

Veritas NetBackup™ for Informix Administrator's Guide

for UNIX and Linux

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VERITAS™

Veritas NetBackup™ for Informix Administrator's Guide

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Veritas Technologies LLC
500 E Middlefield Road
Mountain View, CA 94043

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Introduction to NetBackup for Informix

This chapter includes the following topics:

- [Features of NetBackup for Informix](#)
- [About NetBackup for Informix](#)
- [About NetBackup for Informix terms](#)
- [Example NetBackup for Informix configuration](#)
- [About the Informix ON-bar utility and library](#)
- [How NetBackup for Informix works](#)

Features of NetBackup for Informix

[Table 1-1](#) shows NetBackup for Informix's main features and introduces some terms used in this documentation.

Table 1-1 NetBackup for Informix features and descriptions

Feature	Description
Media and device management	All devices supported by Media Manager are available to NetBackup for Informix.

Table 1-1 NetBackup for Informix features and descriptions (*continued*)

Feature	Description
Scheduling facilities	<p>NetBackup scheduling facilities on the master server can be used to schedule automatic and unattended Informix backups.</p> <p>This feature also lets you choose the times when these operations can occur. For example, to prevent interference with normal daytime operations, you can schedule your database backups to occur only at night.</p>
Multiplexed backups and restores	<p>NetBackup for Informix lets you take advantage of NetBackup's multiplexing capabilities. Multiplexing directs multiple data streams to one backup device, thereby reducing the time necessary to complete the operation.</p>
Transparent Informix and regular file system backup and restore operations	<p>All backups and restores run simultaneously and transparently without any action from the NetBackup administrator.</p> <p>The database administrator can run database backup and restore operations through NetBackup. An administrator or any other authorized user can use NetBackup to run database backups and restores.</p> <p>Alternatively, you can use the Informix ON-Bar utility as if NetBackup were not present.</p>
Sharing the same storage units used for other file backups	<p>It is possible to share the same devices and media used for other backups or to give Informix exclusive use of certain devices and media. NetBackup for Informix can use Media Manager, disk, and PureDisk storage units.</p>
Centralized and networked backup operations	<p>From the NetBackup master server, you can schedule database backups or start them manually for any client. The Informix databases can also reside on hosts that are different from the devices on which NetBackup stores the backups.</p>
Graphical user interfaces	<p>NetBackup provides the following graphical user interfaces for client users and administrators:</p> <ul style="list-style-type: none">■ NetBackup Administration Console■ Backup, Archive, and Restore user interface <p>A database administrator or NetBackup administrator can start backup or restore operations for Informix from the NetBackup graphical user interface on the master server.</p>

Table 1-1 NetBackup for Informix features and descriptions (*continued*)

Feature	Description
Parallel backup and restore operations	NetBackup for Informix supports the parallel backup and restore capabilities of Informix ON-Bar. For example, this permits the user to run more than one tape device at a time for a single Informix backup or restore, thereby reducing the time necessary to complete the operation.
Compression	Compression increases backup performance over the network and reduces the size of the backup image that NetBackup writes to the storage unit.

About NetBackup for Informix

NetBackup for Informix integrates the database backup and recovery capabilities of the Informix ON-Bar utility with the backup and the recovery management capabilities of NetBackup and its media manager.

This topic introduces NetBackup for Informix, and it explains how this agent relates both to the Informix ON-Bar utility and NetBackup.

About NetBackup for Informix terms

[Table 1-2](#) lists the terms that may be new to an Informix database administrator or a NetBackup administrator.

Table 1-2 Terminology

Term	Meaning
Informix ON-Bar utility	The Informix ON-Bar utility lets database administrators back up and restore Informix databases on UNIX systems. However, this utility does not directly manage storage devices and media. The Informix ON-Bar utility must be integrated with a media management system that can access devices and keep information about the media used in Informix database backups. NetBackup for Informix provides this media-management capability by integrating the utility with NetBackup.
<code>onbar</code>	More information about this command is available. The <code>onbar</code> command starts a backup or restore with the Informix ON-Bar utility. See the <i>IBM Informix Backup and Restore Guide</i> .

Table 1-2 Terminology (*continued*)

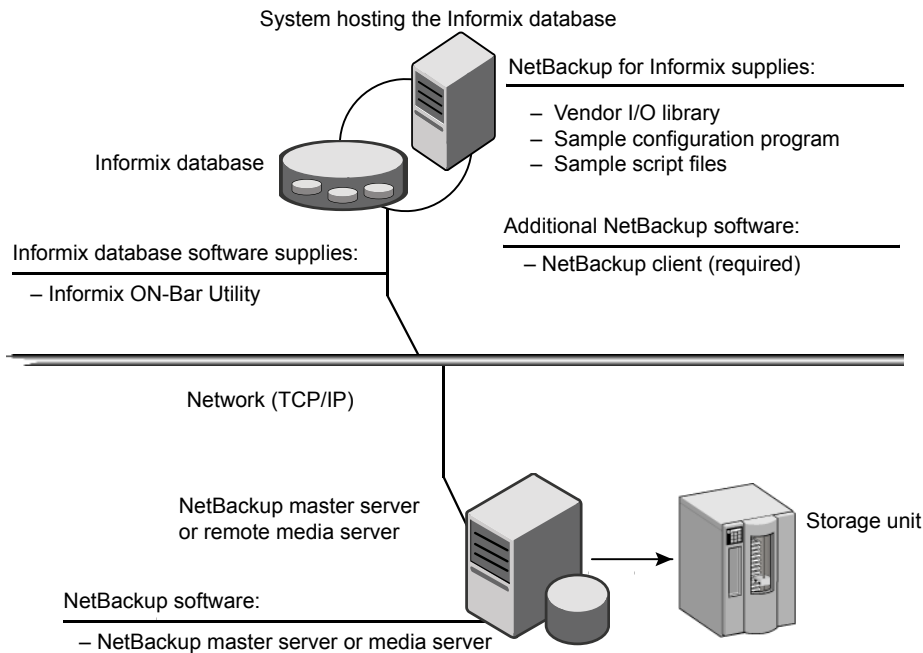
Term	Meaning
ON-Bar scripts	A Bourne-shell script that contains <code>onbar</code> commands.
<code>onmsmsync</code>	The <code>onmsmsync</code> utility is an Informix version XPS 8.x, IDS 9.x, and later feature that synchronizes the NetBackup catalog with the Informix backup catalog. The <code>onmsmsync</code> utility deletes images from both Informix backup catalogs and NetBackup catalogs. For more information, see your IBM Informix documentation.

Example NetBackup for Informix configuration

The server that hosts the Informix database must be a NetBackup client. It must have NetBackup for Informix and the Informix ON-Bar utility installed.

Figure 1-1 shows the major components in a NetBackup for Informix configuration.

Figure 1-1 Major components in a NetBackup for Informix configuration



About the Informix ON-bar utility and library

During a backup or restore, the Informix ON-Bar utility provides the interface to the databases and performs the actual extraction and insertion of data.

To start a database backup or restore, the database administrator runs a command called `onbar`. This command, which is part of the Informix ON-Bar utility, can be executed from the command line, from an ON-Bar script, or from an application such as NetBackup. An ON-Bar script includes the `onbar` command to be executed and defines the database objects to be backed up or restored.

During a backup or restore, the Informix ON-Bar utility controls the data streams going into or out of a database. To access the storage devices, this utility must be integrated with a media-management system such as the one provided by NetBackup and its Media Manager.

The `onbar` command is documented in the *IBM Informix Backup and Restore Guide*.

Instructions are available for how to find the supported Informix version level.

See [“Verifying the operating system and platform compatibility”](#) on page 13.

NetBackup for Informix has a special library that contains the functions necessary for the Informix ON-Bar utility to use NetBackup.

How NetBackup for Informix works

You can run an ON-Bar script in one of the following ways:

- Automatically, from the NetBackup scheduler
- From the NetBackup administration interface on the NetBackup master server
- From the command line on the NetBackup client

With the exception of the command-line method, a NetBackup process named `bphdb` starts the ON-Bar script on the client.

The following events occur for a backup:

- The `onbar` command starts the requested operation on the databases.
- If the process requires media to store backup data, `onbar` starts a user-directed backup by issuing a backup request.
- The NetBackup media server connects to ON-Bar through the NetBackup library on the client and transfers the database data to secondary storage.

A restore works in essentially the same manner except that `onbar` issues a restore request. This action causes NetBackup to retrieve the data from secondary storage and send it to NetBackup for Informix on the client.

The status for an ON-Bar operation is logged in the Informix `BAR_ACT_LOG`. A database administrator can use this log to determine if a backup or restore was successful.

NetBackup also logs status, but only for its own part of the operation. This debug log is located in the following directory:

```
/usr/opensv/netbackup/logs/infbsa
```

A database administrator cannot use NetBackup status to determine whether ON-Bar was successful because errors can occur in ON-Bar that do not affect NetBackup and are not recorded in its logs.

See [“About NetBackup for Informix scripts”](#) on page 27.

Installing NetBackup for Informix

This chapter includes the following topics:

- [Planning the installation of NetBackup for Informix](#)
- [Verifying the operating system and platform compatibility](#)
- [NetBackup server and client requirements](#)
- [Informix server software requirements](#)
- [About the license for NetBackup for Informix](#)
- [Specifying the Informix home path](#)
- [Adding new Informix instances](#)

Planning the installation of NetBackup for Informix

[Table 2-1](#) shows the major installation steps needed to run NetBackup for Informix.

Table 2-1 Installation steps for NetBackup for Informix

Step	Action	Description
Step 1	Verify the installation prerequisites.	See “Verifying the operating system and platform compatibility” on page 13. http://www.netbackup.com/compatibility See “NetBackup server and client requirements” on page 13. See “Informix server software requirements” on page 14.

Table 2-1 Installation steps for NetBackup for Informix (*continued*)

Step	Action	Description
Step 2	Verify that master server has a valid license for NetBackup for Informix and any NetBackup options or add-ons that you want to use.	See “ About the license for NetBackup for Informix ” on page 14.
Step 3	Specify the Informix home path.	See “ Specifying the Informix home path ” on page 14.
Step 4	Add a new database instance.	See “ Adding new Informix instances ” on page 15.

Verifying the operating system and platform compatibility

Verify that the NetBackup for Informix agent is supported on your operating system or platform.

To verify operating system and compatibility

- 1 Go to the following webpage:
<http://www.netbackup.com/compatibility>
- 2 In the list of documents, click on the following document:
[Application/Database Agent Compatibility List](#)

NetBackup server and client requirements

Verify that the following requirements are met for the NetBackup server:

- The NetBackup server software is installed and operational on the NetBackup server.
See the [NetBackup Installation Guide](#).
- Make sure that you configure any backup media that the storage unit uses. The number of media volumes that are required depends on several things:
 - The devices that are used and storage capacity of the media
 - The sizes of the databases that you want to back up
 - The amount of data that you want to archive
 - The size of your backups
 - The frequency of backups or archives

- The length of retention of the backup images
See the [NetBackup Administrator's Guide, Volume I](#).

Verify that the following requirements are met for the NetBackup clients:

- The NetBackup client software is installed on the computer that has the databases you want to back up.
If the database is clustered, you must use the same version of NetBackup on each node in the cluster.
- To use the new features that are included in NetBackup for Informix in NetBackup 8.1, you must upgrade your NetBackup for Informix clients to NetBackup 8.1. The NetBackup media server must use the same version as the NetBackup for Informix client or a higher version than the client.

Informix server software requirements

Verify the following regarding the Informix server software on the NetBackup server or client:

- Informix server software must be installed and operational.
- One or more Informix instances must exist.

See "[NetBackup server and client requirements](#)" on page 13.

About the license for NetBackup for Informix

The NetBackup for Informix agent is installed with the NetBackup client software. No separate installation is required. A valid license for the agent must exist on the master server.

More information is available on how to add licenses.

See the [NetBackup Administrator's Guide, Volume I](#).

Specifying the Informix home path

After you install NetBackup with a valid license for NetBackup for Informix, run this script on the computer where the Informix vendor software is installed. With this script, NetBackup can gather additional information about your Informix environment.

Complete this procedure if you licensed NetBackup for Informix for the first time.

To specify the Informix home path

- 1 Change to the following directory:

```
/usr/opensv/netbackup/bin
```

- 2 Run the following script:

```
./informix_config
```

- 3 Supply the home path for the database instance.

- 4 Verify the Informix ON-Bar configuration.

This script creates the following entry in the Informix instance home path's `etc/sm_versions` file for each client.

```
1|1.1.0|Veritas-NetBackup|1
```

- 5 Make sure `$BAR_BSALIB_PATH` is correctly linked to NetBackup's `infxbsa.[so,sl,a]`.

See [“Verifying the NetBackup for Informix configuration”](#) on page 49.

- 6 Set the `BAR_RETRY` configuration parameter to 5.

The configuration parameter `BAR_RETRY` is used in the `$INFORMIXDIR/etc/$ONCONFIG` file. This parameter specifies the number of times ON-Bar attempts to back up or restore the storage space or logical log if the first attempt fails. Informix recommends setting `BAR_RETRY` to 5.

Adding new Informix instances

If you install a new Informix instance after you install NetBackup, you need to add this new instance to the NetBackup configuration. This action ensures that all new Informix instances are included in backup operations.

See [“Specifying the Informix home path”](#) on page 14.

Configuring NetBackup for Informix

This chapter includes the following topics:

- [About configuring NetBackup for Informix](#)
- [About configuring a backup policy for an Informix database](#)
- [About NetBackup for Informix scripts](#)
- [Configuring an additional bp.conf file](#)
- [About permissions for NetBackup for Informix log files](#)
- [Reviewing the auto-discovered mappings in Host Management](#)
- [Configuring the Maximum jobs per client](#)
- [Performing a manual backup](#)

About configuring NetBackup for Informix

Before you configure NetBackup for Informix, complete the installation procedure. After you complete the installation procedure, complete the procedures in [Table 3-1](#) to configure your environment.

Table 3-1 Steps to configure NetBackup for Informix

Step	Action	Description
Step 1	Configure a backup policy.	See “About configuring a backup policy for an Informix database” on page 17.

Table 3-1 Steps to configure NetBackup for Informix (*continued*)

Step	Action	Description
Step 2	Configure NetBackup for Informix scripts.	See “About NetBackup for Informix scripts” on page 27.
Step 3	Configure an additional bp.conf file.	See “Configuring an additional bp.conf file” on page 32.
Step 4	Configure permissions for log files on UNIX systems	See “About permissions for NetBackup for Informix log files” on page 33.
Step 5	Configure the Maximum jobs per client.	See “Configuring the Maximum jobs per client” on page 36.
Step 6	Test the configuration settings.	See “Performing a manual backup” on page 36.

About configuring a backup policy for an Informix database

A backup policy for a database defines the backup criteria for a specific group of one or more clients.

These criteria include the following:

- Storage unit and media to use
- Policy attributes
- Backup schedules
- Clients to be backed up
- The script files to run on the clients

To back up the database environment, define at least one Informix-ON-Bar policy with the appropriate schedules. A configuration can have a single policy that includes all clients, or there can be many policies, some of which include only one client.

In addition to the Informix-ON-Bar policy, back up the `$INFORMIXDIR/etc` files that are specified in the backup scripts. Define a Standard policy with a User Backup schedule type to back up these files.

To add and configure a policy, see the following topics:

- See [“Adding a new NetBackup for Informix policy”](#) on page 18.
- See [“About policy attributes”](#) on page 19.

- See [“About adding schedules to a NetBackup for Informix policy”](#) on page 19.
- See [“Adding clients to a policy”](#) on page 23.

Adding a new NetBackup for Informix policy

This topic describes how to add a new backup policy for a database.

To add a new NetBackup for Informix policy

- 1 Log on to the master server as administrator (Windows) or root (UNIX).
- 2 Start the NetBackup Administration Console.
- 3 If your site has more than one master server, choose the one on which you want to add the policy.
- 4 In the NetBackup Administration Console, select **NetBackup Management > Policies**. Then select **Actions > New > Policy**.
- 5 In the **Add a New Policy** dialog box, in the **Policy name** box, type a unique name for the new policy.
- 6 Click **OK**.
- 7 In the **Add New Policy** dialog box, in the **Policy type** list, select **Informix-ON-Bar**.

The Informix-ON-Bar policy type does not appear in the drop-down list unless your master server has a license for the database agent.

- 8 Complete the entries on the **Attributes** tab.
See [“About policy attributes”](#) on page 19.
- 9 Add other policy information as follows:
 - Add schedules.
See [“About adding schedules to a NetBackup for Informix policy”](#) on page 19.
 - Add clients.
See [“Adding clients to a policy”](#) on page 23.
 - Add scripts to the backup selections list.
See [“Adding NetBackup for Informix scripts to the backup selections list”](#) on page 24.
- 10 When you have added all the schedules, clients, and backup selections you need, click **OK**.

About policy attributes

With a few exceptions, NetBackup manages the policy attributes set for a database backup like a file system backup. Other policy attributes vary according to your specific backup strategy and system configuration.

[Table 3-2](#) describes some of the policy attributes available for a NetBackup for Informix policy. For more information on policy attributes, see the [NetBackup Administrator's Guide, Volume I](#).

Table 3-2 Policy attribute descriptions for NetBackup for Informix policies

Attribute	Description
Policy type	Determines the types of clients that can be backed up with the policy. For Informix databases, select the policy type Informix-ON-Bar.
Keyword phrase	For NetBackup for Informix, the Keyword phrase entry is ignored. However, it can be set using the environment variable <code>INFXBSA_KEYWORD</code> . See "About NetBackup for Informix environment variables" on page 31.

About adding schedules to a NetBackup for Informix policy

Each policy has its own set of schedules. These schedules initiate automatic backups and specify when a user can initiate operations. A database backup has these types of schedules: application backup and automatic backup.

Configuring an application backup schedule

A database backup requires an application backup schedule. You cannot perform backups if this type of schedule is not included in the policy. The NetBackup for Informix agent automatically creates this schedule and names it **Default-Application-Backup**.

The backup window for an application backup schedule must encompass the time period during which all scheduled jobs and client-initiated jobs can occur. This window is necessary because the application backup schedule accepts the backup request from NetBackup for Informix regardless of whether the backup was initiated from an automatic schedule or from the client. You can choose to set the window for the application backup schedule for 24 hours per day, seven days per week. This window ensures that your operations are never locked out due to the application backup schedule.

To configure an application backup schedule

- 1 In the **Policy** dialog box, click the **Schedules** tab.
 To access the **Policy** dialog box, double-click the policy name in the **Policies** list in the NetBackup Administration Console.
- 2 Double-click the schedule that is named **Default-Application-Backup**.
- 3 Specify the other properties for the schedule.
 See [“About schedule properties”](#) on page 22.

Example application backup schedule

Note: (Optional) Specify the application backup schedule name in the `bp.conf` file on the client.

See [“Configuring an additional bp.conf file”](#) on page 32.

Assume the following:

- Users perform database backup operations during business hours, 08:00 to 13:00.
- The automatic backups that use this policy start between 18:00 and 22:00.

In this scenario, the application backup schedule must have a start time of 0800 and a duration of 14 hours. Alternatively, the schedule can have two windows each day; one with a start time of 0800 and duration of 5 hours, and another with a start time of 1800 and a duration of 4 hours.

Table 3-3 Example settings for a NetBackup for Informix application backup schedule

Schedule option	Setting
Retention	2 weeks
Backup window	Sunday through Saturday 00:08:00 - 22:00:00

Configuring automatic backup schedules

If you plan to have NetBackup perform automatic scheduled backups, you need one or more automatic backup schedules.

To configure an automatic backup schedule

- 1** On the **Policy** dialog box, click the **Schedules** tab.
- 2** Click **New**.
- 3** Specify a unique name for the schedule.
- 4** Select the **Type of backup**.
 See [“NetBackup for Informix backup types”](#) on page 21.
- 5** Specify the other properties for the schedule.
 See [“About schedule properties ”](#) on page 22.
- 6** Click **OK**.

Example automatic backup schedule

[Table 3-4](#) shows example settings for automatic backup schedules.

Table 3-4 Example settings for NetBackup for Informix automatic backup schedules

Type of backup	Schedule property	Setting
Automatic Full Backup	Retention	2 weeks
	Frequency	Every week
	Backup window	Sunday, 18:00:00 - 22:00:00
Automatic Incremental Backup	Retention	1 week
	Frequency	Every day
	Backup window	Sunday through Saturday 18:00:00 - 22:00:00

NetBackup for Informix backup types

[Table 3-5](#) shows the backup schedules you can specify.

Table 3-5 Informix backup types

Backup type	Description
Application Backup	The Application Backup schedule enables user-controlled NetBackup operations from the client. These operations include those initiated from the client and those initiated by an automatic schedule on the master server. NetBackup uses the Application Backup schedule when the user starts a backup manually. Configure at least one Application Backup schedule for each database policy. The Default-Application-Backup schedule is configured automatically as an Application Backup schedule.
Automatic Full Backup	An Automatic Full Backup copies all blocks into the backup set. It skips only the data file blocks that have never been used. Note that a full backup is not the same as a whole database backup; full is an indicator that the backup is not incremental. This type of backup corresponds to an Informix Level-0 backup, which is a baseline backup.
Automatic Incremental Backup	An Automatic Incremental Backup is a backup of only those blocks that have changed since the last Automatic Full (baseline) backup. This kind of backup takes less time and space than a full backup because the Automatic Incremental Backup contains only the changed data. This type of backup corresponds to an Informix Level-1 backup.

About schedule properties

This topic describes the schedule properties that have a different meaning for database backups than for file system backups. Other schedule properties vary according to your specific backup strategy and system configuration. Additional information about other schedule properties is available. See the [NetBackup Administrator's Guide, Volume I](#).

Table 3-6 Description of schedule properties

Property	Description
Type of backup	Specifies the type of backup that this schedule can control. The selection list shows only the backup types that apply to the policy you want to configure. See " NetBackup for Informix backup types " on page 21.

Table 3-6 Description of schedule properties (*continued*)

Property	Description
Schedule type	<p>You can schedule an automatic backup in one of the following ways:</p> <ul style="list-style-type: none"> ■ Frequency Frequency specifies the period of time that can elapse until the next backup operation begins on this schedule. For example, assume that the frequency is 7 days and a successful backup occurs on Wednesday. The next full backup does not occur until the following Wednesday. Typically, incremental backups have a shorter frequency than full backups. ■ Calendar The Calendar option lets you schedule the backup operations that are based on specific dates, recurring week days, or recurring days of the month.
Retention	<p>The retention period for an application backup schedule refers to the length of time that NetBackup keeps backup images. The retention period for an automatic schedule controls how long NetBackup keeps records of when scheduled backups occurred. For example, if your database is backed up once every Sunday morning, you should select a retention period of at least 2 weeks.</p> <p>The type of schedule you select affects the retention period as follows:</p> <ul style="list-style-type: none"> ■ Frequency-based scheduling Set a retention period that is longer than the frequency setting for the schedule. For example, if the frequency setting is set to one week, set the retention period to be more than one week. The NetBackup scheduler compares the latest record of the automatic backup schedule to the frequency of that automatic backup schedule. This comparison is done to determine whether a backup is due. So if you set the retention period to expire the record too early, the scheduled backup frequency is unpredictable. However, if you set the retention period to be longer than necessary, the NetBackup catalog accumulates unnecessary records. ■ Calendar-based scheduling The retention period setting is not significant for calendar-based scheduling.
Multiple copies	<p>If you want to specify multiple copies of a backup for the policy, configure Multiple copies on the application backup schedule. If using Snapshot Client, also specify Multiple copies on the automatic schedule.</p>

Adding clients to a policy

The client list contains a list of the clients on which your scripts are run during an automatic backup or the clients that can send backup requests to the application schedule. A NetBackup client must be in at least one policy but can be in more than one.

For a NetBackup for Informix policy, clients you want to add must have the following items installed or available:

- Informix
- NetBackup client or server
- The backup or restore scripts

To add clients to a NetBackup for Informix policy

- 1 Open the policy you want to edit or create a new policy.
 To access the **Policy** dialog box, double-click the policy name in the **Policies** list in the NetBackup Administration Console.
- 2 Click the **Clients** tab.
- 3 Click **New**.
- 4 Type the name of the client and select the hardware and operating system of the client.

If Informix is installed in a cluster, specify the virtual name of the Informix server as the client name.

Note: For NetBackup 8.1, if you installed NetBackup on more than one node in the Informix cluster, you must perform additional configuration.

See [“Reviewing the auto-discovered mappings in Host Management”](#) on page 33.

- 5 Choose one of the following:
 - To add another client, click **Add**.
 - If this client is the last client you want to add, click **OK**.
- 6 In the **Policy** dialog box, click **OK**.

Adding NetBackup for Informix scripts to the backup selections list

The backup selections list in a database policy is different from the list in non-database policies. For example, in a Standard or MS-Windows policy, the list contains files and directories to be backed up. In a database policy, you specify scripts to be run.

Add scripts to the backup selections list only if you want to create a policy for automatic backups. In that case, add the scripts to a policy that has automatic

backup schedules. NetBackup runs the scripts in the order that the scripts appear in the backup selections list.

To add scripts to the backup selections list

- 1 Ensure that the script resides on the client.
 See [“Registering authorized locations used by a NetBackup database script-based policy”](#) on page 58.
- 2 Open the **Policy** dialog box.
 To access the **Policy** dialog box, double-click the policy name in the policies list in the NetBackup Administration Console.
- 3 Click the **Backup Selections** tab.
- 4 Click **New**.
- 5 In the **Script** box, type the full path name of a script on the client.
 For example:

```
/usr/opensv/netbackup/ext/db_ext/backup.sh
```

- 6 Click **Add**.
- 7 Choose one of the following:
 - To add another script, repeat step 5 and step 6.
 - If this client is the last script you want to add, click **OK**.
- 8 Click **OK**.

To browse for scripts to add to the backup selections list

- 1 Ensure that the script resides on the client.
 See [“Registering authorized locations used by a NetBackup database script-based policy”](#) on page 58.
- 2 In the **Policy** dialog box, click the **Backup Selections** tab.
 To access the **Policy** dialog box, double-click the policy name in the policies list in the NetBackup Administration Console.
- 3 Click **New**.
- 4 Click **Browse**.
- 5 Navigate to and select the script file, then click **OK**.
- 6 Choose one of the following:
 - To add another script, repeat step 4 and step 5.

- If this client is the last script you want to add, click **OK**.
- 7 Click **OK**.

Rules for NetBackup for Informix scripts

Observe the following when you use scripts:

- To ensure that scripts run successfully on all clients, ensure that:
 - The scripts reside on each client in the client list and in the same location on each client
 - The script location is registered.
See [“Registering authorized locations used by a NetBackup database script-based policy”](#) on page 58.
 - That NetBackup can access the location.
 - If you use NetBackup for Informix in a cluster, that the scripts reside in a location that is available after a failover.
- NetBackup installs sample scripts when you install the software; you can modify these scripts for your own use. Write the scripts to a location outside of the original installation location. This action ensures that future NetBackup upgrades do not overwrite your site’s scripts.

See [“About NetBackup for Informix scripts”](#) on page 27.

Configuring a Standard policy

In addition to the Informix policy, you also must configure a Standard type policy. A Standard policy enables the backup of the `$INFORMIXDIR/etc` files that is specified in the scripts.

Note the following:

- You must specify the name of the policy in the backup scripts that you modify on the client.
- You do not need to configure a file list for this policy because the policy uses a User Backup type schedule.

To configure a Standard policy

- 1 Add a new policy.
See [“Configuring a NetBackup Policy.”](#)
- 2 Specify the general attributes for the policy.
 - Select **Standard** for the policy type.

- Specify other attributes as desired.

3 Add a schedule.

Provide the following information.

Name	Type the name of your schedule.
Type of Backup	Select User Backup . A User Backup schedule enables user controlled NetBackup operations performed on the client.
Retention	Set the time period that is needed to retain two full backups of your database. For example, if your database is backed up once every Sunday morning, select a retention period of at least two weeks.
Start Window	Set the time of day when you want backup operations to be available to the user. Set this window to the same time periods as the Application Backup schedule in the Informix-ON-Bar policy.

4 Specify the clients to be backed up.

The client must have both Informix and NetBackup for Informix installed.

5 Click **OK**.

About NetBackup for Informix scripts

The NetBackup installation software writes Informix scripts to the following directory:

```
/usr/opensv/netbackup/ext/db_ext/informix/scripts
```

For more information on ON-Bar scripts, see your Informix documentation.

Be sure to modify these scripts for your environment. Although each script can perform multiple ON-Bar operations, each type of operation requires a separate script. For example, you need separate scripts for backups and restores.

Note: Always specify the correct script when you configure automatic backups or when you start operations through NetBackup. NetBackup for Informix does not generate an error if a restore script is used for a backup operation or a backup script is used for a restore operation.

The NetBackup for Informix installation software includes the following example scripts:

- `informix_dbspace_list`
- `informix_logical_log_backup`
- `informix_onbar_backup_of_dbspace1`
- `informix_onbar_backup_of_rootdbs`
- `informix_onbar_backup_of_rootdbs_and_dbspace1`
- `informix_onbar_backup_using_file_list`
- `informix_onbar_restore_dbspace1`
- `informix_onbar_restore_rootdbs`
- `infx_remove_expired_backup`

Modifying NetBackup for Informix scripts

The following procedure shows how to modify a script. Repeat this procedure for each script that you modify.

To modify NetBackup for Informix scripts

- 1 Copy the example scripts from `/usr/opensv/netbackup/ext/db_ext/informix/scripts` to a different location on your client.

The Informix scripts can reside anywhere on the client. Do not store your scripts in the sample directory because your modifications are lost if you upgrade or reinstall. Always relocate your scripts to a safe location. In a NetBackup cluster, the script must be available after a failover.

- 2 Enable proper permissions on the script files so NetBackup can access the script files.

Set the access permissions of the scripts to `775`. For example:

```
chmod 775 script_name
```

- 3 Open the script file with a text editor.

For example, use the following command to modify the `informix_onbar_backup_of_rootdbs` script:

```
vi informix_onbar_backup_of_rootdbs
```

4 Modify the script according to the instructions in the file.

Customize the scripts to reflect your Informix installation. Refer to the comments in the scripts that indicate "Replace". The scripts need to be modified to have the correct Informix home path and Informix server name. The scripts also must include the policy that you want to use to back up the files and the name of the Informix configuration file.

For example, the `informix_onbar_backup_of_rootdbs` script contains the following lines:

```
#!/bin/sh

# Replace xxxxx below with the extension used for your onconfig file.
ONCONFIG=onconfig.xxxxx

# Replace yyyyy below with the Informix home path.
INFORMIXDIR=/yyyyy/informix

# Replace zzzzz below with the name of the Informix server.
INFORMIXSERVER=zzzzz

# Replace informix_etc below with the name of the NetBackup server policy
# to be used to back up the $INFORMIXDIR/etc directory.
INFX_ETC_POLICY=informix_etc

echo "Started `date`"

export ONCONFIG
echo "exported ONCONFIG"

export INFORMIXDIR
echo "exported INFORMIXDIR"

export INFORMIXSERVER
echo "exported INFORMIXSERVER"

echo "INFXBASA_SERVER = $INFXBASA_SERVER"
echo "INFXBASA_SCHEDULED = $INFXBASA_SCHEDULED"
echo "INFXBASA_USER_INITIATED = $INFXBASA_USER_INITIATED"
echo "INFXBASA_FULL = $INFXBASA_FULL"
echo "INFXBASA_INCR = $INFXBASA_INCR"
echo "INFXBASA_POLICY = $INFXBASA_POLICY"
```

```
RETURN_STATUS=0

if [ "${INFXBSA_INCR}" = "1" ]
then
    # NetBackup has started an incremental backup.
    echo "$INFORMIXDIR/bin/onbar -b -L 1 rootdbs"
    $INFORMIXDIR/bin/onbar -b -L 1 rootdbs
    RETURN_STATUS=$?
else

    echo "$INFORMIXDIR/bin/onbar -b -L 0 rootdbs"
    $INFORMIXDIR/bin/onbar -b -L 0 rootdbs
    RETURN_STATUS=$?

fi

if [ "$RETURN_STATUS" -eq "0" ]
then

    # Initiate a backup of the directory that contains the onconfig,
    # sqlhosts, oncfg_$INFORMIXSERVER.SERVERNUM, and ixbar.SERVERNUM
    # files after doing the backup.

    echo "bpbackup -p $INFX_ETC_POLICY -w 0 $INFORMIXDIR/etc"
    /usr/openv/netbackup/bin/bpbackup -p $INFX_ETC_POLICY -w 0 $INFORMIXDIR/etc
    BPBACKUP_STATUS=$?

    if [ "$BPBACKUP_STATUS" -ne "0" ]
    then
        echo ""
        echo "bpbackup of $INFORMIXDIR/etc returned $BPBACKUP_STATUS"
    fi
fi

echo "Finished `date`"

echo "exit $RETURN_STATUS"
echo ""
```

```
exit $RETURN_STATUS
```

5 Test the scripts that you created.

More information is available on how to test your configuration.

See [“Performing a manual backup”](#) on page 36.

About NetBackup for Informix environment variables

When a schedule runs, NetBackup sets environment variables for the local shell scripts to use when it performs the backup. The `echo` lines are used to show what Informix environment variables are available.

You can use the Informix environment variables in the following lists to perform conditional functions inside the scripts. These variables are local to the Informix shell script.

NetBackup sets the following variables:

<code>INFXBSA_FULL</code>	Set to 1 if this backup is a full backup (Automatic Full Backup).
<code>INFXBSA_INCR</code>	Set to 1 if this backup is an incremental backup (Automatic Incremental Backup).
<code>INFXBSA_SCHEDULED</code>	Set to 1 if this backup is a scheduled backup (Automatic Full Backup or Automatic Incremental Backup).
<code>INFXBSA_USER_INITIATED</code>	Set to 1 if this backup is a user-initiated backup (Application Backup backup).

The Informix user can set the following variables either in the script or manually from the command line in the same environment from which `onbar` is issued:

<code>INFXBSA_SERVER</code>	Name of the NetBackup server.
<code>INFXBSA_LOGICAL_POLICY</code>	Name of the policy to be used for a logical logs backup. If this variable is set, NetBackup backs up the logical logs with this policy.
<code>INFXBSA_LOGICAL_SCHED</code>	Name of the schedule to be used for a logical logs backup. If this variable is set, NetBackup distinguishes and backs up logical logs with this schedule.

INFXBSA_POLICY	Name of the Informix-ON-Bar policy. If this variable is set, NetBackup backs up Informix databases with this policy.
INFXBSA_SCHED	Name of the Application Backup schedule. If this variable is set, NetBackup backs up Informix databases with this schedule.
INFXBSA_KEYWORD	The keyword phrase you want to associate with a backup image.

Configuring an additional bp.conf file

The administrator can add options to the NetBackup `bp.conf` file on the NetBackup master server. The administrator can create an additional `bp.conf` file in the home directory of the Informix user's account used for the backup or restore.

Before you use NetBackup for Informix, you can create a `bp.conf` file in the home directory of the Informix user's account used for the backup on the NetBackup client. The path to this directory can be equal to the value of the `$INFORMIXDIR` variable.

For example, if the home directory is `/informix`, the path is as follows:

```
/informix/bp.conf
```

After you create a `bp.conf` file in the Informix home directory, add the following options to the file and replace the italicized text with the information that pertains to the client:

```
BPBACKUP_POLICY=informix_policy  
BPBACKUP_SCHED=informix_sched  
SERVER=server_name  
CLIENT_READ_TIMEOUT=1800
```

The variables are as follows:

<i>informix_policy</i>	The name of the Informix-ON-Bar policy that was configured in the backup policy. See “About configuring a backup policy for an Informix database” on page 17.
<i>informix_sched</i>	The schedule name for the <i>informix_policy</i> . By default, it is Default-Application-Backup.
<i>server_name</i>	The name of the NetBackup master server.

NetBackup uses the `bp.conf` file in the Informix user's home directory only for backups and restores initiated by this Informix user.

About permissions for NetBackup for Informix log files

NetBackup uses the `/usr/opensv/netbackup/logs` directory tree not only for the recording of troubleshooting information, but for progress and communication updates to users and other NetBackup applications. Restrictive permissions on these directories can not only disable the collection of troubleshooting data, but also prevent the application itself from functioning correctly.

Back up and restore operations fail when permissions are too restrictive. We recommend that you make all of the `usr/opensv/netbackup/logs` directories and subdirectories readable and writeable by all users (777 permissions). However, security requirements may prohibit global read-write access. If so, you can restrict permissions of specific directories to a single group or user. You can restrict permissions in this way if the processes the group or a user runs initiate all backup and restore operations for that directory.

Check that the `/usr/opensv/netbackup/logs/user_ops` directory tree has 777 permissions. The items in this directory need to be accessible for the applications to operate correctly.

Reviewing the auto-discovered mappings in Host Management

In certain scenarios, a NetBackup host shares a particular name with other hosts or has a name that is associated with a cluster. To successfully perform backups and restores with NetBackup for Informix, you must approve each valid **Auto-Discovered Mapping** that NetBackup discovers in your environment. These mappings appear in the Host Management properties on the master server. You can also use the `nbhostmgmt` command to manage the mappings. See the [Security and Encryption Guide](#) for more details on Host Management properties.

Examples of the configurations that have multiple host names include:

- A host is associated with its fully qualified domain name (FQDN) and its short name or its IP address.
- If the Informix server is clustered, the host is associated with its node name and the virtual name of the cluster.

Auto-discovered mappings for a cluster

In a Informix cluster environment, you must map the node names to the virtual name of the cluster if the following apply:

- If the backup policy includes the cluster name (or virtual name)
- If the NetBackup client is installed on more than one node in the cluster
 If the NetBackup Client is only installed on one node, then no mapping is necessary.

To approve the auto-discovered mappings for a cluster

- 1 In the NetBackup Administration Console, expand **Security Management > Host Management**.
- 2 At the bottom of the **Hosts** pane, click the **Mappings for Approval** tab.

The list displays the hosts in your environment and the mappings or additional host names that NetBackup discovered for those hosts. A host has one entry for each mapping or name that is associated with it.

For example, for a cluster with hosts `client01.lab04.com` and `client02.lab04.com`, you may see the following entries:

Host	Auto-discovered Mapping
client01.lab04.com	client01
client01.lab04.com	clustername
client01.lab04.com	clustername.lab04.com
client02.lab04.com	client02
client02.lab04.com	clustername
client02.lab04.com	clustername.lab04.com

- 3** If a mapping is valid, right-click on a host entry and click **Approve**.

For example, if the following mappings are valid for `client01.lab04.com`, then you approve them.

Auto-discovered Mapping	Valid name for
client01	The short name of the client
clustername	The virtual name of the cluster
clustername.lab04.com	The FQDN of the virtual name of the cluster

- 4** When you finish approving the valid mappings for the hosts, click on the **Hosts** tab at the bottom of the **Hosts** pane.

For hosts `client01.lab04.com` and `client02.lab04.com`, you see **Mapped Host Names/IP Addresses** that are similar to the following:

Host	Mapped Host Names/IP Addresses
client01.lab04.com	client01.lab04.com, client01, clustername, clustername.lab04.com
client02.lab04.com	client02.lab04.com, client02, clustername, clustername.lab04.com

- 5** If you need to add a mapping that NetBackup did not automatically discover, you can add it manually.

Click on the **Hosts** tab, then right-click in the **Hosts** pane and click **Add Shared or Cluster Mappings**. For example, provide the name of the virtual name of the cluster. Then click **Select Hosts** to choose the node names in the cluster to which you want to map that virtual name.

Table 3-7 Example mapped host names for a Informix cluster environment

Environment	Host	Mapped Host Names
Cluster with two nodes	Physical name of <i>Node 1</i>	Virtual name of Informix server
	Physical name of <i>Node 2</i>	Virtual name of Informix server

Configuring the Maximum jobs per client

The following procedure shows how to set the **Maximum jobs per client** attribute.

To configure the maximum jobs per client

- 1 In the left pane of the NetBackup Administration Console, expand **NetBackup Management > Host Properties**.
- 2 Select **Master Server**.
- 3 In the right pane, double-click the server icon.
- 4 Click **Global Attributes**.
- 5 Change the **Maximum jobs per client** value to 99.

The **Maximum jobs per client** specifies the maximum number of concurrent backups that are allowed per client. The default is 1.

You can use the following formula to calculate a smaller value for the Maximum jobs per client setting:

Maximum jobs per client = *number_of_streams* X *number_of_policies*

Refer to the following definitions:

number_of_streams The number of backup streams between the database server and NetBackup. Each separate stream starts a new backup job on the client.

number_of_policies The number of policies of any type that can back up this client at the same time. This number can be greater than one. For example, a client can be in two policies to back up two different databases. These backup windows can overlap.

Note: Enter a large enough value for the **Maximum jobs per client** attribute to meet the number of jobs that Informix runs. You may need to experiment with different values at your site.

Performing a manual backup

After you configure the servers and clients in your environment, you can test the configuration settings with a manual backup. Perform a manual backup (or backups) with the automatic backup schedules you created. A description of status codes and other troubleshooting information is available.

See the [NetBackup Status Codes Reference Guide](#).

See the [NetBackup Logging Reference Guide](#).

To perform a manual backup

- 1** Log onto the master server as administrator (Windows) or root (UNIX).
- 2** Start the NetBackup Administration Console.
- 3** In the left pane, click **Policies**.
- 4** In the **All Policies** pane, select the policy you want to test.
- 5** Select **Actions > Manual Backup**.
- 6** Select the schedule that you want to use for the manual backup.
- 7** Select the clients that you want to include for the manual backup.
- 8** To check the status of the backup, click **Activity Monitor** in the NetBackup Administration Console.

The Activity Monitor and the script output indicate the status of the backup operation.

Performing backups and restores of Informix

This chapter includes the following topics:

- [About using NetBackup for Informix](#)
- [About Informix ON-Bar backup types](#)
- [Example Informix backup strategy](#)
- [Automatic backup policy for Informix](#)
- [Manual backup policy for Informix](#)
- [Using the onbar command to perform a user-directed backup](#)
- [About browsing Informix backups](#)
- [Restoring files to the original client](#)
- [Redirecting an Informix restore to a different client](#)
- [Example of procedure for restoring an Informix database](#)

About using NetBackup for Informix

When all installation and configuration are complete, you can start Informix backups and restores through NetBackup or run the `onbar` command directly.

Always specify the correct ON-Bar script when configuring automatic backups or when starting operations through NetBackup. NetBackup for Informix does not generate an error if a restore ON-Bar script file is used for a backup operation or a backup ON-Bar script is used for a restore operation.

About Informix ON-Bar backup types

The Informix ON-Bar utility supports different types of backups.

Table 4-1 describes each backup type.

Table 4-1 Informix ON-Bar backup types

Backup type	Description
Level 0 backup (Full)	An Informix level 0 backup is a full backup. It includes all the records in the selected dbspaces and is the only type of backup that allows a complete restore without performing any recovery steps.
Level 1 backup (Incremental)	An Informix level 1 backup is an incremental backup. It backs up the records that changed since the last level 0 backup in the selected dbspaces.
Level 2 backup	An Informix level 2 backup backs up the records that changed since the last Level 1 Backup in the selected dbspaces. NetBackup does not support this type of backup with an equivalent automatic schedule. To perform level 2 backups write a script and by keep track of the previous backup type with the ON-Bar script.
Logical-log backup	An Informix logical-log backup backs up the filled logical logs. By using the Informix <code>ALARMPROGRAM</code> configuration option, these backups can be started on demand when the logical logs fill.

For more information, see your Informix documentation.

Example Informix backup strategy

The backup strategy in the following example is for a database that requires frequent backups to provide protection against disk failure.

This strategy is as follows:

- Perform an Informix full backup (level 0) every Friday night.
This backs up the selected dbspaces.
- Perform an Informix incremental backup (level 1) each night.
- Back up the `$(INFORMIXDIR)/etc` directory once a day.
The sample scripts that NetBackup for Informix installs by default include parameters to back up the `$(INFORMIXDIR)/etc` directory after each full or each incremental backup.

- Configure the Informix `ALARMPROGRAM` to start a logical-log backup as the logs fill.
If you do not want to wait for log files to fill, you can set up a separate NetBackup policy and then schedule a full logical-log backup to occur as often as necessary. Have a good strategy for backing up logical-log files because they are needed for database recovery.

Automatic backup policy for Informix

The most convenient way to back up your database is to set up schedules for automatic backups.

When the NetBackup scheduler invokes a schedule for an automatic backup, the ON-Bar scripts run as follows:

- In the same order as they appear in the file list
- On all clients that have them (that is, matching path names)

The ON-Bar scripts start the database backup.

Instructions for how to add a new schedule or change an existing schedule for automatic backups are available.

Manual backup policy for Informix

The administrator on the master server can use the NetBackup server software to manually execute an Automatic Backup schedule for the Informix-ON-Bar policy.

Using the `onbar` command to perform a user-directed backup

You can run the `onbar` command from the UNIX command line on the client to start a backup.

About browsing Informix backups

Use the `bplist` command to browse the Informix backup history on the master server. The result is the list of dump file names. The following example assumes that the root user issued the `bplist(1M)` command from the NetBackup master server to search all Informix backups for a client named `cabbage`:


```
bplist -C cabbage -t 6 -R /legohead  
/legohead/0/18  
/legohead/0/17  
/legohead/0/17  
/legohead/rootdbs/0  
/legohead/0/17  
/legohead/0/17  
/legohead/0/17  
/legohead/0/16  
/legohead/rootdbs/0
```

The `-t 6` on this command specifies the Informix backups (dumps). Alternatively, you can specify `-t 0` to browse the backups of files in the `$(INFORMIXDIR)/etc` files. For more information on this command, see the `bplist(1M)` man page.

Restoring files to the original client

Start all restores from the NetBackup for Informix client. A backup must have completed successfully before a restore is started. Otherwise, an error message is generated.

To perform a user-directed restore, use the `onbar` command from the UNIX command line on the client.

Note: You cannot run restore operations from the server.

To restore files to the original client

- 1 Before you replace any disks that have failed, salvage the logical-log files.

Use the following command:

```
onbar -l -s
```

- 2 (Conditional) Determine whether you need to restore the `$(ONCONFIG)` file, `sqlhosts` file, emergency boot file, or the `oncfg_$(INFORMIXSERVER).SERVERNUM` file.

If you need to restore these files, use the NetBackup Administration Console, as follows:

- Change to the `$(INFORMIXDIR)/etc` directory.

Use the following command:

```
cd $(INFORMIXDIR)/etc
```

- Start the Java interface:
Use the following command:

```
/usr/opensv/netbackup/bin/jbpSA &
```

- Select the files to restore and start the restore.

3 Use `onbar` to physically restore the damaged dbspaces.

For example:

```
onbar -r -p dbspace1 dbspace2
```

4 Use `onbar` to logically restore the dbspaces that you physically restored.

For example:

```
onbar -r -l
```

Redirecting an Informix restore to a different client

You have the option to restore an Informix database to a client other than the one that originally supplied the backup. This process of restoring data to a different client is called a redirected restore. You must be the NetBackup administrator to perform these tasks.

To perform a redirected restore, the following conditions must be present:

- The source and the destination clients must have identical operating system versions and bit levels.
- The source and the destination clients must have identical Informix database versions.
- The Informix ownerId, Informix groupId, and Informix home must be identical on the source and on the destination clients.

For more information on redirected restores, see the [NetBackup Administrator's Guide, Volume I](#).

To redirect an Informix restore to a different client

- 1** Create the following file on the master server:

```
/usr/opencv/netbackup/db/altnames/client_name
```

For *client_name*, specify the name of the client that is allowed to perform the redirected restore. Add the name of the NetBackup for Informix source client to that file.

- 2** Back up the logical logs on the NetBackup for Informix source client.

A logical log contains records of all the database activity that occurs between backups. These records contain all the database transactions that have taken place after the last backup.

Log into the source client as Informix ownerId and issue the following command:

```
onbar -b -l
```

- 3** If the source client database server is down, salvage the logical logs.

This command backs up any logical logs that have not yet been backed up and are not corrupted or destroyed.

Log into the source client as Informix ownerId and issue the following command:

```
onbar -l -s
```

- 4** Shut down the Informix database server on both the source client and the destination client.

Issue one of the following commands:

- For Informix Dynamic Server:

```
onmode -ky
```

- For Extended Parallel Server:

```
xctl onmode -ky
```

- 5** On the NetBackup for Informix destination client, back up the files that reside in the `$INFORMIXDIR/etc` directory to preserve the original configuration. The following steps overwrite files in this directory.

- 6** Copy configuration and informational files in the `$INFORMIXDIR/etc` directory from the NetBackup for Informix source client to the `$INFORMIXDIR/etc` directory on the NetBackup for Informix destination client.

You can use `ftp(1)` to copy files from the source client to the destination client.

- Copy the emergency or the backup boot files.
 For the Informix Dynamic Server, the emergency boot file is
`$INFORMIXDIR/etc/ixbar.servernum`.
 For the Extended Parallel Server, the backup boot file is
`$INFORMIXDIR/etc/Bixbar_hostname.servernum`.
 For *servernum*, specify the value of the `SERVERNUM` configuration parameter that is specified in the `$INFORMIXDIR/etc/$ONCONFIG` file.
- Copy the connectivity information file, `$INFORMIXDIR/etc/sqlhosts`, which specifies how the client application finds and connects to an Informix database server .
- Copy the database configuration file that the environment variable `ONCONFIG` specifies. This file is located in the `$INFORMIXDIR/etc` directory.
- Copy the files that the Informix database server creates and updates every time a `dbspace`, `blobspace`, logical-log file, or chunk is added or deleted.
 For Informix Dynamic Server, this file is
`$INFORMIXDIR/etc/oncfg_servername.servernum`
 For Extended Parallel Server and for each coserver this file is
`$INFORMIXDIR/etc/oncfg_servername.servernum.coserverid`
 The variables are as follows:

<i>servernum</i>	The value of the <code>SERVERNUM</code> configuration.
<i>servername</i>	The value of the <code>DBSERVERNAME</code> configuration.
<i>coserverid</i>	The ID of the coserver.

- (Conditional) Copy file `xcfg_servername.servernum`.
 Perform this step if you use the Extended Parallel Server. File `xcfg_servername.servernum` contains information about coserver location and `dbslice` definition.
 In the file name, the variables are as follows:

<i>servernum</i>	The value of the <code>SERVERNUM</code> configuration.
<i>servername</i>	The value of the <code>DBSERVERNAME</code> configuration.

7 Configure the NetBackup for Informix destination client.

- Set the `INFXBASA_CLIENT` environment variable to the host name of the source client.

- (Conditional) Set the `INFXBSA_SERVER` environment variable to the NetBackup master server that is used for the source client backup. Perform this step if the NetBackup master server that is used for the source client backup is different than the server that is specified in the `bp.conf` file on the destination.
- 8 Perform the redirected restore.
- Log onto the NetBackup for Informix destination client as Informix ownerId.
 - Perform a physical restore.
Use the following command to restore storage spaces to their most recent backed-up state:

```
onbar -r -p
```
 - Perform a logical restore.
Use the following command to update the most recent backed-up version of the storage spaces with later transactions:

```
onbar -r -l
```

Example of procedure for restoring an Informix database

This example shows the procedure for restoring an Informix database from the original source computer, `camel`, to the destination computer, `giraffe`. For this example, the redirected restore is necessary because the original computer, `camel`, failed. You also can use a redirected restore to duplicate your Informix database in a development or in a test environment.

This example assumes the following:

- Source client `camel` is a Solaris computer that is running Informix.
 - `SERVERNUM` is 6
 - `DBSERVERNAME` is `srcdb`
 - Host name is `camel`
- Destination client `giraffe` is a Solaris computer that is running Informix.
 - `SERVERNUM` is 0
 - `DBSERVERNAME` is `destdb`
 - Host name is `giraffe`

- NetBackup master server is `lion`. The `bp.conf` on `camel` includes `SERVER=lion`. If `SERVER=lion` were not the first server in the `bp.conf` file, then the environment variable `INFXBSA_SERVER` on `camel` you would set to `lion`, as follows:

```
export INFXBSA_SERVER=lion
```

- Previously you performed the `onbar -b` Informix database backup on `camel`.
- Previously you performed a file system backup of `$INFORMIXDIR/etc` on `camel`, which effectively backed up the following:
 - `ixbar.6`
 - `sqlhosts`
 - `onconfig`
 - `oncfg_srcdb.6`
- You salvaged the logical logs on `camel` by using the following command:

```
onbar -l -s
```

To redirect an Informix restore (Example)

- 1 As the NetBackup administrator, create the following file on the NetBackup server, `lion`:

```
/usr/opensv/netbackup/db/altnames/giraffe
```

- 2 Add the name `camel` to the file.
- 3 Log into `giraffe` as Informix ownerId and ensure that the Informix database server is shut down.
- 4 Perform a manual file system backup of `$INFORMIXDIR/etc` on `giraffe`.

Including the following files:

- `ixbar.0`
- `sqlhosts`
- `onconfig`
- `oncfg_destdb.0`

Note that this step is a precautionary measure. It is performed in case these configuration files are needed to recreate the environment on `giraffe`. This backup is not used for the redirected restore.

- 5** On `giraffe`, change the Informix server environment variable to match the variable on `camel`.

Use the following command:

```
export INFORMIXSERVER=srcdb
```

- 6** On `giraffe`, change the `INFXBSA_CLIENT` environment variable to `camel`.

For example:

```
export INFXBSA_CLIENT=camel
```

This causes `giraffe` to browse backups from `camel`.

- 7** (Conditional) On `giraffe`, set the `INFXBSA_SERVER` environment variable to `lion`.

For example:

```
export INFXBSA_SERVER=lion
```

This step is needed only if the first server that is specified in the `bp.conf` file on `giraffe` is not `lion`.

- 8** Browse the file system backups from `camel` and restore to `$(INFORMIXDIR)/etc` on `giraffe`.

Restore the following files:

- `ixbar.6`
- `sqlhosts`
- `onconfig`
- `oncfg_destdb.6`

- 9** Perform the redirected restore to `giraffe`.

Complete the following steps:

- To perform the physical restore, run the following command:

```
onbar -r -p
```

- Verify the return status by using the following command:

```
echo $?
```

If the restore was successful, the return status is 0.

- To perform the logical restore run the following command

```
onbar -r -l
```

- Verify the return status by using the following command:

```
echo $?
```

If the restore was successful, the return status is 0.

- 10** On the destination client (*giraffe*), start the database.

Troubleshooting

This chapter includes the following topics:

- [Verifying the NetBackup for Informix configuration](#)
- [Verifying NetBackup for Informix log files](#)
- [Enabling the debug logs manually](#)
- [About the NetBackup for Informix log files](#)
- [About NetBackup server reports](#)
- [About Informix ON-Bar utility logs](#)
- [Setting the debug level](#)
- [Minimizing timeout failures on large database restores](#)
- [Minimizing the loading and unloading of tapes for database backups](#)
- [About deleting expired backups from the Informix backup database](#)
- [Delays in completion of backup jobs](#)

Verifying the NetBackup for Informix configuration

Use the following procedure to verify that environment variables, paths, and other settings are correct for your installation.

To verify the configuration

- 1 Verify the existence of `$BAR_BSALIB_PATH`, which is defined in the Informix `$CONFIG` file. This path should point to NetBackup's `/usr/opensv/netbackup/bin/infxbsa.[so,sl,a]` library. Ensure that the permissions are set to `755`.
- 2 Verify that the Informix policy and schedule are properly created.
 See [“About configuring a backup policy for an Informix database”](#) on page 17.
- 3 Set the following variables in the Informix `$INFORMIXDIR/etc/$ONCONFIG` configuration file:
 - `BAR_DEBUG`. This variable sets the level of detail to be gathered about the backup. The range is 0-9, with 9 providing the most detail. The Informix instance uses the value that is specified in this variable, and it provides debugging information according to the level specified.
 - `BAR_DEBUG_LOG`. This variable sets the location of the file to collect the log. This should be the same location `MSGPATH` specifies in the Informix configuration file, `$ONCONFIG`.

To set these variables, stop and restart the Informix instance, as follows:

- For Informix version 9.x, run the following Informix commands:

```
onmode -uky
oninit
```

- For Informix version 8.x, run the following commands:

```
xctl onmode -uky
xctl -C oninit
```

- 4 Make sure the table `bar_version` in the `sysutils` database has the correct value for the `bar_version` column. The value should be `1.1.0`.
- 5 (Optional) Verify that you are using the correct library.
 Perform this step if you use NetBackup for Informix on an IBM AIX platform.

Verifying NetBackup for Informix log files

Use the following procedure to verify that the log files are configured correctly.

To verify the NetBackup for Informix log files

- 1** Check the Informix instance log specified by `MSGPATH` in the Informix configuration file `$ONCONFIG`.
- 2** Verify the existence of the following log directories:

```
/usr/opensv/netbackup/logs/user_ops/dbext/logs
/usr/opensv/netbackup/logs/infxbsa
```

The `user_ops` and `infxbsa` directories and any subdirectories should have `777` permissions. They must exist and be accessible for the applications to operate correctly.

- 3** Examine the client logs in the following order:
 - The Informix server log. This path is specified in `ONCONFIG`.
 - `OnBAR` debug log. This path is specified in `ONCONFIG`.
 - The NetBackup for Informix debug log directory, `/usr/opensv/netbackup/logs/infxbsa`. If this directory was created properly and no log is present, then stop. The absence of a file in a properly created directory indicates a problem with the communication from `ON-Bar` to NetBackup for Informix. This file is the starting point of communication with NetBackup. Its absence indicates there are no further NetBackup activities on either the server or client.

4 Examine other log files.

The following log files reside in the `/usr/opensv/netbackup/logs` directories on the servers indicated:

Master server	<code>bpcd, bpdbm, bprd</code>
Media server	<code>bpbrm, bpcd, bpdm, bptm</code>
Client	<code>/user_ops/dbext/logs, bpcd, bphdb, infxbsa</code>

NetBackup writes a log file to

`/usr/opensv/netbackup/logs/user_ops/dbext/logs` for each backup and restore session. NetBackup writes the other log files on a daily basis. Log files in the log directories have the naming convention of `log.mmddy.` or `mmddy_nnnn.log` (if robust logging is enabled). These files may offer additional debug information.

For example, the `bprd` log file shows if a backup or restore request from `bpbackup` or `bprestore` was received. Examine the request's details such as client name, policy type, client type, and backup file name.

5 Examine the communication progress file.

The communication progress file logs communication between the NetBackup server and the NetBackup client during backups and restores. This file is the key file in the debugging process.

The following is an example of a progress file name:

```
/usr/opensv/netbackup/logs/user_ops/dbext/logs/6749.0.1115233002
```

Perform the following steps to determine the communication progress file's name:

- Use the `cd(1)` command to change to the `/usr/opensv/netbackup/logs/infxbsa` directory.
- Use an editor to open the file in that directory. The following are examples of file names: `log.103105`, `103105.00001.log`.
- Use an editor to open the log file and search for the communication progress file's name.

For example, search for the string `openProgressFile`.

The search flags the following lines in the file:

```
13:56:42.905 [6749] <4> openProgressFile: entering openProgressFile.
13:56:42.905 [6749] <4> openProgressFile: commFull = </usr/opensv/
netbackup/logs/user_ops/dbext/logs/6749.0.1115233002>
```

This output tells you that the communication progress file's name is 6749.0.1115233002.

Enabling the debug logs manually

To enable the debug logs manually

- 1 Create the following directories on the client:

```
/usr/opensv/netbackup/logs/bpbackup
/usr/opensv/netbackup/logs/bpbkar

/usr/opensv/netbackup/logs/bphdb

/usr/opensv/netbackup/logs/bprestore

/usr/opensv/netbackup/logs/tar
/usr/opensv/netbackup/logs/infxbsa
chmod 777 /usr/opensv/netbackup/logs/infxbsa
```

For example:

```
cd /usr/opensv/netbackup/logs
mkdir bphdb
```

- 2 The `user_ops`, each of the log directories, and any subdirectories should have 777 permissions. They must exist and be accessible for the applications to operate correctly.

For example:

```
chmod 777 bphdb
```

See [“About permissions for NetBackup for Informix log files”](#) on page 33.

- 3 Enable logging for the `nbpem`, `nbjrm`, and `nbrb` scheduling processes that use unified logging.

NetBackup writes unified logs to `/usr/opensv/logs`.

You do not need to create log directories for processes that use unified logging.

Information on how to use logs and reports is available.

See the [NetBackup Troubleshooting Guide](#).

About the NetBackup for Informix log files

The following topics describe the logs that are created when you create the log directories. Use a text editor to view the contents of the logs.

See “[About the bphdb directory on the database client](#)” on page 54.

About the bphdb directory on the database client

The `/usr/opensv/netbackup/logs/bphdb` directory contains logs.

The following types of logs exist:

- `onbar_stdout.mmdyy`

Unless it is redirected elsewhere, NetBackup writes ON-Bar script output to this file.

- `onbar_stderr.mmdyy`

Unless it is redirected elsewhere, NetBackup writes ON-Bar script errors to this file.

- `log.mmdyy`

This log contains debugging information for the `bphdb` process. `bphdb` is the NetBackup database backup binary. It is invoked when an automatic backup schedule is run. NetBackup for Informix uses this client process for ON-Bar script execution.

About the infxbsa directory on the database client

The `/usr/opensv/netbackup/logs/infxbsa` directory contains execution logs.

The following execution log exists:

- `log.mmdyy`

This log contains debugging information and execution status for the NetBackup for Informix client process.

About NetBackup server reports

NetBackup provides other reports that are useful in isolating problems. One such report is All Logs Entries on the server. Information on server reports is available.

See the [NetBackup Administrator’s Guide, Volume I](#).

About Informix ON-Bar utility logs

The Informix ON-Bar utility performs its own error logging and tracing in the file specified by `BAR_ACT_LOG` in the `$INFORMIXDIR/etc/ONCONFIG` file. Database administrators can use this log file to determine what happened during ON-Bar execution.

Setting the debug level

To control the amount of information that is written to the debug logs, change the “Database” debug level. Typically, the default value of 0 is sufficient. However, Technical Support may ask you to set the value higher to analyze a problem.

The debug logs are located in `/usr/openv/netbackup/logs`.

To set the debug level on a UNIX client

- ◆ Enter the following line in the `bp.conf` file.

```
VERBOSE = X
```

Where *X* is the debug level you want.

Minimizing timeout failures on large database restores

Large database restores sometimes fail when multiple restore sessions compete for resources. In this situation, a restore session can be delayed while waiting for media or device access. If the delay is too long, the restore session times out. Use the following procedure to minimize session timeouts and to allow the restores to complete successfully.

To minimize timeout failures on large database restores

- 1 In the NetBackup Administration Console, expand **NetBackup Management > Host Properties > Clients**.
- 2 Double-click the client.
- 3 Select the **Timeouts** properties.

- 4 Set the **Client read timeout** property to a large value.

The default for the **Client read timeout** setting is 300 seconds (5 minutes). For database agent clients, increase the value significantly from the recommended value.

See the [NetBackup Administrator's Guide, Volume 1](#).

For example, change this setting to 30-60 minutes to minimize timeout errors.

- 5 Click **OK** for each client.

Note: This change may delay detecting problems during subsequent backups. Consider putting the original value back in place once any restore that requires a change is complete.

Minimizing the loading and unloading of tapes for database backups

You can minimize excessive unloading and reloading of tapes between multistreamed database backups by changing the media settings for the master or the media server.

See the [NetBackup Administration Guide, Volume 1](#) for details.

To minimize loading and unloading of tapes

- 1 Open the NetBackup Administration Console.
- 2 Choose **Host Properties**.
- 3 Choose **Master Servers** or **Media Servers**.
- 4 Double-click on the name of the server.
- 5 In the left pane, click **Media**.
- 6 Configure the following settings:
 - **Media unmount delay**
 - **Media request delay**

Use this variable only with non-robotic drives, such as tape stackers.

About deleting expired backups from the Informix backup database

The following topics describe how to delete expired backup images.

Informix versions XPS 8.x and IDS 9.x

`onsmsync` is an Informix version XPS 8.x, IDS 9.x utility that synchronizes the NetBackup catalog with the Informix backup catalog. Use the `onsmsync` utility to delete images from both Informix backup catalogs and NetBackup catalogs. For information on the `onsmsync` utility, see your Informix documentation.

Informix version IDS 7.x

Informix version IDS 7.x does not have a mechanism for deleting records of expired backups from its backup database. NetBackup for Informix provides a script that can delete these records from the Informix backup database if the NetBackup image database has expired the backups. Run execute the following command as user `informix` or the Informix Administrator.

```
/usr/opensv/netbackup/ext/db_ext/informix/scripts/infx_remove_expired_images
```

When this script runs, it creates files in the `/tmp` directory. These files are not removed. Later, they can be used to diagnose any problems that occur.

Delays in completion of backup jobs

Sometimes you may see a NetBackup for Informix backup job complete the data transfer but appear to hang before the job completes. The delay may be due to one of the following:

- Network issues
- Storage transfer delays
- NetBackup server post-backup processing

To determine the cause of the delay, refer to the following article:

<http://www.veritas.com/docs/TECH198864>

Register authorized locations

This appendix includes the following topics:

- [Registering authorized locations used by a NetBackup database script-based policy](#)

Registering authorized locations used by a NetBackup database script-based policy

During a backup, NetBackup checks for scripts in the default script location and any authorized locations. The default, authorized script location for UNIX is `usr/opencv/netbackup/ext/db_ext` and for Windows is `install_path\netbackup\dbext`. If the script is not in the default script location or an authorized location, then the policy job fails. You can move any script into the default script location or any additional authorized location and NetBackup recognizes the scripts. You need to update the policy with the script location if it has changed. An authorized location can be a directory and NetBackup recognizes any script within that directory. An authorized location can also be a full path to a script if an entire directory does need to be authorized.

If the default script location does not work for your environment, use the following procedure to enter one or more authorized locations for your scripts. Use `nbsetconfig` to enter an authorized location where the scripts reside. You can also use `bpsetconfig`, however this command is only available on the master or the media server.

Note: One recommendation is that scripts should not be world-writable. NetBackup does not allow scripts to run from network or remote locations. All scripts must be stored and run locally. Any script that is created and saved in the NetBackup `db_ext` (UNIX) or `dbext` (Windows) location needs to be protected during a NetBackup uninstall.

For more information about registering authorized locations and scripts, review the knowledge base article:

<http://www.veritas.com/docs/000126002>

To add an authorized location

- 1 Open a command prompt on the client.
- 2 Use `nbsetconfig` to enter values for an authorized location. The client privileged user must run these commands.

The following examples are for paths you may configure for the Oracle agent. Use the path that is appropriate for your agent.

- On UNIX:

```
[root@client26 bin]# ./nbsetconfig
nbsetconfig>DB_SCRIPT_PATH = /Oracle/scripts
nbsetconfig>DB_SCRIPT_PATH = /db/Oracle/scripts/full_backup.sh
nbsetconfig>
<ctrl-D>
```

- On Windows:

```
C:\Program Files\Veritas\NetBackup\bin>nbsetconfig
nbsetconfig> DB_SCRIPT_PATH=c:\db_scripts
nbsetconfig> DB_SCRIPT_PATH=e:\oracle\fullbackup\full_rman.sh
nbsetconfig>
<ctrl-Z>
```

Note: Review the [NetBackup Command Reference Guide](#) for options, such as reading from a text file and remotely setting clients from a NetBackup server using `bpsetconfig`. If you have a text file with the script location or authorized locations listed, `nbsetconfig` or `bpsetconfig` can read from that text file. An entry of `DB_SCRIPT_PATH=none` does not allow any script to execute on a client. The `none` entry is useful if an administrator wants to completely lock down a server from executing scripts.

Registering authorized locations used by a NetBackup database script-based policy

- 3** (Conditional) Perform these steps on any clustered database or agent node that can perform the backup.
- 4** (Conditional) Update any policy if the script location was changed to the default or authorized location.

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