Novell ZENworks® for Desktops

3.2

www.novell.com

GETTING STARTED GUIDE

November 11, 2003

Novell®

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ZENworks for Desktops 3.2 Getting Started Guide
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Contents

Getting Started With ZENworks for Desktops

This *Getting Started* guide includes information about the installing, planning, setting up, and testing processes that ZENworks® for Desktops (ZfD) customers will typically encounter while implementing this product on a test system.

Check the ZfD documentation Web site (http://www.novell.com/documentation/lg/zdfs/docui/index.html) for updated or additional information.

This guide contains these major sections:

What's New in ZENworks for Desktops 3.2

ZENworks for Desktops 3.2 (ZfD 3.2) includes some new enhancements, including:

- Imaging enhancements (for more information, see Chapter 5, "Workstation Imaging," on page 49).
  - Compression on disk – around 50% of original size
  - Compression over the wire – up to 20% less traffic
  - Advanced imaging accessible by policy
  - Server-based multicast
  - Integration with Preboot Services to enable the Preboot Execution Environment
- Enhanced thin client integration
  - Compatibility with Windows* 2000 Terminal Server
  - Compatibility with Citrix* MetaFrame XP
- New Policy Copy tool
- Enhanced Remote Control performance
  - Remote Control across a slow WAN connection
  - Up to 90% improvement over a LAN connection

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1 Installation and Setup

This section includes information about the installation of ZENworks® for Desktops (ZfD). More specifically, it focuses on the Typical Install option in order to provide an overall look at the ZfD components available for installation prior to deployment on a production system.

This section also includes important information you will need before the installation and while you are using the installation program, as well as information you will need in order to use most of the ZfD components:

Hardware and Software Requirements

This section includes the hardware and software specifications necessary for a successful installation of ZfD, including:

Overall Hardware Requirements

For full functionality and performance, ZfD requires the following minimum amounts of processing power, disk space, and RAM on the servers and workstations where it will be installed:

Resource	Minimum Disk Space	Minimum Hardware Requirement
User workstation; complete ZfD installation	5 MB	A Pentium* (or higher) personal computer, 75 MHz, 16 MB of RAM
User workstation with ZfD Preboot Services installed	0 MB	A Pentium (or higher) personal computer, 75 MHz, 16 MB of RAM; Preboot Execution Environment (PXE) -enabled network adapter or PXE-On-Disk boot diskette
User workstation with ZfD Remote Management installed	2 MB	Available disk space on the drive where Windows* is installed

Resource	Minimum Disk Space	Minimum Hardware Requirement
ZENworks server without ZENworks database installed	160 MB	NetWare® 4.11, 4.2, 5.*x, or 6* servers: 128 MB of RAM (minimum) with 7 MB free
ZENworks server with ZENworks database installed	220 MB (database will expand)	256 MB of RAM on NetWare 4.11, 4.2, 5.*x*, or 6 servers with 40 MB free
ZENworks server with ZENworks Preboot Services installed	10 MB	128 MB of RAM with 8 MB free

IMPORTANT: ZfD is not supported on the NEC* 9800 (also known as PC98) series of personal computers.

Overall Software Requirements

The requirements table in this section lists the software that is required to be installed on the server where you install ZfD. In addition, this section includes the following software accessibility information:

- "Support for ZfD in an IPX Environment" on page 13
- "Obtaining NetWare Support Packs" on page 14
- "Obtaining and Installing the JVM for Your NetWare Server" on page 14
- "Obtaining and Installing ConsoleOne" on page 14
- "Obtaining and Installing the Novell Client" on page 16

Platform	Minimum Software Requirement
Management Console	ConsoleOne® 1.3.2 (or later) included on the ZfD *Companion* CD shipping with ZENworks for Desktops — must be installed after any NetWare Support Packs are applied
NetWare 4.*x*	◆ NetWare 4.11 with NW4SP9.EXE applied (SFTIII™ or SMP not supported); NetWare 4.2 with NW4SP8A.EXE patch (or later) applied ◆ JVM (Java* Virtual Machine) 1.1.7b (dated January 2001 or later) included on the ZfD *Companion* CD shipping with ZENworks for Desktops — must be installed after any NetWare Support Packs are applied ◆ ORB.EXE shipping on the ZfD *Companion* CD — must be installed after any NetWare Support Packs are applied ◆ IP Protocol Stack bound and available on the server **IMPORTANT:** ZfD 3.2 Preboot Services are not supported on NetWare 4.*x*.
NetWare 5.0	◆ NW5SP6.EXE (or later) patch applied ◆ JVM 1.1.7b (dated January 2001 or later) included on the ZfD *Companion* CD shipping with ZENworks for Desktops — must be installed after any NetWare Support Packs are applied ◆ IP Protocol Stack bound and available on the server

Platform	Minimum Software Requirement
NetWare 5.1	◆ NW51SP2A.EXE (or later) patch applied ◆ JVM 1.1.7b (dated January 2001 or later) included on the ZfD *Companion* CD shipping with ZENworks for Desktops — must be installed after any NetWare Support Packs are applied ◆ IP Protocol Stack bound and available on the server
NetWare 6 **NOTE:** NetWare 6 is supported with ZfD 3.2 SP1 or later	◆ Support Pack 3 (recommended) ◆ Novell eDirectory (8.6.0 minimum, 8.7 recommended) ◆ JVM 1.3.1 (minimum) with JAVA.NLM must be installed ◆ IP Protocol Stack must be bound and available on the server
Windows NT* server	◆ NDS® Corporate Edition or NDS eDirectory™ ◆ IP Protocol Stack bound and available on the server
Windows 2000 server	◆ NDS eDirectory 8 or NDS eDirectory 8.5. ◆ IP Protocol Stack bound and available on the server
Novell Client™ for Windows 95/98	Version 3.3 with the SP4 patch. The basic version of the client is available from the Novell Software Downloads Web site (http://download.novell.com). The SP4 patch is available from the \CLIENT directory of the *Companion* CD shipping with ZfD 3.2 (English only version). or Version 3.31, which is available on the \CLIENT directory on the ZfD 3.2 *Companion* CD (English, French, German version). Check the Novell Client Documentation Web site (http://www.novell.com/documentation) for minimum requirements.
Novell Client for Windows NT/2000/XP	Version 4.83 with the SP4 patch. The basic version of the client is available from the Novell Software Downloads Web site (http://download.novell.com). The SP4 patch is available from the \CLIENT directory of the *Companion* CD shipping with ZfD 3.2 (English only version). or Version 4.81, which is available on the \CLIENT directory of the ZfD 3.2 *Companion* CD (English, French, German version). Check the Novell Client Documentation Web site (http://www.novell.com/documentation) for minimum requirements.

Support for ZfD in an IPX Environment

ZfD functions correctly when the IP protocol stack is loaded or bound to the network interface card (NIC) on the workstation. This is possible in a pure IP or IP/IPX™ environment using the NetWare Core Protocol™ (NCP™), but not in a pure IPX environment without NCP and when the IP stack is not bound.

The following table lists several network protocol configurations and their support for ZfD.

Network Protocol	ZfD Support
Pure IPX (no IP stack loaded or bound to the NIC on the workstation).	◆ Automatic Workstation Import will not work ◆ Some parts of Remote Management will not work ◆ Policies are supported ◆ Application Launcher is supported
IPX for NCP (IP stack for the Internet, host, etc.)	Fully supported
IP/IPX for NCP	Fully supported
Pure IP for NCP	Fully supported

IMPORTANT: ZfD will not function in an IP-to-IP gateway or in an IPX-to-IP gateway environment.

Obtaining NetWare Support Packs

If you install ZfD on a NetWare 5.*x* or NetWare 6 server, make sure you have installed the appropriate NetWare patch first. Support Pack files for NetWare are available from the Minimum Patch List at the Novell Support Connection® Web site (http://support.novell.com/misc/patlst.htm).

Obtaining and Installing the JVM for Your NetWare Server

To determine the version of the NetWare JVM on your NetWare server, show the date of the JAVA.NLM by entering the following command at the system console:

```
modules java
```

You can also determine the version by entering the following command at the system console:

```
java -version
```

If you plan to install ZfD on a NetWare 4.*x* server, you should install the JVM for NetWare version 1.1.7b available from the *Companion* CD that ships with ZfD. Using this version will help you avoid errors when loading Automatic Workstation Import. It is fully compatible with ZENworks for Desktops 3.2 and ZENworks for Servers 2.0 (or higher).

In some circumstances, the time to run Auto Workstation Import may take a very long time to run on a NetWare 5.1 server. If this is the case, you can use the JVM for NetWare version 1.2.2 from the *Companion* CD that ships with ZfD.

WARNING: If you are using ZENworks for Servers 2.0 Tiered Electronic Distribution (TED) in a mixed JVM environment, you must disable subscriber security. For more information, see TID 10060307 at the Novell Knowledgebase Web site (http://support.novell.com/cgi-bin/search/searchtid.cgi?/10060307.htm).

Obtaining and Installing ConsoleOne

We recommend that you use ConsoleOne 1.3.2 from the *Companion* CD that ships with ZfD. Using version 1.3.2 (or later) will help you avoid errors when using context-sensitive JavaHelp for the ZfD snap-ins. You can also obtain this version of ConsoleOne from the Novell Software Downloads Web site (http://download.novell.com).

WARNING: If you have previously installed ConsoleOne on your server, check the version number. If your installed ConsoleOne is a newer version than the 1.3.2 version that ships on the *Companion CD*, do not attempt to install the older version over the newer version.

From the *Companion* CD, you should browse to and install ConsoleOne 1.3.2 on a network server.

IMPORTANT: ZfD snap-ins do not load properly on the NetWare server console. After installation, do not run ConsoleOne directly from the server console to administer ZfD snap-ins. Instead, run ConsoleOne from a Windows workstation with a shortcut to the network server where you installed it.

This section includes the following topics:

Installing ConsoleOne on a NetWare Server

Use the following steps if you install ConsoleOne on a NetWare server volume:

1. Bring down Java* and any Java applications that are running on the server, including the server GUI. You can do this by entering the following command at the server console:

   ```
   java -exit
   ```

2. Ask all users who are currently running ConsoleOne remotely through a network connection exit their ConsoleOne sessions.
3. At a Windows workstation, insert the *Companion* CD > browse to the \CONSOLEONE directory > run C1.EXE.
4. Follow the prompts in the installation program. When asked to specify an installation path, enter *SERVER_NAME*\SYS\PUBLIC\MGMT\CONSOLEONE\1.2.
5. At the Summary screen, click Finish.
6. If you receive a prompt asking how to handle overwriting newer files, select Never Overwrite Newer files > click OK.
7. After the installation, an Installation Complete message appears. Click Close.

Installing ConsoleOne and ZfD on a Windows NT Server

NDS for NT servers must have a share name to install to. Normally, when NDS for NT is installed, if you install the admin programs, the share name is created for you. To establish a valid connection to a Windows NT server, map a drive to the NT SYS share and log in as Administrator.

If you have not installed the admin programs, you must create a share for the *C*:\NOVELL (or whichever drive where NDS for NT is installed) directory named SYS.

If the SYS share name does not exist, an error is displayed indicating that ConsoleOne cannot be found. ConsoleOne snap-ins (such as ZfD) cannot be installed under this condition.

Installing ConsoleOne to a Workstation Hard Drive

Although the ConsoleOne installation program lets you install ConsoleOne files to a local hard drive, and though minor performance enhancements can be achieved by doing so, such an installation will not include the ZfD snap-ins.

Instead of using the ConsoleOne installation program to get a local installation, we recommend the following:

1. Install ConsoleOne and ZfD to the server, including all of the components you plan to use.
2. From the PUBLIC\MGMT\CONSOLEONE directory on the server, copy the 1.2 folder > paste it to a clean area on your local drive.
3. Create a shortcut on your desktop to the 1.2\BIN\CONSOLEONE.EXE file in your local installation.

Another alternative is to use snAppShot™ to create your own application object (.AOT file) for ConsoleOne snap-ins or to use the pre-packaged ConsoleOne Application object (created during ZfD installation) to distribute the ConsoleOne snap-ins to other workstations.

You can configure the pre-packaged Application object by running the C1UPDATE.EXE program from SYS\PUBLIC\ZENWORKS on the server where you have installed ZfD. This utility helps you configure the object with the path to ConsoleOne on the server (usually SYS\PUBLIC\MGMT\CONSOLEONE\1.2). Configuring with this path ensures that all of ConsoleOne and the ZfD snap-ins will be available. The program also lets you configure a path for local installation of ConsoleOne (usually C:\NOVELL\CONSOLEONE\1.2).

When the update is executed, it prepares the ConsoleOne Update object for association and distribution to a workstation or a user. For information about distributing a pre-defined .AOT object, see "Application Management" in *Administration* at the ZENworks for Desktops 3.2 documentation Web site (http://www.novell.com/documentation).

Obtaining and Installing the Novell Client

All versions of ZfD, including ZfD 3.2, require the appropriate version of the Novell Client. Both the the International (English, French, German) and the English-only version of ZfD 3.2 can use client version 3.31 for Windows 9*x* workstations or version 4.81 for Windows NT/2000 workstations or servers. You can obtain the Novell Client from the *Companion* CD (English, French, German) or download from the Novell Software Downloads Web site (http://download.novell.com).

To install the Windows 95/98 client, run SETUP.EXE from the CLIENT\PRODUCTS\WIN95\IBM_*language* directory.

To install the Windows NT/2000 client, run SETUPNW.EXE from the CLIENT\PRODUCTS\I386 directory.

For more information about installing a Novell Client, particularly in a ZfD environment, see the Novell Client documentation Web site (http://www.novell.com/documentation).

ZfD Installation Prerequisites

Before you can install ZfD, you must perform the following tasks:

- ❑ Make sure that you have made and archived a reliable backup.
- ❑ Make sure that all of the recommended hardware and software requirements are met. In particular, make sure that the recommended version of ConsoleOne is installed on the server where you will install ZfD. For more information, see “Obtaining and Installing ConsoleOne” on page 14.
- ❑ Make sure that you have Admin or equivalent rights to all NetWare servers where you will install ZfD components. For installation on Windows NT/2000 servers, you should have Full Control permissions.

- ❑ Make sure you are authenticated to the server as an administrator equivalent if you are installing to an NT server. If you log in to the NT server using an IP address, your user object will not be authenticated to the server with the server name that is necessary for the installation program. It is not necessary to map a drive to the server to authenticate to it.

  To authenticate to an NT server, go to Network Neighborhood > double-click the server name > enter your user ID (admin or equivalent) and password.
- ❑ Make sure that NDS for NT servers have a share name to install to. For more information, see "Installing ConsoleOne and ZfD on a Windows NT Server" on page 15.
- ❑ Make sure that the Java runtime environment (JRE) is not running on any Windows NT server you are installing to as you start the installation program.
- ❑ Make sure that you have Admin or equivalent rights to extend the NDS schema.
- ❑ Make sure that the workstation where you will run the installation program has NDS (eDirectory) authentication to the server (or to the servers) where you plan to install the product.
- ❑ If you will be installing on a NetWare server, it will be necessary to unload JAVA.NLM (at the Server Console, type **`java -exit`**). Make sure you do this when Java is not being used by another process and the proper Java components have already been installed.
- ❑ Exit any program that uses files in the SYS:PUBLIC directory on any server where you will be installing ZfD.
- ❑ If you choose to install the Sybase* database and it is already running on the server, be sure to quit the database process before proceeding with the installation program.
- ❑ Exit any Windows programs on the network workstation from which you will be running the installation program.
- ❑ Set the screen resolution on the ConsoleOne administration workstation at 800 × 600. You will not be able to view all of the ConsoleOne information on the screen if the resolution is set lower than 800 × 600.
- ❑ We recommend installing ZfD 3.2 from a Windows NT/2000 workstation or server.

Pre-Selecting an Installation Option

Although this section of *Getting Started* focuses on the Typical install option so that you can become acquainted with all of the features of the ZfD product, there are actually three install options you can choose from when installing ZfD:

- "Typical Install Option" on page 17
- "Product Install Option" on page 18
- "Custom Install Option" on page 18

NOTE: PXE is included in the installation program by default if you choose a Typical install option. You must choose Imaging (PXE) if you want to install PXE in the Custom or Product install options. PXE is part of ZfD 3.2 Preboot Services, which must be purchased separately.

Typical Install Option

The ZfD Typical install option is designed to install all ZfD components at one time on the servers you select. It extends the schema of the NDS tree, copies the appropriate files to the server or servers, and creates the new Application objects in the server's container.

For administrators who know that they want to use all of the components, this can save time. In a test environment, for example, the need to evaluate the entire ZfD product may indicate choosing this option. The components that are installed in a Typical Install include:

- Application Management
- Automatic Workstation Import
- Workstation Management
- Workstation Imaging with Preboot Services
- Remote Management
- Workstation Inventory
- Sybase Database (optional)

Product Install Option

The ZfD Product install option is designed to install selected groups of ZfD components on the servers you select. For administrators who know that they want to select a specific group or groups of components, this can save time. In a test environment, for example, the need to evaluate only the components relevant to your business may indicate choosing this option. The following groups can be individually selected when you choose the Product Install:

- Workstation Management (which includes the Automatic Workstation Import, Workstation Inventory, and Workstation Manager components)
- Remote Management
- Application Management
- Workstation Imaging

You can select the specific parts of the products you select for installation, including files, schema extensions, NDS Objects, and support for PXE (also called ZfD Preboot Services).

Custom Install Option

The ZfD Custom install option is designed to let you install any of the ZfD components individually (or in a grouping of your choice) on the servers you select.

For administrators who know that they want to use only certain components, this can save time and server space. In a test environment, for example, the need to evaluate only the ZfD component or components you are interested in may indicate choosing this option. The following components can be individually selected when you choose the Custom Install:

- Application Management
- Automatic Workstation Import
- Remote Management
- Workstation Inventory
- Workstation Management
- Sybase Database
- Workstation Imaging

You can select the specific parts of the components you select for installation, including files, schema extensions, NDS Objects, and PXE support.

Using the Typical Install Option

Although you may eventually choose another installation type, the Typical install option documented here contains information you will need to know when you install using any of the options in your production environment. The sections include:

Running the Typical Installation Option

Use the steps in this section to get ZfD up and running on a NetWare or Windows NT/2000 server using the Typical install option:

1. Select a network workstation (or a Windows NT/2000 server) where you can later run ConsoleOne to administer ZfD. This is the workstation/server where you will run the ZfD installation program.

   IMPORTANT: Make sure that this workstation/server and all other administrative workstations or servers are not running ConsoleOne while the ZfD installation is running.

2. At the workstation/server, insert the ZfD *Program* CD.

   The WINSETUP.EXE program will autorun. If it does not autorun, run it from the root of the CD.

   At any time while the NIS setup program is running, you have the option of clicking Back to change your install preferences.

3. Click English > Install ZENworks to launch the NIS setup program.

   A warning dialog box is displayed to let you know that this version of ZfD is English only and will overwrite a localized version of ZfD previously installed on your server.

   3a Click Yes to continue.

4. At the Novell Product Installation dialog box, read the notes and cautions > click Next to display the License Agreement for the ZfD software.

5. Read the License agreement > click Accept if you agree with the terms of the license and the limited warranty.

   If you do not agree with the terms of the software agreement, do not install the software.

6. In the Install Prerequisites dialog box, ensure that the network server or servers to which you are installing meet the minimum requirements listed > click Accept when you are ready to proceed.

7. In the ZENworks Install Types dialog box, select Typical > click Next.

8. In the ZENworks List of Trees dialog box, click the name of the NDS tree where you want to install ZfD > click Next.

   If you are installing on a server where a previous version of ZfD Workstation Inventory or the Inventory database is installed, a ZfD3.2 Upgrade Notice is displayed. You have the choice of selecting Upgrade or Full Install.

   If you choose Upgrade, only ZfD 3.2 Inventory enhancements will be installed on the ZfD 3 servers.

If you choose Full Install, the servers you select later will have the Sybase database and the policies and configurations overwritten.

8a Click the type of install you want, depending on your test environment.

9 In the ZENworks List of Servers dialog box, click the names of the servers where you want to install ZfD > click Next.

10 In the Inventory Database Server Selection dialog box, select the server where you want to install the ZENworks Inventory database (you can also choose not to install the database at this time) > click Next.

If you choose to install the database, a subsequent dialog box will be displayed where you can choose the server volume where you want to install it. You should choose a volume other than SYS: to avoid filling up vital disk space on that volume. For more information, see "Setting Up Workstation Inventory" on page 71.

11 In the Languages dialog box, English is chosen by default. Click Next.

12 In the Automatic Workstation Import Management dialog box, select the Import (or Import/Removal) role for at least one of the servers where you are installing ZfD > click Next.

For more information about server roles in Automatic Workstation Import, see Understanding Automatic Workstation Import and Removal in Automatic Workstation Import and Removal in *Deployment*.

13 In the Inventory Server Roles dialog box, select the assignment you want to give to each of the Inventory servers you have created > click Next.

For more information about server roles in Workstation Inventory, see Implementing the Inventory Server Roles in *Deployment*.

14 In the ScanDir Volume dialog box, select the server volume where you want the scan data files to be stored. For more information, see "Setting Up Workstation Inventory" on page 71.

14a If you previously chose to install the database, you will be prompted to enter a unique site ID and name on the Site ID for Database dialog box. For more information, see "Setting Up Workstation Inventory" on page 71.

15 Click Next to continue.

16 In the Summary dialog box, review the list of the products to be installed and the disk space that each product will consume when installed > click Finish to begin the installation process.

17 If you have chosen to install ZfD Preboot Services, the ZfD 3.2 Preboot Services dialog box is displayed to remind you that you will have to insert the *Preboot Services* CD in the CD drive, or browse to the appropriate PXE files. Click OK.

18 In the Preboot Services Source Location dialog box, select the location (at the root of the CD) where the ZFDPXE file is located > click OK.

NOTE: If you copy the ZfD *Program* CD and the ZfD *Preboot Services* CD to a local drive, the installation program will not prompt for a change of CDs. For more information, see "Preboot Services CD Installation Options" on page 21.

The Typical install option checks to see if you have the proper rights to copy files and to extend the schema, then the program executes these processes for each ZfD component until all are installed.

Preboot Services CD Installation Options

If you choose to install ZfD Preboot Services, the ZfD installation program requires a discrete subinstall of this feature. Because the Preboot Services software is available only on a separate CD, you have three options for installing the PXE software:

1. Copy the ZfD *Program* CD to a network location and use the ZfD *Preboot Services* CD in the local CD drive of the workstation you are using for the installation. You would use this method if you want to install PXE at different times or to different servers.
2. Use the ZfD *Program* CD in the CD drive of the workstation you are using for installation, then swap to the *Preboot Services* CD when the Preboot Services subinstall is called. You would use this method if you want to visit several sites to perform multiple installations.
3. Copy the ZfD *Program* CD to the hard drive of the workstation you are using for installation, then copy the *Preboot Services* CD to the \PXE subdirectory now located in the directory you created when you copied the ZfD *Program* CD. You would use this method to perform any number of installations on servers accessible from your site. It does not require swapping CDs. Be aware that by default, this installation method will install Preboot Services every time the installation runs. There will be no prompts or pauses.

Determining Whether the NDS Schema Has Been Extended

After you install ZfD 3.2, you can use the ConsoleOne Schema Manager tool to determine whether your NDS schema has been extended by the ZfD 3.2 product installation program. When the schema has been extended for ZfD 3.2, attributes are added to the list.

To use the Schema Manager after the ZfD 3.2 product installation:

1. From ConsoleOne, click Tools > Schema Manager.
2. Click Attributes to open the list of schema attributes.

You should see the following attributes if ZfD 3.2 is installed:

```
ZENLOCZfD3Installed
ZENLOCZfD3SP1Installed
ZENLOCZfD332Installed
```

Setting Up Required Desktop Policies

ZfD requires policy packages in the NDS tree that can hold the desktop policies that you can later configure and enable. Any ZfD installation option (including a Typical install) also requires that you create and associate one Search Policy so that it will be enabled to find the other policies you create.

This section includes the information you need for setting up Desktop Policies, including:

- “Creating the Policy Packages” on page 22
- “Setting Up the Search Policy” on page 23
- “Associating the Container Package” on page 24

In a production environment (that is, a live network with actual users where you will install ZfD) after the ZfD test installation, you can add the policies that the individual components need to function correctly. For general guidelines about setting up policies, see Understanding ZfD Policies and Policy Packages in Planning Workstation Management in *Deployment*.

Creating the Policy Packages

A policy package holds the individual Windows desktop policies that dictate the rules of use or configuration for users or their workstations. You should create an Organizational Unit (OU) for holding the policy packages. Consider the following when determining where to place this OU:

- Whether you have partitions in your tree
- The 256-character limit in NDS for the full distinguished name
- The Search policy is used to locate the policy package

To minimize tree walking, it is best to create this policy package OU at the root of the partition that contains the objects with which the policy package will be associated. In doing so, the following benefits are realized:

- Tree walking is minimized with the root of the partition and the Search policy being used
- Placing the OU at the partition's root maximizes the number of characters that will be available for naming plural policies

To create a policy package:

1. In ConsoleOne, right-click the container where you want the container for the policy packages placed > click New > click Object > click Organizational Unit > click OK.
2. Give the container a short name.

   Because you can have both ZfD and ZenWorks for Servers (ZfS) policies in the same tree, make sure you distinguish your ZfD policies container with a unique name. For example, *ZfD Policies*.
3. Right-click the policy package's container > click New > click Policy Packages.
4. Select one of the following policy packages:

   Container Package
   Server Package
   Service Location Package
   User Package
   Workstation Package
5. Click Next > give the package a short name > click Next > click Create Another Policy Package (unless this is the last one being created) > click Finish.

   Short package name suggestions include:

   Container
   Server
   Location
   User
   Workstation
6. Repeat Step 4 through Step 5 for each policy package to be created.

Setting Up the Search Policy

The Search Policy is required for finding other policies.

To create the Search Policy:

1. In ConsoleOne, right-click the Container Package > click Properties.
2. Check the check box under the Enabled column for the Search policy.

   This both selects and enables the policy.
3. Click Properties.

   The Search Level tab is displayed.
4. Select the level to search up to:

   [Root]: Search to the root of the tree.

   Object Container: Search to the parent container.

   Partition: Search to the partition root.

   Selected Container: Search to the selected container.
5. If you chose Selected Container, browse to select the container.
6. To determine the searching limits in either direction, enter a number:

Number	Description
0	Limits the search to the selected level.
1	Limits the search to one level above the selected level. For example, if you selected the server's parent container, this would limit the search to one level *above* the parent level.
-1	Limits the search to one level below the selected level. For example, if you selected [Root], -2 would limit the search up to two levels *below* [Root].

7. Click the Search Order tab > select the policy searching order.

   Use the arrow keys, the Add button, and the Remove button as necessary to create your search order.
8. Click the Refresh Interval tab > select the frequency for how often the policy should be refreshed.

   The default is hourly. If you should set both time increments to zero (0), policies will never be refreshed.
9. Click the Associations tab > Add.
10. Browse to select the container object for association to the Search Policy.
11. Click OK when finished.

Associating the Container Package

The Search Policy you configured and enabled will not be in effect until you associate the Container Package with a container object.

To associate the Container Package:

1. In ConsoleOne, right-click the Container Package > click Properties.
2. Click the Associations tab > Add.
3. Browse for the container high in the tree for associating the package > click OK.

Other Things You Can Do

For detailed information about installing and configuring specific ZfD components, see the following sections:

- "Setting Up Automatic Workstation Import" on page 28
- "Installing Application Management" on page 38
- "Preparing an Imaging Server" on page 53
- "Installing the Remote Management Component" on page 65
- Installing Workstation Inventory to NetWare Servers in *Deployment*
- Installing Workstation Inventory to Windows NT/2000 Servers in *Deployment*
- Installing Workstation Inventory in an Existing ZfD 3 Setup in *Deployment*

2 Automatic Workstation Import

ZENworks® for Desktops (ZfD) Automatic Workstation Import provides simplified, hands-off management of users' workstations. Workstation objects provide you with a way to push software and computer settings down to the client using Novell® Application Launcher™ (NAL).

Automatic Workstation Import includes Automatic Workstation Removal. However, for your test system, you initially do not need to set up Automatic Workstation Removal. For information on Automatic Workstation Removal, see Installing Automatic Workstation Import and Removal in *Deployment*.

Automatic Workstation Import must be set up before you set up Workstation Management (User and Workstation policy packages), Workstation Inventory, Imaging, or Remote Control.

To use Automatic Workstation Import, you must select Automatic Workstation Import and either the Import or Import/Removal option when you install ZfD.

You must also configure the import policy for ZfD, then associate the Server Package as part of setting up Automatic Workstation Import.

To get you started with a setup of Automatic Workstation Import on your test system, perform the steps in the following sections:

- "Installing Automatic Workstation Import" on page 25
- "Setting Up Policies for Automatic Workstation Import" on page 26
- "Setting Up Automatic Workstation Import" on page 28
- "Other Things You Can Do" on page 32

Installing Automatic Workstation Import

If you have already installed Automatic Workstation Import, such as in performing a Typical Install, skip to "Setting Up Policies for Automatic Workstation Import" on page 26.

Use the following steps to get Automatic Workstation Import installed on a NetWare® or NT*/2000 server:

1. Select a workstation where you can run the ZfD installation program and later run ConsoleOne® to administer ZfD.

   IMPORTANT: Make sure that this workstation and all other administrative workstations are not running ConsoleOne while the ZfD installation is running and that Java* is unloaded on all NetWare 5.*x* servers.

2. At the workstation, insert the ZENworks for Desktops *Program* CD.

   The WINSETUP.EXE program will autorun. If it does not autorun, run it from the root of the CD.

3. To launch the NIS setup program, click English > Install ZENworks.

4. To display the License Agreement for the ZfD software, click Next > read the agreement > click Accept if you agree with the terms of the agreement.

   If you do not agree with the terms of the software agreement, do not install the software.

5. In the Install Prerequisites screen, ensure that the network server or servers to which you are installing meet the minimum requirements listed > click Accept when you are ready to proceed.

6. In the ZENworks Install Types dialog box, select Custom > click Next.

7. Deselect all options except for Automatic Workstation Import > click Next.

8. If you have already extended the schema on the current tree for ZfD, deselect Schema Extensions > click Next.

   Keep the other two options selected, because both files and NDS® objects need to be installed for Automatic Workstation Import.

9. In the ZENworks List of Trees dialog box, click the name of the NDS tree where you want to install Automatic Workstation Import > click Next.

10. In the ZENworks List of Servers dialog box, click the names of the servers where you want to install Automatic Workstation Import > click Next.

11. In the Languages dialog box, click the language of the files that you have chosen to be installed to the server > click Next.

    TIP: English is chosen by default and must be installed in addition to any other language you choose.

12. In the Automatic Workstation Import Management dialog box, select the Import (or Import/Removal) role for at least one of the servers where you are installing Automatic Workstation Import > click Next.

13. In the Summary dialog box, review the list of the products to be installed and the disk space that each product will consume when installed > click Finish to begin the installation process.

Setting Up Policies for Automatic Workstation Import

To set up the necessary policies for Automatic Workstation Import, do the following in order:

1. "Configuring the Workstation Import Policy for ZfD" on page 26
2. "Associating the Server Package" on page 27

Configuring the Workstation Import Policy for ZfD

For Automatic Workstation Import to work, you must configure the Workstation Import Policy. This policy determines how the workstation objects will be named and placed in NDS.

To configure the Workstation Import Policy for ZfD:

1. If you have not created a Server Package, in ConsoleOne, right-click the server container where your server object is found > click New > click Policy Package > select Server Package > select Workstation Import > click Next > name the package > click Next > click Finish.

2. Right-click the Server Package > click Properties.

   The Policies tab with the General page is displayed. You should use the General policies for your test system. General policies will apply to all valid platforms (NetWare and Windows* NT*/2000).

3. On the General page, check the box under the Enabled column for the Workstation Import policy.

   This both selects and enables the policy.

4. Click Properties.

5. On the Containers tab, click Add.

6. Select a valid workstation container where rights are needed to create workstations > click OK.

7. Click the Platforms tab.

   The General page with its Location tab is displayed. Again, use these settings, which will apply to all platforms.

8. To select where to create workstation objects, click the Create Workstation Objects In drop-down list > select one of the following:

   Selected Container: The selected path is displayed (recommended). You may need to create the container before you can select it here.

   Server Container: Uses a server container, or enter a relative DS path.

   User Container: Uses a user container, or enter a relative DS path.

   Associated Object Container: Uses an associated object container, or enter a relative DS path.

9. Click the Naming tab.

10. To change the default workstation naming syntax, do one or more of the following:

    - Click Add to add name field items (Computer+MAC Address defaults). You can select from the following: User, Container, DNS, Server, OS, CPU, IP Address, or user-defined.
    - Click an item, then click either the up-arrow or down-arrow to change the item's position in the syntax.

11. To set login limits, click the Limits page > do any of the following:

    - Select the user login number if relative to a user container, or if "user" is part of the workstation's name. This number represents how many times you will allow a user to log in before importing the workstation.
    - To limit the number of workstations that can be imported per hour, check the box.
    - Select the upper limit for the number of Workstation objects that can be created in an hour.

12. Click OK.

Associating the Server Package

The policies you configured and enabled will not be in effect until you associate their policy package with a Server or Container object.

To associate the Server Package:

1. In ConsoleOne, right-click the Server Package > click Properties.

2. Click the Associations tab > Add.

3. Browse for the server container or server object for associating the package > click OK.

Setting Up Automatic Workstation Import

The following steps assume that you selected the Import or Import/Removal option as part of Automatic Workstation Import installation.

To set up Automatic Workstation Import:

1. Set up a DNS name for Automatic Workstation Import to use.

   This can be either a DNS entry or an entry in a local HOSTS file. An example of a DNS name is www.novell.com.

   The following is an example of the text you would add in a HOSTS file for Automatic Workstation Import:

   ```
   151.155.155.55 zenwsimport
   ```

   In this example, the TCP/IP address is for the server where you are running the Automatic Workstation Import service. "zenwsimport" is not the name of a server, but a DNS name that resolves to this TCP/IP address. In other words, zenwsimport is a label to identify the server as the one running the Automatic Workstation Import service.

   For Windows 95/98, the HOSTS file's location should be:

   Win95-98_drive:*Win95-98_directory*\HOSTS

   IMPORTANT: Note that the default host file in Windows is named HOSTS.SAM. Do not use the .SAM extension with your host filename. Rename HOSTS.SAM to HOSTS, or make a copy and rename the copy. Remember that by default, Windows 95/98 hides filename extensions that are of a known type. Therefore, make sure filename extensions are being displayed so that you can correctly rename the HOSTS.SAM file to HOSTS.

   For Windows NT/2000, the HOSTS file's location should be:

   WinNT-2K_drive:*WinNT-2K_directory*\SYSTEM32\DRIVERS\ETC\HOSTS

   Note that HOSTS as shown above is a filename, not a folder name. By default, Windows 95/98 will hide filename extensions (such as .SAM) because it is a known file type.

2. To verify the DNS name or TCP/IP address, at the workstation command prompt type:

   ping zenwsimport

3. To place Workstation Manager on the workstation, install the Novell® Client™ that ships with ZfD.

4. Check the box to enable Workstation Manager.

   At this point, if the scheduler is working, registration should happen automatically when any of these events occur:

   - Scheduler service startup (95/98 and NT/2000)
   - User login (95/98 and NT/2000)
   - User logout (NT/2000 only)

   TIP: If WSREG32.LOG shows problems or no activity, registration can be forced to run (without event logging) by running WSREG32.EXE (located at *windows_drive*:*windows_directory**windows_system_directory*).

5. To verify that Automatic Workstation Import is running on a NetWare server, on the server console type:

   java -show

and look for:

```
com.novell.application.zenworks.autowsmanagement...
```

6 To verify that Automatic Workstation Import is running on a Windows NT/2000 server, check services for:

```
ZENworks Workstation Import
```

7 If Automatic Workstation Import is not running, restart the server.

Other Things You Can Do

After you have installed and set up a test system with Automatic Workstation Import, you can set up additional features:

- **Automatic Workstation Removal:** Automatically remove Workstation objects from the tree.
- **Logged In Workstations:** View which workstations a user is logged in to.
- **Reporting:** Create reports on workstation activities.
- **User Histories:** View the user history for a workstation.
- **Workstation Associations:** View which workstations are associated with a User object.
- **Workstation Groups:** Manage multiple workstations as a group.
- **Workstation Registration:** View when a workstation was last registered.

For more information, see Automatic Workstation Import in *Administration*.

3 Workstation Management

ZENworks® for Desktops (ZfD) Workstation Management includes policies and configuration files for the User and Workstation policy packages.

For more information on policies, see Workstation Management in *Administration*.

This section contains the following topics:

If you have not already installed Workstation Management, such as in performing a Typical Install, perform the steps in the following section.

Installing Workstation Management

Use the following steps to install Workstation Management on a NetWare® or Windows* NT*/2000 server:

1. Select a workstation where you can run the ZfD installation program and later run ConsoleOne® to administer ZfD.

   IMPORTANT: Make sure that this workstation and all other administrative workstations are not running ConsoleOne while the ZfD installation is running.

2. At the workstation, insert the *ZENworks for Desktops* product CD.

   The WINSETUP.EXE program will autorun. If it does not autorun, run it from the root of the CD.

3. To launch the NIS setup program, click English > Install ZENworks.

4. To display the License Agreement for the ZfD software, click Next > read the agreement > click Accept if you agree with the terms of the license and limited warranty.

   If you do not agree with the terms of the software agreement, do not install the software.

5. In the Install Prerequisites screen, ensure that the network server or servers to which you are installing meet the minimum requirements listed > click Accept when you are ready to proceed.

6. In the ZENworks Install Types dialog box, select Custom > click Next.

7. Deselect all options except for Workstation Management > click Next.

8. If you have already extended the schema on the current tree for ZfD, deselect Schema Extensions > click Next.

   The Files and NDS Objects options should be left enabled.

9. In the ZENworks List of Trees dialog box, click the name of the NDS® tree where you want to install Workstation Management > click Next.
10. In the ZENworks List of Servers dialog box, select the servers where you want to install Workstation Management > click Next.
11. In the Languages dialog box, click the language of the files that you have chosen to be installed to the server > click Next.

    English is chosen by default and must be installed in addition to any other language you choose.
12. In the Summary dialog box, review the list of the products to be installed and the disk space that each product will consume when installed > click Finish to begin the installation process.

Other Things You Can Do

After you have installed and set up a ZfD test system, you can set up additional policies.

Other things you can do with ZfD policies:

- **Effective Policies:** Policies can be in effect for both User and Workstation objects.
- **Policy Package Migration:** Migrate the ZENworks 2 policies to ZfD 3.2 policies and packages.
- **Policy Package Copy Utility:** Copy a Policy package from one NDS container to another using the Policy Package Copy utility.
- **Scheduled Actions:** Schedule specific actions for the workstation.
- **Scheduling Policies:** Schedule when policies will be in effect.

Other ZfD policies you can configure:

- **Client Configuration:** Set configuration parameters for workstations. This policy is found only on the WinNT-2000, Win95-98, and Win3*x* pages.
- **Computer Extensible:** Set user-defined policies (from .ADM files) for workstation objects.
- **Desktop Preferences:** Set defaults for a user's desktop.
- **Dynamic Local User:** Establish parameters for governing Windows NT*/2000 users.
- **Help Desk:** Establish how users can obtain help desk support.
- **Inventory Roll-Up:** Configure how to roll up workstation inventory information to a server.
- **RAS Configuration:** Configure dial-up networking parameters.
- **Remote Control:** Specify policy parameters for remotely controlling a user or workstation.
- **Restrict LogIn:** Include or exclude users who can log in using a particular workstation.
- **SMTP Host:** Establish the IP address of the relay host that precesses outbound Internet e-mail.
- **SNMP Trap Target:** Establish SNMP trap targets.
- **User Extensible:** Set user-defined policies (from .ADM files) for user objects.
- **Workstation Inventory:** Establish parameters for inventorying workstations.
- **Workstation Removal:** Configure when to remove unused Workstation objects.

- **Windows 2000 Group:** Copy Active Directory group policies to NDS and edit them.
- **Windows Terminal Server:** Configure support for Citrix*.

For information, see Workstation Management in *Administration*.

4 Application Management

ZENworks® for Desktops (ZfD) lets you use NDS® to manage applications for users on Windows* 95/98 and Windows NT*/2000 workstations (32-bit Windows platforms). The following sections provide information to help you understand, set up, and test ZfD Application Management:

Application Management Overview

Using ZfD Application Management, you can distribute (install) applications to workstations and uninstall the applications you've distributed. The following sections introduce the components involved in Application Management and provide additional information about distributing, uninstalling, and caching applications:

Application Management Components

ZfD Application Management consists of three main components:

Application Objects

For an application to be distributed to a workstation, the application must first have an NDS object that defines the information required to distribute it. ZfD Application Management includes a ConsoleOne® snap-in that enables you to create Application objects in NDS. Application objects define information such as:

- The physical location of application source files on the network
- The target location for installation of the application on a workstation
- Registry settings, .INI files, text configuration files, application files, icons, shortcuts, and other settings that support the application
- The users or workstations associated to (and thus authorized to use) the application
- Additional settings such as availability scheduling, granting of rights, fault tolerance, load balancing, application site lists, and folders

Application objects give you tremendous control over how applications are distributed. For example, you could create an Application object that installs an application to the user's workstation and then immediately runs the application. Or you could create an Application object that automatically installs files when the user logs in to a workstation and then disappears from the workstation's desktop. You could even create Application objects that are available for a certain period of time or only on specific days.

In addition to adding Application objects to NDS, the Application Management snap-in adds new property pages to the following objects: User, Group, Workstation, Workstation Group, Organizational Unit, and Organization. These property pages let you associate applications with a specific user, a specific workstation, groups of users, groups of workstations, entire organizational units, or entire organizations.

snAppShot

Distributing an application to a workstation can require various changes to the workstation, such as modifying the workstation's settings and installing the application's source files. All these changes must be recorded in the Application object.

To help you create Application objects that contain the correct distribution information, ZfD Application Management provides the snAppShot™ utility. SnAppShot creates application installation packages that consist of two types of files: an Application object template (.AOT) file and one or more application source (.FIL) files.

The .AOT file contains information about the application source (.FIL) files that will be installed and the workstation settings that will be modified to support the application. When you create an Application object, you can specify the .AOT file to use as the template for the Application object, in which case the .AOT information is used to populate the Application object's information fields (source files location, installation target directory, Registry settings, .INI files, shortcuts, and so forth).

To use snAppShot to create an installation package for an application, you start snAppShot on a workstation that does not have the application installed. SnAppshot records the changes that occur on the workstation as the application is installed. As the installation proceeds, snAppShot captures the differences between the workstation's pre-installation configuration state and the workstation's post-installation state, compares the two pictures, and records any differences in the .AOT file. SnAppShot also tracks all of the files that are installed to the workstation. These files, which become the application source files, are copied to a network source location, renamed numerically, and given a .FIL file extension.

SnAppShot can be used on Windows 95/98 and Windows NT/2000 workstations.

Novell Application Launcher and Application Explorer

Novell® Application Launcher™ and Application Explorer are workstation applications that display Application object icons on users' workstations and perform various application management functions, such as distributing (installing) applications, uninstalling applications, and caching applications. Application Launcher and Application Explorer display only the Application objects to which the user or workstation has been associated (granted rights).

Application Launcher is a standalone desktop window. With Application Launcher, users can create personal folders (if you've given them the appropriate rights), refresh applications, change views, and get information about folders and applications.

Application Explorer also provides a standalone desktop window. Application Launcher limits you to displaying Application objects only in the Application Launcher window, but Application Explorer lets you display Application objects in the Application Explorer window, the Start menu, the Quick Launch toolbar, the system tray, and the desktop.

Both Application Launcher and Application Explorer can be used on Windows 95/98 and Windows NT/2000 workstations. The main difference is that Application Launcher can be used to replace the Windows desktop, providing greater administrative control of users' workstations, while Application Explorer extends the desktop and allows users to access Application objects from multiple locations.

You control whether users run Application Launcher/Explorer by including the appropriate executable commands in users' login scripts.

Application Launcher/Explorer requires the Novell Client™ to be installed on the workstation.

Application Distribution

ZfD Application Management provides the ability to distribute applications to Windows 95/98 and Windows NT/2000 workstations. You can:

- Distribute applications to workstations whose users are authenticated to NDS.
- Distribute applications to workstations whose users are not currently authenticated to NDS. Workstations that have been disconnected from the network (NDS) can continue to run, install, and verify applications. To run, the applications must have already been installed. To install or verify applications, the applications must reside in a local cache (hidden directory). The applications can be distributed from the network (prior to disconnecting) or from a portable storage medium, such as a CD or Jaz* drive (after disconnecting).
- Distribute MSI-based applications. Application objects can be created using Microsoft* Windows Installer (.MSI) packages and distributed to users.
- Distribute applications to users in a Microsoft Windows Terminal Server environment or Citrix* MetaFrame environment.
- Distribute applications to newly imaged workstations as part of the imaging process.

Application Uninstall

Any application (including MSI-based applications) distributed through ZfD Application Management can be uninstalled. The uninstall includes the deletion of all files, .INI entries, and registry entries associated with the application. Shared DLL references are observed.

Each user's workstation contains a local cache that contains information about applications installed on the workstation. When you uninstall an application, this cache is used to ensure that the appropriate files and settings are removed from the workstation.

By default, users are restricted from uninstalling applications themselves; however, you as a system administrator can enable users with this capability, or you can limit application uninstall to yourself and other system administrators.

Application Caching

Application caching enables users to install, run, and verify (repair) applications while they are disconnected from NDS.

ZfD Application Management creates a hidden cache directory (NALCACHE) on the root of each user's workstation. This cache directory contains the NDS information required to run an application when the workstation is disconnected from NDS. If the application has already been installed to the workstation and the user disconnects from NDS, the application will continue to run just as if the user were still connected.

The cache directory also can contain the application source files and other information required to install the application or verify (repair) problems that may occur with the application while in disconnected mode. For example, if a user does not install the application before disconnecting from NDS, he or she can still install it if the application has been cached to the workstation's cache directory.

To ensure that users will always have mission-critical applications when disconnected, you can configure Application objects to be cached automatically when you associate the Application objects with users. This is called a forced cache. In addition, you can configure Application Launcher/Explorer to display the Application Management dialog box. This dialog box, which is turned of by default, enables users to select which applications they want to cache to their workstations' local drives.

To save disk space, application files are compressed before being stored in the cache directory.

Installing Application Management

If you followed the installation instructions in Chapter 1, "Installation and Setup," on page 11 to perform a Typical Install, Application Management was installed at that time. Skip to the next section, "Starting Application Launcher and Application Explorer" on page 39. Otherwise, complete the tasks in the following sections:

- "Completing the Installation Prerequisites" on page 38
- "Running the Installation Program" on page 39

Completing the Installation Prerequisites

Before you can install ZfD Application Management, you must perform the following tasks:

- Make sure that all of the recommended hardware and software requirements are met. For details, see "Overall Hardware Requirements" on page 11 and "Overall Software Requirements" on page 12.
- Make sure that you have Admin equivalent rights to the server where you will install Application Management.

- Make sure that you have Admin equivalent rights to extend the NDS schema.
- Make sure that the workstation from where you will run the installation program is authenticated to the server where you are installing the product.
- If you will be installing on a NetWare® server, it will be necessary to unload JAVA.NLM (at the Server Console, type **`java -exit`**). Make sure you do this when Java* is not being used by another process and the proper Java components have already been installed.
- Exit any program that uses files in the SYS:PUBLIC directory on the server where you will be installing Application Management.
- Exit any Windows programs on the network workstation from which you will be running the installation program.

Running the Installation Program

Complete the following steps to install ZfD Application Management:

1. Select a network workstation where you can later run ConsoleOne to administer Application Management. This is the workstation where you will run the ZfD installation program.

   IMPORTANT: Make sure that this workstation and all other administrative workstations are not running ConsoleOne while the ZfD installation is running.

2. At the workstation, insert the ZENworks for Desktops *Program* CD.

   The WINSETUP.EXE program will autorun. If it does not autorun, run it from the root of the CD.

3. Click English > Install ZENworks to launch the NIS setup program.
4. Follow the prompts until you reach the ZENworks Install Types dialog box.
5. In the ZENworks Install Types dialog box, select Custom > click Next.
6. In the Components dialog box, deselect all components except Application Management > click Next.
7. In the ZENworks Part Selection dialog box, make sure all parts (Files, Schema Extensions, and NDS Objects) are selected > click Next.
8. In the ZENworks List of Trees dialog box, select the name of the NDS tree where you want to install Application Management > click Next.
9. In the ZENworks List of Servers dialog box, select the name of the server where you want to install Application Management > click Next.
10. In the Languages dialog box, select the language you want installed > click Next.
11. In the Summary dialog box, review the products to be installed > click Finish > follow the prompts to complete the installation.

Starting Application Launcher and Application Explorer

Application Launcher/Explorer must be running on each workstation to which you want to distribute applications. Complete the steps in the following sections to start Application Launcher/Explorer on users' workstations:

- "Starting Application Launcher" on page 40
- "Starting Application Explorer" on page 40

Starting Application Launcher

1. To manually start Application Launcher on a workstation, run NAL.EXE from the SYS:\PUBLIC directory on the server where you installed ZfD Application Management.

   or

   To automatically start Application Launcher each time the user logs in to NDS, enter the following line in the user's login script:

   ```
   @\\servername\sys\public\nal.exe
   ```

   where *servername* is the actual name of your network server.

Starting Application Explorer

1. To manually start Application Explorer on a workstation, run NALEXPLD.EXE from the SYS:\PUBLIC directory on the server where you installed ZfD Application Management.

   or

   To automatically start Application Explorer each time the user logs in to NDS, enter the following line in the user's login script:

   ```
   @\\servername\sys\public\nalexpld.exe
   ```

   where *servername* is the actual name of your network server.

Distributing an Application

Distributing applications is one of the primary tasks you'll perform using ZfD Application Management. The following sections provide instructions for distributing a simple application, Microsoft Notepad, from the network to a user's workstation. Once you've distributed Notepad, you'll better understand the process required to distribute more complex applications that use snAppShot packages or Microsoft Windows Installer packages.

Copying NOTEPAD.EXE to a Network Directory

An application's source files must be kept in a network directory so that Application Launcher/Explorer can access the files from the user's workstation to install them. We recommend that you create separate directories for each application's source files.

1. Create a NOTEPAD directory in the network location where you want the application source files.
2. Copy NOTEPAD.EXE from a workstation's Windows directory (for example, C:\WINDOWS or C:\WINNT) to the NOTEPAD directory.

IMPORTANT: Copy Notepad from a workstation that is running the same operating system as the one to which you want to distribute Notepad. For example, if you want to distribute Notepad to a Windows 95/98 workstation, copy NOTEPAD.EXE from a Windows 95/98 workstation, not a Windows NT/2000 workstation. This ensures that the workstation will be able to run that version of Notepad.

Creating the Notepad Application Object

1. In ConsoleOne, right-click the container in which you want to create the Application object > click New > click Object.
2. Click App:Application in the list > click OK.
3. Click Manually (No .AOT/.AXT or .MSI File) > click Next.
4. In the Object Name field, enter **Notepad**. This is the name that will be given to the Application object.
5. In the Path to Executable field, enter:

   %*windisk%\notepad\notepad.exe

   %*windisk% is a Windows macro variable that represents the disk drive where the Windows directory is located (typically C:). The path specified above will cause NOTEPAD.EXE to be run from the workstation's C:\NOTEPAD directory.

   Application Launcher/Explorer support a variety of macros, including Windows macro variables, environment variables, NDS macro variables, login script variables, and Application object macros.
6. Click Finish to create the Application object.

Specifying NOTEPAD.EXE as the Application File to Install

Notepad will be run from the workstation's %*windisk%\NOTEPAD directory. You need to configure the Application object to copy NOTEPAD.EXE from the network to the workstation's %*windisk%\NOTEPAD directory.

1. Right-click the Notepad Application object > click Properties.
2. Click the Distribution Options tab > click Application Files.
3. Click Add > File to display the Edit Files dialog box.
4. In the Source File field, enter the UNC path for the NOTEPAD.EXE file you copied to the network. For example:

   `\\NOVELL\APPS\NOTEPAD\NOTEPAD.EXE.`
5. In the Target File field, enter:

   %*windisk%\notepad\notepad.exe
6. Click OK to add NOTEPAD.EXE to the Application Files list. Only files in this list will be copied to the workstation.
7. Leave the Application object properties open > continue with the next section.

Defining the Application's Operating System Requirement

Before Application Launcher/Explorer can distribute the Application object to a user, it must verify that the user's workstation meets the application's requirements for the operating system.

By default, when you create an Application object, the operating system requirements are defined as any version of Windows 95/98 or Windows NT/2000. These requirements are sufficient for distributing Notepad. If you want to see where the operating system requirements are set, you can follow the steps below to verify the requirements. If not, you can skip to the next section, "Associating the Application Object with a User" on page 42.

To verify the application's operating system requirements:

1. Click the Availability tab > click System Requirements.
2. Verify that the list contains an OS Version requirement (Windows NT/2000 or Windows 95/98) for the workstation you want to distribute the application to. If the correct OS version is not listed, click Add > Operating System > enter the requirements for the operating system > click OK to add it to the list.

   IMPORTANT: An OS Version requirement must be defined before an application will be distributed.
3. Leave the Application object properties open > continue with the next section.

Associating the Application Object with a User

1. Click the Associations tab.
2. Click Add > browse and select a user you want to distribute the application to > click OK to add the user to the Associations list.
3. Select the locations where you want the Application object icon to display. To do so, select the appropriate check boxes located in front of the user in the Associations list.

   Application Launcher can display the icon in the Application Launcher window. Application Explorer can display the icon in the Application Launcher window, the Start menu, the system tray, the Quick Launch toolbar, and the desktop. Click the Help button for more information about each location.
4. Click OK (or Apply) to save the Application object information.

Running Notepad on the User's Workstation

1. At the user's workstation, make sure the user is logged in to NDS.
2. If Application Launcher/Explorer is not running, start it. See "Starting Application Launcher and Application Explorer" on page 39.

   or

   If Application Launcher/Explorer is already running, right-click the Application Launcher/Explorer icon > click Refresh.

   The Application object icon should appear in the locations you specified when associating the Application object with the user.
3. Double-click the Application object to install Notepad to the workstation and run the application.

   You can verify that Notepad was installed to the workstation by looking in the C:\NOTEPAD directory.
4. When you are finished with Notepad, close it.

Uninstalling an Application

To see how to uninstall an application, you can uninstall Notepad. If you have not distributed and run Notepad on a workstation, see “Distributing an Application” on page 40.

Before uninstalling Notepad, you must enable it to be uninstalled. Once you’ve done this, you can uninstall Notepad through ConsoleOne (a forced uninstall) or you can uninstall it from the workstation (a user-initiated uninstall). The following sections provide instructions:

- “Enabling Notepad to be Uninstalled” on page 43
- “Forcing an Uninstall” on page 43
- “Enabling Users to Uninstall Applications” on page 44

Enabling Notepad to be Uninstalled

Application Launcher/Explorer will not uninstall an application unless it has been marked as uninstallable. By default, applications are not marked as uninstallable.

To enable Notepad to be uninstalled:

1. In ConsoleOne, right-click the Notepad Application object > click Properties.
2. Click the Common tab > click Uninstall.
3. Select the Enable Uninstall option to turn it on.
4. Click Apply.
5. Continue with “Forcing an Uninstall” on page 43 or “Enabling Users to Uninstall Applications” on page 44.

Forcing an Uninstall

You can force an application to be uninstalled by disassociating it from the user.

1. If the Notepad Application object’s property pages are not displayed, right-click the Notepad Application object > click Properties.
2. Click the Associations tab.
3. Select the user you want to disassociate from the application > click Delete.
4. Click OK.

   The next time Application Launcher/Explorer refreshes, it will uninstall Notepad from the user’s workstation.
5. To force a refresh, right-click the Application Launcher/Explorer icon on the user’s workstation > click Refresh.

TIP: You can use the Unassociated Days to Uninstall option to specify a longer grace period for the user. To do so, right-click the user’s object in ConsoleOne > click Properties > click the Application Launcher tab > click Edit > modify the option.

Enabling Users to Uninstall Applications

By default, users are not allowed to uninstall applications that you've distributed to them. You can, however, enable users to do so.

IMPORTANT: If, in the previous section, you disassociated Notepad from the user in order to force an uninstall, you need to associate Notepad with the user, refresh Application Launcher/Explorer on the user's workstation, and double-click the Notepad icon to install Notepad again before completing the following steps.

1. If the Notepad Application object's property pages are not displayed, right-click the Notepad Application object > click Properties.
2. Click the Common tab > click Uninstall.
3. Select Enable User to Perform a Manual Uninstall.
4. Click OK.
5. At the user's workstation, right-click the Application Launcher/Explorer icon > click Refresh.
6. After Application Launcher/Explorer has refreshed, right-click the Notepad icon > click Uninstall > click Yes.

When Application Launcher/Explorer uninstalls an application, it removes all application files and settings from the workstation. However, if the Application object is still associated with the user, the Application object's icon will remain on the workstation. This enables the user to reinstall the application at a later time.

Working While Disconnected from NDS

ZfD Application Management provides users with the ability to run applications, install applications, and verify (repair) applications while disconnected from NDS. To enable a user to run, install, or verify Notepad while disconnected, complete the tasks in the following sections:

- "Marking Notepad as Disconnectable" on page 44
- "Running Notepad While Disconnected from NDS" on page 45
- "Caching Notepad" on page 45
- "Installing Notepad from the Cache" on page 47

Marking Notepad as Disconnectable

Before an application can be run, installed, or verified on a disconnected workstation, it must be marked as being a disconnectable application. By default, when you create an Application object, the application is marked as disconnectable.

Marking an application as disconnectable does not necessarily mean that a user will be able to run the application when disconnected. Running the application also requires that the application be installed or cached on the workstation (for more information on caching, see "Caching Notepad" on page 45). If, however, an application is installed on a workstation but is not marked disconnectable, Application Launcher/Explorer will not display the application icon when disconnected.

Applications that are run from the network or are dependent upon network resources such as a database should not be marked disconnectable.

To verify that Notepad is disconnectable:

1. In ConsoleOne, right-click the Notepad Application object > click Properties.
2. On the Identification Icon page, verify that Disconnectable is checked.
3. Click OK (or Cancel).

Running Notepad While Disconnected from NDS

When a workstation disconnects from NDS, Application Launcher/Explorer continues to display an Application object's icon if the application is installed (or cached) on the workstation. As part of the installation of a disconnectable application, Application Launcher/Explorer copies the application's NDS information to a hidden directory (C:\NALCACHE) on the workstation. This information, along with the installed application files, enables the user to run the application just like he or she would if connected to NDS.

To disconnect, you can use the Work Offline option provided with Application Launcher/Explorer. The Work Offline option causes Application Launcher/Explorer to ignore NDS even when the user is authenticated.

1. Make sure that Notepad is installed on the workstation.
   - If you have not distributed and run Notepad on the user's workstation, see "Distributing an Application" on page 40.
   - If you uninstalled Notepad in the previous section by disassociating Notepad from the user, associate the application again (see "Associating the Application Object with a User" on page 42).
   - If you uninstalled Notepad from the workstation, double-click the Notepad Application object's icon to install Notepad again.
2. At the user's workstation, right-click the Application Launcher/Explorer icon > click Work Offline.

   Application Launcher/Explorer disconnects from NDS and refreshes the workstation to reflect the applications that are still available in disconnected mode. The Notepad icon should still be displayed in the same locations as when Application Launcher/Explorer is connected to NDS.
3. Double-click the Notepad icon to launch Notepad.
4. When you finish using Notepad, close it.
5. Right-click the Application Launcher/Explorer icon > click Work Online to reconnect to NDS.

Caching Notepad

If a user has not installed an application, you can make the application available for installation in disconnected mode. Or, if the application is already installed, you can make it possible for the user to verify or repair problems with the application.

This is accomplished by caching the application source files to a local drive (either the hard drive or portable media such as a Jaz drive or CD). Application source files are compressed to save space on the local disk.

You can enable users to cache their own applications, or you can force cache an application. The following sections use Notepad to explain these options.

- “Enabling Users to Cache Applications” on page 46
- “Forcing Notepad to Be Cached” on page 46

IMPORTANT: The following sections require Notepad to be uninstalled before starting them. To uninstall Notepad, right-click the Notepad icon > click Uninstall.

Enabling Users to Cache Applications

Application Launcher/Explorer’s Manage Applications dialog box lets users manage the applications that are installed or cached on their workstation. Using the dialog box, users can install, uninstall, cache, and remove cached applications.

By default, the Manage Applications dialog box is not available to users. To enable and use the dialog box:

1. In ConsoleOne, right-click the user’s object > click Application Launcher > click Edit.
2. Click the User tab > select Enable Manage Applications Dialog > select Yes from the Setting list.
3. Click OK > click OK again to save the change.
4. At the user’s workstation, make sure the NDS tree that contains the user’s object is the primary tree (right-click the Novell icon in the system tray > click NetWare Connections > select a tree > click Set Primary).
5. Right-click the Application Launcher/Explorer icon > click Refresh.
6. Right-click the Application Launcher/Explorer icon > click Manage Applications.

   The Manage Applications dialog box opens with the Install Applications tab displayed.
7. Click the Cache Applications tab.

   Notepad appears in the Cache Applications to Install/Verify While Disconnected list. This list includes all applications that you can cache to your local drive.
8. Check the Notepad box to select Notepad > click Apply.

   Notepad is moved from the Cache Application to Install/Verify While Disconnected list to the Remove Applications from Cache list, indicating that it has been added to the cache. To verify that Notepad was cached, you can use Windows Explorer to look in the C:\NALCACHE*NDS_tree_name*\.Notepad.*context* directory. If the application is cached, this directory will contain an INSTALL directory.

   NOTE: NALCACHE is a hidden directory. To see the directory, Windows Explorer must be configured to view hidden directories and files. In Windows Explorer > click the View menu > Folder Options > View. Under Hidden Files, select Show All Files > click OK.
9. If you plan to complete the steps in the next section to see how to force an application to be cached, select Notepad (in the Remove Applications From the Cache list) > click Apply. Otherwise, skip to “Installing Notepad from the Cache” on page 47.

Forcing Notepad to Be Cached

To force Notepad to be cached locally:

1. In ConsoleOne, right-click the Notepad Application object > click Properties.
2. Click the Associations tab.
3. In the Associations list, select the user for whom you want to cache the application > check the Force Cache box (on the same line as the user).

4. Click OK.

   The next time Application Launcher/Explorer refreshes on the user's workstation, the application will be cached to the C:\NALCACHE directory.

5. To force a refresh, right-click the Application Launcher/Explorer icon on the user's workstation > click Refresh.

6. To verify that Notepad was cached, use Windows Explorer to look in the C:\NALCACHE*NDS_tree_name*\.Notepad.*context* directory.

   If the application is cached, this directory will contain an INSTALL directory. You can also use the Manage Applications dialog box, discussed in "Enabling Users to Cache Applications" on page 46, to verify that Notepad is cached.

   NOTE: NALCACHE is a hidden directory. To see the directory, Windows Explorer must be configured to view hidden directories and files. In Windows Explorer > click the View menu > Folder Options > View. Under Hidden Files, select Show All Files > click OK.

Installing Notepad from the Cache

Once an application has been cached to a user's workstation, the user can install the application when he or she needs it.

To install Notepad from the cache:

1. Make sure Notepad is uninstalled. To do so, right-click the Notepad icon > click Uninstall > click Yes

2. Disconnect from NDS. To do so, right-click the Application Launcher/Explorer icon > click Work Offline.

3. After Application Launcher/Explorer has disconnected, double-click the Notepad icon.

   or

   Right-click the Application Launcher/Explorer icon > click Manage Applications > select Notepad in the Install Applications list > click OK.

Other Things You Can Do

The previous sections introduced you to the basics of distributing, uninstalling, and caching applications. You can also do such things as:

- Distribute applications that use snAppShot (.AOT) packages.
- Distribute applications that use Microsoft Windows Installer (.MSI) packages.
- Distribute applications to users in a Microsoft Windows Terminal Server environment or Citrix MetaFrame environment.
- Create folders to organize applications you distribute. You can specify the workstation locations where you want to use folders (Start menu or Application Launcher/Explorer window).
- Set up schedules and more detailed workstation requirements for distributing applications.
- Set up load balancing, fault tolerance, site lists, and source lists to ensure that applications are available whenever needed.
- Create virtual CDs of applications that can be used to distribute applications to disconnected workstations.

For information about these topics and many more, see Application Management in *ZENworks for Desktops 3.2 Administration Guide* at the ZENworks for Desktops 3.2 documentation Web site (http://www.novell.com/documentation).

For information about deploying ZfD Application Management throughout your business, see Application Management in *ZENworks for Desktops 3.2 Deployment Guide* at the ZENworks for Desktops 3.2 documentation Web site (http://www.novell.com/documentation).

5 Workstation Imaging

ZENworks® for Desktops (ZfD) includes an Imaging component that lets you take images of workstation hard disks and put them on other workstations over the network. You can perform imaging tasks by using Preboot Services, by physically visiting workstations (manually), or automatically through NDS®.

What's New for Workstation Imaging

This section of *Getting Started* gives an overview of the new features for workstation imaging.

Preboot Services

PXE (Preboot Execution Environment) is an industry-standard protocol that allows a workstation to boot up and execute a program from the network before the workstation operating system starts. PXE uses DHCP and TFTP protocols. The PXE environment is loaded from either the NIC (Network Interface Card) in flash or ROM, or in the same memory as the system BIOS.

Minimum Hardware Requirements

The following table lists the minimum hardware requirements for Preboot Services.

Resource	Minimum Disk Space	Minimum Hardware Requirements
User workstation	0 MB	A Pentium* (or higher) personal computer, 75 MHz, 16 MB of RAM; PXE-enabled network adapter or PXE-On-Disk boot diskette
PXE server	10 MB	128 MB of RAM with 8 MB free

Minimum Software Requirements

The following table lists the minimum software requirements for the server where you will install Preboot Services.

Platform	Minimum Software Requirements
NetWare® 4.*x*	Not supported
NetWare 5.0	NW5SP5.EXE (or later) patch applied
NetWare 5.1	NW51SP1.EXE (or later) patch applied
Windows NT* 4.0 server	Service Pack 6a (or later) applied
Windows* 2000 server	No special requirements

A standard DHCP server must already be installed—either on the same server where you are installing ZfD Preboot Services or on another server in the network—before you install the ZfD Preboot Services Proxy DHCP server. If the standard DHCP server is on the same server where you are installing the Proxy DHCP server, you must set option tag 60 in DHCP services. For more information, see the *ZfD 3.2 Preboot Services Administration* guide at the ZfD 3.2 Preboot Services documentation Web site (http://www.novell.com/documentation/lg/zd32pb/index.html).

IMPORTANT: Installing and running the Proxy DHCP server on a NetWare 5.*x* server that is already running a standard DHCP server is not supported.

Using PXE

By using PXE, you can put an image on a workstation even if the workstation's hard disk is blank. You do not need to install a Linux* imaging partition on the workstation. Before you can use PXE, make sure that you have installed the new Imaging and PXE Support components of ZfD 3.2 on your server.

When a PXE-enabled workstation is booted, it looks for the server where PXE is installed. Using a DHCP request, it checks the server to see if there is any imaging work to do. If there is imaging work to do, it downloads the Linux imaging environment from the server so that the workstation can be booted to Linux. Then the image is downloaded to the workstation. If there is no imaging work to do, these three files are not downloaded and the workstation proceeds to boot to its operating system.

To image a workstation using PXE, you need to find out if the workstation is PXE capable, and then make sure that PXE is enabled. (When PXE is enabled, it can lengthen the time of the boot process slightly, so most NICs have PXE turned off by default.) To enable PXE, enter the computer system BIOS and look at the boot up options. These typically include Floppy Disk, Hard Disk, and CD-ROM. If PXE is not listed and the NIC is embedded in the motherboard, refer to the integrated devices section of the BIOS. In the integrated devices section, you may have an option to activate

PXE. It may be called by another name, such as MBA (Managed Boot Agent) or Pre-Boot Service. Once you have activated it, it will become available in the Boot section of the BIOS. If the computer system does not have an integrated NIC, you may need to use NIC management software to configure your NIC to support PXE. Refer to your NIC documentation for support of PXE.

If the workstation is not PXE capable, you may be able to make it capable by updating your BIOS version or NIC driver, using a PXE boot disk, or purchasing a PXE capable NIC and installing it in your computer. To create a PXE boot disk, use the PXE-On-Disk utility that is installed as part of PXE Support in ZfD 3.2. You can access the utility with the Create PXE Disk button in Imaging Boot Disk Creator. (To start this utility from ConsoleOne®, click Tools > ZENworks Utilities > Imaging > Create or Modify Boot Diskette.)

If you are using a PXE-enabled workstation but have previously installed a Linux imaging partition on the workstation, you can disable or delete the partition. You can disable (and enable) the imaging partition at any time when you boot to Linux. You can delete the partition only when you are putting an image on the workstation using standard imaging.

IMPORTANT: After you have deleted the partition, you need to make sure that the image you put on the workstation was made on a computer without a Linux imaging partition. Otherwise, the wrong MBR (Master Boot Record) is restored, and the computer will fail to boot. In addition, in you remove the Linux imaging partition from a Windows NT or Windows 2000 machine, Windows will no longer be able to boot. You should only remove the Linux imaging partition if you are going to restore an image to the workstation.

For More Information

Refer to the *ZfD 3.2 Preboot Services Installation* guide for information about installing and configuring PXE. To access this guide, start the ZfD 3.2 installation > click English > click Preboot Services Installation Guide. You can also find this guide at the ZfD 3.2 Preboot Services documentation Web site (http://www.novell.com/documentation/lg/zd32pb/index.html).

Refer to the *ZfD 3.2 Preboot Services PXE-On-Disk User Guide* for information about creating a PXE boot disk. To access this guide, on a Windows machine that has ZfD 3.2 PXE components installed on it, click the Start button > Programs > PXE > PXE on Disk > PXE on Disk Manual. You can also find this guide at the ZfD 3.2 Preboot Services documentation Web site (http://www.novell.com/documentation/lg/zd32pb/index.html).

Detailed product documentation about configuring PXE is included in the *ZfD 3.2 Preboot Services Administration Guide*, which is available at the ZfD 3.2 Preboot Services documentation Web site (http://www.novell.com/documentation/lg/zd32pb/index.html).

Compression

When you take an image of a workstation, you can choose from three new compression options:

- Optimize for Speed takes the least amount of time but creates the largest image file. This is used by default when an image is made.
- Optimize for Space creates the smallest image file but may take a significant amount of time.
- Balanced is a compromise between compression time and image file size.

These options are available on the ZENworks Imaging Configuration property page and from the Linux command line. They are also available in Image Explorer. (To start this utility from ConsoleOne, click Tools > ZENworks Utilities > Imaging > Image Explorer.) In Image Explorer, you can compress an open image by clicking File > Compress Image, or you can compress any image without opening it by clicking Tools > QuickCompress.

All image files are in compressed form when they are sent over the network. The image file is compressed on the workstation before it is sent to the server to be stored. When restoring an image, the compressed file is sent to the target workstation where it is decompressed.

If you have used Delete to hide files in the image, they are removed from the image during compression.

Purge Deleted Files from an Image

In Image Explorer, you can remove excluded or hidden files and folders from the open image by clicking File > Purge Delete Files.

Creating Imaging Boot Diskettes

There are now three imaging boot diskettes instead of two. You can create these diskettes with Imaging Boot Disk Creator.

Multicast from ConsoleOne

You can perform imaging multicasting from ConsoleOne. Three new property pages on the Server object (Multicast Session Settings, Multicast Session Participation, and ZENworks Imaging Multicast Sessions) let you explicitly define or use rules to define the workstations that will be included in the session, specify the image file or workstation you want to use as the master for the multicast session, and specify the requirements for a session to begin. You can also specify to delete the session information as soon as the session has finished. For more information, see Multicasting Images in the *ZENworks for Desktops 3.2 Administration Guide* guide.

Scripted Imaging

In addition to the standard imaging option, there is now a scripted imaging option on the Workstation Image Files property page in ConsoleOne that allows you to specify advanced commands for imaging a workstation. See the ConsoleOne Help on this property page for examples of commands you can use.

Linux Menu

When you boot up a workstation with a Linux imaging partition and enter **img** at the Linux bash prompt, the img commands are now available from a menu. For more information, see Imaging Engine (img: Command Line and Menu) in Imaging Utilities and Options in the *ZENworks for Desktops 3.2 Administration Guide* guide.

Additional Updates

- The Linux kernel version is now 2.4.3.
- There are now five files on the bootable CD instead of three.
- The Pump utility has been updated to a new version that works with more versions of Microsoft* DHCP servers.
- Network drivers are now built as files (modules) on the boot diskette so that it is easier to update drivers to new versions.
- USB support has been added.
- Token Ring support has been added. (Drivers are not provided by default.)

Basic Imaging Operations

The following sections of *Getting Started* provide instructions for setting up and testing the following basic imaging operations:

- Taking an image of a workstation manually
- Putting an image on a workstation manually
- Enabling a workstation for unattended imaging operations
- Triggering unattended imaging operations through NDS
- Defining a workstation imaging policy in NDS

These sections will help you prepare for and test the basic workstation imaging operations:

- "Preparing for Basic Imaging Operations" on page 53
- "Testing Basic Imaging Operations" on page 55
- "Other Things You Can Do" on page 62

Preparing for Basic Imaging Operations

In order to test the basic imaging operations covered in *Getting Started*, you need a minimum setup of one ZfD server, one 32-bit Windows* workstation, and three high-density diskettes.

The following sections cover the details of why these items are needed and how to prepare them:

- "Preparing an Imaging Server" on page 53
- "Preparing a Workstation for Imaging" on page 54
- "Creating Imaging Boot Diskettes" on page 55

Preparing an Imaging Server

Although it is possible to image a workstation without connecting to a server (by booting the workstation from diskettes or a CD), it is easier and more typical to connect to a server to perform imaging operations. One reason for this is that workstation images are typically quite large (even if compressed), and so having a server to store them on is helpful. Also, burning CDs and configuring workstations to boot from them are not always convenient. Accordingly, the imaging tests covered in *Getting Started* will use an imaging server. Here are the requirements for this server:

Server Must Have	Because
A fixed IP address	When you connect to the imaging server during a workstation imaging operation, you must do so using the fixed IP address or DNS name of the imaging server.
Enough space to store a workstation image	The workstation images that you take during your tests will be stored on the imaging server. Unless you use compression for your workstation images, they are nearly the same size as the data on the workstation hard disk, which could be hundreds of MB.

Server Must Have	Because
The Imaging and Automatic Workstation Import components of ZfD installed	These software components enable the server to act as an imaging server and to register workstations in NDS® for unattended imaging operations. If you have already done a typical ZfD installation on the server, the server is ready to act as an imaging server. If not, use the following steps to install the needed components: 1. Make sure your server meets the "Overall Software Requirements" on page 12. 2. Run the ZfD installation program (WINSETUP.EXE) either on your server (Windows NT*/2000) or from a Windows workstation with a drive mapped to your server (NetWare®). 3. When prompted for the install type, choose Custom Install. 4. When prompted for the components to install, choose Automatic Workstation Import and Imaging. 5. When prompted for the NDS tree to install to, choose the tree that your server is in. 6. When prompted for the import/removal role, choose Import. 7. If you are installing Preboot Services (PXE), insert the ZfD 3.2 Preboot Services CD or browse to the location of the Preboot Services installation files. 8. When the installation is done, restart your server.

Preparing a Workstation for Imaging

As mentioned in the previous section, it is possible (but typically not as convenient) to image a workstation without connecting to the network. It is also possible to image non-Windows computers, but such operations can't be fully automated through NDS and the images can only be raw, bit-by-bit images of the entire hard disk, as opposed to customizable, file-by-file images of the data only. For these reasons, the imaging tests covered in *Getting Started* will use a network-connected Windows workstation. Here are the requirements for this workstation:

Workstation Must Have	Because
A supported Ethernet card	The workstation must connect with the imaging server to store or retrieve the images used in your tests. This connection is made when the workstation is under the control of the ZfD imaging engine (which is a Linux application), not when the workstation is running under Windows. Therefore, make sure the workstation has one of the Supported Ethernet Cards listed in Workstation Imaging in *Administration*.
Windows 95, 98, NT, or 2000 installed	Your imaging tests will include unattended operations that are currently supported only on 32-bit Windows platforms.
15 MB free disk space	Unless you are using PXE, your imaging tests will include unattended operations that require a small ZfD imaging (Linux) partition to be installed on the workstation hard disk, so that the imaging engine can gain control on bootup. It is permissible for the 15 MB free space to be inside an existing partition.
Standard hardware architecture	NEC* PC98 architecture is not supported.
PXE enabled	If you are using Preboot Services, PXE must be enabled either in the BIOS or through a PXE boot disk. See "Preboot Services" on page 49 for more information.

Creating Imaging Boot Diskettes

As mentioned in the previous section, the imaging engine that performs the actual imaging of the workstation is a Linux application. Therefore, the workstation must be booted to Linux temporarily while the imaging is performed. This means you need to prepare a bootable device that has the Linux kernel, ZfD imaging engine, and network drivers installed. Generally, you can use diskettes, a CD, or a small hard-disk partition. If you use PXE, these Linux components are downloaded to the workstation when it boots if there is imaging work to do. The imaging tests covered in *Getting Started* will make use of diskettes initially and a hard-disk partition later on. For now, just create the imaging diskettes as follows:

1. Format three high-density diskettes, or use preformatted blank diskettes. If you need the imaging diskettes to include support for booting your test workstation with a non-English keyboard, you'll need a fourth diskette.
2. Browse to the ZENWORKS\IMAGING folder in your ZfD installation (on the imaging server) and run ZIMGBOOT.EXE.

   TIP: You can also start ZIMGBOOT.EXE in ConsoleOne by clicking Tools > ZENworks Utilities > Imaging > Create or Modify Boot Diskette.
3. On the screen that appears, near the bottom under Imaging Proxy Server Address, enter either the fixed IP address or the full DNS name of your imaging server.
4. For the other fields and options on the screen, keep the default settings unless you have a specific reason to change a setting, such as to include support for a non-English keyboard. Click Help for details on specific settings.
5. Click Create Boot Disk 1 > insert the first diskette > click OK.
6. When the first diskette has been created, click Create Boot Disk 2 > insert the second diskette > click OK.
7. When the second diskette has been created, click Create Boot Disk 3 > insert the third diskette > click OK.
8. If you need the imaging diskettes to include support for a non-English keyboard, when the third diskette has been created, click Create Language Disk > insert the fourth diskette > click OK. Otherwise, skip this step.
9. When the last (third or fourth) diskette has been created, click Close.

Testing Basic Imaging Operations

Once you have completed the preparations outlined in the previous section, you can begin testing the basic imaging operations listed below. We recommend that you conduct the tests in the order listed.

Test	What It Is	What It Involves
1	"Manually Taking an Image of a Workstation" on page 56	Taking an image of the workstation by booting from the imaging diskettes and entering a particular imaging command. The image will be stored on your imaging server.
2	"Manually Putting an Image on a Workstation" on page 57	Putting an image on the workstation by booting from the imaging diskettes and entering a particular imaging command. The image will be retrieved from your imaging server.

Test	What It Is	What It Involves
3	"Enabling a Workstation for Unattended Imaging Operations" on page 58	Registering the workstation as an object in your NDS tree, installing a ZfD imaging agent on the workstation, and installing a permanent ZfD imaging partition on the hard disk. The imaging agent stores certain unique data about the workstation, such as its NETBIOS name and its NDS distinguished name, in a safe place on the hard disk so it can be restored when the workstation is reimaged.
4	"Triggering an Unattended Imaging Operation" on page 60	Setting a flag in the Workstation object that says to take or put an image on the workstation the next time it is booted, and then verifying that the imaging operation occurs as expected.
5	"Defining a Workstation Policy for Unattended Imaging Operations" on page 61	Creating a Workstation Imaging Policy object (within a Workstation Policy Package) that specifies which image to put on a workstation during an unattended imaging operation, based on factors such as the workstation's chipset type, hard drive type, and so on.

Manually Taking an Image of a Workstation

1. Insert the first imaging diskette and reboot the workstation.
2. At the boot prompt, type **`manual`** > press Enter.
3. When prompted, insert the second diskette > press Enter.
4. When prompted, insert the third diskette > press Enter.
5. If you are prompted for a language diskette, insert it > press Enter.
6. (Optional) At the bash prompt, type **`img dump`** > press Enter.

   This displays a list of the partition slots on the workstation. For your reference, note the number and type of partitions and which one is active.

   or

   Type **`img`** to display a menu > select Dump > No Geometry.
7. To take an image of the workstation, you have two choices:

   - You can enter a command at the bash prompt using the following format:

     `img makep` ***`serverIPaddr_or_DNSname`*** **`[comp=`*`comp level`*`] //uncpath/`** ***`newimg`*****`.zmg`**

     The makep parameter stands for "make on proxy," or in other words, create an image and store it on the imaging (proxy) server. The IP address or DNS name should be that of your imaging server, and the UNC path specifies the location and filename where the new image is to be stored. *comp level* is the amount of compression used when creating the image. Specify any number from 0-9. 0 means no compression. 1 is the same as Optimize for Speed and is used by default if you do not specify this parameter. 6 is the same as Balanced. 9 is the same as Optimize for Space. See below for more information.

     For example:

     `img makep 137.65.95.127 comp=6 //xyz_srv/sys/imgs/cpqnt.zmg`

     IMPORTANT: Make sure to use *forward slashes* in the UNC path as shown above. Backslashes aren't recognized by Linux. Alternatively, you can use backslashes and enclose the entire UNC path in quotes. The path you specify must exist on your imaging server.

   - You can type **`img`** to display a menu > select an Image > Proxy Image. Type the IP address or DNS name of your imaging (proxy) server. Type the UNC path and filename

where the new image is to be stored on the imaging (proxy) server. Select a compression option. (Optimize for Speed takes the least amount of time but creates the largest image file. Optimize for Space creates the smallest image file but may take a significant amount of time. Balanced is a compromise between compression time and image file size.) Specify any advanced parameters, such as x*partition*. If you want, specify additional information in the Description (a description of the image), Machine Name (the computer on which the image is being stored), Author (the name of the person entering this information), and Comments (any additional comments) fields.

For details on this and other related img command parameters, see Imaging Engine (img: Command Line and Menu) in Imaging Utilities and Options in *ZENworks for Desktops 3.2 Administration Guide*.

Depending on the amount of data on the hard disk, the image might take several minutes to create. If the screen goes blank, just press any key. (Linux enters a screen-saving mode after a few minutes.)

8. When the image has been created and the bash prompt reappears, remove any diskettes from the drive and reboot the workstation.
9. (Optional) Verify that the image file was created on your imaging server. You might also want to check its size.

Manually Putting an Image on a Workstation

1. If you haven't already done so, create the image that you will put on the workstation, as instructed in "Manually Taking an Image of a Workstation" on page 56.

   Make sure the image is of the same type of workstation (same hardware configuration) and is stored on your imaging server. You can use a previous image of the same workstation.

   IMPORTANT: If you are putting an image on a workstation without a Linux imaging partition, make sure the image was made on a workstation without a Linux imaging partition. Otherwise, the wrong MBR (Master Boot Record) is restored, and the workstation will fail to boot.

2. (Optional) Boot the workstation from a Windows startup disk and run FDISK to remove all partitions from the hard disk.

   TIP: Running FDISK is not required, but it is recommended for purposes of comparing the workstation's partitions before and after the imaging operation.

3. Insert the first imaging diskette and reboot the workstation.
4. At the boot prompt, type **`manual`** > press Enter.
5. When prompted, insert the second diskette > press Enter.
6. When prompted, insert the third diskette > press Enter.
7. If you are prompted for a language diskette, insert it > press Enter.
8. (Optional) At the bash prompt, type **`img dump`** > press Enter.

   This displays a list of the partition slots on the workstation. For your reference, note the number and type of partitions and which one is active. If you removed all partitions using FDISK, each slot should be empty and none should be active.

   or

   Type **`img`** to display a menu > select Dump > No Geometry.

9. To put the new image on the workstation, you have two choices:

- You can enter a command at the bash prompt using the following format:

  `img restorep` *`serverIPaddr_or_DNSname //uncpath/newimg`*`.zmg`

  The restorep parameter stands for "restore from proxy," or in other words, retrieve an image from the imaging (proxy) server and put it on this workstation. The IP address or DNS name should be that of your imaging server, and the UNC path specifies the location and filename where the image is to be retrieved from. For example:

  `img restorep 137.65.95.127 //xyz_srv/sys/imgs/cpqnt.zmg`

  IMPORTANT: Make sure to use *forward slashes* in the UNC path as shown above. Backslashes aren't recognized by Linux. Alternatively, you can use backslashes and enclose the entire UNC path in quotes. The server portion of the path must be the name of your imaging server.

- You can type **`img`** to display a menu > select Restore an Image > Proxy Image. Type the IP address or DNS name of the imaging (proxy) server. Type the UNC path and filename where the image is to be retrieved from. Specify any advanced parameters, such as s*fileset* or a*partition*:p*partition*.

  For details on this and other related img command parameters, see Imaging Engine (img: Command Line and Menu) in Imaging Utilities and Options in *ZENworks for Desktops 3.2 Administration Guide*.

Depending on the size of the image, it might take several minutes to lay down. Images actually take slightly longer to lay down than they do to take. If the screen goes blank, just press any key. (Linux enters a screen-saving mode after a few minutes.)

10 (Optional) When the image has been laid down and the bash prompt reappears, type **`img dump`** > press Enter.

or

Type **`img`** to display a menu > select Dump > No Geometry.

As before, this displays a list of the partition slots on the workstation. You should now see information about the new partitions that were created and activated by the image that you just laid down.

11 At the bash prompt, type **`lilo.s`** > press Enter.

12 Remove any diskettes from the drive and reboot the workstation. Verify that it boots to the operating system that was installed by the new image.

Enabling a Workstation for Unattended Imaging Operations

If you have enabled PXE on the workstation and have installed PXE support on your imaging server, this procedure is not a prerequisite to performing unattended imaging operations. When a PXE-enabled workstation is booted, it looks for the server where PXE is installed. Using a DHCP request, it checks the server to see if there is any imaging work to do. If there is imaging work to do, it downloads the files LINUX.1, LINUX.2, and LOADLIN.EXE so that the workstation can be booted to Linux. Then the image is downloaded to (or taken of) the workstation.

Follow this procedure if you are not using PXE. This procedure needs to be performed only once on your test workstation, prior to performing the unattended imaging operations covered in the next two sections. It is not a prerequisite to performing manual imaging operations or other automated imaging operations that you might want to perform in a production environment. For more information, see "Other Things You Can Do" on page 62.

1 If you haven't already done so, install the Novell® Client™ required by ZfD on the workstation. For instructions, see "Overall Software Requirements" on page 12.

2 If you haven't already done so, register the workstation as an object in your NDS tree. For instructions, see "Automatic Workstation Import" on page 25.

You don't need to complete all the tasks mentioned in the instructions. Just create a server policy package that contains a minimal workstation import policy (use the defaults for naming, groups, and limits), and then associate the server package with the container where you want the Workstation object to be created. Then, configure the workstation to communicate with the import service on the imaging server, and reboot the workstation. Before proceeding with the next step, check your NDS tree to make sure the Workstation object was created.

3 Install the ZfD imaging agent on the workstation.

NOTE: The ZfD imaging agent has already been installed on the workstation if in Step 1 you did a custom Novell client installation and chose the Imaging Services option. If this is the case, skip to Step 4. Otherwise, proceed with Step 3a to install the ZfD imaging agent.

3a Browse to the ZENWORKS\IMAGING folder in your ZfD installation (on the imaging server).

3b Complete the steps that correspond to the type of workstation:

Workstation Type	Steps
Windows 95 or 98	1. Copy ZISWIN.EXE, ZISLIB16.DLL, and ZISLIB32.DLL to the NOVELL\ZENIS folder. 2. Run ZISWIN.EXE from the NOVELL\ZENIS folder. 3. Run REGEDIT.EXE and browse to HKEY_LOCAL_MACHINE > Software > Microsoft > Windows > CurrentVersion > RunServices. 4. Add the string value `ZENwork Imaging Service` and set it to the filename and path of the ZISWIN.EXE file. For example, c:\novell\zenis\ziswin.exe 5. Save the changes and close REGEDIT.
Windows NT or 2000	1. Copy ZISWIN.EXE and ZISWINR.DLL (in the NLS\ENGLISH subfolder or the appropriate language subfolder) to your WINNT\SYSTEM32 folder. 2. From a command prompt, change to your WINNT\SYSTEM32 folder > type **`ziswin -install`** > press Enter.

3c Reboot the workstation.

4 Take an image of the workstation again as instructed in "Manually Taking an Image of a Workstation" on page 56.

IMPORTANT: Do this even if you have taken an image of the workstation previously. This ensures that the new image captures the changes you made in the preceding steps.

5 When the image has been created, reboot the workstation with the first imaging diskette > type **`install`** at the boot prompt > press Enter.

This starts the process of creating the ZfD imaging (Linux) partition in the first partition slot. It also destroys all existing partitions, even if slot 1 is empty and available. By default, the ZfD partition size will be 15 MB.

TIP: If the ZfD imaging partition already exists, it will be upgraded, and your existing Windows partitions will be left intact. For more information on installing or upgrading the ZfD imaging partition, see Setting Up Workstations for Imaging in Workstation Imaging in *Deployment*.

6. When prompted, reinsert the first imaging diskette > press Enter.
7. (Optional) When the ZfD imaging partition has been created and the bash prompt reappears, type **`img dump`** > press Enter.

   This displays a list of the partition slots on the workstation. Unless you were upgrading your ZfD imaging partition, each partition slot should be empty and none should be active. The ZfD imaging partition is hidden from the list, so the number of partition slots in the list should be one less than before.

   or

   Type **`img`** to display a menu > select Dump > No Geometry.
8. At the bash prompt, restore the image you took in Step 4. Use the **`img restorep`** command or select Restore an Image > Proxy Image from the menu as instructed in Step 9 of "Manually Putting an Image on a Workstation" on page 57.
9. (Optional) When the image has been restored and the bash prompt reappears, use the **`img dump`** command to redisplay the list of the partition slots on the workstation.

   or

   Type **`img`** to display a menu > select Dump > No Geometry.

   You should now see information about the Windows partitions that were restored and activated. There should still be one less partition slot than before because the Linux partition is still hidden (and will continue to be).
10. At the bash prompt, type **`lilo.s`** > press Enter.
11. When the bash prompt reappears, remove the diskette and reboot the workstation.

    The workstation should boot to Windows. If the bash prompt reappears, enter the **`lilo.s`** command again and reboot a second time.

From this point on, whenever the workstation is rebooted, the imaging engine will gain control and check the imaging server to see if an imaging operation should be performed. If you have not configured the Workstation object (in NDS) to trigger an unattended imaging operation, the imaging engine will simply exit and automatically reboot the workstation to Windows.

Triggering an Unattended Imaging Operation

1. If the imaging operation that you want to trigger is to put an image on the workstation, do the following. Otherwise, skip this step.

   1a If you haven't already done so, create the image to be put on the workstation. Make sure to store it on your imaging server. For instructions, see "Manually Taking an Image of a Workstation" on page 56.

   1b In ConsoleOne, create a Workstation Image object in your NDS tree. Configure the object to point to the image file that is to be put on the workstation. For details on pointing to the image file, click Help in the Image File Location dialog box.
2. In ConsoleOne, right-click the Workstation object > click Properties.
3. On the ZENworks Imaging Configuration page, do either of the following:

- To take an image of the workstation the next time it boots, check the first check box > click the browse button next to the available field > select your imaging server and the path and filename under which to store the new image > check the Use Compression check box and select a compression option if you want to use compression (click Help for details) > click OK.
- To put an image on the workstation the next time it boots, check the Put an Image on This Workstation on Next Boot check box > check the box that says to use an image other than the effective policy image or multicast session > click the browse button next to the available field > select the Workstation Image object you created in Step 1b > click OK.

4. Click OK to save the imaging configuration settings.

   TIP: Once the imaging operation has been performed on the workstation, ZfD will clear these imaging configuration settings automatically so that the imaging operation won't keep recurring.

5. Verify that the imaging operation occurs as expected when you reboot the workstation.

Defining a Workstation Policy for Unattended Imaging Operations

1. In ConsoleOne, right-click the container that holds the Workstation objects that you want to create the policy for > click New > Policy Package.
2. Click Workstation Package > Workstation Imaging Policy > Next.
3. Enter a name for the policy package (such as Workstation Policies for This Container) > click Next.
4. Select Define Additional Properties > click Finish.
5. Enable the Workstation Imaging Policy > click Properties.
6. On the Image Selection Rules page, click Add > select a Workstation Image object > use the drop-down fields and operators to specify the conditions under which the selected image should be used (click Help for details) > click OK.

   Repeat this step as many times as needed to specify the particular images that should be used under different conditions.

   TIP: These rules will be used by your imaging server to determine which image to put on workstations during unattended imaging operations. The various hardware configuration data specified in the rules are compared against the actual hardware configuration data detected by the ZfD imaging engine on the workstation. To see this data for a particular workstation, boot it with the ZfD imaging diskettes in manual mode and issue the **`img info`** command or type **`img`** > select Information from the menu.

7. Click OK to save the policy.
8. On the Associations page of the policy package, add the container that holds the Workstation objects that you want the policy to apply to > click OK.
9. Test the policy by configuring the Workstation object to receive an image on its next boot as instructed in "Triggering an Unattended Imaging Operation" on page 60. Be sure to choose the option to use the effective policy image.
10. Verify that the imaging policy selects the correct image when the unattended imaging operation is triggered on the workstation (the next time it boots).

Other Things You Can Do

Besides the basic imaging operations covered in *Getting Started*, ZfD gives you the additional imaging capabilities listed below. These capabilities are described elsewhere in the ZfD documentation.

- **Boot from a CD to perform imaging operations:** This gives you more space to include additional, custom files (such as drivers and images) on the imaging boot device. See Setting Up Workstations for Imaging in Workstation Imaging in *Deployment*.
- **Perform disconnected imaging operations:** You can perform imaging operations on a workstation without connecting to an imaging server if you store the needed image files on a local device, such as a CD, hard-disk partition, or Jaz* drive. See Setting Up Imaging Services in Workstation Imaging in *Deployment*.
- **Manipulate workstation partitions:** When a workstation is booted in manual imaging mode, you can issue various commands to resize or otherwise manipulate the existing workstation partitions. See Imaging Utilities and Options in Workstation Imaging in *Administration*.
- **Deploy images using an imaging server policy:** An imaging server policy helps you to automate the deployment of images to workstations that haven't been specifically enabled for unattended imaging operations. See Setting Up Imaging Services in Workstation Imaging in *Deployment*.
- **Multicast an image:** In a single operation, you can take an image of a workstation, broadcast it over the network to multiple other workstations, and lay it down on those workstations simultaneously with no NDS involvement. In ZfD 3.2, you can perform imaging multicasting from ConsoleOne. New property pages on the Server object let you explicitly define workstations or use rules to define workstations that will be included in the session, specify the image file or workstation you want to use as the master for the multicast session, and specify the requirements for a session to begin. You can also specify to delete the session information as soon as the session has finished. See Multicasting Images in Workstation Imaging in *Administration*.
- **Manipulate images:** After creating an image, you can customize it by creating variants that include or exclude certain files or that add specific registry settings. You can also create add-on images from Application objects in NDS or by dragging individual files into a new image archive. You can associate multiple add-on images with a single Workstation Image object in NDS. See Preparing Images in Workstation Imaging in *Administration*.

6 Remote Management

ZENworks® for Desktops 3.2 (ZfD 3.2) Remote Management lets you remotely manage workstations from the remote management console. Remote Management lets you do the following:

- Remotely wake up a powered-off managed workstation
- Assume control of the managed workstation
- Execute files found on the managed workstation
- Reboot the managed workstation
- Transfer files between the remote management console and the managed workstation
- Chat with the user at the managed workstation
- Diagnose problems on the managed workstation
- Ping the Remote Management Agent on the managed workstation
- Blank the managed workstation screen during a Remote Control session
- Lock the keyboard and mouse controls at the managed workstation during a Remote Control session
- Suppress the wallpaper displayed on the desktop of the managed workstation during a Remote Control or Remote View session
- Configure the time-out period for a Remote Control or a Remote View session

Remote Management can save you and your organization time and money. For example, you or your organization's help desk can analyze and remotely fix workstation problems without visiting the user's workstation, which reduces problem resolution times and increases productivity.

IMPORTANT: ZfD 3.2 Remote Management functionality can be used to remotely manage Windows* 95/98 or Windows NT*/2000 workstations. If you need to remotely manage Windows NT/2000 servers, you can use the ZENworks for Servers (ZfS) Remote Management functionality. For more information, see the ZENworks for Servers documentation (http://www.novell.com/documentation).

This document covers the following information:

Installation Prerequisites for Remote Management

Before you begin a remote management session, you must prepare the workstation you are going to manage. Complete the following tasks:

- ❑ Install ZfD 3.2 on the ZfD server.
- ❑ Prepare the managed workstation for Remote Management.
  - Uninstall any third-party remote control agent or remote control application running on the managed workstation.
  - Install the Novell® Client™ that ships with ZfD 3.2 or later on the managed workstation.

    Ensure that you select the option to install the Workstation Manager on the managed workstation.
  - Register the managed workstation with NDS®.

    For details, see "Setting Up Automatic Workstation Import" on page 28.
- ❑ Prepare the management console for Remote Management.
  - Install the network management utility, ConsoleOne®, on the management console.
  - Import the registered managed workstation into NDS. For details, see "Setting Up Automatic Workstation Import" on page 28.
  - Associate the Remote Management policy settings for the managed workstation in either of the following ways:

    For a Workstation object or for the Container of a Workstation object, you can associate a Remote Management policy with the Workstation object or Container.

    For a Workstation object, you can ignore the Remote Management policy and associate the settings from the Remote Management settings page.

    You can similarly associate Remote Management settings with the User object, Group, or Container of the logged-in user. For details, see The Package Associations Report in Reporting in *Administration*.

    NOTE: If you are upgrading ZENworks 2 to ZfD 3.2, ensure that the ZfD 3.2 policies have been created and appropriately associated.
- ❑ Make sure you have the administrator rights to install the Remote Management Agent.
- ❑ Make sure you have the required rights to access a managed workstation. For details, see Setting Up Remote Management Security in Remote Management in *Deployment*.

Specific Hardware and Software Requirements for Remote Management

The following requirements must be met for full Remote Management functionality:

Platform	Minimum Hardware and Software Requirements
ZfD 3.2 server	◆ See "Overall Software Requirements" on page 12 ◆ Appropriate protocol stack (IP, IPX™, or IP/CMD)

Platform	Minimum Hardware and Software Requirements
Management console	◆ See "Overall Software Requirements" on page 12 ◆ Appropriate protocol stack (IP, IPX, or IP/CMD)
Managed workstation	◆ Windows 95/98, Windows NT/2000 ◆ Novell Client that ships with ZfD3.2 (Workstation Manager installed) ◆ Appropriate protocol stack (IP, IPX, or IP/CMD) ◆ 2 MB hard disk space on the drive on which Windows is installed

Installing the Remote Management Component

To install the Remote Management Agent, ensure you have administrator rights.

To remotely access a workstation, the appropriate Remote Management Agent must be loaded on that workstation. The Remote Management Agent is a service installed on the Windows 95/98/NT/2000 workstation that runs automatically after installation. The agent can be installed using the Novell Application Launcher™ (NAL), the login script or the RMSETUP.EXE program.

The preferred method for installing the agent is to add the Remote Management Install Application object to the Application Launcher and associate the Application object with the managed workstation. The Remote Management Install Application object is created in NDS during ZfD 3.2 installation.

The following sections provide information for installing the Remote Management Agent:

- "Installing the Remote Management Agent using the Application Launcher" on page 65
- "Installing the Remote Management Agent using the Login Script" on page 66
- "Installing the Remote Management Agent using the RMSETUP.EXE Program" on page 66

IMPORTANT: For Windows NT/2000 managed workstations, you must associate the Application object with the Workstation object or the Container of the Workstation object. You will not be able to launch the Application object if you associate it with a User object.

Installing the Remote Management Agent using the Application Launcher

To install the Remote Management Agent using the Application Launcher:

1. From the management console, right-click a managed workstation.
2. Click Properties > Applications.
3. Click Add > browse to select Remote Management Install.
4. From the Applications page, select an association for Remote Management Install.

   The default association for the Remote Management Agent Application object is App Launcher. When this option is selected, the Remote Management Install Application object icon is displayed in the Application Launcher and Application Explorer (browser view), depending what ones you make available at the managed workstation.
5. Click OK.
6. Double-click the Remote Management Agent from the Application Explorer.

NOTE: Upgrade the ZfD 3.2 Remote Management files on the ZENworks server before running the Remote Management Install object from the Application Explorer.

Installing the Remote Management Agent using the Login Script

If the NAL components are not installed on the ZENworks server and the target machine, you can add the Remote Management agent install program (RMSETUP.EXE) in the login script, at any user/container object level.

To add RMSETUP.EXE to the login script:

1. From ConsoleOne, right-click the container or any user object > click Properties > Login Script.
2. Add the following line to the login script:

   ***#ZENworks_server_name*\SYS\PUBLIC\ZENWORKS\RMSETUP.EXE**
3. Click Apply > Close.
4. From the target workstation, log in as user where the modified login script is associated.

Installing the Remote Management Agent using the RMSETUP.EXE Program

1. From the workstation where you want to install the Remote Management Agent, map to the SYS:\PUBLIC\ZENWORKS directory located on the ZfD server.
2. Double-click RMSETUP.EXE

   This automatically installs the Remote Management Agent files on the managed workstation.

Setting Up Security for Remote Management Sessions

Default values are provided for parameters in each page of the Remote Management policy. You can change the default values to suit your requirements.

1. Right-click the managed workstation from the management console.
2. Click Properties > Remote Management.
3. Click the Use These Setting and Ignore Workstation Remote Management Policy option.
4. Click the remote session tab for which you want to change settings > enable or disable the following options:
   - The Remote Management session for Remote Control, Remote View, File Transfer, Remote Execute, Chat, and Diagnostic sessions.
   - The Prompt User for Permission option for Remote Control, Remote View, File Transfer, and Remote Execute sessions.
   - The Give User Audible Signal option for Remote Control and Remote View sessions.
   - The Give User Visible Signal option for Remote Control and Remote View sessions.
   - The Display Remote Management Agent Icon option for Remote Control, Remote View, File Transfer, Remote Execute, Chat, and Diagnostic sessions.
   - The Allow Blanking User's Screen option for Remote Control session.
   - The Allow Locking User’s Keyboard and Mouse option for Remote Control session.

Starting a Remote Management Session

Remote Management security is enabled when a Remote Management session is initiated by the administrative user (the network administrator or another user). Refer to the following table for directions to initiate a Remote Management session.

Remote Management Session	To Initiate
Ping	Right-click the managed workstation > click Actions > click Ping Remote Management Agent.
Remote Control	Right-click the managed workstation > click Actions > click Remote Control.
Remote View	Right-click the managed workstation > click Actions > click Remote View.
File Transfer	Right-click the managed workstation > click Actions > click File Transfer.
Remote Execute	Right-click the managed workstation > click Actions > click Remote Execute.
Chat	Right-click the managed workstation > click Actions > click Chat.
Diagnostics	Right-click the managed workstation > click Actions > click Diagnostics.
Remote Wake Up	Right-click the managed workstation > click Actions > click Remote Wake Up.

Other Things You Can Do

The following section provides information about other Remote Management tasks that you can do using ZfD 3.2:

- **Remote Management Security:** Obtain details about parameters for each page in the Remote Management policy, set up remote management rights for the management console user, and monitor login and logout events. For details, see Setting Up Remote Management Security in Remote Management in *Deployment*.
- **Ping:** Ping the Remote Management Agent installed on the workstation. For details, see Pinging the Remote Management Agent from the Management Console in Managing Remote Workstations in *Administration*.
- **Remote Wake Up:** Remotely wake up a powered-off network node. For details, see Managing a Remote Wake Up Session in Managing Remote Workstations in *Administration*.
- **Remote Control:** Remotely control a managed workstation. For details, see Managing a Remote Control Session in Managing Remote Workstations in *Administration*.
- **Remote View:** Remotely view the desktop of a managed workstation. For details, see Managing a Remote View Session in Managing Remote Workstations in *Administration*.
- **Remote Execute:** Remotely execute an executable on a managed workstation. For details, see Running an Application on the Managed Workstation in Managing Remote Workstations in *Administration*.
- **Remote Diagnostics:** Remotely diagnose problems on a managed workstation. For details, see Diagnostic Information in *Administration*.
- **File Transfer:** Transfer files between the management console and the managed workstation. For details, see Managing a File Transfer Session in Managing Remote Workstations in *Administration*.

- **Chat:** Chat with the user at the managed workstation. For details, see Managing a Chat Session in Managing Remote Workstations in *Administration*.

7 Workstation Inventory

ZENworks for Desktops® (ZfD) 3.2 lets you gather complete hardware and software inventory information for all managed workstations on your network. Using a centralized database, the network administrator can query, view, or report this inventory information using ConsoleOne®. ZfD also provides roll-up of inventory information across servers for large networks.

The following sections contain detailed information to help you plan, set up, and begin using Workstation Inventory in a test environment:

The focus of *Getting Started* is setting up a test system so you can better understand ZfD. Before you install Workstation Inventory in your working environment, you must plan and decide the inventory server tree hierarchy for your company. You should organize your inventory deployment based on your network and information requirements. See Workstation Inventory in *Deployment* for more information.

Specific Hardware and Software Requirements for Workstation Inventory

The following requirements must be met for full Workstation Inventory functionality:

Platform	Minimum Hardware and Software Requirements
NetWare® 4.*x* or 5.*x* servers	• NetWare 4.*x* with Support Pack 8a or later installed, NetWare 5.0 with Support Pack 5 or later installed, or NetWare 5.1 with Support Pack 2 or later installed . See "Obtaining NetWare Support Packs" on page 14 for more information. • 128 MB RAM. • 45 MB for inventory with a database, 35 MB for inventory. • Availability of a NetWare volume other than \SYS:. • Valid IP address and IP Services installed. • Java* Virtual Machine (JVM) shipped with the ZfD 3.2 *Companion* CD. See "Obtaining and Installing the JVM for Your NetWare Server" on page 14. • On a NetWare 4.*x* server, install JVM and then install VisiBroker* shipped with the ZfD 3.2 *Companion CD*. Run the ORB.EXE to install VisiBroker on a NetWare 4.*x* server. • Long name space installed.

Platform	Minimum Hardware and Software Requirements
Windows* NT*/2000 servers	◆ Windows NT 4.0 with Support Pack 4 or later installed. ◆ NDS® for NT 8 or later installed, or NDS eDirectory™ 8.34. ◆ Ensure that you have installed the Management Utilities when installing NDS on Windows NT/2000. The Management Utilities share the existing NDS default directory as SYS. To install Workstation Inventory, this SYS share directory should exist. ◆ You must log in to the Windows NT/2000 server as an administrator or with administrator rights. ◆ You must run the installation program from a Windows NT or a Windows 2000 server or workstation. The installation program assigns rights to the scan directory (\SCANDIR) and loads Sybase* and Service Manager as services. ◆ If you have configured the Inventory server that is a Windows NT/2000 server and there are Windows 95/98 workstations that will send their scan data to that Windows NT/2000 server, you must do the following for the scanners to collect data: If there are NDS users who are also Windows NT/2000 domain users, ensure that the users logged in are valid users of the Windows NT/2000 domain in the existing share created by ZfD. If there are users logged in to a different domain, ensure that the users are trusted users of the domain in the existing share created by ZfD. If there are NDS users who are not users of any Windows NT/2000 domain, ensure that the users do not log in to NDS during workstation startup. However, these users can log in to NDS later.
Inventory database server	Database requirements: ◆ Sybase ASA 7.0.0.505 ◆ Oracle* version 8.0.4.2.0 or 8i on NetWare 5.*x* servers. Oracle version 8.1.5 on Windows NT/2000 servers. To maintain the database in Oracle, see Configuring the Inventory Database for Oracle in Workstation Inventory in *Deployment* for more information. Hard disk requirements: ◆ Recommended minimum hard disk space on a lowest level server with 10,000 workstations is 1 GB. ◆ The minimum hard disk space on the topmost level server (Root Server) is 20 GB. ◆ Depending on the number of workstations attached, the hard disk size may vary from 1 GB to 20 GB. RAM requirements: ◆ Recommended minimum memory on the database is 256 MB with minimum cache size of 32 MB. 512 MB or higher is recommended at the Root Server level with a cache size of 256 MB. ZfD Inventory database files should not be installed on an NFS-mounted volume of a NetWare server. If you want to install the Inventory database on a different version of Oracle, the Inventory database schema should be regenerated. Contact Novell® Technical Services℠ for more information.

Platform	Minimum Hardware and Software Requirements
Windows 95/98 workstation	Novell Client™ version 3.3 shipped with the ZfD 3.2 *Client* CD (English only). Novell Client version 3.31 shipped with the ZfD 3.2 *Companion* CD (English, French, German). For more information, see "Obtaining and Installing the Novell Client" on page 16.
Windows NT/2000 workstation	Novell Client version 4.8 shipped with the ZfD 3.2 *Client* CD (English only). Novell Client version 4.81 shipped with the ZfD 3.2 *Companion* CD (English, French, German). For more information, see "Obtaining and Installing the Novell Client" on page 16.

For IPX™ workstations, NetBEUI should be installed on the workstations. For Windows NT/2000 workstations the NetBios service should be running.

ZfD supports Workstation Inventory in a Novell Cluster Services environment. For more information, see Integrating ZfD 3.2 or ZfD 3.2 SP1 with Novell Cluster Services in *Administration*.

Setting Up Workstation Inventory

Follow this sequence to set up Workstation Inventory:

1. Ensure that the necessary prerequisites are met.
   - Ensure that you have installed the JVM. See "Obtaining and Installing the JVM for Your NetWare Server" on page 14 for more information.
   - Ensure that you have installed ConsoleOne. See "Obtaining and Installing ConsoleOne" on page 14.
   - Use top-down deployment for Inventory installation. Always begin the installation at the topmost level server and proceed with the next lower-level servers. For example, in an inventory setup with a Root Server and a Leaf Server, complete the inventory installation at the Root Server, and then run the installation for the Leaf Server.
2. Run the installation program.
3. Choose the following options to install the Inventory components on the server:
   - Select the Custom Install option.
   - Select the Workstation Inventory and Sybase components.
   - Select the Files, Schema Extensions, and NDS Objects options.

   If you are installing ZfD 3.2 on an existing ZfD3/SP1 server, you must select the Files, Schema Extensions, and NDS Objects options.
4. Select the NDS tree where you want to install ZfD.

   The installation program detects if ZfD 3 already exists. If ZfD 3 exists, the installation program prompts you to choose either Upgrade or Full Install. If you are installing on an existing ZfD setup, see Installing Workstation Inventory in an Existing ZfD 3 Setup in Workstation Inventory in *Deployment*.
5. Select the server from the displayed list of servers to which you have logged in to while installing.

On the server, the installation program will create an Inventory Service object with the following name *servername*_ZenInvservice in NDS for each server. This object contains the inventory settings.

6 (Optional) Select the database server from the displayed list of servers connected to the tree you have logged in to.

The Sybase database (MGMTDB.DB) and related database files will be installed on the server you specify. To install the Inventory database on the different servers, run ZfD installation for each database server.

During the database installation, if you are prompted that a newer version of the Inventory database files exist, choose to overwrite the existing database.

6a Specify the volume on the database server.

If a database already exists, and you specify a different volume during the installation, the existing database will not be overwritten.

Because the database file can grow large, place the database on a volume other than SYS:.

7 Choose a role for each selected server.

For information about each server role, see Implementing the Inventory Server Roles in Workstation Inventory in *Deployment*.

The installation program copies all Inventory components on each server, irrespective of the server role.

8 Specify the location of the Scan Directory (SCANDIR) on the server.

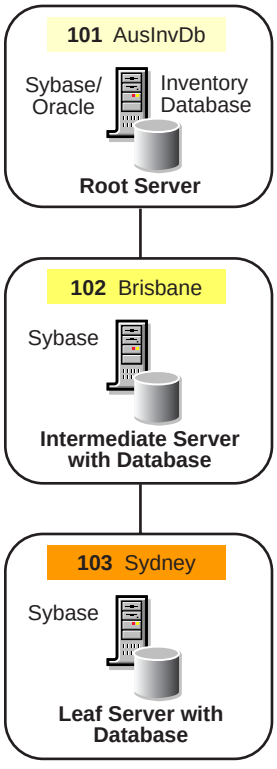
The location of SCANDIR that contains the scan data files is *specified_scandir_volume*\ZENWORKS\SCANDIR on the specified server. These files grow with each scan cycle and depend on the number of scanned workstations, choose a directory on a volume other than SYS:. If you place files other than the STR files in this directory, the inventory components will delete these files.

9 Assign unique site information for each database.

This information identifies the database so that you can query an individual database, report information, and view inventory information for the database.

In the following illustration, each Inventory database has been given unique identification. The database at the Root Server has site ID 101 and site name *AusInvDB*, the database at the Intermediate Server has site ID 102 and site name *Brisbane*, and the database at the Leaf Server has site ID 103 and site name *Sydney*. To obtain inventory information, you can query the database with the name Sydney, or you can view the collective information from the AusInvDB Root Server.

Site ID	Site Name
101	AusInvDb
102	Brisbane
103	Sydney



The site ID must be between 0 to 255. Also, the site name should not contain any underscore characters (_). ZfD does not verify whether the site information is unique.

To understand the changes that the inventory installation makes, see Understanding the Effects of Workstation Inventory Installation in *Administration*.

On NetWare servers, after installing the Inventory components on the server, the server need not be rebooted.

10 Install the Inventory files on the workstations.

10a Ensure that the workstations meet the requirements specified in "Specific Hardware and Software Requirements for Workstation Inventory" on page 69.

10b (Optional) On an existing ZfD setup, ensure that Inventory scanning is not scheduled on the workstation. The Workstation Manager in the System tray should display No for Inventory - Currently Running tab.

10c Run the Novell Client installation program on the workstation. Novell Client will install the inventory files. See "Obtaining and Installing the Novell Client" on page 16.

If the required Novell Client already exists, the preferred method for installing the inventory files is to add the Inventory Application object to the Application Launcher and associate the Application object with the managed workstation. The Inventory Application object is created in NDS during installation. Use ConsoleOne to configure the Inventory Application object. The Inventory Application object on Windows 95/98 is ZFD3INV95. On Windows NT/2000, the Inventory Application object is ZFD3INVNT. You can use NAL to execute the Application object.

When you configure the policies, ensure that you schedule the Inventory task for the workstation.

11 Load the database on the server.

- On a NetWare server, enter **mgmtdbs** at the server console. The MGMTDBS.NCF file in the SYS:\SYSTEM directory loads the Inventory database (MGMTDB.DB) maintained in Sybase.
- On a Windows NT/2000 server, the installation program creates the database server as a service: Adaptive Service Anywhere - ZENworks for Desktops 3. At server startup, this service is automatically loaded.

12 To set up the workstations for scanning, the workstations must be registered in NDS and be imported as NDS Workstation objects. See Setting Up Automatic Workstation Import for more information.

13 Configure the policies for the servers. For more information, see "Configuring the Policies on the Servers" on page 74.

NOTE: Do not rename any ZfD NDS objects such as the Inventory Service object or the Database object, and other policy objects that ZfD generates. ZfD will not function properly if you rename any ZfD objects.

There may be optional tasks that you need to do to implement Workstation Inventory. See "Other Things You Can Do" on page 77 for more information.

Configuring the Policies on the Servers

Based on the role of the Inventory server, configure the inventory settings. Consider the following sample scenarios:

- "Configuring Inventory in a Standalone Scenario" on page 74
- "Configuring Inventory in a Roll-Up Scenario" on page 74

NOTE: For information about configuring policies based on the servers, see Configuring Servers for Workstation Inventory in Workstation Inventory in *Deployment*.

Configuring Inventory in a Standalone Scenario

In a standalone server scenario, there is a single server that acts as the Inventory server and also the database server. There is no requirement for roll-up of inventory data.

During the installation, you selected to install Workstation Inventory and Sybase components. You also assigned the role for the server as Standalone Server, and assigned a unique site ID and site name to the database.

To configure the inventory settings for the Standalone Server:

1 Complete the steps in "Configuring the Database Location Policy" on page 75.

2 Complete the steps in "Configuring the Workstation Inventory Policy" on page 76.

3 Start Inventory Services. On the NetWare server, enter **startinv**. ZfD updates for Inventory will be effective only if you start the Inventory services on the servers.

Configuring Inventory in a Roll-Up Scenario

In this setup, one server acts as the Root Server with Database, and the other server is a Leaf Server. The Leaf Server configuration does not require a database.

During the installation for the Root Server, you selected to install Workstation Inventory and Sybase components. You also assigned the role for the server as Root Server, and assigned a unique site ID and site name to the database.

To configure the inventory settings for the Root Server:

1. Complete the steps in "Configuring the Database Location Policy" on page 75.
2. Start Inventory Services. On the NetWare server, enter **`startinv`**. ZfD updates for Inventory will be effective only if you start the Inventory services on the servers.

During the installation for the Leaf Server, you selected to install Workstation Inventory. You also assigned the role for the server as Leaf Server.

To configure the inventory settings for the Leaf Server:

1. Specify the details of the next-level server in the Roll-Up policy contained in the Server package. Complete the steps in "Configuring the Roll-Up Policy" on page 75.
2. Complete the steps in "Configuring the Workstation Inventory Policy" on page 76.
3. Start Inventory Services. On the NetWare server, enter **`startinv`**. ZfD updates for Inventory will be effective only if you start the Inventory services on the servers.

Configuring the Database Location Policy

To enable the Database Location policy in the Service Location package and associate the database object with the Inventory Service object of the server:

1. In ConsoleOne, right-click the Policy Packages container > click New > Policy Package > Service Location Package > ZENworks Database > Next.
2. Type the name for the Service Location Package > click Next > click Finish.

   This procedure creates the Service Location package.
3. In ConsoleOne, right-click the Service Location Package > click Properties > click Policies.
4. Check the check box under the Enabled column for the ZENworks Database policy.
5. Click Properties.
6. Browse to the DN of the ZENworks Database object > click OK twice.
7. Click the Associations tab > Add.
8. Browse to select the container under which the Inventory Service object is present > click OK twice.

Configuring the Roll-Up Policy

To configure the Roll-Up policy:

1. In ConsoleOne, right-click the Policy Packages container > click New > Policy Package > Server Package > zeninvRollUpPolicy > Next.
2. Type the name for the Server Package > Next > Finish.
3. In ConsoleOne, right-click the Server Package > click Properties > Policies.
4. Select any of these: General, NetWare, or WinNT-2000.
5. Check the check box under the Enabled column for the zeninvRollup policy.
6. Click Properties.
7. Browse to select the DN of the Inventory Service object > click OK.
8. Click the Associations tab > Add.
9. Browse for the server that you want to associate the Roll-Up policy to > click OK twice.

10 In ConsoleOne, right-click the Server Package > click Properties > Policies.

11 Select any of these: General, NetWare, or WinNT-2000.

12 Click the Roll-Up policy row > Properties > Roll-Up policy tab > Roll-Up Schedule.

13 Specify the roll-up time > click OK.

This will schedule the roll-up time.

When scheduling the roll-up of data in the Inventory policies, we recommend that the roll-up frequency should be at least one day. If the roll-up of scan data is scheduled too frequently (for example less than one hour), there may be some performance degradation of the Inventory server.

Configuring the Workstation Inventory Policy

To configure the Workstation Inventory policy package:

1 In ConsoleOne, right-click the Policy Packages container > click New > Policy Package > Workstation Package > Workstation Inventory > Next.

2 Type the name for the Workstation Package > click Next > Finish.

3 In ConsoleOne, right-click the Workstation Package > click Properties > Policies > click Win95-98 or WinNT-2000 tab.

4 Check the Workstation Inventory policy > click OK.

5 Click the Associations tab > Add.

6 Browse to select the container object under which the workstations are registered > click OK twice.

7 In ConsoleOne, right-click the Workstation Package > click Properties > Policies > Win95-98 or WinNT-2000 tab.

8 Click Workstation Inventory row > Properties > Workstation Inventory Policy tab.

9 Browse to select the DN of the Inventory Service object.

This setting specifies that the scanner will send the workstation scan data to this Inventory server.

10 Check the Enable the software scan option to enable software scanning of workstations > click OK.

11 In ConsoleOne, right-click the Workstation Package > click Properties > Policies > Win95-98 or WinNT-2000 tab.

12 Click Workstation Inventory policy row > click Properties > click the Policy Schedule tab.

13 Modify the schedule > click OK twice.

14 In ConsoleOne, right-click the Inventory Service object (*servername*_ZenInvService) > click Properties > click the Inventory Service Object Properties tab.

15 Check Enable Scan of Workstations > click OK.

This setting ensures that scanning is enabled for the workstations associated with the selected Inventory server.

Viewing the Inventory Information

The following list gives the steps to view inventory information, query inventory, and generate inventory reports:

NOTE: To view the inventory information, you must have administrative privileges. An administrator can assign users as trustees of the database object. See Assigning Trustees to the Database Object in Workstation Inventory in *Administration.*

To view the following inventory information in ConsoleOne:

- **Inventory summary of a managed workstation:** Click Tools > click Configure DB > click a ZENworks Database object > click OK. Right-click a workstation > click Actions > Inventory.
- **Minimal inventory information of a managed workstation:** Right-click a managed workstation > click Properties > click ZENworks Inventory > click Minimal Information.
- **Query the Inventory database:** Click Tools > click Configure DB > click a ZENworks Database object > click OK. Click a container > click Tools > click Inventory Query.
- **Generate the inventory reports:** Click Tools > click Configure DB > click a ZENworks Database object > click OK. Click the server object > Click Tools > click Inventory Reports > Click the report you want to generate. Specify the Selection Criteria. Click the Run Selected Report button.

  NOTE: To generate inventory reports from an Inventory database with inventory information of more than 2,000 workstations, use the Data Export tool for better performance. The Data Export tool generates the inventory information in to a comma separated value (.CSV) file. Use this .CSV file along with any standard reporting tool such as Seagate* Crystal Reports*.
- **Exporting the inventory data to comma separated value format:** Click Tools > click Configure DB > click a ZENworks Database object > click OK. Click Tools > click Data Export. Follow the Data Export wizard instructions.

Other Things You Can Do

The following list illustrates additional tasks that you can do with Workstation Inventory:

- **Configuring an Inventory database for Oracle:** See Configuring the Inventory Database for Oracle in Workstation Inventory in *Deployment* for more information.
- **Optimizing the performance of the Oracle database:** To optimize the Oracle database to improve the performance while querying and generating reports from a large Inventory database, see Optimizing the Performance of the Oracle Database in Workstation Inventory in *Administration*.
- **Planning the optimum database cache size:** To plan the optimum database cache size for Sybase, see Using an Optimal Database Cache Size on the Inventory Database Server to Improve Performance in Workstation Inventory in *Administration*.
- **Organizing the database spaces for Sybase database:** To organize the database files on Sybase, see Organizing the Database Spaces for a Sybase Database on NetWare or Windows NT/2000 Servers (AlterDBSpace Tool) in Workstation Inventory in *Administration*.
- **Optimizing the Sybase database on Windows NT/2000 servers:** To optimize the Sybase database on Windows NT/2000 servers using the Inventory database service configuration tool, see Using the Inventory Database Service Configuration Tool for Windows NT/2000 in Workstation Inventory in *Administration*.

- **Using ZENworks 2 Inventory policies and database:** To reuse the ZENworks 2 inventory policies and database in ZfD 3.2, see Migrating ZENworks 2 Inventory Information in Workstation Inventory in *Administration*.
- **Customizing software scanning of workstations:** To specify the applications you want to scan for, to import files that contain the list of applications, or to export and modify the list of applications as a text file, see Customizing Software Scanning of Workstations in Workstation Inventory in *Administration*.
- **Customizing software scanning information of vendors and products in the display:** To customize the names by using the software rules file, see Customizing the Software Scanning Information of Vendors and Products in Workstation Inventory in *Administration*.
- **Synchronizing the Inventory database with NDS:** To view whether the workstations objects in NDS are synchronized with the Inventory database, see Synchronizing the Inventory Database with eDirectory (NDS-DB Sync Tool) in Workstation Inventory in *Administration*.
- **Changing the existing role of the Inventory Service object:** To modify the roles that you have specified during installation, see Changing the Role of the Inventory Service Object in Workstation Inventory in *Administration*.
- **Backing up the Inventory database:** To make a backup of the inventory database for Sybase or Oracle, see Backing Up the Inventory Database in Workstation Inventory in *Administration*.
- **Map view of the servers deployed for inventory:** To view the servers and database servers that you have deployed for inventory, see Viewing the Servers Deployed for Inventory in Workstation Inventory in *Administration*.
- **Exporting the inventory data to CSV format:** To filter the inventory information to a CSV file, see Exporting the Inventory Data to CSV Format in Workstation Inventory in *Administration*.
- **Troubleshooting inventory problems with log files and scan status:** To view the status of scan and the log files that the inventory components update in NDS, see Troubleshooting Workstation Inventory with Status Logs in Workstation Inventory in *Administration*.

A Documentation Updates

The information in this section is grouped according to the date when the *ZENworks for Desktops 3.2 Getting Started Guide* was updated and republished. Updates were made to this guide on the following dates:

- August 15, 2003
- October 10, 2003
- November 11, 2003

August 15, 2003

Location	Update
"Overall Software Requirements" on page 12	Added support for Novell® NetWare®6.

October 10, 2003

Location	Update
"ZfD Installation Prerequisites" on page 16	Added information to the eighth item in the checklist to make it clear that the server being installed to must reside in an eDirectory® tree.

November 11, 2003

Location	Update
"ZfD Installation Prerequisites" on page 16	Rewrote information in the eighth item in the checklist for clarification.