Apache Server Configuration for FLEXCUBE
Oracle FLEXCUBE Universal Banking
Release 14.2.0.0.0
[December] [2018]
# Table of Contents

1. PURPOSE........................................................................................................................................... 1-3  
2. INTRODUCTION ...................................................................................................................................... 2-4  
3. INSTALLATION OF APACHE .................................................................................................................. 3-5  
4. CONFIGURE APACHE SERVER INFRONT OF WEBLOGIC SERVER.................................................. 4-6  
5. CONFIGURING SSL FOR APACHE SERVER.......................................................................................... 5-11  
   5.1 SSL configuration for Inbound Request to Apache ........................................................................... 5-11  
   5.2 Configuring SSL between Apache and Oracle Weblogic Server..................................................... 5-13  
6. STARTING, STOPPING, AND RESTARTING APACHE......................................................................... 6-18  
7. DEBUGGING ............................................................................................................................................ 7-19  

ORACLE
1. Purpose

The objective of this document is to explain the installation and configuration of Apache 2.2.25. This includes setting up of server details and enabling SSL.
Below is the typical deployment diagram and this document covers the setup for Apache Webserver Instance.

![Diagram of Apache Webserver Instance setup]
3. Installation of Apache

Unzip the Apache software, in this example the unzipped location is /scratch/oracle/software/httpd-2.2.25. Below steps should be executed from inside this directory location.

Software Directory : /scratch/oracle/software/httpd-2.2.25

1. $ ./configure --prefix=/scratch/oracle/apache --enable-ssl --with-included-apr

   Where / scratch/oracle/apache is the apache home directory

2. $ make

3. $ make install
4. Configure Apache Server infront of Weblogic Server

1. Copy `mod_wl_22.so` from any weblogic Server (`$WLS_HOME/server/plugin/linux/x_86_64`) to `$PREFIX/modules` location in Apache Server.

   **NOTE:** In this example the OS is Linux, copy the file from appropriate folder according to the weblogic installed directory.

2. Edit `http.conf` located under folder `$PREFIX/conf` to include `mod_wl_22.conf` file.

   ```
   LoadModule weblogic_module /scratch/oracle/apache/modules/mod_wl_22.so
   ```

3. Modify `http.conf` file for the required listen port

   ```
   Listen <HOST NAME>:<PORT>
   ```

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

4. Modify the `http.conf` file to include the weblogic server details

   a. 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 7004
</Location>

This will forward /FCJNeoWeb from Apache server to /FCJNeoWeb on WebLogic Server wlserver1: 7004

**NOTE**: If you want to allow more than one context root, then either add different Location entries for each context root eg: <Location /FCJNeoWeb>, <Location /FCJWebServices>, etc

or Add <Location /> which will all the context roots.
b. For Weblogic instances in cluster

```xml
<Location /<<context/url>> >
  SetHandler weblogic-handler
  WebLogicCluster <server1>:<port1>,<server2>:<port2>
</Location>
```

Example

```xml
<Location / FCJNeoWeb >
  SetHandler weblogic-handler
  WebLogicCluster wlserver1:7065, wlserver2:7067
</Location>
```

This will forward /FCJNeoWeb from Apache server to /FCJNeoWeb on WebLogic Cluster wlserver1:7065 and wlserver2:7067
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
   i. Click on <Domain> -> 'Web Applications'
   ii. Check the 'WebLogic Plug-In Enabled' box.
   iii. Click ‘Save’
iv. Restart the server.

6. Restart the apache server and application can be accessed using link

http://<hostname>:<port>/FCJNeoWeb/
5. Configuring SSL for Apache 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.

SSL configuration can be done between

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

5.1 SSL configuration for Inbound Request to Apache

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

1. In httpd.conf, uncomment the below line

   Include conf/extra/httpd-ssl.conf

2. Edit httpd-ssl.conf file located in $PREFIX/conf/extra/ to give the server address and port as below

   Listen <hostname>:<port>
NOTE: This is the https port and not for http

3. Obtain a certificate from CA or create a self signed certificate using openSSL

   a. Steps to create certificate using openSSL

      openssl genrsa -des3 -out test.key 1024

      openssl req -new -key test.key -out test.csr

      openssl x509 -req -days 365 -in test.csr -signkey test.key -out test.crt

      This will generate 3 files named test.key, test.csr, test.crt

4. Copy the files with extension.crt and .key to $PREFIX/conf/ folder.

5. Edit httpd-ssl.conf to give the location and name for .crt and .key as below

   SSLCertificateFile "/scratch/oracle/apache/conf/test.crt"

   SSLCertificateKeyFile "/scratch/oracle/apache/conf/test.key"
6. Restart apache and application can be accessed using URL

https://<hostname>:<port>/FCJNeoWeb/

NOTE: When apache is started with SSL enabled it will ask for pass phrase: here enter the pass phrase used during creation of certificate

5.2 Configuring SSL between Apache and Oracle Weblogic Server

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

    keytool -genkeypair -alias testselfcert -keyalg RSA -keypass admin123 -validity 365 -keystore testidentity.jks

    keytool -export -alias testselfcert -file test.cer -keystore testidentity.jks

2. Configure in weblogic to use the generated keyStore
   a. Enable the enable SSL port for the managed server
b. In KeyStores tab select Custom Identity and Java Standard Trust

c. Enter the Path where KeyStore generated is stored and then Enter the passphrase
d. Under SSL tab Enter the Alias and the key Passphrase

3. Certificate displayed by Weblogic needs to be copied to apache, below steps needs to be followed

   a. Execute the openSSL command, openssl s_client -connect <WL host: Port>

   Eg: openssl s_client -connect wlservlet1:7004.
   It will give output as below

   -bash-4.1$ openssl s_client -connect wlservlet1:7004
   CONNECTED(00000003)
   depth=0 C = IN, ST = IN, L = IN, O = IN, OU = IN, CN = IN
   verify error:num=18:self signed certificate
verify return:1
depth=0 C = IN, ST = IN, L = IN, O = IN, OU = IN, CN = IN
verify return:1

---
Certificate chain
0 s:/C=IN/ST=IN/L=IN/O=IN/OU=IN/CN=IN
i:/C=IN/ST=IN/L=IN/O=IN/OU=IN/CN=IN
---
Server certificate
-----BEGIN CERTIFICATE-----
MIICezCCAXygAwIBAgIEUigrQTANBgkqhkiG9w0BAQUFADBOMQswCQYDVQQGEwJJ
TjELMAkGa1UECBMUCmVjdDQwMDA2MDAwMDowMDAsMDIwMDIwMDIwMDAwMDIwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MDaw-----END CERTIFICATE-----

subject=/C=IN/ST=IN/L=IN/O=IN/OU=IN/CN=IN
issuer=/C=IN/ST=IN/L=IN/O=IN/OU=IN/CN=IN

---
No client certificate CA names sent
---
SSL handshake has read 665 bytes and written 295 bytes
---
New, TLSv1/SSLv3, Cipher is RC4-MD5
Server public key is 1024 bit
Secure Renegotiation IS NOT supported
Compression: NONE
Expansion: NONE
SSL-Session:
  Protocol : TLSv1
  Cipher : RC4-MD5
  Session-ID: EF4D92AFC99069ADF35DB9B16EB36C9
  Session-ID-ctx:
  Master-Key:
  3B9AD7F1F72C0A50FF4C10458F392C763331CDD5313832A8BF28EDEBBFCDB8E6D928944D
  4698FC302F3A490116DC6E320
  Key-Arg : None
  Krb5 Principal: None
  PSK identity: None
  PSK identity hint: None
  Start Time: 1378442902
  Timeout : 300 (sec)
  Verify return code: 18 (self signed certificate)

b. The section highlighted in red above is the certificate presented by weblogic. This needs to be copied to new file and name this file as server.pem under location $PREFIX/conf/
4. Apache to be configured to use the SSL

   In httpd.conf add the below directive

   <Location /FCJNeoWeb>
   SetHandler weblogic-handler
   SecureProxy ON
   WLProxySSL ON
   RequireSSLHostMatch false
   TrustedCAFile /scratch/oracle/apache/conf/server.pem
   EnforceBasicConstraints false
   </Location>

5. Restart Apache and access using the URL

   https://<hostname>:<port>/FCJNeoWeb/
6. Starting, Stopping, and Restarting Apache

Run below commands

- $PREFIX/bin/apachectl start
- $PREFIX/bin/apachectl stop
- $PREFIX/bin/apachectl restart
7. Debugging

1. LogLevel and ErrorLog directives in httpd.conf file control the location and log file severity.

   ```
   LogLevel warn
   <IfModule log_config_module>
   
   # ErrorLog: The location of the error log file.
   # If you do not specify an ErrorLog directive within a <VirtualHost>
   # container, error messages relating to that virtual host will be
   # logged here. If you *do* define an error log file for a <VirtualHost>
   # container, that host's errors will be logged there and not here.
   ErrorLog "logs/error_log"
   
   # LogLevel: Control the number of messages logged to the error_log.
   # Possible values include: debug, info, notice, warn, error, crit,
   # alert, error.
   LogLevel warn
   </IfModule>
   ```

2. To enable debugging for communication between apache and weblogic add the following directives under Location tag

   WLLogFile <File path>
   Debug ALL
   DebugConfigInfo ON

   ```
   /scratch/oracle/apache/conf/httpd.conf
   
   # ServerAdmin: Your address, where problems with the server should be
   # e-mailed. This address appears on some server-generated pages, such
   # as error documents. e.g. admin@your-domain.com
   # ServerAdmin you@example.com
   
   LoadModule weblogic_module /scratch/oracle/apache/modules/mod_wl_22.so
   <IfModule mod_weblogic.so>
   <Location /FusionWeb>
   #SetHandler weblogic-handler
   #WebLogicCluster wserv2:7065, wserv2:7067]
   #SecureProxy ON
   #WPProxySSL ON
   #RequireSSLHostMatch false
   #TrustedCAFile /scratch/oracle/apache/conf/server.pem
   #EnforceBasicConstraints false
   
   WLLogFile /scratch/oracle/apache/logs/wlproxy.log
   Debug ALL
   DebugConfigInfo ON
   </Location>
   </IfModule>
   ```