Installation and Getting Started

Novell®
ZENworks® Orchestrator

1.3

September 8, 2008

www.novell.com

Novell Trademarks

For Novell trademarks, see the Novell Trademark and Service Mark list (http://www.novell.com/company/legal/trademarks/tmlist.html).

Third-Party Materials

All third-party trademarks are the property of their respective owners.

Contents

About This Guide

This *Installation and Getting Started Guide* introduces Novell® ZENworks® Orchestrator 1.3, including its basic administration environment, accessed through the ZENworks Orchestrator console, and its interface for developers, accessed through the developer portal. It provides an introductory overview of the Orchestrator and explains how to install, monitor, and manage applications running on the Orchestrator. The guide is organized as follows:

- Chapter 1, "Overview," on page 11
- Chapter 2, "Understanding Basic Functionality," on page 21
- Chapter 3, "Planning the Installation," on page 27
- Chapter 4, "Installation and Configuration," on page 39
- Chapter 5, "First Use of Basic ZENworks Orchestrator Components," on page 109

General Audience

This book is intended for data center managers, and IT or operations administrators. It assumes that users of the product have the following background:

- General understanding of network operating environments and systems architecture.
- Knowledge of basic UNIX* shell commands and text editors.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comments feature at the bottom of each page of the online documentation, or go to www.novell.com/documentation/feedback.html (http://www.novell.com/documentation/feedback.html) and enter your comments there.

Additional Product Documentation

In addition to this *Installation and Getting Started Guide*, ZENworks Orchestrator 1.3 includes the following additional guides that contain valuable information about the product:

- *Novell ZENworks Orchestrator 1.3 Administration Guide*
- *Novell ZENworks Orchestrator 1.3 Virtual Machine Management Guide*
- *Novell ZENworks Orchestrator 1.3 Job Management Guide*
- *Novell ZENworks Orchestrator 1.3 Developer Guide and Reference*

Documentation Updates

This *Installation and Getting Started Guide* is updated periodically. To view the most recent version, visit the ZENworks Orchestrator 1.3 Web site (http://www.novell.com/documentation/zen_orchestrator13/) and look for the documentation updates section included at the end of the book.

Documentation Conventions

In Novell documentation, a greater-than symbol (>) is used to separate actions within a step and items in a cross-reference path.

A trademark symbol ($^®$, ™, etc.) denotes a Novell trademark. An asterisk (*) denotes a third-party trademark.

When a single pathname can be written with a backslash for some platforms or a forward slash for other platforms, the pathname is presented with a backslash. Users of platforms that require a forward slash, such as Linux* or UNIX*, should use forward slashes as required by your software.

Overview

1

Welcome to Novell® ZENworks® Orchestrator 1.3. This section of the *Getting Started Guide* includes the general information you need to become acquainted with the product. The main topics in this section are:

- Section 1.1, "Introduction," on page 11
- Section 1.2, "Software Architecture," on page 14
- Section 1.3, "How Do I Interact with ZENworks Orchestrator?," on page 16
- Section 1.4, "How Orchestrator Components Communicate," on page 18

1.1 Introduction

The following sections contain information to help introduce you to ZENworks Orchestrator:

- Section 1.1.1, "What Is ZENworks Orchestrator?," on page 11
- Section 1.1.2, "How Do I Obtain and License ZENworks Orchestrator?," on page 13
- Section 1.1.3, "The Purpose of This Guide," on page 14
- Section 1.1.4, "The Audience for This Guide," on page 14

1.1.1 What Is ZENworks Orchestrator?

ZENworks Orchestrator 1.3 uses its functional components to:

- Perform high-performance-computing-style task breakdown across multiple machines (resources) in a data center
- Provide distributed, CRON-style job scheduling
- Provide a messaging system between the ZENworks Orchestrator Server and the managed machines

The Orchestrator system consists of a central server (the Orchestrator Server), agents capable of executing work on each managed resource, and an optional client application (the ZENworks Orchestrator Console) that can be used to drive and monitor the Orchestrator system. Work is described to the system in the form of a "job." A job is written in an embedded Python* script and deployed to and managed by the server. When a job is run, constraint-based placement (a kind of rules engine) directs the work to suitable and available resources. The job might partially execute on the managed systems and can further execute any process as the desired user on the managed system.

The following figure illustrates how ZENworks Orchestrator is used as the basic building block for the ZENworks Virtual Machine Management Pack (VM Management), which is available as a separate product, and future management packs to be developed and released by Novell.

Figure 1-1 *ZENworks Orchestrator and Management Packs*

ZENworks Orchestrator

+ ZENworks Orchestrator Server
  • Rules Engine
  • Policy
  • Scheduling
  • Grid Services
  • Utilization & Billing
+ Scheduler
+ Load Balancer
+ Job/Definition/Deployment
+ Monitoring Server

ZENworks Virtual Machine Management

Future

Future

Future

Management Pack

Management Pack

Management Pack
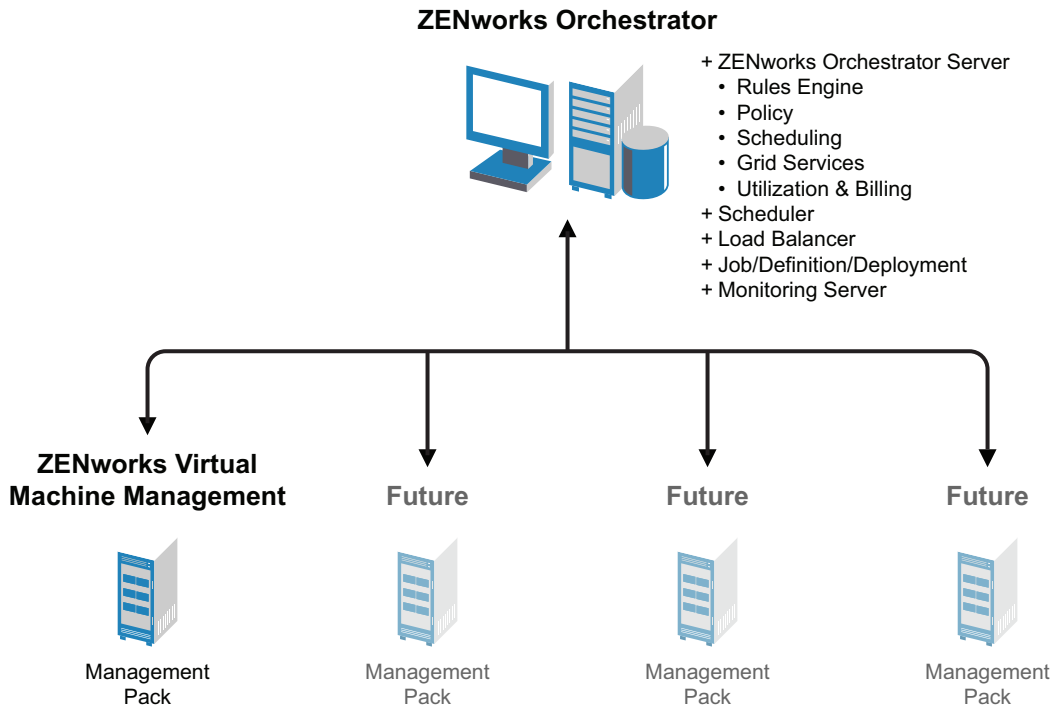
Management Pack

ZENworks VM Management adds increased functionality to Novell ZENworks Orchestrator. If you purchase this management pack, you will be able to deploy predefined jobs to manage the life cycle of various virtual machine technologies, including the ability to move files around in both unicast and multicast distribution modes. This Orchestrator capability helps administrators, IT operators, and job developers improve and expand the performance of the data center by automating provisioning and by using Virtual Machines (VMs) as resources in the data center computing environment. Better managed VMs can help control associated data center costs by addressing several data center issues, including cooling, space, power usage, and efficient hardware usage. For more information about ZENworks Virtual Machine Management, see the *Novell ZENworks Orchestrator 1.3 Virtual Machine Management Guide*.

Key Product Features

ZENworks Orchestrator includes these core features:

- ◆ Resource Discovery
- ◆ Workload Management
- ◆ Policy Management for SLA
- ◆ Auditing/Accounting
- ◆ Software Compliance
- ◆ Heterogeneous Virtual Machine (VM) Life Cycle Management (available with a VM Management license only)

New in This Release

Some of the new features in ZENworks Orchestrator 1.3 include:

- High Availability
  - Server failover (if a server in a configured cluster goes down, another server goes online to take its place)
  - Virtual Machine restart after failure
- Support for VM Builder/Warehouse installed on a server separate from the Orchestrator Server
- Upgradability (from version 1.2 to 1.3 and later)
- New Provisioning Adapters:
  - VMWare* Virtual Center 2 (support for new versions of VMWare infrastructure)
  - SUSE® Linux Enterprise Server (SLES) 10 SP2 with Xen* 3.2
- Enhancements to the VMM Graphical Console:
  - VM Warehouse features a hierarchical view of the VM collection
  - Improvements to the VM Management Welcome Page
  - Addition of a new dialog to display the version number of all back-end services
  - Enhancements to the VM Creation Wizard (for example, the persistence of recent user selections)
- New man page documentation for command line utilities
- Improvements applied to server-agent communication
- Support for Orchestrator Agent installed on SLES 10 SP2
- Improvements in the Job Scheduler

1.1.2 How Do I Obtain and License ZENworks Orchestrator?

To download the product for evaluation or purchased install of ZENworks Orchestrator, contact an authorized Novell Sales representative or a Certified Novell Partner.

You can evaluate the product before purchase by downloading a trial key, which controls the number of users and managed nodes you can configure. The trial key also sets an expiration date. The trial key is available on the product download site.

For fully-supported functionality, ZENworks Orchestrator requires a purchased license key. Contact your Novell Sales Representativeor a Certified Novell Partner for purchase information.

Upgrading the Server from a Purchased License to a Trial License

If you you are operating ZENworks Orchestrator with a Trial License Key, use the following steps to upgrade to a license key you purchased from Novell:

1 Stop the ZENworks Orchestrator Server.

2 Rename the purchased license file to `key.txt`.

3 Copy the purchased license file (`key.txt`) to the `/opt/novell/zenworks/zos/server/license` directory, overwriting the old license key.

4 Restart the Orchestrator Server.

1.1.3 The Purpose of This Guide

The purpose of this guide is to introduce you to the basic Orchestrator components (that is, the Orchestrator components that provide high performance computing functions and are basic to Orchestrator Management Packs that can be purchased separately), to help you plan the installation of these components, to install them, and to help you understand how to use them in basic usage scenarios.

For information about installing and using the Virtual Machine Management capabilities of ZENworks Orchestrator, see the *Novell ZENworks Orchestrator 1.3 Virtual Machine Management Guide*.

1.1.4 The Audience for This Guide

The contents of this guide are of interest to the following individuals:

Administrator: An Orchestrator administrator deploys applications, manages users, and monitors distributed computing resources. Administrators can also create and set policies for automating the usage of these computing resources. For more information about the tasks and tools used by the Administrator, see the *Novell ZENworks Orchestrator 1.3 Administration Guide*.

User: The end user of ZENworks Orchestrator, also called a "Job Manager," runs and manages jobs that have been created by a Job Developer and deployed by the administrator. It is also possible that the end user could be a developer who has created applications to run on distributed computing resources. For more information about the tasks and tools used by the Job Manager, see the *Novell ZENworks Orchestrator 1.3 Job Management Guide*.

Developer: The developer has control of a self-contained development system where he or she creates jobs and policies and tests them in a laboratory environment. When the jobs are tested and proven to function as intended, the developer delivers them to the Orchestrator administrator. For more information about the tasks and tools used by the Job Developer, see the *Novell ZENworks Orchestrator 1.3 Developer Guide and Reference*.

1.2 Software Architecture

ZENworks Orchestrator is built as an enterprise server with capabilities to support extremely large computing environments. It includes all the services required to provide an enhanced grid computing application server environment.

A simple view of the ZENworks Orchestrator software architecture is diagrammed below, showing the Orchestrator software components:

Figure 1-2 *ZENworks Orchestrator Software Architecture*
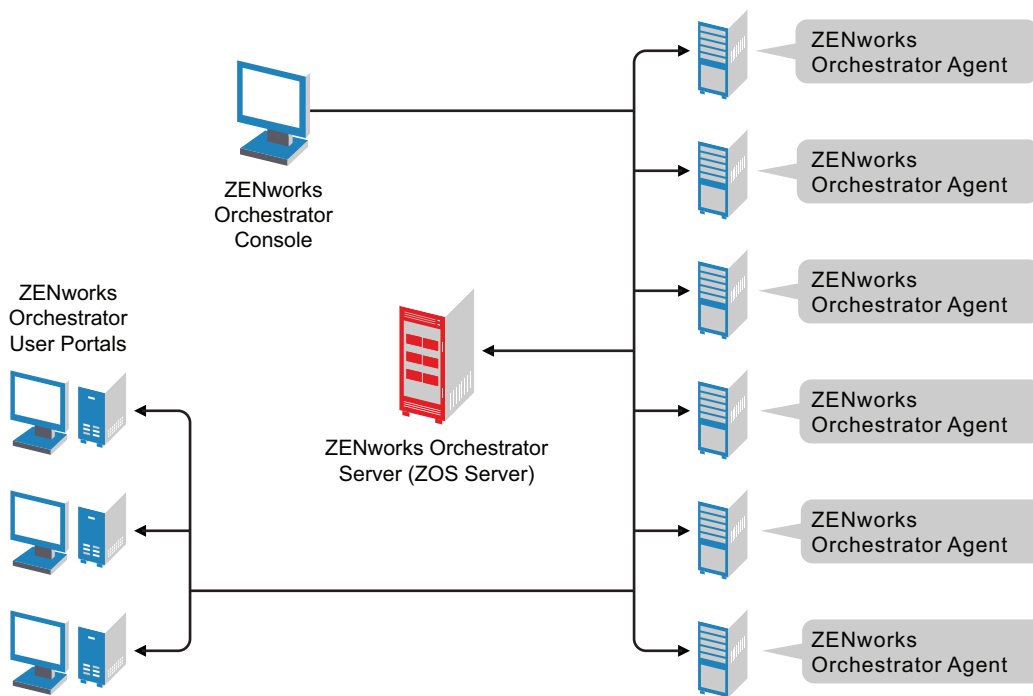
The ZENworks Orchestrator Server

The ZENworks Orchestrator Server is the gateway between enterprise applications and resource servers. The server has two primary functions:

 * To manage the resource servers
 * To manage jobs submitted from applications to run on the computing resource

In the first function, the server manages the computing resources by collecting, maintaining, and updating their status availability, service cost, and other facts. Changes to the computing resources can be made either by the administrator or by the computing resource owner if there is one. The individual who makes changes (administrator or owner) is not important in this first function. What is important is that changes are discovered and the computing resource attributes are kept up-to-date.

The second function of the server is to run application requests—called jobs—on the computing resources. Because the server is capable of handling multiple jobs, it uses a policy-based broker and scheduler to decide when and how a job should run on the managed computing resources. The decisions are based on many controlled factors, including the number of computing resources, their cost, and a variety of other factors as requested by the application, but managed under policy constraints set up by the server administrator.The server runs the job and provides all the job's output responses back to the requesting application.The server handles and responds to the application with any error conditions, includes security, faults, outages, etc., that it might encounter. It provides failover capabilities to allow jobs to continue if computing resources and network conditions degrade.

The ZENworks Orchestrator Agent

The ZENworks Orchestrator Agent is installed on all computing resources that are to be managed. It runs applications under the management of the Orchestrator Server.

The ZENworks Orchestrator Clients

The ZENworks Orchestrator Clients let a computing resource administrator troubleshoot, initiate, change, or shut down server functions for ZENworks Orchestrator and its computing resources. The clients also monitor all managed computing resource job activity and provide facilities to manage application jobs. When you install the Clients on a computing resource, you are installing the following tools:

- ◆ zos command line interface
- ◆ zosadmin command line interface
- ◆ ZENworks Orchestrator Console (optional)
- ◆ Java* SDK (toolkit)

For more information about the clients, see Section 1.3, "How Do I Interact with ZENworks Orchestrator?," on page 16. For more information about the toolkit, see "Using the Orchestrator Client SDK" in the *Novell ZENworks Orchestrator 1.3 Developer Guide and Reference*.

The ZENworks Orchestrator Console

The ZENworks Orchestrator Console is a graphical user interface running on Java. It provides a way for the Orchestrator administrator to troubleshoot and to initiate, change, or shut down the functioning of the Orchestrator Server and its resources. It also functions as a monitor of all Orchestrator job activity, and it provides an interface for managing Orchestrator jobs. For more information about the Orchestrator Console, see Section 2.2, "The ZENworks Orchestrator Console," on page 22 and *Using the ZENworks Orchestrator Console* in the *Novell ZENworks Orchestrator 1.3 Administration Guide*.

The ZENworks Orchestrator User Portal

The ZENworks Orchestrator User Portal is available as a thin client. It provides end users with the ability to administer their jobs among the managed computing resources. For more information about the User Portal, see "Using the ZENworks Orchestrator User Portal" in the *Novell ZENworks Orchestrator 1.3 Job Management Guide*.

Other ZENworks Orchestrator Components

As indicated in Section 1.1.1, "What Is ZENworks Orchestrator?," on page 11, ZENworks Virtual Machine Management (VM Management) can be licensed as an add-on Management Pack to the basic ZENworks Orchestrator components. For more information about VM Management software architecture, see the *Novell ZENworks Orchestrator 1.3 Virtual Machine Management Guide*.

1.3 How Do I Interact with ZENworks Orchestrator?

Administrators and users perform their activities by using their own graphical tool or command line interface tool available from the server. In general, the same functions are available in either the graphical or the command line tools. The toolset is summarized in the chart below.

Table 1-1 *Summary of the ZENworks Orchestrator Toolset*

Role	Tool Type	Description	Common Function
Administrator	Graphical Interface	The ZENworks Orchestrator Console, which is an installed client	◆ Stops or starts the server(s) for Orchestrator.
	Command Line Interface	Sample command line for help: `zosadmin command --help`	◆ Deploys jobs. ◆ Manages Group and Policy associations. ◆ Monitors jobs. ◆ Helps troubleshoot jobs/policies. ◆ Monitors computing resource usage. ◆ Creates and manages user accounts.
User	Graphical Interface	The Orchestrator User Portal, which is a Web application	◆ Searches for deployed jobs.
	Command Line Interface	Sample command line for help: `zos command --help`	◆ Searches for available computing resources. ◆ Runs jobs. ◆ Monitors users running jobs. ◆ Manages the user's own jobs. That is, a user can cancel, pause, restart, and change job priority.

Other functions can also be performed by using either the graphical or command line tools. The sections that follow show examples for performing these functions from either interface, when applicable.

To help you understand how these tools can be used, you can find more information in the following sections:

1.4 How Orchestrator Components Communicate

The following diagram illustrates how the various components of ZENworks Orchestrator communicate with the Orchestrator Server. An explanation for each communication link follows the diagram.

Figure 1-3 *Communication Ports Used By the Orchestrator Server*
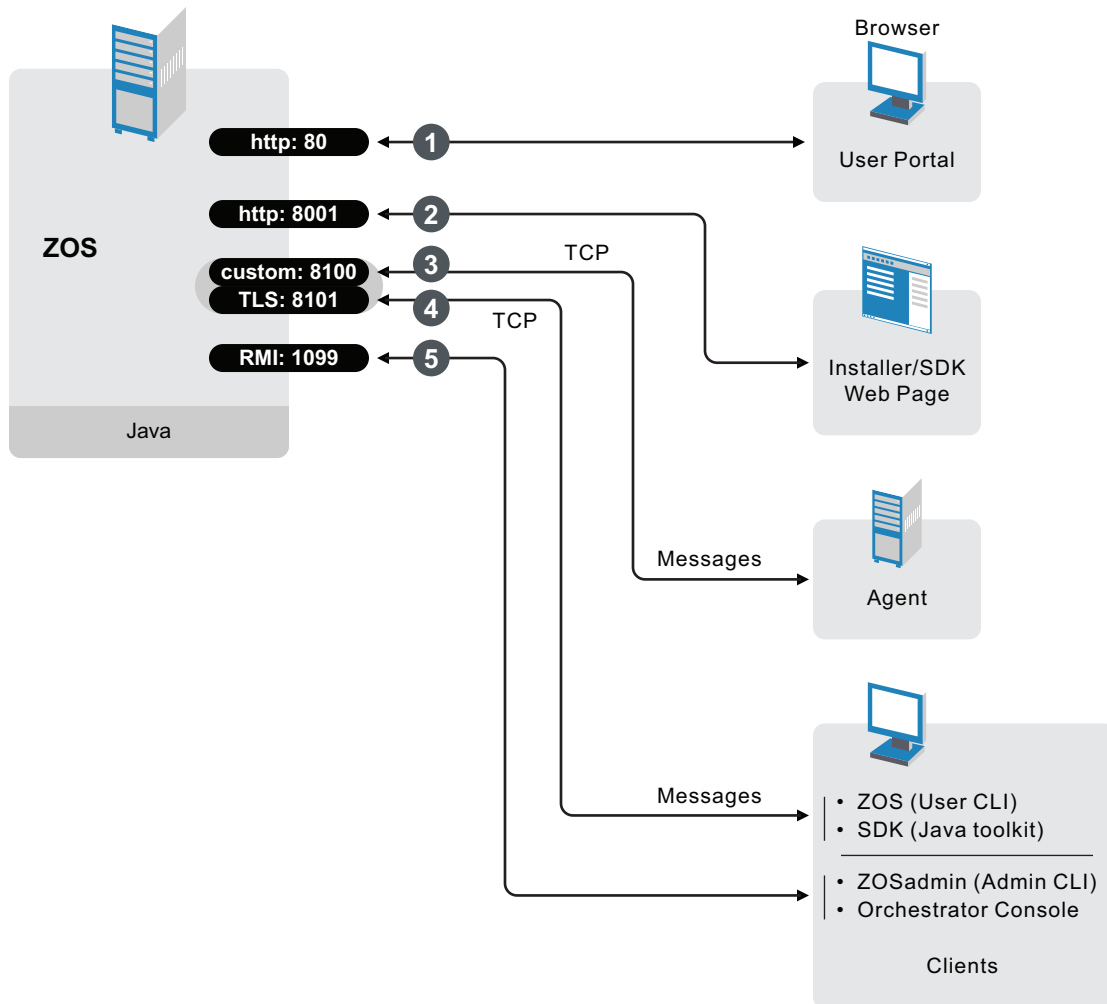
1. Users who open the User Portal for managing jobs do so by opening a Web browser and entering the URL to the Orchestrator Server followed by the port designated for the User Portal during installation. In a basic installation of ZENworks Orchestrator, this is port 80. The URL would therefore be entered as follows:

   ```
   http://DNS_Name_or_IP_Address:80
   ```

2. Administrators who want more information about Orchestrator and a method to access or install additional clients or agents can access the Administrator Information page. To do so, he or she opens a Web browser and enters the URL to the Orchestrator Server, followed by the port designated for the Web Info page during installation. In a basic installation of ZENworks Orchestrator, the default is port 8001. The URL would therefore be entered as follows:

```
http://DNS_Name_or_IP_Address:8001
```

3. The Orchestrator Server establishes and maintains contact with an installed Orchestrator Agent on a computing resource through port 8100 using a custom protocol.

4. When a user invokes the `zos` command line interface (available after ZENworks Orchestrator clients are installed on a machine), or when he or she launches the Java toolkit SDK from the Web Info page, those client tools communicate with the Orchestrator Server over ports 8100 and 8101.

5. When the administrator invokes the `zosadmin` command line interface (available after ZENworks Orchestrator clients — including the console — are installed on a machine), or when he or she starts the ZENworks Orchestrator Console, those client tools communicate with the Orchestrator Server over port 1099, which uses a Java RMI (Remote Method Invocation) protocol.

Understanding Basic Functionality

2

This section provides further information about some important administrator tasks that use the Novell[®] ZENworks[®] Orchestrator Console. You can investigate these tasks further after you have successfully deployed and run your first job.

The section includes the following information:

2.1 Basic Orchestrator Terms and Concepts

This section includes the following information:

2.1.1 The Grid

When you install the ZENworks Orchestrator Server, you create an entity called a grid, which is basically an administrative domain container. A grid contains all of the objects in your network or data center that the Orchestrator is responsible to monitor and manage, including Users, Resources, and Jobs.

2.1.2 Users

For ZENworks Orchestrator, a user is an individual who authenticates to the Orchestrator Server for the purpose of managing (that is, running, monitoring, cancelling, pausing, stopping, or starting) a deployed job. The Orchestrator administrator can use the Orchestrator Console to identify users who are running jobs and to monitor the jobs that are currently running or that have run during the current server session.

2.1.3 Resources

For ZENworks Orchestrator, a resource refers to a computing node somewhere in your network (that is, your grid or data center network), which has a ZENworks Orchestrator Agent (Orchestrator Agent) installed on it. When the Orchestrator Agent is installed on a resource, communication between the agent and the ZENworks Orchestrator Server (Orchestrator Server) is established and the computing resource can be discovered and can begin performing jobs that are assigned to it by the Orchestrator Server.

2.1.4 Jobs

For ZENworks Orchestrator, a job is an application module that can run on some or all of the resources. Job logic is written in Python, and can include instructions and policies that dictate how, when, and where that job runs. In addition, the job can embed instructions that dictate any processes or applications that the resource needs to launch.

A Job Developer uses Python in a prepackaged Job Definition Language (JDL) editor to create or modify a job. When the job is ready, the administrator of the Orchestrator system uses the Orchestrator Server functionality to deploy it and to allocate appropriate resources to run it (when so directed), based on its parameters and associated policies.

2.1.5 Typical Use of the Grid

In general, the everyday use of the grid and its computational components follows this sequence:

1. Jobs containing applications programmed by developers are created. A job component includes the application code, instructions for running the job, and policies to apply to the job.
2. The Orchestrator Server is started. It identifies all the available computing resources.
3. The administrator logs in to the server and deploys jobs to it so that users can run these jobs. The administrator also creates and distributes user logins.
4. Users log in to the server and search for deployed jobs they want to run.
5. When a user selects a job to run, he or she runs the job based on selected options; for example, he or she might select when to run the job, how many computing resources the job should run on, the type of computing resources to be used, and so on.
6. Users monitor and control their own jobs by using certain functions, such as canceling a job, pausing a job, or even changing the priority of a job if they have rights to do so.
7. Administrators can monitor and control all of the running jobs. They can dynamically change how a job runs before or while it is executing, they can change job priorities, or they can turn computing resources off or on.
8. Steps 5, 6, and 7 can be repeated as long as the Orchestrator Server is running.

2.2 The ZENworks Orchestrator Console

Both the grid administrator and the job developer need to have access to and use the ZENworks Orchestrator Console. The administrator needs to use the console to perform any management functions, such as creating user accounts and managing Orchestrator Server activities. The developer uses the console to access the JDL editor for creating or modifying jobs and policies.

The following figure shows the general areas on the console interface that are referred to in this guide.

Figure 2-1   *The Interface of the ZENworks Orchestrator Console*
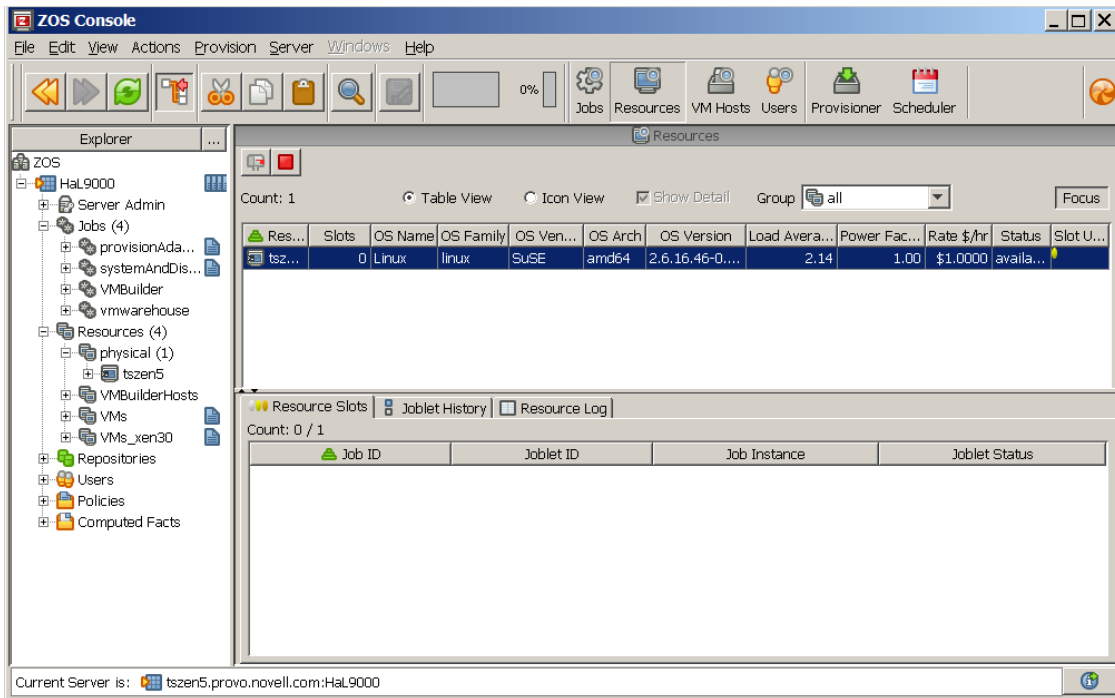
The following chart describes the functional areas of the main ZENworks Orchestrator Console display.

Table 2-1 *Detailed Description of Console Areas*

Area	Description
Menu bar	Provides operations categorized under menus such as *File*, *Edit*, *View*, *Grid*, *Server*, *Windows*, and *Help*.
	◆ The *File* menu lets you save any changes you've made or exit the console.
	◆ The *Edit* menu lets cut, copy, and paste items and choose general and server preferences for console.
	◆ The *View* menu lets you manipulate the display of the different components of the console and refresh the Explorer and Workspace panels.
	◆ The *Actions* menu lets you launch specific tools that create and delete users or user groups, computing resources, jobs, policies, and computed facts.
	◆ The *Server* menu lets you start a local server, log in to the server, create and display logs for logged in servers, log out from the server, and shut down the server.
	◆ The *Windows* menu lets you select console windows to display when you have more than one console window open. You can open the Explorer panel and the two tabs of the Info panel (*<Orchestrator> Log* and *Console Output*) in their own windows by right-clicking the tab and choosing *Open in window* in the pop-up menu.
	◆ The *Help* menu provides access to the About box for the console. It also provides a link to ZENworks Orchestrator documentation on the Web.
Main toolbar	The main toolbar has buttons for executing common tasks. The basic tasks are *Go Back*, *Go Forward*, *Refresh the view*, *Hide or Show the Explorer Panel*, *Cut*, *Copy*, *Paste*, and *Save changes in workspace view* and *Open the Find Dialog*. Additional tools are available if you install the Virtual Machine Management Pack.
	The toolbar also includes buttons that open monitoring views for *Jobs*, *Resources*, and *Users*. And additional monitor for Virtual Machine host groups plugs in to the toolbar if you install Virtual Machine Management.
	To the far left of the toolbar, a pinwheel icon indicates when the console is busy.
Explorer panel	The Explorer panel displays a hierarchical tree. The tree lets you navigate to different objects; you can click items in the tree to see their details. For example, you can display computing resources for a selected grid. When you click *Computing Resources* in the tree, its details appear in the Workspace panel with a list of active computing resources. You can edit the *Computing Resource* attributes in the workspace panel.
Workspace panel	The Workspace panel displays a detailed view for an item you select in the Explorer panel. For example, if you select a computing resource under *physical* in the Explorer panel, the Workspace panel view changes to show the details for that resource. You can edit the properties of an Orchestrator object in the views displayed in the Workspace panel.

Area	Description
Info panel	The Info panel displays a variety of information, such as validation and error messages, log files, and query results. You can display or hide the Info panel by clicking the *Info panel* button in the Status bar.
Status bar	The status bar displays general identity information about the Orchestrator Server where you are logged in.

For information about launching the console and using it for the first time, see Section 5.1, "Walkthrough: Launch the ZENworks Orchestrator Console," on page 109.

For detailed information about the components, icons, and usage of the ZENworks Orchestrator Console, see "Using the ZENworks Orchestrator Console" in the *Novell ZENworks Orchestrator 1.3 Administration Guide*.

Planning the Installation

3

Before you begin installing Novell® ZENworks® Orchestrator 1.3, you need to compare your system resources with the requirements of the Orchestrator product. This section includes information to help you with that evaluation so that you can adequately plan for the installation. The following subsections are included:

- Section 3.1, "Orchestrator Server Requirements," on page 27
- Section 3.2, "Managed Node (Orchestrator Agent) Requirements," on page 28
- Section 3.3, "Orchestrator Client Node Requirements," on page 29
- Section 3.4, "Tested Platforms and Installation Methods for the Orchestrator Server, Agent, and Clients," on page 30
- Section 3.5, "Tested Platforms and Installation Methods for Virtual Machine Management Components," on page 34

3.1 Orchestrator Server Requirements

The network server where you install the Orchestrator Server software must meet the following requirements:

Table 3-1   *Orchestrator Server Requirements*

Item	Requirement
Server Usage	◆ **ZENworks Orchestrator Server:** Your server might be capable of handling tasks in addition to the tasks an Orchestrator Server performs for ZENworks Orchestrator. However, we strongly recommend that you install the Orchestrator Server software on a dedicated server to ensure optimal performance. For example, you might not want the server to host Novell eDirectory™.
	◆ **ZENworks Virtual Machine Warehouse/Builder Server:** You can install ZENworks Virtual Machine Management (the VM Warehouse and VM Builder patterns) on the same computer as the Orchestrator Server. However, for better scale and performance we recommend that you install these Virtual Machine Management patterns on a separate server.
	◆ **ZENworks Monitoring Server:** This pattern is an Apache Web server that can be installed on the Orchestrator Server, the VMM Server, or on its own Monitoring Server. It does not rely on the other Orchestrator patterns to run and does not use a lot of resources.
	Refer to the information in Appendix A, "ZENworks Orchestrator Components: Install Patterns," on page 139 for more detail about these patterns.
Operating System	◆ SUSE® Linux Enterprise Server 10 (SLES 10) Service Pack 1 (SP1) or Service Pack 2 (SP2), on the 32-bit (x86) and 64-bit (x86-64) architectures (Intel* and AMD* Opteron* processors)

Item	Requirement
Hardware	◆ **Processor:** (minimum) Xeon* 2.8 GHz 32-bit, or equivalent AMD or Intel processor; (recommended) Dual-Core Xeon 4 GHz 32-bit or 64-bit
	◆ **RAM:** (minimum) 2 GB; (recommended) 4 GB
	◆ **Disk Space:** (recommended for installing) 350 MB; (recommended for managign fewer than 100 resources) 1 GB.
Hostname Resolution	The server must resolve device hostnames by using a method such as DNS (recommended).
IP Address	The server must have a static IP address or a permanently leased DHCP address.
TCP Ports	The server must allow traffic on TCP ports 80, 8001 8100, 8101, and 1099:
	◆ Port 80 is used for communication with the Orchestrator User Portal.
	If the server is running other services on ports 80, such as Apache requests on behalf of ZENworks Monitoring, the installation program asks you for new ports to use.
	◆ Port 8001 is used for communication with the Administrator Information page.
	◆ Port 8100 is used with a custom protocol for communication with the Orchestrator Agent and for invoking the `zos` command line interface or opening the Java Developer's toolkit.
	◆ Port 8101 is also used for invoking the `zos` command line interface or opening the Java Developer's toolkit by using TLS.
	◆ Port 1099 is used with RMI for invoking the `zosadmin` command line interface or for running the Orchestrator Console.

NOTE: For more information about the requirements for Virtual Machine Management, see .

3.2 Managed Node (Orchestrator Agent) Requirements

ZENworks Orchestrator manages jobs on and gathers data about data center computing resources that meet the following minimum requirements:

IMPORTANT: The platforms listed here have been tested for the 1.3 release, and as such are the only platforms supported at this time.

Table 3-2   *Managed Node Requirements for High Performance Computing*

Item	Requirement

Operating System	Linux machines:
	
	  • SUSE Linux Enterprise Server 9 SP3 (32-bit or 64-bit)
	  • SUSE Linux Enterprise Server 10 SP1 (32-bit or 64-bit)
	  • SUSE Linux Enterprise Server 10 SP2 (32-bit or 64-bit)
	  • Red Hat* Enterprise Linux* 4 (32-bit or 64-bit)
	  • Red Hat Enterprise Linux 5 (32-bit or 64-bit)
	
	Windows* machines:
	
	  • Windows 2003 (32-bit or 64-bit)

Hardware	Minimums:
	
	  • 100 MB disk space
	  • 800 MHz CPU
	  • 512 MB RAM

TCP Ports	The computing node communicates with the Orchestrator Server over a custom protocol. The server listens for the agent on port 8100.

3.3 Orchestrator Client Node Requirements

You can monitor and run jobs, run the command line interfaces, and create and modify jobs using the tools and monitors included with the ZENworks Orchestrator clients. ZENworks Orchestrator manages jobs on and gathers data about data center computing resources that meet the following minimum requirements:

IMPORTANT: The platforms listed here have been tested for the 1.3 release, and as such are the only platforms supported at this time.

Some of the install programs for other operating systems that are embedded with the Administrator Information page have not been tested for this release.

Table 3-3   *Client Node Requirements for High Performance Computing*

Item	Requirement

Operating System	Linux machines:
	
	  • SUSE Linux Enterprise Server 10 SP1 (32-bit or 64-bit)
	  • SUSE Linux Enterprise Server 10 SP2 (32-bit or 64-bit)
	
	Windows machines:
	
	  • Windows XP (32-bit)
	  • Windows 2003 (32-bit or 64-bit)

Item	Requirement
Hardware	Minimums: ◆ 100 MB disk space ◆ 800 MHz CPU ◆ 512 MB RAM ◆ SVGA-grade monitor
TCP Ports	The Orchestrator clients consist of various components that communicate with the Orchestrator Server: ◆ Port 8100 is used with a custom protocol for invoking the `zos` command line interface or for opening the SDK (Java Developer's toolkit). ◆ Port 8101 is also used for invoking the `zos` command line interface or opening the Java Developer's toolkit by using TLS. ◆ Port 1099 is used with RMI for invoking the `zosadmin` command line interface or for running the Orchestrator Console.

3.4 Tested Platforms and Installation Methods for the Orchestrator Server, Agent, and Clients

The following table shows the tested platforms and installation methods you can use for the Orchestrator Server, the Orchestrator Agents, and the Orchestrator Clients.

Table 3-4 *ZENworks Orchestrator Installation Methods and Sources*

Orchestrator Component	Tested Installation Platform	Installation Method and Source
Orchestrator Server	SLES 10 SP1 (32-bit or 64-bit)	Available as an RPM package distribution (ISO images, 32-bit or 64-bit) available from the Novell Downloads Web site (http://download.novell.com) after purchase and receipt of a license key. Uses the Add-On CD installation (ZENworks Orchestrator Server pattern) available in YaST. Requires server configuration after installation by using a text interface at the Linux console (`./config`) or by using a GUI program (wizard). For installation details, see Section 4.2, "Installing and Configuring ZENworks Orchestrator Components," on page 39.
	SLES 10 SP2 (32-bit or 64-bit)	Available as an RPM package distribution (ISO images, 32-bit or 64-bit) available from the Novell Downloads Web site (http://download.novell.com) after purchase and receipt of a license key. Uses the Add-On CD installation (ZENworks Orchestrator Server pattern) available in YaST. Requires server configuration after installation by using a text interface at the Linux console (`./config`) or by using a GUI program (wizard). For installation details, see Section 4.2, "Installing and Configuring ZENworks Orchestrator Components," on page 39.

Orchestrator Component	Tested Installation Platform	Installation Method and Source
Orchestrator Agent	SLES 9 SP3 (32-bit or 64-bit)	Available as an RPM package distribution (ISO images, 32-bit or 64-bit) available from the Novell Downloads Web site (http://download.novell.com) after purchase and receipt of a license key. Uses the Add-On CD installation (ZENworks Orchestrator Agent pattern) available in YaST.
		For installation details, see Section 4.2, "Installing and Configuring ZENworks Orchestrator Components," on page 39.
		After Orchestrator Server installation, available from the server through a downloadable installation script (.sh file) from the Administrator Information page (port 8001) or run as a post-install from the ISO image.
		For installation details, see Section 4.3, "Independent Installation of the Agent and Clients," on page 68.
	SLES 10 SP1 (32-bit or 64-bit)	Available as an RPM package distribution (ISO images, 32-bit or 64-bit) available from the Novell Downloads Web site (http://download.novell.com) after purchase and receipt of a license key. Uses the Add-On CD installation (ZENworks Orchestrator Agent pattern) available in YaST.
		For installation details, see Section 4.2, "Installing and Configuring ZENworks Orchestrator Components," on page 39.
		After Orchestrator Server installation, available from the server through a downloadable installation script (.sh file) from the Administrator Information page (port 8001) or run as a post-install from the ISO image.
		For installation details, see Section 4.3, "Independent Installation of the Agent and Clients," on page 68.
	SLES 10 SP2 (32-bit or 64-bit)	Available as an RPM package distribution (ISO images, 32-bit or 64-bit) available from the Novell Downloads Web site (http://download.novell.com) after purchase and receipt of a license key. Uses the Add-On CD installation (ZENworks Orchestrator Agent pattern) available in YaST.
		For installation details, see Section 4.2, "Installing and Configuring ZENworks Orchestrator Components," on page 39.
		After Orchestrator Server installation, available from the server through a downloadable installation script (.sh file) from the Administrator Information page (port 8001) or run as a post-install from the ISO image.
		For installation details, see Section 4.3, "Independent Installation of the Agent and Clients," on page 68.
	RHEL 4 (32-bit or 64-bit)	After Orchestrator Server installation, available from the server through a downloadable installation script (.sh file) from the Administrator Information page (port 8001) or run as a post-install from the ISO image.
		For installation details, see Section 4.3, "Independent Installation of the Agent and Clients," on page 68.

Orchestrator Component	Tested Installation Platform	Installation Method and Source
Orchestrator Agent (continued)	RHEL 5 (32-bit or 64-bit)	Available as an RPM package distribution (ISO images, 32-bit or 64-bit) available from the Novell Downloads Web site (http://download.novell.com) after purchase and receipt of a license key. Uses the Add-On CD installation (ZENworks Orchestrator Agent pattern) available in YaST. For installation details, see Section 4.2, "Installing and Configuring ZENworks Orchestrator Components," on page 39. After Orchestrator Server installation, available from the server through a downloadable installation script (.sh file) from the Administrator Information page (port 8001) or run as a post-install from the ISO image. For installation details, see Section 4.3, "Independent Installation of the Agent and Clients," on page 68.
	Windows 2003 (32-bit or 64-bit)	After Orchestrator Server installation, available as a downloadable GUI installation program (.exe file) in the ISO images (32-bit or 64-bit). For installation details, see "Using the ISO to Install the Orchestrator Agent or the Orchestrator Clients on Windows Machines" on page 86 in Section 4.3, "Independent Installation of the Agent and Clients," on page 68. After Orchestrator Server installation, available as a downloadable GUI installation program (.exe file) from the Administrator Information page (port 8001). For installation details, see "Using the ISO to Install the Orchestrator Agent or the Orchestrator Clients on Windows Machines" on page 86 in Section 4.3, "Independent Installation of the Agent and Clients," on page 68.
Orchestrator Clients	SLES 10 SP1 (32-bit or 64-bit)	Available as an RPM package distribution (ISO images, 32-bit or 64-bit) available from the Novell Downloads Web site (http://download.novell.com) after purchase and receipt of a license key. Uses the Add-On CD installation (ZENworks Orchestrator Agent pattern) available in YaST. For installation details, see Section 4.2, "Installing and Configuring ZENworks Orchestrator Components," on page 39. After Orchestrator Server installation, available from the server through a downloadable installation script (.sh file) from the Administrator Information page (port 8001) or run as a post-install from the ISO image. For installation details, see Section 4.3, "Independent Installation of the Agent and Clients," on page 68.

Orchestrator Component	Tested Installation Platform	Installation Method and Source
Orchestrator Clients (continued)	SLES 10 SP2 (32-bit or 64-bit)	Available as an RPM package distribution (ISO images, 32-bit or 64-bit) available from the Novell Downloads Web site (http://download.novell.com) after purchase and receipt of a license key. Uses the Add-On CD installation (ZENworks Orchestrator Agent pattern) available in YaST. For installation details, see Section 4.2, "Installing and Configuring ZENworks Orchestrator Components," on page 39.
		After Orchestrator Server installation, available from the server through a downloadable installation script (.sh file) from the Administrator Information page (port 8001) or run as a post-install from the ISO image. For installation details, see Section 4.3, "Independent Installation of the Agent and Clients," on page 68.
	Windows 2003 (32-bit or 64-bit) or Windows XP (32-bit or 64-bit)	After Orchestrator Server installation, available as a downloadable GUI installation program (.exe file) in the ISO images (32-bit or 64-bit). For installation details, see in "Using the ISO to Install the Orchestrator Agent or the Orchestrator Clients on Windows Machines" on page 86 in Independent Installation of the Agent and Clients.
		After Orchestrator Server installation, available as a downloadable GUI installation program (.exe file) from the Administrator Information page (port 8001). For installation details, see in "Using the ISO to Install the Orchestrator Agent or the Orchestrator Clients on Windows Machines" on page 86 in Independent Installation of the Agent and Clients.

3.5 Tested Platforms and Installation Methods for Virtual Machine Management Components

The following table represents the components added to ZENworks Orchestrator with the addition of Virtual Machine Management (VM Management).

Table 3-5 *VM Management Components and Supported Operating Systems*

Component	Type	Supported Operating Systems	Installation Method
VM Management Interface	Console	◆ SLES 10 SP1 (32-bit and 64-bit)	DVD `/SLE10/nvmminst`
		◆ SLES 10 SP2 (32-bit and 64-bit)	DVD `\Windows2003\nvmminst.exe`
		◆ Windows XP (32-bit only)	DVD `\WindowsXP\nvmminst.exe`

Component	Type	Supported Operating Systems	Installation Method
VM Warehouse	Server	◆ SLES 10 SP1 (32-bit and 64-bit) ◆ SLES 10 SP2 (32-bit and 64-bit)	YaST Install
VM Builder[1] (CIM Provider and Command Line Interface)	n/a	◆ SLES 10 SP1 (32-bit and 64-bit) ◆ SLES 10 SP2 (32-bit and 64-bit)	YaST Install
Monitoring Server	Server	◆ SLES 10 SP1 (32-bit and 64-bit) ◆ SLES 10 SP2 (32-bit and 64-bit)	YaST Install
Monitoring Agent	Agent	◆ SLES 9 SP3 (32-bit and 64-bit) ◆ SLES 10 SP1 (32-bit and 64-bit) ◆ SLES 10 SP2 (32-bit and 64-bit) ◆ RHEL 4 (32-bit and 64-bit) ◆ RHEL 5 (32-bit and 64-bit)	YaST Install or RPMs on DVD
Xen Host	Server	◆ SLES 10 SP1 (32-bit and 64-bit) ◆ SLES 10 SP2 (32-bit and 64-bit) ◆ RHEL 5 (32-bit and 64-bit)	YaST Install or RPMs on DVD

[1] The VM Builder can be installed on the host operating system of the Orchestrator Server and Orchestrator Agent nodes, or on its own server. It cannot be installed on (or inside) a Virtual Machine. A VM cannot be the host of another VM.

VM Builder supports automated building of Xen VMs on host machines that are running SLES 10 SP1 or SP2 (32 bit and 64 bit) with the Orchestrator Agent and the VM Builder packages installed.

3.5.1 Hardware Guidelines for the VM Management

You can install ZENworks Virtual Machine Management (the VM Warehouse and VM Builder server +patterns) on the same computer as the Orchestrator Server. However, for better scale and performance we recommend that you install these Virtual Machine Management patterns on a separate server. The following is a list of supported hardware configurations for these two server components:

Table 3-6 *Minimum and Recommended Hardware Requirements for VM Management*

Operating System	Minimum Requirements	Recommended Hardware
SLES 10 SP 1 or SP2	◆ 2 GHz x86 Processor ◆ 2 GB RAM ◆ 350 MB Hard Drive Space ◆ Gig-E Network Connection	◆ 4 GHz Intel Xeon ◆ 4 GB RAM ◆ 1 GB Hard Drive Space ◆ Gig-E Network Connection ◆ Multiple network interface cards to accommodate large VM file transfers. ◆ VM Warehouse should use high-speed SCSI disk or fibre channel storage (iSCSI is also supported).

3.5.2 Hardware Guidelines for VM Builder Agent Machines

While it does not matter which operating system you have on your VM Builder Agent machine, the hardware does matter. A better machine is recommended to have the VM Builder Agent installed on it. If you intend to make a machine part of your VM Builder pool, it needs to have a processor that matches the intended VM (x86 and x86_64 chips are the only ones supported in the 1.3 release). Most VMs take 2 GB or more of disk space. The following table displays the requirements for a machine to be used in the VM Builder pool as a build machine:

Table 3-7 *Minimum and Recommended Hardware Requirements for VM Builder Machines*

Operating System	Minimum Requirements	Recommended Hardware
SLES 10 SP1	◆ x86 or x86_64 ◆ 2 GB RAM ◆ 30 GB Hard Drive Space	◆ x86 or x86_64 ◆ 4+ GB RAM ◆ 100+ GB Hard Drive Space
SLES 10 SP2	◆ x86 or x86_64 ◆ 2 GB RAM ◆ 30 GB Hard Drive Space	◆ x86 or x86_64 ◆ 4+ GB RAM ◆ 100+ GB Hard Drive Space

3.5.3 Hardware Guidelines for VM Host Machines

We recommend that computers designated as VM hosts in your data center be able to host the VM and run it according to designated parameters of the specific VM. The processor architecture must match the designated VM's processor in architecture though not in number. In order for a machine to serve as a host machine, it must also have a hypervisor installed along with the operating system. For a detailed table of the supported hypervisors, see Table 4-2 on page 93.

Table 3-8 *Minimum and Recommended Hardware Requirements for VM Host Machines*

Host Operating System	Minimum Requirements	Recommended Hardware
SLES 10	◆ x86 or x86_64 ◆ 2 GB RAM ◆ 30 GB Hard Drive Space	◆ x86 or x86_64 ◆ 4+ GB RAM ◆ 100+ GB Hard Drive Space
SLES 10 SP1 or SP2	◆ x86 or x86_64 ◆ 2 GB RAM ◆ 30 GB Hard Drive Space	◆ x86 or x86_64 ◆ 4+ GB RAM ◆ 100+ GB Hard Drive Space
RHEL 4	◆ x86 or x86_64 ◆ 2 GB RAM ◆ 30 GB Hard Drive Space	◆ x86 or x86_64 ◆ 4+ GB RAM ◆ 100+ GB Hard Drive Space
RHEL5	◆ x86 or x86_64 ◆ 2 GB RAM ◆ 30 GB Hard Drive Space	◆ x86 or x86_64 ◆ 4+ GB RAM ◆ 100+ GB Hard Drive Space

Installation and Configuration

4

This section explains the installation and setup of various Novell® ZENworks® Orchestrator components. The content includes the following information:

4.1 Installation Prerequisites

During installation of ZENworks Orchestrator, you need to have the following information available:

- (Optional) Certificate Authority information (internal, or signed certificate, private key, and public certificate)
- License key (a 60-day trial option is available)

For more information on these items, see Table 4-1, "Orchestrator Configuration Information," on page 53.

4.2 Installing and Configuring ZENworks Orchestrator Components

The ZENworks Orchestrator Server (Orchestrator Server) is supported on SUSE® Linux Enterprise Server 10 Service Pack 1 (SLES 10 SP1) or Service Pack 2 (SLES 10 SP2) only. You should install the ZENworks Orchestrator Server on a dedicated server for optimal performance.

After you install and configure the components you want from ZENworks Orchestrator, there are other basic tasks you need to perform to make the Orchestrator system perform at a basic level. Those tasks are documented in Chapter 5, "First Use of Basic ZENworks Orchestrator Components," on page 109.

IMPORTANT: For this guide, the installation of the Orchestrator Server, the Virtual Machine (VM) Warehouse and Builder, and the ZENworks Monitoring Server are all shown. The Virtual Machine Management components are purchased under a separate license, but for the purpose of this guide, the same installation is used for all.

These components (if licensed and selected during the installation) can be installed on the same machine where the Orchestrator Server is installed. However, for better scale and performance we recommend that you install the VM Warehouse and VM Builder together on a separate machine, and

the VM Builder must be installed on Dom$_0$ boxes where Xen exits. The Monitoring Server can be installed on any server as it runs independently of the other components. For more information, see Section 3.1, "Orchestrator Server Requirements," on page 27.

Also, the VM Builder cannot be installed on a VM and must only be installed on the host operating system of the VM Builder node. Multiple servers with VM host capability can be used as VM Builder machines to make the VM Builder group.

This section includes the following information:

- Section 4.2.1, "Installation and Configuration Steps," on page 40
- Section 4.2.2, "ZENworks Orchestrator Configuration Information," on page 52
- Section 4.2.3, "Correcting Configuration Errors and Repeating the Configuration Process," on page 59
- Section 4.2.4, "Installing and Configuring the ZENworks Orchestrator for Use with a PostgreSQL Audit Database on a Different Host," on page 59
- Section 4.2.5, "Installing and Configuring the ZENworks Orchestrator for Use with a Local PostgreSQL Audit Database," on page 65
- Section 4.2.6, "Configuring the Audit Database after ZENworks Orchestrator is Configured," on page 67

4.2.1 Installation and Configuration Steps

To install and configure a typical ZENworks Orchestrator system:

1 Review Chapter 3, "Planning the Installation," on page 27 to verify that the device where you want to install the Orchestrator Server software fulfills the necessary requirements.

2 Download the appropriate ZENworks Orchestrator Server ISO (32-bit or 64-bit) to an accessible network location.

3 (Optional) Create a DVD ISO (32-bit or 64-bit) that you can take with you to the machine where you want to install it.

4 Install ZENworks Orchestrator software:

    4a Log in to the target SLES 10 SP1 or SP2 server as `root`, then open YaST2.

    4b In the YaST Control Center, click *Software*, then click *Add-on Product* to display the Add-on Product Media dialog box.

    4c In the Add-on Product Media dialog box, select the ISO media (*Local Directory* or *DVD*) to install.

        4c1 (Conditional) Select *DVD*, click *Next*, insert the DVD, then click *Continue*.

        4c2 (Conditional) Select *Local Directory*, click *Next*, select the *ISO Image* check box, browse to ISO on the file system, then click *OK*.

    4d Read and accept the license agreement, then click *Next* to display YaST2.

    4e In YaST2, click the *Filter* drop-down menu, then select *Patterns* to display the install patterns available on the ZENworks Orchestrator ISO.
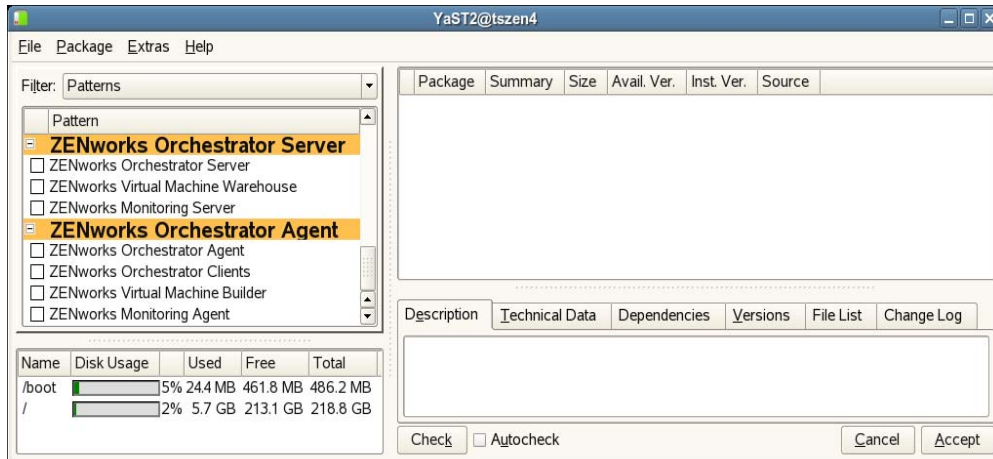
4f Select the ZENworks Orchestrator installation patterns that you want to install:

- ◆ **ZENworks Orchestrator Server:** This pattern is the gateway between enterprise applications and resource servers. The Orchestrator Server manages computing nodes (resources) and the jobs that are submitted from applications to run on these resources.

- ◆ **ZENworks Virtual Machine Warehouse:** Stores VM images and image data, versions the images, designates the gold master VM image, and checks out and in the VM images.

    For better scale and performance, we recommend that you install this pattern to a different server than where the Orchestrator Server is installed.

    NOTE: If you are installing the VM Warehouse and the VM Builder on a machine separate from the Orchestrator Server, make sure you install and configure the Orchestrator component first, as described in Step 5 through Step 7, then complete Step 9 to set up VM Management with an NFS Share.

    If the VM Management packages are installed on the same machine as the Orchestrator Server, no share needs to be created.

- ◆ **ZENworks Monitoring Server:** Uses open source Ganglia monitoring of the performance of certain data on network resources in a user-defined time period.

    This pattern can be installed on a server where any other ZENworks Orchestrator pattern is installed, or on a server by itself.

- ◆ **ZENworks Orchestrator Agent:** This pattern is installed on all computing resources that are to be managed. It runs applications under the management of the Orchestrator Server and reports its status to the Orchestrator Server.

- ◆ **ZENworks Orchestrator Clients:** Installing this patter lets the administrator of a computing resource administrator troubleshoot, initiate, change, or shut down server functions for ZENworks Orchestrator and its computing resources. For information about the tools included in this pattern, see "ZENworks Orchestrator Clients:" on page 140.

- ◆ **ZENworks Virtual Machine Builder:** This pattern is an agent that builds the VM images as the jobs are sent to it by the Orchestrator Server. The Xen hypervisor must exist on the server where this pattern is installed.

We recommend for better scale and performance that this pattern be installed to a different server than where the Orchestrator Server is installed. Also, it must be installed on the same server where the VM Warehouse pattern is installed.

> **NOTE:** If you are installing the VM Warehouse and the VM Builder on a machine separate from the Orchestrator Server, make sure you install and configure the Orchestrator component first, as described in Step 5 through Step 7, then complete Step 9 to set up VM Management with an NFS Share.
>
> If the VM Management packages are installed on the same machine as the Orchestrator Server, no share needs to be created.

  ◆ **ZENworks Monitoring Agent:** This pattern is installed with any installation of the Orchestrator Server, and it installs the Ganglia Agent on each monitored node, which collects performance metrics and sends the data to the ZENworks Monitoring Server.

Refer to the information in Appendix A, "ZENworks Orchestrator Components: Install Patterns," on page 139 for more detail about these patterns.

If you choose not to install the ZENworks Orchestrator Agent or the ZENworks Orchestrator Clients on some machines using this method now, you can install them later by using installers that are accessible from a hosted Web page from the ZENworks Orchestrator Server or you can repeat this process by downloading the ISO to the machine where you want to install the agent or clients. For more information, see Section 4.3, "Independent Installation of the Agent and Clients," on page 68.

4g Click *Accept* to install the packages.

5 Configure the ZENworks Orchestrator components that you have installed. You can use one of two information gathering methods to perform the configuration:

  ◆ The Orchestrator product configuration script. If you use this method, continue with Step 5a.

  ◆ The GUI Configuration Wizard. If you use this method, skip to Step 5b.

> **TIP:** Although the text-based configuration process detects which RPM patterns are installed, the GUI Configuration Wizard requires that you specify which components are to be configured.

5a (Optional) Run the Orchestrator product configuration script.

  5a1 Make sure you are logged in as `root` to run the configuration script.

  5a2 Run the script, as follows:

  ```
  /opt/novell/zenworks/orch/bin/config
  ```

  When the script runs, the following information is initially displayed:

  ```
  Welcome to Novell ZENworks Orchestrator.

  This program will configure Novell ZENworks Orchestrator 1.3


  Select whether this is a new install or an upgrade
  ```

```
i) install
u) upgrade
- - - - - -

Selection [install]:
```

5a3 Determine whether this is a new installation or an upgrade.

This section discusses standard installation, so specify `i` (for install) or press Enter to accept the default. For more information about upgrade, see the *Novell ZENworks Orchestrator 1.3 Upgrade Guide*.

When you make the selection, the following information is displayed:

```
Select products to configure

 #   selected  Item
 1)    yes     ZENworks Monitoring Service
 2)    yes     ZENworks Orchestrator Server
 3)    yes     ZENworks Orchestrator Agent
 4)    yes     ZENworks Orchestrator VM Builder
 5)    yes     ZENworks Orchestrator VM Warehouse

Select from the following:
  1 - 5)  toggle selection status
      a)   all
      n)   none
      f)   finished making selections
      q)   quit -- exit the program
```

5a4 Determine which installed products you want to configure. The options are listed with option numbers.

5a4a Select or deselect an option by typing its number to toggle its selection status, or type `a` and press *Enter* to select all of them.

5a4b When you have selected the products you want to configure, type `f` and press *Enter* to finish the selection and begin the configuration

For information to help you complete the configuration interview, see Section 4.2.2, "ZENworks Orchestrator Configuration Information," on page 52

When the you have finished answering questions in the configuration interview, continue with Step 6.

5b (Optional) Run the GUI Configuration Wizard.

5b1 Run the script for the ZENworks Orchestrator Configuration Wizard as follows:

```
/opt/novell/zenworks/orch/bin/guiconfig
```

The GUI Configuration Wizard launches.
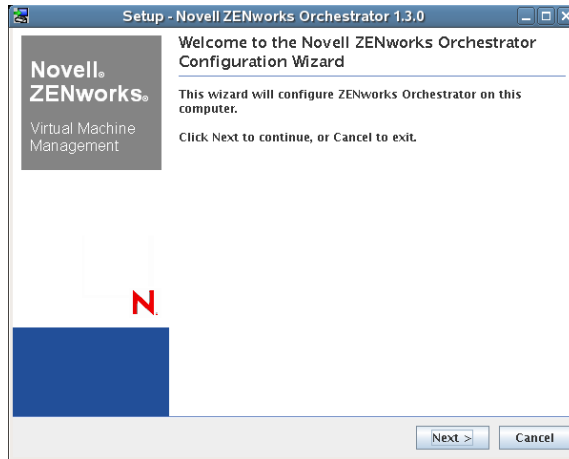
IMPORTANT: If you only have a keyboard to navigate through the pages of the GUI Configuration Wizard, use the Tab key to shift the focus to a control you want to use (for example, a *Next* button), then press the space bar to activate that control.

5b2 Click *Next* to display the license agreement.
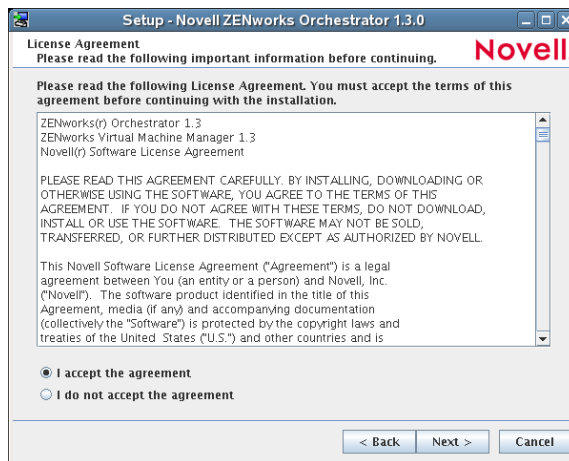
5b3 Accept the agreement, then click *Next* to display the ZENworks Orchestrator components page.
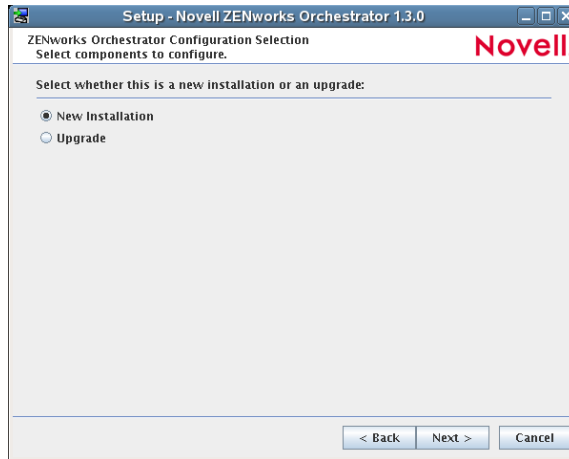
This section discusses new installation. For more information about upgrade, see *Novell ZENworks Orchestrator 1.3 Upgrade Guide*.

5b4 Select *New Installation*, then click *Next* to display the ZENworks Orchestrator components page.
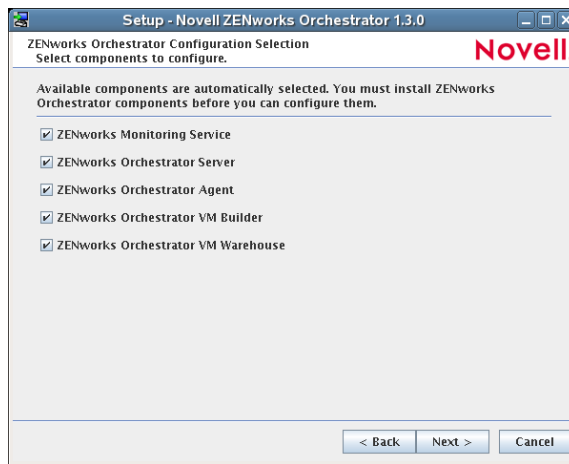
The components page lists the ZENworks Orchestrator components that are available for configuration (already installed). By default, all installed components are selected for configuration.

5b5 Click *Next* to confirm the components you want to install and to display the High Availability Configuration page of the wizard.

or

Deselect any ZENworks Orchestrator components that you do not want to configure, then click Next to display the High Availability Configuration page of the wizard.
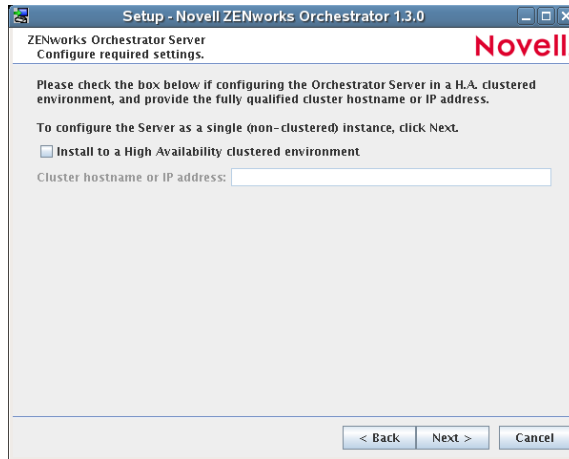
5b6 Click *Next* on the succeeding pages and provide information for the wizard to be used the configuration process. As the configuration interview in the wizard proceeds, refer to the information in Table 4-1, "Orchestrator Configuration Information," on page 53 for details about the configuration data that you need to provide. The GUI Configuration Wizard uses this information to build a response file that is consumed by the setup program inside the GUI Configuration Wizard.

When you have finished answering the configuration questions in the wizard, the ZENworks Orchestrator Configuration Summary page is displayed.
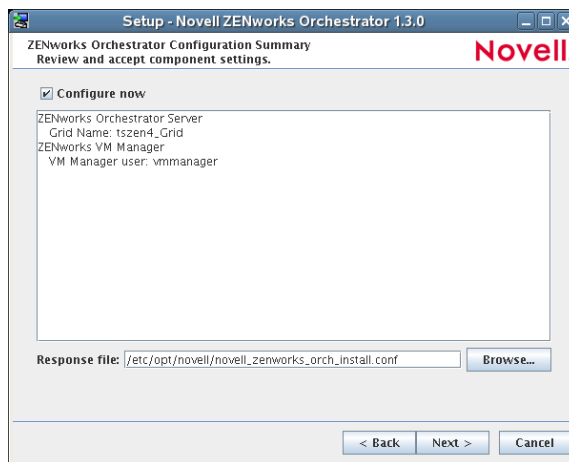
IMPORTANT: Although this page of the wizard lets you navigate using the Tab key and spacebar, you need to use the Shift+Tab combination to navigate past the summary list. Click *Back* if you accidentally enter the summary list and re-enter the page to navigate to the control buttons.

By default, the *Configure now* check box on this page is selected. If you accept the default of having it selected, the wizard starts ZENworks Orchestrator and applies the configuration settings. If you deselect the check box, the wizard writes out the configuration file to `/etc/opt/novell/ novell_zenworks_orch_install.conf` without starting Orchestrator or applying the configuration settings.

NOTE: You can use this `.conf` file to start the Orchestrator server or client and apply the settings either manually or with an installation script. Use the following command to run the configuration:

```
/opt/novell/zenworks/orch/bin/config -rs
```

5b7 Click *Next* to display the following wizard page.
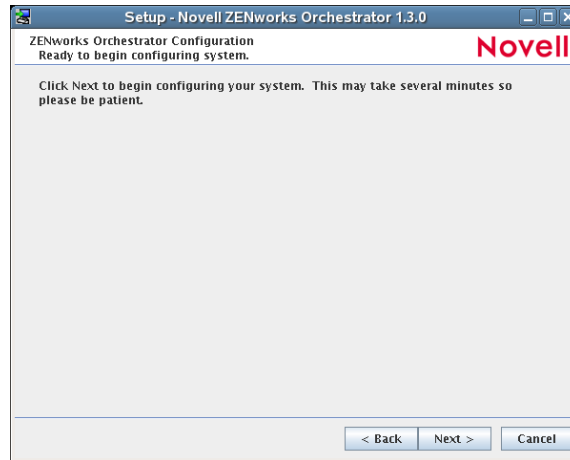
5b8 Click *Next* to launch the configuration script. When the configuration is finished, the following page is displayed:
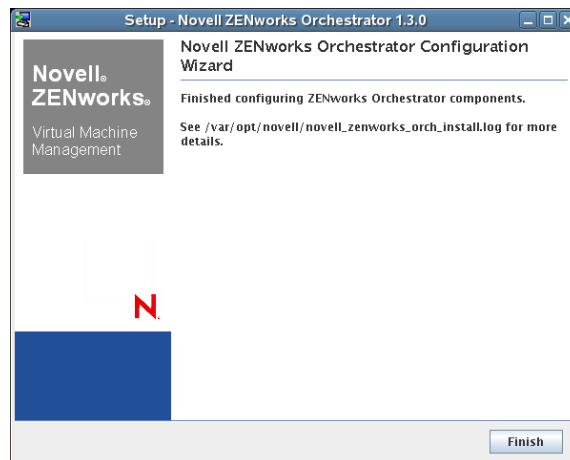
5b9 Click *Finish* to close the configuration wizard.

IMPORTANT: When the installation and configuration are complete, you need to register the resources to be managed by the ZENworks Orchestrator system. Please refer to Chapter 5, "First Use of Basic ZENworks Orchestrator Components," on page 109 for detailed information about getting resources to manage in the ZENworks Orchestrator system.

6 Open the configuration log file (`/var/opt/novell/novell_zenworks_orch_install.log`) to make sure that the components were correctly configured.

You might want to change the configuration if you change your mind about some of the parameters you provided in the configuration process. For information about what to do in these circumstances, see Section 4.2.3, "Correcting Configuration Errors and Repeating the Configuration Process," on page 59.

7 Access the ZENworks Orchestrator Administrator Information Page to verify that the Orchestrator Server is installed and running. Use the following URL to open the page in a Web browser:

```
http://DNS_name_or_IP_address_of_Orchestrator_Server:8001
```

The Administrator Information page includes links to separate installation programs (installers) for the ZENworks Orchestrator Agent (Orchestrator Agent) and the ZENworks Orchestrator Clients (Orchestrator Clients). The installers are used for various operating systems.

IMPORTANT: Currently, most of the installers listed on this page have not been fully tested, and are therefore not currently supported by Novell.This includes the RPM agent installer without JRE (`novell-zenworks-zos-agent-1.3.0-33604.i586.rpm`) which is not labeled as being unsupported.

---

8 (Conditional and Optional) If you installed the ZENworks Orchestrator Clients, you can increase the heap size that the JVM handles. This enables the console to manage a larger number of objects.

8a Open the `zoc` bash shell script at `/opt/novell/zenworks/zos/server/bin`.

NOTE: On Microsoft Windows, the path to the console is `files\novell\zos\clients\bin\zoc.bat`. For more information, see Section 4.3, "Independent Installation of the Agent and Clients," on page 68.

8b Inside the script, find the following line where the JVM parameters are defined:

```
JVMARGS="-Xmx256m -Xms256m -Xmn64m -XX:NewSize=64m -XX:MaxNewSize=64m"
```

The `-Xmx` argument specifies the maximum heap size for the JVM. Increasing the heap size prevents a JVM out of memory condition.

8c Change the value in the `-Xmx` argument from 256MB to 512MB.

9 (Conditional) If you installed ZENworks Virtual Machine Management (VM Builder and VM Warehouse Server) on a machine other than the one where you installed the ZENworks Orchestrator Server, you need to set up an NFS Share between the Orchestrator Server and the VM Management Server.

NOTE: Execute this part of the procedure only after the Orchestrator packages are installed and you have run the configuration script or the GUI Configuration Wizard.

9a At the command line of the machine where the ZENworks Orchestrator Server is installed, run the following commands to create the directories required for the NFS Share to work:

```
mkdir /var/opt/novell/zenworks/zos/server/dataGrid/files/
warehouse/
```

```
mkdir /var/opt/novell/zenworks/zos/server/dataGrid/files/
warehouse/import
```

```
mkdir /var/opt/novell/zenworks/zos/server/dataGrid/files/
warehouse/export
```

9b Start the NFS Server on each node in the cluster where the Orchestrator Server is installed.

9b1 At the command line, run the following command:

```
yast2 nfs_server
```

The NFS Server Configuration utility is displayed.
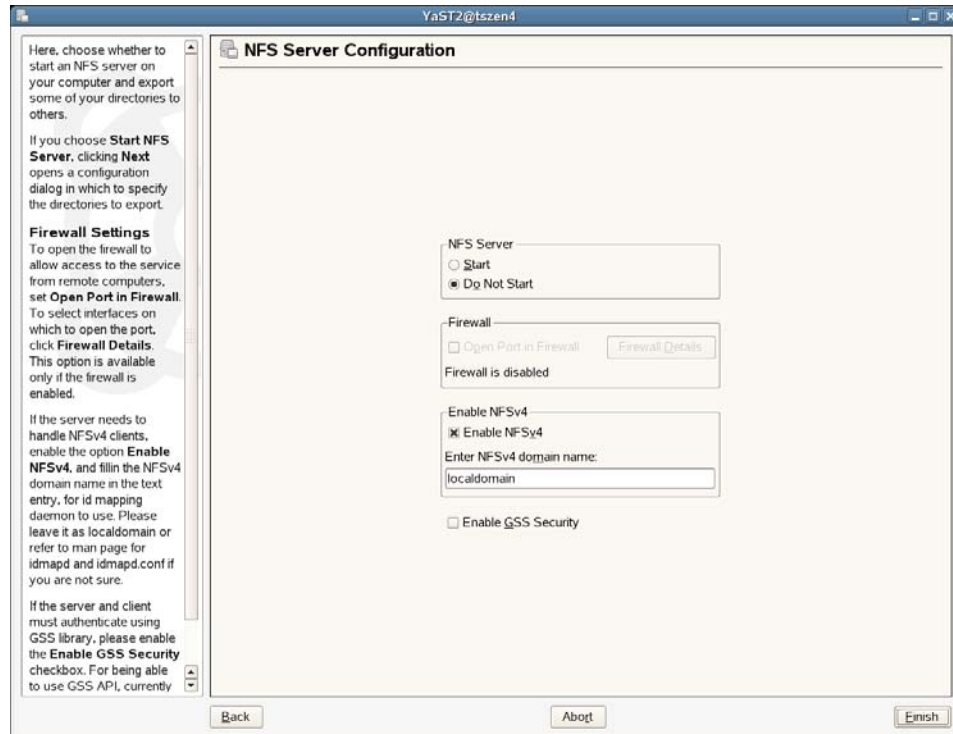
9b2 In the NFS Server Configuration utility, select *Start*, deselect *Enable NFSv4*, then click *Next* to display the Directories to Export page.
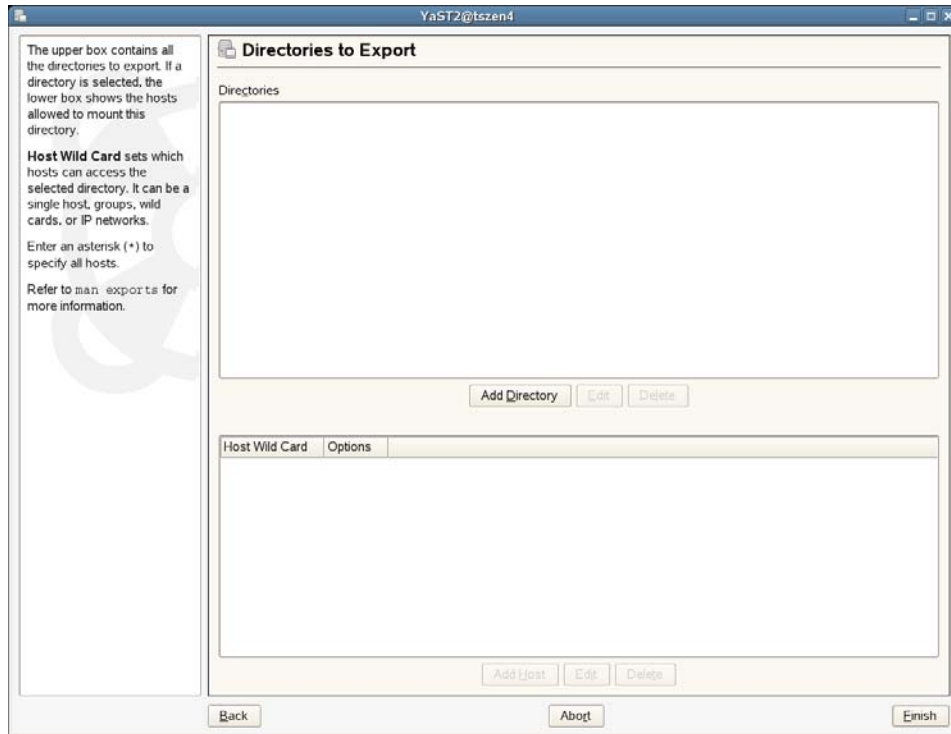
9b3 On the Directories to Export page, click *Add Directory*, add `/var/opt/novell/zenworks/zos/server/dataGrid/files/warehouse/export` as the directory path, then click *OK* to display a browser popup box.

9b4 In the popup box, browse to the `/var/opt/novell/zenworks/zos/server/dataGrid/files/warehouse/export` directory, then click *OK* to display the Directories to Export page with an overlaid configuration popup box.

9b5 In the popup box, fill in the fields:

Host Wild Card: Enter the IP address of the VM Warehouse Server.

Options: Edit the options string so that it appears as `rw,sync,no_root_squash`

9b6 Click *Finish* to save the configuration and start the NFS Server.

9c Mount the VM Warehouse share located inside the cluster using one of the following two methods:

9c1 (Method 1) On the command line of the VM Warehouse/Builder Server, run the following command:

```
yast2 nfs add spec="<ip address of zos server>:/var/opt/
novell/zenworks/zos/server/dataGrid/files/warehouse"
file="/var/opt/novell/zenworks/zos/server/dataGrid/
files/warehouse"
```

9c2 (Method 2) On the command line of the VM Warehouse/Builder Server, run the following command:

```
yast2 nfs
```

This command displays the NFS Client Configuration utility.
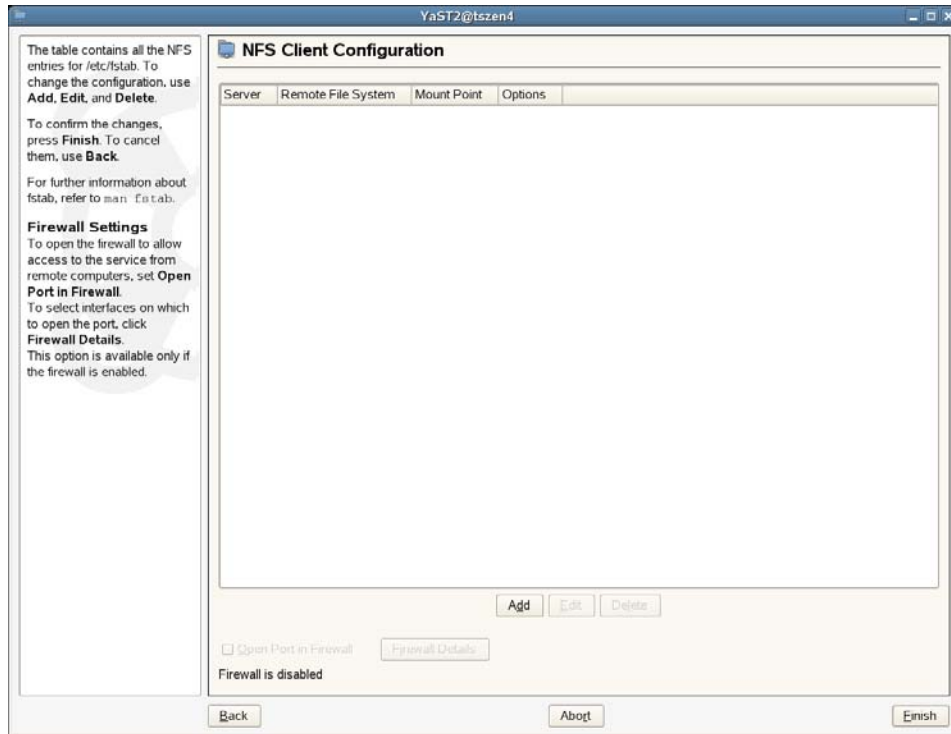
9c3 In the NFS Client Configuration utility, click *Add* to open a dialog box you can use to specify the share information.
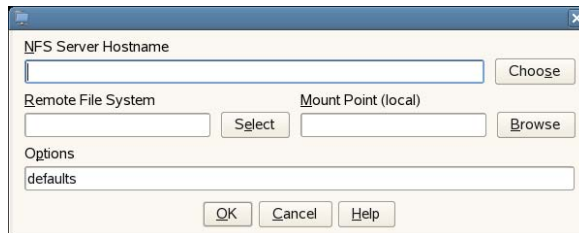
9c4 In the dialog box, fill in the fields:

NFS Server Hostname: Enter the IP Address of the ZENworks Orchestrator Server and the shared directory you created, for example:

192.168.1.255

Remote File System: Enter the name of the remote file system (that is, the shared directory) you created:

`/var/opt/novell/zenworks/zos/server/dataGrid/files/`
`warehouse`

Mount Point: Enter the local mount point:

`/var/opt/novell/zenworks/zos/server/dataGrid/files/`
`warehouse`

9c5 Click *OK*, then click *Finish*.

4.2.2 ZENworks Orchestrator Configuration Information

The following table includes information about the information required by the ZENworks Orchestrator configuration (`config`) and the configuration wizard (`guiconfig`). The information is organized in this way to make it readily available if you want to evaluate the entire product. The information is listed in the order that it is presented in the configuration file.

Table 4-1 *Orchestrator Configuration Information*

Configuration Information	Explanation
ZENworks Monitoring	If you installed the ZENworks Monitoring Server and the ZENworks Monitoring Agent, the following questions are asked during the configuration process.

- ◆ **Monitored or Monitoring**: `You can configure this host to be the Monitoring Server or a monitored node. Configure this host as the Monitoring Server? (y/n)`
  - ◆ Default value = yes (if the ZENworks Monitoring Server is installed on this machine)
  - ◆ This question always appears if you installed the Monitoring Server component.
  - ◆ Because the configuration already knows that ZENworks Monitoring is installed, you are choosing whether the machine being installed to is to be the controlling node for monitoring.
- ◆ **Hostname of Monitoring Server:** `Specify the hostname or IP address of the ZENworks Monitoring Server.`
  - ◆ Default value = none
  - ◆ This question appears if you did not install the Monitoring Server on this machine. It is the name or IP address of the server (also known as the controlling node) where the Monitoring Agent will send its metrics.
- ◆ **Location:** `Enter a name describing this monitored computer's location.`
  - ◆ Default value = *name_of_this_computer*
  - ◆ This question always appears if you specify this computer as a monitored node (that is, you answer `no` when asked if this machine is to be the Monitoring Server).
  - ◆ The descriptive name you create here appears in the Monitoring user interface as the name of the device.
- ◆ **Monitoring user:** `Create a user for ZENworks Monitoring.`
  - ◆ Default = none
  - ◆ This question always appears if you specify this host as the Monitoring Server.
  - ◆ The name you create here is used to authenticate to the Monitoring Service.
  - ◆ You should record this username for future use.
- ◆ **Monitoring User password:** `Specify the password for <Monitoring user>:`
  - ◆ Default = none
  - ◆ The password you create here is used to authenticate to the Monitoring Service.
  - ◆ You should remember this password for future use.

Configuration Information	Explanation
Type of Configuration	`Select whether this is a standard or high-availability server configuration.` ◆ Default value = `standard` ◆ Your answer here determines whether this is a standard installation or a High Availability installation. This section discusses standard installation, so specify `s` (for `standard`) or press Enter to accept the default. For more information about High Availability configuration, see the *Novell ZENworks Orchestrator 1.3 High Availability Configuration Guide*.

Configuration Information	Explanation
Orchestrator Server	Because the ZENworks Orchestrator Server must always be installed for a full Orchestrator system, the following questions are always asked when you have installed server patterns prior to the configuration process:

- **ZENworks Orchestrator Administrator user:** `Create an Administrator user for ZENworks Orchestrator.`
  - Default = none
  - The name you create here is required when you access the ZENworks Orchestrator Console or the `zosadmin` command line interface.
  - You should remember this username for future use.

- **ZENworks Orchestrator Administrator password:** `Specify the password for <Administrator user>`
  - Default = none
  - This password you create here is required when you access the ZENworks Orchestrator Console or the `zosadmin` command line interface.
  - You should remember this password for future use.

- **ZENworks Orchestrator grid name:** `Select a name for the Orchestrator grid.`
  - Default = *hostname_grid*
  - A grid is an administrative domain container holding all of the objects in your network or data center. The Orchestrator monitors and manages these objects, including users, resources, and jobs.
  - The grid name you create here is displayed as the name for the container placed at the root of the tree in the Explorer panel of the Orchestrator console.

- **Audit Database:** `Do you want to install the audit database?`
  - Default = `no`
  - If you answer `yes` to this question, the configuration creates an audit database and a simple schema that persists all of the jobs (and the parameters for them) and maintains every login/logout user event in that database.
  - The audit database can be configured only on a server where a PostgreSQL* relational database has been installed. For more information, see Section 4.2.4, "Installing and Configuring the ZENworks Orchestrator for Use with a PostgreSQL Audit Database on a Different Host," on page 59 or Section 4.2.5, "Installing and Configuring the ZENworks Orchestrator for Use with a Local PostgreSQL Audit Database," on page 65.

- **License file:** `Specify the full path to the license file.`
  - Default = none
  - A license key is required to use this product. You should have received this key from Novell, then you should have subsequently copied it to the network location that you specify here. Be sure to include the name of the license file in the path.
  - A Novell license key for ZENworks Orchestrator High Performance Computing (HPC) differs from the Novell license key for ZENworks Orchestrator Virtual Machine Management. If you purchased the Orchestrator HPC license and provide it here, none of the Orchestrator VM Management functionality will be visible or available. If you purchase the ZENworks Orchestrator Virtual Machine Management license, HPC functionality is also visible and available.

Configuration Information	Explanation

Orchestrator Server (continued)	◆ **User Portal**[1]: `Specify the User Portal port.`
	   ◆ Default = `8080` (if ZENworks Monitoring is installed) or `80` (if ZENworks Monitoring is not installed).
	   ◆ Because Apache uses port 80 for ZENworks Monitoring, it forwards non-monitoring requests to the Orchestrator Server on the port you specify here.
	◆ **Administrator Information port**[1]: `Specify the Administrator Information page port.`
	   ◆ Default = `8001`
	   ◆ Port 8001 on the ZENworks Server provides access to an Administrator Information page that includes links to product documentation, agent and client installers, and product tools to help you understand and use the product. Specify another port number if 8001 is reserved for another use on this server.
	◆ **Agent Port**[1]: Specify the Agent port.
	   ◆ Default = `8100`
	   ◆ Port 8100 is used for communication between the Orchestrator Server and the Orchestrator Agent. Specify another port number if 8100 is reserved for another use.
	◆ **TLS Certificate and Key**[1]: `Generate a TLS certificate and key?`
	`Specify the full path to the TLS server certificate.`
	`Specify the full path to the TLS server private key.`
	   ◆ Default = `yes` (the Orchestrator Server must generate a certificate and key for authentication)
	   ◆ A PEM-encoded TLS certificate and key is needed for secure communication between the Orchestrator Server and Orchestrator Agent.
	   ◆ If you respond with `no`, you need to provide the location of an existing certificate and key.
	◆ **TLS Server Certificate**[2]: `Specify the full path to the TLS server certificate.`
	   ◆ Default = `/etc/ssl/servercerts/servercert.pem`
	   ◆ Specify the path to the existing TLS certificate.
	◆ **TLS Server Key**[2]: `Specify the full path to the TLS server private key.`
	   ◆ Default = `/etc/ssl/servercerts/serverkey.pem`
	   ◆ Specify the path to the existing TLS private key.
	◆ **Xen VNC password:** `Set the password that will be used for VNC on Xen virtualization hosts. You will need this password when logging into virtual machines using VNC.`

Configuration Information	Explanation

Orchestrator Agent	You can install and configure the Orchestrator Agent on any computing node. It is not necessary to install it on the same machine with the Orchestrator Server. If you installed the Orchestrator Agent, the following questions are asked in the configuration process.
	
	♦ **Agent Name:** `Specify the name of the ZOS Agent on this node.`
	  ♦ Default = none
	  ♦ The name you create here is used by the Orchestrator Agent to authenticate to the Orchestrator Server.
	
	    IMPORTANT: When the VM Warehouse is installed on a machine, the name of the Orchestrator Agent on that machine must match the machine's host name.
	
	♦ **ZOS Server:** `Specify the hostname or IP address of the ZOS Server.`
	  ♦ Default = none
	  ♦ Specify the DNS name or IP address of the Orchestrator Server that this agent will bind to.
	
	♦ **ZOS Server Certificate**[3]: `Do you want to provide an existing ZOS Server certificate?`
	  ♦ Default = no
	  ♦ In configuring the Orchestrator Server, you either entered a PEM-encoded TLS certificate and key, or the system generated them.
	  ♦ If you answer `no`, the agent always trusts the server certificate. The certificate is downloaded from the Orchestrator Server to the Orchestrator Agent the first time the agent connects.
	  ♦ If you answer `yes`, the agent uses the certificate to verify that it is communicating with the correct server.
	
	♦ **Virtual Machine**[3]: `Is the host for the agent a Virtual Machine?`
	  ♦ Default = no
	  ♦ This setting helps the Orchestrator system to know how to treat this host.
	
	♦ **Agent Port**[3]: Specify the Agent port.
	  ♦ Default = `8100`
	  ♦ Port 8100 is used for communication between the Orchestrator Server and the Orchestrator Agent. Specify another port number if 8100 is reserved for another use.
	
	♦ **Agent IP Address:** `Specify the Agent IP address.`
	  ♦ Default = none
	  ♦ This value is on the advanced page for the Orchestrator Agent settings.
	
	♦ **Orchestrator Server Certificate File**[4]: `Specify the path to the Orchestrator Server certificate file.`
	  ♦ Default = `/root/zos_server_cert.pem`

Configuration Information	Explanation
VM Builder	If you installed the ZENworks Virtual Machine Builder, the following questions are asked in the configuration process.
	◆ **ZOS Orchestrator Administrator user:** `Specify the name of the ZENworks Orchestrator Administrator user.`
	◆ Default = none
	◆ This is the name of the Administrator user you previously created when you configured the Orchestrator Server. See "Orchestrator Server" on page 55. If you supplied this name when configuring the Orchestrator Server, this question is not displayed.
	◆ **VM Manager Proxy user:** `Create a proxy ZOS user to be used by VM Builder.`
	◆ Default = none
	◆ This proxy user represents the VM Builder as it communicates with the Orchestrator Server.
	◆ This name is also used for the VM Warehouse, if you have installed it. The configuration script does not ask you for it again.
	◆ **VM Manager Proxy user password:** `Create a proxy ZOS user password to be used by VM Builder.`
	◆ Default = none
	◆ This proxy user password authenticates the VM Builder as it communicates with the Orchestrator Server.
	◆ This password is also used for the VM Warehouse, if you have installed it. The configuration script does not ask you for it again.
VM Warehouse	If you installed the ZENworks Virtual Machine Warehouse, the following questions are asked in the configuration process.
	◆ **VM Manager Proxy user:** `Create a proxy ZOS user to be used by VM Warehouse.`
	◆ Default = none
	◆ This proxy user represents the VM Warehouse as it communicates with the Orchestrator Server.
	IMPORTANT: If you install the Orchestrator Agent, the Orchestrator Server, and the VM Warehouse on the same machine, you must be certain that the agent and the warehouse have the same object name as the Orchestrator Server.
	◆ This name is also used for the VM Builder, if you have installed it. The configuration script does not ask you for it again.
	◆ **VM Manager Proxy user password:** `Create a proxy ZOS user password to be used by VM Warehouse.`
	◆ Default = none
	◆ This proxy user password authenticates the VM Warehouse as it communicates with the Orchestrator Server.
	◆ This password is also used for the VM Builder, if you have installed it. The configuration script does not ask you for it again.

Configuration Information	Explanation

Configuration Summary	When you have completed the configuration process, you have the option of viewing a summary of the configuration information.
	
	◆ **View summary:** `Do you want to view summary information?`
	    ◆ Default = `yes`
	    ◆ Answering `yes` to this question displays a list of all the Orchestrator components you have configured and the information with which they will be configured.
	    ◆ Answering `no` to this question starts the configuration program.
	
	◆ **Configuration information change:** `Do you want to make changes?`
	    ◆ Default = `no`
	    ◆ Answering `yes` to this question restarts the configuration process so that you can make changes to the configuration information.
	    ◆ Answering `no` to this question starts the configuration program.

1 This configuration parameter is considered an advanced setting for the Orchestrator Server in the ZENworks Orchestrator Configuration Wizard. If you select the *Configure Advanced Settings* check box in the wizard, the setting is configured with normal defaults. Leaving the check box deselected lets you have the option of changing the default value.

2 This configuration parameter is considered an advanced setting for the Orchestrator Server in the ZENworks Orchestrator Configuration Wizard. If you select the *Configure Advanced Settings* check box in the wizard, this parameter is listed, but default values are provided only if the previous value is manually set to *no*.

3 This configuration parameter is considered an advanced setting for the Orchestrator Agent in the ZENworks Orchestrator Configuration Wizard. If you select the *Configure Advanced Settings* check box in the wizard, the setting is configured with normal defaults. Leaving the check box deselected lets you have the option of changing the default value.

4 This configuration parameter is considered an advanced setting for the Orchestrator Agent in the ZENworks Orchestrator Configuration Wizard, but only if you set *Provide Existing Orchestrator Server Certificate* to *yes*.

4.2.3 Correcting Configuration Errors and Repeating the Configuration Process

If you want to reconfigure the components of the ZENworks Orchestrator system that you previously installed and configured, you can rerun the configuration script or the GUI Configuration Wizard and change your responses during the configuration process.

4.2.4 Installing and Configuring the ZENworks Orchestrator for Use with a PostgreSQL Audit Database on a Different Host

When you install ZENworks Orchestrator, you can optionally point it to a relational database that you can use to audit the work done by the product. There is no relational database management system bundled with the product, but because ZENworks Orchestrator is supported by default on

SLES 10 SP1 or SP2, you can use a PostgreSQL database and configure it for use with Orchestrator auditing. If you want to use some other database, you have to configure it separately for use with Orchestrator. This section includes the following information:

Installing the PostgreSQL Package and Dependencies on an Independent Host

When you enable and configure ZENworks Orchestrator auditing, you create a small custom database and a simple schema that persists all of the Orchestrator jobs that have been run, along with their parameters.The database also maintains the login or logout activity of the Orchestrator users and resources.

NOTE: We recommend that you install the PostgreSQL packages on a SLES 10 SP1 or SP2 server that is different from the server where you install the ZENworks Orchestrator Server. This ensures an adequate amount of space for running the server as the database is used.

For High Availability Orchestrator Server configurations, you need to install the database outside of the High Availability cluster.

If you want to run the database on the same host with ZENworks Orchestrator, see Section 4.2.5, "Installing and Configuring the ZENworks Orchestrator for Use with a Local PostgreSQL Audit Database," on page 65.

If the SLES 10 SP1 or SP2 machine does not have PostgreSQL packages installed and running, use YaST to search for `postgresql-server`, then install the package and its dependencies.

```
yast2 -i postgresql-server
```

When PostgreSQL is installed, you need to create the default database and start it. Use the following commands:

```
su - postgres
```

```
initdb
```

```
pg_ctl start
```

These commands create or update the PostgreSQL privilege database and installs the prepared tables. For more detail about what you will see when you run these commands, see "Detail" on page 61.

NOTE: You cannot run the `pg_ctl` command as root. You must first change to the superuser for PostgreSQL (`su - postgres`). Failure to issue this command first results as follows:

```
# pg_ctl start
pg_ctl: cannot be run as root
Please log in (using, e.g., "su") as the (unprivileged) user that will
own the server process.
```

Detail

```
postgres> initdb
The files belonging to this database system will be owned by user "postgres".
This user must also own the server process.

The database cluster will be initialized with locale en_US.UTF-8.
The default database encoding has accordingly been set to UTF8.

creating directory /var/lib/pgsql/data ... ok
creating directory /var/lib/pgsql/data/global ... ok
creating directory /var/lib/pgsql/data/pg_xlog ... ok
creating directory /var/lib/pgsql/data/pg_xlog/archive_status ... ok
creating directory /var/lib/pgsql/data/pg_clog ... ok
creating directory /var/lib/pgsql/data/pg_subtrans ... ok
creating directory /var/lib/pgsql/data/pg_twophase ... ok
creating directory /var/lib/pgsql/data/pg_multixact/members ... ok
creating directory /var/lib/pgsql/data/pg_multixact/offsets ... ok
creating directory /var/lib/pgsql/data/base ... ok
creating directory /var/lib/pgsql/data/base/1 ... ok
creating directory /var/lib/pgsql/data/pg_tblspc ... ok
selecting default max_connections ... 100
selecting default shared_buffers ... 1000
creating configuration files ... ok
creating template1 database in /var/lib/pgsql/data/base/1 ... ok
initializing pg_authid ... ok
enabling unlimited row size for system tables ... ok
initializing dependencies ... ok
creating system views ... ok
loading pg_description ... ok
creating conversions ... ok
setting privileges on built-in objects ... ok
creating information schema ... ok
vacuuming database template1 ... ok
copying template1 to template0 ... ok
copying template1 to postgres ... ok

WARNING: enabling "trust" authentication for local connections
You can change this by editing pg_hba.conf or using the -A option the
next time you run initdb.

Success. You can now start the database server using:

    postmaster -D /var/lib/pgsql/data
or
    pg_ctl -D /var/lib/pgsql/data -l logfile start

postgres> postmaster -i
```

Configuring PostgreSQL to Accept Remote Database Connections

To configure the PostgreSQL database to accept remote database connections, you need to add the following line to the `/var/lib/pgsql/data/pg_hba.conf` file:

```
host    all     all         0.0.0.0/0       trust
```

NOTE: After initial configuration, you can replace the `0.0.0.0/0` with a more restrictive mask. In a high availability server configuration, make sure that each host in the high availability cluster is enabled as a remote host.

After you make the change to the `pg_hba.conf` file, you need to specify the following command so that you do not receive an error when remote hosts try to connect:

```
pg_ctl restart
```

If `pg_hba.conf` is not configured when attempting to connect, an error similar to the following is displayed:

```
psql: FATAL:  no pg_hba.conf entry for host "164.99.15.64", user "postgres",
database "postgres", SSL off
```

For remote database access, you need to edit the `listen_addresses section` of the `/var/lib/pgsql/data/postgresql.conf` file. This enables the database server to listen for incoming connections on the specified IP addresses.

Edit this section of the file:

```
listen_addresses = 'localhost'
                    # what IP address(es) to listen on;
                    # comma-separated list of addresses;
                    # defaults to 'localhost', '*' = all
```

Your edit should look like this:

```
listen_addresses = '*'
                    # what IP address(es) to listen on;
                    # comma-separated list of addresses;
                    # defaults to 'localhost', '*' = all
```

NOTE: You might have to unremark the `listen_addresses` line in the file (that is, remove the pound sign (#) preceding the listen_address line).

Save the `postgresql.conf` file and then specify the following command:

```
pg_ctl restart
```

IMPORTANT: Restarting the PostgreSQL server is mandatory; the new address does not take effect without it.

Logging in Locally to the PostgreSQL Database

When you have installed the database, the next step is to check that you can connect to the database on the database host. The default admin username is `postgres`. Use the following commands to set up a password for the postgres user on the database host machine:

```
psql
```

NOTE: Remember the password. You will need it to log in later to log in to the database.

Running this command results in a screen like this:

```
Welcome to psql 8.1.11, the PostgreSQL interactive terminal.

Type:  \copyright for distribution terms
       \h for help with SQL commands
       \? for help with psql commands
       \g or terminate with semicolon to execute query
       \q to quit

postgres=# alter user postgres password 'pass';
ALTER ROLE
postgres=#
```

Creating an Orchestrator User for the PostgreSQL Database

Next, set up a PostgreSQL user to own the audit database schema before you running the server configuration script or the GUI Configuration Wizard.

1 On the database host machine, use the following commands to log in as root at the database host machine:

```
su - postgres
```

```
psql
```

2 At the `psql` prompt on the database host, use the following command to create a user specific to the ZENworks Orchestrator Server host:

```
create username password password;
```

Where you supply the username and password.

3 Enter the `\q` command at the `psql` prompt to exit the database.

Configuring the Orchestrator Audit Database on a Separate Host

The easiest way to configure the audit database is to do so when you configure the ZENworks Orchestrator Server. Use the following procedure to configure the database.

NOTE: Although the interview questions presented in the config script are shown here, the questions presented in the graphical Configuration Wizard are similar.

1 After you have installed the ZENworks Orchestrator packages you want, run the configuration (either the config script or the graphical Configuration Wizard) until you see the following question:

```
Enable Auditing (y/n) [no]:
```

2 Enter `yes` to answer this question. The following question displays:

```
Configure Audit DB (y/n) [no]:
```

3 Enter `yes` to answer this question. the following question displays:

```
Jdbc URL [jdbc:postgresql://localhost/]:
```

4 Enter the URL of the server where PostgreSQL is running, then press Enter.

```
jdbc:postgresql://IP_address_of_database_server/
```

> **NOTE:** This is a standard JDBC URL because this server is Java and uses JDBC for the interface database. The URL must be properly formed, with a slash and without a database name at the end. We do not recommend using "localhost" as the URL.

The following prompt is displayed:

```
DB Admin Username:
```

5 Specify the PostgreSQL database administrator username, then press Enter.

This is the same username that was created when PostgreSQL was installed. In most instances, the username is `postgres`.

The following prompt is displayed:

```
DB Admin Password:
```

6 Specify the PostgreSQL database administrator password, then press Enter.

The following prompt is displayed:

```
Retype password:
```

7 Retype the database administrator password to verify it, then press Enter. The following prompt is displayed:

```
ZOS Audit Database Name [zos_db]:
```

8 Specify the name of the database you want to create for ZENworks Orchestrator auditing, then press Enter. The following prompt is displayed:

```
Audit DB Username:
```

9 Specify the name you want to use for the PostgreSQL database user that will be used by ZENworks Orchestrator for auditing (that is, a user with Read and Write privileges, not the administrator), then press Enter. The following prompt is displayed:

```
Audit DB Password:
```

10 Specify the password you want to use for authentication by the designated PostgreSQL database user, then press Enter. The following prompt is displayed:

```
Retype password:
```

11 Retype the password, then press Enter.

After you retype the new audit database password, the configuration interview for the Orchestrator Server continues normally.

4.2.5 Installing and Configuring the ZENworks Orchestrator for Use with a Local PostgreSQL Audit Database

When you install ZENworks Orchestrator, you can optionally point it to a relational database that you can use to audit the work done by the product. There is no relational database management system bundled with the product, but because ZENworks Orchestrator is supported by default on SLES 10 SP1 or SP2, you can use a PostgreSQL database and configure it for use with Orchestrator auditing. If you want to use some other database, you have to configure it separately for use with Orchestrator. This section includes the following information:

Installing the PostgreSQL Package and Dependencies

NOTE: We recommend that you install the PostgreSQL package on a SLES 10 SP1 or SP2 server that is different from the server where you install the ZENworks Orchestrator Server. This ensures an adequate amount of space for running the server as the database is used.

For more information, see Section 4.2.4, "Installing and Configuring the ZENworks Orchestrator for Use with a PostgreSQL Audit Database on a Different Host," on page 59.

If your SLES 10 SP1 or SP2 machine does not have PostgreSQL package installed and running, use YaST to search for `postgresql-server`, then install the package and its dependencies.

You can also run the following command from the bash prompt:

You can also run the following command from the bash prompt:

```
yast2 -i postgresql-server
```

When PostgreSQL is installed, you need to create the default database and start it. Use the following commands:

```
su - postgres

initdb

pg_ctl start
```

These commands create or update the PostgreSQL privilege database and installs the prepared tables. For more detail about what you will see when you run these commands, see "Detail" on page 61.

NOTE: You cannot run the `pg_ctl` command as root. You must first change to the superuser for PostgreSQL (`su - postgres`). Failure to issue this command first results as follows:

```
# pg_ctl start
pg_ctl: cannot be run as root
Please log in (using, e.g., "su") as the (unprivileged) user that will
own the server process.
```

Logging in Locally to the PostgreSQL Database

When you have installed the database, the next step is to check that you can connect to the database on the database host. The default admin username is `postgres`. Use the following commands to set up a password for the postgres user on the database host machine:

```
pgsql
```

NOTE: Remember the password. You will need it to log in later to log in to the database.

Running this command results in a screen like this:

```
Welcome to psql 8.1.11, the PostgreSQL interactive terminal.

Type:  \copyright for distribution terms
       \h for help with SQL commands
       \? for help with psql commands
       \g or terminate with semicolon to execute query
       \q to quit

postgres=# alter user postgres password 'pass';
ALTER ROLE
postgres=#
```

Installing and Configuring the Local Orchestrator Audit Database

When you enable and configure ZENworks Orchestrator auditing, you create a small custom database and a simple schema that persists all of the Orchestrator jobs that have been run, along with their parameters.The database also maintains the login or logout activity of the Orchestrator users and resources.

The easiest way to configure the audit database is to do so when you configure the ZENworks Orchestrator Server. Use the following procedure to configure the database.

NOTE: Although the interview questions presented in the config script are shown here, the questions presented in the graphical Configuration Wizard are similar.

---

1 After you have installed the ZENworks Orchestrator packages you want, run the configuration (either the config script or the graphical Configuration Wizard) until you see the following question:

```
Enable Auditing (y/n) [no]:
```

2 Enter `yes` to answer this question. The following question displays:

```
Configure Audit DB (y/n) [no]:
```

3 Enter `yes` to answer this question. the following question displays:

```
Jdbc URL [jdbc:postgresql://localhost/]:
```

4 Press Enter to accept the default (`jdbc:postgresql://localhost/`) by pressing Enter.

NOTE: This is a standard JDBC URL because this server is Java and uses JDBC for the interface database. The URL must be properly formed, with a slash and without a database name at the end.

The following prompt is displayed:

```
DB Admin Username:
```

5 Specify the PostgreSQL database administrator username, then press Enter.

This is the same name that was specified when PostgreSQL was installed. In most instances, the username is `postgres`.

The following prompt is displayed:

```
DB Admin Password:
```

6 Specify the PostgreSQL database administrator password, then press Enter.

The following prompt is displayed:

```
Retype password:
```

7 Retype the database administrator password to verify it, then press Enter. The following prompt is displayed:

```
ZOS Audit Database Name [zos_db]:
```

8 Specify the name of the database you want to create for ZENworks Orchestrator auditing, then press Enter. The following prompt is displayed:

```
Audit DB Username:
```

9 Specify the name you want to use for the PostgreSQL database user that will be used by ZENworks Orchestrator for auditing (that is, a user with Read and Write privileges, not the administrator), then press Enter. The following prompt is displayed:

```
Audit DB Password:
```

10 Specify the password you want to use for authentication by the designated PostgreSQL database user, then press Enter. The following prompt is displayed:

```
Retype password:
```

11 Retype the password, then press Enter.

After you retype the new audit database password, the configuration interview for the Orchestrator Server continues normally.

4.2.6 Configuring the Audit Database after ZENworks Orchestrator is Configured

If you have already installed and configured ZENworks Orchestrator, it is still possible to configure an audit database.

1 On the ZENworks Orchestrator host machine, use your favorite editor to edit the script `/opt/novell/zenworks/zos/server/conf/audit_db_def.sql`.

   1a Replace the `${DB_NAME}` variable with *zos_db*.

   1b Replace the `${DB_USER}` variable with *zos*.

   1c Replace the `${DB_PASSWORD}` variable with *zos*.

2 Use the following command to log into PostgreSQL as the database administrator:

```
psql zos_db zos -f audit_db_def.sql
```

3 In the Explorer view of the ZENworks Orchestrator console, select the grid that you created in the configuration, then scroll down the Info/Configuration view to the Audit Database Configuration section.

4 Confirm that the database username and password match the values you replaced in the variables of the `.sql` script. In this example, the username is `zos` and the password is `zos`.

5 Click *Connect*.

The *Is Connected* check box is selected: the Orchestrator Server is connected to the database so that any queued data and subsequent job, user, and resource events are written there.

4.3 Independent Installation of the Agent and Clients

You have two options for installing the Orchestrator Agent and the Orchestrator Clients after the initial installation:

- Section 4.3.1, "Installing the Agent and Clients by Using the Product ISO," on page 68
- Section 4.3.2, "Installing the Agent and Clients from the Administrator Information Page (Unsupported)," on page 86

4.3.1 Installing the Agent and Clients by Using the Product ISO

If you want to independently install the Orchestrator Agent or the Orchestrator Clients to a node in your grid, you can do so, but the procedures for doing so vary depending on the platform where you are installing them.

- "Using the ISO to Install the Agent or the Clients on SLES 10 Machines" on page 68
- "Using the ISO to Install the Orchestrator Agents on SLES 9 SP3 Machines" on page 70
- "Using the ISO to Install the Orchestrator Agents on RHEL 4 Machines" on page 75
- "Using the ISO to Install the Orchestrator Agents on RHEL 5 Machines" on page 80
- "Using the ISO to Install the Orchestrator Agent or the Orchestrator Clients on Windows Machines" on page 86

Using the ISO to Install the Agent or the Clients on SLES 10 Machines

Use the following procedure if you want to use the Add-on CD method to install just the Orchestrator Agent or the Orchestrator Clients to a SLES machine.

IMPORTANT: The Orchestrator Clients are not supported on SLES 9 SP3. The Orchestrator Agent is supported on SLES 9 SP3, SLES 10 SP1, and SLES 10 SP2.

1 To verify that the device where you want to install the agent and client software fulfills the necessary requirements, review Chapter 3, "Planning the Installation," on page 27.

2 Download the appropriate ZENworks Orchestrator ISO (32-bit or 64-bit) to an accessible network location.

3 Install ZENworks Orchestrator Agent or ZENworks Orchestrator Clients software:

   3a Log in to the target SLES server as `root`, then open YaST2.

   3b In the YaST Control Center, click *Software*, then click *Add-on Product* to display the Add-on Product Media dialog box.

   3c In the Add-on Product Media dialog box, select the ISO media (*Local Directory* or *DVD*) to install.

      3c1 (Conditional) Select *DVD*, click *Next*, insert the DVD, then click *Continue*.

         or

      3c2 (Conditional) Select *Local Directory*, click *Next*, select the ISO Image check box, browse to the ISO in the file system, then click *OK*.

   3d Read and accept the license agreement, then click *Next* to display YaST2.

   3e In YaST2, click the *Filter* drop-down menu, then select *Patterns* to display the install patterns available on the ZENworks Orchestrator ISO.
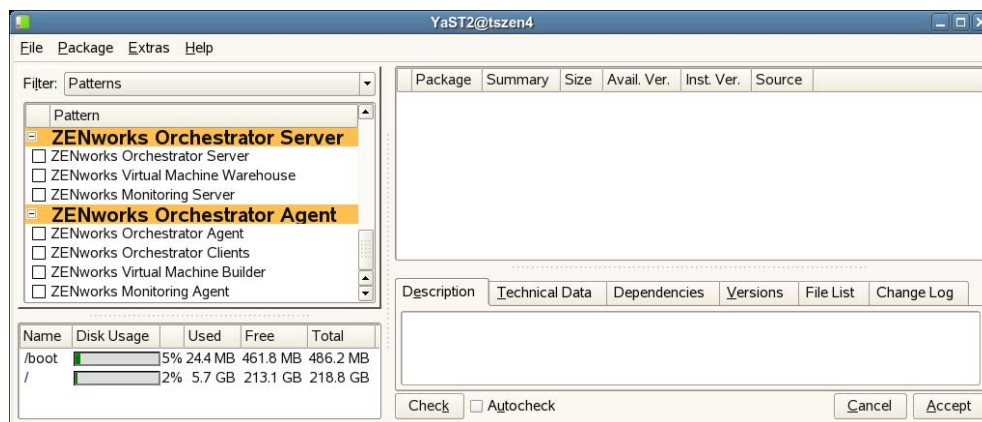
   3f Select the ZENworks Orchestrator installation patterns that you want to install:

      ◆ **ZENworks Orchestrator Agent:** Runs applications on all managed nodes under the management of the Orchestrator Server. An agent reports its status to the Orchestrator Server.

      ◆ **ZENworks Monitoring Agent:** This pattern installs the Ganglia Agent on each monitored node, which collects performance metrics and sends the data to the ZENworks Monitoring Server.

      Refer to the information in Appendix A, "ZENworks Orchestrator Components: Install Patterns," on page 139 for details on the installation data that you need to know.

   3g Click *Accept* to install the packages.

4 Configure the ZENworks Orchestrator agents that you have installed. You can use one of two information gathering methods to perform the configuration:

- ◆ The Orchestrator product configuration script. If you use this method, continue with Step 5 on page 70.

- ◆ The GUI Configuration Wizard. If you use this method, skip to Step 6 on page 70.

5 (Optional) Run the Orchestrator product configuration script.

5a Make sure you are logged in as `root` to run the configuration script.

5b Run the script, as follows:

```
/opt/novell/zenworks/orch/bin/config
```

When the script runs, the following information is initially displayed:

```
Welcome to Novell ZENworks Orchestrator.
This program will configure Novell ZENworks Orchestrator 1.3

Select products to configure

 #   selected  Item
 1)    yes     ZENworks Monitoring Service
 2)    no      ZENworks Orchestrator Server
 3)    yes     ZENworks Orchestrator Agent
 4)    no      ZENworks Orchestrator VM Builder
 5)    no      ZENworks Orchestrator VM Warehouse

Select from the following:
  1 - 5)  toggle selection status
       a)  all
       n)  none
       f)  finished making selections
       q)  quit -- exit the program
Selection [finish]:
```

5c Determine which installed products you want to configure. The options are listed with option numbers.

5c1 Select or deselect an option by typing its number to toggle its selection status, or type `a` and press *Enter* to select all of them.

5c2 When you have selected the products you want to configure, type `f` and press *Enter* to finish the selection and begin the configuration.

6 (Optional) Run the GUI Configuration Wizard.

During the configuration process, refer to the information in Table 4-1, "Orchestrator Configuration Information," on page 53 for details about the configuration data that you need to provide.

Default values are built into the script; most of these defaults are set to configure all of the product patterns that were installed using the Add-on Product Media utility in SLES 10.

Using the ISO to Install the Orchestrator Agents on SLES 9 SP3 Machines

Because YaST in SLES 9 SP3 does not have an add-on feature, you need to use another method for installing Orchestrator Agents to a SLES 9 machine.

This section includes the following information:

- "Installing the Orchestrator Agent Only on a SLES 9 Machine" on page 71
- "Installing the Monitoring Agent Only on a SLES 9 Machine" on page 72
- "Installing Both the Monitoring Agent and the Orchestrator Agent on a SLES 9 Machine" on page 74

Installing the Orchestrator Agent Only on a SLES 9 Machine

Use the following procedure if you want to install just the Orchestrator Agent to a SLES 9 SP3 machine.

1 To verify that the device where you want to install the agent and client software fulfills the necessary requirements, review Chapter 3, "Planning the Installation," on page 27.

2 Run the following command to install the Python package included with SLES 9 SP3

```
yast -i python
```

3 Download the appropriate ZENworks Orchestrator ISO (32-bit or 64-bit) to an accessible network location.

4 Mount the Orchestrator ISO as a loopback device as in the following example:

```
mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

This mounts the ISO in the `/mnt` folder.

5 Navigate to the directory path where the SLES 9 packages reside. For example:

```
cd /mnt/SLES9
```

There are five packages in the `SLES9` directory:

```
novell-zenworks-monitor-gmond
novell-zenworks-orch-config
novell-zenworks-orch-config-gui
novell-zenworks-zos-agent
novell-zenworks-zos-java
```

6 Use the `rpm` command to install the Orchestrator Agent package and the configuration package:

```
rpm -iv novell-zenworks-zos-agent-* novell-zenworks-zos-java-*
novell-zenworks-orch-config-*
```

NOTE: This command installs the agent, the configuration script, and the Java update packages. It should be run as one command.

---

7 Configure the ZENworks Orchestrator components that you have installed.

NOTE: You must be logged in as `root` to run the configuration script.

7a Run the script, as follows:

```
/opt/novell/zenworks/orch/bin/config
```

When the script runs, the following information is initially displayed:

```
Welcome to Novell ZENworks Orchestrator.

This program will configure Novell ZENworks Orchestrator 1.3


Select whether this is a new install or an upgrade

i) install
u) upgrade
- - - - - -

Selection [install]:
```

7b Determine whether this is a new installation or an upgrade.

This section discusses standard installation, so specify i (for install) or press Enter to accept the default. For more information about upgrade, see the *Novell ZENworks Orchestrator 1.3 Upgrade Guide*.

When you make the selection, the following information is displayed:

```
Select products to configure

 #    selected  Item
 1)    no       ZENworks Monitoring Service
 2)    no       ZENworks Orchestrator Server
 3)    yes      ZENworks Orchestrator Agent
 4)    no       ZENworks Orchestrator VM Builder
 5)    no       ZENworks Orchestrator VM Warehouse

Select from the following:
  1 - 5)  toggle selection status
       a)  all
       n)  none
       f)  finished making selections
       q)  quit -- exit the program
```

7c Type f and press *Enter* to finish the selection and begin the configuration.

8 During the configuration process, refer to the information in Table 4-1, "Orchestrator Configuration Information," on page 53 for details about the configuration data that you need to provide.

Default values are built into the script; most of these defaults are set to configure all of the product patterns that were installed.

Installing the Monitoring Agent Only on a SLES 9 Machine

Use the following procedure if you want to install just the Monitoring Agent to a SLES 9 SP3 machine.

1 To verify that the device where you want to install the agent and client software fulfills the necessary requirements, review Chapter 3, "Planning the Installation," on page 27.

2 Download the appropriate ZENworks Orchestrator ISO (32-bit or 64-bit) to an accessible network location.

3 Mount the Orchestrator ISO as a loopback device as in the following example:

```
mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

This mounts the ISO in the `/mnt` folder.

4 Navigate to the directory path where the SLES 9 packages reside. For example:

```
cd /mnt/SLES9
```

There are five packages in the `/SLES9` directory:

```
novell-zenworks-monitor-gmond
novell-zenworks-orch-config
novell-zenworks-orch-config-gui
novell-zenworks-zos-agent
novell-zenworks-zos-java
```

5 Use the `rpm` command to install the Monitoring Agent packages:

```
rpm -iv novell-zenworks-monitor-gmond-* novell-zenworks-orch-
config-*
```

NOTE: The Monitoring Agent does not require a Java update.

6 Configure the ZENworks Orchestrator components that you have installed.

NOTE: You must be logged in as `root` to run the configuration script.

6a Run the script, as follows:

```
/opt/novell/zenworks/orch/bin/config
```

When the script runs, the following information is initially displayed:

```
Welcome to Novell ZENworks Orchestrator.

This program will configure Novell ZENworks Orchestrator 1.3


Select whether this is a new install or an upgrade

i) install
u) upgrade
- - - - - -

Selection [install]:
```

6b Determine whether this is a new installation or an upgrade.

This section discusses standard installation, so specify `i` (for install) or press Enter to accept the default. For more information about upgrade, see the *Novell ZENworks Orchestrator 1.3 Upgrade Guide*.

When you make the selection, the following information is displayed:

```
Select products to configure

 #   selected  Item
 1)   yes      ZENworks Monitoring Service
 2)   no       ZENworks Orchestrator Server
 3)   no       ZENworks Orchestrator Agent
 4)   no       ZENworks Orchestrator VM Builder
 5)   no       ZENworks Orchestrator VM Warehouse
```

```
Select from the following:
  1 - 5)  toggle selection status
        a)  all
        n)  none
        f)  finished making selections
        q)  quit -- exit the program
```

6c Type `f` and press *Enter* to finish the selection and begin the configuration.

7 During the configuration process, refer to the information in Table 4-1, "Orchestrator Configuration Information," on page 53 for details about the configuration data that you need to provide.

Default values are built into the script; most of these defaults are set to configure all of the product patterns that were installed.

Installing Both the Monitoring Agent and the Orchestrator Agent on a SLES 9 Machine

Use the following procedure if you want to install the Monitoring Agent and the Orchestrator Agent to a SLES 9 SP3 machine.

1 To verify that the device where you want to install the agent and client software fulfills the necessary requirements, review Chapter 3, "Planning the Installation," on page 27.

2 Run the following command to install the python package included with SLES 9 SP3.

```
yast -i python
```

3 Download the appropriate ZENworks Orchestrator Server ISO (32-bit or 64-bit) to an accessible network location.

4 Mount the Orchestrator ISO as a loopback device as in the following example:

```
mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

This mounts the ISO in the `/mnt` folder.

5 Navigate to the directory path where the SLES 9 packages reside. For example:

```
cd /mnt/SLES9
```

There are five packages in the `/SLES9` directory:

```
novell-zenworks-monitor-gmond
novell-zenworks-orch-config
novell-zenworks-orch-config-gui
novell-zenworks-zos-agent
novell-zenworks-zos-java
```

6 Use the `rpm` command to install the packages. For example:

```
rpm -Uvh *.rpm
```

7 Configure the ZENworks Orchestrator components that you have installed.

NOTE: You must be logged in as `root` to run the configuration script.

7a Run the script, as follows:

```
/opt/novell/zenworks/orch/bin/config
```

When the script runs, the following information is initially displayed:

```
Welcome to Novell ZENworks Orchestrator.

This program will configure Novell ZENworks Orchestrator 1.3


Select whether this is a new install or an upgrade

i) install
u) upgrade
- - - - - -

Selection [install]:
```

7b Determine whether this is a new installation or an upgrade.

This section discusses standard installation, so specify i (for install) or press Enter to accept the default. For more information about upgrade, see the *Novell ZENworks Orchestrator 1.3 Upgrade Guide*.

When you make the selection, the following information is displayed:

```
Select products to configure

 #   selected  Item
 1)    yes     ZENworks Monitoring Service
 2)    no      ZENworks Orchestrator Server
 3)    yes     ZENworks Orchestrator Agent
 4)    no      ZENworks Orchestrator VM Builder
 5)    no      ZENworks Orchestrator VM Warehouse

Select from the following:
  1 - 5)  toggle selection status
      a)  all
      n)  none
      f)  finished making selections
      q)  quit -- exit the program
```

7c Determine which installed products you want to configure. The options are listed with option numbers.

7c1 Select or deselect an option by typing its number to toggle its selection status, or type a and press Enter to select all of them.

7c2 When you have selected the products you want to configure, type f and press *Enter* to finish the selection and begin the configuration.

8 During the configuration process, refer to the information in Table 4-1, "Orchestrator Configuration Information," on page 53 for details about the configuration data that you need to provide.

Default values are built into the script; most of these defaults are set to configure all of the product patterns that were installed.

Using the ISO to Install the Orchestrator Agents on RHEL 4 Machines

Because RHEL does not have an add-on feature, you need to use another method for installing agents to a RHEL 4 machine.

This section includes the following information:

Installing the Orchestrator Agent Only on a RHEL 4 Machine

1 To verify that the device where you want to install the agent and client software fulfills the necessary requirements, review Chapter 3, "Planning the Installation," on page 27.

2 Download the appropriate ZENworks Orchestrator ISO (32-bit or 64-bit) to an accessible network location.

3 Mount the Orchestrator ISO as a loopback device as in the following example:

```
mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

This mounts the ISO in the /mnt folder.

4 Navigate to the directory path where the RHEL 4 packages reside. For example:

```
cd /mnt/RHEL4
```

There are five packages in the RHEL4 directory:

```
novell-zenworks-monitor-gmond
novell-zenworks-orch-config
novell-zenworks-orch-config-gui
novell-zenworks-zos-agent
novell-zenworks-zos-java
```

5 Use the rpm command to install the packages:

```
rpm -iv novell-zenworks-zos-agent-* novell-zenworks-zos-java-*
novell-zenworks-orch-config-*
```

NOTE: This command installs the agent, the configuration script, and the Java update packages. It should be run as one command.

6 Configure the ZENworks Orchestrator components that you have installed.

NOTE: You must be logged in as root to run the configuration script.

6a Run the script, as follows:

```
/opt/novell/zenworks/orch/bin/config
```

When the script runs, the following information is initially displayed:

```
Welcome to Novell ZENworks Orchestrator.

This program will configure Novell ZENworks Orchestrator 1.3


Select whether this is a new install or an upgrade
```

```
                   i) install
                   u) upgrade
                   - - - - - -

                   Selection [install]:
```

6b Determine whether this is a new installation or an upgrade.

This section discusses standard installation, so specify `i` (for install) or press Enter to accept the default. For more information about upgrade, see the *Novell ZENworks Orchestrator 1.3 Upgrade Guide*.

When you make the selection, the following information is displayed:

```
Select products to configure


  #   selected  Item
  1)    no      ZENworks Monitoring Service
  2)    no      ZENworks Orchestrator Server
  3)    yes     ZENworks Orchestrator Agent
  4)    no      ZENworks Orchestrator VM Builder
  5)    no      ZENworks Orchestrator VM Warehouse

Select from the following:
  1 - 5)  toggle selection status
       a)  all
       n)  none
       f)  finished making selections
       q)  quit -- exit the program
```

6c Type `f` and press *Enter* to finish the selection and begin the configuration.

7 During the configuration process, refer to the information in Table 4-1, "Orchestrator Configuration Information," on page 53 for details about the configuration data that you need to provide.

Default values are built into the script; most of these defaults are set to configure all of the product patterns that were installed.

Installing the Monitoring Agent Only on a RHEL 4 Machine

1 To verify that the device where you want to install the agent and client software fulfills the necessary requirements, review Chapter 3, "Planning the Installation," on page 27.

2 Download the appropriate ZENworks Orchestrator ISO (32-bit or 64-bit) to an accessible network location.

3 Mount the Orchestrator ISO as a loopback device as in the following example:

`mount -o loop zenworks_orch-1.3.x86_64.iso /mnt`

This mounts the ISO in the `/mnt` folder.

4 Navigate to the directory path where the RHEL 5 packages reside. For example:

`cd /mnt/RHEL4`

There are five packages in the `RHEL4` directory:

```
novell-zenworks-monitor-gmond
novell-zenworks-orch-config
novell-zenworks-orch-config-gui
```

```
novell-zenworks-zos-agent
novell-zenworks-zos-java
```

5 Use the `rpm` command to install the Monitoring Agent package. For example:

```
rpm -iv novell-zenworks-monitor-gmond-* novell-zenworks-orch-
config-*
```

NOTE: The monitoring agent does not require a Java update.

6 Configure the ZENworks Orchestrator component that you have installed.

NOTE: You must be logged in as `root` to run the configuration script.

6a Run the script, as follows:

```
/opt/novell/zenworks/orch/bin/config
```

When the script runs, the following information is initially displayed:

```
Welcome to Novell ZENworks Orchestrator.

This program will configure Novell ZENworks Orchestrator 1.3


Select whether this is a new install or an upgrade

i) install
u) upgrade
- - - - - -

Selection [install]:
```

6b Determine whether this is a new installation or an upgrade.

This section discusses standard installation, so specify `i` (for install) or press Enter to accept the default. For more information about upgrade, see the *Novell ZENworks Orchestrator 1.3 Upgrade Guide*.

When you make the selection, the following information is displayed:

```
Select products to configure

 #   selected  Item
 1)    yes     ZENworks Monitoring Service
 2)    no      ZENworks Orchestrator Server
 3)    no      ZENworks Orchestrator Agent
 4)    no      ZENworks Orchestrator VM Builder
 5)    no      ZENworks Orchestrator VM Warehouse

Select from the following:
  1 - 5)  toggle selection status
```

```
                          a)   all
                          n)   none
                          f)   finished making selections
                          q)   quit -- exit the program
```

6c Type `f` and press *Enter* to finish the selection and begin the configuration.

7 During the configuration process, refer to the information in for details about the configuration data that you need to provide.

Default values are built into the script; most of these defaults are set to configure all of the product patterns that were installed.

Installing the Orchestrator Agent and the Monitoring Agent on a RHEL 4 Machine

1 To verify that the device where you want to install the agent and client software fulfills the necessary requirements, review .

2 Download the appropriate ZENworks Orchestrator Server ISO (32-bit or 64-bit) to an accessible network location.

3 Mount the Orchestrator ISO as a loopback device as in the following example:

```
mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

This mounts the ISO in the `/mnt` folder.

4 Navigate to the directory path where the RHEL 4 packages reside. For example:

```
cd /mnt/RHEL4
```

There are five packages in the `RHEL4` directory:

```
novell-zenworks-monitor-gmond
novell-zenworks-orch-config
novell-zenworks-orch-config-gui
novell-zenworks-zos-agent
novell-zenworks-zos-java
```

5 Use the `rpm` command to install the packages. For example:

```
rpm -Uvh *.rpm
```

If you encounter an issue regarding missing dependencies, you can use the `up2date` command to download and install those. For example, if you were missing `libcaplso` or `libcap.so.1`, you would run the following:

```
up2date --solvedeps=libcp.so,libcap.so.1
```

6 Configure the agents that you have installed.

NOTE: You must be logged in as `root` to run the configuration script.

6a Run the script, as follows:

```
/opt/novell/zenworks/orch/bin/config
```

When the script runs, the following information is initially displayed:

```
Welcome to Novell ZENworks Orchestrator.

This program will configure Novell ZENworks Orchestrator 1.3


Select whether this is a new install or an upgrade

i) install
u) upgrade
- - - - - -

Selection [install]:
```

6b Determine whether this is a new installation or an upgrade.

This section discusses standard installation, so specify i (for install) or press Enter to accept the default. For more information about upgrade, see the *Novell ZENworks Orchestrator 1.3 Upgrade Guide*.

When you make the selection, the following information is displayed:

```
Select products to configure

#   selected  Item
1)    yes     ZENworks Monitoring Service
2)    no      ZENworks Orchestrator Server
3)    yes     ZENworks Orchestrator Agent
4)    no      ZENworks Orchestrator VM Builder
5)    no      ZENworks Orchestrator VM Warehouse

Select from the following:
  1 - 5)  toggle selection status
      a)  all
      n)  none
      f)  finished making selections
      q)  quit -- exit the program
```

6c Determine which installed products you want to configure. The options are listed with option numbers.

6c1 Select or deselect an option by typing its number to toggle its selection status, or type a and press Enter to select all of them.

6c2 When you have selected the products you want to configure, type f and press *Enter* to finish the selection and begin the configuration.

7 During the configuration process, refer to the information in Table 4-1, "Orchestrator Configuration Information," on page 53 for details about the configuration data that you need to provide.

Default values are built into the script; most of these defaults are set to configure all of the product patterns that were installed.

Using the ISO to Install the Orchestrator Agents on RHEL 5 Machines

Because RHEL does not have an add-on feature, you need to use another method for installing agents to a RHEL 5 machine.

This section includes the following information:

Installing the Orchestrator Agent Only on a RHEL 5 Machine

1 To verify that the device where you want to install the agent and client software fulfills the necessary requirements, review Chapter 3, "Planning the Installation," on page 27.

2 Download the appropriate ZENworks Orchestrator ISO (32-bit or 64-bit) to an accessible network location.

3 Mount the Orchestrator ISO as a loopback device as in the following example:

```
mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

This mounts the ISO in the `/mnt` folder.

4 Navigate to the directory path where the RHEL 5 packages reside. For example:

```
cd /mnt/RHEL5
```

There are five packages in the `RHEL5` directory:

```
novell-zenworks-monitor-gmond
novell-zenworks-orch-config
novell-zenworks-orch-config-gui
novell-zenworks-zos-agent
novell-zenworks-zos-java
```

5 Use the `rpm` command to install the packages:

```
rpm -iv novell-zenworks-zos-agent-* novell-zenworks-zos-java-*
novell-zenworks-orch-config-*
```

NOTE: This command installs the agent, the configuration script, and the Java update packages. It should be run as one command.

6 Configure the ZENworks Orchestrator components that you have installed.

NOTE: You must be logged in as `root` to run the configuration script.

6a Run the script, as follows:

```
/opt/novell/zenworks/orch/bin/config
```

When the script runs, the following information is initially displayed:

```
Welcome to Novell ZENworks Orchestrator.

This program will configure Novell ZENworks Orchestrator 1.3


Select whether this is a new install or an upgrade
```

```
            i) install
            u) upgrade
            - - - - - -

            Selection [install]:
```

6b Determine whether this is a new installation or an upgrade.

This section discusses standard installation, so specify `i` (for install) or press Enter to accept the default. For more information about upgrade, see the *Novell ZENworks Orchestrator 1.3 Upgrade Guide*.

When you make the selection, the following information is displayed:

```
Select products to configure


 #   selected  Item
 1)    no      ZENworks Monitoring Service
 2)    no      ZENworks Orchestrator Server
 3)    yes     ZENworks Orchestrator Agent
 4)    no      ZENworks Orchestrator VM Builder
 5)    no      ZENworks Orchestrator VM Warehouse

Select from the following:
   1 - 5)  toggle selection status
        a)  all
        n)  none
        f)  finished making selections
        q)  quit -- exit the program
```

6c Type `f` and press *Enter* to finish the selection and begin the configuration.

7 During the configuration process, refer to the information in Table 4-1, "Orchestrator Configuration Information," on page 53 for details about the configuration data that you need to provide.

Default values are built into the script; most of these defaults are set to configure all of the product patterns that were installed.

Installing the Monitoring Agent Only on a RHEL 5 Machine

1 To verify that the device where you want to install the agent and client software fulfills the necessary requirements, review Chapter 3, "Planning the Installation," on page 27.

2 Download the appropriate ZENworks Orchestrator ISO (32-bit or 64-bit) to an accessible network location.

3 Mount the Orchestrator ISO as a loopback device as in the following example:

```
mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

This mounts the ISO in the `/mnt` folder.

4 Navigate to the directory path where the RHEL 5 packages reside. For example:

```
cd /mnt/RHEL5
```

There are five packages in the `RHEL5` directory:

```
novell-zenworks-monitor-gmond
novell-zenworks-orch-config
novell-zenworks-orch-config-gui
```

```
novell-zenworks-zos-agent
novell-zenworks-zos-java
```

5 Use the `rpm` command to install the Monitoring Agent package. For example:

```
rpm -iv novell-zenworks-monitor-gmond-* novell-zenworks-orch-
config-*
```

NOTE: The monitoring agent does not require a Java update.

6 Configure the ZENworks Orchestrator component that you have installed.

NOTE: You must be logged in as `root` to run the configuration script.

6a Run the script, as follows:

```
/opt/novell/zenworks/orch/bin/config
```

When the script runs, the following information is initially displayed:

```
Welcome to Novell ZENworks Orchestrator.

This program will configure Novell ZENworks Orchestrator 1.3


Select whether this is a new install or an upgrade

i) install
u) upgrade
- - - - - -

Selection [install]:
```

6b Determine whether this is a new installation or an upgrade.

This section discusses standard installation, so specify `i` (for install) or press Enter to accept the default. For more information about upgrade, see the *Novell ZENworks Orchestrator 1.3 Upgrade Guide*.

When you make the selection, the following information is displayed:

```
Select products to configure

 #   selected  Item
 1)    yes     ZENworks Monitoring Service
 2)    no      ZENworks Orchestrator Server
 3)    no      ZENworks Orchestrator Agent
 4)    no      ZENworks Orchestrator VM Builder
 5)    no      ZENworks Orchestrator VM Warehouse

Select from the following:
  1 - 5)  toggle selection status
```

```
a)  all
n)  none
f)  finished making selections
q)  quit -- exit the program
```

6c Type f and press *Enter* to finish the selection and begin the configuration.

7 During the configuration process, refer to the information in Table 4-1, "Orchestrator Configuration Information," on page 53 for details about the configuration data that you need to provide.

Default values are built into the script; most of these defaults are set to configure all of the product patterns that were installed.

Installing the Orchestrator Agent and the Monitoring Agent on a RHEL 5 Machine

1 To verify that the device where you want to install the agent and client software fulfills the necessary requirements, review Chapter 3, "Planning the Installation," on page 27.

2 Download the appropriate ZENworks Orchestrator Server ISO (32-bit or 64-bit) to an accessible network location.

3 Mount the Orchestrator ISO as a loopback device as in the following example:

```
mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

This mounts the ISO in the /mnt folder.

4 Navigate to the directory path where the RHEL 5 packages reside. For example:

```
cd /mnt/RHEL5
```

There are five packages in the RHEL5 directory:

```
novell-zenworks-monitor-gmond
novell-zenworks-orch-config
novell-zenworks-orch-config-gui
novell-zenworks-zos-agent
novell-zenworks-zos-java
```

5 Use the rpm command to install the packages. For example:

```
rpm -Uvh *.rpm
```

If you encounter an issue regarding missing dependencies, you can use the yum command to download and install those. For example, if you were missing python , you would run the following:

```
yum install python
```

6 Configure the agents that you have installed.

NOTE: You must be logged in as root to run the configuration script.

6a Run the script, as follows:

```
/opt/novell/zenworks/orch/bin/config
```

When the script runs, the following information is initially displayed:

```
Welcome to Novell ZENworks Orchestrator.

This program will configure Novell ZENworks Orchestrator 1.3


Select whether this is a new install or an upgrade

i) install
u) upgrade
- - - - - -

Selection [install]:
```

6b Determine whether this is a new installation or an upgrade.

This section discusses standard installation, so specify i (for install) or press Enter to accept the default. For more information about upgrade, see the *Novell ZENworks Orchestrator 1.3 Upgrade Guide*.

When you make the selection, the following information is displayed:

```
Select products to configure

 #   selected  Item
 1)    yes     ZENworks Monitoring Service
 2)    no      ZENworks Orchestrator Server
 3)    yes     ZENworks Orchestrator Agent
 4)    no      ZENworks Orchestrator VM Builder
 5)    no      ZENworks Orchestrator VM Warehouse

Select from the following:
  1 - 5)  toggle selection status
      a)   all
      n)   none
      f)   finished making selections
      q)   quit -- exit the program
```

6c Determine which installed products you want to configure. The options are listed with option numbers.

> **6c1** Select or deselect an option by typing its number to toggle its selection status, or type a and press Enter to select all of them.

> **6c2** When you have selected the products you want to configure, type f and press *Enter* to finish the selection and begin the configuration.

7 During the configuration process, refer to the information in Table 4-1, "Orchestrator Configuration Information," on page 53 for details about the configuration data that you need to provide.

Default values are built into the script; most of these defaults are set to configure all of the product patterns that were installed.

Using the ISO to Install the Orchestrator Agent or the Orchestrator Clients on Windows Machines

The ZENworks Orchestrator Agent is supported on Windows 2003, but not on Windows XP, Windows 2000, or earlier releases (Windows ME, Windows 95, etc.). The ZENworks Orchestrator Clients are supported on both platforms. Use the following steps to download the Orchestrator component you want to install:

1 To verify that the device where you want to install the agent and client software fulfills the necessary requirements, review Chapter 3, "Planning the Installation," on page 27.

2 Download the appropriate ZENworks Orchestrator Server ISO (32-bit or 64-bit) to an accessible network location.

3 Create a DVD from the ISO or use a tool that will mount the ISO.

4 Navigate to the directory path where the Windows packages (Windows 2003 or Windows XP) reside.

5 Double-click the appropriate file (`.exe`) to launch an installation and configuration wizard. See "Installing and Registering the ZENworks Orchestrator Agent" on page 87 and "Installing the Orchestrator Console" on page 89 in Installing the Agent and Clients from the Administrator Information Page (Unsupported) for information about this wizard.

4.3.2 Installing the Agent and Clients from the Administrator Information Page (Unsupported)

After you install the server for ZENworks Orchestrator on the network, you can launch the ZENworks Orchestrator Administrator Information page. The page has links to various installer programs that you can use to install required Orchestrator software on the computing resources that you will be utilizing in the grid system.

IMPORTANT: Although installing ZENworks Orchestrator 1.3 components from the ZENworks Orchestrator Administrator Information page allows non-RPM installation of the Orchestrator client and agent components, you must understand that installing the agent component any of the installers listed on this page has not been fully tested, and is therefore not yet supported by Novell. This includes the RPM agent installer without JRE (`novell-zenworks-zos-agent-1.3.0-33604.i586.rpm`).

The following browsers support the ZENworks Portal and ZENworks Orchestrator Administrator's Web page applications:

- Internet Explorer, version 6.0 or higher
- Netscape* Navigator*, version 6.0 or higher
- Mozilla*, version 1.5 or higher
- Mozilla Firefox*

Using a supported browser, enter the following URL to access the Administrator Information page for ZENworks Orchestrator from the server:

```
http://server_name_for_ZENworks_Orchestrator:8001/
```

This URL is the DNS name (or IP address) of the server for ZENworks Orchestrator. Be sure to use Port 8001 in the address to access and display the page, as shown in the following illustration:
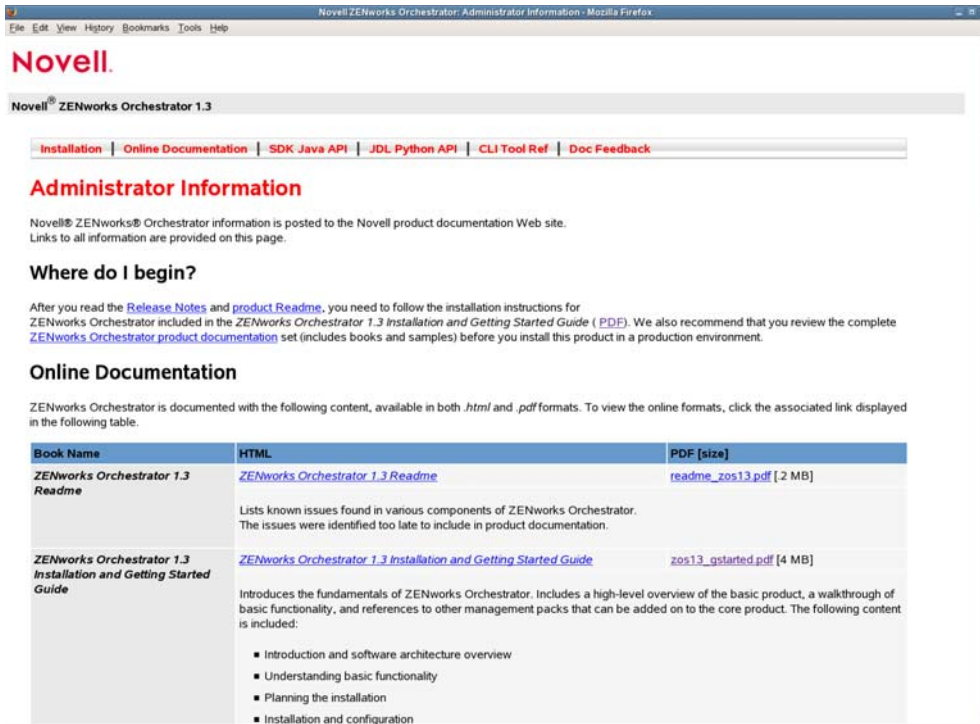
The page includes links to information for ZENworks Orchestrator administrators, including product documentation, Release Notes, and the installers for the console and the agent for ZENworks Orchestrator.

This section includes the following information about installing the Orchestrator Agent and Orchestrator Clients from the Administrator Information page:

- "Installing and Registering the ZENworks Orchestrator Agent" on page 87
- "Installing the Orchestrator Console" on page 89

Installing and Registering the ZENworks Orchestrator Agent

ZENworks Orchestrator requires computing resources in order to run applications. The ZENworks Orchestrator Agent must be installed on each managed device to add that computing resource to the grid where the Orchestrator Server can manage it.

Use the following steps to install the agent on a computing resource:

1 From the managed device desktop, launch a browser to access the Web page for ZENworks Orchestrator, as described in Section 4.3.2, "Installing the Agent and Clients from the Administrator Information Page (Unsupported)," on page 86.

2 Scroll to the *Installation* section of the page:
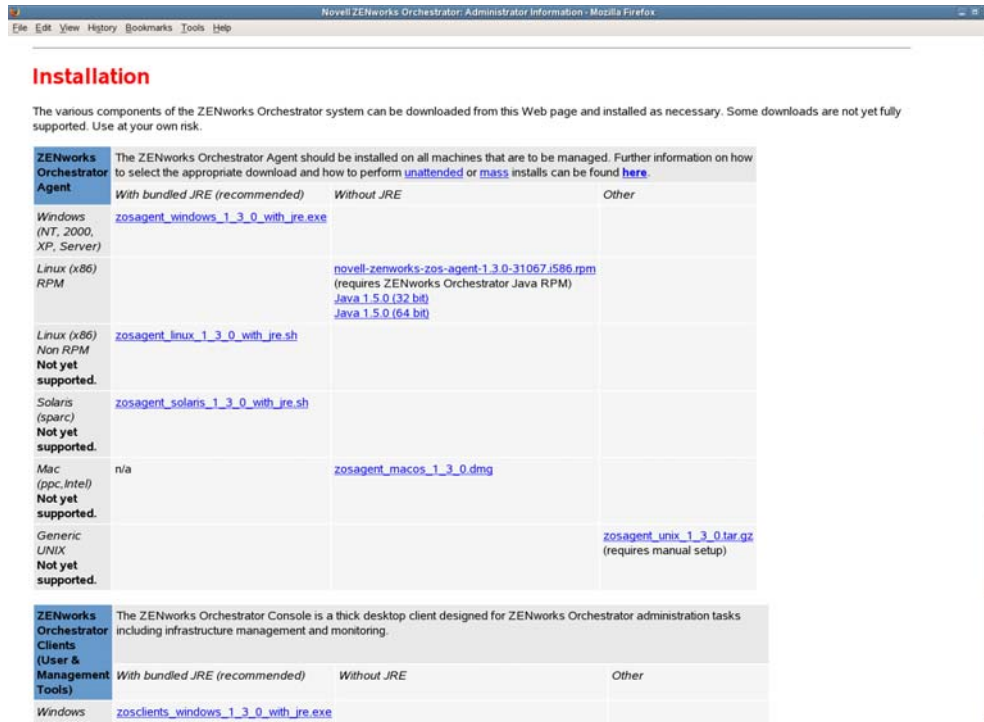
3 In the agent section of the Orchestrator Web page, identify the installer link for the operating system (that is, Windows, Linux, Solaris*, Mac*, Generic UNIX*) of the device where you want to install the agent.

For this release, only the Windows and Linux clients and agents are supported. For more information, see Chapter 3, "Planning the Installation," on page 27.

The ZENworks Orchestrator Agent can be installed with or without Java runtime (JRE*.) The computing resource might already have Java runtime installed, but to ensure that you have a compatible version of Java runtime with the agent, we recommend that you select the installer for both the agent and Java runtime.

Some operating systems for the managed device are not currently supported.

4 Click the installer link to launch the installation wizard to install the agent on the computing resource.

5 Follow the prompts in the wizard until the *Identify ZOS Server* page displays. Here, you need to ensure that you correctly enter *IP_or_hostname_for_ZENworks_Orchestrator_ Server* in the *Server* field.
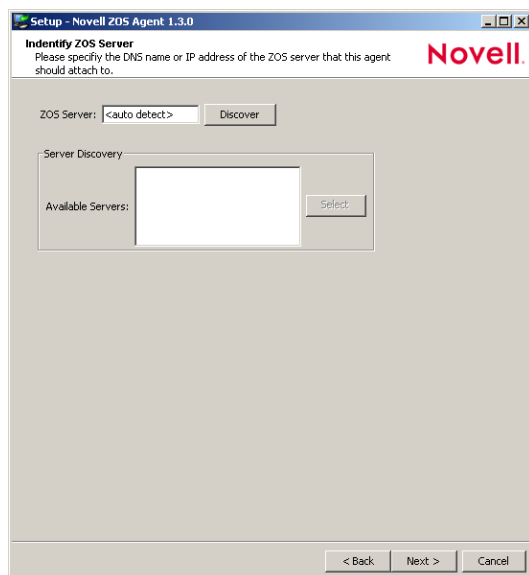
You might find it easier to click *Discover* so that the installer searches for and finds the server for ZENworks Orchestrator on the network.

6 Accept the remaining defaults on the wizard pages to complete the installation of the agent.

7 When the installation is complete, click *Finish* to exit the installer.

Repeat Step 1 through Step 7 for each computing resource you want to add to the grid.

Agents can be automatically installed on multiple computing resources or groups of computing resources using your favorite configuration management software.

Installing the Orchestrator Console

Before you can perform any ZENworks Orchestrator management functions, such as creating user accounts and managing activities of the server, you need to install the console for ZENworks Orchestrator. The console is a thick desktop client designed for administrative tasks including infrastructure management (for example, managing computing resources) and monitoring. You can install the console on the server itself or on another network computer.

1 On the computer where the console is to be installed, launch the ZENworks Orchestrator Administrator Information page. For information about how to do this, see Section 4.3.2, "Installing the Agent and Clients from the Administrator Information Page (Unsupported)," on page 86.

2 Scroll to the *Installation* section of the page:

3 In the clients section of the Web page, identify the installer link for the operating system running on the computing resource.

The ZENworks Orchestrator Console can be installed with or without Java runtime (JRE.) The computing resource might already have Java runtime installed, but to ensure that you have a compatible version of Java runtime with the agent, we recommend that you select the installer for both the console and Java runtime.

If the operating system for the managed device does not have a link available, it is not currently supported. For more information, please contact the Novell Business Partner from whom you purchased ZENworks Orchestrator.

4 Click the installer link to initiate the installation of the console for ZENworks Orchestrator on the computer. Follow the setup wizard for setting up the console.

5 On the *Select Components* page of the setup wizard, select *ZOS Management Console & Tools*.
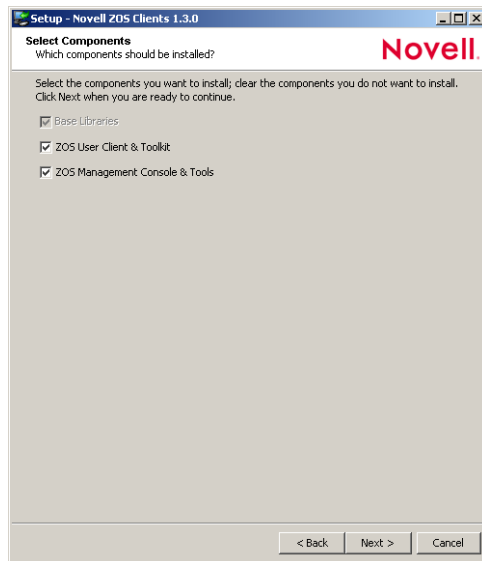
Do not select the *ZOS User Client & Toolkit* check box. ZENworks provides an installed client and an HTML Web client to grid users for creating, submitting, and managing running jobs.

6 Accept the remaining defaults in the setup wizard to complete the console installation.

7 When the wizard completes the installation, click *Finish*.

4.4 Performing a Silent Install of the ZENworks Orchestrator Agent on Multiple Network Resources

In a large data center, it might not be practical to perform an interactive configuration of the Orchestrator Agent on the multiple servers that you intend to use for Orchestrator resources. The information in this section provides information about performing a silent install and configuration under different circumstances:

- Section 4.4.1, "Silent Install and Configuration of the Orchestrator Agent RPM," on page 90
- Section 4.4.2, "Silent Install and Configuration of the Orchestrator Agent for Windows," on page 91

4.4.1 Silent Install and Configuration of the Orchestrator Agent RPM

Use the following process to configure the Orchestrator Agent RPM (downloaded from the product ISO) on multiple servers:

1 Perform the product installation and manual configuration of the agent on a "seed" machine. The processes to do this are described in Section 4.2.1, "Installation and Configuration Steps," on page 40.

2 On the "seed" machine, copy the file found at `/etc/opt/novell/novell_zenworks_orch_install.conf` to a location where you can modify it locally.

3 Edit the local copy of `novell_zenworks_orch_install.conf`, updating the fields that require a password (for security purposes, when a configuration program runs, the passwords in the `.conf` file are wiped).

4 Edit any other fields you may find necessary for the configuration of the Orchestrator Agent.

5 Distribute the modified file to the machine(s) where you want to perform a silent configuration.

6 At the machine where you distributed the `.conf` file, open YaST and perform the Add-on Installation of the RPMs as described in Step 1 through Step 4 in Section 4.2, "Installing and Configuring ZENworks Orchestrator Components," on page 39. Make sure that you do not configure the agent manually.

7 From the bash prompt on the machine where you are configuring the agent, run the following command:

```
/opt/novell/zenworks/orch/bin/config -s -C $CONF_FILE
```

where *CONF_FILE* is the modified configuration file from Step 5, above.

The silent configuration runs, then the agent is displayed in the ZENworks Orchestrator Console as registered with the server node.

4.4.2 Silent Install and Configuration of the Orchestrator Agent for Windows

The Windows Agent installer can be downloaded from the Administrator Information page, as documented in Section 4.3.2, "Installing the Agent and Clients from the Administrator Information Page (Unsupported)," on page 86.

ZENworks Orchestrator includes an installation help page that provides tips for installing the Windows Orchestrator Agent on many machines by using some sort of scripting or automation.

The page is accessed from the Orchestrator Server's IP address:

```
http://IP_address:8001/install.html
```

Figure 4-1 *ZENworks Orchestrator Silent Installation Help for the Windows Agent*
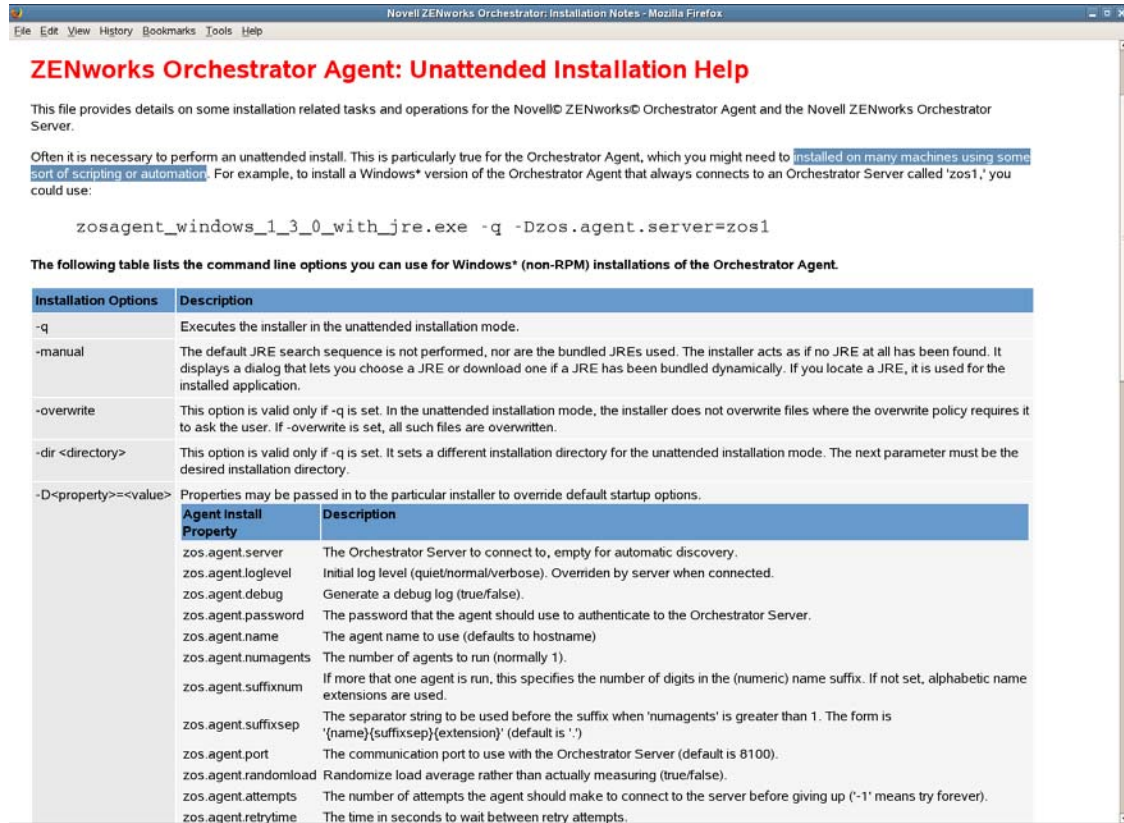
4.5 Installing the ZENworks Orchestrator Agent on VM Hosts and VMs

When you have the Orchestrator Server installed with VM Management, you need to install the ZENworks Orchestrator Agent (Orchestrator Agent) on your VM host machines in order to manage them. The ZENworks Orchestrator Virtual Machine Agent is an extension to the Orchestrator Agent. This allows Orchestrator to identify the VM and differentiate it from a physical machine. You also need to install the Agent on the guest operating systems of the VMs in order to use them as deployable resources for your data center.

4.5.1 Installing the ZENworks Orchestrator Agent on VM Hosts

A VM host machine already has an operating system installed on it as well as a hypervisor (also known as a Virtual Machine Manager or VMM), which allows it to handle and provision VMs. For Orchestrator 1.3, the supported Host operating systems are:

- SLES 10
- SLES 10 with Service Pack 1

- SLES 10 with Service Pack 2
- RHEL 4
- RHEL 5
- Microsoft* Windows Server 2003*

VM Technologies, VM Hosts, and Supported Guest Operating Systems

The operating system must have a Orchestrator-supported hypervisor. The following table represents the supported hypervisors and host operating systems. For a listing of currently supported guest operating systems refer to the host operating system vendor Web site

Table 4-2 *Hypervisors and Supported Host Operating Systems*

Hypervisor	Host Operating System
Xen	SLES 10
	SLES 10 SP 1
	RHEL 5
VMware Server	SLES 10
	SLES 10 SP 1
	RHEL 4
	RHEL 5
	Windows Server 2003
VMware Virtual Center	*Subject to the VMWare support matrix

With the hypervisor installed on one of the supported operating systems, the Orchestrator Server deploys the VMs to the host machine using the hypervisor-associated provisioning adapter to start and use the VMs for jobs. The provisioning adapters allow you to control and migrate the VM. For a detailed explanation of the actions you can perform with a VM through its provisioning adapter, see "Managed VM Actions" in the *Novell ZENworks Orchestrator 1.3 Virtual Machine Management Guide*.

Automatically Installing the Orchestrator Agent on a VM Host

Because Orchestrator jobs are the main focus of the Orchestrator Server, you can write a job to automatically install and configure the Orchestrator Agent on a VM. These jobs may be a script similar to the one found in "Installing the ZENworks Orchestrator Agent on an Apache Virtual Machine" in the *Novell ZENworks Orchestrator 1.3 Virtual Machine Management Guide*. For more information on developing jobs see the *Novell ZENworks Orchestrator 1.3 Developer Guide and Reference*.

Another way to run a quick job for installing the Orchestrator Agent on a VM is to right-click on the VM in the Orchestrator Console tree, and then select *Install Agent*. When the job is finished running, the Agent is installed and configured.

Manually Installing the Orchestrator Agent on a VM Host

The manual installation procedure for the Orchestrator Agent on VM hosts in the data center depends on the operating system installed on the VM host.

The installed Orchestrator Agent components are:

- ◆ `novell-zenworks-monitor-gmond`
- ◆ `novell-zenworks-orch-config`
- ◆ `novell-zenworks-zos-agent`
- ◆ `novell-zenworks-zos-java`

The Orchestrator Agent can be installed only on the following types of VM host operating systems:

- ◆ "SLES 10 VM Host" on page 94
- ◆ "SLES 9 VM Host" on page 95
- ◆ "RHEL 5 VM Host" on page 95
- ◆ "RHEL 4 VM Host" on page 95
- ◆ "Windows VM Host" on page 96

SLES 10 VM Host

In SLES 10 you install the agent from the YaST screen just as you would on a SLES 10 physical machine. The following figure represents a YaST screen as seen when you change to YaST *Patterns*.

Figure 4-2 *YaST Patterns for ZENworks Orchestrator Agent Install*
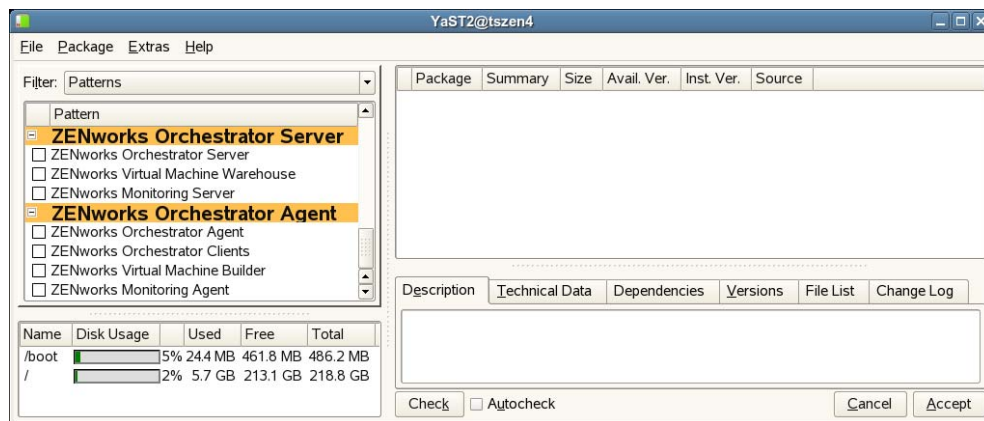
To install the Orchestrator Agent from this screen

1 Click *Computer > YaST*.

2 Change the *Filter* to *Patterns* in the drop-down menu.

3 Scroll down to the section titled *ZENworks Orchestrator Agent*.

4 Select the *ZENworks Orchestrator Agent (For VM Management)* check box. This also selects the *ZENworks Orchestrator Agent*, *ZENworks Orchestrator Clients*, and *ZENworks Monitoring Agent*.

5 Click *Accept* to install the Agent.

SLES 9 VM Host

To install the four packages of the Orchestrator Agent on SLES 9:

1 Download the pertinent 32-bit or 64-bit Add-On ISO from the DVD.

2 Mount the ISO as a loopback device.

If you are mounting a 64-bit ISO the command is:

```
$ mount -o loop zenworks_orch-1.3.x86_64.iso /mntf
```

3 Change your working directory to the location of the SLES 9 package:

```
$ cd /mnt/SLES9
```

4 Use the `rpm` command to install the packages:

```
$ rpm -Uvh *.rpm
```

5 Use the `up2date` command to download and install missing dependencies if any are present.

For example, if you are missing `libcap.so` and `libcap.so.1`, you would enter:

```
$ up2date --solvedeps=libcap.so, libcap.so.1
```

6 Run the configuration script:

```
$ /opt/novell/zenworks/orch/bin/config
```

RHEL 5 VM Host

To install the four packages of the Orchestrator Agent on RHEL 5:

1 Download the pertinent 32-bit or 64-bit Add-On ISO from the DVD.

2 Mount the ISO as a loopback device.

If you are mounting a 64 bit ISO, the command is:

```
$ mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

3 Change your working directory to the location of the RHEL package:

```
$ cd /mnt/RHEL5
```

4 Use the package manager included in RHEL to install the Orchestrator Agent packages.
(Missing dependencies are met by using RHN):

```
$ yum localinstall *.rpm
```

5 Run the configuration script:

```
$ /opt/novell/zenworks/orch/bin/config
```

RHEL 4 VM Host

To install the four packages of the Orchestrator Agent on RHEL 4:

1 Download the pertinent 32-bit or 64-bit Add-On ISO from the DVD.

2 Mount the ISO as a loopback device.

If you are mounting a 64 bit ISO, the command is:

```
$ mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

3 Change your working directory to the location of the RHEL package:

```
$ cd /mnt/RHEL4
```

4 Use the `rpm` command to install the packages:

```
$ rpm -Uvh *.rpm
```

5 Use the up2date command to download and install missing dependencies if any are present.

For example, if you are missing `libcap.so` and `libcap.so.1`, you would enter:

```
$ up2date --solvedeps=libcap.so, libcap.so.1
```

6 Run the configuration script:

```
$ /opt/novell/zenworks/orch/bin/config
```

Windows VM Host

To install the Orchestrator Agent on Microsoft Windows 2003 Server:

1 Download the pertinent 32-bit or 64-bit Add-On ISO from the DVD.

2 Create a CD from the ISO or use ISO Buster (or a similar tool) to mount the CD.

3 Browse to the Windows 2003 folder for the Orchestrator Agent.

4 Double-click the Orchestrator Agent icon and follow the wizard through the setup.

4.5.2 Installing the Orchestrator Agent on VMs

In order to be able to use a VM as a Resource for the Orchestrator Server, you must also install the Orchestrator Agent on the VM with other installed applications. The Orchestrator Server manages and provisions VMs without the Orchestrator Agent, but is unable to levy them as Resources. This can be done as an automated job or manually.

Automatically Installing the Orchestrator Agent on a VM

To install the Orchestrator Agent on a VM, right-click on a shut down VM and select *Install Agent*. This launches a job that starts the VM and installs the Orchestrator Agent and the ZENworks Orchestrator Virtual Machine Agent. This will install when the VM launches again.

Another way to install the Orchestrator Agent as an automated job is to write a Orchestrator script similar to the one found in "Installing the ZENworks Orchestrator Agent on an Apache Virtual Machine" in the *Novell ZENworks Orchestrator 1.3 Virtual Machine Management Guide*.

Manually Installing the ZENworks Orchestrator Agent on a VM

The manual installation procedure for the Orchestrator Agent on the existing or deployed VMs in the data center depends on the guest operating system on the VM.

The installed Orchestrator Agent components are:

 * `novell-zenworks-monitor-gmond`
 * `novell-zenworks-orch-config`
 * `novell-zenworks-zos-agent`
 * `novell-zenworks-zos-java`

The Orchestrator Agent can only be installed on the following types of VM guest operating systems:

SLES 10 VM

In SLES 10 you install the agent from the YaST screen just as you would on a SLES 10 physical machine. The following figure represents a YaST screen as seen when you change to YaST *Patterns*.

Figure 4-3   *YaST2 Patterns for Installing ZENworks Orchestrator*
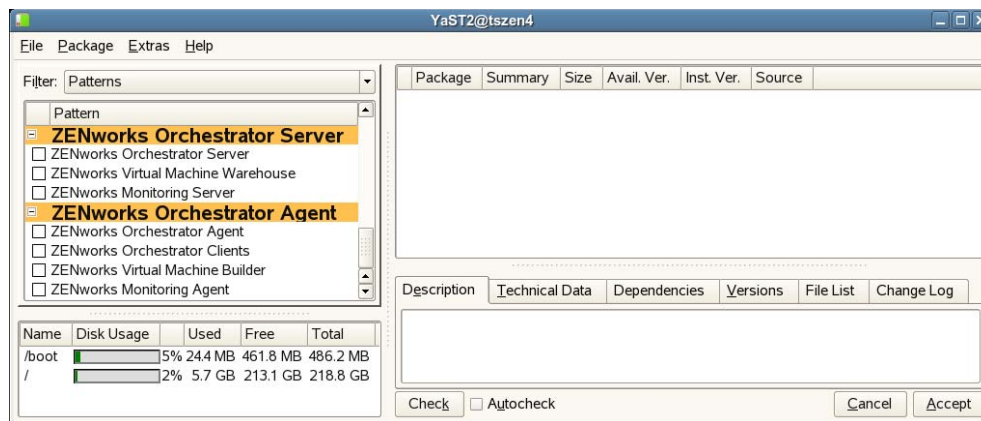
To install the Orchestrator Agent from this screen

1 Click *Computer > YaST*.

2 Change the *Filter* to *Patterns* in the drop-down menu.

3 Scroll down to the section titled *ZENworks Orchestrator Agent*.

4 Select the *ZENworks Orchestrator Agent* check box.

5 Click *Accept* to install the Agent.

SLES 9 VM

To install the four packages of the Orchestrator Agent on SLES 9:

1 Download the pertinent 32-bit or 64-bit Add-On ISO from the DVD.

2 Mount the ISO as a loopback device.

If you are mounting a 64-bit ISO the command is:

```
$ mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

3 Change your working directory to the location of the SLES 9 package:

```
$ cd /mnt/SLES9
```

4 Use the `rpm` command to install the packages:

```
$ rpm -Uvh *.rpm
```

5 Use the `up2date` command to download and install missing dependencies if any are present.

For example, if you are missing `libcap.so` and `libcap.so.1`, you would enter:

```
$ up2date --solvedeps=libcap.so, libcap.so.1
```

6 Run the configuration script:

```
$ /opt/novell/zenworks/orch/bin/config
```

RHEL 5 VM

To install the four packages of the Orchestrator Agent on RHEL 5:

1 Download the pertinent 32-bit or 64-bit Add-On ISO from the DVD.

2 Mount the ISO as a loopback device.

If you are mounting a 64 bit ISO, the command is:

```
$ mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

3 Change your working directory to the location of the RHEL package:

```
$ cd /mnt/RHEL5
```

4 Use the package manager included in RHEL to install the Orchestrator Agent packages. (Missing dependencies are met by using RHN):

```
$ yum localinstall *.rpm
```

5 Run the configuration script:

```
$ /opt/novell/zenworks/orch/bin/config
```

RHEL 4 VM

To install the four packages of the Orchestrator Agent on RHEL:

1 Download the pertinent 32-bit or 64-bit Add-On ISO from the DVD.

2 Mount the ISO as a loopback device.

If you are mounting a 64 bit ISO, the command is:

```
$ mount -o loop zenworks_orch-1.3.x86_64.iso /mnt
```

3 Change your working directory to the location of the RHEL package:

```
$ cd /mnt/RHEL4
```

4 Use the `rpm` command to install the packages:

```
$ rpm -Uvh *.rpm
```

5 Use the up2date command to download and install missing dependencies if any are present.

For example, if you are missing `libcap.so` and `libcap.so.1`, you would enter:

```
$ up2date --solvedeps=libcap.so, libcap.so.1
```

6 Run the configuration script:

```
$ /opt/novell/zenworks/orch/bin/config
```

Windows VM

To install the Orchestrator Agent on Microsoft Windows 2003 Server:

1 Download the pertinent 32-bit or 64-bit Add-On ISO from the DVD.
2 Create a CD from the ISO or use ISO Buster (or a similar tool) to mount the CD.
3 Browse to the Windows 2003 folder for the Orchestrator Agent.
4 Double-click the Orchestrator Agent icon and follow the wizard through the setup.

4.5.3 Configuring the Orchestrator Agent

After installation, you need to configure the Orchestrator Agent on the virtual machine in order to point it to the Orchestrator Server. To configure the Orchestrator Agent, run the configuration script or the GUI Configuration Wizard. See Table 4-1 on page 53 for an explanation of the configuration for the Orchestrator Agent.

4.6 Installing the VM Management Console

The VM Management Console is installed separately from ZENworks Orchestrator on your Linux or Windows administration machines.

The VM Management Console is an Eclipse-based rich client environment designed to allow you to use the VM Builder, VM Warehouse, and ZENworks Orchestrator Monitoring.

- Section 4.6.1, "Installation Minimum Requirements," on page 99
- Section 4.6.2, "Installing the VM Management Console in a Linux Environment," on page 100
- Section 4.6.3, "Installing the VM Management Console on a Windows Operating System," on page 103

For information on setting up VM Management after installing the ZENworks VM Management console, see "VM Management Setup and Tutorial" in the *Novell ZENworks Orchestrator 1.3 Virtual Machine Management Guide*.

4.6.1 Installation Minimum Requirements

The following table contains a list of operating system, hardware requirements, and install file paths for the VM Management console. The installation file is found in the ISO in the indicated folder.

Table 4-3 *Installation Constraints*

Operating System	Recommended Hardware	Install File
SLED 10, SLES 10, SLES 10 SP1, SLES 10 SP2	◆ i386 (32-bit) ◆ 257 MB of free space	*cdrom_drive*/SLE10/nvmminst
Windows Server 2003	◆ i386 (32-bit) ◆ 240 MB of free space	*cdrom_drive*\Windows2003\nvmminst.exe

Operating System	Recommended Hardware	Install File
Windows XP	◆ i386 (32-bit) ◆ 240 MB of free space	`cdrom_drive\WindowsXP\nvmminst.exe`

NOTE: When you install the Xen kernel, make sure you install the `kernel-xenpae` to ensure that Xen VMs can be used on any 32-bit or 64-bit operating system.

4.6.2 Installing the VM Management Console in a Linux Environment

After installing the ZENworks Orchestrator Server, you need to run the InstallAnywhere* script contained on the CD in the `/i386/SLE10` directory to install the VM Management console. You can do this on the Orchestrator Server, or on another Linux device.

For sources of the installation software, see "VM Management Installation Sources" in the *Novell ZENworks Orchestrator 1.3 Virtual Machine Management Guide*.

To install the console:

1 Open a terminal and log in as `root`.

2 Find the `nvmminst` file on the DVD in the `SLE10` directory.

3 Mount the `SLE10` directory to a temporary mount point.

4 From the `SLE10` directory, enter `./nvmminst` to launch the installer.

5 Click *Next* as necessary to proceed past the introduction and license agreement pages.

6 Choose your VM Management installation directory.
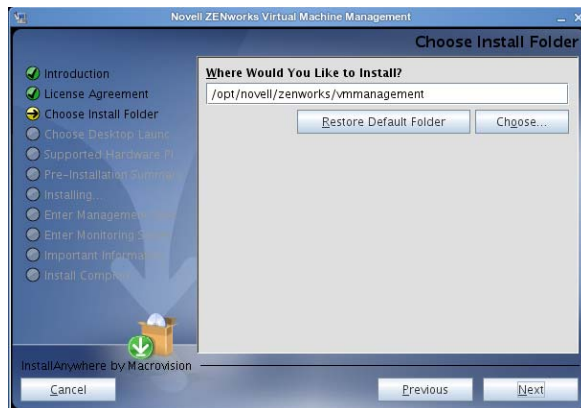
You can only install to the default location shown above if you are authenticated as root.

7 Click *Next* to continue to the Choose Desktop Launcher Folder page:
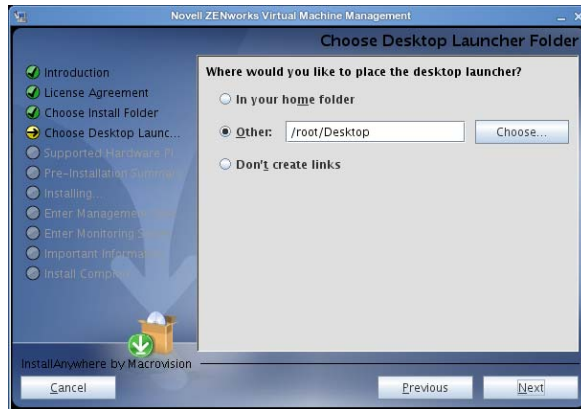
8 Select where to install a launcher icon, then click *Next* to continue to the Supported Hardware Platforms page:
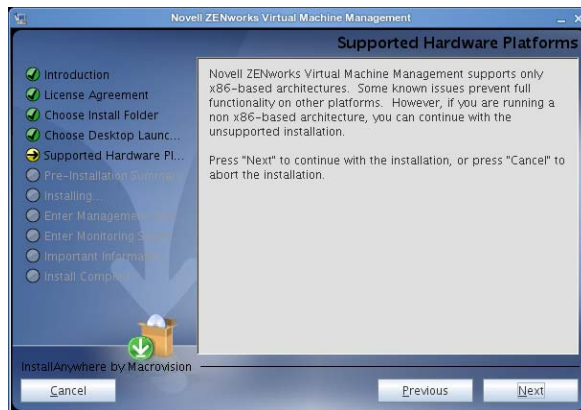
9 If your target machine is supported, click *Next* to continue to the Pre-Installation Summary page:
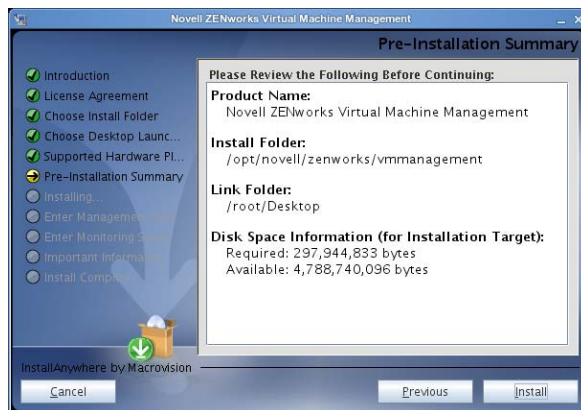
10 Verify the information, then click *Install* to begin the installation.
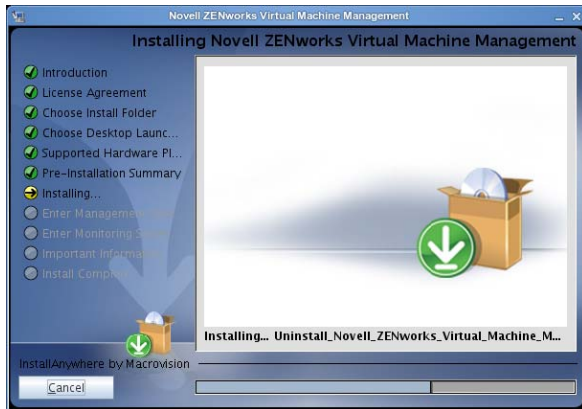
11 When the Enter Management Server Information page is displayed, specify the URL or name of the server and your username for the VM Management Server you wish to connect to, then enter `root` for the login name.
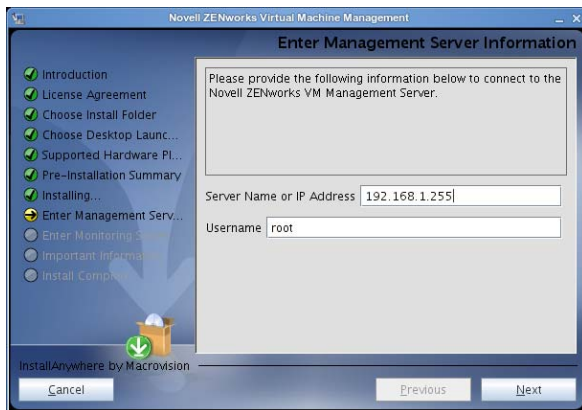
This is the identity of the VM Warehouse/Builder Server. If you installed it to a different server than the Orchestrator Server, be sure to provide the correct server ID. For example, the VM Warehouse/Builder Server's IP address, not the Orchestrator Server's IP address.

The root login is required because this connects to the CIM service, which communicates with the ZENworks Orchestrator Server.

12 Click *Next* to display the Enter Monitoring Server Information page:
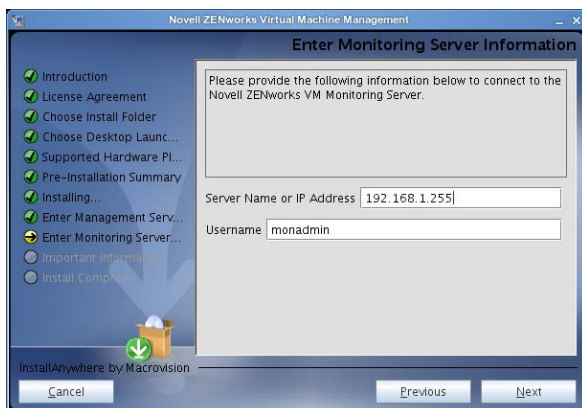
IMPORTANT: This page is displayed very quickly, is very similar to the Enter Management Server Information page, and populates the same field information that you entered in the previous page. Be sure to change the *Username* field before clicking *Next* again. Also, if the Monitoring Server is different from the VM Warehouse/Builder Server, be sure to make that server change.

Provide the URL or name of the server for the Monitoring Server you wish to connect to, then enter the Monitoring Server login name that you created when installing the Monitoring Server pattern.

This might be different than your Orchestrator Server or VM Warehouse/Builder Server.

13 Click *Next* to display the Important Information page:
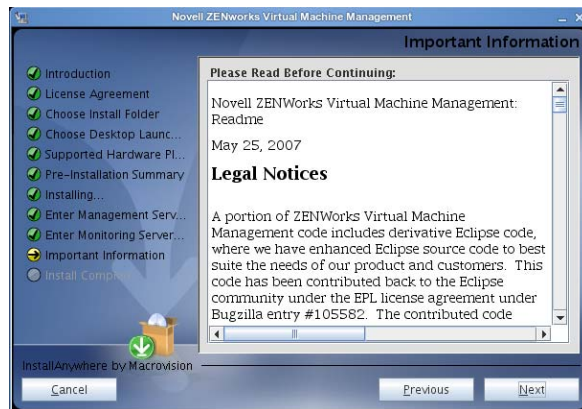
14 Click *Next* to display the Install Complete page:
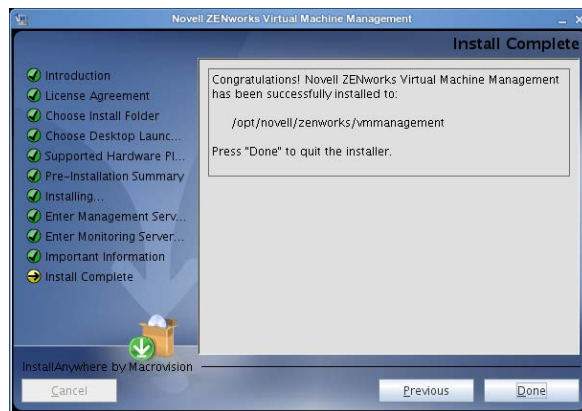
15 Click *Done* to finish the installation.

4.6.3 Installing the VM Management Console on a Windows Operating System

You can install and run the VM Management console on a Windows Server 2003 or Windows XP machine and build VMs using the VM Builder, as well as manage the VM Warehouse and monitor your managed nodes. A Windows machine cannot be the Orchestrator Server.

For sources of the installation software, see "VM Management Installation Sources" in the *Novell ZENworks Orchestrator 1.3 Virtual Machine Management Guide*.

NOTE: These installation steps apply only to Windows Server 2003 and Windows XP.

1 Copy the `nvmminst.exe` file from the \Windows2003 or \Windows XP folder (depending on which operating system you are using) to a location on your target Windows machine.

2 Double-click the `nvmminst.exe` file to start the installation program.

3 Click *Next* on the introduction page.

4 Read and agree to abide by the terms of the license agreement, then click *Next* to display the Choose Install Folder page:
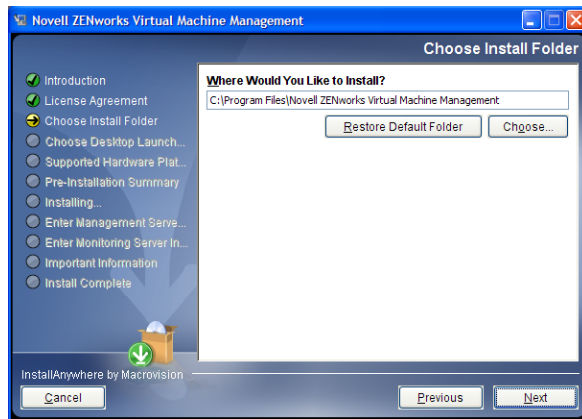
5 Select your installation folder, then click *Next* to display the Choose Desktop Launcher Folder page:
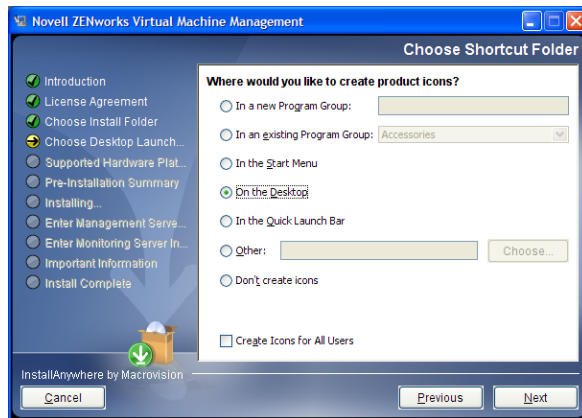
6 Select a shortcut folder and any other options and groupings you want for the control of this console, then click *Next* to display the Supported Hardware Platforms page:
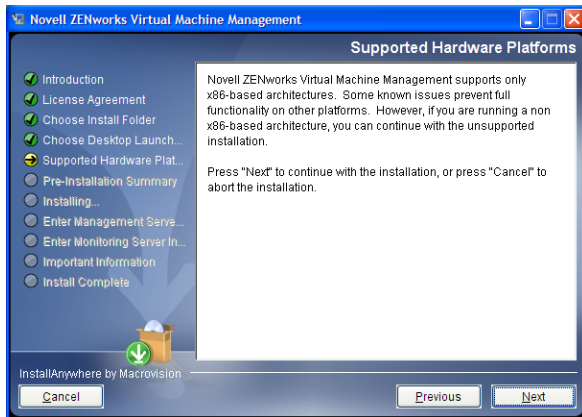
7 Click *Next* to display the Pre-Installation Summary page:
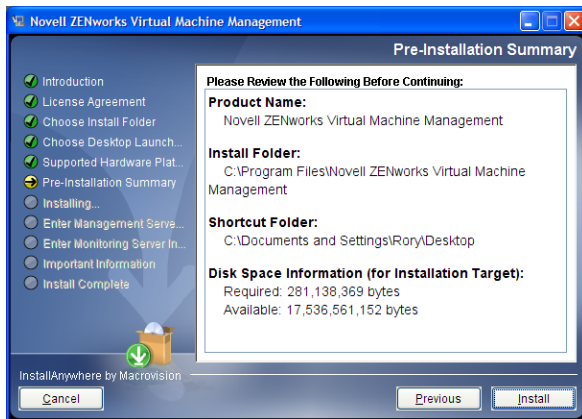
8 Verify the information, then click *Install* to being the installation.
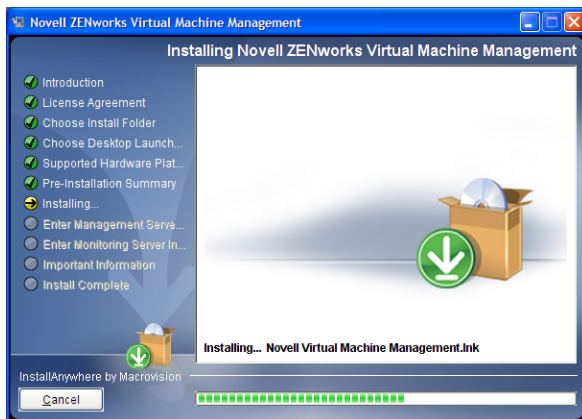
9 When the Enter Management Server Information page is displayed, specify the VM Management Server URL, then enter `root` for the login name.
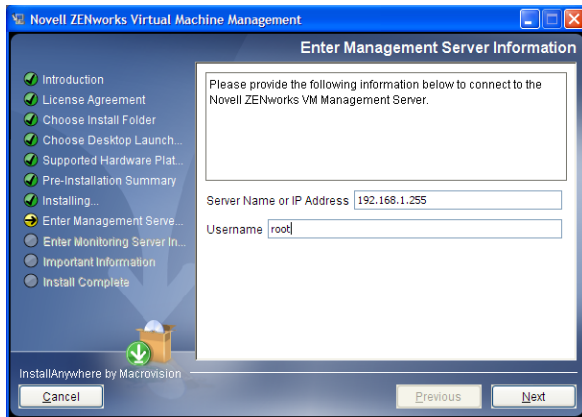
This is the identity of the VM Warehouse/Builder Server. If you installed it to a different server than the Orchestrator Server, be sure to provide the correct server ID. For example, the VM Warehouse/Builder Server's IP address, not the Orchestrator Server's IP address.

The root login is required because this connects to the CIM service, which communicates with the ZENworks Orchestrator Server.

10 Click *Next* to display the Enter Monitoring Server Information page:
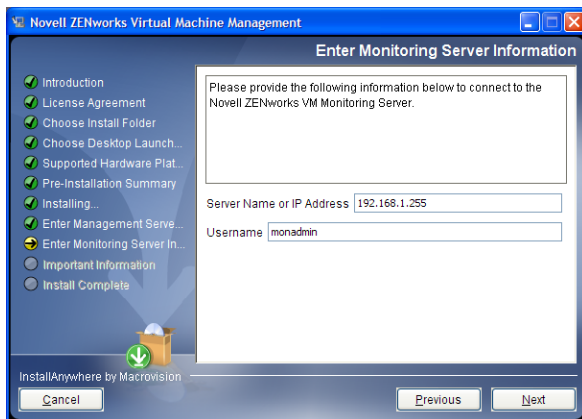
Specify the VM Management Monitoring Server URL and the Monitoring Server login name that you created when installing the Monitoring Server pattern.

This might be different than your Orchestrator Server or VM Warehouse/Builder Server.

11 Click *Next* to display the Important Information page:
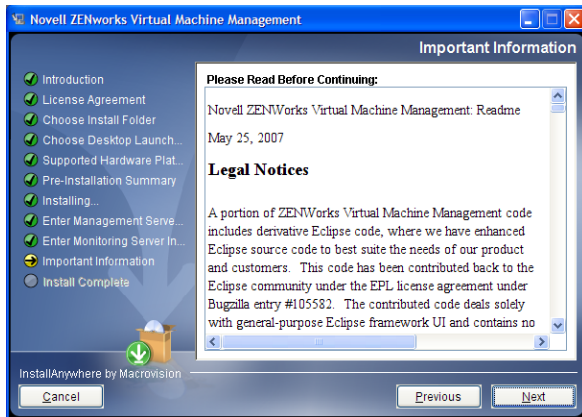
12 Click *Next* to display the Install Complete page:
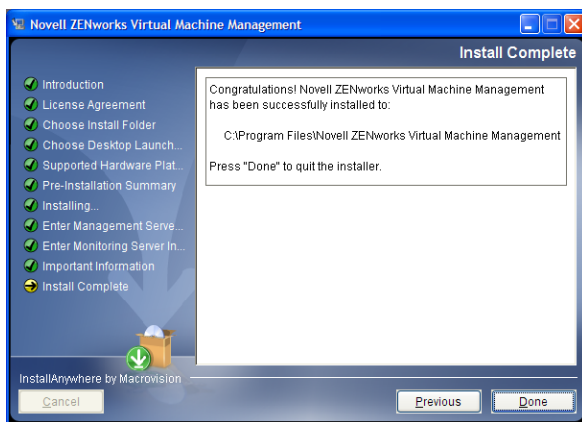
13 Click *Done* to finish the installation.

4.7 Determining the Product Version

ZENworks Orchestrator is a product made up of many components, which you saw and chose whether to install when you first installed the product. If you are new to ZENworks Orchestrator, if you need to determine component compatibility, or if you need to confer with Novell Support, it is useful to know how to obtain the version number of the different components.

One way to determine which version of the Orchestrator RPM packages you have installed is to use the following command on the machine where an Orchestrator component is installed:

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

The table below provides additional methods you can use to determine the version number for Orchestrator components.

Table 4-4 *How to Determine Component Version Number in ZENworks Orchestrator*

Component	How to Determine Version Number
Orchestrator Server	At the Orchestrator Console Explorer view, select the grid object, then open the Info/Configuration page of the workspace panel. The version number is listed in the *Server Version* field.
	Advanced Orchestrator users can also find the version value in the `matrix.version` fact.
Orchestrator Agent	After the agent is registered at the Orchestrator Console Explorer view, select its resource object listed under *Resources*, then open the Info/Groups page of the workspace panel. On the Info/Groups page, select *Agent Information*. The version number is listed in the *Agent Version* field.
	Advanced Orchestrator users can also find the version value in the `resources.agent.version` fact.
Orchestrator Console	At the console, click *Help > About ZENworks Orchestrator Console*.
	Console version number and license expiration date is listed on the About ZENworks Orchestrator dialog box.
Command Line Tools (zos, zosadmin)	No method is currently available.
VM Builder	Version information is displayed in the VM Management Console.
VM Warehouse	Version information is displayed in the VM Management Console.
VM Management Console	Version information is displayed in the VM Management Console (Client).

ZENworks Monitoring Server	On the command line of the machine where the Monitoring Server is running, enter (at `/opt/novell/zenworks/monitor/sbin`) the following command:
	
	`gmetad -V`
	
	`gmetad -- version`

ZENworks Monitoring Agent	On the command line of the machine where the agent is running, enter (at `/opt/novell/zenworks/monitor/sbin`) the following command:
	
	`gmond -V`
	
	`gmond -- version`

First Use of Basic ZENworks Orchestrator Components

5

After you install and configure basic Novell® ZENworks® Orchestrator components (that is, the ZENworks Orchestrator Server, the ZENworks Orchestrator Agent, and the ZENworks Orchestrator Clients), you will want to see them at work. The information in this section is organized sequentially (that is, in a "walkthrough" scenario) so that you can follow the process an administrator might use to begin applying ZENworks Orchestrator capabilities in a production environment.

The first three subsections listed above are basic tasks you need to perform to make the Orchestrator system perform at a basic level. The other sections include information to help you understand how the Orchestrator system can work in your production environment.

For information about the first use of ZENworks Virtual Machine Management components, see "VM Management Setup and Tutorial" in the *Novell ZENworks Orchestrator 1.3 Virtual Machine Management Guide*.

5.1 Walkthrough: Launch the ZENworks Orchestrator Console

This section assumes that you have installed all of the basic ZENworks Orchestrator components, including the ZENworks Orchestrator Server (Orchestrator Server), the ZENworks Orchestrator Agent (Orchestrator Agent), and the ZENworks Orchestrator Clients (Orchestrator Clients). For more information about installation, see Chapter 4, "Installation and Configuration," on page 39.

The installation of the Orchestrator Clients actually installs four separate subcomponents: the ZENworks Orchestrator Console, the zos command line interface, the zosadmin command line interface, and the Java SDK (toolkit) for ZENworks Orchestrator. The console and the command line interfaces (CLIs) constitute the clients for the product. Using them, you can troubleshoot, initiate, change, or shut down server functions for ZENworks Orchestrator and its computing resources.

Those who use console are the job developer, who uses the tools in the console to create and debug jobs, and the Orchestrator administrator (sometimes called the grid administrator), who oversees job deployment and overall Orchestrator usage.

To launch the console:

1 Navigate to the location where the console was installed.

  ◆ **SLES 10 SP1 or SP2:** Change to the following directory:

    /opt/novell/zenworks/zos/server/bin

  ◆ **Windows:** In the *Start* menu, click *Programs > Novell > ZOS > Clients*.

2 Launch the console.

  ◆ **SLES 10 SP1 or SP2:** Use the following command to launch the console:

    ./zoc

  ◆ **Windows:** In the *Start* menu, click *Programs > Novell > ZOS > Clients* submenu, click *ZOS Management Console*.

When the console is launched, it broadcasts throughout the network to discover all of the Orchestrator Servers that have been previously installed. The server or servers are displayed at the root of the Explorer panel in the console.

Figure 5-1 *ZENworks Orchestrator Console After First Launch*
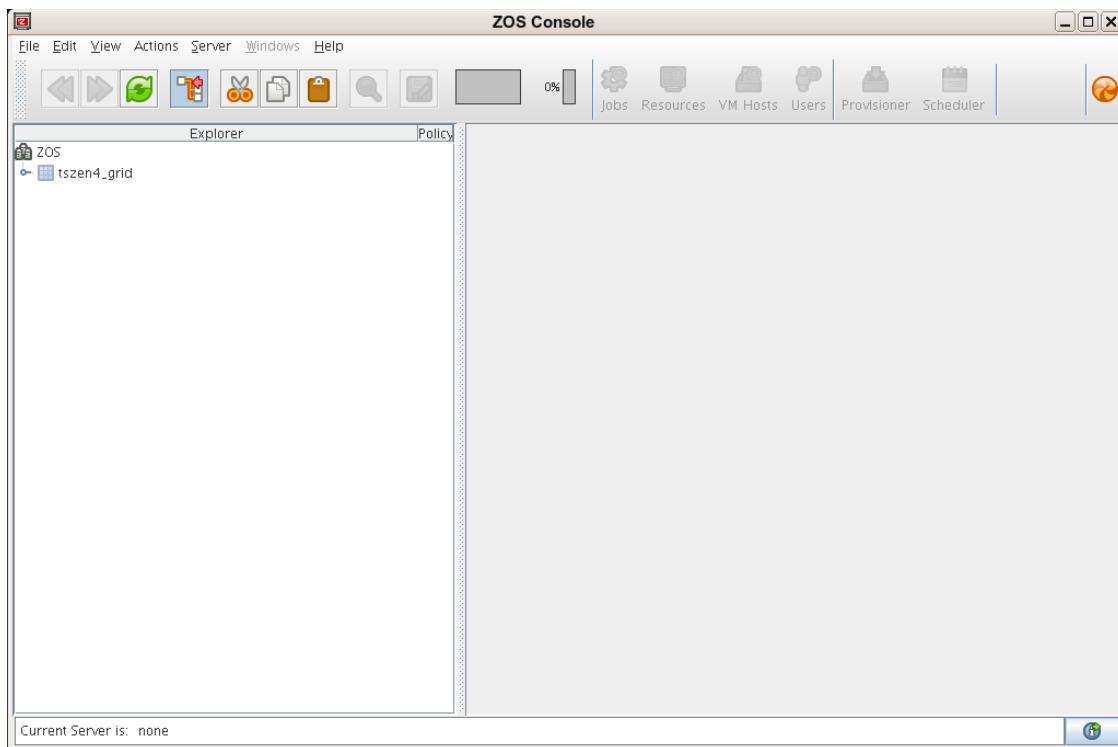
NOTE: Orchestrator Server discovery by the console might not find and display Orchestrator Servers that are installed on virtual machines; the console can only discover servers on a broadcast-capable network.

To begin using the console, you first need to log in to an Orchestrator Server. To understand and continue with the server login process, see Section 5.2, "Walkthrough: Log in to the ZENworks Orchestrator Server," on page 111.

5.2 Walkthrough: Log in to the ZENworks Orchestrator Server

Before you can perform any administrator functions, you need to log in to the Orchestrator Server to establish your credentials as an authorized administrator. The information in this sections explains three methods for logging in to the server.

- ◆ Section 5.2.1, "Log In by Using the Explorer," on page 111
- ◆ Section 5.2.2, "Log In Explicitly to a Named Server," on page 111
- ◆ Section 5.2.3, "Log In As Default," on page 112

When you have logged in to the Orchestrator Server, you can create accounts for the computing resources that will eventually run computing jobs. To understand how resource accounts are created, see Section 5.3, "Walkthrough: Create a Resource Account," on page 114.

5.2.1 Log In by Using the Explorer

If the Orchestrator grid you created during the install is displayed in the Explorer panel, the Orchestrator Server that services it is available for authentication. The grid cannot be expanded and navigated until you log in to the Orchestrator Server in that grid.

1 In the Explorer panel of the ZENworks Orchestrator Console, click the grid name to launch a server login dialog box.
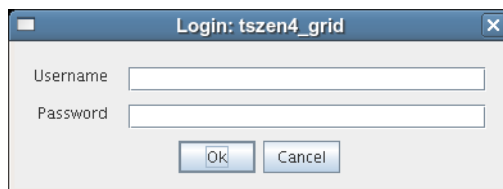
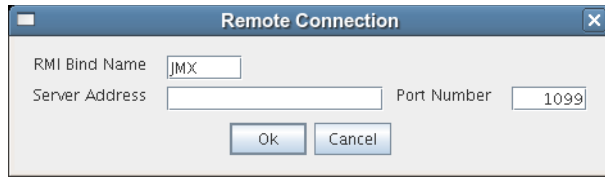**2** In the dialog box, enter the Administrator user name and password that you supplied when you installed the server.

5.2.2 Log In Explicitly to a Named Server

If you are not operating in a broadcast-capable network and you have installed the Orchestrator Clients on a machine with a different subnet from the server, ZENworks Orchestrator might not be able to discover your Orchestrator Server. If this is the case, you will have to log in explicitly to the server you are looking for. Use the following steps to log in explicitly to a named server.

1 From the Orchestrator Console, click *Server,* then click *Login* to display the Remote Connection dialog box.

ZENworks Orchestrator supports multiple servers on the same network.

This login option allows you to select the server before you enter the administrator name and password.

2 In the dialog box, specify the IP address of the Orchestrator Server in the *Server Address* field, then click *OK* to display the login dialog box.
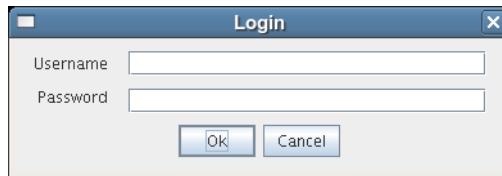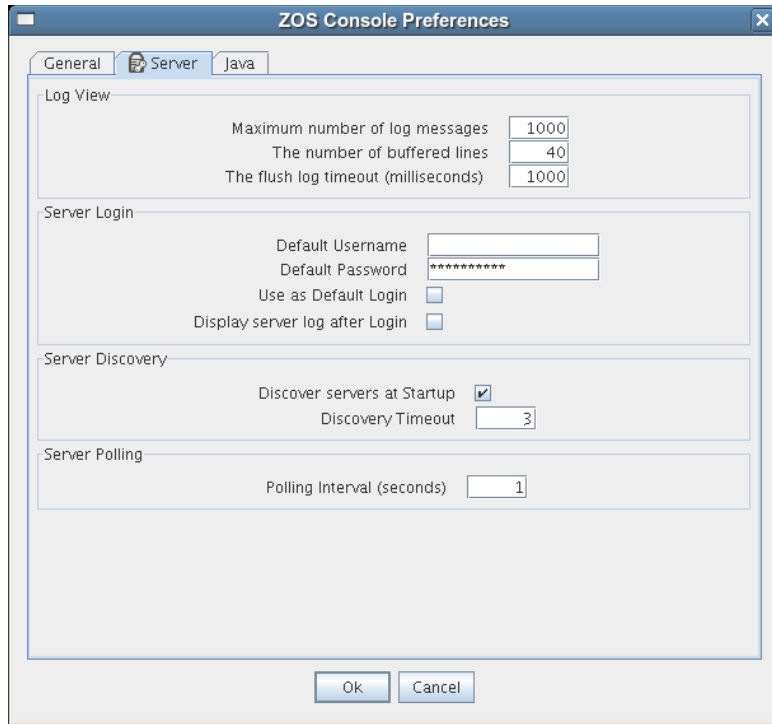

3 Specify the administrator name (created during the install) in the *Username* field, specify the administrator password in the *Password* field, then click *OK* to log in to the server.

5.2.3 Log In As Default

If you want to save time during login, you can set a login preference to prepopulate the administrator username and password. Use the following steps to set the preference and log in as default.

1 From the console, click *Edit*, then click *Preferences* to display the Orchestrator Console Preferences dialog box.

2 In this dialog box, click the *Server* tab to display the Server page.

3 In the *Server Login* section of the page, specify the administrator username in the *Default Username* field, then specify the administrator password in the *Default Password* field.

4 Select the *Use as Default Login* check box, then click *OK*.

The next time you log in, either to an explicit, named server or by exploring the Orchestrator grid, the default login dialog box is displayed.

Figure 5-2 *Default Login Dialog Box*
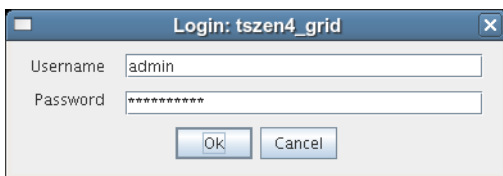
If the default user you provided as a preference is still accurate, you can simply click *OK* to log in.

TIP: If you re-install ZENworks Orchestrator and specify a new administrator username and password, that information is not displayed in the default login unless you change the login preferences. The information you provided in the earlier install and established as the default is retained as a cached file in the user directory until overwritten with new default preferences.

5.3 Walkthrough: Create a Resource Account

After being installed on a computing node, having its credentials defined, and associating itself with the computing node, the Orchestrator Agent begins broadcasting the availability of its host as a potential computing resource. Before the Orchestrator Server can allow an agent to authenticate and establish ongoing communication, you need to create a resource account for the agent on the Orchestrator Server. When this account is created or "registered," the agent's host node can be discovered and recognized as a computing resource that can perform the jobs assigned to it.

It is also possible to create a resource account for an agent before that agent is actually installed on a computing node.You can also create a resource account on the Orchestrator Server and have it waiting in an offline state in anticipation of agent installation and login.

This section includes the information you need to create a resource account on the Orchestrator Server:

When resources are created, connected to the Orchestrator Server and online, you will see some jobs deploy and run on their own. For more information, see

5.3.1 Open the Resources Monitor

Now that you have installed a Orchestrator Server and launched the ZENworks Orchestrator Console, you can begin to create resource accounts.

1 Open the ZENworks Orchestrator Console and click *Resources* to open the Resources Monitor in the Workspace panel of the console.
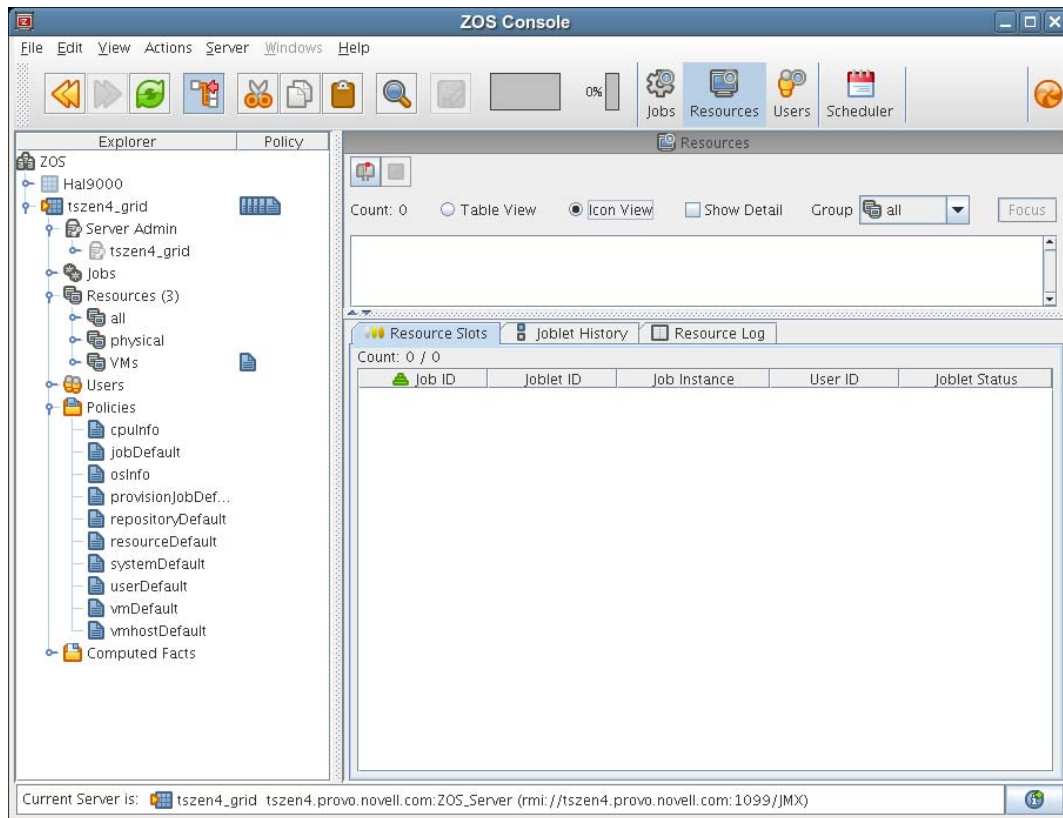
From this monitor, you can see the resources that are connected to the server and what they are doing in the grid.

If an agent is installed but has not been registered (that is, no account is created for it), it attempts a server login every 90 seconds. If this is the case (as in the figure above), the Resource Registration icon has a "flag up" ⬛ status, meaning that an agent is waiting to register. If the icon has a "flag down" ⬛ status, either no Orchestrator Agents have been installed in the network or all active agents are logged in, so none are waiting to register.

You can use the console to register a resource automatically (see "Automatically Register a Resource" on page 116) or to register a resource manually (see "Manually Register a Resource" on page 116). If you choose to, you can also select which agents can log in to create accounts (see Section 5.3.4, "Select a Resource for Manual Registration," on page 120).

The Resources Monitor has many features to help you manage resources when they are registered, including the jobs and joblets assigned to individual resources. For more detailed information about the Resources Monitor, see "Monitoring Server Resources" in the *Novell ZENworks Orchestrator 1.3 Administration Guide*.

5.3.2 Automatically Register a Resource

If your network environment does not require a high level of security (such as in a development and testing environment) and you want a quick way to create a resource account, you can do so at the console.

1 In the ZENworks Orchestrator console, select the grid object in the Explorer panel to open the *Info/Configuration* page of the grid object.

2 In the *Object Registration* section of the page, select the *Auto Register Resources* check box. The setting is saved automatically.
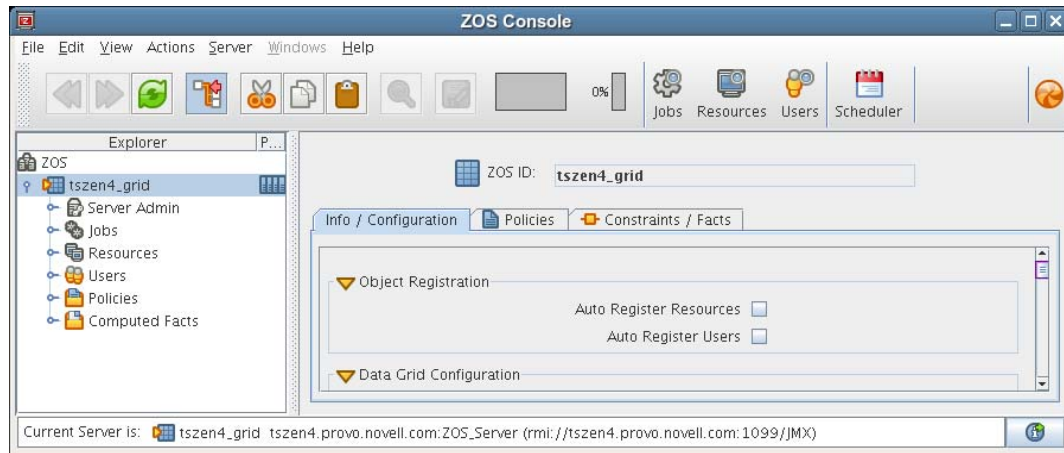
The resource object is created and registered in ZENworks Orchestrator, although offline (the object is dimmed in the tree of the Explorer panel) until it the agent tries to log in.

The next time the agent tries to log in, it is automatically authenticated and ZENworks Orchestrator creates a a new resource account.

When the resource is online, the Resources Monitor displays a labeled box representing the registered agent. This box includes information about the agent, including the number of available slots it has and a status color indicating its state of readiness for Orchestrator jobs.
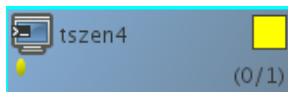
The status color window can be white (inactive), yellow (available for use), or red (in use). If the color changes from yellow to red, a job is running on this resource. To find out what kind of job is running, you can click the *Jobs* monitor button on the toolbar.

5.3.3 Manually Register a Resource

If you want a higher level of security between the agent and the server, you can manually create a resource account in the console before the Orchestrator Agent is installed. This section walks through both stages of the procedure.

- ◆ "Use the Console to Create a Resource Account" on page 117
- ◆ "Install an Orchestrator Agent to Match the New Resource" on page 118

Use the Console to Create a Resource Account

Use the following steps to create a resource object in the ZENworks Orchestrator Console.

1 Make sure that the *Auto Register Resources* check box on the grid object's *Info/Configuration* page is not selected (see).

2 (Optional) Create a new resource from the Explorer panel in the console.

  2a In the Explorer panel in the console, right-click *Resources*, then click *New Resource* to display the Create a new Resource dialog box.
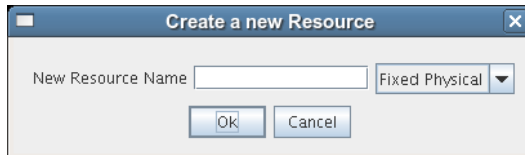
  2b Specify the name of the new resource you want to create in the *New Resource Name* field, then click *OK*.

3 (Optional) Create a new resource from the Main Menu in the console.

  3a In the console, click *Actions* > click *Create Resource* to display the an expanded version of the Create a new Resource dialog box.
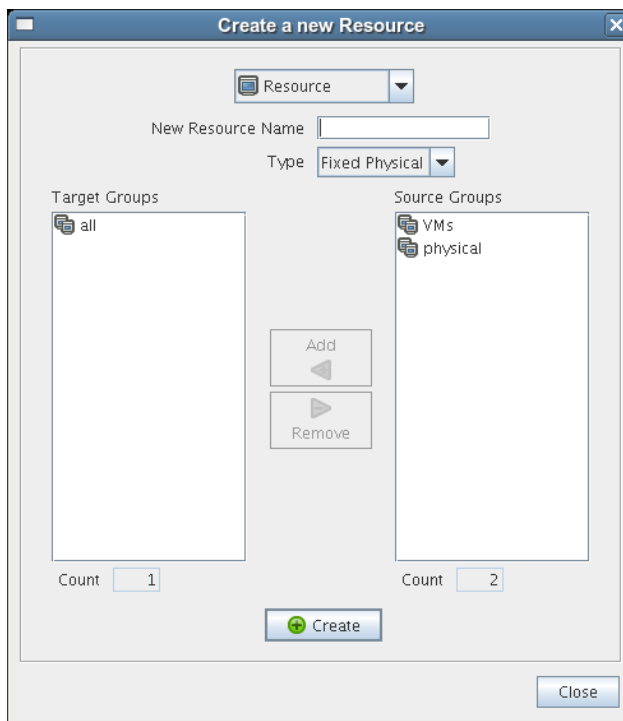
  This dialog box includes a method for designating the resource as a fixed physical type or a virtual machine type. It also includes a method for including the resource in various resource groups. In this walkthrough, we will install a Orchestrator Agent on a fixed physical resource and include it in the *physical* resource group.
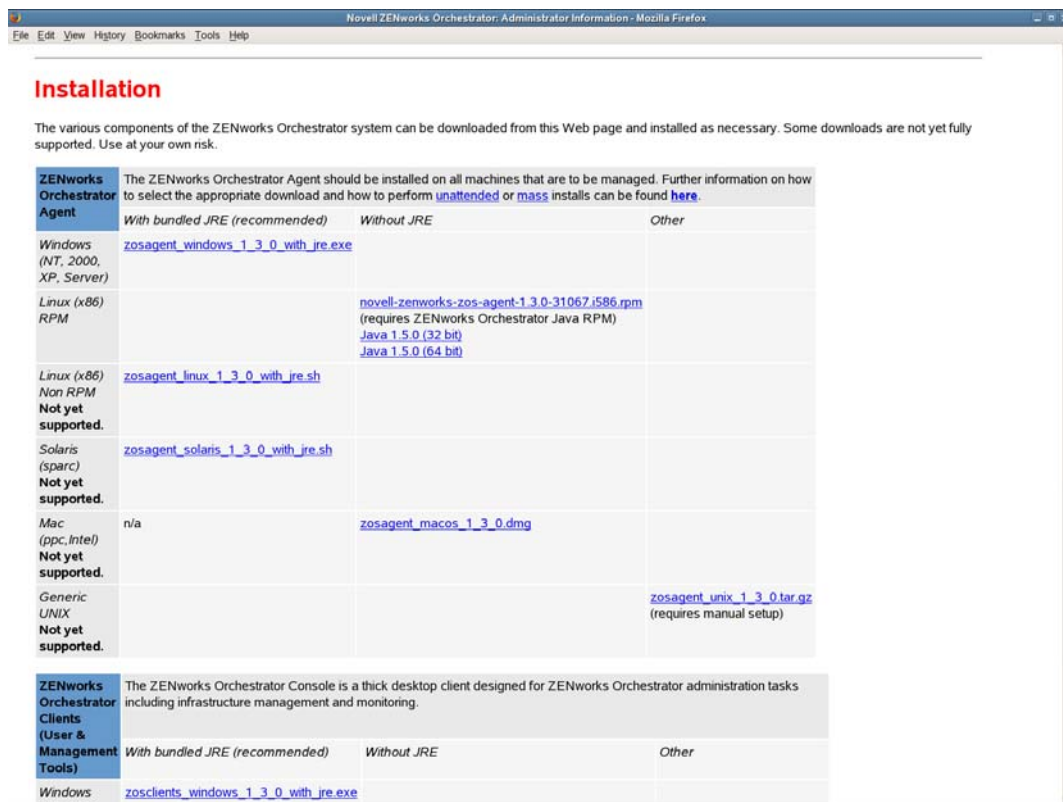
  The Virtual Machine resource type is not available if you installed the High Performance Computing license only for ZENworks Orchestrator.

3b Specify the new resource name in the *New Resource Name* field, then click *Create*.

3c Make sure *Fixed Physical* is selected in the *Type* drop-down box.

3d In the *Source Groups* list box, select the *physical* resource group icon, click *Add* to move this source group to the *Target Groups* list box, click *Create*, then click *Close*.

The resource account is created, but is offline ▣, as indicated by its object icon in the Explorer panel or in the Information view of each resource group to which it belongs. It is not online until an Orchestrator Agent matching the resource is installed.

Install an Orchestrator Agent to Match the New Resource

This section demonstrates installing an Orchestrator Agent to be used as a resource in your Orchestrator grid. The information in this part of the walkthrough assumes that a resource account has already been created for the Orchestrator Agent being installed.

1 From the managed device desktop, launch a browser to access the Web page for ZENworks Orchestrator, as described in .

2 Scroll to the *Installation* section of the page:

3 In the agent section of the Administrator Information page, identify the installer link for the operating system of the device where you want to install the agent. For this walkthrough, we will install the agent on a Linux operating system.

4 Click the installer link to download the *Linux (x86) Non RPM Agent with Bundled JRE* (`zosagent_linux_1_1_0_with_jre.sh`) to the computing node where you plan to install it.

5 From the machine where you will install the agent (in this walkthrough, a SUSE* Linux 10 SP1 or SP2 machine), open a terminal and navigate to the location where you saved the Orchestrator Agent file, then run the following command:

```
sh zosagent_linux_1_1_0_with_jre.sh
```

The Orchestrator Agent Setup Wizard is launched.
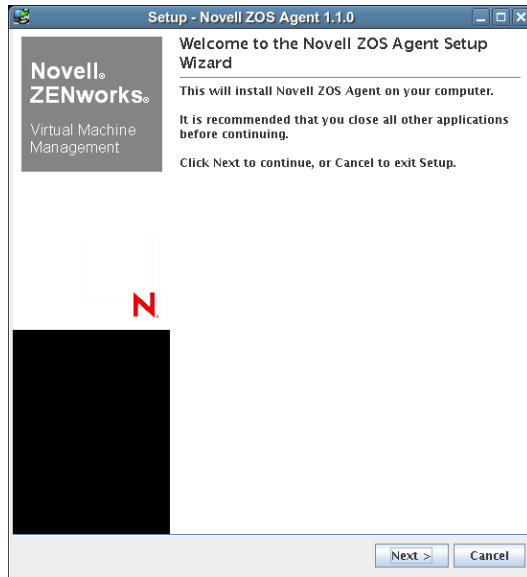
6 Follow the prompts in the wizard until the *Identify ZOS Server* page displays. Here, you need to ensure that you correctly enter the *server_name_for_ZENworks_Orchestrator* in the *ZOS Server* field.
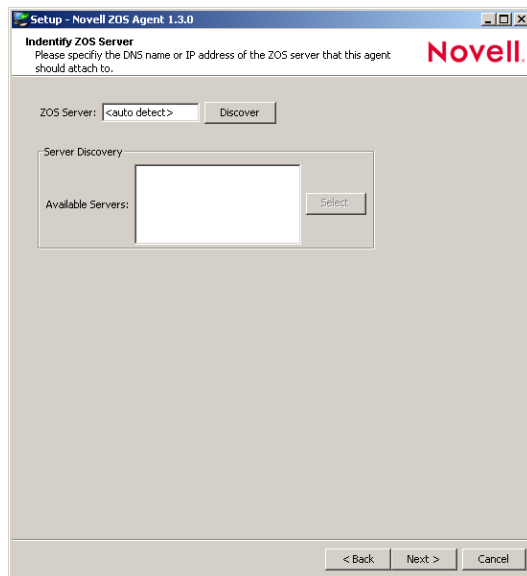
You might find it easier to click *Discover* so that the installer searches for and finds the Orchestrator Server on the network.

7 Accept the remaining defaults on the wizard pages to complete the installation of the agent.

IMPORTANT: Make sure that the name you give the agent during the installation matches the name of the resource account you created in "Use the Console to Create a Resource Account" on page 117.

**8** When the installation is complete, click *Finish* to exit the wizard.

9 In the ZENworks Orchestrator Console, open the Resources Monitor to observe the resource object you created change from offline to online. When the object is no longer grayed out, the agent has logged in as a resource and is registered.

When the resource is online, the Resources Monitor displays a labeled box representing the registered agent. This box includes information about the agent, including the number of available slots it has and a status color indicating its state of readiness for Orchestrator jobs.
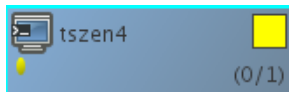

The status color window can be white (inactive), yellow (available for use), or red (in use). If the color changes from yellow to red, a job is running on this resource. To find out what kind of job is running, you can click on the *Jobs* monitor button on the toolbar.

5.3.4 Select a Resource for Manual Registration

If you do not select the *Auto Register Resources* check box on the grid object's *Info/Configuration* page, you have the option of explicitly accepting or denying the login attempts of a resource, thus preventing it from creating an account.

The following steps assume that you have already created a resource in your grid.

1 In the Resources Monitor, click the Resource Registration icon to open the Resource Registration Monitor dialog box.
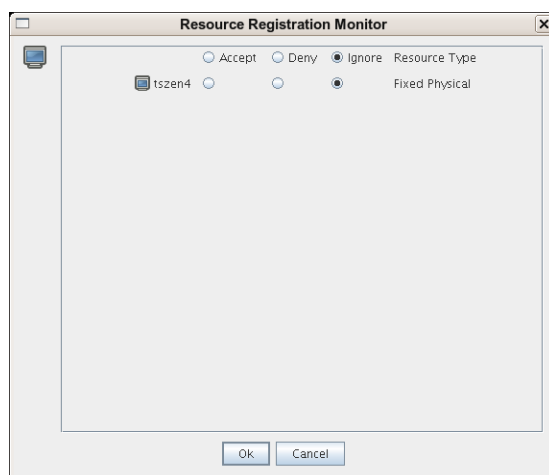

This dialog box lets you preview the Orchestrator Agents that are installed in the network and trying to log in to the server. The top row of radio buttons is a mass selector for all listed agents, allowing you the choice to accept, deny, or ignore automatic registration for all agents, both those currently listed and those that might try to log in later.

If you want to choose the agents that can be allowed to auto register, you can visually identify the agent by name and select how you want to handle that agent's request for registration the next time it tries to log in.

2 For this example, select the *Accept* radio button adjacent to the agent you want to register, then click *OK*.

3 From the ZENworks Orchestrator Console, open the Resources Monitor to observe the resource object you created change from offline to online. When the object is no longer dimmed, the agent has logged in as a resource and is registered.

When the resource is online, the Resources Monitor displays a labeled box representing the registered agent. This box includes information about the agent, including the number of available slots it has and a status color indicating its state of readiness for Orchestrator jobs.
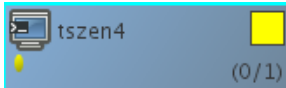
The status color window can be white (inactive), yellow (available for use), or red (in use). If the color changes from yellow to red, a job is running on this resource. To find out what kind of job is running, you can click on the *Jobs* monitor button on the toolbar.

5.4 Walkthrough: Observe Discovery Jobs Run

When you created a resource account for the first time, you might have noticed the status window of the Resource object change colors (see Step 2 on page 121) from red to yellow. You might also notice new jobs displayed as objects in the Explorer panel. What you are observing are the "discovery" jobs that are shipped with ZENworks Orchestrator (different discovery jobs are shipped with ZENworks Orchestrator, depending on which management pack you license).

To understand the reason why these jobs run:

1 In the ZENworks Orchestrator Console, click *Scheduler* to open the Orchestrator Schedule view in the workspace.
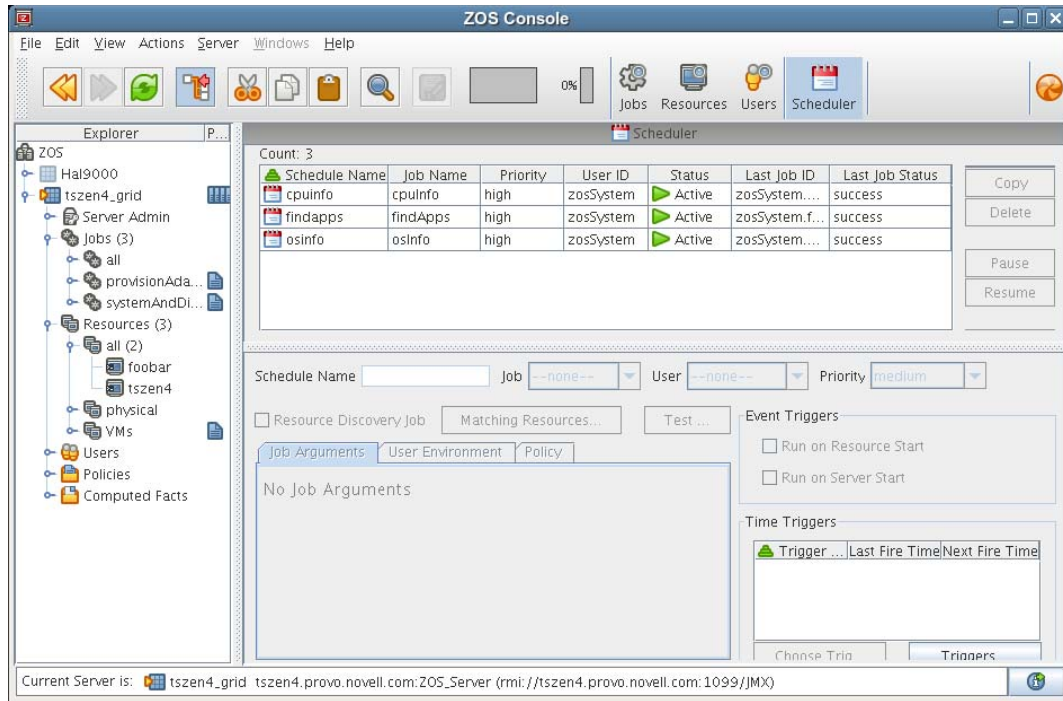
In this walkthrough of basic ZENworks Orchestrator functionality (the basic HPC management pack), you can see three jobs were configured to run. If you select one of the jobs, such as cpuInfo, you will see that it was configured to *Run on Resource Start*. All of the discovery jobs, like cpuInfo, are configured to run on resource start, that is, when the resource connects to the Orchestrator Server.

The discovery jobs run basic operations at resource start as a convenience, to gather data that you or a job developer might need later when creating jobs, or that the Orchestrator system might need as it allocates resources to run jobs. For example, the cpuInfo job and the osInfo job do some basic probing of the computing node (the machine where the agent is installed and has a resource account) for later reference.

To verify this, you can view the resource account that you created earlier in Walkthrough: Create a Resource Account (page 114) by selecting its object in the Explorer panel console. By default, the *Info/Groups* page for the resource opens in the console workspace.

Figure 5-3 *Discovery Jobs Information Page*
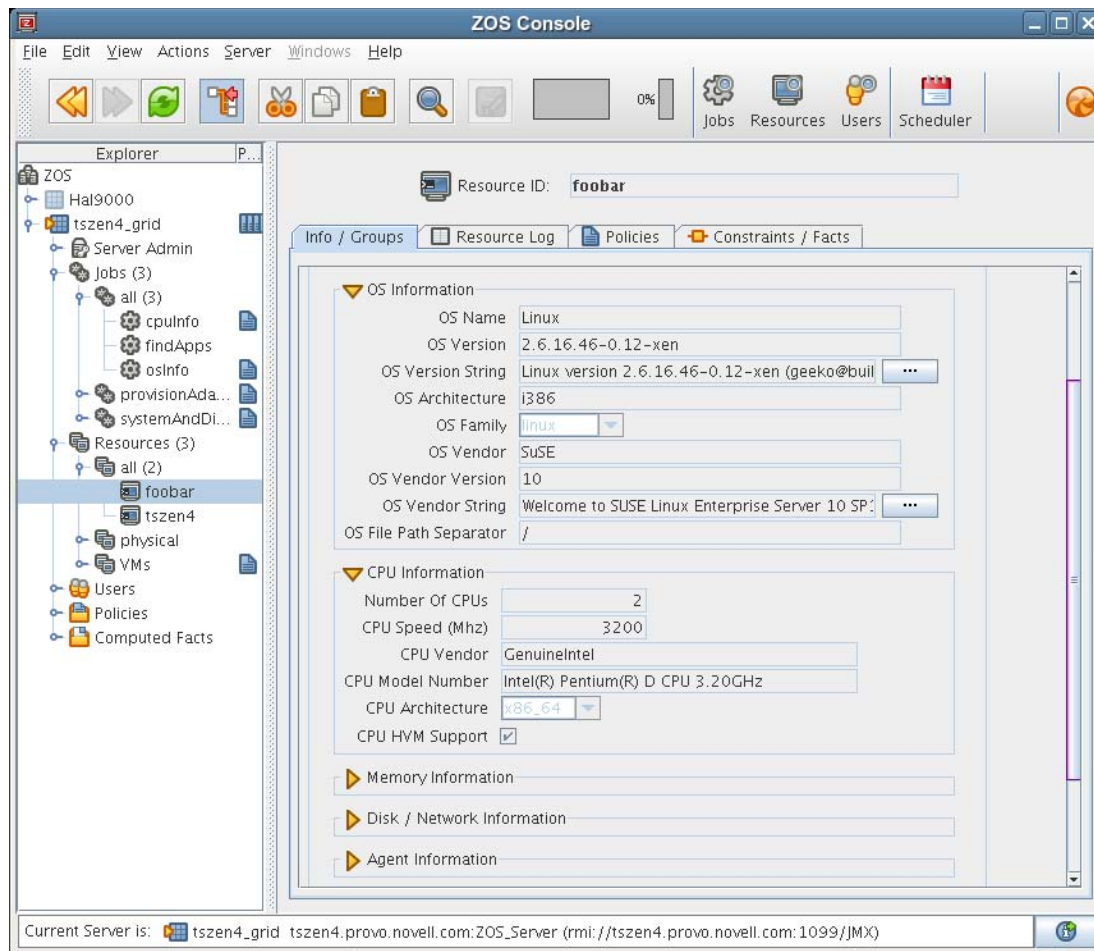
If you scroll down on the *Info/Groups* page, you see that the discovery jobs have gathered basic data about the processor and operating system of this computing node. If the jobs had not run at resource start, this information about the resource would not be ready for use.

Now that you have seen a how jobs are run by the Orchestrator system on resource start, you can walk through the process of deploying and running a sample job on your own by proceeding with Section 5.5, "Walkthrough: Deploy a Sample Job," on page 123.

5.5 Walkthrough: Deploy a Sample Job

One of the main functions of the ZENworks Orchestrator is to run application requests, called jobs, on grid resources. Because the Orchestrator Server is capable of handling multiple application requests, it uses a policy-based broker and scheduler to decide when and how a job should run on the resources. These decisions are based on many controlled factors, including the number of resource nodes, their cost, and a variety of other factors as requested by the application, but managed under policy constraints set up by the administrator or the job developer.

Developing a job involves the creation of an application executable and a job file. See the *Novell ZENworks Orchestrator 1.3 Developer Guide and Reference* for more information on creating and building jobs using the ZENworks Orchestrator Job Description Language (JDL) and the job policies.

Before a job can run, the ZENworks Orchestrator administrator must deploy it, which involves moving it from a development state to a state where it is ready and available for users. Only the administrator has the necessary rights to deploy a job.

There are three methods you can use to deploy a job:

◆ Deploy from the ZENworks Orchestrator Console by right-clicking the *Jobs* container in the Explorer panel.

◆ Deploy from the ZENworks Orchestrator Console by selecting the *Actions* menu in the console.

◆ Deploy from the `zosadmin` command line (`zosadmin deploy` *path_to_job*).

For this walkthrough, we will deploy a simple job developed for ZENworks Orchestrator customers to demonstrate how jobs are deployed and run. Although the walkthrough shows only the first method for deploying, the other methods are relatively simple, so no further explanation is provided.

1 In the Explorer panel of the ZENworks Orchestrator Console, right-click the *Jobs* container, then click *Deploy Job* to open the Select the Component File to Deploy dialog box.
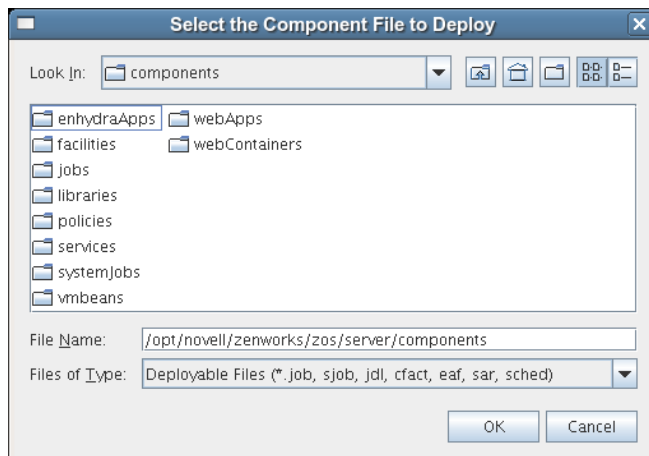
2 Open the *Look In* drop-down list, then navigate to the location of the job you want to deploy.

Although a job developer can store Orchestrator jobs at any location on the network, the sample jobs shipped with ZENworks Orchestrator are limited to the directories where the product is installed. For this walkthrough, navigate to the `/opt/novell/zenworks/zos/clients/examples` directory.

3 Select `whoami.job`, then click *OK* to deploy the job to the *Jobs* container.

The *whoami* job appears in the *all* container and in the *examples* container in the tree.
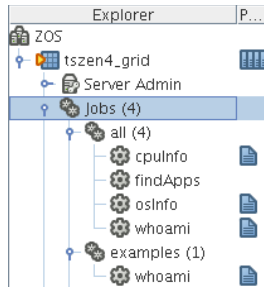
When deployed, the job is sent over the wire to the Orchestrator Server with which it is associated. It is persisted there until undeployed.

When the job is available, you need to create a user who can run that job. For more information, see Section 5.6, "Walkthrough: Create a User Account," on page 125

5.6 Walkthrough: Create a User Account

Although ZENworks Orchestrator has some pre-assembled jobs, such as the `cpuInfo` discovery job that you learned about earlier, most jobs must be developed by a job developer and run and be managed by a user (also called a job manager). Without an authorized individual who can log in to the ZENworks Orchestrator system to manage the use of a job, the product does not realize its potential.

This section of the walkthrough introduces the basics of creating a user account:

- ◆ Section 5.6.1, "Open the Users Monitor," on page 125
- ◆ Section 5.6.2, "Automatically Register a User," on page 127
- ◆ Section 5.6.3, "Manually Register a User," on page 128
- ◆ Section 5.6.4, "Log In a User for Manual Registration," on page 129

5.6.1 Open the Users Monitor

Now that the Orchestrator Server has run discovery jobs and you have deployed a sample job, you can begin to create user accounts. To do so, open the console and click *Users* to open the Users Monitor in the Workspace panel of the console.

Figure 5-4 *Users Monitor of the ZENworks Orchestrator Console*
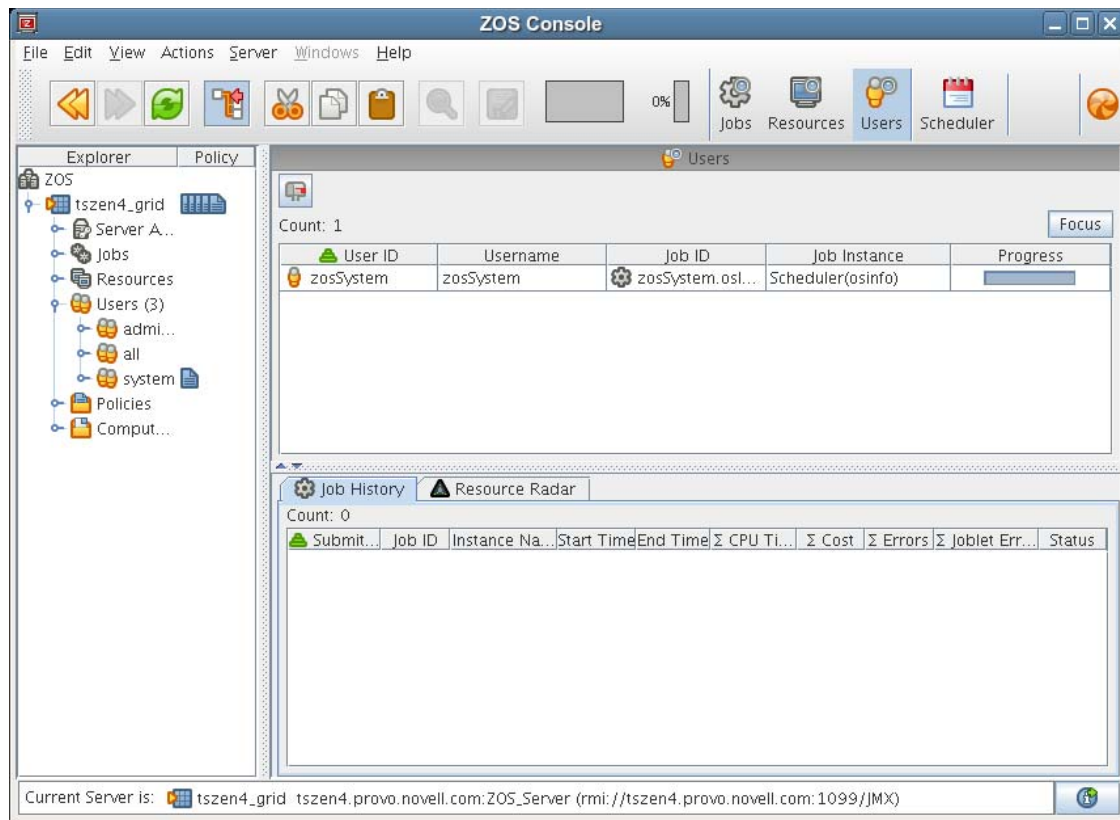
In this monitor, you can see the users that are connected to the server and what they are doing in the grid.

If a user logs in but has not been registered (that is, no account is created for that user), the authentication to the server is retried every 90 seconds. If this is the case, the User Registration icon has a "flag up" [icon] status, meaning that a user is waiting to register. If the icon has a "flag down" [icon] status, either no user accounts have been created or all active users are logged in, so none are waiting to register.

You can use the console to register a user automatically (see Section 5.6.2, "Automatically Register a User," on page 127) or to register a user manually (see Section 5.6.3, "Manually Register a User," on page 128). If you choose to, you can also select which users can log in to create accounts (see Section 5.3.4, "Select a Resource for Manual Registration," on page 120).

The Users Monitor has many features to help you manage users when they are registered, including the jobs and joblets assigned to individual users. For more detailed information about the Users Monitor, see "Using the ZENworks Orchestrator Console" in the *Novell ZENworks Orchestrator 1.3 Administration Guide*.

5.6.2 Automatically Register a User

If your network environment does not require a high level of security (such as in a development and testing environment) and you want a quick way to create a user account, you can do so at the console.

1 In the Explorer panel of the ZENworks Orchestrator Console, select the grid object representing the Orchestrator Server to open the *Info/Configuration* page of the grid object.

2 In the *Object Registration* section of the page, select the *Auto Register Users* check box.
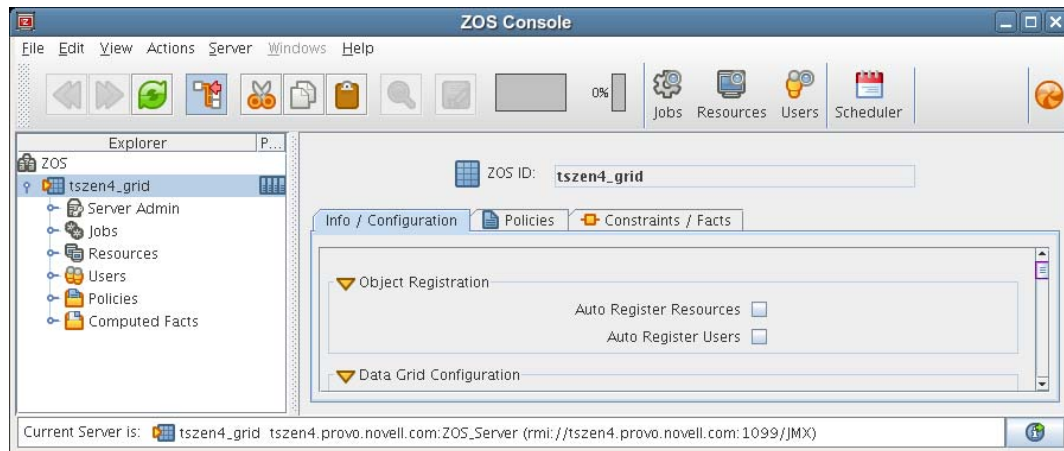
3 Use the `zos` command line interface to log in to the server.

3a From a system terminal, enter the following command:

```
zos login --user=user
```

If you are attempting to log in to a machine other than the local host, you can alter the command to the following:

```
zos login Orchestrator_Server_name --user=user
```

3b Enter the password for the user credentials. For this walkthrough, you can simply press *Enter* to enter an empty password.

3c When prompted for a decision regarding whether you want to accept the server certificate, enter `yes`.

When a user with credentials attempts to log in the to Orchestrator Server, a user account is created for that user, but the user is not currently running jobs, as indicated by its object icon 🔲 in the Explorer panel or in the Information view of each User group to which it belongs. The icon is not dimmed when that user has jobs running or a when a custom application (built with the Orchestrator SDK) is logged in.

5.6.3 Manually Register a User

If you want a higher level of security for authorized users, you can manually create a user account in the console before the user logs in. When a user is created in the ZENworks Orchestrator Console, that user is ready to run jobs.
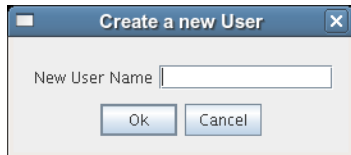
1 (Optional) Create a new user from the Explorer panel in the console.

    1a In the Explorer panel in the console, right-click *Users* > click *New User* to display the Create a new User dialog box.

    1b Specify the name of the new user you want to create in the *New User Name* field, then click *OK*.

        The user account is created, but is not currently running jobs, as indicated by its object icon   in the Explorer panel or in the Information view of each User group to which it belongs.

2 (Optional) Create a new user from the Main Menu in the console.

    2a In the console, click *Actions* > *Create User* to display an expanded version of the Create a new Resource dialog box.
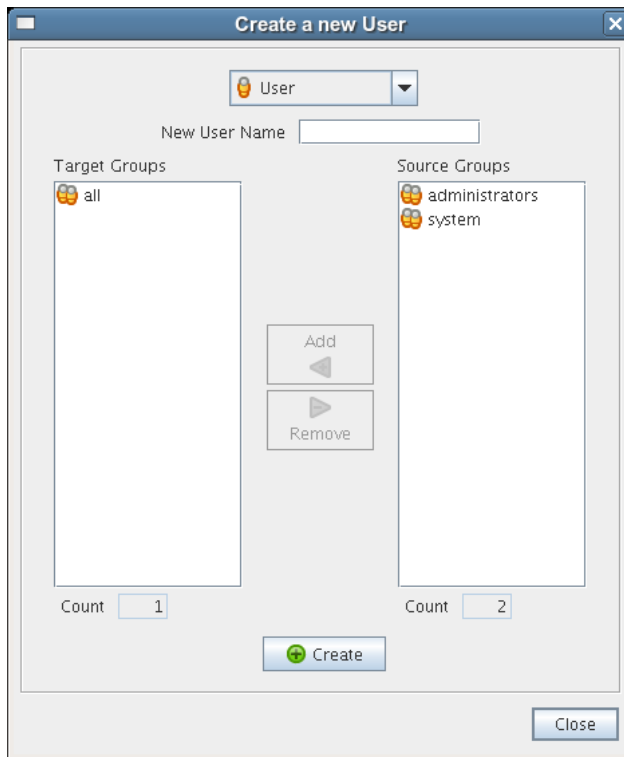
This dialog box includes a method for designating the user as a member of the *administrators* user group. In this walkthrough, we will create the user as a member of the *all* group, which does not place the user in the administrators group.

2b Specify the new username in the *New User Name* field, click *Create*, then click *Close*.

The user account is created, but is not currently running jobs, as indicated by its object icon 👤 in the Explorer panel, or in the Information view of each User group to which it belongs.

5.6.4 Log In a User for Manual Registration

If you do not select the *Auto Register Users* check box on the grid object's *Info/Configuration* page, you have the option of explicitly accepting or denying the login attempts of a user, thus preventing that user from creating an account.

1 Make sure that the *Auto Register Users* check box on the grid object's *Info/Configuration* page is not selected (see Step 2 on page 116).

2 Use the `zos` command line interface to log in to the server.

2a From a system terminal, enter the following command:

```
zos login --user=user
```

If you are attempting to log in to a machine other than the local host, you can alter the command to the following:

```
zos login Orchestrator_Server_name --user=user
```

2b Enter the password for the user credentials. For this walkthrough, you can simply press *Enter* to enter an empty password.

2c When prompted for a decision regarding whether you want to accept the server certificate, enter `yes`.

3 In the Users Monitor, click the User Registration icon 📬 to open the User Registration Monitor dialog box.
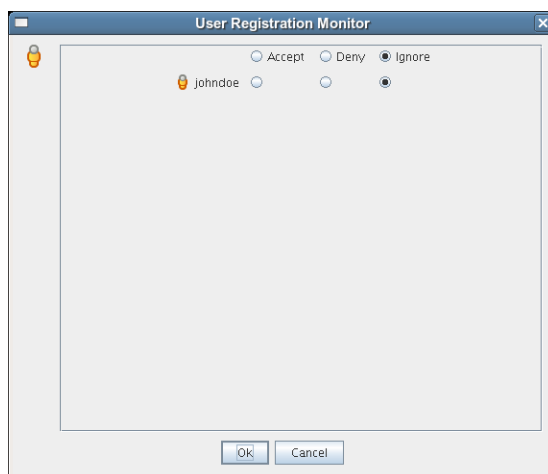
This dialog box lets you preview the users who are trying to log in to the server. The top row of radio buttons is a mass selector for all listed users, allowing you the choice to accept, deny, or ignore automatic registration for all listed agents.

If you want to choose the users that can be allowed to auto register, you can identify the user by name and select how you want to handle that agent's request for registration the next time it tries to log in.

4 For this example, select the *Accept* radio button adjacent to the user you want to register, then click *OK*.

The user account is created, but is not currently running jobs, as indicated by its object icon in the Explorer panel, or in the Information view of each User group to which it belongs.

5.7 Walkthrough: Run the Sample Job

Deployed jobs can be run from the User Portal, from the Scheduler utility inside of the ZENworks Orchestrator console, or from the `zos` command line. For the purpose of this walkthrough, we will run a sample job from the command line.

1 From a system terminal, enter the following command:

```
zos run whoami
```

If you have more than one resource connected, you might want to run the job on one resource in particular. If you want do run the job this way, you can do so by adding an argument to the command line:

```
zos run whoami resource=name_of_resource
```

Now that you have run the sample job, you need to use some of the ZENworks Orchestrator tools to verify that it has run. For more information, see Section 5.8, "Walkthrough: Look at the Job After It Has Run," on page 130

5.8 Walkthrough: Look at the Job After It Has Run

After you have run the job, there are several ways to verify that it has run. This section explains those methods.

- Section 5.8.1, "Verification at the Command Line," on page 130
- Section 5.8.2, "Verification at the Jobs Monitor," on page 132
- Section 5.8.3, "Verification at the User Portal," on page 133

5.8.1 Verification at the Command Line

The following sections explain some of the `zos` commands that you can use to verify that a job has run and monitor some of the results of the job:

- "zos jobs" on page 131
- "zos jobinfo job_name" on page 131
- "zos status --detail" on page 131
- "zos log job_id --verbose" on page 132

zos jobs

You can use the `zos jobs` command to list all of the jobs that have run while you have been logged in as a user. Running this command yields an output like this:

```
Job      JobID         User   Started               Elapsed State
whoami   foo.whoami.24 foo    06/26/2007 07:19:35 0:00:01 Completed
```

zos jobinfo job_name

You can use the `zos jobinfo` *job_name* command to display information for a named job the last time it was run. Running this command yields an output like this:

```
Jobname/Parameters    Attributes
------------------    ----------
whoami              Desc: This is a demo example of enhanced exec

   numJoblets       Desc: The number of joblets to schedule
                    Type: Integer
                 Default: 1

   resource         Desc: The resource id to run on
                    Type: String
                 Default: .*
```

zos status --detail

You can use the `zos status --detail` command to display the status of the most recently run job. Running this command yields an output like this:

```
Job Status for foo.whoami.24
---------------------------
            State: Completed
   Resource Count: 0              (0 this job)
  Percent Complete: 100%
        Queue Pos: n/a
  Child Job Count: 0              (0 this job)
    Joblet Counts: 1 (0)          (1 (0/0/1/0/0) this job)

     Instance Name: whoami
         Job Type: whoami
            Memo:
         Priority: medium
        Arguments: <none>

     Submit Time: 06/26/2007 07:19:35
    Delayed Start: n/a
       Start Time: 06/26/2007 07:19:35
         End Time: 06/26/2007 07:19:36
     Elapsed Time: 0:00:01
       Queue Time: 0:00:00
       Pause Time: 0:00:00

   Total CPU Time: 0:00:00        (0:00:00 this job)
```

```
       Total GCycles: 0:00:00          (0:00:00 this job)
          Total Cost: $0.0002          ($0.0002 this job)
           Burn Rate: $0.5455/hr       ($0.5455/hr this job)

    Termination Type: n/a
           Job Error: <none>

  Joblet Error Count: 0                (0 this job)
    Node Error Count: 0                (0 this job)
      Excluded Nodes: 0                (0 this job)

Bad Provision Count: 0                 (0 this job)
Excluded Provisions: 0                 (0 this job)
```

zos log job_id --verbose

If you know the Job ID for a particular job that has run, you can use the `zos log job_id --verbose` command to display its detailed job log. Running this command yields an output like this:

```
Agent logged in with ID: user_foo_4900 (comms ok)
Launching 1 joblets for user 'foo'
[foobar] cmd=whoami
[foobar] root
[foobar] result=0
Agent ID: user_foo_4900 (comms ok) logged out.
```

5.8.2 Verification at the Jobs Monitor

If you want to use the ZENworks Orchestrator Console to verify that the job has run, you can open the *Jobs* Monitor to look at the Job Log and see the result of the job being run.

   1 In the console, click *Jobs* in the main toolbar to open the Jobs Monitor view.

   2 In the Jobs Monitor view, click the *Jobs* tab to open the Jobs page in the workspace panel.
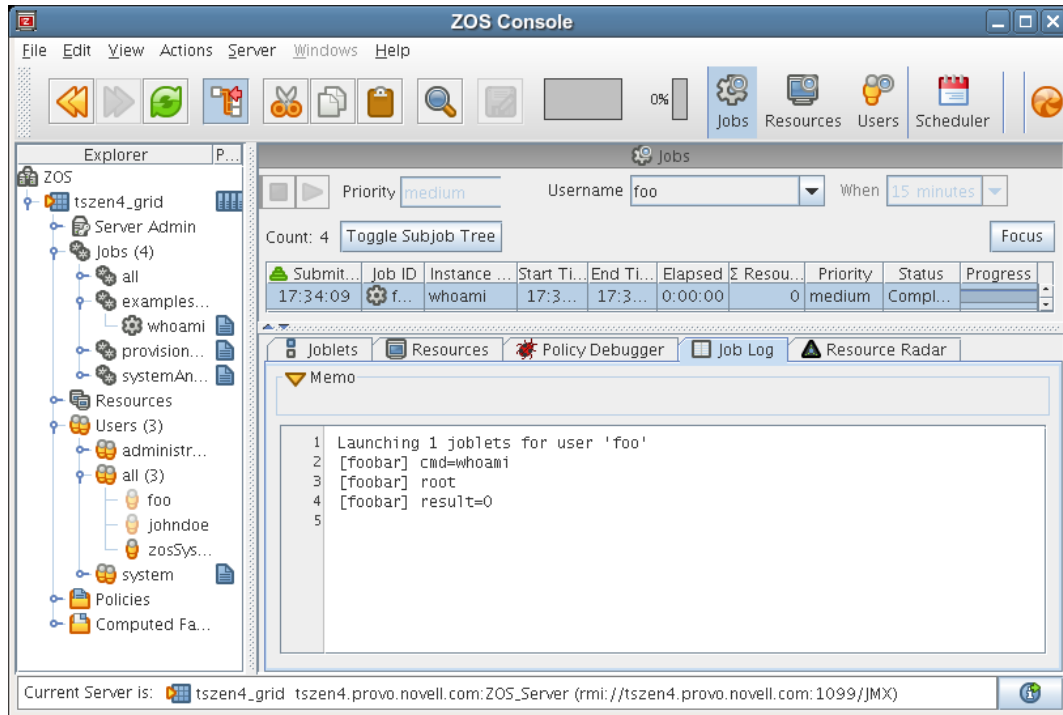
3 In the *Username* drop-down list box, select the user who ran the `whoami` job.

Although there is much more you can learn about a job in the Jobs Monitor view, you can see by displaying a recent job that the console picks up the job activity and makes it available at the console.

5.8.3 Verification at the User Portal

Your data center might have an individual whose main function is to regularly schedule and run jobs on data center resources. That person, the Job Manager or Orchestrator User, has an graphical interface called the ZENworks Orchestrator User Portal where he or she can do their work. This section introduces the User Portal and how you can verify at the portal that a job has run.

1 On any machine with a Web browser, enter the following URL:

Orchestrator_Server_DNS_Name_or_IP_Address:*designated_User_Portal*

For example:

`10.255.255.255:80`

(The default port is 80, unless you have ZENworks Monitoring installed.) When you enter the URL, the User Portal is displayed in the browser.
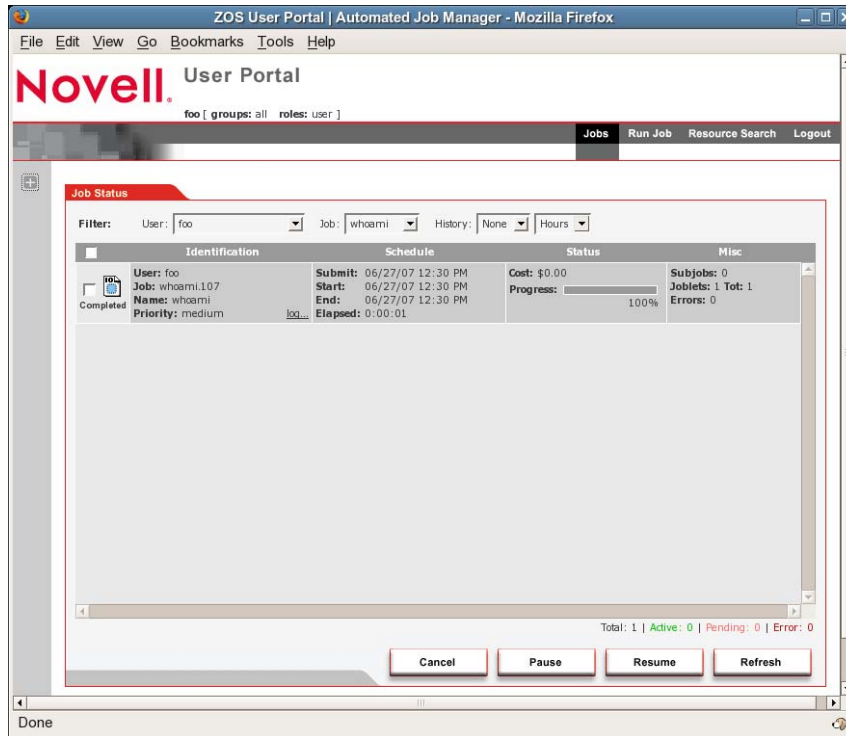
2 Verify that the job you ran is displayed in the history of the User Portal.

3 Click the *log* link in the *Identification* column of the job history to open the job log.
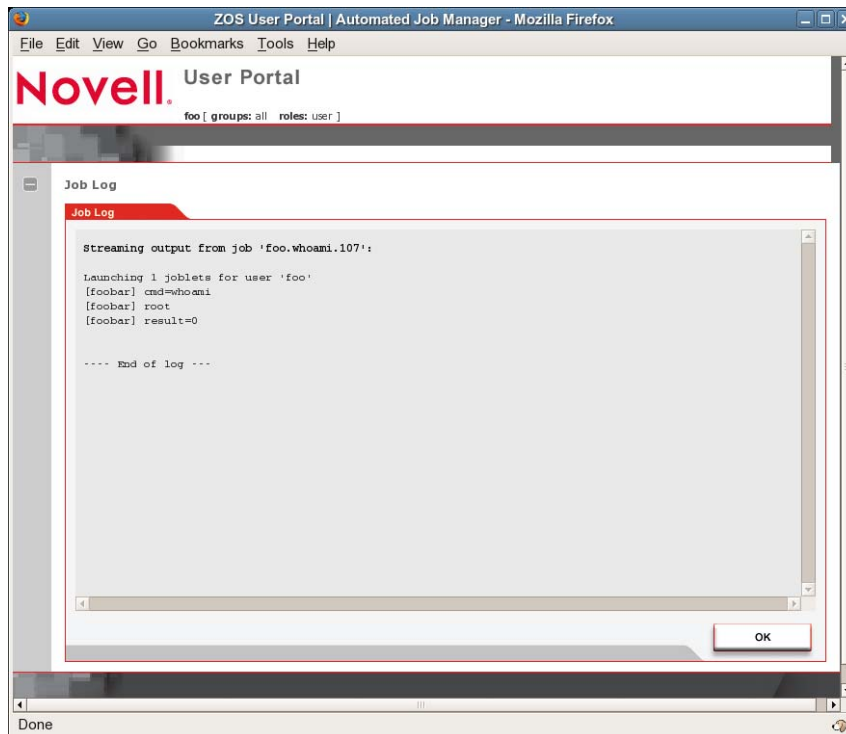
You now have a basic understanding of the User Portal and how to use it to verify that a job has run. As the last experiment in the walkthrough for ZENworks Orchestrator, you can use the `zosadmin` command line to gather information about your system. For more information, see Section 5.9, "Walkthrough: Use the zosadmin Command to Gather Information," on page 135.

5.9 Walkthrough: Use the zosadmin Command to Gather Information

You can use the `zosadmin` command line to learn what users or nodes are defined in your ZENworks Orchestrator system. Follow these steps to learn about the users and nodes in your system.

1 Log in to the ZENworks Orchestrator system by using the following command:

```
zosadmin login
```

You can also use the server's host name as an argument when you log in.

If you use the grid= parameter, you can specify the grid name you want to log into. If other Orchestrator Servers are installed on the local host, the system cannot log in to any unless you use this parameter. For more information, see "The zosadmin Command Line Tool" in the *Novell ZENworks Orchestrator 1.3 Administration Guide*.

2 Enter the administrator's user name and password.

If the login was successful, the command line tool returns a message like this:

```
Logged into tszen4_grid on server 'tszen4.provo.novell.com'
```

3 Enter the following command to list the active users on your ZENworks Orchestrator system:

```
zosadmin users
```

You can add the `--help` option at the command line to determine the run options for this command.

4 Enter the following command to list the active nodes on your ZENworks Orchestrator system:

```
zosadmin nodes
```

You can add the `--help` option at the command line to determine the run options for this command.

Congratulations! With the completion of this part of the walkthrough, you have a good understanding of the parts of ZENworks Orchestrator and how they work. If you want more information about the details of the ZENworks Orchestrator Console, see the *Novell ZENworks Orchestrator 1.3 Administration Guide*. If you want to learn about the job manager's role, see the *Novell ZENworks Orchestrator 1.3 Job Management GuideNovell ZENworks Orchestrator 1.3 Developer Guide and Reference*.

5.10 Stopping and Starting ZENworks Orchestrator Components

Use the following methods for stopping and starting ZENworks Orchestrator components.

◆ Section 5.10.1, "Stopping and Starting the ZENworks Orchestrator Server," on page 136

5.10.1 Stopping and Starting the ZENworks Orchestrator Server

You can use the following methods for stopping and starting the ZENworks Orchestrator Server.

Stopping the Server

You need to shut down the Orchestrator Server before you power off the computer where it is running. This routine prevents possible data corruption.You must be logged in to a Orchestrator Server in order to stop it. There are two methods to stop the current server:

- If you are in the ZENworks Orchestrator Console, click *Server* > click *Shutdown ZOS*.
- If you are at the command line, enter the following command:

  ```
  /etc/rc.d/rcnovell-zosserver stop
  ```

Starting the Server

The ZENworks Orchestrator installation and configuration automatically starts the Orchestrator Server. The Orchestrator Server must be stopped before you can start it. You must be logged in to a Orchestrator Server to start it. There are two methods you can use to start the current server:

- If you are at the command line, enter the following command:

  ```
  /etc/rc.d/rcnovell-zosserver start
  ```

- To restart the Orchestrator Server from the command line, enter the following command:

  ```
  /etc/rc.d/rcnovell-zosserver restart
  ```

  This command stops the server before restarting it.

5.10.2 Stopping and Starting the ZENworks Orchestrator Agent

You can use the following methods for stopping and starting the ZEnworks Orchestrator Agent.

Stopping the Agent

There are several methods you can use to stop the agent:

- If you are in the ZENworks Orchestrator Console, select the *Resources* Monitor, select a resource, then click the red icon in the work area to shut down that agent.

- If you are running the agent at a Windows machine, click *Start > Programs > Novell > ZOS > Agent > Shutdown ZOS Agent*.

- If you are at the Linux bash prompt, enter the following command:

  ```
  /etc/rc.d/rcnovell-zosagent stop
  ```

Starting the Agent

- To start the ZENworks Orchestrator Agent from a Windows machine, double click the *ZOS Agent* shortcut on your desktop or click *Start > Programs > Novell > ZOS > Agent > Start ZOS Agent*.

- If you are at the Linux bash prompt, enter the folowing command:

  ```
  /etc/rc.d/rcnovell-zosagent start
  ```

5.10.3 Starting and Stopping the ZENworks Orchestrator Console

You can use the following methods for stopping and starting the ZENworks Orchestrator Console.

Stopping the Console

To stop the ZENworks Orchestrator console at the console itself, click *File > Exit*, or click the shutdown icon on the console window.

Starting the Console

To start the ZENworks Orchestrator console from a Linux machine, enter `./zoc` at the command line.

To start the ZENworks Orchestrator console from a Windows machine, double click the *ZOS Clients* shortcut on your desktop or click *Start > Programs > Novell > ZOS > Clients > ZOS Management Console*.

ZENworks Orchestrator Components: Install Patterns

<div style="text-align: right; font-size: 3em;">A</div>

This section includes the following information:

A.1 ZENworks Orchestrator Install Pattern Descriptions

This section includes information about the server and agent installation patterns available for installing a ZENworks Orchestrator 1.3 ISO on a SUSE Linux machine.

NOTE: Because the Eclipse GUI is not a part of the Add-on Product patterns, its installation is explained in the *Novell ZENworks Orchestrator 1.3 Virtual Machine Management Guide*.

A.1.1 ZENworks Orchestrator Server Install Pattern Descriptions

The following sections describe the purpose of the various server patterns that you can install.

ZENworks Orchestrator Server: The Orchestrator Server is the gateway between enterprise applications and resource servers. The server manages computing nodes (resources) and it also manages jobs that are submitted from applications to run on these resources.

ZENworks Virtual Machine Warehouse: The VM Warehouse is used to:

- Store VM images and image data
- Version VM images and image data
- Designate the gold master VM image and image data
- Check out VM images and image data
- Check in VM images and image data

ZENworks Monitoring Server: The Monitoring Server uses open source Ganglia monitoring to monitor the performance of certain data on network resources in a user-specified time period.

A.1.2 ZENworks Orchestrator Agent Install Pattern Descriptions

The following sections describe the purpose of the various agent patterns that you can install.

ZENworks Orchestrator Agent: The Orchestrator Agent is installed on all computing resources that are to be managed. It runs applications under the management of the Orchestrator Server and reports its status to the Orchestrator Server.

ZENworks Orchestrator Clients: The Orchestrator Clients let a computing resource administrator troubleshoot, initiate, change, or shut down server functions for ZENworks Orchestrator and its computing resources. When you install the Orchestrator Clients on a computing resource, you are installing the following tools:

- zos command line interface
- zosadmin command line interface
- ZENworks Orchestrator Console
- Java SDK (toolkit)

ZENworks Virtual Machine Builder: The VM Builder agent is installed on a computer with the Xen* hypervisor to allow it to be used as a build machine for VMs as the jobs are sent to it by the ZENworks Orchestrator Server.

ZENworks Monitoring Agent: The Monitoring Agent is installed with any installation of the Orchestrator Agent. This installs the Ganglia Agent on the monitored node, which collects performance metrics and sends this data to the ZENworks Monitoring Server.

ZENworks Orchestrator Config: The configuration is not visible as an installation pattern, but is required for most of the patterns you install. For more information, see .

A.2 Installation Patterns in YaST

The table in this section provides information about each of the server and agent installation patterns.

Table A-1 *Orchestrator Install Patterns Information*

Install Pattern and {Short Name}	Default Packages Installed	Required Patterns	Additional Recommended Patterns	Server/ Agent
ZENworks Orchestrator Server patterns				
ZENworks Orchestrator Server [zw_zos_server]	novell-zenworks-zos-java novell-zenwroks-zos-server novell-zenworks-zos-server-data-agent novell-zenworks-zos-server-data-clients novell-zenworks-zos-server-data-jre	zw_orch_config	zw_mon_server zw_zos_clients	S

Install Pattern and {Short Name}	Default Packages Installed	Required Patterns	Additional Recommended Patterns	Server/ Agent
ZENworks Virtual Machine Warehouse [zw_vm_warehouse]	novell-zenworks-vmwarehouse-base novell-zenworks-vmwarehouse-cimproviders	zw_zos_agent zw_zos_client zw_vm_builder zw_orch_config	zw_mon_server	S
ZENworks Monitoring Server [zw_mon_server]	novell-zenworks-monitor-gmetad novell-zenworks-monitor-web	zw_mon_agent zw_orch_config		S
ZENworks Orchestrator Agent patterns				
ZENworks Orchestrator Agent [zw_zos_agent]	novell-zenworks-zos-java novell-zenworks-zos-agent xen-cim-cmpi fuse hivetools ntfs-3g python-pywbem	zw_orch_config	zw_mon_agent	A
ZENworks Orchestrator Clients [zw_zos_clients]	novell-zenworks-zos-java novell-zenworks-zos-clients			S or A
ZENworks Virtual Machine Builder [zw_vm_builder]	novell-zenworks-vmbuilder-zosjob novell-zenworks-vmbuilder-cimproviders novell-zenworks-vmbuilder-cli	zw_zos_agent zw_zos_clients Zw_orch_config	zw_mon_agent	A
ZENworks Monitoring Agent [zw_mon_agent]	novell-zenworks-monitor-gmond	zw_orch_config		A
ZENworks Orchestrator Config (not visible) [zw_orch_config]	novell-zenworks-orch-config novell-zenworks-orch-config-gui			S or A

Documentation Updates

B

This section contains information on documentation content changes that have been made in the Installation guide since the initial release of Novell® ZENworks® Orchestrator 1.3 (June 9, 2008). The information will help you to keep current on updates to the documentation.

All changes that are noted in this section were also made in the documentation. The documentation is provided on the Web in two formats: HTML and PDF. The HTML and PDF documentation are both kept up-to-date with the documentation changes listed in this section.

The documentation update information is grouped according to the date the changes were published. Within a dated section, the changes are alphabetically listed by the names of the main table of contents sections for ZENworks Orchestrator 1.3.

f you need to know whether a copy of the PDF documentation you are using is the most recent, the PDF document contains the date it was published on the front title page.

The documentation was updated on the following dates:

B.1 September 8, 2008

The following changes were made in this section:

Location	Change
Section 4.3.1, "Installing the Agent and Clients by Using the Product ISO," on page 68	Added more detailed information to the SLES 9 SP3, RHEL 4, and RHEL 5 sections.

B.2 August 13, 2008

The following changes were made in this section:

Location	Change
Section 3.1, "Orchestrator Server Requirements," on page 27	Restated the user requirements for hardware.
Section 3.2, "Managed Node (Orchestrator Agent) Requirements," on page 28	Restated the user requirements for hardware.
Section 3.3, "Orchestrator Client Node Requirements," on page 29	Restated the user requirements for hardware.

B.3 July 21, 2008

The following sections are affected by updates:

- Section B.3.1, "Some Installers Available on Administrator Information Page are Not Supported," on page 144
- Section B.3.2, "ZENworks Orchestrator 1.3 Is Now Supported on SLES 10 SP2," on page 144

B.3.1 Some Installers Available on Administrator Information Page are Not Supported

The following changes were made in this section:

Location	Change
Section 4.2.1, "Installation and Configuration Steps," on page 40	Added information to indicate that all of the RPM installers are unsupported.
Section 4.3.2, "Installing the Agent and Clients from the Administrator Information Page (Unsupported)," on page 86	Added information to indicate that all of the RPM installers are unsupported.

B.3.2 ZENworks Orchestrator 1.3 Is Now Supported on SLES 10 SP2

The following changes were made in this section:

Location	Change
Section 3.1, "Orchestrator Server Requirements," on page 27	Added information to indicate that ZENworks Orchestrator 1.3 is now supported on SUSE Linux Enterprise Server 10 Service Pack 2.
Section 3.2, "Managed Node (Orchestrator Agent) Requirements," on page 28	Added information to indicate that ZENworks Orchestrator 1.3 is now supported on SUSE Linux Enterprise Server 10 Service Pack 2.
Section 3.3, "Orchestrator Client Node Requirements," on page 29	Added information to indicate that ZENworks Orchestrator 1.3 is now supported on SUSE Linux Enterprise Server 10 Service Pack 2.
Section 3.4, "Tested Platforms and Installation Methods for the Orchestrator Server, Agent, and Clients," on page 30	Added information to indicate that ZENworks Orchestrator 1.3 is now supported on SUSE Linux Enterprise Server 10 Service Pack 2.
Section 3.5, "Tested Platforms and Installation Methods for Virtual Machine Management Components," on page 34	Added information to indicate that ZENworks Orchestrator 1.3 is now supported on SUSE Linux Enterprise Server 10 Service Pack 2.

Location	Change
Section 4.2, "Installing and Configuring ZENworks Orchestrator Components," on page 39	Added information to indicate that ZENworks Orchestrator 1.3 is now supported on SUSE Linux Enterprise Server 10 Service Pack 2.
Section 4.5, "Installing the ZENworks Orchestrator Agent on VM Hosts and VMs," on page 92	Added information to indicate that ZENworks Orchestrator 1.3 is now supported on SUSE Linux Enterprise Server 10 Service Pack 2.
Section 4.6, "Installing the VM Management Console," on page 99	Added information to indicate that ZENworks Orchestrator 1.3 is now supported on SUSE Linux Enterprise Server 10 Service Pack 2.

B.4 July 11, 2008

The following changes were made in this section:

Location	Change
Section 4.2.1, "Installation and Configuration Steps," on page 40	Added a note following Step 7 to draw attention to the fact that Novell does not support the agent installers listed on the Administrator Information Page (IP_address:8001).
Section 4.2.4, "Installing and Configuring the ZENworks Orchestrator for Use with a PostgreSQL Audit Database on a Different Host," on page 59	Modifed the text to show the correct way to edit the `postgresql.conf` file; also corrected the command syntax. Corrected the command syntax in Step 2 of "Creating an Orchestrator User for the PostgreSQL Database" on page 63.
Section 4.3.2, "Installing the Agent and Clients from the Administrator Information Page (Unsupported)," on page 86	Modified the Important note at the beginning of the section to indicate that Novell does not support the use of the installers listed on the Administrator Information Page.