Oracle HTTP Server 11g R1 Configuration for FLEXCUBE Oracle FLEXCUBE Universal Banking Release 14.4.0.0.0 [May] [2020]



Table of Contents

1.	. PURPOSE	
2.	. INTRODUCTION TO ORACLE HTTP SERVER (OHS)	
-	2.1 HTTP LISTENER2.2 MODULES (MODS)	
3.	. INSTALLATION OF OHS 11G	
4.	. CONFIGURE ORACLE HTTP SERVER INFRONT OF WEBLOGIC SERVER	
2	4.1 FOR WEBLOGIC IN SINGLE INSTANCE	
4	4.2 FOR WEBLOGIC INSTANCES IN CLUSTER	
5.	. ENABLE "WEBLOGIC PLUG-IN ENABLED" FLAG IN WEBLOGIC	
6.	. COMPRESSION RULE SETTING	6-16
(6.1 LOADING MOD DEFLATE	
(6.2 CONFIGURING FILE TYPES	
(6.3 HTTPD.CONF FILE CHANGES	
7.	. CONFIGURING SSL FOR ORACLE HTTP SERVER	
-	7.1 SSL CONFIGURATION FOR INBOUND REQUEST TO ORACLE HTTP SERVER	
	7.1.1 Create a new Wallet and import Certificate	
	7.1.2 Configuring Wallet in ssl.conf file	
	7.2 CONFIGURING SSL BETWEEN ORACLE HTTP SERVER AND ORACLE WEBLOGIC SERV	
	7.2.1 Turn off KeepAliveEnabled	
	7.2.2 To enable one-way SSL	
	7.2.3 To enable two-way SSL	
8.	. SAMPLE CONFIGURATION FILES	
9.	. STARTING, STOPPING, AND RESTARTING ORACLE HTTP SERVER	
Ģ	9.1 Start	
Ģ	9.2 Stop	
Ģ	9.3 Restart	
10.	0. TEST THE APPLICATION	
11.	1. SERVER LOGS LOCATION	
12.	2. REFERENCES	



1. Purpose

The objective of this document is to explain the installation and configuration of Oracle HTTP Server 11g R1 (11.1.1.6.0). This includes setting up of server details, configuration of compression rules and enabling SSL.



2. Introduction to Oracle HTTP Server (OHS)

Oracle HTTP Server is the Web server component for Oracle Fusion Middleware. It is based on Apache web server, and includes all base Apache modules and modules developed specifically by Oracle. It provides a HTTP listener for Oracle WebLogic Server and the framework for hosting static pages, dynamic pages, and applications over the Web. Key aspects of Oracle HTTP Server are its technology, its serving of both static and dynamic content and its integration with both Oracle and non-Oracle products.

Oracle HTTP Server consists of several components that run within the same process. These components provide the extensive list of features that Oracle HTTP Server offers when handling client requests.

Following are the major components:

2.1 HTTP Listener

Oracle HTTP Server is based on an Apache HTTP listener to serve client requests. An HTTP server listener handles incoming requests and routes them to the appropriate processing utility.

2.2 Modules (mods)

Modules extend the basic functionality of Oracle HTTP Server, and support integration between Oracle HTTP Server and other Oracle Fusion Middleware components. There are modules developed specifically by Oracle for Oracle HTTP Server. Ex: mod_wl_ohs, mod_plsql

Oracle HTTP Server also includes the base Apache and third-party modules out-of-the-box. These modules are not developed by Oracle. Ex: mod_proxy, mod_perl



3. Installation of OHS 11g

Invoke the setup exe to start the installation

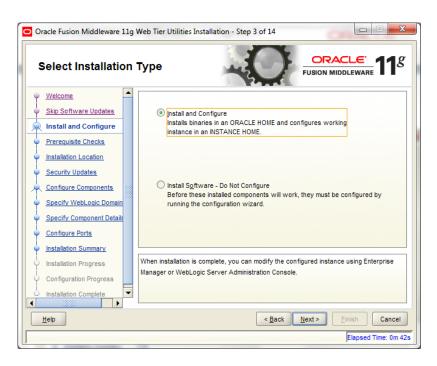


Select Skip Software Updates

Install Software Up	dates	ORACLE TUSION MIDDLEWARE
Welcome Welcome Skip Software Updates Install and Configure Prerequisite Checks Installation Location Security Updates Configure Components Specify WebLogic Domain Specify Component Details Configure Ports Installation Summary Installation Progress Configuration Progress	Skip Software Updates Search My Oracle Support for Updates Usgr Name: Password: Proxy Setting: Search Local Directory for Updates Local Directory: Search For Updates	s Test Connection
Installation Complete	< Back	Next > Einish Cancel



Select Install and Configure



Oracle Fusion Middleware 11g	Web Tier l	Utilities Installation - Step 4 of 14	OR	
Prerequisite Check	(S	-0		<u>e</u> 11
Welcome	Selection	Check	Progress	Status
Skip Software Updates	1	Checking operating system certification	100%	 Image: A set of the set of the
Install and Configure	1	Checking physical memory	100%	 Image: A second s
Prerequisite Checks				
Installation Location				
Security Updates				
Configure Components				
Specify WebLogic Domain				
Specify Component Details				
Configure Ports		A	bort <u>R</u> etry	Continue
Installation Summary				
Installation Progress		hecking operating system certification		
Configuration Progress	⊞ ✔ C	hecking physical memory		
Installation Complete				
Help		< <u>B</u> ack	<u>N</u> ext > <u>Finis</u>	sh Cancel
	_		E	apsed Time: 0m 52s



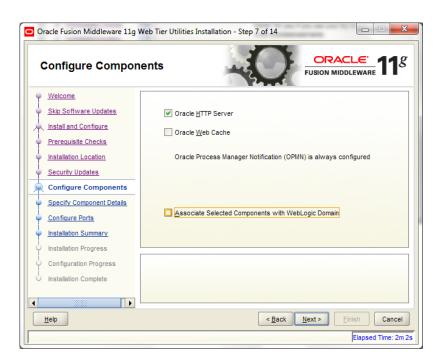
Oracle Fusion Middleware 11g	Web Tier Utilities Installation -	Step 5 of 14	
Specify Installation	Location		
	Oracle <u>M</u> iddleware Home: Oracle Home Directory:	C:\OracleMiddleware Oracle_WT1	▼ Browse
Configuration Progress	🚵 An Application Server m	ust already be installed.	Einish Cancel
			Elapsed Time: 1m 2s







Select only Oracle HTTP Server

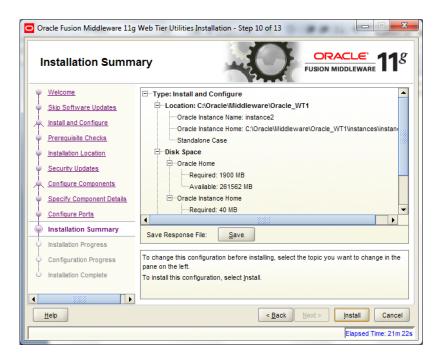


Enter the required OHS instance and component names

Oracle Fusion Middleware 11g	Web Tier Utilities Installation - S	Step 8 of 13
Specify Componer	nt Details	FUSION MIDDLEWARE 118
Welcome Skip Software Updates Install and Configure Prerequisite Checks Installation Location Security Updates	Instance Home Location: In <u>s</u> tance Name:	C:\Oracle\Middleware\Oracle_ Browse
Configure Components Specify Component Detail: Configure Ports Installation Summary Installation Progress	OHS Component Name:	ohs1
Configuration Progress		alphabetic character, may only contain alphanumeric or hyphen (-) characters and are 4 to 30 characters
Help		< <u>Back</u> <u>Next></u> Einish Cancel Elapsed Time: 24m 12s



Oracle Fusion Middleware 11g V	Neb Tier Utilities Installation - Step 9 of 13
Configure Ports	EUSION MIDDLEWARE 118
Welcome Skip Software Updates Install and Configure Prerequisite Checks Installation Location Security Updates Configure Components Specify Component Details Configure Ports Installation Progress Configuration Progress Installation Complete	Auto Port Configuration Specify Ports using Configuration file Elle name: C:\Users\nmb\staticports.ini Browse View/Edit File
	< <u>Back</u> <u>Next></u> <u>Finish</u> Cancel Elapsed Time: 20m 57s





-	gress	
Welcome	Configuration Tools	
Skip Software Updates	Name	Progress
Install and Configure	🖃 🖳 🖌 Web Tier Configuration	100%
Prerequisite Checks	Create and Start AS Instance (instance2)	Success
Installation Location	Create and Start OHS Component (ohs1)	 Success Success
 Security Updates 	Create Shortcuts	V Success
Configure Components		
Specify Component Details		
Configure Ports	Abort	Retry Continue
_	Configuration Log Location: C:\Program	
Installation Summary	Files\Oracle\Inventory\logs\install2013-01-09_12-18-24P	M.log
Installation Progress		
Configuration Progress	E ··· ✓ Web Tier Configuration	
Installation Complete		
Help	< Back	lext > Einish Cancel
Oracle Eusion Middleware 11a	Web Tier Utilities Installation - Step 13 of 13	
Installation Compl		
	ete	ORACLE FUSION MIDDLEWARE
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This completes the installation of Oracle HTTP Server with <Instance> and <component>. Example: Instance is instance1 and component is ohs1.

If you would like to change the port after the installation(OHS Listen Port) edit \$ORACLE_INSTANCE/config/OHS/<component_name>/httpd.conf and change the listen port.

NOTE: This port is for http protocol and not for https.



😑 http	d.conf
181	
182	÷
183	# Listen: Allows you to bind Apache to specific IP addresses and/or
184	\ddagger ports, instead of the default. See also the <virtualhost></virtualhost>
185	# directive.
186	÷
187	# Change this to Listen on specific IP addresses as shown below to
188	# prevent Apache from glomming onto all bound IP addresses (0.0.0.0)
189	÷
190	# Listen 12.34.56.78:80
191	
192	# OHS Listen Port
193	Listen 7777
194	
195 196	T
196	<pre># Dynamic Shared Object (DSO) Support #</pre>
197	* # To be able to use the functionality of a module which was built as a DSO you
190	<pre># how to place corresponding `LoadModule' lines at this location so the</pre>
200	# directives contained in it are actually available before they are used.

- 200 # directives contained in it are actually available _before_ they are u
 201 # Statically compiled modules (those listed by `httpd -l') do not need
 202 # to be loaded here.
 203 #
 204 # Example:
 205 # LoadModule foo_module "\${ORACLE_HOME}/ohs/modules/mod_foo.so"
 206



4. Configure Oracle HTTP Server infront of Weblogic Server

In Oracle HTTP Server requests from Oracle HTTP Server to Weblogic server are proxied using mod_wl_ohs module. This configuration file needs to be modified to include the Weblogic server and port details.

mod_wl_ohs.conf file is located at

{ORACLE_INSTANCE}/config/OHS/{COMPONENT_NAME}/mod_wl_ohs.conf

Add the below directives to mod_wl_ohs.conf file.

4.1 For WebLogic in single instance

<Location /<<context/url>>>

SetHandler weblogic-handler

WebLogicHost <<server name>>

WeblogicPort <<port>>

</Location>

Example:

<Location /FCJNeoWeb>

SetHandler weblogic-handler

WebLogicHost wlserver1

WeblogicPort 7707

</Location>

This will forward /FCJNeoWeb from HTTP server to /FCJNeoWeb on WebLogic Server wlserver1: 7707



mo	d_wl_ohs.cont
1	# NOTE : This is a template to configure mod_weblogic.
2	
3	LoadModule weblogic_module "\${ORACLE_HOME}/ohs/modules/mod_wl_ohs.so"
4	LoadModule deflate_module "\${ORACLE_HOME}/ohs/modules/mod_deflate.so"
5	
6	# This empty block is needed to save mod_wl related configuration from EM to t
7	<ifmodule weblogic_module=""></ifmodule>
8	<pre># WebLogicHost <weblogic_host></weblogic_host></pre>
9	# WebLogicPort <weblogic_port></weblogic_port>
10	# Debug ON
11	# WLLogFile /tmp/weblogic.log
12	# MatchExpression *.jsp
13	
14	
15	# <location weblogic=""></location>
16	# SetHandler weblogic-handler
17	# PathTrim /weblogic
18	
19	<pre># </pre>
20	
21	<location fcjneoweb=""></location>
22	SetHandler weblogic-handler
23	WebLogicHost wlserver1
24	WebLogicPort 7707
25	

4.2 For Weblogic instances in cluster

<Location /<<context/url>>>

SetHandler weblogic-handler

WebLogicCluster <server1>:<port1>,<server2>:<port2>

</Location>

Example

<Location / FCJNeoWeb >

SetHandler weblogic-handler

WebLogicCluster wlserver1:7010, wlserver2:7010

</Location>

This will forward /FCJNeoWeb from HTTP server to /FCJNeoWeb on WebLogic Cluster wlserver1:7010 and wlserver2:7010



🚽 mo	d_wl_ohs.conf
1	# NOTE : This is a template to configure mod_weblogic.
2	
3	LoadModule weblogic_module "\${ORACLE_HOME}/ohs/modules/mod_wl_ohs.so"
4	LoadModule deflate_module "\${ORACLE_HOME}/ohs/modules/mod_deflate.so"
5	
6	# This empty block is needed to save mod_wl related configuration from EM to this fi
7	<ifmodule weblogic_module=""></ifmodule>
8	# WebLogicHost <weblogic_host></weblogic_host>
9	# WebLogicPort <weblogic_port></weblogic_port>
	# Debug ON
11	· ····································
12	
14	
15	<pre># <location weblogic=""></location></pre>
	# SetHandler weblogic-handler
17	
18	
19	#
2	<location fcjneoweb=""></location>
2.	<location fcjneoweb=""></location>
2.	SetHandler weblogic-handler
2	WebLogicCluster wlserver1:7010,wlserver2:7010
2	
2	(/ 1004010/1)



5. Enable "WebLogic Plug-In Enabled" flag in weblogic

This flag needs to be enabled in weblogic if it is accessed through proxy plugins. When the WebLogic plugin is enabled, a call to getRemoteAddr will return the address of the browser client from the proprietary WL-Proxy-Client-IP header instead of the web server.

- a. Plugin flag at managed server level
 - i. Click on 'Environment'- > 'Servers' -> '<ManagedServer>' -> 'General' -> 'Advanced'
 - ii. Check the 'WebLogic Plug-In Enabled' box.
 - iii. Click 'Save'
 - iv. Restart the Server.
- b. Plugin flag at domain level
 - v. Click on <Domain> -> 'Web Applications'
 - vi. Check the 'WebLogic Plug-In Enabled' box.
 - vii. Click 'Save'
 - viii. Restart the server.



6. Compression rule setting

Content compression in Oracle HTTP Server is done using mod_deflate. This can compress HTML, text or XML files to approx. 20 - 30% of their original sizes, thus saving on server traffic. However, compressing files causes a slightly higher load on the server, but clients' connection times to server is reduced.

6.1 Loading mod_deflate

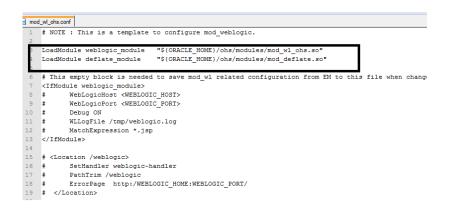
mod_deflate is used for compression in OHS and this is installed in Oracle HTTP Server under location

"\${ORACLE_HOME}/OHS/modules/mod_deflate.so"

But it might not be loaded.

To load the file add the below directive in mod_wl_ohs.conf file

LoadModule deflate_module "\${ORACLE_HOME}/OHS/modules/mod_deflate.so"



6.2 Configuring file types

mod_deflate also requires to specify which type files are going to be compressed.

In the LOCATION section of mod_wl_ohs.conf file add the below entries.

AddOutputFilterByType DEFLATE text/plain

AddOutputFilterByType DEFLATE text/xml

AddOutputFilterByType DEFLATE application/xhtml+xml

AddOutputFilterByType DEFLATE text/css



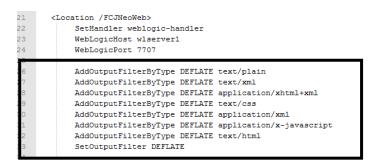
AddOutputFilterByType DEFLATE application/xml

AddOutputFilterByType DEFLATE application/x-javascript

AddOutputFilterByType DEFLATE text/html

SetOutputFilter DEFLATE

Images are supposed to be in a compressed format, and therefore are bypassed by mod_deflate.



6.3 httpd.conf file changes

This is a server configuration file which typically contains directives that affect how the server runs, such as user and group IDs it should use, and location of other files. Cross check the existence of mod_wl_ohs.conf include in httpd.conf file.

httpd.conf file is present under location

"\${ORACLE_INSTANCE}/config/OHS/{COMPONENT_NAME}/httpd.conf"

In this file cross check for the below entry

include "\${ORACLE_INSTANCE}/config/OHS/\${COMPONENT_NAME}/mod_wl_ohs.conf"

If above include entry is not present, then add the above include section.



#Directives to setup logging via ODL OraLogDir "\$(ORACLE_INSTANCE)/diagnostics/logs/\$(COMPONENT_TYPE)/\$(COMPONENT_NAME)" OraLogSeverity WANNING:32 OraLogSeverity WANNING:32 OraLogSetup of the set of the s



7. Configuring SSL for Oracle HTTP Server

Secure Sockets Layer (SSL) is required to run any Web site securely. Secure Sockets Layer (SSL) is an encrypted communication protocol that is designed to securely send messages across the Internet.

Reading of "**SSL_Configuration on Weblogic**" document provided as part of FCUBS installation is recommended before proceeding with further setup.

In Oracle HTTP server, SSL configuration can be done between

- 1. Browser to Oracle HTTP Server(Mandatory)
- 2. Oracle HTTP Server to Oracle Weblogic Server(If required)

7.1 SSL configuration for Inbound Request to Oracle HTTP

<u>Server</u>

Perform these tasks to enable and configure SSL between browser and Oracle HTTP Server.

1. Obtain a certificate from CA or create a self signed certificate.

2. Create an Oracle Wallet which contains the above SSL Certificate. The default wallet that is automatically installed with Oracle HTTP Server is for testing purposes only. The default wallet is located in "\${ORACLE_INSTANCE}/config/OHS/\${COMPONENT_NAME}/keystores/default"

3. Configuring Wallet in ssl.conf file

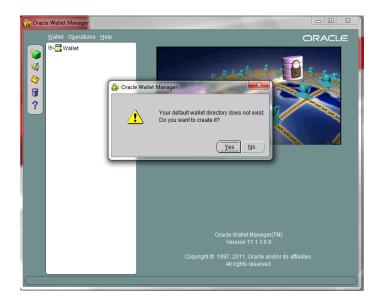
7.1.1 Create a new Wallet and import Certificate

1. Go to the \Oracle_WT1\bin\launch.exe, this will launch your wallet manager





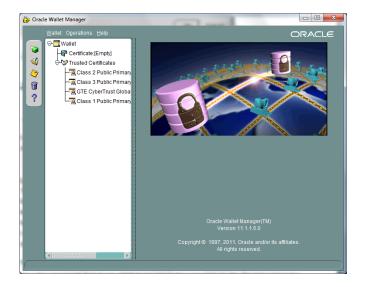
2. Click on Create new and then click no option.



3. Enter the wallet password and click on OK, this will create a new wallet.

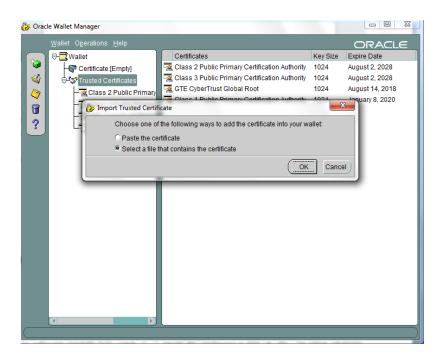


4. Not it will ask for certificate request creation, Click on NO to proceed

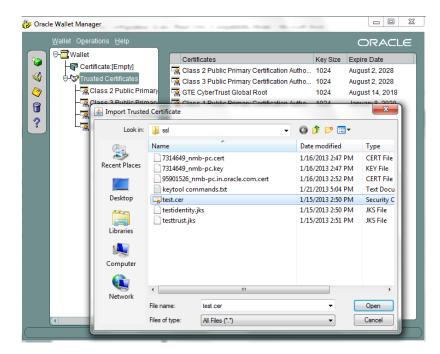




5. Right click on trusted certificates and then import trusted certificate.



6. Browse to the folder where certificate is stored and click on Open





- Click on Save Wallet button on the left side navigation and save the wallet either to default location("\${ORACLE_INSTANCE}/config/OHS/\${COMPONENT_NAME}/keystores/default") or folder of your choice.
- 🐉 Oracle Wallet Manager ORACLE Vallet Operations Hel ٩ 4 Close 8 Download From The Directory Service.. 8 Save Ctrl+W ? Save As.. Save In System Default Delete... Change Password.. Auto Login Use Windows Registry Alt+F4 Exit acle Wallet Manager(TM) Version 11.1.1.6.0
- 8. Click on Wallet tab and enable Auto Login



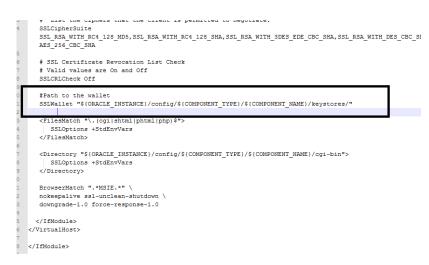
7.1.2 Configuring Wallet in ssl.conf file

In ssl.conf file the newly created wallet need to updated. This file is located under folder

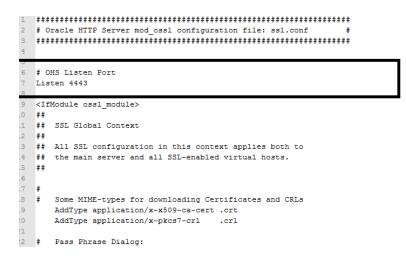
"\${ORACLE_INSTANCE}/config/OHS/\${COMPONENT_NAME}/

1. Change the SSLWallet directive to point to the location of new wallet created.

SSLWallet "\${ORACLE_INSTANCE}/config/\${COMPONENT_TYPE}/\${COMPONENT_NAME}/keystores/"



2. Change the Listen port number in ssl.conf file to the SSL enabled port, by default the value is 4443





7.2 <u>Configuring SSL between Oracle HTTP Server and Oracle</u> <u>Weblogic Server</u>

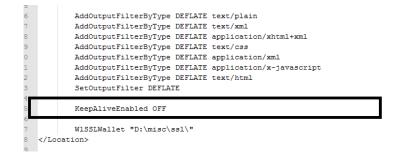
SSL for outbound requests from Oracle HTTP Server are configured in mod_wl_ohs.

Refer to "**SSL_Configuration on Weblogic**" document for weblogic server setting mentioned in below section.

7.2.1 <u>Turn off KeepAliveEnabled</u>

The below parameter in mod_wl_ohs should be turned off, by default it is on. Add the below directive under LOCATION section of mod_wl_ohs file

KeepAliveEnabled OFF



7.2.2 To enable one-way SSL

- 1. Generate a custom keystore identity.jks for Weblogic Server containing a certificate.
- 2. At Identity section in Keystores tab in weblogic Admin Console for server set
 - a. The custom trust store with the identity.jks file location
 - b. The keystore type as JKS
 - c. The passphrase used to created the keystore



					odate your t	SSL Configuratio	n. Please rev	view your se	ettings on the	e SSL tab.	
ve been activ	vated. No re	estarts	are n	ecessary-							
ed successfu	diγ.										
Server											
Protocols	Logging	Debug	M	lonitoring	Control	Deployments	Services	Security	Notes		
Services	Keysto	res	SSL	Federati	on Services	Deployment	Migration	Tuning	Overload	Health Monitoring	Server Start
					e keys and t	rusted certificat	e authorities	(CAs). This	page lets ye	ou view and define va	rious keystore o
e security of	r message u	ansma	sions.								
					Custom Id	entity and Cust	m Trust Ch	ange	Which a		
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										- C	
Keystore:					D:\misc	\testidentity.j	ks		The pal	B and file name of th	e identity keyst
Keystore	Type:				lucs				The typ	of the keystore. G	enerally, this is
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Keystore	Passphras	ie:							The end keystor	a pted custom identi	ty keystore's pa
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Identity K	eystore Pa	assphr	ase;								
store:					D:\misc	:\\testtrust jks			The pat	th and file name of th	e custom trust i
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- 3. Copy the certificate to Oracle HTTP Server and import the new certificate into OHS wallet as a trusted certificate.
- 4. Add following new directive in mod_wl_ohs.conf to point to the wallet location

WISSLWallet "\${ORACLE_INSTANCE}/config/OHS/{COMPONENT_NAME}/keystores/default"

5. Change the port in mod_wl_ohs file to point to SSL port of Weblogic server.

WebLogicHost wlserver1
WebLogicPort 443
AddOutputFilterByType DEFLATE text/plain
AddOutputFilterByType DEFLATE text/xml
AddOutputFilterByType DEFLATE application/xhtml+xml
AddOutputFilterByType DEFLATE text/css
AddOutputFilterByType DEFLATE application/xml
AddOutputFilterByType DEFLATE application/x-javascript
AddOutputFilterByType DEFLATE text/html
SetOutputFilter DEFLATE
KeepAliveEnabled OFF
WISSLWallet "\${ORACLE INSTANCE}/config/OHS/{COMPONENT NAME}/keystores/"

6. Restart both Weblogic Server and Oracle HTTP Server

7.2.3 To enable two-way SSL

- 1. Perform one-way SSL configuration steps
- 2. Generate a new trust store, trust.jks for Weblogic server

- 3. Keystore created for one-way SSL could be used, but it is recommended to create a separate truststore
- 4. Export the user certificate from Oracle HTTP Server wallet, and import it into truststore created above
- 5. At Trust section in Keystores tab in Weblogic Admin Console for the server set
 - a. The custom trust store with the trust.jks file location
 - b. The keystore type as JKS
 - c. The passphrase used to created the keystore

All changes have been	activates	d. No restart	aren	ecessary.								
Settings updated succ	essfully.											
ettings for AdminServe	r											
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General Cluster Ser	rices R	Ceystores	55L	Federati	on Services	Deployment	Migration	Tuning	Overload	Health Monitoring	Server Star	
Save												
Keystores ensure the secur you to manage the secur					keys and t	trusted certificati	e authorities	(CAs). Thi	page lets yo	ou view and define vi	arious keystore	
Keystores:					Custom Identity and Custom Trust Change				Which configuration rules should be used for trust keystores? More Info			
Identity							- 10 A	80.425	ULST N	eystores/ more trit	hite	
Custom Identity Keystore:					D:\misc\testidentity.jks				The path and file name of the identity keys			
Custom Identity Keystore Type:					JKS			The type of the keystore. Generally, this i				
Custom Identity Keyst	ore Pass	sphrase:						The encrypted custom identity keystore's j keystore will be opened without a passpir.				
Confirm Custom Ident	ty Keyst	tore Passpl	wase:									
Trust	10						-				_	
Custom Trust Keystore:					D.\misc\\testtrust.jks				The path and file name of the custom b			
Custom Trust Keystor	Type:				JKS				The typ	pe of the keystore. G	enerally, the is	
Custom Trust Keystore Passphrase:								The custom trust keystore's passphrase If be opened without a passphrase. Mor In				

6. Under the SSL tab

Ensure trusted CA is set as from Custom Trust Keystore.

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cungs for A	aminserv	er									
Configuratio	n Proto	ols L	Logging	Debug	Monitoring	Control	Deployments	Services	Security	Notes	
General C	uster <u>Se</u>	rvices	Keysto	res 55	L Federatio	n Services	Deployment	Migration	Tuning	Overload	Health Monitoring
Save		Con	figuratio	n - Servi	es- Tab						
			-								
This page let	s vou view	and de	fine vario	us Secure	Sockets Laver	r (SSL) setti	ings for this serv	er instance.	These setti	nas hela voi	u to manage the securi
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7. Restart Weblogic Server



8. Sample Configuration Files





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httpd.conf



9. Starting, Stopping, and Restarting Oracle HTTP Server

Navigate to the below location in command prompt \${ORACLE_INSTANCE}/bin/ and run below commands

9.1 <u>Start</u>

opmnctl startproc ias-component={COMPONENT_NAME}

Example: opmnctl startproc ias-component=ohs1

9.2 <u>Stop</u>

opmnctl stopproc ias-component={COMPONENT_NAME}

Example: opmnctl stopproc ias-component=ohs1

9.3 <u>Restart</u>

opmnctl restartproc ias-component={COMPONENT_NAME}

Example: opmnctl restartproc ias-component=ohs1



10. Test the application

Test the application deployed on Weblogic using Oracle HTTP Server after restarting both the oracle http server and weblogic server

https://ohs_servername:ohs_https_port/<<context/url>>

http://ohs_servername:ohs_http_port/<<context/url>>

ohs_servername: server on which OHS is deployed

ohs_https_port: port number mentioned against LISTEN directive in SSL.conf file

ohs_http_port: port number mentioned against LISTEN directive in httpd.conf file

Example:

https://localhost:4443/FCJNeoWeb/welcome.jsp

Or

http://localhost:7777/FCJNeoWeb/welcome.jsp



11. Server Logs Location

Oracle HTTP Server Logs are generated under folder

{ORACLE_INSTANCE}/diagnostics/logs/OHS/{COMPONENT_NAME}/



12. References

SSL_Configuration.doc for Weblogic provided as part of FCUBS installation. http://docs.oracle.com/cd/E16764_01/web.1111/e10144/under_mods.htm http://docs.oracle.com/cd/E25054_01/core.1111/e10105/sslconfig.htm



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