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Oracle VM Templates for PeopleSoft HCM

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Introduction

Deploying a PeopleSoft environment begins with installing and configuring software components across multiple physical hosts. Careful consideration is given to security, load balancing, failover and performance. Applications are typically customized and tailored to the needs of the target environment. The power of a PeopleSoft application is fortified by a diverse set of administrative features that offer fine level management capabilities and opportunities for customization throughout.

This paper introduces a full PeopleSoft HCM environment deployed as a pre-packaged, fully functional Oracle Virtual Machine (OVM) assembly. This assembly allows you to bring up a starting point PeopleSoft application within minutes instead of days. The HCM template incorporates best practices that help you fast-track the customization of your environment without starting from scratch.

The intended audience for this white paper is anyone interested in deploying a PeopleSoft HCM environment using Oracle VM. The templates described herein may serve as a demonstration environment or as a starting point for a fully functioning PeopleSoft HCM installation. This document assumes a familiarity with the PeopleSoft architecture and Oracle VM.

Additional Documentation

Because this paper does not introduce the concept of virtualization or Oracle VM Templates the reader is recommended to review the following topics as required:

- [Introduction to Oracle VM Templates](#)
- [Oracle VM user documentation](#)
- [Oracle VM product website](#)
- [Oracle VM site on the Oracle Technology Network website](#)

OVM Templates Overview

Oracle VM Templates are the genetic material for all Oracle Virtual Machines. The template serves as a starting point from which individual virtual machines can be created. Templates can be seeded with different software applications pre-conceived for a designated function. This ranges from software infrastructure components such as Oracle Database or Weblogic to packaged application software such as Siebel or eBusiness Suite. The template introduced here contains a ready-to-run GA PeopleSoft HCM 9.1 system based on PeopleTools 8.50.

Templates are obtained from Oracle eDelivery. Templates are downloaded as tar files and extracted into an Oracle VM seed pool. The template itself is little more than a configuration file and one or more disk images. The disk images contain the operating system and software application upon which the template has been built. Once extracted, the template can be imported into Oracle VM using the Oracle VM Manager console. After being successfully imported, new VMs can be created from the template. Oracle VM Templates represent the starting point for a customizable environment that allows the installation and Hello World deployment to be skipped completely. From Oracle VM templates customizations can be made and re-packaged as a new template. This allows the creation of golden images for archive, cloning and re-distribution purposes.

Oracle VM plays a crucial role in our corporate strategy towards decoupling environments from the limitations of physical hardware limitation and towards more nimble, readily deployable applications. The availability of a full Oracle stack from Lifecycle Management and Operating System to end user application gives you a unique opportunity to reduce operational costs.

Consult the documentation described above for more details about the fundamentals of Oracle VM.

Conventional PeopleSoft Deployment

Readers may be familiar with traditional, bare-metal PeopleSoft deployments. Like most enterprise software applications this requires the installation of any number of independent software products that act as key parts of the system architecture. Prior to installing the application, hardware needs to be allocated and operating systems need to be installed and updated. Third party software applications must be installed in addition to any dependencies. This process is typically managed by an IT team that is familiar with the application and the platform on which it will run.

A minimal PeopleSoft environment is composed of three distinct tiers:

- PeopleSoft Pure Internet Architecture (PIA)

- Application – Batch Server
- Application Database

These three tiers typically reside on different physical hardware and need to be installed and configured separately. Configuration is a separate step that takes place independent of installation. The minimal configuration involves:

- Setting up the Database and starting the ODBC listener.
- Creating and configuring an Application Server domain to connect to the Database.
- Starting PIA to run on the preferred Web Server and connect to the previously configured Application Server domain.

After the test environment has been successfully created the administrator begins the process of adding security, load balancing, failover and customizations. This is the beginning of a process that culminates in a fully functional production system.

Accelerating Deployment with OVM Templates

The steps described above to create a test PeopleSoft system can be time consuming for administrators and are typically repeated when scaling the environment. Reduction of this effort to as few steps as possible is the primary goal of PeopleSoft HCM templates. Each of the three tiers in a PeopleSoft deployment – Database, Application Server and PIA, are represented by an Oracle VM Template. This means that a PeopleSoft HCM environment can be deployed by simply starting three Oracle VMs based on each of the templates above:

1. Import templates to Oracle VM Manager.
2. Create an HCM DB Virtual Machine
3. Create a PeopleTools Application Server to connect to this Database
4. Create a PIA Virtual machine to provide end user browser access to the environment.
5. Sign in to PIA to verify successful startup.

To begin this process you will need an Oracle VM environment with at least one server pool that can handle three individual VMs with the requirements described below.

PEOPLESOFT HCM TEMPLATES CONTENTS AND RUNTIME REQUIREMENTS

TEMPLATE	CONTENTS	DOWNLOAD SIZE	RUNTIME REQUIREMENTS
HCM Demo Database	OEL 5.2 64 bit Oracle 11.1.0.6 DBMS PeopleSoft HCM 9.1 GA Single User Demo Database	7.5 GB	<ul style="list-style-type: none"> • 60 GB disk space • 2 GB RAM • Two virtual processors
App Batch	OEL 5.2 64 bit Oracle Tuxedo 10gr3 PeopleTools 8.50.02 PeopleSoft HCM 9.1 GA Verity 6.2.1	4 GB	<ul style="list-style-type: none"> • 15 GB disk space • 1 GB RAM • Two virtual processors
PIA	OEL 5.2 64 bit Oracle Weblogic 11g (10.3.1) PeopleTools PIA 8.50.02	2.5GB	<ul style="list-style-type: none"> • 8 GB disk space • 1 GB RAM • One virtual processor

When deploying the PeopleSoft HCM system above VMs are instantiated in the order – DB, AppBatch and PIA.

HCM Template Functionality

The PeopleSoft HCM template is a fully functioning environment that contains a limited set of demo data. All HCM 9.1 application functionality is present. This is equivalent to the demo database that is shipped in a traditional PeopleSoft HCM distribution. This means that it is possible to use upgrade tools to add production data to the Database.

As expected it is possible to configure integrations, recruit applicants, hire employees, administer benefits, manage compensation, plan successions, schedule jobs using Process Scheduler, generate XML reports, run SQR reports, etc.

Although COBOL source code is provided with the template, it is necessary to compile the COBOL source before it can be used in the VM. A license for the COBOL compiler must be obtained before doing so. Crystal Enterprise and nVision reports cannot be generated without installing those third party products independent of the template. For licensing reasons the above software components are not present in the template.

HCM Template Initialization

VMs built using the HCM template require minimal startup information to be provided by the administrator. As with all Oracle VM initialization, it is necessary to provide details to allow the VM to join the network. In addition to the networking information supplied some PeopleSoft specific details must be provided for the server to be initialized.

For HCM Database initialization the following details are required:

- Database System Identifier (SID)
- Listener ports for Database and Oracle Application Express

For Application Server the following details are required to connect to the application database:

- The System Identifier (SID)
- The Database host
- Database listener port

For PIA the following details are required.

- Host and port for the AppServer domain to which to connect.

The Database template contains a HCM Demo Database running on Oracle 11gR1. When the template initializes, the connectivity configuration such as tnslisten and tnsnames.ora are created and the database services are started. When template initialization has completed the database is ready for incoming connections.

Having captured database connectivity details from the administrator, an Application Server and Master Process Scheduler domain are created in the new VM. These domains contain default values for connecting to a HCM Demo Database. The Application Server domain listens on the default port 9000 for incoming connections from PIA.

PIA running on Weblogic Server listens on port 8000 for incoming connections. The system should be tested when the PIA VM has initialized by logging on to PIA at http://<pia_vm_hostname>:8000/ps/signon.html with the user-password combination PS/PS.

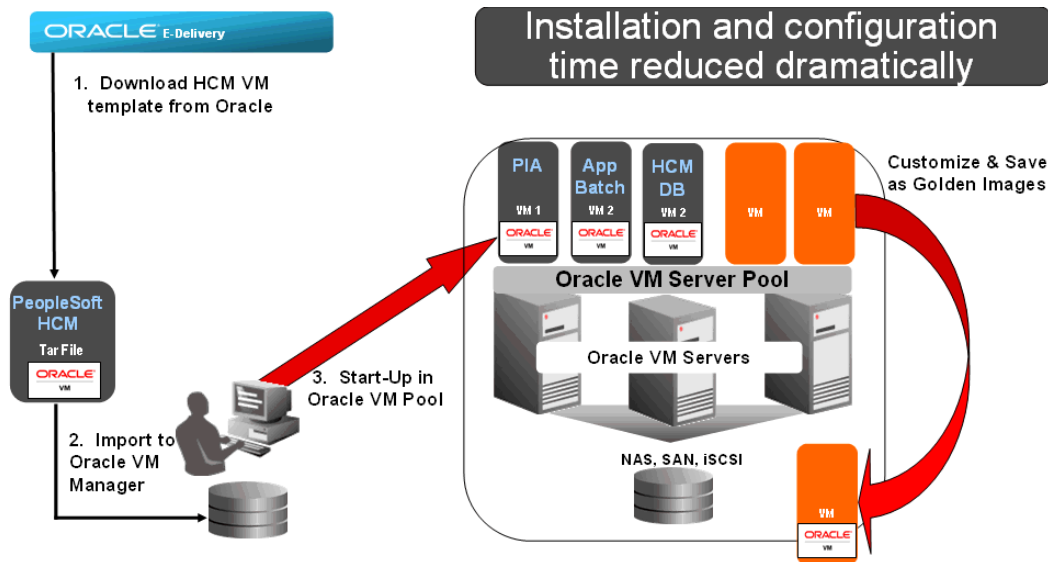


Figure 1: Shown above are the steps taken to deploy a PeopleSoft HCM environment in Oracle VM.

Best Practices Built In

The PeopleSoft HCM template is shipped with the newest features included and enabled. The Application Server and Process Scheduler domain configuration settings are tuned for a small environment serving 30 or fewer concurrent users. Kernel parameters such as IPC settings are pre-configured in the template. The system also includes the recommended Secure PS_HOME deployment which means that the domain processes are excluded from writing to PS_HOME and other sensitive file system locations. The user under whom the PIA and Application Server domain processes will run has restricted privileges. This is the application security model that is recommended for production PeopleSoft systems. The iptables firewall is included but disabled. You may easily enable this firewall as required.

HCM Template Flexibility

As shipped the HCM template is comprised of three distinct VM templates. Each of these templates can be deployed in a load balanced and failover environment. For example, a PIA VM can connect to any number of Application Servers or a monolithic, non-virtual Database.

There is nothing to preclude you from completely reconfiguring the templates to add customer data, additional security, compiled COBOL etc. You can add firewalls, resize domains and take any typical steps towards customizing your environment.

Template Lifecycle Management

The true power of Oracle VM Templates is the potential for customization for your specific needs. There are multiple opportunities to exploit Oracle VM to streamline your IT operations.

Archiving

By making changes to a running VM you can save this gold version as a new template using Oracle VM Manager. In this way Oracle VM Templates can be archived as you refine your environment providing a history as you tune the application for production. This makes it fast and easy to rollback to an earlier version of the same environment. Because VMs can be saved as gold images it becomes possible to extend and modify the templates shipped by Oracle. These gold images can then be rolled out through the enterprise with consistency between nodes as you scale your system.

Patch and Update Propagation

Like non-virtual environments it is crucial that system updates and patches are applied. Because the PeopleSoft HCM template is indistinguishable from a bare metal environment, fixes can be safely applied to the environment using a process with which you will already be familiar. Rather than patching across all instances of PIA and Application Server it is now possible to patch one environment, save it as a template and re-deploy that template as new VMs.

Configuration Plug In

The PeopleSoft HCM template adds an extra dimension of customization through its template configuration plug-in. This plug-in provides a functional entry point for any code that you wish to invoke during VM initialization. The plug-in is a script that is called whenever a PeopleSoft HCM VM is being initialized. You can therefore add your own scripts that can be called during Virtual Machine initialization to reflect any functionality that you wish to add or override. All that is required is to:

1. Create a PeopleSoft HCM virtual machine (PIA, AppBatch or Database).
2. Edit the shell script `/opt/oracle/psft/vm/oraclevm-template-ext.sh` to add your desired functionality.
3. Add any additional products, libraries, etc to support the additional functionality.
4. Reset the template by invoking `/usr/sbin/oraclevm-template --cleanup` followed by `/usr/sbin/oraclevm-template --enable`
5. Using Oracle VM Manager save the VM as a template.
6. Create a VM from this new template to see your additional start up scripts called by the plug-in.

Developers can find more information about the configuration plug-in in the template initialization scripts located in all PeopleSoft VMs at `/opt/oracle/psft/vm`.

Licensing and Redistribution

Use of the PeopleSoft HCM Templates requires the purchase of a license for the product version being used.

Third party software products used within OVM templates must be licensed consistently with the licensing requirements stipulated by the appropriate vendor. Take note that these licensing obligations may differ between virtual and bare metal environments.

For Oracle products contained within these templates all licensing requirements issued on a per-CPU or site level apply to virtual environments in the same way that they apply to bare metal installations.

Conclusion

Harnessing the power of Oracle VM Templates with PeopleSoft HCM brings a functioning environment to life in minutes rather than days. Replacing the software installation process with template instantiation helps you skip error-prone, time consuming tasks of preparing an environment for application deployment. Oracle VM Templates allow you to customize your PeopleSoft environment, save the gold image as a template and clone throughout your organization, allowing you to drive down IT costs and accelerate application availability. Oracle continuously strives to lower the total cost of ownership and improve the supportability of our products in your infrastructure.



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