Oracle HTTP Server 11g R1 Configuration for FLEXCUBE

Oracle FLEXCUBE Universal Banking

Release 14.4.0.1.0

[August] [2020]

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FINANCIAL SERVICES

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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.

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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 <u>HTTP Listener</u>

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 <u>Modules (mods)</u>

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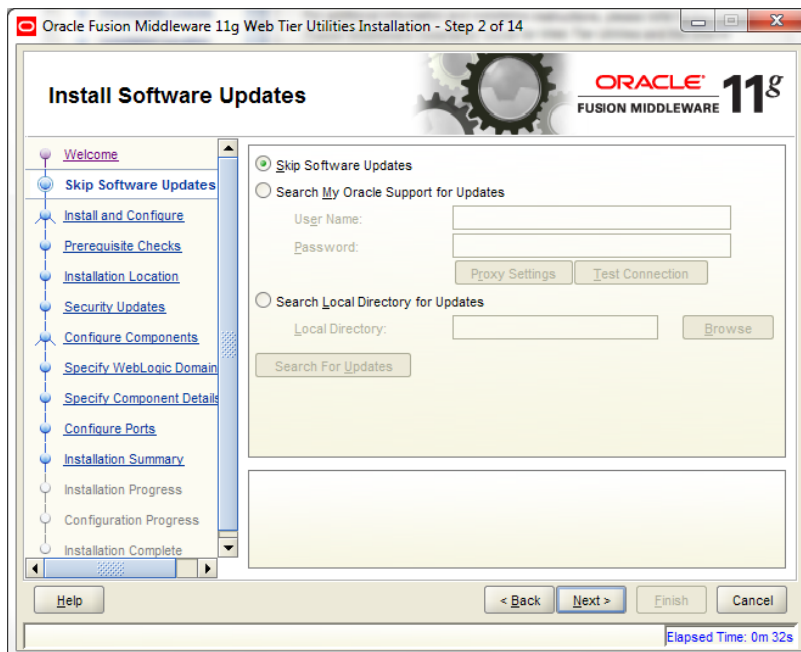
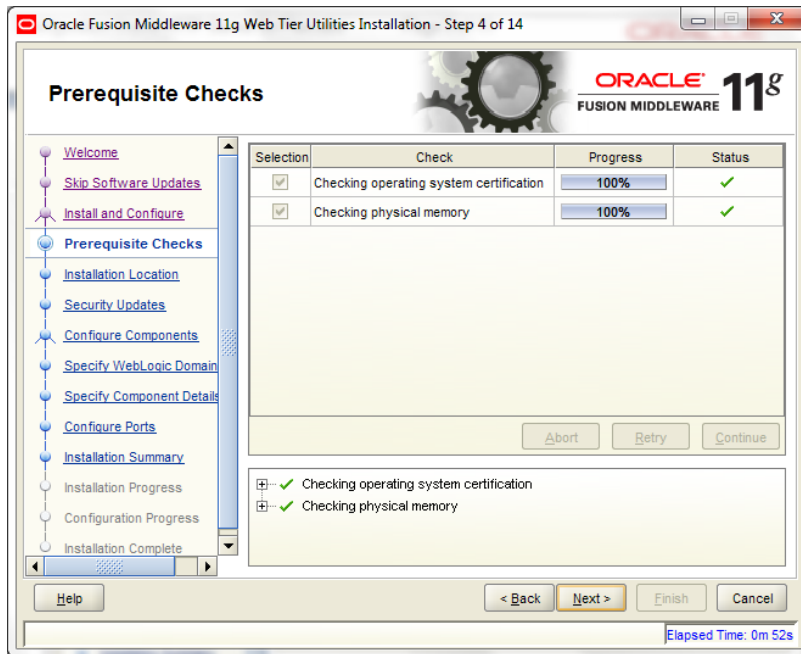Oracle HTTP Server also includes the base Apache and third-party modules out-of-the-box. These modules are not developed by Oracle. Ex: mod_proxy, mod_perl

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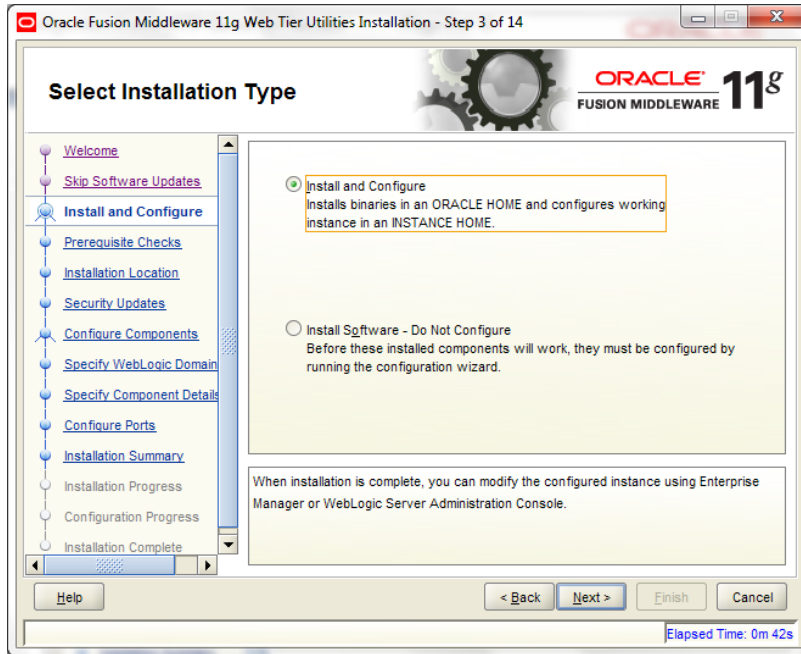
Invoke the setup exe to start the installation

Select Skip Software Updates

Select Install and Configure
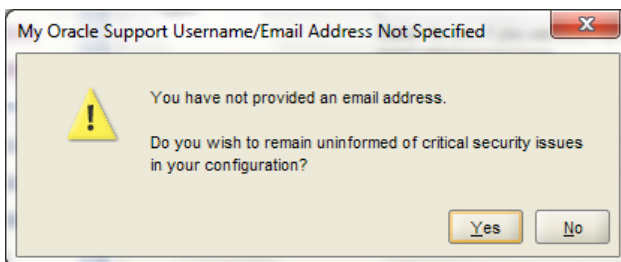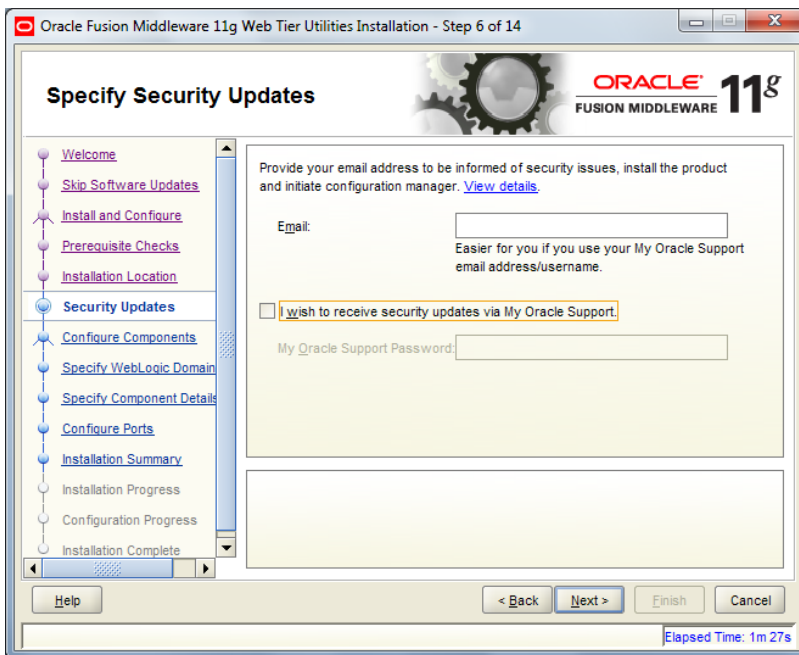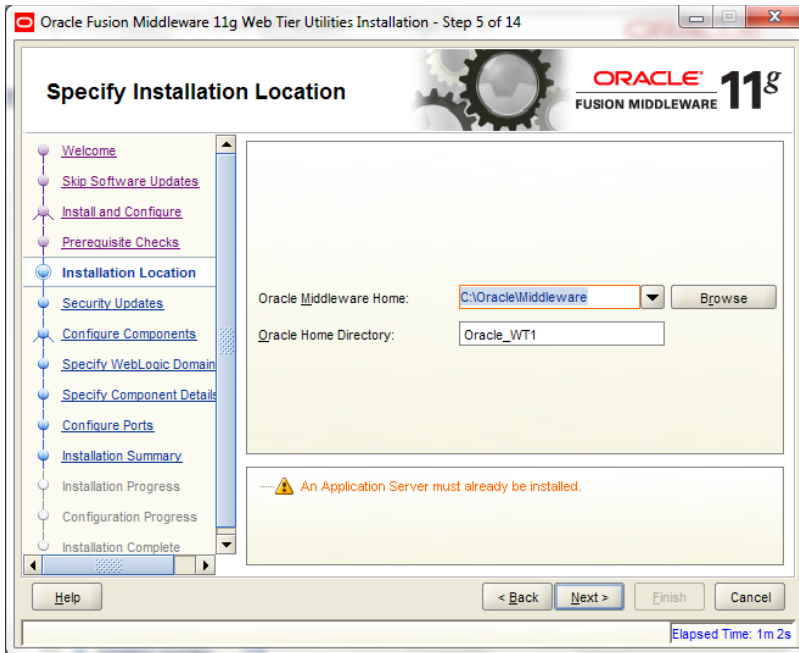
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Select only Oracle HTTP Server
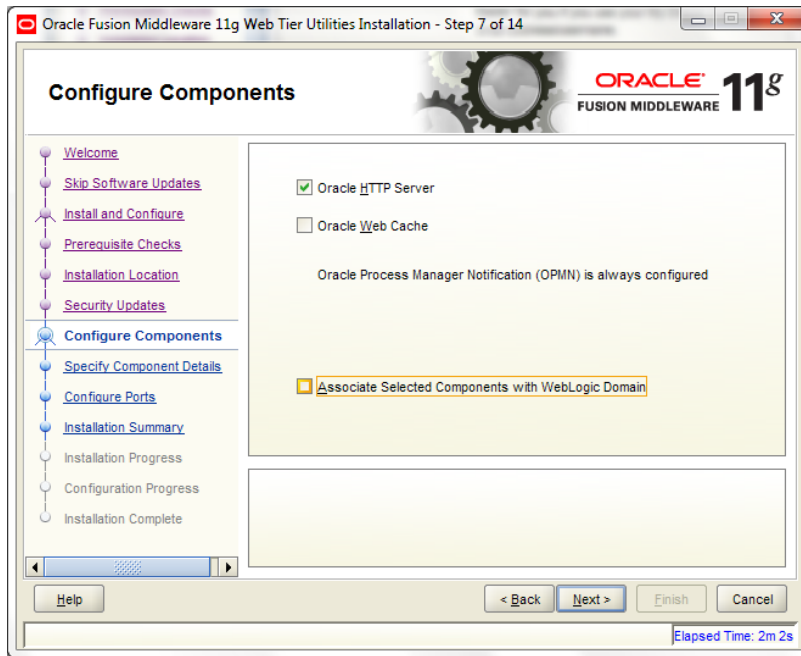
Enter the required OHS instance and component names
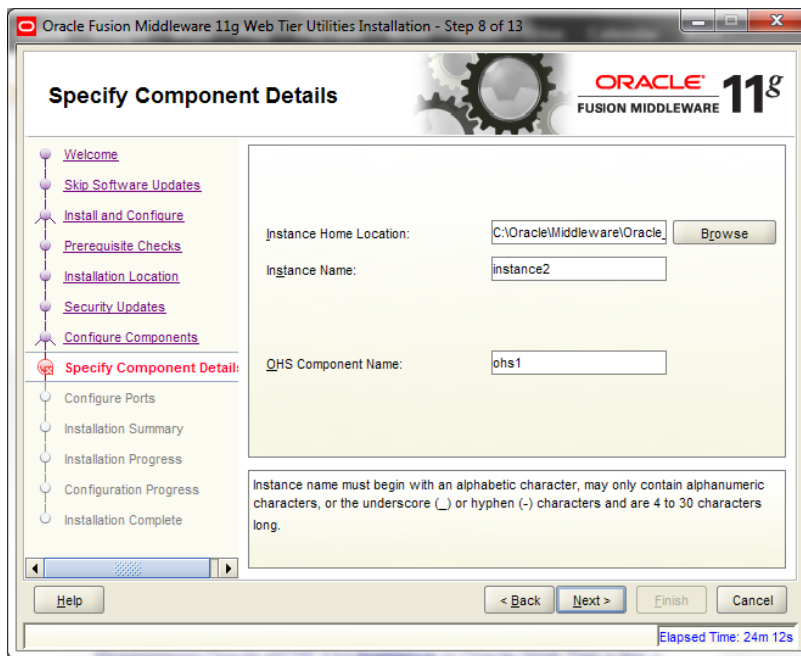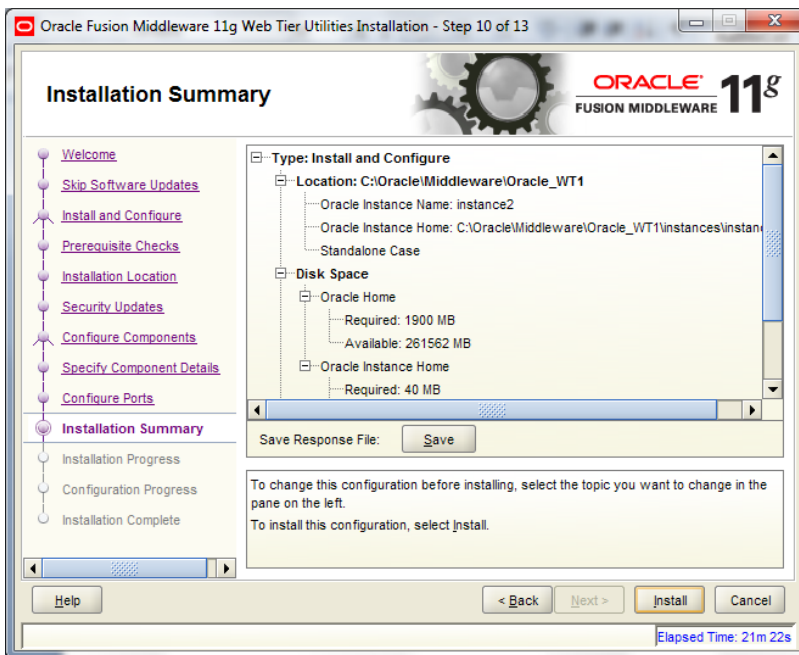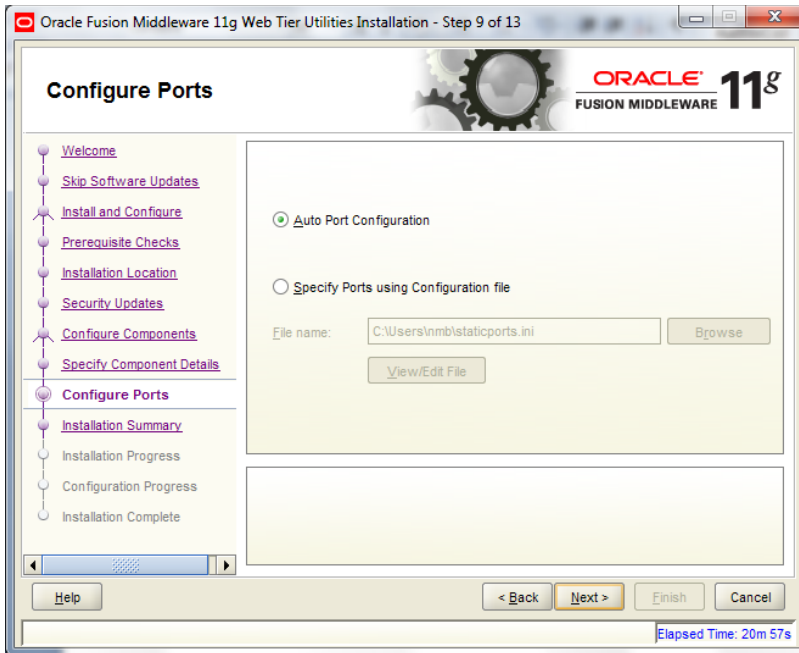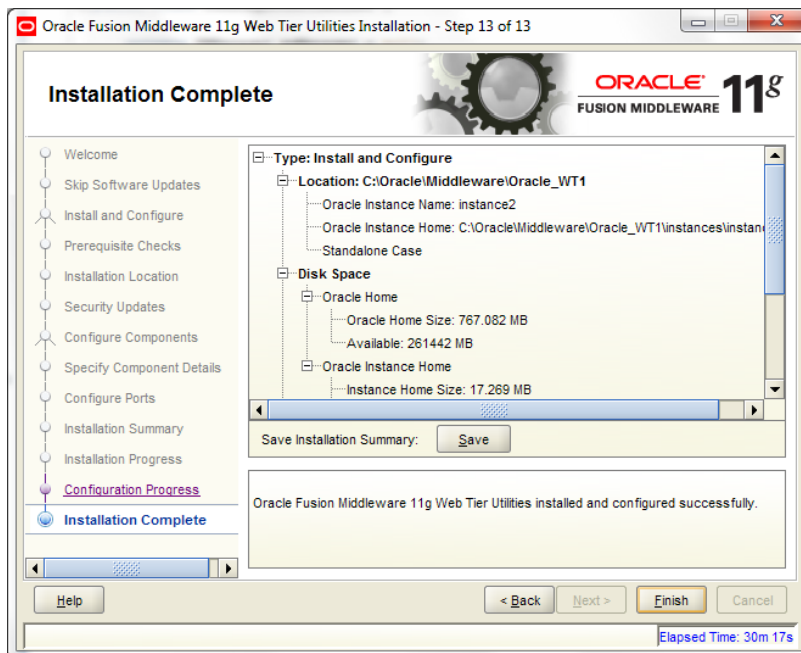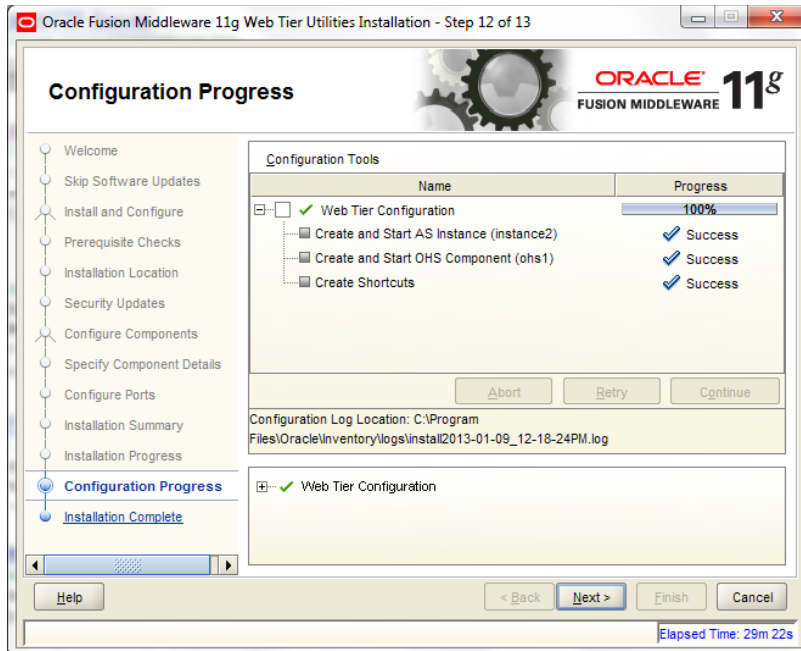
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This completes the installation of Oracle HTTP Server with <Instance> and <component>. Example: Instance is instance1 and component is ohs1.

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.

```
httpd.conf
181
182   #
183   # Listen: Allows you to bind Apache to specific IP addresses and/or
184   # ports, instead of the default. See also the <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   # 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   # have to place corresponding `LoadModule' lines at this location so the
200   # directives contained in it are actually available _before_ they are used.
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
```

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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

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```
 mod_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 t
 7   <IfModule weblogic_module>
 8   #      WebLogicHost <WEBLOGIC_HOST>
 9   #      WebLogicPort <WEBLOGIC_PORT>
10   #      Debug ON
11   #      WLLogFile /tmp/weblogic.log
12   #      MatchExpression *.jsp
13   </IfModule>
14
15   # <Location /weblogic>
16   #      SetHandler weblogic-handler
17   #      PathTrim /weblogic
18   #      ErrorPage  http:/WEBLOGIC_HOME:WEBLOGIC_PORT/
19   # </Location>
20
21      <Location /FCJNeoWeb>
22          SetHandler weblogic-handler
23          WebLogicHost wlserver1
24          WebLogicPort 7707
25      </Location>
```

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

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```
mod_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>
 8  #       WebLogicHost <WEBLOGIC_HOST>
 9  #       WebLogicPort <WEBLOGIC_PORT>
10  #       Debug ON
11  #       WLLogFile /tmp/weblogic.log
12  #       MatchExpression *.jsp
13  </IfModule>
14
15  # <Location /weblogic>
16  #       SetHandler weblogic-handler
17  #       PathTrim /weblogic
18  #       ErrorPage  http:/WEBLOGIC_HOME:WEBLOGIC_PORT/
19  #  </Location>
2
2       <Location /FCJNeoWeb>
2           <Location / FCJNeoWeb >
2               SetHandler weblogic-handler
2               WebLogicCluster wlserver1:7010,wlserver2:7010
2           </Location>
2
```

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.

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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.
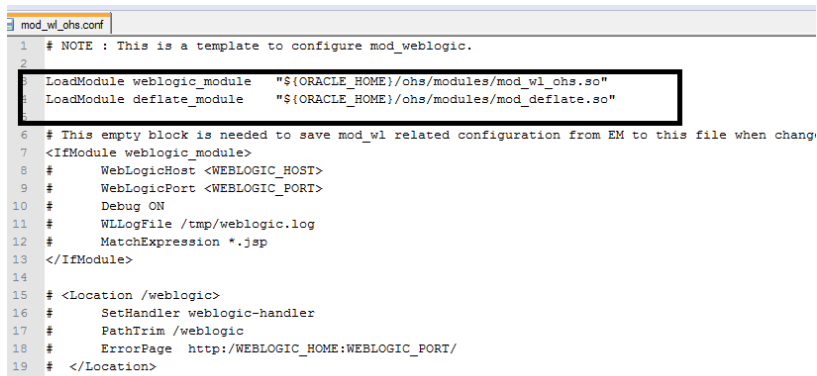
6.1   Loading mod_deflate

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"

```
mod_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 file when chang
 7    <IfModule weblogic_module>
 8    #      WebLogicHost <WEBLOGIC_HOST>
 9    #      WebLogicPort <WEBLOGIC_PORT>
10    #      Debug ON
11    #      WLLogFile /tmp/weblogic.log
12    #      MatchExpression *.jsp
13    </IfModule>
14
15    # <Location /weblogic>
16    #      SetHandler weblogic-handler
17    #      PathTrim /weblogic
18    #      ErrorPage  http:/WEBLOGIC_HOME:WEBLOGIC_PORT/
19    #  </Location>
```

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

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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.

```
21      <Location /FCJNeoWeb>
22          SetHandler weblogic-handler
23          WebLogicHost wlserver1
24          WebLogicPort 7707

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
```

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.

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```
1013   #Directives to setup logging via ODL
1014   OraLogDir "${ORACLE_INSTANCE}/diagnostics/logs/${COMPONENT_TYPE}/${COMPONENT_NAME}"
1015   OraLogMode odl-text
1016   OraLogSeverity WARNING:32
1017   OraLogRotationParams S 10:70
1018
1019
1020   # Set it to On to enable Audit Logs
1021   OraAuditEnable On
1022
1023   # Include the configuration files needed for mod_weblogic
1024   include "${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/mod_wl_ohs.conf"
1025
1026   # Include the SSL definitions and Virtual Host container
1027   include "${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/ssl.conf"
1028
1029   # Include the admin virtual host (Proxy Virtual Host) related configuration
1030   include "${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/admin.conf"
1031
1032   include "moduleconf/*.conf"
1033
```

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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   <u>SSL configuration for Inbound Request to Oracle HTTP 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

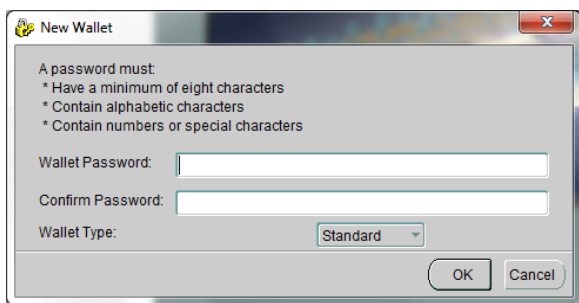### 7.1.1   <u>Create a new Wallet and import Certificate</u>

1.   Go to the \Oracle_WT1\bin\launch.exe, this will launch your wallet manager
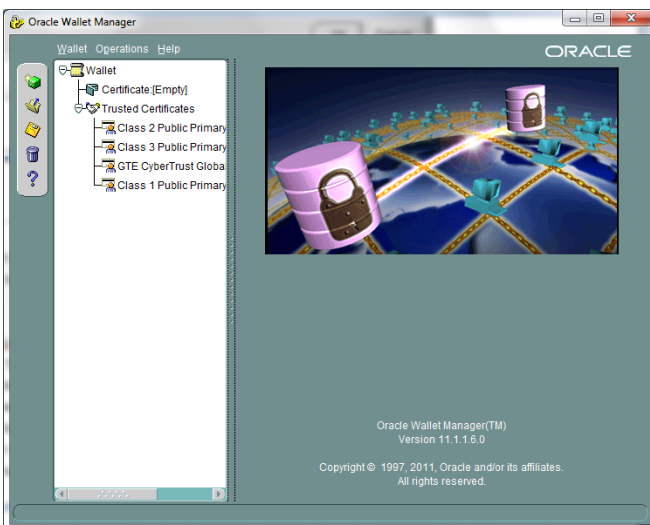
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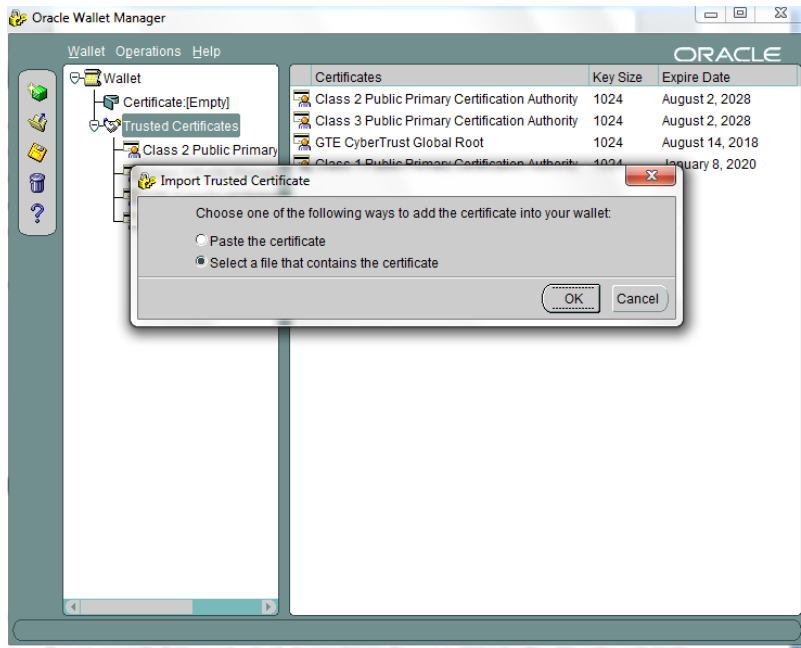2. Click on Create new and then click no option.
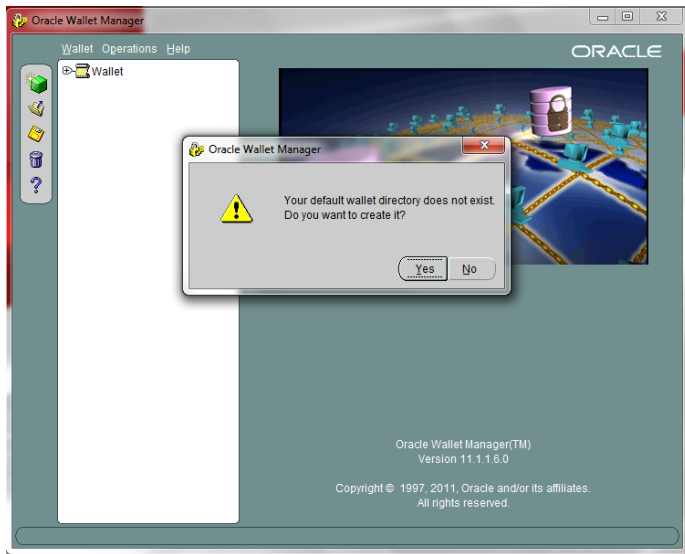
3. Enter the wallet password and click on OK, this will create a new wallet.
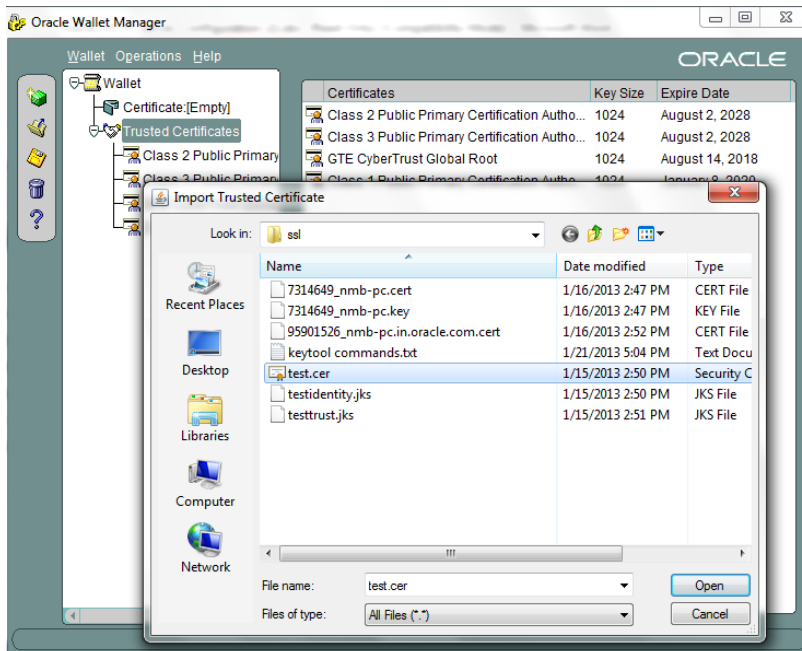

4. Not it will ask for certificate request creation, Click on NO to proceed

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

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

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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.

8. Click on Wallet tab and enable Auto Login
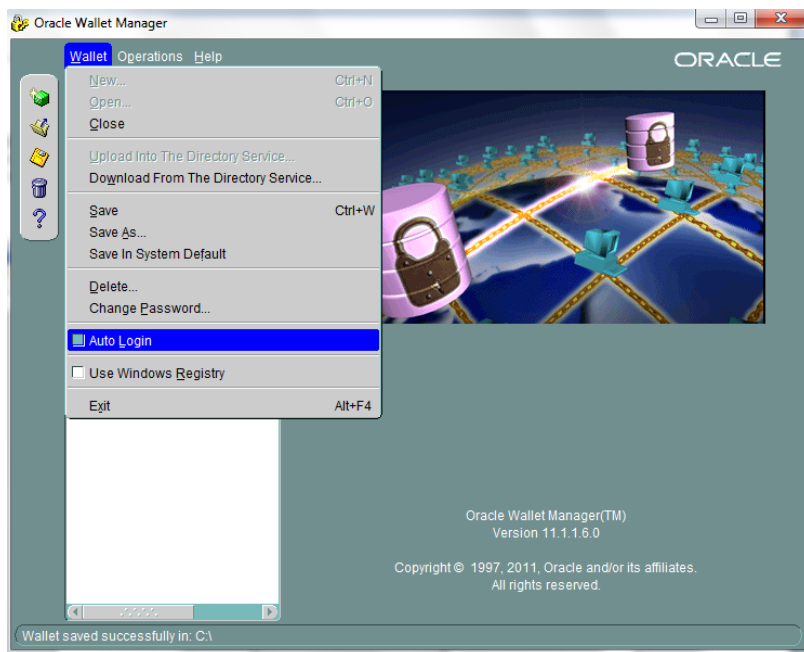
7.1.2 Configuring Wallet in ssl.conf file

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/"

```
4    SSLCipherSuite
     SSL_RSA_WITH_RC4_128_MD5,SSL_RSA_WITH_RC4_128_SHA,SSL_RSA_WITH_3DES_EDE_CBC_SHA,SSL_RSA_WITH_DES_CBC_S
     AES_256_CBC_SHA
5
6    # SSL Certificate Revocation List Check
7    # Valid values are On and Off
8    SSLCRLCheck Off
9
0    #Path to the wallet
1    SSLWallet "${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/keystores/"
2
3    <FilesMatch "\.(cgi|shtml|phtml|php)$">
4        SSLOptions +StdEnvVars
5    </FilesMatch>
6
7    <Directory "${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/cgi-bin">
8        SSLOptions +StdEnvVars
9    </Directory>
0
1    BrowserMatch ".*MSIE.*" \
2    nokeepalive ssl-unclean-shutdown \
3    downgrade-1.0 force-response-1.0
4
5    </IfModule>
6  </VirtualHost>
7
8  </IfModule>
```

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

```
1    ####################################################################
2    # Oracle HTTP Server mod_ossl configuration file: ssl.conf        #
3    ####################################################################
4
5
6    # OHS Listen Port
7    Listen 4443
8
9    <IfModule 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   #    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:
```

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7.2 Configuring SSL between Oracle HTTP Server and Oracle Weblogic Server

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

```
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
6
7        WlSSLWallet "D:\misc\ssl\"
8    </Location>
9
```

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
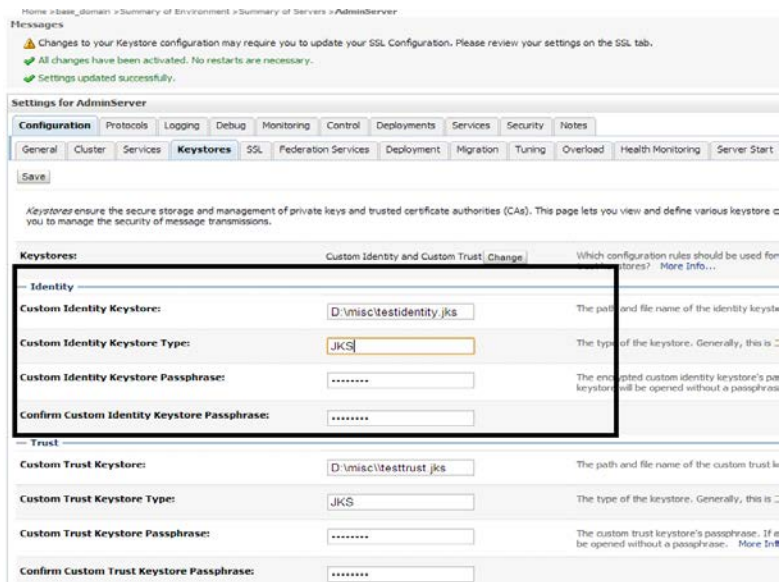
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3. Copy the certificate to Oracle HTTP Server and import the new certificate into OHS wallet as a trusted certificate.

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.

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

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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
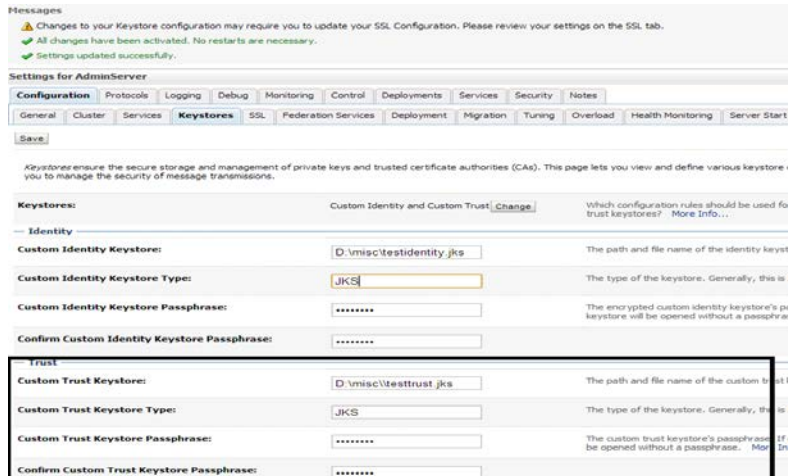
6. Under the SSL tab

   Ensure trusted CA is set as from Custom Trust Keystore.
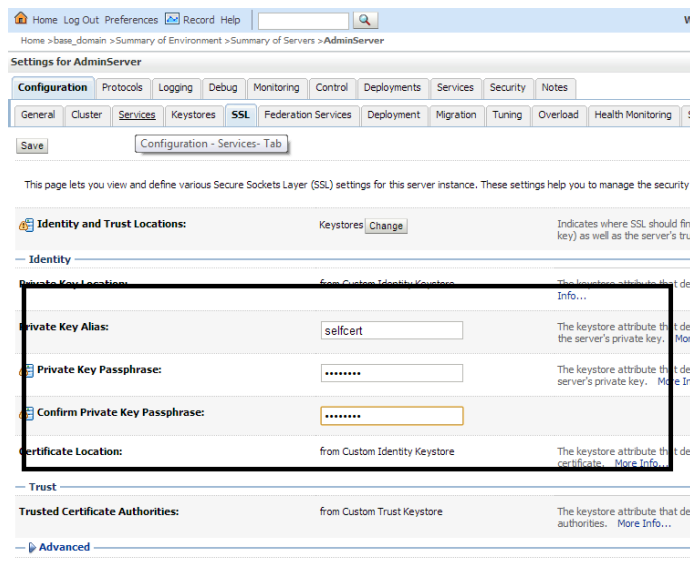
7. Restart Weblogic Server

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8. Sample Configuration Files

httpd.conf   mod_wl_ohs.conf   ssl.conf

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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

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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

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11. Server Logs Location

Oracle HTTP Server Logs are generated under folder

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

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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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Oracle_HTTP_Server_Configuration
[August] [2020]
Version 14.4.0.1.0

Oracle Financial Services Software Limited
Oracle Park
Off Western Express Highway
Goregaon (East)
Mumbai, Maharashtra 400 063
India

Worldwide Inquiries:
Phone: +91 22 6718 3000
Fax: +91 22 6718 3001
https://www.oracle.com/industries/financial-services/index.html

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