

Installation Guide

NovaNET®

NovaStor Corporation

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Before You Begin

The *NovaNET Installation Guide* provides all of the information necessary to effectively 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 — Installation Overview

This chapter describes what you need to do to install NovaNET.

In This Chapter

- System Requirements
- Supported Platforms
- Before You Install NovaNET
- Installing NovaNET

System Requirements

Most operating systems list both *minimum* and *recommended* system requirements. As a general rule, if your system meets the *minimum* requirements for the operating system, it will also meet the minimum system requirements for NovaNET. However, for better performance, we recommend that your system meet or exceed the *recommended* system requirements.

For example, Windows XP Professional requires a 233 MHz Pentium or Celeron family or AMD-K6, AMD Athlon or AMD Duron family processor, 64MB of RAM and 1.5GB of available hard disk space. But Microsoft recommends a 300 MHz processor and 128MB of RAM.

Depending on your specific requirements, your system should also meet the following:

- VGA display with 800x600 resolution, for use with Windows or X Window
- Tape backup device for use with Disaster Recovery
- CD drive for NovaNET installation (recommended)
- CD writer for use with the Disaster Recovery (recommended)
- Bootable tape backup device for use with Disaster Recovery (optional)

Supported Platforms

NovaNET is supported and has been tested with many different versions of Windows, NetWare, DOS, Linux and FreeBSD operating systems. Refer to the following table for the specific versions of each platform:

Platform	Version
Windows	98, Me, NT 4.x (SP6a or later; Internet Explorer 6.x or later), 2000 (SP2 or later required for disaster recovery), XP, Server 2003
NetWare	4.2, 5.1, 6.x (SP1 or later required for disaster recovery)
MS-DOS	6.22
Linux (kernel versions 2.2.x and 2.4.x)	Red Hat: 7.0, 7.1, 7.2, 7.3, 8.0, Advanced Server 2.1 Mandrake: 7.2, 8.0, 8.1, 8.2, 9.0 SuSE: 7.0, 7.1, 7.3, 8.0, 8.1 Debian: 3.0 Slackware: 8.0 SCO: Linux Server 4.0
FreeBSD	FreeBSD: 4.5

Note We always recommend that you install the latest service packs and updates for your platform.

Note Refer to the NovaNET release notes for additional versions of these platforms.

Before You Install NovaNET

Even though NovaNET is easy to install, you must first make some important decisions about how to implement NovaNET. Before you install NovaNET, resolve the following issues:

NovaNET Storage Management Zone

When you install NovaNET, you will define a storage management zone. Each zone includes one storage management server, a computer that contains the NovaNET storage management database. Each zone may also include other computers, including other workstations or servers. Since NovaNET is scalable, you can easily upgrade your license whenever you need to expand the zone.

To define the storage management zone, identify:

- The name of the new zone (if creating a new storage management zone).
- The computer that will be the storage management server.
- The workstations or servers that will belong to the zone.

For more information about creating and managing storage management zones, refer to *Chapter 1 — NovaNET Overview* and *Chapter 10 — Tips, Techniques and Strategies* in the *NovaNET User's Guide and Technical Reference*.

NovaNET Service

The NovaNET service lets you schedule jobs to run automatically, whether or not an operator is present. When installed, the NovaNET service automatically loads at system startup. It runs in the background *without the user interface*. At any time, you can activate the NovaNET administrator. Later, when you close the administrator, NovaNET returns to service mode and runs in the background.

If the system loses power, the NovaNET service automatically restarts following system restart. Therefore, your backup jobs still run as scheduled.

We recommend that you install the NovaNET service on each computer that will be included in an automatic backup schedule.

Note NovaNET is only available as a service on Windows and X Window (Linux/FreeBSD) platforms. The NovaNET Agent is available for NetWare systems.

For information on using the NovaNET service, refer to *Appendix E — Using the NovaNET Service*.

NovaNET License

When fully implemented, NovaNET can work with any network configuration of Windows, NetWare, DOS, Linux and FreeBSD machines with no limit of workstations, servers or backup devices.

However, depending on the product that you purchased, the number of servers and the network platform in a storage management zone may be limited. You can purchase licenses for a single workstation, a single server or an unlimited number of servers. Likewise, your license determines whether NovaNET runs only on a Windows, NetWare, Linux or FreeBSD network or on a mixed networks.

If you purchased a single server license, you can set up one NovaNET storage management server in that zone. To add access to multiple servers in a single storage management zone, you can purchase an upgrade to your license.

If you purchased a license to install NovaNET on only one network platform, you cannot install NovaNET on other network platforms. To install NovaNET on another network platform, you can purchase an upgrade to your license.

To create additional storage management database, you must purchase additional licenses. You can only create one storage management database for each NovaNET license.

Backup Devices

NovaNET supports most of the tape devices and autoloaders on the market today. Because of the device driver design, you can add support for most new devices and autoloaders by simply adding a few parameters in the NovaNET configuration file. You can access updated configuration files from our website (www.NovaStor.com).

NovaNET automatically detects and recognizes any backup devices or autoloaders attached to your server or workstation. If your machine recognizes it as a valid device, then the device automatically appears in the storage management database.

If the device does not appear, make sure your machine or network recognizes the device. Refer to the device documentation for more information.

Installing NovaNET

First, install all of your backup devices, according to the manufacturer's directions.

Second, install NovaNET on the workstation or server that will contain the storage management database. This creates a storage management zone and identifies the directory in the NovaNET database has been installed. NovaNET uses this information to configure other machines that belong in this storage management zone.

For Windows operating systems, refer to *Chapter 2 — Windows Operating Systems*. For NetWare, DOS, Linux or FreeBSD operating systems, refer to *Chapter 3 — Non-Windows Operating Systems*.

Third, install NovaNET on the other workstations or servers in the storage management zone. When the NovaNET installer displays available servers and zones, select the server or zone to join.

If you have any installation problems, refer to *Appendix A — Troubleshooting Guide*. You can also refer to *General Installation Notes* and the installation notes for your platform in *Chapter 4 — Installation Notes* for additional information.

Chapter 2 — Windows Operating Systems

NovaNET supports many versions of Windows (refer to *Chapter 1 — Installation Overview* for a list of supported operating systems). Its graphical user interface makes it easy to install and administer NovaNET.

In This Chapter

- NovaNET Installation Manager Overview
- Launch NovaNET Installation Manager
- Using NovaNET Installation Manager

NovaNET Installation Manager Overview

The NovaNET Installation Manager lets you easily install or remove NovaNET and any NovaNET options easily from the console prompt. Specifically, it:

- Guides you step-by-step through the installation process.
- Offers online help.
- Automatically detects active NovaNET database servers.
- Puts all of its files in one directory, unlike other software.
- Requires no manual configuration.
- Upgrades NovaNET and NovaNET options automatically.
- Lets you update your license key codes.

First, launch the NovaNET Installation Manager from the NovaNET CD-ROM (see *Launch NovaNET Installation Manager* below).

Second, use it to install or remove NovaNET and any NovaNET options (see *Using NovaNET Installation Manager* later in this chapter).

Launch NovaNET Installation Manager

To launch the NovaNET Installation Manager

Note If NovaNET is running, you must close it before continuing.

1. Insert the NovaNET CD-ROM in your CD drive. The NovaNET Installation Manager launches automatically.
2. If the Installation Manager does not launch automatically, access the root directory on the NovaNET CD-ROM and double-click **Setup.exe**.
3. If the NovaNET service is running, a **NovaNET Installation Manager** message appears. Click **Yes** to stop the NovaNET service.
4. If the Installation Manager detects an older version of NovaNET on your system, you can update NovaNET to a new service pack or version using your existing settings. Select one of the following from the message screen:
 - Click **Yes** to update NovaNET using your current settings. The Installation Manager installs the new version of both NovaNET and all installed NovaNET options.
 - Click **No** to perform a clean NovaNET install. You can enter new installation settings and overwrite your existing NovaNET installation.

When the **NovaNET Installation Manager** screen appears, you can perform a number of installation tasks (see *Using NovaNET Installation Manager* below).

To display the Installation Manager screens, options and messages in a different language, click the appropriate button at the top of the window.



Help button

To display the online help system, click the help button.

Using NovaNET Installation Manager

When the **NovaNET Installation Manager** screen appears, select one of the following options (refer to the corresponding section later in this chapter):

- View Release Notes
- Install NovaNET
- Remove NovaNET
- Install Option

- Remove Option
- Update License

When you are finished using the Installation Manager, click **Exit**. Then click **Yes** when the exit confirmation screen appears. The **NovaNET Installation Manager** screen closes.

To start the NovaNET Administrator, refer to *Starting NovaNET* in *Chapter 2 — NovaNET Workplace* in the *NovaNET User's Guide and Technical Reference*.

View Release Notes

We recommend that you always review the release notes when installing either a new or upgrade version of NovaNET or a NovaNET service pack.

1. Access the **NovaNET Installation Manager** screen (see *Launch NovaNET Installation Manager* earlier in this chapter).
2. Click **View Release Notes**. The Installation Manager displays the release notes in a separate browser window.

Install NovaNET

Use this option to install NovaNET for the first time or to reinstall NovaNET. The NovaNET installer guides you through each step of the installation process. In general, you should accept the installer's suggested directory locations.

Before you continue, you must identify the role of this computer:

- Administer an existing storage server database on a different computer (see *Connect to an Existing Storage Server* below).
- Create a new storage server database on this computer, to be either a standalone or a storage server (see *Create a New Storage Server* below).

Connect to an Existing Storage Server

1. Access the **NovaNET Installation Manager** screen (see *Launch NovaNET Installation Manager* earlier in this chapter).
2. Click **Install NovaNET**. The **Thank You** screen appears.

Note At any point in this process, you can click **Cancel** or press **Esc** to return to the **NovaNET Installation Manager** screen.

3. Click **Next**. The **License Agreement** screen appears.

4. If you accept the NovaNET license agreement, click **Next**. The **Registration Information** screen appears.
5. Enter your **Name** and **Company**.
6. Click **Next**. The **Destination Location** screen appears.
7. The default location is **c:\Programs Files\NovaNET**. To install NovaNET to a different directory, click **Browse**. When the **Choose Directory** screen appears, locate the directory and click **OK**.
8. Click **Next**. The **Create or Join Zone** screen appears.
9. Select **I want to join an existing storage management zone** and click **Next**.

Note If you connect to an existing storage server, NovaNET uses the key code from the existing storage management database.

10. When the **Protocol** screen appears, it lists all protocols that are installed on this computer. Select one of the following:
 - **NetWare/Windows IPX**: Select this option and click **Next**.

Note The **NetWare/Windows IPX** option only appears if the IPX protocol has been installed on a Windows or NetWare system.

- **Internet TCP/IP**: Select this option and click **Next**. The **Host** screen appears. If this computer and the host server are on different network subnets:
 - a. Enter the host address or host name for the host server in the field beside the **Add** button.
 - b. Click **Add**. The host name or host address appears in the **Hosts to be scanned** window.
11. Click **Next**. When the **Join an Existing Zone** screen appears, select the storage management zone to join and click **Next**.

Tip If the desired zone exists, but does not appear in the list, click **Refresh** to refresh the list of storage management zones.

12. When the **Node Name** screen appears, enter the **Node name** for this computer and click **Next**. The default is the existing computer name, if any.
13. When the **NovaNET Service** screen appears, the **...run NovaNET as a service** option is selected by default. To disable this feature, de-select the option.
14. Click **Next**.

15. When the **Question** screen appears, confirm the installation:
 - Select **Yes** and click **Next** to install NovaNET. The Installation Manager copies NovaNET to the installation directory.
 - Select **No** and click **Next** to cancel installation. The **NovaNET Installation Manager** screen appears.
16. When the installation complete message appears, click **OK**. The **NovaNET Installation Manager** screen appears again.

Note After NovaNET installation is complete, you can install one or more NovaNET options. You can install any option at any time. You can also install a 30-day evaluation of most NovaNET options.

Create a New Storage Server

1. Access the **NovaNET Installation Manager** screen (see *Launch NovaNET Installation Manager* earlier in this chapter).
2. Click **Install NovaNET**. The **Thank You** screen appears.

Note At any point in this process, you can click **Cancel** or press **Esc** to return to the **NovaNET Installation Manager** screen.

3. Click **Next**. The **License Agreement** screen appears.
4. If you accept the NovaNET license agreement, click **Next**. The **Registration Information** screen appears.
5. Enter your **Name** and **Company**.
6. Click **Next**. The **Destination Location** screen appears.
7. The default location is **c:\Programs Files\NovaNET**. To install NovaNET to a different directory, click **Browse**. When the **Choose Directory** screen appears, locate the directory and click **OK**.
8. Click **Next**. The **Create or Join Zone** screen appears.
9. Select **I want to create a new storage management zone** and click **Next**.
10. When the **Question** screen appears, select one of the following:
 - **Yes:** If this is an evaluation version, select **Yes** and click **Next**.

- **No:** If this is a licensed version, select **No** and click **Next**. When the **License Key** screen appears, enter your key code in the **License key** field and click **Next**. You must enter a key code after your 30-day evaluation period is over.

Note If you are upgrading a licensed copy of NovaNET, your key code automatically appears in the field.

11. When the **Protocol** screen appears, it lists all protocols that are installed on this computer. Select one of the following:
 - **Standalone Desktop/No network support:** Select this option and click **Next** if this is a standalone computer. The Installation Manager skips to step 13 below.
 - **NetWare/Windows IPX:** Select this option and click **Next**.

Note The **NetWare/Windows IPX** option only appears if the IPX protocol has been installed on a Windows or NetWare system.

- **Internet TCP/IP:** Select this option and click **Next**.
12. When the **Create New Zone** screen appears, enter the **Zone name** of the new storage server and click **Next**.
 13. When the **Node Name** screen appears, enter the **Node name** for this computer and click **Next**. The default is the existing computer name, if any.
 14. When the **NovaNET Service** screen appears, the **...run NovaNET as a service** option is selected by default. To disable this feature, de-select the option.
 15. Click **Next**.
 16. When the **Question** screen appears, confirm the installation:
 - Select **Yes** and click **Next** to install NovaNET. The Installation Manager copies NovaNET to the installation directory.
 - Select **No** and click **Next** to cancel installation. The **NovaNET Installation Manager** screen appears.
 17. When the installation complete message appears, click **OK**. The **NovaNET Installation Manager** screen appears again.

Note After NovaNET installation is complete, you can install one or more NovaNET options. You can install any option at any time. You can also install a 30-day evaluation of most NovaNET options.

Remove NovaNET

Select this option to uninstall NovaNET, all installed NovaNET options and the storage management database.

Note You do not have to uninstall NovaNET before upgrading to a newer version.

To remove NovaNET

1. Access the **NovaNET Installation Manager** screen (see *Launch NovaNET Installation Manager* earlier in this chapter).
2. Click **Remove NovaNET**. The **Destination Location** screen appears.

Note At any point in this process, you can click **Cancel** or press **Esc** to return to the **NovaNET Installation Manager** screen.

3. The default location is **c:\Programs Files\NovaNET**. To remove NovaNET from a different directory, click **Browse**. When the **Choose Directory** screen appears, locate the directory and click **OK**.
4. Click **Next**.
5. When the remove NovaNET confirmation screen appears, confirm removal:
 - Click **Yes** to remove NovaNET. The Installation Manager erases all NovaNET files from the installation directory.
 - Click **No** to cancel removal. The **NovaNET Installation Manager** screen appears.
6. When the removal complete message screen appears, click **OK**. The **NovaNET Installation Manager** screen closes.

Install an Option

You can install a NovaNET option at any time after you install NovaNET. While some options are included with NovaNET and do not require a key code, others can only be installed for a 30-day evaluation or with a separate key code. Contact your NovaNET representative for more information.

To install an option

1. Access the **NovaNET Installation Manager** screen (see *Launch NovaNET Installation Manager* earlier in this chapter).
2. Click **Install Option**. The **Thank You** screen appears.

Note At any point in this process, you can click **Cancel** or press **Esc** to return to the **NovaNET Installation Manager** screen.

3. Click **Next**. The **Destination Location** screen appears.
4. The default location is **c:\Programs Files\NovaNET**. To install NovaNET to a different directory, click **Browse**. When the **Choose Directory** screen appears, locate the directory and click **OK**.
5. Click **Next**. When the **Available Options** screen appears, select the option to install and click **Next**.
6. If the selected NovaNET option requires a separate key code, the **Question** screen appears. Select one of the following:
 - **Yes:** If this is an evaluation version, select **Yes** and click **Next**.
 - **No:** If this is a licensed version, select **No** and click **Next**. When the **License Key** screen appears, enter your key code in the **License key** field and click **Next**. You must enter a key code after your 30-day evaluation period is over.

Note If you are upgrading a licensed copy of this NovaNET option, your key code automatically appears in the field.

7. When the **Question** screen appears, confirm the installation:
 - Select **Yes** and click **Next** to install the NovaNET option. The Installation Manager enables the NovaNET option.
 - Select **No** and click **Next** to cancel installation. The **NovaNET Installation Manager** screen appears.
8. When the installation complete message appears, click **OK**.
9. When the **NovaNET Technical Support** screen appears, click **OK**. The **NovaNET Installation Manager** screen appears again.

Remove an Option

Select this option to remove a NovaNET option package that was previously installed.

Note You do not have to uninstall the NovaNET option before upgrading to a newer version.

To remove a NovaNET option

1. Access the **NovaNET Installation Manager** screen (see *Launch NovaNET Installation Manager* earlier in this chapter).

2. Click **Remove Option**. The **Destination Location** screen appears.

Note At any point in this process, you can click **Cancel** or press **Esc** to return to the **NovaNET Installation Manager** screen.

3. The default location is **c:\Programs Files\NovaNET**. To remove the NovaNET option from a different directory, click **Browse**. When the **Choose Directory** screen appears, locate the directory and click **OK**.
4. Click **Next**. When the **Available Options** screen appears, select the option to remove and click **Next**.
5. When the remove NovaNET option confirmation screen appears, confirm removal:
 - Click **Yes** to remove the NovaNET option. The Installation Manager disables the NovaNET option.
 - Click **No** to cancel removal. The **NovaNET Installation Manager** screen appears.
6. When the removal complete message appears, click **OK**. The **NovaNET Installation Manager** screen appears again.

Update License

NovaNET uses a system of key codes that represent your license to use all NovaNET features as well as its options. When you purchase and install NovaNET key codes, you can use NovaNET and all licensed options. This function lets you enter your NovaNET key codes.

To enter a new key code

1. Access the **NovaNET Installation Manager** screen (see *Launch NovaNET Installation Manager* earlier in this chapter).
2. Click **Update License**. The **Thank You** screen appears.

Note At any point in this process, you can click **Cancel** or press **Esc** to return to the **NovaNET Installation Manager** screen.

3. Click **Next**. The **Destination Location** screen appears.
4. The default location is **c:\Programs Files\NovaNET**. If you installed NovaNET to a different directory, click **Browse**. When the **Choose Directory** screen appears, locate the directory and click **OK**.

5. When the **Available Options** screen appears, select the item to license and click **Next**. The **License Key** screen appears.
6. Enter the key code in the **License key** field and click **Next**.
7. After NovaNET accepts the key code, click **OK**. The **NovaNET Installation Manager** screen appears again.

Chapter 3 — Non-Windows Operating Systems

NovaNET supports many versions of NetWare, DOS, Linux and FreeBSD (refer to *Chapter 1 — Installation Overview* for a list of supported operating systems). It uses a common text interface to make it easier to administer NovaNET on different platforms. While the installer for these platforms uses a text interface, the Linux and FreeBSD versions can also operate from the graphical user interface under X Window.

In This Chapter

- NovaNET Installer Overview
- Launch NovaNET Installer
- Using NovaNET Installer

NovaNET Installer Overview

The NovaNET installer lets you easily install or remove NovaNET and any NovaNET options easily from the console prompt. Specifically, it:

- Guides you step-by-step through the installation process.
- Offers online help.
- Automatically detects active NovaNET database servers.
- Puts all of its files in one directory, unlike other software.
- Requires no manual configuration.
- Upgrades NovaNET and NovaNET options automatically.
- Lets you update your license key codes.

First, launch the NovaNET installer from the NovaNET CD-ROM (see *Launch NovaNET Installer* below).

Second, use it to install or remove NovaNET and any NovaNET options (see *Using NovaNET Installer* later in this chapter).

Launch NovaNET Installer

NetWare Launch

You must have administrator rights in NetWare Directory Services (NDS) to install NovaNET. After installation, when you log in to NovaNET for the first time, you must log in to NDS with the NDS administrator password. For more information, refer to *Running NovaNET for NetWare for the first time* in *Chapter 4 — Installation Notes*.

Note Be sure a CD drive is attached to your NetWare Server before using the following installation instructions. If a CD drive is not attached, you must either access the NovaNET CD-ROM over the network or copy the `\net` directory to your local hard drive.

1. Insert the NovaNET CD-ROM.
2. If the CD drive does not load automatically, type **load cdrom** at the console prompt and press **Enter**. Wait a moment for NetWare to mount the CD-ROM.
3. If you are running NetWare 4.2, type **cd mount NovaNET** at the console prompt and press **Enter**.

Note If NovaNET or the NovaNET agent is running, you must close it before continuing.

4. Type **load NovaNET:install** at the console prompt and press **Enter** to run the installation program.
5. If the **Available Languages** screen appears, select the language option and press **Enter**.
6. If the installer detects an older version of NovaNET on your system, the **Update to NovaNET Version...** screen appears. You can update NovaNET using your existing settings. Select one of the following:
 - Select **Yes** and press **Enter** to update NovaNET using your current settings. The program installs the new version of NovaNET as well as all installed NovaNET options.
 - Select **No** and press **Enter** to perform a clean NovaNET install. You can enter new installation settings and overwrite your existing NovaNET installation.
7. The **Installation Options** screen appears (see *Using NovaNET Installer* later in this chapter).

DOS Launch

Note If you cannot install NovaNET directly from the CD-ROM under DOS, you must copy the **\dos** directory to your local hard drive. This occurs under some versions of MSCDEX.

1. Access the drive and directory that contains the installation program (modify the following examples as necessary):
 - At the **C:>** prompt, type **m:**, where **m:** represents your CD drive. Then press **Enter** to access the NovaNET CD-ROM.
 - At the **C:>** prompt, type **d:**, where **d:** represents a hard drive on your computer. Then press **Enter** to access the drive that contains the installation files. Then type **cd \nndos** and press **Enter** to access the directory that contains the installation files. The **D:\NNDOS>** prompt appears.

Note If NovaNET is running, you must close it before continuing.

2. Type **install** and press **Enter** to run the installation program.
3. If the **Available Languages** screen appears, select the language option and press **Enter**.
4. If the installer detects an older version of NovaNET on your system, the **Update to NovaNET Version...** screen appears. You can update NovaNET using your existing settings. Select one of the following:
 - Select **Yes** and press **Enter** to update NovaNET using your current settings. The program installs the new version of NovaNET as well as all installed NovaNET options.
 - Select **No** and press **Enter** to perform a clean NovaNET install. You can enter new installation settings and overwrite your existing NovaNET installation.
5. The **Installation Options** screen appears (see *Using NovaNET Installer* later in this chapter).

Linux/FreeBSD Launch

You must have root access to install NovaNET because it installs itself as a service (or daemon).

Note Be sure a CD drive is attached to your Linux or FreeBSD machine before using the following installation instructions. If a CD drive is not attached to the machine, you must copy the appropriate directory from the CD-ROM, such as **/lin** (Linux), to your local hard drive.

Note Run all installation commands from a terminal window. Do NOT open the installation program directly from an X Window desktop.

1. Insert the NovaNET CD-ROM.
2. If auto-mount is not enabled on your system, you must mount the CD-ROM yourself. Refer to the following example for some Linux systems:
 - a. Access a terminal window.
 - b. Type **mount /dev/cdrom /mnt/cdrom** and press **Enter**.
 - c. Wait a moment for Linux to mount the CD-ROM.
3. Access the root directory on the CD-ROM. For example, on some Linux systems, type **cd /mnt/cdrom** and press **Enter** to access the root directory on the installation CD-ROM.

Note If NovaNET is running, you must close it before continuing.

4. To run the installation program, type **./install** and press **Enter**.
5. If **The NovaNET service is currently running...** message appears, select **Yes** and press **Enter** to stop it.
6. If the **Available Languages** screen appears, select the language option and press **Enter**.

7. If the installer detects an older version of NovaNET on your system, the **Update to NovaNET Version...** screen appears. You can update NovaNET using your existing settings. Select one of the following:
 - Select **Yes** and press **Enter** to update NovaNET using your current settings. The program installs the new version of NovaNET as well as all installed NovaNET options.
 - Select **No** and press **Enter** to perform a clean NovaNET install. You can enter new installation settings and overwrite your existing NovaNET installation.
8. The **Installation Options** screen appears (see *Using NovaNET Installer* below).

Using NovaNET Installer

When the **Installation Options** screen appears, select one of the following options (refer to the corresponding section later in this chapter):

- View Release Notes
- Install NovaNET
- Remove NovaNET
- Install an Option
- Remove an Option
- Licensing

Note Once launched, the NovaNET Installer runs the same under NetWare, DOS, Linux and FreeBSD.

When you are finished using the NovaNET installer, press **Esc**. Then select **Yes** and press **Enter** when the exit confirmation screen appears. As soon as the console prompt appears, remove and store the NovaNET CD-ROM.

Note On some platforms, you must unmount the CD drive to remove the NovaNET CD-ROM.

To start the NovaNET Administrator, refer to *Starting NovaNET* in *Chapter 2 — NovaNET Workplace* in the *NovaNET User's Guide and Technical Reference*.

View Release Notes

We recommend that you always review the release notes when installing either a new or upgrade version of NovaNET or a NovaNET service pack.

1. Access the **Installation Options** screen of the NovaNET installer (see *Launch NovaNET Installer* earlier in this chapter).
2. Select **View Release Notes** and press **Enter**. The release notes appear.
3. Use the arrow keys to review the release notes. You can also use **Page Up** and **Page Down**, if they are supported by your platform.
4. Press **Esc** to return to the **Installation Options** screen.

Install NovaNET

Use this option to install NovaNET for the first time or to reinstall NovaNET. The NovaNET installer guides you through each step of the installation process. In general, you should accept the installer's suggested directory locations.

Before you continue, you must identify the role of this computer:

- Administer an existing storage server database on a different computer (see *Connect to an Existing Storage Server* below).
- Create a new storage server database on this computer, to be either a standalone or a storage server (see *Create a New Storage Server* below).

Connect to an Existing Storage Server

1. Access the **Installation Options** screen of the NovaNET installer (see *Launch NovaNET Installer* earlier in this chapter).
2. Select **Install NovaNET** and press **Enter**. The **Install To** screen appears.

Note At any point in this process, you can press **Esc** to back up to a previous screen.

3. Enter the name of the installation directory and press **Enter**. The default is:
 - **SYS:NNADMIN** (NetWare)
 - **C:NNADMIN** (DOS)
 - **/usr/local/novanet** (Linux/FreeBSD)
4. When the **Storage Management Server** screen appears, select **Connect to existing storage server** and press **Enter**.

Note If you connect to an existing storage server, NovaNET uses the key code from the existing storage management database.

5. When the **Available Protocols** screen appears, it lists all protocols that are installed on this computer. Select one of the following:
 - **NetWare/Windows IPX:** Select this option and press **Enter**. Continue with step 8 below.

Note The **NetWare/Windows IPX** option only appears if the IPX protocol has been installed on a Windows or NetWare system.

- **Internet TCP/IP:** Select this option and press **Enter**. The installer displays the following information screen:

Under some protocols (like TCP/IP), there is no standard way to identify all machines running NovaNET. During startup, NovaNET sends a broadcast to all computers with a direct connection to your network. Only machines with a direct network connection receive the broadcast and respond as actively running NovaNET.

Other machines may be running NovaNET to which you want to connect. To connect to the machines, you must enter some additional information about the machine.

6. Press **Enter** to display to the following information screen:

You may enter either:

The host address
The host address takes the a.b.c.d form, such as 192.168.0.49.
The address varies according to your system.

The host name
This name resolves to a host address using the DNS or a file on your local machine, depending on your system configuration:
SYS:\ETC\hosts for NetWare, /etc/hosts for Linux or FreeBSD.

NOTE: For DOS systems, you must enter a host address because host names cannot be resolved under DOS.

7. Press **Enter** to display the **Current Hosts** screen (TCP/IP only). If this computer and the host server are on different network subnets:
 - a. Press **Insert**. The **Enter Host Name** field appears.
 - b. Enter the **Host Name** or the IP address for the host server.
 - c. Press **Enter**. The host name or IP address appear in the **Current Hosts** list.

8. Press **Enter** to display the following information screen:

To manage the storage process, NovaNET creates a database on one or more machines on the network. These machines are called storage management servers (or storage servers for short). On any network, there must be at least one storage server. You must decide which machines will be the storage servers. The storage server is used to track tapes, files on each tape, jobs, etc. The storage server is a vital component of the NovaNET system.

Once a storage server is created, other machines in the network can use it to track their files and media. The collection of machines using a single server is called the storage management zone. If you create a new storage server, the local machine will be the only machine in the storage management zone. When other machines are installed, they can then join your new storage management zone.

9. Press **Enter**. The **Available Storage Servers** screen appears.
10. Select the storage server to connect to and press **Enter**.
11. When the **Name of Local Machine** field appears, enter the name for this computer and press **Enter**. The default is the existing computer name, if any.
12. When the **Install NovaNET...** screen appears, confirm installation:
 - Select **Yes** and press **Enter** to install NovaNET. The installation program copies NovaNET to the installation directory.
 - Select **No** and press **Enter** to cancel installation. The previous screen appears. Press **Esc** repeatedly until the **Installation Options** screen appears.
13. When the installation complete message screen appears, press **Enter**. The **Installation Options** screen appears again.

Note After NovaNET installation is complete, you can install one or more NovaNET options. You can install any option at any time. You can also install a 30-day evaluation of most NovaNET options.

Create a New Storage Server

1. Access the **Installation Options** screen of the NovaNET installer (see *Launch NovaNET Installer* earlier in this chapter).
2. Select **Install NovaNET** and press **Enter**. The **Install To** screen appears.

Note At any point in this process, you can press **Esc** to back up to a previous screen.

3. Enter the name of the installation directory and press **Enter**. The default is:
 - **SYS:NNADMIN** (NetWare)
 - **C:\NNADMIN** (DOS)
 - **/usr/local/novanet** (Linux/FreeBSD)
4. When the **Storage Management Server** screen appears, select **Create new storage server** and press **Enter**.
5. When **Is this copy an evaluation version?** appears, select one of the following:
 - **Yes:** If this is an evaluation version, select **Yes** and press **Enter**.
 - **No:** If this is a licensed version, select **No** and press **Enter**. Then enter the key code in the license key field and press **Enter**. You must enter a key code after your 30-day evaluation period is over.

Note If you are updating a licensed version of NovaNET, your key code automatically appears in the field.

6. When the **Available Protocols** screen appears, it lists all protocols that are installed on this computer. Select one of the following:
 - **Standalone Desktop/No network support:** Select this option and press **Enter** if this is a standalone computer. The installer skips to step 10 below.
 - **NetWare/Windows IPX:** Select this option and press **Enter**. Continue with step 8 below.

Note The **NetWare/Windows IPX** option only appears if the IPX protocol has been installed on a Windows or NetWare system.

- **Internet TCP/IP:** Select this option and press **Enter**. The installer displays the following information screen:

Under some protocols (like TCP/IP), there is no standard way to identify all machines running NovaNET. During startup, NovaNET sends a broadcast to all computers with a direct connection to your network. Only machines with a direct network connection receive the broadcast and respond as actively running NovaNET.

Other machines may be running NovaNET to which you want to connect. To connect to the machines, you must enter some additional information about the machine.

7. Press **Enter** to display the following information screen:

```
You may enter either:

The host address
  The host address takes the a.b.c.d form, such as 192.168.0.49.
  The address varies according to your system.

The host name
  This name resolves to a host address using the DNS or a file
  on your local machine, depending on your system configuration:
  SYS:\ETC\hosts for NetWare, /etc/hosts for Linux or FreeBSD.

NOTE: For DOS systems, you must enter a host address because
      host names cannot be resolved under DOS.
```

8. Press **Enter** to display the following information screen:

```
To manage the storage process, NovaNET creates a database on one
or more machines on the network. These machines are called storage
management servers (or storage servers for short). On any network,
there must be at least one storage server. You must decide which
machines will be the storage servers. The storage server is used
to track tapes, files on each tape, jobs, etc. The storage server
is a vital component of the NovaNET system.

Once a storage server is created, other machines in the network can
use it to track their files and media. The collection of machines using
a single server is called the storage management zone. If you create
a new storage server, the local machine will be the only machine in the
storage management zone. When other machines are installed, they can then
join your new storage management zone.
```

9. Press **Enter**. The **Name of storage server to create** screen appears.
10. Enter the name of the new storage server and press **Enter**.
11. When the **Name of Local Machine** field appears, enter the name for this computer and press **Enter**. The default is the existing computer name, if any.
12. When the **Install NovaNET...** screen appears, confirm installation:
- Select **Yes** and press **Enter** to install NovaNET. The installation program copies NovaNET to the installation directory.
 - Select **No** and press **Enter** to cancel installation. The previous screen appears. Press **Esc** repeatedly until the **Installation Options** screen appears.
13. When the installation complete message screen appears, press **Enter**. The **Installation Options** screen appears again.

Note After NovaNET installation is complete, you can install one or more NovaNET options. You can install any option at any time. You can also install a 30-day evaluation of most NovaNET options.

Remove NovaNET

Select this option to uninstall NovaNET, all installed NovaNET options and the storage management database.

Note You do not have to uninstall NovaNET before upgrading to a newer version.

To remove NovaNET

1. Access the **Installation Options** screen of the NovaNET installer (see *Launch NovaNET Installer* earlier in this chapter).
2. Select **Remove NovaNET** and press **Enter**. The **NovaNET Installation Directory** screen appears.

Note At any point in this process, you can press **Esc** to back up to a previous screen.

3. Enter the name of the installation directory and press **Enter**. The default is:
 - **SYS:NNADMIN** (NetWare)
 - **C:\NNADMIN** (DOS)
 - **/usr/local/novanet** (Linux/FreeBSD)
4. When the **Remove NovaNET...** screen appears, confirm removal:
 - Select **Yes** and press **Enter** to remove NovaNET. The installation program erases all NovaNET files from the installation directory.
 - Select **No** and press **Enter** to cancel removal. The previous screen appears. Press **Esc** repeatedly until the **Installation Options** screen appears.
5. When the removal complete message screen appears, press **Enter**. The command prompt appears.

Install an Option

You can install a NovaNET option at any time after you install NovaNET. While some options are included with NovaNET and do not require a key code, others can only be installed for a 30-day evaluation or with a separate key code. Contact your NovaNET representative for more information.

To install an option

1. Access the **Installation Options** screen of the NovaNET installer (see *Launch NovaNET Installer* earlier in this chapter).

2. Select **Install an Option** and press **Enter**. The **NovaNET Installation Directory** screen appears.

Note At any point in this process, you can press **Esc** to back up to a previous screen.

3. Enter the name of the installation directory and press **Enter**. The default is:
 - **SYS:NNADMIN** (NetWare)
 - **C:\NNADMIN** (DOS)
 - **/usr/local/novanet** (Linux/FreeBSD)
4. When the **Available Options** screen appears, select the option to install and press **Enter**.
5. Some NovaNET options require a separate key code. When **Is this copy an evaluation version?** appears, select one of the following:
 - **Yes:** If this is an evaluation version, select **Yes** and press **Enter**.
 - **No:** If this is a licensed version, select **No** and press **Enter**. Then enter the key code in the license key field and press **Enter**. You must enter a key code after your 30-day evaluation period is over.

Note If you are updating a licensed version of NovaNET, your key code automatically appears in the field.

6. When the **Install...** screen appears, confirm installation:
 - Select **Yes** and press **Enter** to install. The installer enables the NovaNET option.
 - Select **No** and press **Enter** to cancel the install. The **Available Options** screen appears.
7. After you install the option, the **Installation Options** screen appears.

Remove an Option

Select this option to remove a NovaNET option package that was previously installed.

Note You do not have to uninstall the NovaNET option before upgrading to a newer version.

To remove a NovaNET option

1. Access the **Installation Options** screen of the NovaNET installer (see *Launch NovaNET Installer* earlier in this chapter).

2. Select **Remove an Option** and press **Enter**. The **NovaNET Installation Directory** screen appears.

Note At any point in this process, you can press **Esc** to back up to a previous screen.

3. Enter the name of the installation directory and press **Enter**. The default is:
 - **SYS:NNADMIN** (NetWare)
 - **C:NNADMIN** (DOS)
 - **/usr/local/novanet** (Linux/FreeBSD)
4. When the **Remove...** screen appears, confirm removal:
 - Select **Yes** and press **Enter** to remove the NovaNET option. The installation program disables the NovaNET option.
 - Select **No** and press **Enter** to cancel removal. The previous screen appears. Press **Esc** repeatedly until the **Installation Options** screen appears.
5. When the removal complete message screen appears, press **Enter**. The **Installation Options** screen appears again.

Licensing

NovaNET uses a system of key codes that represent your license to use all NovaNET features as well as its options. When you purchase and install NovaNET key codes, you can use NovaNET and all licensed options. The licensing option lets you enter your NovaNET key codes.

To enter a new key code

1. Access the **Installation Options** screen of the NovaNET installer (see *Launch NovaNET Installer* earlier in this chapter).
2. Select **Licensing** and press **Enter**. The **NovaNET Installation Directory** screen appears.

Note At any point in this process, you can press **Esc** to back up to a previous screen.

3. Enter the name of the installation directory and press **Enter**. The default is:
 - **SYS:NNADMIN** (NetWare)
 - **C:NNADMIN** (DOS)
 - **/usr/local/novanet** (Linux/FreeBSD)

4. When the **Available Options** screen appears, select the item to license and press **Enter**.
5. Enter the key code and press **Enter**.
6. After NovaNET accepts the key code, press **Enter** again to display the **Installation Options** screen.

Chapter 4 — Installation Notes

In this chapter

- General Installation Notes
- NetWare Installation Notes
- Linux/FreeBSD Installation Notes
- Linux Installation Notes

General Installation Notes

Device Buffer Sizes

To maintain optimal performance, NovaNET sets a default buffer size that is allocated evenly between each device attached to your computer. For example, if two devices are attached to your computer, the buffer size is 32MB and the available free memory is 32MB or more, NovaNET allocates 16MB to each device.

The default (recommended) device buffer size is 25% of physical memory. If this amount is 32MB or more, NovaNET sets the buffer size to 32MB. If the 25% is not exactly equal to 16MB, 8MB, 4MB, 2MB or 1MB, NovaNET sets the buffer size to the next lower setting.

For example, if 96MB is installed, 25% is 24MB. As a result, NovaNET sets the buffer size to the next lowest setting (16MB).

Setting this value higher can enhance performance, especially if more than two devices are attached to your system. NovaNET can buffer more data in memory by reading larger amounts of data from the disk at a time. However, do not set the buffer size to exceed available system memory or your performance will decrease due to excessive disk operations.

To change the device buffer size

1. Locate the following line in the **Device** performance tuning section of the **NNCfg.ini** file:

```
;devBufferSize=n
```

2. Enter one of the following in place of **n** (in bytes):

```
32768 (32MB)
16384 (16MB)
8192 (8MB)
4096 (4MB)
2048 (2MB)
1024 (1MB)
```

3. Erase the semi-colon at the start of the line, as follows:

```
devBufferSize=n
```

Note If you enter a different setting, NovaNET sets the device buffer size to the next lower of these options. For example, if you enter 32000, NovaNET sets the device buffer size to 16384 (16MB).

Note Setting the device buffer size above 32MB per device will not improve performance.

Multiple SCSI Buses with Autoloaders

If your autoloader and its devices are connected to different SCSI buses, the device driver may become confused as to which device is contained within the autoloader. If the autoloader and its devices use either the SCSI-2 serial number or the new SCSI-3 identifier protocol, all devices will be correctly identified. However, if the autoloader supports neither the SCSI-2 serial number nor the SCSI-3 identifier protocol, you must connect the autoloader and its devices to the same SCSI bus. You can also configure the drivers manually as follows:

1. Log in to NovaNET.
2. Access the **Device** tab to get the name of the autoloader and its devices. For example:

```
Autoloader:      Ldr-2.0.3.0: ADIC Scalar
Device 1:        Dev-3.0.3.0: DLT 4000
Device 2:        Dev-4.0.3.0: DLT 4000
```

3. Exit NovaNET.

4. Add the autoloader and device lines to the `NNCfgr.ini` configuration file as follows:

```
[Ldr-2.0.3.0: ADIC Scalar]
device1=Dev-3.0.3.0: DLT 4000
device2=Dev-4.0.3.0: DLT 4000
```
5. Restart NovaNET.
6. Access the **Device** tab again to verify the name of the autoloader and its devices.

NetWare Installation Notes

Running NovaNET for NetWare for the First Time

When you run NovaNET the first time after installing NovaNET on a NetWare Server, NetWare asks you to enter the NetWare Directory Services (NDS) login password for the administrator. You must enter this password before you can log in to NovaNET.

The default NDS information provided by NovaNET may not be correct for your NDS installation. If the NDS login displays something like:

```
cn=admin.ou=organizationalunit.o=organization
```

try changing the path to:

```
cn=admin.o=organization
```

After you successfully log on to NDS, the normal NovaNET display login screen appears.

Note You are only asked to enter the NDS login password once. After you enter the password, the normal NovaNET login screen always appears.

Users with Adaptec Controllers Must Install the Latest Drivers

Some NetWare users with Adaptec controllers may be using outdated drivers, which will affect NovaNET operation. Therefore, if you have an Adaptec controller, please update your drivers before installing NovaNET.

Using NWASPI.CDM

NWASPI.CDM is a NetWare Peripheral Architecture (NWP) driver written as a Custom Device Module (CDM). It allows applications that access devices with the ASPI interface to do the same on a NetWare server.

You must load NWASPI.CDM for both SCSI and fibre channel devices. Refer to the appropriate section below to configure NWASPI.CDM for single or multiple LUNs.

Single LUN Devices

For NovaNET to “see” your single LUN devices, you must load NWASPI.CDM. However, single LUN devices do not require any LUN support.

1. Add the following line to the `STARTUP.NCF` file:

```
load NWASPI.CDM
```

Note Add this line above all HAM drivers in the `STARTUP.NCF` file. Otherwise, NetWare will not load the HAM drivers.

2. Restart the NetWare server and load NovaNET.
3. Access the **Device** tab to verify that the device appears.

Multiple LUN Devices

For NovaNET to “see” your multiple LUN devices, you must load NWASPI.CDM and enable LUN support for the device.

1. First, add the following line to the `STARTUP.NCF` file:

```
load NWASPI.CDM /LUN
```

Note Add this line above all HAM drivers in the `STARTUP.NCF` file. Otherwise, NetWare will not load the HAM drivers.

If this line already exists, make sure it includes the `/LUN` option.

2. Second, locate the HAM driver for your device in the `STARTUP.NCF` file. For example, the following line appears for an Adaptec 29160 SCSI card:

```
load ADPT160M.HAM
```

3. Add `lun_enable=ff` to the end of driver line. For example, to enable LUN support for an Adaptec 29160 SCSI card, the new line would be:

```
load ADPT160M.HAM lun_enable=ff
```

4. Restart the NetWare server and load NovaNET.
5. Access the **Device** tab to verify that the device appears.

Configuring Btrieve Database Sets

Btrieve is a network database record manager that is designed for NetWare. If you are using Btrieve, you must configure a special control file to back up and restore your database.

The use of a control file is necessary because related databases (record sets that work with each other) need to be backed up in a single operation. This ensures database integrity by not recording changes made to one database that are not recorded in a corresponding, related database.

You must manually specify which files are related, that is, which files need to be backed up and restored in a single operation. To do so, you create a *set*, that is, a group of database files that are related. NovaNET will open and close these files at the same time, ensuring that none of the files are modified while one of the files is being backed up or restored.

When properly configured, the **Selection** tab of a job's property sheet and the **Database** tab will display a special folder named **Btrieve Database Sets**. When you expand this folder, the sets you defined will appear. (The sets appear as a file with your assigned set name.) You can select these sets just like any other file or folder for backup, restore or verifying. Remember, however, that when you select a set, you are actually selecting the group of files defined by that set.

Defining Btrieve Sets

To define a Btrieve database set and specify which record files belong to that set, you must create and edit a special control file named NN\$BTRV.DAT, as follows:

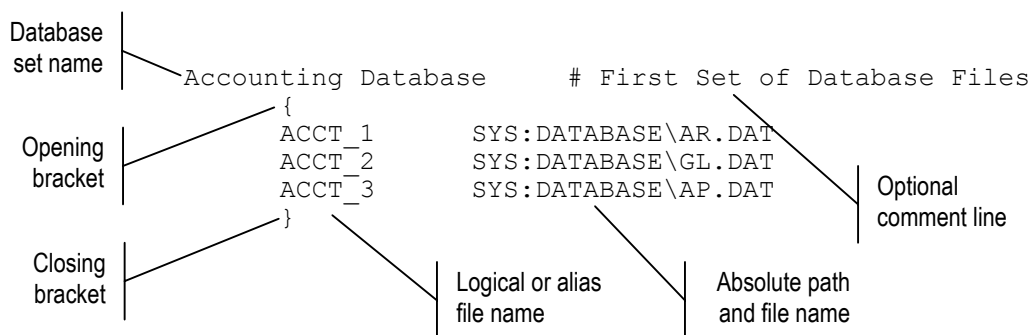
1. Create or edit the SYS:\SYSTEM\NN\$BTRV.DAT file. Follow this example:

```
:LOAD EDIT SYS:\SYSTEM\NN$BTRV.DAT
```

2. Specify the contents of the NN\$BTRV.DAT file, using the following format:

```
Accounting      # First set of database files
{
  ACCT_1        SYS:DATABASE\AR.DAT
  ACCT_2        SYS:DATABASE\GL.DAT
  ACCT_3        SYS:DATABASE\AP.DAT
}
Accounting Temp # Redirected accounting files
{
  ACCT_1        SYS:DATABASE\OLD\AR.DAT
  ACCT_2        SYS:DATABASE\OLD\GL.DAT
  ACCT_3        SYS:DATABASE\OLD\AP.DAT
}
Customer        # Second set of database files
{
  CUST_1        SYS:CUSTOMER\SALES.DBF
}
```

The above example defines three database sets. As illustrated below, each set definition includes the following: database set name, optional comment line, opening bracket, logical or alias file name, absolute path and file name and closing bracket:



Backing Up and Restoring Files

NovaNET backs up Btrieve database sets just like it backs up any other file. Review the object detail area of the **Selection** tab of a backup job to make sure the database set is selected.

NovaNET restores database sets in the same way as other files. Its only limitation is that you cannot restore a Btrieve database file with a different name without editing the NN\$BTRV.DAT file.

Note You cannot save the database *set* with a new name because the set only appears in NovaNET's database, not in the NetWare directory.

To restore database sets to a *different* folder, simply drag the database set to the new location on the **Selection** tab of a restore job. To restore the database set to a *new* folder, use the **New Object** button to create a new folder; then drag the database set to that new folder.

If you need to restore a Btrieve database file with a different name, the easiest solution would be to first restore it to a new location and then change its name in the operating system. However you can change the name by editing the NN\$BTRV.DAT file. In this case, leave the logical or alias name unchanged, but modify the absolute path and file name. (Be certain to change the NN\$BTRV.DAT file back to its original form if you wish to continue to back up the original file.)

Additional Notes

You can specify any number of database sets. Each set can contain as many as 255 files.

The logical or alias file name is used by NovaNET to track a file, regardless of its physical location on a volume. Each logical name must be less than 48 characters long.

Btrieve files can be open and in use while NovaNET is backing up database sets. However, you must exit any Btrieve application before restoring a database set.

Linux/FreeBSD Installation Notes

Copying the NovaNET Installer to a Local Disk

If you copied the installation files from the NovaNET CD-ROM and the installation failed, you must change the executable attribute on the install and nnunxins files.

Note In the following sections, <os> represents the operating system directory on the NovaNET CD-ROM, for example, **/lin** (Linux).

Enter the following from the command prompt:

```
chmod +x <os>_install  
chmod +x <os>/nnunxins
```

Then try the install again.

Graphical User Interface

The graphical user interface of NovaNET has the look and feel of the KDE desktop. However, it does not require that you install KDE or GNOME. You can run NovaNET from any window manager.

NovaNET Icon for the X Window Desktop

Many users choose to put a NovaNET icon on the desktop so they can start NovaNET with a single click.

KDE Desktop

To put a NovaNET icon on the KDE desktop

1. Right-click on the desktop to display a popup menu.
2. Select **Create New**. A flyout menu appears.
3. Select **Link to Application**. The **Properties for Program.desktop** screen appears.
4. Enter **NovaNET**.
5. Click the icon button. The **Select Icon** screen appears.
6. Select **Other icons**. The **Browse** button is enabled.
7. Click **Browse**. The **Open** screen appears.
8. Navigate to the NovaNET directory. The default location is **/usr/local/novanet**.
9. Locate and select the **iconnn.xpm** file. Then click **OK**. The NovaNET icon appears on the properties screen.
10. Click the **Execute** tab.
11. Click **Browse**. The **Open** screen appears.
12. If the screen does not open to the NovaNET directory, navigate to it. The default location is **/usr/local/novanet**.
13. Locate and select the **nnxadmin** file. Then click **OK**. The NovaNET administrator path and file name appear in the **Command** field.
14. Select **Run in terminal**.

15. Click **OK**. The NovaNET icon should appear on the KDE desktop.

GNOME Desktop

To put a NovaNET icon on the GNOME desktop

1. Navigate to the NovaNET directory from the GNOME desktop. The default location is **/usr/local/novanet**.
2. Right-click on **nnxadmin**. A popup menu appears.
3. Select **Make Link**. The **link to nnxadmin** icon appears in the NovaNET directory.
4. Drag the **link to nnxadmin** icon from the NovaNET directory to the desktop.
5. Right-click the **link to nnxadmin** icon. A popup menu appears.
6. Select **Show Properties**. The link to **nnxadmin Properties** screen appears.
7. Enter **NovaNET** in the field for the icon name.
8. Click **Select Custom Icon**. The **Select an icon** screen appears.
9. Click **Browse**. The **Select file** screen appears.
10. Navigate to the NovaNET directory. The default location is **/usr/local/novanet**.
11. Locate and select the **iconnn.xpm** file. Then click **OK**. The NovaNET icon appears on the properties screen. The screen name also changes to **NovaNET Properties**.
12. Close the **NovaNET Properties** screen.

Linux Installation Notes

SCSI Autoloaders may not be Detected

By default, most Linux kernels do not enable LUN support. To support autoloaders, you must enable LUN support and recompile your Linux kernel. Once enabled, you must update the configuration file to force the kernel to scan multiple LUNs.

To update the configuration file and verify the configuration (LILO)

1. Add the following line to the end of *each* boot selection section in the `/etc/lilo.conf` file:
`append="max_scsi_luns=2"`

Note Set `max_scsi_luns` to the value required by your autoloader. In most cases, this value is 2.

2. Update your system configuration, using the following command:
`lilo`
3. Save the file and reboot your system.
4. Verify that the change has been implemented, using the following command:
`cat /proc/cmdline`
5. If `max_scsi_luns=2` does not appear, you did not update the configuration file correctly. Start over with step 1 above.
6. Verify that your system detects the autoloader, using the following command:
`cat /proc/scsi/scsi`

To update the configuration file and verify the configuration (GRUB)

1. Locate the `grub.conf` file. This file may also be called `menu.lst`. Possible locations include `/boot/grub` and `/etc`.
2. Add the following text to the end of *each* kernel image line in the `grub.conf` file:
`max_scsi_luns=2`
Each kernel image line will read similar to the following:
`kernel /vmlinuz-2.2.6-2 ro root=/dev/hda3 max_scsi_luns=2`
3. Save the file and reboot your system.
4. Verify that the change has been implemented, using the following command:
`cat /proc/cmdline`
5. If `max_scsi_luns=2` does not appear, you did not update the configuration file correctly. Start over with step 1 above.
6. Verify that your system detects the autoloader, using the following command:
`cat /proc/scsi/scsi`

IDE/ATAPI Support

NovaNET supports the use of IDE/ATAPI tape devices. If your Linux distribution compiled the `ide-tape.o` module into the kernel, update the configuration file and verify the configuration to access these devices.

Note When NovaNET runs, it loads the `ide-scsi` module. This may cause the `ide-cdrom` module to fail to load, which may affect CD operation. To work around this problem, mount the CD as a SCSI device, even though it is an IDE device.

To update the configuration file and verify the configuration (LILO)

1. Add the following line to the end of *each* boot selection section in the `/etc/lilo.conf` file:

Master on primary IDE	<code>append="hda=ide-scsi"</code>
Slave on primary IDE	<code>append="hdb=ide-scsi"</code>
Master on secondary IDE	<code>append="hdc=ide-scsi"</code>
Slave on secondary IDE	<code>append="hdd=ide-scsi"</code>
2. Update your system configuration, using the following command:


```
lilo
```
3. Save the file and reboot your system.
4. Verify that the change has been implemented, using the following command:


```
cat /proc/cmdline
```
5. If `hda=ide-scsi` (or similar) does not appear, you did not update the configuration file correctly. Start over with step 1 above.
6. Verify that your system detects the tape device, using the following command:


```
cat /proc/scsi/scsi
```

To update the configuration file and verify the configuration (GRUB)

1. Locate the `grub.conf` file. This file may also be called `menu.lst`. Possible locations include `/boot/grub` and `/etc`.
2. Add the appropriate text from the following to the end of *each* kernel image line in the `grub.conf` file:

Master on primary IDE	<code>hda=ide-scsi</code>
Slave on primary IDE	<code>hdb=ide-scsi</code>
Master on secondary IDE	<code>hdc=ide-scsi</code>
Slave on secondary IDE	<code>hdd=ide-scsi</code>

Each kernel image line will read similar to the following:

```
kernel /vmlinuz-2.2.6-2 ro root=/dev/hda3 hda=ide-scsi
```

3. Save the file and reboot your system.
4. Verify that the change has been implemented, using the following command:

```
cat /proc/cmdline
```
5. If `hda=ide-scsi` (or similar) does not appear, you did not update the configuration file correctly. Start over with step 1 above.
6. Verify that your system detects the tape device, using the following command:

```
cat /proc/scsi/scsi
```

Libraries Missing from Linux Distribution

Problem: I cannot launch the X Window version of NovaNET. It gives me the following message:

```
error while loading shared libraries libstdc++.so.2.8
```

Cause: Either the `libstdc++` library is missing from your version of Linux distribution or the wrong version of the library is installed.

Solution: Install the missing library.

1. Identify the required version of the library:
 - a. Navigate to the NovaNET directory in a terminal window. The default directory is **/usr/local/novanet**.
 - b. Type **ldd nnxadmin.bin** from the command prompt and press **Enter**. A list of libraries required for NovaNET appears.

The name of the missing `libstdc++` library will be similar to `libstdc++.so.2.8`.
2. Contact your Linux distributor for the missing library.
3. Install the library according to the documentation provided by your distributor.
4. Try to launch the X Window version of NovaNET. It should work properly.

Appendix A — Troubleshooting Guide

Troubleshooting Installation

I entered my key code correctly, but the installation won't continue.

Make sure that the key code you entered supports the platform on which you are trying to install NovaNET. Also, make sure you have not entered any spaces before or after the key code.

Each key code is product and configuration specific. Some key codes let you back up unlimited machines and servers; others only let you back up a single desktop machine. Some key codes work for multiple platforms and networks (Windows, NetWare and Linux); others work on only one platform or network.

Your license agreement determines the number of machines and servers on which you can install NovaNET and the operating system or platform of each workstation or file server. If you need to install NovaNET on additional machines, you can purchase an upgrade to your license agreement.

I selected 'Connect to existing storage server', but the storage server is not displayed.

First, make sure the designated storage server is running. Also, make sure that the necessary networking software is installed and operating properly. You can verify this by using the **Database** tab. Open the **Network** folder on that tab and select the machine you intended to be the storage management server. If that machine has been configured for network operation, you will see a driver named **Xpt-...** in the object detail area of the tab (on the right side). If you don't see that driver, you must reinstall NovaNET on the storage server in order to add networking support.

Second, if you are running TCP/IP, NovaNET will only display servers on your local subnet. If you are not on the same subnet as the storage server, you must specifically add the storage server's host address or host name during installation.

When I try to log on to NDS, NovaNET keeps asking for the password.

When you run NovaNET the first time after installing NovaNET on a NetWare Server, NetWare asks you to enter the NetWare Directory Services (NDS) login password for the administrator. Refer to *Running NovaNET for NetWare for the First Time* in *Chapter 4 — Installation Notes* for details.

I can't log on to NovaNET.

If this is a new NovaNET installation, try to log on as the ADMIN user, which is automatically created during installation. Initially, there is no password for the ADMIN user.

If the message **Error 25 — Service not available** appears, you may not have installed NovaNET correctly. NovaNET requires a storage management server to be active in order for you to log on. During installation, make sure you select **Create a new storage manager** on one of the machines you are installing. Then start NovaNET on that machine before installing it on other machines.

I am using TCP/IP, but it cannot see other servers.

Under some conditions, the TCP/IP driver will not be able to display other Storage Servers on the TCP/IP network. Make sure you entered a valid TCP/IP default gateway, or specify the server address in the NovaNET host address dialog box during installation.

Troubleshooting Backup Devices

I can't see my tape drive on the Device tab.

NovaNET automatically recognizes any backup device attached to your server or workstation. If the device does not appear, first try the following:

All devices and platforms

- Use the manufacturer instructions to verify that you installed the device correctly.
- Refer to *Chapter 4 — Installation Notes* for information about some platform-specific issues.

SCSI devices

- Make sure the most current SCSI drivers are installed.
- Make sure there are no SCSI ID conflicts.

- On Linux and FreeBSD systems, remove and reload the SCSI drivers.

IDE devices Make sure the hardware jumpers are correctly set on the device.

Second, if the devices are correctly installed, make sure your system recognizes them. For example, on Windows platforms, you can use Windows Explorer or the Device Manager; on Linux platforms, you can use the **cat /proc/scsi/scsi** command.

Third, check to see if any device drivers failed when loading NovaNET. Access the **Messages** screen: on Windows and X Window systems, select the **Messages** option on the **Tools** menu; on NetWare, DOS, Linux and FreeBSD systems, press **Ctrl-F8**. See *Restarting Failed Devices in Chapter 9 — Media, Device and Database Tabs* in the *NovaNET User's Guide and Technical Reference* for additional information on reinitializing failed devices.

You can also check for other errors or messages in the `nntrace.txt` file. This file is located in your NovaNET directory.

Finally, if your device is listed as **Dev-Unrecognized device...**, you are using a backup device that is not yet supported by NovaNET. Contact our technical support department at Support@NovaStor.com or visit us online at www.NovaStor.com to see if your device is now supported.

My SCSI autoloader is not active on the Device or Database tabs.

Check the **Device** tab. If the autoloader has an exclamation point icon (Windows or X Window) or if it is grayed out (other platforms), the autoloader may be initializing. The **Diagnostics** tab of the **Properties** page for the loader will display the loader status or error. If it is initializing, wait a minute and then refresh the device list.

NovaNET does not recognize my SCSI autoloader. The tape device is displayed, but not the loader.

First, make sure that no other backup programs are installed. Other backup programs often install drivers that are incompatible with NovaNET.

Second, check the following:

Windows 98/Me Remove the autoloader drivers from the device list on the Windows Control Panel. Sometimes these drivers conflict with the NovaNET drivers.

Windows NT (or later) Disable the autoloader drivers in the Device Manager screen. Sometimes these drivers conflict with the NovaNET drivers.

NetWare

- Make sure **NWASPI.CDM** is loaded (see *Using NWASPI.CDM* in *Chapter 4 — Installation Notes*). If this does not work, remove the **NWTAPE.CDM** command from the **STARTUP.NCF** file.
- Remove the **NWTAPE.CDM** command from the **STARTUP.NCF** file.
- Run **NNSCSI.NLM** from the command line to force a scan of all SCSI devices. If this works, you should add this command to the **STARTUP.NCF** file.

Linux Refer to *SCSI Autoloaders may not be Detected* in *Chapter 4 — Installation Notes*.

Appendix B — Configuring Email Options

You can configure NovaNET to automatically email the job log to the job owner as soon as the job has run. NovaNET supports MAPI and SMTP email interfaces. You can install either interface or both interfaces.

To configure an email option:

1. Install the appropriate email interface.
2. Configure the email interface.
3. Enter one or more valid email addresses on the **Email** tab for the job owner (see *Emailing Job Logs* in *Chapter 8 — Running Jobs* in the *NovaNET User's Guide and Technical Reference*).

Install the Email Interface

To install an email interface, refer to *Install an Option* in either *Chapter 2 — Windows Operating Systems* or *Chapter 3 — Non-Windows Operating Systems*.

Note Only install the email support on the storage management server.

As soon you install an email interface, the **Email** tab appears on the property sheet of each User object. NovaNET will email the job log to the addresses listed on the job owner's **Email** tab.

Installing Both Email Interfaces

NovaNET lets you install both SMTP and MAPI email interfaces. When you do, NovaNET will email two logs from each job to each email address, one SMTP and one MAPI.

To install both email interfaces:

1. Install one email interface.
2. Exit and restart the NovaNET installer.

3. Install the other email interface.

Configure the Email Interface

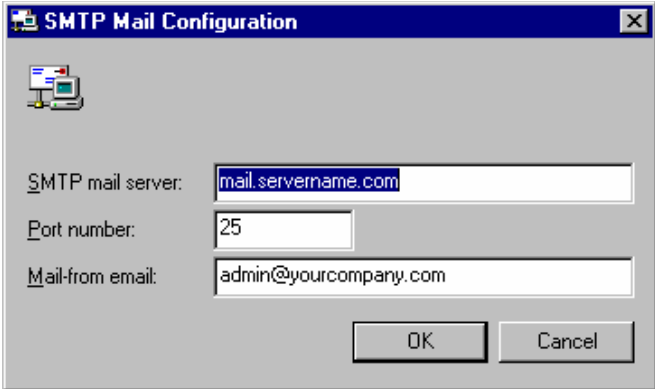
After installing an email interface, you must configure the email:

1. Select **Configurations** from the **Tools** menu.
2. Select either **SMTP Email** or **MAPI Email**. The appropriate mail configuration screen appears.

SMTP Email Configuration

When you select **SMTP Email**, the **SMTP Mail Configuration** window appears.

SMTP Email Configuration window



SMTP mail server: mail.servername.com

Port number: 25

Mail-from email: admin@yourcompany.com

OK Cancel

Enter the following information:

SMTP mail server Enter the name of the mail server.

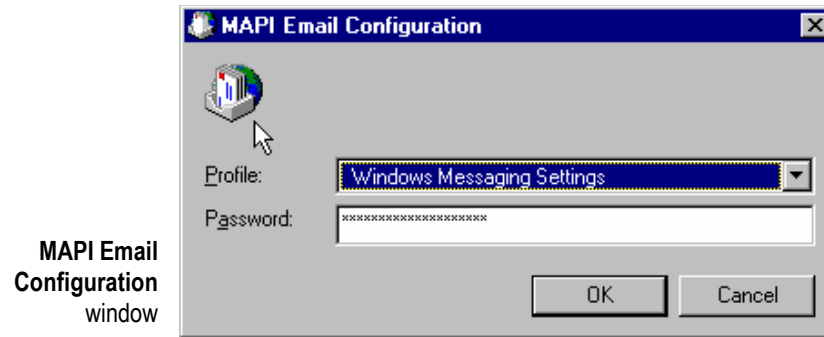
Port number Enter the appropriate SMTP port. The **Port number** default is **25**, which is usually the correct value. If you are using a proxy server, you may have to enter a different **Port number**.

Mail-from email Enter the email address to be entered in the *From* field for each job log email. This email address must be valid.

Note Some SMTP mail servers require that **Mail-from email** be a valid *user@host* address; other SMTP mail servers ignore this field.

MAPI Email Configuration Window

When you select **MAPI Email**, the **MAPI Mail Configuration** window appears.



Enter the following information:

Profile Select a profile from the drop-down list. These profiles are set up independently by your system administrator. If no profiles are listed, your operating system has not been configured with an appropriate MAPI profile. Refer to your email software documentation for more information on configuring a MAPI profile or contact your system administrator.

Password Enter the appropriate password for the selected MAPI profile.

Note NovaNET will use the *From* email address specified in the profile.

Appendix C — Using Microsoft Exchange Server

This appendix contains important information pertaining to backing up and restoring Microsoft Exchange Server databases and configuration data. If you are using NovaNET to back up and restore Microsoft Exchange Server databases, be sure read these instructions carefully.

In This Appendix

- Installing the Microsoft Exchange Connector
- Microsoft Exchange Configuration Window
- Microsoft Exchange Server Notes
- Restoring Microsoft Exchange Databases

Note Anytime NovaNET returns an error message that is greater than 10000, a Microsoft SQL or Exchange error has occurred. Refer to your Microsoft documentation for more information.

Installing the Microsoft Exchange Connector

To install the Microsoft Exchange connector, refer to *Install an Option* in *Chapter 2 — Windows Operating Systems*.

Note You must install the Microsoft Exchange connector on the Microsoft Exchange server.

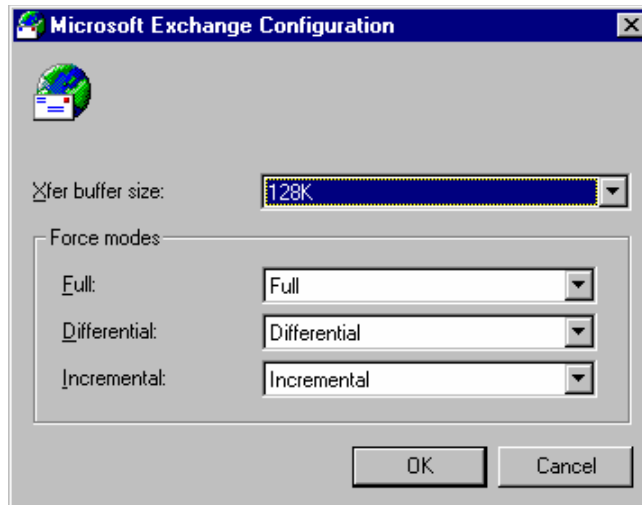
As soon you install the Microsoft Exchange connector on the Microsoft Exchange server, you can access the **Microsoft Exchange Configuration** window.

Microsoft Exchange Configuration Window

After installing the Microsoft Exchange connector, you must configure it:

1. Select **Configurations** from the **Tools** menu.
2. Select **Microsoft Exchange**. The **Microsoft Exchange Configuration** window appears.

Microsoft Exchange Configuration window



Use the **Microsoft Exchange Configuration** window to set certain parameters that control how NovaNET works with Microsoft Exchange.

Transfer Buffer Size

This parameter sets the size of the read or write request NovaNET makes from Microsoft Exchange. The default value is **128K**. You can set the value anywhere from 64K to 1024K, in 64K increments.

The **Xfer buffer size** affects the speed at which data is transmitted and thus the speed at which jobs run. In general, you should leave the default value unchanged. In some installations, however, you may get better results by increasing the buffer size.

Force Modes

As explained in the next section, the **Backup mode** parameter of a backup job affects Microsoft Exchange Server database files differently than file types. The **Force modes** parameters control how NovaNET backs up the database files.

Note that the settings here are only applicable to Microsoft Exchange Server database files; all other file types are backed up in the job's default mode. For example, if the **Backup mode** of a job is set to **Incremental** and the **Force modes** parameter for incremental jobs is set to **Full**, NovaNET will back up the Exchange Server database files in **Full** mode, but all other file types in **Incremental** mode.

Tip You can use this feature to ensure that the database is always backed up in full mode, but that other files are only backed up when changed. This guarantees the greatest security for the most crucial files (that is, the Exchange Server database files), while not making jobs unnecessarily large by *not* backing up the entire network (that is, by backing up only the changed files).

Full When the **Backup mode** of a job is set to **Full**, NovaNET checks this parameter to see how the job should be run with Microsoft Exchange Server database files. **Full** is the only possible parameter, so the database files will be backed up in this mode. In this case, both the database and the transaction logs are backed up.

Differential When the **Backup mode** of a job is set to **Differential**, NovaNET checks this parameter to see how the job should be run with Exchange database files. By default, NovaNET runs the job as a differential job and so only the transaction logs are backed up.

If you want jobs with a **Differential** backup mode to backup both the database *and* the transaction logs, change this parameter to **Full**. In this case, NovaNET will treat the Exchange Server database files as if it were running a job in **Full** backup mode.

Incremental When the **Backup mode** of a job is set to **Incremental**, NovaNET checks this parameter to see how the job should be run with Exchange database files. By default, NovaNET runs the job as an incremental job and so only the transaction logs are backed up.

If you want jobs with an **Incremental** backup mode to backup both the database *and* the transaction logs, change this parameter to **Full**. In this case, NovaNET will treat the Exchange Server database files as if it were running a job in **Full** backup mode.

Microsoft Exchange Server Notes

When you use NovaNET to backup and restore Microsoft Exchange Server databases, you must pay special attention to the role Windows NT security serves in Microsoft Exchange and the backup mode of the NovaNET backup jobs.

Microsoft Exchange and Windows NT

Microsoft Exchange uses Windows NT security information for authentication and thus when planning a comprehensive backup program, you must consider the Windows NT operating system as well. Be certain to include backup and restoration of the Windows NT operating system as part of your Microsoft Exchange disaster recovery plan.

Backup Modes

You can use the **Options** tab of a job to set the **Backup mode** to any of types of backup jobs: *full*, *incremental*, *differential* or *snapshot*. For scheduled automatic rotation jobs, NovaNET automatically updates this job parameter to the value indicated on the **Schedule** tab of the job. For further information, see *Backup Options Automatically Updated* in *Chapter 7 — Job Options* of the *NovaNET User's Guide and Technical Reference*.

When the **Backup mode** is set to **Full**, all files selected are backed up, including the entire information store and directory databases. Transaction logs are also backed up and then purged.

When the **Backup mode** is set to **Incremental**, only changes that have occurred since the last backup job are written. In particular, for database files, only the .log files are included in the backup job. *These .log files are then purged.*

When the **Backup mode** is set to **Differential**, for database files, only the .log files are included in the backup job, *but these files are not purged.*

When the **Backup mode** is set to **Snapshot**, NovaNET runs the job in **Full** backup mode. Note that this will cause the transaction logs to be reset (truncated). For this reason, running a job in **Snapshot** mode can compromise your comprehensive backup strategy if you are not careful to archive the media created by these jobs.

Backup Modes and Circular Logging

Microsoft Exchange Server supports database circular logging. Circular transaction logs differ from normal logs in that only a few log files are maintained. These files are purged automatically as new log files are created. When the transactions in the circular log files are recorded in the database, the log file is then deleted. New transactions are recorded in newly created log files.

If circular logging is enabled, *you cannot do incremental or differential backups*. These backup modes rely upon past transaction logs and thus are not available when circular logging is enabled. When circular logging is enabled, NovaNET will revert to *full* backup mode.

You can check to see if circular logging is enabled for a particular server by examining the **Advanced** tab of that server's **Properties** window. If you turn circular logging off, Microsoft Exchange Server will stop the database service and restart it after making the changes.

Restoring Microsoft Exchange Databases

To restore a Microsoft Exchange Server database, you must restore the database and all of the log files created since the last full backup job. To do so, you either (1) restore the database from the last full backup *if the last backup (the previous day's) was a full backup*; (2) restore the database from the most recent full backup and the last differential backup *if the last backup was a differential backup*; or (3) restore the database from the last full backup and all of the *incremental* backups made between that day and the present day.

Note that when you restore the database, you must create and run a separate job for each set of transaction logs you need to restore. You cannot skip any logs and the logs must be restored in sequential order. Thus, when recreating a database, you must first restore the whole database (created by a backup job running in *full* backup mode). Next, you must restore the transaction logs in the order created *and* in separate jobs. No log can be skipped when restoring.

For example, if you did a *full* backup on Monday and *incremental* backups each day Tuesday through Friday, in order to restore the database to its state at the close of business Friday, you must run five separate jobs: one restoring the database from Monday's full backup job and then four additional *separate* jobs restoring each transaction log in sequential order, beginning Tuesday and continuing with each log sequentially until Friday.

Microsoft Exchange Server Database Instances To check to see if a particular instance of a database is the whole (full) database or just the database log, open the **Instances of...** window of the database by selecting the database and clicking the **Instance** button on the toolbar of the **Selection** tab of the restore job. Highlight the instance you wish to investigate and click the **Details** button. In the **Stream format** field, it will show either **Database Full Stream** or **Database Log Stream**, depending on whether the database instance is the entire (full) database or only a transaction log.

To restore a Microsoft Exchange Server Database

1. Find the date of the last full backup of the database.

To do so, select the database and click the **Check** button. In the **Instances of...** window, click the **Details** button. The **Stream format** field will show either **Database Full Stream** or **Database Log Stream**. Sequentially move through the instances in the **Available instances** field by date until you find the most recent full backup of the database.

That instance will be selected for restoring when it is highlighted in the **Available instances** field. Click **Ok** to restore that instance.

2. Create and run a restore job of the most recent instance of a full backup of the database.
3. If the most backup was a full backup, skip the rest of these steps and restart the Microsoft Exchange Server database. As the service is restarted, it automatically restores all of the transactions from the transaction logs.
4. If the most recent backup job was a differential job *and you have performed no incremental jobs between the date of the last full backup and the most recent backup*, then create and run a new restore job, selecting the **<Latest>** instance of the database. Then restart the Microsoft Exchange Server database. As the service is restarted, it automatically restores all of the transaction from the transaction logs.

Note If you have performed any incremental jobs since the date of the last full backup, continue with the next step.

5. If you have run an incremental backup job after the most recent full backup job, you must create and run a separate restore job for each backup performed after the most recent full backup. Sequentially select instances of the database from the **Available instances** field in the **Instances of...** window of the database. Run and complete each restore job before creating and running a new restore job.

Continue to create and run restore jobs until you have restored the **<Latest>** instance of the database. Then restart the Microsoft Exchange Server database. As the service is restarted, it automatically restores all of the transaction from the transaction logs.

Appendix D — Using Microsoft SQL Server

This appendix contains important information pertaining to backing up and restoring Microsoft SQL Server databases. If you are using NovaNET to back up and restore SQL Server databases, be sure read these instructions carefully.

In This Appendix

- Overview
- Installing the SQL Connector
- SQL Configuration Window
- SQL Server Backup Job Notes
- SQL Server Restore Job Notes
- Restoring SQL Server User Databases
- Restoring SQL Server Master Databases

Overview

Many SQL server environments are mission-critical and must be maintained 24 hours a day, seven days a week. Procedures and plans must be in place to ensure the quick recovery of data in the event of data loss.

Using the transaction logs associated with each database, you can quickly recover your databases. Transactions that were not committed can be rolled back, while transactions that were committed can be written to disk.

While transaction logs assure that only committed transactions are written and restored, in order to use them correctly, you must have a comprehensive backup plan that regularly backs up these logs. Additionally, when you reconstruct a database, you must restore the database and logs using only the procedures set out below.

Installing the SQL Connector

To install the SQL connector, refer to *Install an Option in Chapter 2 — Windows Operating Systems*.

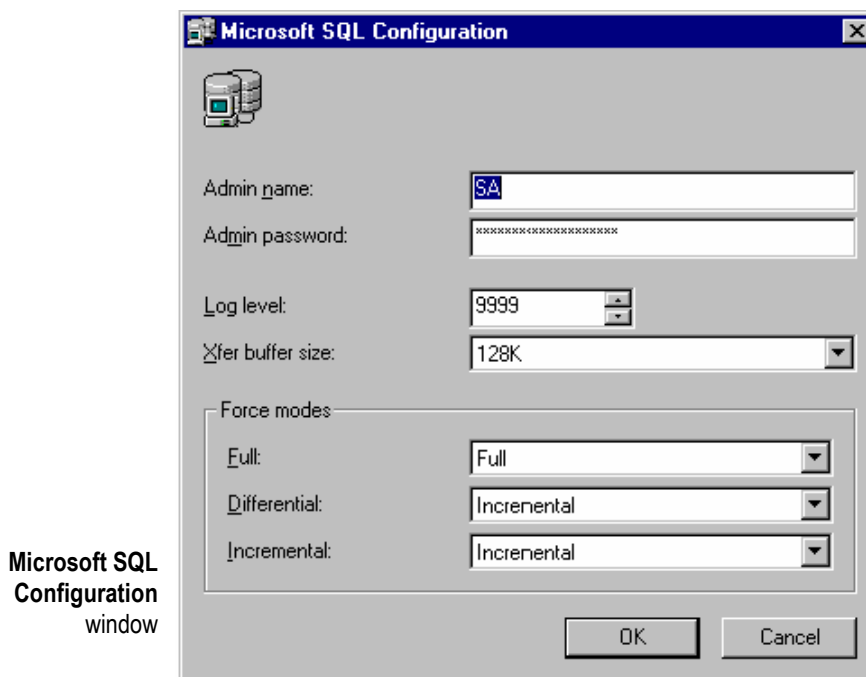
Note You must install the SQL connector on the SQL server.

As soon you install the SQL connector on the SQL server, you can access the **Microsoft SQL Configuration** screen.

SQL Configuration Screen

After installing the SQL connector, you must configure it:

1. Select **Configurations** from the **Tools** menu.
2. Select **Microsoft SQL**. The **Microsoft SQL Configuration** window appears.



Use the **Microsoft SQL Configuration** window to set certain parameters that control how NovaNET works with SQL Server.

Note We recommend that you use the default values on the **Microsoft SQL Configuration** screen.

Admin Name

NovaNET sends this name to Microsoft SQL Server whenever the SQL administrator user name is required. Type the Microsoft SQL administrator name in this field. The default is **SA**.

Admin Password

NovaNET sends this SQL administrator password to Microsoft SQL Server with the SQL administrator's user name whenever required. There is no default value.

Log Level

This parameter controls which error messages are sent by Microsoft SQL. The lower the number is set, the lower the severity of the error message required before the message is sent. Thus lowering the number increases the frequency of messages from Microsoft SQL.

The messages sent to NovaNET can be viewed in the **Message** window, available from the **Tools** menu. Alternatively, these messages are stored in the log of a NovaNET job. The log of any job can be viewed from the **Logs** tab of that job.

The default value is **9999**. In general, you should leave this value unchanged.

Transfer Buffer Size

This parameter sets the size of the read or write request NovaNET makes from SQL. The default value is **128K**. You can set the value anywhere from 64K to 1024K, in 64K increments.

The **Xfer buffer size** affects the speed at which data is transmitted and thus the speed at which jobs run. In general, you should leave the default value unchanged. In some installations, however, you may get better results by increasing the buffer size.

Force Modes

As explained in the next section, the **Backup mode** parameter of a backup job affects Microsoft SQL Server database files differently than file types. The **Force modes** parameters control how NovaNET backs up the database files.

Note that the settings here are only applicable to Microsoft SQL Server database files; all other file types are backed up in the job's default mode. For example, if the **Backup mode** of a job is set to **Incremental** and the **Force modes** parameter for incremental jobs is set to **Full**, NovaNET will back up the SQL Server database files in **Full** mode, but all other file types in **Incremental** mode.

Tip You can use this feature to ensure that the database is always backed up in full mode, but that other files are only backed up when changed. This guarantees the greatest security for the most crucial files (that is, the SQL Server database files), while not making jobs unnecessarily large by *not* backing up the entire network (that is, by backing up only the changed files).

Full When the **Backup mode** of a job is set to **Full**, NovaNET checks this parameter to see how the job should be run with SQL database files. **Full** is the only possible parameter, so the database files will be backed up in this mode. In this case, both the database and the transaction logs are backed up.

Differential When the **Backup mode** of a job is set to **Differential**, NovaNET checks this parameter to see how the job should be run with SQL database files. By default, NovaNET runs the jobs as an incremental job and so only the transaction logs are backed up. *There is no distinct **Differential** job mode for SQL Server databases.*

If you want jobs with a **Differential** backup mode to back up both the database and the transaction logs, change this parameter to **Full**. In this case, NovaNET will treat the SQL Server database files as if it were running a job in **Full** backup mode.

Incremental When the **Backup mode** of a job is set to **Incremental**, NovaNET checks this parameter to see how the job should be run with SQL database files. By default, NovaNET runs the jobs as an incremental job and so only the transaction logs are backed up.

If you want jobs with an **Incremental** backup mode to back up both the database and the transaction logs, change this parameter to **Full**. In this case, NovaNET will treat the SQL Server database files as if it were running a job in **Full** backup mode.

SQL Server Backup Job Notes

Two additional concerns are present when backing up SQL Server databases: setting the **Backup mode** of a job to either **Full**, **Incremental** or **Differential**; and configuring NovaNET to work with SQL Server's built-in backup routine.

Note Anytime NovaNET returns an error message that is greater than 10000, a Microsoft SQL or Exchange error has occurred. Refer to your Microsoft documentation for more information.

SQL Server Databases and the Backup Mode

The **Backup mode** on the **Options** tab of job that backs up SQL Server databases is especially critical and important.

Backup Modes

When the **Full** parameter is selected, all files selected for backup are backed up, including SQL Server databases. However, when either the **Incremental** or **Differential** option is selected, NovaNET backs up only the transaction logs. *There is no difference between **Incremental** and **Differential** jobs for SQL Server databases.*

When the **Backup mode** is set to **Snapshot**, NovaNET runs the job in **Full** backup mode. Note that this will cause the transaction logs to be reset (truncated). For this reason, running a job in **Snapshot** mode can compromise your comprehensive backup strategy if you are not careful to archive the media created by these jobs.

Additional Conditions

The **Backup mode** is subject to the following additional provisions:

- Master, Model, MSDB and Pubs databases support only full backups. The **Backup mode** option is automatically set to **Full** when backing up these databases.
- If the Log Device is the same as the Database Device, only full backups are allowed. The job will always run as a full backup, even if the **Backup mode** is set to **Incremental** or **Differential**.

If you set a job to run in either **Incremental** or **Differential** mode and the job can only run as a full backup (as a result of one of the provisions above), the job will fail to run on each of its initial passes, but will run in **Full** backup mode on its final pass.

Using NovaNET with SQL Server's Backup Routine

SQL Server has built-in utilities and commands for backing up data. When you use NovaNET to back up SQL Server databases, you can still use these built-in SQL Server utilities and commands.

For example, you can use the DUMP command to dump transaction logs to the dump device (preferably, a separate disk drive). You can set this up to occur at regular intervals, such as every 15 minutes or every hour. Next, you can create a backup job that backs up these transaction logs onto archival media every day.

In general, when you implement NovaNET to back up your SQL Server databases, continue to use SQL Server's internal commands to duplicate and back up transaction logs. Set up a separate NovaNET backup job to write these duplicated transaction logs to archival media.

SQL Server Restore Job Notes

When restoring SQL Server databases, you must:

1. Restore the logs in the order created.
2. Restore databases to the appropriate original device.
3. Follow special procedures when renaming databases.

Note Anytime NovaNET returns an error message that is greater than 10000, a Microsoft SQL or Exchange error has occurred. Refer to your Microsoft documentation for more information.

Restoring SQL Server Transaction Logs

When recreating a database, you must first restore the whole database (created by a backup job running in *full* backup mode). Next, you must restore the transaction logs in the order created *and* in separate jobs. No log can be skipped when restoring.

For example, if you did a *full* backup on Monday and *incremental* backups each day Tuesday through Friday, you must run five separate jobs: one restoring the database from Monday's full backup job and then four additional *separate* jobs restoring each transaction log in sequential order, beginning Tuesday and continuing with each log sequentially until Friday.

You do not have to follow these procedures when restoring databases backed up with *full* backup jobs. (**Full** backup jobs back up the entire database, while **Incremental** and **Differential** jobs only back up the database logs.)

SQL Server Database Instances To check to see if a particular instance of a database is the whole (full) database or just the database log, open the **Instances of...** window of the database by selecting the database and clicking the **Check** button on the toolbar of the **Selection** tab of the restore job. Highlight the instance you wish to investigate and click the **Details** button. In the **Stream format** field, it will show either **Database Full Stream** or **Database Log Stream**, depending on whether the database instance is the entire (full) database or only a database log.

Restoring SQL Databases to Devices

When restoring databases, if NovaNET discovers that the database already exists, it restores the database to the current devices, for example, in the appropriate disk partition. *New* devices are created only when the original database is no longer available.

To accomplish this, NovaNET first determines if the database exists. If the database does exist, NovaNET will use that database. (In this case, NovaNET doesn't check to see if database device is the original device.)

If the database does *not* exist, NovaNET next identifies the *database devices* where the database was originally located. If these database *devices* already exist, NovaNET will restore the database to those devices.

If a database *device* does *not* exist, NovaNET *recreates* that database device at its *original* location and with its original size. After all the database devices are created, NovaNET then creates the database with all the original options at the original locations.

As a result, if the original device is no longer available, it will be recreated. NovaNET, however, will only recreate the device if the same physical disk drive is available (that is, in a physical device with the same designated drive name and so forth). Thus, if the drive is not available for some reason, for example, offline or corrupted, the restore job will fail.

Suppose, however, that you wish to restore the database to a new location. For example, you originally had the database on two separate 1GB drives and now want to locate the database on a new 5GB drive. To do this, use SQL Server to set up the database and database device in the new location, then run a NovaNET restore job. NovaNET will find that the database exists and will restore it to that device, even though the database is in a new location.

Restoring SQL Databases with a New Name

You can rename a database while restoring using the normal procedures for renaming files outlined in *Restoring a File with a New Name* in *Chapter 5 — Selecting Files and Instances* in the *NovaNET User's Guide and Technical Reference*. This method involves changing the name on the **Selection** tab of the restore job. However, *you cannot rename the master database*. When you restore a master database, you must follow the procedures specified in *Restoring SQL Server Master Databases* later in this appendix.

Restoring SQL Server User Databases

To restore a database, begin by restoring the most recent **full** backup of the database, followed by *all* the database logs, that is, backups made with the **Backup mode** set to either **incremental** or **differential**.

To check to see if a particular instance of a database is the whole database or just the database log, open the **Instances of...** window of the database by selecting it and clicking the **Check** button on the toolbar of the **Selection** tab of the restore job. Highlight the instance you wish to investigate and click the **Details** button. In the **Stream format** field, it will show either **Database Full Stream** or **Database Log Stream**, depending on whether the database instance is the entire (full) database or only a database log.

When a database is restored, if the database does not yet exist, NovaNET will create the database on the devices where the database was originally located. If these database devices do not exist, NovaNET will automatically create the database devices required for each database before creating the database.

Note If the database already exists, make sure the database devices are all valid and ready. If some of the database devices are not found or if your database is in the “suspect” state, drop the database and any database devices which are having problems. These databases and devices will be recreated by NovaNET when the database is restored.

To Restore a Lost or Damaged Database

1. If the transaction log of the damaged or inaccessible user database is on an undamaged device, make a backup of the transactions before proceeding. (This lets you preserve up to the minute transactions that are not included on the backup tape.)

You may use either a DUMP TRANSACTION statement on the SQL server or use a NovaNET **Incremental** backup job to back up only the transactions logs.

2. If you are restoring the database because the data in the database is no longer needed or is incorrect, skip to step 3. The following instructions are for recreating database devices and the database which had existed previously.

During the restore processes, NovaNET will recreate the database and all segments exactly as they existed when the backup was performed.

To do this, NovaNET first determines if the database exists. If the database does exist, NovaNET will use the database as is *without any further processing or changes*.

If the database does not exist, NovaNET next identifies the database devices on which the database was originally located. If the appropriate database *device* already exists, NovaNET will use that device as is without further processing.

If the database *device* does not exist, NovaNET *recreates* the database device at its *original* location and with its original size. After all the database devices are created, NovaNET then creates the database with all the original options at the original locations.

Tip This method make disaster recovery simple. The user need merely create a restore job and allow NovaNET to recreate whatever is needed in order to successfully restore the database.

Note, however, if a disk drive fails and is not replaced, NovaNET will be unable to restore your database because it will be unable to recreate a database device. For example, if a segment of your database resides on a database named 'DATA' at D:\MSSQL\DATA\DATA.DAT, if D: is lost and not replaced, when NovaNET attempts to recreate the database device, it will fail, since D: no longer exists.

To avoid this problem, manually recreate the database device at some other location. It must be at least as large as the original database device since NovaNET will attempt to create a database segment on it the same size as the original database.

An alternative method is to manually create the entire database itself. Thus, when NovaNET attempts to restore the database, since the database already exists, it will use that preexisting database. This allows you to restore a database in a new location, since NovaNET does not check to see if it is the original device before restoring the database, because the database already exists.

Note NovaNET tracks databases and database devices *by name*. So, if a database or database device already exists with the same name, NovaNET will use that database or device.

3. Using NovaNET, create a restore job and run the job to restore the database. You must start with an instance of the database to restore which was created using a **Full** backup job. Check the **Stream format** field in the **Instances of...** window of the database to verify that it was a **Full Database Stream**.
4. Create additional restore jobs to restore each transaction log backed up after the full database you restored. You must create and run a *separate restore* job for each transaction log.

For example, if you ran a full backup on Friday and incremental jobs (that is, jobs that backed up only the transaction logs) on the following Monday and Tuesday, you must first restore the database using Friday's instance of the database. Next, create a run and restore job that restores Monday's instance (Monday's transaction log). Finally, create and run a job that restores Tuesday's instance (Tuesday's transaction log).

Restoring SQL Server Master Databases

A damaged master database is evident by the failure of the SQL Server to start, by segmentation faults or input/output errors or by a report from DBCC. An example of an error might be damage caused by media failure in the area in which master database is stored.

The procedure used to recover a damaged master database is different from the procedure used to recover user databases. If the master database becomes unusable, it must be restored from a previous dump. All changes made to the master database after the last dump are lost when the dump is reloaded and therefore must be reapplied.

It is strongly recommended that the master database be backed up each time it is changed. This is best accomplished by prohibiting the creation of user-defined objects in the master database and by being aware of the statements and system procedures, and the equivalent actions in SQL Enterprise Manager, that modify it.

The most common statements and system procedures that modify master are:

- DISK INIT
- CREATE DATABASE
- ALTER DATABASE
- DISK MIRROR
- DISK UNMIRROR
- DISK REMIRROR
- sp_dropremotelogin
- sp_addumpdevice
- sp_dropdevice
- sp_addlogin
- sp_droplogin

- sp_addserver
- sp_dropserver
- sp_addremotelogin

If a user database is created, expanded or shrunk after the most recent dump (backup) of the master database and if it becomes necessary to reload the master database, then that user database and all data in will be lost and must be restored from backup. Because of this, *always dump (back up) the master database after creating, expanding or shrinking user databases.*

To Recover a Damaged Master Database

1. Use the SQL Setup program to rebuild the master database.
You must rebuild using the same character set and sort order as the master database dump that will be reloaded.
2. Restart SQL Server in single-user mode.
3. Restore the master database from the most recent backup.
4. Apply to the master database any changes that were not included in the most recent backup.
5. Drop any invalid database devices and databases from the newly restored master database.
6. Restore the msdb database.

Each of these six steps is described below in more detail:

Step 1 — Rebuild the Master Database

1. From the Microsoft SQL Server program group, double-click the **SQL Setup** icon.
(Alternatively, from the distribution media, from the directory containing the software compatible with your hardware platform's processor architecture, run SETUP.EXE.)
2. Respond to the on-screen instructions until the **Options** window appears.
3. Select **Rebuild Master Database** and click **Continue**. A confirmation window appears.
4. Click **Resume**. The **Rebuild Options** window appears.
5. To specify the character set, click **Sets** and complete the **Select Character Set** window that appears. Skip this step if you are using the default character set (ISO 8859-1).

Note You must use the same character set and sort order that were previously used for this master database.

6. To specify the sort order, click **Orders** and complete the **Select Sort Order** window that appears. Skip this step if you are using the default sort order (dictionary order, case-insensitive).
7. In the **Rebuild Options** window, click **Continue**. The **SQL Server Installation Path** window appears.
8. If not correctly displayed in the **SQL Server Installation Path** window, enter the location of the existing SQL Server installation and click **Continue**.

The **Rebuild Master Database** window appears.

9. If it is not correctly displayed in the **Rebuild Master Database** window, enter the location and name of the existing MASTER device. Also enter a MASTER device size and click **Continue**.

The setup program will then rebuild the master database.

10. When rebuilding is complete and the completion window appears, click **Exit**.

Note The files MASTER.DA@ and MASTER.AL@ are stored in the \MSSQL\INSTALL directory. When rebuilding the master database (or when installing SQL Server), one of these two files is used by the setup program. When the default sort order and character set are selected, MASTER.DA@ is expanded and copied onto the server, replacing MASTER.DAT. When an alternate character set and/or sort order is selected, MASTER.AL@ is expanded, copied onto the server, and several SQL scripts are run.

Step 2 — Restart SQL Server in Single-User Mode

Before you can restore the master database, you must start SQL Server in single-user mode.

1. If SQL Server is already running, stop the server. You can perform this operation from either the SQL Enterprise Manager or from the NT Service control panel.
2. From a command prompt, type:

```
SQLSERVER /c /dmaster_device /m
```

where

/c starts SQL Server independent of the Windows NT Service Control Manager

/dmaster_device_path specifies a physical name for the MASTER database device

/m specifies single-user mode.

Consider this example:

```
C:\MSSQL\BIN> SQLSERVER /c /dC:\MSSQL\DATA\MASTER.DAT /m
```

Note SQLSERVER.EXE is usually located in \MSSQL\BIN.

Step 3 — Restore the Master Database from the Most Recent Backup

1. Create a restore job and select the most recent instance of the master database.
2. Run the restore job.

Note This may take some time, typically 10 to 15 minutes, depending on the size of the master database. Restore only the master database while in single user mode. Do not restore any other databases.

Step 4 — Apply Changes to the Master Database

1. Restart the SQL server if it is not already started. You can perform this operation from either SQL Enterprise manager or the NT service control panel.

If there have been no changes to the master database since the last dump, then proceed to step 5.

2. If login IDs or devices have been added to or dropped from the master database since the last backup, those changes must be reapplied. Restart the server and reapply the changes manually or from saved batch files.
3. If databases have been created, expanded or shrunk since the last dump of master, those databases must be dropped and then restored.
4. If you have made many changes and have no recent dump, it is possible that by reloading master in some cases you can regain data in user databases that has been lost. This technique requires the use of DISK REINIT and DISK REFIT and can involve manual modifications to the master database tables.
 - Use DISK REINIT to re-create rows in sysdevices for all database devices that have been added after the most recent dump. DISK REINIT updates sysdevices just as DISK INIT does, but it does not format the physical disk file, so existing data is preserved.
 - Use DISK REFIT to re-create rows in sysusages and sysdatabases for all CREATE and ALTER DATABASE statements that were performed after the most recent dump.

DISK REFIT scans the physical file associated with each space that is allocated to databases. It also adds the corresponding sysdatabases entries. Some of the information is not reconstructed perfectly. For example, the original virtual device number is not assigned, because it is not known. Instead, virtual device numbers are assigned sequentially. The database owner is not extracted while scanning the physical files; ownership is set to the system administrator. It is also not possible to determine how many sysusages entries originally existed. DISK REFIT inserts a separate entry for each different segment type.

- When this is done, correct the entries made by DISK REFIT to sysdatabases and sysusages (if desired) and also add to syslogins any login IDs that were not retained. Then shut down and restart SQL Server.

Warning Capturing the latest changes made to a database by using DISK REFIT and DISK REINIT to re-create the master database is possible, but it is preferable to keep the master database current by dumping it after creating or altering databases. Using DISK REFIT and DISK REINIT is a complicated process that can result in data loss because many of the changes made to a database often must be reconstructed manually in the master database. If you feel this technique is necessary, contact your primary support provider before beginning the recovery process.

Step 5 — Drop Invalid Databases and Database Devices

1. Use the SQL Enterprise manager to drop any invalid database devices and databases from the newly restored master database.

Note If you are recovering from a disaster where you have lost a database device file, the master database you have just restored still contains a reference to it. NovaNET will not be able to restore any databases contained on the database device until the file is restored or the database device is dropped. If the database device is dropped, NovaNET will automatically recreate the device when a database contained on the device is restored.

Step 6 — Restore the msdb Database

Refer to *Restoring SQL Server User Databases* earlier in this appendix for specific information on restoring SQL Server databases.

When restoring a msdb database, keep the following considerations in mind:

- The msdb database supports SQL Executive and provides a storage area for scheduling information. The schedules that you implement using SQL Enterprise Manager are maintained in the msdb database. This includes such things as the tasks that you schedule from the Task Scheduling window, the automatic backups you schedule from the Database Backup/Restore window and all replication tasks, which are automatically created by the system if the server is configured as a replication distributor.
- During installation of a server, the setup program automatically creates two devices (of 2MB and 1MB) on the same disk drive as the master database and then places the msdb database on the 2MB device (MSDBDATA) and its transaction log on the 1MB device (MSDBLOG). Scheduling information is then stored in this database.
- During a rebuild of the master database, the setup program drops and re-creates the msdb database, which results in a loss of all scheduling information.

Appendix E — NovaNET Service

Overview

The NovaNET service lets you run backup jobs automatically and unattended. The NovaNET administrator can be closed, enhancing workstation security. The service makes sure your backup jobs run as schedule even if there is a power loss.

Note NovaNET is only available as a service on Windows and X Window (Linux/FreeBSD) platforms. The NovaNET Agent is available for NetWare systems.

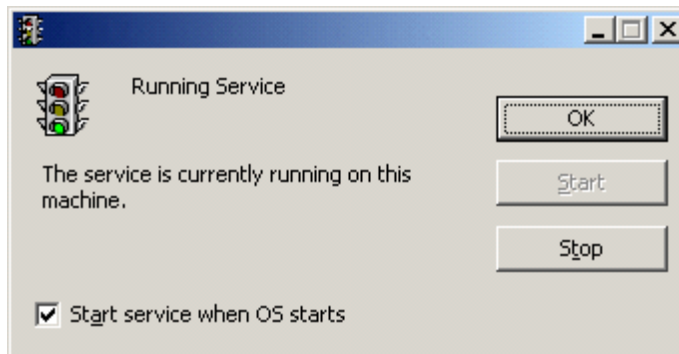
Windows

You can manage the NovaNET service from either the **NovaNET Service Control Manager** screen or the NovaNET service tray icon.

To display the NovaNET Service Control Manager screen

1. Click the **Start** button and select **NovaNET** from the **Program** submenu.
2. Select **NovaNET Service Control**. The **NovaNET Service Control Manager** screen appears.

**NovaNET Service
Control Manager**
window



This screen displays the NovaNET service status as well as the available service control options.

NovaNET Service Controls

You can perform the following from the **NovaNET Service Control Manager** screen:

OK Select this option to close the **NovaNET Service Control Manager** screen. Closing the screen does not change the service status.

Start Select this option to start the NovaNET service. The **Start Pending** message appears, followed by the **Running Service** message. Your backup jobs will automatically start as scheduled.

Stop Select this option to stop the NovaNET service. The **Stopped** message appears. Your backup jobs will not automatically start as scheduled. Selecting this option does not affect the **Start service...** option.

Start service when OS starts Select this option to automatically start the NovaNET service when your computer starts up. If you de-select this option, the NovaNET service will not start when your computer starts up. In this case, your scheduled backup jobs may not run. Your selection takes effect the next time your computer starts up.

To display the **NovaNET Service** icon in the icon tray, click the minimize button (see *NovaNET Service Icon* below).

NovaNET Service Icon



NovaNET
Service
icon

When you minimize the **NovaNET Service Control Manager** screen, the NovaNET service icon appears in the icon tray.

Right-click the NovaNET service icon to access any of the following NovaNET service commands:

NovaNET Administrator Select this option to load the NovaNET Administrator.

Start service Select this option to start the NovaNET service.

Stop service Select this option to stop the NovaNET service.

Install service Select this option to start the NovaNET service automatically when your computer starts up. Your selection takes effect the next time your computer starts up.

Uninstall service Select this option to not start the NovaNET service automatically when your computer starts up. In this case, your scheduled backup jobs may not run. Your selection takes effect the next time your computer starts up.

Restore Select this option to display the **NovaNET Service Control Manager** screen. You can also double-click the NovaNET Service icon to display the **NovaNET Service Control Manager** screen. Closing the screen does not change the service status.

Exit Select this option to close the **NovaNET Service Control Manager**. Closing the manager does not change the service status.

NetWare

The NovaNET agent extends the basic NovaNET service functionality to NetWare. Like the NovaNET service, it loads at system startup and runs in the background.

Note The NovaNET agent and the NovaNET administrator cannot run at the same time. Therefore, you must stop one before you can start the other.

Running the NovaNET Agent

To automatically run the NovaNET agent at system startup, add the following line to the end of the `AUTOEXEC.NCF` file:

```
load nnagent
```

To manually run the NovaNET agent, type **load nnagent** from the console prompt and press **Enter**.

Once loaded, the NovaNET agent status appears on the screen.

Stopping the NovaNET Agent

To manually stop the NovaNET agent:

1. Use **Alt-Esc** to display the NovaNET Agent screen.
2. Press **Esc**.
3. When the **Exit NovaNET** message appears, select **Yes** and press **Enter**.

Linux/FreeBSD

On Linux and FreeBSD platforms, you manage the NovaNET service from the command prompt.

Access the service program (`nnunxsvc`) in the NovaNET directory. For example, type **cd /usr/local/novanet** and press **Enter**.

Enter one of the following commands:

Install service Type **./nnunxsvc -i** and press **Enter** to start the NovaNET service automatically when your computer starts up. Your selection takes effect the next time your computer starts up.

Uninstall service Type `./nnunxsvc -r` and press **Enter** to not start the NovaNET service automatically when your computer starts up. In this case, your scheduled backup jobs may not run. Your selection takes effect the next time your computer starts up.

Start service Type `./nnunxsvc -s` and press **Enter** to start the NovaNET service.

Stop service Type `./nnunxsvc -x` and press **Enter** to stop the NovaNET service.

Query service status Type `./nnunxsvc -q` and press **Enter** to display the status of the NovaNET service.

Appendix F — Keyboard Shortcuts

This appendix lists the basic keyboard shortcuts for the console interface versions of NovaNET. Some commands may not be available for your platform. For Windows and X Window shortcuts, refer to *Keyboard Shortcuts* in *Chapter 2 — NovaNET Workplace* in the *NovaNET User's Guide and Technical Reference*.

Note Since some telnet systems do not support function keys, alternative shortcut key appear in parentheses.

Standard Keys

Ctrl+A	Popup alert box
Tab/Shift-Tab	Switch to next/previous tab
F1(?)	Help
F3	Edit properties
F4/Shift-F4	Find object/Find object again
F5(I)/F6(I)	Mark/Unmark object
Shift-F5/Shift-F6	Mark/Unmark all objects
F8(=)	Switch to next pane
Shift-F8	Refresh tree branch
F9	Display additional key assignments
Shift-F9	Refresh all
F10(`)	Continue/Done/Dismiss dialog box
+/-	Expand/Collapse tree branch
*	Expand all tree branches
Space	Toggle branch expansion
Insert/Delete	Create/Delete object

Special keys

Shift-F1	Macro control
Shift-F2	Monitor/color control pane
F2	Reset current palette to default
F3	Reset all palettes to default
F4	Toggle mono/color mode
F5	Toggle code page
Shift-F3	Display trace messages

Appendix G — Configuring Autoprint for Windows

Before you can print from a Windows NT (or later) system to a network printer, you must configure the NovaNET service to log on to the printer. Refer to the appropriate sections for either Windows NT or Windows 2000 and later.

System Configuration (Windows NT)

To run the Autoprint Log feature from the NovaNET service on Windows NT machines, configure the service as follows:

Note To run this feature from the NovaNET service, you may need assistance from the system administrator.

1. Access the NovaNET **Properties** screen:
 - a. Access the **Control Panel**: **Start** | **Settings** | **Control Panel**.
 - b. Double-click on **Services**. The **Services** screen appears.
 - c. Scroll down to NovaNET.
 - d. Double-click on **NovaNET**. The **Service** screen for NovaNET appears.
2. Configure the NovaNET service:
 - a. Select **This account**. The account and password fields are enabled.
 - b. Enter the account name, e.g., server1\joe.
 - c. Enter the password twice.
 - d. Click **OK**. The **Service** screen closes.

3. Restart the NovaNET service:
 - a. Select **NovaNET**.
 - b. Click **Stop**.
 - c. Click **Yes** to confirm.
 - d. Select NovaNET again.
 - e. Click **Start**.
 - f. Click **Close** on the **Services** screen.
 - g. Close the **Control Panel**.
4. Configure your network to let the local machine access the network printer, if necessary. Contact your system administrator for more information.

System Configuration (Windows 2000 or later)

To run the Autoprint Log feature from the NovaNET service on Windows 2000 and later machines, configure the service as follows:

Note To run this feature from the NovaNET service, you may need assistance from the system administrator.

1. Access the **NovaNET Properties** screen from the **Computer Management** screen:
 - a. Right-click **My Computer** on the desktop. A popup menu appears.
 - b. Select **Manage**. The **Computer Management** screen appears.
 - c. Expand the **Services and Applications** folder.
 - d. Scroll down to **NovaNET**.
 - e. Double-click on **NovaNET**. The **NovaNET Properties** screen appears.
2. Configure the NovaNET service:
 - a. Click the **Log On** tab.
 - b. Select **This account**. The account and password fields are enabled.
 - c. Enter the account name, e.g., server1\joe.
 - d. Enter the password twice.
 - e. Click **OK**. The **NovaNET Properties** screen closes.

3. Restart the NovaNET service:
 - a. Right-click on **NovaNET**. A popup menu appears.
 - b. Select **Stop**.
 - c. Right-click on **NovaNET**.
 - d. Select **Start** from the popup menu.
 - e. Close the **Computer Management** screen.
4. Configure your network to let the local machine access the network printer, if necessary. Contact your system administrator for more information.

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