Oracle® Banking Electronic Data Exchange for Corporates SSL Setup Guide



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Oracle Banking Electronic Data Exchange for Corporates SSL Setup Guide, Release 14.8.0.0.0

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Preface

- Purpose
- Audience
- Acronyms and Abbreviations
- Documentation Accessibility
- Screenshot Disclaimer

Purpose

This guide provides information about the configurations of SSL for Oracle Weblogic application server.

Audience

This guide is intended for WebLogic admin or ops-web team who are responsible for installing the OFSS banking products.

Acronyms and Abbreviations

The list of acronyms and abbreviations that are used in this guide are as follows:

Abbreviation	Description
OBEDX	Oracle Banking Electronic Data Exchange for Corporates

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1 Configure SSL on Oracle WebLogic

This topic provides the information about the configurations for SSL on Oracle Weblogic application server.

- Setup SSL on Oracle WebLogic
 This topic provides the systematic instructions to setup the SSL on Oracle WebLogic.
- Certificates and Keypairs This topic provides the information about certificates and keypairs.

1.1 Setup SSL on Oracle WebLogic

This topic provides the systematic instructions to setup the SSL on Oracle WebLogic.

- 1. Obtain an identity (private key and digital certificates) and trust (certificates of trusted certificate authorities) for Oracle WebLogic application server.
- 2. Store the identity and trust.

The private keys and trust CA certificates are stored in keystores.

- Configure the identity and trust the keystores for Oracle WebLogic application server in the administration console.
- Set SSL attributes for the private key alias and password in Oracle WebLogic administration console.

1.2 Certificates and Keypairs

This topic provides the information about certificates and keypairs.

The certificates are used for validating the authenticity of the server. Certificates contains the name of the owner, certificate usage, duration of validity, resource location, or distinguished name (DN), which includes the common name (CN - web site address or e-mail address depending of the usage) and the certificate ID of the person who certified (signs) these information. It also contains the public key and a hash to ensure that the certificate has not been tampered with. A certificate is insecure until it is signed. Signed certificates cannot be modified.

A certificate can be self-signed or obtained from a reputable certificate authority such as Verisign, Inc., Entrust.net, Thawte, GeoTrust or InstantSSL.

The SSL uses a public key and a private key cryptographickeys. These keys are similar in nature and can be used alternatively. What one key encrypts can be decrypted by the other key of the pair. The private key is kept secret, while the public key is distributed using the certificate.

A keytool stores the keys and certificates in a keystore. The default keystore implementation implements it as a file. It protects private keys with a password. The different entities (key pairs and the certificates) are distinguished by a unique **alias**. Through its keystore, Oracle WebLogic server can authenticate itself to other parties.



In Java, a keystore is a **java.security.KeyStore** instance that the user can create and manipulate using the keytool utility provided with the Java Runtime.

There are two keystores to be managed by Oracle Weblogic server to configure SSL:

- **1. Identity Keystore**: contains the key pairs and the Digital certificate. This can also contain certificates of intermediate CAs.
- 2. Trust Keystore: contains the trusted CA certificates.

2 Choose the Identity and Trust Stores

This topic provides the information to choose the identity and trust stores.

Oracle Financial Services Software recommends that the choice of Identity and Trust stores be made up front. Oracle WebLogic server supports the following combinations of Identity and Trust stores:

- Custom Identity and Command Line Trust
- Custom Identity and Custom Trust
- Custom Identity and Java Standard Trust
- Demo Identity and Demo Trust

Oracle Financial Services does not recommend choosing Demo Identity and Demo Trust for production environments.

It is recommend to separate the identity and trust stores, since each WebLogic server tends to have its own identity but might have the same set of trust CA certificates. Trust stores are usually copied across Oracle WebLogic servers, to standardize trust rules; it is acceptable to copy trust stores since they contain public keys and certificates of CAs. Unlike trust stores, identity stores contain private keys of the OracleWebLogic server, and hence should be protected against unauthorized access.

Command Line Trust, if choosen requires the trust store to be specified as a command line argument in the Weblogic Server startup script. No additional configuration of the trust store is required in the Weblogic Server Administration Console.

Java Standard Trust would rely on the cacerts files provided by the Java Runtime. This file contains the list of trust CA certificates that ship with the Java Runtime, and is located in the 'JAVA_HOME/jre/lib/security' directory. It is highly recommended to change the default Java standard trust store password, and the default access permission of the file. Certificates of most commercial CAs are already present in the Java Standard Trust store. Therefore, it is recommended to use the Java Standard Trust store whenever possible. The rest of the document will assume the use of Java Standard Trust, since most CA certificates are already present in it.

One can also create custom trust stores containing the list of certificates of trusted CAs. For further details on identity and trust stores, please refer the Oracle WebLogic Server documentation on Securing Oracle WebLogic Server.

3 Obtain the Identity Store

This topic provides the information to obtain the identity store.

- Create Identity Store with Self-Signed Certificates
 This topic provides the information to create the identity store with self-signed certificates.
- Keystore Creation This topic provides the information about keystore creation.
- Configure Identity and Trust Stores for Weblogic This topic provides the information to configure Identity and Trust Stores for Weblogic.
- Export Private Key as Certificate This topic provides the information to export private key as certificate.
- Import Trusted Certificate This topic provides the information to import trusted certificate.

3.1 Create Identity Store with Self-Signed Certificates

This topic provides the information to create the identity store with self-signed certificates.

Self-signed certificates are acceptable for use in a testing or development environment. Oracle Financial Services does not recommend the use of self-signed certificates in a production environment.

To create a self-signed certificate, the genkeypair option provided by the keytool utility of Sun Java 6 needs to be utilized.

Create Self-Signed Certificate

Browse to the bin folder of JRE from the command prompt and type the following command. The items highlighted are placeholders, and should be replaced with suitable values when running the command.

```
keytool -genkeypair -alias alias -keyalg RSA -keysize 1024 -sigalg SHA1withRSA -validity 365 -keystore keystore
```

Table 3-1 Keyword Description

Keyword Description	
alias	Used to identify the public and private key pair created. This alias is required later when configuring the SSL attributes for the managed servers in Oracle Weblogic Server.
keystore	It is used to specify the location of the JKS file. If no JKS file is present in the path provided, one will be created.

The command prompts for the following attributes of the certificate and keystore:



Attributes	Description
Keystore Password	Specify a password used to access the Keystore. This password needs to be specified later when configuring the identity store in Kafka server.
Key Password	Specify a password used to access the private key stored in the Keystore. This password needs to be specified later, when configuring the SSL attributes of the managed server(s) in Oracle Weblogic Server.
First and Last Name (CN)	Enter the domain name of the machine used to access Oracle Banking Virtual Account Management. For example, www.example.com.
Name of your Organizational Unit	The name of the department or unit making the request. For example, BDP. Use this field to further identify the SSL Certificate for creating. For example, by department or by physical server.
Name of your Organization	The name of the organization making the certificate request. For example, Oracle Financial Services. It is recommended to use the company or organization's formal name, and this name entered here must match the name found in official records.
Name of your City or Locality	The city in which your organization is physically located. For example, Mumbai.
Name of your State or Province	The state/province in which your organization is physically located. For example, Maharashtra.
Two-letter Country Code for this Unit	The country in which your organization is physically located. For example, US, UK, IN, etc.

The key generation algorithm has been specified as RSA, the key size as 1024 bits, the signature algorithm as SHA1withRSA, and the validity days as 365. These can be changed to suitable values if the need arises. For further details, please refer to the documentation of the keytool utility in the JDK utilized by Oracle WebLogic Server.

The sample execution command is listed below:

```
D:\Oracle\weblogic11g\jrockit 160 05 R27.6.2-20\bin>keytool -genkeypair -
alias selfcert -keyalq RSA -keysize 1024 -sigalq SHA1withRSA -validity 365 -
keystore D:\keystores\AdminOBVAMKeyStore.jks
Enter keystore password: <Enter a password to protect the keystore>
Re-enter new password: <Confirm the password keyed above>
What is your first and last
  name? [Unknown]:
  cvrhp0729.oracle.com
What is the name of your organizational
  unit? [Unknown]: BPD
What is the name of your
  organization? [Unknown]: Oracle
  Financial Services
What is the name of your City or
  Locality? [Unknown]: Mumbai
What is the name of your State or Province?
  [Unknown]: Maharashtra
What is the two-letter country code for this
  unit? [Unknown]: IN
```

```
Is CN=cvrhp0729.i-flex.com, OU=BPD, O=Oracle Financial Services, L=Mumbai,
ST=Maharashtra, C=IN correct?
  [no]: yes
Enter key password for <selfcert>
RETURN if same as keystore password): <Enter a password to protect the key>
Re-enter new password: <Confirm the password keyed above>
```

3.2 Keystore Creation

This topic provides the information about keystore creation.

```
keytool -genkeypair -keystore <keystore_name.jks> -alias <alias_name> -dname
"CN=<hostname>, OU=<Organization Unit>, O=<Organization>, L=<Location>,
ST=<State>,
C=<Country_Code>" -keyalg <Key Algorithm> -sigalg <Signature Algorithm> -
keysize <key size>
-validity <Number of Days> -keypass <Private key Password> -storepass <Store
Password>
```

Example:

```
keytool -genkeypair -keystore AdminOBVAMKeyStore.jks -alias OBVAMCert -dname
"CN=ofss00001.in.example.com, OU=OFSS, O=OFSS, L=Chennai, ST=TN, C=IN" -
keyalg "RSA"
-sigalg "SHA1withRSA" -keysize 2048 -validity 3650 -keypass Password@123 -
storepass
Password@123
```

Note:

CN=ofss00001.in.example.com is the Host Name of the weblogic server

3.3 Configure Identity and Trust Stores for Weblogic

This topic provides the information to configure Identity and Trust Stores for Weblogic.

- Enable SSL on Oracle WebLogic Server This topic provides the systematic instructions to enable the SSL on Oracle WebLogic Server.
- Configure Identity and Trust Stores
 This topic provides the systematic instructions to configure the identity and trust store for WebLogic.

3.4 Export Private Key as Certificate

This topic provides the information to export private key as certificate.

```
keytool -export -v -alias <alias_name> -file
<export certificate file name with location.cer>
```



-keystore <keystore_name.jks> > -keypass <Private key Password> -storepass <Store Password>

Example 3-1

```
keytool -export -v -alias OBVAMCert -file AdminOBVAMCert.cer
-keystore AdminOBVAMKeyStore.jks -keypass Oracle123 -storepass Oracle123
```

If successful, the following message is displayed.

Certificate stored in file < AdminOBVAMCert.cer>

3.5 Import Trusted Certificate

This topic provides the information to import trusted certificate.

```
keytool -import -v -trustcacerts -alias rootcacert
-file <export_certificate_file_name_with_location.cer> -keystore
<keystore_name.jks> >
-keypass <Private key Password> -storepass <Store Password>
```

Example 3-2

```
keytool -import -v -trustcacerts -alias rootcacert
-file AdminOBVAMCert.cer -keystore AdminOBVAMKeyStore.jks -keypass Oracle123
-storepass Oracle123
```



4 Configure Identity and Trust Stores for Weblogic

This topic provides the information to configure Identity and Trust Stores for Weblogic.

- Enable SSL on Oracle WebLogic Server This topic provides the systematic instructions to enable the SSL on Oracle WebLogic Server.
- Configure Identity and Trust Stores
 This topic provides the systematic instructions to configure the identity and trust store for WebLogic.

4.1 Enable SSL on Oracle WebLogic Server

This topic provides the systematic instructions to enable the SSL on Oracle WebLogic Server.

Login to the Oracle WebLogic Admin Console to configure SSL.

- 1. Under Change Center, click Lock & Edit.
- 2. Expand Servers node.
- 3. Select the name of the server for which you want to enable SSL.

Example: example server

- 4. Navigate to Configuration and select General tab.
- 5. Select the SSL Listen Port Enabled option and specify the SSL listen port.
- 6. In Listen Address field, specify the hostname of the machine in which the application server is installed.

4.2 Configure Identity and Trust Stores

This topic provides the systematic instructions to configure the identity and trust store for WebLogic.

Login to the Oracle Weblogic Admin Console.

- 1. Under Change Center, click Lock & Edit.
- 2. Expand Servers node.
- 3. Select the name of the server to configure the keystores.

Example: exampleserver

- 4. Navigate to Configuration and select Keystores tab.
- 5. In the **Keystores** field, select the method for storing and managing private keys/digital certificate pairs and trusted CA certificates.

This choice should match the one made in **Choose the Identity and Trust Stores** section of this document.



- 6. In the **Identity** section, provide the following details:
 - Custom Identity Keystore File Name: Fully qualified path to the Identity keystore.
 - Custom Identity Keystore Type: Set this attribute to JKS, the type of the keystore. If left blank, it is defaulted to JKS (Java KeyStore).
 - **Custom Identity Keystore PassPhrase**: The password you enter when reading or writing to the keystore. This attribute is optional or required depending on the type of keystore. All keystores require the passphrase in order to write to the keystore. However, some keystores do not require the passphrase to read from the keystore. Oracle Weblogic server only reads from the keystore. So whether or not you define this property depends on the requirements of the keystore.
- 7. In the Trust section, provide the following details:

If the user choose **Java Standard Trust**, specify the password used to access the trust store.

If the user choose Custom Trust, the following attributes have to be provided:

- **Custom Trust Keystore**: The fully qualified path to the trust keystore.
- Custom Trust Keystore Type: Set this attribute to JKS, the type of the keystore. If left blank, it defaults to JKS (Java KeyStore).
- Custom Trust Keystore Passphrase: The password you enter when reading or writing to the keystore. This attribute is optional or required depending on the type of keystore. All keystores require the passphrase in order to write to the keystore. However, some keystores do not require the passphrase to read from the keystore. Oracle Weblogic

Server only reads from the keystore. So, whether or not you define this property depends on the requirements of the keystore.

Note:

If the identity and trust stores are in the JKS format, the passphrases are not required.



5 Configure Weblogic Console

This topic provides the systematic instructions to configure the WebLogic Console.

After domain creation, follow the below steps to enable SSL in WebLogic Admin server. Login to the **Oracle Weblogic Server Admin Console**.

1. Select Admin Server to enable SSL options.

domáin.		A server is an instance of V	/ebLogic Server that runs in its	own Java Virtual Machine (JV	M) and has its own configuration.			
Domain Structure	1	This page summarizes each server that has been configured in the current WebLogic Server domain.						
platoinfra_domain ▲ ⊕ Domain Partitions ● ← Environment ● ⊖ Clusters ● ⊕ - Clusters ●		Customize this table Servers (Filtered - More	Columns Exist)					
Resource Groups Resource Group Templates		New Clone Delete Showing 1 to 5 of 5 Previous Nex					ing 1 to 5 of 5 Previous Next	
Machines		🔲 Name 🗇	Туре	Cluster	Machine	State	Health	Listen Port
····Virtual Targets		AdminServer(admin)	Configured			RUNNING	🖋 ок	7001
··· Work Managers ··· Concurrent Templates		WLS_CONFIG	Configured	config_cluster	platoinfra_Machine	SHUTDOWN	Not reachable	7004
Resource Management	1	WL5_DISCOVERY	Configured	discovery_cluster	platoinfra_Machine	SHUTDOWN	Not reachable	7003
How do I	1	WLS_GATEWAY	Configured	gateway_cluster	platoinfra_Machine	SHUTDOWN	Not reachable	7006
Create Managed Servers		WLS_ZIPKINUI	Configured	zipkinui_cluster	platoinfra_Machine	SHUTDOWN	Not reachable	7005
Clone servers Delete Managed Servers Delete the Administration Server		New Clone Delete					Show	ing 1 to 5 of 5 Previous Next

Figure 5-1 Configuration

- 2. Click General tab.
- 3. Select SSL Listen Port Enabled, Client Cert Proxy Enabled, and Weblogic Plug-In Enabled.



Figure 5-2 Listen Port	
✓ Listen Port Enabled	
Listen Port:	7001
SSL Listen Port Enabled	
SSL Listen Port:	7101
🕑 街 Client Cert Proxy Enabled	
Java Compiler:	javac
Diagnostic Volume:	Low •
Default Datasource:	
- 🖓 Advanced	
Virtual Machine Name:	platoinfra_domain_AdminSe
WebLogic Plug-In Enabled:	<mark>yes</mark> ▼

4. Click Save.



✓ Settings updated successfully.						
Settings for AdminServer						
Configuration Protocols Logging Debug Monitoring Control Deployments	Services	Se				
General Cluster Services Keystores SSL Federation Services Deployment	Migration	Т				
Save						

5. Click Keystores tab.

Keystores:	Custom Identity and Custom Trust Change
Identity	
Custom Identity Keystore:	C:\AdminOBLMKeyStore.jks
Custom Identity Keystore Type:	jks
Custom Identity Keystore Passphrase:	
Confirm Custom Identity Keystore Passphrase:	
- Trust	
Custom Trust Keystore:	C:\AdminOBLMKeyStore.jks
Custom Trust Keystore Type:	iks
Custom Trust Keystore Passphrase:	
Confirm Custom Trust Keystore Passphrase:	

Figure 5-4 Keystores

- 6. Specify **Custom Identity Keystore** and **Custom Trust Keystore** same as the **Keystore Name** created in above steps with full path.
- 7. Specify Custom Identity Keystore Type and Custom Trust Keystore Type as jks.
- 8. Specify Custom Identity Keystore Passphrase, Confirm Custom Identity Keystore Passphrase, Custom Trust Keystore Passphrase and Confirm Custom Trust Keystore Passphrase same as the Store Password entered in above steps.
- 9. Click Save.
- 10. Click SSL tab.

General	Cluster	Services	Keystores	SSL	Federation Services	Deployment	Migration	Tuning
General Guster Services Reystores SSL Fed					rederation services	Deployment	Migration	runing
Save								
This page	e lets you v	view and def	fine various S	iecure S	ockets Layer (SSL) sett	ings for this ser	ver instance.	These se
街 Ident	ity and Ti	rust Locatio	ons:		Keystore	es Change		
— Identit	у							
Private K	ey Locati	on:			from Cu	stom Identity K	eystore	
Private Key Alias:					OBLN	1Cert		
街 Privat	te Key Pa	ssphrase:			•••••	•••••		
街 Confi	rm Privat	e Key Pass	phrase:		•••••	•••••		
Certificate Location:				from Cu	stom Identity K	eystore		
— Trust –								
Trusted (Trusted Certificate Authorities:				from Cu	stom Trust Key	store	
— 🕞 Adva	nced —							

Figure 5-5 SSL

- 11. Specify **Private Key Alias** as same as the alias name entered in above steps.
- 12. Specify Private Key Passphrase and Confirm Private Key Passphrase as same as the Private Key Password entered in above steps.
- **13**. Change the **Hostname Verification** to **None**.
- 14. Click Save.

Repeat the same steps for all the managed servers as well. The admin server and managed servers are SSL enabled.

15. Restart all the servers.

Configure SSL Mode in Node Manager for Clustered Environment

This topic provides the systematic instructions to configure the SSL mode in node manager for clustered environment.

1. Edit the nodemanager.properties with SSL configurations and restart the node manager.

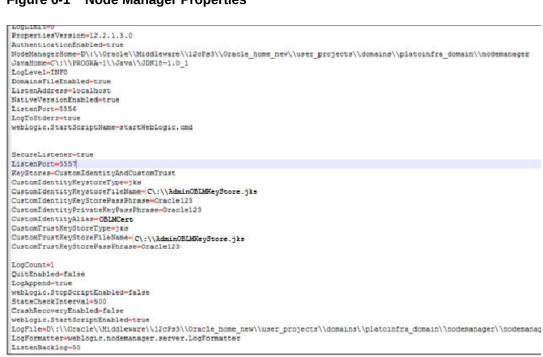


Figure 6-1 Node Manager Properties

 Ensure the SSL configuration is performed in other artifacts, such as startNodeManager.cmd/.sh, startup.properties, config.xml(enable jsse).



7 Set SSL Attributes for Managed Servers

This topic provides the systematic instructions to set the SSL attributes for Managed Servers.

Set SSL Attributes for Private Key Alias and Password

Login to the **Oracle Weblogic Server Admin Console** to configure the private key alias and password.

- 1. Under Change Center, click Lock & Edit.
- 2. Expand Servers node.
- 3. Select the name of the server to configure keystores.

Example: exampleserver

4. Navigate to Configuration and select SSL tab.

Figure 7-1 Configuration

No pending changes exist. Click the Release Configuration button to allow others to edit the	Settings for platoinfra_Machine				
domain.	Configuration Monitoring	Notes			
Lock & Edit Release Configuration	General Node Manager S	ervers			
Domain Structure					
platoinfra_domain ▲ Domain Partitions Environment Servers Clusters Coherence Clusters Resource Groups Resource Group Templates Wirtual Targets Work Managers Work Managers Resource Mananement Resource Mananement	Managed Servers are installed.	the Node Manager configuration for this machine. To control a Managed Server from th ge are used to configure communication between the current domain and Node Manage SSL 5557			
How do I	🕂 Node Manager Home:				
Create and configure machines Monitor Node Manager status Monitor Node Manager logs	委 Shell Command:				

- 5. Select Keystores from Identity and Trust Locations.
- 6. Under Identity section, specify the following details:
 - **Private Key Alias**: Set this attribute to the alias name defined for the key pair when creating the key pair in the Identity keystore.
 - Private Key Passphrase: The password defined for the key pair (alias_password), at the time of its creation. Confirm the password.
- 7. Click Save.
- 8. Under Change Center, click Activate changes.



Activate Changes Undo All Changes	Configuration Monitoring Notes General Node Manager Servers
nain Structure	Save
oinfra_domain Domain Partitions Environment Servers EI-Clusters Coherence Clusters	 This page allows you to define the Node Manager configuration for this mach Managed Servers are installed. The settings defined on this page are used to configure communication betwee the Node Manager instances.
Resource Groups Resource Group Templates	Type: SSL V

Figure 7-2 Configuration - Activate Changes

9. Navigate to **Controls** tab, and check the appropriate server.

Figure 7-3 Control

ck the Lock & Edit button to modify, add or lete items in this domain.	Summary of Servers							
Lock & Edit	Configuration Control							
Release Configuration	Use this page to change the state of the serve the domain-wide administration port.	ers in this WebLogic Server domain. Control operat	ions on Managed Servers require startin	g the Node Manager. Starting Managed Servers in Standby mode requires				
binfra_domain	0							
	© Custonize this table Servers (Filtered - More Columns Exist)							
Resource Groups Resource Group Templates	Start Resume Suspend V Shutdown V Restart SSL Showing 1 to 5 of 5 Previous Next							
	🕑 Server 🗞	Machine	State	Status of Last Action				
Virtual Targets	AdminServer(admin)		RUNNING	None				
Work Managers	WLS_CONFIG	platoinfra_Machine	SHUTDOWN	None				
Resource Management	WLS_DISCOVERY	platoinfra_Machine	SHUTDOWN	None				
/ do I 🖂	WLS_GATEWAY	platoinfra_Machine	SHUTDOWN	None				
art and stop servers	WLS_ZIPKINUI	platoinfra_Machine	SHUTDOWN	None				
art Managed Servers from the Iministration Console	Start Resume Suspend v Shutdow	wn ~ Restart SSL		Showing 1 to 5 of 5 Previous Next				
estart SSL								

10. Click **Restart SSL**, and Confirm when it prompts.



8 Test Configuration

This topic provides the information to test the configuration.

Once the Oracle Weblogic has been configured for SSL, deploy the application in the usual manner. After deployment, the user can test the application in SSL mode.

To launch the application in SSL mode, the user need to enter the URL in the following format:

```
https://(Machine Name):(SSL_Listener_port_no)/(Context_root)
```

Note:

It is recommended to access the Oracle Banking Virtual Account Management web application via the HTTPS channel, instead of the HTTP channel.



9

Configure SSL on Oracle WebLogic

This topic provides the information about the configurations for SSL on Oracle Weblogic application server.

- Setup SSL on Oracle WebLogic This topic provides the systematic instructions to setup the SSL on Oracle WebLogic.
- Certificates and Keypairs This topic provides the information about certificates and keypairs.

9.1 Setup SSL on Oracle WebLogic

This topic provides the systematic instructions to setup the SSL on Oracle WebLogic.

- Obtain an identity (private key and digital certificates) and trust (certificates of trusted certificate authorities) for Oracle WebLogic application server.
- 2. Store the identity and trust.

The private keys and trust CA certificates are stored in keystores.

- Configure the identity and trust the keystores for Oracle WebLogic application server in the administration console.
- Set SSL attributes for the private key alias and password in Oracle WebLogic administration console.

9.2 Certificates and Keypairs

This topic provides the information about certificates and keypairs.

The certificates are used for validating the authenticity of the server. Certificates contains the name of the owner, certificate usage, duration of validity, resource location, or distinguished name (DN), which includes the common name (CN - web site address or e-mail address depending of the usage) and the certificate ID of the person who certified (signs) these information. It also contains the public key and a hash to ensure that the certificate has not been tampered with. A certificate is insecure until it is signed. Signed certificates cannot be modified.

A certificate can be self-signed or obtained from a reputable certificate authority such as Verisign, Inc., Entrust.net, Thawte, GeoTrust or InstantSSL.

The SSL uses a public key and a private key cryptographickeys. These keys are similar in nature and can be used alternatively. What one key encrypts can be decrypted by the other key of the pair. The private key is kept secret, while the public key is distributed using the certificate.

A keytool stores the keys and certificates in a keystore. The default keystore implementation implements it as a file. It protects private keys with a password. The different entities (key pairs and the certificates) are distinguished by a unique **alias**. Through its keystore, Oracle WebLogic server can authenticate itself to other parties.



In Java, a keystore is a **java.security.KeyStore** instance that the user can create and manipulate using the keytool utility provided with the Java Runtime.

There are two keystores to be managed by Oracle Weblogic server to configure SSL:

- **1. Identity Keystore**: contains the key pairs and the Digital certificate. This can also contain certificates of intermediate CAs.
- 2. Trust Keystore: contains the trusted CA certificates.

10 Choose the Identity and Trust Stores

This topic provides the information to choose the identity and trust stores.

Oracle Financial Services Software recommends that the choice of Identity and Trust stores be made up front. Oracle WebLogic server supports the following combinations of Identity and Trust stores:

- Custom Identity and Command Line Trust
- Custom Identity and Custom Trust
- Custom Identity and Java Standard Trust
- Demo Identity and Demo Trust

Oracle Financial Services does not recommend choosing Demo Identity and Demo Trust for production environments.

It is recommend to separate the identity and trust stores, since each WebLogic server tends to have its own identity but might have the same set of trust CA certificates. Trust stores are usually copied across Oracle WebLogic servers, to standardize trust rules; it is acceptable to copy trust stores since they contain public keys and certificates of CAs. Unlike trust stores, identity stores contain private keys of the OracleWebLogic server, and hence should be protected against unauthorized access.

Command Line Trust, if choosen requires the trust store to be specified as a command line argument in the Weblogic Server startup script. No additional configuration of the trust store is required in the Weblogic Server Administration Console.

Java Standard Trust would rely on the cacerts files provided by the Java Runtime. This file contains the list of trust CA certificates that ship with the Java Runtime, and is located in the 'JAVA_HOME/jre/lib/security' directory. It is highly recommended to change the default Java standard trust store password, and the default access permission of the file. Certificates of most commercial CAs are already present in the Java Standard Trust store. Therefore, it is recommended to use the Java Standard Trust store whenever possible. The rest of the document will assume the use of Java Standard Trust, since most CA certificates are already present in it.

One can also create custom trust stores containing the list of certificates of trusted CAs. For further details on identity and trust stores, please refer the Oracle WebLogic Server documentation on Securing Oracle WebLogic Server.

11 Obtain the Identity Store

This topic provides the information to obtain the identity store.

- Create Identity Store with Self-Signed Certificates
 This topic provides the information to create the identity store with self-signed certificates.
- Keystore Creation This topic provides the information about keystore creation.
- Create Identity Store with Trusted Certificates Issued by CA This topic provides the information for creating Identity Store with Trusted Certificates Issued by CA.
- Export Private Key as Certificate
 This topic provides the information to export private key as certificate.
- Import Trusted Certificate This topic provides the information to import trusted certificate.

11.1 Create Identity Store with Self-Signed Certificates

This topic provides the information to create the identity store with self-signed certificates.

Self-signed certificates are acceptable for use in a testing or development environment. Oracle Financial Services does not recommend the use of self-signed certificates in a production environment.

To create a self-signed certificate, the genkeypair option provided by the keytool utility of Sun Java 6 needs to be utilized.

Create Self-Signed Certificate

Browse to the bin folder of JRE from the command prompt and type the following command. The items highlighted are placeholders, and should be replaced with suitable values when running the command.

```
keytool -genkeypair -alias alias -keyalg RSA -keysize 1024 -sigalg SHA1withRSA -validity 365 -keystore keystore
```

Keyword	Description
alias	Used to identify the public and private key pair created. This alias is required later when configuring the SSL attributes for the managed servers in Oracle Weblogic Server.
keystore	It is used to specify the location of the JKS file. If no JKS file is present in the path provided, one will be created.

Table 11-1 Keyword Description

The command prompts for the following attributes of the certificate and keystore:



Attributes	Description
Keystore Password	Specify a password used to access the Keystore. This password needs to be specified later when configuring the identity store in Kafka server.
Key Password	Specify a password used to access the private key stored in the Keystore. This password needs to be specified later, when configuring the SSL attributes of the managed server(s) in Oracle Weblogic Server.
First and Last Name (CN)	Enter the domain name of the machine used to access Oracle Banking Virtual Account Management. For example, www.example.com.
Name of your Organizational Unit	The name of the department or unit making the request. For example, BDP. Use this field to further identify the SSL Certificate for creating. For example, by department or by physical server.
Name of your Organization	The name of the organization making the certificate request. For example, Oracle Financial Services. It is recommended to use the company or organization's formal name, and this name entered here must match the name found in official records.
Name of your City or Locality	The city in which your organization is physically located. For example, Mumbai.
Name of your State or Province	The state/province in which your organization is physically located. For example, Maharashtra.
Two-letter Country Code for this Unit	The country in which your organization is physically located. For example, US, UK, IN, etc.

The key generation algorithm has been specified as RSA, the key size as 1024 bits, the signature algorithm as SHA1withRSA, and the validity days as 365. These can be changed to suitable values if the need arises. For further details, please refer to the documentation of the keytool utility in the JDK utilized by Oracle WebLogic Server.

The sample execution command is listed below:

```
D:\Oracle\weblogic11g\jrockit 160 05 R27.6.2-20\bin>keytool -genkeypair -
alias selfcert -keyalq RSA -keysize 1024 -sigalq SHA1withRSA -validity 365 -
keystore D:\keystores\AdminOBVAMKeyStore.jks
Enter keystore password: <Enter a password to protect the keystore>
Re-enter new password: <Confirm the password keyed above>
What is your first and last
  name? [Unknown]:
  cvrhp0729.oracle.com
What is the name of your organizational
  unit? [Unknown]: BPD
What is the name of your
  organization? [Unknown]: Oracle
  Financial Services
What is the name of your City or
  Locality? [Unknown]: Mumbai
What is the name of your State or Province?
  [Unknown]: Maharashtra
What is the two-letter country code for this
  unit? [Unknown]: IN
```

```
Is CN=cvrhp0729.i-flex.com, OU=BPD, 0=Oracle Financial Services, L=Mumbai,
ST=Maharashtra, C=IN correct?
  [no]: yes
Enter key password for <selfcert>
RETURN if same as keystore password): <Enter a password to protect the key>
Re-enter new password: <Confirm the password keyed above>
```

Create Self-Signed Certificate
 This topic provides information about creating the identity store with self-signed certificates.

11.1.1 Create Self-Signed Certificate

This topic provides information about creating the identity store with self-signed certificates.

Browse to the bin folder of JRE from the command prompt and type the following command. The items highlighted are placeholders, and should be replaced with suitable values when running the command.

```
keytool -genkeypair -alias alias -keyalg RSA -keysize 1024 -sigalg SHA1withRSA -validity 365 -keystore keystore
```

Keyword	Description
alias	Used to identify the public and private key pair created. This alias is required later when configuring the SSL attributes for the managed servers in Oracle Weblogic Server.
keystore	It is used to specify the location of the JKS file. If no JKS file is present in the path provided, one will be created.

Table 11-3 Command Details

The command prompts for the following attributes of the certificate and keystore:

Table 11-4 Command Details

Attributes	Description
Keystore Password	Specify a password used to access the Keystore. This password needs to be specified later when configuring the identity store in Kafka server.
Key Password	Specify a password used to access the private key stored in the Keystore. This password needs to be specified later, when configuring the SSL attributes of the managed server(s) in Oracle Weblogic Server.
First and Last Name (CN)	Enter the domain name of the machine used to access Oracle Banking Virtual Account Management. For example, www.example.com.
Name of your Organizational Unit	The name of the department or unit making the request. For example, BDP. Use this field to further identify the SSL Certificate for creating. For example, by department or by physical server.
Name of your Organization	The name of the organization making the certificate request. For example, Oracle Financial Services. It is recommended to use the company or organization's formal name, and this name entered here must match the name found in official records.

Table 11-4 (Cont.) Command Details

Attributes	Description
Name of your City or Locality	The city in which your organization is physically located. For example, Mumbai.
Name of your State or Province	The state/province in which your organization is physically located. For example, Maharashtra.
Two-letter Country Code for this Unit	The country in which your organization is physically located. For example, US, UK, IN, etc.

The key generation algorithm has been specified as RSA, the key size as 1024 bits, the signature algorithm as SHA1withRSA, and the validity days as 365. These can be changed to suitable values if the need arises. For further details, please refer to the documentation of the keytool utility in the JDK utilized by Oracle WebLogic Server.

Listed below is the example of sample execution of the command:

```
D:\Oracle\weblogic11g\jrockit 160 05 R27.6.2-20\bin>keytool -genkeypair -
alias selfcert -keyalg RSA -keysize 1024 -sigalg SHA1withRSA -validity 365 -
keystore D:\keystores\AdminOBVAMKeyStore.jks
Enter keystore password: <Enter a password to protect the keystore>
Re-enter new password: <Confirm the password keyed above>
What is your first and last
  name? [Unknown]:
  cvrhp0729.oracle.com
What is the name of your organizational
  unit? [Unknown]: BPD
What is the name of your
  organization? [Unknown]: Oracle
  Financial Services
What is the name of your City or
  Locality? [Unknown]: Mumbai
What is the name of your State or Province?
  [Unknown]: Maharashtra
What is the two-letter country code for this
  unit? [Unknown]: IN
Is CN=cvrhp0729.i-flex.com, OU=BPD, O=Oracle Financial Services, L=Mumbai,
ST=Maharashtra, C=IN correct?
  [no]: yes
Enter key password for <selfcert>
RETURN if same as keystore password): < Enter a password to protect the key>
Re-enter new password: <Confirm the password keyed above>
```

11.2 Keystore Creation

This topic provides the information about keystore creation.

```
keytool -genkeypair -keystore <keystore_name.jks> -alias <alias_name> -dname
"CN=<hostname>, OU=<Organization Unit>, O=<Organization>, L=<Location>,
ST=<State>,
C=<Country_Code>" -keyalg <Key Algorithm> -sigalg <Signature Algorithm> -
keysize <key size>
```



```
-validity <Number of Days> -keypass <Private key Password> -storepass <Store Password>
```

Example:

```
keytool -genkeypair -keystore AdminOBVAMKeyStore.jks -alias OBVAMCert -dname
"CN=ofss00001.in.example.com, OU=OFSS, O=OFSS, L=Chennai, ST=TN, C=IN" -
keyalg "RSA"
-sigalg "SHA1withRSA" -keysize 2048 -validity 3650 -keypass Password@123 -
storepass
Password@123
```

Note:

CN=ofss00001.in.example.com is the Host Name of the weblogic server

11.3 Create Identity Store with Trusted Certificates Issued by CA

This topic provides the information for creating Identity Store with Trusted Certificates Issued by CA.

Create Public and Private Key Pair

Browse to the bin folder of JRE from the command prompt and type the following command. The items highlighted are placeholders, and should be replaced with suitable values when running the command.

```
keytool -genkeypair -alias alias -keyalg keyalg -keysize keysize - sigalg
sigalg -validity valDays -keystore keystore
```

Keyword	Description
alias	Used to identify the public and private key pair created. This alias is required later when configuring the SSL attributes for the managed servers in Oracle Weblogic Server.
keyalg	Key algorithm is used to generate the public and private key pair. The RSA key algorithm is recommended.
keysize	Key size of the public and private key pairs generated. A key size of 1024 or more is recommended. Please consult with your CA on the key size support for different types of certificates.
sigalg	This algorithm is used to generate the signature. This algorithm should be compatible with the key algorithm and should be one of the values specified in the Java Cryptography API Specification and Reference.
valdays	The number of days for which the certificate is to be considered valid. Please consult with your CA on this period.
keystore	Used to specify the location of the JKS file. If no JKS file is present in the path provided, the one will be created.

Table 11-5 Keyword Description



The command prompts for the following attributes of the certificate and keystore:

Attributes	Description
Keystore Password	Specify a password used to access the Keystore. This password needs to be specified later, when configuring the identity store in Kafka server.
Key Password	Specify a password used to access the private key stored in the Keystore. This password needs to be specified later, when configuring the SSL attributes of the managed server(s) in Oracle Weblogic Server.
First and Last Name (CN)	Enter the domain name of the machine used to access Oracle Banking Virtual Account Management. For example, www.example.com.
Name of your Organizational Unit	The name of the department or unit making the request. For example, BDP. Use this field to further identify the SSL Certificate for creating. For example, by department or by physical server.
Name of your Organization	The name of the organization making the certificate request. For example, Oracle Financial Services. It is recommended to use the company or organization's formal name, and this name entered here must match the name found in official records.
Name of your City or Locality	The city in which your organization is physically located. For example, Mumbai.
Name of your State or Province	The state/province in which your organization is physically located. For example, Maharashtra.
Two-letter Country Code for this Unit	The country in which your organization is physically located. For example, US, UK, IN, etc.

The sample execution command is listed below:

```
D:\Oracle\weblogic11g\jrockit 160 05 R27.6.2-20\bin>keytool -genkeypair -
alias cvrhp0729 -keyalg RSA -keysize 1024 -sigalg SHA1withRSA -validity 365 -
keystore
D:\keystores\AdminOBVAMKeyStore.jks
Enter keystore password: <Enter a password to protect the keystore>
Re-enter new password: <Confirm the password keyed above>
What is your first and last name?
  [Unknown]: cvrhp0729.i-flex.com
What is the name of your organizational unit?
  [Unknown]: BPD
What is the name of your organization?
  [Unknown]: Oracle Financial Services
What is the name of your City or Locality?
  [Unknown]: Mumbai
What is the name of your State or Province?
  [Unknown]: Maharashtra
What is the two-letter country code for this unit?
  [Unknown]: IN
Is CN=cvrhp0729.i-flex.com, OU=BPD, O=Oracle Financial Services, L=Mumbai,
ST=Maharashtra, C=IN correct? [no]: yes
Enter key password for <cvrhp0729>
```



RETURN if same as keystore password): <Enter a password to protect the key> Re-enter new password: <Confirm the password keyed above>

Generate CSR

To purchase an SSL certificate, the user must generate the CSR for the server where the certificate will be installed.

A CSR is generated from the server and is the server's unique **fingerprint**. The CSR includes the server's public key, which enables server authentication and secure communication. If the keystore file or the password is lost and a new one is generated, the SSL certificate and the private key will no longer match. A new SSL Certificate will have to be requested.

The CSR is created by running the following command in the bin directory of the JRE:

keytool -certreq -alias alias -file certreq file -keystore keystore

Table 11-7 Keyword Description

Keyword	Description
alias	Used to identify the public and private key pair created. The private key associated with the alias will be utilized to create the CSR. Specify the alias of the key pair created in the previous step.
certreq_file	This is the file in which the CSR will be stored.
keystore	This is the location of the keystore containing the public and private key pair.

The sample execution command is listed below:

```
D:\Oracle\Weblogic11g\jrockit_160_05_R27.6.2-20\bin>keytool -certreq -alias
cvrhp0729 -file D:\keystores\certreq.csr -keystore
D:\keystores\AdminOBVAMKeyStore.jks
Enter keystore password: [Enter a password to protect the keystore]
Enter key password for <cvrhp0729>[Enter the password used to access the key
in the keystore]
```

- Create Public and Private Key Pair This topic provides information about creating the public and private key pair.
- Generate CSR
 This topic provides information about generating the CSR

11.3.1 Create Public and Private Key Pair

This topic provides information about creating the public and private key pair.

Browse to the bin folder of JRE from the command prompt and type the following command. The items highlighted are placeholders, and should be replaced with suitable values when running the command.

```
keytool -genkeypair -alias alias -keyalg keyalg -keysize keysize - sigalg
sigalg -validity valDays -keystore keystore
```



Keyword	Description
alias	Used to identify the public and private key pair created. This alias is required later when configuring the SSL attributes for the managed servers in Oracle Weblogic Server.
keyalg	It is a key algorithm used to generate the public and private key pair. The RSA key algorithm is recommended.
keysize	It is the size of the public and private key pairs generated. A key size of 1024 or more is recommended. Please consult with your CA on the key size support for different types of certificates.
sigalg	It is the algorithm used to generate the signature. This algorithm should be compatible with the key algorithm and should be one of the values specified in the Java Cryptography API Specification and Reference.
valdays	It is the number of days for which the certificate is to be considered valid. Please consult with your CA on this period.
keystore	It is used to specify the location of the JKS file. If no JKS file is present in the path provided, one will be created.

Table 11-8 Command Details

The command prompts for the following attributes of the certificate and keystore:

Table 11-9 Command Detail

Attributes	Description
Keystore Password	Specify a password used to access the Keystore. This password needs to be specified later, when configuring the identity store in Kafka server.
Key Password	Specify a password used to access the private key stored in the Keystore. This password needs to be specified later, when configuring the SSL attributes of the managed server(s) in Oracle Weblogic Server.
First and Last Name (CN)	Enter the domain name of the machine used to access Oracle Banking Virtual Account Management. For example, www.example.com.
Name of your Organizational Unit	The name of the department or unit making the request. For example, BDP. Use this field to further identify the SSL Certificate for creating. For example, by department or by physical server.
Name of your Organization	The name of the organization making the certificate request. For example, Oracle Financial Services. It is recommended to use the company or organization's formal name, and this name entered here must match the name found in official records.
Name of your City or Locality	The city in which your organization is physically located. For example, Mumbai.
Name of your State or Province	The state/province in which your organization is physically located. For example, Maharashtra.
Two-letter Country Code for this Unit	The country in which your organization is physically located. For example, US, UK, IN, etc.

Listed below is the example of sample execution of the command:

D:\Oracle\weblogic11g\jrockit_160_05_R27.6.2-20\bin>keytool -genkeypair alias cvrhp0729 -keyalg RSA -keysize 1024 -sigalg SHA1withRSA -validity 365 -

```
keystore
D:\keystores\AdminOBVAMKeyStore.jks
Enter keystore password: <Enter a password to protect the keystore>
Re-enter new password: <Confirm the password keyed above>
What is your first and last name?
  [Unknown]: cvrhp0729.i-flex.com
What is the name of your organizational unit?
  [Unknown]: BPD
What is the name of your organization?
  [Unknown]: Oracle Financial Services
What is the name of your City or Locality?
  [Unknown]: Mumbai
What is the name of your State or Province?
  [Unknown]: Maharashtra
What is the two-letter country code for this unit?
  [Unknown]: IN
Is CN=cvrhp0729.i-flex.com, OU=BPD, O=Oracle Financial Services, L=Mumbai,
ST=Maharashtra, C=IN correct? [no]: yes
Enter key password for <cvrhp0729>
RETURN if same as keystore password): < Enter a password to protect the key>
Re-enter new password: <Confirm the password keyed above>
```

11.3.2 Generate CSR

This topic provides information about generating the CSR

To purchase an SSL certificate, the user must generate the CSR for the server where the certificate will be installed.

A CSR is generated from the server and is the server's unique **fingerprint**. The CSR includes the server's public key, which enables server authentication and secure communication. If the keystore file or the password is lost and a new one is generated, the SSL certificate and the private key will no longer match. A new SSL Certificate will have to be requested.

The CSR is created by running the following command in the bin directory of the JRE:

keytool -certreq -alias alias -file certreq file -keystore keystore

Keyword	Description
alias	Used to identify the public and private key pair created. The private key associated with the alias will be utilized to create the CSR. Specify the alias of the key pair created in the previous step.
certreq_file	It is the file in which the CSR will be stored.
keystore	It is the location of the keystore containing the public and private key pair.

Table 11-10 Command Details

Listed below is the example of sample execution of the command:

```
D:\Oracle\Weblogic11g\jrockit_160_05_R27.6.2-20\bin>keytool -certreq -alias
cvrhp0729 -file D:\keystores\certreq.csr -keystore
D:\keystores\AdminOBVAMKeyStore.jks
Enter keystore password: <Enter a password to protect the keystore>
```



Enter key password for <cvrhp0729>[Enter the password used to access the key in the keystore]

11.4 Export Private Key as Certificate

This topic provides the information to export private key as certificate.

```
keytool -export -v -alias <alias_name> -file
<export_certificate_file_name_with_location.cer>
-keystore <keystore_name.jks> > -keypass <Private key Password> -storepass
<Store Password>
```

Example 11-1

```
keytool -export -v -alias OBVAMCert -file AdminOBVAMCert.cer
-keystore AdminOBVAMKeyStore.jks -keypass Oracle123 -storepass Oracle123
```

If successful, the following message is displayed.

Certificate stored in file < AdminOBVAMCert.cer>

- Obtain Trusted Certificate from CA This topic provides the information to obtain the trusted certificate from CA.
- Import Certificate into Identity Store This topic provides the information to import the certificate into identify store.

11.4.1 Obtain Trusted Certificate from CA

This topic provides the information to obtain the trusted certificate from CA.

The processes of obtaining a trusted certificate vary from one CA to another. The CA might perform additional offline verification. Consult the CA issuing the certificate for details on the process to be followed for submission of the CSR and for obtaining the certificate.

11.4.2 Import Certificate into Identity Store

This topic provides the information to import the certificate into identify store.

Store the certificate obtained from the CA in the previous step, in a file, preferably in PEM format. Other formats like the p7b file format would require conversion to the PEM format. Details on performing the conversion are not listed here.

Note:

Refer to the Oracle WebLogic Server documentation on securing Oracle WebLogic Server for details on converting a Microsoft p7b file to the PEM format.

The command to be executed for importing a certificate into the identity store depend on whether the trust store chosen (Refer to section Choose the Identity and Trust Stores). It is highly recommended to verify the trust path when importing a certificate into the identity store. The commands provided below assume the use of the Java Standard Trust store.



Import the Intermediate CA Certificate

Most Certificate Authorities do not use the root CA certificates to issue identity certificates for use by customers. Instead, Intermediate CAs issue identity certificates in response to the submitted CSRs.

If the Intermediate CA certificate is absent in the Java Standard Trust store, the trust path for the certificate will be incomplete for the certificate, resulting in warnings issued by WebLogic Server during runtime. To avoid this, the intermediate CA certificate should be imported into the identity keystore. Although the intermediate CA certificate can be imported into the Java Standard Trust store, this is not recommended unless the intermediate CA certificate into the following command must be executed to import the intermediate CA certificate into the keystore.

keytool -importcert -alias alias -file cert_file -trustcacerts -keystore
keystore

Keyword	Description
alias	Used to identify the public and private key pair. Specify the alias of the key pair used to create the CSR in the earlier step.
certreq_file	This is the location of the file containing the intermediate CA certificate in a PKCS#7 format (PEM or DER file).
keystore	This is the location of the keystore containing the public and private key pair.

Table 11-11	Keyword	Description
-------------	---------	-------------

The trustcacerts flag is used to consider other certificates (higher intermediaries and the root CA) in the chain of trust. If no chain of trust is established during verification, the certificate will be displayed and one would be prompted to verify it. It is recommended that due diligence be observed, when the prompt is displayed to verify a certificate when a chain of trust is absent.

The sample execution command is listed below:

```
D:\Oracle\weblogic11g\jrockit_160_05_R27.6.2-20\bin>keytool - importcert -
alias verisigntrialintermediateca -file
D:\keystores\VerisignIntermediateCA.cer -trustcacerts -keystore
D:\keystoreworkarea\AdminOBVAMKeyStore.jks
Enter keystore password:<Enter the password used to access the keystore>
Certificate was added to keystore
```

Import the Identity Certificate

The following command should be executed to import the identity certificate into the keystore.

```
keytool -importcert -alias alias -file cert_file -trustcacerts -keystore
keystore
```

Table 11-12	Keyword Description
-------------	---------------------

Keyword	Description
alias	Used to identify the public and private key pair. Specify the alias of the key pair used to create the CSR in the earlier step.
certreq_file	This is the location of the file containing the PKCS#7 formatted reply from the CA, containing the signed certificate.
keystore	This is the location of the keystore containing the public and private key pair.

The trustcacerts flag is used to consider other certificates (intermediate CAs and the root CA) in the chain of trust. If no chain of trust is established during verification, the certificate will be displayed and one would be prompted to verify it. It is recommended that due diligence be observed, when the prompt is displayed to verify a certificate when a chain of trust is absent.

The sample execution command is listed below:

```
D:\Oracle\weblogic11g\jrockit_160_05_R27.6.2-20\bin>keytool - importcert -
alias cvrhp0729 -file
D:\keystores\cvrhp0729.cer - trustcacerts -keystore
D:\keystoreworkarea\AdminOBVAMKeyStore.jks
Enter keystore password: <Enter the password used to access the keystore>
Enter key password for <cvrhp0729>: <Enter the password used to access the
private key>
Certificate reply was installed in keystore
```

The previous set of commands assumed the presence of the appropriate root CA certificate (in the chain of trust) in the Java Standard Trust store, i.e. in the cacerts file. If the CA issuing the identity certificate (for the WebLogic Server) does not have the root CA certificate in the Java Standard Trust store, one can opt to import the root CA certificate into cacerts, or into the identity store, depending on factors including trustworthiness of the CA, necessity of transporting the trust store across machine, among others.

11.5 Import Trusted Certificate

This topic provides the information to import trusted certificate.

```
keytool -import -v -trustcacerts -alias rootcacert
-file <export_certificate_file_name_with_location.cer> -keystore
<keystore_name.jks> >
-keypass <Private key Password> -storepass <Store Password>
```

Example 11-2

```
keytool -import -v -trustcacerts -alias rootcacert
-file AdminOBVAMCert.cer -keystore AdminOBVAMKeyStore.jks -keypass Oracle123
-storepass Oracle123
```



12

Configure Identity and Trust Stores for Weblogic

This topic provides the information to configure Identity and Trust Stores for Weblogic.

- Enable SSL on Oracle WebLogic Server
 This topic provides the systematic instructions to enable the SSL on Oracle WebLogic
 Server.
- Configure Identity and Trust Stores
 This topic provides the systematic instructions to configure the identity and trust store for
 WebLogic.

12.1 Enable SSL on Oracle WebLogic Server

This topic provides the systematic instructions to enable the SSL on Oracle WebLogic Server.

Login to the Oracle WebLogic Admin Console to configure SSL.

- 1. Under Change Center, click Lock & Edit.
- 2. Expand Servers node.
- 3. Select the name of the server for which you want to enable SSL.

Example: example server

- 4. Navigate to **Configuration** and select **General** tab.
- 5. Select the SSL Listen Port Enabled option and specify the SSL listen port.
- 6. In **Listen Address** field, specify the hostname of the machine in which the application server is installed.

12.2 Configure Identity and Trust Stores

This topic provides the systematic instructions to configure the identity and trust store for WebLogic.

Login to the Oracle Weblogic Admin Console.

- 1. Under Change Center, click Lock & Edit.
- 2. Expand Servers node.
- 3. Select the name of the server to configure the keystores.

Example: exampleserver

- 4. Navigate to **Configuration** and select **Keystores** tab.
- 5. In the **Keystores** field, select the method for storing and managing private keys/digital certificate pairs and trusted CA certificates.

This choice should match the one made in **Choose the Identity and Trust Stores** section of this document.



- 6. In the **Identity** section, provide the following details:
 - Custom Identity Keystore File Name: Fully qualified path to the Identity keystore.
 - Custom Identity Keystore Type: Set this attribute to JKS, the type of the keystore. If left blank, it is defaulted to JKS (Java KeyStore).
 - **Custom Identity Keystore PassPhrase**: The password you enter when reading or writing to the keystore. This attribute is optional or required depending on the type of keystore. All keystores require the passphrase in order to write to the keystore. However, some keystores do not require the passphrase to read from the keystore. Oracle Weblogic server only reads from the keystore. So whether or not you define this property depends on the requirements of the keystore.
- 7. In the Trust section, provide the following details:

If the user choose **Java Standard Trust**, specify the password used to access the trust store.

If the user choose Custom Trust, the following attributes have to be provided:

- **Custom Trust Keystore**: The fully qualified path to the trust keystore.
- Custom Trust Keystore Type: Set this attribute to JKS, the type of the keystore. If left blank, it defaults to JKS (Java KeyStore).
- Custom Trust Keystore Passphrase: The password you enter when reading or writing to the keystore. This attribute is optional or required depending on the type of keystore. All keystores require the passphrase in order to write to the keystore. However, some keystores do not require the passphrase to read from the keystore. Oracle Weblogic

Server only reads from the keystore. So, whether or not you define this property depends on the requirements of the keystore.

Note:

If the identity and trust stores are in the JKS format, the passphrases are not required.



13 Configure Weblogic Console

This topic provides the systematic instructions to configure the WebLogic Console.

After domain creation, follow the below steps to enable SSL in WebLogic Admin server. Login to the **Oracle Weblogic Server Admin Console**.

1. Select Admin Server to enable SSL options.

domain.		Configuration Control						
Lock & Edit								
Release Configuration		A server is an instance of WebLogi	c Server that runs in its own	n Java Virtual Machine (JVM) ar	d has its own configuration.			
Jomain Structure		This page summarizes each server	that has been configured in	the current WebLogic Server of	lomain.			
atoinfra_domain B-Domain Partitions	-	62						
Environment Servers		Customize this table						
Clusters		Servers (Filtered - More Colum	ins Exist)					
Coherence Clusters		New Clone Delete				Showi	ng 1 to 5 of 5 Previous	
···Resource Group Templates							511011	Ing I to 5 or 5 Previous
Machines Virtual Hosts		🔲 Name 🗇	Туре	Cluster	Machine	State	Health	Listen Port
····Virtual Targets		AdminServer(admin)	Configured			RUNNING	🖋 ок	7001
Work Managers		WLS_CONFIG	Configured	config_cluster	platoinfra_Machine	SHUTDOWN	Not reachable	7004
Resource Management	*	WLS_DISCOVERY	Configured	discovery_cluster	platoinfra_Machine	SHUTDOWN	Not reachable	7003
low do I		WLS_GATEWAY	Configured	gateway_cluster	platoinfra_Machine	SHUTDOWN	Not reachable	7006
Create Managed Servers		WLS_ZIPKINUI	Configured	zipkinui_cluster	platoinfra_Machine	SHUTDOWN	Not reachable	7005
Clone servers		New Clone Delete					Showi	ng 1 to 5 of 5 Previous
Delete Managed Servers								
Delete the Administration Server								

Figure 13-1 Configuration

- 2. Click General tab.
- 3. Select SSL Listen Port Enabled, Client Cert Proxy Enabled, and Weblogic Plug-In Enabled.



Figure 13-2 Listen Port	·
✓ Listen Port Enabled	
Listen Port:	7001
SSL Listen Port Enabled	
SSL Listen Port:	7101
🖉 街 Client Cert Proxy Enabled	
Java Compiler:	javac
Diagnostic Volume:	Low •
Default Datasource:	
— 🖓 Advanced —	
Virtual Machine Name:	platoinfra_domain_AdminSe
WebLogic Plug-In Enabled:	<mark>yes</mark> _▼

4. Click Save.



Settings for AdminServer							
Configuration Protocols Logging Debug Monitoring Control Deployments Services Se							
General Cluster Services Keystores SSL Federation Services Deployment	Migration	Т					
Save							

5. Click Keystores tab.



Ceystores:	Custom Identity and Custom Trust Change
Identity	
Eustom Identity Keystore:	C:\AdminOBLMKeyStore.jks
ustom Identity Keystore Type:	jks
Sustom Identity Keystore Passphrase:	•••••
Confirm Custom Identity Keystore Passphrase:	
Trust	
Eustom Trust Keystore:	C:\AdminOBLMKeyStore.jks
Lustom Trust Keystore Type:	iks
Custom Trust Keystore Passphrase:	•••••
Confirm Custom Trust Keystore Passphrase:	· · · · · · · · · · · · · · · · · · ·

Figure 13-4 Keystores

- 6. Specify **Custom Identity Keystore** and **Custom Trust Keystore** same as the **Keystore Name** created in above steps with full path.
- 7. Specify Custom Identity Keystore Type and Custom Trust Keystore Type as jks.
- 8. Specify Custom Identity Keystore Passphrase, Confirm Custom Identity Keystore Passphrase, Custom Trust Keystore Passphrase and Confirm Custom Trust Keystore Passphrase same as the Store Password entered in above steps.
- 9. Click Save.
- 10. Click SSL tab.

General	Cluster	Services	Keystores	SSL	Federation Services	Deployment	Migration	Tuning
Save								
This pag	e lets you	view and de	fine various S	ecure S	ockets Layer (SSL) sett	ings for this ser	ver instance.	These se
🗧 Ident	tity and Ti	rust Locati	ons:		Keystore	es Change		
Identit	у							
Private K	ey Locati	on:			from Cu	stom Identity K	eystore	
Private Key Alias:			OBLM	OBLMCert				
🖯 Priva	te Key Pa	ssphrase:			•••••			
🗄 Confi	rm Privat	e Key Pass	phrase:		••••••	•••••		
Certificate Location:		from Custom Identity Keystore						
Trust								
Trusted Certificate Authorities:			from Cu	stom Trust Keys	store			

Figure 13-5 SSL

- 11. Specify **Private Key Alias** as same as the alias name entered in above steps.
- 12. Specify Private Key Passphrase and Confirm Private Key Passphrase as same as the Private Key Password entered in above steps.
- **13**. Change the **Hostname Verification** to **None**.
- 14. Click Save.

Repeat the same steps for all the managed servers as well. The admin server and managed servers are SSL enabled.

15. Restart all the servers.

Configure SSL Mode in Node Manager for Clustered Environment

This topic provides the systematic instructions to configure the SSL mode in node manager for clustered environment.

Edit the nodemanager.properties with SSL configurations and restart the node manager. 1.



Figure 14-1 Node Manager Properties

Ensure the SSL configuration is performed in other artifacts, such as 2. startNodeManager.cmd/.sh, startup.properties, config.xml(enable jsse).



15 Set SSL Attributes for Managed Servers

This topic provides the systematic instructions to set the SSL attributes for Managed Servers.

Set SSL Attributes for Private Key Alias and Password

Login to the **Oracle Weblogic Server Admin Console** to configure the private key alias and password.

- 1. Under Change Center, click Lock & Edit.
- 2. Expand Servers node.
- 3. Select the name of the server to configure keystores.

Example: exampleserver

4. Navigate to **Configuration** and select **SSL** tab.

Figure 15-1 Configuration

No pending changes exist. Click the Release Configuration button to allow others to edit the	Settings for platoinfra_Machin	e
domain.	Configuration Monitoring	Notes
Lock & Edit Release Configuration	General Node Manager S	ervers
Domain Structure		
platoinfra_domain Domain Partitions Environment Custers Coherence Clusters Coherence Clusters Coherence Clusters Coherence Clusters Custers Custers	Managed Servers are installed.	the Node Manager configuration for this machine. To control a Managed Server from th ge are used to configure communication between the current domain and Node Manage SSL 5557
How do I 😑	👸 Node Manager Home:	
Create and configure machines Monitor Node Manager status Monitor Node Manager logs	街 Shell Command:	

- 5. Select Keystores from Identity and Trust Locations.
- 6. Under Identity section, specify the following details:
 - **Private Key Alias**: Set this attribute to the alias name defined for the key pair when creating the key pair in the Identity keystore.
 - Private Key Passphrase: The password defined for the key pair (alias_password), at the time of its creation. Confirm the password.
- 7. Click Save.
- 8. Under Change Center, click Activate changes.



ake effect.	Configuration Monitoring Notes General Node Manager Servers
nain Structure	Save
oinfra_domain Domain Partitions Environment Servers Clusters Coherence Clusters	 This page allows you to define the Node Manager configuration for this maching Managed Servers are installed. The settings defined on this page are used to configure communication betwee the Node Manager instances.
Resource Groups Resource Group Templates Machines	a∰ Type: SSL ▼

Figure 15-2 Configuration - Activate Changes

9. Navigate to **Controls** tab, and check the appropriate server.

Figure 15-3 Control

ck the Lock & Edit button to modify, add or lete items in this domain.	Summary of Servers						
lock & Edit	Configuration Control						
Release Configuration	Use this page to change the state of the serve the domain-wide administration port.	ers in this WebLogic Server domain. Control operat	ions on Managed Servers require startin	g the Node Manager. Starting Managed Servers in Standby mode requires			
toinfra_domain Domain Partitions EnvironmentServersServers	₹2						
Coherence Clusters Resource Groups Resource Group Templates	Start Resume Suspendy Shutdown Restart SSL Showing 1 to 5 of 5 Previous Next						
Machines	🕑 Server 🐟	Machine	State	Status of Last Action			
Virtual Targets	AdminServer(admin)		RUNNING	None			
Work Managers Concurrent Templates	WLS_CONFIG	platoinfra_Machine	SHUTDOWN	None			
Resource Management	WLS_DISCOVERY	platoinfra_Machine	SHUTDOWN	None			
w do I 🖂	WLS_GATEWAY	platoinfra_Machine	SHUTDOWN	None			
Start and stop servers	WLS_ZIPKINUI	platoinfra_Machine	SHUTDOWN	None			
Start Managed Servers from the Administration Console	Start Resume Suspend - Shutdow	wn ∽ Restart SSL		Showing 1 to 5 of 5 Previous Next			
Restart SSL							

10. Click **Restart SSL**, and Confirm when it prompts.



16 Test Configuration

This topic provides the information to test the configuration.

Once the Oracle Weblogic has been configured for SSL, deploy the application in the usual manner. After deployment, the user can test the application in SSL mode.

To launch the application in SSL mode, the user need to enter the URL in the following format:

https://(Machine Name):(SSL_Listener_port_no)/(Context_root)

Note:

It is recommended to access the Oracle Banking Virtual Account Management web application via the HTTPS channel, instead of the HTTP channel.



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