

Oracle® Fusion Middleware

WebLogic Server on JRockit Virtual Edition Installation and
Configuration Guide

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Oracle Fusion Middleware WebLogic Server on JRockit Virtual Edition Installation and Configuration Guide,
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Preface

This document describes how to configure Oracle WebLogic Server 11g R1 (10.3.4) on JRockit Virtual Edition 11g R1 (11.1.1.3.1) as virtual machines, in order to create and manage domains as virtual machines to run on Oracle VM 2.2.1.

Audience

This guide is intended for:

- System administrators who administer Oracle WebLogic Server.
- Application developers who are developing applications and deploying them on Oracle WebLogic Server.

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Related Documents

For more information, see the following documents:

- *JRockit Virtual Edition User's Guide*
- *Oracle Virtual Assembly Builder*
- *Oracle Virtual Assembly Builder Release Notes*
- *Oracle Virtual Assembly Builder Installation Guide*
- *Oracle Virtual Assembly Builder User's Guide*
- *Oracle VM Manager User's Guide*
- *Oracle VM Server User's Guide*
- *Deploying Applications to Oracle WebLogic Server*
- *Using Clusters for Oracle WebLogic Server*
- *Creating Domain Templates Using the Domain Template Builder*
- *Oracle WebLogic Scripting Tool*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

What Is WebLogic Server on JRockit VE?

WebLogic Server on JRockit VE is a virtualized version of WebLogic Server that is optimized to run on JRockit Virtual Edition, which is a version of the JRockit JVM that runs natively on the Oracle VM hypervisor. WebLogic Server on JRockit VE packages WebLogic Server 11g R1 (10.3.4) with JRockit Virtual Edition 11g R1 (11.1.1.3.1) and provides tooling that together enables you to create and manage WebLogic Server domains as virtual machines on Oracle VM 2.2.1, which features the latest Xen-based, industry-standard hypervisor, Xen 3.4.

- [Section 1.1, "WebLogic Server VM Image"](#)
- [Section 1.2, "Oracle JRockit Virtual Edition"](#)
- [Section 1.3, "Supported Features"](#)
- [Section 1.4, "Known Limitations"](#)
- [Section 1.5, "Use Cases for WebLogic Server on JRockit VE"](#)

1.1 WebLogic Server VM Image

Oracle VM is a platform that provides an environment to leverage the benefits of virtualization technology. You can create a virtual machine in Oracle VM by using a virtual machine image. A WebLogic Server virtual machine image has the same format as an Oracle VM Template.

The VM image bundled with WebLogic Server on JRockit VE can be copied and used as a template to create as many virtual machines as necessary. The VM image is DHCP enabled for easy instantiation of the VM image in your Oracle VM environment. However, if your environment requires static IP addresses, you can modify the VM image's networking configuration.

Tip: Although DHCP is enabled by default, Oracle recommends using static IPs for virtual machines when working in a virtualized environment and let DHCP handle the other network parameters. This makes it easier to find your server and is required when working with clusters. Please work with your network administrator and have them configure the DHCP server to lock an IP number to your specific MAC address. For more information, see "Creating a Guest Using a Template" in the *Oracle VM Server User's Guide*.

You can modify the VM image prior to instantiation and afterward (in non-running mode) using the bundled JRockit Virtual Edition Image Tool, as explained in [Section 1.2, "Oracle JRockit Virtual Edition"](#).

1.1.1 Required Reading for Oracle VM

Before proceeding with these instructions, we recommend familiarizing yourself with the following Oracle VM products and documentation:

- *Oracle VM Server*, a self-contained virtualization environment designed to provide a lightweight, secure, server-based platform to run virtual machines.

For more information about Oracle VM Server, see the *Oracle VM Server User's Guide*.

- *Oracle VM Manager*, which enables you to manage Oracle VM servers, virtual machines, and resources.

For more information about Oracle VM Manager, see the *Oracle VM Manager User's Guide*.

1.2 Oracle JRockit Virtual Edition

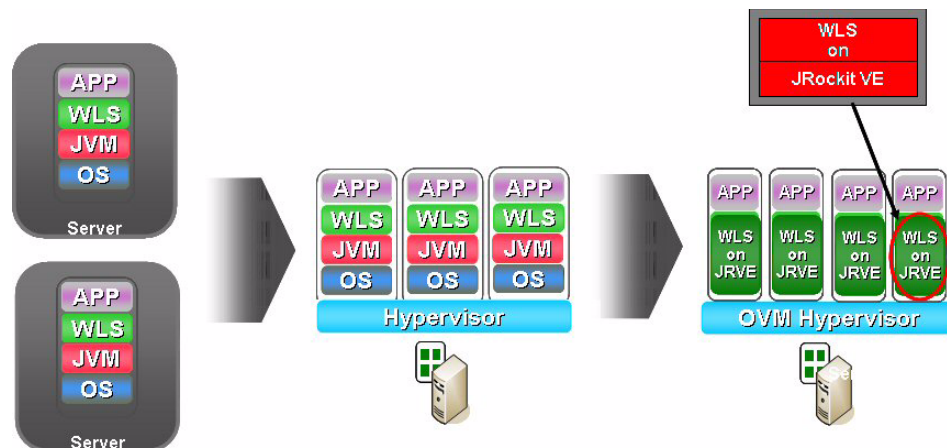
JRockit Virtual Edition integrates functionality normally found in operating systems, as such replacing the role of a guest OS in a VM image; therefore, each VM image containing JRockit Virtual Edition and WebLogic Server only executes a single Administration or Managed Server instance. Multiple VM image instances may be combined either on a single physical server, or across several such servers to model traditional physical deployments of Multiple Managed server instances sharing the same OS instance on a physical server.

WebLogic Server on JRockit VE includes an Image Tool (`wlsveimagetool.jar`) that provides full access to a VM image's file system, on a guest machine running a Linux OS. With the Image Tool, you can configure and modify non-running virtual machines, including the ability to create, read, update, and delete user application files, as well as change virtual hardware parameters and modify the default disk size. You can also use the Image Tool to modify the Java arguments for the WebLogic Server start-up command in the VM image configuration file.

The Image Tool requires having the Java Runtime Environment (at least JDK version 6) installed on your development Linux machine. The Image Tool is an offline manipulation tool for existing virtual machines. You should not attempt to apply it to virtual machines whose file systems are mounted or in use.

Note: Use of the Image Tool for physical-to-virtual WebLogic Server domain migrations is not supported on Windows platforms.

[Figure 1-1](#) illustrates how WebLogic Server on JRockit VE fully utilizes the potential of server virtualization for Enterprise Java Applications by delivering management simplicity with improved performance and better utilization.

Figure 1–1 How WebLogic Server on JRockit VE Utilizes Server Virtualization**Required Reading for JRockit Virtual Edition**

Before proceeding with these instructions, you should familiarize yourself with the *User's Guide for Oracle JRockit Virtual Edition* to fully understand the many commands you can use with the Image Tool. For example, you can:

- Insert, extract, and browse files
- Use the SCP and SFTP tools
- Set virtual hardware parameters
- Configure network settings
- Assemble/disassemble VM images
- Set and/or change virtual disk size

For more information about JRockit Virtual Edition and using the Image Tool, see the *User's Guide for Oracle JRockit Virtual Edition*.

1.3 Supported Features

WebLogic Server on JRockit VE supports the deployment and management of WebLogic Server domains as a collection of virtual machines:

- Online (server running) configuration management of applications and servers using existing WebLogic Server features, such as the Administration Console and WLST online, except those noted in [Section 1.4, "Known Limitations."](#)

The VMM Node Manager client functionality can control WebLogic Server domain deployments:

- Use the Administration Console to control the Administration Server, Managed Servers, and clusters.

Note: You can also use the Oracle VM Manager to restart Managed Servers.

- Use WLST online to control the Administration Server, Managed Servers, and clusters.
- Configure HA support for attempting to automatically restart a server in-place for a specified number of times. Such restarts only relate to server health state checks that WebLogic Servers performs and not to external Oracle VM actions, such as `xm destroy`.

- Use of WLST in offline mode to modify a WebLogic Server configuration.
- Online deployment of business applications to running WebLogic Server virtual machines:
 - Deploy applications using the WebLogic Server deployment tools, such as the Administration Console, the `weblogic.Deployer` tool, the `wldeploy` Ant task, and WLST.
 - Deploy applications using the bundled SSHD service to access the virtual file system using SFTP or SCP.
- Use the bundled Image Tool to easily:
 - Perform off-line creation and modification of WebLogic Server VM images (create, read, update, and delete "file" content), including application deployment.
 - Create a *profile* that defines a subset of the VM virtual file system, which simplifies the process of using SmartUpdate to patch offline (server not running) WebLogic Server virtual machine images.
- Use shared disks on an NFS server to:
 - Externally write server log files to a shared location.
 - Use shared disk read access to support the `nostage` and `external_stage` modes of application file deployment. For more information about the `nostage` and `external_stage` deployment modes, see "Controlling Deployment File Copying with Staging Modes" in *Deploying Applications and Modules with weblogic.Deployer*.
- Use the Oracle Virtual Assembly Builder to introspect an existing domain and create configuration metadata, which you can then use to assemble, create, and edit templates that can be deployed on Oracle VM. For more information, see the *Virtual Assembly Builder User's Guide*.

1.4 Known Limitations

A WebLogic Server virtual machine is based on Oracle WebLogic Server. However, it does not include the following parts of the standard WebLogic Server distribution:

- Web Server Plug-ins
- JDKs
- Performance Packs
- Native Code

In this release, WebLogic Server on JRockit VE *does not* support the following functionality:

- Use of the Image Tool for physical-to-virtual domain migrations or transformations is not supported on Windows platforms. Windows users should instead use a Linux machine for such operations.
- The Image Tool can only modify the WebLogic Server configuration when the VM is not running. If the VM is running, any WebLogic Server configuration changes can only be done using the Administration Console or WLST online.
- It is not possible to set OS-specific parameters from the WebLogic Server Administration Console or using WLST (for example, setting OS-level network

parameters, virtual hardware resources, turn JVM management beans on/off, turn the SSHD service on/off, etc.).

- In online mode (server running), any access to a WebLogic Server VM file system, other than that access executed by the virtual machine itself, is supported only through the use of the SSHD service that runs in JRockit Virtual Edition.
- No operations can be performed on a WebLogic Server VM when it is in a Paused/Suspended state.
- Whole server migration and JMS-related service migration are not supported. In addition, Oracle VM-based HA failover of WebLogic Server VMs from one physical Oracle VM server to another is not supported.
- Only one process can run in a WebLogic Server VM; therefore, the Configuration Wizard and Pointbase DB products cannot run within an WebLogic Server VM because that would require an additional process.
- The SmartUpdate tool cannot be run within a virtual machine running WebLogic Server. However, you can still use SmartUpdate to patch virtual machines while they are offline. See [Section 5.5, "Patching Virtual Machines"](#).

1.5 Use Cases for WebLogic Server on JRockit VE

This section describes some typical use cases when using WebLogic Server on JRockit VE.

1.5.1 Create a New, Bootable Single-server Virtual Machine On Oracle VM

Deploy the packaged WebLogic Server VM image to Oracle VM after using the Image Tool to create new single-server domain in the VM image. See [Section 3.2, "Deploying the Base VM Image With a New Single-Server Domain."](#)

1.5.2 Migrate a Physical Domain to a Virtual Machine Image

You can use the Image Tool to migrate a physical, Unix-base, multi-server WebLogic Server 11g Release 10.3.4 domain to a WebLogic Server VM image. See [Section 3.3, "Migrating a Physical, Multi-server Domain to a VM Image."](#)

You can also use Oracle Virtual Assembly Builder to introspect an existing domain and create configuration metadata, which you can then use to assemble, create, and edit templates that can be deployed on Oracle VM. For more information, see the *Virtual Assembly Builder User's Guide*.

1.5.3 Transform a Physical WebLogic Server Environment Into a Virtual Machine

You can use the Image Tool to transform a physical, multi-server WebLogic Server 11g Release 10.3.4 environment into a WebLogic Server VM. See [Section 3.4, "Transforming a Physical WebLogic Server Environment Into a Virtual Machine."](#)

1.5.4 Deploy Applications to a Virtual Domain

You can develop and deploy applications to WebLogic Server VMs using any of the following methods:

- *Use WebLogic Server tools on a running virtual machine:* Deploy applications using the WebLogic Server deployment tools, such as the Administration Console, the `weblogic.Deployer` tool, the `wldeploy` Ant task, and WLST. See [Section 4.1, "Using WebLogic Server Tools to Deploy Applications to Running VMs."](#)

- *Use the SSHD Service on a running virtual machine:* After creating a new domain or developing a new application on your development Linux machine, you can use the bundled SSHD service to inject the new domain directory and application files into an running virtual machine. See [Section 4.2, "Accessing Running Virtual Machines Using SSH."](#)
- Configure shared disk read-access on NFS for WebLogic Server VMs to support application deployment (nostage or External_stage). See [Section 5.6, "Configuring a Shared Disk On NFS to Store Server Log Files."](#)

1.5.5 Manage a Virtual Domain

You can manage WebLogic Server VMs running on Oracle VM, in both running and non-running mode:

- Use the Administration Console on your development machine to add Managed Servers to a virtual domain on a running Administration Server VM. See [Section 5.1, "Adding Managed Servers to a Domain on a Running Administration Server VM."](#)
- Use the Administration Console on your development machine to create a cluster on a running Administration Server VM, and add your Managed Server VMs to the cluster. See [Section 5.2, "Creating a Virtual WebLogic Server Cluster."](#)
- Control virtual servers on Oracle VM using WLST (via the VMM Node Manager client). See [Section 5.3.2, "Managing Running Virtual Servers With WLST."](#)
- Control virtual servers on Oracle VM with the Administration Console (via the VMM Node Manager client). See [Section 5.3.1, "Managing Running Virtual Servers With the Administration Console."](#)
- Use WLST in online mode to manage the domain configuration of a running WebLogic Server virtual machine. See [Section 5.4, "Modifying a WebLogic Server Configuration Using WLST Online."](#)
- Use the Image Tool to patch non-running, assembled virtual machines on your development machine. See [Section 5.5, "Patching Virtual Machines."](#)
- Configure shared disk read-access on NFS for WebLogic Server VMs to externally store server log files. See [Section 5.6, "Configuring a Shared Disk On NFS to Store Server Log Files."](#)
- Use the Image Tool to create new single-server domain in the VM image outside the default `/application` directory, using a name of your choice. See [Section 5.7, "Creating a Root Domain Directory Other Than the Default `/application` Domain Directory."](#)
- Use the Image Tool to create a profile (or properties) file that allows you to define a subset of the VM virtual file system to be extracted or inserted by name. See [Section 5.8, "Using the Image Tool to Extract or Insert Files With Profile-based Support."](#)
- Use the Image Tool to inject an upgraded physical WebLogic Server 11g Release 10.3.4 domain to a WebLogic Server VM image. See [Section 5.9, "Injecting an Upgraded Domain into a WebLogic Server VM Image."](#)

1.6 Roadmap for Starting and Running WebLogic Server VMs on Oracle VM

Table 1–1 summarizes the overall process for locally installing WebLogic Server on JRockit VE package and instantiating WebLogic Server virtual machines on Oracle VM.

Table 1–1 Roadmap for Starting and Running WebLogic Server VMs on Oracle VM

Steps	Description
<p>Step 1 Download the WebLogic Server on JRockit VE package.</p>	<p>The WebLogic Server on JRockit VE package is contained in a ZIP file that you can download from the Oracle Technology Network onto your development Linux machine.</p>
<p>Step 2 Extract the package contents.</p>	<p>Use the unzip tool to extract the contents of the packaged <code>wlsvePackage.zip</code> file to a directory of your choice on your development Linux machine.</p> <p>For a description of the files installed, see Section 2.2.1, "WebLogic Server on JRockit VE Package Contents"</p>
<p>Step 3 Create a bootable virtual machine.</p>	<p>Choose one of the following methods:</p> <ul style="list-style-type: none"> ■ Deploy the packaged VM image to Oracle VM after using the Image Tool to create new single-server domain in the VM image. See Section 3.2, "Deploying the Base VM Image With a New Single-Server Domain". ■ Use the Image Tool to <i>migrate</i> a physical WebLogic Server 11g Release 10.3.4 <i>domain</i> into the VM image. See Section 3.3, "Migrating a Physical, Multi-server Domain to a VM Image". ■ Use the Image Tool to <i>transform</i> a physical WebLogic Server 11g Release 10.3.4 <i>environment</i> into a VM. See Section 3.4, "Transforming a Physical WebLogic Server Environment Into a Virtual Machine". ■ Use Oracle Virtual Assembly Builder to create virtual machine assemblies and deploy them on Oracle VM. For more information, see the <i>Virtual Assembly Builder User's Guide</i>.
<p>Step 4 Transfer the VM image to Oracle VM.</p>	<p>Copy the <code>vm.cfg</code> and <code>system.img</code> files to the Oracle VM server, under the <code>/OVS/seed_pool/vm-name/</code> directory.</p> <p>Oracle recommends then using the Oracle VM Manager console to import and approve the virtual image, which you can then use to create a virtual machine on Oracle VM server. This will move the virtual image to the <code>/OVS/running_pool/vm-name/jklmn_vm_name</code> directory, where <code>jklmn</code> is an integer assigned by Oracle VM to distinguish VMs in the running pool directory.</p> <p>Note: For more information, see "Managing Resources" in the <i>Oracle VM Manager User's Guide</i>.</p>

Table 1–1 (Cont.) Roadmap for Starting and Running WebLogic Server VMs on Oracle

Steps	Description
Step 5 Start the VM on Oracle VM.	<p>Using Oracle VM Manager:</p> <p>You can use the Oracle VM Manager console to start the VM. However, if you want to access the WebLogic Server start-up output to <code>stdout</code>, which can scroll by quickly, you must also use the <code>\$xm console <vm-name></code> command. If you do not see any output, you can press 1 to list the server configuration and get the last output from the server log. To exit the VM console, use Ctrl+].</p> <p>Note: The Oracle VM Manager console cannot access the server logs or console of the WebLogic Server VM.</p> <p>Using the <code>xm create -c</code> Command:</p> <p>You can also start the VM on an Oracle VM server from a command-line, use the following command:</p> <pre>xm create -c vm.cfg</pre> <p>Specifying the <code>-c</code> option provides access to the VM instance console so you can see output messages when starting virtual machine instances or any operations performed on the server.</p> <p>When the virtual machine has started successfully, the status changes from <code>Pending</code> to <code>Running</code>.</p>
Step 6 Deploy applications to WebLogic Server VMs.	<p>The following sections in this document explain how to deploy applications to WebLogic Server VMs.</p> <ul style="list-style-type: none"> ▪ Section 4.1, "Using WebLogic Server Tools to Deploy Applications to Running VMs" ▪ Section 4.2, "Accessing Running Virtual Machines Using SSH" ▪ Section 4.3, "Configuring Shared Disk Read-access On NFS to Support the <code>nostage</code> and <code>external_stage</code> Deployment Modes"
Step 7 Manage WebLogic Server VMs	<p>The following sections in this document explain how to manage WebLogic Server VMs.</p> <ul style="list-style-type: none"> ▪ Section 5.1, "Adding Managed Servers to a Domain on a Running Administration Server VM" ▪ Section 5.2, "Creating a Virtual WebLogic Server Cluster" ▪ Section 5.3, "Managing Virtual Servers on Oracle VM" ▪ Section 5.4, "Modifying a WebLogic Server Configuration Using WLST Online" ▪ Section 5.5, "Patching Virtual Machines" ▪ Section 5.6, "Configuring a Shared Disk On NFS to Store Server Log Files" ▪ Section 5.7, "Creating a Root Domain Directory Other Than the Default <code>/application</code> Domain Directory" ▪ Section 5.8, "Using the Image Tool to Extract or Insert Files With Profile-based Support" ▪ Section 5.9, "Injecting an Upgraded Domain into a WebLogic Server VM Image"

Installing WebLogic Server on JRockit VE

This chapter contains the hardware and software requirements for using WebLogic Server on JRockit VE, and also defines the components in the package.

2.1 Physical Requirements

The following hardware and software are required to configure and run WebLogic Server on JRockit VE:

2.1.1 Hardware Requirements and Suggestions

- Two separate x86 Linux machines:
 - *Development machine* – With an installed WebLogic Server 11g R1 (10.3.4) development platform for all the pre-deployment activities, such as downloading the Zip file package, applying patches, running the Image Tool for CRUD operations on the image, and building applications.
 - *Deployment machine* – That runs in production mode on Oracle VM Server 2.2.1.
- Allocate 1024 MB of memory and 1024 MB of disk space for each WebLogic Server virtual machine that will be running on Oracle VM Server.
- WebLogic Server on JRockit VE requires a CPU with PAE support.

2.1.2 Software Requirements

- Oracle VM Manager 2.2.0, deployed as an Oracle VM Manager template on an Oracle VM Server 2.2.1.
 - For information about the prerequisites for installing Oracle VM Manager and Oracle VM Server, see the *Oracle VM Server Installation Guide* and the *Oracle VM Manager Installation Guide*.
 - For information about Oracle VM templates, see the Oracle VM Templates page on the Oracle Technology Network at <http://www.oracle.com/technology/products/vm/templates/vm-manager.html>.
- The Image Tool requires having the Java Runtime Environment (at least JDK version 6) installed on your development Linux machine.
- WebLogic Server 11g R1 (10.3.4) on your development Linux machine for building applications, running WLST (online or offline), and running the Administration Console.

2.1.3 Usage Recommendations

The following usage recommendations apply to this release of WebLogic Server on JRockit VE.

- In a virtual machine that is configured with multiple virtual CPUs, in certain circumstances (for example, when there is a lot of synchronization between threads), performance might be affected. To avoid performance bottlenecks, run your WebLogic Server VMs with single virtual processors only.
- Avoid intensive file I/O operations.

2.2 Installing the WebLogic Server on JRockit VE Package

To install WebLogic Server on JRockit VE, extract the contents of the packaged `wlsvePackage.zip` file to a directory of your choice on your Linux development machine.

2.2.1 WebLogic Server on JRockit VE Package Contents

Table 2–1 describes the files that are installed after you unzip the package file.

Table 2–1 Package Contents

File	Description
<code>/wlsve</code> directory	<p>Contains the WebLogic Server virtual image, which includes these files:</p> <ul style="list-style-type: none"> ■ <code>vm.cfg</code> - Oracle VM configuration file for the virtual machine. ■ <code>system.img</code> - Oracle VM template for WebLogic Server on JRockit VE, which contains these directories: <ul style="list-style-type: none"> <code>/application/user_projects/domains/wlsve_domain</code>, a placeholder directory for a new domain to be created. <code>/jrockitve</code> - Contains the Oracle JRockit JVM files, configuration files for the virtual machine, and files that provide the required kernel capabilities for JRockit Virtual Edition. <p>Note: The <code>/application</code> directory functions as a <code>BEA_HOME</code> and contains an Oracle WebLogic Server 11g R1 (10.3.4) image with special patches applied for exclusive WebLogic Server on JRockit VE functionality.</p>
<code>wlsveimagetool.jar</code>	The Image Tool, with which you can configure, create, and modify WebLogic Server VMs.
<code>README.txt</code>	Contains basic information about WebLogic Server on JRockit VE.
<code>THIRDPARTYLICENSEREADME.txt</code>	Contains a list of third-party software that may be included in Oracle JRockit Virtual Edition.
<code>wlsve_medrec_domain_with_odb.pdf</code>	Contains instructions to reconfigure the MedRec sample application to work with an external Oracle Database.

Deploying WebLogic Virtual Machines

These sections explain how to use the Image Tool to create new single-server domain in the VM image, migrate a physical, multi-server domain to the VM image, or transform an entire, physical, multi-server WebLogic Server environment into the VM image.

3.1 Deploying WebLogic Server VMs On Oracle VM Server

Depending on how you intend to use WebLogic Server on JRockit VE, you can use the Image Tool to create new single-server domain in the VM image, using either the template's default "Admin Server" names or using names of your choosing. You can also migrate a physical multi-server domain to VM image, or transform an entire, physical, multi-server WebLogic Server environment into a VM image.

After the configured VM image is uploaded and started on Oracle VM, you can use the Administration Console or WLST online to deploy and manage applications and managed servers in a domain, much like you would in a physical WebLogic Server environment.

- [Section 3.2, "Deploying the Base VM Image With a New Single-Server Domain"](#)
- [Section 3.3, "Migrating a Physical, Multi-server Domain to a VM Image"](#)
- [Section 3.4, "Transforming a Physical WebLogic Server Environment Into a Virtual Machine"](#)

Caution! As a security precaution, VM templates containing WebLogic Server domains should not be used as templates to clone new domains.

Default Administration Server Domain Name and Password

After initially starting the VM in your Oracle VM environment, which causes the new domain to be created, for security purposes Oracle recommends modifying the Java command-line in the `wlsve.xml` file to remove the settings for the username and password you specified. Instead, the `boot.properties` file should be used for username and password retrieval upon server startup. For more information, refer to [Section 6.2, "Starting a WebLogic Server VM Domain With the `boot.properties` File"](#).

To log into the Administration Server, use the `username` and `password` values specified in the `<java-arguments>` section of the `wlsve.xml` file, which is explained in [Section 3.2, "Deploying the Base VM Image With a New Single-Server Domain."](#)

Production vs. Development Mode

Newly created domains are always created in Development mode. And although full support for WebLogic Server on JRockit VE is only provided when running in

Production mode, you may want to experiment with the product while using Development mode, which allows you to, for example, use the `autodeploy` feature. You can change the domain to Production mode using the Administration Console or WLST. Production mode is enabled in the console in the domain configuration section. For more information, see "Development vs. Production Mode Default Tuning Values" in *Performance and Tuning for Oracle WebLogic Server*.

Directly Editing the `wlsve.xml` Configuration versus Using the Image Tool Commands

The WebLogic Server VM image configuration tasks in this section focus on configuring a VM image for the first time, and, therefore, use the extraction/injection method for updating the image's `wlsve.xml` configuration file with a text editor. However, the Image Tool commands can be used for all these tasks as well, without having to extract the configuration file, which is particularly useful for updating non-running, configured VM images.

3.2 Deploying the Base VM Image With a New Single-Server Domain

On your development machine, you can use the Image Tool to create a new, single-server WebLogic Server 11g Release 10.3.4 domain in the VM image. This will require updating the `wlsve.xml` file, which represents the configuration file for the virtual image.

Best Practice Tip: The WebLogic Server image template represents a WebLogic Server VM instance; however, a default domain is not included in the installation package. To simplify the domain creation process, the `wlsve.xml` configuration file in the VM image has placeholders for a new domain to be created under the `/application/user_projects/domains/wlsve_domain/` directory, with an Administration Server name of "WlsveAdmin" and a domain name of "wlsve_domain." This way, you can use the Image Tool to quickly create a new single-server domain in the VM image, so you can experiment with the product while using Development mode, which allows you to, for example, use the `autodeploy` feature, using either the default names or names of your choosing.

1. From the directory where you unzipped the WebLogic Server on JRockit VE package, use the following Image Tool command to extract a copy of the `wlsve.xml` configuration file from the original VM image:

```
$java -jar wlsveimagetool.jar -r vm.cfg get config wlsve.xml
```

Here are the default settings in the `wlsve.xml` file:

```
<jrockitve-imagetool-config
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="jrockitve-imagetool-config.xsd" version="5.1">
<jrockitve-config memory="1024" cpus="1">
  <storage>
    <disks>
      <disk id="root" size="1024 MB"/>
    </disks>
    <mounts>
      <mount>
        <mount-point>/</mount-point>
        <disk>root</disk>
      </mount>
    </mounts>
  </storage>
  <vm-name>wlsve_domain_WlsveAdmin</vm-name>
```

```

<working-dir>/application/user_projects/domains/wlsve_domain</working-dir>
<java-arguments>
-cp $JAVA_HOME/lib/tools.jar:/jrockitve/lib/common.jar:
/application/patch_wls1034/profiles/default/sys_manifest_classpath/
weblogic_patch.jar:/application/wlserver_10.3/server/lib/weblogic.jar
-Dweblogic.Name=WlsveAdmin -Dweblogic.Domain=wlsve_domain weblogic.Server
</java-arguments>
<network>
  <nics>
    <nic type="bridged"/>
  </nics>
</network>
<locale-data>
  <locale>en_US</locale>
  <timezone>America/New_York</timezone>
  <encoding>ISO-8859-1</encoding>
</locale-data>
</jrockitve-config>
</jrockitve-imagetool-config>

```

- Using a text editor, update the `working-dir` tag in the `wlsve.xml` file to point the virtual image to the new domain you will be using. For example:

```
<working-dir>/application/user_projects/domains/domain_name</working-dir>
```

where *domain_name* represents the name of the WebLogic Server domain (for example, *mywlsve_domain*).

Tip: You can use the Image Tool to create new single-server domain in the VM image outside the default `/application` directory with a name of your choice. For more information, see [Section 5.7, "Creating a Root Domain Directory Other Than the Default "/application" Domain Directory."](#)

- With the `wlsve.xml` file open in your text editor, update the `<java-arguments>` section for the `-Dweblogic.Name`, `-Dweblogic.Domain`, `-Dweblogic.management.username`, and `-Dweblogic.management.password` arguments to specify the server name, domain name, and username/password for the new domain. You also need to add the `-Dweblogic.management.GenerateDefaultConfig=true` argument to create the new domain upon booting the VM, as shown in the following example:

```

-Dweblogic.Name=adminServerName
-Dweblogic.Domain=domainName
-Dweblogic.management.username=username
-Dweblogic.management.password=password
-Dweblogic.management.GenerateDefaultConfig=true

```

where *adminServerName* is the name of the Administration Server (for example, *WlsveAdmin*), *domainName* represents the name of the WebLogic Server domain (for example, *wlsve_domain*), and *username* and *password* are the user name and password for the domain.

- Update the `vm-name` tag in the `wlsve.xml` file to the name of your virtual machine.

```
<vm-name>wlsve-name</vm-name>
```

This name represents the name of the WebLogic Server VM seen by the Oracle VM frameworks and must be unique.

5. If your environment requires static IP addresses, which is recommended in virtualized environments, you need to update the network settings in the `wlsve.xml` configuration file; specifically, the network information of the virtual host where the WebLogic Server virtual machine will be running must be added, including:
 - DNS server(s) and IP address
 - IP address for the virtual host
 - Gateway
 - Mask

An updated `<network>` section in the `wlsve.xml` configuration file should look like this:

```
<network>
  <dns>
    <server-order>
      <server ip="17.11.10.2"/>
    </server-order>
    <lookup-order>
      <name suffix="us.oracle.com"/>
    </lookup-order>
  </dns>
  <nics>
    <nic type="bridged">
      <ip>17.22.20.20</ip>
      <netmask>255.255.255.0</netmask>
      <gateway>17.22.20.1</gateway>
      <mac>12:ab:34:cd:56:ef</mac>
    </nic>
  </nics>
</network>
```

Note: If any `<nic>` network tag is not specified, the hypervisor will attempt to retrieve any unspecified network configuration using DHCP, if available.

If your network *does* use DHCP, you do not need to update the network settings.

Tip: When working in a virtualized environment, Oracle recommends using static IPs for virtual machines and letting DHCP handle the other network parameters. This makes it easier to find your server and is required when working with clusters. Please work with your network administrator and have them configure the DHCP server to lock an IP number to your specific MAC address. For more information, see "Creating a Guest Using a Template" in the *Oracle VM Server User's Guide*.

6. Use the Image Tool to inject the updated `wlsve.xml` file inside the VM image with the following command:


```
$java -jar wlsveimagetool.jar -r vm.cfg set config wlsve.xml
```
7. Transfer the VM image to your Oracle VM environment, and then start the virtual machine, as described in [Table 1-1, "Roadmap for Starting and Running WebLogic Server VMs on Oracle VM"](#).

For more detailed directions on how to deploy, register, and start a virtual machine on Oracle VM, see the *Oracle VM Server Documentation*.
8. Starting the virtual machine automatically creates a new single-server domain with the name that you specified in the Java arguments.

To connect to the Administration Server using the Administration Console:

- a. From a browser, connect to the server address at this URL:

```
http://virtual.host.ip.address:7001/console
```

where *virtual.host.ip.address* is the IP address assigned to your virtual machine

- b. When prompted for your credentials, enter the username and password that you specified in the Java arguments in the `wlsve.xml` file.

Once you are logged in to WebLogic Server, you can change these credentials. For more information, see [Section 6.2, "Starting a WebLogic Server VM Domain With the `boot.properties` File."](#)

9. For instructions on configuring the SSH/WebLogic Server security integration startup class in the newly created domain, refer to [Section 4.2, "Accessing Running Virtual Machines Using SSH."](#)
10. You can use the Administration Console on the running Administration Server VM to add any Managed Server VMs to your domain. For more information, see [Section 5.1, "Adding Managed Servers to a Domain on a Running Administration Server VM."](#)

3.3 Migrating a Physical, Multi-server Domain to a VM Image

On your development machine, you can use the Image Tool to migrate a physical WebLogic Server 11g Release 10.3.4 domain to a WebLogic Server VM image. This will require updating the `wlsve.xml` file, which represents the configuration file for the virtual image.

Note: Using the Image Tool for physical-to-virtual domain migrations is not supported on Windows platforms. Windows users should instead use a Linux machine for physical-to-virtual domain migrations.

1. On your development machine, install WebLogic Server 11g Release 10.3.4 into an `MW_Home` directory. You can create a `MW_Home` directory named `/application/` to match the default `MW_Home` directory in the image template, or you can create a `MW_Home` using a name of your choice.
2. Use the Configuration Wizard Create to create a WebLogic Server domain in your `MW_HOME` directory.

You can also migrate a physical domain into the VM image outside the default `/application` directory, using a name of your choice. See [Section 5.7, "Creating a Root Domain Directory Other Than the Default `/application` Domain Directory."](#)
3. Use the `WebLogic Server pack` and `unpack` commands to migrate the domain from the source directory on the development machine to the target directory on the machine where you will be packaging up your VM image. The `pack` and `unpack` commands are available in the `/common/bin` subdirectory of the product installation directory.
 - a. Use the `pack` command to create a snapshot "template" of the domain in one simple step.

- b. Use the `unpack` command to recreate the domain in the directory on the machine where you will be packaging up your VM image.

For more information about the `pack` and `unpack` commands, see *Creating Templates and Domains Using the Pack and Unpack Commands*.

4. Access the migrated domain using the WLST `readDomain('/path/to/domain')` command, and then update the domain's configuration file (`config.xml`), as follows:

For more information about using WLST, see the *Oracle WebLogic Server Scripting Tool* user guide.

- Modify the listen address, server name, machine name, and cluster address to correspond with the virtual host where the VM will be running.
- You may need to modify your application's deployment paths. Also, if you want to use a root domain directory other than the default `/application` directory in the VM image, see [Section 5.7, "Creating a Root Domain Directory Other Than the Default "/application" Domain Directory."](#)
- Due to the limited amount of storage space per VM, you may also want to disable the server access logs. You can then configure the VM to have its server logs hosted on a shared disk on NFS, as explained in [Section 5.6, "Configuring a Shared Disk On NFS to Store Server Log Files."](#)

Important! In most circumstances, you should not use a text editor or other non-Oracle tools to modify a domain's configuration document. Instead, use the Administration Console, WLST, or one of the other tools described in the "Overview of Oracle WebLogic Server System Administration" in the *Introduction to Oracle WebLogic Server*.

5. Use the Image Tool to inject the unpacked and updated domain into the VM image.
6. From the directory where you unzipped the WebLogic Server on JRockit VE package, use the Image Tool to either create a new `wlsve.xml` configuration file or extract a copy of a `wlsve.xml` file from the original VM image:

- To create a new `wlsve.xml` file:

```
$java -jar wlsveimagetool.jar -c wlsve.xml <vm-name>
```

where `vm-name` is the name of the virtual image.

- To extract a copy of the `wlsve.xml` file:

```
$java -jar wlsveimagetool.jar -r vm.cfg get config wlsve.xml
```

7. Point the virtual image to the domain you will be using by updating the `<working-directory>` tag in the `wlsve.xml` file. For example:

```
<working-dir>/application/user_projects/domains/wlsve_domain</working-dir>
```

8. Update the `<java-arguments>` tag in the `wlsve.xml` file by specifying the `-cp` argument with the CLASSPATH, server name, and the server access credentials. The following example shows the Java arguments that should be explicitly set for an Administration Server before booting the virtual machine.

```
-cp $JAVA_HOME/lib/tools.jar:/jrockitve/lib/common.jar:  
/application/patch_wls1034/profiles/default/sys_manifest_classpath/  
weblogic_patch.jar:/application/wlserver_10.3/server/lib/weblogic.jar  
-Dweblogic.Name=adminServerName  
-Dweblogic.Domain=domainName weblogic.Server
```


where *domainName* represents the name of the WebLogic Server domain (for example, *wlsve_domain*) and *adminServerName* is the name of the Administration Server (for example, *WlsveAdminServer*).

Note: The CLASSPATH includes all existing WebLogic Server referenced JARs created by the Configuration Wizard startup scripts, except any JAR used by the Configuration Wizard or Pointbase. You can get the complete CLASSPATH list by starting the Administration Server using the `startWeblogic.sh` script on the development machine.

9. If your environment requires static IP addresses, which is recommended in virtualized environments, you need to update the network settings in the `wlsve.xml` file; specifically, the configuration file must have the same IP address that used when you created the physical domain using Configuration Wizard (Step 2) or updated using WLST (Step 4).

The other network information must match that of the virtual host where the WebLogic Server VM will be running must be added, including:

- DNS server(s) and IP address
- IP address for the virtual host
- Gateway
- Mask

An updated `<network>` section in the `wlsve.xml` file should look similar to this example:

```
<network>
  <dns>
    <server-order>
      <server ip="17.11.10.2"/>
    </server-order>
  <lookup-order>
    <name suffix="us.oracle.com"/>
  </lookup-order>
</dns>
<nics>
  <nic type="bridged">
    <ip>17.22.20.20</ip>
    <netmask>255.255.255.0</netmask>
    <gateway>17.22.20.1</gateway>
    <mac>12:ab:34:cd:56:ef</mac>
  </nic>
</nics>
</network>
```

Note: If any `<nic>` network tag is not specified, the hypervisor will attempt to retrieve any unspecified network configuration using DHCP, if available.

If your network *does* use DHCP, you do not need to update the network settings.

Tip: When working in a virtualized environment, Oracle recommends using static IPs for virtual machines and letting DHCP handle the other network parameters. This makes it easier to find your server and is required when working with clusters. Please work with your network administrator and have them configure the DHCP server to lock an IP number to your specific MAC address. For more information, see "Creating a Guest Using a Template" in the *Oracle VM Server User's Guide*.

10. If necessary, update the disk size, memory amount, and number of CPUs needed for the virtual image.
11. For each new virtual machine in a domain, you must update the `vm-name` tag for the virtual image in the `wlsve.xml` file.

```
<vm-name>wlsve-name</vm-name>
```

This name represents the name of the WebLogic Server VM seen by the Oracle VM frameworks and must be unique.

12. Use the Image Tool to inject the updated `wlsve.xml` file inside the VM image with the following command:

```
$java -jar wlsveimagetool.jar -r vm.cfg set config wlsve.xml
```

13. Transfer the VM image to your Oracle VM environment, and then start the virtual machine, as described in [Table 1-1, "Roadmap for Starting and Running WebLogic Server VMs on Oracle VM"](#).

For more detailed directions on how to deploy, register, and start a virtual machine on Oracle VM, see the *Oracle VM Server Documentation*.

14. If you created Manage Servers in your domain with the Configuration Wizard (see step 2), then repeat steps 6–12 for each Managed Server template image in the domain.

15. Starting the WebLogic Server VM starts an Administration Server. To connect to the Administration Server using the Administration Console:

- a. From a browser, connect to the server address at this URL:

```
http://virtual.host.ip.address:7001/console
```

where `virtual.host.ip.address` is the IP address assigned to your virtual machine

- b. When prompted for your credentials, enter the username and password that you specified when you created the domain using the Configuration Wizard.

Once you are logged in to WebLogic Server, you can change these credentials. For more information, see [Section 6.2, "Starting a WebLogic Server VM Domain With the `boot.properties` File."](#)

16. You can use the Administration Console on the running Administration Server VM to add any Managed Server VMs to your domain. For more information, see [Section 5.1, "Adding Managed Servers to a Domain on a Running Administration Server VM."](#)

17. After you have added Managed Server VMs to your domain, you can also use the Administration Console to create a cluster to add the Managed Server VMs to. for more information, see [Section 5.2, "Creating a Virtual WebLogic Server Cluster."](#)

3.4 Transforming a Physical WebLogic Server Environment Into a Virtual Machine

On your development machine, you can use the Image Tool to transform a physical, Unix-based, multi-server WebLogic Server 11g Release 10.3.4 environment into a WebLogic Server VM. This will require updating the `wlsve.xml` file, which represents the configuration file for the virtual image.

Notes:

Physical-to-virtual domain migrations are not supported on Windows platforms. Users should instead use a Unix-based physical WebLogic Server installation for physical-to-virtual domain migrations.

Oracle does not support directly editing the `wlsve.xml` configuration file, and instead recommends using the corresponding Image Tool commands.

1. On your development machine, install WebLogic Server 11g Release 10.3.4 into a `MW_Home` directory. You can create a `MW_Home` directory named `/application/` to match the default `MW_Home` directory in the image template, or you can create a `MW_Home` using a name of your choice.
2. Use the Configuration Wizard Create to create a WebLogic Server domain in your `MW_HOME` directory.
3. From the directory where you unzipped the WebLogic Server on JRockit VE package, use the Image Tool to either create a new `wlsve.xml` configuration file or extract a copy of a `wlsve.xml` file from the original VM image:

To create a new `wlsve.xml` file:

```
$java -jar wlsveimagetool.jar -c wlsve.xml <vm-name>
```

where `vm-name` is the name of the virtual image.

To extract a copy of the `wlsve.xml` file:

```
$java -jar wlsveimagetool.jar -r vm.cfg get config wlsve.xml
```

4. Using a text editor, update the `<jrockitve-filesystem-imports>` tag in the `wlsve.xml` file to copy files from the location where WebLogic Server has been installed in the physical file system to the virtual file system. For example:

```
<jrockitve-filesystem-imports>
  <copy from="/scratch/user/WLS-PS3/*" todir="/scratch/user/WLS-PS3/" />
</jrockitve-filesystem-imports>
```

For more information about the `<jrockitve-filesystem-imports>` tag, see the *User's Guide for Oracle JRockit Virtual Edition*

5. Extract the `jrockitve.bin` file from the downloaded virtual image (`system.img`) and point the virtual image to this file by updating the `wlsve.xml` file, as follows:
 - a. To access the `jrockitve.bin` file, disassemble the `system.img` file using the following command:

```
java -jar wlsveimagetool.jar -d vm.cfg output_dir
```

- b. Point the virtual image to the `jrockitve.bin` file by updating the `<jrockitve-binary-url>` tag in the `wlsve.xml` file. For example:

```
<jrockitve-binary-url>file:../jrockitve.bin</jrockitve-binary-url>
```

Note: If you do not specify this element, when the Image Tool assembles the application, it looks for the `jrockitve.bin` file in the directory in which the configuration XML file resides.

6. Point the virtual image to the domain you will be using by updating the `<working-directory>` tag in the `wlsve.xml` file. For example:

```
<working-dir>/scratch/user/WLS-PS3/user_projects/domains/wlsve_
domain</working-dir>
```

7. Update the `<java-arguments>` tag in the `wlsve.xml` file by specifying the `-cp` argument with the CLASSPATH, server name, and the server access credentials. The following example shows the Java arguments that should be explicitly set for an Administration Server before booting the virtual machine.

```
-cp $JAVA_HOME/lib/tools.jar:/jrockitve/lib/common.jar:
/scratch/user/WLS-PS3/patch_wls1034/profiles/default/sys_manifest_classpath
/weblogic_patch.jar:/scratch/user/WLS-PS3/wlserver_10.3/server
/lib/weblogic.jar
-Dweblogic.management.username=username
-Dweblogic.management.password=password
-Dweblogic.Name=adminServerName
-Dweblogic.Domain=domainName weblogic.Server
```

where *domainName* represents the name of the WebLogic Server domain (for example, *base_domain*) and *adminServerName* is the name of the Administration Server (for example, *AdminServer*).

Note: The CLASSPATH includes all existing WebLogic Server referenced JARs created by the Configuration Wizard startup scripts, except any JAR used by the Configuration Wizard or Pointbase. You can get the complete CLASSPATH list by starting the Administration Server using the `startWeblogic.sh` script on the development machine.

8. If your environment requires static IP addresses, which is recommended in virtualized environments, you need to update the network settings in the `wlsve.xml` file; specifically, the configuration file must have the same IP address that used when you created the physical domain using the Configuration Wizard in Step 2.

The other network information must match that of the virtual host where the WebLogic Server VM will be running must be added, including:

- DNS server(s) and IP address
- IP address for the virtual host
- Gateway
- Mask

An updated `<network>` section in the `wlsve.xml` file should look similar to this example:

```
<network>
  <dns>
    <server-order>
      <server ip="17.11.10.2"/>
    </server-order>
    <lookup-order>
      <name suffix="us.oracle.com"/>
    </lookup-order>
  </dns>
  <nics>
    <nic type="bridged">
      <ip>17.22.20.20</ip>
      <netmask>255.255.255.0</netmask>
```

```

    <gateway>17.22.20.1</gateway>
    <mac>12:ab:34:cd:56:ef</mac>
  </nic>
</nics>
</network>

```

Note: If any <nic> network tag is not specified, the hypervisor will attempt to retrieve any unspecified network configuration using DHCP, if available.

If your network *does* use DHCP, you do not need to update the network settings.

Tip: When working in a virtualized environment, Oracle recommends using static IPs for virtual machines and letting DHCP handle the other network parameters. This makes it easier to find your server and is required when working with clusters. Please work with your network administrator and have them configure the DHCP server to lock an IP number to your specific MAC address. For more information, see "Creating a Guest Using a Template" in the *Oracle VM Server User's Guide*.

9. If necessary, update the `wlsve.xml` file with the disk size, memory amount, and number of CPUs needed for the virtual image.
10. For each new virtual machine in a domain, you must update the `vm-name` tag for the virtual image in the `wlsve.xml` file.

```
<vm-name>wlsve-name</vm-name>
```

This name represents the name of the WebLogic Server VM seen by the Oracle VM frameworks and must be unique.

11. Use the Image Tool to create the P2V virtual machine by using the following command:

```
$java -jar wlsveimagetool.jar -a wlsve.xml <output_dir>/
```

where <output_dir>/ is the directory where the WebLogic Server VM will be created and stored.

Important! WebLogic Server must not be running while creating the virtual machine.

The output of this command is two files: `system.img` and `vm.cfg`. The `vm.cfg` file is used by Oracle VM to start up the image and holds a reference to the absolute path of the `system.img` on the target Oracle VM machine.

12. Transfer the VM image to your Oracle VM environment, and then start the virtual machine, as described in [Table 1-1, "Roadmap for Starting and Running WebLogic Server VMs on Oracle VM"](#).

For more detailed directions on how to deploy, register, and start a virtual machine on Oracle VM, see the *Oracle VM Server Documentation*.

13. Starting the WebLogic Server VM starts an Administration Server. To connect to the Administration Server using the Administration Console:

- a. From a browser, connect to the server address at this URL:

```
http://virtual.host.ip.address:7001/console
```

where `virtual.host.ip.address` is the IP address assigned to your virtual machine

- b. When prompted for your credentials, enter the username and password that you specified when you created the domain using the Configuration Wizard.

Once you are logged in to WebLogic Server, you can change these credentials. For more information, see [Section 6.2, "Starting a WebLogic Server VM Domain With the boot.properties File."](#)

14. You can use the Administration Console on the running Administration Server VM to add any Managed Server VMs to your domain. For more information, see [Section 5.1, "Adding Managed Servers to a Domain on a Running Administration Server VM."](#)
15. After you have added Managed Server VMs to your domain, you can also use the Administration Console to create a cluster to add the Managed Server VMs to. for more information, see [Section 5.2, "Creating a Virtual WebLogic Server Cluster."](#)

Deploying Applications to WebLogic Server VMs

Once your WebLogic Server VM is running on Oracle VM, you can continue to configure your WebLogic Server domain configuration, as well as deploy applications, in both running and non-running, as described in the following sections.

- [Section 4.1, "Using WebLogic Server Tools to Deploy Applications to Running VMs"](#)
- [Section 4.2, "Accessing Running Virtual Machines Using SSH"](#)
- [Section 4.3, "Configuring Shared Disk Read-access On NFS to Support the nostage and external_stage Deployment Modes"](#)

4.1 Using WebLogic Server Tools to Deploy Applications to Running VMs

You can use the WebLogic Server deployment tools, such as the Administration Console, on your development machine to deploy applications to a virtual domain on a running WebLogic Server VM.

Note: This section explains how to use the Administration Console to deploy an application; however, you can also deploy applications on a running VM using the `weblogic.Deployer` tool, the `wldeploy` Ant task, and WLST. For more information on using these deployment tools, see *Deploying Applications to Oracle WebLogic Server*.

1. Start the WebLogic Server virtual machine using WLST, the `xm` command (`xm create -c vm.cfg`), or Oracle VM Manager.
2. From the development machine where the application resides, open a browser and log in to the Administration Server to access the Administration Console of the virtual machine:

`http://admin.server.ip.address:7001/console`

where `admin.server.ip.address` is the IP address assigned to your virtual machine.
3. If necessary, click **Lock & Edit** to upload an application to the domain.
4. Click **Deployments**, and then click **Install**.
5. Click the **"upload your file(s)"** option to select an application from an existing location on the development machine from which you are currently browsing.

6. After locating the file, click **Next** to upload this deployment to the Administration Server.
7. Install the file as an application.
8. Select deployment targets and click **Next**.
9. From Optional Settings under Source accessibility, select the staging option (that is, the recommended selection).
10. Click **Finish** to finish the deployment.
11. Activate the changes and start the application.

4.2 Accessing Running Virtual Machines Using SSH

You can transfer files to and from the file system of a running virtual machine through the SSH-protocol-based clients, SCP (secure copy) and SFTP (secure FTP). The SSHD service is included in virtual machines built using the Image Tool, but it is not enabled by default.

The section contains the following topics:

- [Section 4.2.1, "Enabling the SSHD Service"](#)
- [Section 4.2.2, "Deploying and Targeting the SSH Startup Class in a WebLogic Server VM"](#)
- [Section 4.2.3, "Using the SSHD Service on a Running VM to Copy and Get Files"](#)
- [Section 4.2.4, "Configuring WebLogic Server Roles and Policies for SSHD"](#)

4.2.1 Enabling the SSHD Service

WebLogic Server includes a startup class in the classpath that integrates the SSHD service with the WebLogic Server security. For security purposes, you must manually enable and target the SSHD service when using the packaged WebLogic Server VM image as a template for new or migrated domains.

As a best practice, we recommend using the Image Tool to enable the SSHD service on your image template prior to deploying it to Oracle VM. However, you can also transfer a virtual machine from the Oracle VM environment to your Linux development machine, and then use the Image Tool to enable SSHD.

To enable the SSHD service, follow these steps:

1. Stop the running WebLogic Server VM.
2. Transfer the VM from the Oracle VM environment to your Linux development machine.
3. From a command prompt, enter the following Image Tool command to enable the SSHD service.

```
java -jar wlsveimagnetool.jar -r vm.cfg enable service sshd
```

4. Transfer the VM back to the running pool Oracle VM environment.
5. Restart the WebLogic Server VM on Oracle VM using WLST, the `xm` command (`xm create -c vm.cfg`), or Oracle VM Manager.

When the virtual machine starts, the following message is displayed on the virtual machine console:

```
JRockitVE sshd service started (port 22)
```


4.2.1.1 Verify Whether SSHD Is Enabled in the Image Configuration File

Another way to verify whether the SSHD service is enabled, is to check the image configuration file (`wlsve.xml`) to see if the SSHD service element exists:

```
<services>
  <service name="sshd"/>
</services>
```

4.2.1.2 Useful Image Tool Commands for Services

There are two more useful Image Tool commands for WebLogic Server on JRockit VE services.

To view a list of enabled services, enter:

```
java -jar wlsveimagetool.jar -r vm.cfg get enabled-services
```

For example, after enabling the SSHD service, you'll see, "sshd (An SSH2 implementation with SCP and SFTP support)".

To disable the SSHD service after it has been enabled, enter:

```
java -jar wlsveimagetool.jar -r vm.cfg disable service sshd
```

4.2.2 Deploying and Targeting the SSH Startup Class in a WebLogic Server VM

For security purposes, you must manually enable and target the SSHD service when using the packaged WebLogic Server VM image as a template for new or migrated domains.

4.2.2.1 Using the Administration Console to Deploy and Target the SSH Startup Class

You can use the Administration Console to deploy and target the SSH startup class:

1. Make sure the WebLogic Server VM is running.
2. Launch the WebLogic Server Administration Console.
3. Navigate to the domain (Under the Domain Structure panel on the upper-left), such as *mywlsve_domain*, Environment, Startup & Shutdown Classes.
4. In the Summary of Startup and Shutdown Classes table:
 - a. Click **New**.
 - b. Select **Startup Class**.
 - c. Enter `ssh-startup` as the name and `weblogic.wlsve.sshserver.SSHStartup` as the Class Name.
 - d. Select the **Target Servers** that you want the startup class to run on.

When `ssh-startup` appears in the table, then the startup class is properly deployed, as shown in [Figure 4-1](#).

Figure 4–1 The Startup and Shutdown Classes Table Showing the ssh-startup Class

Name	Type	Class Name	Deployment Order	Arguments
ssh-startup	Startup	weblogic.wlsve.sshserver.SSHStartup	1000	

- After adding the `ssh-startup` information, you must restart WebLogic Server. Even though the Administration Console advises that: *All changes have been activated. No restarts are necessary* – you must restart the server for the startup class to run and integrate with the SSHD service so that you can connect, authenticate, and use the service.)

4.2.2.2 Checking the WebLogic Server Configuration File to Verify the SSH Startup Class

You can also verify that the SSH startup class is deployed and properly targeted by checking your WebLogic Server configuration file for the following `config.xml` fragment.

```
<startup-class>
  <name>ssh-startup</name>
  <target>WlsveAdmin</target>
  <class-name>weblogic.wlsve.sshserver.SSHStartup</class-name>
  <failure-is-fatal>true</failure-is-fatal>
  <load-before-app-deployments>true</load-before-app-deployments>
</startup-class>
```

Common SSH Classpath Problems

- If you get a schema validation error with this fragment in your `config.xml`, it's likely because the order of elements in the `config.xml` is important. Try putting the `<startup-class>` fragment immediately before the `<admin-server-name>` clause.
- If you get the exception: `java.lang.ClassNotFoundException: weblogic.wlsve.sshserver.SSHStartup`, then the SSH startup class JAR is not in the correct location. Verify that `com.oracle.weblogic.wlsve.sshstartup_1.0.0.0.jar` is in the `/application/wlserver_10.3/server/lib/ext` directory, where it is automatically added to the classpath. Note that no explicit classpath entry is required since all JARs in `/application/wlserver_10.3/server/lib/ext` become part of the WebLogic Server's extended classpath.

4.2.3 Using the SSHD Service on a Running VM to Copy and Get Files

Once enabled, the SSHD service permits access to the virtual file system using SFTP and SCP. When used with WebLogic Server VMs, the WebLogic Server authentication mechanisms allow access to the SSH service.

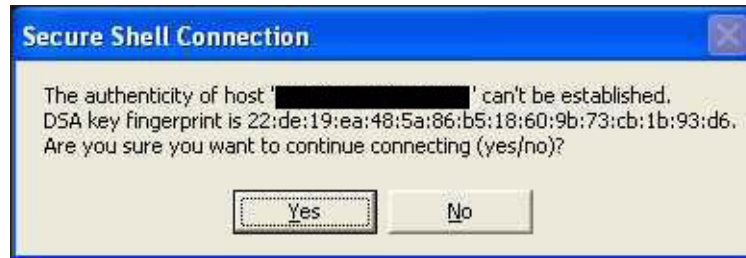
- Enable SSH on your WebLogic Server VM by following the steps in [Section 4.2.1, "Enabling the SSHD Service."](#)
- Start the SSH-enabled WebLogic Server VM on Oracle VM using WLST, the `xm` command (`xm create -c vm.cfg`), or Oracle VM Manager.

- Using an SFTP or SCP client to connect to the WebLogic Server VM on Oracle VM.

```
$ sftp weblogic@hostname/ip-address-of-server
```

- The first time you attempt to connect to the VM, you get a host authenticity prompt, as shown in [Figure 4-2](#).

Figure 4-2 Initial SSH Connection Window



- Click **Yes** to continue. Another prompt requests your password, as shown in [Figure 4-3](#).

Figure 4-3 Enter Password Window



- Enter the password and click **OK**.

Note: You may be prompted by both of these messages again.

- Once connected, you can browse all the files in your domain (for example, `/application/user_projects/domains/mywlsve_domain`). You can also navigate through the entire image and put and get the file(s) you need.
- Using SFTP get or put files into the running VM.

Here is an example of using SFTP to get the log file from a running server.

```
$ sftp weblogic@<hostname>/<ip-address-of-server>
Connecting to <ip-addr-of-ssh-server>...
weblogic@<hostname>/<ip-address-of-server>
sftp> ls
autodeploy                bin                        config
console-ext               edit.lok                  fileRealm.properties
init-info                  lib                       pending
security                    servers                   startWebLogic.sh
sftp> pwd
sftp>cd servers/WlsveAdmin/logs

sftp> get WlsveAdmin.log
```

```
Fetching /application/user_projects/domains/  
<mywlsve_domain>/servers/<MyWlsveAdmin>/logs/MyWlsveAdmin.log to WlsveAdmin.log  
/application/user_projects/domains/<mywlsve_doma> 100% 103KB 102.7KB/s 00:00  
  
sftp> bye
```

Notes:

If WebLogic Server is in development mode, then when files are copied to the autodeploy directory, the server may notice the presence of the file before the copy has completed. If this happens, deployment of the archive or exploded directory will start and may fail. To avoid such a failure, Oracle recommends using SFTP to copy the application to a temporary directory outside of the autodeploy directory (for example, `tmp/myapp.ear`) and then move/rename the file into the autodeploy directory. In production mode, autodeploy is turned off.

If you attempt to connect using SFTP or SCP and get repeated prompts for your password followed by a message, such as Error: The connection could not be made, then one of two things may be wrong: The SSH startup class is not deployed or the SSH startup class is deployed, but not targeted to your server. See [Section 4.2.2, "Deploying and Targeting the SSH Startup Class in a WebLogic Server VM."](#)

4.2.4 Configuring WebLogic Server Roles and Policies for SSHD

By default, all users with the Admin role have permission to use the SSH service. If you want additional control over who can perform SSH operations, you can use the Administration Console and do some additional configuration. For example, you can grant specific users permission to use the SSH service to move files back and forth between the WebLogic Server file system and their local file system.

Important! The WebLogic Server user (`testadminuser` in these instructions) must either already exist or be created in order to grant SSH permissions. Also, the existing/new user must have a role other than the Admin Role, since, by default, all Admin users have permission to use the SSH service. For more information, see *Securing Resources Using Roles and Policies for Oracle WebLogic Server*.

1. Use the Domain Structure panel to navigate to the WebLogic Server domain (for example, `mywlsve_domain`) and click the **domain name**.
2. On the Settings page, click the **Security** tab.
3. On the ensuing page, click the **Policies** tab.
4. Click the **SSH** tab.
5. In the Policy Conditions section, click the **Add Conditions** button.
6. On the Choose a Predicate page, select **User** from the Predicate List, and click **Next**.
7. Type in the user name (for example, `testadmin`) in the User Argument Name field, then click **Add**, and then click **Finish**.
8. Click **Save**.

Note that an ensuing message may say something like *Policy Overridden: Admin*, it means that you have eliminated the ability for WebLogic administrator users to use SSH. If you want to retain the ability for an administrator to do SSH, as well as user *testadmin*, you must update the policy to be `User:testadmin` or `Role:Admin`, as shown in [Figure 4-4](#).

Figure 4-4 Policy Conditions Section of the Security > Policies > SSH Window



The screenshot displays the 'Policy Conditions' section of the Security > Policies > SSH window. It features a title bar 'Policy Conditions' and a subtitle 'These conditions determine the access control to your Domain Administrative SSH resource.' Below the subtitle are several buttons: 'Add Conditions', 'Combine', 'Uncombine', 'Move Up', 'Move Down', 'Remove', and 'Negate'. The main area contains two conditions, each with a checkbox and a label: ' Role : Admin' and ' User : testadmin'. Between these conditions is an 'Or' dropdown menu. Below the conditions are another set of buttons: 'Add Conditions', 'Combine', 'Uncombine', 'Move Up', 'Move Down', 'Remove', and 'Negate'. At the bottom left is a 'Save' button. Below the 'Save' button is the 'Overridden Policy' section, which shows 'Role : Admin'.

9. Try using SFTP or SCP as user *testadmin* to transfer files to confirm that the new policy setting works.

4.3 Configuring Shared Disk Read-access On NFS to Support the nostage and external_stage Deployment Modes

You can use the Network File System (NFS) to automount and transparently access a read-only shared disk on your network. This way, you can upload your applications to the shared disk where they can be deployed to your WebLogic Server VMs using either the nostage and external_stage deployment modes.

- [Section 4.3.1, "Configure the NFS Server and Mounting Points In a Virtual Machine"](#)
- [Section 4.3.2, "Configuring nostage Mode Deployment on NFS"](#)
- [Section 4.3.3, "Configuring external_stage Mode Deployment on NFS"](#)

Note: For instructions on mounting a shared disk on NFS to store WebLogic Server log files, see [Section 5.6, "Configuring a Shared Disk On NFS to Store Server Log Files"](#).

For more detailed information on configuring NFS mounts using the Image Tool, see the Image Tool Command-Line Option Reference (the `-r` option) in the *User's Guide for Oracle JRockit Virtual Edition*.

4.3.1 Configure the NFS Server and Mounting Points In a Virtual Machine

Before configuring a deployment mode for your VMs, you must configure the NFS server and the VM's mounting points to the read-only shared disk.

1. On your Linux development machine, configure the NFS Server export directory for the virtual host DNS name/IP Address. For example, add the following to the `/etc/exports` file:

```
<Export dir> <Remote VM Client IP/DNS Address>(<permissions>)
```

For example:

```
/scratch/<userdir>/nfs 10.137.145.92(rw,sync,no_root_squash)
```

Note: Make sure that the directory you export exists on the NFS location.

2. Restart the NFS Daemon.


```
/etc/init.d/nfs restart
```
3. Use the Image Tool to create the mounting point in the `wlsve.xml` configuration file for the virtual machine.

```
java -jar wlsveimagetool.jar --reconfigure <vm.cfg> add mount nfs
<mount-point> <nfs server> <nfs server-path> <option1> <option2> <...>
<optionN>
```

For example:

```
java -jar wlsveimagetool.jar --reconfigure vm.cfg add mount nfs /logs
adc2190200.us.oracle.com /scratch/<userdir>/nfs/logs uid=11735 gid=900
```

4.3.2 Configuring nostage Mode Deployment on NFS

In nostage mode, the Administration Server does not copy the archive files from their source location. Instead, each target server must access the archive files from a single source directory for deployment. The staging directory of target servers is ignored for nostage deployments.

1. Follow the directions in [Section 4.3.1, "Configure the NFS Server and Mounting Points In a Virtual Machine"](#) to configure the NFS server export directory.
2. Create the Upload directory in the NFS location.
3. Using the Image tool, create the mounting point in the `wlsve.xml` configuration file for the upload directories for the VM.

```
java -jar wlsveimagetool.jar --reconfigure vm.cfg add mount nfs
<mount-point> <NFS Server Host> /<NFS Location in Server>/<Upload Directory>
```

For example:

```
java -jar wlsveimagetool.jar --reconfigure vm.cfg add mount nfs
/application/user_projects/domains/wlsve_domain/servers/WlsveAdmin/upload
adc2190200.us.oracle.com /scratch/<userdir>/nfs/upload uid=11735 gid=900
```

4. Transfer the VM image to your Oracle VM environment, and then start the VM using WLST, the `xm create -c vm.cfg`, or Oracle VM Manager.
5. Deploy the application using `-nostage`.

- Using the `weblogic.Deployer` command-line tool:

```
java weblogic.Deployer -adminurl t3://<VM Admin Host>:<Admin Port>
-user <User Name> -password <Password> -name <App Name> -targets
<Server Name/Cluster> -nostage -upload -deploy /<NFS Deploy Location>
/<Ear/WAR file>
```

- From the Administration Console. (Refer WLS doc for deployment using Administration Console.)

While deploying the application, select `nostage` (it will make the deployment accessible from the following location) and finish the deployment.

When you deploy an application using `nostage` mode, deployed applications are available in `/<NFS Location in Server>/<Upload Directory>`.

Note: If you are deploying an application to a cluster, make sure that all the Managed Servers in the cluster are configured with the NFS mounting location.

For more information about the `nostage` deployment mode, see "Controlling Deployment File Copying with Staging Modes" in *Deploying Applications and Modules with weblogic.Deployer*

4.3.3 Configuring external_stage Mode Deployment on NFS

The Administration Server does not copy deployment files. Instead, the Administrator must ensure that deployment files are distributed to the correct staging directory location before deployment (for example, by manually copying files prior to deployment).

1. Follow the directions in [Section 4.3.1, "Configure the NFS Server and Mounting Points In a Virtual Machine"](#) to configure the NFS server export directory.
2. Create the Upload and Stage directory in the NFS location.
3. Using the Image Tool, create the mount point in the `wlsve.xml` configuration file for the deploy (Upload directory) and stage directories for the VMs

```
java -jar wlsveimagetool.jar --reconfigure vm.cfg add mount nfs
/<Server_Stage_Dir> <NFS Server host> <NFS_location>/<Stage_directory>
<Options>
```

```
java -jar wlsveimagetool.jar --reconfigure vm.cfg add mount nfs
/<Server_Upload_Dir> <NFS Server host> <NFS_location>/<Upload_directory>
<Options>
```

Note: Make sure that the `<Stage_directory>` and `<Upload_directory>` directories exists on the exported NFS location.

For example:

```
java -jar wlsveimagetool.jar --reconfigure vm.cfg add mount nfs
/application/user_projects/domains/wlsve_domain/servers/WlsveAdmin/upload
adc2190200.us.oracle.com /scratch/<userdir>/nfs/deploy uid=11735 gid=900
```

```
java -jar wlsveimagetool.jar --reconfigure vm.cfg add mount nfs
/application/user_projects/domains/wlsve_domain/servers/WlsveAdmin/stage
adc2190200.us.oracle.com /scratch/<userdir>/nfs/stage uid=11735 gid=900
```

4. On each target server for the deployment, create a subdirectory in the staging directory that has the same name as the deployment name.

```
/scratch/<userdir>/nfs/stage/<Application_Name>
```

5. Copy the deployment files into the newly created staging subdirectories. For example:

```
/scratch/<userdir>/nfs/stage/<Application_Name>/ <Application_Name>.ear(.war)
```

6. Transfer the VM image to your Oracle VM environment, and then start the VM using WLST, the `xm` command (`xm create -c vm.cfg`), or Oracle VM Manager.
7. Deploy the application or module from a remote client using the `weblogic.Deployer` utility.

```
java weblogic.Deployer -adminurl t3://<VM Admin Host>:<Admin Port>
-user <User Name> -password <Password> -name <App Name> -targets
<Server Names/Cluster Name> -name <Application Name> -external_stage
-upload -deploy <WAR/EAR file>
```

For more information about the `external_stage` deployment mode, see "Controlling Deployment File Copying with Staging Modes" in *Deploying Applications and Modules with weblogic.Deployer*

Managing WebLogic Virtual Machines

These sections explain how to manage WebLogic Server VM s running on Oracle VM, in both running and non-running mode, as described in the following sections.

- Section 5.1, "Adding Managed Servers to a Domain on a Running Administration Server VM"
- Section 5.2, "Creating a Virtual WebLogic Server Cluster"
- Section 5.3, "Managing Virtual Servers on Oracle VM"
- Section 5.4, "Modifying a WebLogic Server Configuration Using WLST Online"
- Section 5.5, "Patching Virtual Machines"
- Section 5.6, "Configuring a Shared Disk On NFS to Store Server Log Files"
- Section 5.7, "Creating a Root Domain Directory Other Than the Default "/application" Domain Directory"
- Section 5.8, "Using the Image Tool to Extract or Insert Files With Profile-based Support"
- Section 5.9, "Injecting an Upgraded Domain into a WebLogic Server VM Image"

5.1 Adding Managed Servers to a Domain on a Running Administration Server VM

On your development machine, you can use the original WebLogic Server image template image as a base to make the desired number of copies of VM images, and then use the Image Tool to modify each VM image copy to correspond to each Managed Server in your domain, before uploading them to your Oracle VM environment.

Caution! As a security precaution, VM templates containing WebLogic Server domains should not be used as templates to clone new domains.

1. From your production machine, use the Administration Console to access the online VM running the Administration Server domain. Open a browser and enter the following URL:

```
http://admin.server.ip.address:7001/console
```

where *admin.server.ip.address* is the IP address assigned to your virtual machine.

2. From the Administration Console, add the desired number of Managed Servers to your domain.

3. Create and add a Machine for each Managed Server in order for the VMM Node Manager client to be able to manage them while deployed on Oracle VM.
 - a. Navigate to the Domain > Environment > Machines page.
 - b. On the General tab, click **New**.
 - c. Provide a name for the new Machine, select **Virtual** for the Machine OS, and then click **Next**.
 - d. On the Virtual Manager tab, define the Virtual Manager properties for the Machine:

Table 5–1 Virtual Manager Tab Properties

Property	Definition
Type	The VMM Node Manager client type: either VMM (Insecure) or VMMS (Secure).
Listen Address	The host name or IP address where the VMM Node Manager client listens for connection requests.
Listen Port	The port where the Oracle VM Manager listens for connection requests (either Secure or inSecure).
Adapter	Defaults to OracleVM(2.2.1), which is the only supported adapter.
User	User name used by the VMM Node Manager client.
Password/Confirm Password	Password used by the VMM Node Manager client.

- e. Click **Save**.
 - f. Return to the Managed Server page and add the Machine to the Managed Server.
 - g. Repeat this step for each Managed Server in the domain.
4. Configure health monitoring capability for each Managed Server in the domain to improve reliability and availability of each server:
 - a. Navigate to the Domain > Environment > Servers page.
 - b. Select a server from the **Summary of Servers** table to open the **Settings for Servers** page, and then select the **Health Monitoring** tab.
 - c. Select the **Auto Restart** check box so the VMM Node Manager client can automatically restart the server if it crashes or goes down unexpectedly.
 - d. In the **Max Restarts Within Interval** field, specify the number of times the VMM Node Manager client can restart the server.
 - e. In the **Restart Delay Seconds** field, specify the number of seconds the VMM Node Manager client should wait before restarting the server.
 - f. Click **Save**.

Note: Such restarts only relate to server health state checks that WebLogic Servers performs and not to external Oracle VM actions, such as `xm destroy`.
5. Using the original WebLogic Server VM image as a base, make the desired number of copies of VM images that will represent your virtual Managed Servers.
6. Use the Image Tool to configure these VM image copies to correspond to each Managed Server, as follows:

- a. Update the `<java-arguments>` to start up the Managed Servers on the virtual machine.

```
$java -jar wlsveimagetool.jar -r vm.cfg set java-arguments <new arguments>
```

The new arguments must include the domain name, the Managed Server name, the username and password, and the Administration Server it connects to:

```
-cp $JAVA_HOME/lib/tools.jar:/jrockitve/lib/common.jar:  
/application/patch_wls1034/profiles/default/sys_manifest_classpath  
/weblogic_patch.jar:/application/wlserver_10.3/server/lib/weblogic.jar  
-Dweblogic.management.username=username  
-Dweblogic.management.password=password  
-Dweblogic.Domain=domainName  
-Dweblogic.Name=managedServerName  
-Dweblogic.management.server=admin.server.ip.address:7001 weblogic.Server
```

where *admin.server.ip.address* is the IP address assigned to your virtual machine, and *username* and *password* are the user name and password for the Administration Server.

- b. Update the `vm-name` for each added Managed Server.

```
$java -jar wlsveimagetool.jar -r vm.cfg set vm-name <new vm-name>
```

Each VM image requires a different name, which represents the name of the WebLogic Server virtual machine seen by the management frameworks.

Tip: To more easily manage your VM's using the VMM Node Manager client, Oracle suggests following the naming convention for Virtual Machine Name, which is `<domain_name>_<Server_Name>`. However, if you need to change the VM name to something else, you can use either WLST to set the `virtualMachineName` attribute on the `MachineMBean`, or you can use the Administration Console to modify the **Virtual Machine Name** field on the `Server Settings > Configuration` tab (under **Advanced** entries).

- c. If your network is not using DHCP, modify the network configuration parameters in the `wlsve.xml` for each Managed Server, as explained in Step 2 of [Section 3.2, "Deploying the Base VM Image With a New Single-Server Domain"](#).
 - d. Repeat these steps as necessary for each Managed Server VM image.
7. Transfer the Managed Server VMs to an Oracle VM server under the `/OVS/running_pool/<vm-name>/` directory.

For more detailed directions on how to deploy, register, and start a virtual machine on Oracle VM, see the *Oracle VM Server Documentation*.

8. In order to manage your Administration and Managed Server VM images using the VMM Node Manager client, you must import the images to the Oracle VM Manager using the Oracle VM Manager console.
 - a. Log in to the OVM Manager.
 - b. Select the **Resources** tab.
 - c. Open the Virtual Machine Images page and click **Import**.
 - d. Click the **Select from Server Pool (Discover and register)** option, and then click **Next**.
 - e. Complete the following options:

- Select the Server Pool Name.
 - Select Virtual Machine Image Name from the selected server pool.
 - Enable High Availability.
 - Select the Operating System.
 - Complete the remaining VM username and password parameters.
- f. Click **Next**, and then click **Confirm**.
 - g. After the VM import status completes (the status will be Pending), select the **VM name** and click **Approve**.
Return to the Virtual Machine Images page, and verify that the imported VM's name appears in list of VM images.
9. After all the Managed Servers VMs have been started, they will show up in the Administration Console as *running*, where you can now manage them as described in [Section 5.3, "Managing Virtual Servers on Oracle VM."](#)

5.2 Creating a Virtual WebLogic Server Cluster

After adding your Managed Server VMs to a domain that is running Administration Server VM, you can create a cluster, and then add your Managed Server VMs to it.

1. From your development machine, open a browser and enter the following URL to access the online VM running the Administration Server domain.

`http://admin.server.ip.address:7001/console`

where *admin.server.ip.address* is the IP address assigned to your Administration Server virtual machine.

2. From the Administration Console, navigate to the **<domain> -> Environment -> Servers -> Summary of Servers** page.
3. Select the **Control** tab, and then stop the running Managed Server VMs.
4. Navigate to the **<domain> -> Environment -> Clusters** page.
5. Create a new cluster by providing the following information:
 - Name: *demoCluster*
 - Messaging Mode: Multicast
 - Multicast Address: 239.192.0.0 (default)
 - Multicast Port: 7050
6. Navigate to the **demoCluster -> Configuration -> Servers** page.
7. Add the Managed Servers to the cluster.
8. Restart the Managed Server VMs, as described in [Table 1–1, "Roadmap for Starting and Running WebLogic Server VMs on Oracle VM"](#).
9. Navigate to the **<domain> -> Environment -> Servers** page. Note that the Managed Servers are available as members of the *demoCluster*.

5.3 Managing Virtual Servers on Oracle VM

After you have added Managed Servers to your virtual domain, you can then manage their life cycle using either the Administration Console or WLST.

- [Section 5.3.1, "Managing Running Virtual Servers With the Administration Console"](#)
- [Section 5.3.2, "Managing Running Virtual Servers With WLST"](#)

5.3.1 Managing Running Virtual Servers With the Administration Console

You can use the Administration Console to change the state of the Manage Servers in a running WebLogic Server domain.

1. From your development machine, open a browser and enter the following URL to access the online VM running the Administration Server domain.

```
http://admin.server.ip.address:7001/console
```

where *admin.server.ip.address* is the IP address assigned to your Administration Server virtual machine.

2. From the Administration Console, navigate to the **<domain> -> Environment -> Servers -> Summary of Servers** page.
3. Select the **Control** tab.
4. In the Server Status table, select the check box next to the name of the Managed Server(s) VM that you want to control, and then select one of the following options:
 - Start – Sends a request to the VMM Node Manager client to start the selected servers.
 - Stop – Sends a request to the VMM Node Manager client to stop the selected servers.
 - Suspend– Sends a request to the VMM Node Manager client to suspend the selected servers (either "When work completes" or "Force Suspend Now").
 - Shutdown – Sends a request to the VMM Node Manager client to shut down the selected servers (either "When work completes" or "Force Shutdown Now").
 - Restart SSL – Restarts the SSL listen sockets so that keystore changes take effect.
5. Accept or reject your selection on the Server Life Cycle Assistant page by clicking **Yes** or **No**.
6. To view status information related to this task, click the **Task** link in the Status of Last Action column.

For more information about the states through which a WebLogic Server instance can transition, see "Understanding Server Life Cycle" in *Managing Server Startup and Shutdown for Oracle WebLogic Server*.

5.3.2 Managing Running Virtual Servers With WLST

You can use the WebLogic Scripting Tool (WLST) in online mode to change the state of the servers in a running WebLogic Server domain.

- [Section 5.3.2.1, "Setting Up the Classpath and Starting WLST"](#)
- [Section 5.3.2.2, "Using the VMM Node Manager Client to Connect to the Oracle VM Manager"](#)

- [Section 5.3.2.3, "Using the Virtual Machine Manager to Start the Administration Server"](#)
- [Section 5.3.2.4, "Connecting to the Administration Server and Controlling the Managed Servers"](#)
- [Section 5.3.2.5, "Shutting Down the Administration Server"](#)

5.3.2.1 Setting Up the Classpath and Starting WLST

First, you need to make sure that your classpath is correct and contains the relevant WebLogic Server bits. The `weblogic_patch.jar` and the VMM Node Manager client and adapter modules need to be ahead of the usual WebLogic CLASSPATH JARs needed for WebLogic Server.

One way to set your classpath is to disassemble your image into an `/application` directory on your Linux development machine so you have everything you need on your local machine.

Set the Classpath

Set the classpath as follows:

```
. /application/wlserver_10.3/server/bin/setWLSEnv.sh
```

This command does not setup the classpath in `$CLASSPATH`, but instead in `$WEBLOGIC_CLASSPATH`, so you can either use that or set `$CLASSPATH` to the value of `$WEBLOGIC_CLASSPATH`.

Start Up WLST

```
java -cp $WEBLOGIC_CLASSPATH weblogic.WLST
Initializing WebLogic Scripting Tool (WLST) ...
Welcome to WebLogic Server Administration Scripting Shell
Type help() for help on available commands
wls:/offline>
```

5.3.2.2 Using the VMM Node Manager Client to Connect to the Oracle VM Manager

Use the following VMM Node Manager client command to connect Oracle VM Manager that is hosting the WLS on JRVE servers that you want to control.

```
wls:/offline> nmConnect('admin','oracle','<machine-name>','8888',
'wlsve_domain', '/application/user_projects/domains/wlsve_domain',
'VMM-OracleVM_2.2')
Connecting to Node Manager ...
Successfully Connected to Node Manager.
wls:/nm/wlsve_domain>
```

The available `nmConnect` properties are described in [Table 5-2](#).

Table 5-2 nmConnect() Properties

Property	Definition
<code>username</code>	User name used by the Oracle VM Manager to connect to the VMM Node Manager client.
<code>password</code>	Password used by the Oracle VM Manager to connect to the VMM Node Manager client.
<code>host</code>	The host name or IP address where Oracle VM Manager listens for connection requests from the VMM Node Manager client.

Table 5–2 (Cont.) nmConnect() Properties

Property	Definition
port	The port where the Oracle VM Manager listens for connection requests (either Secure or inSecure) from the VMM Node Manager client.
domain	WebLogic Server domain name.
domaindir	WebLogic Server domain directory.
nmType	A string with the following syntax: [VMM[S] [-<adapter-name>] [_<adapter-version>]] where, <ul style="list-style-type: none"> ▪ -<adapter-name> is OracleVM (the default) for WLS on JRVE ▪ _<adapter-version> is 2.2.1 (the default) for WLS on JRVE ▪ S if present, indicates a secure connection For example, if you want to use a secure connection, you would substitute VMMS for VMM in the Node Manager type field, VMMS-OracleVM_2.2, and change to the secure port.

5.3.2.3 Using the Virtual Machine Manager to Start the Administration Server

To use a VMM (Virtual Machine Manager) Node Manager client with WLST, you do not have to have one configured in the Administration Console. This is because the VMM (or secure VMMS) Node Manager client does not use a Node Manager service/process like non-virtual WebLogic Server Node Managers, but is, instead, a Web service interface with the Oracle VM Manager being used to host WebLogic Server VMs.

When you want to control a server using the VMM Node Manager client and the nm commands, you need to use the virtual machine name instead of the server name. For example, when starting an Administration Server with the default VirtualMachineName. In the VM image template, the default VirtualMachineName for the Administration Server is WlsveAdmin, so you should issue the nmStart() command to start the Administration Server.

To check the Administration Server's status, enter:

```
wls:/nm/wlsve_domain> nmServerStatus('wlsve_domain_WlsveAdmin')
```

```
POWEREDOFF
```

To start the Administration Server, enter:

```
wls:/nm/wlsve_domain> nmStart('wlsve_domain_WlsveAdmin')
Starting server wlsve_domain_WlsveAdmin ...
Successfully started server wlsve_domain_WlsveAdmin ...
```

To re-check the Administration Server's status, enter:

```
wls:/nm/wlsve_domain> nmServerStatus('wlsve_domain_WlsveAdmin')
RUNNING
```

To stop the Administration Server, enter:

```
wls:/nm/wlsve_domain> nmKill('wlsve_domain_WlsveAdmin')
Killing server wlsve_domain_WlsveAdmin ...
```

Successfully killed server wlsve_domain_WlsveAdmin

5.3.2.4 Connecting to the Administration Server and Controlling the Managed Servers

After you have started the Administration Server, you can connect to it and then simply use the non-nm server control commands to control your managed servers using just the WLS server names without have to use the potentially very long VM names. The reason that you don't need to know the VM names at this point is that the Administration Server knows what they are and can do the mapping from WLS server name to VM name for you.

To connect to the Administration Server, enter:

```
wls:/nm/wlsve_domain> connect('weblogic','welcome1', 't3://<host>:7001')
Connecting to t3://paia:7001 with userid weblogic ...
Successfully connected to Admin Server 'WlsveAdmin' that belongs to domain 'wlsve_
domain'.
```

```
wls:/wlsve_domain/serverConfig> state('WlsveMgd1','Server')
Current state of 'WlsveMgd1' : POWEREDOFF
```

To start a Managed Server, enter:

```
wls:/wlsve_domain/serverConfig> start('WlsveMgd1','Server')
Starting server WlsveMgd1 .....

Server with name WlsveMgd1 started successfully
wls:/wlsve_domain/serverConfig> state('WlsveMgd1','Server')
Current state of 'WlsveMgd1' : RUNNING
```

If you have a cluster defined, you can use the `state()` command as follows:

```
wls:/wlsve_domain/serverConfig> state('WlsveCluster','Cluster')

There are 2 server(s) in cluster: WlsveCluster

States of the servers are
WlsveMgd1---RUNNING
WlsveMgd2---SHUTDOWN
```

You can also control Managed Servers without connecting to the Administration Server. However, it is not as convenient because you have to use the nm commands and have to know and use the virtual machine names. However, this method works best if you are using the default VirtualMachineName, and not the potentially long VM names.

5.3.2.5 Shutting Down the Administration Server

To stop the Administration Server, enter:

```
wls:/nm/wlsve_domain> nmKill('wlsve_domain_WlsveAdmin')
Killing server wlsve_domain_WlsveAdmin ...
Successfully killed server wlsve_domain_WlsveAdmin
```

To check the Administration Server status and after shutting it down, enter:

```
wls:/nm/wlsve_domain> nmServerStatus('wlsve_domain_WlsveAdmin')
POWEREDOFF
```


5.4 Modifying a WebLogic Server Configuration Using WLST Online

You can use the WebLogic Scripting Tool (WLST) in online mode to modify the domain configuration of a running WebLogic Server virtual machine.

Note: WLST in offline mode is not supported on the VM image directly but it is supported with the physical WebLogic installation on WebLogic Server VMs.

1. On your Linux development machine for the online WebLogic Server VM, set up the WLST environment, as follows:
 - Run the `setWLSenv.sh` script in `WL_HOME\server\bin`.
 - Adds WebLogic Server classes to the `CLASSPATH` and `WL_HOME\server\bin` to the `PATH`.
2. Invoke WLST from the development WebLogic Server environment, as follows:


```
java weblogic.WLST
```

WLST starts in Offline mode.
3. Connect to the running WebLogic Server VM domain. For example:


```
wls:/offline> connect('weblogic','welcome1','admin.server.ip.address:7001')
```

where `admin.server.ip.address` is the IP address assigned to your virtual machine.
4. Once connected you can perform WLST configuration management options on virtual machines. The following table describes some common WLST operations that are available in Online mode:

Table 5-3 Common WLST Online Commands

WLST Command	What it does...
Change to the edit tree	<code>wls:/wl_server/domainConfig> edit()</code>
Get an edit lock	<code>wls:/wl_server/edit> startEdit()</code>
Make changes	<pre>wls:/wl_server/edit!> svr = cmo.createServer("managedServer") wls:/wl_server/edit!> svr.setListenPort(8001) wls:/wl_server/edit!> svr.setListenAddress("my-address")</pre> <p>Note: Replace <code>my-address</code> with the IP address of your VM.</p>
Save (and implicitly validate) your changes	<code>wls:/wl_server/edit!> save()</code>
Activate/distribute, release lock	<code>wls:/wl_server/edit!> activate()</code>

5.5 Patching Virtual Machines

You can apply patches to WebLogic Server VMs by using SmartUpdate to leverage the Image Tool's "profile properties" file to perform profile-based updates of the WebLogic Server installation in the VM:

Note: Using the Image Tool to disassemble and re-assemble VM images is not supported on Windows platforms. Windows users should instead use a Linux machine for virtual machine disassembly and assembly operations.

For more information, see [Section 5.8, "Using the Image Tool to Extract or Insert Files With Profile-based Support"](#).

1. Download the virtual machine onto the file system of your development machine.
2. On your development machine, run the following command as the root user, to extract the directories required for patching from the image.

```
java -jar wlsveimagnetool.jar -e vm.cfg wls
```

Tip: Add `-force` to the command-line if the `/application` directory is not empty.

3. Before running the Smart Update tool, change the `JAVA_HOME` in the `/application/utills/bsu/bsu.sh` file to your development machine's `JAVA_HOME`.
4. Run the Smart Update tool:

```
sh bsu.sh
```

5. In the Smart Update GUI, select **File -> Target Installation-> Find Other BEA home -> Patch/application**. Now `Patch/application` serves as the `BEA_HOME` where patches will be downloaded and applied.
6. Get the patches that are listed by Smart Update or by using the patch ID and password.
7. Apply the patches.
8. Use profile-based insertion to insert the patched image back into the VM:

```
java -jar wlsveimagnetool.jar -i vm.cfg wls
```

9. Transfer the patched VM to your Oracle VM environment, and then start the virtual machine, as described in [Table 1-1, "Roadmap for Starting and Running WebLogic Server VMs on Oracle VM"](#).

For more detailed directions on how to deploy, register, and start a virtual machine on Oracle VM, see the *Oracle VM Server Documentation*.

10. Verify the patched VM running on the Oracle VM server.

5.6 Configuring a Shared Disk On NFS to Store Server Log Files

You can use the Network File System (NFS) to automount and transparently access a read-only shared disk on your network. This way, you can output the WebLogic Server logs to the shared disk to save disk space on your VMs.

1. Follow the directions in [Section 4.3.1, "Configure the NFS Server and Mounting Points In a Virtual Machine"](#) to configure the NFS server export directory.
2. Create a /logs directory in the NFS location.
For example, <Export dir>/logs.
3. Using the Image tool, create the mounting point in the wlsve.xml configuration file for the upload directories for the VM.

```
java -jar wlsveimagetool.jar --reconfigure vm.cfg add mount nfs
<WLSVE server's log file location> <nfs server> <nfs server-path>
<option1> <...> <optionN>
```

Here's how to create it using the default domain names in the VM template:

```
java -jar wlsveimagetool.jar --reconfigure vm.cfg add mount nfs
/application/user_projects/domains/wlsve_domain/servers/WlsveAdmin/logs/
<nfs server> <nfs server-path> <option1> <option2> <...> <optionN>
```

For example:

```
java -jar wlsveimagetool.jar --reconfigure vm.cfg add mount nfs
/application/user_projects/domains/wlsve_domain/servers/WlsveAdmin/logs/
scratch/userdir/nfs/logs uid=11735 gid=900
```

In this example, the logs directory is created in the NFS Server location (/scratch/userdir/nfs/) for the mounting point in the VM /application/user_projects/domains/wlsve_domain/servers/WlsveAdmin/logs.

4. After starting the VM, the logs are created under the NFS Server shared location <nfs server-path>.
5. Tail the log file to see the logs, or you can read the logs.

Note: In this release, log files are read-only, and so should not be modified. Therefore, if you attempt to overwrite the log files at the shared location, the following information will appear in the VM console output:

```
Handler: '/<path>/WlsveAdmin.log' raised exception when flushing.
Handler: '/<path>/WlsveAdmin.log' raised exception when flushing.
Handler: '/<path>/WlsveAdmin.log' raised exception when flushing.
Handler: '/<path>/WlsveAdmin.log' reported critical error(s). Shutting it down.
```

Tip: If some reason, a user does modify the log files at a shared location, see ["Section 7.2, "Using WLST to Reopen a Closed Log File."](#)

5.7 Creating a Root Domain Directory Other Than the Default "/application" Domain Directory

To simplify the domain creation process, the wlsve.xml file in the packaged WebLogic Server virtual image has placeholders for a new domain to be created in Development mode under the /application/user_projects/domains/wlsve_domain/ directory. However, you can also use the Image Tool to create new single-server domain in the VM image outside the default /application directory, using a name of your choice.

1. From the directory where you unzipped the WebLogic Server on JRockit VE package, use the following Image Tool command to extract a copy of the wlsve.xml configuration file from the original VM image:

```
$java -jar wlsveimagetool.jar -r vm.cfg get config wlsve.xml
```

- Using a text editor, update the `working-dir` tag in the `wlsve.xml` file to point the virtual image to the new domain you will be using. For example:

```
<working-dir>/other_than_application_dir/domain_name</working-dir>
```

where *domain_name* represents the name of the WebLogic Server domain (for example, *mywlsve_domain*).

- Complete the process for creating a new domain, transfer the VM to Oracle VM, and starting the new VM by following steps 3–8 in [Section 3.2, "Deploying the Base VM Image With a New Single-Server Domain"](#)

Note: Newly created domains are always created in Development mode.

- After logging in to WebLogic Server, use the Administration Console to make the following directory location changes:
 - [Section 5.7.1, "Changing the Deployment and Applications Directory Location Other Than /application"](#)
 - [Section 5.7.2, "Changing the Server Log Directory Location Other Than /application"](#)

5.7.1 Changing the Deployment and Applications Directory Location Other Than /application

After specifying your domain application directory in the VM's configuration file, you need to make parallel changes to the server. To change these directories using the Administration Console, follow these steps:

- Navigate to the Environments > Servers page.
- Select the server whose directory locations you are going to change to match the directory locations in the VM.
- Click the **Deployment** tab.
- Enter the new location of the staging directory and the new location of the upload directory. For example:

```
Staging Directory Name: /stage_directory/WlsveAdmin/stage
```

```
Upload Directory Name: /upload_directory//WlsveAdmin/upload
```

- Click **Save**.
- Click **Activate Changes**.
- Restart the server for the changes to get affected fully.

5.7.2 Changing the Server Log Directory Location Other Than /application

After specifying your log directory in the VM's configuration file, you need to make parallel changes to the server. To change the this directory using the Administration Console, follow these steps:

- Navigate to the Environments > Servers page.
- Select the server whose directory locations you are going to change to match the locations in the VM.
- Click the **Logging** tab.

4. Enter the new location of the server log directory. For example:
Log File Name: /new_serverlog_location/WlsveAdmin.log
5. Click **Save**.
6. Click **Activate Changes**.
7. Restart the server for the changes to get affected fully.

5.8 Using the Image Tool to Extract or Insert Files With Profile-based Support

The Image Tool provides a profile (or properties) file that allows you to define a subset of the VM virtual file system to be extracted or inserted by name. The default profile supports the extraction and reinsertion of the files that constitute the WebLogic Server installation within a WebLogic Server VM for the purpose of using SmartUpdate to perform updating of the WebLogic Server installation in the VM

- [Section 5.8.1, "Creating a Profile"](#)
- [Section 5.8.2, "Performing Profile-based File Extraction On an Image"](#)
- [Section 5.8.3, "Performing Profile-based File Insertion On an Image"](#)

5.8.1 Creating a Profile

The profile properties file defines which files or entire directories are extracted or inserted. To create a profile (*myprofile.properties*) for insertion and extraction, use this command:

```
subset=<source file/directory>,<target file/directory>
```

The Image Tool checks whether the profile directive refers to a directory or a single file. If it refers to a directory, only the top-level files in that directory are moved unless the *r* option (for recursive) is appended to the subset name for the line in question.

Here's an example of the built-in profile when using default /application domain:

```
wls.description=WebLogic Server files needed for running Smart Update
wls.1=/application/*,/application/
wls.2.r=/application/modules/*,/application/modules/
wls.3.r=/application/patch_wls1034/*,/application/patch_wls1034/
wls.4.r=/application/utills/*,/application/utills/
wls.5.r=/application/wlserver_10.3/*,/application/wlserver_10.3/
```

A recommended pattern to move all top-level files from /src to /target is:

```
a.1=/src/*,/target/
```

(Make sure there is a trailing slash after *target* or the Image Tool will not recognize it as a directory.)

```
a.2.r=/src/*,/target/
```

This is similar to the first line, but the *r* option directs the Image Tool to descend into the /src directory and recursively copy everything in it.

5.8.2 Performing Profile-based File Extraction On an Image

Before executing the *extract* command, you can preview the command output.

```
java -jar wlsveimagetool.jar --extract vm.cfg <subset> --profile <my.properties>
--preview
```

Then execute the extract command:

```
java -jar wlsveimagetool.jar --extract vm.cfg <subset> --profile <my.properties>
```

If a destination directory already exists with files, the extraction will fail. In this case, you have to use the force command, which overwrites files that already exist in the destination location.

```
java -jar wlsveimagetool.jar --extract vm.cfg <subset> --profile <my.properties>
--force
```

Example: Extracting Files From an Image:

This section provides an example profile, `testprofile.properties`, used for file extraction.

```
testprofile.description=WebLogic Server files needed for running Smart Update
testprofile.1=/application/modules,/home/userdir/modules
testprofile.2.r=/application/utills/,/home/userdir/utills/
testprofile.3.r=/application/patch_wls1034,/home/userdir/patch_wls1034
```

Execute the extract command:

```
$java -jar wlsveimagetool.jar --extract vm.cfg testprofile --profile
testprofile.properties --preview
```

```
testprofile - WebLogic Server files needed for running Smart Update
Will execute the following cmd: -f vm.cfg get /application/modules
/home/userdir/modules
Will execute the following cmd: -f vm.cfg rget /application/utills/
/home/userdir/utills/
Will execute the following cmd: -f vm.cfg rget /application/patch_wls1034
/home/userdir/patch_wls1034
Done
```

5.8.3 Performing Profile-based File Insertion On an Image

Before executing the insert command, you can preview the command output.

```
java -jar wlsveimagetool.jar --insert vm.cfg <subset> --profile <my.properties>
--preview
```

Then execute the insert command:

```
java -jar wlsveimagetool.jar --insert vm.cfg <subset> --profile <my.properties>
```

Example: Inserting Files Into an Image:

This section provides an example profile, `testprofile.properties`, used for file insertion.

```
testprofile.description - WebLogic Server files needed for running Smart Update
testprofile.1=/application/modules,/home/userdir/modules
testprofile.2.r=/application/utills/,/home/userdir/utills/
testprofile.3.r=/application/patch_wls1034,/home/userdir/patch_wls1034
```

Execute the insert command:

```

$java -jar wlsveimagetool.jar --insert vm.cfg testprofile --profile
testprofile.properties --preview

testprofile - WebLogic Server files needed for running Smart Update
Will execute the following cmd: -f vm.cfg put /application/modules
/home/userdir/modules
Will execute the following cmd: -f vm.cfg rput /application/utills/
/home/userdir/utills/
Will execute the following cmd: -f vm.cfg rput /application/patch_wls1034
/home/userdir/patch_wls1034
Done

```

5.9 Injecting an Upgraded Domain into a WebLogic Server VM Image

On your development machine, you can use the Image Tool to inject an upgraded physical WebLogic Server 11g Release 10.3.4 domain to a WebLogic Server VM image. This will require updating the `wlsve.xml` file, which represents the configuration file for the virtual image.

1. On your development machine, use the Configuration Wizard to create a WebLogic Server domain in your `MW_HOME` directory.
2. Access the migrated domain using the WLST `readDomain('/path/to/domain')` command, and then update the domain's configuration file (`config.xml`), as follows:

For more information about using WLST, see the *Oracle WebLogic Server Scripting Tool* user guide.

- Modify the listen address, server name, machine name, and cluster address to correspond with the virtual host where the VM will be running.
- You may need to modify your application's deployment paths. Also, if you want to use a root domain directory other than the default `/application` directory in the VM image, see [Section 5.7, "Creating a Root Domain Directory Other Than the Default "/application" Domain Directory."](#)
- Due of the limited amount of storage space per VM, you may also want disable the server access logs. You can then configure the VM to have its server logs hosted on a shared disk on NFS, as explained in [Section 5.6, "Configuring a Shared Disk On NFS to Store Server Log Files."](#)

Important! In most circumstances, you should not use a text editor or other non-Oracle tools to modify a domain's configuration document. Instead, use the Administration Console, WLST, or one of the other tools described in the "Overview of Oracle WebLogic Server System Administration" in the *Introduction to Oracle WebLogic Server*.

3. Upgrade the domain using Domain Upgrade Wizard, as follows:

```
sh $BEA_HOME/wlserver_10.3/common/bin/upgrade.sh
```

4. Inject the domain into the WebLogic Server VM image using the following command:

```
java -jar wlsveimagetool.jar -f vm.cfg rput $BEA_HOME/user_projects
/domains/domain_name /applicationn/user_projects/domains/
```

5. Use the Image Tool to extract the `wlsve.xml` configuration file from the image:

```
$java -jar wlsveimagetool.jar -r vm.cfg get config wlsve.xml
```

6. Point the virtual image to the domain you will be using by updating the `<working-directory>` tag in the `wlsve.xml` file. For example:

```
<working-dir>/application/user_projects/domains/wlsve_domain</working-dir>
```

7. Update the `<java-arguments>` tag in the `wlsve.xml` file as follows:

```
-Dweblogic.Name=serverName  
-Dweblogic.Domain=domainName weblogic.Server
```

where *domainName* represents the name of the WebLogic Server domain (for example, *wlsve_domain*) and *ServerName* is the name of the server (for example, *WlsveServer*).

8. Use the Image Tool to inject the updated `wlsve.xml` file inside the VM image with the following command:

```
$java -jar wlsveimagetool.jar -r vm.cfg set config wlsve.xml
```

9. Transfer the VM image to your Oracle VM environment, and then start the virtual machine, as described in [Table 1-1, "Roadmap for Starting and Running WebLogic Server VMs on Oracle VM"](#).

For more detailed directions on how to deploy, register, and start a virtual machine on Oracle VM, see the *Oracle VM Server Documentation*.

Post Installation Tasks

This section includes post-installation tasks that can be run with configured WebLogic Server VMs.

- [Section 6.1, "Using the MedRec Sample Domain With Oracle Database"](#)
- [Section 6.2, "Starting a WebLogic Server VM Domain With the boot.properties File"](#)
- [Section 6.3, "Installing Demo Certificates for SSL Usage"](#)
- [Section 6.4, "Setting Localization Parameters"](#)

6.1 Using the MedRec Sample Domain With Oracle Database

The WebLogic Server on JRockit VE package includes instructions that are necessary to reconfigure the MedRec application to work with Oracle Database. Please follow the steps in *Using the Oracle WebLogic Server on JRockit Virtual Edition MedRec Domain With Oracle DB* ([wlsve_medrec_domain_with_odb.pdf](#)).

6.2 Starting a WebLogic Server VM Domain With the boot.properties File

You can start a WebLogic Server VM domain using a `boot.properties` file, which removes the need to specify a username and password in the `java-arguments` section of the `wlsve.xml` file. However, there are additional steps required to use the `boot.properties` file in some cases.

Changing the Username and Password In `boot.properties`

When changing the username and password in the `boot.properties` file, the new username and password values must match an existing user account in the Authentication provider for the default security realm *and* must belong to a role that has permission to start a server.

Configuring `boot.properties` When Creating a New Domain

When creating a new domain, you have to pass `weblogic.management.username` and `weblogic.management.password` in the Java arguments in the `wlsve.xml` configuration file for the VM image.

After creating the domain, stop the server instance and remove the `weblogic.management.username` and `weblogic.management.password` from the Java arguments in the `wlsve.xml` file. When you restart the server instance, it will automatically take the username and password from server's `boot.properties` file.

Creating boot.properties for Managed Servers

For Managed Servers, if you haven't specified the username and password in the `wlsve.xml` configuration file, you have to create a new `boot.properties` file and inject it into the Managed Server's VM at the security directory of the Managed Server's root directory.

For more information, see "Provide User Credentials to Start and Stop Servers" in *Managing Server Startup and Shutdown for Oracle WebLogic Server*.

6.3 Installing Demo Certificates for SSL Usage

Because a physical Oracle WebLogic Server installation captures the installation host name in the `DemoIdentity.jks` certificate, WebLogic Server on JRockit VE does not include standard installation demo certificates even though WebLogic Server is configured by default to use it. Therefore, in order to use SSL with WebLogic Server VMs you have to generate and install your own demo certificates.

For more information about SSL for WebLogic Server, refer to "Configuring Identity and Trust" and "Configuring SSL" in *Securing Oracle WebLogic Server*.

- [Section 6.3.1, "Use CertGen to Generate a Certificate Signed By the WebLogic Demo CA"](#)
- [Section 6.3.2, "Store the Certificate In the DemoIdentity Keystore"](#)
- [Section 6.3.3, "Accessing WebLogic Server VMs With SSL Using a Browser"](#)
- [Section 6.3.4, "Accessing WebLogic Server VMs Using WLST"](#)
- [Section 6.3.5, "Accessing the VMM Node Manager Client Using WLST"](#)
- [Section 6.3.6, "Configuring WebLogic Server to Securely Connect to VMM Node Manager Clients"](#)

Note: The instructions in this section refer to the files in the WebLogic Server directories as if they were on a local file system. However, the files need to be updated in the WebLogic Server image, either by using the Image Tool to get/put them in a non-running image, or by using SCP (secure copy) or SFTP (secure FTP) to get/put the files on a running WebLogic Server VM.

6.3.1 Use CertGen to Generate a Certificate Signed By the WebLogic Demo CA

The following steps assume that you have a physical WebLogic Server installation or used the Image Tool to extract a server configuration from a WebLogic Server VM to a local `/application` directory.

1. Set your environment so you have access to the WebLogic Server utilities:

```
./application/wlserver_10.3/server/bin/setWLSEnv.sh
```

If you get this message: "The JDK wasn't found in directory. Please edit the `startWebLogic.sh` script so that the `JAVA_HOME` variable points to the location of your JDK." Then you need to edit `/application/wlserver_10.3/common/bin/commEnv.sh` to set `JAVA_HOME`.

2. Use this command to create a new certificate and key files for your WebLogic Server VM host, using the fully-qualified hostname:

```
java utils.CertGen -keyfile privatekeyfile -keyfilepass DemoIdentityPassPhrase
-certfile certfile -cn hostname
```

Creates the following files:

- **certfile.der** - public certificate in der (Distinguished Encoding Rules) format.
- **certfile.pem** - public certificate in pem (Privacy Enhanced Mail) format.
- **privatekeyfile.der** - the private key in der format, protected with password 'DemoIdentityPassPhrase'.
- **privatekeyfile.pem** - the private key in pem format, protected with password 'DemoIdentityPassPhrase'.

Important! You must use the DNS name when creating certificates. Also, the `-cn hostname` must match the hostname in the URL you use; otherwise, hostname verification will fail resulting in failed connection attempts to the server. Some certificates contain the long name and some the short.

The files `CertGenCA.der`, `CertGenCAKey.der`, and the key `CertGenCAKey.der` from the `weblogic\server\lib` directory are used for issuing the CA.

3. Convert `CertGenCA.der` to `CertGenCA.pem`:

```
java utils.der2pem CertGenCA.der
```

This command creates a `CertGenCA.pem` file in `/application/wlserver_10.3/server/lib/CertGenCA.pem`

6.3.2 Store the Certificate In the Demoidentity Keystore

In general, it is best to create two keystores: one for identity and one for trust. That way the trust keystore can be distributed over the network and the identity keystore containing the private key/digital certificate pairs can be isolated and not distributed, and therefore, be better protected from unauthorized use or modifications. You are going to reuse the `DemoTrust.jks` (unchanged) and create a new and valid `DemoIdentity.jks` and put it in the image's `/application/wlserver_10.3/server/lib` directory.

Since you have created a certificate with `CertGen`, you can use the `WebLogic Server ImportPrivateKey` utility to import the certificate into a keystore. (If Sun's `keytool` had been used, it could have added the private keys and certificates to a keystore, but it cannot be used to take existing files and add them to a keystore, which is why `ImportPrivateKey` is being used.)

- Trust keystores only need certificates
 - Identity keystores need certificates and private keys
1. Combine the generated certfile with the supplied `CertGenCA`.

```
cat certfile.pem CertGenCA.pem > newcerts.pem
```

2. Create a new `DemoIdentity.jks` keystore containing `newcerts.pem` and `privatekeyfile.pem`. (An identity keystore contains certificates and the certificate chain used to generate them.)

```
java utils.ImportPrivateKey -keystore DemoIdentity.jks -storepass
DemoIdentityKeyStorePassPhrase -keyfile privatekeyfile.pem -keyfilepass
DemoIdentityPassPhrase -certfile newcerts.pem -alias DemoIdentity
```

```
No password was specified for the key entry
Key file password will be used
```

```
Imported private key privatekeyfile.pem and certificate newcerts.pem
into a new keystore DemoIdentity.jks of type jks under alias DemoIdentity
```

3. You can verify that you have properly created a new `DemoIdentity.jks` by using Sun's keytool. If all has gone well, the `DemoIdentity.jks` will contain two certificates, one for your host, and one for the issuing CA, `CertGenCAB`.

```
keytool -list -v -keystore DemoIdentity.jks

Enter keystore password: DemoIdentityKeyStorePassPhrase
Keystore type: JKS
Keystore provider: SUN
Your keystore contains 1 entry
Alias name: demoidentity
Creation date: Mar 19, 2010
Entry type: PrivateKeyEntry
Certificate chain length: 2
Certificate[1]:
Owner: CN=some-WLS-host, OU=FOR TESTING ONLY, O=MyOrganization, L=MyTown,
ST=MyState, C=US
Issuer: CN=CertGenCAB, OU=FOR TESTING ONLY, O=MyOrganization, L=MyTown,
ST=MyState, C=US
Serial number: 1eedee30d98d58ff424373a7ce8bc486
Valid from: Thu Mar 18 13:31:23 EDT 2010 until: Wed Mar 19 13:31:23 EDT 2025
Certificate fingerprints:
    MD5:  6F:BB:98:E1:3F:1E:F7:03:56:53:D7:F3:9A:13:41:CD
    SHA1: 4E:EE:E9:56:22:E1:E7:07:ED:A1:95:91:31:12:2A:AE:98:D9:C9:51
    Signature algorithm name: MD5withRSA
    Version: 1
Certificate[2]:
Owner: CN=CertGenCAB, OU=FOR TESTING ONLY, O=MyOrganization, L=MyTown,
ST=MyState, C=US
Issuer: CN=CertGenCAB, OU=FOR TESTING ONLY, O=MyOrganization, L=MyTown,
ST=MyState, C=US
Serial number: 234b5559d1fa0f3ff5c82bdfed032a87
Valid from: Thu Oct 24 11:54:45 EDT 2002 until: Tue Oct 25 11:54:45 EDT 2022
Certificate fingerprints:
    MD5:  A2:18:4C:E0:1C:AB:82:A7:65:86:86:03:D0:B3:D8:FE
    SHA1: F8:5D:49:A4:12:54:78:C7:BA:42:A7:14:3E:06:F5:1E:A0:D4:C6:59
    Signature algorithm name: MD5withRSA
    Version: 3
Extensions:
#1: ObjectId: 2.5.29.15 Criticality=true
KeyUsage [
  Key_CertSign
]
#2: ObjectId: 2.5.29.19 Criticality=true
BasicConstraints:[
  CA:true
  PathLen:1
]
*****
*****
```

4. Copy your keystore to your WebLogic Server image (using SCP or SFTP for a running server, or the Image Tool for a non-running server).

By default, WebLogic Server is configured to use the `DemoIdentity.jks` and `DemoTrust.jks`, so your updated keystore will be picked up.

6.3.3 Accessing WebLogic Server VMs With SSL Using a Browser

After enabling port 7002 for https, if you attempt to access WebLogic Server with a browser, you will get a security exception because the CA used to generate the demo certificate is untrusted. The CertGenCA is used for demo purposes. Simply accept the certificate as trusted and the browser will successfully access WebLogic Server.

6.3.4 Accessing WebLogic Server VMs Using WLST

If you attempt to connect to the server configured above with WLST simply by invoking:

```
java weblogic.WLST
connect('weblogic', 'welcome1', 't3s://some-WLS-host:7002')
```

Then, you may get the following error:

```
Connecting to t3s://some-WLS-host:7002 with userid weblogic ...
```

```
<Mar 19, 2010 2:51:12 PM EDT> <Warning> <Security> <BEA-090542> <Certificate
chain received from some-WLS-host - 10.137.144.13 was not trusted causing
SSL handshake failure. Check the certificate chain to determine if it should be
trusted or not. If it should be trusted, then update the client trusted CA
configuration to trust the CA certificate that signed the peer
certificate chain. If you are connecting to a WLS server that is using demo
certificates (the default WLS server behavior), and you want this client to
trust demo certificates, then specify -Dweblogic.security.TrustKeyStore=DemoTrust
on the command line for this client.>
```

To correct this problem, simply follow the error message's suggestion (assuming you are running out of the `/application/wlserver_10.3/server/lib/` directory.)

```
java -Dweblogic.security.TrustKeyStore=DemoTrust weblogic.WLST
```

```
connect('weblogic', 'welcome1', 't3s://some-WLS-host:7002')
```

```
Connecting to t3s://some-WLS-host:7002 with userid weblogic ...
```

```
Successfully connected to Admin Server 'WlsveAdmin' that belongs to domain 'wlsve_
domain'.
```

6.3.5 Accessing the VMM Node Manager Client Using WLST

Next, comes the process of accessing a VMM Node Manager client from WLST using an `nmConnect()` call. If you connect with `nmConnect` using the secure port, as follows, it might initially say "Successfully Connected to Node Manager."

```
nmConnect('admin', 'oracle', 'some-OVM-host', '4443', 'wlsve_domain',
'/application/user_projects/domains/wlsve_domain', 'VMMS-OracleVM_2.2')
```

However, on your first attempt to execute an `nm` command, you may end up with an error like this:

```
java.io.IOException: java.io.IOException: HTTP transport error:
javax.net.ssl.SSLHandshakeException: sun.security.validator.ValidatorException:
PKIX path building failed:
sun.security.provider.certpath.SunCertPathBuilderException:
unable to find valid certification path to requested target
```

The problem is that the trust store does not have the certificate in it for the Oracle VM server at some-OVM-host. Proceeding with the approach of using the DemoTrust, you first have to obtain the certificate from the Oracle VM host. There are a number of ways to do this, but one is to point at the secure port using a browser and https and view and save the certificate to a file.

Using Firefox, for example, if you haven't already viewed and stored an exception for the Oracle VM's host certificate, when attempting to browse it using https://ovmhost:4443, you will get this message: "This Connection is Untrusted." Clicking **I Understand the Risks** and **Add Exception**, you can view the certificate, and under the Details tab, click Export to export the file to /application/wlsve_10.3/server/lib/ovmhost.crt.

Next, you need to update your DemoTrust.jks with the certificate you just retrieved from the Oracle VM host machine.

```
keytool -importcert -file locbox-ovmm-22.crt -keystore DemoTrust.jks -storepass
DemoTrustKeyStorePassPhrase
```

```
Owner: CN=locbox-ovmm-22, OU=Linux, O=Oracle, L=Beijing, ST=Beijing, C=CN
Issuer: CN=locbox-ovmm-22, OU=Linux, O=Oracle, L=Beijing, ST=Beijing, C=CN
Serial number: 4af6d0e1
Valid from: Sun Nov 08 09:08:33 EST 2009 until: Sat Feb 06 09:08:33 EST 2010
Certificate fingerprints:
    MD5: 14:63:65:A1:DB:46:08:43:C8:49:3F:3A:C0:FC:3F:9B
    SHA1: 2E:55:B0:CC:49:F7:3C:E1:1D:DC:E4:F5:36:3C:1E:AB:D4:29:9D:88
    Signature algorithm name: SHA1withRSA
    Version: 1
Trust this certificate? [no]: yes
Certificate was added to keystore
```

Now, invoke WLST so that the VMM node manager client uses the updated keystore by running java weblogic.WLST, and it will use the DemoTrust by default.

Then, when you issue nmConnect using the secure port version of VMM, VMMS, and follow it with nm commands, they will work.

```
wls:/offline> nmConnect('admin', 'oracle', 'some-OVM-host', '4443', 'wlsve_
domain', '/application/user_projects/domains/wlsve_domain', 'VMMS-OracleVM_2.2')

Connecting to Node Manager ...
Successfully Connected to Node Manager.
wls:/nm/wlsve_domain> nmServerStatus('wlsve_domain_WlsveAdmin')
RUNNING
wls:/nm/wlsve_domain>
```

6.3.6 Configuring WebLogic Server to Securely Connect to VMM Node Manager Clients

No additional configuration is required. Simply verify that the DemoTrust.jks is updated as explained in [Section 6.3.5, "Accessing the VMM Node Manager Client Using WLST"](#) with the Oracle VM host's certificate and is copied to the server/lib directory on the WebLogic Server image.

6.4 Setting Localization Parameters

You can set the desired locale using the Image Tool. Here's an example of setting a Japanese locale:

```
java -jar wlsveimagetool.jar -r vm.cfg set locale ja Asia/Tokyo eucJP
```

Troubleshooting Guidelines

This section includes some troubleshooting guidelines that may improve the performance of WebLogic Server on JRockit VE.

- [Section 7.1, "Changing a VM's Memory Allocation and Disk Size"](#)
- [Section 7.2, "Using WLST to Reopen a Closed Log File"](#)
- [Section 7.3, "Where Do VM Core Dumps Go?"](#)
- [Section 7.4, "Why Do I Get a "Corrupted ELF Image" Error Message When Starting an Oracle VM Server?"](#)
- [Section 7.5, "Why Can't I Connect to a VM Using SFTP or SCP?"](#)

7.1 Changing a VM's Memory Allocation and Disk Size

If you need more memory or a larger disk size for your VM(s), you can use the Image Tool to update the `wlsve.xml` file with the desired disk size and memory amount.

The command for setting the disk size is:

```
java -jar wlsveimagetool.jar -r vm.cfg set disk-size 1 "600 MB"
```

The command for setting the memory allocation is:

```
java -jar wlsveimagetool.jar -r vm.cfg set memory 1024
```

7.2 Using WLST to Reopen a Closed Log File

In this release, WebLogic Server VM log files on shared disks are read-only, and so they should not be modified. If some reason, a user does modify a log file at a shared location, you can use WLST to execute the `ensureLogOpened()` operation on the `LogRuntimeMBean`, which will attempt to re-open the log file.

For example:

```
connect('weblogic', 'weblogic', 't3://localhost:7001')
serverRuntime()
ls()
cd('LogRuntime/AdminServer')
ls()
cmo.forceLogRotation()
```

where 'AdminServer' is the name of the server.

7.3 Where Do VM Core Dumps Go?

If you are suddenly running out of disk space on an Oracle VM server, then check in the `/var/xen/dump/` directory, which is where the core dumps are stored by default.

7.4 Why Do I Get a "Corrupted ELF Image" Error Message When Starting an Oracle VM Server?

Check for unneeded dump files if you get the following error message when starting an Oracle VM server:

```
Error: (2, 'Invalid kernel', 'xc_dom_parse_elf_kernel: corrupted ELF image\n')
```

This typically happens when you have run out of disk space because there are many unneeded core dumps in the `/var/xen/dump/` directory. The error message is thrown when Oracle VM/Xen tries to place a copy of the JRockit VE ELF kernel image under `/var/run/xend/`, which it then tries to read. However, this fails because the `/var` partition is full.

7.5 Why Can't I Connect to a VM Using SFTP or SCP?

For security purposes, you must manually enable and target the SSHD service when using the packaged WebLogic Server VM image as a template for new or migrated domains. If you attempt to connect using SFTP or SCP and get repeated prompts for your password followed by a message, such as *Error: The connection could not be made*, then either of two things may be wrong:

- The SSH startup class is not deployed, or
- The SSH startup class is deployed, but not targeted to your server

See [Section 4.2.2, "Deploying and Targeting the SSH Startup Class in a WebLogic Server VM."](#)

Known Issues

This section includes current known issues for WebLogic Server on JRockit VE.

- [Section 8.1, "Install Oracle VM Server Patch \(Version 2.2 Only\)"](#)
- [Section 8.2, "No Support for Sample Domains"](#)
- [Section 8.3, "Performance When Using Multiple CPUs"](#)
- [Section 8.4, "Initially Start Virtual Machines Using OVM Manager"](#)
- [Section 8.5, "Improve Performance with Conversational Web Services"](#)
- [Section 8.6, "Random JMX Warnings During VM Shutdown"](#)
- [Section 8.7, "Use Only the DNS Name of WebLogic VM When Creating Demo Certificates"](#)
- [Section 8.8, "Patch Set 3 README File Contains Incorrect Documentation URLs"](#)

Note: For a list of known issues in Oracle JRockit Virtual Edition 11.1.1.3.1, refer to the "Known Issues" section in the *User's Guide for Oracle JRockit Virtual Edition*.

For a list of known issues in Oracle WebLogic Server, refer to the *Oracle® Fusion Middleware Release Notes 11g Release 1 (11.1.1) for Linux x86*. []

8.1 Install Oracle VM Server Patch (Version 2.2 Only)

In order to fully support high availability, it is recommended that you install the patch for the Oracle VM agent and Xen packages. This patch is not required to be installed if you are using Oracle VM 2.2.1 or later.

If you do not install the recommended patch, any normal or abnormal shutdowns of WebLogic Server will result in WebLogic Server being automatically restarted by Oracle VM, regardless of whether this is the intended behavior. For example, if WebLogic Server shuts down because of a non-restartable failure, or if the user logs in to the WebLogic Server Administration Console to manually shut down a WebLogic Server VM, Oracle VM will restart the VM and server. In addition, the configured limits for maximum number of restart attempts for the server are ignored.

The Oracle VM patch is available from the Oracle Unbreakable Linux (ULN) site at <http://linux.oracle.com> by selecting the ovm22_i386_latest channel. For detailed instructions, see the FAQ at https://linux.oracle.com/uln_faq.html. Once you update the Oracle VM Server using the patch, ensure that the Oracle VM packages use the following minimum versions:

- ovs-agent-2.3-38
- xen-3.4.0-0.1.10
- xen-64-3.4.0-0.1.10
- xen-debugger-3.4.0-0.1.10
- xen-devel-3.4.0-0.1.10
- xen-tools-3.4.0-0.1.10

8.2 No Support for Sample Domains

This version of WebLogic Server on JRockit VE does not include support for the medrec, medrec-spring, or the wls-server sample domains.

However, the WebLogic Server on JRockit VE package includes instructions to reconfigure the MedRec sample domain in a physical environment to work with Oracle Database, and then that environment can be migrated to a WebLogic Server VM. For more information, see *Using the Oracle WebLogic Server on JRockit Virtual Edition MedRec Domain With Oracle DB* (wlsve_medrec_domain_with_odb.pdf).

8.3 Performance When Using Multiple CPUs

In a virtual machine that is configured with multiple virtual CPUs, in certain circumstances (for example, when there is a lot of synchronization between threads), performance might be affected.

In the current release, Oracle recommends that you start with a configuration with a single virtual CPU. If necessary, you can try adding more virtual CPUs to see if it helps improve performance, but in this release adding additional Virtual CPUs may not improve performance on all workloads.

8.4 Initially Start Virtual Machines Using OVM Manager

There is a delay in communication between Oracle VM Manager and Xen (xm) when initially starting the WebLogic Server VM using the xm command.

Workaround

Use the Oracle VM Manager console to initially import, discover, and approve the virtual image, and then you can safely use WLST, the Administration Console, and the xm command to start and stop WebLogic Server VMs.

8.5 Improve Performance with Conversational Web Services

To improve performance when using conversational Web services, include the following option in the <java-arguments> stanza of the wlsve.xml file:

```
-Dweblogic.store.AvoidDirectIO=true
```

8.6 Random JMX Warnings During VM Shutdown

Random JMX warnings are thrown when a WebLogic Server on JRockit VE instance is shutdown. The occurrence of these JMX warnings are non-fatal.

8.7 Use Only the DNS Name of WebLogic VM When Creating Demo Certificates

If you create your demo certificates using the IP address for a WebLogic VM instead of using the DNS name for the VM, then you will not be able to access the online help from the Administration Console in SSL mode when using either the IP address/DNS name in the URL for the Administration Console.

Workaround

Create your demo certificates using only the DNS name for a WebLogic VM.

8.8 Patch Set 3 README File Contains Incorrect Documentation URLs

The `README.txt` file in the `wlsvePackage.zip` package, contains incorrect URLs to the latest version of the WebLogic Server on JRockit VE documentation and the *WebLogic Server Performance and Tuning Guide*.

Workaround

For the WebLogic Server on JRockit VE documentation home page, use this URL:

http://download.oracle.com/docs/cd/E20382_01/index.htm.

For the *WebLogic Server Performance and Tuning Guide*, use this URL:

http://download.oracle.com/docs/cd/E17904_01/web.1111/e13814/wls_tuning.htm.

