Legato NetWorker®
Storage Node™ Installation Guide

Release 5.5, MPE/iX Version

LEGATO™

Legato NetWorker Installation Guide, MPE/iX Version, Release 5.5
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Contents

Preface

About This Guide

The *Legato NetWorker® Installation Guide, MPE/iX Version,* contains instructions on how to install and configure a Legato NetWorker client and storage node on an HP 3000 business server.

After you install the MPE/iX Version of Legato NetWorker as a client and/or storage node, refer to the *Legato NetWorker Administrator's Guide* to configure the HP 3000 as a NetWorker client and storage node to back up to a NetWorker server. You can access the *Legato NetWorker Administrator's Guide* through the *Documents Library* option at *http://www.legato.com.*

Audience

System administrators who have experience with MPE/iX will benefit from this guide. This guide assumes that the system administrator also has experience configuring NetWorker on a NetWorker server.

Legato Product Manuals and Documentation

Legato offers an extensive archive of product documentation at its web site (*http://www.legato.com*). Most of the documents are in Adobe Acrobat® Portable Document Format (PDF) that you can easily view by downloading Adobe Acrobat Reader, which is also available from Legato's web site.

To access the archive:

1. Select *Documents Library* from the home page (*http://www.legato.com*).

2. Make your selection from the *Legato Product Manuals and Documentation* search choices. You can search the archive by part number, title, publication date, version, or OS/platform.

Year 2000 Compliance

NetWorker supports dates in the year 2000 and beyond. For additional information and details about related test cases, see the Year 2000 Compliance (Y2K) section on the Legato web site at *www. legato.com*.

Information and Services

Legato offers a variety of services, including electronic, telephone, and fax support that provide company, product, and technical information.

Legato Service or Resource	Technical Bulletins	Binary Patches	Company & Product Information	Training Programs
http://www.legato.com	Yes	Yes	Yes	Yes
ftp.legato.com, Internet address 137.69.200.1 (log in as *anonymous*)	Yes	Yes		
Legato Inside Sales, (650) 812-6000 or *sales@legato.com*			Yes	
Legato Education Services, (650) 812-6096 or *training@legato.com*				Yes
Note: For detailed information about our services, support policies, and software subscriptions, please refer to the booklet *LegatoCare Service, Support and Training Programs* included in the NetWorker package.				

Customer Feedback

The Legato NetWorker Client/Storage Node, MPE/iX Version team welcomes your comments and suggestions about software features, the installation procedure, and documentation. Please send any suggestions and comments to *feedback@legato.com*. You will receive a notice confirming receipt of your e-mail. Although we cannot respond personally to every request, we consider all your comments and suggestions during product design.

Technical Support

If you purchased technical support from HP, please refer to your HP Support Contract.

You must register the Legato NetWorker Client/Storage Node, MPE/iX Version with Legato Systems, Inc. before you can purchase Legato technical support. Legato also provides several sources to fulfill your technical support needs.

Technical Support Service	Address
Hotline	(650) 812-6100
E-mail	*support@legato.com*
Tech Dialog (requires password)	*http://www.legato.com/tech_dialog*

Customer Service

Contact Legato Customer Service if you have questions about licensing, registering, or authorizing your Legato products. Customer Service also supplies instructions for transferring licenses to a different server (rehosting) and provides status on product orders.

Customer Service	Address
Telephone number	(650) 812-6000 (option 3)
Fax number	(650) 812-6220
E-mail	*service@legato.com*
E-mail for order status	*orderadmin@legato.com*

Conventions

This guide uses the following typographic conventions and symbols to make information easier to access and understand.

- **boldface, lowercase or UPPERCASE** – Indicates references to NetWorker programs or commands within paragraphs as in the following example:

  You can start the NetWorker **NSRSAVE** program either from the MPE/iX Command Interpreter (CI) or from the POSIX shell if you prefer.

- *italic* – Indicates directory pathnames, files, computer names, new terms defined in the Glossary or within the chapter, and emphasizing words or ideas as in the following example:

  With the NetWorker ClientPak for MPE/iX, you can manually perform *client-initiated backups.*

- `fixed-width` – Used for examples and information displayed on the screen as in the following example:

  `NSRSAVE: /reports/ 389 KB 00:00:30 5 files.`

- **`fixed-width, boldface lowercase or UPPERCASE`** – Used for commands and text you type exactly as shown, such as the **`recover`** command or the **`RUN NSRRECOV;INFO=`** command in the following examples:

  `recover>` **`recover`**

  `:` **`RUN NSRRECOV;INFO="-s server -c client"`**

- ***`fixed-width, boldface italic lowercase`*** – Used for commands and text you type for which you need to substitute a variable, as used for ***`reports`***, ***`server`***, and ***`client`*** in the following examples:

  `recover>` **`add`** ***`reports`***

  `:` **`RUN NSRRECOV;INFO="-s`** ***`server`*** **`-c`** ***`client`***`"`

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  Important: Indicates important information and cautionary notes that prevent you from making a mistake.

MPE Versus MPE/iX POSIX Filepath Naming Conventions

The HP documentation discusses naming conventions for defining filepaths in MPE and MPE/iX POSIX. We have included a comparison here for your convenience.

MPE	MPE/iX POSIX
FILENAME.GROUP.ACCOUNT (Must be uppercase)	/ACCOUNT/GROUP/filename (The filename is case-sensitive)

Chapter 1: Introduction to NetWorker

Overview

MPE/iX is the operating system for Hewlett-Packard® HP 3000 business servers. Legato NetWorker provides enterprise storage management capability to the HP 3000-UNIX-NT coexistent market. Legato NetWorker Client/Storage Node, MPE/iX Version, relies on HP's TurboSTORE software to interface with MPE/iX.

The MPE/iX version of NetWorker provides HP customers with client-initiated backup, recovery, archive, and retrieve capabilities using the command line from the MPE/iX Command Interpreter (CI) or from the POSIX shell on the HP 3000.

NetWorker Server

Before installing the NetWorker software on your HP 3000, you must install NetWorker on a server. A NetWorker *server* is a computer running the NetWorker server software with a backup device connected to it. The server provides backup and recover services to all *client* computers on the network.

NetWorker Client

A client is a computer that accesses the NetWorker server to back up or to recover files. Refer to the *Legato Networker Installation Guide* included with your NetWorker server software for instructions on installing NetWorker on a server.

About NetWorker

NetWorker employs a client/server model to accomplish storage management tasks. One or more NetWorker servers provide data protection services to clients on the network.

With this release of NetWorker, you can designate a system with storage devices to act as storage nodes of the NetWorker server. Storage nodes manage the media that contain backed-up data, while the NetWorker server manages the information required to administer the clients and to track and recover data.

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Clients

To add a client to the NetWorker server's list of systems to back up, follow these steps:

1. Install the NetWorker client software.

2. Configure a client resource for that system on the NetWorker server.

Note that the NetWorker server only provides backup and recovery services to clients with a configured resource on the server. Refer to the **nsr** man page for a comprehensive description of the access control policies employed by the NetWorker server.

Storage Nodes

With NetWorker, you can designate a system with storage devices to act as storage nodes of the NetWorker server.

To affiliate NetWorker clients to a storage node for backup and recovery requests, use the NetWorker Administrator program. Distributing media management tasks to other systems on the network reduces the load placed on the controlling NetWorker server and allows you to manage remote storage management tasks across a distributed enterprise network from a central location.

Supported Devices

NetWorker supports a variety of media types, either standalone or in an autochanger. Devices can be attached to a NetWorker server or a designated storage node.

Supported media types include:

• 4 mm and 8 mm tape
• Optical disk
• Digital linear tape (DLT)
• Disk file

To obtain the latest list of supported devices, visit the Legato web site at *www.legato.com* for document 1905, the *Legato Compatibility Guide.*

To use NetWorker for MPE/iX permanently, you must purchase an enabler code. See "How to Enable and Register NetWorker" on page 53 for details.

New Features

In addition to the storage node, the following system variables have been added to this release of NetWorker for MPE/iX:

• Specifying a notification at the start or end of an online backup.
• Controlling the TurboSTORE 7x24 True-Online Backup.
• Specifying a periodic message to report on the progress of backups.
• Changing the name of the creator of a file when recovering them.
• Relocating files from one group or account to another during recovery.

For information on setting variables, refer to the following sources:

- "Configuring the MPE Client on the NetWorker Server" on page 23
- "Setting System Variables for Client-Initiated Backups" in the Legato NetWorker User's Guide, MPE/iX Version, Release 5.5
- "Setting System Variables for a Recovery Session" in the Legato NetWorker User's Guide, MPE/iX Version, Release 5.5

Your distribution files contain the NetWorker software for a storage node and client of the MPE/iX platform on an HP 3000.

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Chapter 2: Installation

Software Installation Roadmap

NetWorker's default installation program installs all the NetWorker software packages during a single session.

Read the sections referenced for each procedure before you install the NetWorker software following these steps:

1. If you have an earlier version of NetWorker installed on your HP 3000, you *must* remove the existing NetWorker software before you install this release of NetWorker. See "Removing an Earlier Release of NetWorker" on page 16.

2. Confirm that you have met each of the system requirements. See "Installation System Requirements" on page 16.

3. Load the NetWorker software from the product tape. See "Loading the NetWorker Software" on page 17.

4. Install the required NetWorker software (client and storage node) on the system you want to designate as the NetWorker client and storage node. See "Installing the NetWorker Software" on page 17.

5. If you did not create the MPE group when installing the software, you must manually create the MPE Group and reinstall NetWorker. See "Manually Creating the MPE Group" on page 19.

6. Create the MPE user. See "Creating the MPE User" on page 19.

7. Start the NetWorker daemons. See "Starting the NetWorker Daemons" on page 20.

8. Configure the MPE client on the NetWorker Server. When you configure the MPE client on the server, you must use the correct naming conventions for the MPE volume sets.

   NetWorker for MPE/iX allows you to list the groups in an MPE volume set, back up multiple save paths in parallel, and determine what server-initiated saves will run. See the following sections for more information:

   – "Naming Conventions for Backing Up MPE Volume Sets" on page 24
   – "Backing Up Multiple Save Paths in Parallel" on page 25
   – "Determining What Server-Initiated Saves Will Run" on page 25

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9. Configure the system variables to customize the scheduled backups of the MPE client from the NetWorker server. See "Setting System Variables for Server-Initiated Backups" on page 26.

10. Affiliate the NetWorker MPE Client with the NetWorker MPE Storage Node. See "Affiliating Clients to a Storage Node on the NetWorker Server" on page 29.

11. Configure the NetWorker storage node on the NetWorker server. See "Configuring the Storage Node on the NetWorker Server" on page 30.

12. Install and configure the NetWorker Autochanger Support.

13. Enable and register the NetWorker software. See "How to Enable and Register NetWorker" on page 53.

Removing an Earlier Release of NetWorker

If you have an earlier release of NetWorker ClientPak for MPE/iX installed on the client, you need to remove it before you install release 5.5.

To remove the NetWorker software, follow these steps:

1. Copy NSRIZE from the */sys/netwrkr* directory to another directory, for example:

   ```
   :  copy /SYS/NETWRKR/NSRIZE, /tmp/NSRIZE
   ```

2. Change the group to PUB:

   ```
   :  CHGROUP PUB
   ```

3. Change to the */tmp* directory:

   ```
   :  CHDIR /tmp
   ```

4. Enter the following command to remove the NetWorker software:

   ```
   :  ./NSRIZE REMOVE
   ```

Installation System Requirements

The Legato NetWorker software is distributed on tape.

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Important: If an earlier release of NetWorker is installed, follow the instructions in "Removing an Earlier Release of NetWorker" on page 16 before you install this release of NetWorker.

To install NetWorker on an MPE client, your system *must* meet *each* of the following requirements:

• HP 3000 MPE/iX release 5.5 operating system or above.

• HP 3000 FOS STORE/iX or TurboSTORE/iX II (Prod no. B5151AA) or TurboSTORE/iX 7x24 True-Online Backup (Prod no. B5152AA).

• MPE Patch MPEKXA7. The MPE patch numbers are the correct patch numbers at the time of printing this guide.

- MPE Patch MPEKX37. The MPE patch numbers are the correct patch numbers at the time of printing this guide.

  Please call the HP North American Response Center for the latest MPE Patch.

- 30 MB of disk space.
- NS 3000 Network Services up and running.
- TCP/IP configured through the NS 3000 Network Services.
- NetWorker Windows NT or UNIX server version 4.2 or above as the server of the client.
- Names of the servers of which the HP 3000 is a client and storage node.

Loading the NetWorker Software

This section describes how to load the NetWorker software on a client or storage node with a local tape drive.

Before you load NetWorker, verify that your system recognizes the tape drive.

To load the software, follow these steps:

1. Log on as the system manager:

   : **HELLO MANAGER.SYS**

2. Place the Legato NetWorker tape in the tape drive.

3. Set the following file equation:

   : **FILE T;DEV=TAPE**

4. Restore the MPE/iX files from the product tape onto your system with the following command:

   : **RESTORE *T;/legato;CREATE;TREE**

After you load the software, you can install it.

Installing the NetWorker Software

This section describes how to install the Legato NetWorker software. You use the **NSRIZE** command to install the NetWorker software. The installation script provides *pathnames* for the locations of the software.

The installation script automatically creates a new MPE group, named NETWRKR.SYS. The NETWRKR.SYS group has the following capabilities: BA, IA, PM, MR, DS, PH.

The installation script gives you the option to create the group automatically or manually. If you plan to create the group manually, see "Manually Creating the MPE Group" on page 19.

Daemons are programs that implement services. NetWorker has two generic daemons, PORTMAP and NSREXECD. These two daemons allow a client and storage node to communicate with the server. Clients must be running the NSREXECD daemon for the server to back them up or to initiate automatic storage node services. A third daemon, NSRMMD, is started automatically by the server for each active storage node tape device.

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The NETWRKR.SYS group is a special group that only exists for the NetWorker daemons. This separate group allows you to identify the daemons in the **SHOWJOB** listing. This group also allows you to stop the daemon jobs.

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>
> **Important:** You should *not* carry out any other work as NETWRKR.SYS.

To install the NetWorker software, follow these steps:

1. Change to the *legato* directory:

   : **CHDIR /legato**

2. Begin the installation with the following command:

   : **./NSRIZE INSTALL**

   The following script text is displayed on the screen:

   ```
   This product includes software developed by the University of
   California, Berkeley and its contributors.

   NSRIZE is about to INSTALL NetWorker client and storage node
   software on machine MARS.

   Do you want to continue? [Yes] [Enter]

   In order to install the NetWorker client and storage node
   software a new MPE group must be added to your system. If you
   wish NSRIZE to automatically create the MPE group, answer
   'yes' to the question below. If you wish to create the MPE
   group manually respond 'no'. For further information please
   read 'Installing the NetWorker Software' and 'Manually
   Creating the MPE Group' sections in the Installation Guide.

   Do you wish NSRIZE to create the group automatically [yes]?
   [Enter]
   ```

If you responded **no** to creating the group automatically, see .

If you responded **yes** to creating the group automatically, the installation continues and the following message is displayed:

```
Installing the NetWorker executables.

Making the symbolic links.

Installing the NSRHELP pages.

Installing miscellaneous jukebox files.

NetWorker installation was successful.
```

Once the installation is complete, if you created the MPE group automatically, you must now create the MPE user (see). If you did *not* create the MPE group automatically, you must create the MPE group manually and you must create the MPE user.

Manually Creating the MPE Group

If you responded no to creating the MPE group while installing NetWorker, the following message is displayed:

```
Exiting script so the installer can create a new group.
```

Important: If the MPE group was not was created automatically, the installation script will not be completed unless you create the new MPE group with the same name, NETWRKR.SYS. Changing the name of the group or altering its capabilities is not supported and will cause NetWorker to fail.

To create the MPE group manually, follow these steps:

1. When the NSRIZE script exits, enter the following command:

   : **NEWGROUP NETWRKR.SYS;CAP=BA,IA,PM,MR,DS,PH**

2. After you create the group, you must run the NSRIZE script again:

   : **./NSRIZE INSTALL**

   The following script text is displayed:

   ```
   This product includes software developed by the University of
   California, Berkeley and its contributors.

   NSRIZE is about to INSTALL NetWorker client software on
   machine MARS.

   Do you want to continue? [Yes] [Enter]

   The group NETWRKR.SYS already exists. If there are any
   NetWorker files in this group they will be overwritten.

   Do you wish to continue using the existing NETWRKR.SYS [yes]?
   [Enter]

   Installing the NetWorker executables.

   Making the symbolic links.

   Installing miscellaneous jukebox files.

   Installing the NSRHELP pages.

   NetWorker installation was successful.
   ```

Creating the MPE User

In order for automated NetWorker backups to run successfully, you must create the MPE user. The MPE user has the following capabilities: SF, BA, IA, PH, SM, ND.

To create the MPE user, enter the following commands:

: **NEWUSER NETWRKR.SYS;PASS=NEW_PASSWORD;**
CAP=SF,BA,IA,PH,SM,ND;HOME=NETWRKR

Starting the NetWorker Daemons

![warning icon]

Important: You must start the two generic NetWorker daemons, PORTMAP and NSREXECD. Note that the third storage node daemon, NSRMMD, is started automatically by the server, using NSREXECD, for each active storage node tape device. NetWorker daemons must be running at all times if automated backups and storage node services are to be enabled.

Before you start the two generic daemons, you must edit the J*PRTSTRT* and *JNSRSTRT job* files. These files start the two generic daemon jobs.

To edit the job files, follow these steps:

1. Change to the NetWorker directory by entering the following command:

    : **CHDIR /SYS/NETWRKR**

2. Alter the *JPRTSTRT* and the *JNSRSTRT* files so they work with your system security and passwords.

    a. Locate the following line in the *JNSRSTRT* file:

        !run nsrexecd.netwrkr.sys;info=""

    b. Depending on whether you are adding one or more servers, insert the host NetWorker name or names between the double quotation marks in the *JNSRSTRT* file:

        –   If you have only one NetWorker server, enter the name as follows:

            !run nsrexecd.netwrkr.sys;info=**"-s jupiter"**

        –   If you have more than one NetWorker server, enter all server names between the double quotation marks, as in the following example:

            !run nsrexecd.netwrkr.sys;info=**"-s jupiter -s pluto"**

To start the generic NetWorker daemons, follow these steps:

1. Start the PORTMAP daemon by entering the following command:

    : **STREAM JPRTSTRT**

2. Start the NSREXECD daemon by entering the following command:

    : **STREAM JNSRSTRT**

    Note that before you can add the two STREAM commands to */SYS/PUB/SYSSTRT,* you must first add the commands that start the networking services.

3. Verify that the daemons are running:

    : **SHOWJOB**

The job list is displayed :

```
JOBNUM STATE IPRI JIN JLIST INTRODUCED JOB NAME

#S2     EXEC        20  20     THU 2:06P  MANAGER.SYS

#J1     EXEC        10S LP     THU 2:07P  FTPMON,FTP.SYS

#J2     EXEC        10S LP     THU 2:07P  JINETD,MANAGER.SYS

#J11    EXEC        10S LP     THU 3:18P  PORTMAP,NETWRKR.SYS

#J12    EXEC        10S LP     THU 3:18P  NSREXECD,NETWRKR.SYS
```

The installation is complete.

How to Stop the NetWorker Daemons

Use the following command to stop the NetWorker daemons:

: **NSRDOWN.NETWRKR.SYS**

Important: Only use the **nsrdown** command to stop the NetWorker daemons; do not use the **abortjob** command in the CI or the **kill 9** command in the POSIX shell.

Chapter 3: Configuration

Configuring the MPE Client on the NetWorker Server

Before you use NetWorker to back up a NetWorker MPE client, you must add the client to the NetWorker server. When you add the client, you need to choose a network-wide backup schedule, assign a backup group, and choose backup directives. Make sure the server can access the client for its scheduled network-wide backups. Refer to the *Legato NetWorker Administrator's Guide* for your NetWorker server platform for information on configuring a new NetWorker client on a NetWorker server.

You can configure your HP 3000 as two MPE client resources on the NetWorker server: one for performing server-initiated backups of non-volume sets, such as specific files and directories, and one for performing server-initiated backups of MPE volume sets.

The advantages of configuring a separate client resource for MPE volume sets are as follows:

- You can customize the backup schedules of your MPE volume sets to do "Full" backups so you get an entire, consistent view of the NetWorker save sets. Nevertheless, NetWorker does not prevent the use of incremental backups of MPE volume sets. Refer to Chapter 3, "Scheduled Backup Configuration," of the *Legato NetWorker Administrator's Guide* for more information on configuring schedules for your client.

- You can schedule infrequent full backups of MPE volume sets, for example, once a month. However, if an entire volume set has nonsystem data that changes frequently, you should increase the frequency of the full backups, for example, every week or every day.

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Naming Conventions for Backing Up MPE Volume Sets

MPE supports two types of volume sets: system volume sets and nonsystem volume sets. MPE systems are shipped with a single preconfigured system volume set called *MPEXL_SYSTEM_VOLUME_SET.* You can add as many nonsystem volume sets as you need.

The naming conventions for each type of volume set differs:

- For both system and nonsystem volume sets, add a slash (/) before the volume set name, for example: */MPEXL_SYSTEM_VOLUME_SET.*

- For an MPE nonsystem volume set, append the tag *_VOLUME_SET* to the end of volume set name. For example, if you were backing up or recovering all project files that reside exclusively on an MPE volume set, PROJECTS, you would name the volume set */ PROJECTS_VOLUME_SET.*

    Do not append _VOLUME_SET to the end of an MPE system volume set. When an HP system is installed, it automatically creates the MPE system volume, *MPEXL_SYSTEM_VOLUME_SET.*

To perform server-initiated backups of MPE volume sets, add the correct save set names for the MPE volume sets to the Client resource on the NetWorker server.

When NetWorker saves an MPE volume set, it saves the directory accounting information file in the pseudo file, */PROJECTS_VOLUME_SET_DAF.*

To recover all the files and directories on an MPE volume set, you use the *save set identification* (ssid) for the volume set. Refer to "Recovering Volume Sets" in "Chapter 4: Recovering Files" of the *Legato NetWorker User's Guide*, *MPE/iX Version, Release 5.5* for more information on recovering MPE volume sets.

If the default keyword "All" appears in the Save Set attribute in the Clients resource on the NetWorker server, all currently mounted MPE volume sets for the MPE client are backed up according to the group and schedule listed in the Clients resource.

Listing Groups in an MPE Volume Set

You can get a list of all accounts and groups in an MPE volume set that NetWorker will back up in a server-initiated backup.

Enter the following MPE command at the CI prompt to display a list of groups in an MPE volume set:

```
: REPORT ;ONVS= PROJECTS
```

Backing Up Multiple Save Paths in Parallel

A new feature of the NetWorker ClientPak for MPE/iX allows you to back up multiple save paths in parallel. The actual number is limited by the "parallelism" value assigned to the parallelism attribute for MPE client configuration on the NetWorker server.

The default setting for the parallel attribute is 4 parallel backups. The number of parallel backups is also limited by other clients competing for the NetWorker server's resources at the time of the backup. Powerful client hosts should be able to run several scheduled backup processes concurrently.

Setting the parallelism attribute to "1" turns parallelism off. You can also turn off parallelism using a new system variable. See for information on this new system variable.

Determining What Server-Initiated Saves Will Run

The **SAVEFS** program determines what server-initiated saves will run. You can probe the server from your MPE client with the **SAVEFS** program, as in the following example:

```
: RUN SAVEFS;INFO="-p -s jupiter"

type: NSR client description;

pools supported: Yes;

remote user: MANAGER.SYS;

client OS type: HpMPEOS;

IP address: 137.69.101.27;

NetWorker version: dev;

OS: MPE/iX  C.55.00;

version: dev;

save set: path=/PROJ_VOLUME_SET, level=full, diskno=1,
max_sessions=1,

stype=save,\

path=/MPEXL_SYSTEM_VOLUME_SET, level=full, diskno=0,
max_sessions=1,

stype=save,\

path=/, level=full, diskno=0, max_sessions=1, stype=save,\
```

The **SAVEFS** program always computes the correct maximal parallelism schedule when all save paths are volume set names.

You can set the parallelism attribute to a lower value through the "parallelism" attribute on the NetWorker server. You can also set the system variable NSR_MPE_SCHED_SAVES_PARALLELISM_OFF on the MPE/iX client to completely turn off any parallelism.

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3

Setting System Variables for Server-Initiated Backups

You can set system variables to customize the scheduled backups of the HP 3000 NetWorker MPE client from the NetWorker server. You set these system variables by adding them to the *JNSRSTRT* file on the MPE/ix client.

Users can also set these system variables in the CI shell for client-initiated backups. Refer to "Backing Up Volume Sets" and "Recovering Volume Sets" in the *Legato NetWorker User's Guide, MPE/iX Version,* which came with the Legato NetWorker product.

System variables that you add to the *JNSRSTRT* file do not affect client-initiated backups.

The system variables that you can set for server-initiated backups, include:

• Setting the NetWorker time zone to match the HP STORE process
• Creating logs of your NetWorker backups
• Storing shadow logs of TurboSTORE online backups on a separate MPE volume set
• Specifying the frequency for displaying a message on the progress of backups
• Turning the parallelism attribute on and off
• Specifying a notification to start an action either at the start or end of an online backup
• Controlling the 7x24 true online back up

Important: When you enter system variables in the JNSRSTRT file, put them before the following line: `!run nrexecd.netwrkr.sys;info=""`

Setting the NetWorker Time Zone to Match the HP STORE Program

The HP STORE program runs in the Command Interpreter, which uses the local time zone set for your MPE client. NetWorker runs in POSIX, which by default is Greenwich Mean time. To correct a potential discrepancy between time zones, set the TZ variable.

Important: You should always have the TZ variable set when performing server-initiated backups, doing client-initiated backups, or recovering files and directories with NetWorker. For example, when you are recovering your files, you need to set the time zone variable; otherwise the recover browse will be in Greenwich Mean Time.

To set the time zone for server-initiated backups, add the following system variable to the *JNSRSTRT* file:

```
!setvar TZ "EST5daylight"
```

Note that the value EST5daylight is only an example; it might not be appropriate for your time zone.

For information about the value to use to set the TZ variable, display the **timezone** man page from the POSIX prompt only:

```
$ man timezone
```

Creating Logs of Your NetWorker Backups

You can set the NSR_MPE_LOGNAME system variable in the MPE/iX Command Interpreter to save information on scheduled backups in a log file.

To create logs of your server-initiated backups, add the following system variable to the *JNSRSTRT* job stream file to set the variable, as in the following example:

```
!SETVAR NSR_MPE_LOGNAME "/ACCOUNT/GROUP/log"
```

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_LOGNAME="/ACCOUNT/GROUP/log"
```

The name *log* is the required name of the log file. Note that the name of the directory and file are in POSIX format. The actual name of the file will have the date and time stamp appended to it. You can name this directory anything you want and put it wherever you want.

Storing Temporary Shadow Logs for Online Backups

You can set the NSR_MPE_ONLINE_SAVE_LOGVOLSET system variable to specify the MPE volume set on which the 7x24 TurboSTORE will store the temporary *shadow logs* for online backups. Shadow logs contain the before-backup images of any files that are changed during the backup. If you do not set this system variable, the shadow logs are saved to the MPE volume set of the file that NetWorker and TurboSTORE are backing up currently. If you decide not to save the shadow log to a different volume set, then make sure that you have enough space on the volume set where you are backing up files.

Important: You must *not* include the NetWorker-expected tag "_VOLUME_SET" on nonsystem volume sets.

To store temporary shadow logs on a separate MPE volume set named SHADOW_LOG, enter the following system variable to the *JNSRSTRT* file:

```
!SETVAR NSR_MPE_ONLINE_SAVE_LOGVOLSET "SHADOW_LOG"
```

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_ONLINE_SAVE_LOGVOLSET="SHADOW_LOG"
```

Specifying the Frequency for Displaying the Progress of Backups

You can set the NSR_MPE_PROGRESS variable to set the frequency for displaying a message on the progress of backups.

To report on the progress of backups, for example, enter the following system to the *JNSRSTRT* file:

```
!SETVAR NSR_MPE_PROGRESS "5"
```

Note that the value given represents a time in minutes.

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_PROGRESS=5
```

3

Turning Off Parallel Backups

Setting the system variable NSR_MPE_SCHED_SAVES_PARALLELISM_OFF to any value, including null, turns off any parallelism of server-initiated backups. Backups that are scheduled to run at the same time as defined in the client resource on the NetWorker server will run sequentially.

This variable is useful when the host and its I/O are unable to gracefully sustain more than one volume-set-based save at the same time. Note that parallelism can also be turned off by setting the "parallelism" attribute of the client resource to "1" (refer to the *Legato NetWorker Administrator's Guide)*.

To turn parallelism of server-initiated backups off, add the following system variable to the *JNSRSTRT* file:

```
!SETVAR NSR_MPE_SCHED_SAVES_PARALLELISM_OFF ""
```

Note that if you set this variable to "no", parallelism will still be turned off.

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_SCHED_SAVES_PARALLELISM_OFF=""
```

Specifying a Notification at the Start of an Online Backup

To set the notification system variable to on or off (the default is off), use the following command:

```
!SETVAR NSR_MPE_NOTIFY_ON ""
```

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_NOTIFY_ON=""
```

Refer to the *900 Series HP3000 Computer Systems STORE and TurboSTORE/iX Products Manual* for more information on this feature.

Controlling the 7x24 True Online Backup

You can set three different controls for the 7x24 True Online Backup:

- The ONLINE=START option allows you to enable active data backups. This setting is the default.
- The ONLINE option allows you to specify ONLINE without START.
- The OFF option allows you to turn the ONLINE off.

To control the 7x24 True Online Backup, add one of the following system variables to the *JNSRSTRT* file:

```
!SETVAR NSR_MPE_7X24_ONLINE "ONLINE=START"

!SETVAR NSR_MPE_7X24_ONLINE "ONLINE"

!SETVAR NSR_MPE_7X24_ONLINE "OFF"
```

You can also set these system variables from the POSIX shell:

```
$ export NSR_MPE_7X24_ONLINE="ONLINE=START"

$ export NSR_MPE_7X24_ONLINE="ONLINE"

$ export NSR_MPE_7X24_ONLINE="OFF"
```

Refer to the *900 Series HP3000 Computer Systems STORE and TurboSTORE/iX Products Manual* for more information on this feature.

Affiliating Clients to a Storage Node on the NetWorker Server

The link between a client resource and a list of storage nodes is called *storage node affinity*. Use the NetWorker Administrator program on the NetWorker server to affiliate NetWorker clients to a storage node. You define storage node affinity in the Storage Nodes attribute in the Clients resource. The default setting for the Storage Nodes attribute on most NetWorker client resources is the NetWorker server. For the client resource of a storage node computer, the default setting of the Storage Nodes attribute is the storage node and the NetWorker server. You can add the names of other storage nodes to the list. The NetWorker server uses the list in the Storage Nodes attribute to determine which device writes the data from each savestream.

Important: When the server's index and the bootstrap save set are backed up, the data is always written to a device that is local to the NetWorker server. A bootstrap cannot be backed up to a remote device, but a *bootstrap clone* can be written to a remote device. If you use **mmrecov** to recover a bootstrap save set or the server's index, you must recover the data from a local device.

During backup, only the devices attached to the storage node machine in the Storage Nodes attribute list are considered to receive that client's data. You *cannot* specify a different list of storage nodes to be used for different operations, but you can add and remove storage node names from the Storage Nodes attribute in the Clients resource at any time.

If a backup fails with the following message, the problem is storage node affinity:

```
no matching devices; check storage nodes, devices or pools
```

Common storage node affinity problems include the following:

- No devices are enabled on the storage nodes in the Storage Nodes list.
- The devices do not have volumes that match the pool required by a backup request.
- All devices are set to read-only.

A common example of a storage node affinity problem occurs when the client has only one storage node in its affinity list, and all devices on that storage node are disabled.

To resolve a storage node affinity problem, try using one or all of the following solutions and then restart the backup:

- Enable devices on one of the storage nodes on the client's list.
- Correct the pool restrictions for the devices on the storage node list.
- Add another storage node to the list that has enabled devices meeting the pool restrictions.
- Set one of the devices to read/write.
- Adjust the Save Mount Timeout and Save Lockout attributes for the storage node's Devices resource. For more information, see the online help.

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Configuring the Storage Node on the NetWorker Server

This section describes how to configure NetWorker storage nodes for MPE/iX to use autochangers and tape devices. These sections are adapted for MPE/iX from the *Legato NetWorker Administrator's Guide, UNIX Version,* for Release 5.1. For a detailed description of storage nodes, refer to this document in the *Documents Library* from the Legato home page (*http://www.legato.com*).

Storage Nodes

A *storage node* is connected to a NetWorker server and one or more devices used in a NetWorker backup and archive process. Devices attached to storage nodes are called *remote devices* because they are not physically attached to the controlling NetWorker server. The storage node runs special NetWorker software that controls devices. The data stored on media in remote devices is tracked in the media database and online client file indexes on the controlling NetWorker server.

Storage nodes you add to your NetWorker configuration can increase the NetWorker server's performance, give you more flexibility in designing your network, and centralize the control of data management activities to one or more NetWorker servers.

To create a storage node, you must install the storage node binaries from the NetWorker software distribution on the storage node computer. You already installed the storage node automatically when you installed the NetWorker for MPE/iX software.

Configuring Autochangers

The term "autochanger" refers to a variety of backup devices: autoloader, carousel, library, near-line storage, datawheel, tape devices, and jukebox. Note that NetWorker for MPE/iX does not support silos. For an autochanger, you must manually add the storage node's hostname to the Administrator list on the NetWorker server before you define the devices with the **JBCONFIG** program.

To configure a remote autochanger, follow these steps:

1. Verify that the storage node is included in the Administrator list in the Server resource of the controlling server. It must have the form *manager.sys@hostname*, where *hostname* is the hostname of the storage node.

2. Run the **JBCONFIG** program on the MPE/iX storage node computer to define each device in the autochanger. Refer to the **JBCONFIG** or **jbconfig** man page for the syntax and options for this program.

3. When the **JBCONFIG** program is complete, you can remove the storage node's hostname from the Administrator's list.

   – If you need to configure a new autochanger later, you must add the hostname before you run the **JBCONFIG** program again.

   – After you add the storage node's hostname to the Administrator list, one instance of **NSRMMD** starts on the storage node for each device that it controls. Refer to the **NSRMMD** or **nsrmmd** man page for the syntax and options for this program.

To enable and use the optional autochanger module with a NetWorker storage node for MPE/iX, you must perform the following configuration tasks before you can configure and enable the autochanger to work with NetWorker:

Selecting SCSI Addresses for the Autochanger

Use the **ODE** command and the **run mapper** command within ODE at the ISL prompt during bootup to list the currently used SCSI addresses. Then set the device on the autochanger (robotics) and the tape devices to use available SCSI addresses.

Shutting Down the NetWorker Storage Node

Before installing the autochanger device hardware, you should shut down your system. Refer to the MPE/iX shutdown procedure in the HP MPE documentation.

Installing the Autochanger Hardware

To install the autochanger hardware, follow the instructions in the appropriate hardware installation manuals, provided by your vendor.

Restarting the NetWorker Storage Node

After you install the autochanger device hardware, you should turn on the storage node and autochanger in the following order:

1. Turn the main power switch of the autochanger to the "On" position.

2. Reboot the sever. Rebooting the servers is required after installing new autochanger hardware.

Configuring Tape and Autochanger Devices on MPE/iX

An example of how to configure a DLT Library on an HP 3000 is used to illustrate how to configure tape and autochanger devices on MPE/iX.

Note that the following example for configuring a DLT Library on an HP 3000 works for connectivity and illustrates the driver binding, but is *not* optimized for performance. The example has the entire library on a single differential bus, but for performance no more than two drives should be on the same bus for concurrent operations.

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To configure the DLT Library on an HP 3000 perform the following steps:

1. During bootup, run ODE at the ISL prompt:

   ```
   ISL> ODE
   ```

   Note that the MPE ISL ODE "RUN MAPPER" utility might not recognize and list all fast-wide SCSI devices.

2. Run mapper to get device paths:

   ```
   ODE> RUN MAPPER
   STARTING EXECUTION OF MAPPER
   Processer Identification:
   ...
   I/O Configuration:
   Type HW SW Revisions
   Path Component Name ID Mod Mod Hdwr Firm
   ...
   /4/4 HP-PB Fast Wide SCSI . . .
   /4/4.0.0 C1194F . . .
   /4/4.1.0 DLT7000 . . .
   /4/4.2.0 DLT7000 . . .
   /4/4.3.0 DLT7000 . . .
   /4/4.4.0 DLT7000 . . .
   ```

3. Boot the system.

   At the MPE prompt, run **sysgen** and start the io section:

   ```
   : sysgen
   SYSGEN version E . . .
   sysgen> io
   ** IO configurator commands **
   ```

4. If not already configured, configure the differential card and the pseudo/target level of the SCSI path:

   ```
   io> apath 10/4/4 id=HP28696A
   io> apath 10/4/4.0 id=pseudo
   io> apath 10/4/4.1 id=pseudo
   io> apath 10/4/4.2 id=pseudo
   io> apath 10/4/4.3 id=pseudo
   io> apath 10/4/4.4 id=pseudo
   ```

5. Configure the robotic transport/"picker" and DLT tape drives. Use one of the following IDs:

   – HPC1194F (for robotics and DLT and STK libraries)
   – DLT7000
   – DLT4000
   – COMP3840

   For example:

   ```
   io> adev 30 id=HPC1194F path=10/4/4.0.0

   io> adev 31 id=DLT7000 path=10/4/4.1.0 mode=autoreply

   io> adev 32 id=DLT7000 path=10/4/4.2.0 mode=autoreply

   io> adev 33 id=DLT7000 path=10/4/4.3.0 mode=autoreply

   io> adev 34 id=DLT7000 path=10/4/4.4.0 mode=autoreply
   ```

6. Verify the bindings between the PATH, LDEV number, ID, PMGR (device drivers), and LMGR attributes for each device configured.

   a. Verify the binding for the device adapter (the fw/differential dam):

   ```
   io> lpath 10/4/4

   PATH: 10/4/4 LDEV:

   ID: HP28696A TYPE: DA

   PMGR: FWSCSI_DAM PMGRPRI: 6

   LMGR: MAXIOS: 0
   ```

   Repeat this verification step for lpath 10/4/4.1, 4.2, 4.3, and 4.4.

   b. Verify the binding for the targets (the transparent dm):

   ```
   io> lpath 10/4/4.0

   PATH: 10/4/4.0 LDEV:

   ID: PSEUDO TYPE: DA

   PMGR: TRANSPARENT_MGR PMGRPRI: 6

   LMGR: MAXIOS: 0
   ```

   Repeat this verification step for lpath 10/4/4.1, 4.2, 4.3, and 4.4.

   c. Verify the binding for the picker (the pass-through driver):

   ```
   io> lpath 10/4/4.0.0

   PATH: 10/4/4.0.0 LDEV: 30

   ID: HPC1194F TYPE: MOSAR_AC

   PMGR: MO_SCSI_PTHRU_DM PMGRPRI: 10

   LMGR: LOGICAL_DEVICE_MANAGER MAXIOS: 0
   ```

   Repeat this verification step for lpath 10/4/4.1, 4.2, 4.3, and 4.4.

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d. Verify the binding for the tape drives (the differential tape dm):

```
io> lpath 10/4/4.1.0
PATH: 10/4/4.1.0 LDEV: 31
ID: DLT7000 TYPE: TAPE
PMGR: SCSI_TAPE2_DM PMGRPRI: 10
LMGR: LOGICAL_DEVICE_MANAGER MAXIOS: 0
```

Repeat this verification step for lpath 10/4/4.2.0, 4.3.0, and 4.4.0.

e. Verify the ldev specifications:

```
io> ldev 30/34
LDEV: 30 DEVNAME: OUTDEV: 0 MODE:
ID: HPC1194F RSIZE: 128 DEVTYPE: MOSAR_AC
PATH: 10/4/4.0.0 MPETYPE: 24 MPESUBTYPE: 4
CLASS:
LDEV: 31 DEVNAME: OUTDEV: 0 MODE:
ID: DLT7000 RSIZE: 128 DEVTYPE: TAPE
PATH: 10/4/4.1.0 MPETYPE: 24 MPESUBTYPE: 8
CLASS: TAPE
...
LDEV: 34 DEVNAME: OUTDEV: 0 MODE:
ID: DLT7000 RSIZE: 128 DEVTYPE: TAPE
PATH: 10/4/4.4.0 MPETYPE: 24 MPESUBTYPE: 8
CLASS: TAPE
```

7. Save the configuration changes as follows:

a. Hold the configuration changes:

```
io> hold
```

b. Exit the io section:

```
io> exit
```

c. If you have followed the local convention for backing up the configuration file, keep the changes:

```
sysgen> keep
keeping to group CONFIG.SYS
```

⚠ ————————————————————

Important: Check with system management to make sure you can keep the changes to the configuration file.

————————————————————

```
Purge old configuration (yes/no)? y
```

d. Exit sysgen and reboot according to local convention:

```
sysgen> exit
```

Creating the Device Files Using the mknod Utility

An important final step in the autochanger installation is creating the device files required to use the autochanger. Again, you need the SCSI addresses previously selected for the autochanger.

To create the device files to bind the LDEV numbers to the POSIX device special files, follow these steps:

1. Create the robotics/"picker" device file as follows:

    > **mknod/dev/sjid1u1 c 0 30**

2. Create the tape device files as follows:

    > **mknod /dev/tape31 c 0 31**

    > **mknod /dev/tape32 c 0 32**

    > **mknod /dev/tape33 c 0 33**

    > **mknod /dev/tape34 c 0 34**

Where *30*, *31*, *32*, *33*, and *34* are the LDEV numbers you assigned in sysgen.

Configuring Tape Devices to Accept Data

To configure tape devices to accept data, use one of the following procedures:

*   At the MPE prompt, enter the following command for each tape device:

    : **accept data *ldev number***

    For example:

    > **accept data 31**

    > **accept data 32**

    > **accept data 33**

    > **accept data 34**

*   Place the **accept data** command in the MPE startup file *SYSSTART.PUB.SYS.*
*   Place the **accept data** command in the NetWorker startup file *JNSRSTRT. NETWRKR.SYS.*

Note: The **accept** command is executable only from the console, unless distributed to users with the **allow** command.

Configuring and Operating NetWorker Autochanger Support

This section provides information on how to configure and operate NetWorker autochanger support. Much of the information is copied from the *Legato NetWorker Administrator's Guide, UNIX Version.* The commands have been modified to use the MPE program names. Refer to the chapter on Device and Media Management in the *Legato NetWorker Administrator's Guide* for your NetWorker server platform for additional information pertinent to all backup devices. The following topics are addressed in this section:

Overview

The NetWorker software displays the term "jukebox" to refer to an autochanger. The term "autochanger" refers to a variety of robotic libraries, including carousel, library, near-line storage, datawheel, and autoloader.

Autochangers automate the task of loading, mounting, and labeling backup media. Before NetWorker can back up data to an autochanger, you must:

- Connect and configure the autochanger to the NetWorker storage node machine.
- Install and enable the NetWorker storage node software and device drivers.
- Use the **JBCONFIG** program to configure your autochanger.
- Enable the NetWorker Autochanger Module.
- Load and label your volumes.

You determine most of the autochanger configuration when you run the **JBCONFIG** program. After you complete the configuration tasks, you can change the attributes of the autochanger in the Jukeboxes resource.

Important: You cannot add or create autochanger resources using the NetWorker Administrator program. You can only modify autochangers previously installed and configured using the **JBCONFIG** program.

If you want to install and use additional autochangers for backups with your NetWorker storage node machine at a later time, you must purchase and enter additional enabler codes to allow NetWorker to use the additional autochangers.

You use the NetWorker Administrator program (**NSRADMIN** or **JBCONFIG**) to modify the configuration of an autochanger or an autochanger device, and remove an autochanger from the list available for use by NetWorker.

The **nsrd** daemon must be running on your NetWorker server before you start the **JBCONFIG** program.

Testing the Autochanger Connection

To use an autochanger for NetWorker storage management, you must first use the **JBEXER** command to test that the device software you installed has been suitably configured for use with NetWorker.

To test the autochanger connection, follow these steps:

1. Become MANAGER.SYS on the NetWorker storage node.

2. Insert two volumes, one each into the first and last slots of the autochanger. Make sure that the drives are empty and that all drive doors are closed.

3. Enter the **JBEXER** command at the CI prompt; specify the control port and the device type.

    The control port for SCSI autochanger models is typically expressed in the format */dev/sjid1u1,* as in the above example. You can obtain the exact control port pathname from the response displayed by the **JBCONFIG** command script.

    For example, the following command runs the **JBEXER** program on the Quantum DLT/Digital DLT autochanger detected by the **JBCONFIG** script:

    ```
    : JBEXER;INFO="-c /dev/sjid1u1 -m "Quantum DLT/Digital DLT"
    ```

Note: Make sure that no NetWorker processes are running on the storage node when running the **JBEXER** utility.

See "Appendix B: Command Line Reference" of the *Legato NetWorker Administrator's Guide, UNIX Version,* or refer to the **jbexercise(1m)** man page for additional information on the command options available for the **JBEXER** command.

Configuring the Autochanger

Follow the instructions in this section to configure and test the device driver software on a NetWorker storage node with a SCSI autochanger attached.

To configure an autochanger, follow these steps:

1. Become MANAGER.SYS on the NetWorker storage node.

2. Enter the **JBCONFIG** command.

    The following example shows the responses to configure an SJI autochanger:

    ```
    : JBCONFIG

    What kind of Jukebox are you installing? [1]

    Select the manufacturer of your jukebox:

    1) ADIC

    2) ATL

    3) BoxHill

    4) Breece Hill

    5) EMASS

    6) Exabyte

    7) Hewlett-Packard

    8) MaxOptix
    ```

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```
9) Overland Data

10) Philips

11) Qualstar

12) Quantum

13) SONY

14) StorageTek

15) Sun

16) Other

Choice? 14
```

Enter the number corresponding to the type of jukebox you are installing:

```
1) STK 9714

2) STK 9730

3) STK 9710

4) STK 9708/LS-380L

5) STK 9704/LS-340L

6) STK 9709/ACL5480

7) ACL 2640

Choice? 3
```

Installing an 'STK 9710' jukebox.

Name you would like to assign to the jukebox device? **jboxstk9710**

Pathname of the control port for the jukebox device? /dev/stk9710diff [**Return**]

Do you want automated device cleaning support enabled? (yes/no) **n**

Enter pathname of media drive 1 /dev/tape41: ? [**Return**]

This media device has not been configured yet. Please select a media device type for /dev/tape41.

```
1) 3480

2) 3570

3) 4890

4) 4mm

5) 4mm 4GB

6) 4mm 8GB

7) 8mm

8) 8mm 5GB

9) 9490

10) 9840

11) dlt
```

```
12) dlt7000

13) tz85

14) tz86

15) tz87

16) tz88

17) tz89

18) himt

19) qic

20) SD3

21) file

22) logical

23) optical

Choice? 11

Enter pathname of media drive 2 /dev/tape42: ? [Return]

This media device has not been configured yet. Please select a
media device type for /dev/tape42.

1) 3480

2) 3570

3) 4890

4) 4mm

5) 4mm 4GB

6) 4mm 8GB

7) 8mm

8) 8mm 5GB

9) 9490

10) 9840

11) dlt

12) dlt7000

13) tz85

14) tz86

15) tz87

16) tz88

17) tz89

18) himt

19) qic

20) SD3

21) file
```

3

```
22) logical

23) optical

Choice? 11

Your jukebox has a bar code reader.

Do you want bar code reader support enabled? (yes/no) y

Do you want volume labels to match bar code labels? (yes/no) y

Jukebox has been added successfully
```

Repeat this step for the remaining devices, for example /dev/tape 43.

When you use the **JBCONFIG** program to configure an autochanger, NetWorker creates a new resource with the name you specified. You can view the new resource in the Jukeboxes resource in the NetWorker Administrator program. Refer to the online help or the **nsr_jukebox(5)** man page for details on the attributes of the Jukeboxes resource.

Enabling and Registering the Autochanger Software Module

After you install, configure, and test the autochanger, enter the enabler code for the NetWorker Autochanger Software Module according to the instructions on your enabler certificate. Be sure to register and authorize the Autochanger Software Module, or the software disables itself 45 days after you enter the enabler. Refer to "Enabler Code Entry" in the *Legato NetWorker Administrator's Guide, UNIX Version,* for further information.

If you install additional autochangers at a later time, you must enable and register each additional Autochanger Software Module you purchase. You must also configure and test the driver software for the new autochanger. You only need to reinstall the NetWorker device drivers to add an additional autochanger if you removed the device driver software after the original installation.

Remote Autochanger Management

Autochangers that are connected to storage node machines require a few additional configuration and management steps.

You can control most operations on remote autochanger devices from the NetWorker Administrator program. But for some remote autochanger operations, such as, reset, you must use the **NSRJB** or **JBCONFIG** command on the storage node machine. You can issue the commands as MANAGER.SYS, either from the local machine or through a remote login session.

After you install the storage node binaries on the storage node machine, define the storage node's devices. The method for defining devices is described in "Remote Device Configuration" in the *Legato NetWorker Administrator's Guide, UNIX Version.* An overview is provided here.

When you add a remote autochanger device:

1. Add the storage node's hostname to the Administrator attribute in the NSR resource (Server window in the NetWorker Administrator program) in the following form:

    `manager.sys@storage-node-hostname`

2. Run the **JBCONFIG** program on the storage node machine to define each device in the autochanger. Refer to "Appendix B: Command Line Reference" of the *Legato NetWorker Administrator's Guide, UNIX Version*, or refer to the **jbexercise(1m)** man page for additional information on the command options available for the **JBEXER** command.

    The device names for remote devices begin with a prefix of "rd=" and the name of the storage node machine. For example, *rd=omega:/dev/tape31* is a device called */dev/tape31* on a storage node machine called *omega*.

Autochanger Configuration and Management

After you install and test your autochanger on a storage node machine, use the instructions in this section to manage the devices and media in your autochangers.

Adding More Autochanger Devices

To add more devices to an autochanger:

1. Define the new devices in the Devices resource so the NetWorker storage node recognizes the added devices.

2. Enter the pathnames for the autochanger devices in the Jukeboxes resource so NetWorker recognizes that the new devices belong to the autochanger.

Important: After you add a device pathname to the Devices resource, you must also add it to the Devices field in the Jukeboxes resource. NetWorker associates the device in the autochanger with the autochanger name. Refer to the NetWorker online help for a description of the Devices resource and how to use it.

If an autochanger has more than one device, first list the device pathnames in the same order as their physical location in the autochanger. If you are unsure of their order, refer to the autochanger hardware manual or refer to the HP MPE documentation.

Auto Media Management with Autochanger Devices

The auto media management feature further automates the backup procedure. It frees you from the task of prelabeling volumes before backup. When you enable the auto media management attribute in the Jukeboxes resource, NetWorker assumes that the volumes loaded in the autochanger can be handled exclusively as NetWorker media. Backup volumes that appear unlabeled are considered blank and are automatically labeled, mounted, and overwritten with new data. NetWorker only uses volumes that it considers unlabeled if it cannot locate a writable volume or a volume ready for recycling.

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NetWorker does not recognize the following volume labels and considers these volumes unlabeled and available for use:

- Volumes without a label
- Volumes labeled with something other than a NetWorker label
- Volumes with NetWorker labels that were written in a density different from the device in which it is currently loaded. For example, if you performed NetWorker backups on an older 8 mm tape drive, a newer 8 mm tape drive might not be able to read the volumes from the older device because a different density was used to write the data.

Important: Be careful about sharing NetWorker volumes between different backup devices if you have auto media management enabled. You can potentially relabel and overwrite valuable data. If you place or store other volumes you do not want NetWorker to use in the autochanger, place them in slots that are not included in the available slot range assigned for NetWorker to use.

The auto media management attribute is located in both the Jukeboxes and Devices resources. For autochangers, you only need to enable the Auto Media Management attribute in the Jukeboxes resource. NetWorker does not allow you to enable Auto Media Management in the Devices resource if the device is located in an autochanger.

If you back up to a stand-alone device and want to use the Auto Media Management feature, refer to "Stand-Alone Device Configuration" in the *Legato NetWorker Administrator's Guide, UNIX Version.*

Cleaning Cartridge Use and Management

Maintaining a backup device in good working order requires periodic cleaning. NetWorker provides automatic cleaning of devices located in an autochanger. NetWorker does not support automatic cleaning for stand-alone devices.

The Legato NetWorker Device Supplement contains a list of currently supported autochangers for which NetWorker automatically recognizes cleaning cartridges.

Use both the Jukeboxes and Devices resources to make the necessary selections for automatically cleaning your autochanger devices.

The choices specific to the autochanger appear in the Jukeboxes resource, where you enable and disable the automatic cleaning feature. Select the appropriate cleaning slots for the cartridges.

The functions specific to the devices located in the autochanger appear in the Devices resource. You are notified when a device needs cleaning and of the date the device was last cleaned, and can decide how often a device should be cleaned.

NetWorker only cleans devices before mounting or after unmounting a volume in a device to ensure that there is no interference with other autochanger operations.

The NetWorker cleaning cartridge support provides notification messages to inform you of cleaning cartridge operations, as shown in Table 1.

Table 1. Auto Clean Notifications

Notification Message	Meaning
Device cleaning required	The Auto Clean attribute is disabled and the device needs to be cleaned.
Device cleaned	The Auto Clean attribute is enabled and the device has been cleaned.
Cleaning cartridge required	The Auto Clean attribute is enabled and there are no usable cleaning cartridges available.
Cleaning cartridge expired	The cleaning cartridge has been used the specified number of times and needs to be replaced.

Check the documentation from your autochanger manufacturer for recommendations on the frequency and cleaning methods for your autochanger devices.

Using a Non-Default Slot for the Cleaning Cartridge

To use a non-default slot for the cleaning cartridge, follow these steps:

1. Insert the cleaning cartridge in the slot you select.

2. In the Jukeboxes resource, find the Default Cleaning attribute and write down the number of uses left on the cleaning cartridge. To view the Default Cleaning attribute in the NetWorker Administrator program, display the Jukeboxes window in details mode.

3. Specify the slot number you want to use for the cleaning cartridge in the Cleaning Slots attribute, and set the Auto Clean attribute to Yes.

4. Change the Available Slots attribute to reflect the range of slots available for data volumes.

    If the slot for your cleaning cartridge is not the first or last slot in the autochanger, you must specify two ranges of slots in the Available Slots attribute. This is because the inventory of the autochanger must be performed in two steps, once for each range of slots.

    For example, if the autochanger contains 11 slots and slot 6 is used for the cleaning slot, specify

    ```
    1-5
    ```

    ```
    7-11
    ```

    on separate lines in the Available Slots attribute, or use the following syntax with **NSRADMIN**:

    ```
    available slots: 1-5, 7-11;
    ```

3

5. At the command line, enter the following command:

    : **NSRJB;info="-U** *uses* **-j autochanger -S** *slot***"**

    – where *uses* is the number of uses left on the "Default Cleaning" field (the number you wrote down in Step 2) and *slot* specifies the slot you now use as the cleaning slot.
    – You can omit the **-j** option if there is only one autochanger

Every time you replace the cleaning cartridge in the autochanger, you must run the **NSRJB** program to specify the number of uses left.

Important: If your autochanger does not support the element status or barcode labeling option, you must issue the command shown in Step 5 to direct the autochanger to add the cleaning cartridge to its inventory.

Cartridge Access Port

A Cartridge Access Port (CAP) enables you to deposit and withdraw volumes in an autochanger without opening the door to the autochanger. Each time you open the door of an autochanger to add or remove media, you invalidate the status of the autochanger. You then need to reinventory the contents of the autochanger so that NetWorker can track the backup media. The inventory process can take a long time to complete.

This CAP feature is useful because you can add (deposit) and remove (withdraw) volumes in an autochanger without having to reinventory the autochanger.

When you use the CAP to add or remove volumes, NetWorker does not automatically take inventory, read barcode labels, or locate empty slots in the autochanger. Use the autochanger inventory feature and Jukeboxes resource for these tasks.

Depositing a Volume

To use the CAP to deposit a volume, follow these steps:

1. Become MANAGER.SYS on the NetWorker storage node machine.

2. Press the button on the front of the autochanger to move the cartridge holder forward and open the CAP.

3. Place the volume in the holder and press the button again to move the media into the autochanger and close the CAP.

4. Enter the **NSRJB** command at the system prompt. Replace *slot* with the slot number for the volume and *volume* with the label name of the volume:

    : **NSRJB;info="-d -S** *slot volume***"**

    If you do not specify a volume name with the **NSRJB** command, NetWorker marks the slot with a "-*" to indicate that the volume in that slot is unknown.

5. Inventory the slot with the following command:

    : **NSRJB;info="-I -S** *slot***"**

6. To verify that the volume was deposited in the correct slot, use NetWorker to mount the volume.

Withdrawing a Volume

To use the CAP to withdraw a volume from a specific slot in the autochanger, follow these steps:

1. Become MANAGER.SYS on the NetWorker storage node machine.

2. Enter the **NSRJB** command at the system prompt. Replace *slot* with the slot number for the volume and *volume* with the label name of the volume:

   `: NSRJB;info="-w -S slot volume"`

3. When the volume reaches the CAP, press the button to open the CAP.

4. Remove the volume and close the CAP.

Volume Management

The topics in this section provide instructions for several volume management tasks.

- To perform volume management tasks, use the NetWorker Administrator program (**NWADMIN**), the **NSRADMIN** interface, or the **NSRJB** program.
- For specific instructions on how to use the windows in the NetWorker Administrator program, refer to the online help.
- For details on the **NSRADMIN** and **NSRJB** commands, refer to the **nsradmin(1m)** and **nsrjb(1m)** man pages. The **NSRJB** command is also described in "Appendix B: Command Line Reference" in the *Legato NetWorker Administrator's Guide, UNIX Version.*

Mounting a Volume in an Autochanger

To mount a volume in an autochanger, follow these steps:

1. Select the autochanger device in the Devices attribute.

2. Mount the device, or enter the following command at the CI prompt:

   `: NSRJB;info="-l slot"`

3. Place an adhesive label on the outside of the autochanger to identify its device pathnames. When you use more than one autochanger, this practice is especially useful to remind you which device pathnames belong to the autochanger.

Labeling a Volume in an Autochanger

Because NetWorker takes some time to label the volumes in an autochanger, you might want to perform the volume label process when you do not need to back up or recover files.

To label a volume in an autochanger, follow these steps:

1. Select a backup device in an autochanger from the Devices attribute.

2. Select a label template in the Pools resource and then verify that there are volumes in the autochanger.

3. Start the volume label operation; at the command line, enter the following command:

   `: NSRJB;info="-L"`

3

NetWorker starts to label the media in the autochanger with the label displayed in the Starting With attribute. The First Slot and Last Slot attributes determine the range of slots containing volumes that NetWorker labels.

Consider the following conventions when labelling volumes:

- If you label a specific range of volumes, the name in the Starting With attribute must match the label template.
- If you label a single volume, you can use any name; it does not have to match the label template. To label a single volume, put the same value in the First Slot and Last Slot attributes.
- When a valid NetWorker label already exists on the media that you are trying to label, NetWorker displays a confirmation message to prevent you from accidentally relabeling the media.
- When a volume is relabeled, you cannot recover its contents under the previous label. When you select OK to confirm, the volumes in the slots are loaded, labeled, and unloaded.

Important: Before reloading an autochanger with new volume, always remove the existing volumes. This will prevent you from accidentally relabelling the existing volumes.

For more information on labeling volumes, refer to "Storage Management Operations" in the *Legato NetWorker Administrator's Guide, UNIX Version.*

How NetWorker Uses Barcode Labels with Autochangers

The use of external barcode labels to label media provides two distinct advantages:

- Significantly speeds up volume inventory
- Provides improved accuracy for internal volume labels

With barcode labels, the inventory operation is fast and efficient because the autochanger does not have to load the volumes into the device. Instead, the autochanger scans the external barcode labels with an infrared light while the volumes remain in their slots. Performing an inventory with barcode labels greatly reduces the time it takes to locate a volume or determine the contents of a volume.

Barcode labels also provide greater accuracy because the labels are attached to the media prior to being loaded and scanned in the autochanger. After the autochanger scans the barcode label, NetWorker records and tracks the label in the media database.

NetWorker only uses barcode labels to inventory volumes. NetWorker uses the internal volume label (usually created with a label template) to identify the volumes required for backup and recovery. However, NetWorker displays both the barcode label and the volume label in the pending messages, and the Volumes resource contains both the volume label and its associated barcode label.

When to Use Barcode Labels

Consider the following conventions when using barcodes:

- If you have volumes that you use often for recovery or for overwriting with new data, it is beneficial to label them with barcode labels. When your volumes are labeled with barcodes, you save hours of time when you inventory your volumes.

- If your existing volumes are stored in a vault or offsite for long periods at a time, you do not have to label existing volumes with barcode labels. This is because you do not inventory these volumes often, if ever.

If you decide to use barcode labels on your existing volumes, follow these steps:

1. Apply the barcode labels to the existing volumes.

2. Load and mount each volume individually so that NetWorker can match the barcode label to the existing volume label.

Types of Barcode Labels

You can purchase a variety of barcode labels from a third-party vendor. You can choose numeric, alphanumeric, or a special combination of numbers and characters to meet your labeling needs. You can even order barcode labels that match your current volume labeling scheme.

If you label your volumes with the storage node name and an extension such as "001," order a range of labels starting with "storage node_name.001" and ending with "storage node_name.100." Labeling instructions for barcode labels are usually provided with your autochanger hardware documentation. If you have questions about barcode labels, contact the hardware manufacturer.

Using a consistent labeling scheme helps you better organize and track your volumes. It also aids the inventory process if all the volumes, rather than a limited number of them, use barcode labels.

When NetWorker relabels volumes automatically, it reuses the original volume label name. You can only change the label name if you relabel the volumes manually. NetWorker scans the barcode label during the labeling process and updates the media database with the new volume name and its associated barcode label.

Autochanger Inventory

If the autochanger inventory becomes outdated, either by rebooting your system or by opening the autochanger door, you can update the information about the autochanger's contents by performing an inventory.

To update the inventory of the autochanger contents, use one of the following methods:

- Log on as MANAGER.SYS, at the shell prompt or CI and issue the **NSRJB** -**E** -**I** command.

- Open the NetWorker Administrator program and use the graphical Inventory command.

3

Labeling an Autochanger Volume with Barcodes

A volume must have a volume label, but it does not require a barcode label. Use the Jukeboxes resource to associate barcode labels with your volumes.

To label NetWorker volumes with barcode labels, follow these steps:

1. Apply the barcode labels to your volumes.

2. Place the volumes with the barcode labels in the autochanger.

3. Display the Jukeboxes resource.

4. Set the Barcode Reader and Match Barcode Labels fields to Yes.

5. Label the volumes using either the NetWorker Administrator program or
   `: NSRJB;info=" -L"`

![warning icon]

Important: Do not use identical barcode labels for any of your NetWorker volumes. Using identical labels defeats the purpose of using barcode labels. If you try to label a second volume with an identical barcode label and you enabled Match Barcode Labels in the Jukeboxes resource, NetWorker displays an error message and does not allow you to label the second volume. To correct the problem, apply a different label and begin the labeling process again.

If you choose not to match the volume label to the barcode label, you should create and attach volume labels to the outside of your media.

If you choose not to have the labels match, label the volumes in this manner:

1. Attach all the barcode labels to the media, then load the volumes in the autochanger.

2. In the Jukeboxes resource, set the Barcode Reader attribute to Yes, and set the Match Barcode Labels attribute to No. If you set both Barcode Reader and Match Barcode Labels to Yes and you forget to attach a barcode label, you receive an error message that says there is no barcode label for that volume.

3. Begin the labeling process. NetWorker uses the next available label from the label template for the volume name. NetWorker labels the volumes and records both labels in the media database.

4. After NetWorker completes the labeling process, open the Volumes resource to determine the volume label and barcode label for each volume. Create your own volume labels to attach to the volumes.

Use the information in the Volumes resource to match the correct volume labels to the barcode labels. This is the easiest way to make sure that you attach the correct volume labels to the volumes with barcode labels.

How the Inventory Process Works

When NetWorker labels the contents of an autochanger, it registers the location of the volumes in the autochanger slots when it assigns the volume label. As long as you do not change the volumes in the autochanger after labeling them, NetWorker can access the volumes because each volume label is assigned to a specific slot.

However, if you change the contents of the autochanger without performing the labeling process, or if you move volumes into new slots, you must inform NetWorker that the autochanger now holds a different set of labeled volumes or that the volumes are in a different order. This is called taking inventory.

When you inventory the volumes in the autochanger, NetWorker reads the label of each volume and records its slot number. For example, if you have more than one job pack for an autochanger, and you do not label the volumes in the new job pack, you must take inventory each time you remove one job pack and load another one into the autochanger.

NetWorker provides the capability of reading barcode labels to speed up the inventory process. We strongly recommend that you use barcode labels if you have a large number of volumes or change your autochanger contents often. Refer to "How NetWorker Uses Barcode Labels with Autochangers" in the *Legato NetWorker Administrator's Guide, UNIX Version,* for more information.

Inventory Volumes in an Autochanger

To inventory volumes in an autochanger when you have moved or added volumes, you can either start the inventory operation in the NetWorker Administrator program or at the command line as follows:

```
: NSRJB;info="-Iv"
```

After completing an inventory, NetWorker registers the contents of the autochanger and then proceeds with its network-wide backup and recover services.

Determining Which Volumes Are Used for Backup

The Available Slots attribute enables you to control which volumes NetWorker uses for backing up data. NetWorker uses all of the volumes in the autochanger for recoveries. However, you can control which volumes NetWorker automatically selects for backups by designating a range of available slots in the autochanger.

For example, you might designate slots 1 through 5 for your NetWorker backups in an autochanger that contains 10 slots. The entries can be a range of slot numbers or a single slot number.

With two-sided media, the number of available slots is always half the number of labels (or sides of the optical disks). For example, if you have 32 optical disks, labeled atlas.001.a to atlas.032.b, you have 64 labels (and 64 sides). However, the number of available slots is 32.

Important: Make sure you place volumes in all the available slots of the autochanger so NetWorker can proceed uninterrupted with an automatic backup.

3

Checking Autochanger Notifications

NetWorker uses e-mail to send notices about NetWorker events. The software uses the three Tape Mount Request notifications to inform you that the autochanger needs attention, as listed below:

- *Tape Mount Request 1* - displays a pending request for mounting a backup volume. In most cases, the server is waiting for an operator to perform a routine task. This notification is undefined so you can create your own notification message.
- *Tape Mount Request 2* - sends a request for mounting a backup volume, using a priority of critical. This message identifies that the sever has detected an error that should be fixed.
- *Tape Mount Request 3* - logs a message to the sys.log file for mounting a backup volume, using a priority of alert. This message requires immediate attention.

The following situations also require attention:

- The volumes in the autochanger are 90% full.
- The autochanger needs more volumes to continue.
- The autochanger has a mechanical problem.
- The autochanger device needs cleaning.
- The cleaning cartridge in the autochanger needs replacing.

The Notifications resource contains tape mount and device cleaning request notifications pertaining to autochanger operations. Refer to "Preconfigured Notifications" in the *Legato NetWorker Administrator's Guide, UNIX Version,* for more information.

If the volume is loaded in the autochanger, NetWorker can automatically mount the correct volume so that the recovery proceeds. If NetWorker requires volumes for a recovery that are not loaded in the autochanger, you receive a notice in the Pending window of the NetWorker Administrator program.

After you correct an autochanger problem, you might need to mount a volume before continuing to back up or recover files. Check the Pending window in the NetWorker Administrator program for messages.

Suggestions for Operating Autochangers

This section provides additional suggestions to help you use your autochanger and backup media effectively and reliably.

Recycling Versus Adding More Backup Volumes

NetWorker can save files on volumes marked "appen" (appendable) in the Volumes resource. If the volumes inside the autochanger are marked full, they cannot receive additional backups.

You can perform one of the following options if a volumes is marked "full":

- If you need to keep the volumes for long-term storage, remove the full volume and replace it with new media.

- If you do not need the data on the full volume, you can manually change the mode to "recyc" in the Volumes resource. NetWorker overwrites the data with new backups, but maintains the existing labels. This is the only instance in which you do not need to relabel a volume to make it eligible to be overwritten with new data.

The mode of a volume is automatically changed to recyclable when all the save sets on the volume have passed the time period specified by its retention policy.

There are advantages to both recycling media and adding more media to a pool. By recycling, you reuse the same volumes and do not add new volumes to the pool. However, the media may wear out over time and have a higher failure rate.

On the other hand, if your site requires that you maintain the backups in storage for a certain period of time, then you might have to add more media to the volume pool instead of recycling it. For example, an autochanger might need new volumes every three months if your company policy is to maintain the backups for a year. In this case, you have to keep adding new media to the pool until you can recycle the volumes that contain expired or old backups.

Using Pools with an Autochanger

If you plan to have full and nonfull backups, we recommend that you estimate the number of volumes needed for your full backups and assign them to the Full pool. This ensures that your full backups are in a consecutive range of slots in the autochanger, which makes it easy for you to remove all the volumes at the same time.

Calibrating the Devices

Check the autochanger manufacturer's documentation for information about the frequency and method for calibrating the loading mechanism for the autochanger device.

Moving Media

Always use NetWorker to move the media inside an autochanger. If you physically move the media, the autochanger inventory becomes outdated. If this occurs inadvertently, follow these steps:

1. Reset the autochanger:

   : **NSRJB;info="-H"**

2. Inventory the autochanger contents:

   : **NSRJB;info="-I -E"**

Refer to "Appendix B: Command Line Reference" in the *Legato NetWorker Administrator's Guide, UNIX Version,* and the **nsrjb** man page for details on the **NSRJB** program.

Chapter 4: Enabling Networker

How to Enable and Register NetWorker

The enabler certificate you purchased provides the enabler code you need to enter to use the NetWorker software permanently.

Using the Enabler Code

To enter the enabler code, follow these steps:

1. Become root on your NetWorker server.

2. Start the GUI version of the NetWorker Administrator program using the following command:

   ```
   # nwadmin &
   ```

3. Open the Server window. Fill in the name, address, phone, and e-mail information requested.

4. Open the Registration window and click the Create button.

5. Enter the enabler code in the Enabler Code field.

6. Print the enabler information sheet:

   a. Select the Tabular option from the View menu.
   b. Select Print from the File menu.

7. Register your software and fax or e-mail the output to Legato Customer Service at (*service@legato.com*).

After you enable the NetWorker software, you have 45 days to register the software. Legato returns a unique authorization code to you after receiving your completed registration form.

To permanently enable the NetWorker software, enter the authorization code in the Registration window.

4

Enabling NetWorker

To enable the NetWorker software, the specific process you follow depends on whether the NetWorker software you installed is for a new, updated, or evaluation version.

- If you have just purchased your *first* NetWorker product, an Enabler Certificate was sent separately from the product package. You need the enabler code on the certificate to enable and register the NetWorker product you purchased.

- If you purchased an *update* to your existing NetWorker software, use the enabler code provided in the letter you received that announced the updated software.

  - Generate a new copy of the information shown in the Registration window and fax or mail the form to Legato Customer Service.

  - A new authorization code that permanently enables your updated NetWorker software will be returned for you to enter in the Registration window.

- If you purchased an *upgrade* to your existing NetWorker software, an Enabler Certificate was sent separately from the product package. You need to enter, register, and authorize this new enabler code for the additional functionality you purchased.

- If you already have the NetWorker server software enabled and want to *evaluate* any of the optional modules included with this software distribution:

  - Enter the evaluation enabler code (shown in Table • on page 54) for the product you want to evaluate. After entering the enabler code, you can evaluate the product for 45 days.

  - The evaluation enable codes cannot be entered on more than one computer on the network. If you enter the code on more than one computer on the same network, a copy violation error occurs and the NetWorker server software is disabled.

- At the end of the evaluation period, you *must* purchase an enabler code and register the product to authorize it and to use the feature permanently.

Table 2. Evaluation Enabler Codes

NetWorker Product	45-Day Evaluation Enabler Code
Unlimited Slot Jukebox Module	131eea-298758-cb9f4a
Storage Node	66e3e8-3c92b3-44832c
100 Client Connections	8c8e0e-2b00d1-4023c5
Archive	e76c69-a87b2c-3f8fbe
ClientPak for MPE	adaa2f-6b49f2-3f9bf7

- If you installed the NetWorker server software for *evaluation* purposes, you have 30 days to use the software before you must purchase and enter an enabler code.

  - You do not need to enter any evaluation enabler codes to evaluate any of the optional NetWorker software products within the 30-day period.

  - To use the NetWorker software and options beyond the 30-day trial evaluation, you must purchase an enabler code for the software you want to use.

  - At the end of the 30 day evaluation period, if you have not purchased and entered an enabler code, you will be unable to continue to back up data, but you can recover the data backed up during the evaluation period.

Important: If you move the NetWorker software from one computer to another or change the network address of a computer after the software is installed, you will need to obtain new authorization code(s). If you need to move your software or reconfigure your network, first contact Legato Customer Service to obtain a *Host Transfer Affidavit* to avoid an interruption in your scheduled backups.

Testing Your NetWorker Installation

You should test NetWorker on your HP 3000 to make sure that the software is installed properly and that you can access the NetWorker server to back up, recover, archive, and retrieve files. Refer to the *Legato NetWorker User's Guide, MPE/IX Version,* for instructions on using NetWorker to back up, recover, archive, and retrieve files.

4

Appendix A: Common NetWorker Commands

This appendix contains a table of common NetWorker commands and includes instructions on how to display the man pages.

Common NetWorker Commands

Table 3 lists the commands used in the installation and configuration of the Legato NetWorker Client/Storage Node, MPE/iX Version.

Table 3. Common NetWorker Commands

MPE/iX Command	UNIX Manual Page	Description
JBCONFIG	**jbconfig**	Configures a jukebox (Media Changer Device) for a NetWorker server.
JBEXER	**jbexercise**	Tests the functionality of a jukebox.
JBINFO	**jbinfo**	Tests a jukebox for SJI compliance using a standard inquiry. It also performs medium transfers between tape drives and slots.
NSRIZE	**nsr_ize**	Installs and removes NetWorker
NSRJB	**nsrjb**	Manages jukeboxes for NetWorker servers.
NSRMMD	**nsrmmd**	The **nsrmmd** daemon provides RPC-based media multiplexing and demultiplexing service.
SCANNER	**scanner**	Directly reads NetWorker media, such as backup tapes or disks, to confirm the contents of a volume, extract a save set from a volume, or rebuild the NetWorker online indexes.
TAPEEXER	**tapeexercise**	Writes sample data to a tape, and tests to see if positioning and read operations perform as expected to the NetWorker server.

Displaying the Man Pages

You must display the man pages from the */SYS/NETWRKR* directory.

To display the man pages, follow these steps:

1. Change to the NetWorker directory:

    : **CHDIR /SYS/NETWRKR**

2. Enter the command to display the man page:

    : **NSRHELP** *man-page*

    For example, display the NetWorker man page for **nsr** as follows:

    : **NSRHELP nsr**

A