaNET backs up all security information that network software includes in the data stream. If the option is unchecked, NovaNET uses a generic format that removes security information.

After the job has completed, create a restore job, selecting the same files to restore. Make certain you have selected the proper instances of these files by selecting the proper instance date in the **Instances** window. You can then restore the files to a different operating system.

Setting Up an Autoloader for Automatic Cleaning

Insert a cleaning cartridge into the autoloader and then change the status of the storage slot.

Depending on the model and manufacturer, some autoloaders support automatic cleaning cycles. They will alert NovaNET when a cleaning cycle needs to be performed. If NovaNET knows that a particular storage slot on an autoloader magazine holds a cleaning cartridge, NovaNET will automatically run a cleaning cycle before running a backup job whenever a cleaning cycle is required.

For more information on setting up a cleaning cartridge on an autoloader, see *Status Tab* in *Chapter 12 — Object and Property Reference*.

To set up an autoloader for automatic cleaning, insert the cleaning cartridge into the autoloader magazine. Then open the **Status** tab of the autoloader and change the status of the slot that holds the cleaning cartridge. Select the storage slot and then click the **Change Status** button. In the **Change Status** window, change the storage status to **Clean**. NovaNET will automatically use the cartridge in this slot when performing a cleaning cycle.

To manually clean an autoloader, highlight the device and select **Clean Device...** from the **Device** menu. Alternatively, open the autoloader's **Status** tab and select the device you want to clean. NovaNET will check to see if one of the slots holds a cleaning cartridge. If it does, the cleaning cycle will be performed in the background; if not, an error message is shown.

If you are using a device that is not an autoloader, you must manually clean the device at the manufacturer's suggested intervals.

Chapter 11 — Advanced Permissions and Security

This chapter provides a detailed summary of NovaNET's extensive security system. If it is your responsibility to manage the security of your NovaNET storage management database and you are working with sensitive data, this chapter can help you set up a complex security system that meets your particular security needs.

In This Chapter

- Overview
- Adding New Users and Groups
- Effective Permissions
- Permissions Reference

Overview

Permissions control what actions a user is allowed to perform within a given storage management zone. Users can be given extensive or limited permissions, allowing the NovaNET administrator to distribute backup duties to various users and workgroups. This allows for a flexible, non-centralized backup system while providing the highest degree of security for the network.

How your security is arranged depends on your unique security needs. Before setting up your security system, consider the following questions:

- *Is more than one storage management zone required?*

Setting up separate storage management zones can provide a high level of security. If your security needs require that access to some data be strictly limited, setting up a separate storage management database is often the simplest way to achieve this.

Data cannot be shared between zones without using advanced procedures. Media from one storage management database must be imported into a new database before the data on it can be read or used. When it is imported, NovaNET requires the media password, if set. If you assigned the media a password when it was created, the media cannot be imported without that password.

If you do not assign the media a password, the media can be easily imported into any storage management database. As a result, the data is actually less secure when there are two or more databases than it would be with just one database. If you are relying on multiple storage management databases for security purposes, make sure that each created media is assigned a password.

There may be, however, some limitations on the number of storage management databases you can set up. In particular, machines (workstations and file servers) can only be an object in one storage management database. Similarly, volumes can only belong to one storage management zone. Files in one storage management zone cannot, without importing the media, be shared with database objects in other storage management zones.

Thus your ability to set up separate storage management zones is limited by the number of backup devices you have and their respective locations on separate machines. For example, to set up two storage management databases, you would require at least two separate workstations or file servers, each with at least one backup device.

- *Within a single storage management zone, must some users be prevented access to some data?*

Multiple workgroups may share a single tape drive or backup device and thus are members of the same storage management zone. However, there may be reasons to allow these groups to work with only their own data. For example, an accounting workgroup may share a common tape drive with a personnel workgroup, although neither can be allowed access to the files and directories of the other group.

The security needs of these situations can be addressed by carefully assigning permissions, particularly to the machines, backup devices, media, volumes and directories.

- *Should access to certain functions be limited?*

You may wish to distribute certain backup tasks to various users or workgroups. For example, each workgroup might be responsible for their own daily backup jobs and archive jobs. On the other hand, access to certain NovaNET features may need to be limited. Users might be able to *create* tapes, for example, but not *restore* files to disk or *delete* files on disk. Alternatively, you may want users to *run* jobs you create, but not *create* their own jobs.

The security needs of these situations can be addressed by carefully assigning users select permissions to various objects in the database. For example, you might assign permission to write files to tapes, but not to volumes, thus preventing restore jobs from running.

Before Proceeding Further

The most powerful user in any storage management database is the NovaNET administrator. Because NovaNET administrators are granted supervisor rights to the System Container, they have unlimited access to all of the objects in the storage management database. Any user who logs on as the NovaNET administrator will have complete access to all of the files and machines on the storage management database.

Warning NovaNET administrators have unlimited access to all of the objects in the database. Any user who logs on as the NovaNET administrator will have complete access to all of the files and machines on the database.

Your first security step should be to change the NovaNET administrator's password. Click on the **Security** tab. Select the **Admin** user object. Select **Change Password...** from the **Security** menu. Type in the new administrator's password, enter it again to confirm and click **OK**. Do not continue until you have changed this password.

The only difference between the NovaNET administrator (**Admin**) and other users is that the NovaNET administrator has **Supervisor** rights to the root object in the NovaNET hierarchy, that is, the System Container. You may also create additional NovaNET administrators as well as rename the **Admin** user.

Warning Do NOT delete **Admin** unless you assign **Supervisor** or **Access** permission to the System Container to another user.

Adding New Users and Groups

Generally, the first step to arranging the security system is to set up users and groups. You create new users and groups on the **Security** tab of the main NovaNET window. Use the **New Object...** option from the **File** menu, the **New Object** button or the shortcut (right-click) menu to create new users and groups.

New User/Group Folders

Each time you add a new user or group object to the **Security** tab, NovaNET automatically creates a new User/Group folder in the **Home** folder with the same name as the new user or group. For example, if you create a new user named **Galen Clark**, NovaNET creates a new User/Group folder named **Galen Clark Folder**.

The user or group is automatically assigned six permissions to their User/Group folder: **Access, Create, Modify, Delete, Write and Read**. You can modify these permissions at any time using the **Permissions** tab of the new user or group property sheet.

Setting Up Users

As you create new users, NovaNET automatically opens the property sheet of the new user. Use the tabs on the property sheet to control the user's password, account activity, group membership, equivalencies and permissions.

To Create a New User

1. Click the **Security** tab.
2. Create the new user by either
 - Selecting **New Object...** from the **File** menu and then selecting **User Object** from the **New Object** window, or
 - Right-clicking in the NovaNET object detail area and selecting **New User Object** from the shortcut menu, or
 - Clicking the **New Object** button on the toolbar and then selecting **User Object** from the **New Object** window.
3. Type in the new user's name in the **Name** field on the **General** tab.



New Object
button

Logon Control Tab, User Object

The **Logon Control** tab controls whether passwords are required, whether and when the password must be changed, whether an account has expired and the number of connections a user can have to the network.

Properties of New User Object

General Logon Control Groups Equivalencies Email Autoprint Permissions

Expiration

☐ Account is disabled

Date account expires: 01-Oct-2002

Grace logons

☒ Grace logons allowed

Limit grace logons: 6

Remaining grace logons: 6

Password

☒ Require password

Minimum password length: 5

☒ Require unique passwords

☒ Force periodic password changes

Days between forced changes: 40

Date password expires: 02-Nov-2002

Connection

Number of concurrent connections: 250

User can log on from these machines:

Add... Delete

OK Cancel Apply Help

**Logon
Control tab**

Expiration A user account can expire on a given date. When the account expires, NovaNET disables the account and checks the **Account is disabled** box. This user will be unable to log on until the **Account is disabled** box is cleared.

You can manually disable an account by checking the **Account is disabled** box.

To make a disabled account active again, clear the **Account is disabled** box and change the **Date account expires**.

Connection These parameters control the allowable machines and simultaneous logons for a user.

The **Number of concurrent connections** parameter controls how many different logons a user may have simultaneously from different machines. For example, if the **Number of concurrent connections** is set to **5**, this user can log on to NovaNET from up to five separate machines at the same time.

The user can only log on to NovaNET on the machines listed in the **User can log on from these machines** field. To add a machine, click **Add...** and select the machine from the **Browse** window. To remove a machine, select it and click **Delete**.

Note If no machine is listed, a user can log on from any machine.

Grace Logons When **Grace Logons** is checked, a user can log on to NovaNET a set number of times after their old password has expired. For example, if the **Grace logons allowed** box is checked and **Remaining grace logons** is set to **2**, the user will be allowed to log on two times after their old password has expired. On the third logon attempt, the user must change their password.

Note Grace logons do not function when passwords are not required, that is, when the **Require password** check box is cleared.

Password When **Require password** is checked, NovaNET requires the user to have a password.

The minimum length of the password is determined by the **Minimum password length** parameter.

Note If you clear the **Require password** box and the user has a password, NovaNET will continue to require that user to input their password.

If you check the **Require unique passwords** box, NovaNET only accepts the new password if you have never used it.

If you check the **Force periodic password changes** box, either the user or the NovaNET administrator must change the password per the **Days between forced changes** and **Date password expires** settings.

If you check the **Allow user to change password** box, the user can change their password on their own.

Tip The NovaNET administrator can change a user's password without knowing the user's current password. NovaNET does not even ask you to enter the old password. This is useful when the user has forgotten his or her password.

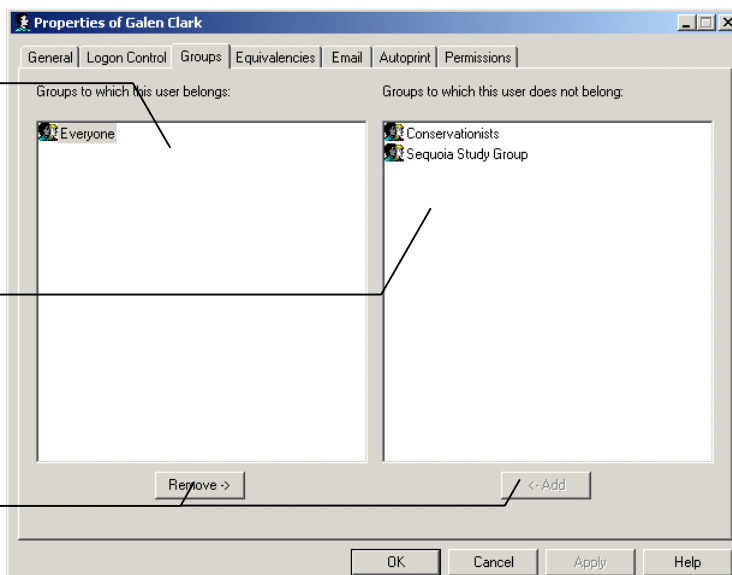
Groups Tab, User Object

Use this tab to add or remove a user from a group. To add a user to a new group, select the group in the right window pane and click the **Add** button; the group is moved to the left window pane. Similarly, to remove a user from a group, select the group in the left window pane and then click the **Remove** button.

The left side of the **Groups** tab lists the groups of which this user is a member.

The right side of the **Groups** tab lists the groups of which this user is not a member.

To add or remove the user from a group, select the group and then click the appropriate button.



Everyone group When a new user is created, they are automatically added to the **Everyone group**. Members of this group have **Modify**, **Delete**, **Create**, **Write** and **Read** permissions to the **Everyone Folder**. You can modify these permissions at any time, including from the **Permissions** tab of the new user's property sheet.

Equivalencies

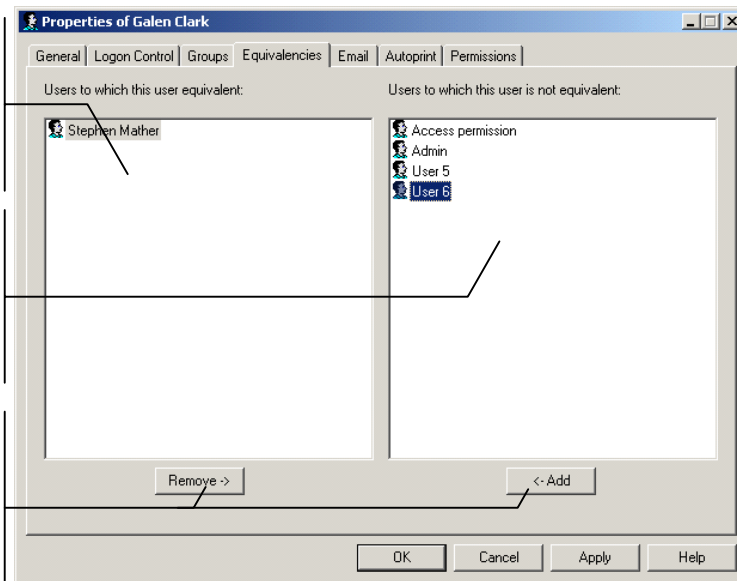
One quick way to assign user permissions is to make the current user equivalent to another user. This can be very useful for managing complex NovaNET installations with multiple users and varying security or for making temporary changes to a user's permissions.

Use this tab to make the current user equivalent to another user. To make the current user equivalent to another user, select the other user in the right window pane and click the **Add** button; the user is moved to the left window pane. Similarly, to end an equivalency, select the other user in the right window pane and then click the **Remove** button.

The left side of the **Equivalencies** tab shows other users who are equivalent to the current user.

The right side of the **Equivalencies** tab shows users who are not equivalent to the current user.

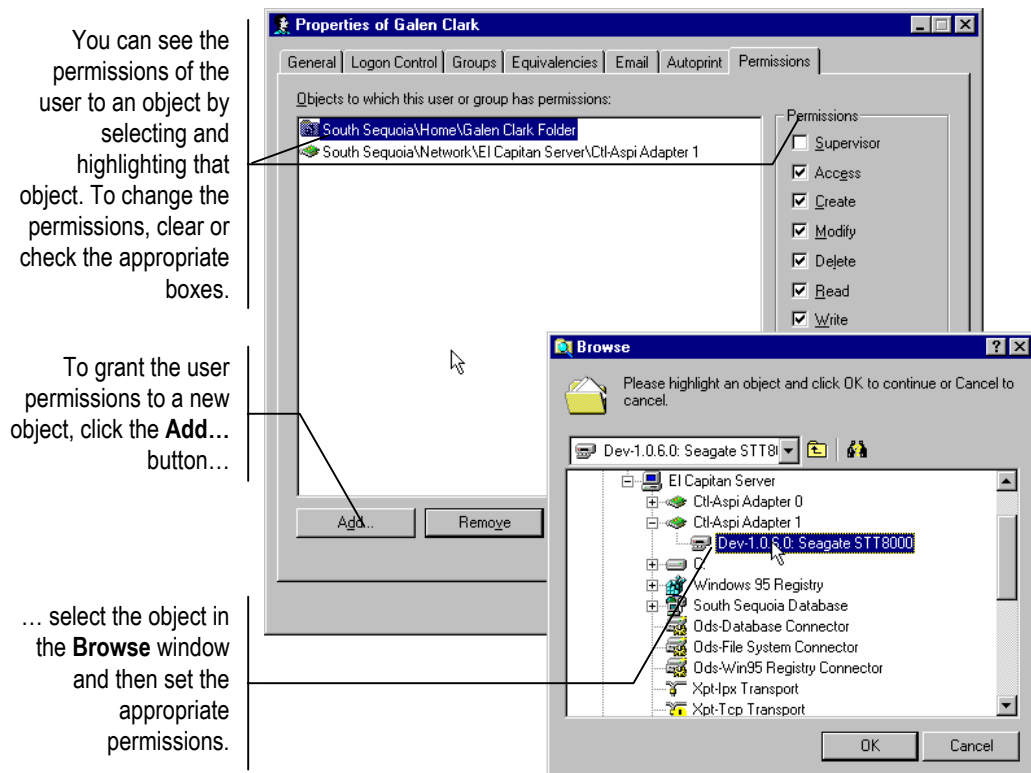
To create new equivalencies or end old equivalencies, select the user and click the appropriate button.



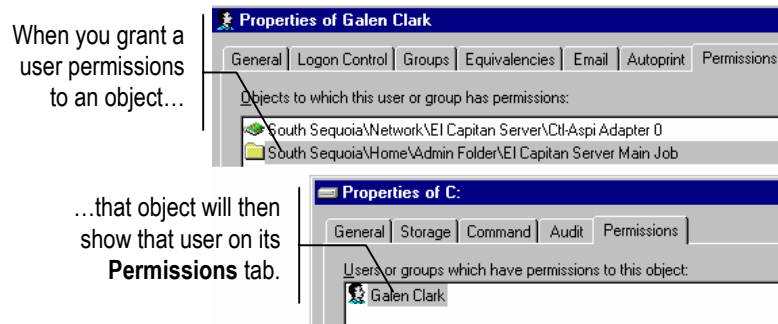
Note that equivalencies only work in one direction; they are not reciprocal. The current effective permissions of the user whose property sheet is open will be calculated using the direct and inherited permissions of the user they are made equivalent to. For example, if a user named Galen Clark is made equivalent to a user named Stephen Mather, Clark's effective permissions are calculated using *both* Mather's *and* Clark's direct permissions. However, Mather's effective permissions remain unchanged.

Permissions Tab, User Object

Use this tab to grant users permissions to objects in the storage management database. The **Permissions** check boxes show the permissions of whatever object is selected in the **Objects to which this user or group has permissions** list. Select another object to see the user's permissions to that object.



Note that permissions can be granted from either the property sheet of the database object or the property sheet of the user. Either way, the permissions appear on the appropriate corresponding object's **Permissions** tab. For example, if Galen Clark is granted permissions to the **C:** volume from the **Permissions** tab on his property sheet, the **Permissions** tab on the property sheet of the **C:** volume will list Clark as a user who has permissions. Alternatively, if Clark is granted permissions from the property sheet of the **C:** volume, the appropriate permissions will appear on Clark's **Permissions** tab.



Note additionally that a user has direct permissions only to those objects listed on that user's **Permissions** tab. Any and all other effective permissions to other objects are calculated through inherited permissions, through equivalencies or through groups.

Setting Up Groups

As you create new groups, NovaNET automatically opens the property sheet of the new group. Use the tabs on the property sheet to assign members to the group and assign permissions to the group.

To Create a New Group

1. Click the **Security** tab.
2. Create the new group by either
 - Selecting **New Object...** from the **File** menu and then selecting **Group Object** from the **New Object** window, or
 - Right-clicking in the NovaNET object detail area and selecting **New Group Object** from the shortcut menu, or
 - Clicking the **New Object** button on the toolbar and then selecting **Group Object** from the **New Object** window.
3. Type in the new group's name in the **Name** field on the **General** tab.



New Object
button

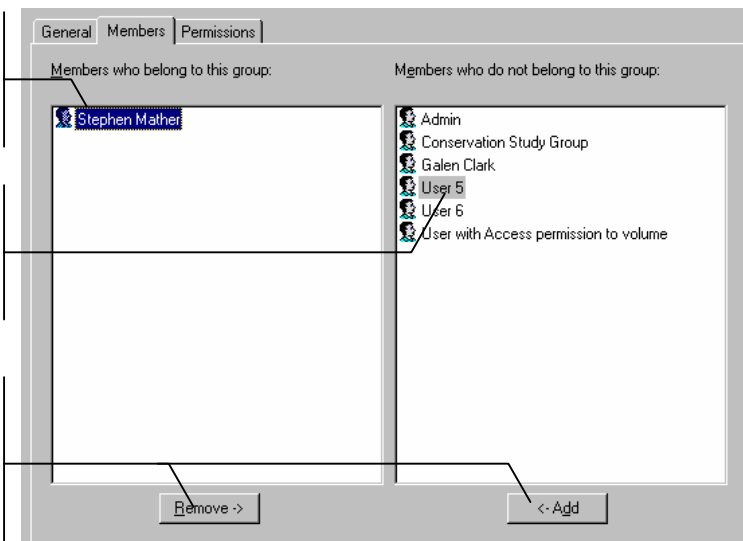
Members Tab

Use the **Members** tab of the group's property sheet to add and remove users from the group. To add a user to the group, select the user in the right window pane and click the **Add** button; the user is moved to the left window pane, under **Members who belong to this group**. To remove a user from a group, select the user in the left window pane and click the **Remove** button; the user is moved to the right window pane, under **Members who do not belong to this group**.

The left side of the **Members** tab shows users who are members of this group.

The right side of the **Members** tab shows users who are not members of this group.

To add or remove users from the group, select and highlight the user and then click the appropriate button.



Permissions Tab, Group Object

If a user is a member of a group, that user's effective permissions are determined using the direct permissions that group has to objects in the storage management database. Use this tab to assign the group permissions to objects. The **Permissions** check boxes show the permissions of whatever object is selected in the **Objects to which this user or group has permissions** list. Select another object to see the group's permissions to that object.

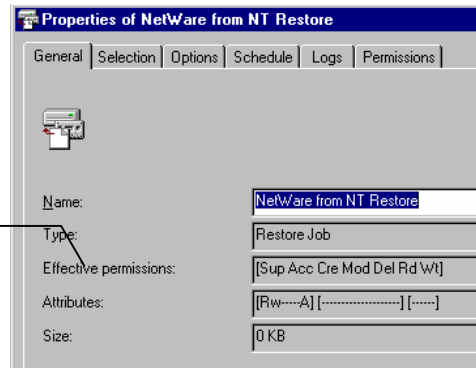
Note that the permissions granted from this tab, like all permissions, are reciprocal. Changes made on this tab appear on the tabs of the corresponding object. For example, if you grant permission to a folder to a group, the **Permissions** tab of that folder will list the group, along with the appropriate corresponding permissions.

Effective Permissions

NovaNET ensures the security of the storage management database and network by calculating the **effective permissions** a user has to an object and using these permissions to determine what actions that user can perform.

The current user's effective permissions to an object are displayed on the **General** tab of the object's property sheet. The **Effective permissions** box shows the current user's effective permissions to the object.

The current user's effective permissions to an object are shown on the **General** tab of that object.



Calculating Effective Permissions

A user is assigned effective permissions to an object in one of two ways, either through **direct permissions** or through **inherited permissions**.

A user has *direct permissions* to an object if they are listed on the **Permissions** tab of the object, if they are equivalent to a user who has direct permissions to the object; or if they are a member of a group that is listed on the Permissions tab of that object. Note that a user can gain permissions from any combination of these.

A user has *inherited permissions* to an object if (1) they do not have direct permission and (2) they have effective permissions to the container that contains the object. This means that, if you do not have direct permissions to an object, you must have effective permissions to the container in which the object is stored.

Note Your effective permissions to the container object can be either direct or inherited permissions. All that matters is that you have effective permissions to the container.

When NovaNET determines the effective permissions a user has to an object, it first looks to see if the user has direct permission; if not, NovaNET then checks to see if the user has inherited permission.

Effective Permissions Algorithm

NovaNET uses the following algorithm to determine effective permissions:

- Does the user have direct permissions to the object? If yes, these are used to calculate the effective permissions. NovaNET does not check to see if the user has inherited permissions.

- Does the user have effective permissions to the container that contains the current object (inherited permissions)? If yes, these permissions are used to calculate the effective permissions. If not, then the user does not have effective permissions to the object.

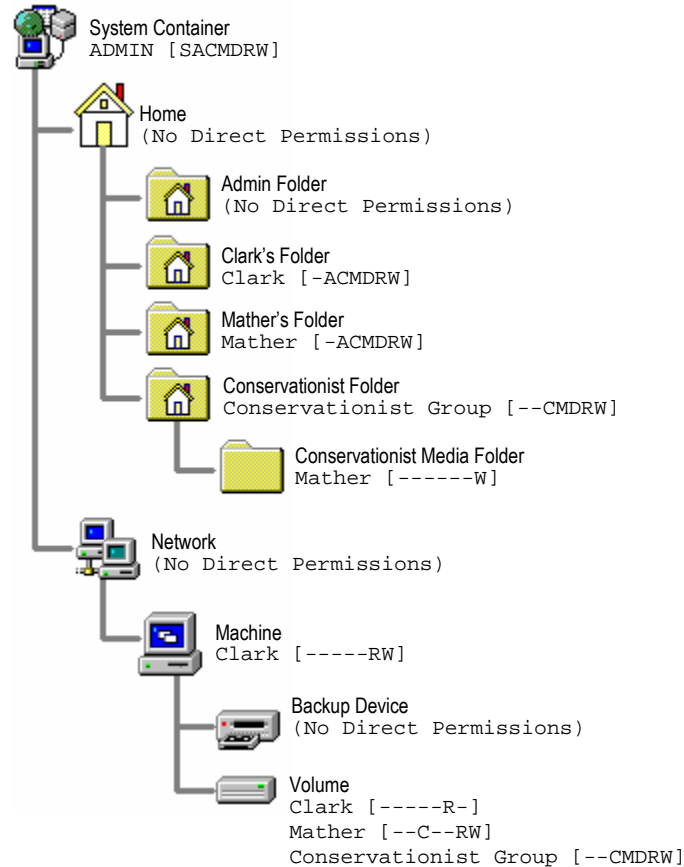
Permissions from Multiple Sources

Users can gain *direct* permissions to objects either as users, as a result of equivalencies or as members of a group. When the direct permissions result from multiple sources, NovaNET uses all of the sources to determine the permissions.

Consider the following example: Galen Clark has direct permissions to **Read** and **Write** to a folder called **Conservationist Archive Jobs**; Clark is also a member of a group that has direct permissions to **Modify** to the folder. As a result, Clark's effective permissions are **Read**, **Write** and **Modify**.

Examples of Effective Permissions

The following six examples illustrate how effective permissions are calculated. The diagram below illustrates these six examples.



1. The NovaNET administrator has direct permissions to the **System Container**, the object at the very top of the storage management database hierarchy. These determine his or her effective permissions to this object. Because it is a container, the objects below it in the storage management database all have inherited permissions because the object directly above them has effective permissions. So, for example, the NovaNET administrator has effective permissions to the **Home Folder** because it inherits its permissions from the object that contains it, the **System Container**. Thus, the NovaNET administrator has effective permissions to all of the objects in the storage management database.

2. A user named Stephen Mather has direct permissions to his User/Group folder, named **Mather's Folder**. As a result, by inherited permission, Mather has effective permissions to the objects stored in this folder, including any jobs, media or job folders stored in this folder. Mather does not, however, have effective permissions to the **Home Folder** or to the **System Container**—these objects are *above* his User/Group folder and thus do not inherit permissions.
3. A user named Galen Clark has direct permissions to a **Machine**, in this case a file server with an attached tape drive and several associated disk drives. The direct permissions to the file server mean that Clark also has effective permissions (by inheritance) to the tape drive. So, for example, Clark might be given read and write permissions to the file server and thus to the tape drive.

However, Clark is prevented from having permissions to the volumes on the file server. He is listed on the **Permissions** tab of the volume and these direct permissions are used to deny him access to the volume. In this example, he is granted **Read** permission by checking that box, but denied **Write** permissions by clearing the appropriate box.

Thus even though Clark has effective permissions to the container that contains the volume, Clark's effective permissions to the volume are determined *only* by his direct permissions to the volume. Because Clark has direct permissions, NovaNET does not check to see if Clark has inherited permissions.

4. The following example is more complex, but illustrates an important concept: that NovaNET does not check for inherited permissions when there are direct permissions.

A user named Stephen Mather is a member of the **Conservationist** group, which has five direct permissions to the **Conservationist Folder**: Create, Modify, Delete, Write and Read permissions. Mather also has direct permissions to the **Conservationist Media Folder**, but only Write permission.

Mather has five effective permissions to objects contained in the **Conservationist Folder**, but not to the **Conservationist Media Folder**, where he has only one (Write permission). NovaNET does not look to see if Mather has effective permissions to the container that contains the **Conservationist Media Folder** because Mather has direct permissions to that object. Thus even though other members of the **Conservationist** group have effective permissions to the **Conservationist Media Folder** through inherited permissions, Mather will not. Mather will have only **Write** permissions to this folder.

5. The following example shows how equivalencies and group membership work together to determine effective permissions.

Suppose that Mather is a member of the **Conservationist** group *and* that he is made equivalent to Clark. What permissions will Mather have?

Mather has permissions to all of the User/Group folders, except the **Admin Folder**. For example, he has permissions to **Clark's Folder** because he is equivalent to Clark. (Note that this equivalency does not give Clark permission to **Mather's Folder**.) Mather also has the same permissions to the **Machine** and **Tape Drive** that Clark does.

However, Mather's permissions to the **Volume** are different from Clark's. Mather has direct permission to the **Volume** in three ways: as a user, as a member of the **Conservationist** group and as a result of his equivalency to Clark. When NovaNET calculates his effective permissions, it uses these direct permissions from all three sources. In this case, Mather will have five permissions (Create, Modify, Delete, Write and Read).

Note that it does not matter that Mather's own direct permissions as a user do not include Create and Modify permissions. NovaNET uses all three sources to determine Mather's effective permissions to the volume. In this case, Mather's membership in the **Conservationist** group grants him Create and Modify permissions.

6. Given the above example, suppose we wanted to deny Mather *all* permissions to the **Volume**. How could this be accomplished?

To deny Mather all permissions to the **Volume**, three things must happen: Mather's equivalency to Clark must end; Mather's membership in the Conservationist group must end; and Mather's direct permissions must be changed so that Mather is listed on the **Permissions** tab of the **Volume** but no permission boxes are checked.

Note that listing Mather on the **Permissions** tab and clearing the permissions check boxes is not enough to deny Mather permissions to the tab. Mather must no longer be equivalent to Clark and Mather must no longer be a member of the Conservationist group.

Checking Effective Permissions

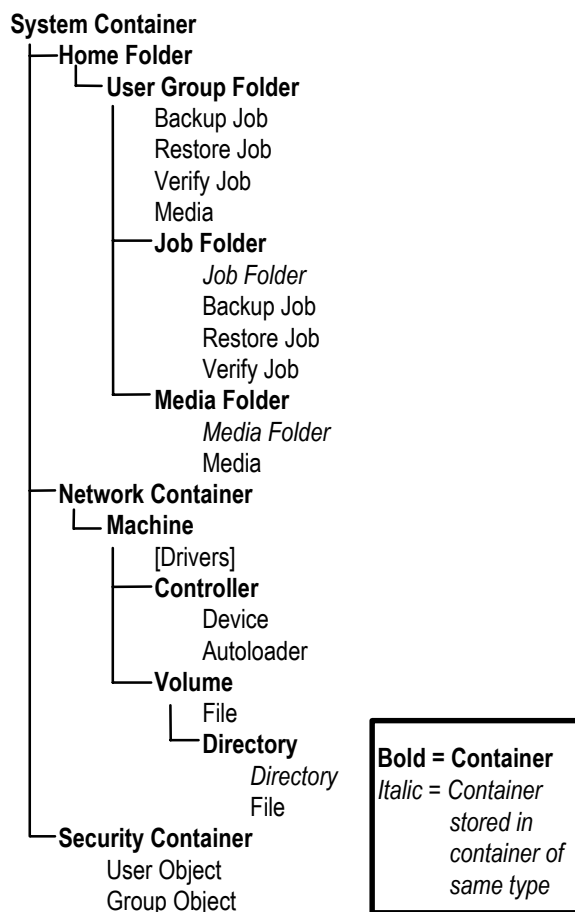
On complex installations with multiple users and groups and varying levels of security, a particular user's effective permissions can be difficult to identify. The easiest way to identify a user's effective permissions is to log on as that user.

If you have not yet assigned the user a password, simply log on as the user. Browse the various **General** tabs of the objects in the storage management database. Verify that the displayed effective permissions match your intended security measures.

If the user has a password and you do not know it, create an “alias” user and make it equivalent to the user whose permissions you wish to check. Then log on as the alias user. Be certain to delete both the alias user and its folder after verifying the effective permissions.

Permissions Reference

There are seven permissions: **Read**, **Write**, **Delete**, **Modify**, **Create**, **Access** and **Supervisor**. These permissions affect different objects in the NovaNET storage management database differently. Even though a particular permission may not apply directly to that object, objects below it in the storage management database hierarchy can still inherit permissions from that object.



Read Permission

Affected Objects Media, controller, device, autoloader, volume, directory, file, storage management database.

Description Controls whether a user can read from a given storage management database object.

In the case of physical peripherals that perform read functions, such as controllers, devices, autoloaders and volumes, **Read** permission to the peripheral is required in order for NovaNET to instruct the peripheral to read files or directories.

In case of storage management database objects that hold data, such as media, volumes, directories and files, **Read** permission is required to read the data these objects contain.

Affected Commands *Copy, Run (job type), Rewind, Start, Eject Media, Eject Magazine, Retension, Restore Database, Clean Device, Identify Media, Import Media, Restore Database.*

This permission enables **Copy** (but not **Paste**), allowing the user to copy objects in the storage management database.

Read permission is also required to run jobs. Backup jobs require **Read** permission to the appropriate volumes, directories and files. Restore jobs require **Read** permission to the appropriate devices, autoloaders and media. Verify jobs require **Read** permission to all of these objects.

Many commands that perform utility functions, such as **Clean Device** or **Eject Media** on a device, require **Read** permission. Device commands that also read media in backup devices require this permission.

Write Permission

Affected Objects Media, device, autoloader, volume, directory, file, storage management database.

Description Controls whether a user can write to a given storage management database object.

In the case of physical peripherals that perform write functions, such as controllers, devices, autoloaders and volumes, **Write** permission to the peripheral is required in order for NovaNET to instruct the peripheral to write files or directories.

In the case of storage management database objects that hold data, such as media, volumes, directories and files, **Write** permission is required to write data to these objects.

Affected Commands *Run (job type).*

Write permission is also required to run jobs. Backup jobs require **Write** permission to the appropriate devices, autoloaders and media. Restore jobs require **Write** permission to the appropriate volumes, directories and files.

Delete Permission

Affected Objects Media, device, autoloader, volume, directory, file, storage management database.

Description Controls whether a user can delete storage management database objects or perform delete functions.

In the case of physical peripherals that perform delete functions *including overwrite functions*, such as controllers, devices, autoloaders and volumes, **Delete** permission to the peripheral is required in order for NovaNET to instruct the peripheral to delete or overwrite files or directories.

In case of database objects that hold data, such as media, volumes, directories and files, **Delete** permission is required to delete or overwrite the data contained in these objects.

Affected Commands *Delete, Run (job type).*

This permission enables **Delete**, allowing the user to delete objects in the storage management database.

Delete permission is also required for some types of jobs. Backup jobs require **Delete** permission to the appropriate devices, autoloaders and media whenever files are overwritten or media are formatted. Restore jobs require **Delete** permission to the appropriate volumes, directories and files whenever the files are overwritten.

Modify Permission

Affected Objects All storage management database objects.

Affected Property Sheet Tabs *General, Selection, Options, Schedule, Logs, Storage,* machine diagnostic tabs.

Description Controls whether a user can change the name of an object, modify the specified tabs on an object's property sheet or move an object to a new location in the storage management database.

For any object, **Modify** permission allows the user to change the object's **General** tab. (This affects only the name of the object.)

For backup, restore and verify jobs, **Modify** permission *to the job* allows the user to change the job's **Selection**, **Options**, **Schedule** and **Logs** tabs. Note that **Read** permission to the volume is required in order to select the volume's files and directories on the **Selection** tab.

For machines, controllers and volumes, **Modify** permission allows the user to modify the diagnostic tabs, such as **Communication Test** and **Ping Test**.

Affected Commands *Move...*, *Rename*.

This permission enables **Move...** and **Rename**, allowing users to move objects in the storage management database and rename them.

Create Permission

Affected Objects Home folder, user/group folder, job folder, media folder, restore job.

Description Controls whether a user can create new objects within a container object.

For the Home folder, **Create** permission is required in order to create new User/Group folders.

For User/Group folders, **Create** permission is required in order to create new job folders, backup jobs, restore jobs, verify jobs, media folders and media.

For Job folders, **Create** permission is required in order to create new job folders, backup jobs, restore jobs and verify jobs.

For Media folders, **Create** permission is required in order to create new Media folders and media.

For Restore Jobs, jobs that restore files in new locations or with new names require **Create** permission to the appropriate machines, volumes and directories.

Affected Commands *New...Job*, *New...Folder*, *New Object...*, *Paste*.

This permission enables the **New...Job** and **New...Folder** commands, for each type of job and folder. This permission also enables the **New Object...** command on the **File** menu.

This permission enables **Paste**, allowing the user to paste objects in the storage management database.

Access Permission

Affected Objects All storage management database objects, except Security Container, User Object and Group Object.

Affected Property Sheet Tabs *Permissions*.

Description Controls whether a user can see and modify the **Permissions** tab of an object.

For any object, **Access** permission allows the user to change the permissions to the object. To add a new user to the **Permissions** tab, **Modify** permission is also required. A user listed on the **Permissions** tab can be deleted with **Access** permission alone.

Note that **Access** permission does not allow the user to change the **Permissions** tab on the Security Container, a User Object or a Group Object.

Supervisor Permission

Affected Objects All storage management database objects.

Affected Property Sheet Tabs *Logon Control, Equivalencies, Groups, Members, Permissions.*

Description This permission gives the user unlimited permissions to the object and all objects below it in the storage management database. Additionally, only a user with **Supervisor** permission to the Security Container can create new users and groups.

When a user has **Supervisor** permission to an object, the user is automatically granted all seven permissions to the object. Furthermore, the user cannot be denied any permission to any object below it in the hierarchy, even by assigning that user direct permission. As a result, a user with **Supervisor** permission to an object will have *all* permissions to the object and *every* object below it in the storage management database tree.

Supervisor permission to the Security Container is required to create new users and groups. Additionally, the **Logon Control**, **Groups**, **Equivalencies**, **Email**, **Autoprint** and **Members** tabs are only available to users with **Supervisor** permission to the Security Container.

Normally, only the NovaNET administrator has **Supervisor** permission to the System Container.

Affected Commands *New User, New Group*

This permission enables the **New User** and **New Group** commands, allowing the user to create new users and groups.

Chapter 12 — Objects and Properties Reference


This chapter provides reference details for every object and property in the NovaNET database. It is organized alphabetically according to the name of each property sheet tab. The property sheet tab name appears at the beginning of each entry and in the page header. The applicable objects for each property tab are listed under the *Applicable Objects* heading. Various fields and parameters on each property sheet tab are indicated by bold headings, followed by a short description. List box choices and field parameters are indicated by bold in-line headings.

In addition to the property sheet tabs, this chapter provides reference information for the **Instances**, **Preferences**, **Query** and **Selection Filters** windows.

Address Tab

Applicable Objects *Machine*

The **Address** tab shows the machine object's network address.



The screenshot shows a software window with a tab labeled "Address". Inside the window, there are two input fields. The first field is labeled "Protocol:" and contains the text "UDP". The second field is labeled "Net address:" and contains the text "192.168.0.64:58084". The rest of the window is a large, empty gray area.

Address
tab

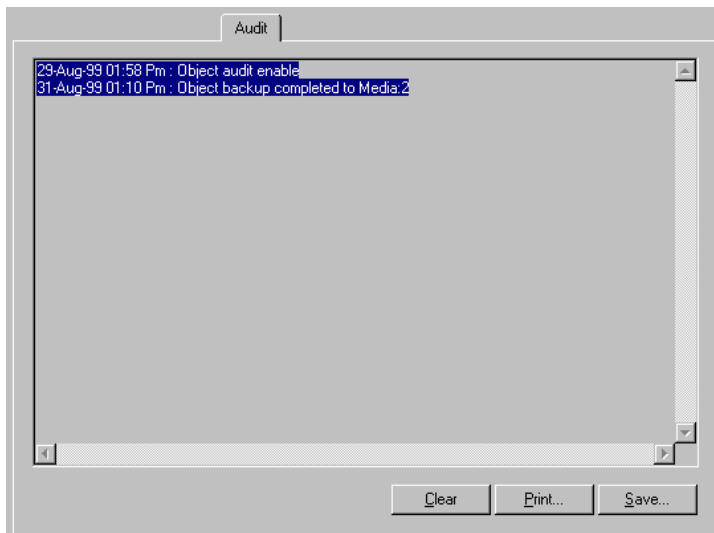
Protocol This field shows either **Ipx** or **UDP**, depending on your network operating system. If this is a standalone machine, it shows **Local**.

Net Address This field shows the machine address used by the network operating system. If this is a standalone machine, it shows **Local**.

Audit Tab

Applicable Objects *File, Directory, Volume*

The **Audit** tab shows the audit log for the object. It appears on the property sheet of an object that has been *audit enabled*.



Audit tab

To enable an object's audit log, open the **Storage** tab of the object and change the **Audit object actions** setting to **Audit enable**.

When audit is enabled, NovaNET enters into that object's log a record every action performed on that object. For example, there will be an entry each time the object is backed up or restored. Additionally, the audit log will show the media on which instances of the object are stored.

Clear Click to erase all audit log entries.

Print Click to print the audit log. Note that some logs can be quite long; check the length of the document before printing it.

Save Click to save the audit log as a text file.

For more information on...

See...

Using audit logs

Audit Logs, Chapter 8 — Running Jobs

Autoprint Tab

Applicable Objects *User Object, Group Object*

The **Autoprint** tab shows the print settings to use when automatically printing a job log.

Autoprint tab

The **Autoprint** tab appears on the property sheet of a user or group object. When the **Autoprint log** option is selected on the **Advanced Options** window for a job, the job log prints automatically as soon as the job is complete. It prints to the printer specified on the **Autoprint** tab for the job owner.

For more information on...	See...
Job logs	<i>Job Logs, Chapter 8 — Running Jobs</i>
Autoprinting logs	<i>Autoprinting Job Logs, Chapter 8 — Running Jobs</i>
The Advanced Options window	<i>Advanced Options, Chapter 7 — Job Options</i>
Configuring autoprint for Windows NT (or later)	<i>Appendix G — Configuring Autoprint for Windows, NovaNET Installation Guide</i>

Command Tab

Applicable Objects *Volume, Directory, File*

Use the **Command** tab to execute operating system commands before and after backup jobs. These commands can execute programs, batch files or scripts.

The default path for these programs, batch files or scripts is the same as the path of the current object (e.g., the volume, directory or file whose property sheet is open). You can specify another path if necessary.

Be sure that you enter commands appropriate to the operating system. On Windows systems, you can specify **.exe** and **.bat** files, such as **c:\mybatch.bat**. On NetWare systems, you can specify **.ncf** files, such as **mybatch.ncf**. On Linux and FreeBSD systems, you can specify shell scripts, such as **myscript.sh**. You can also specify any parameters with these commands, according to the operating system.

Command

Command to execute before backup:

c:\stop_acct.bat

Command to execute after successful backup:

c:\start_acct.bat

Command to execute after failed backup:

c:\error.bat

Command
tab

For example, you may want to temporarily close certain files before backing up. You could prepare one batch file to close these files and one to open these files after a successful backup. You could also prepare a batch file to execute if the backup job fails. Then you would enter these commands in the appropriate fields.

Note If a command takes more than 15 seconds to execute, NovaNET continues the job. This is a precaution in case the command fails in some way, which would prevent NovaNET from continuing. If the command must be run, we recommend that you assign it to the next object up in the tree view.

Command to execute before backup NovaNET executes this command before it opens the current object for backup. Enter the command with its path (if necessary) and any parameters.

Command to execute after successful backup NovaNET executes this command after it has successfully backed up and closed the current object. Enter the command with its path (if necessary) and any parameters.

Note If the backup job includes a verify step, NovaNET executes this command if the current object was backed up successfully. NovaNET closes the object and executes this command. Then it performs the verify step.

Command to execute after failed backup NovaNET executes this command after it closes the current object if the backup fails. Enter the command with its path (if necessary) and any parameters.

Note If the backup job includes a verify step, NovaNET executes this command if the backup of the current object fails. NovaNET closes the object and executes this command. Then it performs the verify step.

Communication Test Tab

Applicable Objects *Machine*

Use the **Communication Test** tab to test the communication performance of the network. It can also be used to evaluate the ability to transfer data under optimum circumstances.

Comm Test

Transfer type:
 Backup ☒ With data checking

Communication status

Packet No.:	<input type="text"/>
Transfer rate (KBytes/sec):	<input type="text"/>
Transfer rate (MBytes/min):	<input type="text"/>
No. of ACKs sent:	<input type="text"/>
No. of NACKs sent:	<input type="text"/>
No. of timeouts:	<input type="text"/>

Communication Test tab

Running the Test

Note To accurately test network performance, stop the NovaNET service on the machine to be tested (see *Appendix E — NovaNET Service* in the *NovaNET Installation Guide*). Then start the NovaNET administrator and access the **Communication Test** tab.

1. Configure the **Transfer type** parameter:

Backup Simulates data transfer during a backup job. The local machine sends a large packet; the remote machine sends small replies acknowledging receipt of the data.

Restore Simulates data transfer during a restore job. The remote machine sends a large packet; the local machine sends small replies acknowledging receipt of data.

Large packet Send a large-sized packet of data between remote and local machine.

Medium packet Send a medium-sized packet of data between remote and local machine.

Small packet Send a small-sized packet of data between remote and local machine.

2. Select **With data checking** to send a known byte pattern between machines. The receiving machine will verify the pattern.
3. Click **Start** to begin the test. As the test runs, the **Communication status** fields reflect the results of the test.
4. Click **Stop** to end the test. The final results appear in the **Communication status** fields.

Test Results

The **Communication status** fields display the test results:

Packet No. This is the number of data packets sent from one machine to another up to this point in the test.

Transfer rate (KBytes/sec) The rate at which the test data packets are being transferred in kilobytes per second.

Transfer rate (MBytes/min) The rate at which the test data packets are being transferred in megabytes per minute.

No. of ACKs sent The number of network ACKs (acknowledgments) sent between machines.

No. of NACKs sent The number of network ACKs (negative acknowledgments) sent between machines.

No. of timeouts The number of communication errors encountered. This only occurs if a machine on the network fails to respond in timely fashion.

Note Use this information to identify current transfer rates between machines. If the rates are less than expected, try one or more NovaNET optimization strategies.

For more information on...

See...

Optimizing backup jobs by increasing data transfer rate

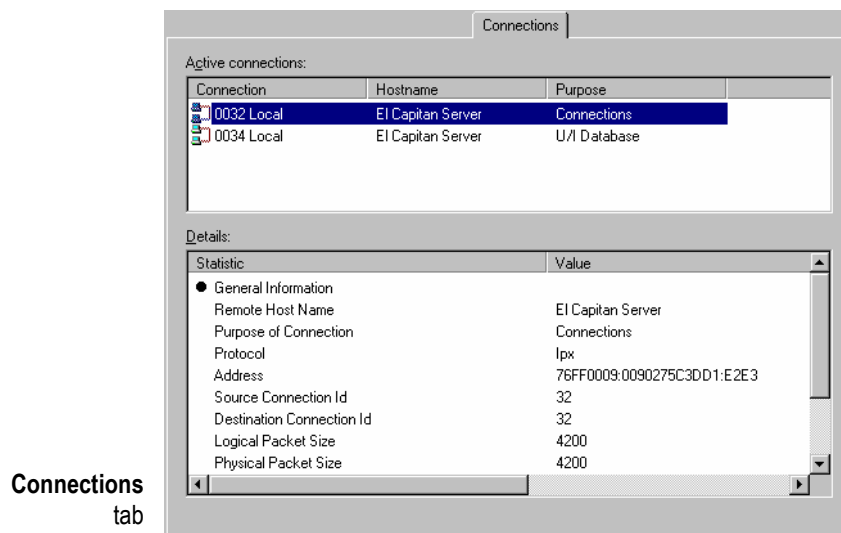
Strategies for Faster Jobs, Chapter 10 — Tips, Techniques and Strategies

Connections Tab

Applicable Objects *Machine*

The **Connections** tab shows the active connections for this machine. It is for information purposes only.

Connections are established for varying purposes and are automatically opened and closed as necessary.



Active connections Lists the currently active connections for this machine.

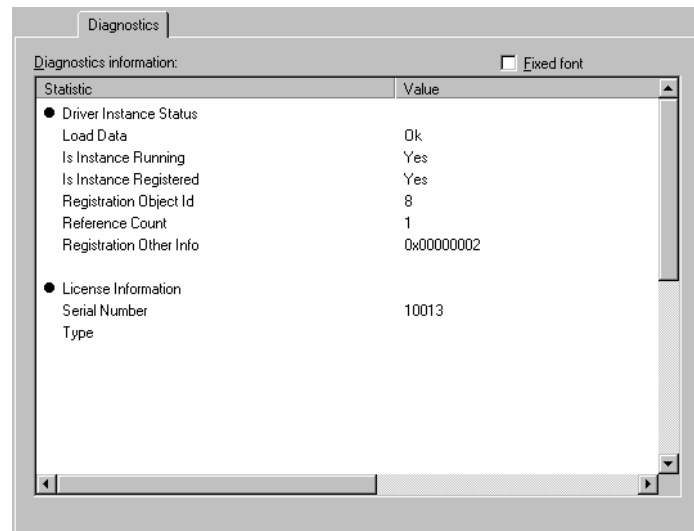
Details Shows detailed information about the selected active connection.

Diagnostics Tab

Applicable Objects *Machine, Drivers*

The **Diagnostics** tab provides detailed information about the current machine or driver object. It is available for all active machines and drivers, including controllers, logical tape formats and services. It is for information purposes only.

Diagnostics
tab



The screenshot shows a window titled "Diagnostics" with a tab labeled "Diagnostics". Inside the window, there is a section titled "Diagnostics information:" with a checkbox for "Fixed font". Below this, there is a table with two columns: "Statistic" and "Value". The table contains two main sections: "Driver Instance Status" and "License Information".

Statistic	Value
● Driver Instance Status	
Load Data	Ok
Is Instance Running	Yes
Is Instance Registered	Yes
Registration Object Id	8
Reference Count	1
Registration Other Info	0x00000002
● License Information	
Serial Number	10013
Type	

Drivers Tab

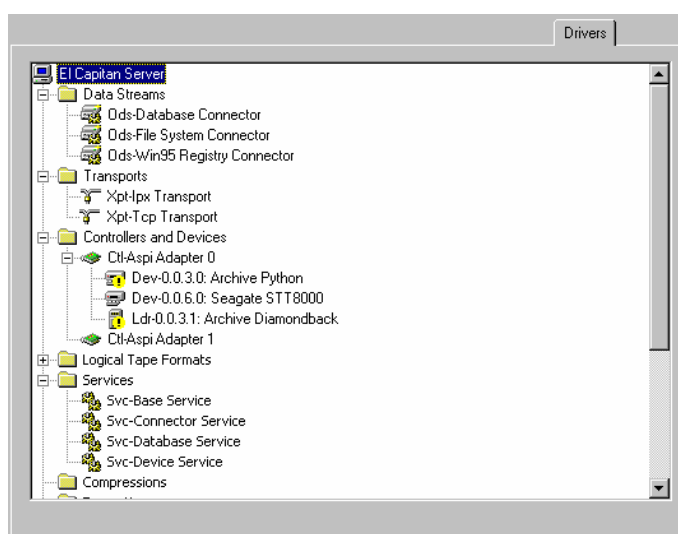
Applicable Objects *Machine*

The **Drivers** tab shows the available drivers for this machine. It provides users with a single view of all drivers associated with this machine. (The **Drivers** tab also appears on the **Database** tab in various locations.) It is for information purposes only.

Drivers are used by NovaNET for differing purposes. The name of each folder on this tab indicates the purpose of the drivers in that folder.

Drivers that are marked with a yellow exclamation point are currently unavailable for some reason. The device could be initializing or there may be an actual failure. For example, a controller driver may be marked with this icon during device initialization. Once initialized, the exclamation disappears when you press **F5**. When there is an actual failure, you must correct the problem and restart the driver. You must exit and restart NovaNET and the NovaNET service. When NovaNET restarts, it will reinitialize these devices.

Drivers
tab



Email Tab

Applicable Objects *User Object*

The **Email** tab shows the email address to which logs of jobs will be emailed when that user is the owner of a job that runs. This tab only appears when the optional email package has been installed and configured.

Enter email address(es) to send logs to when jobs are completed.
For example: admin@company.com,steve@hotmail.com

Email address(es):
systemadmin@yourcompany.com

Email
tab

When email has been installed and configured, NovaNET will attempt to email the log of every job after it has run. The log is sent to the address listed on the **Email** tab for the job owner.

You can enter multiple email addresses by separating each address with a semicolon (no additional spaces).

The address entered here need not be the address of the user. For example, you can enter the NovaNET administrator's address in this field for any or all users.

For more information on...

See...

The owner of a job

How Forcing Jobs to Run Affects Permissions, Chapter 8 — Running Jobs

Installing and configuring email

Appendix C — Configuring Email Options, NovaNET Installation Guide

Using email to send job logs

Emailing Job Logs, Chapter 8 — Running Jobs

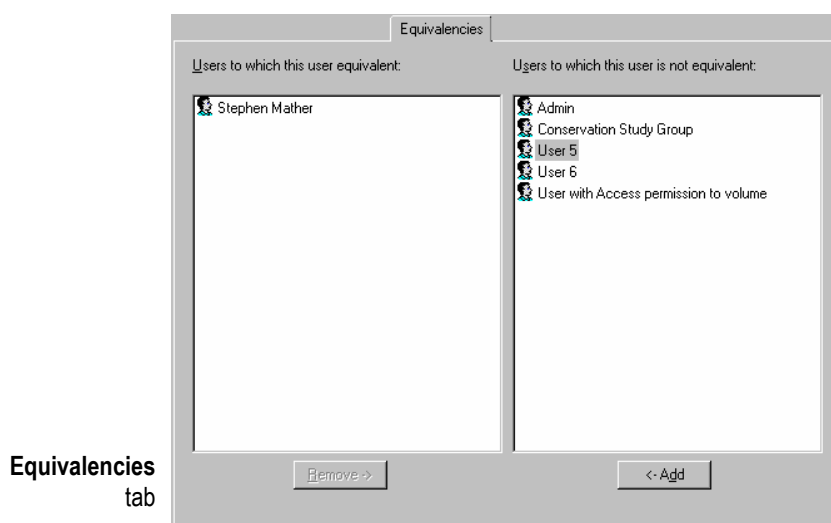
Equivalencies Tab

Applicable Objects *User Object*

The **Equivalencies** tab is used to assign an individual user effective permissions equivalent to the effective permissions of another user.

Note that equivalencies only work in one direction; they are not reciprocal. The current user's effective permissions (the effective permissions of the user whose property sheet is open) will be calculated using the direct and inherited permissions of the user they are made equivalent to. For example, if a user named Galen Clark is made equivalent to a user named Stephen Mather, Clark's effective permissions are calculated using *both* Mather's *and* Clark's direct permissions. However, Mather's effective permissions remained unchanged.

Additionally, note that users can gain *direct* permissions to objects either as users, as a result of equivalencies or as members of a group. When the direct permissions result from multiple sources, NovaNET uses all of the sources to determine the permissions.



Users to which this user is equivalent Lists those users to whom the current user (whose property sheet is open) is equivalent.

Users to which this user is not equivalent Lists those users to whom the current user (whose property sheet is open) is *not* equivalent.

Remove To remove a user from the equivalent list, select the user from the left window pane and click **Remove**. The user is moved to the right window pane.

Add To add a user to the equivalent list, select the user from the right window pane and click **Add**. The user is moved to the left window pane.

For more information on...**See...**

Calculating effective permissions

*Effective Permissions, Chapter 11 —
Advanced Permissions and Security*

Examples of equivalencies

*Examples of Effective Permissions, Chapter
11 — Advanced Permissions and Security*

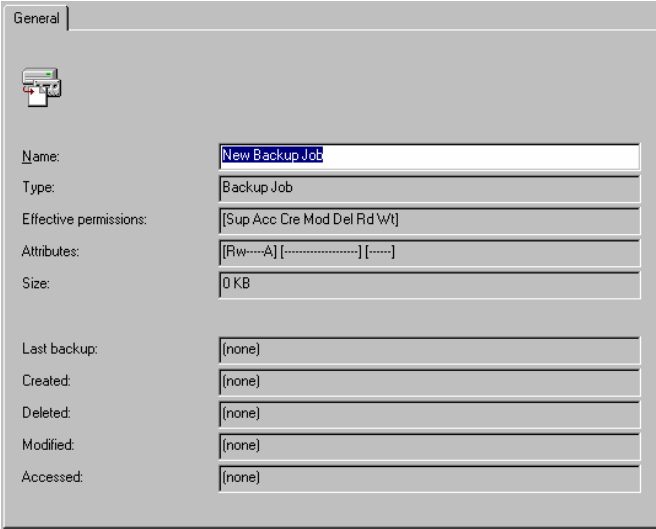
General Tab

Applicable Objects *All objects*

The **General** tab shows information and object attributes stored in the NovaNET database for the current object.

The data on this tab is taken from the NovaNET database. For files, directories and volumes, this data is regularly updated. Each time NovaNET opens a directory or volume, it updates it database with any new information about these files and directories.

General tab

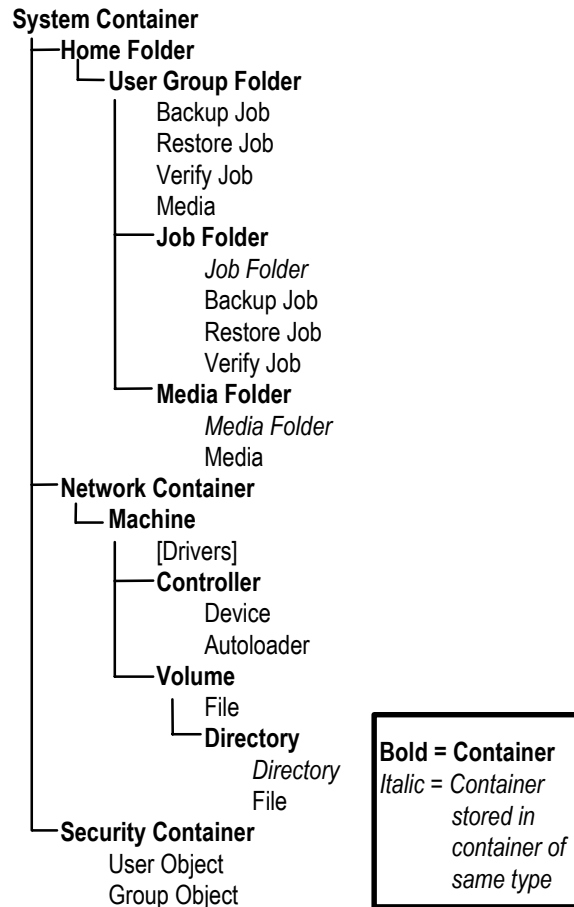


The screenshot shows a window titled 'General' with a tab labeled 'General'. Inside the window, there is a small icon of a floppy disk with a red 'X' on it. Below the icon, there are several fields for object information:

Name:	New Backup Job
Type:	Backup Job
Effective permissions:	[Sup Acc Cre Mod Del Rd Wt]
Attributes:	[Rw----A] [-----] [-----]
Size:	0 KB
Last backup:	(none)
Created:	(none)
Deleted:	(none)
Modified:	(none)
Accessed:	(none)

Name Shows the name of the current object. To change the name, select it and type in a new name. An object name can be up to 256 characters long.

Type Shows the type or category of object. There are 21 object types in the NovaNET database, plus drivers. The object names and their possible relationships to each other are illustrated below.



Effective Permissions Shows the effective permissions the current user has to this object. Note that these are the *effective* permissions, not the *direct* permissions. There are seven possible permissions, abbreviated as follows:

Sup	Supervisor
Acc	Access
Cre	Create
Mod	Modify
Del	Delete
Rd	Read
Wt	Write

Attributes Shows operating system attribute information about file or directory. The attribute information is taken from the operating system and is updated each time the directory that contains the file is opened. You can use this information to sort files with filters.

The attribute abbreviations are grouped as follows:

Ro	Read only
Rw	Read and write
H	Hidden
Sy	System
X	Execute only
D	Directory
A	Archive
I	Incremental
D	Differential
E	Encrypted
Sh	Share
Tm	Temporary
T	Transaction
Ra	Read audit
Wa	Write audit
P	Immediate purge
Ri	Rename inhibit
Di	Delete inhibit
Ci	Copy inhibit
Dm	Migrate inhibit
Ds	Sub-allocation inhibit
Ic	Immediate compression
Dc	Don't compress
Co	Compressed
Cc	Can't compress
Mg	Migrated

Size Shows operating system information about file or directory size. Information about the size of the file or directory is taken from the operating system and is updated each time the directory that contains the file is opened. You can use this information to sort files with filters.

Last backup Shows the date and time when this object was last backed up. You can use this information to sort files with filters.

Created Shows operating system information about date file or directory created. The create date is taken from the operating system and is updated each time the directory that contains the file is opened. You can use this information to sort files with filters.

Deleted When a file that was previously backed up is deleted, NovaNET assigns it a delete date. When NovaNET opens a directory, it compares the files it finds with information about instances of files in its database. When an instance of the file is found in the database, but not in the directory, NovaNET assigns that instance a delete date.

Modified Shows operating system information about date file or directory last modified. The modify date is taken from the operating system and is updated each time the directory that contains the file is opened. You can use this information to sort files with filters.

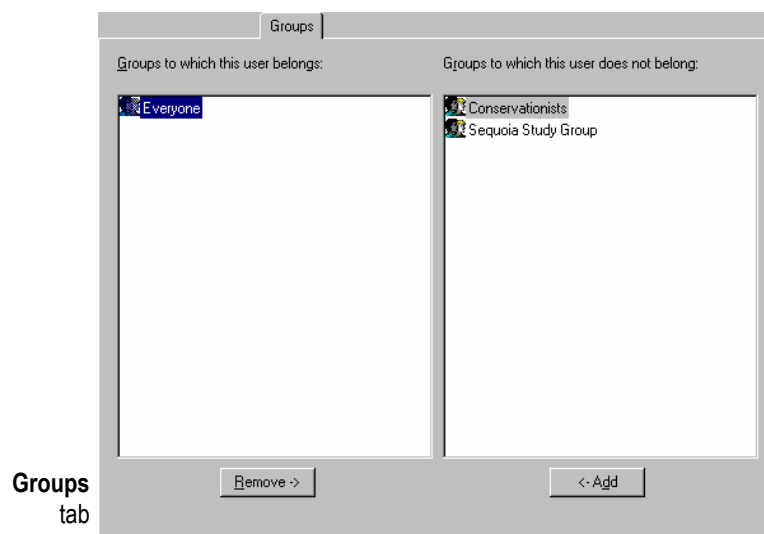
Accessed Shows operating system information about the date the file or directory last accessed. The access date is taken from the operating system and is updated each time the directory that contains the file is opened. You can use this information to sort files with filters.

For more information on...	See...
Calculating effective permissions	<i>Effective Permissions, Chapter 11 — Advanced Permissions and Security</i>
Sorting selected files according to object attributes	<i>Filter Selection Criteria, Chapter 5 — Selecting Files and Instances</i>

Groups Tab

Applicable Objects *User Object*

The **Groups** tab shows the groups to which the current user belongs. Use this tab to add or remove a user from a group.



Groups to which this user belongs Shows the groups to which the current user belongs. To add the user to a new group, select the group in the right window pane and click the **Add** button; the group is moved to the left window pane. Similarly, to remove a user from a group, select the group from the left window pane and then click the **Remove** button.

Everyone group Normally, this group will be listed in this field. When created, new users are automatically added to the **Everyone** group. Members of this group have **Modify**, **Delete**, **Create**, **Write** and **Read** permissions to the **Everyone Folder**. You can remove a user from this group by selecting the **Everyone** group and then clicking remove.

Groups to which this user does not belong Shows the groups to which this user does *not* belong.

For more information on...	See...
Calculating effective permissions	<i>Effective Permissions, Chapter 11 — Advanced Permissions and Security</i>
Assigning members to groups	<i>Setting Up Users, Chapter 11 — Advanced Permissions and Security</i>

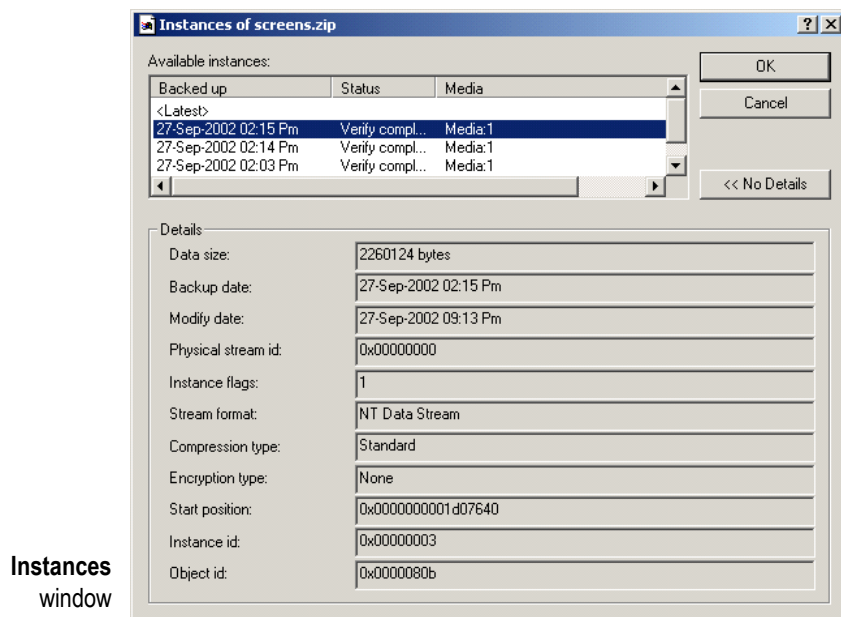
Instances Window

Open the **Instances of...** window by clicking the **Check** button on the toolbar of the **Selection** tab of either a restore or verify job. This window is used to select an instance of the object targeted on the **Selection** tab.

Each time an object is backed up, an *instance* of that object is created. There may be multiple instances of objects stored on different media created by different backup jobs. NovaNET keeps track of all the instances of each object in its database and the media on which each instance is stored. When media is overwritten or deleted, NovaNET deletes those instances from its database as well.

When you select an object for restoring, NovaNET initially selects the **<Latest>** instance. To select a different instance, use the **Instances of...** window.

The **<Latest>** instance is a wildcard and automatically selects the most recent instance. Which instance is selected is updated as the restore or verify job is run.



Available Instances

Shows a list of the instances of the object and the media on which those instances are stored.

Backed up Shows the date and time the job was run. All objects backed up during a single job will be listed with the same date and time.

Status Shows whether or not the object was verified when the job was run. It is either **Verify complete**, **Verify failed** or **Not verified**.

Media Shows the media on which the instance is stored.

Select the instance to restore and click **OK**.

Details

Shows more information about whatever instance of an object is highlighted. When you click **Details**, NovaNET displays the following information about the object. Click **No Details** to close the **Details** window.

Data size Shows the size of the data fork for the selected object: 0 bytes for folders and directories; the size of each file.

Backup date The date and time this instance was created.

Modify date The last time the object was modified. This information is recorded from the operating system when the object is backed up.

Physical stream id Shows internal data used by NovaNET to manage the instance.

Instance flags Shows internal data used by NovaNET to manage the instance.

Stream format Shows what format the instance is recorded in. The stream format is controlled by the **Advanced Options** window. You can use this information to see if you can transfer the object from one operating system to another. Stream format can only be set when creating instances, not when restoring them.

Compression type Shows the compression setting on the **Options** tab for the backup job.

Encryption type *(Reserved for future use.)*

Start position Shows internal data used by NovaNET to manage the instance.

Instance id Shows internal data used by NovaNET to manage the instance.

Object id Shows internal data used by NovaNET to manage the instance.

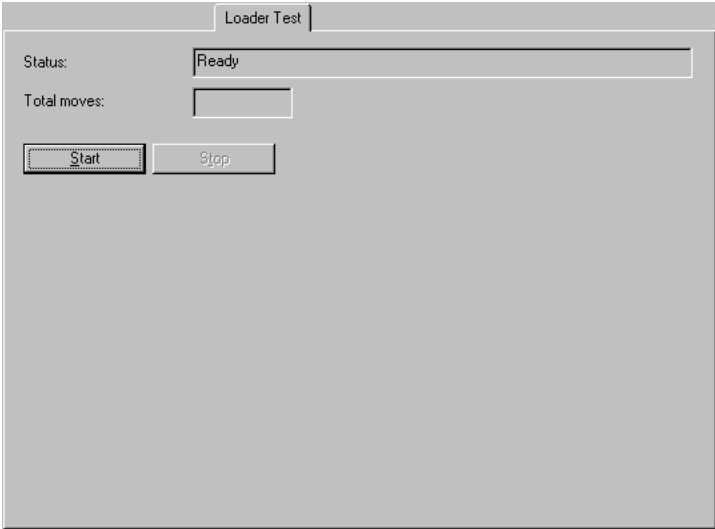
For more information on...	See...
Selecting instances	<i>Selecting Instances of Files for Restore Jobs, Chapter 5 — Selecting Files and Instances</i>
Using filters to select instances	<i>Backup Range, Chapter 5 — Selecting Files and Instances</i>

Loader Test Tab

Applicable Objects *Autoloader*

The **Loader Test** tab lets you test the ability of the autoloader to load and unload media to the associated device.

Click **Start** to begin the test. Click **Stop** to end the test.



The screenshot shows a software window titled "Loader Test". Inside the window, there is a "Status:" label followed by a text box containing the word "Ready". Below this is a "Total moves:" label followed by an empty text box. At the bottom left of the window are two buttons: "Start" and "Stop". The "Start" button is highlighted with a dashed border. To the left of the window, the text "Loader Test tab" is displayed.

Status Shows an informational message about the current autoloader activity.

Total Moves Shows the total number of media loads and unloads performed during the current test.

Logon Control Tab

Applicable Objects *User Object*

The **Logon Control** tab controls the ability of a user to log on to the current NovaNET database zone. Controls whether passwords are required, whether and when the password must be changed, whether an account has expired and the number of connections a user can have to the network.

Logon Control tab

The screenshot shows the 'Logon Control' tab for a user object. It is divided into several sections:

- Expiration:**
 - ☐ Account is disabled
 - Date account expires: 01-Oct-2002
- Grace logons:**
 - ☒ Grace logons allowed
 - Limit grace logons: 6
 - Remaining grace logons: 6
- Connection:**
 - Number of concurrent connections: 250
 - User can log on from these machines: (empty list box)
 - Buttons: Add..., Delete
- Password:**
 - ☒ Require password
 - Minimum password length: 5
 - ☒ Require unique passwords
 - ☒ Force periodic password changes
 - Days between forced changes: 40
 - Date password expires: 02-Nov-2002
 - ☒ Allow user to change password

Expiration

Controls when the current account will expire. A user account can expire on a given date or can be disabled manually.

Account is disabled Checked when the account has expired.

Date account expires Specifies a date when the account will no longer be active. When the account expires, NovaNET disables the account and checks the **Account is disabled** box. This user will be unable to log on until the **Account is disabled** box is cleared.

To make a disabled account active again, clear the **Account is disabled** box and change the **Date account expires**.

Connection

Controls the allowable machines and simultaneous logons for a user.

Number of concurrent connections Controls how many different logons a user may have simultaneously from different machines. For example, if the **Number of concurrent connections** is set to **5**, this user can log on to NovaNET from up to five separate machines at the same time.

User can log on from these machines Lists the machines from which a user can log on to NovaNET. The user cannot log on to NovaNET from any machine unless it is listed. To add machines, click **Add...** and select the appropriate machine from the **Browse** window. To remove machines, select the machine and click **Delete**.

Note If no machine is listed, a user can log on from any machine.

Grace Logons

Controls how many times a user can log on to NovaNET after their password has expired. For example, if the **Allow grace logons** box is checked and the **Remaining grace logons** is set to **2**, the user will be allowed to log on two times after their old password has expired. On the third logon attempt, the user must change their password.

Note Grace logons do not function when passwords are not required, that is, when the **Require password** check box is cleared.

Grace logons allowed If checked, a user can log on after their old password has expired.

Limit grace logons Shows the maximum number of grace logons allowed. For example, if it is set to **2**, the user can log on with an expired password two times.

Remaining grace logons Shows the number of remaining grace logons. NovaNET automatically adjusts this number each time the user logs on with expired password. You can also set this manually.

Password

Controls whether a user must have a password to log on.

Require password When checked, NovaNET requires the user to have a password.

Note If you clear the **Require password** box and the user has a password, NovaNET will continue to require that user to input their password.

Minimum password length Specifies the minimum length of the password.

Require unique passwords If checked, NovaNET only accepts the new password if the user has not used it before.

Force periodic password changes If checked, either the user or the NovaNET administrator must change the password per the **Days between forced changes** and **Date password expires** settings.

Days between forced changes Specifies the interval between forced password changes.

Date password expires Calculated date of next password expiration, based on **Days between forced changes** parameter.

Allow user to change password If checked, the user can change their password on their own.

Tip The NovaNET administrator can change a user's password without knowing the user's current password. NovaNET does not even ask you to enter the old password. This is useful when the user has forgotten his or her password.

For more information on...	See...
----------------------------	--------

Setting up new users

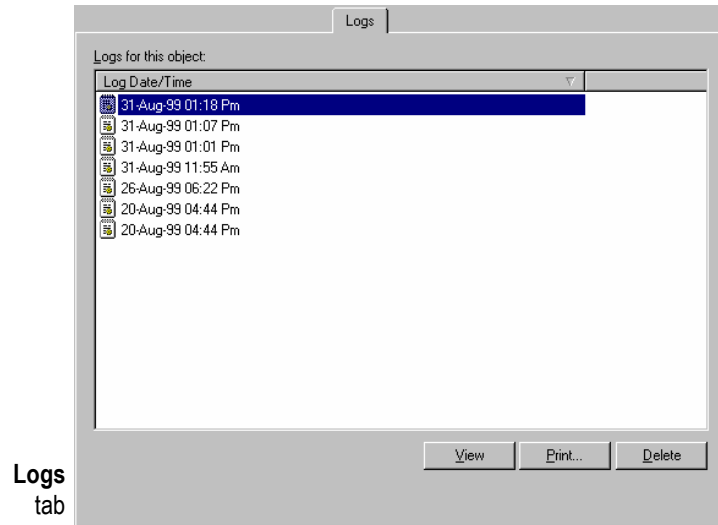
Setting Up Users, Chapter 11 — Advanced Permissions and Security

Logs Tab

Applicable Objects *Backup Job, Restore Job, Verify Job*

The **Logs** tab shows the available logs for the current job.

NovaNET creates a log for each job, according the **Log option** on the job's **Options** tab. After the job runs, you can view or print this log to see the files that were successfully or unsuccessfully backed up, restored or verified.



Logs for this object Lists the available logs for this job.

View Select a log and click to open the file in the specified text editor. (Specify the text editor to use in the **Preferences** window.) You can print the log from the text editor. Note that some logs can be quite long; check the length of the document before printing it.

Print Select a log and click to print the log. Note that some logs can be quite long; check the length of the document before printing it.

Delete Select one or more logs and click to delete them.

Note The maximum number of logs per job is 64. NovaNET will overwrite the oldest log when you reach this maximum.

For more information on...	See...
Creating logs	<i>Log Option, Chapter 7 — Job Options</i>
Accessing and printing job log	<i>Job Logs, Chapter 8 — Running Jobs</i>
Specifying a text editor	<i>Preference Window, Chapter 12 — Object and Property Reference</i>

Media Control Tab

Applicable Objects *Media*

The **Media Control** tab shows information about the current media that NovaNET stores in its database.

Media Control

First format:	28-Aug-99 03:13 Pm
Last format:	28-Aug-99 03:13 Pm
Last read:	28-Aug-99 04:37 Pm
MBytes read:	0
Count read:	2
Last write:	28-Aug-99 04:37 Pm
MBytes written:	0
Count written:	1
Number of sessions:	1
Current KBytes:	1
Media identifier:	935622629
Media volume tag:	

Media Control tab

First format Shows the date and time the current media was first formatted.

Last format Shows the date and time the current media was last formatted.

Last read Shows the date and time the current media was last read. Matches the last time files were read for either a restore or verify job or the verify pass of a backup job.

MBytes read Shows the total number of megabytes read during the last verify or restore job.

Count read Shows the total number of times this media has been read. This number is not reset when the media is overwritten.

Last write Shows the date and time the current media was last written to. Matches the last time files were written to the media during a backup job.

MBytes written Shows the total amount of data written in megabytes to this media over the life of the media.

Count written Shows the total number of times this media has been written to. This number is not reset when the media is overwritten.

Number of sessions Shows the number of jobs this media has been used with. This number is reset each time the media is overwritten. In general, this number is the number of backup jobs currently stored on the media, including the first overwrite job and subsequent append jobs.

Current KBytes Shows the amount of data written to this media during the last backup job in Kbytes. This number is reset when the tape is overwritten.

Media identifier Shows the unique number used internally by NovaNET to track the media in the database.

Media volume tag Shows the volume tag for the physical media. In general, this number equals the bar code number on the media. Used by devices with optical readers to identify media. This is only available for media used with devices that support volume tags.

For more information on...**See...**

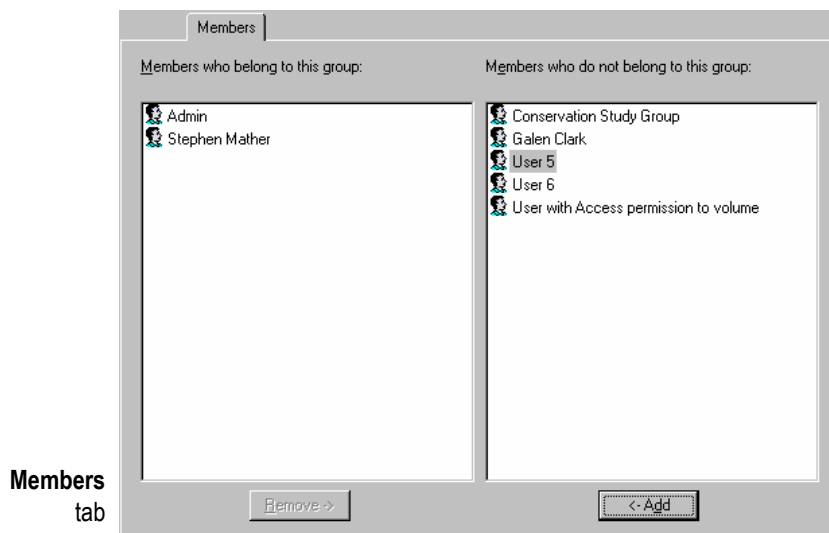
Formatting media

*Creating New Media, Chapter 9 — Media,
Device and Database Tabs*

Members Tab

Applicable Objects *Group Object*

The **Members** tab shows the users that are members of the group. Use it to add and remove members from a group. A user's group membership is used to calculate their effective permissions. For more information about effective permissions, see *Effective Permissions in Chapter 11 — Advanced Permissions and Security*.



Members who belong to this group This window shows the users that are members of the group.

Members who do not belong to this group This window shows the users that are not members of the group.

Add To add a user to the group, select the user in the right window and click **Add**. The user is moved to the left window.

Remove To remove a user from the group, select the user in the left window and click **Remove**. The user is moved to the right window.

For more information on...

See...

Adding users to groups

Groups Tab, User Object, Chapter 11 — Advanced Permissions and Security

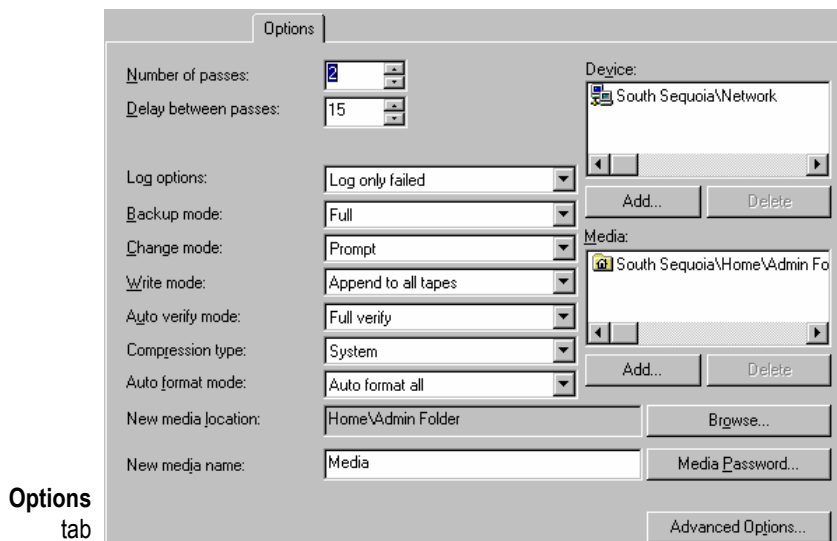
Calculating effective permissions

Effective Permissions, Chapter 11 — Advanced Permissions and Security

Options Tab

Applicable Objects *Backup Job, Restore Job, Verify Job*

The **Options** tab on the property sheet of a job controls various parameters important to how NovaNET runs backup, restore and verify jobs.



Number of Passes

Determines how many times NovaNET will attempt to access a file. The default is **3**.

If NovaNET needs to use a file that is currently being used, NovaNET waits until that user is done with the file. Each attempt to open a file is called a **pass**.

For backup jobs, when NovaNET is unable to back up a file on the first pass, it attempts to back up that file on subsequent passes. On the last pass, NovaNET opens the file in *shared* mode.

Delay Between Passes

Determines how many seconds NovaNET waits before attempting the next pass. If your historical usage suggests that many files are being opened on the last pass, consider increasing this parameter to a higher number.

Log Options

Determines the kind of log that NovaNET keeps of the current job. The **Log options** is either **None**, **Log only failed**, **Log only completed** or **Log all**.

After a job is run, you can view or print the log to see which files were successfully or unsuccessfully backed up, restored or verified. The default value is **Log only failed**, which writes to the log any files that were not successfully backed up, restored or verified.

None Instructs NovaNET to not keep a log of the backup job as it runs.

Log only failed Instructs NovaNET to log the name of any selected file that was not successfully backed up, restored or verified.

Log only completed Instructs NovaNET to log the name of any file selected for and successfully backed up, restored or verified.

Log all Instructs NovaNET to log the name of every file selected and whether or not that file was successfully backed up, restored or verified.

Backup Mode

(Backup jobs only)

Determines whether all files or only changed files are backed up. For scheduled automatic rotation jobs, NovaNET uses the backup mode for each backup set as indicated on the **Schedule** tab; for unscheduled or manual jobs, NovaNET uses the parameters set by the user.

The **Backup mode** is either **Full**, **Incremental**, **Differential** or **Snapshot**.

Full Instructs NovaNET to back up all selected files. For each file, NovaNET resets the incremental bit in the storage management database and the archive bit on disk.

Differential Instructs NovaNET to back up all selected files that have changed since the *last full* backup. When a file changes, its differential bit has been set. NovaNET does not reset any bits.

Incremental Instructs NovaNET to back up all selected files that have changed since the *last* backup. For each file, NovaNET resets the incremental bit in the storage management and the archive bit on disk.

Snapshot Instructs NovaNET to back up *all* selected files. It has no effect on any future scheduled job. After backing up each file, the archive bit is *left unchanged*.

Change Mode

(Backup jobs only)

Determines what action NovaNET will perform when it fails to find the media it was expecting to use for a job. When NovaNET runs a job, if the job uses specific media, NovaNET scans the network for devices with that media. If it does not find the media it expects, its response is determined by the **Change mode** parameter.

The **Change mode** is either **Skip device**, **Force to append** or **Prompt**.

Skip device Instructs NovaNET to skip the designated device and look for other devices on the network with the proper media. NovaNET continues to scan for the correct media until it is found. As a result, the job may never run if the correct media is not found.

Force to append Instructs NovaNET to append data to whatever media it finds in the designated backup device. If it cannot find the correct media, NovaNET appends data to whatever media is available. This option will ensure that the job runs, if the media contains enough room to complete the job.

Prompt Instructs NovaNET to continue to scan for the expected media and to send an alert warning that the proper media has not been found. This option will not allow a job to run with any other media except with the expected media. Additionally, this option will not search for another device that might contain the proper media.

Write Mode

(Backup jobs only)

Determines whether the old data on the media is *overwritten* with new data or whether the new data is *appended* to the end of the old data. When media is overwritten, all of the data previously stored on it is lost. Appending data will preserve the old data.

For scheduled automatic rotation jobs, NovaNET defaults to **Overwrite all tapes**; for unscheduled and manual jobs, NovaNET uses the parameters set by the user.

The **Write mode** is either **Append to all tapes**, **Append to 1st tape, overwrite others** or **Overwrite all tapes**.

Append to all tapes Instructs NovaNET to append all data to the end of the media. No data is overwritten. Select this parameter for permanent storage.

Append to 1st tape, overwrite others Instructs NovaNET to append data to the end of the first media, but to overwrite all media that follows. For example, NovaNET will not overwrite the first tape inserted, but will overwrite the second, third and later tapes. This parameter is useful if you have a set of media with old data you no longer need. By selecting this option, NovaNET preserves your most recent data on the first media, but overwrites older, unneeded media.

Overwrite all tapes Instructs NovaNET to overwrite all media. All data on media that is overwritten is lost. Use this option for tapes that are going to be recycled.

Auto Verify Mode

(Backup and verify jobs)

Verifies that a file was backed up correctly. NovaNET compares the file to the original file.

The **Auto verify mode** is either **No verify**, **Full verify** or **Quick verify**.

No verify Instructs NovaNET to skip the verification step. It is not recommended.

Full verify Instructs NovaNET to compare every selected file stored on media with the original file from the workstation or file server. This default option is strongly recommended.

Quick verify Instructs NovaNET to be certain that every file backed up onto the tape is in readable condition. It does not verify that the data is correct, only that the data stored on the tape (incorrect or not) can be read. While selecting this option can save time, it is nonetheless not recommended.

Compression Type

(Backup jobs only)

Controls how NovaNET compresses or maintains the compression of files and directories.

The **Compression type** is either **None**, **Standard**, **System** or **Both**.

None Instructs NovaNET to write all data to the tape in a decompressed format. If the file is stored on disk in a compressed format, the file will be decompressed before writing. This option is useful if the device supports hardware data compression and the files are to be restored to a different operating system.

Standard Instructs NovaNET to write all data to tape in the NovaNET compression format. If the file is stored on disk in a compressed format, the file will be decompressed before being re-compressed by NovaNET. This option is useful if the tape device does not support hardware data compression and the files are to be restored to a different operating system.

System Instructs NovaNET to write all data to tape in the same mode it is stored on disk. If the file is stored on disk in compressed format, NovaNET will write the data in the host's compressed format. If the file is not compressed on disk, NovaNET will store the file on tape in a non-compressed format. This option is useful if the hardware supports data compression and the files are to be restored to the same operating system. This option also gives better performance.

Note If the backup device supports hardware compression, be sure to select the **System** option. Then enable **Hardware compression** on the **Advanced Options** window.

Both Instructs NovaNET to write all compressed data in its compressed format. Any uncompressed files will be stored in the NovaNET compression format. This option is useful if the hardware does not support data compression and the files are to be restored to the same operating system.

Auto Format Mode

(Backup jobs only)

Determines whether or not NovaNET will format media automatically.

Before data can be written to media, the media must be formatted. When media is formatted, any data on it is lost. Tapes and other media are formatted when NovaNET does not recognize the media, that is, when it has no information in its storage management database about that particular media. This will occur when the media is blank, it has been erased, it is first used or it has been deleted from the database.

The **Auto format mode** is either **No auto format**, **Auto format blank media** or **Auto format all**.

No auto format Instructs NovaNET to send an alert to the alert window if it encounters media that needs to be formatted (either blank or unrecognized media). While waiting for a user reply, NovaNET scans the network for devices with the media it was expecting. When selected, NovaNET waits for a reply to the alert before formatting unrecognized media.

Auto format blank media Instructs NovaNET to automatically format all new or blank media. However, if NovaNET encounters unrecognized media, it sends an alert to the alert window and then scans the network for the media it was expecting. This parameter can help prevent data from being accidentally destroyed by formatting, while not needlessly querying the user before formatting a blank media.

Auto format all Instructs NovaNET to automatically format all of the media inserted into the tape drive which require formatting. With this parameter selected, NovaNET will automatically format all new (or blank) media and all unrecognized media.

New Media Location

(Backup jobs only)

Specifies the folder in which NovaNET will store any new media created while the job is run. By default, NovaNET stores media in the current User/Group folder; the media will appear there on the **Media** and **Database** tabs. You can also store the media in a separate media folder inside the User/Group folder.

Select the folder in which to store any new media by clicking the **Browse...** button. Then select the folder from the **Browse** window. If the folder does not exist, use the **Media** tab to create it first. Then you can select the **New media locations**.

When NovaNET runs any scheduled automatic rotation job, it automatically creates new media folders for the job. The folders are organized by the name of the job and the various rotation sets in that job. There is no reason to create these folders manually. NovaNET will automatically create these folders for you.

Note NovaNET does not automatically create new media folders for manual jobs.

New Media Name

(Backup jobs only)

Specifies the name NovaNET gives to any new media it creates while running the job. For scheduled automatic rotation jobs, NovaNET automatically updates this parameter to match the media's place in the rotation schedule. For example, if the media is the first media in the yearly rotation set, NovaNET names it "Year Set 1:1". (This means the media was used with a yearly backup job and that it was the first tape in the first set.)

For manual rotation and unscheduled jobs, NovaNET assigns any new media it creates the name listed in this field. This is also true for automatic rotation jobs that are "forced" to run.

Device

Specifies which tape drive or other removable media device NovaNET will use to run the backup, restore or verify job.

By default, NovaNET sets this parameter to the network container. When running the job, NovaNET will use whatever device it finds on the network. If there is only one device in your storage management zone or if you only have permissions to one device, there is no reason to change this parameter.

However, if there are several devices on your network and you need to select a specific device, specify which device the job should use by selecting it from the **Device** list. (If a machine has only one device, you can just select the machine and not the device.)

To use a device that is not shown in the **Device** list, click the **Add...** button and select the new device from the **Browse** window. Then select the undesired network container from the **Device** list, click **Delete** and confirm the deletion.

Media

(Backup jobs only)

Specifies the media folder in which the tape or other removable media are stored. NovaNET will look here for media to use with this job.

The default folder is the current User/Group folder. If you wish to use media from another folder, specify which folder by selecting it from the **Media** list.

If you wish to use a folder that is not shown in the **Media** list, click the **Add...** button and select the new folder from the **Browse** window.

Media Password...

(Backup jobs only)

When a job creates new media, you can assign that media a password. A password prevents the media from being imported into another NovaNET storage management database and can be an important part of your overall security plan.

To have the job assign a password to the new media, click the **Media Password...** button and type and confirm your password.

Note that passwords can only be assigned when media is formatted. Additionally, media passwords are only required when importing media.

For more information on...	See...
Setting job options	<i>Job Options, Chapter 7 — Job Options</i>
Backup mode	<i>Backup Mode, Chapter 6 — Scheduling Jobs</i>
Formatting media	<i>Creating New Media, Chapter 9 — Media, Device and Database Tabs</i>

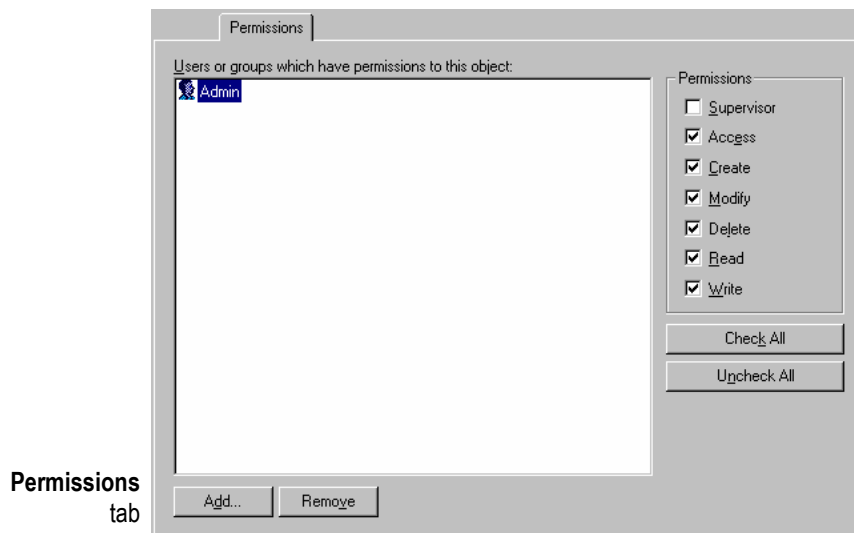
Permissions Tab

Applicable Objects *All database objects*

For user objects and group objects, the **Permissions** tab lists the objects to which the current user or group has permissions. For all other objects, it shows the users or groups that have permissions to the current object.

Use this tab to grant users or groups permissions to objects. Note that permissions can be granted from either the property sheet of the database object or the property sheet of the user or group. Either way, the permissions appear on the appropriate corresponding object's **Permissions** tab. For example, if Galen Clark is granted permissions to the **C:** volume from the **Permissions** tab on his property sheet, the **Permissions** tab on the property sheet of the **C:** volume will list Clark as a user who has permissions. Alternatively, if Clark is granted permissions from the property sheet of the **C:** volume, the appropriate permissions will appear on Clark's **Permissions** tab.

Note additionally that a user has direct permissions only to those objects listed on that user's **Permissions** tab. Any and all other effective permissions to other objects are calculated through inherited permissions, through equivalencies or through groups.



Users or groups which have permissions to this object Lists the users or groups which have permissions to the current object (does not apply to either group or user objects).

To display the permissions for a user or group, select the user or group; the permissions appear in the **Permissions** fields.

To add a user or group, click **Add**. To remove a user or group, select the group or user and click **Remove**.

Objects to which this user or group has permissions Lists the objects to which the current user or group has permissions (only applies to group and user objects).

To see the permissions each user or group has to a particular object, select the object; the permissions to that object appear in the **Permissions** fields.

To grant a user or group permissions to a new object, click **Add** and select the appropriate permissions. To end permissions to an object, select the object and click **Remove**.

Permissions Shows the permissions granted to the currently highlighted object, user or group. Check or uncheck the appropriate boxes to grant or restrict permissions.

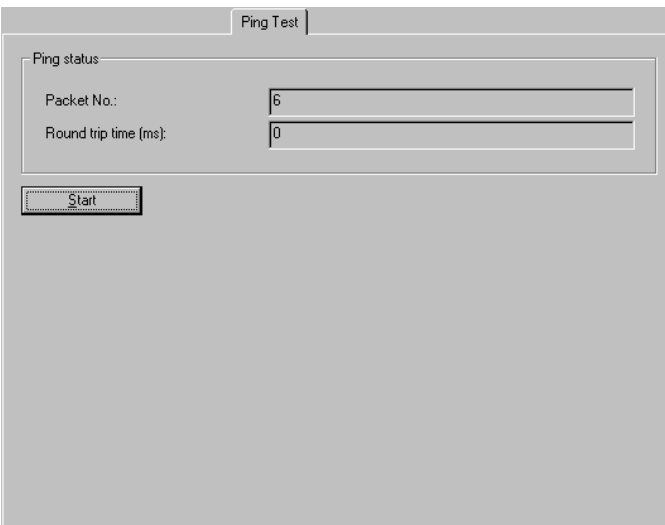
For more information on...	See...
Calculating effective permissions	<i>Effective Permissions, Chapter 11 — Advanced Permissions and Security</i>
Assigning user permissions	<i>Permission's Tab, User Object, Chapter 11 — Advanced Permissions and Security</i>
Assigning group permissions	<i>Permission's Tab, Group Object, Chapter 11 — Advanced Permissions and Security</i>
Differing types of permissions	<i>Permissions Reference, Chapter 11 — Advanced Permissions and Security</i>

Ping Test Tab

Applicable Objects *Machine*

Use the **Ping Test** tab for a machine to measure how long it takes an echo packet to travel back and forth on the network. The packet is sent from the machine on which NovaNET is currently running to the machine whose property sheet is open.

Click **Start** to begin the test. Click **Stop** to end the test.



Ping Test

Ping status

Packet No.: 6

Round trip time (ms): 0

Start

Ping Test
tab

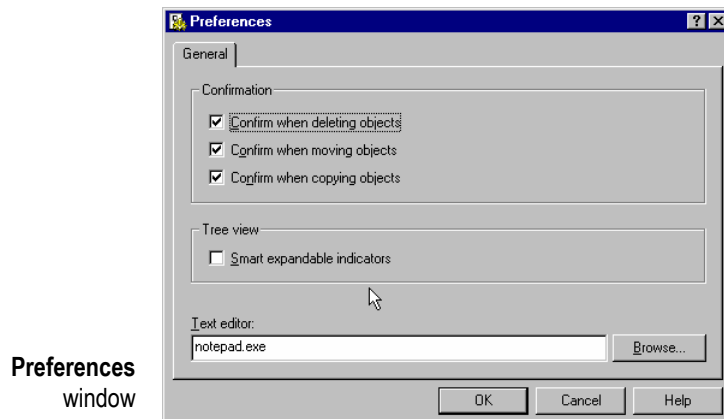
The **Ping status** fields display the test results:

Packet No. Shows the number of data packets sent from one machine to another up to this point in the test.

Round trip time (ms) Shows the average time for the echo packet to travel between the two machines.

Preferences Window

Use the **Preferences** window to set certain options that control the user interface.



Confirmation

Allows user to determine if NovaNET will prompt before completing certain commands.

Confirm when deleting objects When checked, NovaNET opens the **Confirm Delete** window before deleting an object. It requires user confirmation before deleting a database object.

Confirm when moving objects When checked, NovaNET opens the **Confirm Move** window before moving an object. It requires user confirmation before moving a database object.

Confirm when copying objects When checked, NovaNET opens the **Confirm Copy** window before pasting a copied object. It requires user confirmation before pasting a database object.

Tree View



Expand tree icon

Determines whether NovaNET calculates if containers in hierarchical, tree views have containers within them. Determines whether or not NovaNET displays expand tree icons next to containers that cannot be expanded, i.e., that do not contain additional containers.

Smart expandable indicators When checked, NovaNET looks in every container in the hierarchical, tree view. If it does not have any additional containers, the expand tree icon is not displayed.

When unchecked, NovaNET displays an expand tree icon for every container. NovaNET only checks if a container holds other containers when you click the expand tree icon. In this case, the expand tree icon does not necessarily indicate additional containers in the container. Leave this option unchecked to display the hierarchical tree faster.

Text Editor

Identifies the text editor (word processor) that NovaNET will use when displaying logs. When you select a job log on the **Logs** tab and click **View**, NovaNET opens the log using the specified text editor. You can change the text editor by either entering the run command for the text editor or by clicking **Browse** and selecting another text editor. Note that the default Windows text editor is **Notepad.exe**.

Query Window

Applicable Objects *All storage management database objects*

Use the Query window to sort files for displaying on **Database** tab. Use it to exclude or “filter out” files that do not meet the specified selection criteria.

Selection filters are applied to all of the volumes, folders and files ordinarily displayed on the **Database** tab. *You cannot apply different filters to different machines or volumes.* NovaNET uses the selection filters to sort the files and only displays the files that meet the selection criteria.

Query window

Backup range Displays files according to their backup date. The backup date is assigned to a file each time it is backed up. The backup date for a file is the same as the *last* time it was backed up.

Modify range Displays files according to their modify date. Each time a file is modified, its modified date is updated. You can use this filter to display files whose modified date matches your criteria. NovaNET checks the directory information on the volume to see if the file should be included in the job.

Create range Displays files according to their create date. When a file is first created, it is assigned a create date. You can use this filter to display only those files which match your criteria. NovaNET checks the created date for each file stored in the directory of the volume and uses this to sort files.

Delete range Displays files according to their delete date.

When files have been backed up and are later deleted, NovaNET marks the file as having been deleted and assigns it a delete date. This filter instructs NovaNET to display only files which have a delete date that matches the selection criteria. If a file has not been deleted, it will not have a delete date and will not be displayed.

Access range Displays files according to their access date. Each time a file is read, whether or not it is modified, its access date is updated by the operating system. You can use this information to select and filter files.

Size range Displays files according to their size.

Instance range Displays files according to their instance date. Each time NovaNET backs up a file, it creates a new instance of that file and assigns it an instance date.

Wildcard type Displays the wildcard format used by the **Must match** and **Cannot match** filters. Select one of three types of wildcard formats: **DOS**, **Long** or **UNIX**.

Must match Displays files that match specified wildcards. Only files that match the wildcard indicated in this field are selected.

Specify multiple wildcards by separating each with a semicolon (no spaces). NovaNET displays any file that matches any one of the wildcards. For example, if you enter ***.exe;*.doc** in the **Must match** field, NovaNET displays all files that have *either* the .exe extension *or* the .doc extension.

Cannot match Files that match the specified wildcard are not displayed; they are excluded. You can specify multiple wildcards by separating them with a semicolon (no spaces); if you specify multiple wildcards, NovaNET excludes any file that matches any one of the wildcards you specify.

Required attributes Displays files according to attributes controlled by the operation system.

Operating systems track certain features of files called attributes that they use to manage these files. In this field, if an attribute is checked, NovaNET only displays those files which have these attributes.

You can select multiple attributes. In this case, NovaNET only displays those files that meet *all* of the required attributes.

Note that some of these attributes are only supported by certain operating systems. If you specify an attribute that is specific to a particular operating system, then only files created under that operating system will be displayed.

Exclude attributes Files with specified operating system attributes are not displayed.

This field works like the **Required attributes** field except that NovaNET excludes files that match these attributes.

You can select multiple attributes. NovaNET excludes any file that has *any one* of the attributes. For example, if you the **Hidden** and **System** attributes, a file will be excluded if it has *either* the **Hidden** attribute *or* the **System** attribute.

Parents Determines whether or not the directories are displayed.

When this option is checked, NovaNET displays the directories for any object that meets the other display criteria.

Children When this option is checked, NovaNET backs up and restores the selected files. If you want only to back up or restored the marked *directories*, uncheck this option. When the **Children** box is unchecked and the **Parents** box is checked, NovaNET backs up the directory structure, but not the files stored in the directories (that is, in the folders).

Media Displays files which have a valid instance on the media listed in this field.

NovaNET tracks instances of files and the media on which those instances are stored. You can use this information to sort files according to the media on which they appear. Only files with instances on the media in the **Media** field will be displayed. If there are multiple media shown in the **Media** filter field, only files which have a valid instance on *all* the media listed will be displayed.

Schedule Tab

Applicable Objects *Backup Job, Verify Job, Restore Job*

The **Schedule** tab controls when and how often a job is run.

General | Selection | Options | **Schedule** | Logs | Permissions

Backup mode: Incremental Count: 8

Type: Custom Daily: Full Weekly: Full Monthly: Full Yearly: Full

Start time: 11:00 Pm End of week: Friday

Legend:

- Completed
- Warning
- Failed
- None
- Daily
- Weekly
- Monthly
- Yearly

November 2002

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1* Yearly	2
3	4 Daily	5 Daily	6 Daily	7 Daily	8 Weekly	9
10	11 Daily	12 Daily	13 Daily	14 Daily	15 Weekly	16
17	18 Daily	19 Daily	20 Daily	21 Daily	22 Weekly	23
24	25 Daily	26 Daily	27 Daily	28 Daily	29 Monthly	30

To schedule: Drag legend to calendar or right mouse click on calendar.

Schedule tab

Type

Sets the type of schedule.

For restore and verify jobs, the type is either **Not Scheduled** or **Manual**. In addition, for backup jobs, there are eight automatic rotation schedules plus the custom schedule.

Not Scheduled The job will run only when instructed to do so. Uses parameters set on job's **Options** tab.

Manual Turns on scheduling calendar, allowing job to be scheduled to run repeatedly. Job will run every day indicated on calendar. Uses parameters set on job's **Options** tab. User manually controls set count, media rotation, media name and backup mode.

Custom Turns on automatic rotation schedule. Applies to backup jobs only. Job will run every day as scheduled in the calendar. NovaNET will automatically update the **Backup mode**, **Write mode**, **New media location** and **New media name** parameters on the **Options** tab of the job when it runs the job as scheduled. (These parameters are not updated if the job is manually “forced” to run by a user.) Allows the user to determine the set count for each set type; however, NovaNET will automatically control the implementation of these features. When first selected, initially defaults to GFS–25 schedule.

Automatic Rotation Schedules There are eight automatic rotation schedules: GFS 30-tape, GFS 25-tape, GFS 20-tape, Simple 12-tape, Simple 11-tape, Simple 10-tape, Simple 5-tape, Simple 4-tape. Applies only to backup jobs. Job will run every day scheduled in calendar. NovaNET will automatically update the **Backup mode**, **Write mode**, **New media location** and **New media name** parameters on the **Options** tab of the job when it runs the job as scheduled. (These parameters are not updated if the job is manually “forced” to run by a user.) Set count for each set type is predetermined; NovaNET automatically controls media rotation.

Start Time

Specifies the time of day the job will run. Note that jobs can run concurrently.

Daily, Weekly, Monthly, Yearly

Indicates the backup mode and set count for the **Daily**, **Weekly**, **Monthly** and **Yearly** media sets respectively. **Backup mode** and set **Count** can be set by the user when the **Custom** schedule is selected.

End of Week

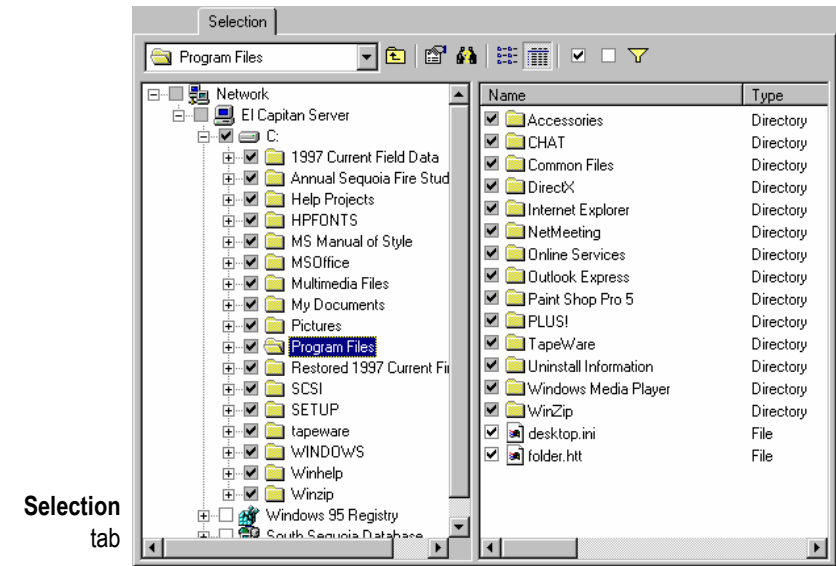
Indicates the day of the week that NovaNET will use to schedule **Weekly** backup jobs. Change the list box to match whatever day of the week NovaNET should run weekly jobs.

For more information on...	See...
Differences between schedule types	<i>Which Built-in Schedule to Select, Chapter 6 — Scheduling Jobs</i>
Manually forcing scheduled jobs to run	<i>Forcing Scheduled Jobs to Run, Chapter 8 — Running Jobs</i>
Scheduling jobs to run once only	<i>Scheduling a Job to Run Once Only, Chapter 10 — Tips, Techniques and Strategies</i>
Working with the calendar	<i>Modifying Built-in Schedules, Chapter 6 — Scheduling Jobs</i>

Selection Tab

Applicable Objects *Backup Job, Restore Job, Verify Job*

Use the **Selection** tab to select the files and instances for use by the current job.



NovaNET uses the following to identify selected objects for all job types:

- The box is checked for each selected object.
- The box is grayed for each container (folder, volume, machine and network) that has one or more selected objects.

If you select a container, all objects within that container are selected. If you add new objects to a marked container, those objects will also be selected when the job is run.

If a container is both unmarked and not gray, it contains no selected objects and it is not itself selected.

For more information on...	See...
Filtering and selecting files for jobs	Chapter 5 — Selecting Files and Instances

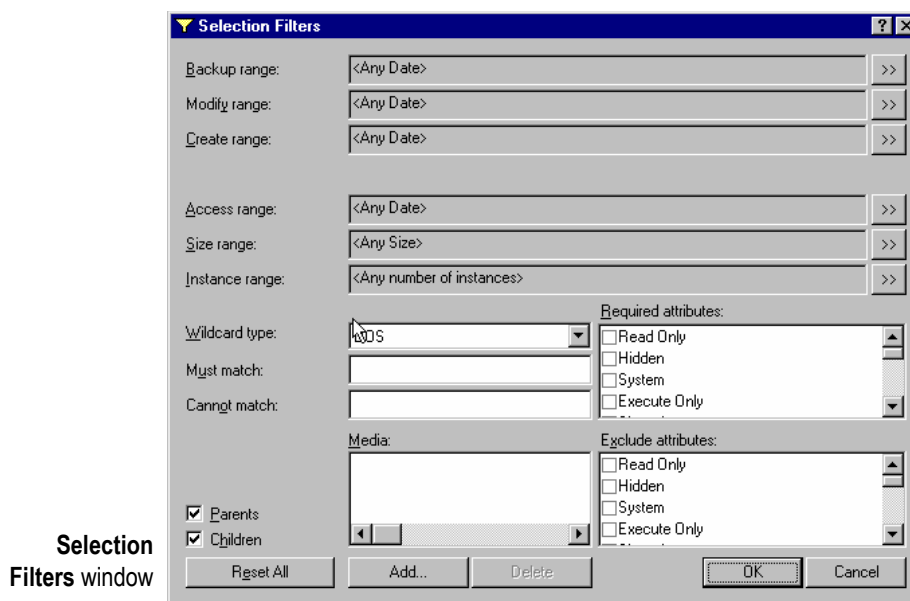
Selection Filters Window

Applicable Objects *Backup Job, Restore Job, Verify Job*

Use the **Selection Filters** window to specify the selection criteria for a job. It excludes or “filters out” files that do not match the selection criteria.

The selection filters are applied to all of the volumes, folders and files that have been marked for backup. *You cannot apply different filters to different folders or volumes.* If a folder or other container has been marked for backup, NovaNET uses the selection filters to sort through the files and unmark any files that do not meet the selection criteria. *NovaNET does not use the selection filters to add files to the backup set.*

The filter criteria are applied to all marked files, regardless if they were marked before or after the filter criteria were specified. After specifying the selection filter criteria, you can then mark or unmark files, folders and volumes for backup. Additionally, you can change the filter criteria at any time; NovaNET will automatically reapply the new selection filter criteria to the marked folders and files.



Backup range Selects files according to their backup date. The backup date is assigned to a file each time it is backed up. The backup date for a file is the same as the *last* time it was backed up.

Modify range Selects files according to their modify date. Each time a file is modified, its modified date is updated. You can use this filter to select files whose modified date matches your criteria. NovaNET checks the directory information on the volume to see if the file should be included in the job.

Create range Selects files according to their create date. When a file is first created, it is assigned a create date. You can use this filter to select only those files which match your criteria. NovaNET checks the created date for each file stored in the directory of the volume and uses this to sort files for the job.

Delete range Applies only to restore jobs. Selects files according to their delete date.

When files have been backed up and are later deleted, NovaNET marks the file as having been deleted and assigns it a delete date. This filter instructs NovaNET to only restore files which have a delete date that matches the selection criteria. If a file has not been deleted, it will not have a delete date and will not be selected.

Access range Selects files according to their access date. Each time a file is read, whether or not it is modified, its access date is updated by the operating system. You can use this information to select and filter files.

Size range Selects files according to their size.

Instance range Selects files according to their instance date. Each time NovaNET backs up a file, it creates a new instance of that file and assigns it an instance date. For restore and verify jobs, this is the only filter that selects *instances* of files, rather than *files* themselves.

Wildcard type Specifies the wildcard format used by the **Must match** and **Cannot match** filters. Select one of three types of wildcard formats: **DOS**, **Long** or **UNIX**.

Must match Selects files that match specified wildcards. Only files that match the wildcard indicated in this field are selected.

Specify multiple wildcards by separating each with a semicolon (no spaces). NovaNET selects any file that matches any one of the wildcards. For example, if you enter ***.exe;*.doc** in the **Must match** field, NovaNET selects all files that have *either* the .exe extension *or* the .doc extension.

Cannot match Files that match the specified wildcard are not selected; they are excluded. You can specify multiple wildcards by separating them with a semicolon (no spaces); if you specify multiple wildcards, NovaNET excludes any file that matches any one of the wildcards you specify.

Required attributes Selects files according to attributes controlled by the operation system.

Operating systems track certain features of files called attributes that they use to manage these files. In this field, if an attribute is checked, NovaNET only selects those files which have these attributes.

You can select multiple attributes. In this case, NovaNET only selects those files that meet *all* of the required attributes.

Note that some of these attributes are only supported by certain operating systems. If you specify an attribute that is specific to a particular operating system, then only files created under that operating system will be selected for backup.

Exclude attributes Unselects files according to attributes controlled by the operating system.

This field works like the **Required attributes** field except that NovaNET excludes files that match these attributes.

You can select multiple attributes. NovaNET excludes any file that has *any one* of the attributes. For example, if you select the **Hidden** and **System** attributes, a file will be excluded if it has *either* the **Hidden** attribute *or* the **System** attribute.

Parents Determines whether or not the directory information is selected.

When this option is checked, when NovaNET backs up or restores a file, it also backs up or restores the directory information relevant to that file. This option must be checked in order for folders and other directory data to be backed up or restored. When this option is not checked, NovaNET will not back up or restore any parent information for any file backed up. If unchecked, directory information about folders and volumes is not backed up.

Children Determines whether or not the files are selected.

When this option is checked, NovaNET backs up and restores the selected files. If you want only to back up or restore the marked *directories*, uncheck this option. When the **Children** box is unchecked and the **Parents** box is checked, NovaNET backs up the directory structure, but not the files stored in the directories (that is, in the folders).

Media Selects files which have a valid instance on the media listed in this field.

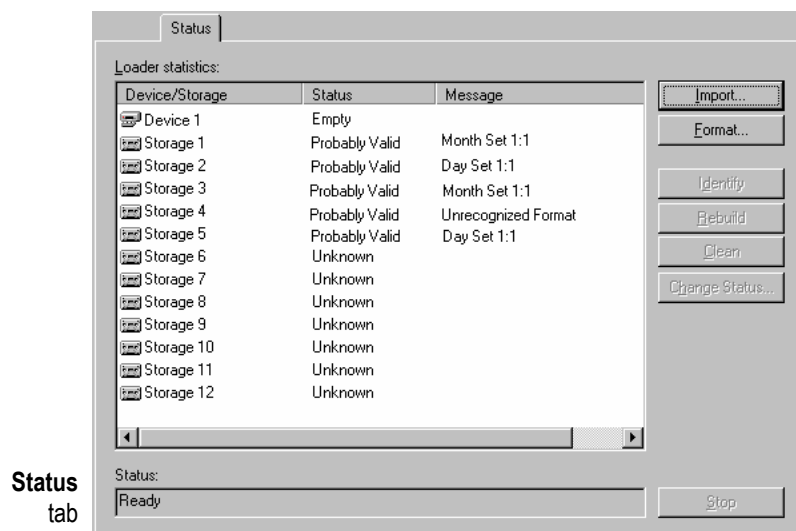
NovaNET tracks instances of files and the media on which those instances are stored. You can use this information to sort files according to the media on which they appear. Only files with instances on the media in the **Media** field will be selected for a job. If there are multiple media shown in the **Media** filter field, only files which have a valid instance on *all* the media listed will be selected.

For more information on...	See...
Using file selection filters	<i>File Selection Criteria, Chapter 5 — Selecting Files and Instances</i>
Selecting deleted files only	<i>Selecting Deleted Files for Restoring, Chapter 10 — Tips, Techniques and Strategies</i>
Using filters to select instances	<i>Backup Range, Chapter 5 — Selecting Files and Instances</i>
Using filters to copy directories	<i>Copying a Directory Structure, Chapter 10 — Tips, Techniques and Strategies</i>

Status Tab

Applicable Objects *Autoloader*

The **Status** tab shows the device and storage status that is associated with each slot in an autoloader. Use it to select storage slots and media or to perform various functions on the media in the autoloader.



Loader Statistics

Shows information about the current magazine in the autoloader.

Device/Storage Specifies the device or the storage slot.

Status Shows the current or likely status of the device or storage slot.

- **Valid** The slot is known to hold media that is in the current database.
- **Probably Valid** The slot held valid media previously. NovaNET verifies that the media is valid before using it. When you exit and restart NovaNET, media marked **Valid** is reset to **Probably Valid**.
- **Invalid** The slot holds media that is definitely not in the current database.
- **Probably Invalid** The slot holds media that may not be in the current database. When you exit and restart NovaNET, media marked **Invalid** is reset to **Probably Invalid**.

- **Empty** The slot is either known to be empty or a user changed its status to **Empty**.
- **Probably Empty** The slot was empty previously. When you exit and restart NovaNET, slots marked **Empty** are reset to **Probably Empty**.
- **Unknown** The status of the slot is not known, usually because it has not been used yet.
- **Cleaning Tape** A user marked the slot as holding a cleaning cartridge. The number of remaining cleaning cycles also appears. NovaNET does not verify that a cleaning cartridge was, in fact, inserted into this slot.
- **Reserved** The slot was disabled by a user. NovaNET will ignore it during any job. You can only change the status of a reserved slot.

Message Displays the name of a **Valid** or **Probably Valid** media. Also displays the status to the slot.

Import...

Opens the **Import Media** window for the selected storage slots.

Format...

Opens the **Format Media** window for the selected storage slots.

Identify

Identifies the selected media. Reads the media header information and checks to see if media is in current database.

Rebuild

Identifies the selected media. If the autoloader supports optical scanning of media bar codes, NovaNET uses bar codes to identify the media, comparing it to the current database. If the autoloader does not support optical scanning of media, NovaNET reads the media header information and checks to see if the media is in current database.

Clean

Performs a cleaning cycle on the selected device. Select the device and click **Clean**. Once complete, NovaNET decreases the **Number of remaining cleaning cycles** by one. This option requires a cleaning cartridge in a storage slot whose status is **Clean**.

Change Status...

Opens the **Change Status** window. Lets the user assign one of the following to the media or slot:

- **Unknown** NovaNET will identify the media in the slot before using it.
- **Empty** NovaNET marks the slot as empty.
- **Clean** NovaNET will use the media in this slot to perform a cleaning cycle.
- **Reserved** NovaNET ignores the storage slot until a user changes its status again.

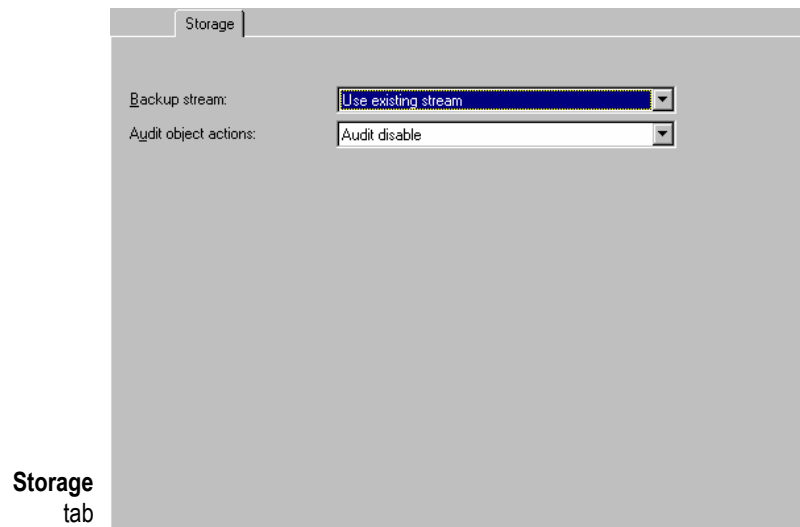
Storage Tab

Applicable Objects *File, Directory, Volume*

Use the **Storage** tab to configure the **Backup stream** and **Audit object actions** for this object.

NovaNET is capable of controlling up to 16 data streams simultaneously (up to eight streams per device). Data streams are automatically created for each machine object; this parameter cannot be changed.

By default, new data streams are created for each volume, while files and directories use the data stream of their parent volume by default. For files, directories and volumes, these parameters can be modified.



Storage
tab

Backup Stream

Determines whether or not a new data stream is created for the current object.

Use existing stream NovaNET does not create a new stream for this object. This is the default value for directories and files.

Select this parameter for a volume when you do not want to create a new stream for that volume. For example, you may wish to not create an additional stream when the volume is only a logical partition—not a physically separate device.

Create new stream NovaNET will create a new stream for this object when running a backup job. This is the default value for volumes.

Select this parameter for directories and files when you want to create a new stream for these objects. For example, to speed up a backup job, you may wish to create an additional stream for a very large file or for a RAID device.

Audit Object Actions

Enables or disables the audit log for this object.

For more information on...	See...
Optimizing backup streams	<i>Strategies for Faster Jobs, Chapter 10 — Tips, Techniques and Strategies</i>
Audit logs	<i>Audit Logs, Chapter 8 — Running Jobs</i>

Appendix A — Disaster Recovery

The NovaNET disaster recovery system is designed to operate as automatically as possible during initial preparation and recovery. Once installed, disaster recovery will perform its tasks without any intervention by you.

In This Appendix

- Create the disaster recovery backup
- Testing disaster recovery media
- Recovering from a disaster
- Using disaster recovery with autoloaders
- Using disaster recovery with Windows active directory

Overview

NovaNET's Disaster Recovery can be prepared using diskettes, CD-R/CD-RW or tape, depending on computer configuration and tape drive. You create bootable media (diskettes, CD, tape), which you use to recover your system configuration, software and data following a system or disk failure. You can use this media to boot your system and initiate the recovery process.

To make your disaster recovery process as easy as possible, please note the following:

- NovaNET rewrites most system configuration information to the media each time it overwrites the media. Therefore, when making a full backup to be used for disaster recovery, you should select **Overwrite all tapes** on the backup job's **Options** tab.
- Disaster Recovery works best with full backups, where all disks on your system fit on a single media. If the total amount of data on your system requires more than one media, NovaNET still functions correctly. However, you will have to change media during recovery. You can also use incremental and differential jobs for recovery purposes, but you must insert the recovery media in the correct chronological order.

- If you have an autoloader, make sure the most recent backup media is loaded in slot 1. For more information, see *Using Autoloaders with Disaster Recover* later in this appendix.
- When recovering your system, NovaNET gives you the option to recover your whole system or just the hard disk that your system boots from. If the volumes on your boot hard disk are split among multiple physical hard disks, you should recover the entire system and not just the boot disk. Otherwise, some system data may not be restored.
- You must install the disaster recovery option and prepare bootable media on each system that will use this feature. NovaNET does not support remote disaster recovery. It only saves recovery information for the local system.

For example, if the tape device is connected to Machine1 and you make a remote backup of Machine2, the media will contain system configuration information for Machine1, not Machine2. You can use the media to boot Machine1, but NovaNET only restores system information to Machine1 during recovery. All other files on the media were backed up from Machine2. To perform disaster recovery on Machine2, you must connect a tape device to Machine2.

When performing disaster recovery, NovaNET assumes that major changes to your hardware have not occurred. The hardware on the target system must be nearly identical to the source system with the following exceptions:

- You may change your video adapter as long as the new video adapter is VGA compatible.
- You may increase the size of your hard disk, but the geometry of the hard disk should remain the same. For example, if your original system had a hard disk with 63 sectors per track and 255 heads, then the new hard disk should be the same. The actual number of cylinders can be larger. If the geometry has changed, NovaNET will still use it, but the recovered operating system may not function correctly.
- Your SCSI, ATAPI, Fibre Channel or USB tape drive and adapter must be the same or use the same driver as it did when the disaster recovery media was created.
- You may change network cards, USB ports and USB peripherals, except tape drives, without restriction.
- You may not perform disaster recovery to a USB hard drive.

Note Ideally, you should perform the disaster recovery operation on the same computer after replacing the faulty hardware that caused the system failure.

Create the Disaster Recovery Backup

Preparing for disaster recovery is a three-step process:

1. Install NovaNET and the Disaster Recovery option on each computer that will use disaster recovery (see *Chapter 2 — Windows Operating Systems* and *Chapter 3 — Non-Windows Operating Systems* in the *NovaNET Installation Guide*).
2. Create a full backup of your system, according to the instructions in *Create Full Backup* below.
3. Create the bootable media (see *Create Bootable Media* later in this appendix). If you have a bootable tape device, you already created bootable media when you ran the full backup.
4. Test the bootable media to make sure you have created it properly (see *Testing Disaster Recovery* later in this appendix).

Note We recommend that you create at least one extra set of bootable media in case the first set fails during disaster recovery.

Create Full Backup

NovaNET automatically creates disaster recovery media whenever you run a full backup with the **Overwrite all tapes** job option. To create your disaster recovery media:

1. Log in to NovaNET.
2. Insert the first disaster recovery media.
3. Create a backup job in the **Admin Folder**.
4. Enter a name for the job, such as **Disaster Recovery Backup**.
5. Click the **Selection** tab and select the check box for the local computer.

Note When creating the disaster recovery media, back up the local machine only. Otherwise, disaster recovery may not restore properly.

6. Click the **Options** tab. The **Backup mode** should be set to **Full** by default.
7. Select **Overwrite all tapes** from the **Write mode** drop-down list.
8. Select **Full verify** from the **Auto verify mode** drop-down list.

9. If your backup device does not support compression, select **Standard** from the **Compression type** drop-down list.
10. If your backup device supports automatic eject, you can configure the job to eject the media after the job finishes. Click **Advanced Options**. When the **Advanced Options** window appears, select **Auto eject** and click **OK**.
11. Click **OK**. The job appears in the **Admin Folder** on the **Backup** tab.
12. Run the job, inserting additional media as required.

Note If you have a bootable tape device, NovaNET makes each media bootable. For example, if the full backup uses three media, all three media are bootable.

13. Once the backup job is complete, we recommend that you test the disaster recovery media on a test computer (see *Testing Disaster Recovery* later in this appendix).
14. After the test is successful, store the disaster recovery media.

Create Bootable Media

After you make a full backup of your system, you must create bootable disaster recovery media. Depending on your platform (Windows, NetWare, Linux), NovaNET lets you create bootable diskettes or a bootable CD (CD-R/CD-RW).

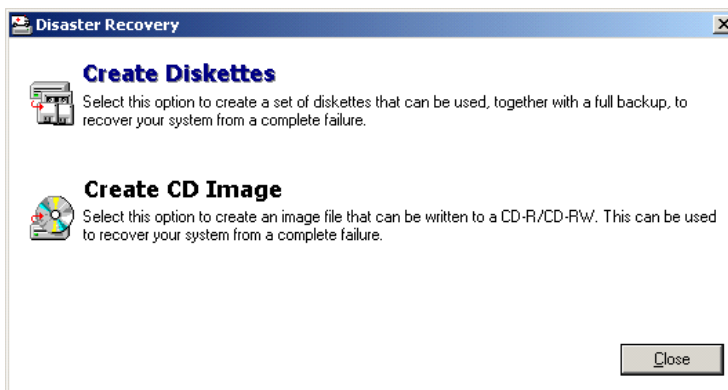
Note If you have a bootable tape device, NovaNET already made bootable media when you created the disaster recovery backup (see *Create Full Backup* earlier in this appendix). However, you should still create bootable diskettes or a bootable CD (CD-R/CD-RW) as a precaution.

Windows

Under Windows, you can create either bootable diskettes or a bootable CD. To create the bootable media:

1. Log in to NovaNET.

2. Select **Disaster Recovery** from the NovaNET **Wizards** tab. The **Disaster Recovery** window appears.



3. Select one of the following options:
 - **Create Diskettes** Create a set of bootable floppy diskettes (see *Windows Diskettes* below).
 - **Create CD Image** Create a bootable CD-R/CD-RW (see *Windows CD* below).
4. When the **Disaster Recovery** window appears again, click **Close**.

Windows Diskettes

This procedure creates a set of bootable floppy diskettes that will be used to initiate a system recovery. Windows 98/Me/NT typically requires three blank, formatted diskettes. Windows 2000/XP typically requires four blank, formatted diskettes. Windows Server 2003 typically requires six blank, formatted diskettes. However, you may need more, depending on your system configuration.

After you select **Create Diskettes**, NovaNET prepares the system information to be copied to diskette. Each time you are prompted, label the blank diskette as directed, insert the diskette and click **OK**. After all the diskettes have been created, NovaNET returns to the **Disaster Recovery** window.

As soon as you create the diskettes, we recommend that you test the disaster recovery media on a test computer (see *Testing Disaster Recovery* later in this appendix). After the test is successful, store the diskettes.

Windows CD

This procedure creates a CD image file in your NovaNET main directory, **BOOTCD.ISO** by default. Use this image to create a bootable CD. The image file created contains the entire ISO-9660 bootable image required to boot your system and initiate the recovery process.

Note NovaNET creates the CD image file; it does not create the CD itself. Use your CD writer software and drive to create the actual bootable CD-R/CD-RW. When creating the CD, make sure you use the write image option instead of the normal file write option.

After you select **Create CD Image**, the **Create Boot CD Image** window appears. Enter the name of the CD image file and click **OK**. The default is **BOOTCD.ISO**.

NovaNET prepares the system information and copies it to the CD image file. After the image file has been created, NovaNET returns to the **Disaster Recovery** window. Start your CD writer software and burn the CD image file directly to the CD-R/CD-RW.

As soon as you create the CD, we recommend that you test the disaster recovery media on a test computer (see *Testing Disaster Recovery* later in this appendix). After the test is successful, store the CD.

NetWare

Under NetWare, you can create either bootable diskettes or a bootable CD. To create the bootable media:

1. Log in to NovaNET.
2. Select **Other** from the **Available Options** menu.
3. Select **Disaster Recovery** from the **Other Options** menu.
4. Select one of the following from the **Available Options** menu:
 - **Create Boot Diskettes** Create a set of bootable floppy diskettes (see *NetWare Diskettes* below).
 - **Create CD Image** Create a bootable CD-R/CD-RW (see *NetWare CD* below).
5. When the **Available Options** menu appears again, press **Esc** twice to return to the main **Available Options** menu.

NetWare Diskettes

This procedure creates a set of bootable floppy diskettes that will be used to initiate a system recovery. NetWare 4.x typically requires three blank, formatted diskettes. NetWare 5.x typically requires five diskettes. NetWare 6.x typically requires seven diskettes. However, you may need more, depending on your system configuration.

After you select **Create Boot Diskettes**, NovaNET prepares the system information to be copied to diskette. Each time you are prompted, label the blank diskette as directed, insert the diskette and click **OK**. After all the diskettes have been created, NovaNET returns to the **Available Options** menu.

As soon as you create the diskettes, we recommend that you test the disaster recovery media on a test computer (see *Testing Disaster Recovery* later in this appendix). After the test is successful, store the diskettes.

NetWare CD

This procedure creates a CD image file in your NovaNET main directory called **BOOTCD.ISO**. Use this image to create a bootable CD. The image file created contains the entire ISO-9660 bootable image required to boot your system and initiate the recovery process.

Note NovaNET creates the CD image file; it does not create the CD itself. Use your CD writer software and drive to create the actual bootable CD-R/CD-RW. When creating the CD, make sure you use the write image option instead of the normal file write option.

After you select **Create CD Image**, NovaNET prepares the system information and copies it to the CD image file. After the image file has been created, NovaNET returns to the **Available Options** menu. Start your CD writer software and burn the CD image file **BOOTCD.ISO** directly to the CD-R/CD-RW.

As soon as you create the CD, we recommend that you test the disaster recovery media on a test computer (see *Testing Disaster Recovery* later in this appendix). After the test is successful, store the CD.

Linux

Under Linux, you can only create a bootable CD.

This procedure creates a CD image file in your NovaNET main directory, **BOOTCD.ISO** by default. Use this image to create a bootable CD. The image file created contains the entire ISO-9660 bootable image required to boot your system and initiate the recovery process.

Note NovaNET creates the CD image file; it does not create the CD itself. Use your CD writer software and drive to create the actual bootable CD-R/CD-RW. When creating the CD, make sure you use the write image option instead of the normal file write option.

Console Interface

To create a bootable CD from the console version of NovaNET:

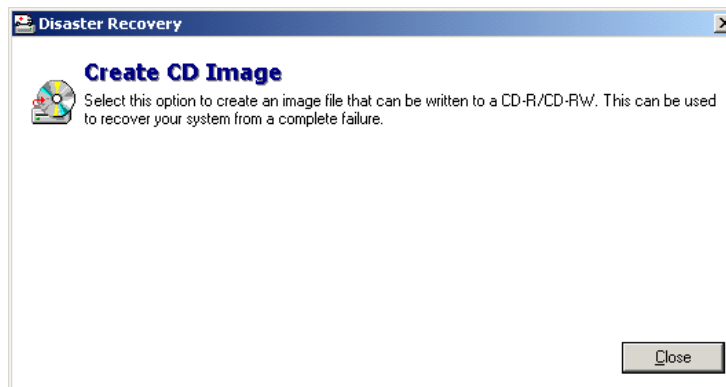
1. Log in to NovaNET.
2. Select **Other** from the **Available Options** menu.

3. Select **Disaster Recovery** from the **Other Options** menu.
4. Select **Create CD Image**. NovaNET prepares the system information and copies it to the CD image file.
5. When the **Available Options** menu appears again, press **Esc** twice to return to the main **Available Options** menu.
6. Start your CD writer software and burn the CD image file **BOOTCD.ISO** directly to the CD-R/CD-RW.
7. As soon as you create the CD, we recommend that you test the disaster recovery media on a test computer (see *Testing Disaster Recovery* later in this appendix). After the test is successful, store the CD.

X Window Interface

To create a bootable CD from the X Window version of NovaNET:

1. Log in to NovaNET.
2. Select **Disaster Recovery** from the NovaNET **Wizards** tab. The **Disaster Recovery** window appears.



3. Select **Create CD Image**. The **Create Boot CD Image** window appears.
4. Enter the name of the CD image file and click **Save**. The default is **BOOTCD.ISO**. NovaNET prepares the system information and copies it to the CD image file. After the image file has been created, NovaNET returns to the **Disaster Recovery** window.
5. Click **Close** to return to the **Wizard** tab.
6. Start your CD writer software and burn the CD image file directly to the CD-R/CD-RW.

7. As soon as you create the CD, we recommend that you test the disaster recovery media on a test computer (see *Testing Disaster Recovery* later in this appendix). After the test is successful, store the CD.

Troubleshooting Disaster Recovery Backup

When creating disaster recovery backups, any of the following problems may occur:

- **Error Number 11 - File Not Found**
Examine the `nnttrace.txt` file located in your NovaNET installation directory. This will list the file that was not found. All files must reside in “standard” directory locations provided by the operating system, e.g., `\WINNT\SYSTEM32\DRIVERS` subdirectory under Windows NT and `SYS:SYSTEM` or `C:\NWSERVER` under NetWare. If the file is not a driver file for your hardware, please contact technical support for assistance.
- **Error Number 1062 - Unable to open registry**
NovaNET requires full access to the registry to create disaster recovery information. Make sure you are starting NovaNET from an account with full administration privileges.
- **Error Number 1523 - Get/Set Server Info Failure**
An error has occurred while retrieving your disk configuration information. Consult the `nnttrace.txt` file for additional details on this error. It usually occurs if a hard drive is not powered on or if a user does not have adequate system security rights.
- **Error Number 5 - Error opening file**
Error Number 7 - File read error
Error Number 8 - File write error
An error has occurred while accessing one of the floppy diskettes. The floppy may be defective. Reformat or replace it. Then try again.

When to Create New Bootable Media

Your bootable media may become obsolete whenever any of the following occurs:

- You update your operating system by installing a service pack or other software.
- You add or remove hardware from your computer.
- You change the configuration of your disk drives, e.g., adding or removing volumes or partitions.
- You change your NovaNET environment information, including changes to the `NNCfgr.ini` file.

Therefore, we recommend that you create new bootable media anytime you change the environment.

Testing Disaster Recovery Media

We recommend that you test your disaster recovery media before you have to rely on it following a disaster. We also recommend that you create additional bootable media in case your new hardware configuration does not support your original bootable media. For example, if you create a bootable CD, but your new hardware does not support booting from CD, you should also create a set of bootable diskettes or a bootable tape.

Warning Before relying on any disaster recovery media, you should verify that your system can boot from the bootable device as described below.

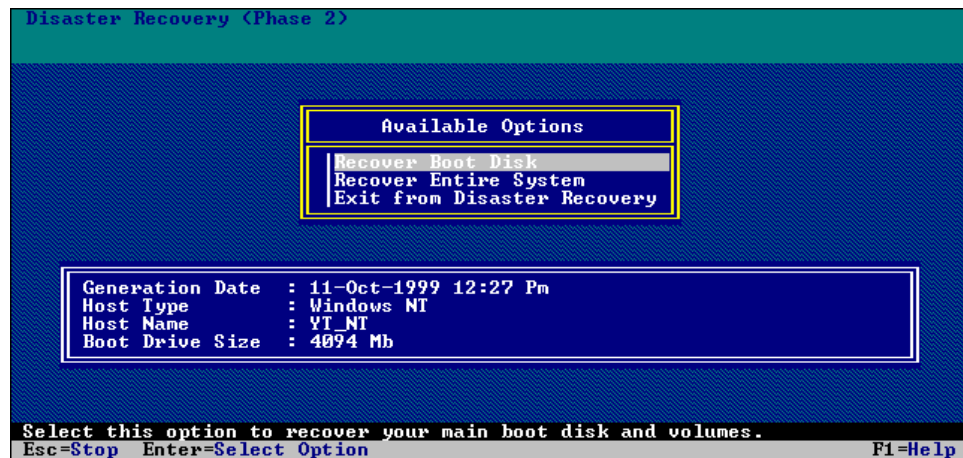
To test your disaster recovery media, perform the following steps. You will not lose any data on your system. This procedure is completely safe.

1. Make a full backup of your system and create bootable media as directed in *Create the Disaster Recovery Backup* earlier in this appendix.
2. Shut down your system as normal.
3. If you are using a bootable CD:
 - a. Insert the disaster recovery CD into your computer.
 - b. Power on your computer.
 - c. Perform any special steps for booting your computer from CD (refer to your system documentation).
 - d. The system boots from the CD.
4. If you are using a set of bootable diskettes:
 - a. Insert the first diskette into your computer.
 - b. Power on your computer.
 - c. The system boots from the diskette.
 - d. NovaNET prompts you to insert the rest of the diskettes.
5. If you are using a bootable tape:
 - a. Remove all media from all tape drives and/or autoloader magazine slots.
 - b. Insert the first bootable media:

- If you are using a single tape drive, insert the first bootable media into the drive.
- If you are using an autoloader, insert the first (or only) bootable media into slot 1 of the magazine. If the full backup used two or more media, insert the rest of the full backup media into the autoloader magazine in their proper order.

Note Slot 1 must contain the first (or only) bootable media from the most recent full backup.

- c. Perform any special steps for booting your computer from the tape drive (refer to your system documentation). Most bootable drives use a combination of power cycling and pressing the **Eject** button on the front panel. Many also require that you update the computer BIOS.
 - d. The system boots from the tape.
6. If your system boots and displays the **Disaster Recovery (Phase 2)** screen, your bootable media should function correctly during disaster recovery.



7. If you are using a bootable tape, the **Disaster Recovery (Phase 2)** screen may not appear. Your system may hang during startup or your operating system may not boot from the tape. If either case, you must use bootable diskettes or a bootable CD to perform disaster recovery. Your tape device is not compatible with bootable tape.
8. Select **Exit from Disaster Recovery** and press **Enter**.
9. Remove the bootable media and restart your computer. This ends the disaster recovery test.

Recovering from a Disaster

If disaster strikes and you are unable to boot your system using your normal boot procedure, use one of the following procedures to recover your system. You will need your bootable media (diskettes, CD, tape), your most recent full backup and any incremental or differential backups.

Note Data that has changed since the last full backup will not be restored. You must restore the rest of your data from incremental or differential backups. Any data that has not been backed up must be recreated. Therefore, you should only use Disaster Recovery as a last resort.

Disaster Recovery from Diskette/CD

Note Do not restore incremental or differential backup media until after you complete disaster recovery.

1. If you are using a bootable CD:
 - a. Insert the disaster recovery CD into your computer.
 - b. Power on your computer.
 - c. Perform any special steps for booting your computer from CD (refer to your system documentation).
 - d. The system boots from the CD.
2. If you are using a set of bootable diskettes:
 - a. Insert the first diskette into your computer.
 - b. Power on your computer.
 - c. The system boots from the diskette.
 - d. NovaNET prompts you to insert the rest of the diskettes.
3. Insert the first disaster recovery media.

Note For disaster recovery, use only full backup media that were created with the **Overwrite all tapes** option. After disaster recovery is complete and your system has restarted, use the standard NovaNET options to restore any incremental or differential media to your system. The standard NovaNET restore procedure optimizes restoration and restores incremental and differential media faster than the disaster recovery process.



4. When the **Disaster Recovery (Phase 2)** screen appears, select one of the following options:
 - **Recover Boot Disk** Select this option to only recover the boot disk. Use it if your boot disk is corrupt or if you replaced the boot disk. This option does not usually affect the data on other hard disks.
 - **Recover Entire System** Select this option to recover data to multiple hard disks, including the boot disk. Use this option if you replaced one or more hard disks.
5. Press **Enter**.
6. If a warning screen appears, read it and then press **F10**.
7. Read through each information screen. Press **F10** to advance to the next screen.
8. When the first confirmation message appears (**Are you sure?**), select the appropriate **Yes** option and press **Enter**.
9. When the second confirmation message appears, select **Yes, Perform the Recovery** and press **Enter**.

The system does not require any input from you until it finishes restoring the first media to your system. Restoring the first media can take from 15 minutes to two or three hours, depending on the amount of data on the media, the speed and capabilities of the tape drive and whether you are recovering the entire system or just the boot disk.

10. After the system has restored the media, it asks for the next media to restore. Select **Yes** or press **F10** to restore another media.
11. After restoring the last media, remove the disaster recovery CD or diskette.
12. Press **Esc**. A message screen appears.
13. Press **F10**. NovaNET restarts your computer.
14. You can now use NovaNET to restore the data from your incremental and differential backup media, if needed.

Disaster Recovery from Bootable Tape

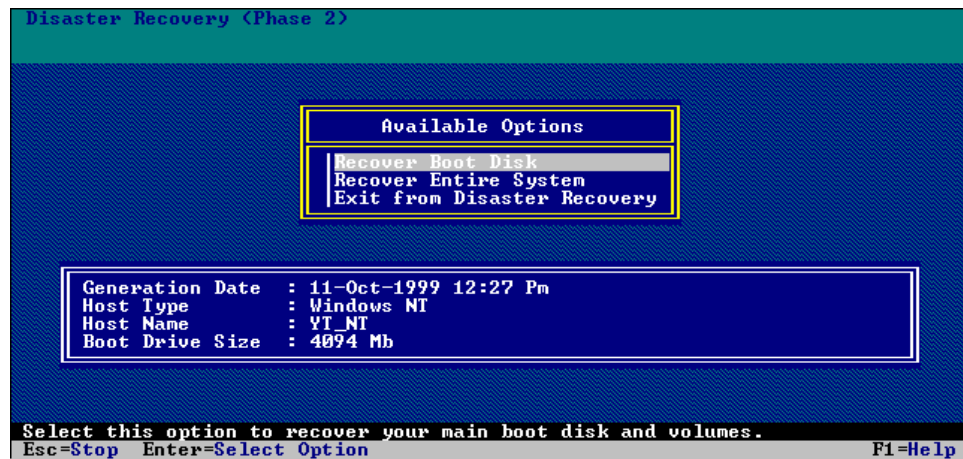
Note Do not restore incremental or differential backup media until after you complete disaster recovery.

1. Remove all media from all tape drives and/or autoloader magazine slots.
2. Insert the first bootable media:
 - If you are using a single tape drive, insert the first bootable media into the drive.
 - If you are using an autoloader, insert the first (or only) bootable media into slot 1 of the magazine. If the full backup used two or more media, insert the rest of the full backup media into the autoloader magazine in their proper order.

Note Slot 1 must contain the first (or only) bootable media from the most recent full backup. When you use the **Overwrite all tapes** option, NovaNET makes each media bootable (see *Create the Disaster Recovery Backup* earlier in this appendix). For example, if the full backup uses three media, all three media are bootable.

3. Perform any special steps for booting your computer from the tape drive (refer to your system documentation). Most bootable drives use a combination of power cycling and pressing the **Eject** button on the front panel. Many also require that you update the computer BIOS.

Note For disaster recovery, use only full backup media that were created with the **Overwrite all tapes** option. After disaster recovery is complete and your system has restarted, use the standard NovaNET options to restore any incremental or differential media to your system. The standard NovaNET restore procedure optimizes restoration and restores incremental and differential media faster than the disaster recovery process.



4. When the **Disaster Recovery (Phase 2)** screen appears, select one of the following options:
 - **Recover Boot Disk** Select this option to only recover the boot disk. Use it if your boot disk is corrupt or if you replaced the boot disk. This option does not usually affect the data on other hard disks.
 - **Recover Entire System** Select this option to recover data to multiple hard disks, including the boot disk. Use this option if you replaced one or more hard disks.
5. Press **Enter**.
6. If a warning screen appears, read it and then press **F10**.
7. Read through each information screen. Press **F10** to advance to the next screen.
8. When the first confirmation message appears (**Are you sure?**), select the appropriate **Yes** option and press **Enter**.
9. When the second confirmation message appears, select **Yes, Perform the Recovery** and press **Enter**.

The system does not require any input from you until it finishes restoring the first tape to your system. Restoring the first tape can take from 15 minutes to two or three hours, depending on the amount of data on the tape, the speed and capabilities of the tape drive and whether you are recovering the entire system or just the boot disk.
10. After the system has restored the tape, it asks you to insert the next tape to restore. Select **Yes** or press **F10** to restore another tape.
11. After restoring the last tape, remove the tape.
12. Press **Esc**. A message screen appears. Then NovaNET restarts your computer.

13. You can now use NovaNET to restore the data from your incremental and differential backup media, if needed.

Troubleshooting Recovering from a Disaster

When attempting to recover your system, the following are common errors that occur:

- Error Number 1523 - Get/Set Server Info Failure

This message appears when NovaNET cannot reconfigure the disk drives and volumes on the target system. Make sure that all disks are powered on and ready and that any new disks are the same size or larger than the old disks. Make sure that the geometries of any new disks are also the same size or larger. Make sure you have enabled logical block addressing in your BIOS configuration and that any SCSI controllers are configured the same as when you created the recovery tape. If you changed SCSI adapters, NovaNET may not be able to access any peripherals from the new adapter unless it uses the same driver as the old adapter.

- Unable to boot from tape

This message appears if the tape does not contain a valid disaster recovery boot track. Try another tape or tape drive, if available.

- Dynamic disk failure

In some dynamic disk configurations under Windows 2000/XP/Server 2003, including RAIDs and mirrors, you may receive a dynamic disk failure message. The layout is usually recovered successfully. You simply have to re-activate the mirror set.

Using Disaster Recovery with Autoloaders

When using Disaster Recovery with an autoloader, remember the following:

- Make sure the most recent full backup media is loaded into slot 1 of the autoloader. NovaNET will only boot from the tape in slot 1. Make sure the media was created using the **Overwrite all tapes** option.

- NovaNET will restore all media that are contained in the autoloader during the final recovery process. Therefore, make sure that you only load media in the autoloader that you will need to restore during recovery. For example, if you are using the Simple 10-tape schedule, NovaNET will have four daily differential backups, two weekly full backups and two monthly full backups. You should only perform disaster recovery with the latest full backup. After your system has been recovered, use the standard NovaNET restore procedures to recover any other changes from the differential backups.
- Remove all media not associated with the recovery from the autoloader. If the full backup spans more than one media, put the additional full backup media into additional slots. NovaNET will then restore these media along with the slot 1 media.

Note Slot 1 must contain the first (or only) bootable media from the most recent full backup. When you use the **Overwrite all tapes** option, NovaNET makes each media bootable (see *Create the Disaster Recovery Backup* earlier in this appendix). For example, if the full backup uses three media, all three media are bootable.

Using Disaster Recovery with Windows Active Directory

When performing disaster recovery on a system with Windows Active Directory, use the following general steps:

1. Perform the general system-level disaster recovery to restore the basic system data.
2. When the **Starting Windows** screen appears during system startup, press **F8**.
3. Select **Directory Services Restore Mode** and press **Enter**.
4. Log in to the system.
5. Log in to NovaNET.
6. Create a restore job.
7. Select **Windows Active Directory** for the restore job from the **Selection** tab.
8. Run the restore job.
9. Exit NovaNET.
10. Restart the computer, letting Windows load normally.
11. Verify that Windows active directory is running properly.

Appendix B — Troubleshooting Guide

This appendix contains useful information about commonly encountered problems and frequently asked questions when using NovaNET.

In This Appendix

- Troubleshooting Backup Jobs
- Troubleshooting Restore Jobs
- Troubleshooting Verify Jobs
- Troubleshooting Backup Devices
- Troubleshooting the Storage Management Database
- Troubleshooting Error Messages

Note Please refer to the *NovaNET Installation Guide* for useful information about installing NovaNET.

Troubleshooting Backup Jobs

When I run a backup job, it uses the backup device on my local machine instead of the one on the server.

On the **Options** tab of the job, you have probably accepted the default **Network** device selection. When this is enabled, NovaNET will use any device on the network, in this case, your local backup device.

To send the job to a specific device:

1. Access the **Options** tab for the backup job.

2. Delete the current network device:
 - a. Select the path to the device in the **Device** field.
 - b. Click **Delete**. The path disappears from the **Device** field.
3. Add the local device:
 - a. Click **Add**. The **Browse** screen appears.
 - b. Select the local device.
 - c. Click **OK**. The path to the local device appears in the **Device** field.

My scheduled job is not running.

First, make sure the job is scheduled. Check the **Schedule** tab for the job's properties. After reviewing the schedule, close the properties sheet or the job will not run. Then check the **Queue** tab to verify that the job is scheduled.

Second, if you have not installed NovaNET as a service, make sure NovaNET is open and running. If you exit NovaNET, the job cannot execute. We recommend that you log out of NovaNET to prevent unauthorized access to NovaNET.

Third, if you have installed NovaNET as a service, make sure the service has been started.

To start the service on a Windows computer, access **NovaNET Service Control** from the **Start** menu.

On a Linux or FreeBSD computer, open a terminal window (if necessary). Then access the directory where you installed NovaNET, e.g., **usr/local/novanet**. Type **./nnunxsvc**.

For additional information, see *Automatically Running Scheduled Jobs* in Chapter 8 — *Running Jobs* and *Logging Out and Running Scheduled Jobs* in Chapter 2 — *NovaNET Workplace*.

I have two tape drives, but it is only using one to run a job.

NovaNET uses “streams” to divide a job up and to assign the job to devices for backup. By default, it creates a new stream for each disk volume to be backed up, e.g., one each for **C:** and **D:** drives. If you only have a single volume, NovaNET only creates one stream by default.

To use multiple devices, you must first add each device to the device list. Access the **Options** tab for the backup job. Then click **Add** to display the **Browse** screen. Select the local device and click **OK**. The path to the local device appears in the **Device** field.

To create additional streams for different objects, change the **Backup stream** parameter to **Create new stream** on the **Storage** tab for each object. Then the streams will be distributed evenly across all available backup devices. For further information, see *Storage Tab* in *Chapter 12 — Object and Property Reference* and *Strategies for Faster Jobs* in *Chapter 10 — Tips, Techniques and Strategies*.

Note Since multiple streams run concurrently, creating multiple streams on the same physical disk drive does not necessarily result in faster backup jobs. The drive tries to stream to multiple devices at once, which requires numerous seek and read commands from various sectors at the same time.

How do I replace media in a rotation group?

NovaNET automatically creates a series of folders and media for use with rotation jobs. These folders control the daily, weekly, monthly and yearly media.

To remove a media that is lost or damaged physically, select the media on the **Media** tab and delete it. When you use replacement media, NovaNET will automatically format it if necessary.

To move media to an offsite location, create a new media folder called **Offsite Media** (or similar) in your User/Group folder. Then drag the media to this folder. If the media is required by NovaNET during the rotation schedule, it will automatically create a new media to replace the media that you moved offsite.

How can I tell when the next job will run and which media is required?

Click on the **Wizards** tab and select **Instructions and Logs**.

How can I easily view the logs for each job?

Click on the **Wizards** tab and select **Instructions and Logs**. Tab to the **Logs** screen and view any available log.

How can I determine which files were not backed up?

Check the **Details** section of the job log for any failed objects. Access the **Logs** tab for the backup job and select the date of the backup you want to check. NovaNET uses the text editor specified on the **Preferences** screen to display the job log. Then you can save the log to a file after editing. NovaNET can also print the log directly to the printer.

Note You are only working with a copy of the log. The original log is still available.

Troubleshooting Restore Jobs

I can't restore a backup to a different operating system.

Windows, NetWare, DOS, Linux and FreeBSD systems store information in different formats. For example, if you backed up NetWare information in a compressed format, Windows cannot read the NetWare compressed data.

To restore to a different operating system, even to a different version of the *same* operating system, you must create the backup in a generic format.

Note If you did not create your backup in a generic format, you may not be able to restore it to a different operating system. You should either restore it on a similar operating system or create a new backup.

1. Access the backup job's **Options** tab.
2. Click the **Advanced options** button. The **Advanced Options** window for the job appears.
3. Deselect the **Native data streams format** option. When you run the backup job, NovaNET decompresses the data and strips the information specific to the operating system before backing it up.

Note You may lose security information under certain operating systems.

For additional information, see *Moving Data Between Operating Systems* in *Chapter 10 — Tips, Techniques and Strategies*.

How can I restore data to a different file name?

Select the file, directory or volume you wish to restore with a different name. Then open the properties sheet for that object. On the **General** tab, type in the new name and press **OK**.

For additional information, see *Restoring Files with New Names* in *Chapter 10 — Tips, Techniques and Strategies*.

How can I restore data to another location?

To restore data to another location, open the **Selection** tab of the restore job. Click on the directory or file you want restored to a different location, then drag that object to the new target location. To use the keyboard, use CTRL+C to copy the object and CTRL+V to move the object to its new location.

If you have not backed up the target directory, that is, the directory to move the files to, it will not be displayed. In this case, right-click the files or directories to move and then select **Move** from the shortcut menu. In the **Confirm Move** window, click **Browse** to select a new target location.

How can I restore all the files from a single instance?

Every instance of a file or directory backed up during a single job has the same instance date. You can use this information to select all the files from a single backup job.

On the **Selection** tab of the restore job, highlight the file, directory or volume to restore. Press the **Select Instance** button on the tool bar to open the **Instances of...** window. Select the date of the instance you want restored. All children (objects) having the same instance will also be selected.

For additional information, see *Selecting Instances from a Specific Job* in *Chapter 10 — Tips, Techniques and Strategies*.

How can I determine which files are on particular media?

Click on the **Wizard** tab and select **Media Content**. Follow the tree and pick the media you want information about.

When restoring, I get many alerts. What is wrong?

If you select many devices or set the **Device** field on the **Options** tab of the job to **Network** (the default setting), NovaNET will attempt to complete the restore job using *all* the devices listed or found. If a device does not contain media or the device contains the wrong media, an alert is sent. This alert informs you to put the desired media into the appropriate device.

For example, suppose you are restoring from a single media but the **Device** field on the **Options** tab lists four devices. If the target media is in the third device listed, NovaNET will issue two alerts, one for each of the first two devices. These alerts can be ignored.

Also note that you do not have to insert the *requested* media into the device. To fulfill the request, you can place any media required by the job into the device. NovaNET will then use the media that you actually did put into the device.

If you want the job to use a specific device, first delete the **Network** object in the **Device** field. Then click **Add** and add the specific device you want the restore job to use.

Does NovaNET back up files as compressed?

NovaNET will copy files to tape in compressed format without decompressing them first. This significantly enhances the speed of the backup.

Troubleshooting Verify Jobs

I occasionally get a 'stream sync error' when verifying media.

This is usually caused by a physical read problem from the backup device. The data NovaNET expected from the media was not found. This can be caused by:

- *Bad media:* Try replacing the media.
- *Read errors on the drive:* Try cleaning the drive heads.
- *SCSI errors:* Try checking the SCSI termination.
- *Driver errors:* Try checking to see that you are not using a real mode ASPI drive. Check your config.sys file for something like:

```
device=ASPI4DOS.SYS, ASPI8DOS.SYS...
```

Troubleshooting the Storage Management Database

How do I select the location of the storage management database in a network installation?

The network location of the storage management database can be very important. On larger networks, to minimize the time required to perform disaster recovery, install the storage management database on a dedicated storage management server. This server performs no operations except the storage management processing. Then install the tape devices to the servers to be backed up. If the storage manager server fails, no data is lost and recovery of the server can proceed in a non-critical manner. If any other server fails, recovery can be quickly performed because the storage server is still operational.

On smaller networks, you can install the storage management database on the same server as the tape devices. Recovery does not take as much time because the databases are smaller.

For additional information, see *Managing the Storage Management Database* in *Chapter 10 — Tips, Techniques and Strategies*.

How do I create a storage management zone?

When you install NovaNET, you can choose to either join an existing storage management zone or create a new zone. The storage management zone is associated with the same computer on which its database is installed.

To create a new storage management zone, run the NovaNET installer. When prompted, enter the name for the zone and the disk location for the zone database. The default location is the **NovaNET** directory on your system, e.g., **c:\Program Files\NovaNET** on a Windows computer.

For additional information, see *Chapter 2 — Windows Operating Systems* and *Chapter 3 — Non-Windows Operating Systems* in the *NovaNET Installation Guide*.

When recovering from a storage server failure, does NovaNET recover all of the database information?

Most of the database information is restored when you restore the storage management database. The only thing that will not be restored is the complete log of the job that was running when the database was backed up. The reason for this is that the log is not written until after the job has completed. Jobs are not completed until the database is written to the media.

Troubleshooting Error Messages

Error 51 – Database corrupt appears during a backup or when adding a new object.

Normally, if the database is corrupted, NovaNET automatically repairs it during initialization. However, the quick check used during initialization may not detect any errors. To force NovaNET to repair the database:

1. Stop the NovaNET service.

2. Edit the NNCfg.ini configuration file in the directory where you installed NovaNET. Change the line that reads **repairDatabase=No** in the **[configuration]** section to **repairDatabase=Yes**.
3. Start NovaNET.
4. When the database repair message appears, click **Yes**. NovaNET automatically repairs the database and changes the configuration file line back to **repairDatabase=No**.

Error 212 – Unknown error appears when I restore files under Windows.

Windows stores security information in the data stream on the backup media. This information depends on the registry from the file's original location. If you are restoring to a different system or are restoring files to the same machine with a new registry, the security information on the media is no longer valid.

To prevent this problem, open the **Advanced Options** window from the **Options** tab of the restore job and clear the **Parent security** and **Child security** options. This causes NovaNET to restore the data in the file, but not the security information, such as the owner or access control lists for the file.

Error 630 – Unable to create a directory appears when I restore files under Windows.

This message appears if you do not have the appropriate Windows rights to the hard drive during the restore. Make sure you have full control on the **CREATOR OWNER** and **SYSTEM** rights on the **Local Disk Properties** screen for the hard drive. Then try again. After you have restored the files, you can change the Windows rights to their original settings.

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