Oracle HTTP Server 11g R1 Configuration
Oracle FLEXCUBE Investor Servicing
Release 14.0.0.0.0
[May] [2018]

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1. Purpose

The objective of this document is to explain the installation and configuration of Oracle HTTP Server 11g R1 (11.1.1.9.0). 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.

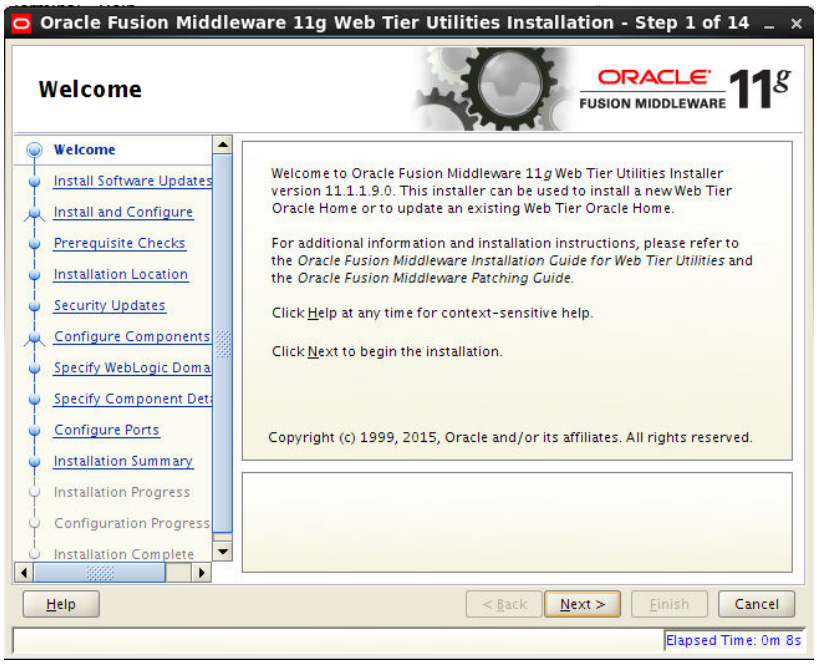
2.2 Modules (mods)

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

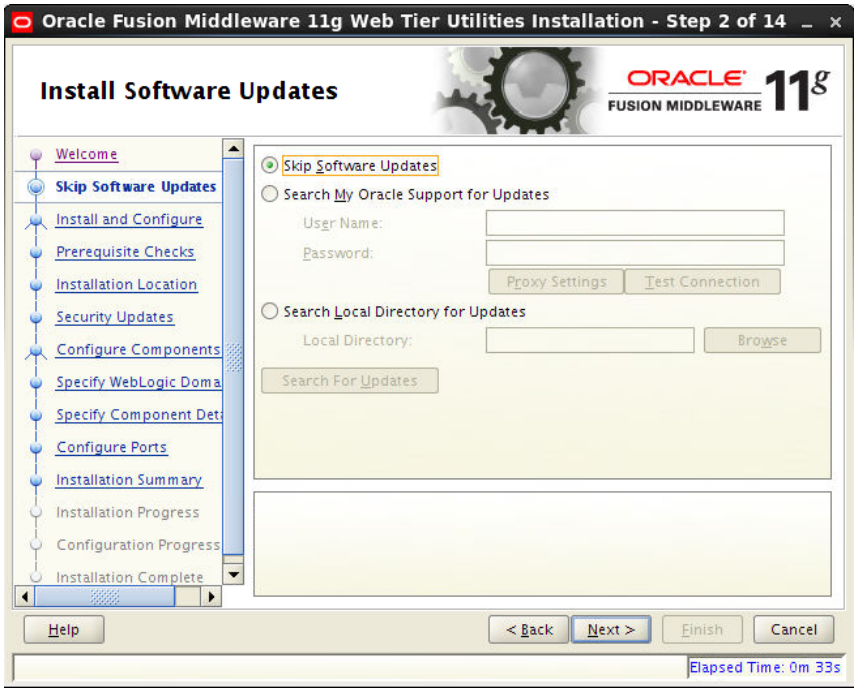
Oracle HTTP Server also includes the base Apache and third-party modules out-of-the-box. These modules are not developed by Oracle. Ex: mod_proxy, mod_perl

3. Installation of OHS 11g

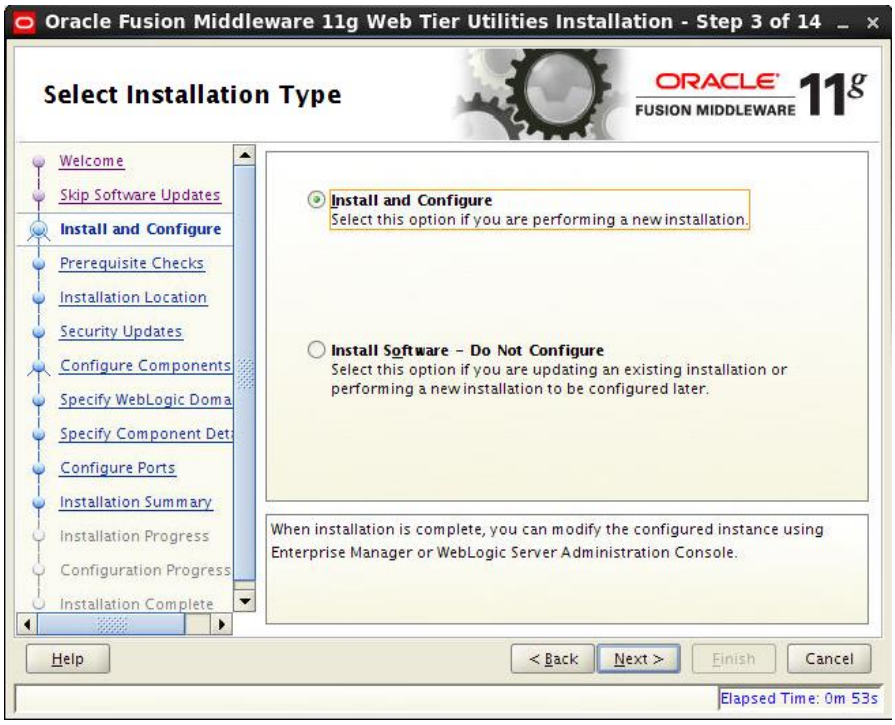
Invoke the setup exe to start the installation

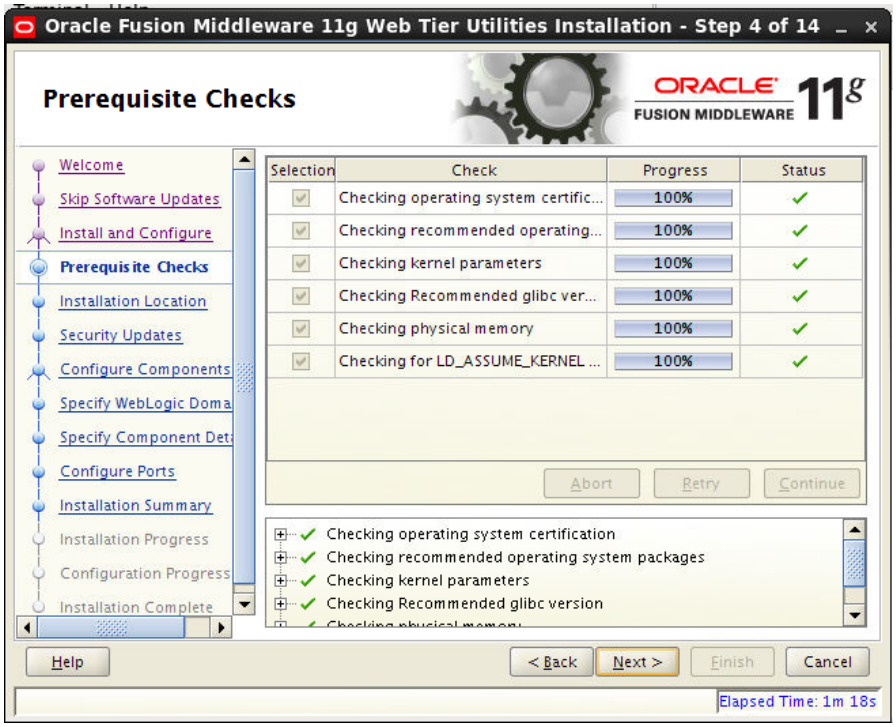


Select Skip Software Updates

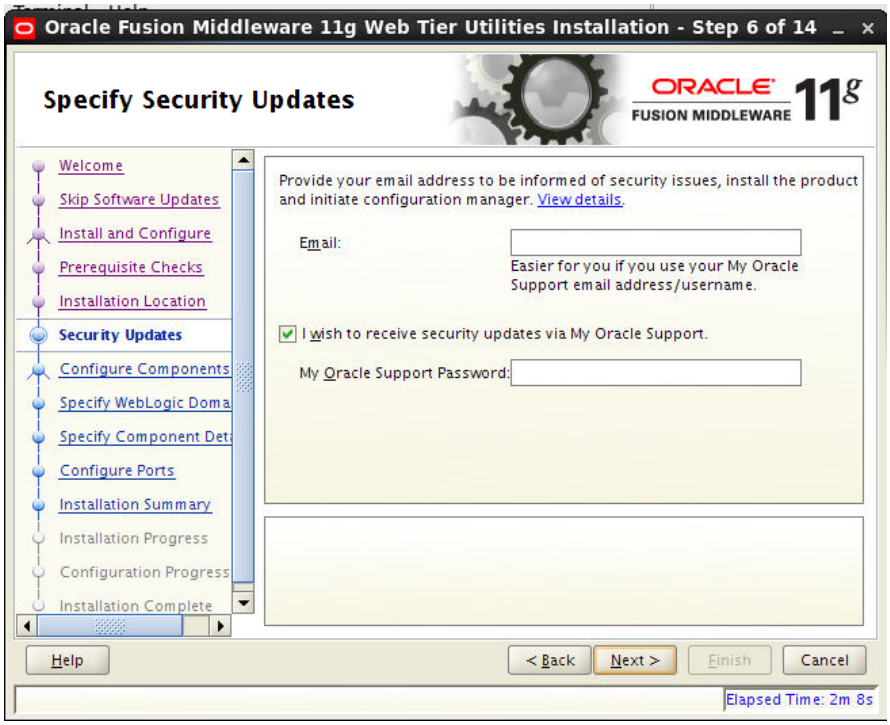


Select Install and Configure

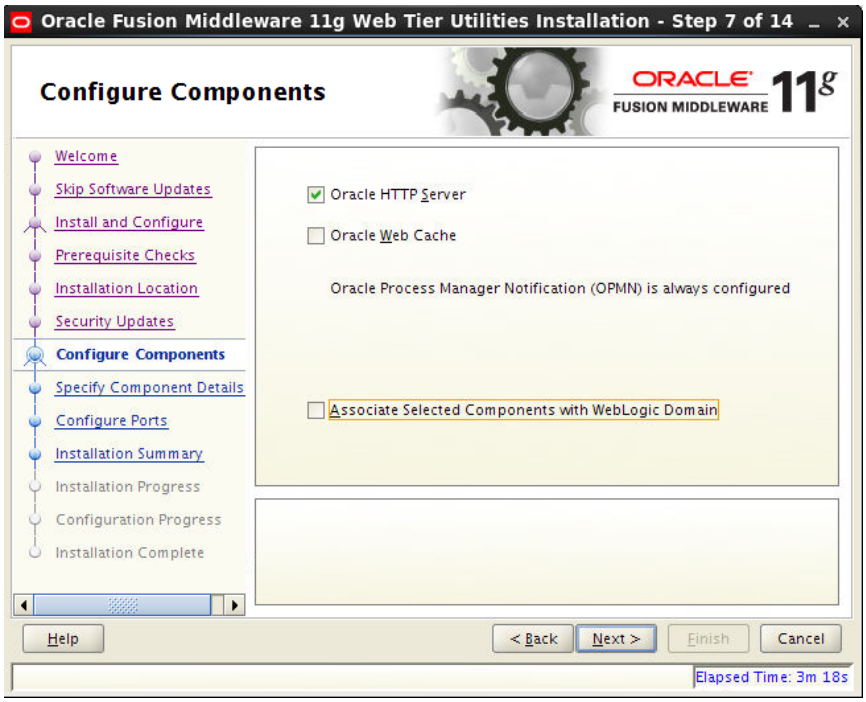




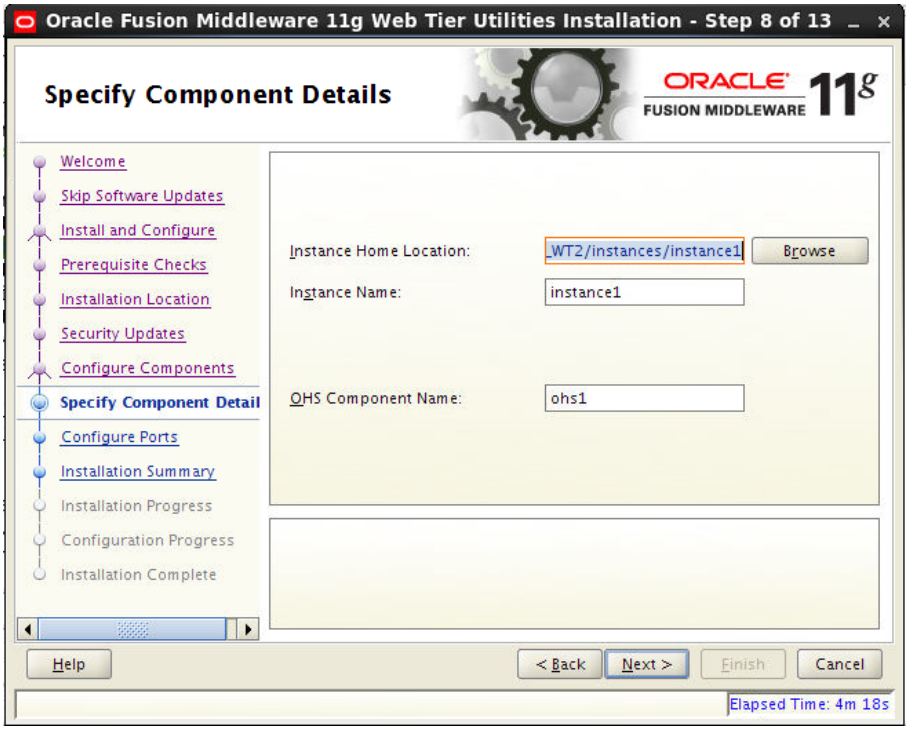
Oracle Fusion Middleware 11g Web Tier Utilities Installation - Step 5 of 14
Specify Installation Location
ORACLE FUSION MIDDLEWARE 11g
Welcome
Skip Software Updates
Install and Configure
Prerequisite Checks
Installation Location
Security Updates
Configure Components
Specify WebLogic Doma
Specify Component Det
Configure Ports
Installation Summary
Installation Progress
Configuration Progress
Installation Complete
Oracle Middleware Home:
a/Software/Weblogic10.3.6
Browse
Oracle Home Directory:
Oracle_WT1
An Application Server must already be installed.
Help
< Back
Next >
Finish
Cancel
Elapsed Time: 1m 43s

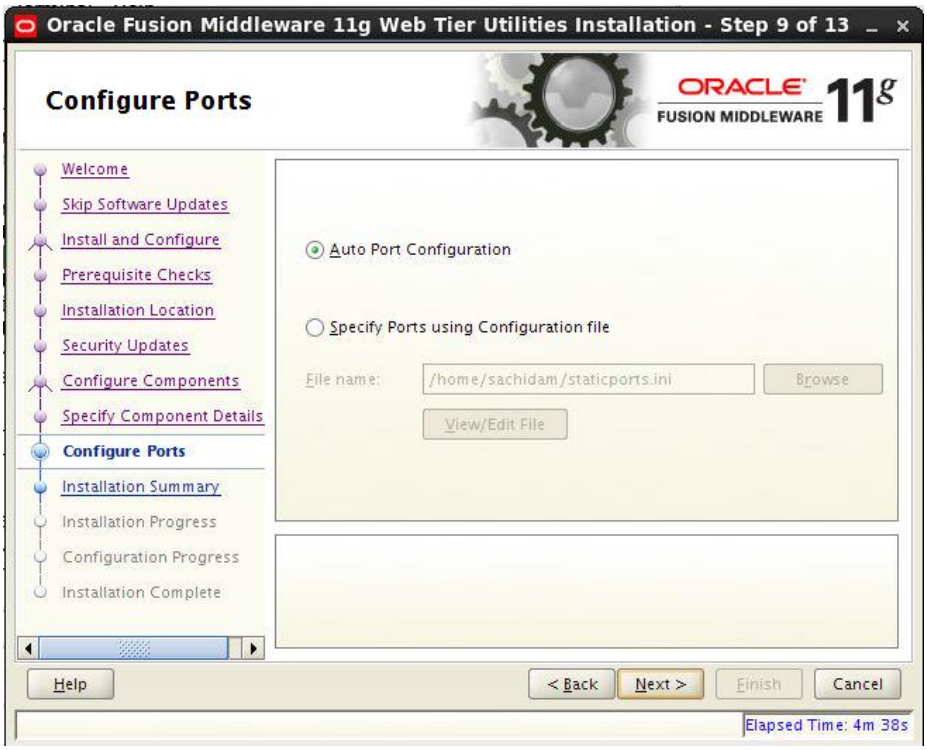

Oracle Fusion Middleware 11g Web Tier Utilities Installation - Step 6 of 14
Specify Security Updates
ORACLE FUSION MIDDLEWARE 11g
Welcome
Skip Software Updates
Install and Configure
Prerequisite Checks
Installation Location
Security Updates
Configure Components
Specify WebLogic Doma
Specify Component Det
Configure Ports
Installation Summary
Installation Progress
Configuration Progress
Installation Complete
Provide your email address to be informed of security issues, install the product and initiate configuration manager. View details.
Email:
Easier for you if you use your My Oracle Support email address/username.
I wish to receive security updates via My Oracle Support.
My Oracle Support Password:
Help
< Back
Next >
Finish
Cancel
Elapsed Time: 2m 8s

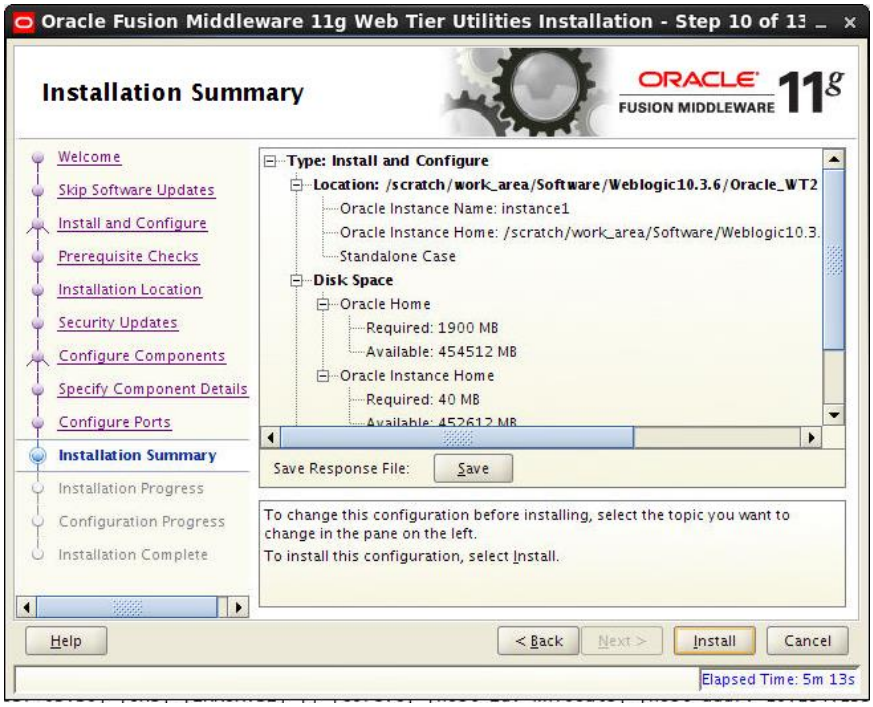
Select only Oracle HTTP Server

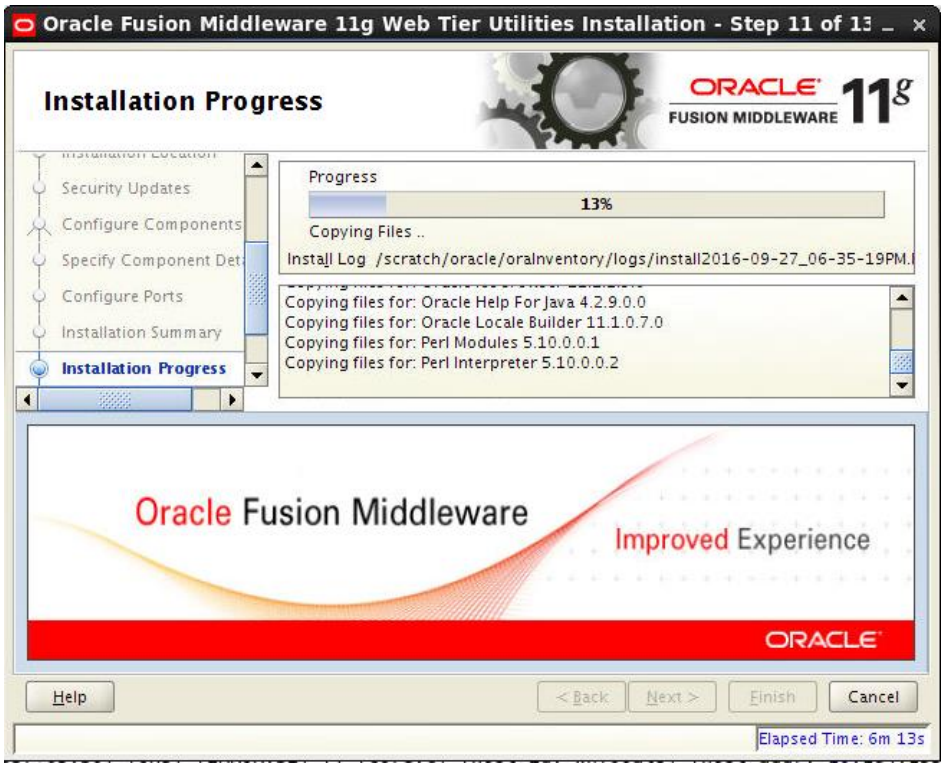


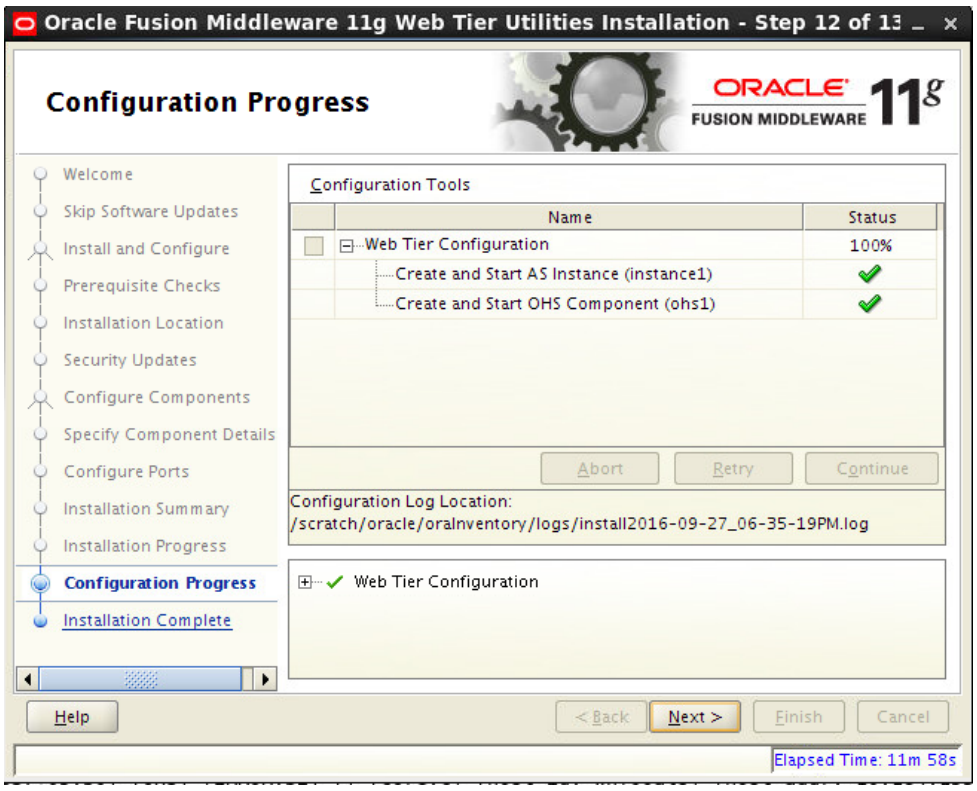
Enter the required OHS instance and component names

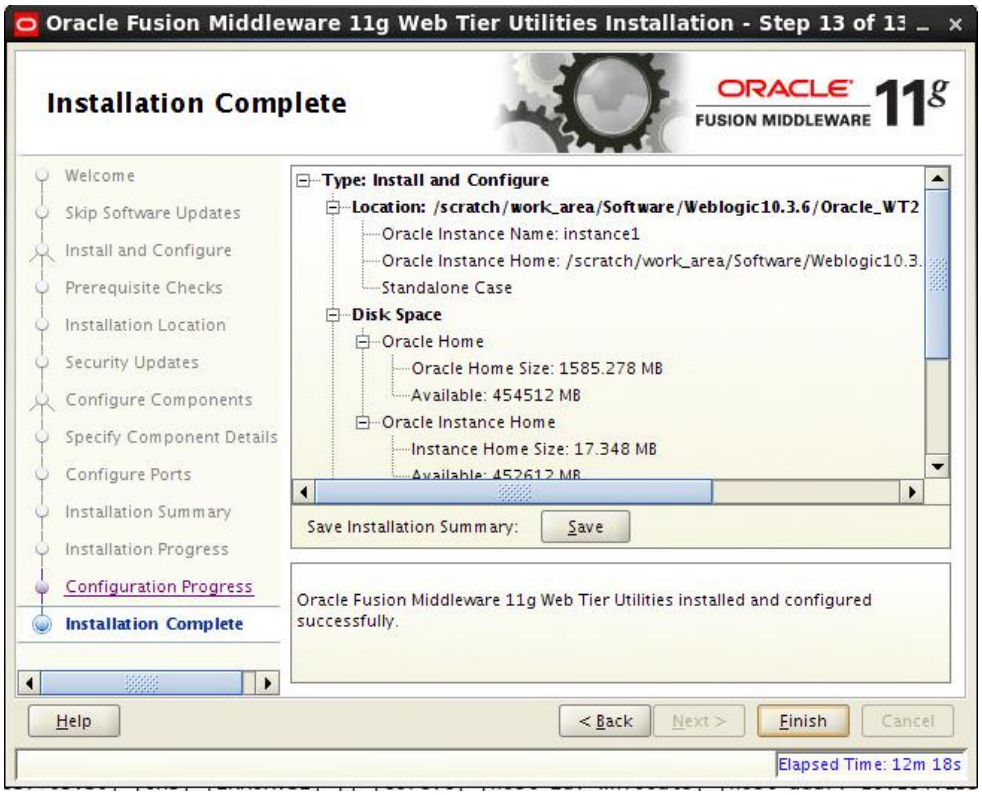





Oracle Fusion Middleware 11g Web Tier Utilities Installation - Step 10 of 13
Installation Summary
ORACLE FUSION MIDDLEWARE 11g
Welcome
Skip Software Updates
Install and Configure
Prerequisite Checks
Installation Location
Security Updates
Configure Components
Specify Component Details
Configure Ports
Installation Summary
Installation Progress
Configuration Progress
Installation Complete
Type: Install and Configure
Location: /scratch/work_area/Software/Weblogic10.3.6/Oracle_WT2
Oracle Instance Name: instance1
Oracle Instance Home: /scratch/work_area/Software/Weblogic10.3.
Standalone Case
Disk Space
Oracle Home
Required: 1900 MB
Available: 454512 MB
Oracle Instance Home
Required: 40 MB
Save Response File:
Save
To change this configuration before installing, select the topic you want to change in the pane on the left.
To install this configuration, select Install.
Help
< Back
Next >
Install
Cancel
Elapsed Time: 5m 13s


Oracle Fusion Middleware 11g Web Tier Utilities Installation - Step 11 of 13
Installation Progress
ORACLE FUSION MIDDLEWARE 11g
Security Updates
Configure Components
Specify Component Det
Configure Ports
Installation Summary
Installation Progress
Progress
13%
Copying Files ..
Install Log /scratch/oracle/oraInventory/logs/install2016-09-27_06-35-19PM.
Copying files for: Oracle Help For Java 4.2.9.0.0
Copying files for: Oracle Locale Builder 11.1.0.7.0
Copying files for: Perl Modules 5.10.0.0.1
Copying files for: Perl Interpreter 5.10.0.0.2
Oracle Fusion Middleware
Improved Experience
ORACLE
Help
< Back
Next >
Finish
Cancel
Elapsed Time: 6m 13s

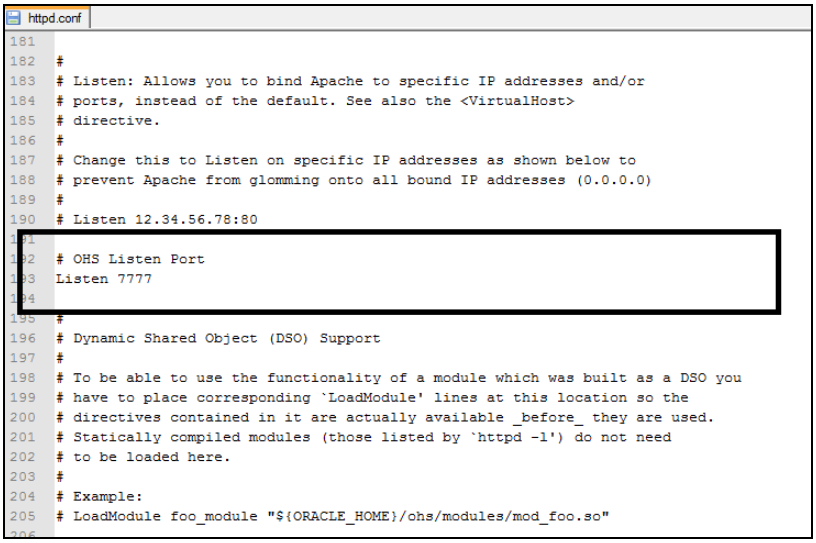




This completes the installation of Oracle HTTP Server with <Instance> and <component>. Example: Instance is instance1 and component is ohs1.

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.



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 /FCISNeoWeb>

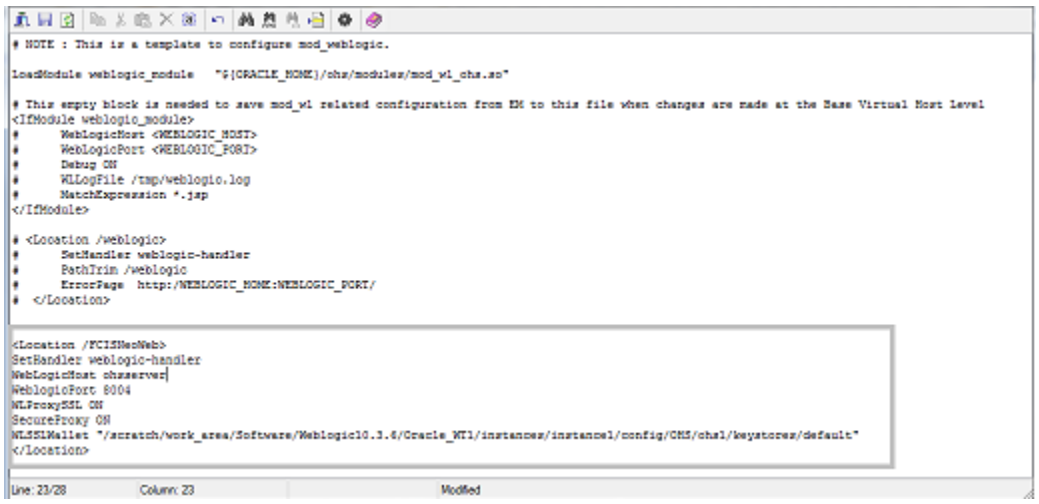
SetHandler weblogic-handler

WebLogicHost wlserver1

WeblogicPort 7707

</Location>

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



4.2 For Weblogic Instances in Cluster

<Location /<<context/url>> >

SetHandler weblogic-handler

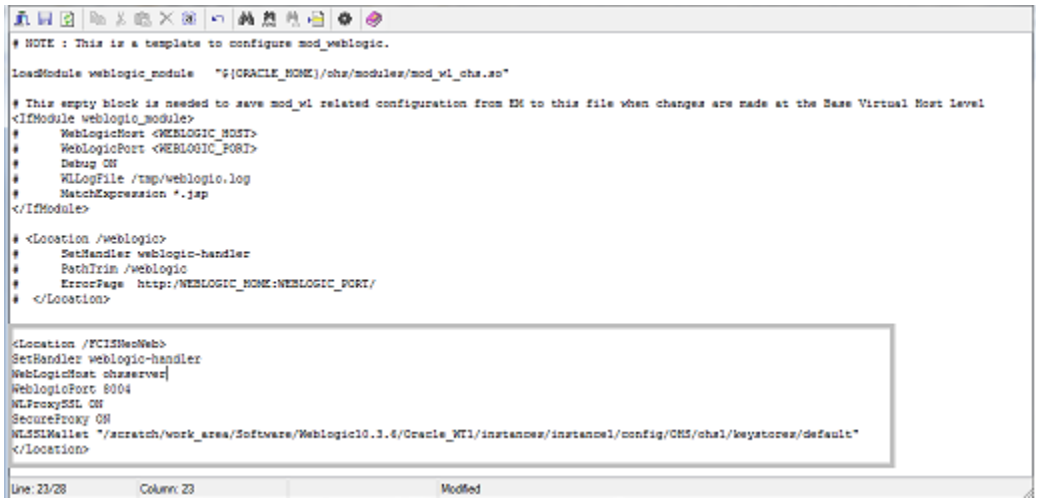
WebLogicCluster <server1>:<port1>,<server2>:<port2>

</Location>

Example

<Location / FCISNeoWeb >
SetHandler weblogic-handler
WebLogicCluster wlserver1:7010, wlserver2:7010
</Location>

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



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

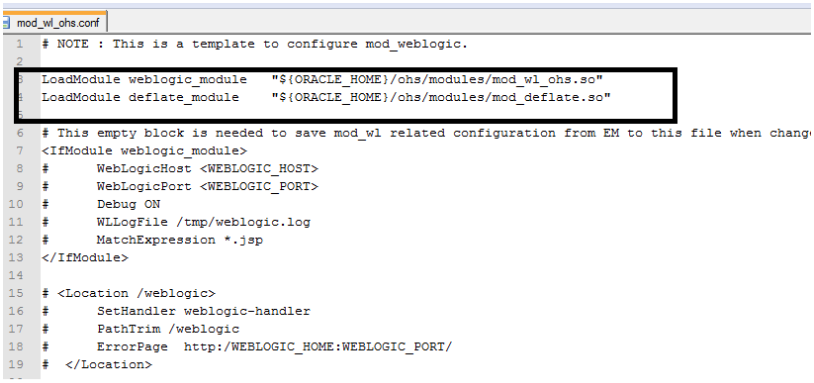
mod_deflate is used for compression in OHS and this is installed in Oracle HTTP Server under location

"${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.

```
21      <Location /FCJNeoWeb>
22          SetHandler weblogic-handler
23          WebLogicHost wlserver1
24          WebLogicPort 7707
25
26          AddOutputFilterByType DEFLATE text/plain
27          AddOutputFilterByType DEFLATE text/xml
28          AddOutputFilterByType DEFLATE application/xhtml+xml
29          AddOutputFilterByType DEFLATE text/css
30          AddOutputFilterByType DEFLATE application/xml
31          AddOutputFilterByType DEFLATE application/x-javascript
32          AddOutputFilterByType DEFLATE text/html
33          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.

```
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
```

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 FCIS installation is recommended before proceeding with further setup.

In Oracle HTTP server, SSL configuration can be done between

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

7.1 SSL Configuration for Inbound Request to Oracle HTTP Server

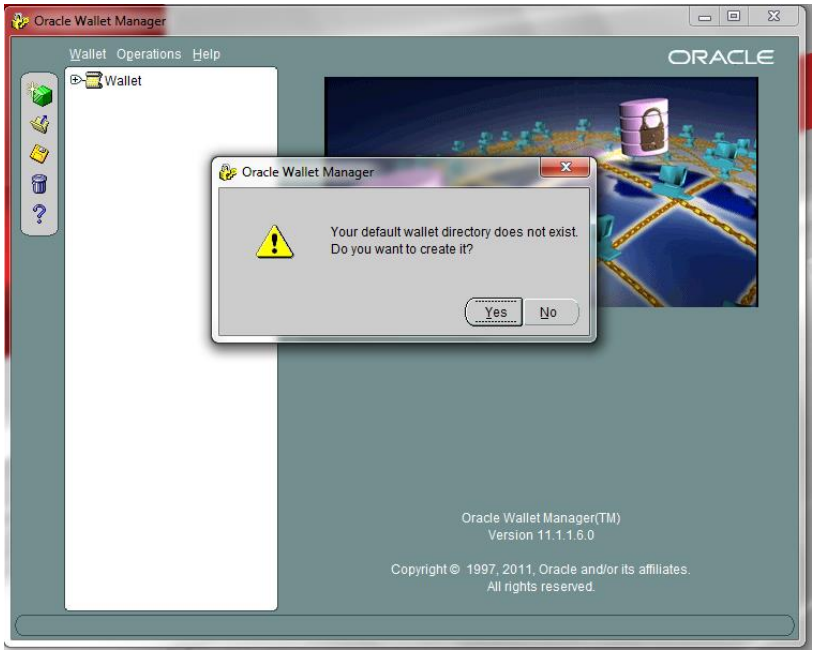
Perform these tasks to enable and configure SSL between browser and Oracle HTTP Server.

- Obtain a certificate from CA or create a self signed certificate.
- 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"
- Configuring Wallet in ssl.conf file

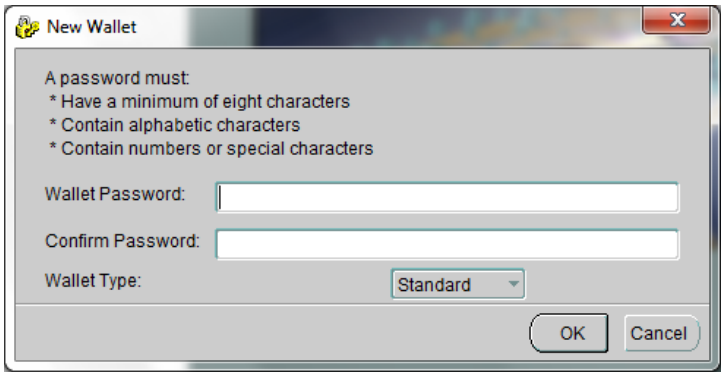
7.1.1 Create a new Wallet and import Certificate

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

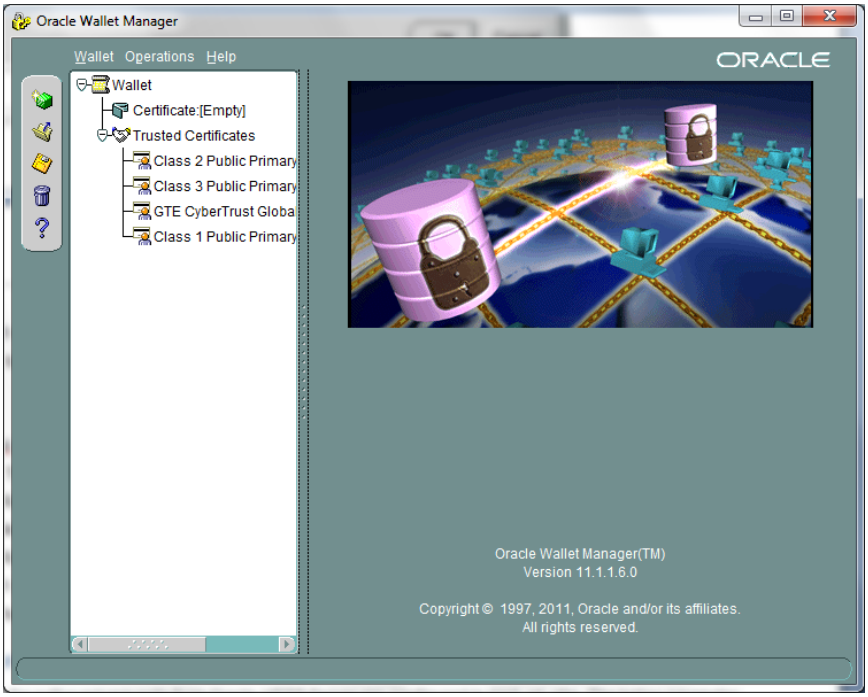
2. Click on Create new and then click no option.



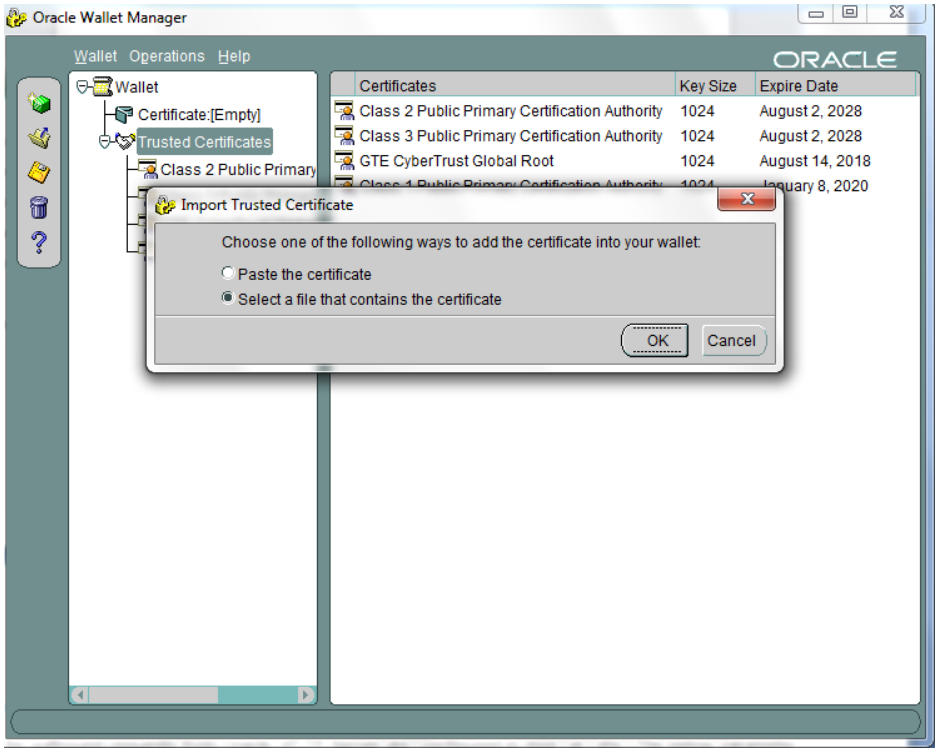
3. Enter the wallet password and click on OK, this will create a new wallet.



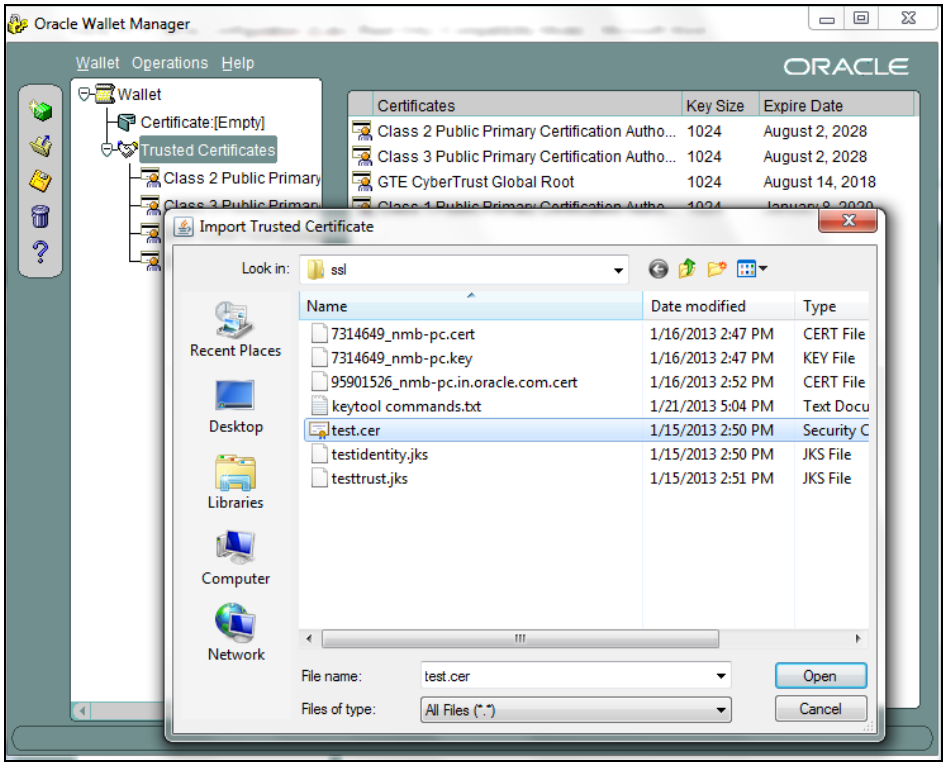
4. Not it will ask for certificate request creation, Click on NO to proceed



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

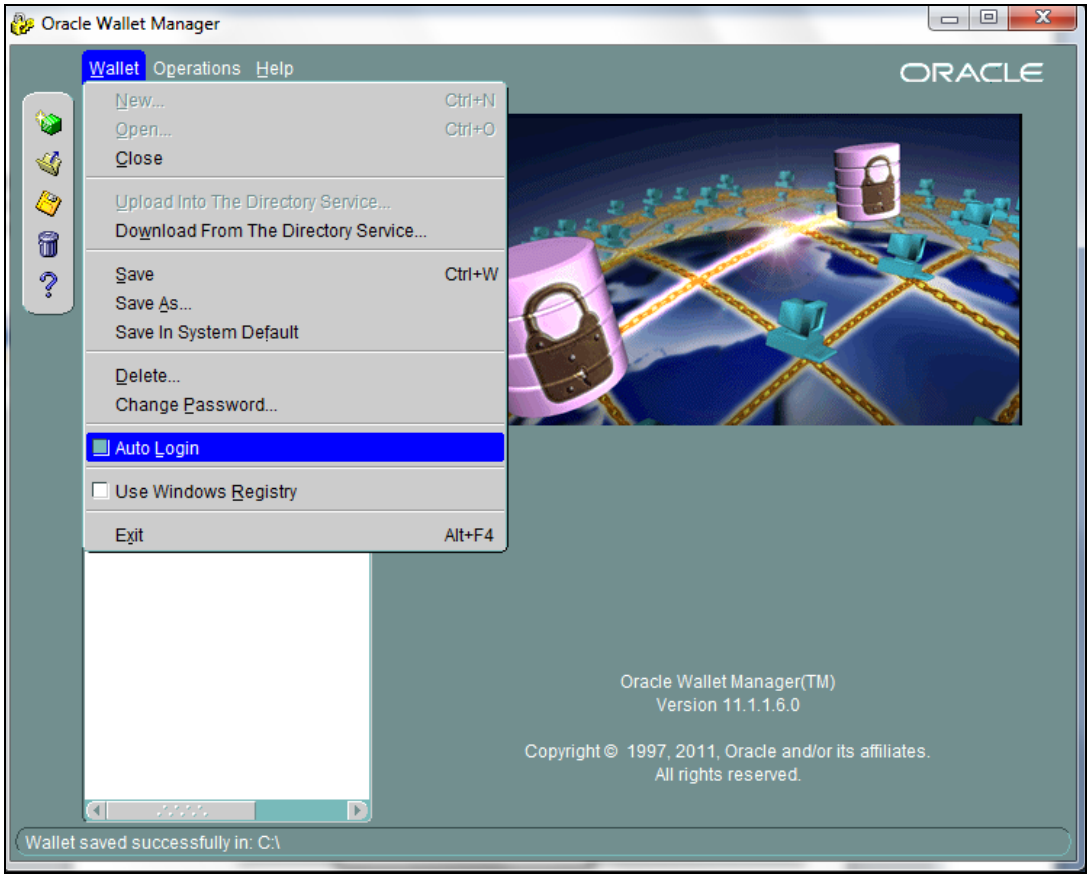


6. Browse to the folder where certificate is stored and click on Open



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.

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}/

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

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

```
    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

    # SSL Certificate Revocation List Check
    # Valid values are On and Off
    SSLCRLCheck Off

    #Path to the wallet
    SSLWallet "${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/keystores/"

    <FilesMatch "\.(cgi|shtml|phtml|php)$">
      SSLOptions +StdEnvVars
    </FilesMatch>

    <Directory "${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/cgi-bin">
      SSLOptions +StdEnvVars
    </Directory>

    BrowserMatch ".*MSIE.*" \
    nokeepalive ssl-unclean-shutdown \
    downgrade-1.0 force-response-1.0

  </IfModule>
</VirtualHost>

</IfModule>
```

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

```
##########################################################################
# Oracle HTTP Server mod_ossl configuration file: ssl.conf        #
##########################################################################


# OHS Listen Port
Listen 4443

<IfModule ossl_module>
##
##  SSL Global Context
##
##  All SSL configuration in this context applies both to
##  the main server and all SSL-enabled virtual hosts.
##


#
#   Some MIME-types for downloading Certificates and CRLs
    AddType application/x-x509-ca-cert .crt
    AddType application/x-pkcs7-crl    .crl

#   Pass Phrase Dialog:
```

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

```
        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

        WlSSLWallet "D:\misc\ssl\"
</Location>
```

7.2.2 To enable one-way SSL

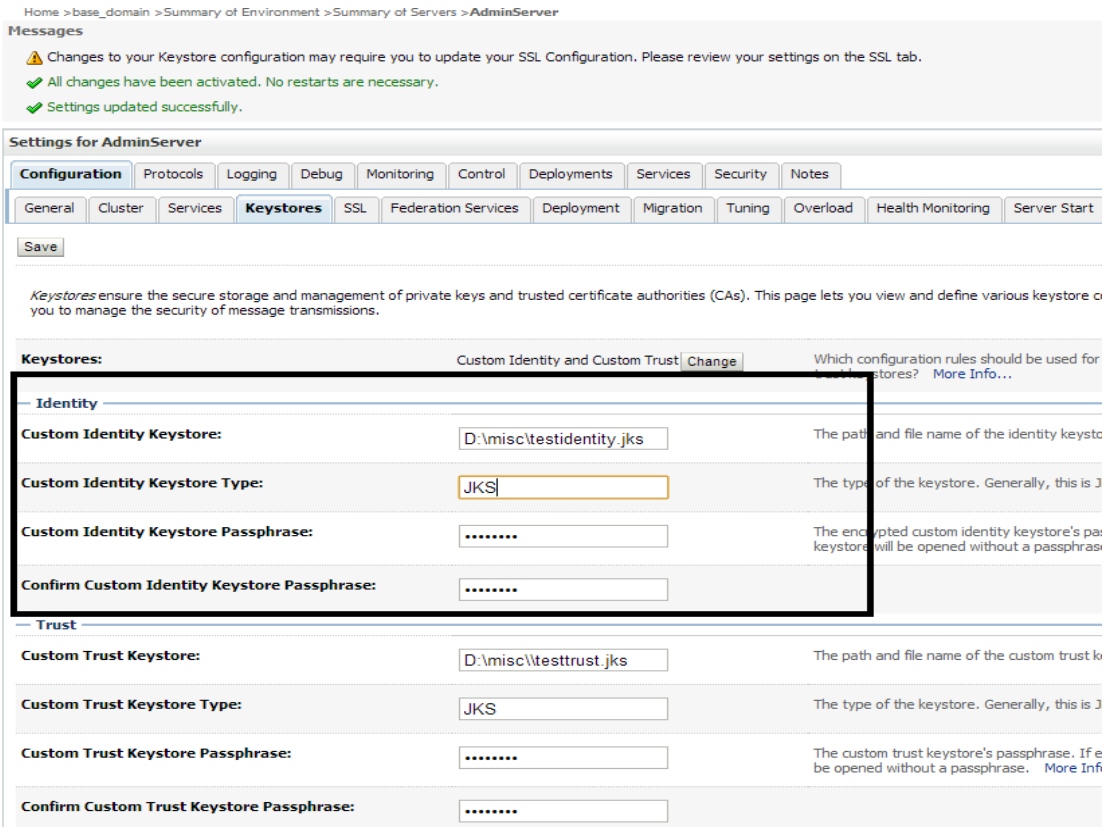
1. Generate a custom keystore identity.jks for Weblogic Server containing a certificate.

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



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

    WlSSLWallet "${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.

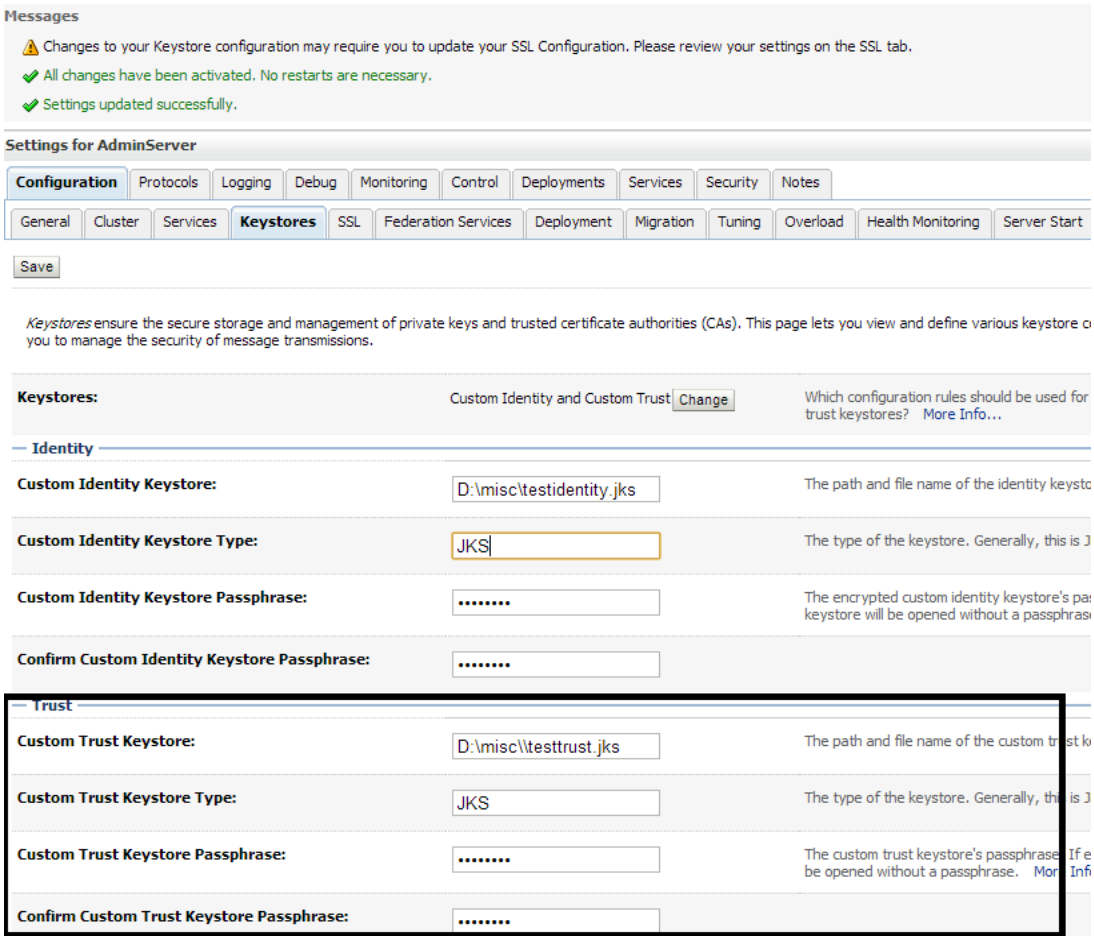
```
<Location /FCJNeoWeb>
        WebLogicHost wlserver1
        WebLogicPort 443

        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

        WlSSLWallet "${ORACLE_INSTANCE}/config/OHS/{COMPONENT_NAME}/keystores/"
</Location>
```

Restart both Weblogic Server and Oracle HTTP Server

To enable two-way SSL

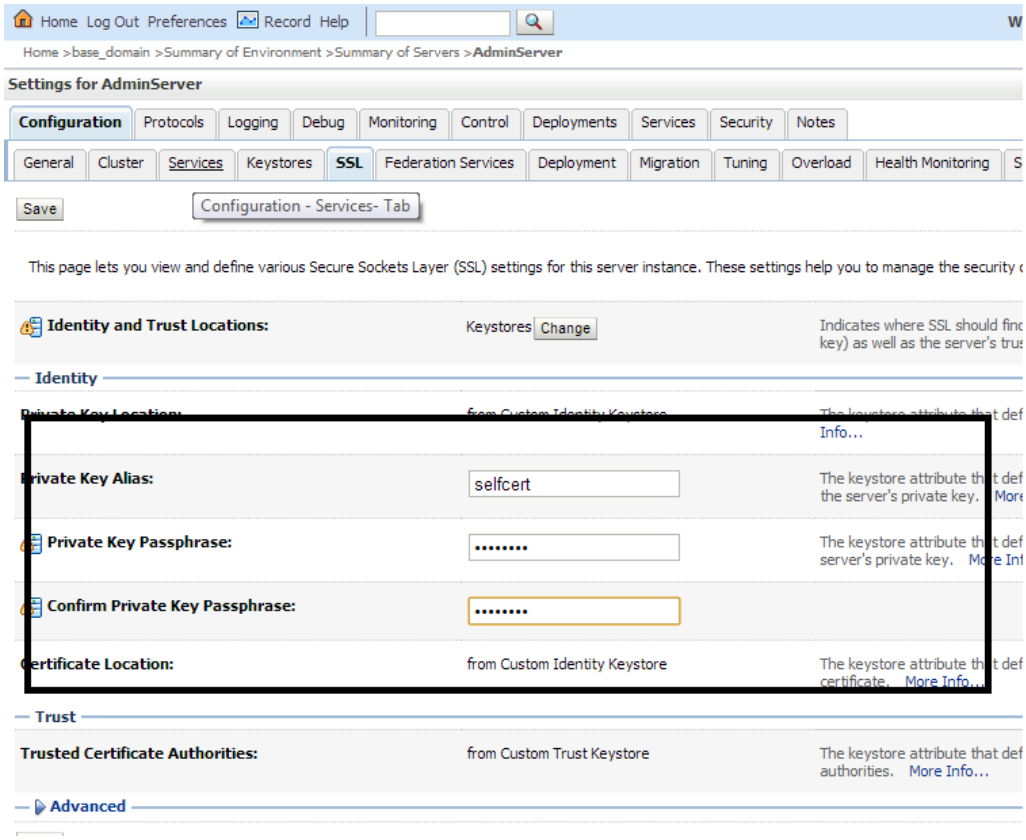
- Perform one-way SSL configuration steps
- Generate a new trust store, trust.jks for Weblogic server
- Keystore created for one-way SSL could be used, but it is recommended to create a separate truststore
- Export the user certificate from Oracle HTTP Server wallet, and import it into truststore created above
- At Trust section in Keystores tab in Weblogic Admin Console for the server set

- The custom trust store with the trust.jks file location
- The keystore type as JKS
- The passphrase used to created the keystore



1. Under the SSL tab

   Ensure trusted CA is set as from Custom Trust Keystore.



2. Restart Weblogic Server

8. Starting, Stopping, and Restarting Oracle HTTP Server

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

8.1 Start

opmnctl startproc ias-component={COMPONENT_NAME}

Example: opmnctl startproc ias-component=ohs1

8.2 Stop

opmnctl stopproc ias-component={COMPONENT_NAME}

Example: opmnctl stopproc ias-component=ohs1

8.3 Restart

opmnctl restartproc ias-component={COMPONENT_NAME}

Example: opmnctl restartproc ias-component=ohs1

9. 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

10. Server Logs Location

Oracle HTTP Server Logs are generated under folder

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

11. References

SSL_Configuration.doc for Weblogic provided as part of FCIS 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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