# IRIX NetWorker™ Installation Guide

Document Number 007-3505-002

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# About This Guide

The *IRIX NetWorker Installation Guide* contains information on how to install and license the IRIX NetWorker™ backup and recover software. Information on how to initiate backups using NetWorker default configurations is also included.

## Intended Audience

This manual is intended for system administrators who install software and maintain the servers and clients on a network.

For details about using the NetWorker windows and menus, and for configuration information, refer to the *IRIX NetWorker Administrator's Guide*. For instructions on using the manual Backup and Recover applications, refer to the *IRIX NetWorker User's Guide*. To get information about a specific version of NetWorker, refer to the *IRIX NetWorker Release Notes* for your release. If you want technical information about the NetWorker commands, see the online reference pages after you have installed NetWorker.

## Conventions

The following conventions are used in this manual to make information easy to access and understand.

- Command names are displayed in **bold** typeface. For example:

  To start the NetWorker Administrator program, use the **nwadmin** command.

- Examples of what *you* type are shown in bold fixed-width typeface. For example:

  # **nwadmin &**

- Words where you need to substitute a variable are displayed in italic typeface. For example:

  % **man** *nsrCommand*

- Examples, shell prompts, and information displayed on the screen are displayed in fixed-width typeface.  For example:

  ```
  media waiting: recover waiting for 8mm 5GB tape volume name
  ```

- Names of NetWorker buttons, displays, menus, scrolling lists, and windows are displayed in Helvetica typeface.  For example:

  Click the Cancel button to close the Help window.

- Directory *pathnames*, machine names, and new terms defined in the glossary are displayed in *italic* typeface.  For example:

  When you use IRIX NetWorker to back up your */usr* files from the *client* machine, you are saving them to *backup volumes* on the IRIX NetWorker server.

- The following paragraph types indicate various kinds of information to help you use NetWorker productively.

  **Caution:**  Important pieces of information and cautionary notes that prevent you from making a mistake are marked "Caution."

  **Note:**  Helpful information that you might want to know is marked "Note."

  **Tip:** Tips or suggestions that you do not necessarily have to follow, but may give you hints as to how to set up NetWorker at your site, are marked "Tip."

## Documentation and Support

Both the *IRIX NetWorker Administrator's Guide* and *IRIX NetWorker User's Guide* are available online, as IRIS InSight™ books. To view the manuals, install the subsystems *networker4.books.NetWorker_AG* and *networker4.books.NetWorker_UG.*

To access these books over the World Wide Web, please visit the Technical Publications Library at http://www.sgi.com/Technology/TechPubs.  Once there, click Library Search and search for "NetWorker" in document titles.

Silicon Graphics® offers a comprehensive product support and maintenance program for IRIX products. For information about using support services for this product, refer to the release notes that accompany it.

# Installing NetWorker

This chapter describes the procedure for installing, licensing, enabling, and removing IRIX NetWorker 4.2.9. The NetWorker software distribution CD-ROM contains all the software you need for Silicon Graphics servers and clients, including:

- IRIX NetWorker server. The server edition supports parallel backup and recover sessions and concurrent devices on a Silicon Graphics server. The network edition also supports 10 network clients; additional clients can be added.

- IRIX NetWorker client software for Silicon Graphics workstations.

- Optional Autochanger Software Modules to support various jukeboxes.

- PerformancePak option, which offers large indexes, multistream filesystem saves, and sparse file support.

- NetWorker Archive option for file archiving and grooming.

- The BusinesSuite Module for Oracle and the Database Module for Informix, to perform high-volume database backup.

Licenses are required to enable each of these items except a NetWorker client. Each NetWorker server and each autochanger require a license. NetWorker software is license-protected with FlexLM™ nodelocked licenses. The NetWorker distribution is shipped with a temporary license that enables full use of the basic NetWorker server for a short period until you obtain permanent licenses from Silicon Graphics.

## Versions and Compatibility

The NetWorker 4.2.9 server runs on IRIX 6.2 and above. The NetWorker server requires tertiary storage (such as a tape drive) and enough disk space to store the installation images and the index files. Indexes consume about 1 MB of space for each GB of backup data. Refer to the *IRIX NetWorker Release Notes* for a list of patch requirements.

**Caution:** Server upgrades from NetWorker 4.1.3 or NetWorker 4.2.5 to NetWorker 4.2.9 are supported, but upgrades from earlier versions have not been tested.

The NetWorker 4.2.9 client software runs on IRIX 5.x or IRIX 6.x. Earlier versions of the NetWorker client are interoperable with later versions of the NetWorker server.

An IRIX NetWorker server can back up Silicon Graphics clients and client systems from other vendors as well. NetWorker software for other vendors' clients, and installation information for those clients, is included in the NetWorker ClientPak, which is available either from Legato Systems or from Silicon Graphics.

NetWorker requires a no-rewind tape backup device (except for optical drives) because it writes a file mark on the backup volume at the end of each backup and then appends data based on the position of the file mark. If a device rewinds, the file mark position is lost and previously written data is overwritten by the next backup.

## Overview of Installation Procedures

To deploy NetWorker on Silicon Graphics servers, you must install the NetWorker server software, obtain licenses, and enable the server and its optional components. To back up the local disks of workstations across the network, you must also install NetWorker client software on each workstation.

- For instructions on installing the NetWorker server, see the section "Installing and Enabling NetWorker Servers" on page 3.
    - Use the **inst** command to install NetWorker server software.
    - Obtain permanent licenses from Silicon Graphics, and use the **LicenseManager** command to activate these licenses.
    - Enable the permanent licenses using the **nsrcap** command. Permanent licenses replace the temporary license.
- For instructions on installing the NetWorker clients, see the section "Installing Client Software" on page 12.
    - Use the **inst** command to install NetWorker client software.
    - No license is necessary, but network configuration is advised to that clients can quickly recognize the NetWorker server.

**Note:** NetWorker ClientPak products may include older versions of client software for Silicon Graphics workstations. For the most up-to-date NetWorker client software, please install from the IRIX NetWorker CD-ROM instead of from the ClientPak.

## Installing and Enabling NetWorker Servers

To install and enable NetWorker, you perform these tasks:

- Install NetWorker, as described in the section "Installing NetWorker Servers."

- Activate licenses and perform other tasks to enable the NetWorker products, as described in the section "Licensing NetWorker Servers."

- Configure DNS (domain naming system), NIS (network information service), or */etc/hosts* files on relevant systems, so clients can recognize the NetWorker server. This is described in the section "Configuring Clients to Recognize the Server."

- For autochangers with the Archive option, plan to dedicate a slot for archiving.

### Installing NetWorker Servers

To install NetWorker on an IRIX server, you need a filesystem on the server with enough free disk space to store both NetWorker and its indexes. For each client (including the server itself), the size of the indexes on the server is approximately 2% of the disk space in use on the client, assuming average-size files and the default backup schedule.

**Caution:** Upgrading from NetWorker 4.1.3 to 4.2.9 converts the index files to a new format, and is irreversible (4.2.5 indexes are the same format as 4.2.9). Before upgrading, the NetWorker server should have as much free disk space on the */nsr* partition as the indexes currently consume, since index size can nearly double during conversion.

Follow this procedure to install Networker server software:

1. Load the IRIX NetWorker software distribution CD-ROM.

2. On the NetWorker server, switch user to root.

   ```
   % /bin/su -
   Password:
   ```

   If you are upgrading from an older version of NetWorker, stop the daemons now, and make a copy of the */nsr* partition, for example using **xfsdump**:

   ```
   # /etc/init.d/networker stop
   # xfsdump -f /dev/tape -J /nsr
   ```

3. Run the **inst** command, specifying the location of the NetWorker distribution:

   ```
   # inst -f /CDROM/dist
   inst> list
   ```

**3**

4. Select subsystems inside **inst**. Use Table 1-1 as a guide to selecting product images. For example, to install the software, reference pages, release notes, and the InSight versions of two NetWorker manuals, enter these commands:

```
Inst> keep *
Inst> i networker4.sw.server networker4.sw.client
Inst> i networker4.man.* *.books.NetWorker_UG *.books.NetWorker_AG
```

For more information on the available product images, refer to the *IRIX NetWorker Release Notes*. For details about **inst**, refer to *IRIX Admin: Software Installation and Licensing*, or see the inst(1M) reference page.

**Table 1-1**    Subsystems for NetWorker Servers

| Subsystem | Description | Required/Optional |
|---|---|---|
| *networker4.sw.server* | NetWorker server software for system performing backups | Required |
| *networker4.sw.client* | NetWorker client software for IRIX 5.x and IRIX 6.x | Required |
| *networker4.man.server* | Reference pages for NetWorker server software | Optional |
| *networker4.man.client* | Reference pages for NetWorker client software | Optional |
| *networker4.man.relnotes* | Release notes | Optional |
| *networker4.books.NetWorker_UG* | Online version of the *IRIX NetWorker User's Guide* | Optional; IRIS InSight is a prerequisite |
| *networker4.books.NetWorker_AG* | Online version of the *IRIX NetWorker Administrator's Guide* | Optional; InSight needed |
| *networker4.books.NetWorker_IG* | Online version of this book | Optional; InSight needed |
| *networker4.sw.archive* | Archive and retrieve client | Optional; license required |
| *networker4.man.archive* | Reference pages for Archive | Optional |
| *networker4.sw.DMO* | Database Module for Oracle | Optional; license required |
| *networker4.books.NetWorkerDMO* | Online version of DMO book | Optional; InSight needed |
| *networker4.sw.DBMI* | Database Module for Informix | Optional; license required |
| *networker4.books.NetWorkerDBMI* | Online version of DBMI book | Optional; InSight needed |

5. Perform the installation and exit **inst**:

```
Inst> go
...
Inst> quit
```

**Note:** If */nsr* already existed and you want to evaluate NetWorker using temporary licenses, you must delete all existing files and directories under */nsr* now.

6. Choose a filesystem for the NetWorker index files. You can use part of an existing filesystem or dedicate a filesystem (typically called */nsr*).

**Caution:** If you are upgrading from NetWorker 4.1.3 to NetWorker 4.2.9, you need as much free space on */nsr* as the largest client index, because conversion involves making a copy of the index. More space is highly recommended, especially to allow index conversion in parallel. Running out of space results in a hung server.

7. If you choose a non-root partition instead of a dedicated */nsr* filesystem, create a symbolic link so NetWorker knows where to place the index files. For *directory,* substitute the relative pathname of a directory on that filesystem, such as *./bigfs/nsr* on the */bigfs* filesystem.

```
# ln -s directory /nsr
```

If you are upgrading from an older version of NetWorker, expedite the conversion by running **nsrck** on each client index; see nsrck(1M) for more information:

```
# nsrck -D 10 client
nsrck: checking index for client ...
```

8. Start the NetWorker daemons with this command:

```
# /etc/init.d/networker start
```

At this point, the NetWorker server is ready for a test drive as described in Chapter 2. Out of the box, NetWorker operates in evaluation mode using temporary licenses. Because licenses have not yet been installed and enabled, you can ignore the following messages, which eventually appear in */var/adm/SYSLOG* and in mail sent to root:

```
Subject: registration status for client

NetWorker Registration: (notice) server disabled. Install base enabler.
NetWorker registration: (info) Server is disabled (Base expired).
```

Within 30 days after you install the NetWorker server, you must license it by following instructions in the sections below. If your NetWorker server supports networked clients, you must inform some network naming service by following instructions in the section "Configuring Clients to Recognize the Server" on page 14.

## Licensing NetWorker Servers

All NetWorker products are included on the NetWorker software distribution CD-ROM. Table 1-2 lists NetWorker products, their features, and licensing information.

**Table 1-2**     Licensed NetWorker Products

| Product | Description | Licensing Information |
|---|---|---|
| IRIX NetWorker Network edition | Supports 10 or fewer networked clients, up to 32 backup or recover sessions, and up to 16 concurrent devices (tape drives). | IRIX NetWorker license is required on each NetWorker server. |
| IRIX NetWorker Server edition | No built-in client support.  An upgrade makes this identical to network edition. | No clients—primarily intended for backing up single servers. |
| IRIX NetWorker Power edition | Provides support for high-speed backup and high-capacity devices. | This license is required for NetWorker server version 4.2.9. |
| Autochanger Software Module | Enables use of tape libraries and disc jukeboxes.  Available for 1-8 slots, up to 16 slots, up to 32 slots, up to 64 slots, up to 128 slots, up to 256 slots, and more than 256 slots (upgrades possible). | A separate autochanger license (for the appropriate number of slots) is required for each connected tape library or disc jukebox. |
| Archive Module | Provides file archiving and optional grooming and verification. | Client licenses not required, although archive server must be licensed. |
| BusinesSuite Module for Oracle | Provides a NetWorker connection from the Oracle Enterprise Backup Utility. | License required for each Oracle database server (per hostname). |
| Database Module for Informix | Provides a NetWorker connection from Informix Online Backup and Restore. | License required for each Informix database server (per hostname). |
| Server edition upgrade | Server edition becomes Power edition. | Same as NetWorker Power edition. |
| Nework edition upgrade | Network edition becomes Power edition. | Same as NetWorker Power edition. |
| 5 Client Connection | Supports 5 additional clients | Additive up to a maximum of 1000. |
| 25 Client Connection | Supports 25 additional clients | Additive up to maximum of 1000. |
| 100 Client Connection | Supports 100 additional clients | Additive up to maximum of 1000. |
| ClientPak Software Module | Allows client to perform backups to, or administer, the NetWorker server.  Also available from Legato Systems. | Available for many UNIX® systems, various PC desktops, Windows NT®, NetWare®, and Macintosh®. |

When you purchase IRIX NetWorker server or any of the related optional products, you must enable them by installing and activating FlexLM licenses.

### Evaluating NetWorker—Temporary Licenses

The software distribution CD-ROM is shipped with evaluation mode, which provides a temporary NetWorker network edition license, a temporary license for an autochanger with 1-16 slots, and a temporary Archive license. These licenses allow you to use these products on any Silicon Graphics server for a short period.

**Note:** If you are evaluating NetWorker, do not run the **nsrcap** command as shown in the steps below, because it disables the temporary licenses that permit evaluation mode.

### Obtaining Permanent Licenses

To continue using NetWorker products, before the temporary licenses expire, you must obtain a permanent, nodelocked license for each NetWorker product you purchase. To do so, either point your Web browser at http://www.sgi.com/Products/license.html and fill out the forms, or send e-mail to license@sgi.com. Both the Web page and e-mail form ask you to provide proof of purchase.

If you lack Internet access, you may telephone the 1-800-800-4SGI hotline within the United States, or your local sales office elsewhere.

### Inserting Permanent Licenses

If **LicenseManager** is installed on your server (the default in IRIX 6.2), click the Web site's AUTO_INSTALL button, or double-click the e-mail attachment from license@sgi.com, to have **LicenseManager** automatically install licenses in the */var/flexlm/license.dat* file.

If you received e-mail without an installation script, or encounter a Web site without the AUTO_INSTALL button, use your favorite editor to copy and paste the appropriate license lines into the NetWorker server's */var/flexlm/license.dat* file.

The Product Name list in Figure 1-1 shows two NetWorker licenses as they appear after installation, one license for the Archive option, and one for the NetWorker server (network edition with 10 clients).
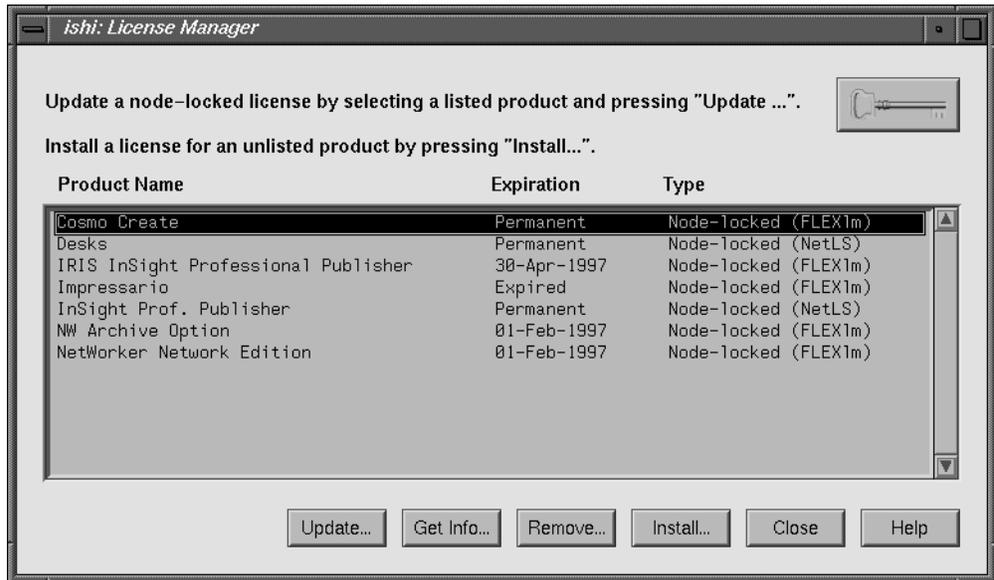
**Figure 1-1**    LicenseManager Interface

The next two sections describe how to enable NetWorker server software by activating licenses.  The section "Enabling Server Software Except Autochangers" explains how to enable all server software except for jukeboxes.  The section "Enabling Autochangers" explains how to enable jukebox licenses.

If you plan to run NetWorker in conjunction with an autochanger (also called a jukebox or robotic library), skip to "Enabling Autochangers" on page 10.

## Enabling Server Software Except Autochangers

Follow the steps below to enable all NetWorker server software except jukebox support. This procedure can be used when the software is initially installed and when you add new licenses, for example, after purchasing the NetWorker 25 Client Connection for an existing NetWorker server.

To enable NetWorker on regular backup devices, follow these steps:

1.  Make sure you have purchased and installed FlexLM permanent nodelocked licenses as described in the previous section.

2.  Switch user to root on the NetWorker server.

    ```
    % /bin/su -
    Password:
    ```

3.  If the subsystem *license_eoe.sw.flexlm_utils* is not already installed, use the **inst** command to install it from the IRIX system software CD-ROM.

4.  Verify that the NetWorker licenses were installed in */var/flexlm/license.dat.* For example, that file should contain lines like these:

    ```
    FEATURE NW_BASE sgifd 4.000 1-jan-0 0 AC215525CE8EFE18215D \
        VENDOR_STRING=NETWORK_EDITION HOSTID=#1762217977 \
        vendor_info="NetWorker Network Edition" \
        ISSUER="Silicon Graphics, Inc."
    ```

5.  Start NetWorker:

    ```
    # /usr/etc/nwadmin &
    ```

6.  Activate the FlexLM licenses by running the **nsrcap** command (see nsrcap(1M) for more information):

    ```
    # /usr/etc/nsrcap -v
    No license is available for feature
    ...
    Found 1 FlexLM license for feature NW_BASE/NETWORK_EDITION
    ...
    Found a FlexLM license for installation:
            name:    NetWorker, Network Edition
            enabler code: AC215525CE8EFE18215D
            license type: B1
            expires:      14299 days (Feb 06, 2036)
    ```

    The **nsrcap** output lists the licenses you installed. These licenses are now activated.

    **Note:** If you have the Registration window open from the **nwadmin** command when you activate NetWorker licenses with **nsrcap**, close it to refresh the window.

    If you are upgrading from an older version of NetWorker, check the Server window for values of Parallelism and Sessions per device, which might not have been correctly preserved during upgrade.

## Enabling Autochangers

The procedure for enabling an Autochanger Software Module differs from the procedure for enabling other NetWorker software in that it uses the **jbm_enabler** command. Use the procedure in this section to enable each Autochanger Software Module you purchase, either initially, or later as you add upgrades.

To enable NetWorker on jukebox devices, follow these steps for each autochanger:

1. Switch user to root and run the **jbm_enabler** command to tell NetWorker about the autochanger; see jbm_enabler(1M) for details. This command queries the system for jukebox devices, and returns a list of the ones it found. For example:

```
# /usr/etc/jbm_enabler
Enter the number of the type of jukebox you are installing:
 1) /dev/scsi/sc2d3l0    : DLT2700/DLT2700XT/DLT2500XT
Choice? 1
Installing DLT2700/DLT2700XT/DLT2500XT jukebox (/dev/scsi/sc2d3l0).
Name you would like to assign to the jukebox device? DLT
Do you want automated device cleaning support enabled? (yes/no) no

Looking for tape devices...

Following tape devices have been found:
*   1) /dev/rmt/tps2d3nrnsv : dlt
Choice for media drive 1? [1] 1

Jukebox has been added successfully
```

**Note:** Automated device cleaning is recommended for devices that lack an indicator for when they need cleaning.

The numbers that you enter for the slots represent a range of slots, not the total number of slots available. Entering a single slot number means that only a single slot would be used for backup and recovery with NetWorker.

If **jbm_enabler** fails to find all the autochangers connected to a system, you can disable automatic recognition as follows:

```
# /usr/etc/jbm_enabler -noauto
Enter the number of the type of jukebox you are installing:
         1) DLT2700/DLT2700XT/DLT2500XT
         2) DLT4700XT/DLT4500XT
         3) ATL/Odetics 2640
         4) Spectra Logic SL-4000
         5) Breece-Hill Q7
         6) Breece-Hill Q47
```

```
       7) Qualstar TLS-4210
       8) IBM 3590
       9) STK-9704/Lago 340
      10) STK-9708/STK-9711/Lago 380
      11) STK-9710
      12) EXB-10e/EXB-10h
      13) EXB-10i
      14) EXB-210
      15) EXB-400 Series
      16) HP-C1553A/Surestore 12000e
      17) other
Choice?
```

**Note:** The list of supported jukebox types is subject to change.

2. Verify that the NetWorker jukebox licenses were installed in */var/flexlm/license.dat*. For example, that file should contains lines like these:

```
FEATURE NW_BASE sgifd 4.000 1-jan-0 0 AC215525CE8EFE18215D \
    VENDOR_STRING=NETWORK_EDITION HOSTID=#1762217977 \
    vendor_info="NetWorker Network Edition" \
    ISSUER="Silicon Graphics, Inc."
FEATURE NW_AUTO sgifd 4.000 1-jan-97 0 DCE11347B151837A0F44 \
    VENDOR_STRING=SLOTS=8 HOSTID=ANY vendor_info="NW Autochg <=8 slots" \
    ISSUER="Silicon Graphics, Inc."
```

3. Start NetWorker:

   # **/usr/etc/nwadmin &**

4. Activate the license by running the **nsrcap** command:

```
# /usr/etc/nsrcap -v
No license is available for feature
...
Found 1 FlexLM license for feature NW_BASE/NETWORK_EDITION
Found 1 FlexLM license for feature NW_AUTO/SLOTS=8
...
Found a FlexLM license for installation:
        name:    NetWorker, Network Edition
        enabler code: AC215525CE8EFE18215D
        license type: B1
        expires:     14299 days (Feb 06, 2036)
Found a FlexLM license for installation:
        name:    NetWorker Autochanger, 8 slots
        enabler code: DF215525CE8EFE18215G
        license type: J8
        expires:     14299 days (Feb 06, 2036)
```

**Note:** If you have the Registration window open from the **nwadmin** command when you activate NetWorker licenses with **nsrcap**, close it to refresh the window.

If you are upgrading from an older version of NetWorker, check the Server window for values of Parallelism and Sessions per device, which might not have been correctly preserved during upgrade.

## Installing and Enabling NetWorker on Clients

To install and enable NetWorker clients, you must perform these tasks:

- Install the NetWorker client software on each NetWorker client workstation, as described in the section "Installing Client Software."

- Configure DNS (domain naming system), NIS (network information service), or */etc/hosts* files on relevant systems, so clients can recognize the NetWorker server. This is described in the section "Configuring Clients to Recognize the Server."

NetWorker clients do not require a license. However, the total number of NetWorker clients may not exceed the maximum number of client connections licensed for the NetWorker server. Additive client licenses are available in units of 5, 25, and 100, and may be applied in any combination.

### Installing Client Software

Follow the steps in this section to install Networker client software. No enabling of the client software is required.

1. On the client, become root and invoke the **inst** command, specifying the location of the NetWorker software distribution:

```
% /bin/su -
Password:
# inst -f /CDROM/dist
Inst> list
```

2. Select subsystems inside **inst**. Use Table 1-3 as a guide to selecting product images. Subsystems not listed below are never needed on NetWorker clients. For example, to install the required client software, the reference pages, and the IRIS InSight version of the NetWorker user manual, enter these commands:

```
Inst> keep *
```

```
Inst> install networker4.*.client
Inst> install networker4.books.NetWorker_UG
```

For additional information on the available NetWorker product images, refer to the *IRIX NetWorker Release Notes.*

**Table 1-3**  Subsystems for NetWorker Clients

| Subsystem | Description | Required/Optional |
|---|---|---|
| *networker4.sw.client* | NetWorker client software | Required |
| *networker4.man.client* | Reference pages for client | Optional |
| *networker4.books.NetWorker_UG* | Online *IRIX NetWorker User's Guide* | Optional; recommended |
| *networker4.books.NetWorker_AG* | Online copy of the *IRIX NetWorker Administrator's Guide* | Optional; useful for system administrators |
| *networker4.sw.archive* | Archive and retrieve client software | Optional; license needed to enable server Archive |
| *networker4.man.archive* | Reference pages for Archive option | Optional |

3.  Perform the installation and exit **inst**:

```
Inst> go
Inst> quit
```

4.  Check to see if the hostname alias *nsrhost* has been set to your NetWorker server:

```
# /usr/etc/ping -c1 nsrhost
PING b2.mktg.corp.com (199.99.172.4): 56 data bytes
64 bytes from 199.99.172.4: icmp_seq=0 ttl=252 time=4 ms
...
```

In this command, the -**c** argument is followed by a numeral **1** to indicate only one **ping** request.  The first line of output should contain the name of the NetWorker server aliased to *nsrhost*, in this case *b2.mktg.corp.com.*

If the output does not contain the name of the NetWorker server, commands such as the **nwadmin** do not automatically connect to the NetWorker server; users must bring up the Change Server dialog box to specify a server, or run **nwadmin** with the -**s** option to specify server name.

To set the hostname alias *nsrhost* to your NetWorker server, follow the directions in the section "Configuring Clients to Recognize the Server" below.

## Configuring Clients to Recognize the Server

The clients on the network can be configured so that when they use the **nwbackup** or **nwrecover** commands (and with the Archive programs, **nwarchive** or **nwretrieve**), NetWorker automatically points to their server.  If clients are not configured this way, users must use the Change Server dialog box to specify their server, or run NetWorker commands with the -**s** option to specify server name.  Configure clients by defining a host alias called *nsrhost* that can be resolved by each client to be the name of their NetWorker server.

Configuring clients to recognize the NetWorker server can be done in these ways:

- If your local network uses NIS (network information service), see the section below, "Using NIS to Configure Clients."

- If your network uses DNS (domain naming system), refer to the chapter on the BIND Name Server in *IRIX Admin: Mail and Networking.*

- If your network uses neither NIS nor DNS, see the section "Configuring Clients Without NIS or DNS."

For more information about how clients bind to NetWorker servers, see the introductory reference page, nsr(1M).

### Using NIS to Configure Clients

If you have NIS on the network, follow these steps to configure clients to recognize the NetWorker server:

1.  Identify the NIS master for each client using the **ypwhich** command on each client; see ypwhich(1) for more information:

    ```
    % ypwhich -m hosts
    ypmaster
    ```

    In this example, *ypmaster* is the master NIS host for the client.

2.  As superuser on each of the master NIS hosts, edit the */etc/hosts* file, adding *nsrhost* as an alias after the original hostname of the NetWorker server.  For example:

    ```
    199.99.172.4    b2 nsrhost
    ```

**Note:** Only one host in */etc/hosts* should have the *nsrhost* alias. If several NetWorker servers back up files on clients served by a single NIS master host, some users may have to specify their server by choosing Change from the Server menu (or with the Change Server button) of **nwbackup** and **nwrecover**.

3. As superuser on each of the master NIS hosts, change directory to */var/yp* and run the **ypmake** command (see ypmake(1M) for details):

```
# cd /var/yp
# ./ypmake
```

4. To verify that each client can recognize the NetWorker server, you can enter this command on each client after waiting a suitable period for the NIS databases to propagate:

```
# ypmatch nsrhost hosts
199.99.172.4    b2 nsrhost
```

The hostname listed in the output should be the name of the NetWorker server.

**Configuring Clients Without NIS or DNS**

This section describes the procedure for configuring a client to recognize the NetWorker server when NIS and DNS (BIND) are not used on the network. This procedure can also be used if NIS or DNS is in use on the network.

Follow these steps to hand-configure clients to recognize the NetWorker server:

1. As superuser on each NetWorker client, edit the */etc/hosts* file, adding *nsrhost* as an alias next to the NetWorker server name:

```
199.99.172.4    b2 nsrhost
```

In this example, the NetWorker client will be backed up by the NetWorker server named *b2*.

**Note:** If you have purchased NetWorker for more than one server, only one host should have the *nsrhost* alias in each client's */etc/hosts* file.

2. If NIS and/or DNS are in use on the network, verify that *nsrhost* is correctly aliased:

```
# /usr/etc/ping -c1 nsrhost
PING b2.mktg.corp.com (199.99.172.4): 56 data bytes
64 bytes from 199.99.172.4: icmp_seq=0 ttl=252 time=4 ms
...
```

In the command, the -**c** argument is followed by a numeral **1** to indicate only one **ping** request. The first line of output should contain the name of the NetWorker server aliased to *nsrhost*, in this case *b2.mktg.corp.com*. If the output does not contain the name of the NetWorker server, modify the client's */usr/etc/resolv.conf* file so that the local */etc/hosts* file is checked before NIS or BIND. See the resolver(4) reference page for more information.

## Removing NetWorker

If you want to remove the NetWorker software and data files from a server system, follow these steps:

1.  Shut down the NetWorker daemons using the following command:

    ```
    # /etc/init.d/networker stop
    ```

2.  Use the **versions** command to remove the NetWorker software; see versions(1M) for more information. For example, to remove all the software, enter this command:

    ```
    # versions remove networker4
    ```

    If you want to remove just the NetWorker server, leaving the client software, enter this command:

    ```
    # versions remove "networker4.*.server"
    ```

    Also remove NetWorker software on network clients using the **versions** command.

3.  Remove the NetWorker configuration files and index files by entering these commands:

    ```
    # rm -r /nsr/*
    # rmdir /nsr
    ```

    If */nsr* is a symbolic link to another filesystem, remove the symbolic link as well.

    If you want to continue running the NetWorker client, start the **nsrexecd** daemon using the following command:

    ```
    # /etc/init.d/networker start
    ```

    The NetWorker client re-creates the */nsr* directories as needed.

# NetWorker Test Drive

This chapter leads you through some simple procedures to get NetWorker started doing scheduled backups. The test drive includes the following tasks:

- starting NetWorker
- changing the device name
- using preconfigured settings
- labeling and mounting a backup volume
- manual backup and recover
- viewing the backup schedules
- viewing the client information
- enabling scheduled backups in the Groups window
- starting a scheduled backup now
- verifying the backup

If you have an evaluation copy of the NetWorker software, it is valid for 30 days from the time you install it. This provides time to learn about NetWorker features and to decide which NetWorker configuration best benefits your network environment.

## Starting NetWorker

To start the NetWorker Administrator program, enter the **nwadmin** command at the system prompt, or click the NetWorker Administrator icon, if visible.

```
# nwadmin -s server_name &
```

If you do not specify a server when you start **nwadmin** and you have more than one server on the network, NetWorker attempts to find the server that backs up the current directory, or a NetWorker server on the local subnet, or hostname *nsrhost*. For more information on automatic server detection, see the nsr(1M) reference page.

**Tip:** To avoid problems when starting NetWorker graphical user interfaces, make sure the *desktop_eoe.sw* product image is installed, that the X Window System is running, and that your DISPLAY variable is set correctly.

The NetWorker window appears, as shown in Figure 2-1. The hostname of the system where you started **nwadmin** appears after the at-sign (@).
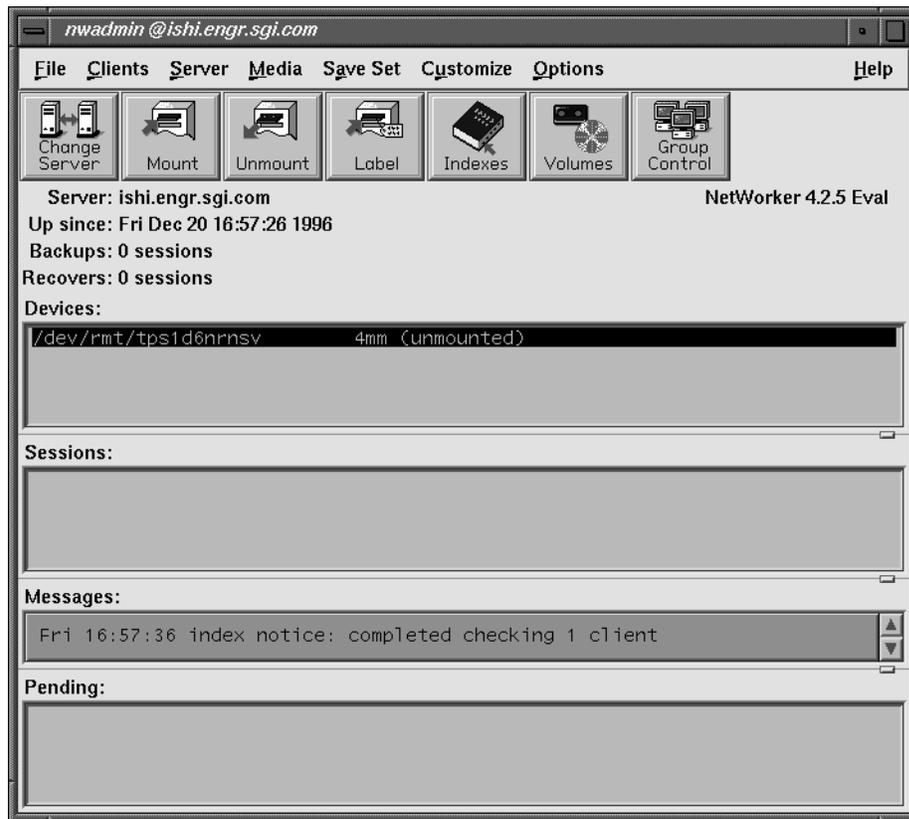


**Figure 2-1**      NetWorker Administrator Window

Use the nwadmin window to administer, monitor, and configure backups. Refer to the *IRIX NetWorker Administrator's Guide* for a complete description of this window and its menu choices.

## Changing the Device Name

NetWorker does not automatically detect and configure non-robotic devices.  If your backup device is not *ical/dev/rmt/tps1d6nrnsv,* you need to inform NetWorker of the correct device name.  (If you used **jbm_enabler** to autoconfigure jukebox devices, as described in "Enabling Autochangers" on page 10, it is not necessary to modify any device names.)  To change the backup device, choose Devices from the Media menu.  The Devices window appears, as shown in Figure 2-2.
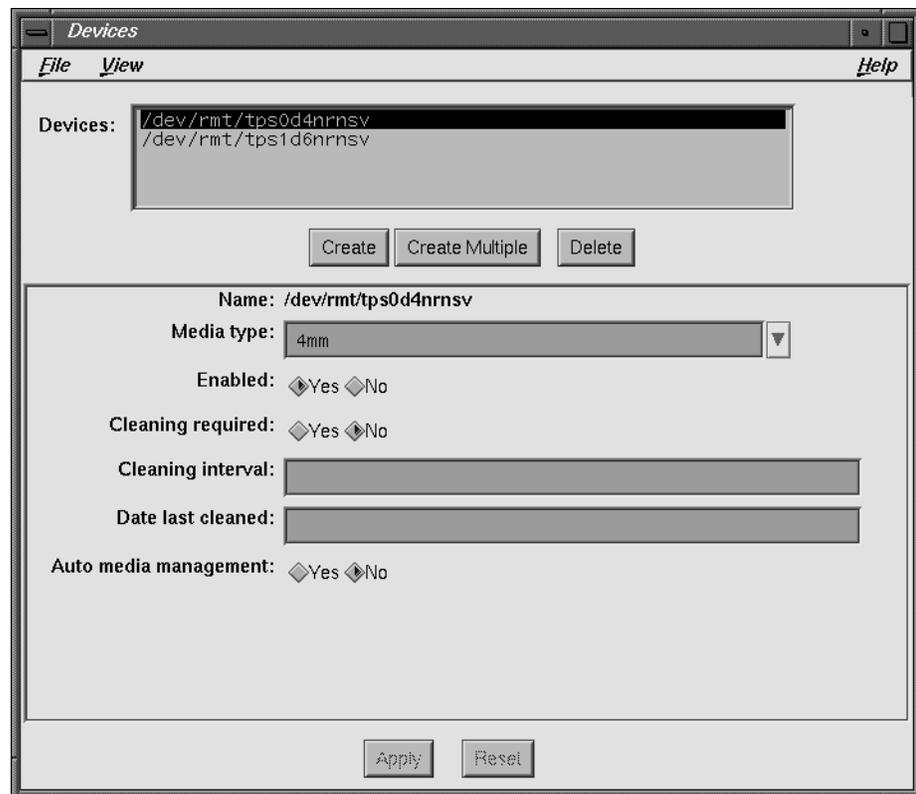


**Figure 2-2**    Devices Window

Click the Create button, and in the Name field, enter the pathname of an *nrnsv* (no-rewind non-byte-swapping variable-blocksize) device listed in */dev/rmt.*  Click the Apply button, and the new name appears in the Devices list.  Set options as required.  To remove the old preconfigured device, select it in the Devices list and click the Delete button.

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When making estimates of tape capacity for display in the Volumes window, NetWorker bases its calculations on the smallest possible tape for a device.  For example, with 4mm devices, NetWorker assumes 60 meter tape with a 1.3 GB capacity.  If your installation deploys higher capacity tapes, increase volume capacity before labeling any tapes.

To increase volume capacity, choose Details from the View menu, entering expert mode. Type the higher limit into the Volume default capacity field, as shown in Figure 2-3.
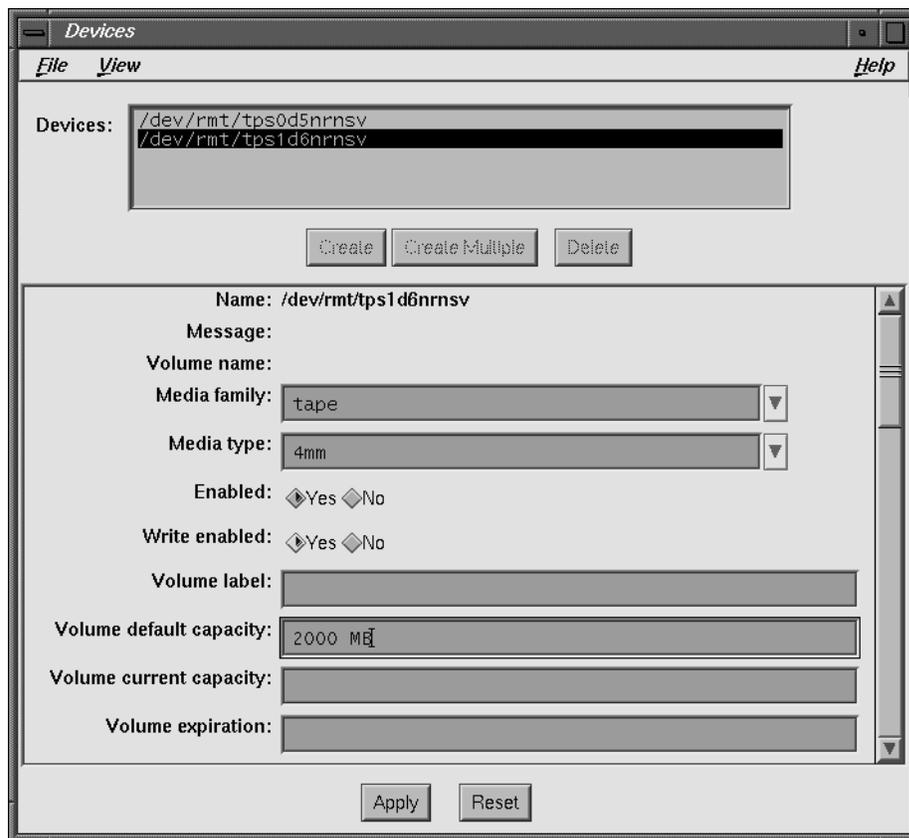


**Figure 2-3**      Devices Window, Details View

**Tip:**  If you label a tape before setting volume capacity, the % used field in the Volumes window shows incorrect numbers, although NetWorker can continue writing until the volume is filled to capacity.

## Using Preconfigured Settings

NetWorker is shipped with a complete set of preconfigured settings, which are the default options for backing up clients on a network. In many cases, especially at first, you do not need to change the NetWorker defaults. NetWorker provides preconfigured settings for the following:

- *schedules* for controlling when and how data is backed up

- *policies* for managing the file and media indexes

- *directives* for customizing the way NetWorker backs up data

- *label templates* for labeling backup volumes consistently and automatically

- *groups* for determining the groups to which clients belong

- *notifications* inform you of NetWorker activity by e-mail and hardcopy

- *pools* for sorting data to preselected backup volumes

You can use these preconfigured settings to back up your client data immediately after installing NetWorker. You may change the preconfigured settings or create your own.

Once you enable the Default group in the Groups window, NetWorker backs up the server as a client of itself using the preconfigured defaults.

## Labeling and Mounting a Backup Volume

Backup volumes must be magnetically labeled before NetWorker employs them for backing up files. NetWorker reads labels to track and identify the contents of backup volumes. Unless your backup device supports bar codes, always place a physical label on tapes corresponding with the magnetic label.

When you start recovery, NetWorker automatically determines the necessary volume(s) and requests them by label name. This gives you time to locate and mount recovery volumes. In a jukebox, NetWorker locates recovery volumes automatically.

You must mount backup volumes after labeling them before you can proceed with a backup. When a jukebox is attached to the system, NetWorker automatically mounts the appropriate volumes. Refer to the *IRIX NetWorker Administrator's Guide* for details on labeling jukebox volumes.

Follow these steps to label and mount backup volumes in a device other than a jukebox:

1.  Locate blank media that can be used for a backup.

2.  Load the media into a NetWorker backup device.

3.  Highlight the device in the Devices display in the nwadmin window.

4.  Click the Label speedbar button.

    The Label dialog box appears, as shown in Figure 2-4, with a field for entering the name of the volume.
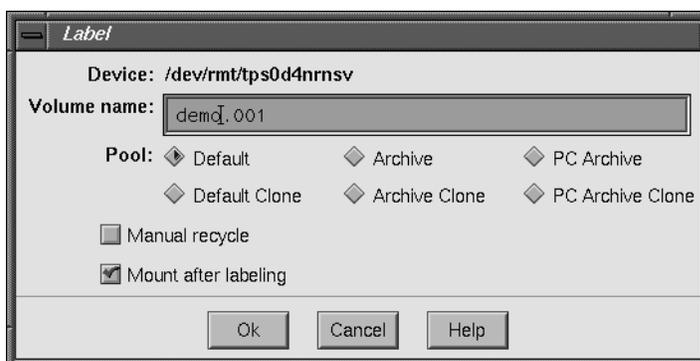


**Figure 2-4**      Label Dialog Box

5.  Enter a name, such as "demo.001" into the Volume name field.  Many administrators use the hostname of the NetWorker server instead of "demo."

    You do not need to select a pool because the Default pool is already selected.

6.  Click the Mount after labeling box.

7.  Click the Ok button to label and mount the backup volume.

    A dialog box might appear, asking you to confirm the request.  If NetWorker detects an existing label, it asks for confirmation to recycle, since existing data on that volume would be lost.  Click OK to confirm the labeling request or Cancel to quit.

    **Note:**  NetWorker does not ask for confirmation to overwrite tapes created by other programs, such as **tar**, **dd**, **dump**, or **xfsdump**.

The name of the mounted volume appears next to the device name in the Devices display in the nwadmin window.

Refer to the *IRIX NetWorker Administrator's Guide* for more information about the labeling and mounting features that NetWorker provides for autoloaders.

## Manual Backup and Recover

Typically, NetWorker operates by automatically performing daily scheduled backups. You can also use the NetWorker Backup program (**nwbackup**) to initiate manual backup of selected files, and the NetWorker Recover program (**nwrecover**) to recover files, either those backed up manually, or during a scheduled backup.

Refer to the "Quick Tour" section in Chapter 2 of the *IRIX NetWorker User's Guide* for a description of how to initiate manual backups and recovers. All users with access to NetWorker client software can perform backup and recovery as needed. This is one of the big advantages of NetWorker, for users and system administrators alike.

Thanks to the online file and media indexes, users can browse their backed-up files and quickly identify files for recovery. NetWorker automatically identifies which backup volumes contain the files needed for recovery. Adding a jukebox to your server allows you to automate backups and recoveries—data protection and recovery then require very little administrative intervention.

NetWorker offers many features to help you recover files in addition to those introduced in the "Quick Tour" section. Refer to the *IRIX NetWorker User's Guide* for a complete description of the backup and recover interfaces.

## Viewing the Backup Schedules

Most backup activity occurs unattended, thanks to the NetWorker scheduling features. This section describes the Schedules window. It is common procedure to change the backup schedule for a client without modifying the Schedules window, as shown below.

The NetWorker backup server is considered a client of itself. Once the Default group is enabled in Autostart field of the Groups window, NetWorker backs up the server using the preconfigured Default schedule. The Default group is disabled at first, to give you a chance to configure devices and prepare backup media.

Open the Schedules window by choosing Schedules from the Customize menu in the main window. The Schedules window appears, as shown in Figure 2-5.

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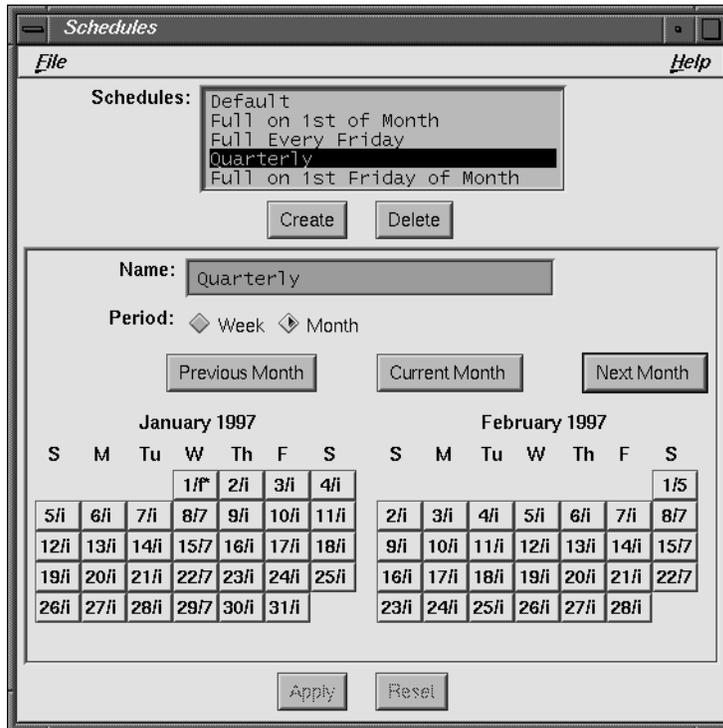
**Figure 2-5**      Schedules Window

The Schedules window provides a calendar for setting up custom backup schedules. Notice that each calendar day displays an "f" or an "i" next to the day: "f" represents a full backup, and "i" represents an incremental backup. The schedule named Default calls for a full backup every Sunday, followed by incremental backups every other day. This minimizes the number of tapes required for recovery, but consumes tape space relatively quickly because of weekly full backups.

In the Schedules list, select the preconfigured Quarterly backup schedule. This schedule calls for a full backup on the first day of a quarter, level 5 backups on the first day of following months, level 7 backups weekly, and incremental backups daily. The quarterly schedule is a good compromise between ease of recovery and moderate tape use. For more information about schedules, refer the *IRIX NetWorker Administrator's Guide.*

**Note:** Regardless of the selections in the preconfigured schedules, NetWorker always performs a full backup the first time it backs up your files.

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## Viewing the Client Information

Open the Clients window by choosing Client Setup from the Clients menu. This is the window to use for controlling backup of networked clients.

After you enable the Default group in the Groups window, the server backs itself up, using settings in the Clients window. Preconfigured client settings are shown in Figure 2-6.
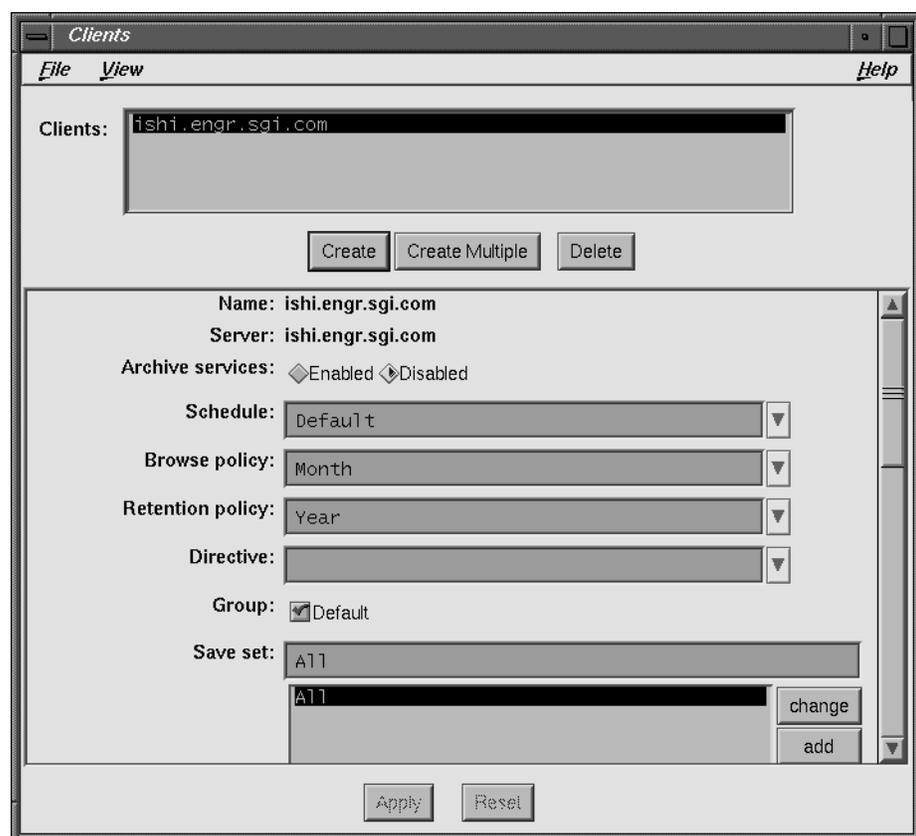


**Figure 2-6**      Clients Window

**Tip:** For this NetWorker test drive, change the Save set field to specify a single filesystem or limited directory hierarchy instead of All. This will allow the test backup to complete more quickly. For example, change the save set to just the */home* directory.

To change from weekly full backups to the quarterly schedule, select Quarterly from the drop-down list in the Schedule field.  In the Aliases field, make sure the simple hostname is listed in addition to the fully-qualified domain name (FQDN).  NetWorker does this automatically for clients, but not for the server.

To back up client machines across the network, install NetWorker on the clients, then use the Clients window to create them as clients in some group.  Refer to the *IRIX NetWorker Administrator's Guide* for information about creating NetWorker clients and groups.

## Enabling Scheduled Backups

Open the Groups window by choosing Groups from the Customize menu.  The Groups window appears, as shown in Figure 2-7.
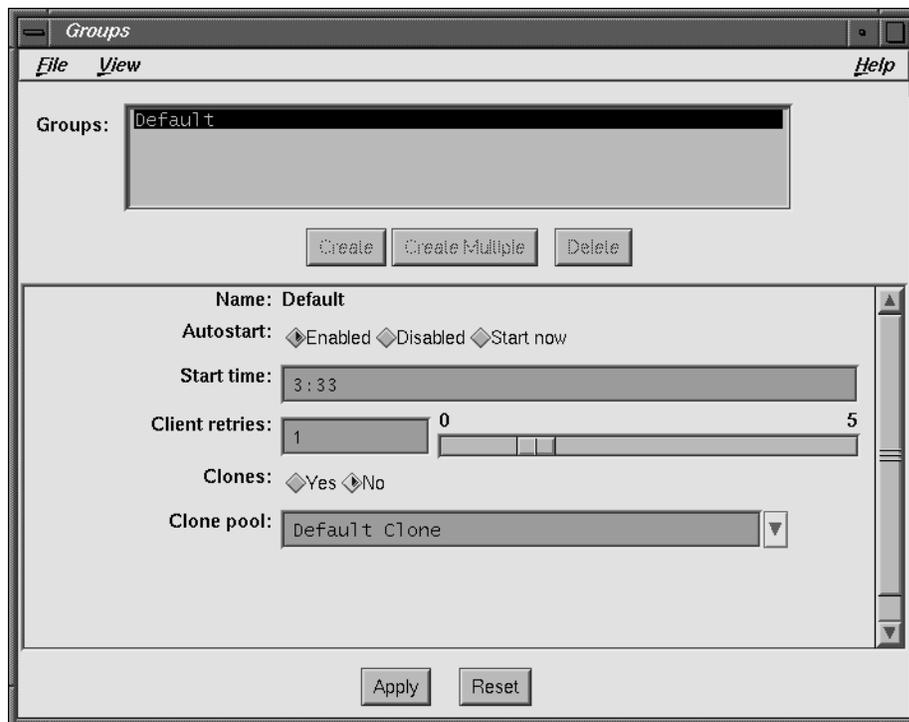


**Figure 2-7**      Groups Window

After you configure devices and label backup media, you can enable the Default group. At first, the only client in the Default group is the NetWorker server. As you add network clients, you can put them in the Default group, or create specialized groups as needed.

Notice that the Start time is 3:33 AM and the preselected value for the Autostart choices is Disabled. If you want to change the time NetWorker starts backing up this group, simply enter a new start time.

To enable the Default group, follow these steps.

1.  Click the Enabled button in the Autostart field.

2.  Click the Apply button to apply the change.

3.  Choose Exit from the File menu to close the Groups window.

Now the NetWorker server, as part of the Default group, will start backing itself up at 3:33 AM every night. To get started, the first night involves a full backup.

The Client retries field controls the number of times NetWorker restarts failed backups. Increasing this number improves backup reliability, but may slow down total save time so that backups fail to complete in a reasonable time.

In the Groups window, choose Details from the View menu. New options appear. Scroll down to the Inactivity timeout field. This value controls the time NetWorker waits before abandoning a network save. For large clients, change this from 30 to 60 minutes.

Cloning backups is a good way of creating redundant volumes that can be stored offsite to improve disaster preparedness. To make cloning work efficiently, it is best to have multiple backup devices attached to the NetWorker server.

Refer to the *IRIX NetWorker Administrator's Guide* for complete information about cloning and the Groups window.

## Starting a Backup Now

Now that you have enabled its Default group, NetWorker is ready to back up the server.

There are two ways to begin a backup immediately. In the Groups window, you could select the Start now choice in the Autostart field and click Apply before exiting the window. The easier way is to click the Start button in the Group Control window.

This example demonstrates how to start a backup in the Group Control window, where buttons can also stop, restart, and monitor the progress of a backup. To start a scheduled backup immediately from Group Control window, follow these steps:

1.   Click the Group Control speedbar button or choose Group Control from the Server menu. The Group Control window appears, as shown in Figure 2-8.
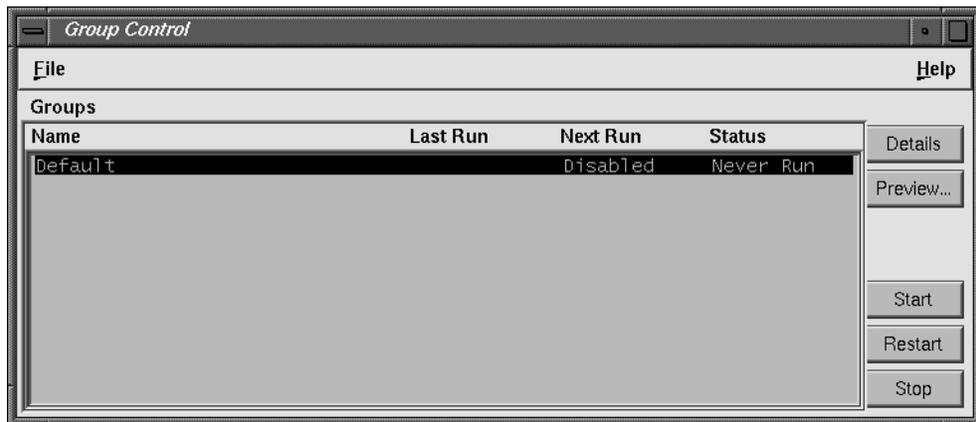


**Figure 2-8**      Group Control Window

2.   If necessary, select the Default group in the Groups list.

3.   Click the Start button on the right. A confirmation dialog box appears, as shown in Figure 2-9. Click OK or Cancel.
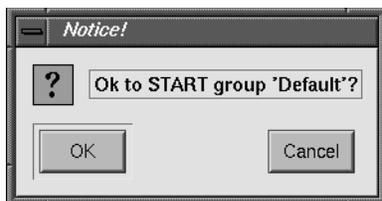


**Figure 2-9**      Confirmation to Start Group

NetWorker begins a backup of clients in the Default group and displays "running" in the Status column of the Group Control window. The Default group uses the Default schedule to back up data, unless you changed the schedule in the Clients window. However, the first time NetWorker backs up any client, it performs a full backup for all of its data, regardless of the schedule assigned.

Starting a backup now does not eliminate the regularly scheduled backup. If the group is enabled, it will back up again as scheduled. In this case, NetWorker will back up the Default group again at 3:33 AM as directed.

## Monitoring the Backup

After clicking the Start button, keep the Group Control window open to verify and monitor the progress of your backup. After NetWorker has successfully backed up your files, the Finished message appears in the Status field.

If you want more detailed information about the files being backed up, click the Details button in the Group Control window. The Group Control Details window appears, as shown in Figure 2-10.
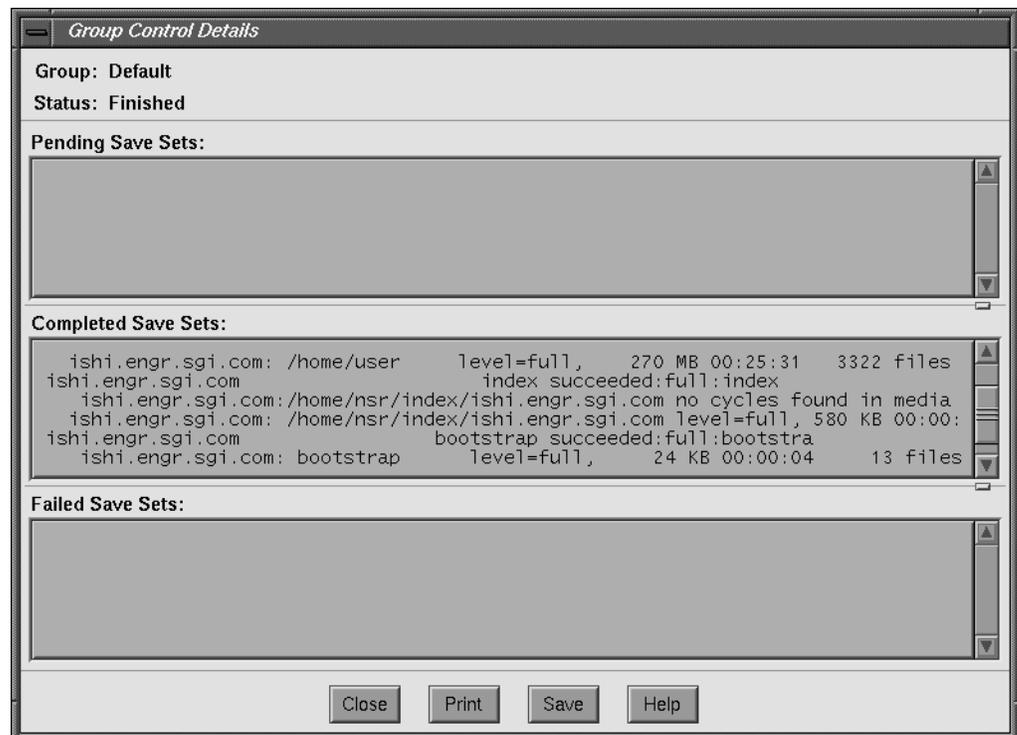


**Figure 2-10**    Group Control Details Window

For more information about the Group Control and the Group Control Details windows, refer to the *IRIX NetWorker Administrator's Guide.*

## Checking Volumes

You might be curious how much space is left on the backup volume. An estimate of this information is available in the media index. To see it, click the Volumes speedbar button, or choose Volumes from the Media menu. The Volume Management window appears, as shown in Figure 2-11.
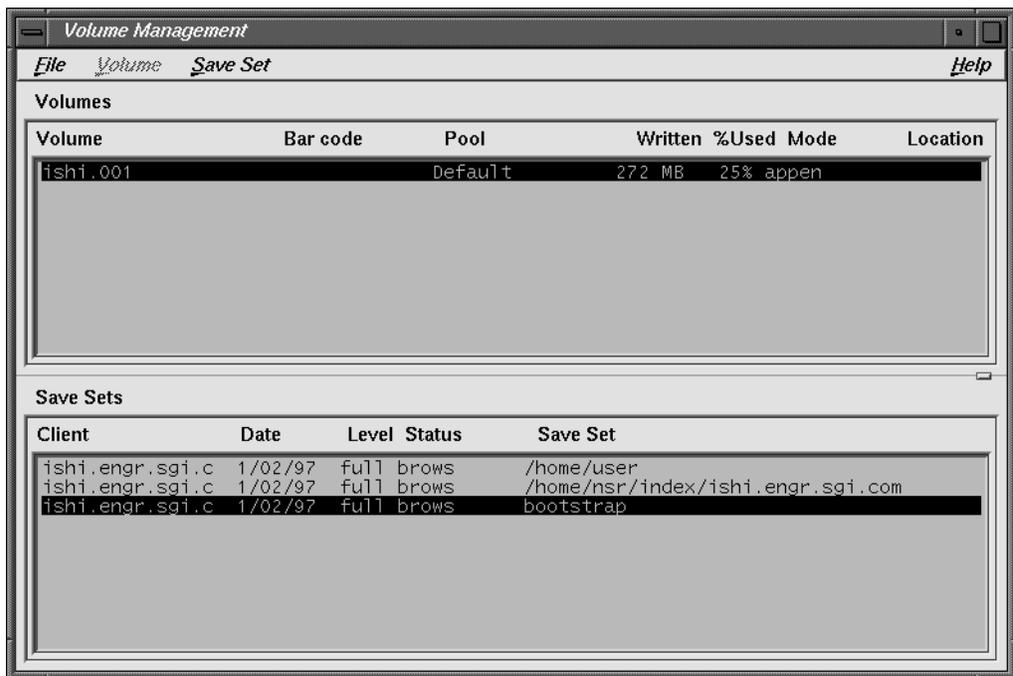


**Figure 2-11**    Volume Management Window

In this example, NetWorker estimates that volume *ishi.001* is 25% full, and remains appen(dable). Increased media length, hardware compression, and tape blocking factors can cause inaccuracies in these estimates. It is wise to be prepared with an alternate backup volume for the inevitable day when the first volume fills up.

## Recovering a File

To verify that data was correctly written to tape, try recovering a single file from the backup just performed. The NetWorker save set recover feature makes this possible.

In the nwadmin window, choose Recover from the Save Set menu. The Save Set Recover window appears, as shown in Figure 2-12.
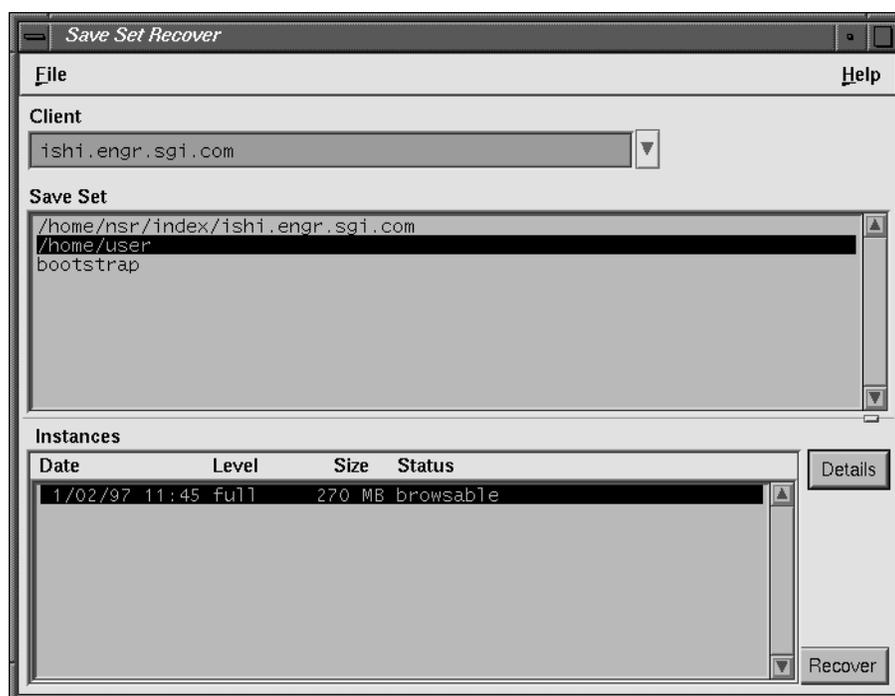


**Figure 2-12**     Save Set Recover Window

In the Save Set field, select the backup data, in this case */home/user*, instead of the index and bootstrap. Then click the Recover button in the lower right. The Save Set Recover Status window appears, as shown in Figure 2-13.

In the Paths to recover text field, enter the name of a text file, in this example *tips*. After you press the [Enter] key, the full pathname of the file appears in the Paths to recover area. Click the Start button at the bottom to begin recovery.
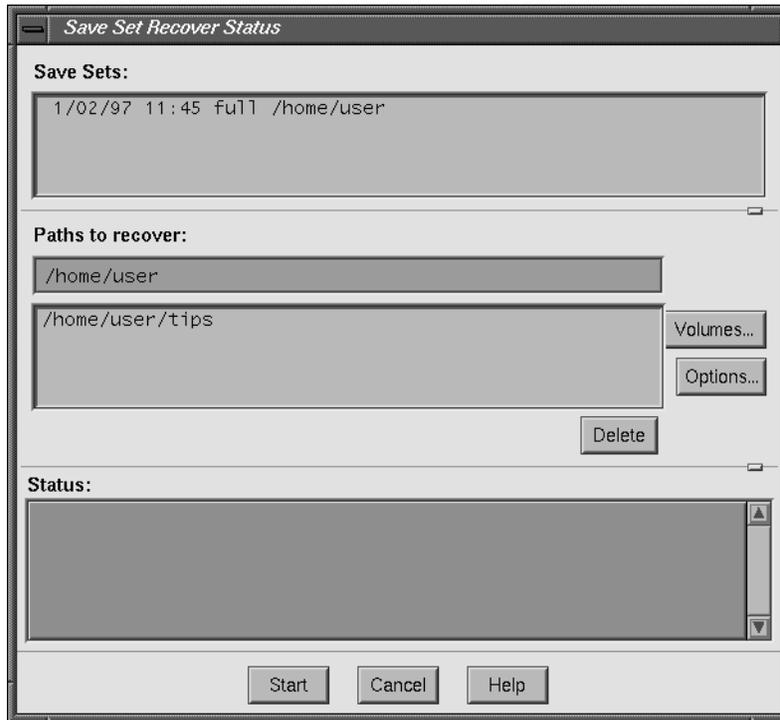
**Figure 2-13**    Save Set Recover Status Window

After a while, the Save Set Recover File Conflict window appears, as shown in Figure 2-14.



**Figure 2-14**    Save Set Recover File Conflict Window

Click Ok to rename the recovered file. After a message appears in the Status field of the Save Set Recover Status window indicating that the file was renamed, click Cancel to avoid futher searching. Run a **diff** command as follows to compare the original file with the recovered file—there should be no output.

```
$ diff /home/user/tips*
```

## E-mail and Print Confirmation

Whenever NetWorker runs **save**, it sends e-mail to root describing the backup. The first time involves a full save and looks something like this:

```
ishi:/home/user no cycles found in media db; doing full save
ishi: /home/user level=full,    232 MB 00:22:09   2846 files
ishi: /nsr/index/ishi no cycles found in media db; doing full save
ishi: /nsr/index/ishi level=full, 500 KB 00:00:05     6 files
ishi: bootstrap       level=full,     24 KB 00:00:03    13 files
```

NetWorker also prints out bootstrap information to assist during disaster recovery. This appears in printed form, since e-mail might be unavailable after a system crash:

```
December 12 18:23 1996  ishi's bootstrap information Page 1

date     time     level     ssid  file  record   volume
12/12/96 18:23:23   full    12096   10      0   ishi.001
```

Save the bootstrap information in a file folder, organized chronologically, in case you need it for disaster recovery someday.

## Grouping Clients

Listed below are suggestions for further configuration exercises.

- Add clients to the Default group and enable the group for an overnight backup. In the morning, check the results of the scheduled backup in your mail.

- Create your own backup schedules and apply them to the appropriate clients. Create several groups containing clients grouped logically by department. For example, create a Marketing group that backs up all their machines at 12:00 AM, and an Engineering group that backs up their machines at 2:00 AM.

# Index

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