

ORACLE®

PEOPLESOFT

Using Oracle VM Templates for PeopleSoft on Oracle Linux

February 2014

ORACLE®

Using Oracle VM Templates for
PeopleSoft on Oracle Linux
SKU_iovm_pt853_olinux_022014

Copyright © 2014, Oracle and/or its affiliates. All rights reserved.

Trademark Notice

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

License Restrictions Warranty/Consequential Damages Disclaimer

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

Warranty Disclaimer

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

Restricted Rights Notice

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS

Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle America, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

Hazardous Applications Notice

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Third Party Content, Products, and Services Disclaimer

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

Contents

Preface

- About this Documentation 5**
- Understanding this Documentation 5
- Audience 5
- Typographical Conventions 5
- Products 7
- Related Information 7
- Comments and Suggestions 9

Chapter 1

- Preparing to Deploy 11**
- Reviewing the Deployment Process 11
- Understanding the Deployment of the Oracle VM Template for PeopleSoft Applications on Oracle Linux 12
- Understanding PeopleSoft Components 13
- Obtaining the Template from My Oracle Support 14
- Planning the Deployment 16
 - Planning the Environment 16
 - Planning the Virtual Machine Configuration 17
- Reviewing the Oracle VM Setup 17

Chapter 2

- Planning Security Administration 19**
- Understanding Virtual Machine Security Administration 19
- Considering Network Security 20
- Considering User Security 20
- Considering the Virtual Machine Guest Operating System Security 22
 - Understanding the Virtual Machine Guest Operating System Security 23
 - Applying Operating System Patches and Updates 23
 - Checking for Critical Patch Updates 24
 - Disabling Unnecessary Services 24
- Considering PeopleSoft Application Security and Client Access 24
 - Understanding PeopleSoft Application Security and Client Access 25
 - Considering PeopleSoft Pure Internet Architecture Security 25
 - Considering Security for Client Tools 25
 - Considering SQL*Plus Security 26

Considering Security for Samba and the VM File System 27

Considering the VM Operating System and Secure Shell Access 27

Summarizing Security Considerations 27

 Deciding on Security Plans 27

 Reviewing a Sample Scenario 28

Chapter 3

Deploying the Oracle VM Template for PeopleSoft on Oracle Linux 31

Importing the Template 31

Creating the Virtual Machines 43

Starting the Virtual Machines 51

 Understanding the Virtual Machine Configuration 51

 Reviewing Virtual Machine Configurations 53

 Configuring the Virtual Machine 53

Using the PeopleSoft Installation 67

 Reviewing the File System and Users 67

 Understanding Samba and File System Access 69

 Using Application Designer 69

 Managing PeopleTools Domains with PSADMIN 72

 Installing PeopleSoft Change Assistant 73

 Installing and Starting Oracle Database Client Tools 73

Configuring Oracle SES 74

Using COBOL 74

Completing Post-Deployment Activities 75

Troubleshooting 76

Managing the Virtual Environment Lifecycle 76

 Understanding Virtual Machine Management 77

 Saving Virtual Machines as Templates 77

 Using the PeopleSoft Configuration Script 78

 Resetting Virtual Machines 79

About this Documentation

This preface discusses:

- Understanding this Documentation
- Audience
- Typographical Conventions
- Products
- Related Information
- Comments and Suggestions

Understanding this Documentation

This documentation is designed to guide you through the deployment of the Oracle® VM templates for Oracle's PeopleSoft Applications. It is not a substitute for the documentation provided for Oracle® VM Server or Oracle® VM Manager.

Audience

This documentation is intended for individuals responsible for deploying templates for Oracle's PeopleSoft applications, with Oracle VM Manager and Oracle VM Server, on Oracle Linux hosts. You should have a basic understanding of virtual machines. You should have a basic understanding of the PeopleSoft system.

Typographical Conventions

To help you locate and understand information easily, the following conventions are used in this documentation:

Convention	Description
Monospace	Indicates a PeopleCode program or other code, such as scripts that you run during the install. Monospace is also used for messages that you may receive during the install process.

Convention	Description
<i>Italics</i>	<p>Indicates field values, emphasis, and book-length publication titles. Italics is also used to refer to words as words or letters as letters, as in the following example:</p> <p>Enter the letter <i>O</i>.</p> <p>Italics are also used to indicate user-supplied information. For example, the term <i>domain</i> is used as a placeholder for the actual domain name in the user's environment. When two such placeholders are used together, they may be set apart with angle brackets. For example, the path <code><PS_CFG_HOME>/appserv/<domain></code> includes two placeholders that require user-supplied information.</p>
Initial Caps	Field names, commands, and processes are represented as they appear on the window, menu, or page.
lower case	File or directory names are represented in lower case, unless they appear otherwise on the interface.
Menu, Page	A comma (,) between menu and page references indicates that the page exists on the menu. For example, "Select Use, Process Definitions" indicates that you can select the Process Definitions page from the Use menu.
Cross-references	<p>Cross-references that begin with <i>See</i> refer you to additional documentation that will help you implement the task at hand. We highly recommend that you reference this documentation.</p> <p>Cross-references under the heading <i>See Also</i> refer you to additional documentation that has more information regarding the subject.</p>
⇒ (line-continuation arrow)	A line-continuation arrow inserted at the end of a line of code indicates that the line of code has been wrapped at the page margin. The code should be viewed or entered as a continuous line of code, without the line-continuation arrow.
" " (quotation marks)	Indicate chapter titles in cross-references and words that are used differently from their intended meaning.
Note. Note text.	Text that begins with <i>Note</i> . indicates information that you should pay particular attention to as you work with your PeopleSoft system.
Important! Important note text.	A note that begins with <i>Important!</i> is crucial and includes information about what you need to do for the system to function properly.

Convention	Description
<i>Warning!</i> Warning text.	A note that begins with <i>Warning!</i> contains critical configuration information or implementation considerations; for example, if there is a chance of losing or corrupting data. Pay close attention to warning messages.

Products

This documentation may refer to these products and product families:

- Oracle® Database
- Oracle® Enterprise Manager
- Oracle® Tuxedo
- Oracle® VM Manager
- Oracle® VM Server
- Oracle® WebLogic Server
- Oracle's PeopleSoft Application Designer
- Oracle's PeopleSoft Customer Relationship Management (CRM)
- Oracle's PeopleSoft Enterprise Learning Management (ELM)
- Oracle's PeopleSoft Financial Management (part of FSCM)
- Oracle's PeopleSoft Human Capital Management (HCM)
- Oracle's PeopleSoft PeopleTools
- Oracle's PeopleSoft Portal Solutions (PS)
- Oracle's PeopleSoft Process Scheduler
- Oracle's PeopleSoft Supply Chain Management (part of FSCM)
- Oracle® Secure Enterprise Search

See <http://www.oracle.com/applications/peoplesoft-enterprise.html> for a list of Oracle's PeopleSoft products.

Related Information

You can find several sources of reference information about PeopleSoft PeopleTools and your particular PeopleSoft application. You can access PeopleBooks for the current release of PeopleSoft PeopleTools and PeopleSoft applications at the Hosted PeopleBooks site. You can also find installation guides and other information by searching for the product name and release number on My Oracle Support.

- Oracle PeopleSoft Hosted PeopleBooks. This page includes links to the most recent documentation for PeopleSoft PeopleTools and PeopleSoft applications.
See Oracle PeopleSoft Hosted PeopleBooks, <http://www.oracle.com/pls/psfthomepage/homepage>.
- PeopleTools PeopleBook: Getting Started with PeopleTools for your release. This documentation provides a high-level introduction to PeopleTools technology and usage.
See Oracle PeopleSoft Hosted PeopleBooks, <http://www.oracle.com/pls/psfthomepage/homepage>.

- My Oracle Support. This support platform requires a user account to log in. Contact your PeopleSoft representative for information.

To locate documentation on My Oracle Support, search for the title and select PeopleSoft Enterprise to refine the search results.

See My Oracle Support, <https://support.oracle.com>.

- PeopleTools 8.53 Installation for Oracle. This documentation provides instructions for installing PeopleSoft PeopleTools on an Oracle RDBMS (using the traditional method).
See My Oracle Support, (search for title).
- Installation guide for your PeopleSoft application. Search My Oracle Support for the application-specific installation instructions.
- PeopleSoft Application Fundamentals PeopleBook for your PeopleSoft application and release. This documentation provides essential information about the setup, design, and implementation of your PeopleSoft application.
See My Oracle Support, (search for title).
- Oracle VM Templates for PeopleSoft. This white paper introduces the use of Oracle VM for deploying a PeopleSoft environment.
See Oracle VM Templates for PeopleSoft, Oracle Technology Network, http://docs.oracle.com/cd/E18128_01/psft/html/docset.html.
- PeopleSoft Oracle Virtual Machine Templates Development and Customization Guide. This red paper is a practical guide to customizing and extending the delivered templates.
See PeopleSoft Oracle Virtual Machine Templates Development and Customization Guide, Oracle Technology Network, http://wd0338.oracle.com/archive/cd_ns/E27263_01/psft/html/docset.html.
- PeopleTools Mid-Tier Deployment Best Practices. This white paper explains the PeopleSoft Homes (for example *PS_APP_HOME*) introduced since the PeopleSoft PeopleTools 8.50 release.

See PeopleTools Mid-Tier Deployment Best Practices, My Oracle Support, Document 1448479.1.

For information on Oracle VM Manager and Oracle VM Server, see the following documentation:

See http://docs.oracle.com/cd/E27300_01/.

- Oracle VM Release Notes for 3.1.1
- Oracle VM Installation and Upgrade Guide for Release 3.1.1
- Oracle VM Getting Started Guide for Release 3.1.1
- Oracle VM User's Guide for Release 3.1.1
- Oracle VM Utilities Guide for Release 3
- Oracle VM Security Guide for Release 3

For information on Oracle Secure Enterprise Search (SES), see the following documentation:

See Oracle Secure Enterprise Search Documentation 11g Release 2 (11.2.2.2), http://docs.oracle.com/cd/E35215_01/index.htm.

- Oracle Secure Enterprise Search Administrator's Guide
- Oracle Secure Enterprise Search Installation and Upgrade Guide for Linux x86 (64-Bit)

Comments and Suggestions

Your comments are important to us. We encourage you to tell us what you like, or what you would like changed about our documentation, PeopleSoft PeopleBooks, and other Oracle reference and training materials. Please send your suggestions to:

PSOFT-Infodev_US@oracle.com

While we cannot guarantee to answer every email message, we will pay careful attention to your comments and suggestions. We are always improving our product communications for you.

Chapter 1

Preparing to Deploy

This chapter discusses:

- Reviewing the Deployment Process
- Understanding the Deployment of the Oracle VM Template for PeopleSoft Applications on Oracle Linux
- Understanding PeopleSoft Components
- Obtaining the Template from My Oracle Support
- Planning the Deployment
- Reviewing the Oracle VM Setup

Reviewing the Deployment Process

The deployment of the Oracle VM Template for PeopleSoft on Oracle Linux includes the following activities:

Task	Reference
Decide how to set up the environment.	See Planning the Deployment
Install Oracle VM server and Oracle VM Manager.	See Reviewing the Oracle VM Setup
Obtain the template.	See Obtaining the Template from My Oracle Support
Import the template to Oracle VM Manager.	See "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Importing the Template
Create the virtual machine.	See "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Creating the Virtual Machines.
Start the virtual machine.	See "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Starting the Virtual Machines.

Task	Reference
Complete post-deployment tasks.	See: <ul style="list-style-type: none"> • "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Using the PeopleSoft Installation • "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Configuring Oracle SES • "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Using COBOL • "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Completing Post-Deployment Activities

Understanding the Deployment of the Oracle VM Template for PeopleSoft Applications on Oracle Linux

This documentation explains how to deploy the Oracle VM template for PeopleSoft on Oracle Linux (the name refers to deployment on host computers with an Oracle Linux operating system). If the host computer that you use for the Oracle VM Manager has an Oracle Linux operating system, you must use the Oracle VM template for PeopleSoft on Oracle Linux. Other PeopleSoft virtualization products are not supported for this environment.

Note. For the sake of brevity, this documentation sometimes uses "OVM PeopleSoft template" to refer to the Oracle VM template for PeopleSoft on Oracle Linux.

The Oracle VM template for PeopleSoft on Oracle Linux includes the following features:

- Oracle Linux operating system

The Oracle VM template for PeopleSoft on Oracle Linux is developed with an Oracle Linux operating system with Unbreakable Enterprise Kernel (UEK).
- PeopleSoft PeopleTools installation directory (this will be found in /opt/oracle/psft/pt/tools after deployment)
- PeopleSoft Pure Internet Architecture (PIA) built with Oracle WebLogic web server
- Application Server configured for the Oracle Linux configuration
- Process Scheduler with a default UNIX configuration
- Oracle Tuxedo
- Search software:
 - If you set up the environment to include a PeopleSoft release 9.1 or earlier application database, use Verity for searches.

The Oracle VM Template for PeopleSoft on Oracle Linux includes Verity software.

See the information on using Verity in the *PeopleTools: System and Server Administration* product documentation.
 - If you set up the environment to include a PeopleSoft release 9.2 and later application database, you must set up a server, install, and configure Oracle Secure Enterprise Search (SES).

See *PeopleTools Installation for Oracle*, "Configuring Integration Between PeopleSoft PeopleTools and Oracle SES."

See *PeopleTools: PeopleSoft Search Technology*.

- PeopleSoft Client Installer
- Oracle Database client tools
- Samba Open Source software for file system access included

Note. See the Readme file included with the Oracle VM template for PeopleSoft on Oracle Linux for version information.

See Obtaining Oracle VM Template for PeopleSoft on Oracle Linux.

Before deploying the PeopleSoft template, you must install Oracle VM Server and Oracle VM Manager. The hardware and software requirements for this deployment are the same as those for Oracle VM Server and Oracle VM Manager.

See Reviewing the Oracle VM Setup.

See the chapter "Planning Security Administration" for information on the administrator roles and tasks required for this setup.

Understanding PeopleSoft Components

Here are brief descriptions of some of the terms referenced in this documentation for components included in a PeopleSoft environment. For more complete information, see the PeopleSoft documentation.

- PeopleSoft Pure Internet Architecture (PIA)

This is the Web Server component of the PeopleSoft system. It is responsible for handling incoming HTTP requests, primarily from the browser. This tier routes requests to the Application Server domain using Tuxedo Jolt. The responses from the Application Server are assembled as the page content observed in the browser. PIA also contains the Integration Gateway for the PeopleTools Integration Broker system, frequently known as Pub/Sub.
- PeopleTools Application Server and Process Scheduler Server

The Application Server acts as the business logic engine of the PeopleSoft system. Built on Oracle Tuxedo, this tier handles all incoming requests from both PIA and PeopleSoft PeopleTools clients using Application Designer. This tier also contains the Process Scheduler, also known as the Batch Server. The Process Scheduler is responsible for processing scheduled tasks or jobs that typically do not happen during the course of a user's browser request. An example might be processing payroll or quarterly sales reports. The Process Scheduler runs in its own Tuxedo domain independent of the Application Server domain and can therefore be physically relocated to another machine that is dedicated to batch processing.
- PeopleSoft Application Database

The Application Database hosts the PeopleTools and PeopleSoft Application tables, also known as meta data. The user data is also located in the database. A demo database contains limited sample data to allow you to perform the functionality.

PeopleSoft Applications refers to Oracle PeopleSoft products such as PeopleSoft Customer Relationship Management (CRM), PeopleSoft Enterprise Learning Management (ELM), PeopleSoft Financials and Supply Chain Management (FSCM), PeopleSoft Human Capital Management (HCM), and PeopleSoft Portal Solutions (PS).

Note. The deployment of the OVM Template for PeopleSoft on Oracle Linux does not install a database.

- Mid-tier and AppBatch components

This documentation uses the term "AppBatch" to refer to the Application Server and Process Scheduler Server.

This documentation uses the term "mid-tier" to refer to PeopleSoft Application Server, Process Scheduler, and PIA.

See Also

"Deploying the OVM Template for PeopleSoft on Oracle Linux," Using the PeopleSoft Installation
"About this Documentation," Related Information.

Task 1-1: Obtaining the Template from My Oracle Support

This procedure describes how to access the Patches & Updates database on My Oracle Support. Contact Oracle if you need a user ID and password for My Oracle Support.

To obtain the Oracle VM template for PeopleSoft on Oracle Linux from My Oracle Support:

1. Go to My Oracle Support at <https://support.oracle.com>
2. Enter your user name and password to log in.
3. Select Patches & Updates.
4. In the Patch Search section, select the Product or Family (Advanced) link.

The Search page includes several search filters.

5. In the Product drop-down list, select PeopleSoft PeopleTools.

Note. This selection is required.

6. In the Release drop-down list, select the desired PeopleSoft PeopleTools release.

Note. This selection is required.

7. Click the Search button (Patch Search).
8. On the Patch Search Results page, click the patch number relating to your desired OVM PeopleSoft template release to access the Readme file and download the software.

Review the Readme documentation for information about supported releases.

9. Download the OVM PeopleSoft template files:

- a. Accept the licence agreement.

When you click the Download button, you may see a notification of the Oracle PeopleSoft licensing terms. You must read the licensing terms and select the Accept option before the download links become available.

- b. Verify the checksum.

On the File Download window, select Show Digest Details to view MD5 and SHA-1 checksum values that you can use to verify the download of each zip file.

- c. Download all files and save the zip files to a temporary directory.

When you download, there will probably be multiple zip files. The multiple zip files are needed due to size limitations. You must extract parts for the OVM PeopleSoft template from these individual zip files and recombine them into a single tgz file before importing onto the host computer. The first zip file contains a readme.txt with information on the file contents.

The zip file names have this format, where `<TOOLS_VERSION>` represents the PeopleSoft PeopleTools

version and patch number, such as 8.53.07, and *n* represents the total number of zip files:

Note. This example refers to the PeopleSoft PeopleTools 8.53.07 patch; for your download refer to the latest available patch.

<TEMPLATE_NAME><TOOLS_VERSION>_PVM_#ofn.zip

For example, for the PeopleSoft PeopleTools 8.53.07 patch:

OVM_EL5U8_X86_64_TOOLS8_53_07_PVM_1ofn.zip

OVM_EL5U8_X86_64_TOOLS8_53_07_PVM_2ofn.zip

...

OVM_EL5U8_X86_64_TOOLS8_53_07_PVM_nofn.zip

10. Extract the contents of each zip file using a standard zip tool.

Extracting the contents of the zip files yields the individual parts of the template tgz file.

For example, for the PeopleSoft PeopleTools 8.53.07 patch:

OVM_EL5U8_X86_64_TOOLS8_53_07_PVM.tgz1of3

OVM_EL5U8_X86_64_TOOLS8_53_07_PVM.tgz2of3

OVM_EL5U8_X86_64_TOOLS8_53_07_PVM.tgz3of3

11. Combine the individual part files into a single tgz file.

For example, if you extracted three zip files, use the following commands.

- On Microsoft Windows, use the `copy /b` command. For example:

```
copy /b <TEMPLATE_NAME><TOOLS_VERSION>_PVM.tgz1of3+<TEMPLATE_
NAME><TOOLS_VERSION>_PVM.tgz2of3+<TEMPLATE_NAME><TOOLS_
VERSION>_PVM.tgz3of3 <TEMPLATE_NAME><TOOLS_VERSION>_PVM.tgz
```

Note. There is a space before the final combined .tgz file name.

- On UNIX or Linux, use the `cat` command. For example:

```
cat <TEMPLATE_NAME><TOOLS_VERSION>_PVM.tgz1of3 <TEMPLATE_NAME><TOOLS_
VERSION>_PVM.tgz2of3 <TEMPLATE_NAME><TOOLS_VERSION>_PVM.tgz3of3 >=
<TEMPLATE_NAME><TOOLS_VERSION>_PVM.tgz
```

Note. Each name is separated by spaces.

12. After you combine the individual files, you have a single template archive file such as:

<TEMPLATE_NAME><TOOLS_VERSION>_PVM.tgz

For example, for the PeopleSoft PeopleTools 8.53.07 patch:

OVM_EL5U8_X86_64_TOOLS8_53_07_PVM.tgz

See the section "Importing a Virtual Machine Template" in the Oracle VM User's Guide on how to upload templates.

See Also

Oracle VM User's Guide for Release 3.1.1, "Importing a Virtual Machine Template"

Task 1-2: Planning the Deployment

This section discusses:

- Planning the Environment
- Planning the Virtual Machine Configuration

Task 1-2-1: Planning the Environment

In planning the deployment of the OVM PeopleSoft template, consider the following:

- Create a database before deploying the OVM PeopleSoft template.
The OVM PeopleSoft template does not contain a PeopleSoft database. This means that for virtual machines (VMs) to be created and used from these templates a database should already be provisioned and available. The database must fulfill these requirements:
 - The database must be a supported PeopleSoft database running on an Oracle RDBMS platform.
 - See the README file provided with the OVM template for the versions of PeopleSoft PeopleTools and software components that are supported for the OVM PeopleSoft template.
 - Verify that the database to which you will connect your VM has been upgraded to the same version of PeopleSoft PeopleTools as the OVM PeopleSoft template. See My Oracle Support, Certification to review support information for PeopleSoft PeopleTools and PeopleSoft applications.
- Ensure that your PeopleSoft environment includes a *PS_APP_HOME* configuration.
The *PS_APP_HOME* location holds the PeopleSoft application installation files. For PeopleSoft PeopleTools 8.53 it can be different from *PS_HOME*, the location which holds the PeopleSoft PeopleTools installation files.
See *PeopleTools: System and Server Administration*, "Working with PS_APP_HOME."
See "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Using the PeopleSoft Installation.
- Ensure that the Oracle VM environment is set up.
The Oracle VM environment must be fully configured and ready to create VMs created from the OVM PeopleSoft template. This means that there must be sufficient virtual resources, such as disk space, RAM, and vCPUs available to run the required VMs.
See Planning the Virtual Machine Configuration.
The PeopleSoft VM is comprised of runtime components such as Application Server, Process Scheduler, and PIA domains that have their own minimum requirements.
- After setting up the virtual machines you will need to use a secure shell (SSH) client to log in to the VMs.
- It is possible to combine one or more deployed PeopleSoft VMs with a conventional, typically non-virtual, installation. There are several possible combinations.
For example, you can connect to a traditional, non-virtual database instance residing outside the PeopleSoft VM. You may choose a demo, testing, or development database, depending upon your requirements.
- You will need an FTP or HTTP server that is accessible from the machine hosting the repository for the Oracle VM Manager repository.
- The environment installed by the deployment of the OVM Template for PeopleSoft on Oracle Linux can be used as a starting point that can subsequently be enhanced and tuned to fit the requirements of the target system.

See "Deploying the OVM Template for PeopleSoft on Oracle Linux," Managing the Virtual Environment Lifecycle.

- To avoid potential conflicts, the Oracle VM administrator in charge of administering virtual networks in the virtual Data Center should keep careful record of the host names and IP addresses associated with the VMs. See Understanding the Deployment of the Oracle VM Template for PeopleSoft Applications on Oracle Linux.

Task 1-2-2: Planning the Virtual Machine Configuration

Before creating a VM it is necessary to have identified the purpose of your VM. Identifying the purpose of your VM is important because it will drive additional decisions that you make concerning how the VM is to be created. Specifically you must figure out what PeopleSoft PeopleTools components you wish to run on the VM. The OVM PeopleSoft template comes prepackaged with default PIA, Application Server and Process Scheduler domains. This default set of PeopleSoft components requires the following resources:

- 4 GB RAM
- 2 vCPUs
- 40 GB Disk

You may of course choose not to use the default PeopleSoft setup, with PIA, Application Server and Process Scheduler domains, that comes with the template. However, be aware that the sizing guidelines that accompany the template are suited for running a single PIA, Application Server and Process Scheduler domain on the VM. For example, if you choose to run additional Application Server domains you will need to devote additional virtual resources to the VM. On the other hand, if you need only run a single PIA domain you will be free to significantly reduce the amount of RAM and vCPUs devoted to the VM. Guidelines cannot be provided for exact amounts of virtual resources required by the VM. This is a function of the load on the system and the usage patterns of the user population. Some of the following items influence the resources required by your system:

- Caching by the PeopleSoft Application Servers — Cached objects tend to be larger in some applications.
- Number of concurrent users — A greater number of online users typically implies a need for larger Application Server domains and thus more RAM
- Integration Broker usage
- Peak usage — Some systems undergo extremely high usage at specific times. Unless you can predict these peaks in system usage it is necessary to permanently devote sufficient resources to support the maximum user population.

See the information on performance guidelines for PeopleSoft in My Oracle Support.

See PeopleTools Performance Guidelines Red Paper, My Oracle Support (Document 747389.1).

In conclusion, you must be aware of what runtime components you wish to run. If in doubt, or when you first begin to work with these templates, it is recommended that you select the defaults and assign the values mentioned in this section when creating your VM.

Task 1-3: Reviewing the Oracle VM Setup

Before you begin the Oracle VM Template for PeopleSoft on Oracle Linux deployment, the Oracle VM Administrator should have completed the following tasks:

- Downloaded the Oracle VM Server and Oracle VM Manager installation software from Oracle Software Delivery Cloud.
- Installed Oracle VM Server and Oracle VM Manager software.

See *Oracle VM Installation and Upgrade Guide for Release 3.1.1*.

- Installed a VNC viewer.

See *Oracle VM Installation and Upgrade Guide for Release 3.1.1*, "Installing Oracle VM Manager."

- Set up a server pool.

See *Oracle VM Getting Started Guide for Release 3.1.1*.

- Set up a server.

See *Oracle VM Getting Started Guide for Release 3.1.1*.

- Recorded, and if necessary, communicated information such as hostnames, IP addresses, and other access information, to the user who will deploy the templates.

- Considered security planning.

See "Planning Security Administration."

You should give due consideration to the best server pool configuration for your system. For example, you can create different virtual machines for the AppBatch and PIA setup, on different physical servers, and put them into the same server pool. The Oracle VM documentation includes guidance on designing your system.

See *Oracle VM Getting Started Guide for Release 3.1.1*, "Managing Server Pools."

Chapter 2

Planning Security Administration

This chapter discusses:

- Understanding Virtual Machine Security Administration
- Considering Network Security
- Considering User Security
- Considering the Virtual Machine Guest Operating System Security
- Considering PeopleSoft Application Security and Client Access
- Summarizing Security Considerations

Understanding Virtual Machine Security Administration

This chapter presents topics for you to consider when planning to secure your PeopleSoft virtual machine (VM). This chapter is not intended to replace or supersede any of the concepts covered in the PeopleSoft PeopleTools Security Red Papers or other sources of corporate infrastructure hardening.

The extent to which your VM must be secured is decided by the way in which it will be used and by whom. The more exposure the VM receives, the more secure it must be.

This chapter does not discuss details concerning the physical security of the servers on which your virtual machines will run. This is because the physical and operational obligations will be unique to your situation and will be based on standards defined at your organization. By the time you are deploying virtual machines you will have implemented a security infrastructure within your data center. You will have secured your network and firewalls and other security infrastructure components at appropriate points.

This chapter therefore discusses the aspects that are specific to the OVM PeopleSoft template and the VM deployed from the template. The chapter sometimes uses the term "guest OS" to mean the VM OS (Oracle Linux in this case) installed on the host OS, such as Microsoft Windows. Communication with the virtual machine and network-based access are subjects that are not included here; decisions concerning these subjects derive from standards and procedures defined at your organization.

See Also

Oracle VM User's Guide for Release 3.1.1

Oracle VM Security Guide for Release 3

PeopleTools: Security Administration

Securing Your PeopleSoft Application Environment, Oracle Technology Network,

http://download.oracle.com/peopletools/documents/Securing_PSFT_App_Environment_May2010%20v4.pdf

Considering Network Security

The approach that you take towards network security will mirror existing guidelines you have in place for traditional non-virtual ("bare-metal") systems. The main distinction between network security for your virtual artifacts and bare-metal systems is that the OVM PeopleSoft templates do not contain a network configuration when shipped. The network configuration is assigned to the VMs when they are initialized from the OVM PeopleSoft templates. This means that prior to this initialization you should plan your network configuration and provide necessary access to the users of this system. The PeopleSoft Security Red Paper provides detailed information about how to plan your network configurations for a multi-tiered PeopleSoft deployment involving load balancers, proxy servers and the logical tiers of a PeopleSoft application including PeopleSoft Pure Internet Architecture (PIA), Application Server, Process Scheduler and Database.

See *Securing Your PeopleSoft Application Environment*, My Oracle Support, (search for the title).

Network services used for reaching the VM services such as Samba, NFS, SSH and so on are configured and sometimes enabled in the VM by default. You must inspect the default configuration of your VM. Use Linux utilities such as `netstat` and `ps` to report the services and ports that are open on the VM. Use this information to reconfigure the system services and other network security utilities such as `iptables`.

Considering User Security

A number of distinct and separate user accounts are used when interacting with the VM. These user accounts are as follows:

- Network users — Network users that access the virtual machine after it is started by using PIA, Application Designer, and so on.
- Application user accounts — User accounts contained in the PeopleSoft application database that are used to sign on to the PeopleSoft application.
- Guest OS user accounts — User accounts for signing on to the guest virtual machine. There are a number of default users in the virtual machine, as described in a later section.

See "Deploying the OVM Template for PeopleSoft on Oracle Linux," *Reviewing the File System and Users*.

It is important to understand the implications of the local user accounts. The availability of these accounts means that there is no domain authentication of user log in. Audit facilities that you employ for tracking user activity and access will not be available for the VM by default. You may wish to disable these accounts and replace them with network users. This will require consideration of the later section that describes the default users. The default configuration for PeopleSoft runtime components and installed software is reliant on these default users. Replacing these users with domain users will require you to map these user roles and responsibilities to the new users.

For example, Oracle Tuxedo domains are tightly bound to the users with whom they were created. You must recreate the Oracle Tuxedo domains if they must be run as a different user account.

- Samba user accounts — User accounts for accessing a limited part of the file system of the VM from outside the virtual machine.

See "Deploying the OVM Template for PeopleSoft on Oracle Linux," *Understanding Samba and File System Access*.

Each of these accounts has different activities or roles that can be associated with them. This partitioning of roles with different authentication mechanisms provides scope for a more secure deployment of the VM similar to a typical environment management strategy used in your data center.

For example, it is possible to manage the environment such that the owner of the VM is unable to log in to the virtual machine. This allows the system and database administrators of the virtual machine to be divided into separate groups.

The following table lists administrators and likely sample activities:

Administrator	Sample Activities and Permissions
Network administrator	<ul style="list-style-type: none"> • Administers network addresses and names • (Sys Admin) Manages the host on which the VM runs and creates the VM. • After initial configuration, cannot log in to guest OS
System administrator	<ul style="list-style-type: none"> • Applies security to the guest OS and PeopleSoft runtime environment • Shuts down non-essential services and configures firewall • Cannot log in to Oracle VM Manager and cannot control starting up and shutting down of the VM.
PeopleSoft runtime administrator	<ul style="list-style-type: none"> • Manages the PeopleSoft runtime components and local installed software. • This is a non-root user and cannot stop or start OS services, install system software, change kernel parameters, and so on. • Manages the three user accounts psadm1 and psadm3, which are installation administrators, and psadm2 which is the runtime administrator. <p>See "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Reviewing the File System and Users.</p> <p>Note. This role may in fact be broken into a number of users along the lines of the three separate user accounts. This separation has been skipped for the sake of simplicity in this example.</p>
Database administrator (DBA)	<ul style="list-style-type: none"> • Manages the PeopleSoft application databases, availability and performance • Participates in creating new databases during upgrade
PeopleSoft administrator	Signs on to PeopleSoft Application (PIA and Application Designer) and manages users, groups and authorization.

Here is a possible scenario for the security administration provided by these four administrators:

1. The network administrator downloads the latest OVM PeopleSoft template to the physical machine on which the VM will run.
2. The network administrator verifies that the checksum for each template part matches the digest information available on the download page.
See "Preparing to Deploy," Obtaining the Template from My Oracle Support.
3. The network administrator imports the OVM PeopleSoft template using Oracle VM Manager.

4. The network administrator creates a VM from the imported OVM PeopleSoft template.
In doing so she assigns resources such as RAM and vCPUs to the VM in addition to assigning virtual network configuration including the IP address allocation method—static or dynamic.
5. The network administrator starts the VM, notifies the System Administrator that the VM has been started, and provides the connectivity details.
See "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Starting the Virtual Machines.
6. The system administrator logs in to the VM and applies security to the guest OS; for example:
 - Firewall configuration
 - Disabling unnecessary services
 - Installing software packages with Yum
 See Applying Operating System Patches and Updates.
7. The system administrator provides temporary root access (or uses `lroot` or `sudo`) to PeopleSoft runtime administrator.

Note. For information on using `lroot` or `sudo`, see Linux user documentation.

See "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Using the PeopleSoft Installation.

8. The database administrator provides connectivity information for the PeopleSoft database to which the VM will connect.
9. The PeopleSoft runtime administrator logs in to the VM and invokes the PeopleSoft configuration script.
The startup procedure includes prompts for the user for which PeopleSoft components should be run on the VM, and the location of the PeopleSoft Application Home (*PS_APP_HOME*).
10. The PeopleSoft runtime administrator changes the passwords for each of the ordinary (non-root) user accounts in the VM.
11. After the PeopleSoft runtime administrator has completed setup of the on-host PeopleSoft components, the system administrator withdraws super-user access from the PeopleSoft runtime administrator.
This may involve changing the root password or perhaps editing the `sudoers` file to withdraw privileges from the PeopleSoft runtime administrator.

Note. The `sudoers` file is a Linux or UNIX file that defines execution privileges for users. For more information, see Linux user documentation.

12. If necessary, the PeopleSoft runtime administrator announces the availability of the VM to the broader end-user population.
This may be unnecessary if the VM is joining an already running PeopleSoft application, for example where the VM has been added to support increased load or high availability.
13. The end-users access the PeopleSoft application through the normal mechanisms of using PIA or Application Designer.

Considering the Virtual Machine Guest Operating System Security

This section discusses:

- Understanding the Virtual Machine Guest Operating System Security
- Applying Operating System Patches and Updates

- Checking for Critical Patch Updates
- Disabling Unnecessary Services

Understanding the Virtual Machine Guest Operating System Security

The OS of the OVM PeopleSoft template is delivered with limited security. The PeopleSoft installation is secure in terms of file system permissions. The OS users that are used to administer the PeopleSoft system are consistent with available recommended guidelines. As noted elsewhere, those users are local to the virtual machine and must have their passwords immediately changed upon initial deployment.

See PeopleTools Mid-Tier Deployment Best Practices, Oracle Technology Network, http://docs.oracle.com/cd/E29604_01/psft/html/docset.html.

Applying Operating System Patches and Updates

The OVM PeopleSoft templates that are downloaded from My Oracle Support contain the most recent versions of PeopleSoft PeopleTools and additional component (third-party) products (for example, Oracle Tuxedo) required by the PeopleSoft application. You may need to apply updates to the VM operating system, Oracle Linux, to ensure that it has all the required patches and fixes to function correctly and securely.

It is highly recommended that you use the fixes and updates for Oracle Linux that are available from the Oracle Yum Public Repository (<http://public-yum.oracle.com>). These fixes can be accessed directly from your VM by configuring yum on your VM to connect directly to the repository. You will connect to the yum repository through a secure channel. If traffic to the public yum repository is required to flow through a corporate proxy, the yum process can be configured to honor those settings. An alternative to using the remote public repository is to create your own yum repository. The approach you take will derive from pre-existing security processes in place within your organization for patching operating systems.

Note. The Yum repository is not configured on the delivered OVM PeopleSoft templates.

See the information on Yum in the Oracle Linux documentation.

See *Oracle Linux Administrator's Solutions Guide for Release 6*, Oracle Technology Network, <http://www.oracle.com/technetwork/indexes/documentation/ol-1-1861776.html>.

Your organization will have pre-existing guidelines and standards set forth for hardening the operating system prior to making any host accessible on your network. You should apply these same security guidelines for the guest OS of any virtual artifacts delivered by Oracle for PeopleSoft environments. Your security personnel should be familiar with published hardening and threat mitigation documentation, including the following from Oracle:

- Tips for Hardening an Oracle Linux Server

Suggestions and techniques for hardening an Oracle Linux server.

See Oracle Technology Network, <http://www.oracle.com/technetwork/articles/servers-storage-admin/tips-harden-oracle-linux-1695888.html>.

- Tips for Securing an Oracle Linux Environment

An overview of the software, network, and system monitoring recommendations for maintaining a secure Oracle Linux environment, plus an overview of the tools to help you do it.

See Oracle Technology Network, <http://www.oracle.com/technetwork/articles/servers-storage-admin/secure-linux-env-1841089.html>.

In addition, review the following Oracle resources for information on securing the machines running the PeopleSoft database:

- Oracle Database Security Guide 11g Release 1 (11.1)

This guide describes how you can configure security for Oracle Database by using the default database features.

See Oracle Database Documentation Library,
http://docs.oracle.com/cd/B28359_01/network.111/b28531/toc.htm.

- Oracle Database 2 Day + Security Guide 11g Release 1 (11.1), "Securing the Network."

This chapter explains how you can encrypt data as it travels through the network, and also provides guidelines that you can follow to secure the network connections for Oracle Database

See Oracle Database Documentation Library,
http://docs.oracle.com/cd/B28359_01/server.111/b28337/tdpsg_network_secure.htm.

- Oracle Database Security Checklist

An Oracle white paper that includes general guidance on configuring an Oracle Database.

See Oracle Technology Network, <http://www.oracle.com/technetwork/database/security/twp-security-checklist-database-1-132870.pdf>.

- Series: Project Lockdown. A phased approach to securing your database infrastructure.

This project is divided into four distinct phases, each of which are achievable and provide measurable improvements within a specific period of time: one day, one week, one month, and one quarter.

See Oracle Technology Network, <http://www.oracle.com/technetwork/articles/index-087388.html>.

Checking for Critical Patch Updates

Critical Patch Updates (CPUs) are made available according to a published schedule. If CPUs have been released subsequent to the availability of the OVM PeopleSoft template, you may want to install these CPUs if your VM is available to an untrusted user population.

See Critical Patch Updates, Security Alerts and Third Party Bulletin, Oracle Technology Networks,
<http://www.oracle.com/technetwork/topics/security/alerts-086861.html>.

You can also search for critical patches in My Oracle Support, Patches & Updates.

See My Oracle Support Patches and Updates for PeopleSoft Products, My Oracle Support, Document 1465172.1.

Disabling Unnecessary Services

At initialization the VM starts a number of services. These frequently run as background or daemon processes, and they may be owned by either root or regular users. These services are responsible for runtime management of the system. Some of these services may be deemed non-essential for the running of your VM.

You may wish to review the services that are running, for example with the following Linux command:

```
service --status-all
```

Decide from those running services which ones are non-essential and whether the essential ones are properly configured. Consult your organization security authorities to determine which services are either mandatory or prohibited.

Considering PeopleSoft Application Security and Client Access

This section discusses:

- Understanding PeopleSoft Application Security and Client Access

- Considering PeopleSoft Pure Internet Architecture Security
- Considering Security for Client Tools
- Considering SQL*Plus Security
- Considering Security for Samba and the VM File System
- Considering the VM Operating System and Secure Shell Access

Understanding PeopleSoft Application Security and Client Access

To effectively use the virtual machine you will need to make it available to users. This access may be direct where the users can communicate directly with the machine from their own machine. For example, this might be in a demo environment where a small and known population of functional users have the host name or IP address of the system to perform tasks such as logging in to PIA. More frequently however, the access will be indirect, where the user is not aware, and should not be aware, that the machine is accessing the VM. In such cases proxy servers and load balancers will be part of a larger system configuration that is employed to make the system opaque to the client with the exception of the specific channels, such as HTTPS, through which the communication is directed.

In the most secure deployment the only user that needs to access the VM is the logged-in user on the host OS. This is not expected to be sufficient in most cases and therefore access to the VM will need to be made available to the user population. The VM should be made only as accessible as it needs to be for the users to perform the required tasks. Each of the VM access channels is discussed below.

Considering PeopleSoft Pure Internet Architecture Security

By default, any user that can reach the VM over TCP/IP can access the PIA login page. The URL for accessing PIA is well-known and can be constructed if the hostname of the VM is known. There are no security certificates with the delivered VM and all traffic is HTTP by default. Because these default characteristics mean that access to the virtual appliance is quite open by default, and because unencrypted HTTP can be observed on the network by anyone that is reading the network path between the user and PIA machine, unless there is a security infrastructure including the use of SSL on front of the PIA domains, HTTP should be disabled and only HTTPS should be used.

For information on setting up SSL for PeopleSoft PeopleTools, see the *PeopleTools: Security Administration* product documentation.

For an example of steps that can be taken to lock down PIA and other components, see *Reviewing a Sample Scenario* later in this chapter.

Considering Security for Client Tools

Understanding Client Tools

PeopleSoft PeopleTools, including Application Designer (PSIDE) and PeopleSoft Change Assistant, are client tools that can run on only a Microsoft Windows machine, which can be the host OS or a remote workstation that has network access to the virtual machine. Alternatively the PeopleTools client installation can be placed on a shared (or mapped) drive that multiple users can access in read-execute mode. The installer for these Microsoft Windows-based client tools is contained within the VM and is exposed through a Samba share. Note that the Samba service is delivered disabled by default.

The administrator should copy the installation program for the client tools from the VM to a shared location in order to make it available to users. See the section on Samba shares later in this documentation for more information about how to manage access to the shared folders. After the client installation has been copied from the VM it is no longer necessary to expose the VM file system to clients.

See "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Understanding Samba and File System Access.

Considering Application Designer Security

Application Designer is not needed for feature demonstration or evaluation purposes; it is used for development or debugging purposes. The Workstation Listener (WSL) port (7000) on the Application Server domain for Application Designer connectivity is disabled in the delivered OVM template for PeopleSoft. This port should be enabled if Application Designer is needed.

Note. If you choose to set up your environment without an Application Home (*PS_APP_HOME*), the WSL port is enabled by default.

See the information on Workstation Listener options in the *PeopleTools: System and Server Administration* product documentation.

Considering SQL*Plus Security

Oracle SQL*Plus is a client tool that allows direct access to the database tables. It can be used by a super-user to manipulate application data, and a database administrator can use it to manipulate the database itself. Obviously, this level of access should only be afforded to the most trusted users and DBAs.

The connectivity information for the PeopleSoft application database is available in the VM file system when the Samba service is enabled and the file system is accessed. This connectivity information is available in the form of a *tnsnames.ora* file that provides the service name and listening port for the database. This can be seen by any user that can log in to the virtual machine over SSH or remotely access the file system of the VM. With this information it is necessary to supply the required credentials to connect to the database with SQL*Plus.

Your environment will include a database created separately from the VM. Nevertheless, as a general rule for database security, access to the database should be disabled for user accounts that do not require direct database access. Passwords for legitimate users should be changed from the default values that are contained in the delivered virtual appliance. Most importantly the administrator must change the password for the SYSADM user immediately after VM startup. The DBA will be familiar with which parts of the PeopleSoft database tablespace must be secured including user accounts and passwords.

Network security can also be employed to turn off remote access in the database service. As noted earlier in this section, the firewall can be configured to only allow connections to the database service listener port from specific clients.

See Also

*SQL*Plus User's Guide and Reference*, Oracle Technology Network, Oracle Database Documentation Library

Considering Security for Samba and the VM File System

The Samba configuration allows users outside the guest OS to access the file system that is internal to the VM. Only a limited part of the file system is exposed, mostly for access to the client installation programs required for PeopleSoft application development and customization. The client installations programs can be copied and relocated.

The Samba service is delivered disabled, and Samba is not required for ongoing use of the virtual machine after initial setup. After the required file systems are used, the Samba service should be disabled. This will further prevent unauthorized users accessing the VM file system. Use this command to disable the Samba service:

```
chkconfig smb off
```

See "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Understanding Samba and File System Access.

Considering the VM Operating System and Secure Shell Access

Remote users (that is, users outside the host OS) can only sign on to the virtual machine using Secure Shell (SSH). All of the default users in the virtual machine must therefore have their passwords changed or invalidated immediately after initial startup.

SSH uses public-private key pairs to authenticate users and restrict access to the machine. The approaches provided in the virtual machine are the same as those used for conventional Linux systems.

See the documentation for your SSH client for more information.

Summarizing Security Considerations

This section discusses:

- Deciding on Security Plans
- Reviewing a Sample Scenario

Deciding on Security Plans

This section includes samples of questions related to security considerations. Use these questions to help you decide the level of security to be applied to your virtual machine:

1. *Question:* Do you have the required hardware available to run the virtual machine?
Implication: You may have to procure new hardware that is an exception to the current hardware in place.
2. *Question:* Does the hardware on which you will run the virtual machine require an exception to the existing organizational standards?
Implication: You will have to work with your security and network administration team.
3. *Question:* Do you have organizational processes and standards in place for assessment or auditing of new hosts on the network?
Implication: You will have to work with your security and network administration team to verify that the VM is permitted to join the corporate network. In addition, consider the use of security scan and analysis tools to help you determine compliance with organizational standards.
4. *Question:* Will multiple users require access to the VM without connection through a proxy or firewall?

Implication: If multiple users require access to the VM it will be necessary to apply network, VM and application security, as discussed earlier in this chapter.

5. *Question:* Will the VM be hosted in a LAN sub-domain that can only be accessed by the authorized domain users?

Implication: If not, and if the unauthorized users have a network path to the VM, additional on-host security will need to be applied to prevent access to the VM.

6. *Question:* What is your timeline for retaining the VM?

Implication: If you download new templates from My Oracle Support frequently, you can take advantage of updated patches and so on. For long-term use, you must consider activities associated with ongoing maintenance of the VM such as OS and PeopleSoft application software patching, password expiration, and so on.

Reviewing a Sample Scenario

Here is a suggested list of steps that an administrator might carry out to secure the system:

1. Review the existing operational guidelines for your organization for adding machines, web servers, AppBatch domains and so on to the network.
2. Update account and authentication settings, by changing default passwords; for example:
 - Change the OS passwords for the non-root users.
If any of the users are not required they can be disabled completely.
See "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," Using the PeopleSoft Installation.
 - Change the default Oracle WebLogic password of PSKEY.
See *PeopleTools: System and Server Administration*, "Implementing WebLogic SSL Keys and Certificates."
 - Change the domain connection password, used in the PIA to Application Server communication.
See *PeopleTools: System and Server Administration*, "Configuring Domain Connection Password."
 - Disable unneeded user accounts in the PeopleSoft database.
PeopleSoft databases contain a number of default users, such as VP1 or PS, with well-known passwords. These users are only needed as templates for creating users with specific roles, and after that is done, they should be removed or disabled. The needed accounts should have their passwords changed on first signon.
See *PeopleTools: Security Administration*, "Purging Inactive User Profiles."
3. Configure iptables to restrict access to well-known ports, such as those listed here, to a restricted set of client IP addresses:
See *Considering Network Security*.
 - Secure shell, SSH, Port 22
 - TNS listener, port 1521
 - Jolt listeners, ports 9000–9003
 - Workstation listeners, ports 7000–7003 (normally disabled by default but needed if Application Designer access is required)
4. Disable HTTP access in PIA.
As noted earlier, HTTP is enabled by default in the virtual machine. Secure HTTP (HTTPS) should be used if the virtual machine is network accessible. This is to prevent eavesdropping on the network between the

authorized user and the VM

See *PeopleTools: Portal Technology*, "Configuring Web Profiles."

5. Obtain and install a valid security certificate from an approved certificate authority (CA).

See *PeopleTools: Security Administration*, "Understanding SSL/TLS and Digital Certificates."

See *PeopleTools: Integration Broker*, "Understanding Digital Certificates."

6. Enable encryption between PIA and Application Server domain.

This is achieved by using the Custom Configuration menu for the Application Server domain. In the section for Workstation Listener options, set the value for Encryption to 128 bit.

See *PeopleTools: System and Server Administration*, "Workstation Listener Options."

7. Configure a forward proxy server if your VM allows communications with an untrusted network, such as communications over the internet.

Note. This is relevant for the next step for access to the yum repository on the internet.

8. Configure the yum repository to use the latest label from Oracle Linux.

See *Considering the Virtual Machine Guest Operating System Security*.

9. Update all packages on the virtual appliance using yum update.

10. Disable any network services that are not needed.

In particular the Samba service should be disabled as soon as it is no longer needed.

See "Deploying the Oracle VM Template for PeopleSoft on Oracle Linux," *Understanding Samba and File System Access*.

Chapter 3

Deploying the Oracle VM Template for PeopleSoft on Oracle Linux

This chapter discusses:

- Importing the Template
- Creating the Virtual Machines
- Starting the Virtual Machines
- Using the PeopleSoft Installation
- Configuring Oracle SES
- Using COBOL
- Completing Post-Deployment Activities
- Troubleshooting
- Managing the Virtual Environment Lifecycle

Task 3-1: Importing the Template

There are several methods of importing virtual machine templates. This section assumes that you downloaded the Oracle VM for PeopleSoft template on Oracle Linux (referred to here as OVM PeopleSoft template) from My Oracle Support, extracted the template, and saved it.

Use the examples shown here for information, but keep in mind that there may be slight differences in appearance due to different browsers and so on. In addition, the import process shown here for Oracle VM version 3.x is different from that seen in previous Oracle VM releases.

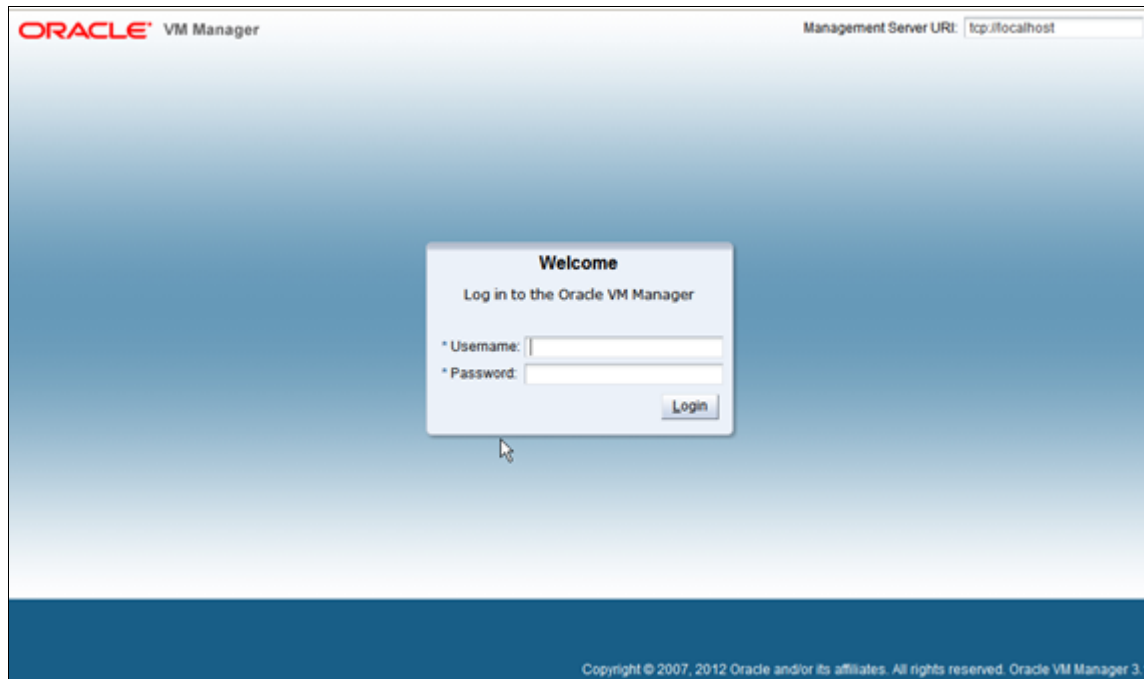
See "Preparing to Deploy," Obtaining the Template from My Oracle Support.

For other methods of importing templates, see the *Oracle VM User's Guide for Release 3.1.1*.

To import the virtual machine template that you downloaded previously, and register it in Oracle VM Manager:

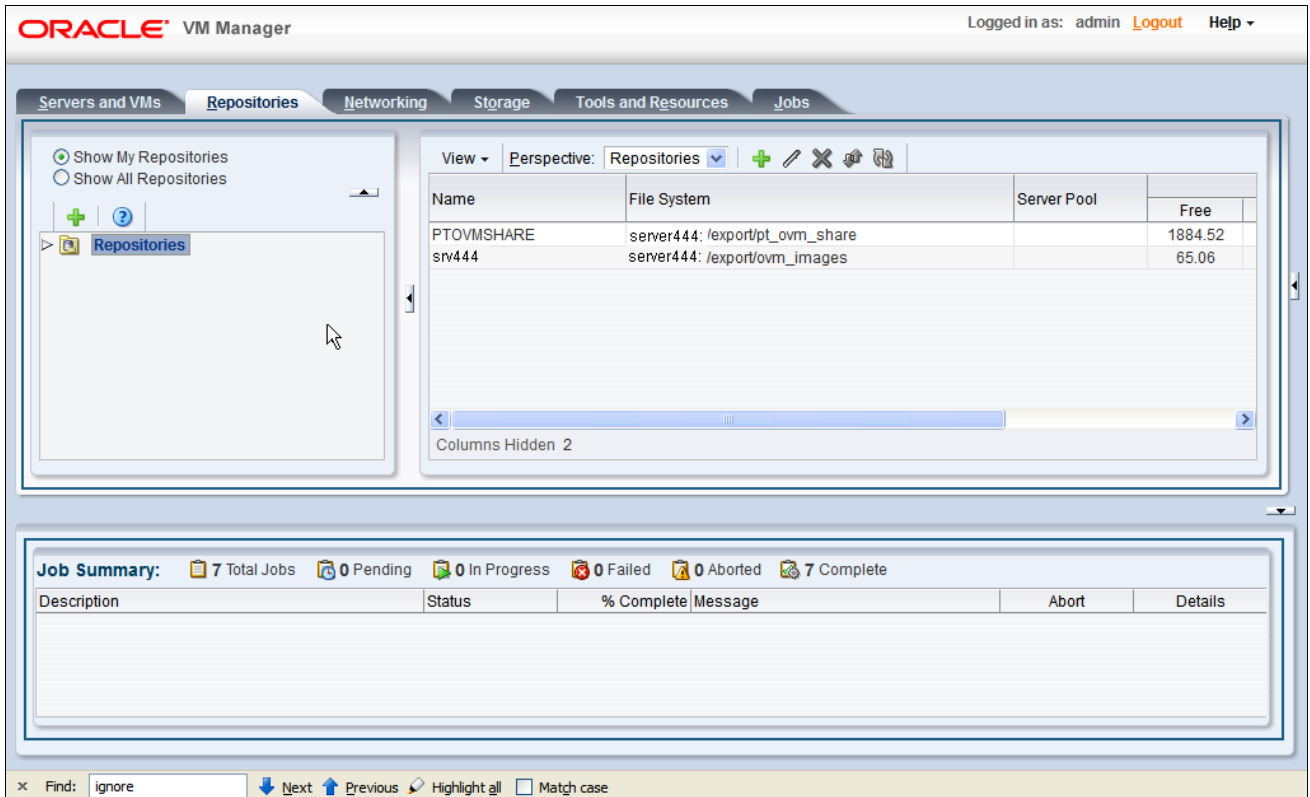
1. Launch the Oracle VM Manager in a browser and enter a Username and Password on the Welcome window, shown in this example.

Log in with a user account that has the permissions to import templates and create virtual machines.



Oracle VM Manager Login window

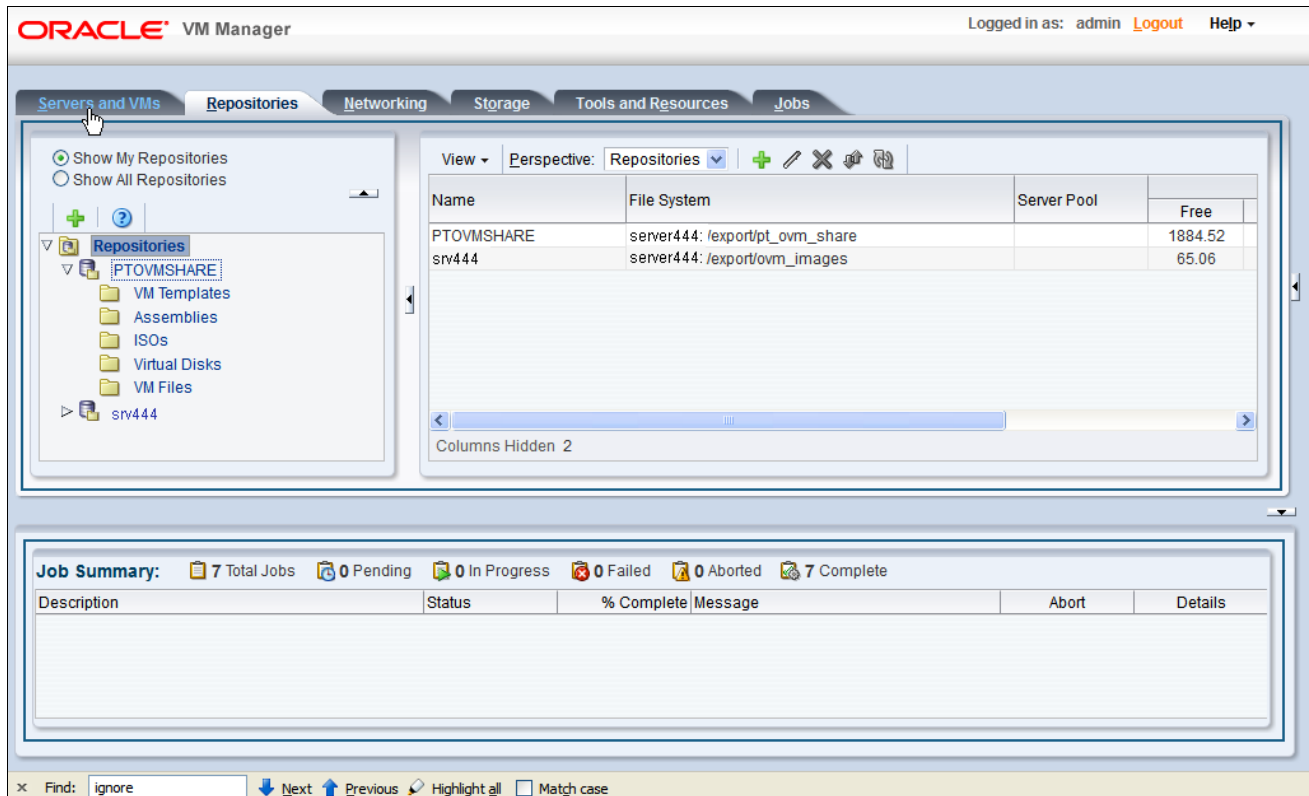
2. Select the Repositories page, as shown in this example:



Oracle VM Manager: Repositories page

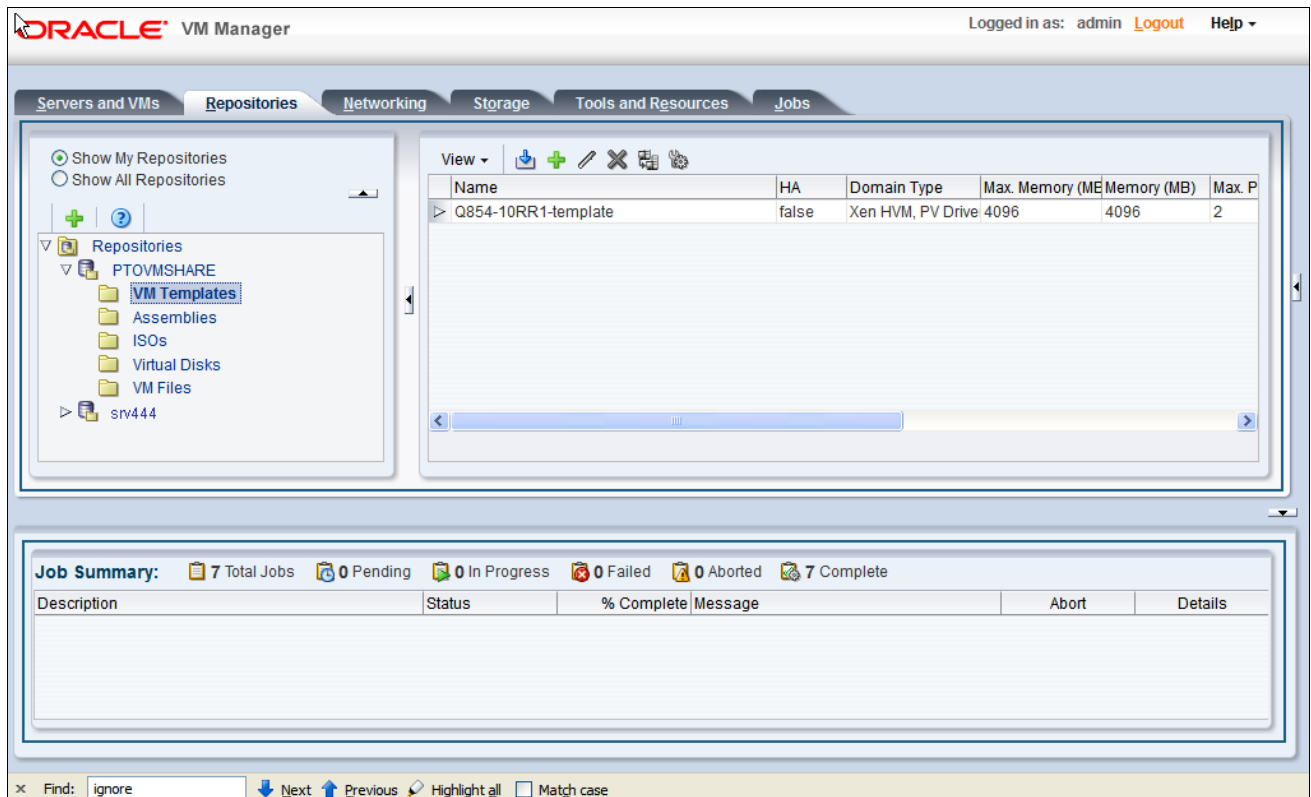
- In the navigation pane on the left, expand the Repositories tree, and then the repository tree, PTOVMSHARE, under it, as in this example.

See *Oracle VM User's Guide for Release 3.1.1*, "Managing Storage."



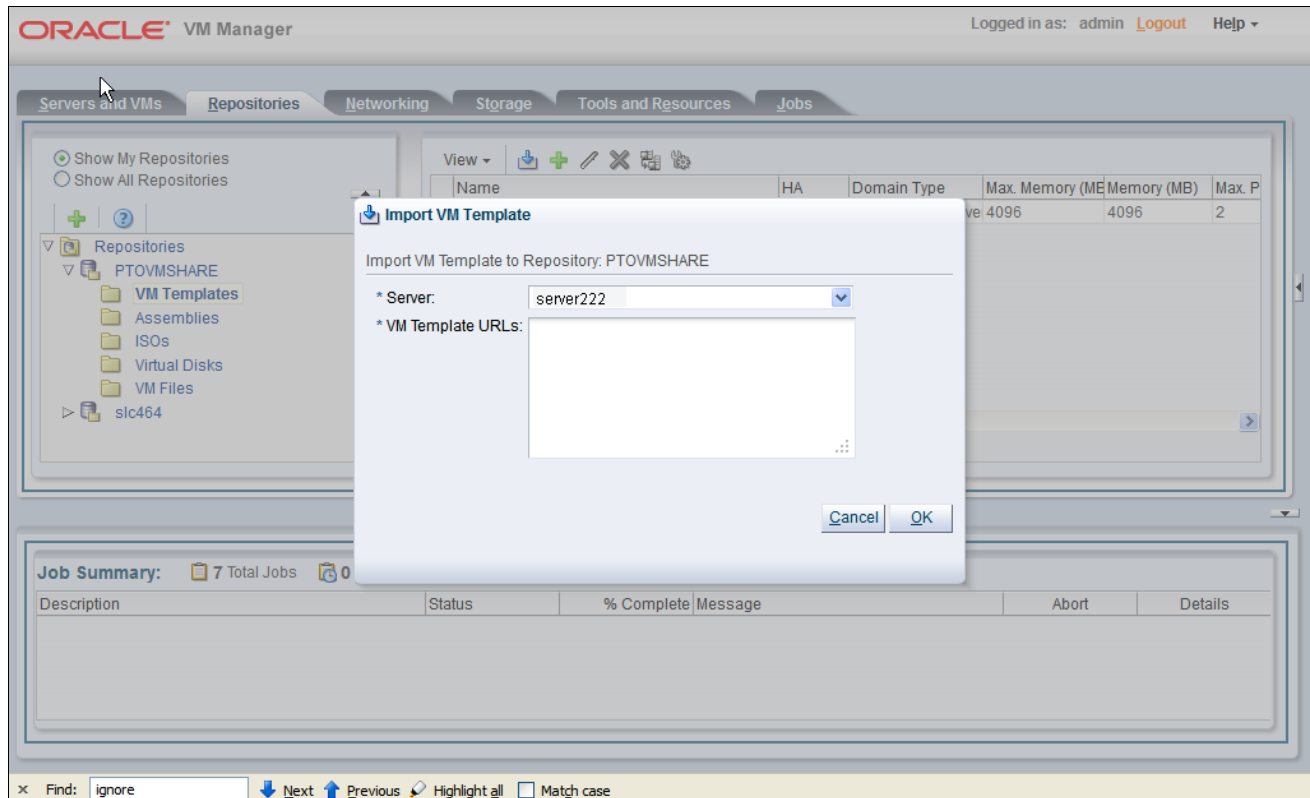
Oracle VM Manager: Repositories page with expanded Repositories tree

- 4. Click the VM Templates folder under PTOVMSHARE, as shown in this example.



Oracle VM Manager Repositories page: Selecting VM Template folder

5. Click the Import VM Template icon (blue arrow) at the top of the management pane on the right.
You see the Import VM Template window with fields for Server and VM Template URLs, as shown in this example:



Import VM Template window

6. In the VM Template URLs field, use either HTTPS, HTTP, or FTP protocol to specify the location for Oracle VM Manager to obtain the template file.

For FTP, use this format: `ftp://<username>:<password>@<machine>//<PATH>/<TEMPLATE-NAME>`

Note. There are two forward slashes between `@machine` and `<PATH>`

The example shown here uses,

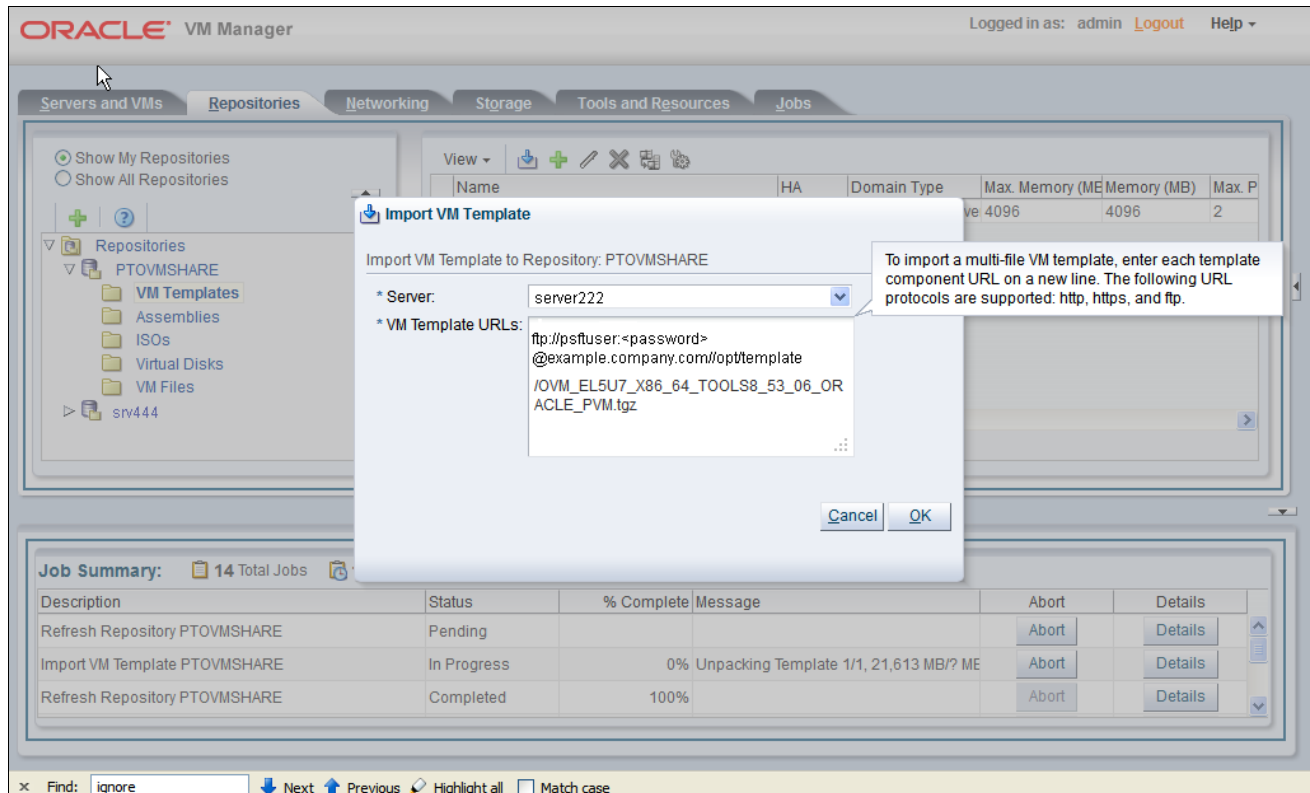
`ftp://psftuser:<password>@example.company.com//opt/templates/OVM_EL5U7_X86_64_TOOLS8_53_06_PVM.tgz`

Note. If the password contains special characters such as `@` or `$`, they have to be hex encoded to operate without any conflicts. For example, if the password contains "`@`" ("`at`") sign it should be replaced with `%40`.

For complete list of conversion codes for special characters refer to the following resource:

<http://www.ascii.cl/htmlcodes.htm>.

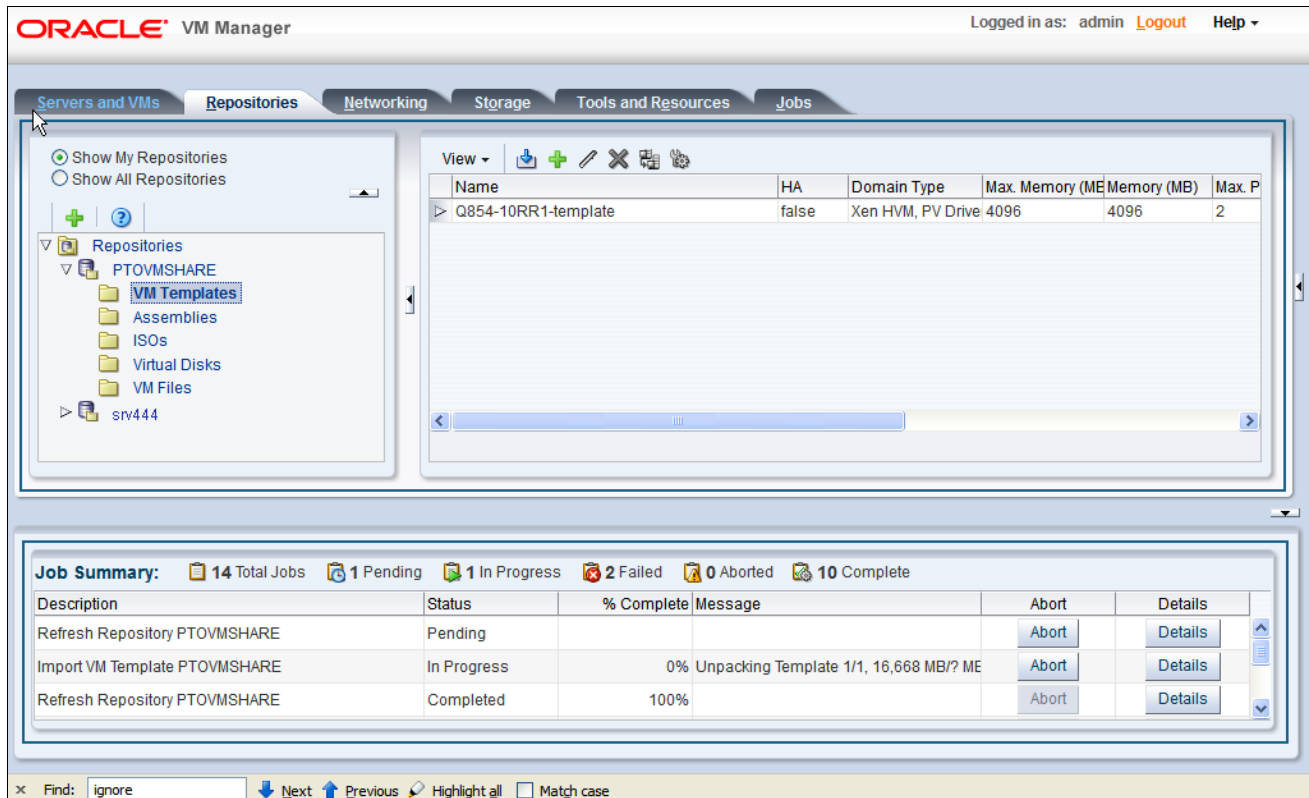
See *Oracle VM User's Guide for Release 3.1.1*, "Virtual Machine Resources – Importing a Virtual Machine Template."



Import VM Template window with FTP information

7. Click OK.

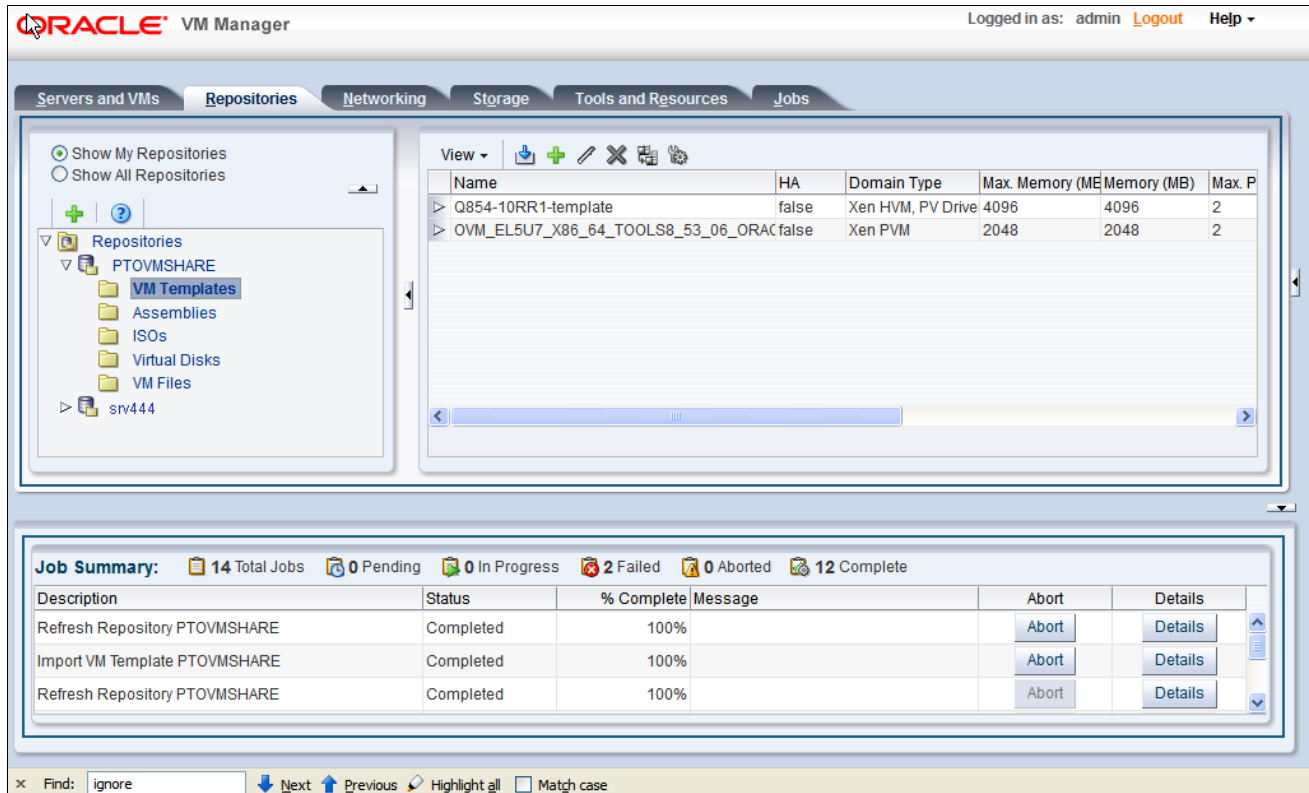
You see the progress of the Import process on the Job Summary grid at the bottom of the Repositories page. This example shows the job Import VM Template PTOVMSHARE with status In Progress.



Repositories page: Job Summary showing import progress

- Once the Import process is complete, the template is listed in the management pane on the right of the page.

In the example shown here, the template name is OVM_EL5U7_X86_64_TOOLS8_53_06_ORACLE_PVM.tgz. (The template that you download may have a different name.)

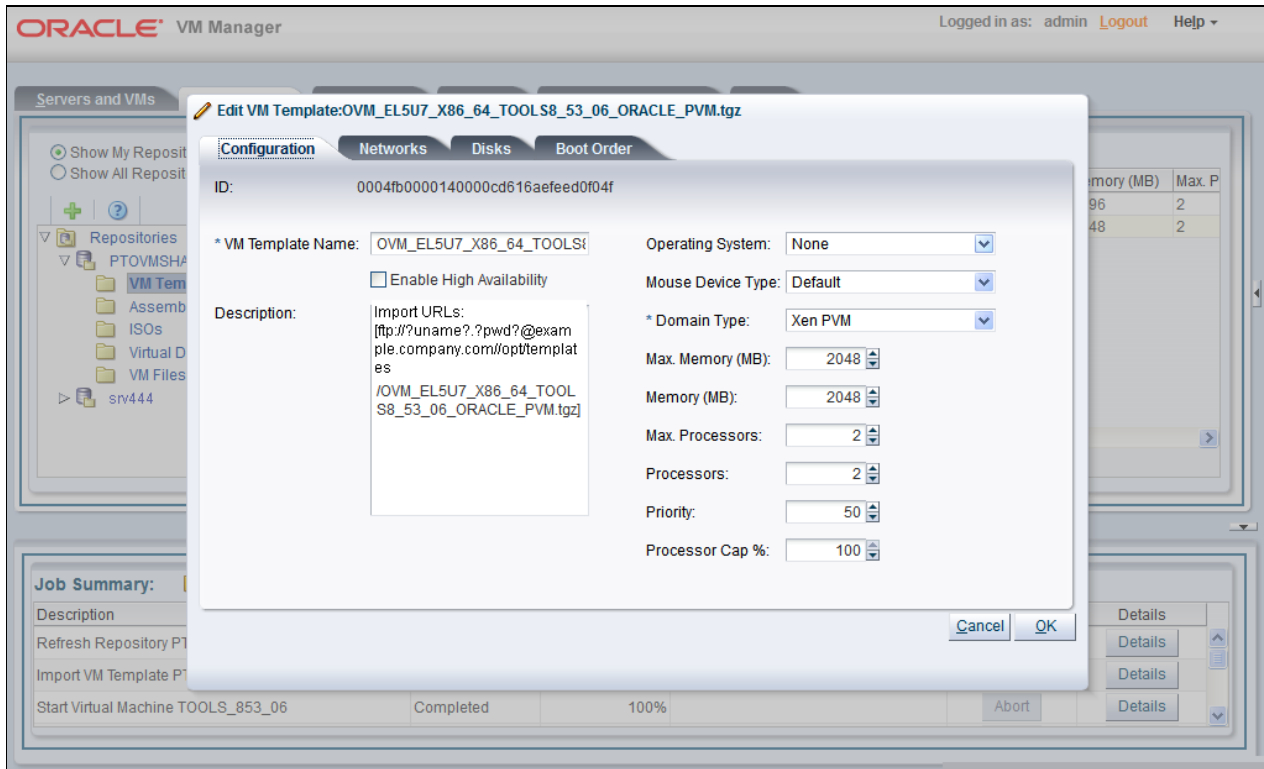


Repositories page showing imported template

- Check that the network is set up correctly for the template, as follows:

- a. Highlight the template name and click the Edit button (the pencil icon at the top of the management pane on the right).

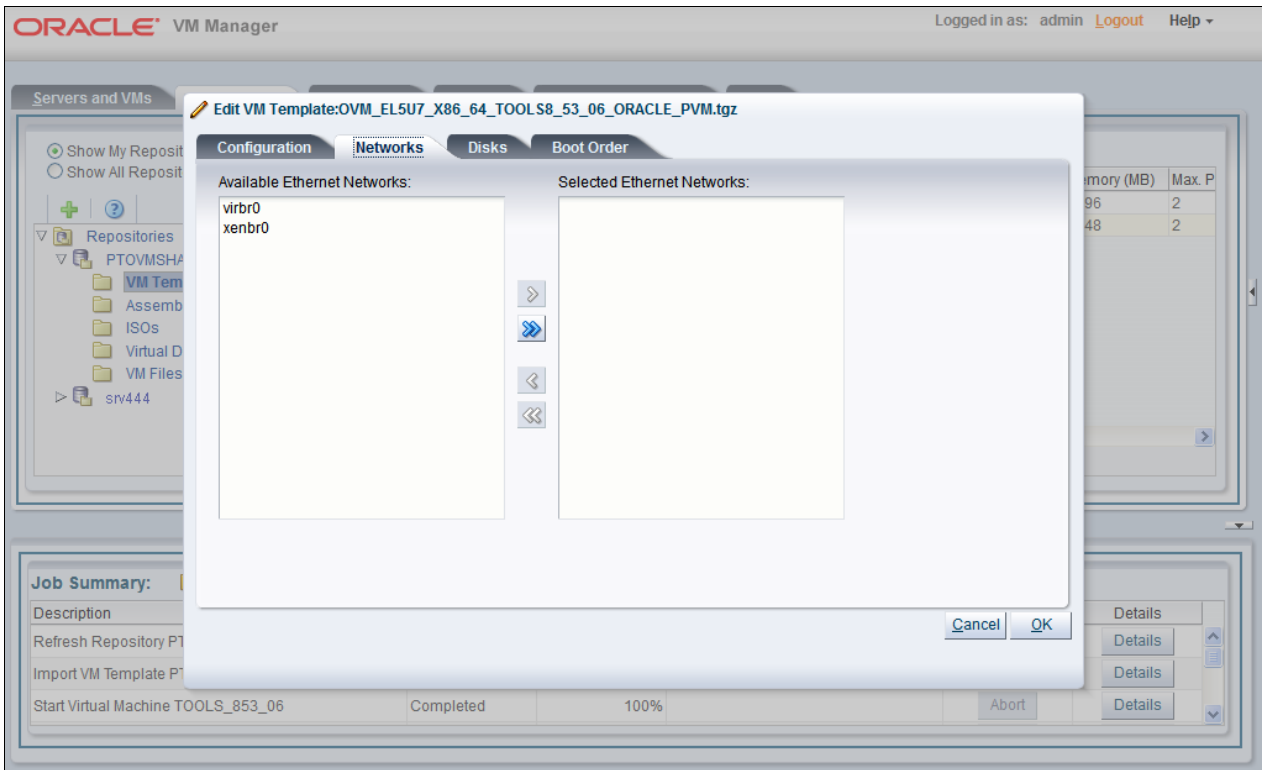
The Edit VM Template window appears. This example shows the Configuration page, which includes details about the template, such as the template name, the Domain Type Xen PVM, and the Maximum Memory, 2048 MB.



Edit VM Template window: Configuration page

- b. Select the Networks page.

The Networks page includes lists for Available Ethernet Networks and Selected Ethernet Networks, as shown in this example.

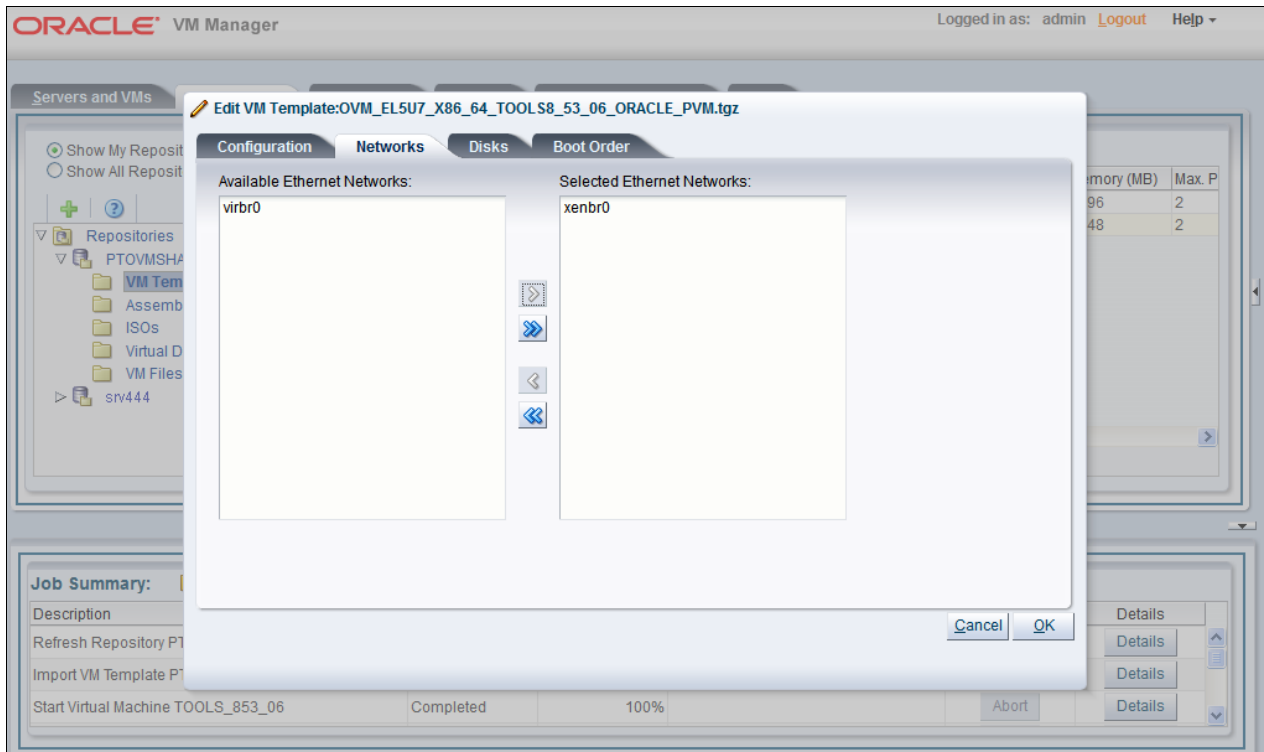


Edit VM Template window: Networks page

- c. Move the network created when setting up the OVS Server from the Available Ethernet Networks list to the Selected Ethernet Networks list, using the arrows.

See *Oracle VM User's Guide for Release 3.1.1*, "Managing Networks."

In this example, the `xenbr0` network was moved to the Selected Ethernet Networks list.



Edit VM Template window: Networks page after selecting network

10. Click OK to return to the Repositories page.

The Job Summary grid should show all jobs with status Completed as shown in this example.

The screenshot displays the Oracle VM Manager interface. The top navigation bar shows 'Servers and VMs', 'Repositories', 'Networking', 'Storage', 'Tools and Resources', and 'Jobs'. The 'Repositories' tab is active. On the left, a tree view shows 'Repositories' expanded to 'PTOVMSHARE', which contains 'VM Templates', 'Assemblies', 'ISOs', 'Virtual Disks', and 'VM Files'. The main area shows a table of VM templates:

Name	HA	Domain Type	Max. Memory (ME)	Memory (MB)	Max. P
Q854-10RR1-template	false	Xen HVM, PV Drive	4096	4096	2
OVM_EL5U7_X86_64_TOOLS8_53_06_ORAC	false	Xen PVM	2048	2048	2

Below the table is a 'Job Summary' section with a status bar: 43 Total Jobs, 0 Pending, 0 In Progress, 1 Failed, 0 Aborted, 42 Complete. The job summary table is as follows:

Description	Status	% Complete	Message	Abort	Details
Edit VM Template OVM_EL5U7_X86_64_TOOLS8_53_06_ORAC	Completed	100%		Abort	Details
Refresh Repository PTOVMSHARE	Completed	100%		Abort	Details
Import VM Template PTOVMSHARE	Completed	100%		Abort	Details

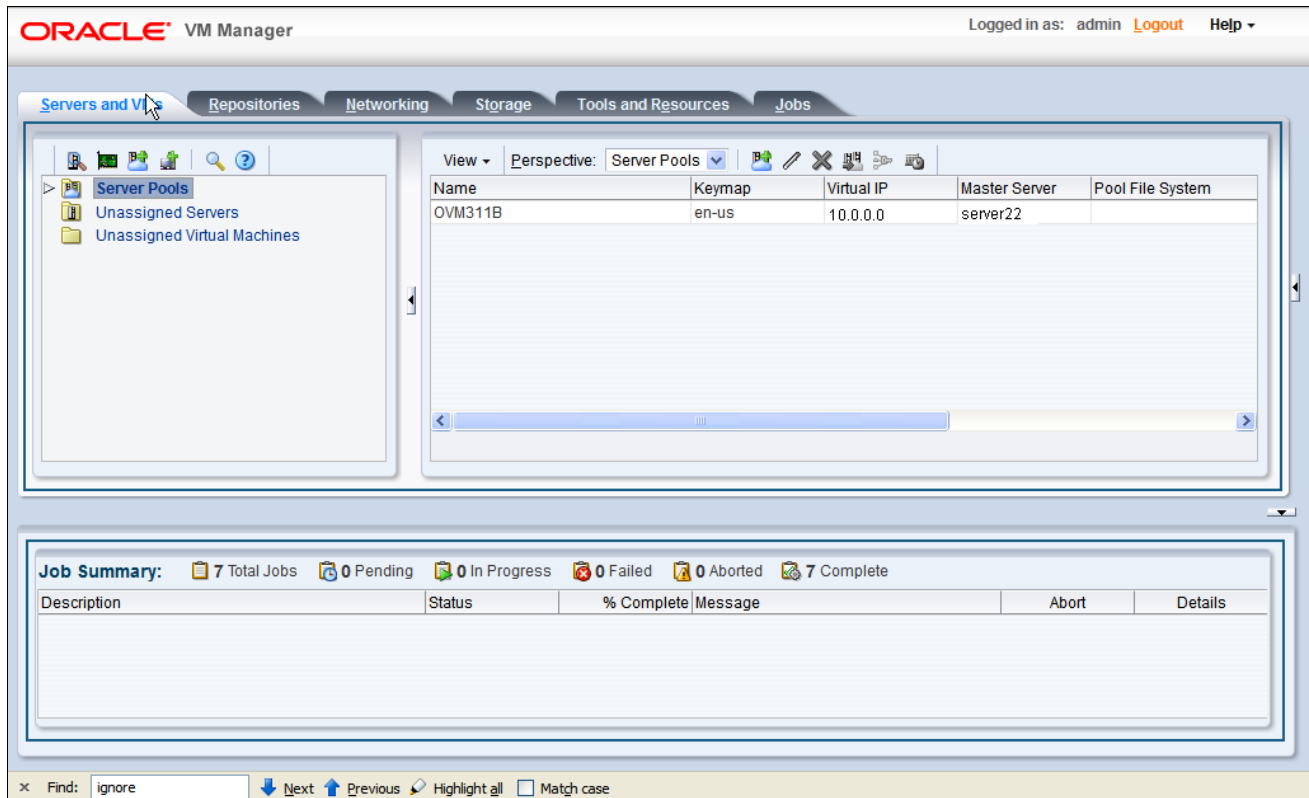
Repositories page after importing template

Task 3-2: Creating the Virtual Machines

This section assumes that you have imported the templates as described in the previous section, and are logged in to Oracle VM Manager. Carry out the procedure described here for each of the Oracle VM Templates for PeopleSoft on Oracle Linux.

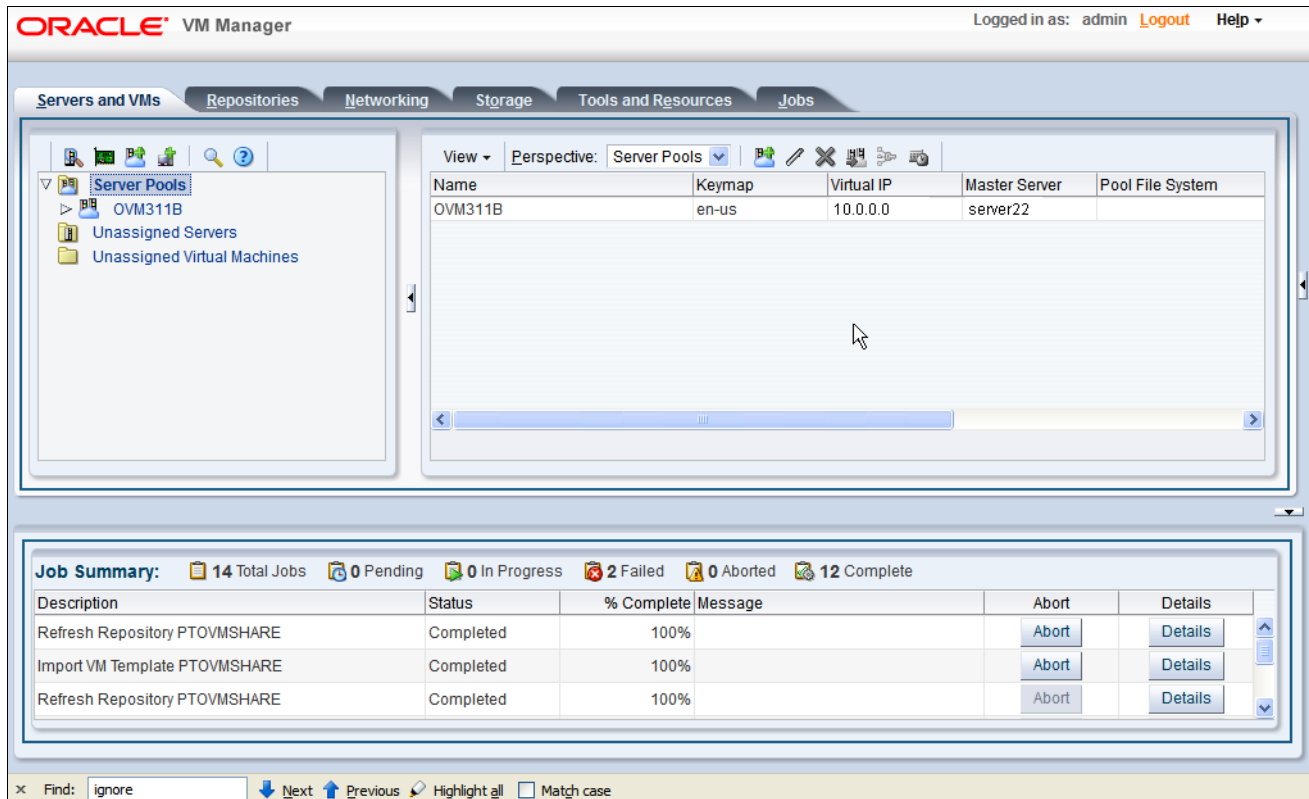
1. In the OVM Manager, select the Servers and VMs page.

The page shown in this example includes folders for Server Pools, Unassigned Servers, and Unassigned Virtual Machines.



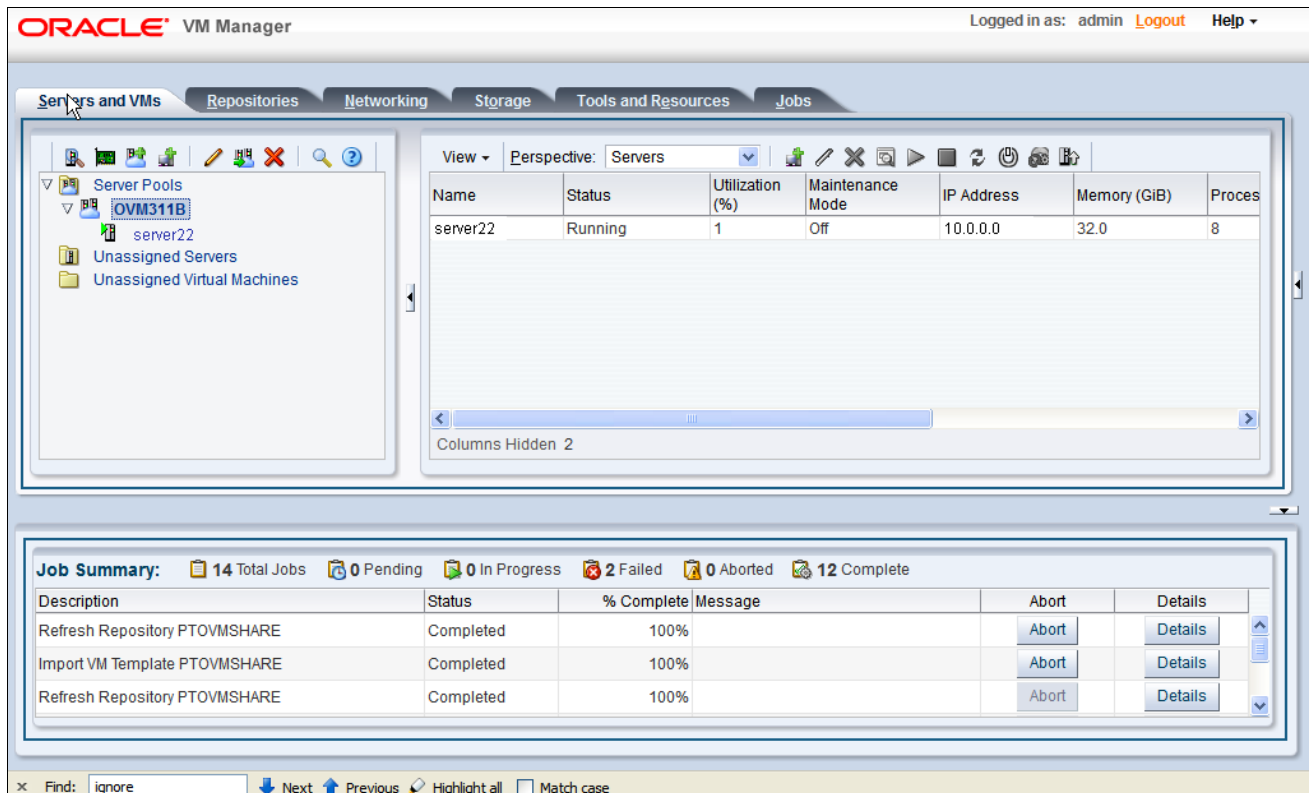
Oracle VM Manager: Servers and VMs page

- 2. Click the Server Pools folder in the navigation pane on the left to expand it and display the list of server pools available, as shown in this example.



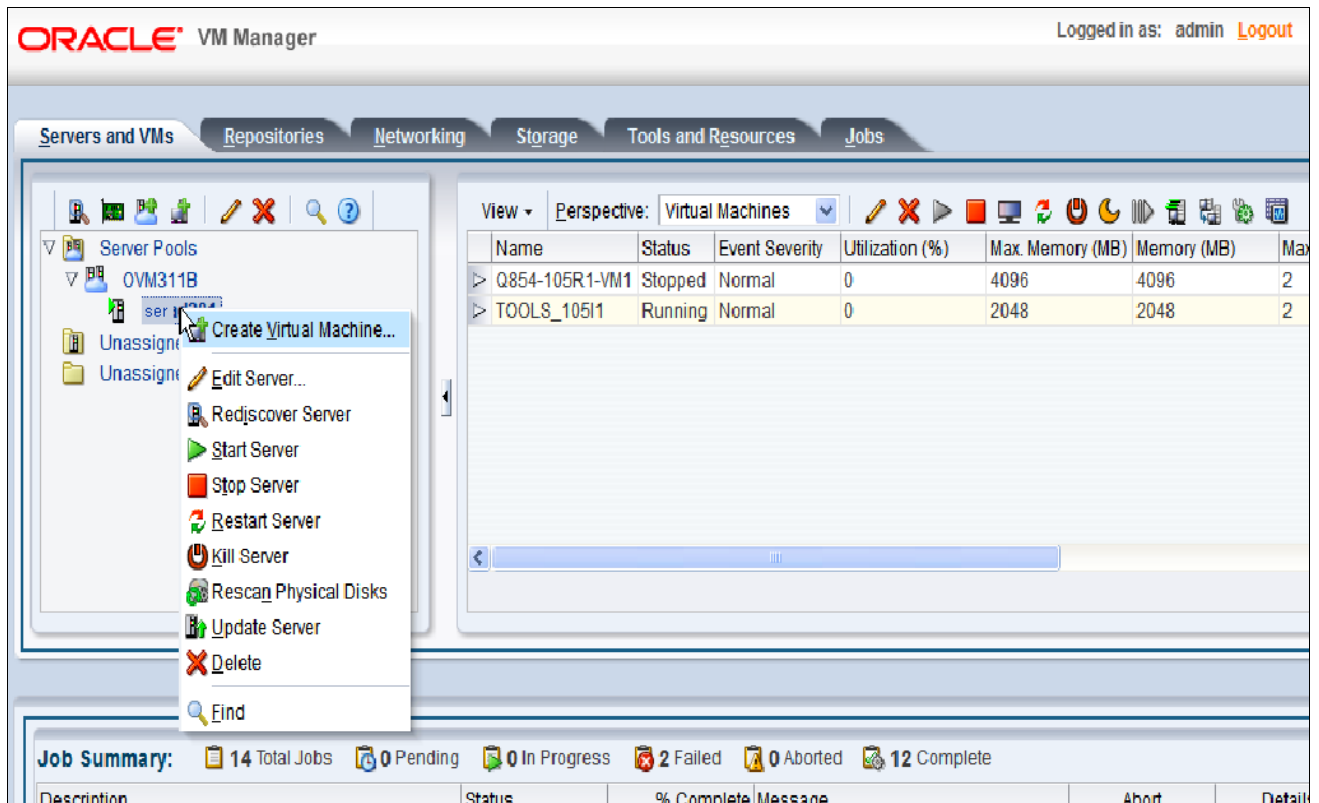
Servers and VMs page with Server Pools folder expanded

- Expand the server pool, OVM311B in this example, to display the list of servers.



Servers and VMs page with Server folder expanded

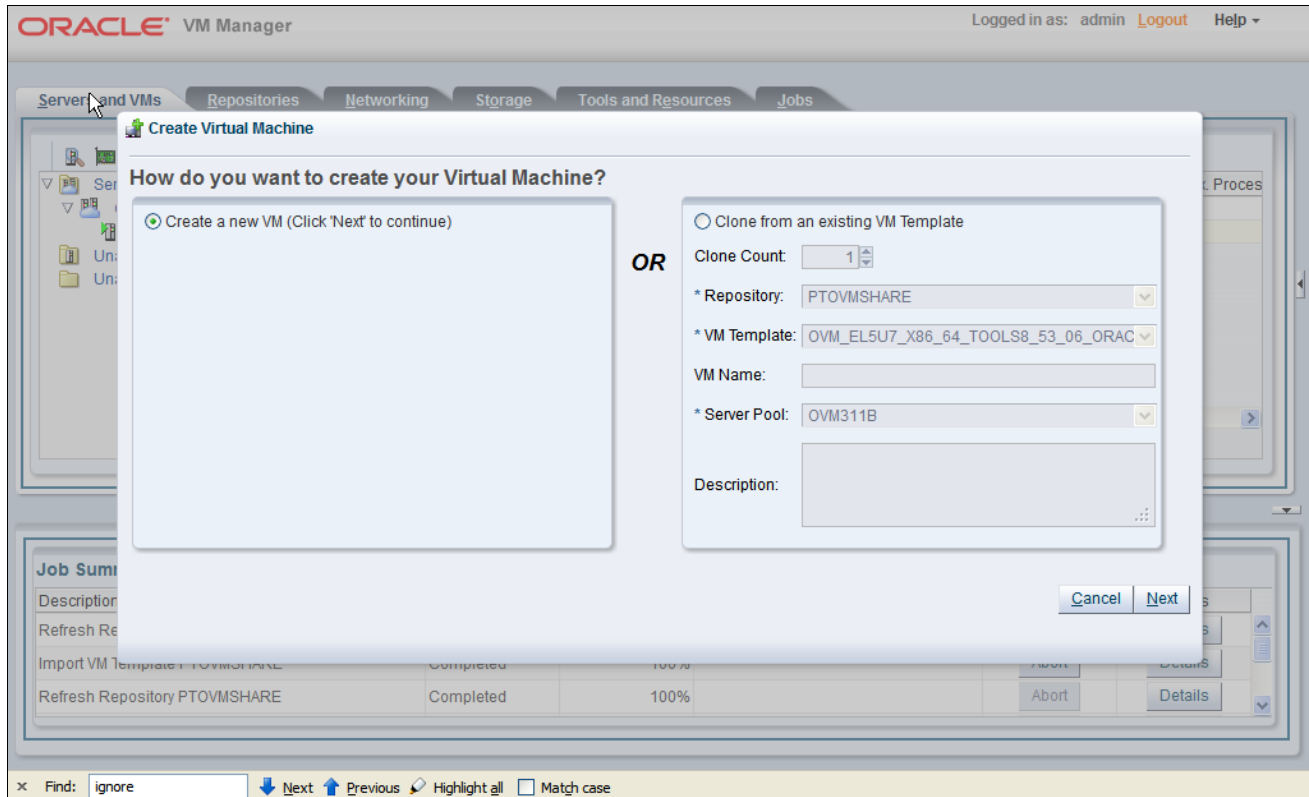
- 4. Highlight the server, server22 in this example, and right-click to display a menu.



Servers and VMs page with Server menu

5. Select Create Virtual Machine from the menu.

The Create Virtual Machine window appears, as shown in this example. The window includes areas with options for creating a virtual machine, either by creating a new virtual machine, or by cloning from an existing VM template.

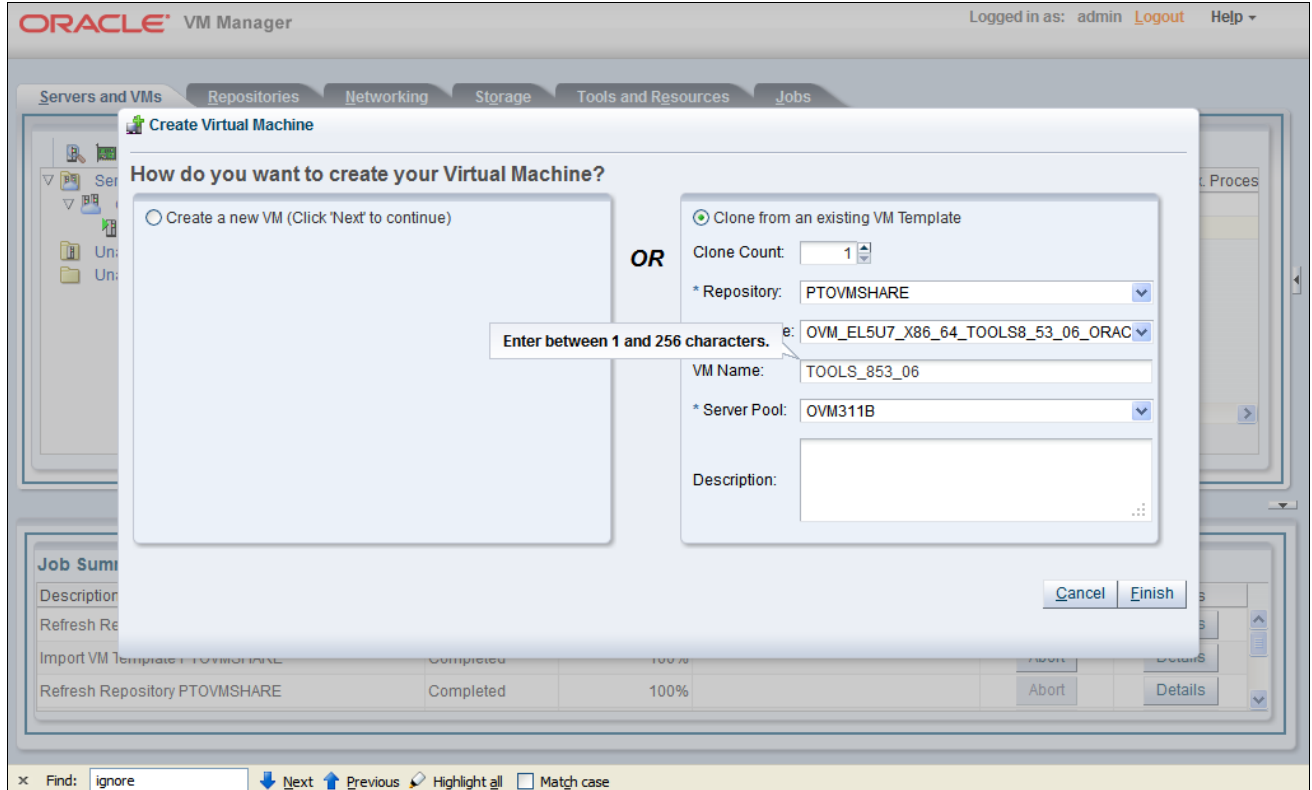


Create Virtual Machine window

- 6. Select the option Clone from an existing VM Template.

The Repository, VM Template, and Server Pool fields are populated with the information from the Servers and VMs page. Verify that the VM Template field points to the template you imported in the previous section.

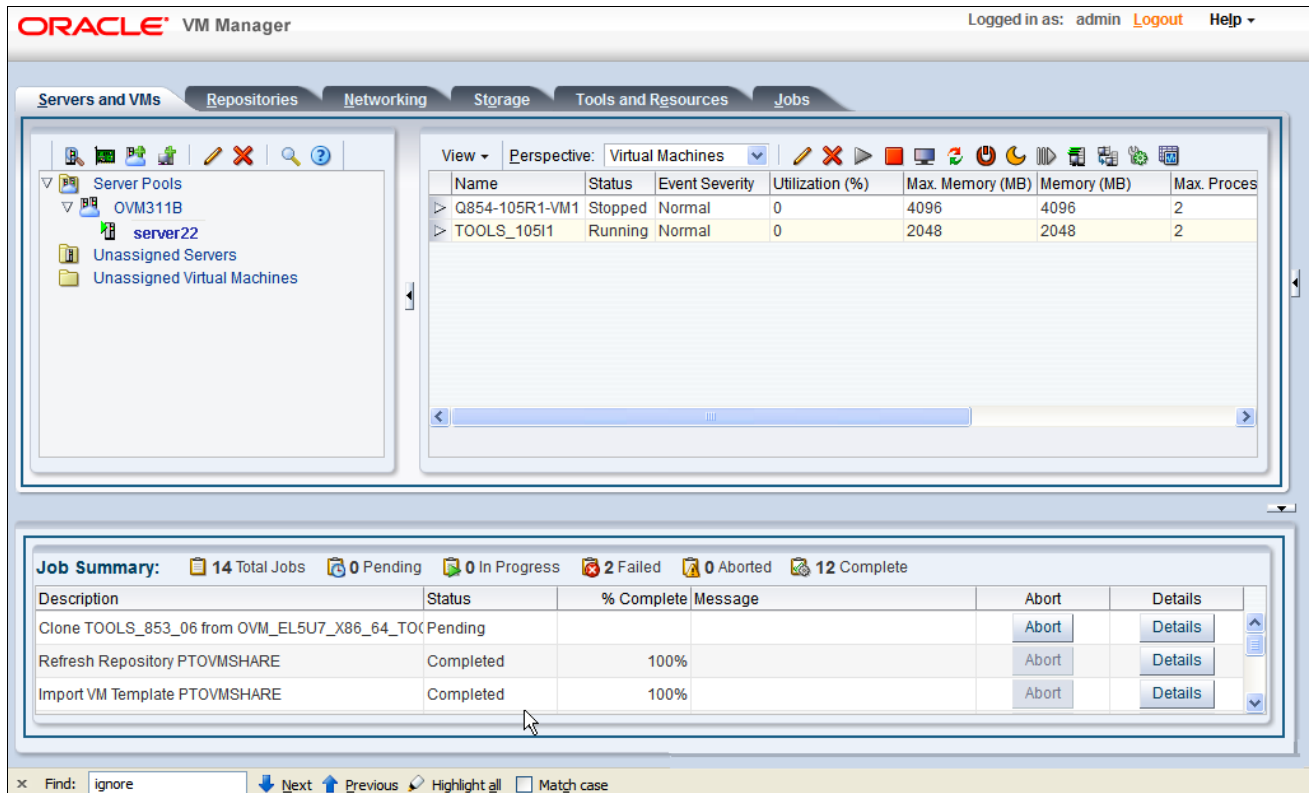
Enter a name in the VM Name field. The name must be between 1 and 256 characters. In this example, the name is TOOLS_853_06.



Create Virtual Machine window with Clone from an existing VM Template option

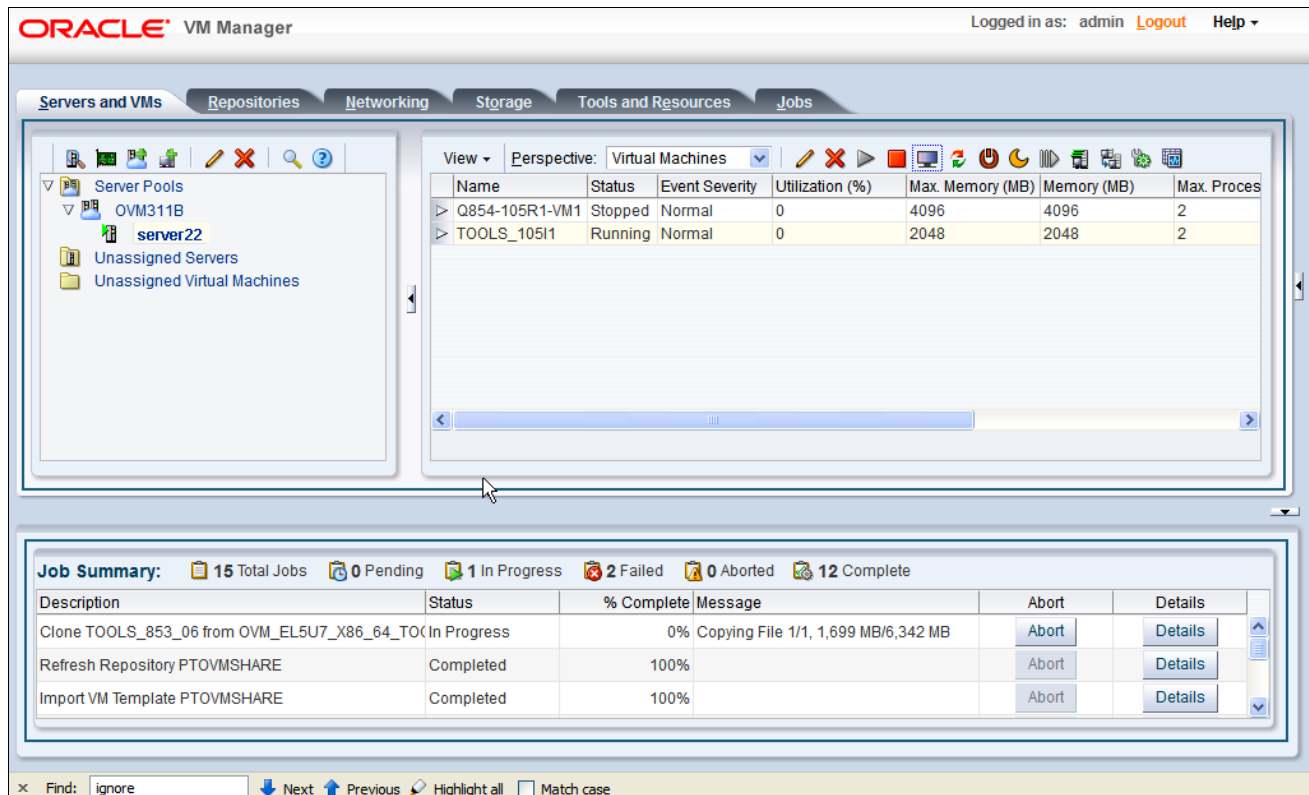
- Click Finish on the Create Virtual Machine window to return to the Servers and VMs page.

On the Servers and VMs page, the Job Summary section shows the progress of the VM creation. In this example, the status of the job cloning the template is Pending.



Servers and VMs page with Create Template job pending

In this example, the Status has changed from Pending to In Progress.



Servers and VMs page with Create Template job in progress

Task 3-3: Starting the Virtual Machines

This section discusses:

- Understanding the Virtual Machine Configuration
- Reviewing Virtual Machine Configurations
- Configuring the Virtual Machine

Understanding the Virtual Machine Configuration

The PeopleSoft virtual machine (VM) that you create from the Oracle VM Template for PeopleSoft on Oracle Linux (OVM PeopleSoft template) is used to run PeopleSoft Pure Internet Architecture (PIA), the PeopleSoft Application Server, and the PeopleSoft Process Scheduler within the same virtual machine.

You can choose to run PIA on one VM, and the PeopleSoft Application Server and Process Scheduler on a separate VM, by your response to the prompts in the section Configuring the Virtual Machine.

Furthermore you can decide to deploy neither the PIA nor AppBatch on a VM. In this case the VM that you created from the OVM PeopleSoft template would be analogous to a traditional system with PeopleSoft PeopleTools installed in *PS_HOME* and PeopleSoft application files installed in *PS_APP_HOME*, and the required versions of Oracle WebLogic and Oracle Tuxedo, but with no Application Server domain, Process Scheduler domain, or PeopleSoft Pure Internet Architecture site set up.

Keep the following in mind when deciding how to configure the VM:

- If PIA is to be started on the VM, the Application Server(s) to which it will connect will need to be started in order to use PIA.

Note. PIA will boot successfully without being able to connect to the Application Server domain but will be unusable because it is dependent on the Application Server to respond to any web page requests, including PIA signon.

- If you plan to start the Application Server or Process Scheduler on the VM, the database must be available for connection from the VM, and you need the following information:
 - Database service name
 - Service listener port on the database server
 - The database name (SID)
 - The Access ID and Access ID password for the database
 - The Connect ID and Connect password for the database
 - The User ID and password for starting the Application Server (called the Domain Boot user in the configuration messages. These criteria are authenticated by the database.)
- When connecting to a PeopleSoft Application database such as an HCM demo database, it will be necessary to be able to access the PeopleSoft Application mid-tier installation. There is an interactive prompt for this location during the configuration script described in the next section.

For more information on *PS_APP_HOME*, see the product documentation *PeopleTools: System and Server Administration* on working with Server Domain configurations.

See PeopleTools Mid-Tier Deployment Best Practices, My Oracle Support, Document 1448479.1.

See Using the PeopleSoft Installation.

- The configuration process includes an interactive prompt for setting up Oracle Secure Enterprise Search (SES). After you complete the initialization, you must deploy and index search definitions. See the section Configuring Oracle SES for information.

If you plan to set up Oracle SES, you must provide the following information during the configuration process:

- Oracle SES server host name
- Oracle SES server port number
- Oracle SES server administrator password
- Proxy identity and password to run a search query
- PeopleSoft callback user name and password for the Oracle SES server
- Integration Broker Gateway host name and port number.
- For all connections to VMs the network path must be available, and any firewall updates and so on must be made by the administrator.

Note. The Linux iptables firewall is not enabled by default in the OVM PeopleSoft template, so these ports will be open for connection. So for example, if a PIA VM created from the OVM PeopleSoft template is connecting to a separate Application Server VM created from this template, no specific steps are required to ensure that the VMs can communicate with one another.

- If your PeopleSoft Application requires COBOL, see the section "Using COBOL with the PeopleSoft Deployment" in this documentation.

Reviewing Virtual Machine Configurations

You will have decided at this point whether you want to run Application Server and Process Scheduler domains on your VM. If you wish to run these domain types you will probably want to connect to a PeopleSoft application database (as opposed to a PeopleTools-only database). This means that you will need to have a PeopleSoft application vcd installation already completed.

For example, if you have an HCM demo database set up, you also need to carry out an installation of the PeopleSoft HCM application.

The PeopleSoft application vcd may be installed on a shared file system location that is accessible from any number of VMs. This is the recommended approach for running PeopleSoft mid-tier environments. The location where you install the PeopleSoft application software is called *PS_APP_HOME*, or Application Home.

1. Obtain the installation files and the PeopleSoft application-specific installation documentation for the PeopleSoft application for which you have a current license from the Oracle Software Delivery Cloud.

Note. You can also obtain the installation guides by searching on My Oracle Support.

2. Move the installer to a file system location accessible from your VM and install the PeopleSoft application vcd there.

This may require you to use secure FTP (SFTP) to transfer the installation binaries to the shared file system.

3. Log in to the shared file system.

If the PeopleSoft application software is installed into a location outside the user home owned by psadm3, the root user will need to change permissions on that user home file system location. See the section *Reviewing the File System and Users* for information on default users.

See the section *Reviewing the File System and Users* for information on default users.

4. Install the PeopleSoft application, following the installation documentation that you obtained in step 1.

See the installation documentation for your PeopleSoft application to determine which version of PeopleSoft PeopleTools is supported for your PeopleSoft application. The Certifications area of My Oracle Support also includes information on the PeopleSoft PeopleTools versions certified for PeopleSoft applications.

Note. Prior to using the PeopleSoft PeopleTools utility PSADMIN to create or administer Application Server and Process Scheduler domains, remember to set the *PS_APP_HOME* environment variable to point to the file system location where your PeopleSoft application is installed.

Task 3-3-1: Configuring the Virtual Machine

Before beginning this procedure, ensure that you fulfill these requirements:

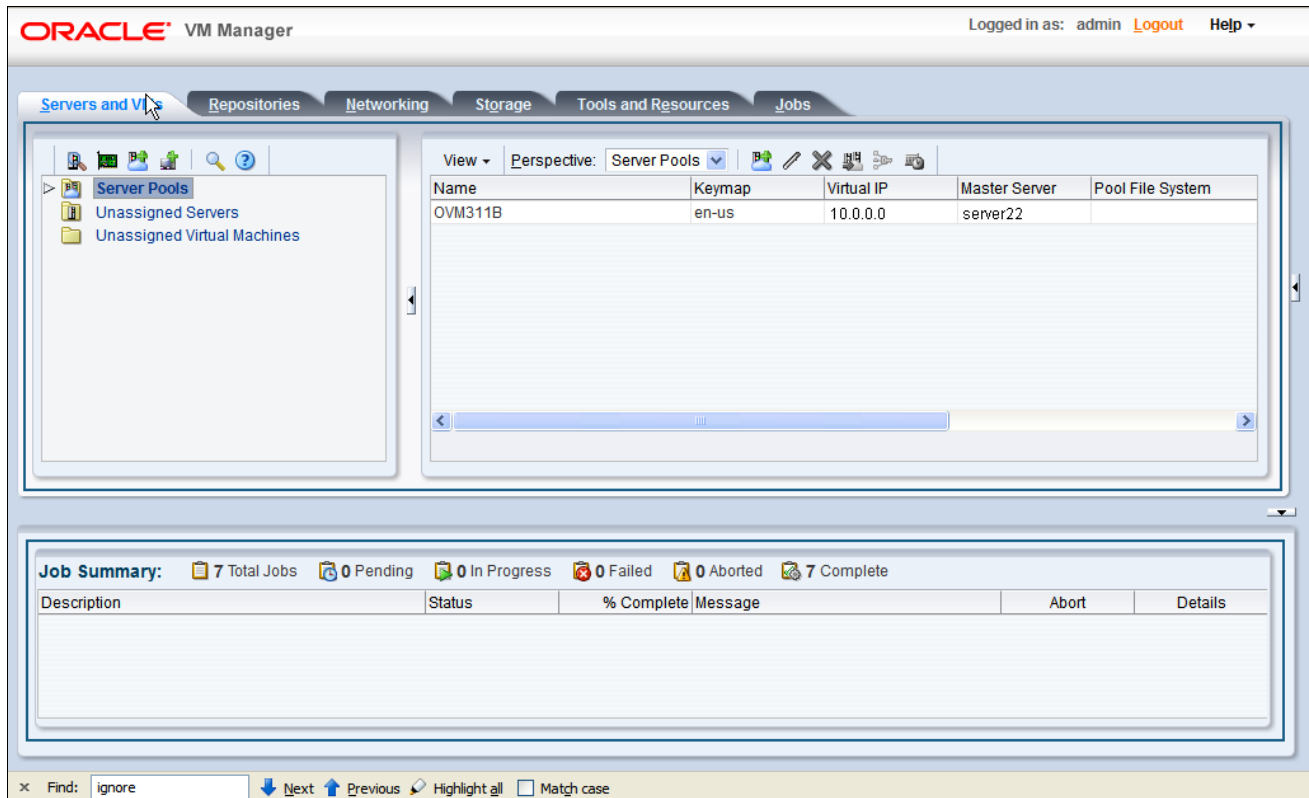
- The database server is running.
- There is a VNC viewer installed in your environment in one of these locations:
 - On the Oracle VM Manager host computer
 - On a Microsoft Windows client computer connecting to the Oracle VM Manager host computer
 - On both the Oracle VM Manager host computer and the client computer

See *Oracle VM Installation and Upgrade Guide for Release 3.1.1*, "Installing Oracle VM Manager," Installing and Configuring a VNC Viewer.

To start and initialize the virtual machine:

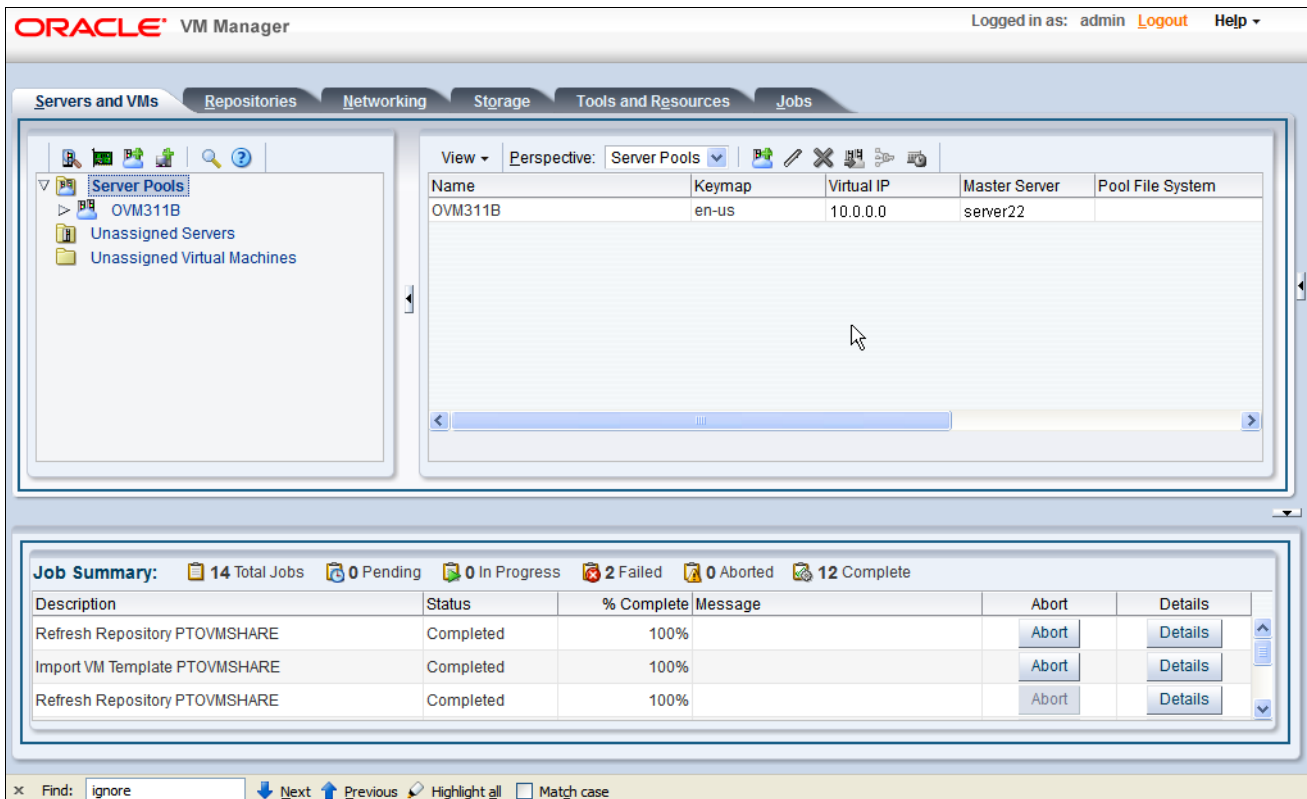
1. Log in to the Oracle VM Manager if necessary, and select the Servers and VMs page as shown in this example.

The page includes folders for Server Pools, Unassigned Servers, and Unassigned Virtual Machines.



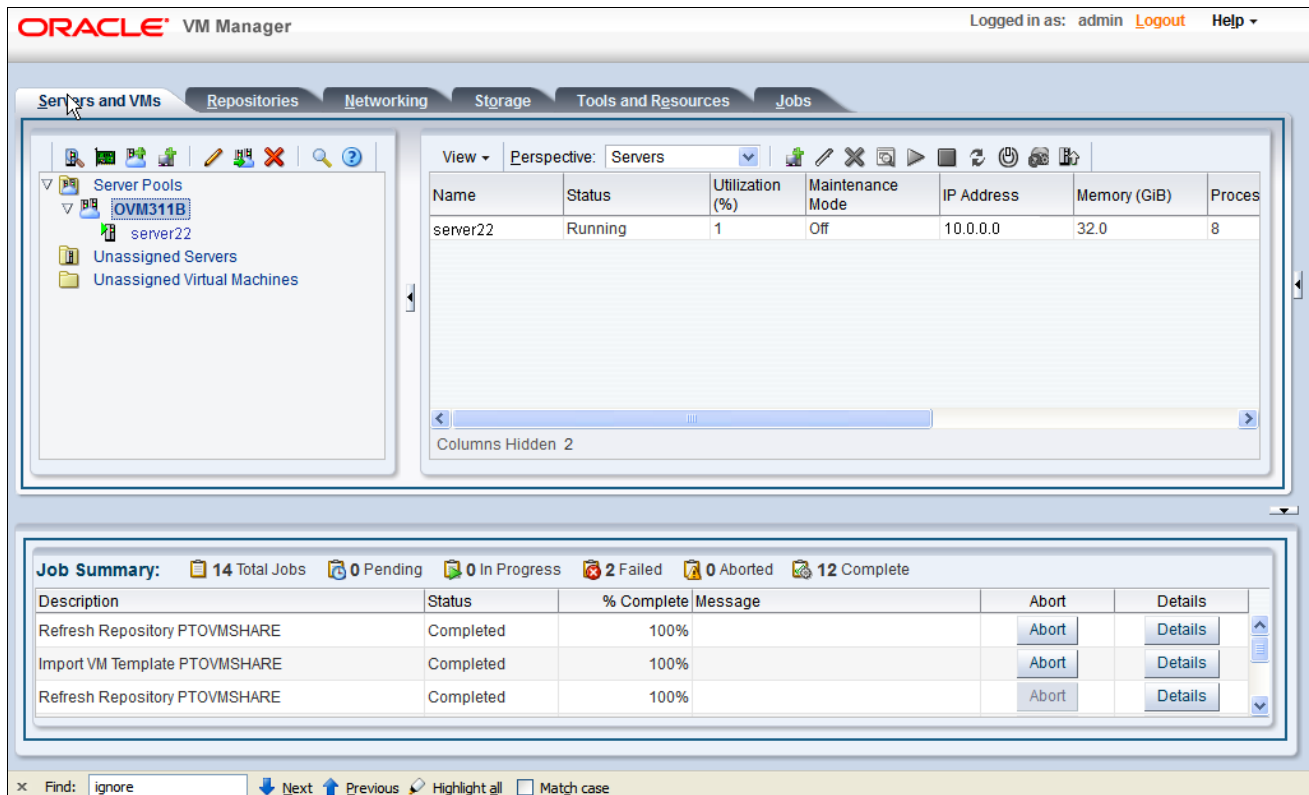
Oracle VM Manager Servers and VMs page

- 2. Click the Server Pools folder to expand it and display a list of server pools, as shown in this example.



Servers and VMs page with Server Pools folder expanded

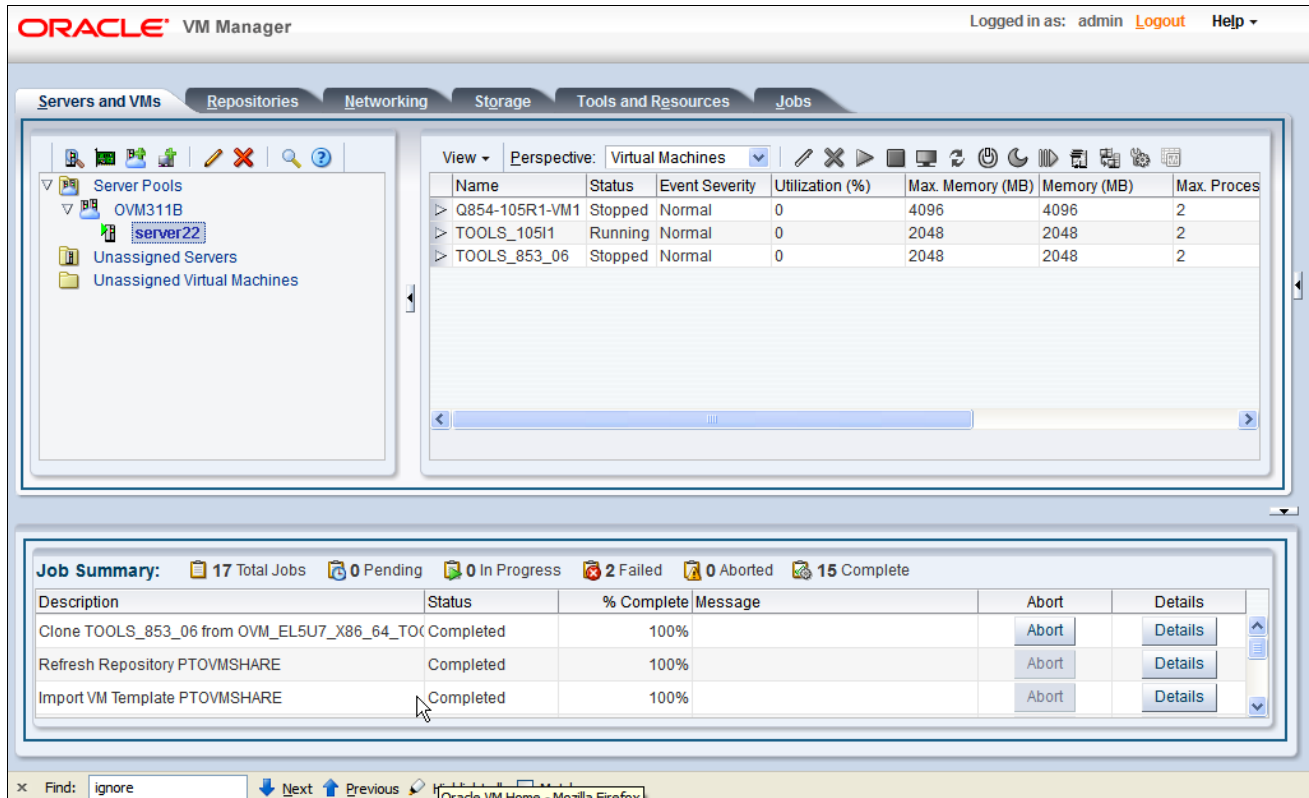
3. Click the server pool, which is OVM311B in this example, to expand it and display a list of servers.



Servers and VMs page with Server Pools folder and server pool expanded

- 4. Select the server, which is server22 in this example.

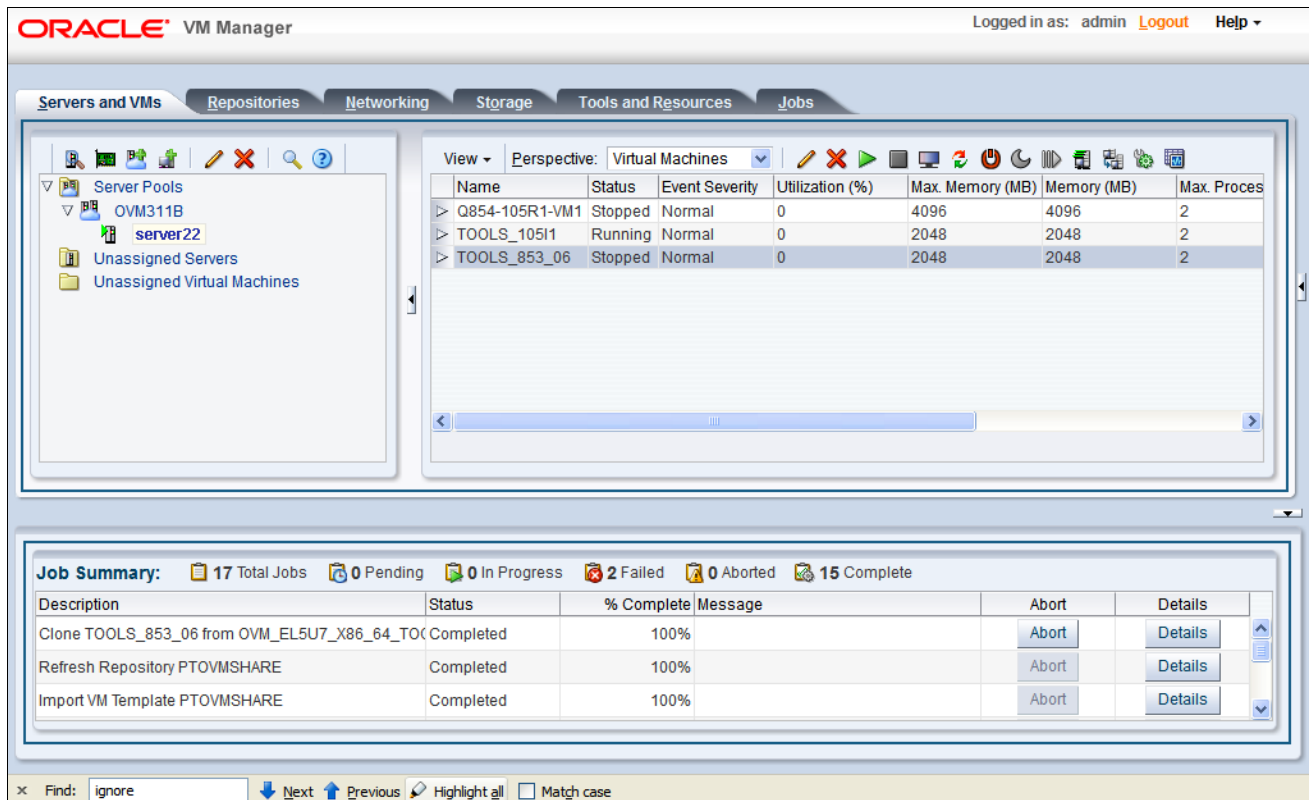
The management pane on the right shows the virtual machines associated with the server.



Servers and VMs page with server selected

5. Select the VM in the management pane on the right.

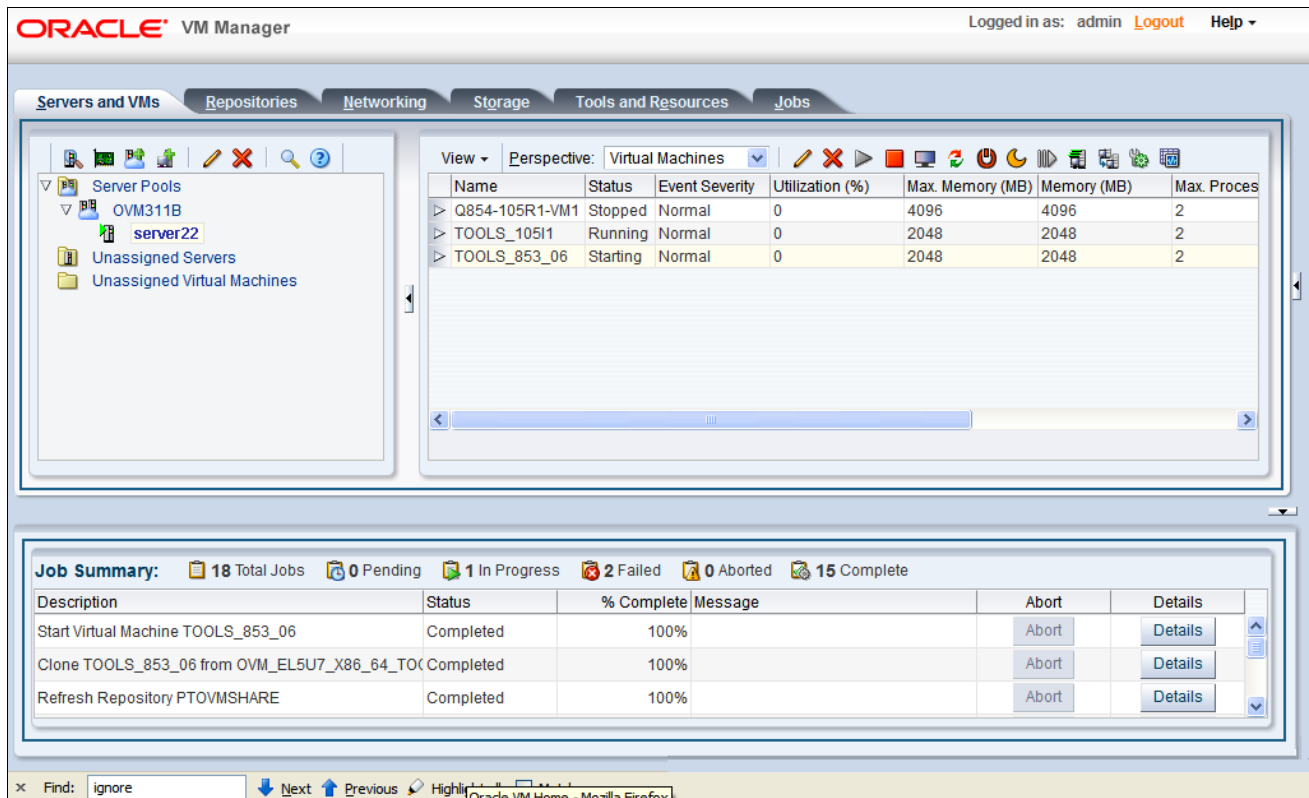
The VM is TOOLS_853_06, with a Status of Stopped, in this example.



Servers and VMs page with virtual machine selected

- 6. Click the Start button (green triangle) at the top of the management pane.

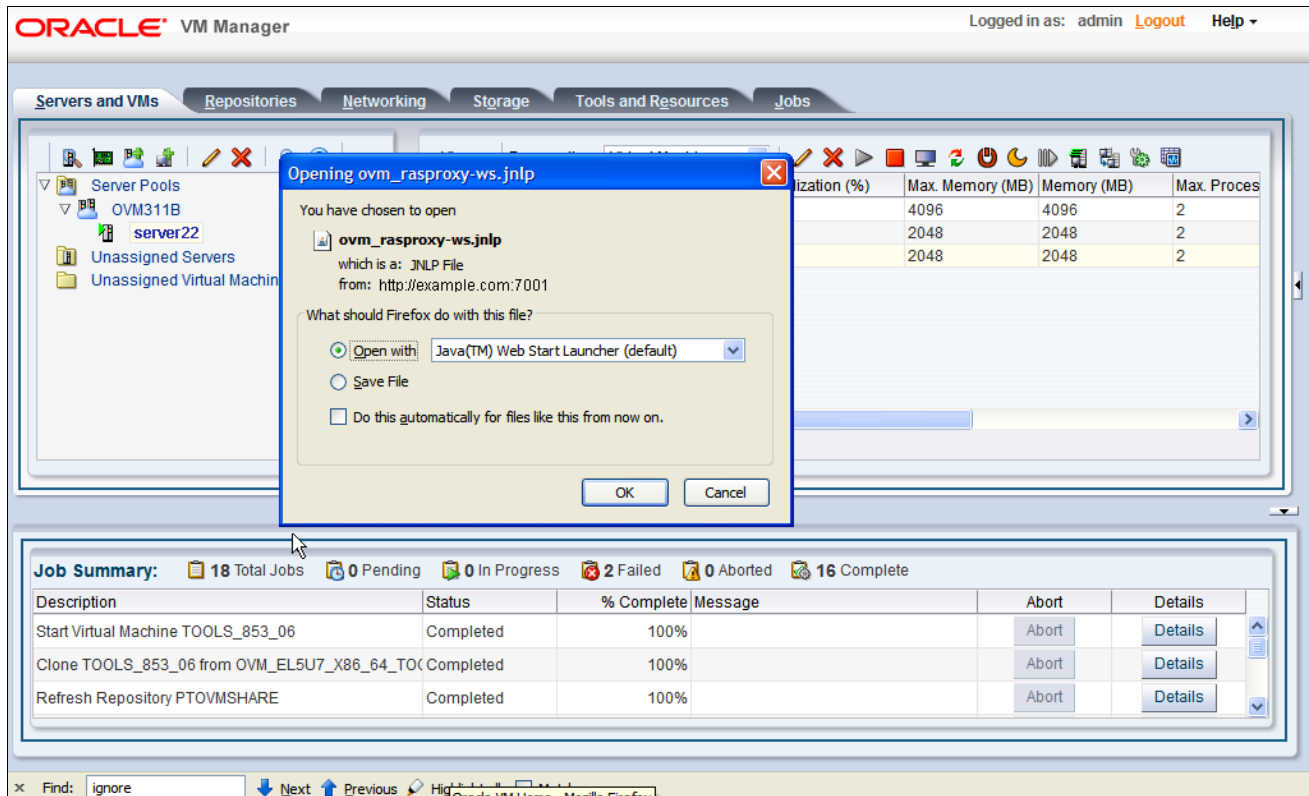
The Status for the VM changes to Starting as shown in this example.



Servers and VMs page after starting the virtual machine.

- Click the Launch Console button at the top of the management pane on the right.

A window appears asking you to confirm that you want to open ovm_rasproxy-ws.jnlp with Java(TM) Web Start Launcher.

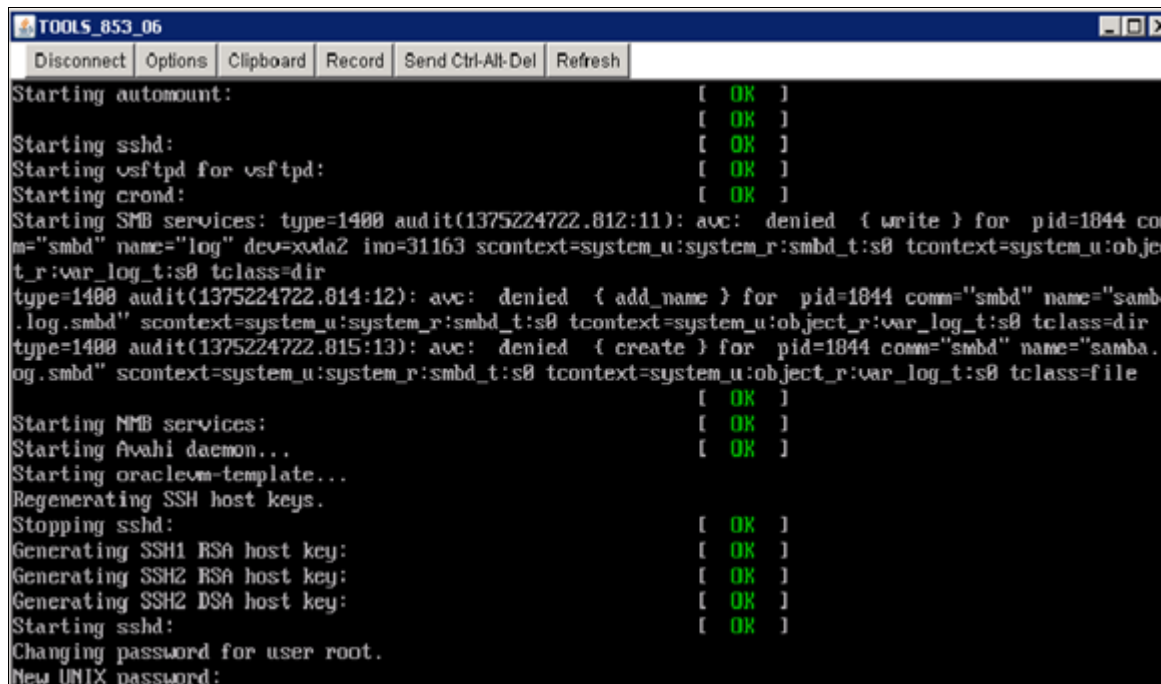


Servers and VMs page: Launching the console

- Click OK.

9. A window opens and the virtual machine boot sequence begins.

This example shows the typical messages, such as starting services, seen during the boot sequence.



```

TOOLS_853_06
Disconnect Options Clipboard Record Send Ctrl-Alt-Del Refresh
Starting automount: [ OK ]
Starting sshd: [ OK ]
Starting vsftpd for vsftpd: [ OK ]
Starting crond: [ OK ]
Starting SMB services: type=1400 audit(1375224722.812:11): avc: denied { write } for pid=1844 comm="smbd" name="log" dev=xvda2 ino=31163 scontext=system_u:system_r:smbd_t:s0 tcontext=system_u:object_r:var_log_t:s0 tclass=dir
type=1400 audit(1375224722.814:12): avc: denied { add_name } for pid=1844 comm="smbd" name="samba.log.smbd" scontext=system_u:system_r:smbd_t:s0 tcontext=system_u:object_r:var_log_t:s0 tclass=dir
type=1400 audit(1375224722.815:13): avc: denied { create } for pid=1844 comm="smbd" name="samba.log.smbd" scontext=system_u:system_r:smbd_t:s0 tcontext=system_u:object_r:var_log_t:s0 tclass=file
Starting NMB services: [ OK ]
Starting Avahi daemon... [ OK ]
Starting oraclevm-template...
Regenerating SSH host keys.
Stopping sshd: [ OK ]
Generating SSH1 RSA host key: [ OK ]
Generating SSH2 RSA host key: [ OK ]
Generating SSH2 DSA host key: [ OK ]
Starting sshd: [ OK ]
Changing password for user root.
New UNIX password:

```

Virtual machine boot sequence

10. At the following prompt, enter the password for root.

New UNIX Password:

Reenter the same password at the following prompt:

Retype new UNIX Password:

11. Enter the required network-related information.

There are several prompts asking for network-related information. You must supply the information for the static IP address, netmask, gateway, and DNS server. The text in bold font includes sample responses.

Configuring network interface.

Network device: eth0

Hardware address: 00:23:F4:00:00:0F

Enter static IP address: **12.345.67.900**

Enter netmask: [255.0.0.0] **555.555.555.5**

Enter gateway: **12.345.678.9**

Enter DNS server: **123.45.678.90**

Shutting down interface eth0: [OK]

Shutting down loopback interface: [OK]

...

Brining up loopback interface: [OK]

Bringing up interface eth0: [OK]

Confirm the host name that is resolved by the DNS server at the prompt⇒

```
and simply press Enter
Enter hostname (e.g, host.domain.com): [host_name]
```

If the networking information is correct, the DNS server uses the IP address of the host and resolves its name. In that case, the host name is shown, and you can confirm it by pressing ENTER.

If the networking information is wrong, the prompt will simply say:

```
Enter hostname (e.g, host.domain.com):

Network configuration change successfully.
IP configuration: Static IP address
  IP address:      12.345.678.900
  Netmask:        555.555.555.5
  Gateway:        12.345.678.9
  DNS server:     123.45.678.90
  Host name:      host_name
```

If you are satisfied with your answers, enter 'Y' or simply press enter⇒ at the prompt

```
Are you happy with your answers? [Y|n]:
```

If you enter 'N', you will go back to the prompts outlined in step 2.

Note. If the host name does not get resolved by the DNS server, the network-related answers are probably wrong and the VM will not boot correctly. If this happens, you will have to reset the virtual machine and restart the whole boot sequence from the beginning. Refer to the section *Resetting Virtual Machines* later in this document.

The next few steps include prompts for setting up the Application Home (*PS_APP_HOME*) file system, and the Application Server, Process Scheduler, and PIA domains. If you chose to manually configure each of these domains for the PeopleSoft environment, answer *n*, no, to each of the prompts.

12. Respond *y* to this prompt if you are configuring the VM to set up a PeopleSoft Application, such as HCM or FSCM.

```
Application Home (PS_APP_HOME) is the file system location
to which your PeopleSoft Application vcd was installed.
Application Server and Process Scheduler domains must access
the PS_APP_HOME to fully support the functionality of your
PeopleSoft Application.
```

```
Do you wish to provide this file system location at this time? [y|n]:
```

Note. If you have not yet created a *PS_APP_HOME* on a remote file system, follow the instructions in the section *Reviewing Virtual Machine Configurations* to obtain and install the Application Home.

13. If you respond *y* to the preceding prompt to use *PS_APP_HOME*, Application Home, you see the following prompt, which asks for the location:

```
You may provide a file system location for your PS_APP_HOME that is
already accessible to this VM.
```

Alternatively provide details to mount the *PS_APP_HOME* from an external

location.

1. File system location already accessible to this vServer
2. Mount external file system location
- q. Return to previous menu

Enter 1, 2 or q(uit):

- a. If you enter 1, specify the full path to a *PS_APP_HOME* directory that is accessible to the VM at this prompt:

Enter the full path of the *PS_APP_HOME* directory:

- b. If you enter 2, specify the full path to an external *PS_APP_HOME* location, including the mount point, at this prompt:

You have chosen to mount the *PS_APP_HOME* from an external file system location.

You will need to provide the full path of the remote directory including the mount point where the *PS_APP_HOME* is installed. For example: `foo:/vol/apps/HR92`.

Enter the full path of the remote *PS_APP_HOME* directory:

- c. If you enter *q*, continue to the next step.

14. Respond *y* to this prompt if you wish to set up an Application Server domain:

Do you wish to setup PeopleSoft Application Server Domain on this VM? => [y|n]:

15. If you select *y* you will be prompted for additional configuration values required to start the Application Server domain.

If you select *n* you skip to the later step concerning setting up the Process Scheduler domain.

The configuration values will include the database connectivity details discussed in the section Configuring the VM for the PeopleSoft Deployment, and some additional values related to Jolt. Jolt is used to allow PIA domains to connect to the Application Server.

Note. You must enter each password twice in the prompt below. The values that you enter for the passwords in this section are not echoed to the shell.

See Understanding the Virtual Machine Configuration.

Enter the database service name [TESTDB]:

Enter the database name [defaults to the service name]:

Enter the hostname for the database server [defaults to the host name=> of the virtual machine on which this is running]:

Enter the port number for the database host [1521]:

Enter the database Access ID [SYSADM]:

Enter the database Access ID password:

Re-Enter the database Access ID password:

Enter the Connect user [people]:

Enter the Connect user password:

Re-Enter the Connect user password:

Enter the Domain Boot user [QEDMO]:[defaults to the Application Pillar=>

```

    default if the Application Home is setup and is valid]
Enter the Domain Boot user password:
Re-Enter the Domain Boot user password:

```

If you want to return to the beginning of the database questions, answer *n* to the following prompt. Otherwise, answer *y* to continue.

```
Are you happy with your answers? [y|n]:
```

16. Supply the Domain Connection password for Jolt at the following prompt:

See *PeopleTools: Security Administration*, "Security Options."

```

Enter the Domain Connection Password:
Re-Enter the Domain Connection Password:

```

The status [OK] indicates that the PeopleSoft Application Server domain is created, configured and started successfully, while the status [FAILURE] denotes failure.

Note. If you experience problems in starting the PeopleSoft Application Server and Process Scheduler domains, see the section Resetting Virtual Machines in this chapter.

17. Respond *y* to this prompt if you wish to set up a Process Scheduler domain:

```
Do you wish to setup PeopleSoft Process Scheduler Domain on this VM? =>
[y|n]:
```

If you select *y* above, and you did not set up the Application Server, you will be prompted for the database connectivity values discussed in an earlier step.

Note. You will not be prompted for database connectivity information if you provided these details in the previous step.

18. Respond *y* to this prompt if you want to set up the Process Scheduler domain as a Master Scheduler:

```
Do you wish to setup this Domain as a Master Scheduler? [y|n]:
```

The status [OK] indicates that the PeopleSoft Process Scheduler domain is created, configured and started successfully, while the status [FAILURE] denotes failure.

19. Respond *y* to this prompt if you wish to create and start a PIA domain:

```
Do you wish to setup PeopleSoft Pure Internet Architecture on this VM? =>
[y|n]:
```

If you select *y* you will be prompted for additional configuration values required to start the PIA domain. This includes the Oracle WebLogic administrator user password, connectivity details for the Application Server domain, the Web profile user password, and the Integration Gateway user password.

See the information on using authentication domains in the *PeopleTools Installation for Oracle* product documentation.

```

Enter a new WebLogic Server admin password:
Re-Enter a new WebLogic Server admin password:

```

Note: The WebLogic admin user password should be at least 8 characters in length and should contain alpha-numeric characters only.

```
Enter the Web Profile user PTWEBSERVER password:
```



```

Re-Enter the Web Profile user PTWEBSEVER password:
Enter the Integration Gateway user Id [administrator]:
Enter the Integration Gateway user password:
Re-Enter the Integration Gateway user password:
Enter the Authentication Domain for PIA []:
Enter the AppServer Domain Connection Password:
Re-Enter the AppServer Domain Connection Password:

```

Note. The Domain Connection password that you enter must match the Domain Connection password that you provided when creating the Application Server domain.

The status [OK] indicates that the PIA domain is created, configured and started successfully, while the status [FAILURE] denotes failure.

20. Enter the connect string for the Application Server domain at the following prompt:

```

Enter the connect string for the AppServer domain. This is the host:⇒
port on
which the Application Server domain will listen for incoming⇒
connections.
You may provide failover and load balancing rules using the format⇒
described
in the PeopleBooks. Hit Enter to use the defaults [<host>:9000]:

```

Note. The default *host:port* points to the hostname of the VM and the default port will be 9000.

See *PeopleTools: System and Server Administration*, "Configuring Jolt Failover and Load Balancing."

The status [OK] indicates that the PIA domain is configured and started successfully while the status [FAILURE] denotes failure.

21. If you have set up all the domains (Application Server, Process Scheduler, PIA) on the VM, you see a prompt asking whether you want the installer to do some additional setup steps.

Enter *y* to the following prompt if you want the installer to complete additional setup steps:

```

You are running both AppBatch and PeopleSoft Internet Architecture in⇒
the
same VM. Due to the presense of muitiple tiers in the same host, some
additional automated setup steps like Help URL, Integration Broker and
Report Distribution can be completed.

```

Note: you may not wish to do this if connecting to an existing database. This is a step typically taken in a demo environment with a clean⇒ database.

```

Do you wish for this additional setup to be performed? [y|n]:

```

The status [OK] indicates that each of the additional setup steps is successful, while the status [FAILURE] denotes failure.

If all three domains are set up, and if the PS_APP_HOME is set up, but is not a valid Application Home, this prompt will not be shown. Instead, you will see the following message on the screen:

```

You have configured an Application Home (PS_APP_HOME). It appears
that this PS_APP_HOME is not a valid PeopleSoft Application Home.

```

As a result, additional automated setup steps like Help URL, Integration Broker and Report Distribution will not be completed.

Consult the documentation provided with these templates for more information about post deployment configuration.

22. If you have set up all the domains (Application Server, Process Scheduler, PIA) on the VM, you see a prompt asking whether you want to set up Oracle SES on the VM.

a. Enter *y* to the following prompt if you want to set up Oracle SES during initialization.

```
Do you wish to setup Secure Search Enterprise (SES) on this VM? =>
[y|n]:
```

b. If you enter *y* you will be prompted for additional configuration values required to configure Oracle SES and set up PeopleSoft connectivity.

Note. After completing this initialization, you must deploy and index search definitions. See the section *Configuring Oracle SES* for information.

```
Enter the hostname for the SES server [defaults to the host name of=>
the virtual machine on which this is running]:
Enter the port number for the SES server [7777]:
Enter the admin password for the SES server:
Re-Enter the admin password for the SES server:
Enter the proxy identity to run a search query:
Enter the proxy identity password to run a search query:
Re-Enter the proxy identity password to run a search query:
Enter the PeopleSoft callback username for the SES server:
Enter the PeopleSoft callback user password for the SES server:
Re-Enter the PeopleSoft callback user password for the SES server:
```

```
Enter the hostname for the Integration Broker Gateway [defaults to=>
the host name of the virtual machine on which this is running]:
Enter the port for the Integration Broker Gateway [8000]:
```

c. If you want to return to the beginning of the Oracle SES questions, answer *n* to the following prompt.

```
Are you happy with your answers? [y|n]:
```

If you answer *n*, then the Oracle SES configuration is not carried out during initialization. In this case, you must carry out the integration between Oracle SES and the PeopleSoft system manually. See the section *Configuring Oracle SES* for information.

d. If you want to continue, answer *y* to the prompt:

```
Are you happy with your answers? [y|n]:
```

The status [OK] indicates that the configuration of Oracle SES and setting up the PeopleSoft connectivity were successful while the status [FAILURE] denotes failure.

23. Respond *y* to this prompt if you want your domains to be restarted automatically when you reboot the VM:

Note. You see this prompt if at least one of the domains (Application Server, Process Scheduler, or PIA) is set up.

```
Do you want PeopleSoft domains to be started on boot? [y|n]:
```

24. After the startup process is complete, you see the following prompt, followed by a prompt to log in:

```
The setup of the PeopleSoft Virtual Environment is completed.           =>
Please review the activity output in /var/log/oraclevm-template.log.
```

Task 3-4: Using the PeopleSoft Installation

This section discusses:

- Reviewing the File System and Users
- Understanding Samba and File System Access
- Using Application Designer
- Managing PeopleTools Domains with PSADMIN
- Installing PeopleSoft Change Assistant
- Installing and Starting Oracle Database Client Tools

Reviewing the File System and Users

The following table includes a description of the default locations for the PeopleSoft installation and configuration, and the access for each. Not all these locations will be applicable if you have customized your VM.

Directory	Description	Access
PS_HOME	The binary installation files are placed into a secure <i>PS_HOME</i> directory at <i>/opt/oracle/psft/pt/tools</i> .	This directory can only be written to by the PeopleSoft administrator, <i>psadm1</i> .
PS_APP_HOME	This is the file system location for your PeopleSoft Application.	If your <i>PS_APP_HOME</i> is located on a remote filesystem, you will have installed it with a specific user account. The user with which it was installed will be the owner. However, the local user <i>psadm3</i> should have write permission to this directory. Ensure this directory is writable by the <i>psadm3</i> user.
ORACLE_HOME (PeopleSoft PeopleTools)	The Oracle RDBMS Client connectivity software, including the SQL*Plus program, is located in <i>/opt/oracle/psft/pt/oracle-client/windows</i> . This is the Oracle RDBMS client installation that is used by PeopleSoft PeopleTools to connect from the PeopleSoft Application Server and Process Scheduler domains to the PeopleSoft database.	This directory is owned by <i>psadmin1</i> .

Directory	Description	Access
PS_CFG_HOME	The application server and Process Scheduler server configuration files are placed into <i>PS_CFG_HOME</i> . The <i>PS_CFG_HOME</i> path is <code>/home/psadm2/psft/pt/<peopletools_version></code>	This directory is owned by psadm2.
Other third-party (non-PeopleSoft) software	<ul style="list-style-type: none"> Oracle WebLogic, located in <code>/opt/oracle/psft/pt/bea</code> Oracle Database client, located in <code>/opt/oracle/psft/pt/oracle-client/11.2.0.x</code> Oracle Tuxedo, located in <code>/opt/oracle/psft/pt/bea/tuxedo</code> 	These directories are owned by psadm1.
Other directories	The rest of the environment, outside <i>PS_HOME</i> and <i>PS_CFG_HOME</i> .	These directories are owned by root. The file system ownership and permissions are similar to typical Oracle Linux installations.

The deployed configuration includes the default users in this table:

Important! All default, non-root passwords are set to expire immediately. On the first login of one of the non-root users, the system will prompt you to provide new passwords. In the case of the passwords that expire immediately, such as those for psadm1 and so on, if you do not log in as the user specified in this table and change the password, the default password documented here remains in effect.

For security guidelines, see the Red Paper "Securing Your PeopleSoft Application Environment," (search on My Oracle Support for the article title, or use the URL http://download.oracle.com/peopletools/documents/Securing_PSFT_App_Environment_May2010%20v4.pdf).

See *PeopleTools: Security Administration*.

User Name	Default Password	Role Definition
psadm1	Oradmin (the first character is the number zero)	The PeopleSoft installation administrator who owns <i>PS_HOME</i> is psadm1. This user cannot write into <i>PS_CFG_HOME</i> .
psadm2	Oradmin (the first character is the number zero)	The domain user who creates and configures the Application Server domain, Process Scheduler (batch server) domain, and the PIA. This user cannot write to <i>PS_HOME</i> , but has read-execute access.

User Name	Default Password	Role Definition
psadm3	Oradmin (the first character is the number zero)	The PeopleSoft installation administrator who owns <i>PS_APP_HOME</i> . Note. Because the <i>PS_APP_HOME</i> file system is outside the VM, the psadm3 user does not own anything in the VM.

See Also

"About this Documentation," Related Information.

PeopleTools: System and Server Administration, "Securing PS_HOME and PS_CFG_HOME"

PeopleTools: System and Server Administration, "Working with Server Domain Configurations"

Understanding Samba and File System Access

The file system location in the VM is made available using Samba. This makes files residing in the VM accessible on the host OS. This also allows files on the host or even on an external network to be shared with the VM.

Note. Samba is Open Source software under the GNU General Public licence that allows for interoperability between Linux or UNIX servers and Microsoft Windows-based clients.

By default Samba configuration is set up to make some of the installation directories on the VM available to the host. However, the Samba service is turned off by default. To turn on the Samba service, log in to the VM as root user and run the command: `service smb start`.

Note. Follow your organization's security guidelines in determining whether you want to enable this service.

The Samba configuration makes the following installation programs available:

- PeopleTools Client in `/opt/oracle/psft/pt/tools/setup/Client`
- PeopleSoft Change Assistant in `/opt/oracle/psft/pt/tools/setup/PSCA`
- Oracle RDBMS client for Microsoft Windows in `/opt/oracle/psft/pt/oracle-client/windows`

By default you cannot put files into the guest using the delivered Samba configuration. This means that you only access the guest in read-only mode. This is sufficient for accessing installation programs such as the PeopleTools Client installation setup. You may modify the Samba configuration file in `/etc/samba/smb.conf` to change which content is accessed from outside the guest OS. See the samba man page in the VM and the web site www.samba.org for more information about configuration options for Samba.

Task 3-4-1: Using Application Designer

This section discusses:

- Understanding Application Designer
- Installing the PeopleSoft Client Tools
- Setting Up Configuration Manager

- Starting Application Designer

Understanding Application Designer

The Microsoft Windows-based program Application Designer is an important tool that is used to perform a variety of administrative tasks in a PeopleSoft environment.

The PeopleSoft installation deployed by the OVM PeopleSoft template includes the PeopleTools Client installer that packages Application Designer and other client tools (for example, Change Assistant, Configuration Manager, and the PeopleSoft Test Framework). The installer is provided in the VM in the following directory: `/opt/oracle/psft/pt/tools/setup/Client`.

See *PeopleTools Installation for Oracle*, "Preparing for Installation," Planning Your Initial Configuration.

Application Designer runs only on Microsoft Windows and therefore cannot be run in the VMs that are provided with this distribution. You must install and run Application Designer on a separate computer with a supported Microsoft Windows operating system, as described in this section.

See the product documentation *PeopleTools: System and Server Administration* for information on using PSADMIN.

See *PeopleTools Installation for Oracle*, "Configuring the Application Server on UNIX," Creating, Configuring, and Starting an Initial Application Server Domain.

Installing the PeopleSoft Client Tools

To install the PeopleTools Client tools:

1. Access the VM file system from your Microsoft Windows host by selecting Start, Run, and entering the Microsoft Windows UNC path containing your VM IP address.

Note. If the Samba service is not enabled, use FTP to obtain the contents of the directory `/opt/oracle/psft/pt/tools/setup/Client`.

Windows Explorer opens displaying a file system location within the VM that contains the PeopleTools Client installer.

2. Copy the "Client" directory contents from `/opt/oracle/psft/pt/tools/setup/Client` on the VM to a convenient directory, referred to here as *TEMP_DIR*, on the Microsoft Windows machine.
3. Run `TEMP_DIR\Client\Disk1\setup.bat` to launch the Client installer.

Specify the installation location for the PeopleSoft Client tools, referred to here as *INSTALL_DIR*, and select defaults for the rest of the options.

Setting Up Configuration Manager

Before starting Application Designer, you must specify the connection details and the Domain Connection Password for the application server domain in Configuration Manager.

To set up Configuration Manager:

1. Run `INSTALL_DIR\bin\client\winx86\pscfg.exe` to start Configuration Manager.
2. Select the Profile tab.
3. Highlight the Default profile and click Edit.
4. On the Edit Profile - 'Default' page, select the Application Server radio button.

5. Enter values for the following:

- Application Server Name

Enter a descriptive name for the application server. The name in the following example is HR91FP3

- Machine Name or IP Address

Enter the IP address or the resolvable server name for the application server. The machine name in the following example is server1.mycompany.com.

- Port Number

Enter the port number for the application server. The port number in the following example is 7000.

- Domain Connection Password

Enter and confirm the same password that you entered for the Domain Connection Password in the section Configuring the Virtual Machine. The Domain Connection Password value must be the same as that defined when configuring the Application Server domain.

6. Click Set.

The application server settings are moved to the grid at the top of the window, as shown in this example:

Server Name	Connect String	Server Type
HR91FP3	server101.mycompany.com:7000	Application Server

Connection Type: Database Application Server

Application Server Name:

Machine Name or IP Address:

Port Number:

TUXEDO Connect String:

Domain Connection Password:

Domain Connection Password (confirm):

Edit Profile - Default page in Configuration Manager dialog box

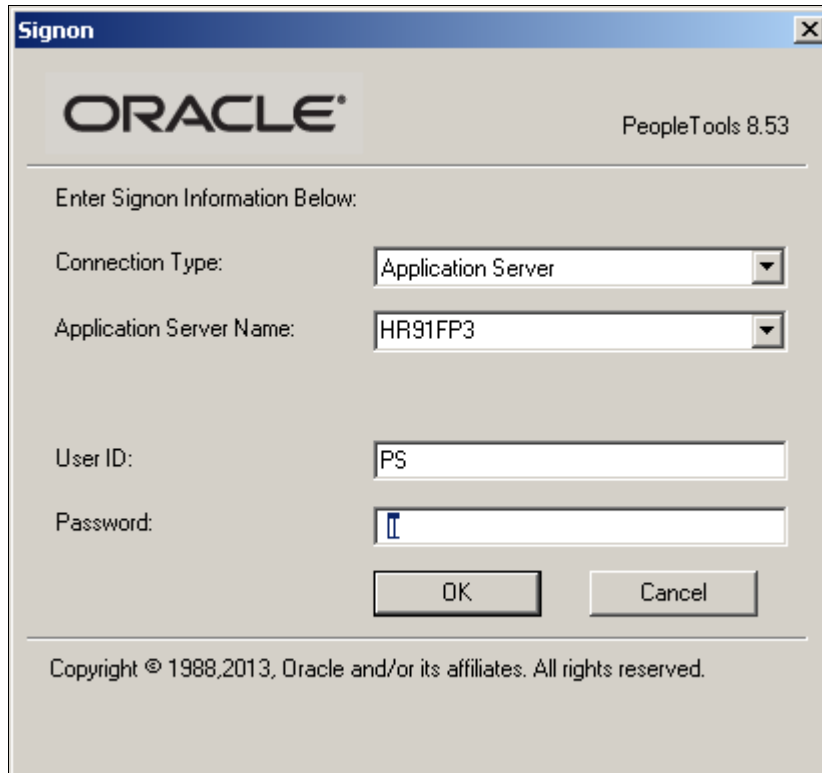
7. Click OK to accept your changes, and OK to close Configuration Manager.

Starting Application Designer

To start Application Designer on a Microsoft Windows machine:

1. Run `INSTALL_DIR\bin\client\winx86\pside.exe` to start Application Designer.

The PeopleSoft Signon dialog box opens.



PeopleSoft Signon dialog box with Application Server Connection Type

2. Select Application Server from the Connection Type drop-down list as shown in the example above.
3. From the Application Server Name drop-down list, select the application server you configured in Configuration Manager in the previous section.

The Application Server Name in the example is HR91FP3.

4. Enter the appropriate User ID and Password for your PeopleSoft Application (for example VP1/VP1, PS/PS, or PTDMO/PTDMO).

Task 3-4-2: Managing PeopleTools Domains with PSADMIN

Use the PSADMIN utility to manage any of the PIA, Application Server or Process Scheduler domains. You must first sign in with the PeopleTools domain user `psadm2`, described in the section *Reviewing the File System and Users*. When you sign in as the PeopleTools domain user, the `psconfig.sh` script is automatically invoked through the user's profile. This is referred to as *sourcing the psconfig.sh script*. This ensures that all of the required environment variables are set prior to working with PSADMIN. You can perform all the usual administrative options for PIA, Application Server and Process Scheduler domains using PSADMIN. You may reconfigure the existing domains, shut them down, restart them and create additional domains if necessary. The environment as delivered has however been sufficiently configured to perform many of the activities for which this VM has been created.

See Also

PeopleTools: System and Server Administration, "Using the PSADMIN Utility"

Task 3-4-3: Installing PeopleSoft Change Assistant

To install PeopleSoft Change Assistant on a Microsoft Windows machine:

See *PeopleTools Installation for Oracle*, "Installing Change Assistant."

1. Access the virtual appliance file system from your Microsoft Windows host by selecting Start, Run, and entering the Microsoft Windows UNC path containing your virtual appliance IP address.

This is the IP address used for your virtual appliance in the section Starting the PeopleSoft VirtualBox Appliance.

Note. If the Samba service is not enabled, use FTP to obtain the contents of the directory `/opt/oracle/psft/pt/tools/setup/PsCA`.

Windows Explorer opens displaying a file system location within the virtual appliance that contains the PeopleSoft Change Assistant installation directory.

See Accessing the Virtual Appliance File System.

2. Copy the "ca" directory contents to a convenient directory, referred to here as *TEMP_DIR*, on the Microsoft Windows machine.
3. Run *TEMP_DIR*\setup.exe to launch the installer.
Follow the instructions in the product documentation *PeopleTools Installation for Oracle*, "Installing Change Assistant" to complete the installation.

Task 3-4-4: Installing and Starting Oracle Database Client Tools

To install the Oracle RDBMS Client tools and start SQL*Plus on a Microsoft Windows machine:

1. Access the VM file system from your Microsoft Windows host by selecting Start, Run, and entering the Microsoft Windows UNC path containing your VM IP address.

Note. If the Samba service is not enabled, use FTP to obtain the Oracle RDBMS Client installation program from the directory `/opt/oracle/psft/pt/oracle-client/windows`.

Windows Explorer opens displaying a file system location within the VM that contains the Oracle RDBMS client installer.

2. Copy the Oracle RDBMS Client installation program `oracle-client-mswin-x86-32.zip` to a convenient directory, referred to here as *TEMP_DIR*, and extract the contents.
This will extract the installation program for the Oracle RDBMS client.
3. Review the instructions for Install the Oracle Database Client Software in the installation documentation that accompanies the installation program.
Access the documentation from *TEMP_DIR*/client/doc/index.htm.
4. Start the installation program *TEMP_DIR*/setup.exe and follow the onscreen instructions to install the Oracle Client.
You may choose an installation location of your preference. This will be referred to as *ORACLE_HOME* for

the remainder of this section.

Once the client installation is complete it is possible to connect to the database running in your virtual appliance. In order to do this you will connect using the SQL*Plus program (also referred to as sqlplus). The sqlplus program will be located in *ORACLE_HOME*.

To connect to the database:

1. Locate the tnsnames.ora file in the same location in which the client installation was located, *TEMP_DIR* in the previous procedure.

This file is used to instruct the Oracle client which database to use and where it is located. Copy the tnsnames.ora file from your virtual appliance to a directory of your choosing, referred to here as *TNS_ADMIN_DIR*.

2. Set environment variables using the following commands:

```
set PATH=%ORACLE_HOME%;%PATH%
set TNS_ADMIN=TNS_ADMIN_DIR
```

3. Connect to the database using the following command:

```
sqlplus SYSADM/SYSADM@DB_SERVICE_NAME
```

Note. Change the password above, SYSADM, immediately after the installation.

At this point you may issue SQL statements against the database that is running on the virtual appliance. You may need to connect using different user name and password combinations depending upon the activity that you wish to perform.

Task 3-5: Configuring Oracle SES

Oracle Secure Enterprise Search (SES) is the search engine on which the PeopleSoft Search Framework relies. To configure your system to use Oracle SES, see the information in the *PeopleTools Installation Guide for Oracle*.

See Also

PeopleTools Installation Guide for Oracle, "Configuring Integration Between PeopleSoft PeopleTools and Oracle SES"

PeopleTools: PeopleSoft Search Technology PeopleBook

PeopleTools: Integration Broker Administration PeopleBook

Oracle® Secure Enterprise Search Installation and Upgrade Guide 11g Release 1 (11.1.2.0.0)

Task 3-6: Using COBOL

If you plan to use any PeopleSoft applications that require COBOL, see the information on obtaining, installing, compiling and running Micro Focus Server Express COBOL in the PeopleTools installation documentation.

Note that you must use a properly licensed Micro Focus COBOL compiler, as discussed in the following references. Contact your Oracle sales representative to obtain a license for the Micro Focus compiler.

See Also

PeopleTools Installation for Oracle for the current release, "Installing and Compiling COBOL on UNIX"

PeopleSoft Enterprise Frequently Asked Questions About PeopleSoft and COBOL Compilers, My Oracle Support, Document 747059.1

Task 3-7: Completing Post-Deployment Activities

This section assumes that you have started the PeopleSoft VM. Depending upon the selections that you made when configuring the VM you may wish to do any of the following:

- Test the VM to ensure that it was configured correctly.

Testing the VM will typically involve logging in to PIA to make sure that the server is accessible. For Process Scheduler servers this will involve running test reports or audits. Note that you must set up report distribution to see the posted reports.

See the section *Setting Up Process Scheduler to Transfer Reports and Logs to the Report Repository* in the product documentation *PeopleTools Installation for Oracle*, "Setting Up Process Scheduler on UNIX."

- Make additional configuration changes to the configured mid-tier components, such as changing port numbers, log file locations, and so on.
- Check for any Critical Patch Updates (CPUs) for any of the installed components at My Oracle Support. Deploy these CPUs to each of the required VM.

Note. To determine the versions of the installed components, review the README file provided with the template.

- Harden and secure the VM.

See "Planning Security Administration."

- Prepare the PeopleSoft Application.

If your *PS_APP_HOME* has not been previously provisioned to a shared location it may be necessary to take additional steps to ensure that the software contains the most recent updates for your application; for example:

- Use PeopleSoft Lifecycle Management tools to update the environment. See the *PeopleTools: Change Assistant and Update Manager* and the *PeopleTools: PeopleSoft Application Designer Lifecycle Management Guide* product documentation for information.
- Apply customizations to the PeopleSoft application. This is frequently in the areas of COBOL, SQR and Crystal.
- Set up the COBOL environment.

Install COBOL Compiler and Runtime and compile the COBOL source code that was delivered with PeopleSoft PeopleTools or the PeopleSoft application.

See Using COBOL.

- Configure the PeopleSoft environment using PIA for functionality such as reporting and Integration Broker. The extent to which this is required depends upon the role of your VM in the environment.
- Implement the PeopleSoft Web Architecture.

This involves setting up proxy servers, load balancers and external authentication services. This is not a mandatory step but is customary for production-grade runtime environments.

Task 3-8: Troubleshooting

Here are some resources to use if you encounter a problem during the deployment of the OVM PeopleSoft template:

- For problems with Oracle VM Manager and Oracle VM Server, read the troubleshooting sections in the user's guide.

See *Oracle VM User's Guide for Release 3.1.1*.

- For logging information, read the `/var/log/oraclevm-template.log` file.

The `oraclevm-template.log` is a centralized log file that includes information about the Oracle VM initialization and the PeopleSoft deployment.

- See the PeopleSoft PeopleTools installation guide and the PeopleSoft product documentation for information on the Application Server, Process Scheduler, and PeopleSoft Pure Internet Architecture.

Here are a few suggestions for typical troubleshooting avenues:

- Verify that you have enough resources—disk space, memory—on the machine that is running the Oracle VM Server.

- If an error status was reported in Oracle VM Manager immediately after starting the virtual machine this may be due to insufficient resources on the host computer.

You can verify this by consulting the log file linked from the Virtual Machine tab in Oracle VM Manager.

This error is commonly reported as "not enough space under /OVS" with a report of how much disk space is required and how much is available.

- If you deployed the templates using more than one computer, make sure the network communication between the computers is functioning.

- Use the Oracle VM Manager for information on template status, as shown previously.

See *Importing the Template*.

- If you are sure the templates are up and running, but the PeopleSoft log in window does not appear, try the same steps that you use for traditional PeopleSoft installations, such as rebooting the Application Server and restarting PeopleSoft Pure Internet Architecture.

To access the PeopleSoft PeopleTools utilities such as PSADMIN, go to `/opt/oracle/psft/pt/tools`.

See *PeopleTools Installation for Oracle*.

Task 3-9: Managing the Virtual Environment Lifecycle

This section discusses:

- Understanding Virtual Machine Management
- Saving Virtual Machines as Templates
- Using the PeopleSoft Configuration Script
- Resetting Virtual Machines

Understanding Virtual Machine Management

After you create and initialize your PeopleSoft virtual machine environment, you may want to customize it and save the customized environment as a template to share within your company. In general, the steps to follow in creating a template from a customized environment are:

1. Set up the virtual machines using the original templates.
2. Customize the environment.
See *Saving Virtual Machines as Templates*.
3. Edit the configuration plug-in script.
See *Using the PeopleSoft Configuration Script*.
4. Issue commands to clean up and restart the virtual machines using the modified configuration script.
See *Resetting Virtual Machines*.
5. Save the virtual machine as a new template.

See Also

Oracle Virtualization, Oracle Technology Network web site,
<http://www.oracle.com/us/technologies/virtualization/index.html>

Task 3-9-1: Saving Virtual Machines as Templates

The virtual machines that you create from the OVM PeopleSoft template can actually be saved as customized templates. For example, you may create a virtual machine from the PeopleSoft PIA-AppBatch template, change some of the domain configuration settings, and then save the virtual machine as a new template. This new template can then be replicated throughout the organization. This means that you don't need to repeat the same customization steps each time you create a virtual machine. Instead it is possible to install software into a virtual machine or add specific configuration preferences and then save the virtual machine as a new template. This new template can be used to create any number of virtual machines.

There are a few things to keep in mind when saving a virtual machine as a template. When saving a virtual machine as a template you may want to install software into the virtual machine from which you will create the template. If you do so, you must make sure that the software that you have installed is virtualization safe. This means that the installation is not bound to the IP address or hostname through any configuration files, database entries, and so on. When you save a virtual machine as a template the installed components must be host neutral, so that they will be able to run without any problems in new virtual machines that have different hostnames or IP addresses.

If the software that you have installed requires licensing on a per host or per processor basis, you should ensure that you have the adequate number of licenses for your site. The terms surrounding licensing will vary from application to application.

When saving a PeopleSoft virtual machine as a template you may wish to add customized first boot configuration steps. This means that you should edit the first boot configuration script, as described in the following section.

See *Using the PeopleSoft Configuration Script*.

Task 3-9-2: Using the PeopleSoft Configuration Script

To add configuration steps to the OVM PeopleSoft templates, use the delivered configuration script, `/opt/oracle/psft/vm/oraclevm-template-ext.sh`. You can find this script in any OVM PeopleSoft template. If you wish to extend the template, you can overwrite or add to this script.

The `oraclevm-template-ext.sh` script includes the four functions described in this table:

Function Name	Description
<code>ovm_configure_pre</code>	This function is run before the PeopleSoft PeopleTools configuration scripts. This function can perform any custom setup steps prior to the running of the PeopleSoft PeopleTools setup.
<code>ovm_configure_post</code>	This function is run after the PeopleSoft PeopleTools configuration scripts. This function can perform any custom steps required after the PeopleSoft PeopleTools setup has completed.
<code>ovm_cleanup_pre</code>	This function is run when a virtual machine is being cleaned up. This function is called before the PeopleSoft PeopleTools cleanup.
<code>ovm_cleanup_post</code>	This function is run when a virtual machine is being cleaned up. This function is called after the PeopleSoft PeopleTools cleanup.

When the template is being initialized, the first boot configuration calls the four functions in the order presented in the table. The first boot configuration calls the function `ovm_configure_pre()` before any of the PeopleSoft PeopleTools setup functions begin, and `ovm_configure_post()` after the PeopleSoft PeopleTools setup functions have completed.

This script does not just play a role when initializing. When the virtual machine is being cleaned, the PeopleSoft PeopleTools cleanup script calls the `ovm_cleanup_pre()` function before any of the PeopleSoft PeopleTools setup functions begin, and `ovm_cleanup_post()` function after the PeopleSoft PeopleTools setup functions have completed. As described in the above table these functions are located in `/opt/oracle/psft/vm/oraclevm-template-ext.sh`.

Any of these functions may be empty. These functions may call any of the functions in the PeopleSoft PeopleTools scripts. This allows them to manipulate and override the functions delivered in the PeopleSoft PeopleTools scripts.

After you have modified the `/opt/oracle/psft/vm/oraclevm-template-ext.sh` configuration script to include your preferred code, it is necessary to reset the template to get it ready to be saved, as described in the following section.

See [Resetting Virtual Machines](#)

For more detailed information about the functions discussed in this section, review the README file included in the `/opt/oracle/psft/vm` directory.

Task 3-9-3: Resetting Virtual Machines

It is possible to reset your virtual machine such that the next time it is started it will appear as a clean, newly started template. This is achieved by using the following commands, in the order given:

```
/usr/sbin/oraclevm-template --cleanup  
/usr/sbin/oraclevm-template --enable
```

Use these commands when you have customized a virtual machine and want to save it as a template. Once you have decided that you want to save a particular virtual machine as a template, connect to the virtual machine using the VNC client, issue the two commands above, shut it down using Oracle VM Manager, and then finish by saving it as a template.

Note. Because the `/usr/sbin/oraclevm-template --cleanup` option resets the network stack on the virtual machine it may appear to hang. If this happens, exit your login session and reconnect to the virtual machine, using the VNC client to invoke the `/usr/sbin/oraclevm-template --enable` option.

See Also

Oracle VM User's Guide for Release 3.1.1, "Managing Virtual Machines"

