

# General Management

The following sections provide information about general Novell® ZENworks® Linux Management features and procedures:

- ♦ Chapter 1, “ZENworks Control Center,” on page 19
- ♦ Chapter 2, “Command Line Administration Utilities,” on page 21
- ♦ Chapter 3, “ZENworks Server,” on page 23
- ♦ Chapter 4, “ZENworks Agent,” on page 29
- ♦ Chapter 5, “ZENworks Administrator Accounts,” on page 33
- ♦ Chapter 6, “ZENworks Database Maintenance,” on page 37



# ZENworks Control Center

# 1

You use the Novell® ZENworks® Control Center to configure system settings and management tasks in your ZENworks Management Zone. The following sections provide information about the ZENworks Control Center:

- ♦ [Section 1.1, “Where the ZENworks Control Center is Installed,” on page 19](#)
- ♦ [Section 1.2, “Accessing the ZENworks Control Center,” on page 19](#)
- ♦ [Section 1.3, “Accessing the ZENworks Control Center through Novell iManager,” on page 20](#)

## 1.1 Where the ZENworks Control Center is Installed

The ZENworks Control Center is installed on all ZENworks Servers in the Management Zone.

You can perform all management tasks on the primary server and most management tasks on the secondary servers. The one management exception on secondary servers is the manipulation (adding, deleting, modifying) of RPM packages in a bundle. This task is not supported because the primary server is the source server for RPM packages, meaning that packages are replicated from the primary server to secondary servers on a regularly scheduled basis. Manipulating an RPM package on a secondary server rather than on the primary server would result in the modified package being replaced (or removed) the next time the secondary server's packages were updated from the primary server. For more information about replication of RPM packages, see [Chapter 18, “Replicating Content in the ZENworks Management Zone,” on page 197](#).

## 1.2 Accessing the ZENworks Control Center

To access the ZENworks Control Center:

- 1 Using a Web browser that meets the requirements listed in “[Administration Workstation Requirements](#)” in “[System Requirements](#)” in the *Novell ZENworks 7 Linux Management Installation Guide*, enter the following URL:

```
https://ZENworks_Server_Address
```

Replace *ZENworks\_Server\_Address* with the IP address or DNS name of the ZENworks Server.

The ZENworks Control Center requires an https:// connection; requests to http:// are redirected to https://.

- 2 When prompted for login credentials, use the Administrator user with the password you provided during the installation.

## 1.3 Accessing the ZENworks Control Center through Novell iManager

ZENworks Linux Management includes a Novell plug-in module (.npm) that you can use to access the ZENworks Control Center from Novell iManager, a management console used by a number of other Novell products.

To install the ZENworks Control Center plug-in for iManager:

- 1 Copy the plug-in (`zlm7link.npm`) from either of the following CDs to a location on your iManager server.

*Novell ZENworks 7 Linux Management CD:* The `zlm7link.npm` file is located in the `/ImanagerPlugin` directory.

*Novell ZENworks 7 Companion 1 CD:* The `zlm7link.npm` file is located in the `/Novell iManager/ZLM Plugins NPM` directory.

- 2 Follow the instructions in the *Novell iManager 2.5 Installation Guide* ([http://www.novell.com/documentation/imanager25/imanager\\_install\\_25/data/bnptalr.html](http://www.novell.com/documentation/imanager25/imanager_install_25/data/bnptalr.html)) to install and configure the plug-in module.
- 3 If Tomcat did not restart during the installation and configuration process, restart Tomcat.
- 4 Log into iManager.
- 5 Click the *ZENworks* icon at the top of the page.
- 6 Enter the ZENworks Control Center URL:  
`https://ZENworks_Server_Address`  
Replace *ZENworks\_Server\_Address* with the IP address or DNS name of the ZENworks Server.
- 7 Click the *ZENworks* icon to launch the ZENworks Control Center.

# Command Line Administration Utilities

# 2

Novell® ZENworks® Linux Management includes several command line utilities to help you manage your ZENworks system. The primary purpose of the command line utilities is to provide access to the ZENworks management functionality in a scriptable environment.

## zlman

The zlman utility lets you perform the same tasks you can perform in the ZENworks Control Center, with the exception of imaging and preboot tasks. It is installed on ZENworks Servers in the following location:

```
/opt/novell/zenworks/bin
```

For more information about zlman, view the zlman man page (man zlman) on the ZENworks Server or view the [HTML version \(http://www.novell.com/documentation/zenworks7/reference/zlman.html\)](http://www.novell.com/documentation/zenworks7/reference/zlman.html) of the man page.

## zlmirror

The zlmirror utility lets you mirror RPM packages from ZENworks 6.x and 7 servers, YaST Online Update (YOU) servers, RedHat Network, and Red Carpet® Enterprise servers. It is installed on ZENworks Servers in the following location:

```
/opt/novell/zenworks/bin
```

For more information about zlmirror, view the zlmirror man page (man zlmirror) on the ZENworks Server, view the [HTML version \(http://www.novell.com/documentation/zenworks7/reference/zlmirror.html\)](http://www.novell.com/documentation/zenworks7/reference/zlmirror.html) of the man page, or see [Chapter 19, “Mirroring Software,” on page 199](#).

## rug

The rug utility lets you perform software and user management through the ZENworks Agent on a managed device. It is installed on managed devices in the following location:

```
/opt/novell/zenworks/bin
```

For more information about rug, view the rug man page (man rug) on a managed device or view the [HTML version \(http://www.novell.com/documentation/zenworks7/reference/rug.html\)](http://www.novell.com/documentation/zenworks7/reference/rug.html) of the man page.

## zmd

The zmd utility lets you control how the ZENworks Agent runs on a managed device. It is installed on managed devices in the following location:

```
/opt/novell/zenworks/sbin
```

For more information about zmd, view the zmd man page (man zmd) on a managed device or view the [HTML version \(http://www.novell.com/documentation/zenworks7/reference/zmd.html\)](http://www.novell.com/documentation/zenworks7/reference/zmd.html) of the man page.

## **zrmservice**

The zrmservice utility lets you control how the ZENworks Remote Management Agent (a component of the ZENworks Agent) runs on a managed device. It is installed on managed devices in the following location:

```
/opt/novell/zenworks/sbin
```

For more information about zrmservice, view the zrmservice man page (man zrmservice) on a managed device or view the [HTML version \(http://www.novell.com/documentation/zenworks7/reference/zrmservice.html\)](http://www.novell.com/documentation/zenworks7/reference/zrmservice.html) of the man page.

# ZENworks Server

# 3

The Novell® ZENworks® Server is the backbone of the ZENworks system. It communicates with the ZENworks Agent on managed devices to deliver software, enforce policies, collect inventory, and perform other management tasks. The following sections provide information about the ZENworks Server:

- ♦ [Section 3.1, “ZENworks Services,” on page 23](#)
- ♦ [Section 3.2, “RPM Package Repository,” on page 25](#)
- ♦ [Section 3.3, “Uninstalling a ZENworks Server,” on page 26](#)

## 3.1 ZENworks Services

The ZENworks Server includes the following services:

**Table 3-1** *ZENworks Services*

Service	Service Name	Description
eDirectory™	nds	Used for the ZENworks Object Store.
PostgreSQL Database	postgres	Used for the ZENworks Data Store; only needed if Data Store resides on ZENworks Server.
ZENworks Server	novell-zenserver	Used for communicating with the ZENworks Agent.
ZENworks Loader	novell-zenloader	Used for loading modules not directly associated with the ZENworks Server. This includes the Content Replication, Inventory Rollup, and QueueRunner modules.
ZENworks Server Management	novell-zented	Used for replicating RPM packages from the primary server to secondary servers.
ZENworks Imaging Service	novell-pbserv	Used to provide imaging services to a device. This includes sending and receiving image files, discovering assigned Preboot bundles, acting as session master for multicast imaging, and so forth.
ZENworks Preboot Policy Daemon	novell-zmgprebootpolicy	Used by PXE-enabled devices to check if there are any Preboot bundles that are assigned to the device.

Service	Service Name	Description
Proxy DHCP Daemon	novell-proxydhcp	Used with a standard DHCP server to inform PXE-enabled devices of the IP address of the Novell TFTP server. It also responds to PXE devices to indicate which bootstrap program (nvlntp.sys) to use.
TFTP Daemon (TFTP Server)	novell-tftp	Used by PXE-enabled devices to request files that are needed to perform imaging tasks. It also provides a central repository for these imaging files, such as the Linux kernel, initrd, and nvlntp.sys. A PXE-enabled device uses this server to download the bootstrap program (nvlntp.sys).
ZENworks Management Daemon (ZENworks Agent)	novell-zmd	Used to enable the server as a managed device.
ZENworks Imaging Agent	novell-zislnx	Used to save and restore image-safe data on the server (as a managed device). Only runs when launched by the ZENworks Agent.

The services reside in the `/etc/init.d` directory on the ZENworks Server. Refer to the following sections for instructions to help you control the ZENworks services:

- ◆ [Section 3.1.1, “Checking the Status of a ZENworks Service,” on page 24](#)
- ◆ [Section 3.1.2, “Starting a ZENworks Service,” on page 24](#)
- ◆ [Section 3.1.3, “Stopping a ZENworks Service,” on page 25](#)
- ◆ [Section 3.1.4, “Restarting a ZENworks Service,” on page 25](#)

### 3.1.1 Checking the Status of a ZENworks Service

To check the current status of a service, use the following command:

```
/etc/init.d/servicename status
```

Replace *servicename* with the name of the service as listed in the table in [Section 3.1, “ZENworks Services,” on page 23](#).

To check the current status of all services, use the following command:

```
/opt/novell/zenworks/bin/zlm-config --status
```

### 3.1.2 Starting a ZENworks Service

To start a service, use the following command:

```
/etc/init.d/servicename start
```

Replace *servicename* with the name of the service as listed in the table in [Section 3.1, “ZENworks Services,” on page 23](#).



To start all services, use the following command:

```
/opt/novell/zenworks/bin/zlm-config --start
```

To ensure that all services start in the correct order, we recommend that you use the `zlm-config --start` option to start all services rather than starting them one at a time.

### 3.1.3 Stopping a ZENworks Service

To stop a service, use the following command:

```
/etc/init.d/servicename stop
```

Replace *servicename* with the name of the service as listed in the table in [Section 3.1, “ZENworks Services,” on page 23](#).

To stop all services, use the following command:

```
/opt/novell/zenworks/bin/zlm-config --stop
```

### 3.1.4 Restarting a ZENworks Service

To restart a service that is already running, use the following command:

```
/etc/init.d/servicename restart
```

Replace *servicename* with the name of the service as listed in the table in [Section 3.1, “ZENworks Services,” on page 23](#).

To restart all services, use the following command:

```
/opt/novell/zenworks/bin/zlm-config --restart
```

To ensure that all services start in the correct order, we recommend that you use the `zlm-config --restart` option to restart all services rather than restarting only one service.

## 3.2 RPM Package Repository

The ZENworks Server contains all of the RPM packages that are included in bundles defined within your Management Zone.

### Package Repository Location

The package repository is the `/var/opt/novell/zenworks/pkg-repo` directory on the ZENworks Server. When you add an RPM package to a bundle, the package is automatically uploaded to the package repository.

If you remove bundles or packages from devices as described in [Section 16.12, “Using a Remote Execute Policy to Remove Bundles and Packages from Devices,” on page 181](#), the packages are not automatically removed from the package repository. You can manually delete packages from the package repository. If, however, you leave the packages in the package repository, and you later include the same packages in another bundle, the packages are already on the Server and will not be automatically uploaded.

## Package Replication

To ensure that all ZENworks Servers have the same RPM packages to distribute, the ZENworks Primary Server can replicate all packages to any ZENworks Secondary Servers in the Management Zone. To enable replication, you need to establish a replication schedule (see [Chapter 18, “Replicating Content in the ZENworks Management Zone,”](#) on page 197).

During replication of packages to a secondary server, only a new packages and updates to existing packages are sent.

## Package Administration

Because of the way that packages are replicated from the primary server to secondary servers, you must run the ZENworks Control Center or `zlm` utility from the primary server to add a package to a bundle. Doing so causes the package to be added to the primary server's package repository and then be replicated to all secondary servers.

If you add a package to a secondary server, the package will not exist on the primary server and is therefore removed the next time the primary server replicates its packages to the secondary server.

The same limitation applies to all package management tasks, such as modifying and deleting a package from a bundle. These tasks must be performed on the primary server.

## 3.3 Uninstalling a ZENworks Server

ZENworks includes a uninstall program (`zlm-uninstall`) to remove the ZENworks services, Object Store, and other files from a server. If for some reason the uninstall program cannot remove the ZENworks server software, you can manually uninstall the software. The following sections provide instructions for uninstalling the software with the uninstall program or manually.

### Uninstalling a ZENworks Server Using `zlm-uninstall`

- 1 Make sure you know the password for the ZENworks Administrator account.
- 2 Log in to the ZENworks Server as `root`.
- 3 Run the following command:  

```
/opt/novell/zenworks/bin/zlm-uninstall
```
- 4 Follow the prompts.

### Uninstalling a Secondary ZENworks Server Using `zlm-config`

- 1 Make sure you know the password for the ZENworks Administrator account.
- 2 Log in to the Secondary ZENworks Server as `root`.
- 3 Run the following command:

```
/opt/novell/zenworks/bin/zlm-config --remove-secondary-server=secondary_server
```

where *secondary\_server* is the full NDS context of the secondary server.

The server is usually in the system context. For example, if your server name is ZEN216, the full command is:

```
/opt/novell/zenworks/bin/zlm-config --remove-secondary-  
server=zen216.system
```

## Manually Uninstalling a Primary or Secondary ZENworks Server

- 1 Stop the services on the ZENworks Server. If necessary, see [Section 3.1.3, “Stopping a ZENworks Service,” on page 25](#).

- 2 Remove the following directories:

```
/opt/novell/zenworks/share/keystore  
/opt/novell/zenworks/datamodel/share/ldap-certs  
/etc/opt/novell/zenworks/serverid  
/etc/opt/novell/zenworks/serversecret
```

- 3 Edit `/etc/crontab` to remove the lines that contain ZENworks.
- 4 (Conditional) If you are removing the primary server and are using a local PostgreSQL database for the ZENworks Data Store, remove the database. To do so, use the following commands:

```
/etc/init.d/postgresql startsu - postgresqldropdb  
zenworksdropuser zenadmin/etc/init.d/postgresql stop
```

- 5 (Conditional) If you are removing a secondary server, remove the secondary server object from the Object Store and Data Store. To do so:

- 5a Create a script file like the following one to create a CLASSPATH variable that includes all of the paths to the ZENworks classes:

```
#!/bin/sh  
CLASSPATH=''  
for i in `ls /opt/novell/zenworks/java/lib/*.jar` ;  
do CLASSPATH="$i:$CLASSPATH" ;  
done ;  
for i in `ls /opt/novell/extend/Common/WSSKD/lib/*.jar` ;  
do CLASSPATH=$i:$CLASSPATH" ;  
done ;  
echo $CLASSPATH
```

- 5b Use the following command to remove the ZENworks secondary server object:

```
/opt/novell/zenworks/lib/java/bin/java -classpath $CLASSPATH  
com.novell.zenworks.datamodel.extensions.installer.LDAPInsta  
ller uninstall admin_password
```

Replace *admin\_password* with the ZENworks Administrator account password.

- 6 Remove the ZENworks Object Store. To do so, use the following commands:

```
ndsconfig rm -F -a admin.system -w admin_passwordrm -rf /var/  
nds/dibrm /etc/nds.conf
```

Replace *admin\_password* with the ZENworks Administrator account password.

- 7 Remove the ZENworks RPM packages. To do so:

- 7a Use the following command to list the package names:

```
rpm -qa | grep novell-zenworks
```

- 7b Remove each of the packages individually using the following command:

```
rpm -e | package_name
```

or

Use the following simple script to remove multiple packages:

```
for i in `rpm -qa | grep novell-zenworks` ; do rpm -e $i ; done
```

Because of package dependencies, you might need to run this script multiple times to remove all packages. You can verify that all packages have been removed by running the command in [Step 7a](#).

**8** Remove the following directories:

```
rm -rf /opt/novell/zenworks/  
rm -rf /etc/opt/novell/zenworks/  
rm -rf /var/opt/novell/zenworks/
```

# ZENworks Agent

# 4

The Novell® ZENworks® Agent is installed on each managed device within your ZENworks Management Zone. The agent communicates with the ZENworks Server to deliver software, enforce policies, and perform other management tasks. The following sections provide information about the ZENworks Agent:

- ♦ [Section 4.1, “ZENworks Agent Filename and Location,” on page 29](#)
- ♦ [Section 4.2, “ZENworks Agent \(zmd\) Cache Settings,” on page 29](#)
- ♦ [Section 4.3, “File System Access,” on page 30](#)
- ♦ [Section 4.4, “ZENworks Linux Management Update Client,” on page 30](#)
- ♦ [Section 4.5, “Uninstalling the ZENworks Agent,” on page 30](#)

## 4.1 ZENworks Agent Filename and Location

The ZENworks Agent is named `zmd`. It is sometimes referred to as the ZENworks Management Daemon. The ZENworks Agent is installed to the following directory:

```
/opt/novell/zenworks/sbin
```

## 4.2 ZENworks Agent (zmd) Cache Settings

As the ZENworks Agent (`zmd`) performs its duties, it maintains a cache that stores the content of bundles that are downloaded for installation on that managed device. You can control the age of contents in the cache and its size by using cache settings. Cache cleanup is enforced on both client startup and refresh.

The cleaning of cached information is always enabled. You can configure the following settings using the `rug set` command in the `rug` utility to manage the cache. For more information about the `rug` utility, see [“rug” on page 21](#).

**Table 4-1** ZENworks Management Daemon Cache Settings

Setting	Description
<i>max-cache-age</i>	<p>Defines the number of days the contents of the cache are retained, after which the contents are deleted. The default is 30 days. If this setting specifies 0 days, the cache content never expires.</p> <p>The cache cleanup is enforced on client startup and refresh. The contents of the cache are sorted by date (oldest to newest) and deleted by applying the <i>max-cache-age</i> setting, starting with the oldest content.</p> <p>To change the <i>max-cache-age</i> setting from the default of 30 days to 60 days, for example, you enter the following command from the managed device:</p> <pre>rug set max-cache-age 60</pre>

Setting	Description
<i>cache-max-size-in-mb</i>	<p>This setting is only enforced at cleanup time; not during bundle download. The default is 300 MB. If this is set to 0, there is no limit to the size of the cache; however, the <b>max-cache-age</b> setting still applies.</p> <p>If the cache size exceeds the maximum size specified with this setting, the cache contents are sorted by date and the oldest contents are deleted until the cache size is within the specified size limit.</p> <p>If this size limit is exceed while downloading bundles, the bundle contents are downloaded; however, the next time the device restarts or refreshes, the cache is cleaned until its size is within the specified size limit. The cache cleanup process will not delete files downloaded within the last 24 hours to get within the specified limit.</p> <p>To change the <i>cache-max-size-in-mb</i> setting from the default of 300 MB to 500 MB, for example, you enter the following command from the managed device:</p> <pre>rug set cache-max-size-in-mb 500</pre>

## 4.3 File System Access

The ZENworks Agent runs as root. This provides it with the file system access required to perform its management functions on the device.

## 4.4 ZENworks Linux Management Update Client

The ZENworks Linux Management Update Client is a component of the ZENworks Agent. It includes a user interface that can be launched from the client menu (Software Updates) or at the command line by using the following command:

```
/opt/novell/zenworks/bin/red-carpet
```

## 4.5 Uninstalling the ZENworks Agent

ZENworks includes a uninstall program (zlm-uninstall) to remove the ZENworks Agent from a device. If for some reason the uninstall program is unable to remove the ZENworks Agent, you can manually uninstall the agent. The following sections provide instructions for removing the software with the uninstall program or manually.

### Using zlm-uninstall to Uninstall the ZENworks Agent

- 1 Make sure you have unregistered the device. See [Chapter 10, “Unregistering and Reregistering Devices,”](#) on page 67.
- 2 Log in to the managed device as root.
- 3 Run the following command:  

```
/opt/novell/zenworks/bin/zlm-uninstall
```
- 4 Follow the prompts.

## Manually Uninstalling the ZENworks Agent

- 1 Use the following command to list the ZENworks RPM package names:

```
rpm -qa | grep novell-zenworks
```

- 2 Remove each of the packages individually using the following command:

```
rpm -e package_name
```

or

Use the following simple script to remove multiple packages:

```
for i in `rpm -qa | grep novell-zenworks` ; do rpm -e $i ; done
```

Because of package dependencies, you might need to run this script multiple times to remove all packages. You can verify that all packages have been removed by running the command in [Step 1](#).

- 3 Remove the following directories:

```
rm -rf /opt/novell/zenworks/  
rm -rf /etc/opt/novell/zenworks/  
rm -rf /var/opt/novell/zenworks/
```





# ZENworks Administrator Accounts

# 5

During installation, a default Administrator account is created. This account provides rights to administer all of your Novell® ZENworks® system.

You can create additional administrator accounts that provide full access to your ZENworks system. You can also create accounts that limit administrative rights to specific device folders, policy folders, bundle folders, and report folders.

The following sections provide information to help you create administrator accounts and manage administrator rights:

- ♦ [Section 5.1, “Creating an Administrator Account,” on page 33](#)
- ♦ [Section 5.2, “Modifying Account Rights,” on page 34](#)

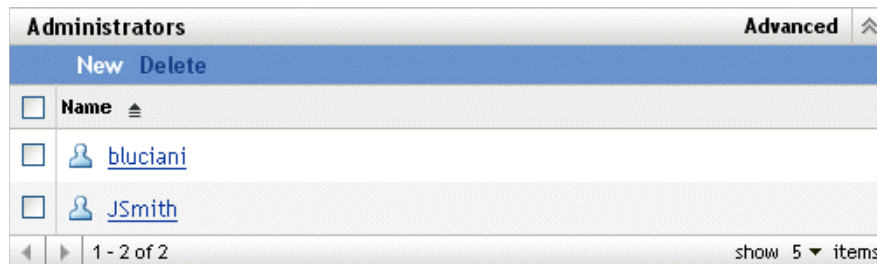
## 5.1 Creating an Administrator Account



- 1 Log in to the ZENworks Control Center using an administrator account that has rights to create other administrator accounts.

The default account, Administrator, has rights to create additional accounts.

- 2 In the ZENworks Control Center, click the *Configuration* tab.

The Administrators section of the Configuration page lists the current accounts.



Administrators		Advanced	⌵
		New	Delete
<input type="checkbox"/>	Name		
<input type="checkbox"/>	 bluciani		
<input type="checkbox"/>	 JSmith		

1 - 2 of 2 show 5 items

- 3 In the Administrators list, click *New* to display the Add new Administrator dialog box.
- 4 Provide a username and password for the account, then click *OK* to add the account to the Administrators list.

The administrator can change the password the first time he or she logs in by clicking the key icon located next to the *Logout* link in the upper-right corner of the ZENworks Control Center.

The newly created administrator account is granted View rights to all objects in the Management Zone. To grant additional rights, or to limit the administrator's rights to specific folders only, you need to modify the rights.

- 5 To change the administrator's rights, see the next section, [Modifying Account Rights](#).

## 5.2 Modifying Account Rights

By default, newly created accounts are granted View rights to all objects in the Management Zone. You can modify an administrator's rights so that the administrator can:

- ♦ Change the Management Zone configuration settings.
- ♦ Create or modify other administrator accounts.
- ♦ Create, modify, and delete all objects in the Management Zone or in a specific folder only.
- ♦ Modify all objects in the Management Zone or in a specific folder only.



To modify an administrator's rights:

- 1 Log in to the ZENworks Control Center using an administrator account that has rights to create and modify other administrator accounts.

The default account, Administrator, has rights to create and modify additional accounts.

- 2 In the ZENworks Control Center, click the *Configuration* tab.

The Administrators section of the Configuration page lists the current accounts.

Administrators		Advanced	⌵
New Delete			
<input type="checkbox"/>	Name		
<input type="checkbox"/>	 bluciani		
<input type="checkbox"/>	 JSmith		
1 - 2 of 2		show 5 items	

- 3 Click the account you want to modify.
- 4 Set the General options as desired:
  - ♦ **Can create and manage other administrators:** Select this option to enable the administrator to create additional administrator accounts, or to change the settings for existing administrator accounts.
  - ♦ **Can modify zone settings:** Select this option to enable the administrator to change the Management Zone settings, registration keys, registration rules, and licensing information included on the Configuration page.


- 5 Set the bundle, device, policy, and report rights as desired.

You use the Assigned Rights sections to control the administrator's rights to manage bundles, devices, policies, and reports. You can give the administrator All rights (Create, Delete, Modify), Modify rights only, or View rights only.

You assign rights at the folder level. The root folders are /Bundles, /Devices, /Policies, and /Reports. Rights assigned at a root folder are effective in all subfolders (for example, /Bundles/Workstations) unless specifically overridden at the subfolder level.

For example, if you want the administrator to be able to view bundles that are located in the /Bundles folder and create, delete, or modify bundles in the /Bundles/Workstations folder, you would assign the administrator View rights to the /Bundles folder and All rights to the /Bundles/Workstation folder.

The following options are available to add folders and modify the administrator's rights to folders:

- ♦ **Add:** By default, the Assigned Rights sections display only the root folders (/Bundles, /Devices, /Policies, and /Reports). To assign rights to a folder that is not listed, you need to add the folder to the list. To do so, click *Add* to display the Add Rights Folder dialog box. In the Folders field, click  to browse for and select the folder. After you select the folder, select the desired rights assignment (All, Modify, or View), then click *OK*.
- ♦ **Edit:** To modify the administrator's rights to a folder that already appears in the list (for example, the /Bundles folder), select the folder by checking the box in front of its name, then click *Edit*. Select the rights assignment you want (All, Modify, or View), then click *OK*.
- ♦ **Delete:** To delete a folder from the list, select the folder by checking the box in front of its name, then click *Delete*. This deletes the administrator's directly assigned rights to the folder. The administrator still inherits the rights assigned to the folder's parent. For example, assume the administrator has View rights in the /Bundles folder and All rights in the /Bundles/Workstations folder. You delete the /Bundles/Workstations folder from the list. The administrator's rights in the /Bundles/Workstations folder revert to the rights inherited from the /Bundles folder. Therefore, in this example, the administrator goes from having All rights in the /Bundles/Workstation folder to having View rights only.  
  
You cannot delete the root folders (/Bundles, /Devices, /Policies, and /Reports).

**6** When finished modifying rights, click *Apply* to apply the changes.



# ZENworks Database Maintenance

# 6

Under normal conditions, the data in the Novell® ZENworks® Object Store and Data Store is always consistent. However, inconsistencies can occur due to database corruption, hardware failures, or even natural disasters. Therefore, we recommend that you back up and restore the Object Store and Data Store on a periodic basis.

ZENworks Linux Management provides tools to back up and restore the ZENworks Object Store. Tools for backing up and restoring a PostgreSQL Data Store are also supplied. If you are using Oracle for the Data Store, we recommend using a tool like RMAN. Basic instructions for using RMAN are included.

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**IMPORTANT:** To restore a ZENworks Linux Management system after the failure of a ZENworks Primary Server, you need backups of the Object Store, Data Store, package repository, and zlmirror configuration files. Therefore, it is important that you complete the instructions in this section. For more information, see “[Disaster Recovery](#)” in the *ZENworks 7 Linux Management Troubleshooting Guide*.

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The following sections provide information about the maintenance tasks you can perform.

- ♦ [Section 6.1, “Maintaining the ZENworks Object Store,” on page 37](#)
- ♦ [Section 6.2, “Maintaining the ZENworks Data Store on PostgreSQL,” on page 38](#)
- ♦ [Section 6.3, “Maintaining the ZENworks Data Store on Oracle,” on page 40](#)
- ♦ [Section 6.4, “Synchronizing the Object Store and Data Store,” on page 44](#)

## 6.1 Maintaining the ZENworks Object Store

The ZENworks Object Store is Novell eDirectory™ 8.7.3. The following sections provide information for backing up and restoring the Object Store:

- ♦ [Section 6.1.1, “Backing Up the ZENworks Object Store,” on page 37](#)
- ♦ [Section 6.1.2, “Restoring the ZENworks Object Store,” on page 38](#)

### 6.1.1 Backing Up the ZENworks Object Store

You use `zlm_ndsbackup.sh`, located in `/opt/novell/zenworks/sbin`, to back up the Object Store.

- 1 Make sure you are logged in as root to the ZENworks Server.
- 2 Enter the following command at the command prompt:  

```
# zlm_ndsbackup.sh -U admin.system
```
- 3 Enter the password to authenticate to the Object Store.

This is the password for the ZENworks Administrator account.

The backup program creates a directory in `/var/opt/novell/zenworks/backup/nds/month-yyyy/yyyy-mm-dd`. The directory name is the date on which the backup is taken. The

backup file is saved in this directory. The name of the backup file has the format *timestamp-backup*, and the time stamp indicates the time when the backup was taken. For example:

```
/var/opt/novell/zenworks/backup/nds/August-2005/2005-08-23/  
10:12:23-backup
```

NDS Backup creates a directory with the current date in `/var/opt/novell/zenworks/backup/nds`. The backup file is saved in this directory.

The log information about the backup operation is saved to `/var/opt/novell/log/zenworks/ndsbackup.log`.

## 6.1.2 Restoring the ZENworks Object Store

If necessary, you can restore the ZENworks Object Store from a backup you created. You use `zlm_ndsrestore.sh`, located in `/opt/novell/zenworks/sbin`, to restore the Object Store from a backup.

- 1 Make sure you are logged in as root to the ZENworks Server.

- 2 Enter the following command on the command prompt:

```
zlm_ndsrestore.sh -U admin.system -F path_to_the_backup_file
```

Make sure that the `-F` option includes the backup file's complete path.

- 3 Enter the password to authenticate to the Object Store.

This is the password for the ZENworks Administrator account.

The log information about the restore operation is saved in `/var/opt/novell/log/zenworks/ndsrestore.log`.

- 4 After the restore is complete, you need to ensure that the Data Store is synchronized with the Object Store. For instructions, see [Section 6.4, “Synchronizing the Object Store and Data Store,” on page 44](#).

## 6.2 Maintaining the ZENworks Data Store on PostgreSQL

The following sections provide instructions for backing up and restoring the ZENworks Data Store using PostgreSQL:

- [Section 6.2.1, “Understanding Automated Database Maintenance,” on page 38](#)
- [Section 6.2.2, “Backing Up the ZENworks Data Store,” on page 39](#)
- [Section 6.2.3, “Restoring the ZENworks Data Store,” on page 39](#)

### 6.2.1 Understanding Automated Database Maintenance

If you are using a PostgreSQL database, there are some automated maintenance tasks that are performed both daily and monthly.

**Daily Maintenance:** Once a day, old versions are flagged, allowing the space used by these records to be used for new data; the statistics used by the query engine are updated to achieve the best possible performance. This maintenance runs every day at 2:15 a.m.

**Monthly Maintenance:** Unlike the daily maintenance, the monthly maintenance actually frees the space used by the flagged old records; this prevents a large disparity between the allocated disk space for the database and the actual space used by the database. Since this is an intensive process, it is scheduled monthly instead of daily. It runs at 3:15 a.m. on the first day of each month.

## 6.2.2 Backing Up the ZENworks Data Store

This section applies only if you are using the PostgreSQL database for your Data Store.

You can use `zlm_dbbackup.sh` to make a backup of the Data Store. This backup utility is located in `/opt/novell/zenworks/sbin`.

- 1 Make sure you are logged in as root to a ZENworks Server.
- 2 Enter the following at the command prompt:

```
zlm_dbbackup.sh
```

A directory with the current date is created at `/var/opt/novell/zenworks/backup/db`. The backup file, named `timestamp-zenworks-backup.tar.gz`, is saved in this directory. For example, if the backup is taken on August 23, 2005 at 11:30 p.m., the following directory and file are created:

```
/var/opt/novell/zenworks/backup/db/2005-08-23/23:30:00-zenworks-backup.tar.gz
```

Log information about the backup operation is saved in the `/var/opt/novell/log/zenworks/dbbackup.log` file.

The utility does not require any user interaction. If desired, you can schedule the database backup operation as a cron job.

## 6.2.3 Restoring the ZENworks Data Store

This section applies only if you are using the PostgreSQL database for your Data Store.

If necessary, you can restore the ZENworks Data Store from a backup you created. You use `zlm_dbrestore.sh`, located in `/opt/novell/zenworks/sbin`, to restore the Data Store from a backup.

The restore operation drops the existing database and creates a new one.

To restore the ZENworks Data Store:

- 1 On all ZENworks Servers, stop the ZENworks Server (`novell-zenserver`) and the ZENworks Loader (`novell-zenloader`) by using the following commands:

```
/etc/init.d/novell-zenserver stop/etc/init.d/novell-zenloader stop
```

Because all ZENworks Servers access the Data Store, you need to stop these services on all ZENworks Servers in your system.

- 2 Make sure you are logged in as root to a ZENworks Server.
- 3 Enter the following at command prompt:

```
zlm_dbrestore.sh -F path_to_the_backup_file
```

Make sure that the -F option includes the backup file's complete path. For example:

```
zlm-dbrestore.sh -F /var/opt/novell/zenworks/backup/db/2005-08-23/  
23:30:00-zenworks-backup.tar.gz
```

- 4 If prompted, enter Y to stop the ZENworks Server (novell-zenserver).
- 5 If prompted, enter Y to stop the ZENworks Loader (novell-zenloader).
- 6 When prompted to supply a password to drop the database, enter the Administrator password.
- 7 When prompted to supply a password to create the new database, enter the Administrator password.

The log information about the restore operation is saved in the file `/var/opt/novell/log/zenworks/dbrestore.log`.

- 8 After the restore is complete, you need to ensure that the Data Store is synchronized with the Object Store. For instructions, see [Section 6.4, “Synchronizing the Object Store and Data Store,” on page 44](#).

## 6.3 Maintaining the ZENworks Data Store on Oracle

The following sections provide instructions for backing up and recovering a ZENworks Data Store using Oracle:

- ♦ [Section 6.3.1, “Backup and Recovery Solutions,” on page 40](#)
- ♦ [Section 6.3.2, “Setting Environment Variables,” on page 41](#)
- ♦ [Section 6.3.3, “Connecting to the Database,” on page 41](#)
- ♦ [Section 6.3.4, “Starting the Database,” on page 41](#)
- ♦ [Section 6.3.5, “Backing Up the Database,” on page 42](#)
- ♦ [Section 6.3.6, “Recovering the Database,” on page 43](#)
- ♦ [Section 6.3.7, “Shutting Down the Database,” on page 44](#)

### 6.3.1 Backup and Recovery Solutions

Oracle provides two methods of backup and recovery:

- ♦ Recovery Manager (RMAN)
- ♦ User-managed backup and recovery.

The RMAN utility is automatically installed with the database. It can back up an Oracle8 database and all later versions of an Oracle database. RMAN uses server sessions on the database to perform backup and recovery. RMAN has its own syntax and is accessible either through a command-line interface or through the Oracle Enterprise Manager GUI. RMAN also provides APIs to interface with third-party media managers.

The advantage of RMAN is that it obtains and stores metadata about its operations in the control file of the database. An independent recovery catalog can be set up, which is a schema that contains metadata imported from the control file, in a separate recovery catalog database. RMAN performs the necessary record keeping for backups, archived logs, and so forth using the metadata, so restoration and recovery is greatly simplified.



An alternative method of performing recovery is to use operating system commands for backups and SQL\*Plus for recovery. This method is called User-managed backup and recovery.

RMAN automates backup and recovery, but the User-managed method requires keeping track of all database files and backups. Therefore, because of its robustness and simplified database administration abilities, RMAN is a highly recommended tool for backup operations. The subsequent sections of this document explain the steps for using RMAN to perform a complete database backup and recovery.

## 6.3.2 Setting Environment Variables

1 Set the following environment variables to the appropriate values before using RMAN:

- ♦ ORACLE\_HOME: The directory where the Oracle software is installed. For example:  
`ORACLE_HOME=/home/oracle/product/9ir2`
- ♦ CLASSPATH: The paths to the libraries installed by Oracle. For example:  
`CLASSPATH=$CLASSPATH:/oracle/opt/oracle/product/9ir2/JRE:/oracle/opt/oracle/product/9ir2/jlib:/oracle/opt/oracle/product/9ir2/rdbms/jlib:/oracle/opt/oracle/product/9ir2/network/jlib`
- ♦ PATH: The Oracle installation's bin directory. For example:  
`PATH=$PATH:/home/oracle/product/9ir2/bin`

## 6.3.3 Connecting to the Database

You can use either of the following methods to connect to the Oracle database being used for the Data Store:

- ♦ Start RMAN at the operating system command line without connecting to a database, by issuing the RMAN command without any connection options:  
`$ rmanRMAN> CONNECT TARGET /`
- ♦ Start the RMAN executable at the operating system command line while connecting to the database:  
`$ rman TARGET /`

If the database is already mounted or open, RMAN displays output similar to the following:

```
Recovery Manager: Release 9.2.0.0.0
connected to target database: RMAN (DBID=1237603294)
```

The DBID value displayed is the database identifier for the target database.

If the target database is not started, RMAN shows the following message:

```
connected to target database (not started)
RMAN> # the RMAN prompt is displayed
```

## 6.3.4 Starting the Database

1 Start the database using the following command:

```
RMAN> startup mount
```

This command starts an Oracle instance if it is not already started, and mounts the database but does not open it.

If the mount was successful, then the following output is displayed:

```
Oracle instance started
database mounted
```

Otherwise, appropriate error messages are displayed, indicating the causes of failure and suitable solutions.

### 6.3.5 Backing Up the Database

You can back up the database to the default disk location. The default location is OS-specific. On Linux, the default path where backup files are stored is `$ORACLE_HOME/dbs`.

To make a full backup of the data files, control files, and the current server parameter file to the default device type (which is the disk), use the following backup command at the RMAN prompt:

```
RMAN> BACKUP DATABASE;
```

In the above command, the `FORMAT` parameter is not specified, so RMAN automatically gives each backup piece a unique name and stores it in the OS-specific default location (`$ORACLE_HOME/dbs` on Linux).

To specify a filename for the backup piece, use the backup command with the `FORMAT` parameter:

```
RMAN> BACKUP DATABASE FORMAT '/tmp/%U';
```

`%U` generates a unique filename.

The RMAN backup command creates a backup set, which is a logical object that contains one or more backup pieces.

The backup command output contains the essential information about the backup, as shown in the following example:

```
Starting backup at OCT 12 2001 19:09:48
using target database controlfile instead of recovery catalogal
located channel: ORA_DISK_1
channel ORA_DISK_1: sid=10 devtype=DISK
channel ORA_DISK_1: starting full datafile backupset
channel ORA_DISK_1: specifying datafile(s) in backupset
including current SPFILE in backupset
including current controlfile in backupset
input datafile fno=00001 name=/oracle/oradata/zenworks/system01.dbf
input datafile fno=00002 name=/oracle/oradata/zenworks/undotbs01.dbf
input datafile fno=00003 name=/oracle/oradata/zenworks/cwmlite01.dbf
input datafile fno=00004 name=/oracle/oradata/zenworks/drsys01.dbf
input datafile fno=00005 name=/oracle/oradata/zenworks/example01.dbf
input datafile fno=00006 name=/oracle/oradata/zenworks /indx01.dbf
input datafile fno=00007 name=/oracle/oradata/zenworks/tools01.dbf
input datafile fno=00008 name=/oracle/oradata/zenworks/users01.dbf
channel ORA_DISK_1: starting piece 1 at OCT 12 2001 19:09:56
channel ORA_DISK_1: finished piece 1 at OCT 12 2001 19:10:31
piece handle=/oracle/dbs/lvd6dtk1_1_1 comment=NONE
```

```
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:39
Finished backup at OCT 12 2001 19:10:33
```

## 6.3.6 Recovering the Database

You can recover a restored data file by applying archived redo logs and online redo logs; that is, records of changes made to the database after the backup was taken. The following sections provide instructions for two methods you can use to recover the database:

- ♦ “Complete Recovery” on page 43
- ♦ “Incomplete Recovery” on page 43

### Complete Recovery

Complete recovery involves using redo data or incremental backups combined with a backup of a database, tablespace, or data file, to update it to the most current point in time. This is called a complete recovery because Oracle applies all of the redo changes contained in the archived and online logs to the backup. Typically, a complete media recovery is performed after a media failure damages data files or the control file.

- 1 Use the following sequence of commands to perform a complete recovery of the database:

```
RMAN> connect target /RMAN> run { 2> startup mount;3> restore
database;4> recover database;5> alter database open;6> }
```

This results in all data files being restored and then recovered. RMAN applies archive logs as necessary until the recovery is complete.

- 2 After the restore is complete, you need to ensure that the Data Store is synchronized with the Object Store. For instructions, see [Section 6.4, “Synchronizing the Object Store and Data Store,” on page 44](#).

### Incomplete Recovery

RMAN can perform recovery of the whole database to a specified non-current time, SCN, or log sequence number. This type of recovery is called incomplete recovery because it does not completely use all of the available redo logs. Incomplete recovery of the whole database is also called database point-in-time recovery (DBPITR).

You should perform an incomplete recovery of the database in the following situations:

- ♦ Media failure destroys some or all of the online redo logs.
- ♦ A user error causes data loss, for example, a user inadvertently drops a table.
- ♦ You cannot perform a complete recovery because an archived redo log is missing.

To perform an incomplete recovery, restore all data files from backups created prior to the time when a recovery is needed, and then open the database with the RESETLOGS option after recovery completes. The RESETLOGS operation creates a new instance of the database—in other words, a database with a new stream of log sequence numbers starting with log sequence 1.

The database must be closed to perform an incomplete recovery.

To perform an incomplete recovery:

- 1 Set the time format environment variable:

```
$ NLS_DATE_FORMAT="Mon DD YYYY HH24:MI:SS"
```

- 2 Use the following sequence of steps:

```
$ rman target /RMAN> startup mount;RMAN> run {2> set until time  
"to_date('Mar 16 2005 10:24:00', 'MM DD YYYY HH24:MI:SS')";3>  
restore database;4> recover database;5> }
```

RMAN uses the last backup created before the time mentioned in the set until command to restore the files to their default locations. Then, it uses archived redo logs (if needed) to recover the database.

Two other parameters that can be used with the set until command are SCN and log sequence numbers. You obtain SCNs from the alert logs. Find the SCN of an event and recover to a prior SCN. For example:

```
SET UNTIL SCN 1000
```

- 3 If recovery was successful, open the database and reset the online logs:

```
ALTER DATABASE OPEN RESETLOGS;
```

- 4 After the restore is complete, you need to ensure that the Data Store is synchronized with the Object Store. For instructions, see [Section 6.4, “Synchronizing the Object Store and Data Store,” on page 44](#).

We recommend that you back up the database immediately, preferably with the database mounted (to avoid possible data loss in an open database). Because the database is a new instance, the backups made before the RESETLOGS are not easily usable.

### 6.3.7 Shutting Down the Database

- 1 Use the following command to shut down the database:

```
RMAN> SHUTDOWN NORMAL;
```

This command dismounts the database and stops the running Oracle instance.

## 6.4 Synchronizing the Object Store and Data Store

If you've restored either the Object Store or the Data Store from backup, you need to make sure the two are synchronized. The `dbsync.sh` utility lets you synchronize the Data Store with the Object store by removing all devices and bundles that are found in the Data Store but not in the Object Store.

- 1 Make sure you are logged in as root to the ZENworks Server.
- 2 Enter the following command on the command prompt:

```
dbsync.sh [--force]
```

The utility has one option, `--force` or `-f`. The synchronization operation compares the list of devices and bundles in the two databases. When you use the `--force` option, `dbsync.sh` logs the GUIDs and names of the devices and bundles found in the Data Store but not in the Object Store. When you use the `--force` option, `dbsync.sh` deletes all devices and bundles that are found in the Data Store but not in the Object Store.

**3** Enter the password to authenticate to the Object Store.

The GUIDs and names of the devices and bundles that are in the Data Store but not in the Object Store are logged in the `/var/opt/novell/log/zenworks/dbsync-message.log` file.