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Using the PeopleSoft VirtualBox Images

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Using the PeopleSoft
VirtualBox Images
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Understanding this Documentation

This documentation is designed to guide you through the deployment of the Oracle VM VirtualBox® appliances for Oracle's PeopleSoft applications. It is not a substitute for the documentation provided for Oracle VM VirtualBox®.

Audience

This documentation is intended for individuals responsible for deploying templates for Oracle's PeopleSoft applications with Oracle VM VirtualBox. The documentation does not include introductory information on virtualization technology or virtual machines. 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
Italics	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: Enter the letter *O*. Italics are also used to indicate user-supplied information. For example, the term *domain* 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 *<PS_CFG_HOME>*/appserv/*<domain>* includes two placeholders that require user-supplied information.
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	Cross-references that begin with *See* refer you to additional documentation that will help you implement the task at hand. We highly recommend that you reference this documentation. Cross-references under the heading *See Also* refer you to additional documentation that has more information regarding the subject.
" " (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 *Note.* 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 *Important!* is crucial and includes information about what you need to do for the system to function properly.
Warning! Warning text.	A note that begins with *Warning!* 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® Linux

- Oracle® Tuxedo

- Oracle® VM

- Oracle VM VirtualBox®

- 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 (FIN)

- Oracle's PeopleSoft Human Capital Management (HCM)

- Oracle's PeopleSoft PeopleTools

- Oracle's PeopleSoft Process Scheduler

- Oracle's PeopleSoft Supply Chain Management (SCM)

- 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 PeopleSoft documentation 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: Getting Started with PeopleTools for your release. This documentation provides a high-level introduction to PeopleTools technology and usage.

  See PeopleTools PeopleBooks for the current release, on the Oracle PeopleSoft Hosted PeopleBooks site, http://www.oracle.com/pls/psfthomepage/homepage

- PeopleTools: Change Assistant and Update Manager

  See Oracle PeopleSoft Hosted PeopleBooks site for PeopleSoft PeopleTools, http://www.oracle.com /pls/psfthomepage/homepage

- PeopleTools: PeopleSoft Update Manager

  See "PeopleSoft Update Manager Home Page," My Oracle Support (Document 1464619.1)

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

Preface

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 Installation for Oracle for the current release. This documentation provides instructions for installing PeopleSoft PeopleTools on an Oracle RDBMS (using the traditional method).

  See My Oracle Support, (search for title).

- PeopleSoft Application Installation guides. Application-specific installation instructions are required in addition to the installation instructions for PeopleSoft PeopleTools.

  See My Oracle Support, (search for title).

- User manual for Oracle VM VirtualBox. This is an extensive document that helps understand how to create and manage virtual machines using Oracle VM VirtualBox.

  See *Oracle VM VirtualBox® User Manual,* Oracle Technology Network, http://www.oracle.com /technetwork/server-storage/virtualbox/documentation/index.html

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 PeopleSoft documentation 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

Prerequisites

This chapter discusses:

• Reviewing Hardware Requirements

• Reviewing Software Requirements

Task 1-1: Reviewing Hardware Requirements

This section describes the hardware requirements for deploying Oracle VM VirtualBox PeopleSoft Appliances. Keep in mind that individual performance is expected to vary depending upon the specific hardware, CPU speed, disk type and speed, and disk fragmentation in your setup.

Note. This documentation uses "virtual appliance" or "image" to refer to the archive that is imported into the VirtualBox Manager. The term "virtual machine (VM)" is used in this documentation to refer to the environment that VirtualBox creates from the virtual appliance.

The requirements listed below apply to the machine used to host the Oracle VM VirtualBox appliances. Keep in mind that a PeopleSoft installation also requires a Microsoft Windows machine on which you install the PeopleTools client utilities. While it is possible to use the same machine as the VirtualBox appliance host and the PeopleSoft Microsoft Windows client, it is not required. To review the certification information for the PeopleSoft Microsoft Windows client, see My Oracle Support, Certifications.

Oracle strongly recommends that you dedicate a Microsoft Windows machine for the PeopleTools client used with the PeopleSoft Update Manager. This should be a machine that is not used for other PeopleSoft purposes.

See "Deploying the PeopleSoft VirtualBox Appliances," Using the PeopleSoft Installation, for information on installing the PeopleTools client utilities.

• *Host computer*: You need a physical host computer to install VirtualBox and deploy the PeopleSoft Image (PI). This host computer can be located remotely and accessed by network-based desktop visualization methods such as RemotePC™ or Microsoft Remote Desktop Connection. However, because the PeopleSoft VirtualBox appliances are 64-bit, the VirtualBox instance that runs them cannot be run in another virtual machine. Also, VirtualBox cannot be used in a cloud or Amazon Machine Image (AMI) environment.

• *Host operating system*: The host operating system must be one of the following:

 • 64-bit Microsoft Windows that is supported by the PeopleSoft PeopleTools client utilities.

 See My Oracle Support, Certifications.

 See PeopleSoft PeopleTools Certifications, My Oracle Support Document 747587.1, for help searching PeopleSoft Certifications.

- 64-bit Linux

  If you use a machine with a Linux operating system to host the VirtualBox appliance, note that you will also need a Microsoft Windows machine for the PeopleTools client.

- *CPU capabilities*: The process must be a 64-bit process with hardware virtualization capabilities. These features must be enabled in the BIOS before the machine is booted.

  The host computer on which the PeopleSoft VirtualBox appliances will run must have a 64-bit processor that can support hardware virtualization.

  PeopleSoft VirtualBox appliance relies on 64-bit Oracle Linux guest operating systems (OSs). VirtualBox does not support software virtualization for 64-bit OSs. So the host system should support hardware virtualization. Your host system must have 64-bit CPUs that support Intel™ Virtualization Technology (Intel VT, first released in 2005) or AMD Virtualization (AMD-V™) Technology (first released in 2006) hardware-virtualization features.

  Most newer CPUs from Intel and AMD contain the required virtualization extensions. These virtualization extensions are not normally enabled by default in a new machine. It is necessary to enter BIOS in your system and enable virtualization extensions before attempting to run any virtual machines. Consult the documentation provided with your computer for information on accessing the BIOS on your machine.

- *RAM (Memory)*: Each PeopleSoft VirtualBox appliance requires a minimum of 4 GB available RAM to run in addition to the requirements of the host OS and the applications previously running on it.

  Note that the memory used by the VirtualBox appliance will not be available to the host OS while the appliance is running. The available RAM refers to memory not used by other processes on the host OS.

- *Disk space*: 100 GB free disk space is required to download the necessary files and initialize each virtual appliance.

Note. The size will vary depending upon the specific virtual appliance. Access the information on the PeopleSoft Update Manager Home Page, My Oracle Support Document 1464619.1, for the requirements specific to the PeopleSoft VirtualBox appliance that you downloaded.

VirtualBox supports the ability to take snapshots of a running appliance, and use them to return to a previous state if your virtual appliance becomes corrupted in any way. You should plan for the space needed for snapshots when allocating storage for your virtual appliance.

See the information on snapshots in *Oracle VM VirtualBox User Manual,* "First Steps."

The disk space requirement includes:

- 15–25 GB for the downloaded zip files

  You may remove these files after you have successfully initialized your virtual machine.

- 15–25 GB for the virtual appliance archive (.OVA) after extraction.

  You may remove the .OVA file after you have successfully initialized your virtual machine. The downloaded virtual appliance archive is required only to set up the virtual machine.

- 40–50 GB for the virtual machine when initialized.

- *Network*: The default installation of the PeopleSoft VirtualBox appliance sets up a "host-only" network configuration.

  If you wish the VM to join the network you will need to make sure that you are able to configure the network stack within the VM in such a way that it will be able to join the local area network (LAN) on which it will reside. This documentation includes brief information on alternative network configurations.

  See Using Alternative Network Configurations.

Task 1-2: Reviewing Software Requirements

Here are the software requirements for deploying Oracle VM VirtualBox PeopleSoft Appliances:

- *Oracle VM VirtualBox*: Before deploying the Oracle VM VirtualBox PeopleSoft Appliances, you must install Oracle VM VirtualBox.

  See Understanding Oracle VM VirtualBox.

  Download the current version of VirtualBox from the Oracle VM VirtualBox web site.

  See Oracle VM VirtualBox, https://www.virtualbox.org.

- *Secure shell client*: You will need a secure shell (SSH) client, for example PuTTY, to log in to the virtual machine after initialization.

- *Web Browser*: You need a version certified for the current PeopleSoft PeopleTools release for end-users.

  See My Oracle Support, Certifications.

CHAPTER 2

Preparing to Deploy

This chapter discusses:

• Understanding Oracle VM VirtualBox and the PeopleSoft Deployment

• Understanding Oracle VM VirtualBox

• Completing the PeopleSoft Application-Specific Installation

• Obtaining Oracle VM VirtualBox for PeopleSoft Appliances

Understanding Oracle VM VirtualBox and the PeopleSoft Deployment

This documentation explains how to deploy the Oracle VM VirtualBox appliance for a PeopleSoft application. The PeopleSoft application is deployed as a single virtual machine (VM) in VirtualBox. The VirtualBox appliance for PeopleSoft applications includes the following features:

Note. Access the links on the PeopleSoft Update Manager Home Page, My Oracle Support Document 1464619.1, for version information.

• PeopleSoft application (HCM 9.2, FSCM 9.2, ELM 9.2, or CRM 9.2 depending on the appliance chosen) demo database, built on Oracle RDBMS database software

The PeopleSoft application database is a demo database with current patches applied.

Note. While the virtual appliances are built on an Oracle RDBMS platform, target environments used with PeopleSoft Update Manager can be any RDBMS platform supported for a PeopleSoft installation.

• PeopleSoft PeopleTools Install directory (this will be found in /opt/oracle/psft/pt/tools after deployment)

• PeopleSoft Client Installer

• PeopleSoft Pure Internet Architecture (PIA) built with Oracle WebLogic web server

• Application Server configured using a PeopleSoft small domain configuration

• Process Scheduler with a default UNIX configuration

• Oracle Tuxedo

• Oracle Linux operating system

• Samba Open Source software for file system access included

The section Using the PeopleSoft Installation later in this document details the components of a PeopleSoft environment deployed by the PeopleSoft VirtualBox Appliance, and gives information on how to work with the environment.

See "Deploying the PeopleSoft VirtualBox Appliances," Using the PeopleSoft Installation.

Before you carry out the procedures in this document to deploy the PeopleSoft VirtualBox appliance for use with a PeopleSoft application update, it is a good idea to review the various installation setups in the PeopleSoft Update Manager documentation, available on the PeopleSoft Update Manager Home Page on My Oracle Support. The way that you carry out these procedures will be impacted by your specific environment.

See *PeopleTools: PeopleSoft Update Manager,* " Setting Up the PeopleSoft Image."

See Also

Understanding Oracle VM VirtualBox

"Prerequisites"

Obtaining Oracle VM VirtualBox for PeopleSoft Appliances

Understanding Oracle VM VirtualBox

Oracle VM VirtualBox is a virtualization product from Oracle that allows one or more guest operating systems (OSs) to be run on and in a single host OS. Oracle VM VirtualBox has the following advantages:

- A guest OS can run any number of applications completely in isolation from the host OS. VirtualBox virtualizes the physical resources of the host OS.

- Memory, CPU, network cards, and so on, are presented to the guest OS such that the guest is unaware that it is running in a virtualized environment.

- Most applications do not require any special modifications in order to run in a guest OS in VirtualBox.

Pre-configured guest OSs, also known as virtual appliances, can be downloaded from My Oracle Support. Virtual appliances can also be created manually on any machine on which VirtualBox is installed. This typically involves running the conventional installation program for the OS that you wish to run as your guest. Once you have created a virtual machine in this manner, it can be redistributed to any number of users.

VirtualBox is intended to host applications with only a very small number of users. VirtualBox is a machine-bound solution — it runs on a single host. Therefore, PeopleSoft VirtualBox appliances as delivered are intended for demonstration or evaluation purposes. They are not intended to be used for a large number of users or for remote access. A typical PeopleSoft application will be secured by the administrator before being made available to the user population. Furthermore, a PeopleSoft deployment typically makes considerations for scalability and fault tolerance. The PeopleSoft VirtualBox appliances have not been constructed to meet these requirements as-delivered. If the decision is made to make the virtual appliance available to a larger user population, the administrator should take steps to implement the necessary security requirements.

See Oracle VM VirtualBox web site, https://www.virtualbox.org/

See *Oracle VM VirtualBox® User Manual,* Oracle Technology Network, http://www.oracle.com/technetwork /server-storage/virtualbox/documentation/index.html

Completing the PeopleSoft Application-Specific Installation

After you complete the installation tasks for the PeopleSoft VirtualBox appliance covered in this documentation, there may be additional installation and configuration steps that are specific to the PeopleSoft Application you are installing. Be sure to obtain the installation documentation for your PeopleSoft Application and complete any necessary tasks covered there. You can find the PeopleSoft Application-specific installation guides by searching on My Oracle Support.

Task 2-1: Obtaining Oracle VM VirtualBox for PeopleSoft Appliances

Use this information to obtain and extract the VirtualBox appliances for a PeopleSoft application.

1. Go to the PeopleSoft Update Manager home page, My Oracle Support Document 1464619.1, to find the information on locating and downloading the image for your PeopleSoft application.

   This page includes links to PeopleSoft Update Manager documentation, as well as links to the individual images.

2. Download the virtual appliance files from My Oracle Support into a single directory.

   This can be any directory that has adequate available space. This directory location, referred to in this documentation as *APPLIANCE_TEMP_DIR*, will be accessed in the next chapter when importing the file into Oracle VM VirtualBox Manager.

   When you download, there will probably be multiple zip files. The multiple files are needed due to size limitations. You must extract parts for the virtual appliance from these individual zip files and recombine them into a single file before importing into Oracle VM VirtualBox Manager.

   The zip file names have the following format, where *<TEMPLATE_NAME>* normally represents the PeopleSoft application name, *<TOOLS_VERSION>* represents the PeopleSoft PeopleTools version and patch number, such as 8.53.04, *<PIxxx>* is the image number, such as PI001, and *n* represents the total number of files:

   *<TEMPLATE_NAME>-<TOOLS_VERSION>-<PIxxx>*_OVA_#of*n*.zip

   For example:

   FSCMDB-85304-PI001_OVA_1of6.zip

   FSCMDB-85304-PI001_OVA_2of6.zip

   ...

   FSCMDB-85304-PI001_OVA_6of6.zip

3. Extract the contents of the first zip file using a standard zip tool.

   The first zip file you extract includes several relatively small files, such as a README, a text file with checksum values, and two scripts. Use the MD-5 or SHA-1 checksum values to verify all of the downloaded zip files. The scripts (ova_gen.bat for Microsoft Windows operating systems, and ova_gen.sh for UNIX or Linux operating systems) are used in the next step to combine the individual parts into a single OVA file.

4. Combine the individual files into a single file with a .ova extension.

Based on your operating system, run ova_gen.bat or ova_gen.sh, which you extracted from the first downloaded zip file, to extract the remaining files and generate the combined OVA file:

• On Microsoft Windows run the ova_gen.bat script.

The script uses a `copy /b` command to combine the separate parts into a single OVA file.

Note. You can also open the script with a text editor and copy the command from the script if you prefer to run it manually.

• On UNIX or Linux run the ova_gen.sh script.

The script uses a `cat` command to combine the separate parts into a single OVA file.

Note. You can also open the script with a text editor and copy the command from the script if you prefer to run it manually.

5. After you combine the individual files, you have a single file with a .ova extension such as:

   <TEMPLATE_NAME>-<TOOLS_VERSION>-<PIxxx>.OVA

   Use the MD-5 or SHA-1 checksum file extracted from the first zip file to verify the checksum values of this OVA file.

   This is the virtual appliance archive that can be imported into Oracle VM VirtualBox.

   See "Deploying the PeopleSoft VirtualBox Appliances," Importing the PeopleSoft VirtualBox Appliance.

CHAPTER 3

Planning Security Administration

This chapter discusses:

• Understanding Security Administration for the PeopleSoft Virtual Machines

• Considering Physical Security

• Considering Host Operating System Security

• 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 Security Administration for the PeopleSoft Virtual Machines

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. The following table describes three scenarios and lists security considerations. Identify the scenario which best matches your use case:

Environment	Description	Considerations
Local (that is, a host-only network setup)	• Single user system • Runs on laptop or desktop • No network access required	• The VM does not need to be secured because it is only used by the same user that owns the host on which it runs. • No additional steps required.

Environment	Description	Considerations
Network, trusted users	• Small user population (fewer than 10 users) • User access can be restricted to a domain of trust that can be implemented as authorization group. • VM does not access external network.	• Network security is required to restrict access to the Guest OS via the LAN. • The security setup uses existing network administration utilities to limit access to the virtual appliance. • Security administration should prevent outbound connectivity from the virtual appliance.
Network, untrusted users	• The user population is not trusted or known. • VM access cannot be restricted to small user group.	• Implement the same security considerations as for the network, trusted users scenario. • The network security should follow that used for other machines on the network. • Disable unnecessary services such as Samba and tighten ports. • Implement PeopleSoft Application Security (PIA)

See Also

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 Physical Security

The virtual appliances are required to run as a guest VM on a physical machine. This physical machine may be any 64-bit machine with an AMD or Intel chip with virtualization extensions enabled. This is discussed in greater detail in the hardware requirements of this documentation. The virtual appliances can therefore be placed on a server grade machine or a machine as modest as a desktop or laptop that fits the hardware requirements. In most cases however, the physical machine on which the guest VM runs will be managed by the system administrator and will reside in the data center or a secured server room. This machine will need to be physically secured in the same way any other machine on your corporate network would be secured.

See "Prerequisites," Reviewing Hardware Requirements.

Considering Host Operating System Security

Virtual Machines run in "user space" on a virtualization platform. (User space is a system administrator term that should be understood by a security consultant). This means that processes within the virtual machine will not have access to host resources. Allowing the guest to access host resources would require additional steps to be taken by the administrator. Therefore the virtual machine can be thought of as a secure container. The steps required to allow the guest OS to see the host OS are not required by the PeopleSoft VMs and are therefore not documented here.

Virtual machines are created in the context of a logged in user on the VirtualBox manager desktop application. The user under whom the VM is created should be a normal non-administrator or non-root user. This is consistent with the least privilege security principle that is advocated for PeopleSoft installation homes and domain configurations.

See "Deploying the PeopleSoft VirtualBox Appliances," Importing the PeopleSoft VirtualBox Appliance.

The virtualization platform for which these virtual machines were built is Oracle VM VirtualBox. The steps regarding host security assume that the VM runs in a host-bound manner and in the context of a single user. Because the VM runs in the context of a specific user, other OS users do not have access to the virtual machine file system when logged on to the host OS. If possible, logon access to the host OS should be restricted to the user that will import, create and manage the lifecycle of the virtual machine.

With minor modifications, it is possible that these virtual machines would work on different virtualization platforms. These modifications are not documented here, nor does this ability suggest fitness to a given application, since Oracle tests and verifies correct functioning of these virtual machines only on the Oracle VM VirtualBox virtualization platform.

The steps for securing the host OS will naturally vary depending upon the virtualization platform. This results from the fact that some virtualization platforms are host-bound and others are enterprise multi-user solutions that have security models built into the virtualization management platform that contain different roles with varying authorization levels.

Considering Network Security

The VMs are delivered with the network adapter in "host-only" network configuration. This means that only users logged into the host OS can access resources within the guest OS. For example, logging into PIA can only be achieved from a browser running on the desktop of the host OS. Furthermore, the VM can only access resources within its own virtual machine. This means that steps need to be taken explicitly to make the VM accessible to and from the network.

It is understood that a host-only configuration is impractical for any real usage of the virtual machine. The delivery of the virtual appliance with a host-only adapter by default is a security precaution to prevent unexpected introduction of a new virtual host on the local area network (LAN) when switching on the virtual machine for the first time. By changing the network adapter settings in VirtualBox Manager you can make the VM available to users on the network.

See "Deploying the PeopleSoft VirtualBox Appliances," Setting the Network Configuration for the Virtual Appliance.

VirtualBox supports up to four network adapters per virtual machine. There are a range of choices of network adapter type. When changing from the default host-only network adapter you will select the most appropriate choice for your network. Oracle tests the deployment of the virtual machine with the Bridged network adapter. This network adapter is tested with both static and dynamic IP addresses to allow remote clients to access the virtual machine and conduct pre-release testing of the virtual appliance.

See the *Oracle VM VirtualBox User Manual* for details about the various network configuration options for VirtualBox.

All network access to the virtual machine is achieved by proxy through the host's network adapter. This means that the host OS should be located on a network sub-domain or segment that restricts access both to and from the virtual machine. This is the same principle as restricting access to and from any machine within your network.

The OS of the VM that you are using is Oracle Linux. Oracle Linux contains the iptables firewall. The iptables utility is turned off by default in the delivered PeopleSoft virtual appliance. You may choose to enable the firewall in order to restrict access to the VM. This allows you to control which resources, ports, and so on, are available to users based on the host credentials from which they reach the VM. The steps required to enable the iptables firewall and limit network access to the VM are documented in the Oracle Linux security documentation

See *Oracle Linux: Security Guide,* Configuring and Using Packet-Filtering Firewalls, Oracle Technology Network, http://docs.oracle.com/cd/E37670_01/index.html

Considering User Security

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

- Host OS user account — User that logs in to the host OS, imports the virtual appliance, and creates the virtual machine.

- 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 PeopleSoft VirtualBox Appliances, " Reviewing the File System and Users.

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

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 four fictitious users, their roles, and sample activities:

User	Role	Sample Activities and Permissions
Amanda	Network administrator	• Administers network addresses and names • (Sys Admin) Manages the host on which VMs run and creates the VM • After initial configuration, cannot log in to guest OS
Bob	System administrator	• Applies security to the guest OS and PeopleSoft runtime environment • Shuts down non-essential services and configures firewall • Cannot log in to host OS on which VM runs
Charlie	Database administrator (DBA)	• Manages the PeopleSoft application databases, availability and performance • Participates in creating new databases during upgrade
Denise	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. Amanda downloads the latest PeopleSoft virtual appliance to the physical machine on which the virtual machine will run.

2. Amanda imports the PeopleSoft virtual appliance using VirtualBox Manager.

3. Amanda creates a virtual machine from the imported virtual appliance.

4. Amanda selects the network adapter for the virtual appliance.

5. Amanda obtains the PeopleSoft database connect ID and password from Charlie.

6. Amanda starts the VM.

   The startup procedure includes prompts for the VM network configuration information, default root password, and the connect ID and password. Amanda provides this information to Bob.

   See "Deploying the PeopleSoft VirtualBox Appliance," Starting the PeopleSoft VirtualBox Appliance.

7. Bob logs in to the virtual machine using Secure Shell (SSH) as VM user root.

8. Bob changes the root password and the passwords for each of user accounts in the virtual machine.

   See "Deploying the PeopleSoft VirtualBox Appliance," Using the PeopleSoft Installation.

9. Bob applies security to the guest OS; for example:

   • Firewall configuration

      • Disabling unnecessary services

      • Installing Critical Patch Updates (CPUs)

10. Bob copies the PeopleTools client installation program to a shared read-only file system location outside the VM for Application Designer users to access.

11. Bob provides Charlie connectivity information for the PeopleSoft application and PeopleSoft database.

12. Charlie makes any necessary configuration or security changes to the DBMS.

13. Denise makes any necessary configuration or security changes to the application through PIA or other PeopleTools utilities.

14. Denise confirms operation of the application.

15. Denise announces the availability of the VM to the broader end-user population.

16. 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 virtual appliance 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 published best practices. 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 virtual appliances 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. The operating system, Oracle Linux, is also *reasonably current*, but you may need to apply updates to ensure that it has all the required patches and fixes to function correctly and securely.

Fixes and updates for Oracle Linux 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.

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

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 virtual appliance 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 Linux command `service --status-all`, and 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. 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. Furthermore, the user accounts that are in the PeopleSoft database in your virtual appliance contain default passwords. There are no security certificates with the delivered VM and all traffic is HTTP by default. If needed, HTTPS must be configured after initial deployment if secure HTTP access is required. These default characteristics mean that access to the virtual appliance is quite open by default.

PIA access can be locked down in a number of ways. The following are examples of steps that can be taken:

- Configuring SSL and disabling HTTP access

- Changing the default PIA HTTP or HTTPS ports

- Disabling non-essential user accounts in the database to prevent unauthorized user login

- Changing default passwords for user accounts in the database

- Configuring the firewall to allow only clients within a specific sub-domain range to access the PIA host

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 virtual appliance and is exposed through a Samba share. 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 virtual appliance it is no longer necessary to expose the VM file system to clients.

See "Deploying the PeopleSoft VirtualBox Appliances," 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 virtual appliance is delivered with an open Workstation Listener (WSL) port (7000) on the Application Server domain for Application Designer connectivity. This port should be disabled if Application Designer is not needed and the administrator needs to secure the virtual appliance.

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

Considering Change Assistant Security

Change Assistant works with the Environment Management Framework in performing PeopleSoft application updates (as well as upgrades). This function requires a variety of access at several points during the update process, including the following:

- The update process requires two-tier connection to both the source and target databases.

- In the case of PeopleSoft Update Manager updates, Change Assistant needs to connect to the virtual machine (PeopleSoft Image) database at the time of Change Package creation.

- Change Assistant in Initial Pass mode requires connectivity to both the source and target databases to apply a Change Package.

- Change Assistant must be able to connect to the Environment Management Hub that is running on the target database when change packages have been created.

See *PeopleTools: PeopleSoft Update Manager,* PeopleSoft Update Manager Home Page, My Oracle Support, (Document 1464619.1)

Network access for Change Assistant would not be required only in the specific scenario in which both Change Assistant and the PeopleTools client tools are installed on the Microsoft Windows machine that is hosting the PeopleSoft virtual machine. In addition, the target database for the PeopleSoft Update Manager update would need to be installed on the same machine, as Change Assistant must upload information about the target from the Environment Management Hub.

In the more likely scenario in which Change Assistant is installed on a separate Microsoft Windows client machine and needs connectivity to the virtual machine's PeopleSoft database across the network, its security considerations depend upon that applied to the client machine. To a large extent this is no different from the way Change Assistant was used in previous releases with the Update Gateway. The administrator would follow organizational standards for security to ensure that Change Assistant can only access specific resources and can only be accessed by the minimal users that are required to do so.

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 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 it is started. 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 access the shared folders of the VM through the Samba share. With this information it is necessary to supply the required credentials to connect to the database with SQL*Plus.

At minimum, 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. Samba is not required for ongoing use of the virtual machine after initial setup. The client installations programs can be relocated. Unless continued access to the VM file system is required, 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 PeopleSoft VirtualBox Appliances," 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 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.

4. *Question:* Will multiple users require access to the VM?

   Implication: If multiple users require access to the VM it will be necessary to apply network, host, 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:* Will you retain the VM beyond the availability of a refresh on My Oracle Support?

Implication: You must consider activities associated with ongoing maintenance of the VM such as OS and PeopleSoft application software patching, password expiration, and so on.

CHAPTER 4

Deploying the PeopleSoft VirtualBox Appliances

This chapter discusses:

- Importing the PeopleSoft VirtualBox Appliance
- Setting the Network Configuration for the Virtual Appliance
- Starting the PeopleSoft VirtualBox Appliance
- Setting the Authentication Domain in the Web Profile
- Using the PeopleSoft Installation
- Using COBOL with the PeopleSoft VirtualBox Appliance
- Resolving Problems with the PeopleSoft Runtime Environment
- Managing the Virtual Environment Lifecycle

Task 4-1: Importing the PeopleSoft VirtualBox Appliance

This section assumes that you have a running VirtualBox installation on your Microsoft Windows machine.

See "Preparing to Deploy," Understanding Oracle VM VirtualBox.

You should have already downloaded and extracted the VirtualBox appliance from My Oracle Support, as described in the previous chapter, and saved the .OVA file in a directory referred to in this documentation as *APPLIANCE_TEMP_DIR*. The OVA is imported directly into VirtualBox at this point.

See "Preparing to Deploy," Obtaining Oracle VM VirtualBox for PeopleSoft Appliances.

To import the virtual appliance into VirtualBox:

1. Start VirtualBox.

   The Oracle VM VirtualBox Manager appears. This example shows the Oracle VM VirtualBox Manager with a previously-imported appliance. If you start Oracle VM VirtualBox Manager with no existing appliances, you see a Welcome page.
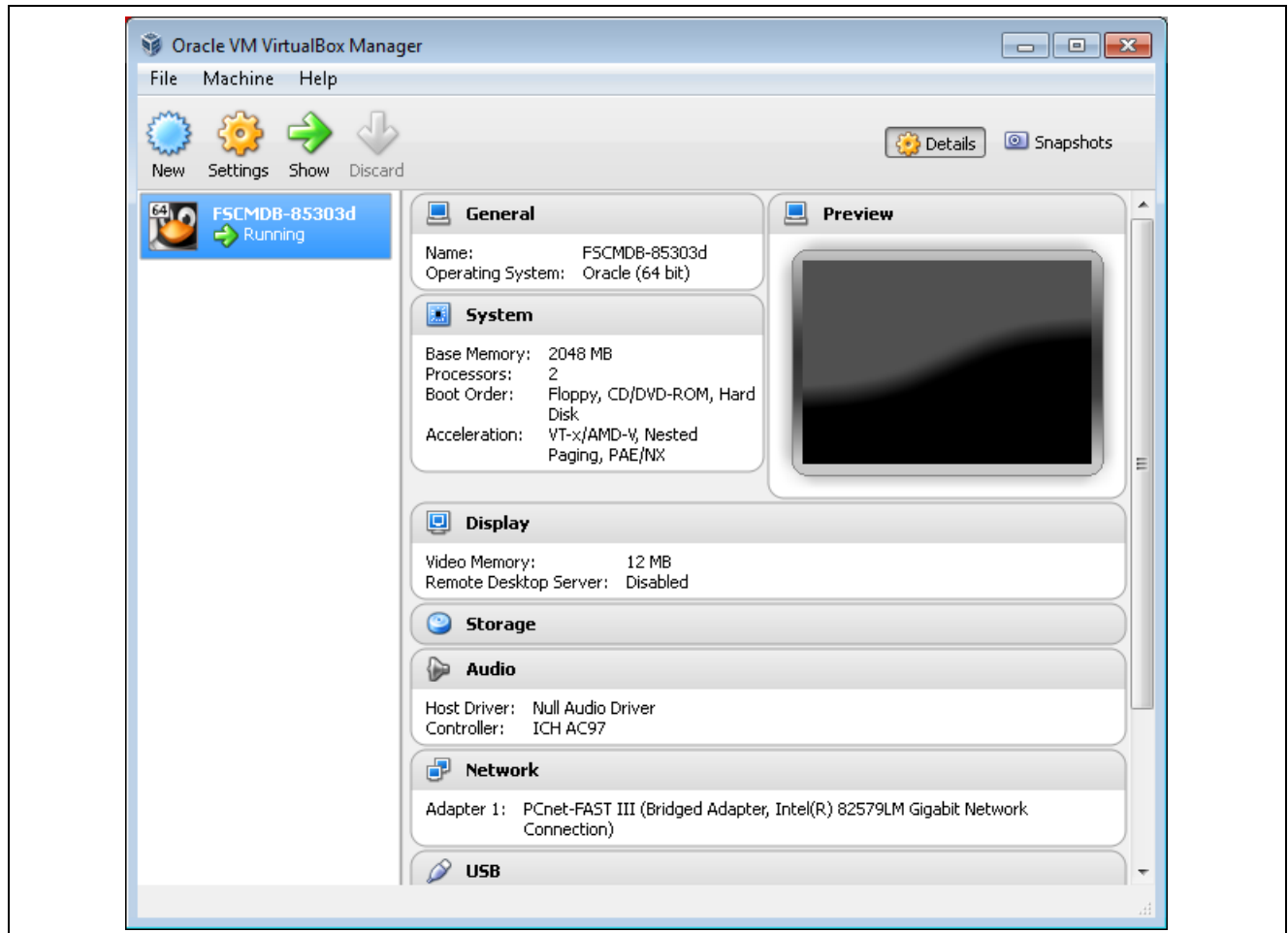
Oracle VM VirtualBox Manager with existing appliance

2. Select File, Import Appliance.
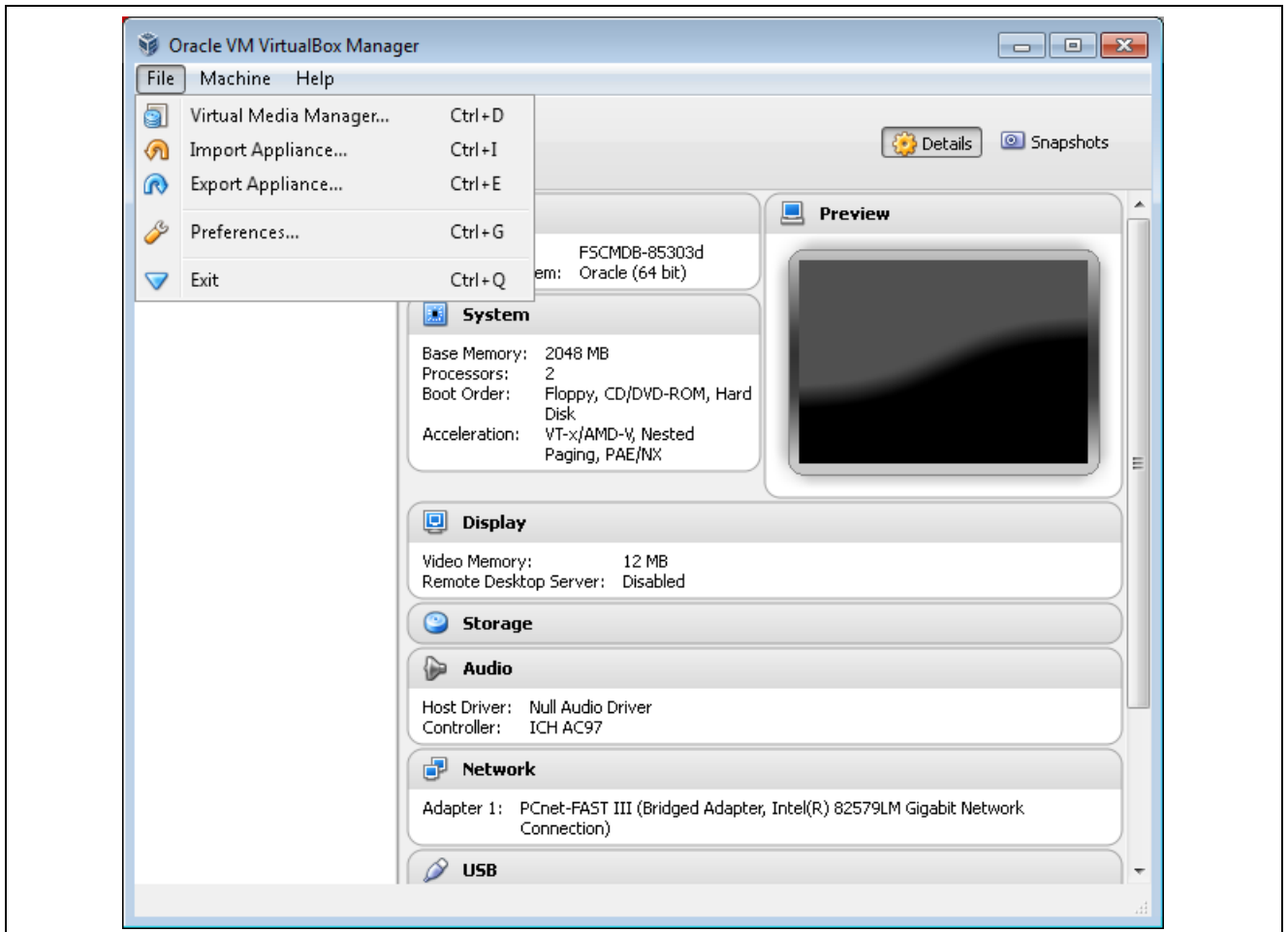
Oracle VM VirtualBox Manager window with File menu

3. Click Open Appliance and browse to *APPLIANCE_TEMP_DIR*.

   Select the OVA installation file and click Next. The appliance in this example is HCMDB-85303d.ova.
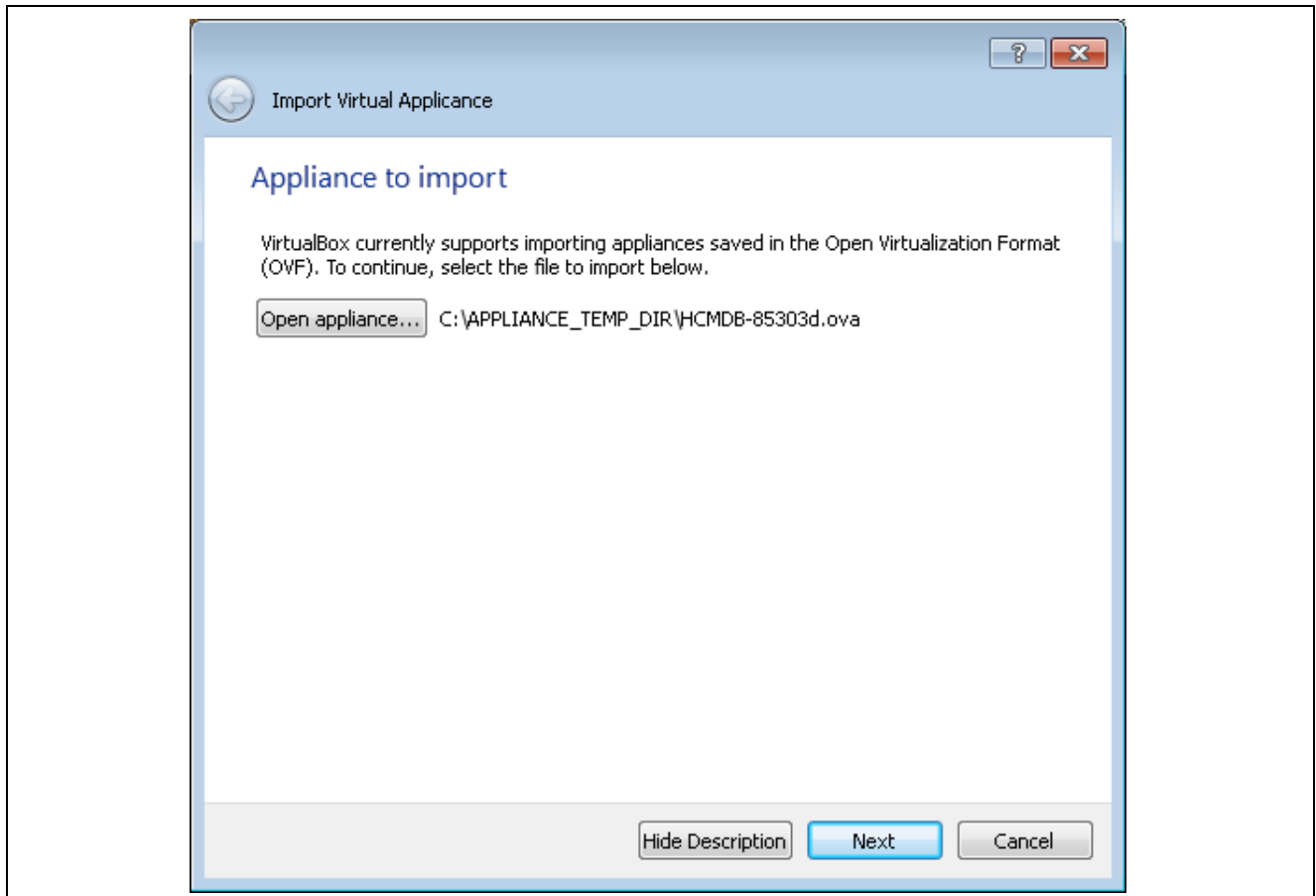
Import Virtual Appliance window

4. Review the configuration details for the virtual appliance.

   The details for your appliance will be different from those shown in this example. The configuration details listed include appliance name, version, and the location of the Virtual Disk Images. To change the Virtual Disk Image location to a preferred file system location, double-click the entry. This may be necessary if the file system onto which you will place the disk images does not have sufficient free space.

   Note. It is recommended that you do *not decrease* the values for CPU and RAM. The virtual appliance requires these minimum resources in order to run effectively and efficiently. If the host OS on which the virtual machine will run does not have adequate resources to direct to the virtual machine you will experience problems when using the virtual machine.
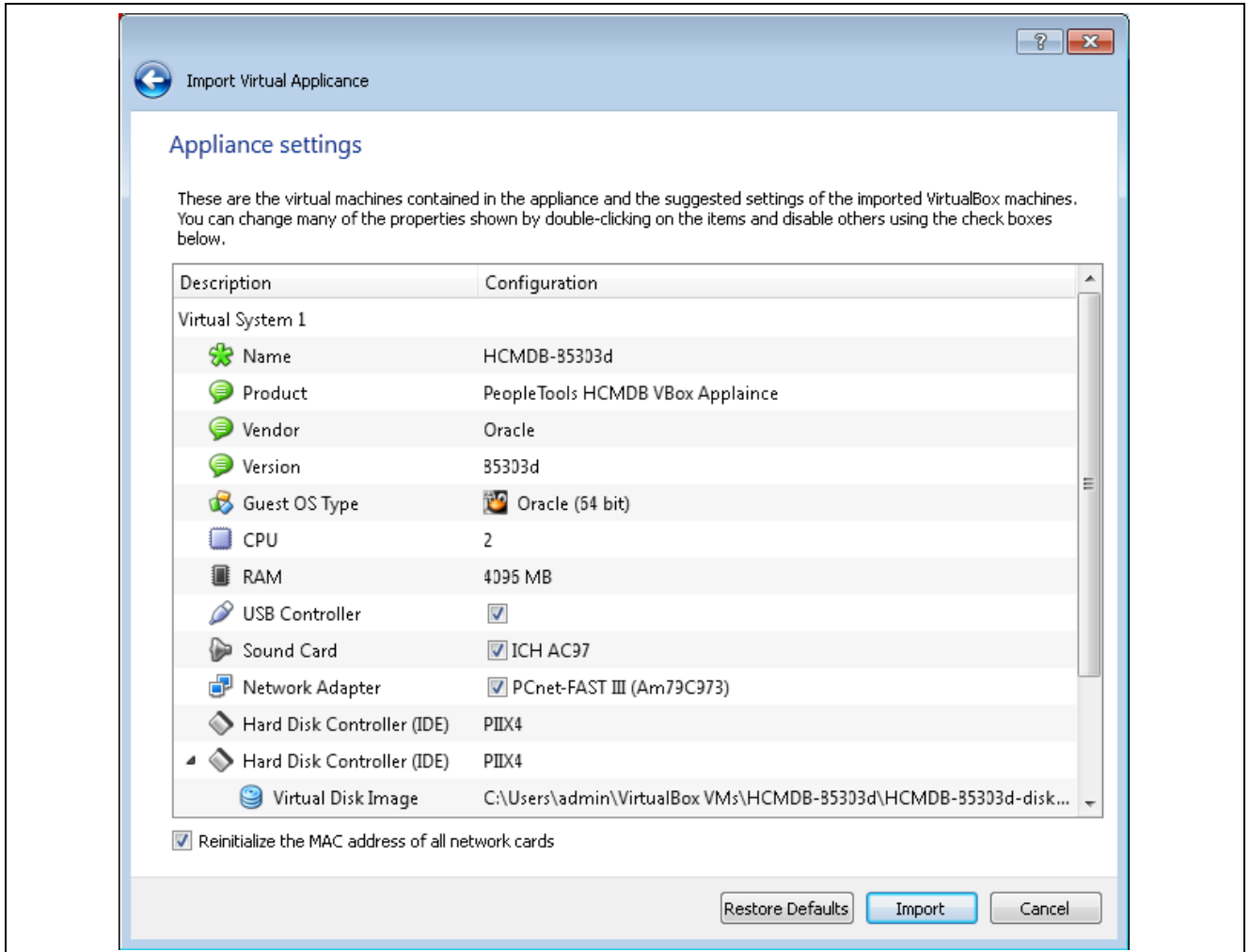
Appliance settings window

5. Select the option Reinitialize the MAC address of all network cards.

Important! This option is required for proper operation of the virtual network interface on the network, whether local or external.

---

6. Click Import.

The import process takes a few minutes, as shown in this example of a progress indicator.
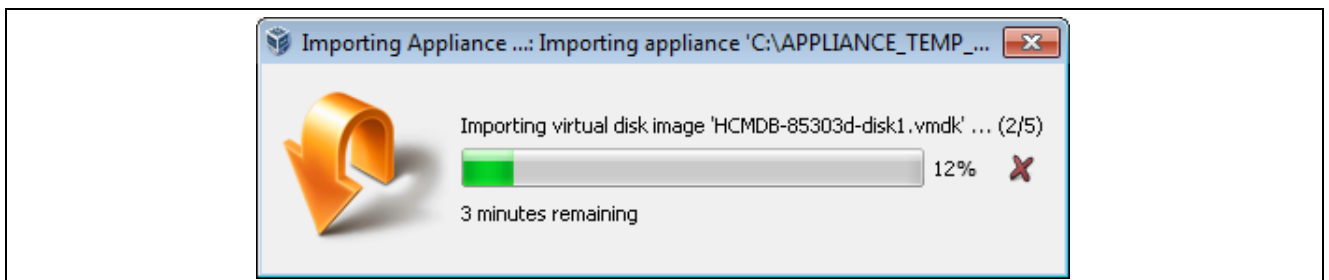
Importing Appliance progress indicator

When the import is complete the imported appliance is shown with the status Powered Off. The steps in the next section begin with this window.

Oracle VM VirtualBox Manager after importing PeopleSoft appliance

7. Perform disk maintenance.

    To address possible performance issues caused by fragmentation occurring when writing the large virtual machine disk files, consider defragmenting the host operating system's hard drive at this point. Depending on the condition of the drive, this make take from a few minutes to a few hours.

Task 4-2: Setting the Network Configuration for the Virtual Appliance

This section discusses:

• Understanding Network Configuration Settings

• Setting a Host-Only Network Configuration

• Using Alternative Network Configurations

Understanding Network Configuration Settings

This section includes procedures for setting the network configuration for the VM. This section assumes that:

- You have imported the virtual appliance as described in the section Importing the PeopleSoft VirtualBox Appliance.

- You have fulfilled the host machine requirements discussed in the "Prerequisites" chapter.

- The virtual machine will be used in a machine-bound deployment.

  This means that the virtual machine will only be used for single user or demonstration purposes and will be accessed only by users logged on to the host OS.

Task 4-2-1: Setting a Host-Only Network Configuration

These instructions apply to the default host-only configuration. See the following sections for other configurations.

See Using Alternative Network Configurations.

This section assumes:

- The virtual machine does not need access to networked resources outside the host.

- Everything required of the runtime environment is contained within the virtual appliance.

To set the network configuration:

1. In the Oracle VM VirtualBox Manager, highlight the virtual appliance and click Settings in the menu bar.

2. On the Settings window, select Network in the left-hand frame.

3. Select *Host-only Adapter* from the Attached to drop-down list, as shown in this example.
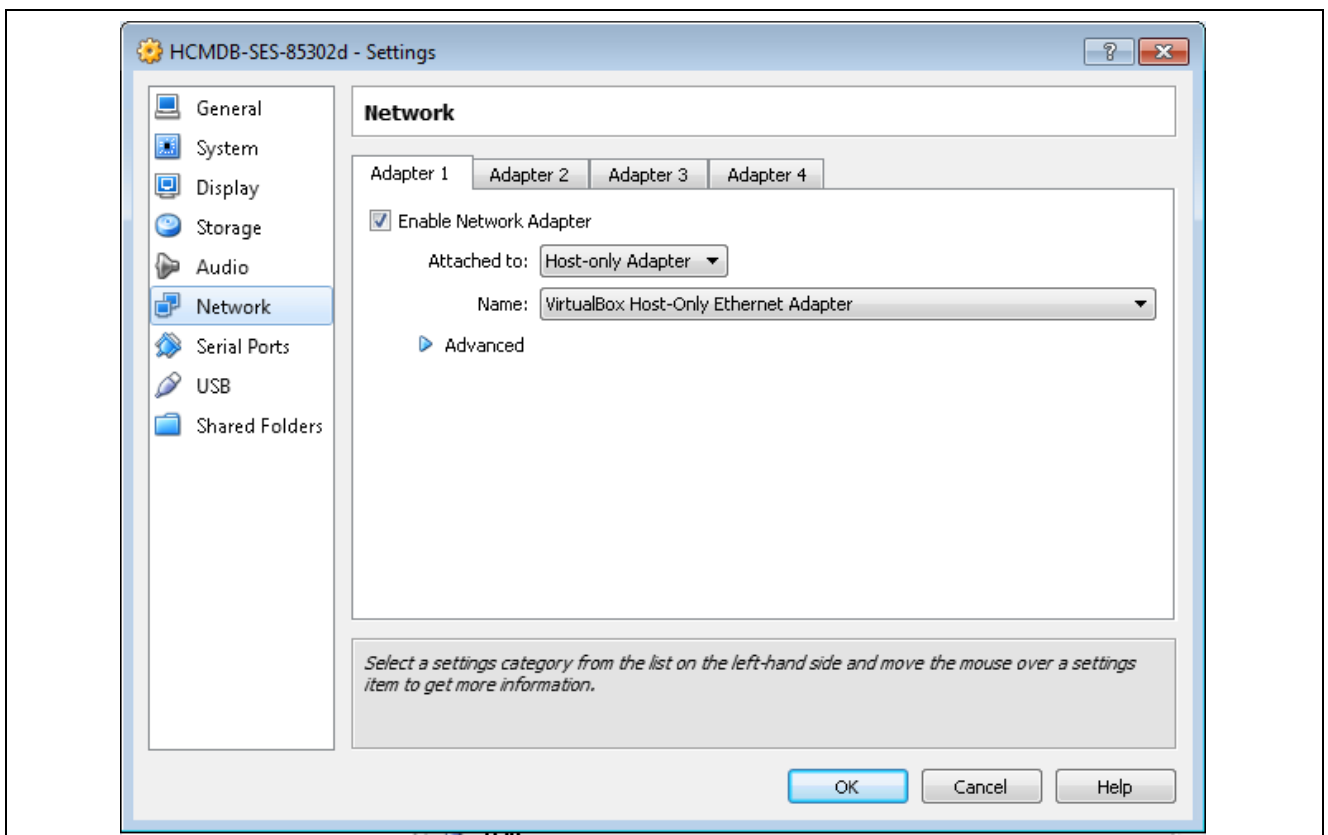
Setting the network configuration for Host-only Adapter

> **Note.** Setting the adapter to being Host-only means that the virtual machine will be unable to access the network outside the host on which it will run. The IP and hostname of the virtual machine will be known only within the host and virtual machine OS. During the time that the virtual machine is connected to the Host-only network consider performing any security configuration you need.

Task 4-2-2: Using Alternative Network Configurations

This section discusses:

- Understanding Alternative Network Configurations

- Allowing Your VM to Access the External Network

- Accessing VirtualBox and Your VM from Another Host

- Resetting the Network Stack of Your Virtual Appliance

- Using the Virtual Machine with VPN

- Using the Virtual Machine Hostname from the Host OS

Understanding Alternative Network Configurations

Oracle VM VirtualBox provides a rich set of network configuration options for your virtual machines (VMs). This will allow the virtual machine to function within your network in the same way as any other physical or virtual host. This topic is described in detail in the Oracle VM VirtualBox User Manual. Topics such as bridging, virtual LANs, dynamic and static IP address assignment are not described in this document. These concepts correlate to general network administrator activities and therefore are not discussed here.

Some of the scenarios with which you may wish to extend your virtual appliance are described here.

Allowing Your VM to Access the External Network

This is possible if your virtual machine has a network configuration that allows it to participate in the wider network. The default instructions in the previous section, Setting a Host-Only Network Configuration, permit the virtual machine to only run within the host machine. In order for the VM to operate in the wider network it is necessary to use one of the other network configuration options offered by VirtualBox. The most common choice is to use a bridged network adapter.

To use a bridged adapter rather than a host-only adapter, access the Network page in the Settings dialog box, as described in Setting a Host-Only Network Configuration, and select Bridged Adapter from the Attached to drop-down list.
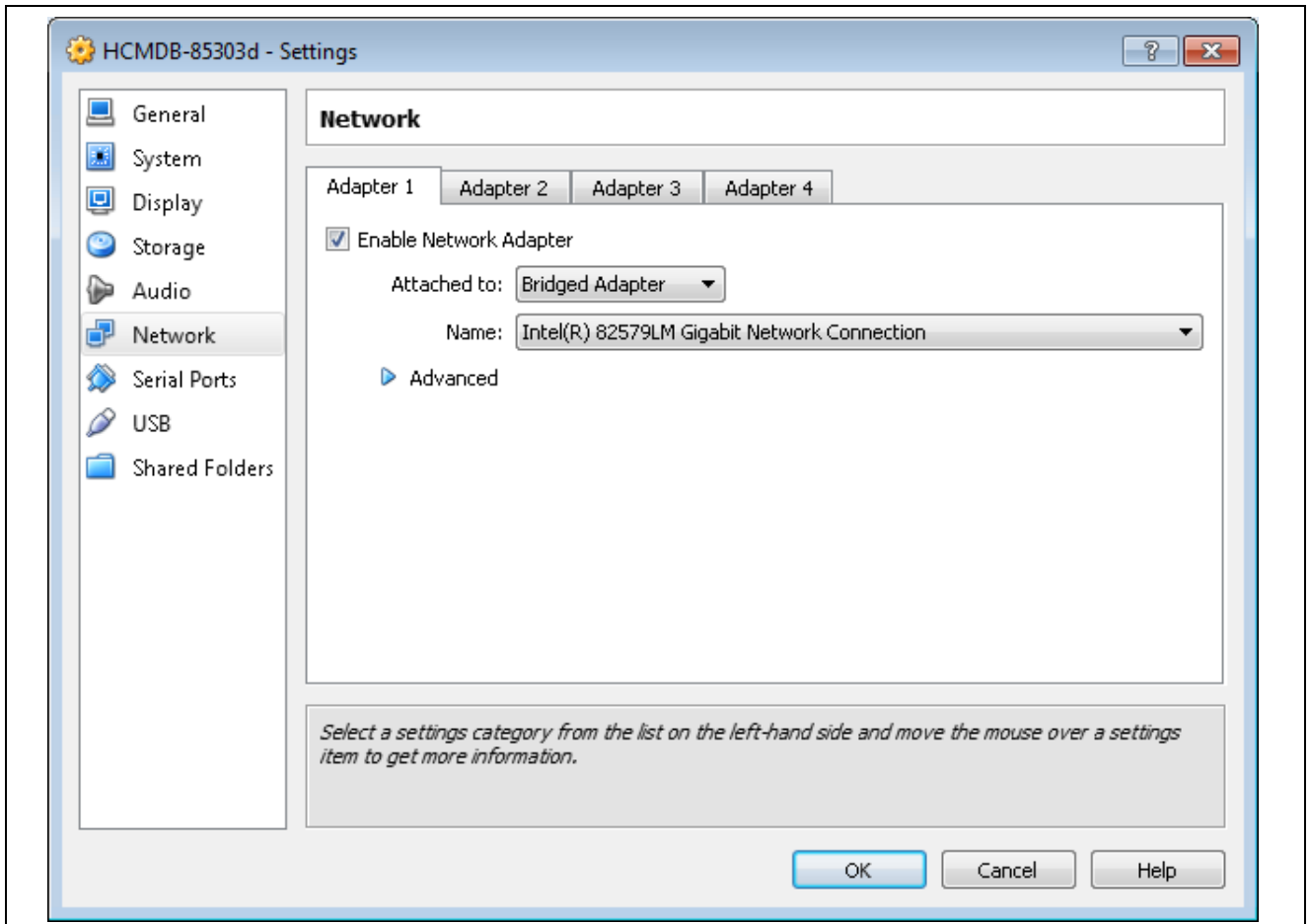
Setting the network configuration for Bridged Adapter

After you choose the Bridged Adapter option, you will select the correct adapter with which to connect to the network. On a single user system such as a laptop this will typically correspond to the wireless network card. If multiple adapters are listed you should consult Windows Control Panel to identify which network adapter to use.

Accessing VirtualBox and Your VM from Another Host

VirtualBox is not intended for use as a server product, or for multi-user access. However, it is in fact possible to access the virtual machine from outside the host on which it runs. In such a case the network configuration of the virtual machine will need to be initialized with settings that are understood by the network in which it will run. The virtual machine will be subject to any rules imposed upon conventional hosts residing on the network. This means that a valid hostname — and IP address if using static IP — will be required.

To allow multiple users to access the VM, you must change the network adapter from Host-Only to Bridged Adapter. The procedure that you follow depends upon where you are in the deployment process.

If you have just imported the VirtualBox appliance, carry out these steps:

1. In the Oracle VM Virtual Box Manager, highlight the virtual appliance and click Settings in the menu bar.

2. On the Settings window, select Network in the left-hand frame.

   The Network page includes four tabs in the right-hand frame, one for each of the network adapters.

3. On the Adapter 1 tab, select *Bridged Adapter* in the Attached to drop-down list.

4. Verify that the Name drop-down list is populated with the correct network adapter.

This will typically be the wireless or wired network adapter that is on the host computer. This can be found, for example, by examining the network configuration in Microsoft Windows Control Panel.

5. Click OK and start the VM.

    See Starting the PeopleSoft VirtualBox Appliance.

If you have already started the VM with the setting Host-Only Adapter, carry out these steps:

See Starting the PeopleSoft VirtualBox Appliance.

1. Open the VM console window and select the following command to stop the VM:

    ```
    Machine, ACPI Shutdown
    ```

2. In the Oracle VM Virtual Box Manager, highlight the virtual appliance and click Settings in the menu bar.

3. On the Settings window, select Network in the left-hand frame.

    The Network page includes four tabs in the right-hand frame, one for each of the network adapters.

4. On the Adapter 1 tab, select *Bridged Adapter* in the Attached to drop-down list.

5. Verify that the Name drop-down list is populated with the correct network adapter.

    This will typically be the wireless or wired network adapter that is on the host computer. This can be found, for example, by examining the network configuration in Microsoft Windows Control Panel.

6. Click OK and start the VM.

    See Starting the PeopleSoft VirtualBox Appliance.

7. Update the hosts file on the host Microsoft Windows machine to reflect the new IP address of the VM.

    See Using the Virtual Appliance Hostname from the Host OS.

Resetting the Network Stack of Your Virtual Appliance

If you made errors while initializing your virtual appliance and wish to reset it to the pre-initialization state, use the technique described in the section Resetting PeopleSoft Virtual Appliances. It is also applicable if you simply want to change the way that your virtual appliance works on the network.

See Resetting PeopleSoft Virtual Appliances.

Using the Virtual Machine with VPN

Your virtual machine may not work as expected if your host OS is connected to a private network using a Virtual Private Network (VPN). In particular, Application Designer, PuTTY or browser connections to PIA may fail. This is because communication to and from the virtual machine takes place through the VirtualBox Network Adapter. When a VPN connection is active, the host OS will route all network communication through the VPN network adapter. The reason that communications to and from the virtual machine will not work is that the VPN adapter does not recognize the private network that VirtualBox is using. Therefore communications from the browser, Application Designer and so forth, get stopped at the VPN adapter and do not get propagated to the virtual machine.

For information on working with VPN, consult the VirtualBox documentation.

See VirtualBox, https://www.virtualbox.org

Using the Virtual Machine Hostname from the Host OS

If the hostname of your virtual machine is not known to the network on which your host OS is running, you will not be able to use it to access the virtual machine. Client connections such as those made by the browser to PIA will not be able to resolve the hostname.

To overcome this issue it is necessary to update the hosts file on the host OS. This file will be located in %SystemRoot%\System32\drivers\etc. %SystemRoot% by default maps to C:\Windows. The hosts file must be updated to contain a mapping from the virtual machine IP address to the hostname that it has been assigned. This will allow the network adapter on the host OS to route any network traffic directly to the virtual appliance.

Add an entry such as the following in order to use the virtual machine hostname rather than the IP address to establish connections:

```
192.168.1.103    hostname.example.com
```

Task 4-3: Starting the PeopleSoft VirtualBox Appliance

This section describes the initial startup of the virtual machine. This section assumes that you have imported the PeopleSoft VirtualBox appliance as described in the previous section. This section also assumes that you have chosen to use host-only networking.

As you use Oracle VM VirtualBox Manager, you may see messages concerning keyboard and mouse control. See the VirtualBox documentation for details about these messages.

See *Oracle VM VirtualBox User Manual,* "First Steps."

Note. If you plan to use a static IP address, you will need to provide a valid IP address, as well as addresses for the Domain Name System (DNS) server, gateway, and netmask in this procedure. A static setup works best with the Bridged Adapter network configuration. If you enter the values for a static networking setup in this procedure, but you have chosen to use host-only networking when importing the virtual appliance, the system will not be able to contact the DNS and validate the hostname.

See the information in Setting the Network Configuration for the Virtual Appliance to configure the Bridged Adapter before beginning this procedure.

To start the virtual machine:

1. Open Oracle VM VirtualBox Manager, highlight your virtual appliance, and click Start (green arrow).

    This example shows both a previously-imported appliance, which is running, and the newly-imported appliance, HCMDB-85303d, which is powered off.

Oracle VM VirtualBox Manager with imported PeopleSoft virtual appliance

A command window appears displaying system initialization messages for the virtual machine, similar to those shown below:

Note. A portion of the messages has been omitted for the sake of brevity.

```
Starting crond:                                                [ OK ]
Starting SMB services:                                         [ OK ]
.
.
.
Starting sshd:                                                 [ OK ]
```

2. Specify a password for the root user at the following prompt.

Take note of the value that you provide as it is essential for performing administrative operations on the virtual machine.

```
Changing password for user root.
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```

3. Choose whether to use dynamic IP configuration for this virtual machine at the following prompt.

```
Configuring network interface.
  Network device: eth0
  Hardware address: 00:11:22:33:AA:BB


Do you want to enable dynamic IP configuration (DHCP) (Y|n)? Y
```

These instructions assume that you are using Host-only networking, as discussed earlier in this document, and therefore you enter *Y* (yes). This will result in a dynamic IP address being assigned by the VirtualBox network adapter (this configuration is referred to as Dynamic Host Configuration Protocol, or DHCP).

4. (Optional) If you wish to assign a static IP address, enter *n* (no) to the prompt in the preceding step.

You must provide a valid IP address to ensure that the virtual host can join the network. You will also need the DNS server IP address, gateway, and netmask. If you do not satisfy these criteria, you see the following prompt:

```
The DNS server entered is not reachable. This is due to either the Virtual⇒
 Machine's network is attached to a Host-only Adapter (applies to VM's running⇒
 on VirtualBox) or some other network issue.
It is not recommended to continue the installation with static IP configuration⇒
 without basic network functionality. Some of components will not initialize⇒
 properly.


Do you want to stop the initialization process to correct this condition? [Y|n]:
```

If you enter *Y* (yes), the system shows the following message, and shuts down.

```
Please refer to the Install document for further instructions regarding Network⇒
 Adapter Configuration.


The Virtual Machine will be shutdown now.
```

If you enter *n* (no), the initialization continues.

Use the following in understanding this prompt:

- If the entered static IP address and the DNS server IP address are valid, the DNS is reachable, and you selected Bridged Adapter when importing the virtual appliance, the system displays the DNS host name and prompts for confirmation.

- If the entered static IP address and the DNS server IP address are valid, but you selected the Host-only networking option when importing the virtual appliance, the system cannot reach the DNS to deduce the hostname and prompts the user to enter the hostname manually. This can be problematic. Rather than entering the hostname manually in the next step, shut down the virtual machine and start again at the beginning of this procedure.

- If either the static IP address or the DNS server IP address is invalid, the system cannot deduce the hostname and prompts the user to enter the hostname manually. This can be problematic. Rather than entering the hostname manually in the next step, shut down the virtual machine and start again at the beginning of this procedure.

5. Choose a hostname.

Use the following considerations in specifying the hostname:

- If you want the virtual machine to access an external network, you must use a legitimate hostname and fully qualified domain name for that network. See Using Alternative Network Configurations.

- If you do not need to access an external network, you can manually configure the hostname. In this case, specify a hostname that is comprised of any alphanumeric name of your choosing, plus a fully qualified domain name; that is, *<hostname>.<domainname>*. For example, hcm.example.com. This should not be a hostname that is currently in use on your network.

- If you do not enter a hostname, the default hostname localhost.*<domainname>* will be assigned.

6. Specify the hostname.

- If you chose to enable dynamic IP configuration (DHCP) in the earlier step, you see the following prompt:

```
Shutting down interface eth0:                                    [ OK ]
Shutting down loopback interface:                                [ OK ]

Configuring network settings.
  IP configuration: DHCP

Bringing up loopback interface:                                  [ OK ]
Bringing up interface eth0:                                      [ OK ]
Determining IP information for eth0... done.

Do you want to manually configure the hostname (y|N)? y

Enter hostname (e.g. host.domain.com):   hostname.example.com

Network configuration changed successfully.
   IP configuration:  DHCP
   IP address:        192.168.1.103
   Netmask:           255.255.255.0
   Gateway:
   DNS Server:
   Hostname: hostname.example.com
```

- (Optional) If you chose not to enable dynamic IP configuration (that is, you are using a static IP address), you see this prompt:

```
Shutting down interface eth0:                              [ OK ]
Shutting down loopback interface:                          [ OK ]

Configuring network settings.
   IP configuration: Static IP address

Bringing up loopback interface:                            [ OK ]
Bringing up interface eth0:                                [ OK ]

Enter hostname (e.g. host.domain.com):  static_hostname.example.com

Network configuration changed successfully.
   IP configuration:  Static IP address
   IP address:        192.168.1.103
   Netmask:           255.255.255.0
   Gateway:           10.147.68.1
   DNS Server:        192.168.190.70
   Hostname: static_hostname.example.com
```

7. If you want to change any of the values you supplied for the IP configuration and hostname in the previous steps, enter *n* (no) to the following prompt:

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

   The system repeats the prompts in the previous steps, beginning with `Configuring network interface.`

8. If you are satisfied with the values you supplied for the IP configuration and hostname in the previous steps, enter *y* when asked if you are happy with your answers, and continue with the next step.

9. If you want to change the database name, enter the new name at the following prompt:

```
Enter the name of the database. Please ensure that the database name includes⇒
 only alphanumeric characters and is no more than 8 characters in length ⇒
[<default-dbname>]:
```

   The prompt displays the name of the database provided with the virtual appliance for <default-dbname>; for example, HCM92. If you do not want to change the database name, press ENTER, and the system uses the default name to set up the database.

   If you enter a database name that does not fulfill the stated requirements, the system repeats the prompt until you supply a correct name.

10. Enter the Connect ID name and password at the following prompt:

```
Note: If this image is intended to be a PUM source for applying maintenance,⇒
 the Connect ID and Password need to match your Target database environment.
Enter the name of PeopleSoft Connect ID [people]:
Enter PeopleSoft Connect ID password:
Re-Enter PeopleSoft Connect ID password:
```

The connect ID user name must be no greater than 8 characters. The connect ID password must be between 6-8 characters. If you enter values that do not match these criteria, the system prompts you to enter the correct values. If you are using this VM to apply PeopleSoft Update Manager-enabled maintenance, the connect ID and password must match the values on your target database.

Note. If you do not see this prompt, the default value for the connect ID user is people, and that for the connect ID password is peop1e (with the letter "l" replaced by the number one "1".)

11. Review the status of the setup steps.

    The system displays messages indicating the steps in the setup process. The success or failure of the step is indicated by [OK] or [FAILURE]. See the log file mentioned at the end of this section for information on failed steps. This example shows portions of the configuration messages:

    • The creation of the database.

    ```
    Setting up PeopleSoft Database <default-dbname> on this VM
    Starting PeopleSoft Database <default-dbname>                  [ OK ]
    ```

    • The creation and startup of the PeopleSoft Application Server and Process Scheduler

    ```
    Setting up PeopleSoft Application Server on this VM
    Setting up Oracle TNS Names Entry:                            [ OK ]
    Creating PeopleSoft Application Domain APPDOM:               [ OK ]
    .
    .
    .
    Starting PeopleSoft Process Scheduler Domain PRCSDOM:        [ OK ]
    ```

    • The installation and startup of PeopleSoft Pure Internet Architecture (PIA)

    ```
    Setting Up Peoplesoft Pure Internet Architecture on this VM
    .
    .
    .
    Starting PIA Domain peoplesoft:                              [ OK ]
    ```

    • The configuration of Process Scheduler report nodes and Integration Broker:

    ```
    Configuring Process Scheduler Report Node:                  [ OK ]
    .
    .
    .
    Starting PeopleSoft Process Scheduler Domain PRCSDOM:       [ OK ]
    ```

12. When you see a message indicating the completion of the initialization, the PeopleSoft runtime environment is available for use. For example:

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

    Review the /var/log/oraclevm-template.log file for information on the initialization process.

13. To confirm external shell access to the virtual machine, log in to the virtual machine from your host OS using Secure Shell (SSH) with a telnet client.

PuTTY is the SSH client used in the example below. In order to connect with SSH you will need the IP address of the virtual machine. The IP address can be identified using the Linux command `ifconfig`.

After the SSH client connects to the host, before you can access the virtual machine, you will need to supply the root user and the password that you provided earlier in this procedure.

Note. You can also log in to the VM on the console using one of the default accounts described in the task Using the PeopleSoft Installation.

This example shows the results of the Linux `ifconfig` command in the console and the PuTTY client dialog box:
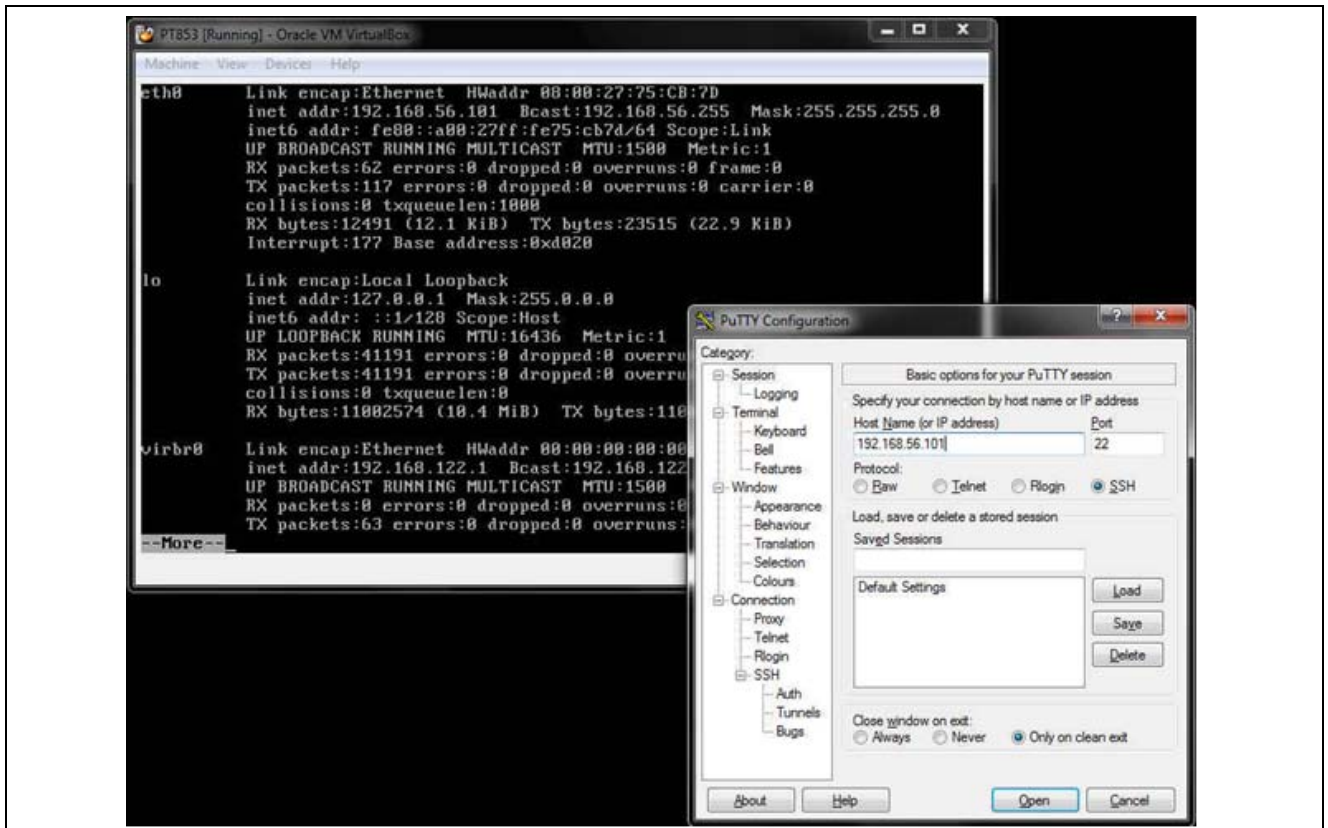
Connecting to the virtual appliance with PuTTY Client

Establishing a connection to the virtual machine verifies its accessibility from the host OS. You may continue to verify that the individual logical tiers within the PeopleSoft environment are available by using utilities such as PeopleSoft PeopleTools PSADMIN and SQL*Plus. Before performing any administrative activities consult the section Reviewing the File System.

See the next section for instructions on signing in to the PeopleSoft application.

See Setting the Authentication Domain in the WebProfile.

See Also

Managing the Virtual Environment Lifecycle

Task 4-4: Setting the Authentication Domain in the Web Profile

In one of the steps in the previous section Starting the PeopleSoft VirtualBox Appliance, you chose whether to configure the virtual machine with dynamic IP configuration (DHCP) or a static IP address.

If you configured the virtual machine using the static networking option, the authentication domain is configured automatically, and you can skip this section. To access the sign-in window when you have configured the virtual machine with the static networking option, use the URL http://hostname.example.com:8000/ps/signon.html.

If you configured the virtual machine to use DHCP, use one of these options to sign in to the PeopleSoft application from a browser on the host OS:

- Use the virtual machine IP address in the URL http://*VM_IP_ADDRESS*:8000/ps/signon.html.

- If you want to use a host name rather than an IP address in the URL that you use to access the PeopleSoft application, you must carry out the procedure in this section to set the authentication domain for PIA manually.

  See *PeopleTools Installation Guide for Oracle for the current release,* "Setting Up the PeopleSoft Pure Internet Architecture."

In all cases, after accessing the PeopleSoft application sign-in window, enter the appropriate user name and password for the PeopleSoft application (for example, VP1/VP1, PS/PS, or PTDMO/PTDMO).

The user IDs and passwords used to sign in to the PeopleSoft application, VP1/VP1 and so on, are delivered with the virtual appliance.

For information on modifying the user ID passwords, see the information on working with passwords in the *PeopleTools: Security Administration* product documentation.

To set the authentication domain:

1. Sign in to the PeopleSoft application in a browser using the virtual machine IP address:

    http://*VM_IP_ADDRESS*:8000/ps/signon.html

2. Select PeopleTools, Web Profile, Web Profile Configuration.

3. Click Search, and select *PROD* from the results list.

4. On the General tab, enter the authentication domain for your host.

    For example, if your virtual machine host name is hostname.example.com, enter .example.com in the Authentication Domain field.

5. Click Save and sign out.

6. On the Microsoft Windows machine hosting the virtual machine, open the C:\Windows\System32\drivers \etc\hosts file for editing.

7. On a new line enter the virtual machine IP address and the full host name with the authentication domain; for example:

    ```
    192.168.1.103 hostname.example.com
    ```

8. Save the file.

9. Shut down and restart the VM.

10. To sign in to the PeopleSoft application, use this URL:

http://hostname.example.com:8000/ps/signon.html

11. On the sign-in window, enter the appropriate user name and password for the PeopleSoft application (for example, VP1/VP1, PS/PS, or PTDMO/PTDMO).

Task 4-5: Using the PeopleSoft Installation

This section discusses:

• Reviewing the PeopleSoft Environment

• Understanding Samba and File System Access

• Reviewing the File System and Users

• Accessing the Shared Drive Folders on the Virtual Appliance File System

• Installing and Starting Oracle Database Client Tools

• Installing the PeopleTools Client Tools and Using Application Designer

• Installing PeopleSoft Change Assistant

• Managing PeopleTools Domains with PSADMIN

• Changing the Access for PI_HOME

Reviewing the PeopleSoft Environment

After you complete the initialization of the virtual machine the PeopleSoft installation will be available. This section includes brief information to help you work with the PeopleSoft environment. For detailed definitions, and information on working with the components in a PeopleSoft installation, see the PeopleSoft documentation referenced earlier.

The specific components that comprise your environment, such as the database platform that your target database runs on, and the release/patch level of your database client, will impact the way you set up your installation. Remember to review *PeopleTools: PeopleSoft Update Manager* for information on configuring the PeopleSoft installation when carrying out a PeopleSoft application update before you carry out the procedures in this chapter.

See "About this Documentation, " Related Information.

Understanding Samba and File System Access

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

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

By default Samba will make some of the installation directories under the /opt/oracle/psft/pt/tools/setup directory of the virtual machine available to the host as shared drives. You can map to these shared drives from Microsoft Windows machines. The following table describes the local directories on the virtual machine, and the shared drive folders that are made available:

Description	Local Directory	Shared Drive Folder
PeopleTools client tools	/opt/oracle/psft/pt/tools/setup/Client	client
Oracle RDBMS client for Microsoft Windows (installation file) **Note.** The Oracle RDBMS client installation executable in this table refers to the 32-bit client. This is required on Microsoft Windows operating systems for connectivity to the PeopleTools Client features.	/opt/oracle/psft/pt/oracle-client	oracle-client
Change Assistant file repository	/opt/oracle/psft/ptdb/pi_home	pi_home

As delivered, the Samba shared drive folders are configured as read only, which is sufficient for installing software to the Microsoft Windows client machine. 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 virtual machine and the web site www.samba.org for more information about configuration options for Samba.

Reviewing the File System and Users

The PeopleSoft installation deployed by the PeopleSoft VirtualBox appliance sets up an environment comprised of several directories. This table lists the directories with a description and the owner:

Directory	Description	Access
PS_HOME	The binary installation files are placed into a secure *PS_HOME* directory at /opt/oracle/psft/pt/tools.	This directory can only be written to by the PeopleSoft administrator, psadm1.
PS_CFG_HOME	The Application Server and Process Scheduler server configuration files are placed into *PS_CFG_HOME*. The *PS_CFG_HOME* path is /home/psadm2/psft/pt/<*peopletools_version*>.	This directory is owned by psadm2.
PS_APP_HOME	The application installation files are placed into a mounted directory at /opt/oracle/psft/pt/apptools.	This directory can only be written to by psadm3.
PS_CUST_HOME	The directory is created at /opt/oracle/psft/ptdb/custhome. For information on using PS_CUST_HOME, see the information on working with PS_CUST_HOME in the *PeopleTools: System and Server Administration* product documentation.	This directory is owned by psadm2.

Directory	Description	Access
PI_HOME	This is the file repository that Change Assistant uses when you define a Change Package in PeopleSoft Update Manager. The location is /opt/oracle/psft/ptdb/pi_home. **Note.** The directory contents will be accessed by Change Assistant. Manual changes are not recommended.	This directory requires read access for Change Packages, and read and write access to apply PeopleSoft Release Patchsets (PRPs). To apply PeopleSoft Release Patchsets (PRPs), use the instructions in the section Changing the Access for PI_HOME to change the access to read/write and disable guest login.
ORACLE_HOME (Oracle RDBMS software)	The Oracle RDBMS database server and client connectivity software, including the SQL*Plus program, is located in /u01/app/oracle/product /11.2.0.x/db_1. The Oracle RDBMS client installation for Linux is the 64-bit client used by PeopleSoft PeopleTools to connect from the PeopleSoft Application Server and Process Scheduler domains to the PeopleTools Database. **Note.** The database listener for the RDBMS hosting the PeopleSoft PeopleTools tables is 1522.	This directory is owned by user oracle.
Oracle database tables (PeopleSoft PeopleTools)	The database tables for PeopleSoft PeopleTools are located in the directory /opt/oracle/psft/ptdb/oradata/<*SID*>, where <*SID*> is the database name.	The owner of the database tables is oracle and its group is oinstall. **Note.** This is different from the users for the PeopleSoft installation and configuration.
Other directories	The rest of the environment, outside *PS_HOME* and *PS_CFG_HOME*. The file system ownership and permissions are similar to typical Oracle Linux installations.	These directories are owned by root.

The deployed configuration includes the default users and default passwords described 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. This applies to the passwords in the following table except SYSADM and root.

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 more information, see "Planning Security Administration," Considering User Security.

| User Name	Default Password	Role Definition
psadm1	0radmin (the first character is the number zero)	The PeopleSoft installation administrator who owns *PS_HOME*. This user cannot write into *PS_CFG_HOME*.
psadm2	0radmin (the first character is the number zero)	The PeopleTools domain user who creates and configures the Application Server domain, Process Scheduler (batch server) domain, and the PIA. This user cannot write to *PS_HOME*, but has read-execute access.
psadm3	0radmin (the first character is the number zero)	The PeopleSoft installation administrator who owns *PS_APP_HOME*.
SYSADM	SYSADM	The Oracle access ID and password. Use this to log in to the database in 2–tier mode.
oracle	oracle	The Oracle Database Server user name.
root	There is no default password for root. The password is specified during the startup procedure.	The root user for the virtual machine.

See Also

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

Task 4-5-1: Accessing the Shared Drive Folders on the Virtual Appliance File System

Use these instructions to access the shared drive folders in the file system made available on the virtual machine.

See Understanding Samba and File System Access.

From Windows Explorer 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 machine IP address, as shown in this example:
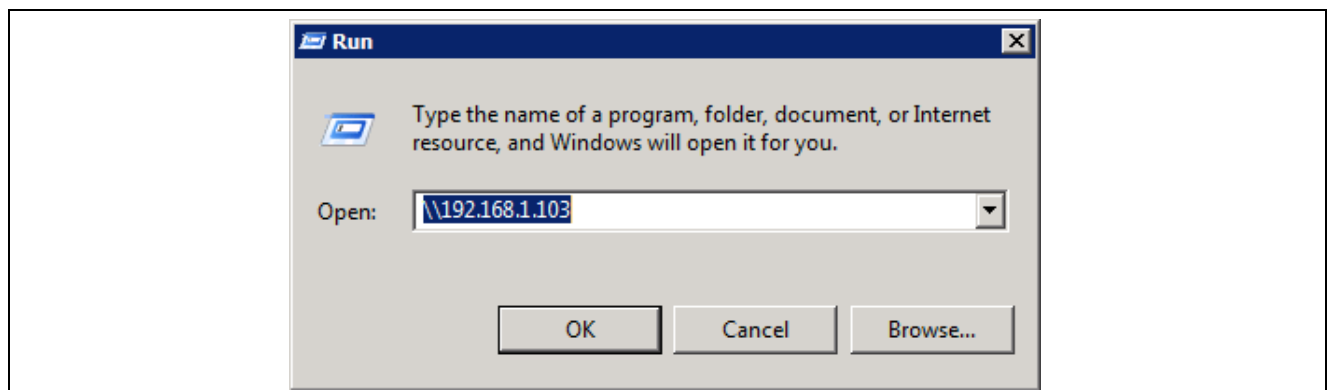
Microsoft Windows Run dialog box with IP address

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

Windows Explorer opens displaying a file system location within the virtual machine with several share drives.

Task 4-5-2: Installing and Starting Oracle Database Client Tools

The PeopleSoft installation deployed by the Oracle VM VirtualBox virtual appliance includes an installation executable for the 32-bit Oracle Database Client for Microsoft Windows. You can install the Oracle Database Client on the Microsoft Windows machine hosting your virtual appliance or another Microsoft Windows machine.

See the PeopleTools installation guide for information on configuring sqlnet.ora.

See *PeopleTools: Installation for Oracle*, "Preparing for Installation," Installing Oracle Net on the Server.

Note. Compare the release/patch level from the installation executable on the PeopleSoft Image and in your target environment installation. Install the Oracle Database Client with the highest release/patch level. See your PeopleSoft Image home page for release/patch information. The link for your PeopleSoft Image home page can be found on PeopleSoft Update Manager Home Page, My Oracle Support Document 1464619.1.

For more information, see *PeopleTools: PeopleSoft Update Manager*.

To install the Oracle Database Client tools on a Microsoft Windows machine:

1. Access the virtual appliance file system from your Microsoft Windows host as described in the section Accessing the Shared Drive Folders on the Virtual Appliance File System.

2. Locate the "oracle-client" share directory.

3. Copy the Oracle Database Client installation program oracle-client-mswin-x86-32.zip to the location known as *TEMP_DIR* above and extract the contents.

   This will extract the installation program for the Oracle Database client.

4. 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.

5. Start the installation program *TEMP_DIR*/client/setup.exe and follow the onscreen instructions to install the Oracle Database Client.

   Install to a directory on the Microsoft Windows client. This will be referred to as *ORACLE_HOME* for the remainder of this section. Select Installation Type Administrator.

6. Locate the tnsnames.ora file in the oracle-client share directory.

   The entries in the tnsnames.ora file provide the Oracle Database Client with database identification and connectivity information. The file in the oracle-client share directory is configured with the information for the virtual appliance.

7. Locate the tnsnames.ora file in the *ORACLE_HOME* installation directory.

   The default location should be *ORACLE_HOME*\network\admin. The directory containing the tnsnames.ora file is referred to as *TNS_ADMIN_DIR* in this section.

   Copy the contents of the tnsnames.ora file from the oracle-client share directory and paste it into the *ORACLE_HOME*\network\admin\tnsnames.ora file.

8. Set environment variables using the following commands:

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

For example, on Microsoft Windows:

a. Open the Control Panel, and select System and Security, System, Advanced system settings.

b. On the System Properties dialog box, select Advanced, and click Environment Variables.

c. Add or modify the environment variables.

After the Oracle Database 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*.

Oracle SQL*Plus is used to issue Structured Query Language (SQL) statements against a relational database. The database must be running before any commands can be issued. The database can be shut down and restarted by using SQL*Plus.

SQL*Plus can be accessed by using the Oracle Database Client installation program for Microsoft Windows discussed in this section, and can be used from the host machine or another Microsoft Windows machine. In addition, in a traditional PeopleSoft installation on Oracle Database, the SQL*Plus utility is installed with an Oracle Database Server installation.

To connect to the database use the following command:

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

Note. Change the password above, SYSADM, immediately after the installation. See the SQL*Plus documentation for information on changing passwords.

For information on changing the PeopleSoft installation user IDs, see the product documentation for *PeopleTools: Data Management*, "Working with Oracle 11g Security Features."

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/password combinations depending upon the activity that you wish to perform.

See Also

Reviewing the File System and Users

*SQL*Plus User's Guide and Reference* Oracle Database Documentation Library, Oracle Technology Network, http://www.oracle.com/technetwork/indexes/documentation/index.html

Task 4-5-3: Installing the PeopleTools Client Tools and Using Application Designer

This section discusses:

• Understanding Application Designer and the Oracle VM VirtualBox Appliance

• Installing and Starting Application Designer

Understanding Application Designer and the Oracle VM VirtualBox Appliance

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 Oracle VM VirtualBox virtual appliance 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 virtual machine in the following directory: /opt/oracle/psft/pt/tools/setup/Client.

Oracle strongly recommends that you dedicate a Microsoft Windows machine for the PeopleTools client for each PeopleSoft Image. This should be a machine that is not used for other PeopleSoft purposes. You should install or upgrade the PeopleTools client tools each time the PeopleTools patch release increments as noted in the PeopleSoft Image (PI) manifest.

Note. Compare the release/patch level from the installation executable on the PeopleSoft Image and in your target environment installation. Install the PeopleTools Client with the highest release/patch level. See your PeopleSoft Image home page for release/patch information for the PeopleTools Client. The link for your PeopleSoft Image home page can be found on PeopleSoft Update Manager Home Page, My Oracle Support Document 1464619.1.

See the PeopleTools installation guide for Oracle for the current release, "Preparing for Installation," Planning Your Initial Configuration.

Application Designer runs only on Microsoft Windows operating systems. You can install and run Application Designer on the host OS or another Microsoft Windows machine. The section Installing and Starting Application Designer describes how to use Application Designer to verify that you can connect directly to the database, that is, using two-tier mode.

For information on using Application Designer in three-tier mode (connection through the Application Server) and for more information on the PeopleTools client tools, see the PeopleSoft documentation.

See the PeopleTools installation guide for Oracle for the current release, "Setting Up the Install Workstation."

See the PeopleTools installation guide for Oracle for the current release, "Configuring the Application Server on UNIX," Creating, Configuring, and Starting an Initial Application Server Domain.

See *PeopleTools: Change Assistant and Update Manager.*

See *PeopleTools: PeopleSoft Update Manager.*

See *PeopleTools: System and Server Administration,* "Using PeopleSoft Configuration Manager."

See *PeopleTools: PeopleSoft Test Framework.*

Installing and Starting Application Designer

To install the PeopleTools Client tools and start Application Designer on a Microsoft Windows machine, use the following steps:

See the PeopleTools Installation guide for Oracle for the current release, "Using the PeopleSoft Installer."

Note. If necessary, you can obtain license codes for PeopleSoft products at http://www.oracle.com/us/support/licensecodes/index.html.

1. Access the virtual machine file system from your Microsoft Windows host as described in the section Accessing the Shared Drive Folders on the Virtual Appliance File System.

2. Locate the "client" share directory, which contains the PeopleSoft Client Installer.

3. Run Client\Disk1\setup.bat to launch the Client installer.

Specify the installation location for the PeopleSoft Client tools, referred to here as *INSTALL_DIR*. If you are installing the PeopleSoft Client tools when using a PeopleSoft Image as a source database for a PeopleSoft application update, select Oracle as the Database Platform and the Unicode option during this installation. For other possible installation configurations, see *PeopleTools: PeopleSoft Update Manager*.

Note. If you choose, you may also copy the "client" directory contents to another convenient directory, on the Microsoft Windows machine, and install from there.

4. Run *INSTALL_DIR*\bin\client\winx86\pside.exe to start Application Designer.

   The PeopleSoft Signon dialog box opens.
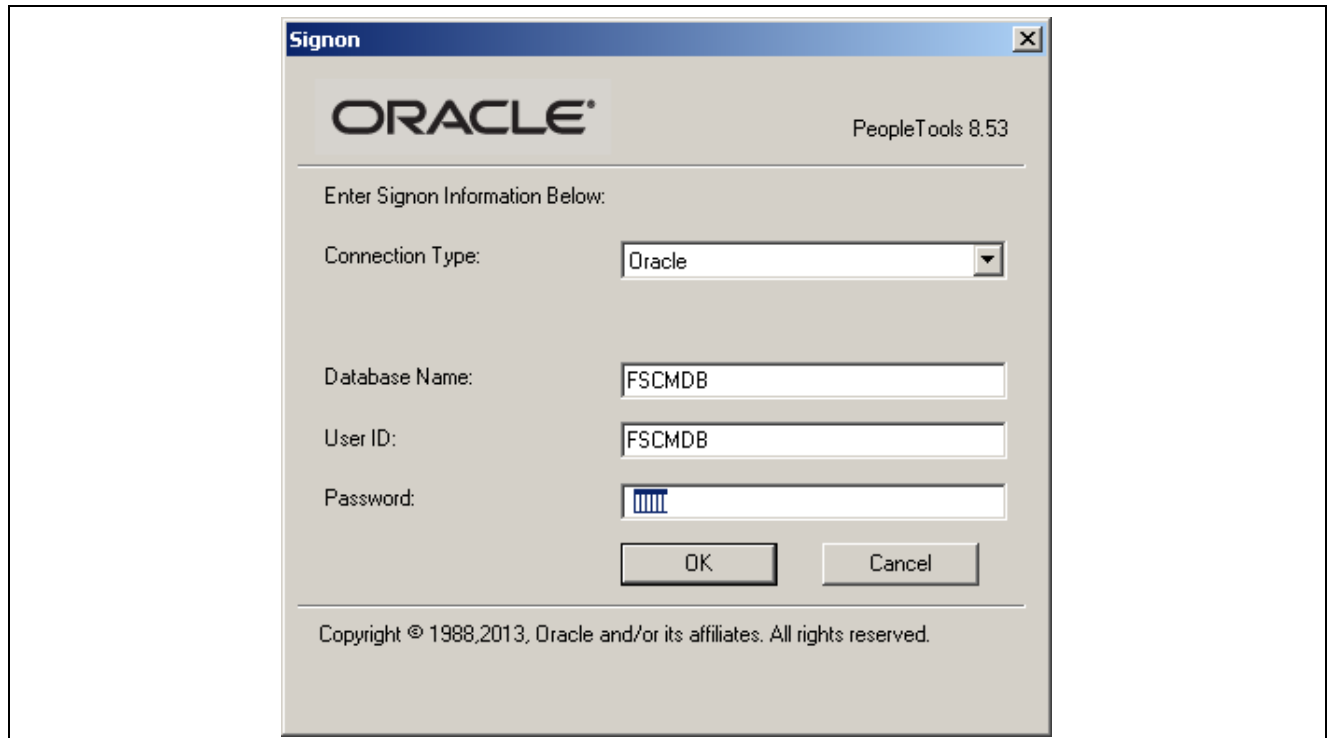
PeopleSoft Signon box for Application Designer in two-tier mode

5. Select Oracle from the Connection Type drop-down list as shown in the example above.

6. Enter the database name.

7. Enter the User ID and Password for the PeopleSoft application (for example, PS/PS, VP1/VP1, or PTDMO/PTDMO).

8. Click OK to start Application Designer.

Task 4-5-4: Installing PeopleSoft Change Assistant

To install the PeopleSoft Change Assistant on a Microsoft Windows machine:

See the PeopleTools Installation guide for Oracle for the current release, "Installing Change Assistant."

Note. Compare the release/patch level from the installation executable on the PeopleSoft Image and in your target environment installation. Install the Change Assistant with the highest release/patch level. See your PeopleSoft Image home page for release/patch information. The link for your PeopleSoft Image home page can be found on PeopleSoft Update Manager Home Page, My Oracle Support Document 1464619.1.

1. Follow the instructions to install the PeopleTools client tools.

   See Installing the PeopleTools Client Tools and Using Application Designer.

2. Locate the *INSTALL_DIR*\setup\PsCA directory, and run setup.exe to launch the installer for PeopleSoft Change Assistant.

3. Follow the instructions in the PeopleTools Installation guide for Oracle for the current release, "Installing Change Assistant" to complete the installation.

Task 4-5-5: 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 virtual machine has been created.

See Also

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

Task 4-5-6: Changing the Access for PI_HOME

If you are applying PeopleSoft Release Patchsets (PRPs), use these instructions to enable user/password login, and to change the access level to read and write.

1. Using Secure Shell (SSH) log in to the virtual appliance as the root user.

2. Stop the Samba server by running the command /etc/init.d/smb stop.

3. In the command prompt window, run the command smbpasswd -a psadm3.

4. Enter the psadm3 user's UNIX password at this prompt:

   ```
   New SMB password:
   Retype new SMB password:
   ```

   Note. Upon successful completion, you should see the message "Added user psadm3."

5. Change directory to /etc/samba by running the command cd /etc/samba.

6. Back up the file /etc/samba/smb.conf; for example:

   ```
   cp /etc/samba/smb.conf /etc/samba.conf.orig
   ```

7. Open the file /etc/samba/smb.conf file in an editor.

8. Go to the section [pi_home] and make the following changes:

   • Change from "writeable = no" to "writeable = yes".

   • Add the line "guest ok = no"

   • Add the line "valid users = psadm3"

9. Review the changes in these examples:

   Before:

   ```
   [pi_home]
   path = /opt/oracle/psft/ptdb/pi_home
   writeable = no
   available = yes
   ```

   After:

   ```
   [pi_home]
   path = /opt/oracle/psft/ptdb/pi_home
   writeable = yes
   available = yes
   guest ok = no
   valid users = psadm3
   ```

10. Save the file.

11. Restart the Samba server by running the command /etc/init.d/smb start.

12. After you complete these steps, in order to access the PI_HOME share, you will be required to provide the user name, psadm3, and the password for that user, configured in the preceding steps.

Task 4-6: Using COBOL with the PeopleSoft VirtualBox Appliance

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 Micro Focus account representative or licensed supplier for details on obtaining a license.

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 4-7: Resolving Problems with the PeopleSoft Runtime Environment

Use the information in this section to guide you in resolving problems with your PeopleSoft virtual machine.

• You are unable to start the virtual machine.

   See "Prerequisites," Reviewing Hardware Requirements.

   • Check that hardware virtualization is supported and enabled in BIOS.

- Verify that you are using the supported version of the host platform (64-bit Microsoft Windows).

- Verify that you have sufficient physical resources on the host machine — RAM, CPU and disk space.

- Check the system information in Oracle VM VirtualBox Manager for warnings about memory usage.

  Open Oracle VM VirtualBox Manager and select your virtual appliance. Select Settings, System. Check for warnings at the bottom of the System page.

- Verify that you are using a supported version of Oracle VM VirtualBox.

  Access the links from the PeopleSoft Update Manager home page, My Oracle Support Document 1464619.1, for the supported version of Oracle VM VirtualBox for your PeopleSoft appliance.

- You are unable to connect to the VM from the host OS.

  Although the VM appears to successfully start, you are unable to connect to the virtual machine through PIA or other clients such as Application Designer or SQL*Plus. This is frequently because the virtual machine cannot be accessed from the host OS. Identify the IP address of the virtual machine using this Linux Bash shell command:

  ```
  ifconfig | more
  ```

  The output of this command is the IP address associated with the eth0 network adapter for the virtual machine.

  In a command prompt on the host OS or Microsoft Windows client machine, use the `ping` command to verify that you can access the IP address.

  See Setting the Network Configuration for the Virtual Appliance.

- You notice poor performance.

  - If you feel the virtual machine exhibits noticeably poor performance, you may need to increase the memory, depending upon your environment. Use the Linux Bash shell command `free`. If the output of this command shows significant use of the swap file system, try increasing the memory of the virtual machine to improve performance.

  - If your VM host machine OS is Microsoft Windows, a common issue is the fragmentation that naturally occurs when files are stored on disk. This can be remedied by running a defragmenting utility, such as comes with the Microsoft Windows OS, or provided by several external vendors. To improve speed of this defragmenting, quiesce the processes running on the host OS, including stopping the PeopleSoft virtual machines. The process will take from a few minutes to several hours depending on the condition of the hard disk

- Application Server and Process Scheduler fail to start.

  The main reason that the Application Server or Process Scheduler domains fail to start is because they cannot connect to the database. This can occur because the database or database listener is not started. You should verify that the database is in fact started using the SQL*Plus utility before proceeding. If you are unable to connect to the database you may need to start the database. This can be done with SQL*Plus.

  The second most observed reason why these domains fail to start is because there are insufficient resources available to support the hardware requirements of the virtual machine.

- You are unable to connect with SQL*Plus from the host OS:

  Check the connectivity to the Oracle database. Try the following solutions:

  - Verify that the virtual machine is responsive using the ping command and the IP address before proceeding.

 • Verify that the tnsnames.ora file contains the correct host entry.

   See Installing and Starting Oracle Database Client Tools.

Task 4-8: Managing the Virtual Environment Lifecycle

This section discusses:

• Understanding Virtual Machine Management

• Customizing and Cloning Virtual Appliances

• Using the PeopleSoft Configuration Script

• Resetting PeopleSoft Virtual Appliances

• Using PeopleSoft Services

• Running Multiple 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. Keep in mind that the template will be large and you should plan for the necessary storage.

In general, the steps to follow in creating a template from a customized environment are:

1. Set up the virtual machine.

2. Customize the environment.

   See Customizing and Cloning Virtual Appliances.

3. Take a snapshot of the working environment.

4. Edit the configuration plug-in script.

   See Using the PeopleSoft Configuration Script.

5. Issue commands to clean up and restart the virtual machine using the modified configuration script.

   See Resetting PeopleSoft Virtual Appliances.

6. Create clones and export the virtual machine to be used on other hosts.

   See the VirtualBox documentation for more information on handling VMs.

   See *Oracle VM VirtualBox® User Manual,* Oracle Technology Network, http://www.oracle.com /technetwork/server-storage/virtualbox/documentation/index.html

Task 4-8-1: Customizing and Cloning Virtual Appliances

The virtual appliances delivered by Oracle for PeopleSoft installation can actually be used as a basis for a customized environment. For example, you may change some of the domain configuration settings and clone the virtual appliance using Oracle VM VirtualBox Manager. This snapshot can be cloned and used on other host OSs. This means that you don't need to repeat the same customization steps each time you initialize a virtual appliance. Instead it is possible to install software into a virtual appliance or add specific configuration preferences and then clone the virtual appliance.

There are a few things to keep in mind when cloning a virtual appliance. Before cloning a virtual appliance it is typically necessary to clean the network stack and remove host-specific configuration settings.

Note. This may not be necessary if the virtual appliance has been set up using host-only networking.

See Resetting PeopleSoft Virtual Appliances.

Before resetting the virtual appliance it is important to preserve the current state of the virtual appliance. This allows you to return to a last known good state. For this reason you should use the Snapshot capability of Oracle VM VirtualBox before making any significant changes to the virtual appliance. In fact, it is good practice to use snapshots as a way of versioning your virtual appliance.

When cloning a virtual appliance you may want to install software into the virtual appliance from which you will create clones. 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 appliance, the installed components must be host neutral, so that they will be able to run without any problems in new instances 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 cloning a PeopleSoft virtual appliance 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 4-8-2: Using the PeopleSoft Configuration Script

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

Function Name	Description
ovm_cleanup_pre	This function is run when a virtual machine is being cleaned up. This function is called before the PeopleSoft PeopleTools cleanup.
ovm_cleanup_post	This function is run when a virtual machine is being cleaned up. This function is called after the PeopleSoft PeopleTools cleanup.

When the virtual appliance 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 appliance 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 virtual appliance to get it ready to be cloned, as described in the following section.

See Resetting PeopleSoft Virtual Machines

Task 4-8-3: Resetting PeopleSoft Virtual Appliances

It is possible to reset your virtual appliance such that the next time it is started it will appear as a clean, newly started virtual appliance.

This technique can be used if you have made changes to the virtual appliance such as installing new software and you wish to make a clone of the virtual appliance. It is also applicable if you simply want to change the way that your virtual appliance works on the network. If you reset the network stack of your virtual appliance, PeopleSoft components will stop functioning correctly. This is because Oracle WebLogic and Tuxedo, on which PeopleSoft relies, communicate through the network stack. The process of resetting the network stack therefore conducts an orderly shutdown and cleanup of these components. It removes the PIA, Application Server and Process Scheduler domains. This means that any changes that you have made to these configurations will be lost by following these instructions.

To reset a virtual appliance:

Note. Resetting the network stack on the virtual appliance will not remove content from the database. This means that information about report nodes, the Integration Gateway and other host-name specific entries may be inaccurate if the virtual appliance is re-initialized with new networking information.

---

1. Invoke the following command to shut down and remove the PeopleSoft domains:

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

2. Invoke the following command to ensure that when the virtual appliance is restarted it will re-prompt for network configuration information:

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

3. Shut down the virtual appliance by selecting the option ACPI Shutdown in the virtual appliance console.

Task 4-8-4: Using PeopleSoft Services

After you initialize the PeopleSoft virtual machine, you can use the following Linux Bash shell commands to start and stop services for the database and mid-tier (application server, Process Scheduler, and PIA) components.

• To find the status of the PeopleSoft database, run the following command:

```
service psft-db status
```

• If the database (called *DBNAME* in this example) and the TNS Listener for the database, are running, you see the following message:

```
PeopleSoft Database DBNAME is Up
PeopleSoft Listener is Up
```

Note. For more information on the TNS listener, see the *Oracle Database Net Services Administrator's Guide*, Oracle Database Documentation Library, http://www.oracle.com/pls/db112/homepage.

• If the database and the PeopleSoft TNS Listener are not running, you see the following message:

```
PeopleSoft Database DBNAME is Down
PeopleSoft Listener is Down
```

• To start the PeopleSoft database and PeopleSoft TNS listener, run the following command:

```
service psft-db start
```

• To stop the PeopleSoft database and PeopleSoft TNS listener, run the following command:

```
service psft-db stop
```

• To find the status of the mid-tier components, that is, the Application Server, Process Scheduler (batch server), and PIA, run the following command:

```
service psft-abw status
```

• If all the mid-tier components are running, you see the following message:

```
Application Server Domain is Up
Process Scheduler Domain is Up
PIA Domain is Up
```

• If the mid-tier components are not running, you see the following message:

```
Application Server Domain is Down
Process Scheduler Domain is Down
PIA Domain is Down
```

• To start the mid-tier components, run the following command:

```
service psft-abw start
```

• To stop the mid-tier components, run the following command:

```
service psft-abw stop
```

Task 4-8-5: Running Multiple Virtual Machines

This documentation discusses the deployment of a single virtual appliance. You can however install and run multiple virtual machines. Keep the following points in mind when planning to deploy multiple VMs:

• Verify that the available disk space and memory is sufficient for the total number of VMs.

For example, if you plan to deploy three VMs that each require 4 GB RAM and 40 GB disk space, you will need at least 12 GB RAM and 120 GB available disk space on the host machine.

See "Prerequisites," Reviewing Hardware Requirements.

• Consult the VirtualBox documentation, as well as this documentation, for network configuration options.

For information on networking options, see the section Setting the Network Configuration for the Virtual Appliance in this documentation. For details about networking configuration on VirtualBox, see the Oracle VM VirtualBox User Manual.

If you plan to deploy more than one VM, and you intend to assign static IP addresses you should plan for multiple addresses. However, keep in mind that since each VM is a separate machine, the ports configured on each VM can be the same.

• You have a range of choices in setting up Change Assistant, the Oracle database client, and PeopleTools client tools discussed earlier in this chapter in the section Using the PeopleSoft Installation. As with any PeopleSoft installation, you will need to carry out specific steps depending upon your target environment's RDBMS platform.

Details about using the VMs with PeopleSoft Update Manager, as well as information about setting up Change Assistant and the Environment Management Framework in different configurations, can be found in the *PeopleTools: PeopleSoft Update Manager* product documentation.

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