

Oracle® Database Appliance

Using Oracle WebLogic Server on Oracle Database Appliance

Release 2.7 for Linux x86-64

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This document describes how to provision Oracle WebLogic Server on Oracle Database Appliance releases 2.5, 2.6, and 2.7.

Oracle Database Appliance Using Oracle WebLogic Server on Oracle Database Appliance, Release 2.7 for Linux x86-64

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Preface

Oracle Database Appliance is a pre-built and ready-to-use clustered database system, that Oracle has optimized to make Oracle Database Appliance easy to deploy, operate, and manage. By integrating hardware and software, Oracle Database Appliance eliminates the complexities of non-integrated, manually assembled solutions. Oracle Database Appliance reduces deployment time from weeks or months to just a few hours, while preventing configuration and setup errors that often result in sub-optimal, hard-to-manage database environments.

The process for installing WebLogic Server and configuring virtual machines, WebLogic domains and clusters on Oracle Database Appliance has also been simplified compared to installation and configuration on industry-standard hardware, dramatically reducing the time needed for provisioning a domain.

Audience

This document is intended for Oracle Database Appliance administrators who are responsible for the initial WebLogic Server configuration and for initiating the process to provision a WebLogic domain. This document is also intended for WebLogic Server administrators who are responsible for administering WebLogic domains after they have been provisioned.

This document assumes that you are familiar with Oracle Database Appliance and Oracle Virtual Machine technology.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

Related Documents

The following documents are published in the Oracle Database Appliance online documentation library at

<http://www.oracle.com/pls/topic/lookup?ctx=dba21>:

- *Oracle Database Appliance Setup Poster*
- *Oracle Database Appliance Getting Started Guide*
- *Oracle Database Appliance Release Notes for Linux x86-64*
- *Oracle Database Appliance Owner's Guide*
- *Oracle Database Appliance Service Manual*
- *Oracle Database Appliance Safety and Compliance Guide*
- *Oracle Database Appliance Licensing Information*

The following documents, and other WebLogic Server documents, are published in the WebLogic Server 10.3.6, WebLogic Server 12.1.1, and WebLogic Server 12.1.2 documentation libraries:

- *Administration Console Online Help*
- *WebLogic Server Scripting Tool Command Reference*
- *Oracle WebLogic Scripting Tool*
- *Oracle WebLogic Server Release Notes*

The WebLogic Server 10.3.6 online documentation library is at the following location:

http://docs.oracle.com/cd/E23943_01/wls.htm

The WebLogic Server 12.1.1 online documentation library is at the following location:

http://docs.oracle.com/cd/E23943_01/wls.htm

The WebLogic Server 12.1.2 online documentation library is at the following location:

<http://docs.oracle.com/middleware/1212/wls/index.html>

Oracle Traffic Director documentation is published in the Oracle Traffic Director online documentation library at the following location:

http://docs.oracle.com/cd/E23389_01/index.htm

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.

This chapter provides an overview of using Oracle WebLogic Server on Oracle Database Appliance and describes how to prepare for the WebLogic Server installation.

Oracle Database Appliance is server, storage, and network hardware, combined with network, cluster, and database software and templates. Oracle fully supports all hardware and software components. The hardware and software are engineered together to be simple to configure and maintain, and to be pre-configured for specific database workloads. Oracle Database Appliance is designed to minimize cost, time, and risk in database deployment and maintenance.

Oracle Database Appliance also supports WebLogic Server clusters. By downloading and installing Oracle Virtual Machine (OVM) templates that provide WebLogic Server and Oracle Traffic Director, you can quickly configure and provision a highly-available WebLogic domain using the Oracle WebLogic Server Configuration for Oracle Database Appliance utility.

In this configuration

- Both the database and WebLogic Server run on virtual machines (VMs)
- The database has direct access to storage
- WebLogic Server high availability is delivered via clustering (2, 4 or 8 nodes), with transaction logs and JMS persistence configured in the database on Oracle Database Appliance by default
- The WebLogic Server Administration Console can be used to manage the environment

The following sections are included in this chapter:

- ["Installation Prerequisites"](#)
- ["Hardware Configuration"](#)
- ["Virtual Machine Topology"](#)

Installation Prerequisites

To use WebLogic Server on Oracle Database Appliance, you must download and install:

- Oracle WebLogic Server Configuration for Oracle Database Appliance utility
- Oracle WebLogic Server on Oracle Database Appliance Kit, either for WebLogic Server 10.3.6 or WebLogic Server 12.1.1 and 12.1.2

Prior to downloading and installing these items, you must complete the following prerequisite tasks as described in *Oracle Database Appliance Getting Started Guide*. Refer also to the *Oracle Database Appliance Setup* poster:

- connecting all hardware.
- configuring a network to transfer the end-user bundle.
- configuring Oracle Database Appliance using the configuration utility.
- completing Oracle Database Appliance post-installation tasks.

After completing these tasks, refer to [Chapter 2, "Installation and Configuration,"](#) for instructions on how to download the support files and the Oracle WebLogic Server Configuration for Oracle Database Appliance utility.

Hardware Configuration

For the hardware specifications for your Oracle Database Appliance, refer to "Hardware Capacity Specifications" in the *Oracle Database Appliance Getting Started Guide*.

For supported configuration information for WebLogic Server, see the Oracle Fusion Middleware Supported Configurations page on the Oracle Technology Network at:

<http://www.oracle.com/technetwork/middleware/ias/downloads/fusion-certification-100350.html>

Virtual Machine Topology

The virtual machine topology for using WebLogic Server on Oracle Database Appliance consists of the following components:

- A WebLogic Server Administration Server VM
- Two, four or eight WebLogic Managed Server VMs
- An Oracle Traffic Director Administration Server VM
- Two Oracle Traffic Director Administrator Node VMs for load balancing

Installation and Configuration

This chapter describes how to provision WebLogic Server, including a fronting load balancer, on the Oracle Database Appliance using the Oracle WebLogic Server Configuration for Oracle Database Appliance utility (configuration utility).

The following sections are included in this chapter:

- ["Downloading the OVM Templates and Configuration Utility"](#)
- ["Installing the OVM Templates and Configuration Utility"](#)
- ["Downloading the Configuration Utility"](#)
- ["Using the Configuration Utility"](#)
- ["Domain Creation and Startup"](#)
- ["Virtual Machine Configuration"](#)
- ["Default Domain Configuration"](#)

Downloading the OVM Templates and Configuration Utility

Oracle WebLogic Server on Oracle Database Appliance is available in different versions.

- 2.7.0.0.0 - supports both Oracle Database Appliance versions X3-2 and V1.
- 2.6.0.0.0 - supports both Oracle Database Appliance versions X3-2 and V1.
- 2.5.0.0.0 - supports only Oracle Database Appliance version V1.

The following procedures are primarily applicable to 2.7.0.0.0 and 2.6.0.0.0 versions. The details for the 2.5.0.0.0 version are explicitly mentioned where necessary.

WebLogic Server support is provided via Oracle Virtual Machine (OVM) template bundles which are pre-configured for the Oracle Database Appliance environment. Each bundle corresponds to a WebLogic version, either 11g (10.3.6) or 12c (12.1.1 and 12.1.2). Each of these bundles include:

- Oracle Linux 5 Update 8
- Oracle WebLogic Server
- Oracle Traffic Director 11g (Oracle WebLogic Server on Oracle Database Appliance 2.7.0.0.0 and 2.6.0.0.0 releases include 11.1.1.7 and Oracle WebLogic Server on Oracle Database Appliance 2.5.0.0.0 release includes 11.1.1.6)
- Oracle WebLogic Server Configuration for Oracle Database Appliance utility

After completing the prerequisite setup steps, perform the following steps to download the Oracle Database Appliance Kit for WebLogic Server.

To download the Oracle Database Appliance Kit for WebLogic Server from the Oracle Software Delivery Cloud, do the following:

1. Go to <https://edelivery.oracle.com>.
2. Sign in by using your Oracle account.
3. Read and accept the **Oracle Software Delivery Cloud Trial License Agreement and the Export Restrictions**.
4. Click **Continue**.
5. In the **Select a Product Pack** field, select **Oracle Fusion Middleware**.
6. In the **Platform** field, select **Linux x86-64**.
7. Click **Go**.
8. In the results displayed, select **Oracle Fusion Middleware 11g Media Pack for Linux x86-64**, and click **Continue**.
9. Select the appropriate file and click the **Download** button:
 - V43086-01.zip for WebLogic Server 12.1.2
 - V43085-01.zip for WebLogic Server 12.1.1
 - V43084-01.zip for WebLogic Server 10.3.6

Installing the OVM Templates and Configuration Utility

The following procedures are primarily applicable to 2.7.0.0.0 and 2.6.0.0.0 versions. The details for the 2.5.0.0.0 version are explicitly mentioned where necessary.

After completing the download, perform the following steps to install the WebLogic Server and Oracle Traffic Director OVM templates:

1. Extract the downloaded ZIP files to any location on the local client. After extraction, the following files are located in the directory, where *version* is either 1036, 1211, or 1212:

Table 2–1 Contents of the Zip File

Release	List of Files
Oracle WebLogic Server on Oracle Database Appliance 2.7.0.0.0	WLS_ <i>version</i> _VMT.tar.gz_aa
	WLS_ <i>version</i> _VMT.tar.gz_ab
	OTD_11117_VMT.tar.gz
	wls_oda_configurator_2.7.0.0.0.tar.gz
Oracle WebLogic Server on Oracle Database Appliance 2.6.0.0.0	WLS_ <i>version</i> _VMT.tar.gz_aa
	WLS_ <i>version</i> _VMT.tar.gz_ab
	OTD_11117_VMT.tar.gz
	wls_oda_configurator_2.6.0.0.0.tar.gz
Oracle WebLogic Server on Oracle Database Appliance 2.5.0.0.0	WLS_ <i>version</i> _VMT.tar.gz_aa
	WLS_ <i>version</i> _VMT.tar.gz_ab
	OTD_11116_VMT.tar.gz
	wls_configurator_2.5.0.0.0.tar.gz

Note: You cannot upgrade from one version of Oracle WebLogic Server to another without re-provisioning. If you begin provisioning using Oracle WebLogic Server 12.1.1, you cannot automatically upgrade to Oracle WebLogic Server 12.1.2 without re-provisioning. You must download the 12.1.2 template and re-provision using the 12.1.2 template. Make sure you download the template with the appropriate Oracle WebLogic Server version.

- From the directory in which the extracted files are located, execute the following command to combine the two WebLogic Server (WLS) files:

```
cat WLS_version_VMT.tar.gz_aa WLS_version_VMT.tar.gz_ab > WLS_
version_VMT.tar.gz
```

- Delete the two original WLS files:

```
rm WLS_version_VMT.tar.gz_aa
rm WLS_version_VMT.tar.gz_ab
```

- Use `scp` to transfer the two template archives from the client to the `/OVS/staging` directory of Domain-0 on Node 0 and Domain-0 on Node 1.

```
scp WLS_version_VMT.tar.gz root@ip_address:/OVS/staging
scp OTD_11116_VMT.tar.gz root@ip_address:/OVS/staging
```

Replace *ip_address* with the IP address of Domain-0 on Node 0, then do the same with the IP address of Domain-0 on Node 1.

Note: For information about the architecture of the Oracle Database Appliance virtualized platform, see "Deploying Oracle Software on Oracle Database Appliance Virtualized Platform" in *Oracle Database Appliance Getting Started Guide*.

Do not extract the WLS and OTD `tar.gz` files.

- Transfer the configuration utility file `wls_configurator_2.5.0.0.0.tar.gz/wls_oda_configurator_2.6.0.0.0.tar.gz` to any location on the ODA_BASE domain on Node 0:

Table 2–2 Command to Transfer the Configuration Utility File

Release	Command
Oracle WebLogic Server on Oracle Database Appliance 2.7.0.0.0	<code>scp wls_oda_configurator_2.7.0.0.0.tar.gz root@ip_address:dest_dir</code>
Oracle WebLogic Server on Oracle Database Appliance 2.6.0.0.0	<code>scp wls_oda_configurator_2.6.0.0.0.tar.gz root@ip_address:dest_dir</code>
Oracle WebLogic Server on Oracle Database Appliance 2.5.0.0.0	<code>scp wls_configurator_2.5.0.0.0.tar.gz root@ip_address:dest_dir</code>

Replace *ip_address* with the IP address of the ODA_BASE domain on Node 0. Replace *dest_dir* with the destination directory.

- Use `ssh` to log in as the root user to the ODA_BASE domain on Node 0, switch to the directory where you stored the configuration utility file, and extract the configuration utility file to any directory on the ODA_BASE domain of Node 0.

7. See "[Using the Configuration Utility](#)" for information on how to run the configuration utility.

Note: If you want to run the configuration utility to create a configuration file on the local client, extract `wls_configurator_version.tar.gz` to any directory on the local client.

Downloading the Configuration Utility

The configuration utility provides an easy way to create and configure a single WebLogic domain with a cluster to serve your business applications, and configure Oracle Traffic Director, a software load balancer that can efficiently balance incoming requests to one of the WebLogic clusters.

Use the following procedure to download the configuration utility and run it on a local Windows, MacOS, or Linux client to create and save the configuration file for later use.

To download and install an updated configuration utility on a Windows or Linux client and on the Oracle Database Appliance:

1. Open a Web browser and access the following URL:

<http://www.oracle.com/technetwork/middleware/weblogic-oda/downloads/index.html>

2. In the Oracle Database Appliance Manager Configurator section, right-click on the **Oracle WebLogic Server Configuration for Oracle Database Appliance** link and save the file to any location on your Windows or Linux client machine.
3. Extract the file to any location on the client machine.
4. Copy the downloaded `tar.gz` file from the client to any location on the ODA_BASE domain of Node 0 using the following `scp` command:

```
scp filename root@ip_address:dest_dir
```

Replace *filename* with the name of the downloaded file, and replace *ip_address* with the IP address of ODA_BASE of Node 0 and replace *dest_dir* with the destination directory.

5. Extract the file to any directory on ODA_BASE.

Note: When downloading an updated configuration utility to replace an existing one, Oracle recommends that you extract the updated files to the same directory as the original to avoid having multiple versions of the utility on the system.

For information on how to run the configuration utility, see "[Using the Configuration Utility](#)."

Using the Configuration Utility

You can use either of the following methods to create a WebLogic domain configuration using configuration utility:

- Download the configuration utility to a Windows, MacOS, or Linux client, and run the configuration utility on the client to create a configuration file. You can then

copy the Configuration file to the Oracle Database Appliance at a later time, and run the configuration utility again to load the file and provision WebLogic Server after you have downloaded the WebLogic Server and Oracle Traffic Directory software to the appliance.

- After you have downloaded the WebLogic Server OVM template to the Oracle Database Appliance, run the configuration utility directly on the Oracle Database Appliance to create a new configuration file (or load an existing configuration file) and provision WebLogic on Oracle Database Appliance.

Collecting the Required Configuration Information

Prior to running the configuration utility, collect the following network configuration information:

- Hostname and IP address to use for the WebLogic Server Administration Server VM.
- Hostname and IP address to use for each WebLogic Server Managed Server VM. Depending on the cluster size you choose, you will need two, four, or eight of each.
- Virtual IP address to use for the OTD load balancer.
- Hostname and IP address to use for the OTD Administration Server VM.
- Two hostnames and IP addresses to use for the two OTD Admin VMs.
- If you need to create an additional data source for use by your application, you need the following information. The data source must be for an Oracle database that is running on this Oracle Database Appliance.
 - The JNDI name (data source name) for the data source
 - The Oracle database service name
 - The schema username and password to be used to connect the database

Resource Requirements

Before provisioning the WebLogic domain, you must ensure that you have enough CPU and memory resources available for the size of the cluster that you want to create (two, four, or eight Managed Servers in the cluster). Note that the database that you create on Oracle Database Appliance uses some of the available machine resources. If the database is large, the machine resources that are available for your Managed Server cluster will be significantly smaller, thus impacting performance. For information about sizing the ODA_BASE virtual machine that is used for the database, see "Sizing ODA_BASE on Oracle Database Appliance Virtualized Platform" in *Oracle Database Appliance Getting Started Guide*.

The following table shows the resource requirements for each available WebLogic cluster size.

Table 2–3 Resources Required for Available Cluster Sizes

Cluster Size	vCPU (Node 0)	RAM (Node 0)	vCPU (Node 1)	RAM (Node 1)
2-server cluster	6	12 GB	6	11 GB
4-server cluster	8	18 GB	8	17 GB
8-server cluster	12	30 GB	12	29 GB

Running the Configuration Utility Offline

To create a configuration file on a Windows or Linux client for later use on Oracle Database Appliance:

1. Change to the directory where you downloaded and extracted the configuration utility files.
2. Enter the following command to start the configuration utility:

```
config.bat (Windows)
```

```
./config.sh (Linux or Mac OSX)
```

If you want to load an existing configuration file, include the path to the file name in the command, for example:

```
./config.sh /config/myconfig.properties
```

3. Configure the WebLogic Server domain as described in "[Configuration Utility Screens](#)." On the Summary screen, click **Save** to save the configuration to a file.
4. When you are ready to create the new WebLogic domain on Oracle Database Appliance, copy the configuration file to the same directory on Node 0 where you extracted the configuration utility.

Running the Configuration Utility on Oracle Database Appliance

Prior to running configuration utility on Oracle Database Appliance:

- ensure that the Java bin directory is set in the classpath. JDK 1.6 is the minimum required JDK.
- either launch XWindows or redirect the display on ODA_BASE of Node 0.

If you have already created a configuration file on a client as described in the previous section and you want to use that file to provision the WebLogic Server domain, ensure that you have already copied the file to the Oracle Database Appliance.

To run the configuration utility on the Oracle Database Appliance:

1. Use SSH to log in as `root` to ODA_BASE of Node 0 of the Oracle Database Appliance:

```
ssh root@ip_address
```

Replace `ip_address` with the IP address of ODA_BASE of Node 0.

2. Change to the directory where you extracted the configuration utility files.
3. Enter the following command:

```
./config.sh config_file
```

Replace `property_file` with the path and filename of the saved configuration file. Alternatively, you can omit this parameter and browse to the file from the Welcome screen.

4. Select the Oracle Database Application version on which you want to run the configuration utility. Enter **1** to select Oracle Database Appliance V1 or **2** to select Oracle Database Appliance X3-2.

To continue, refer to the next section, "[Configuration Utility Screens](#)."

Configuration Utility Screens

After starting the configuration utility:

1. On the Welcome screen that appears, perform the following tasks:
 - click **Next** to continue if you have already loaded a configuration file from the command line or if you want to create a new configuration file.
 - click **Browse** to select and load an existing configuration file, which will be used to populate all fields on the subsequent screens.

If you created a configuration file on a remote client and then transferred the file to Oracle Database Appliance, navigate to the directory where you stored the file and select it.

After loading the configuration file, click **Next** to continue.

2. On the WebLogic Domain Configuration screen that appears, configure the following settings, and click **Next** to continue.

Setting	Description
WebLogic Version	<p>Select the appropriate Oracle WebLogic Server version to provision on the Oracle Database Appliance.</p> <p>The Oracle VM Template archive corresponding to the selected version must be present in the /OVM/staging directory of Domain-0 on both Node 0 and Node 1 for the provisioning process to complete successfully.</p> <p>You cannot upgrade from one version of Oracle WebLogic Server to another without re-provisioning. If you begin provisioning using Oracle WebLogic Server 12.1.1, you cannot automatically upgrade to Oracle WebLogic Server 12.1.1 without re-provisioning. You must download the 12.1.2 template and re-provision using the 12.1.2 template.</p>
Domain Name	<p>Enter the name for the Oracle WebLogic Server Domain. Domain names can consist of only alphanumeric characters, underscores (_), and hyphens (-). The domain name must contain at least one alphabetic character and cannot start with a number, and can be a maximum of 100 characters long.</p>
Cluster Name	<p>Enter the name for the Oracle WebLogic Server cluster. Cluster names can consist of only alphanumeric characters, underscores (_), and hyphens (-) and can be a maximum of 100 characters long.</p>
Cluster Size	<p>Select the number of Managed Servers that you want to create in the cluster. Note that once the domain is created, you will not be able to add additional Managed Server instances.</p>
Listen Port	<p>Enter the value to use for the listen port of the Oracle WebLogic Server instances. A network channel that can handle t3s and https will be created on each Oracle WebLogic Server instance listening on this port number.</p>
Password Confirm Password	<p>Enter the password to use for the Oracle WebLogic Server administration user (<i>system</i>) and the operating system user (<i>root</i>) for the virtual machines that are running Oracle WebLogic Server.</p> <p>Re-enter the password in the Confirm Password field.</p>
JMS Distributed Destinations	<p>Select this option to configure JMS Distributed Destinations. If selected, sample JMS Distributed Queue and Topic backed by a highly available persistent store are created and targeted to the Oracle WebLogic Server cluster.</p> <p>You can customize the JMS configuration further post provisioning via the Oracle WebLogic Server Administration Console or using WLST.</p>

Setting	Description
JDBC Data Source	Select this option to create a Data Source that can be used by applications deployed to the WebLogic Server cluster. The Data Source must be for an Oracle Database that is running on the same Oracle Database Appliance machine. If selected, a screen for collecting Data Source configuration is displayed.

- On the WebLogic VM Information screen that appears, configure the following settings, and click **Next** to continue.

Setting	Description
Network Interface	<p>Select the network interface that you want to use for the Oracle WebLogic Server virtual machines.</p> <p>Note that the same network interface cannot be mapped to multiple sub networks, so care must be taken while providing the network information for Oracle WebLogic Server, Oracle Traffic Director, and Oracle Database tiers on the machine.</p> <ul style="list-style-type: none"> Oracle Database Appliance X3-2: eth1 (bond0) is a fiber-optic 10 GbE interface for public network access. eth2 (xbond0) is a fiber-optic 10 GbE interface. Oracle Database Appliance V1: eth1 (bond0) is a 1 GbE interface for public network access. eth4 (xbond0) is a fiber-optic 10 GbE interface. <p>Ensure that your network switch and cables can support the GbE speed that you select. All network addresses are bonded to ensure redundancy and throughput.</p> <p>For more information, see "Oracle VM Network Infrastructure" in <i>Oracle Database Appliance Getting Started Guide</i>.</p>
Admin Server VM	Specify the hostname ^[1] and IP address ^[2] for the Oracle WebLogic Server Administration Server.
Managed Server <i>n</i> VM	<p>The number of Managed Server VM rows depends on the value you selected for the cluster size (2, 4, or 8) on the WebLogic Domain Information screen in Step 2.</p> <p>For each of the Managed Server virtual machines, specify the Hostname^[1] and IP Address^[2].</p>
Netmask	Provide the netmask for the subnet to which the IP addresses belong.
Gateway	Provide the IP address for the gateway to your network.

[1]: All hostnames must conform to the RFC 952 standard. The network domain that is configured for database provisioning is used to form the fully qualified domain names (FQDN) for the hostnames.

[2]: Only IPV4 format addresses are supported.

- On the Load Balancer Information screen that appears, configure the following settings, and click **Next** to continue.

Setting	Description
Provision Load Balancer	<p>Select whether you want to provision a load balancer. By default, the Provision Load Balancer check box is selected. Deselect the check box if you choose not to provision a fronting load balancer for the Oracle WebLogic Server cluster instances. Click Next to continue.</p> <p>If you uncheck the Provision Load Balancer, the details that are loaded from the properties file will be removed. Later, if you need to retrieve the Load Balancer details again, click Back to navigate to the Load Balancer Information screen and select the Provision Load Balancer check box.</p> <p>This option is not available in Oracle WebLogic Server on Oracle Database Appliance Release 2.5.0.0.0. You have to provision a load balancer by default.</p>
Network Interface	<p>Select the network interface that you want to use for the Oracle Traffic Director (OTD) virtual machines.</p> <ul style="list-style-type: none"> ▪ Oracle Database Appliance X3-2: eth1 (bond0) is a fiber-optic 10 GbE interface for public network access. eth2 (xbond0) is a fiber-optic 10 GbE interface. ▪ Oracle Database Appliance V1: eth1 (bond0) is a 1 GbE interface for public network access. eth4 (xbond0) is a fiber-optic 10 GbE interface. <p>Ensure that your network switch and cables can support the GbE speed that you select. All network addresses are bonded to ensure redundancy and throughput.</p> <p>For more information, see "Oracle VM Network Infrastructure" in <i>Oracle Database Appliance Getting Started Guide</i>.</p>
Virtual IP	<p>Enter the public IP address^[2] for the OTD instances.</p> <p>OTD instances will be configured in an Active-Passive configuration to ensure high availability of this IP address. OTD has the ability to fail over on this virtual IP, thus providing high availability of the back-end applications that are deployed on Oracle WebLogic clusters.</p>
Listen Port	<p>This is the listen port for the OTD instances. Clients can connect using the virtual IP address on this port.</p>
Password	<p>Enter the password to use for OTD administrator user (<code>admin</code>) and the operating system user (<code>root</code>) for the virtual machines that are running OTD.</p>
Confirm Password	<p>Re-enter the password in the Confirm Password field.</p>
Admin Server VM	<p>Specify the Hostname^[1] and IP Address^[2] for the OTD Administration Server virtual machine.</p>
Admin Node <i>n</i> VM	<p>For each of the Admin Node virtual machines, specify the Hostname^[1] and IP Address^[2].</p>
Netmask	<p>Provide the netmask for the subnet to which the IP addresses belong.</p>
Gateway	<p>Provide the IP address for the gateway to your network.</p>

[1]: All hostnames must conform to the RFC 952 standard. The network domain that is configured for database provisioning is used to form the fully qualified domain names (FQDN) for the hostnames.

[2]: Only IPV4 format addresses are supported.

For information about administering and using OTD, refer to the OTD online documentation library at http://docs.oracle.com/cd/E23389_01/index.htm.

5. If you selected the **JDBC Data Source** option on the WebLogic VM Information screen, the Data Source Configuration screen is displayed; otherwise, skip to the next step.

Configure the following settings, and then click **Next** to continue. Note that the data source is only for connecting to the database running on the ODA machine.

6. On the Summary screen that appears, review the configuration summary to ensure that it is accurate.

If you are running the utility on a local machine to generate a configuration file, or if you are running on the Oracle Database Appliance and you intend to use this configuration file to provision later, click **Save** and save the configuration file before exiting the utility. If you need to change the configuration, click **Back** to return to earlier screens.

Click **Cancel** to close without provisioning Oracle WebLogic Server or saving a configuration file.

If you are running Oracle Database Appliance Configuration Utility for WebLogic Server on an Oracle Database Appliance, and you want to proceed immediately with the provisioning, click **Install**. See "[Domain Creation and Startup](#)."

The Licensed Core Count dialog box is displayed. From the drop-down list, select the number of licensed cores and click **OK**. Once the selection is made, the provisioning will begin.

Domain Creation and Startup

After completing the configuration, clicking **Install** initiates the domain creation process.

The domain creation process clones, configures, and starts the needed virtual machines and the corresponding servers within them.

When the creation process is complete, the Oracle WebLogic Administration Server and Managed Servers (along with Node Managers) are up and running. If a load balancer is configured, Oracle Traffic Director Administration Server and instances are also ready for use.

To avoid a single point of failure with a physical node, the virtual machines are spread across the both physical nodes (Node 0 and Node 1).

Notes: At initial provisioning, the domain is configured for Development mode. When you change the domain to Production mode, you must restart the WebLogic servers.

Once provisioning is complete, you must allocate CPUs to each node based on the number of CPUs you have licensed. Refer to the next section, "[CPU Allocation](#)," for more information.

CPU Allocation

For Oracle WebLogic Server configured on Oracle Database Appliance V3-2, cores are already created during the provisioning process.

You must allocate cores for nodes using the following procedure if it is an Oracle WebLogic Server configuration on Oracle Database Appliance V1.

After creating the domain, all VMs are using the CPUs from the default-unpinned-pool. Based on the number of cores you have licensed, you must configure the virtual machines to ensure that only the licensed number cores are used by the provisioned WebLogic Server and OTD VMs. The simplest approach is to allocate half of the available cores to each node and configure the WebLogic Server and OTD VMs on a given node to use the cores from that node's CPU pool. See the example later in this section.

Note: There are many ways to allocate the available CPU resources. For example, you could create a separate CPU pool for each VM. You could also allocate the CPU resources unevenly, for example, if you have 10 licensed cores, allocate one to be shared by both Administration Servers, one for each OTD VMs, and seven for the WebLogic Managed Server VMs. The example in this section describes the simplest approach.

For example, if you have licensed 8 cores, perform the following steps to allocate six cores to each node and configure the VMs on each node to use these CPU pools:

1. Use the following command to create CPU pools on each node (in this example, `wlsCpuPool` is the pool name; you can substitute any pool name you want to use):

```
oakcli create cpupool wlsCpuPool -numcpu 8 -node 0
oakcli create cpupool wlsCpuPool -numcpu 8 -node 1
```

2. For each WebLogic Server and OTD VM, enter the following command to configure the VM to use the CPU pool.

```
oakcli configure vm vm_name -cpupool wlsCpuPool
```

After executing this command, you need to restart each VM for the change to take effect.

3. For each VM, enter the following commands to restart the VMs:

```
oakcli stop vm vm_name
oakcli start vm vm_name
```

For more information about CPU licensing, see "Core Count and Pay-As-You-Grow" in *Oracle Database Appliance Getting Started Guide*.

For more information about OAKCLI commands, see "Oracle Database Appliance Command Line Interface (OAKCLI) Utility Reference" in *Oracle Database Appliance Getting Started Guide*.

Virtual Machine Configuration

This section describes the virtual machine (VM) configuration of the WebLogic domain. It contains the following sections:

- ["VM Naming Conventions"](#)
- ["VM Resource Allocation"](#)
- ["VM Disk Structure"](#)
- ["Accessing VMs"](#)

VM Naming Conventions

The WebLogic Administration Server and Managed Server VM names, as well as the Oracle Traffic Director (OTD) VM names, are based on the physical host number on which the VM resides, the domain name, the cluster name, and in the case of Managed Servers, the Managed Server number. WebLogic Server VM names are prefixed by `WLS_`, while the OTD VM names are prefixed by `OTD_`.

The VM name of the WebLogic Administration Server is as follows:

```
WLS_domainname_AdminServer
```

The VM name of each Managed Server is as follows, where # is the number of the VM with regard to the cluster:

```
WLS_domainname_ManagedServer_#
```

The VM name of the OTD Administration Server is as follows:

```
OTD_domainname_AdminServer
```

The VM name of each OTD server is as follows, where # is the number of the VM with regard to the cluster:

```
OTD_domainname_AdminNode_#
```

Table 2–4 shows the VM names for the Administration Server and Managed Servers in a domain called `mydomain` with four WebLogic Managed Servers.

Note: If the domain name is longer than 13 characters, it will be truncated in each VM name.

Table 2–4 Example Virtual Machine Names

VM	Physical Host	VM Name
WebLogic Administration Server	1	WLS_mydomain_AdminServer
WebLogic Managed Server 1	1	WLS_mydomain_ManagedServer_1
WebLogic Managed Server 2	2	WLS_mydomain_ManagedServer_2
WebLogic Managed Server 3	1	WLS_mydomain_ManagedServer_3
WebLogic Managed Server 4	2	WLS_mydomain_ManagedServer_4
OTD Administration Server	2	OTD_mydomain_AdminServer
OTD AdminNode 1	1	OTD_mydomain_AdminNode_1
OTD AdminNode 2	2	OTD_mydomain_AdminNode_2

VM Resource Allocation

Each VM hosts its own Oracle Enterprise Linux operating system in addition to any installed applications, such as WebLogic Server.

Table 2–5 shows the resources that are provided for each VM.

Table 2–5 VM Resource Allocation per VM

VM	vCPU	MEM	JVM Heap
OTD Administration Server	4	1 GB	n/a
OTD Server Instances	4	4 GB	n/a

Table 2–5 (Cont.) VM Resource Allocation per VM

VM	vCPU	MEM	JVM Heap
WebLogic Administration Server	4	2 GB	512 MB
WebLogic Managed Server	4	6 GB	3 GB

VM Disk Structure

Each VM has an operating system disk (4GB total space). In addition to this, there are two additional virtual disks mounted at `/u01` and `/opt/oracle`. The `/u01` mounted disk contains the WebLogic Server domain configuration and OTD instance home, with 7.5GB total space. The `/opt/oracle` mounted disk contains the WebLogic Server and OTD installations

Table 2–6 shows key directory locations.

Table 2–6 Key Directory Locations

Directory or File	Location
WebLogic Server home	<code>/opt/oracle/middleware/wlserver_version</code>
WebLogic Server domain location	<code>/u01/domain_name</code>
WebLogic Server domain log file	<code>/u01/domain_name/servers/admin_server_name/logs/domain_name.log</code>
WebLogic Server server log	<code>/u01/domain_name/servers/server_name/logs/server_name.log</code>
Middleware home	<code>/opt/oracle/middleware</code>
Oracle Traffic Director home	<code>/opt/oracle/trafficdirector</code>
Oracle Traffic Director server instances	<code>/u01/OTDInstanceHome</code>

Accessing VMs

Once provisioning is complete, the individual VMs can be accessed via `ssh`.

The operating system password of each WebLogic Server VM for `root` is set to the WebLogic Server password that was specified in the **Password** field of the WebLogic VM Information screen of the configuration utility.

The operating system password of each OTD VM for `root` is set to the OTD administrator password that was specified in the **Password** field of the Load Balancer Configuration screen of the configuration utility.

You have the option to change these passwords afterwards.

Default Domain Configuration

When using the configuration utility to create a domain, the domain configuration includes preselected defaults in addition to the settings that are manually defined in a configuration utility session. The preselected defaults are intended to take advantage of the unique capabilities of Oracle Database Appliance and to maximize high availability.

Refer to the following sections for information about the domain configuration that results from the supplied values and preselected settings.

- ["Cluster Settings"](#)
- ["Administration Server Settings"](#)
- ["Managed Server Settings"](#)
- ["Machine and Node Manager Settings"](#)
- ["JMS Settings"](#)

Cluster Settings

The cluster name is what was specified in the **Cluster Name** field of the WebLogic VM Information screen.

Administration Server Settings

Table 2–7 lists the settings for the domain Administration Server.

Table 2–7 Administration Server Settings

Setting	Notes
Name	Automatically set to AdminServer.
Listen Address	The listen channel of the default channel is the internal IP address.
External Listen Port	The Listen Port that was specified in the Listen Port field of the WebLogic VM Information screen, used for https and t3s traffic on the external network. The default is 7001.
Internal Listen Port	Automatically set to 7001.
Internal Secure Listen Port	Automatically set to 7002.

Managed Server Settings

Table 2–8 lists the settings for the Managed Servers in the domain.

Table 2–8 Managed Server Settings

Setting	Notes
Name	Automatically set to ms#, where # is the number that is assigned to each Managed Server in the cluster.
Listen Address	The listen channel of the default channel is the internal IP address.
External Listen Port	The Listen Port that was specified in the Listen Port field of the WebLogic VM Information screen, used for https and t3s traffic on the external network. The default is 7001.
Internal Listen Port	Automatically set to 7001.
Internal Secure Listen Port	Automatically set to 7002.
Machine	Automatically set to m#, where # is the same numeric value that is assigned to the associated Managed Server. For example, Managed Server ms1 is assigned to machine m1. A machine is created for each Managed Server virtual machine in the domain.
Cluster	Automatically set to the cluster name that was specified in the Cluster Name field of the WebLogic VM Information screen.
Transaction Log JDBC Store	Automatically set to allow for cluster-wide JTA recovery.

Table 2–8 (Cont.) Managed Server Settings

Setting	Notes
Replication Group	Automatically set to ensure that the secondary server is on a different physical machine.
Preferred Secondary Group	Automatically set to ensure that the secondary server is on a different physical machine.
JTA Automatic Migration	Automatically enabled.

Machine and Node Manager Settings

[Table 2–9](#) lists the machine and Node Manager settings for the domain. To support Node Manager, a machine is created for each WebLogic Server virtual machine in the domain.

Table 2–9 Machine and Node Manager Settings

Setting	Notes
Machine Name	Automatically set to m#.
Node Manager Listen Port	Automatically set to 5556.
Node Manager Type	Automatically set to Java.

Internal Data Source

A non-XA data source is automatically created for transaction log store for high availability. If you selected the **JMS Distributed Destinations** option on the WebLogic Domain Information screen, a JDBC persistent store for JMS persistence will use this non-XA data source.

JMS Settings

If the **JMS Distributed Destinations** check box was selected on the WebLogic VM Information screen, WebLogic JMS is pre-configured to be highly available and to leverage the Oracle database for persistent messaging. A JMS server, distributed topic, and distributed queue are created and targeted to each WebLogic Managed Server (see [Table 2–10](#)), and a JMS module with both a sample queue and topic is targeted to the cluster (see [Table 2–11](#)).

Table 2–10 JMS Server Settings

Setting	Notes
Name	Automatically set to ms#_JMSServer, where # is the same # value as is assigned to the associated Managed Server.
Persistent store	Automatically set to the persistent store that was created specifically for JMS persistence.
Target	Automatically set to the migratable target instance.

Table 2–11 JMS Module Settings

Setting	Notes
Name	Automatically set to jms-sample-module.
JMS Queue JNDI	Automatically set to jms/sample/queue.

Table 2–11 (Cont.) JMS Module Settings

Setting	Notes
JMS Topic JNDI	Automatically set to <code>jms/sample/topic</code> .

Administering WebLogic Server and Oracle Traffic Director

This chapter describes how to administer WebLogic domains on Oracle Database Appliance. It also describes restrictions on domains that are running on Oracle Database Appliance.

The initial configuration and provisioning process described in [Chapter 2, "Installation and Configuration,"](#) is intended only to provide a starting point for the WebLogic domain. Once provisioned, you can customize the domain as needed and administer the VMs as you would any other Linux VM. This means that you can transfer configuration and log files to and from the machine as needed, and use the WebLogic Scripting Tool (WLST) and the WebLogic Server Administration Console to customize the domain. Note that there are some restrictions on domain customization, as described in ["Restrictions on Modifying Domains"](#).

Customizing a WebLogic Domain

After provisioning the domain, you can further customize and manage the domain using WLST or the Administration Console.

WebLogic Server Administration Console

To access the WebLogic Server Administration Console, open a Web browser and enter the following URL, where *admin-server-ip* and *listen-port* are the IP Address and Listen Port that were configured for the Administration Server on the WebLogic Domain Information screen of the configuration utility:

```
https://admin-server-ip:listen-port/console
```

Log in with the username `system`. The password is the password that was specified on the WebLogic Cluster Settings screen of the configuration utility when you created the domain.

For more information on the Administration Console, reference the following documentation or press F1 while in the Administration Console to access help:

- *Administration Console Online Help* (WebLogic Server 10.3.6) at http://docs.oracle.com/cd/E23943_01/apirefs.1111/e13952/core/index.html
- *Administration Console Online Help* (WebLogic Server 12.1.1) at http://docs.oracle.com/cd/E24329_01/apirefs.1211/e24401/core/index.html
- *Administration Console Online Help* (WebLogic Server 12.1.2) at <http://docs.oracle.com/middleware/1212/wls/index.html>

WLST

You can use WLST in online or offline mode to manage the domain. There are some restrictions, however, on the modifications you can make to the domain. See "[Restrictions on Modifying Domains](#)" for more information.

For online mode, simply connect to the domain's Administration Server using the appropriate public network IP address.

To run WLST scripts in offline mode, `ssh` to the VM that is hosting the Administration Server.

For information about using WLST on WebLogic Server 10.3.6, refer to the following documents:

- *Oracle WebLogic Scripting Tool* at http://docs.oracle.com/cd/E23943_01/web.1111/e13715/toc.htm
- *WebLogic Scripting Tool Command Reference* at http://docs.oracle.com/cd/E23943_01/web.1111/e13813/toc.htm

For information about using WLST on WebLogic Server 12.1.1, refer to the following documents:

- *Oracle WebLogic Scripting Tool* at http://docs.oracle.com/cd/E24329_01/web.1211/e24491/toc.htm
- *WebLogic Scripting Tool Command Reference* at http://docs.oracle.com/cd/E24329_01/web.1211/e24490/toc.htm

For information about using WLST on WebLogic Server 12.1.2, refer to the following documents:

- *Oracle WebLogic Scripting Tool* at <http://docs.oracle.com/middleware/1212/wls/WLSTG/index.html>
- *WebLogic Scripting Tool Command Reference* at <http://docs.oracle.com/middleware/1212/wls/WLSTC/index.htm>.

Starting and Stopping Servers

The Administration Server and all Managed Servers are automatically started as part of the provisioning process. Afterwards, you can use standard WebLogic Server procedures to shut down or restart the Administration Server and Managed Server instances.

For more information, see:

- "Starting and Stopping Servers" in *Managing Server Startup and Shutdown for Oracle WebLogic Server* (WebLogic Server 10.3.6)
- "Starting and Stopping Servers" in *Managing Server Startup and Shutdown for Oracle WebLogic Server* (WebLogic Server 12.1.1)
- "Starting and Stopping Servers" in *Managing Server Startup and Shutdown for Oracle WebLogic Server* (WebLogic Server 12.1.2)

Restrictions on Modifying Domains

Because the WebLogic domain is hosted in a managed, virtualized environment, there are several restrictions that apply when modifying the domain. There is no mechanism in place to enforce these restrictions, and therefore, you must use caution when modifying a WebLogic domain on Oracle Database Appliance.

In general, you should not modify WebLogic Server configuration settings that were initially set during the domain provisioning process unless you know what those settings are doing and you are certain that modifying them will not have any adverse effects on the domain.

The following sections describe specific configuration areas in which you should avoid modifications:

- ["Domain Name"](#)
- ["Cluster Size"](#)
- ["Node Manager"](#)
- ["Data Source"](#)
- ["Creating Multiple Domains and Expanding the Domain"](#)

Domain Name

Some Oracle Database Appliance scripts rely on the ability to identify the associated WebLogic Server domain from the name of a given VM instance. You should therefore not change the name of a domain once the VMs in the domain have been provisioned.

Cluster Size

Currently, there is no support for adding WebLogic Server server instances to a cluster that has already been provisioned on Oracle Database Appliance.

VMs can, however, be deactivated from a provisioned domain by using the OAKCLI `shutdown` command. After shutting down a VM, you can permanently delete its state using the OAKCLI `delete` command. Deleting a VM results in a permanent loss of that VM from the domain. Note that you must also modify the cluster configuration to remove the server instance cleanly.

For example, to permanently delete a VM named `WLS_mydomain_ManagedServer_8`, enter the following commands:

```
cd /opt/oracle/oak/bin
./oakcli stop vm WLS_mydomain_ManagedServer_8
./oakcli delete vm WLS_mydomain_ManagedServer_8
```

For more information about OAKCLI commands, refer to "Oracle Database Appliance Command Line Interface (OAKCLI) Utility Reference" in *Oracle Database Appliance Getting Started Guide*.

Note: If you want to delete all VMs, use the `cleanup.sh` command instead. See ["Deleting the WebLogic Domain."](#)

Node Manager

In this configuration, Node Manager runs inside of each VM. If a VM shuts down, Node Manager will not be available until the VM comes back up again.

Node Manager is initially configured to use the WebLogic Server demo certificates.

For information on how to install certificates and enable SSL for WebLogic Server, see:

- ["Configuring Identity and Trust"](#) and ["Configuring SSL"](#) in *Oracle Fusion Middleware Securing Oracle WebLogic Server* (WebLogic Server 10.3.6)

- "Configuring Identity and Trust" and "Configuring SSL" in *Oracle Fusion Middleware Securing Oracle WebLogic Server* (WebLogic Server 12.1.1)
- "Configure keys, certificates, and trusted certificate authorities" in *Oracle Fusion Middleware Securing Oracle WebLogic Server* (WebLogic Server 12.1.2)

Security Certificates

You must log in to each of the WebLogic Server VMs to install CA security certificates on each VM.

Data Source

Each WebLogic domain contains a data source that is used internally by WebLogic Server for transaction log and JMS storage. Do not modify or delete this data source.

Creating Multiple Domains and Expanding the Domain

Oracle does not support multiple domains and clusters on ODA. After creating the initial domain, do not run the configuration utility again to create additional domains and clusters.

Oracle also does not support creation of additional WebLogic Server and OTD instances in the domain. Oracle recommends that you do not create additional clusters or Managed Servers in this environment, and that you not add Managed Servers to the existing VMs. These scenarios are not supported.

Administering Oracle Traffic Director

Oracle Traffic Director is the fronting load balancer in the Oracle WebLogic Server on Oracle Database Appliance configuration. During configuration, you can choose to not configure Oracle Traffic Director in the 2.7.0.0.0 and 2.6.0.0.0 releases with X3-2 version.

On Oracle Database Appliance, the OTD Administration Server VM and Admin Node VMs are configured to start automatically at the end of the provisioning.

To administer OTD, log in to the following administration URL, where *ip-address* is the IP address of the OTD Administration VM:

`https://ip-address:8989/`

For more information on OTD and OTD administration, see the Oracle Traffic Director 11g (11.1.1.7) library at:

http://docs.oracle.com/cd/E23389_01/index.htm

Starting and Stopping Oracle Traffic Director Server Instances

You can start and stop OTD server instances either from the OTD Administration Console or from a server instance directory in the OTD INSTANCE_HOME directory. The OTD INSTANCE_HOME on ODA is:

`/u01/OTDInstanceHome/`

For information on how to start and stop OTD server instances, see "Starting, Stopping, and Restarting Oracle Traffic Director Instances" in *Oracle Traffic Director Administrator's Guide*.

Configuring Security

You must log in to each OTD VM to configure security and install CA security certificates. For information on configuring security and security certificates for OTD, see "Managing Security" in *Oracle Traffic Director Administrator's Guide*.

Modifying VM Resource Allocations

All VMs that are provisioned for a WebLogic Server domain are allocated with predetermined resources (see "VM Resource Allocation" in Chapter 2). You can use the OAKCLI to modify this resource allocation after the VMs have been provisioned and started.

To modify the resource allocation for a VM:

1. Use the OAKCLI `stop` command to shut down the VM.
2. Use the OAKCLI `configure` command to update the number of virtual CPUs and amount of memory that is allocated for the VM.
3. Use the OAKCLI `start` command to restart the VM.

For example, to change the number of virtual CPUs to 3 and the amount of virtual memory to 4GB for a VM named `WLS_1_mydomain_mycluster_1`, enter the following commands:

```
cd /opt/oracle/oak/bin
./oakcli stop vm WLS_1_mydomain_mycluster_1
./oakcli configure vm WLS_1_mydomain_mycluster_1 -vcpu 3 -memory 4196
./oakcli start vm WLS_1_mydomain_mycluster_1
```

For more information about OAKCLI commands, refer to "Oracle Database Appliance Command Line Interface (OAKCLI) Utility Reference" in *Oracle Database Appliance Getting Started Guide*.

Managing Access Log Files

To prevent WebLogic Server HTTP access logs and Oracle Traffic Director access logs from filling up drive space, configure the access logs appropriately on each server instance. You can limit the access log file size and the number of log files to retain. For more information, see the following topics:

- "Setting Up HTTP Access Logs" in *Configuring Server Environments for Oracle WebLogic Server* (WebLogic Server 10.3.6)
- "Enable and Configure HTTP Logs" in *Administration Console Online Help* (WebLogic Server 10.3.6)
- "Setting Up HTTP Access Logs" in *Configuring Server Environments for Oracle WebLogic Server* (WebLogic Server 12.1.1)
- "Enable and Configure HTTP Logs" in *Administration Console Online Help* (WebLogic Server 12.1.1)
- "Configuring WebLogic Logging Services" in *Administration Console Online Help* (WebLogic Server 12.1.2)

OTD access logs can be configured for log file rotation (based on time). You can configure the rotated log files to be automatically zipped, deleted, or moved elsewhere. For information about OTD log file locations, see "About the Oracle Traffic

Director Logs" in *Oracle Traffic Director Administrator's Guide*. For information about configuring OTD access log rotation see "Configuring Oracle Traffic Director to Rotate Logs Automatically" in *Oracle Traffic Director Administrator's Guide*.

Deleting the WebLogic Domain

If you want to delete the existing WebLogic domain, perform the following steps:

1. Access the directory where you installed the configuration utility.
2. Enter the following command:

```
./cleanup.sh domain_name
```

After running this command, the domain and the associated VMs are deleted. You can then use the configuration utility to create a new domain.

For more information, see the README file in the configuration utility directory.