Oracle HTTP Server 11g R1 Configuration for FLEXCUBE Oracle Banking Corporate Lending Release 14.7.4.0.0 Part No. F98076-01 [May] [2024]



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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

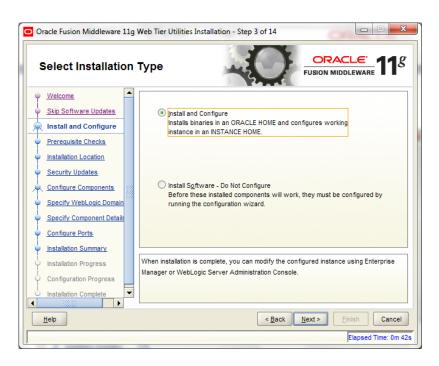


Select Skip Software Updates

Oracle Fusion Middleware 11g	web Tier Utilities Installation - Step 2 of 14
Welcome Skip Software Updates Install and Configure Prerequisite Checks Installation Location Security Updates Configure Components Specify WebLogic Domain 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 Settings Test Connection Search Local Directory for Updates Local Directory: Browse Search For Updates
Unstallation Complete ↓ <u>H</u> elp	< Back Next > Enish Cancel Elapsed Time: 0m 324



Select Install and Configure



Oracle Fusion Middleware 11g	Neb Tier l	Utilities Installation - Step 4 of 14	OR	
Prerequisite Check	(S	-0		<u>eware</u> 11
Welcome	Selection	Check	Progress	Status
Skip Software Updates	1	Checking operating system certification	100%	~
Install and Configure	1	Checking physical memory	100%	×
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>Fini</u>	sh Cancel
	_		E	lapsed Time: 0m 52s



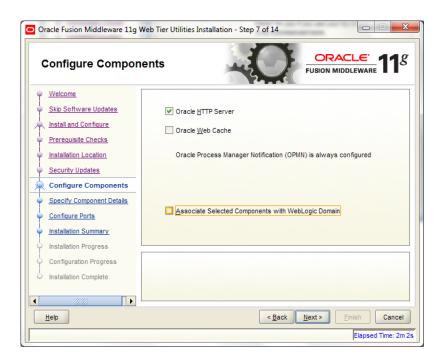
Oracle Fusion Middleware 11g	Web Tier Utilities Installation - Step 5 of 14	
Specify Installation	Location	FUSION MIDDLEWARE 118
	Oracle <u>Mi</u> ddleware Home: <u>C:\Oracle\Mi</u> <u>O</u> racle Home Directory: <u>Oracle_WT</u>	
Configuration Progress Installation Complete Installation Complete Lelp	An Application Server must already be	
		Elapsed Time: 1m 2s







Select only Oracle HTTP Server

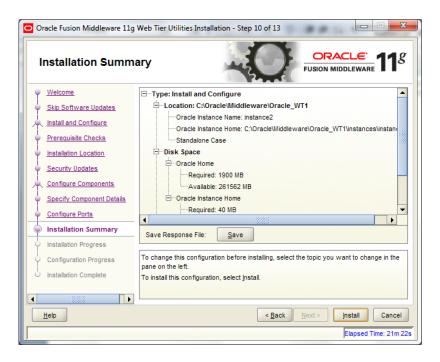


Enter the required OHS instance and component names

O Oracle Fusion Middleware 11g Web Tier Utilities Installation - Step 8 of 13		
Specify Componer	nt Details	FUSION MIDDLEWARE 118
	Instance Home Location: In <u>s</u> tance Name: OHS Component Name:	C:\Oracle\Middleware\Oracle Browse instance2 ohs1
installation Forgress Configuration Progress Installation Complete		alphabetic character, may only contain alphanumeric or hyphen (-) characters and are 4 to 30 characters
		Elapsed Time: 24m 12s



Oracle Fusion Middleware 11g	Web Tier Utilities Installation - Step 9 of 13
Configure Ports	FUSION MIDDLEWARE 118
	Auto Port Configuration Specify Ports using Configuration file File name: C:\Users\nmb\staticports.ini Browse
Configure Component Details Specify Component Details Configure Ports Installation Summary Installation Progress Configuration Progress Installation Complete	View/Edit File
Leip	< <u>Back</u> <u>Finish</u> Cancel Elapsed Time: 20m 57s





Configuration Pro	g Web Tier Utilities Installation - Step 12 of 13 gress	
Velcome	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
 Security Updates 	Create Shortcuts	Success
Configure Components		
Specify Component Details		Data
Configure Ports	Abort	<u>R</u> etry C <u>o</u> ntinue
 Installation Summary 	Configuration Log Location: C:\Program Files\Oracle\Inventory\logs\install2013-01-09_12-18-24P	M.log
Installation Progress	-	
Configuration Progress		
Installation Complete		
]	
Help	< Back	Vext > Finish Cancel
2.4		
		Elapsed Time: 29m
Oracle Fusion Middleware 11c	web Tier Utilities Installation - Step 13 of 13	
Oracle Fusion Middleware 11c		
Installation Comp	lete	CRACLE 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	\sharp 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	# Dynamic Shared Object (DSO) Support
197	÷
198	# To be able to use the functionality of a module which was built as a DSO you
199 200	<pre># have to place corresponding `LoadModule' lines at this location so the # directives contained in it are actually available before they are used.</pre>

- 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	i_wi_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	\ddagger This empty block is needed to save mod_wl related configuration from EM to t
7	<ifmodule weblogic_module=""></ifmodule>
8	# WebLogicHost <weblogic_host></weblogic_host>
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	<pre># ErrorPage http:/WEBLOGIC_HOME:WEBLOGIC_PORT/</pre>
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	1_wl_ohs.conf
1	# NOTE : This is a template to configure mod weblogic.
2	_
з	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>
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	
2:	<location fcjneoweb=""></location>
20 2: 2: 2: 2: 2: 2: 2: 2:	<location fcjneoweb=""></location>
2:	SetHandler weblogic-handler
2	WebLogicCluster wlserver1:7010,wlserver2:7010
2	
21	



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

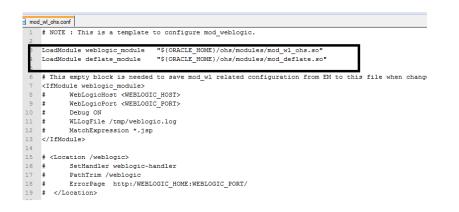
mod_deflate is used for compression in OHS and this is installed in Oracle HTTP Server under location

"\${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

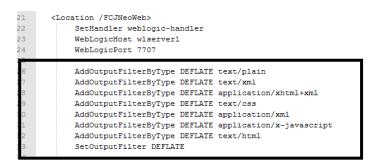
AddOutputFilterByType DEFLATE application/xml

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 OraLogDDr "\$(ORACLE_INSTANCE)/diagnostics/logs/\${COMPONENT_TYPE}}\${COMPONENT_NAME}" OraLogNode odl-text OraLogSeverity WANNING:32 OIT OraLogSeverity WANNING:32 OIT OraLogRotationParams S 10:70 018 020 \$ Set it to On to enable Audit Logs 021 OraAuditEnable On 022 023 \$ Include the configuration files needed for mod_weblogic 033 \$ Include the configuration files needed for mod_weblogic 034 \$ Include the configuration files needed for mod_weblogic 035 026 \$ Include the SSL definitions and Virtual Host container 027 \$ Include the SSL definitions and Virtual Host container 028 029 \$ Include the admin virtual host (Proxy Virtual Host) related configuration 030 \$ Include "\$(ORACLE_INSTANCE)/config/\${COMPONENT_TYPE}\${COMPONENT_NAME}/admin.conf" 031 032 \$ include "\$(ORACLE_INSTANCE)/config/\${COMPONENT_TYPE}\${COMPONENT_NAME}/admin.conf" 033 033



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

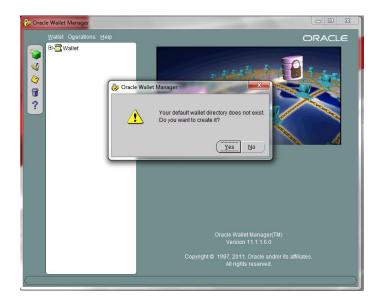
7.1.1 Create a new Wallet and import Certificate

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





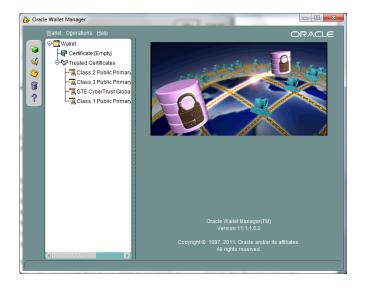
2. Click on Create new and then click no option.



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

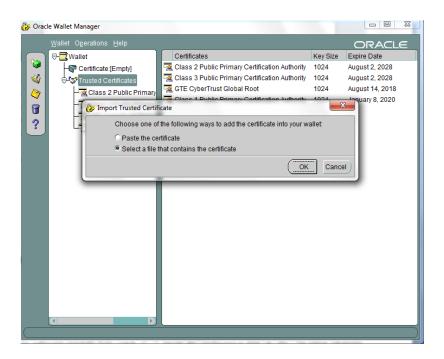


4. Not it will ask for certificate request creation, Click on NO to proceed

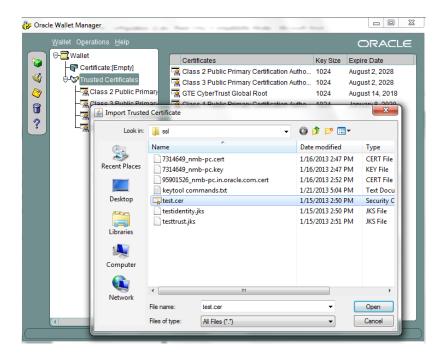




5. Right click on trusted certificates and then import trusted certificate.



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





- 7. 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 racle Wallet Manager(TM) Version 11.1.1.6.0
- 8. Click on Wallet tab and enable Auto Login



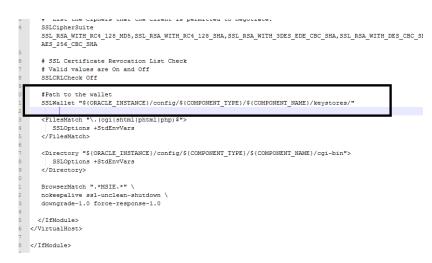
7.1.2 Configuring Wallet in ssl.conf file

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

1	***	*******
2	# O:	racle HTTP Server mod_ossl configuration file: ssl.conf #
3	####	**********
4		
5		
6		HS Listen Port
7	List	ten 4443
8	_	
9	<if< td=""><td>Module ossl_module></td></if<>	Module ossl_module>
.0	##	
.1	##	SSL Global Context
.2	##	
.3	##	All SSL configuration in this context applies both to
.4	##	the main server and all SSL-enabled virtual hosts.
.5	##	
.6		
.7	÷	
.8	ŧ	Some MIME-types for downloading Certificates and CRLs
.9		AddType application/x-x509-ca-cert .crt
0		AddType application/x-pkcs7-crl .crl
1		
2	÷	Pass Phrase Dialog:
. 6	π.	labo Initable Dialog.



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 Turn off KeepAliveEnabled

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

9	
6	AddOutputFilterByType DEFLATE text/plain
7	AddOutputFilterByType DEFLATE text/xml
8	AddOutputFilterByType DEFLATE application/xhtml+xml
9	AddOutputFilterByType DEFLATE text/css
0	AddOutputFilterByType DEFLATE application/xml
1	AddOutputFilterByType DEFLATE application/x-javascript
2	AddOutputFilterByType DEFLATE text/html
3	SetOutputFilter DEFLATE
4	
5	KeepAliveEnabled OFF
7	W1SSLWallet "D:\misc\ssl\"
8	

7.2.2 <u>To enable one-way SSL</u>

- 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



		ve been act	-				Judice your :	SSL Configuration	in medserev	new your si	conga on the	- 55C (00)	
		ve been act ed successf		restarts	are n	ecessary.							
-			un y i										
ettings fo													
Configura	ation	Protocols	Logging	Debu	M	onitoring	Control	Deployments	Services	Security	Notes		
General	Cluste	Services	s Keyst	ores	SSL	Federatio	on Services	Deployment	Migration	Tuning	Overload	Health Monitoring	Server Start
Save													
		the secure					e keys and t	trusted certificati	e authorities	(CAs). This	page lets yo	u view and define va	rious keystore
you to m	lanage u	le security o	i message	u ansmi	5510115.								
Keystore	es:						Custom Id	dentity and Custo	m Trust Ch	ange	Which c	onfiguration rules she	ould be used fo
								Jentity and Coste	0.0	-		stores? More Info	
- Identil	ty —							lentry and cost			1 1 h -	stores? More Info	
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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

6. Restart both Weblogic Server and Oracle HTTP Server

7.2.3 <u>To enable two-way SSL</u>

- 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

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6. Under the SSL tab

Ensure trusted CA is set as from Custom Trust Keystore.

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ave	Cor	nfiguration	n - Servic	es- Tab						
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7. Restart Weblogic Server



8. Sample Configuration Files





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



ORACLE[®]

Oracle HTTP Server 11g R1 Configuration for FLEXCUBE [May] [2024] Version 14.7.4.0.0

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