Oracle Financial Services
Advanced Analytical Applications Infrastructure Application Pack

Administration and Configuration Guide

Release 8.0 - 8.0.5.x.x
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<td>Captured the administration configurations for OFS AAI Application Pack 8.0.0.0.0.</td>
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<td>Restructured the guide and removed irrelevant sections.</td>
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<td>2.0</td>
<td>Dec 2015</td>
<td>Added 8.0.2.0.0 related configurations</td>
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<td>Added Workflow Manager Configurations chapter.</td>
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<td>5.0</td>
<td>Feb 2016</td>
<td>Added Transferring Batch Ownership section as per Bug 22103206.</td>
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<td>Feb 2016</td>
<td>Added SCD Execution on Hive Information Domain section.</td>
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<td>Added a prerequisite for PortC utility based on Bug 22554485.</td>
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<td>Added LDAP Configuration section, which was earlier present in I&amp;C guide.</td>
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<td>• Updated section 'LDAP Configuration' with a note for being not applicable for Release 8.0.4.0.0 and later.</td>
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<td>• Updated LDAP to SMS information in section 'Migrate Data from CSSMS tables to LDAP server and from LDAP to SMS.'</td>
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<td>• Sqoop 1 in cluster mode configurations are introduced.</td>
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| 12.0           | Aug 2017      | - Added configurations required for Distributed AM processing.  
|                |               | - Added section Configuring Components, Dimensions, and Static Options for JIRA OFSAAAAI-8431.  
|                |               | - Added details for Bug 25768642. |
| 13.0           | Sep 2017      | - Added section 5.1 ‘Using X-Frame-Options to Embed OFSAA Content on your Site’ for Bug 26788350. |
| 14.0           | Oct 2017      | - Added section Registering and Invoking your Application's Customized Workflow’ (JIRA OFSAAAAI-9113).  
|                |               | - Modified Distributed AM Based Processing section  
|                |               | - Added Configuring Attributes for Attribute Expression Application Rule section  
|                |               | - Added section ‘Configuring OFSAA OIM Connector’ (JIRA OFSAAAAI-10062). |
| 15.0           | Jan 2018      | - Added 8.0.2.2.0, 8.0.3.3.0, 8.0.4.2.0 and 8.0.5.1.0 ML changes. |
| 16.0           | Feb 2018      | - Added updates for JIRA OFSAAAAI-12376. |
| 17.0           | Apr 2018      | - Added configurations for CMIS Integration in Forms Framework.  
|                |               | - Added Enabling Proxy for Webservices Rule section |
| 18.0           | June 2018     | - Added updates for JIRA OFSAAAAI-14207 and OFSAAAAI-13230. |
| 19.0           | July 2018     | - Updated for OFSAAAAI-13230. |
| 20.0           | Sep 2018      | - Added HTTPS Protocol section based on Bug 27821807. |
| 21.0           | June 2019     | - Added additional information for Tectia configuration in section Other SSH Software (Doc 29771662). |

**NOTE:** For the configurations for OFSAA Release 8.0.6.0.0, see OFS Analytical Applications Infrastructure Administration Guide.
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Preface

This Preface provides supporting information for the Oracle Financial Services Analytical Applications Infrastructure Administration Guide and includes the following topics:

- Summary
- Audience
- Related Documents
- Conventions

Summary

This document includes the necessary instructions for module specific configurations. We recommend you to download the latest copy of this document from OHC Documentation Library which includes all the recent revisions (if any) done till date.

Audience

Oracle Financial Services Analytical Applications Infrastructure Administration Guide is intended for administrators and implementation consultants who are responsible for installing and maintaining OFSAAI.

Related Documents

This section identifies additional documents related to OFSAA Infrastructure. You can access the following documents from OHC Documentation Library.

- Oracle Financial Services Advanced Analytical Applications Infrastructure Application Pack Installation and Configuration Guide
- Oracle Financial Services Analytical Applications Environment Check Utility Guide
- Oracle Financial Services Analytical Applications Infrastructure User Guide
- Oracle Financial Services Analytical Applications Infrastructure Security Guide
Conventions

The following text conventions are used in this document:

<table>
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<th>Conventions</th>
<th>Meaning</th>
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<tr>
<td><strong>Boldface</strong></td>
<td>Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.</td>
</tr>
<tr>
<td><strong>Italic</strong></td>
<td>Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.</td>
</tr>
<tr>
<td><strong>monospace</strong></td>
<td>Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.</td>
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Abbreviations

The following table lists the abbreviations used in this document:

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<thead>
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<tbody>
<tr>
<td>AIX</td>
<td>Advanced Interactive eXecutive</td>
</tr>
<tr>
<td>CDH</td>
<td>Cloudera Distribution Including Apache Hadoop</td>
</tr>
<tr>
<td>EPM</td>
<td>Enterprise Performance Management</td>
</tr>
<tr>
<td>F2H</td>
<td>HDFS File/Flat File to HDFS target</td>
</tr>
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<td>HDFS</td>
<td>Hadoop Distributed File System</td>
</tr>
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<td>H2T</td>
<td>HDFS-Hive source to RDBMS target mapping</td>
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<td>H2H</td>
<td>HDFS-Hive source to HDFS target</td>
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<tr>
<td>H2F</td>
<td>HDFS-Hive source to Flat File target</td>
</tr>
<tr>
<td>KBD</td>
<td>Key Business Dimensions</td>
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<td>OEL</td>
<td>Oracle Enterprise Linux</td>
</tr>
<tr>
<td>OFSAAI</td>
<td>Oracle Financial Services Analytical Applications Infrastructure</td>
</tr>
<tr>
<td>OLH</td>
<td>Oracle Loader for Hadoop</td>
</tr>
<tr>
<td>RDBMS</td>
<td>Relational Database Management System</td>
</tr>
<tr>
<td>RHEL</td>
<td>Red Hat Enterprise Linux</td>
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<tr>
<td>RRF</td>
<td>Run Rule Framework</td>
</tr>
<tr>
<td>SCD</td>
<td>Slowly Changing Dimension</td>
</tr>
<tr>
<td>Abbreviations</td>
<td>Meaning</td>
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<tr>
<td>SQL</td>
<td>Structured Query Language</td>
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<td>UDP</td>
<td>User Defined Properties</td>
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<td>UMM</td>
<td>Unified Metadata Manager</td>
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<tr>
<td>VM</td>
<td>Virtual Machine</td>
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1 Data Management Tools Module Configurations

This chapter details about the configurations required in the Data Management Tools module. It includes the following sections:

- Data Mapping Configurations
- Data File Mapping Configurations
- Oracle® Loader for Hadoop (OLH) Configuration
- Sqoop Configuration
- SCD Execution on Hive Information Domain

1.1 Data Mapping Configurations

This is applicable from OFSAAI version 8.0.2.0.0.

This section talks about the configurations required for data movement involving Hive based source or target. This is required only if you have enabled Big Data Processing within your application pack.

- HDFS-Hive source to RDBMS target (H2T)
- HDFS-Hive source to HDFS target (H2H)
- RDBMS source to HDFS-Hive target (T2H)
- HDFS-Hive source to Flat File target (H2F)
- HDFS/Local-WebLog Source to HDFS Target (L2H)

1.1.1 Data Movement from HDFS Source to RDBMS Target (H2T)

1.1.1.1 Default Implementation

The following property needs to be set in the ETLLoader.properties file which is present in $FICDB_HOME/conf:

- H2TMode=default

1.1.1.2 OLH (Oracle Loader for Hadoop) Implementation

OLH (Oracle Loader for Hadoop) should have been installed and configured in your system. For more information, see Oracle® Loader for Hadoop (OLH) Configuration.

Limitations

- OLH can read data from a Single Source Table (ANSI joins are not supported) and load it into a single target RDBMS table.
OLH 2.3.1 is built against HIVE 0.10. It works well with HIVE 0.12 too; however, Data Type DATE (that is supported in HIVE 12) is not supported by OLH.

1.1.1.3 Sqoop Implementation

Sqoop should have been installed and configured in your system.

Two types of Sqoop implementations are supported:

- **Sqoop 1** (Sqoop 1.4x) – in Client mode. Using Sqoop export
- **Sqoop 1** (Sqoop 1.4x) – in Cluster mode. OFSAAI first SSHs to the Sqoop node on the cluster, and then executes the export command.

For more information, see [Sqoop Configuration](#).

1.1.2 Data Movement from RDBMS Source to HDFS Target (T2H)

1.1.2.1 Default Implementation

The following property needs to be set in the ETLLoader.properties file which is present in $FICDB_HOME/conf:

- T2HMode=default
- ISHIVELOCAL
  - YES - If Hive and OFSAA are installed on the same Virtual Machine (VM)
  - NO - If Hive and OFSAA are on different VM's
- HIVESERVER_NAME – IP address of the Hive Server
- HIVESERVE_PORT – FTP Port of the Hive Server
- HIVESERVER_FTPDRIVE – The shared path on the Hive VM
- HIVESERVER_FTPSHARENAME – Used only in windows, this is not supported now.
- HIVESERVER_FTP_USERID – FTP UserID
- HIVESERVER_FTP_PASSWORD – Password required for FTP connection

1.1.2.2 Sqoop Implementation

Sqoop should have been installed and configured in your system. For more information, see [Sqoop Configuration](#).

Three types of Sqoop implementations are supported:

1. **Sqoop 1** (Sqoop 1.4x) – in Client mode. Using Sqoop import
2. **Sqoop 1** (Sqoop 1.4x) – in Cluster mode. OFSAAI first SSHs to the Sqoop node on the cluster, and then executes the import command.
Limitations of Sqoop 1:

- Derived Column cannot be used as the split by column, hence should not have field order 1.
- Date Type Column cannot be used as the split by column. (Sqoop Limitation: Sqoop-1946). Hence it should not have field order 1.

3. Sqoop 2 (Sqoop 1.9 x)

Limitations of Sqoop 2:

- It does not support Secured Clusters.

1.3 Data Movement of WebLog Source to HDFS Target (L2H)

This is applicable from OFSAAI version 8.0.3.0.0.

1.3.1 Prerequisites

- CDH4 or Apache Hadoop 2.2.0
- Create a Folder /<Weblog Working Directory> in HDFS and provide 0777 permissions for the same.

1.3.2 Configurations

Following are the configurations required in case of HDFS based WebLog source:

1. Set the following properties in the ETLLoader.properties file that is present in $FICDB_HOME/conf:

   - WEBLOG_WORKING_DIR - Temporary working directory in HDFS
   - KEEP_WEBLOG_PROCESSED_FILES
     - YES - The working directory will be retained with the processed WebLog files. If the data loading was successful, the WebLog file name will be appended with Processed. Else, the WebLog file name will be appended with Working.
     - NO - The working directory will be deleted after data loading.

   For example,
   
   `<PROPERTY ID="WEBLOG_WORKING_DIR" VALUE="/user/ofsaaa/WebLogWork"/>
   <PROPERTY ID="KEEP_WEBLOG_PROCESSED_FILES" VALUE="YES"/>

2. Configure the Clusters.XML file located at $FIC_HOME/conf/folder.

   Clusters.XML file is used to configure Hadoop Cluster information in OFSAA. The file will have configuration tags to configure both secured and non-secured Hadoop Clusters.
NOTE: Execution of L2H (with a Local File System based WebLog source) expects an entry with CLUSTER ID as "DEFAULT", and the cluster tag should contain cluster details of the target information domain.

For the Secured Hadoop Cluster tag, enter the details as tabulated:

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster ID</td>
<td>Unique ID to identify the Hadoop Cluster</td>
<td>DEFAULT</td>
</tr>
<tr>
<td>Name</td>
<td>Name of the cluster</td>
<td></td>
</tr>
<tr>
<td>AUTHTYPE</td>
<td>Supported Authentication Types are Kerberos with Keytab (KRB) and Default (non-secured).</td>
<td>KRB- Kerberos with Key Tab</td>
</tr>
<tr>
<td>PRINCIPAL</td>
<td>Kerberos Principal name</td>
<td></td>
</tr>
<tr>
<td>CONFPATH</td>
<td>Path where Kerberos Configuration files reside.</td>
<td>/scratch/ofsaapp/AAAI_HOME/conf</td>
</tr>
<tr>
<td>KEYTAB</td>
<td>Name of the Key Tab file</td>
<td>xxxx.keytab</td>
</tr>
<tr>
<td>REALM</td>
<td>Name of the Kerberos Realm file.</td>
<td>krb5.conf</td>
</tr>
<tr>
<td>CORESITE</td>
<td>Name of core-site.xml</td>
<td>core-site.xml</td>
</tr>
<tr>
<td>HDFSSITE</td>
<td>Name of hdfs-site.xml</td>
<td>hdfs-site.xml</td>
</tr>
<tr>
<td>MAPREDSITE</td>
<td>Name of mapred-site.xml</td>
<td>mapred-site.xml</td>
</tr>
<tr>
<td>YARNSITE</td>
<td>Name of yarn-site.xml</td>
<td>yarn-site.xml</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>Description for the cluster tag</td>
<td></td>
</tr>
<tr>
<td>CREATEDBY</td>
<td>Date on which the cluster tag is created</td>
<td></td>
</tr>
<tr>
<td>CREATETIME</td>
<td>Time on which the cluster tag is created</td>
<td></td>
</tr>
</tbody>
</table>

For example:

```xml
<CLUSTER ID="DEFAULT">
<NAME>DEFAULT</NAME>
<AUTHTYPE>KRB</AUTHTYPE>
<PRINCIPAL>ofsaa</PRINCIPAL>
<CONFPATH>/scratch/ofsaapp/AAAI_HOME/conf</CONFPATH>
<KEYTAB>ofsaa2.keytab</KEYTAB>
<REALM>krb5_All.conf</REALM>
```
For the non-secured Cluster tag, enter the details as tabulated:

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster ID</td>
<td>Unique ID to identify the Hadoop Cluster</td>
<td>DEFAULT</td>
</tr>
<tr>
<td>Name</td>
<td>Name of the cluster</td>
<td></td>
</tr>
<tr>
<td>AUTHTYPE</td>
<td>Supported Authentication Types are Kerberos with Keytab (KRB) and Default (non-secured).</td>
<td>DEFAULT</td>
</tr>
<tr>
<td>CONFPATH</td>
<td>Path where Kerberos Configuration files such as core-site.xml, hdfs-site.xml reside.</td>
<td>/scratch/ofsaapp/AAAI_HOME/conf</td>
</tr>
<tr>
<td>CORESITE</td>
<td>Name of core-site.xml</td>
<td>core-site.xml</td>
</tr>
<tr>
<td>HDFSSITE</td>
<td>Name of hdfs-site.xml</td>
<td>hdfs-site.xml</td>
</tr>
<tr>
<td>MAPREDSITE</td>
<td>Name of mapred-site.xml</td>
<td>mapred-site.xml</td>
</tr>
<tr>
<td>YARNSITE</td>
<td>Name of yarn-site.xml</td>
<td>yarn-site.xml</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>Description for the cluster tag</td>
<td></td>
</tr>
<tr>
<td>CREATEDBY</td>
<td>Date on which the cluster tag is created</td>
<td></td>
</tr>
<tr>
<td>CREATETIME</td>
<td>Time on which the cluster tag is created</td>
<td></td>
</tr>
</tbody>
</table>

For example:

```xml
<CLUSTER ID="NONSECURECLUSTER">
  <NAME>NONSECURECLUSTER</NAME>
  <AUTHTYPE>DEFAULT</AUTHTYPE>
  <CONFPATH>/scratch/ofsaapp/AAAI_HOME/conf</CONFPATH></CONFPATH>
  <CORESITE>core-site.xml</CORESITE>
</CLUSTER ID="NONSECURECLUSTER">
```
<HDFSSITE>hdfs-site.xml</HDFSSITE>
<MAPREDSITE>mapred-site.xml</MAPREDSITE>
<YARNSITE>yarn-site.xml</YARNSITE>
<DESCRIPTION>Details of the Non-Secure Cluster</DESCRIPTION>
<CREATEDBY>NA</CREATEDBY>
<CREATETIME>NA</CREATETIME>

Add additional CLUSTER tags to add more clusters.

3. Copy the required Third Party Jars from the CDH installation libraries into the following location $FIC_HOME/ext/lib:
   - avro-1.7.4.jar
   - commons-cli-1.2.jar
   - commons-httpclient-3.1.jar
   - hadoop-hdfs-2.0.0-cdh4.7.0.jar
   - jackson-core-asl-1.8.8.jar
   - jackson-mapper-asl-1.8.8.jar
   - protobuf-java-2.4.0a.jar
   - servlet-api.jar
   - htrace-core-3.0.4.jar

**NOTE:** Version of Jars depends on the CDH Version and the Drivers used. For CDH 5.8.4 version, additionally htrace-core-4-4.0.1-incubating.jar has to be copied.

Below jars are needed but will already be present in the $FIC_HOME/ext/lib folder as part of CDH Enablement.
   - commons-configuration-1.6.jar
   - commons-collections-3.2.2.jar
   - commons-io-2.4.jar
   - commons-logging-1.0.4.jar
   - hadoop-auth-2.0.0-cdh4.7.0.jar
   - hadoop-common-2.0.0-cdh4.7.0.jar
   - hadoop-core-2.0.0-mrl-cdh4.7.0.jar
   - libfb303-0.9.0.jar
   - libthrift-0.9.0-cdh4-1.jar
- slf4j-api-1.6.4.jar

**NOTE:** The version of jars to be copied will differ depending upon the version of CDH configured.

4. Copy core-site.xml, hdfs-site.xml, mapred-site.xml, hive-site.xml, and yarn-site.xml from the Hadoop Cluster to the path mentioned in the Clusters.XML file. Note that only Client Configuration Properties are required. If Cloudera Manager is used, the same can be downloaded directly which will contain only the client properties.

**NOTE:** If proxy user is enabled and the Job is submitted by the same, the user should be created in every node of the Hadoop Cluster.

For more information, refer http://www.cloudera.com/content/cloudera/en/documentation/cdh4/v4-3-0/CDH4-Security-Guide/cdh4sg_topic_3_16.html

1.1.3.3 **Logger Types Seeded Table**

Standard logger types and their details are seeded in AAI_DMT_WEBLOG_TYPES table. By default, details for Apache and Microsoft-IIS logs are pre-populated. You can add other logger methods to the table to make them visible in the UI.

Below are the sample entries for the logger types.

<table>
<thead>
<tr>
<th>V_LOG_TYPE</th>
<th>V_LOG_COLUMNS</th>
<th>V_LOG_COL_DATATYPE</th>
<th>V_LOG_REGEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apache Sample</td>
<td>IP,Identity,User,Time,URL,Status,Size,Referer,Agent,Bytes</td>
<td>string,string,string,string,string,</td>
<td>((^ <em>) (^ <em>) (^ <em>) (-[[]^]]) (^ ])^[[]^]] (0-9</em>) (0-9</em>) (^ ])^[[]^]] (0-9</em>)</td>
</tr>
<tr>
<td>Microsoft-IIS</td>
<td>IP,User,Date,Time,Service,ServerName,ServerIP,TimeTaken,ClientBytesSent,</td>
<td>string,string,string,string,string,</td>
<td>DELIMITED~,</td>
</tr>
<tr>
<td>Sample</td>
<td>ServerBytesSent,ServiceStatus,WindowStatus,RequestType,TargetOperation,</td>
<td>string,string,string,string,string,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parameters</td>
<td>string,string,string,string,string,</td>
<td></td>
</tr>
</tbody>
</table>

To add a new logger type, add a new entry in the AAI_DMT_WEBLOG_TYPES table as explained:

- **V_LOG_TYPE** - Enter a name for the custom logger type. The values in this column are displayed as **Logger Type** drop-down list in the Preview pane of Source Model Generation window for WebLogs. **V_LOG_COLUMNS** - Enter appropriate column names separated by commas, which will be displayed in the Data Model Preview pane as **Column Names**.
V_LOG_COL_DATATYPE - Enter the data type for the corresponding column names entered in the V_LOG_COLUMNS, separated by commas. The supported Data Types are String and Int. The values in this column are displayed as the Data Type for the corresponding Column Names. If you do not specify Data Type for a column, Integer is selected by default. User can change it to String if required from the Source Model Generation window.

V_LOG_REGEX - Enter the Regular expression for each Column Name separated by a space. This will be displayed as Input Regex in the Source Model Generation window.

1.2 Data File Mapping Configurations

This is applicable from OFSAAI version 8.0.2.0.0.

This section talks about the configurations required for data movement involving Hive based source or target (F2H).

- HDFS-File to HDFS target
- Local Flat File to HDFS Target

1.2.1 Flat File Present in the Local File System (LFS)

The following property needs to be set in the ETLLoader.properties file which is present in $FICDB_HOME/conf:

- ISHIVELOCAL
  - YES - If Hive and OFSAA are installed on the same Virtual Machine (VM)
  - NO - If Hive and OFSAA are on different VM's

- HIVESERVER_NAME – IP address of the Hive Server

- HIVESERVE_PORT – FTP Port of the Hive Server

- HIVESERVER_FTPDRIVE – The shared path on the Hive VM

- HIVESERVER_FTPSHARENAME – Used only in windows, this is not supported now.

- HIVESERVER_FTP_USERID – FTP User ID

- HIVESERVER_FTP_PASSWORD – Password required for FTP connection

NOTE: Set the properties depending on whether the HIVE server and OFSAA are running on the same Virtual Machine (VM).
1.3 **Oracle® Loader for Hadoop (OLH) Configuration**

Oracle® Loader for Hadoop (OLH) is a Map Reduce utility to optimize data loading from Hadoop into Oracle Database. OFSAAI supports OLH as one of the modes for loading data into RDBMS Tables from Hive Tables.

### 1.3.1 Prerequisite

- CDH4.7 or CDH 5.2.1 should have been installed.
- Apache Hive 0.10.0 should have been installed.
- Hadoop Client (version compatible with the Hadoop Cluster) should have been installed on OFSAAI VM. (If OFSAAI and Hadoop are not on the same VM)
- Oracle Loader for Hadoop v 3.0 should have been installed on the OFSAAI VM.

### 1.3.2 Steps for Configuring OLH

**Step 1 : Installing OLH in the OFSAAI VM**

1. Unzip the OLH Package downloaded from the Oracle site in the VM where OFSSAI is installed.
   
   Location: Inside the Home Directory of the user where OFSAAI is installed.

2. Set OLH_HOME environment variable in the .profile.
   
   OLH_HOME contains the directories such as bin, examples, jlib and lib.

**Step 2 : Configuring the Properties Files**

1. Set the following property in the ETLLoader.properties file which is present in the location $FIC_DB_HOME/conf/:
   
   ```
   <PROPERTY ID="H2TMode" VALUE="OLH"/>
   ```

2. Set the following property in the jdbcOutput.xml file, which is present in the location $FIC_DB_HOME/conf/:
   
   ```
   <property>
   <name>oracle.hadoop.loader.connection.defaultExecuteBatch</name>
   <value>100</value>
   </property>
   ```

**STEP 3: Copy Configuration xmls from Hadoop Cluster**

1. Copy the following files from the Hadoop Cluster to $FIC_HOME/conf folder.
   
   - core-site.xml
   - hdfs-site.xml
- mapred-site.xml
- hive-site.xml
- yarn-site.xml

**NOTE:** Only Client Configuration Properties are required. If Cloudera Manager is used, the same can be downloaded directly which will contain only the client properties.

2. Modify the following property in `mapred-site.xml` in `$FIC_HOME/conf`:

```xml
<property>
  <name>mapred.child.java.opts</name>
  <value>-Xmx4096m</value>
</property>
```

**NOTE:** If proxy user is enabled and the Job is submitted by the same, the user should be created in every node of the Hadoop Cluster. For more information, see CDH4 Security Guide.

The version of jars to be copied will differ depending upon the version of CDH configured.

**STEP 4: Copy the required Jars**

- If OFSSAI is using Apache driver

  Usually jars such as `hive-exec-*-jar`, `libfb303-*-jar`, `hive-service-*-jar`, `hive-metastore-*-jar` are present in the `ext/lib` folder and are added to the Classpath. In case of any `ClassNotFoundException`, do the following steps:

  - Edit the `oracle.hadoop.loader.libjars` property present in `OLH_HOME/doc/oraloader-conf.xml` to accommodate the newly added jars. That is, `$FIC_HOME/ext/lib/ hive-exec-*-jar` (repeat for each of the mentioned jars)
  - Copy the entire property to `$FIC_DB_HOME/conf/dtextInput.xml`

- If OFSSAI is using Cloudera Connectors

  OLH is not qualified on Cloudera Connectors. Perform the following workaround:

  - Copy the following jars (Apache Drivers) to `$OLH_HOME/jlib`:
    
    ```
    hive-exec-*-jar, libfb303-*-jar, hive-service-*-jar, hive-metastore-*-jar
    ```

    Usually these jars are added to the Classpath. In case of any `ClassNotFoundException`, do the following steps:
1.3.3 Limitations

- Mapping a Hive column with Data Type STRING (even if it contains a single character) to a RDBMS Column with Data Type CHAR is not allowed. The Destination Column should be at least VARCHAR2 (1) or the Source Column Data Type should be CHAR.

- Joins/Filters/Expressions are not supported in OLH.

- OLH is not supported with Cloudera Connectors. As a workaround, perform Step 4.

1.4 Sqoop Configuration

Sqoop installation through Cloudera® Manager allows the user to load Data into Hive Tables from RDBMS Tables.

1.4.1 Prerequisites

- CDH4 or Apache Hadoop 2.2.0.

- Sqoop 1 & Sqoop 2 (installed with CDH)

- Create a Folder /<Sqoop Working Directory> in HDFS and provide 0777 permissions for the same.

- Sqoop Server should be up and running.

- Make sure that an appropriate jdbc driver is present in Sqoop library path on the cluster.

1.4.2 Steps for Configuring Sqoop

1.4.2.1 Sqoop 1 Cluster Mode

```xml
<PROPERTY ID="H2TMode" VALUE="SQOOP"/>
<PROPERTY ID="T2HMode" VALUE="SQOOP"/>
<PROPERTY ID="SQOOP_VERSION" VALUE="1.44SSH"/>
<PROPERTY ID="SQOOPSERVER_NAME" VALUE=""/>
<PROPERTY ID="SQOOPSERVER_SSH_PORT" VALUE="<SSH Port of the SQOOP Server>"/>
```
PROPERTY ID="SQOOPSERVER_SSH_USERID" VALUE="<SSH User ID of the SQOOP Server>"/
PROPERTY ID="SQOOPSERVER_SSH_PASSWORD" VALUE="<SSH Password of the Sqoop Server>"/
PROPERTY ID="SQOOPSERVER_SSH_ALIAS" VALUE="<Create Auth Alias.>"/

Perform the following steps to create Auth Alias:

a) Login as SYSADMN and navigate to the Database Details window.
b) Click Add (+ symbol) to view the Database Details window.
c) Do not enter Name or Schema name. Select ORACLE for DB Type and DEFAULT for Auth Type.
d) Click Add button for Alias Name.
e) Enter an Auth Alias, enter a valid SSH username in User/Principal Name and enter SSH password in Auth String.
f) Click Save to create and register a new Auth Alias in OFSAA.
g) Close the Database Details window without saving anything else.

NOTE: The SQOOPSERVER_SSH_ALIAS is introduced in 8.0.5.2.0 and 8.0.4.3.0. You need to manually add the property tag SQOOPSERVER_SSH_ALIAS as given above. It should be used instead of SQOOPSERVER_SSH_USERID and SQOOPSERVER_SSH_PASSWORD properties. Restart of OFSAA services is not required after this change in ETLLoader.properties file.

If the SQOOPSERVER_SSH_ALIAS is not set or an invalid value is provided and SQOOPSERVER_SSH_USERID and SQOOPSERVER_SSH_PASSWORD properties have valid values, Sqoop execution will be successful.

PROPERTY ID="SQOOP_PARAMS" VALUE="< any global sqoop configuration to passed for sqoop execution. E.g. --direct --compress. >"/
PROPERTY ID="SQOOP_USE_STAGING" VALUE="<Indicates if the sqoop export creates a temporary staging table before inserting into the destination table. Value can be YES or NO.>"/

NOTE: SQOOP_PARAMS is supported for H2T/T2H only in SQOOP 1.44SSH mode.
SQOOP_USE_STAGING is supported only for H2T in SQOOP 1.44SSH mode.

In case, the cluster is Kerberos secured, add an additional property,

PROPERTY ID="SQOOPSERVER_SSH_KINIT_COMMAND" VALUE="<Command to be executed on the shell for Kerberos authentication. For example, kinit -kt /home/ofsaa.keytab ofsaa@DEV.ORACLE.COM>"

All the above properties, except SQOOP_USE_STAGING, are valid for both Sqoop import and export. SQOOP_USE_STAGING is applicable only for Sqoop export.
NOTE: Copying of any Sqoop jars and Hadoop/Hive configuration XMLs to OFSAAI is not required in cluster mode.

1.4.2.2 Sqoop 1 Client Mode

STEP 1: Configuring the Properties File:
Set the following property in the ETLLoader.properties file which is present in the location $FIC_DB_HOME/conf/:

- <PROPERTY ID="T2HMode" VALUE="SQOOP"/>
- <PROPERTY ID="H2TMode" VALUE="SQOOP"/>
- <PROPERTY ID="SQOOPURL" VALUE="<Ip>:<Port>"/>
- <PROPERTY ID="SQOOP_VERSION" VALUE="1.44"/>
- <PROPERTY ID="SQOOP_WORKING_DIR" VALUE="<Path of a working directory in HDFS, with 777 permissions for ofsaa>"

STEP 2: Copy Third Party Jars
Copy the following Third Party Jars from the CDH installation libraries into the $FIC_HOME/ext/lib folder:

- avro-1.7.4.jar
- commons-cli-1.2.jar
- commons-httpclient-3.1.jar
- hadoop-hdfs-2.0.0-cdh4.7.0.jar
- jackson-core-asl-1.8.8.jar
- jackson-mapper-asl-1.8.8.jar
- protobuf-java-2.4.0a.jar
- servlet-api.jar
- sqoop-test-1.4.3-cdh4.7.0.jar
- sqoop-1.4.3-cdh4.7.0.jar
- htrace-core-3.0.4.jar

NOTE: Version of Jars depends on the CDH Version and the Drivers used. For CDH 5.8.4 version, you should copy htrace-core4-4.0.1-incubating.jar instead of htrace-core-3.0.4.jar.

Following jars are needed, but may be present in the $FIC_HOME/ext/lib folder as part of CDH Enablement:

- commons-configuration-1.6.jar
• commons-collections-3.2.2.jar
• commons-io-2.4.jar
• commons-logging-1.0.4.jar
• hadoop-auth-2.0.0-cdh4.7.0.jar
• hadoop-common-2.0.0-cdh4.7.0.jar
• hadoop-core-2.0.0-mrl-cdh4.7.0.jar
• libfb303-0.9.0.jar
• libthrift-0.9.0-cdh4-1.jar
• slf4j-api-1.6.4.jar

NOTE: The version of jars to be copied will differ depending upon the version of CDH configured.

STEP 3: Copy Configuration XMLs from Hadoop Cluster

Copy core-site.xml, hdfs-site.xml, mapred-site.xml, hive-site.xml, and yarn-site.xml from the Hadoop Cluster to $FIC_HOME/conf folder. Note that only Client Configuration Properties are required.

If Cloudera Manager is used, the same can be downloaded directly which will contain only the client properties.

NOTE: If proxy user is enabled and the Job is submitted by the same, the user should be created in every node of the Hadoop Cluster.

1.4.2.3 Sqoop 2

STEP 1: Configuring the Properties File:

Set the following property in the ETLLoader.properties file which is present in the location $FIC_DB_HOME/conf/:

<PROPERTY ID="T2HMode" VALUE="SQOOP"/>
<PROPERTY ID="SQOOPURL" VALUE="<Ip>:<Port>"/>
<PROPERTY ID="SQOOP_VERSION" VALUE="1.99"/>
<PROPERTY ID="SQOOP_WORKING_DIR" VALUE="<Path of a working directory in HDFS, with 777 permissions for ofsaa>"

STEP 2: Copy Third Party Jars

Copy the following Third Party Jars from the CDH installation libraries into the $FIC_HOME/ext/lib folder:

• avro-1.7.4.jar
- commons-cli-1.2.jar
- commons-httpclient-3.1.jar
- hadoop-hdfs-2.0.0-cdh4.7.0.jar
- jackson-core-asl-1.8.8.jar
- jackson-mapper-asl-1.8.8.jar
- protobuf-java-2.4.0a.jar
- servlet-api.jar
- sqoop-test-1.4.3-cdh4.7.0.jar
- sqoop-1.4.3-cdh4.7.0.jar
- htrace-core-3.0.4.jar

**NOTE:** Version of Jars depends on the CDH Version and the Drivers used.
For CDH 5.8.4 version, you should copy `htrace-core4-4.0.1-incubating.jar` instead of `htrace-core-3.0.4.jar`.

Following jars are needed, but may be present in the `$FIC_HOME/ext/lib` folder as part of CDH Enablement.

- commons-configuration-1.6.jar
- commons-collections-3.2.2.jar
- commons-io-2.4.jar
- commons-logging-1.0.4.jar
- hadoop-auth-2.0.0-cdh4.7.0.jar
- hadoop-common-2.0.0-cdh4.7.0.jar
- hadoop-core-2.0.0-mr1-cdh4.7.0.jar
- libfb303-0.9.0.jar
- libthrift-0.9.0-cdh4.1.jar
- slf4j-api-1.6.4.jar

**NOTE:** The version of jars to be copied will differ depending upon the version of CDH configured.

### 1.4.3 Limitations:

Sqoop2 does not support Kerberized Clusters.
1.5 SCD Execution on Hive Information Domain

This is applicable from OFSAI 8.0.2.0.0 version.

You need to consider the following constraints and assumptions for Slow Changing Dimension (SCD) execution on Hive Infodom:

1.5.1 Prerequisites

- SCD on Hive Information Domain requires table to be present in the Datadom of Hive Information Domain. Execute the following create table script on Datadom of Hive Information Domain:

  ```
  CREATE TABLE DIM_SCD_SEEDED
  (
  SEEDED_SKEY BIGINT,
  SEEDED_CODE String,
  SEEDED_DESC String
  )
  ROW FORMAT DELIMITED FIELDS TERMINATED BY ',' STORED AS INPUTFORMAT
  'org.apache.hadoop.mapred.TextInputFormat' OUTPUTFORMAT
  'org.apache.hadoop.hive.ql.io.HiveIgnoreKeyTextOutputFormat';
  ```

- DIM_SCD_SEEDED table columns should be loaded with data values as mentioned in the following table:

<table>
<thead>
<tr>
<th>SEEDED_SKEY</th>
<th>SEEDED_CODE</th>
<th>SEEDED_DESC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>MSG</td>
<td>Missing</td>
</tr>
<tr>
<td>-1</td>
<td>OTH</td>
<td>Other</td>
</tr>
</tbody>
</table>

1.5.2 Constraints

1. Default Columns with Surrogate Key (SK) as 0 and -1 will be inserted into destination (DIM) table, only if data is present in the table DIM_SCD_SEEDED.

2. PRTY_LOOKUP_REQD_FLG should always be set to 'N'.

3. The data type of SK column in destination (DIM) table should always be INT/BIGINT and it will be generated using the following logic:

   ```
   MAX_SKEY + row_number(n) where (n) is rowid.
   ```

4. Query to fetch Maximum SKEY value will give performance improvement, if indexing is done on DIM table.

5. Stage Column where Column Type = ‘ED’ should be updated with Date in Hive Format – ‘yyyy-mm-dd’.
Apart from this only ‘dd-Mon-yyyy’ format is supported to keep the current seeding intact. Final data in Date column will always be inserted in ‘yyyy-mm-dd’ format.

6. Columns which are not part of STG and DIM mapping will be passed as “” (empty strings).

7. Columns with column type STRING/VARCHAR/CHAR will be inserted as empty strings and all other column types will be inserted as NULL.

1.5.3 Assumptions:

1. Primary Key (PK) and Surrogate Key (SK) Columns are mandatory to map, else SCD will fail.

2. Since Hive does not have PK functionality, you should map an ID Column as PK, on the basis of which STG and DIM tables will be matched for TYPE1 and TYPE2.

3. SK column in destination (DIM) table will always be of data type INT/BIGINT.
2 Dimenion Management Module Configurations

This chapter details about the configurations required in the Dimension Management Module. It consists of the following sections:

- Configurations to use Alphanumeric and Numeric Codes for Dimension Members
- General Configurations for Dimension Management Module

2.1 Configurations to use Alphanumeric and Numeric Codes for Dimension Members

This section explains the configuration required if you want to enable alphanumeric codes for Dimension Members in the Dimension Management module. This feature can be used if you want to use dimensions that are available in external source systems, for which the members may be maintained as a Number or alpha numeric text. For example, for dimensions like currency, alphanumeric codes can be used to denote the currency codes such as INR, USD, and so on, along with the exact amount.

OFSAAI supports both numeric and alphanumeric codes for Members of a Dimension. Both dimension types require a numeric member code. An alphanumeric dimension will additionally store an alphanumeric member code. After performing the Dimension configuration explained in this section, the Alphanumeric Code field in the Member Definition (New Mode) window becomes editable. For more information, see Adding Member Definition section in OFS Analytical Applications Infrastructure User Guide.

The REV_DIMENSIONS_B table stores the required dimension metadata including dimension member data type and the member column names for dimension member tables where the numeric and alphanumeric codes are stored.

In the REV_DIMENSIONS_B table:

- The column MEMBER_DATA_TYPE_CODE with value 'NUMBER' identifies a dimension as numeric and value 'VARCHAR2' identifies a dimension as alphanumeric.
- MEMBER_CODE_COLUMN specifies the member table column which holds the alphanumeric member code. This is optional for numeric dimensions, where alphanumeric and numeric member codes would be equivalent.
- MEMBER_COL specifies the numeric member code column.

**NOTE:** Any change done in REV_DIMENSIONS_B table requires restart of the web server because the dimension definitions data in cache memory has to be refreshed.

A new installation by default will have the seeded key dimensions configured as numeric, although those dimension member tables include a column for alphanumeric member codes. You
can configure any of these dimensions as alphanumeric. For more information, see Configure Alphanumeric Dimensions.

You might also need to run some SQL updates for numeric dimensions. For more information, see Configure Numeric Dimensions.

2.1.1 Configure Alphanumeric Dimensions

To configure a numeric dimension as alphanumeric and to remove the optional code attribute from prior releases you have to back up the affected dimension tables (like REV_DIMENSIONS_B, REV_DIM_ATTRIBUTES_B, REV_DIM_ATTRIBUTES_TL, and DIM_<DIMENSION>_ATTR) and perform the following steps on each applicable dimension.

1. Set the member type as alphanumeric (VARCHAR2) in REV_DIMENSIONS_B and identify the member table’s alphanumeric code column name if it is not populated already using the following code:

   ```sql
   Update REV_DIMENSIONS_B SET Member_Data_Type_Code = 'VARCHAR2', Member_Code_Column = '{Alphanumeric Column Name}' Where Dimension_ID = {Dimension ID}
   Example:
   Update REV_DIMENSIONS_B SET Member_Data_Type_Code = 'VARCHAR2', Member_Code_Column = 'TP_PRODUCT_CODE' Where Dimension_ID = 5;
   ```

   **NOTE:** In OFSAAI 8.0, the seeded key dimensions have already populated MEMBER_CODE_COLUMN.

2. In case, any rows in the Dimension member table contain a null alphanumeric code, you can populate the Numeric Member ID itself as alphanumeric member code as illustrated in the following example. This is to ensure that there is no null value for the Alphanumeric Member Code:

   ```sql
   Update DIM_GENERAL_LEDGER_B set GL_Account_Code = GL_Account_ID Where GL_Account_Code is null;
   Commit;
   ```
2.1.2 Configure Numeric Dimensions

If REV_DIMENSIONS_B.Member_Code_Column is populated for a dimension, any UI which displays an alphanumeric code will look in the specified column for the member's alphanumeric code. If REV_DIMENSIONS_B.Member_Code_Column is null, the UI will assume no alphanumeric code column exists in the member table and will display the alphanumeric code with the same value as the numeric code. Therefore, for numeric dimensions, you may want to update the metadata.

There are two options available to configure Numeric dimensions.

- **Option 1:** When the dimension does not have <DIM>_CODE column in <DIM>_B table
- **Option 2:** When the dimension have <DIM>_CODE column in <DIM>_B table

**NOTE:** By default, no configuration changes are required in Rev_Dimensions_B for Numeric dimension, since the REV_DIMENSIONS_B.MEMBER_CODE_COLUMN column has value either <Dim>_Code or null depending on the availability of <Dim>_Code column.

**Option 1: When the dimension does not have <DIM>_CODE column in <DIM>_B table.**

In this case, the alphanumeric and numeric code value are stored in the same <DIM>_ID column.

- Back up the table REV_DIMENSIONS_B, if you have not done it already.
- Clear the Member Code Column entries for applicable dimensions.

**Example:**

- For specific numeric dimensions, use the following code:

  ```sql
  Update REV_DIMENSIONS_B Set Member_Code_Column = null Where
  Dimension_ID in([values]);
  Commit;
  ```

- For all editable numeric dimensions, use the following code:

  ```sql
  Update REV_DIMENSIONS_B Set Member_Code_Column = null Where
  Member_Data_Type_Code = 'NUMBER' and DIMENSION_EDITABLE_FLAG = 'Y';
  Commit;
  ```

**NOTE:** If the dimension has <Dim>_Code column and **Option 1** is used (that is, the REV_DIMENSIONS_B.MEMBER_CODE_COLUMN is set to null), this will cause the dimension loaders and seeded T2T extracts to fail.

**Option 2: When the dimension have <DIM>_CODE column in <DIM>_B table.**

In this case, the alphanumeric and numeric code value are stored separately in <DIM>_CODE and <DIM>_ID column (though both the values are same).
- Back up the table REV_DIMENSIONS_B, if you have not done it already.
- Populate the Member Code Column entries for applicable dimensions.

**Example:**

- **For specific numeric dimensions:**

  ```sql
  Update REV_DIMENSIONS_B Set Member_Code_Column = <dim>_code 
  Where Dimension_ID in([values]);
  Commit;
  ```

- **For all editable numeric dimensions:**

  ```sql
  Update REV_DIMENSIONS_B Set Member_Code_Column = <dim>_code 
  Where Member_Data_Type_Code = 'NUMBER' and DIMENSION_EDITABLE_FLAG = 'Y';
  Commit;
  ```

### 2.1.3 Configure Alphanumeric Code in Simple Dimension Tables

For some editable seeded and user-defined simple dimensions, the alphanumeric code column currently might not be present in the data model. To add this column to a user-defined simple dimension table, you can use Model Upload. You will also need to update the REV_DIMENSIONS_B table as indicated in [Dimension Configuration](#) section, to configure alphanumeric properties.

**NOTE:** You should not modify the structure of any seeded simple dimensions.

### 2.1.4 Create Index on Code Column

You need to create a unique index on the alphanumeric code column if an index does not exist. While creating index, you need to ensure that the index uniqueness should be case insensitive.

**Example:**

```sql
Create unique index IDX1_DIM PRODUCTS_B on DIM PRODUCTS_B Upper(PRODUCT_CODE)
Commit;
```
2.2 General Configurations for Dimension Management Module

These configuration changes are applicable when Dimension Management features provided in OFSAAI are used. You can open AMHMConfig.properties file present in the $FIC_WEB_HOME/webroot/conf directory to set the properties for the following:

- Member Deletion
- Attribute Default Date Format
- Members Reverse Population
- Hierarchy Reverse Population
- Maximum levels allowed in Hierarchies
- Node Limit for a Hierarchy Tree

Configuration for Dimension and Hierarchy Management has to be done only after the Application Pack installation is done. The properties specific to Information Domain are:

- $INFODOM$=<Name of the Information Domain>
- $DIMENSION_ID$=<Dimension ID for which the property to be set>

2.2.1.1 Configure Member Deletion

This property should be set to allow the user to delete the Members for the Dimension.

<table>
<thead>
<tr>
<th>Value</th>
<th>Code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td># Member Deletion Configuration - VALUE- Y/N</td>
<td>MEMBER_DEL-$INFODOM$-$DIMENSION_ID$=VALUE</td>
<td>MEMBER_DEL-ORAFUSION-1=Y</td>
</tr>
</tbody>
</table>

2.2.1.2 Configure Attribute Default Date Format

This property should be set to display the Default Date Format for Date type Attribute in Attributes window.

<table>
<thead>
<tr>
<th>Value</th>
<th>Code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td># Attribute Default Date Format - DB_DATE_FORMAT:DD-MON-YYYY</td>
<td>ATTR_DEF_DATE_FORMAT-$INFODOM$=$DB_DATE_FORMAT$</td>
<td>ATTR_DEF_DATE_FORMAT-ORAFUSION=DD/MON/YYYY</td>
</tr>
</tbody>
</table>
2.2.1.3 Configure Members Reverse Population

This property should be set for reverse population of Members for the Dimensions in required Information Domains.

<table>
<thead>
<tr>
<th>Value</th>
<th>Code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td># Members Reverse population - VALUE - Y/N</td>
<td>MEMBER_REVERSE_POP-$INFODOM$-</td>
<td>MEMBER_REVERSE_POP-ORAFUSION-1=Y</td>
</tr>
<tr>
<td></td>
<td>$DIMENSION_ID$=$VALUE$</td>
<td></td>
</tr>
</tbody>
</table>

2.2.1.4 Configure Hierarchy Reverse Population

This property should be set for reverse population of Hierarchies for the Dimensions in required Information Domains.

<table>
<thead>
<tr>
<th>Value</th>
<th>Code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>#Hierarchy Reverse population - VALUE - Y/N</td>
<td>HIERARCHY_REVERSE_POP-$INFODOM$-</td>
<td>HIERARCHY_REVERSE_POP-ORAFUSION-1=Y</td>
</tr>
<tr>
<td></td>
<td>$DIMENSION_ID$=$VALUE$</td>
<td></td>
</tr>
</tbody>
</table>

2.2.1.5 Configure Maximum Levels allowed in Hierarchies

This property is required to set the maximum levels allowed to build the Hierarchies tree structure.

<table>
<thead>
<tr>
<th>Value</th>
<th>Code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>#HierarchyMaximum level allowed for the hierarchy in particular Information Domain - VALUE - Integer number</td>
<td>MAX_DEPTH-$INFODOM$=$VALUE$</td>
<td>MAX_DEPTH-FUSION=15</td>
</tr>
</tbody>
</table>

The Maximum Levels allowed in the hierarchies is less than or equal to 15. If the Hierarchy Reverse population is set as "Y" and more than 15 levels are created. Then an alert is displayed as "The number of levels exceeding the limit".

If the maximum level allowed is set as more than 15 and hierarchy reverse population is set as "Y" then an error is displayed as "Error occurred in Reverse populating the hierarchy".

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2.2.1.6 Configure Node Limit for a Hierarchy Tree

This property is required to display the Hierarchy as a small or a large hierarchy. If the tree node limit exceeds the set limit, the Hierarchies are treated as large Hierarchy.

<table>
<thead>
<tr>
<th>Value</th>
<th>Code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>#Tree node limit for the hierarchy - Values is Integer number</td>
<td>TREE_NODE_LIMIT=$VALUE$</td>
<td>TREE_NODE_LIMIT=30</td>
</tr>
</tbody>
</table>
3 Rule Run Framework Configurations

This chapter details about the configurations required in the Rule Run Framework module. It consists of the following sections:

- Performance Optimization Setting for RRF Module
- Component Registration in RRF
- Configure Forms XML to Execute Server Side Rule

3.1 Performance Optimization Setting for RRF Module

*This is an enhancement introduced in 8.0.1.0.0 release.*

The Process engine and Rule engine has been enhanced to take advantage of ORACLE's fast insertion into table and partition swap mechanism.

Based on the new enhancement, Rule and Process Execution supports two additional execution modes (apart from the Merge execution mode where Oracle MERGE query is used). They are:

- Select (select insert query is used) - In this execution mode, all records are moved to a temporary table with the updated records and then moved back to the original table. This improves the performance since INSERT is faster than MERGE. In this execution mode, the actual updated record count cannot be known since all records are moved back from the temporary table to the original.

- Partition (partition swap query is used) - This is somewhat similar to Select execution mode. This also moves all the records to a temporary table with the updated records. However, while moving back, the whole temporary table will be moved as a partition of the original table using the Oracle Partition Swap mechanism. In this mode the record count cannot be known as you are swapping the partitions.

The execution mode can be set in the QRY_OPT_EXEC_MODE parameter of the CONFIGURATION table as well as V_EXECUTION_MODE parameter in the AAI_OBJ_QUERY_OPTIMIZATION table. The parameter value can be set as SELECT, MERGE or PARTITION. The optimization table is newly introduced. Both the tables reside in the Configuration schema.

The Configuration table setting is for global level (applies to all rules and processes execution) and the Optimization setting is for rule/process level.

**NOTE:** The Optimization table setting has preference over the Configuration table setting. That is, if V_EXECUTION_MODE in AAI_OBJ_QUERY_OPTIMIZATION table is set, that will be considered. If it is not set, then the execution mode will be as per the value given in the QRY_OPT_EXEC_MODE parameter in the Configuration table. By default, its value will be MERGE.
The columns and the values to be given in the AAI_OBJ_QUERY_OPTIMIZATION table are indicated as follows:

<table>
<thead>
<tr>
<th>Column Name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_OBJ_CODE</td>
<td>Rule/Process/Run Code</td>
<td>Rule(PR2_RULE_B.V_RULE_NAME) Process(PR2_PROCESS_B.V_PROCESS_NAME) Run(PR2_RUN_B.V_RUN_NAME)</td>
</tr>
<tr>
<td>V_INFODOM_CODE</td>
<td>Infodom Code</td>
<td>Infodom</td>
</tr>
<tr>
<td>V_OBJ_TYPE</td>
<td>Rule/Process/Run Type</td>
<td>Rule(RL) Process(PT) Run(RN)</td>
</tr>
<tr>
<td>V_EXECUTION_MODE</td>
<td>Type of query used while executing.</td>
<td>MERGE- Merge statement will be used SELECT- Select Insert will be used PARTITION- Partition swap will be used</td>
</tr>
<tr>
<td>F_USE_PARTITION</td>
<td>If partition is used as a filter</td>
<td>Y/N</td>
</tr>
<tr>
<td>F_USE_ROWID</td>
<td>If ROWID is used other than primary key in MERGE. This is used only for MERGE query execution.</td>
<td>Y/N</td>
</tr>
<tr>
<td>V_MERGE_HINT</td>
<td>Used for MERGE or INSERT hint.</td>
<td></td>
</tr>
<tr>
<td>V_SELECT_HINT</td>
<td>Used for SELECT hint</td>
<td></td>
</tr>
<tr>
<td>V_PRE_SCRIPT</td>
<td>Used for alter statements executed before rule execution</td>
<td></td>
</tr>
<tr>
<td>V_POST_SCRIPT</td>
<td>Used for alter statements executed after rule execution.</td>
<td></td>
</tr>
</tbody>
</table>
Behavior of Execution Modes

Merge, Select and Partition execution modes are supported. If any value is there in the Optimization table, then the execution mode set in the Configuration table will be ignored and it follows a waterfall model as explained:

For Rule Execution:

With Rule Code - checks if rule level execution mode is set. If it is not set, it checks for the next level.

With Process Code - checks if process level execution mode is set. If it is not set, it checks for the next level.

With Run Code - checks if run level execution mode is set. If it is not set, it checks for the next level, that is, QRY_OPT_EXEC_MODE parameter in the Configuration table.

For Process Execution:

With Process Code (Process Execution) - checks if process level execution mode is set. If it is not set, it checks for the next level.

With Run Code - checks if run level execution mode is set. If it is not set, it checks for the next level, that is, QRY_OPT_EXEC_MODE parameter in the Configuration table.

Consider an example where you have a Run definition (say Run1) with two rules (Rule1 and Rule2). For Rule1, the execution mode is set as SELECT and Rule2, it is not set. For Run1, the execution mode is set as PARTITION. In this case, Rule1 will be executed using Select query (as it is set in rule level) and Rule 2 will be executed using PARTITION query (as it is set in the Run level).

Use ROWID

If this is set to Y, ROWID will also be used along with Primary Key in MERGE query. This entry should be made for MERGE execution mode only. This also follows a waterfall model same like execution mode.

- If Use ROWID is set (as Y/N) in the Optimization table, it will take preference over the Configuration table entry.

- If Use ROWID is set as N in Optimization table and
  - It is set to Y in Configuration table, for all the rules ROWID will be used, irrespective of what is set in rule level.
  - It is set to N in Configuration table, then it will check for rule level setting and behave accordingly.

- If Use ROWID is left blank in the Optimization table, it will be considered as N.
**Use PARTITION**

This has been newly introduced. If a table used in a Rule has partition and is registered with OFSAAI Object Registration, then the partition columns will be added as a filter to all the type of rule queries (MERGE/SELECT/PARTITION); provided the USE PARTITION is set to Y. The behavior is same as that of Use ROWID.

**Hints/ Scripts**

You can enter Merge/ Select Hints and Post/ Pre Scripts in the Optimization table.

- If Hints/ Scripts are given in the Optimization table, those will be considered and it will not check in the Configuration table.
- If no entry is there in the Optimization table, it will check in the Configuration table and Rule level, and both will be considered during execution.

**3.2 Component Registration in RRF**

A Component in the context of OFSAAI is an entity which can be executed individually in Operations module to carry out some definite job for which it has been formed. Components within OFSAAI and its application need to be registered so that it is configurable for different installations with very minimal change.

The component registration process helps you to make the components of Process and Run module configurable inside Run Rule Framework (RRF). With component registration, components can be added, modified and deleted from RRF by doing very minimal changes to the system. For registering a component in RRF, the same should be present in ICC also.

Steps to Register Component

Registering Component has been divided into the following steps respectively:

- Component Detailed Implementation Class
- Deployment
- Entry to PR2_COMPONENT_MASTER Table

**3.2.1.1 Component Detailed Implementation Class**

The component implementation class has to be made for all the components which are inserted to the PR2_COMPONENT_MASTER table.

This class has to extend `com.ofs.aai.pr2.comp.PR2ComponentProps`, in turn to implement the following methods.

- getComponentDescription
- getPorbableParamValues (optional)
Implementation of interface com.ofs.aai.pr2.comp.PR2Component is optional. This interface will be implemented for only the components which can be directly used in a Process or Run. By implementing this class file following methods has to be overwritten.

- getSummay
- getCompDescMap
- fillTaskParameter
- getUsedTables

Each method takes current username and locale by default.

3.2.1.1.1 getComponentDescription

This method is used to get the description for all the components which are show in the component tree.

The Input Parameters are:

- String username
- String locale

Return is:

- String

It returns the localized string that has to be displayed for the component in the component tree.

3.2.1.1.2 getPordableParamValues

This method is used to identify if a parameter input should be a text box or a drop down field.

The Input Parameters are:

- String username
- String locale
- String infodom

Return is:

- Map<String, String>

It returns map containing entry key as the value which is shown to the user. The entry value is stored in database.
3.2.1.3  **getSummary**

This method is used to get all existing definition of the component type existing in the system.

The Input Parameters are:

- String `username`
- String `locale`
- String `infodom`

Return is:

- Hashtable<String, Vector<com.ofs.aai.pr2.comp.bean.TaskDefinition>>

It returns a Hashtable of <String, Vector<TaskDefinition>>. Where key denotes any specific sub-levels to be shown, which in turn contains a JSON object with `compName`, `compDesc`, `isDynamic`, `levelImg` properties for that sub-level and the Vector<TaskDefinition> contains all the data needed for using the component in a process or run.

3.2.1.4  **getCompDescMap**

This method is used to find all details about all specified definitions.

The Input Parameters are:

- String `username`
- String `locale`
- String `infodom`
- Map<String, String> `descMap`
- Boolean `allData`

Return is:

- Map<String, String>

Passed to the method in Map<String, String>, where key is the definition unique code. The value is a JSON object with `defnDesc` property with the value same as code. The same JSON has to be replaced with another JSON object containing `defnDesc`, `defnSubType`, `defnRef1Name`, `defnRef1Value`, `defnRef2Name`, `defnRef2Value`, `defnRef3Name`, `defnRef3Value`, `defnRef4Name`, `defnRef4Value`, `defnOptParamName` properties. The values populated for these properties as follows.
<table>
<thead>
<tr>
<th>Property Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>defnDesc</td>
<td>Populated with <code>&lt;name&gt;</code> for the <code>&lt;code&gt;</code> of the definition, if <code>&lt;name&gt;</code> exists. If <code>&lt;name&gt;</code> does not exist, then populated with <code>&lt;code&gt;</code>:SD. If definition does not exist, then populated with <code>&lt;code&gt;</code>:NA.</td>
</tr>
<tr>
<td>defnSubType</td>
<td>Sub-Type of the definition</td>
</tr>
<tr>
<td>defnRef1Name</td>
<td>Any references which can be used to identify the definition uniquely. There are four of them. So can be put as name and value pairs.</td>
</tr>
<tr>
<td>defnRef1Value</td>
<td></td>
</tr>
<tr>
<td>defnRef2Name</td>
<td></td>
</tr>
<tr>
<td>defnRef2Value</td>
<td></td>
</tr>
<tr>
<td>defnRef3Name</td>
<td></td>
</tr>
<tr>
<td>defnRef3Value</td>
<td></td>
</tr>
<tr>
<td>defnRef4Name</td>
<td></td>
</tr>
<tr>
<td>defnRef4Value</td>
<td></td>
</tr>
<tr>
<td>defnOptParamName</td>
<td>If any optional parameter exits and has to be taken as input from user, then only the name can be provided by this property.</td>
</tr>
</tbody>
</table>

There is another input called `allData`, which is a flag. If it is false then only `defnDesc` has to be passed and when true all the data has to be passed.

After putting the corresponding JSON Object to its `<code>` the same map is returned back.

### 3.2.1.5 fillTaskParameter

This method is used to get the parameters for the component which will be used to execute the component in Operations module.

The Input Parameters are:

- String `username`
- String `locale`
- String `infodom`
- String `uniqueName`
- String `subtype`
- Map<String, String> `allParams`

Return is:

- Map<String, String>
It takes `uniqueName` which is nothing but the `<code>` of the definition. It also takes `subType` of the definition and an allParams which is of data type `Map<String, String>`. This map contains all the probable parameters with it, where key is the parameter name and value is the parameter value. This map contains following params.

- Dollar variables ($RUNID, $RUNSK, $EXEID, $RUNEXECID, $MODE).
- All reference name and value.
- Optional parameter if any.

By using the map another `LinkedHashMap` will be created in this method with all the parameters needed to run the component in Operations module. All the parameter in this map has to be put in correct order. This `LinkedHashMap` will be returned back to the calling method.

### 3.2.1.6 `getUsedTables`

This method is used to get the dependent tables for specified definition of the component type.

The Input Parameters are:

- String `username`
- String `locale`
- String `infodom`
- String `uniqueName`
- `Map<String, String> allParams`

Return is:

- Set<String>

It takes `uniqueName` which is `<code>` of the definition and the same allParam map which is used in `fillTaskParameter` method. By using these inputs a Set<String> will be formed with all the dependant table data. This data is used to identify a Rule Filter / Process Filter can be applied to this component. This Set will be returned to the calling method.

### 3.2.1.2 Deployment

Below steps should be followed for deployment of the component.

1. Place all the image files to the folders mentioned in `V_TREE_IMAGE` column of `PR2_COMPONENT_MASTER` table, relative to `<PIC_WEB_HOME>/webroot` folder of the application.
2. The jar containing the component implementation classes has to be placed into `<PIC_WEB_HOME>/webroot/WEB-INF/lib` folder.
3. Rebuild and redeploy the application.
3.2.1.3  Entry to PR2_LOAD_COMPONENT_MASTER Table

PR2_LOAD_COMPONENT_MASTER is the table for storing all components which are used in RRF. You can enter either through backend which is explained here or through UI which is explained in the Component Registration section under RRF module in the OFS Analytical Applications Infrastructure User Guide.

An entry contains the following fields.

<table>
<thead>
<tr>
<th>Column Name</th>
<th>Type</th>
<th>Description</th>
<th>Null</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_PR2_COMPONENT_ID</td>
<td>VARCHAR2(30)</td>
<td>Represents component type in a Process or Run.</td>
<td>N</td>
</tr>
<tr>
<td>V_PR2_COMPONENT_PARENT_ID</td>
<td>VARCHAR2(30)</td>
<td>Indicates parentage which refers to V_PR2_COMPONENT_ID.</td>
<td>Y</td>
</tr>
<tr>
<td>V_COMPONENT_ID</td>
<td>VARCHAR2(30)</td>
<td>Existing ICC Component Id.</td>
<td>Y</td>
</tr>
<tr>
<td>V_PR2_COMPONENT_CLASS</td>
<td>VARCHAR2(100)</td>
<td>Fully qualified class path of the implementation class for this component.</td>
<td>N</td>
</tr>
<tr>
<td>V_TREE_IMAGE</td>
<td>VARCHAR2(100)</td>
<td>Name with relative path (with respect to web context) of the image which will be displayed in the component tree.</td>
<td>N</td>
</tr>
<tr>
<td>N_TREE_ORDER</td>
<td>NUMBER(9)</td>
<td>Display order of the component in the tree. The order is done upon the peers.</td>
<td>N</td>
</tr>
<tr>
<td>V_SEEDED_BY</td>
<td>VARCHAR2(8)</td>
<td>Differentiates user created and system created. The system created will have this field filled with an application name which cannot be edited from the front-end utility. The components created from front-end utility will not populate any value in this field which can be edited or deleted from front-end.</td>
<td>Y</td>
</tr>
<tr>
<td>V_CREATED_BY</td>
<td>VARCHAR2(30)</td>
<td>Stores the creator username.</td>
<td>N</td>
</tr>
<tr>
<td>D_CREATED_DATE</td>
<td>TIMESTAMP(6)</td>
<td>Stores created date and time.</td>
<td>N</td>
</tr>
</tbody>
</table>
### Example:

```
insert into PR2_COMPONENT_MASTER (V_PR2_COMPONENT_ID, V_PR2_COMPONENT_PARENT_ID, V_COMPONENT_ID, V_PR2_COMPONENT_CLASS, V_TREE_IMAGE, N_TREE_ORDER, V_SEEDED_BY, V_CREATED_BY)
values ('COMPTYP', null, 'Component Sample', 'com.sample.ComponentSample', 'sampleImages/sampleComp.gif', 0, 'SEEDEDBY', 'USER')
```

### 3.2.1.4 Sample Code

The `COMPONENTSAMPLE.txt` file contains the sample code of a created component.

![ComponentSample.txt](attachment://ComponentSample.txt)

### 3.3 Configure Forms XML to Execute Server Side Rule

You can execute database stored procedure and RRF Run using the Forms Framework server side rule configuration.

In order to execute RRF Run using Forms xml, the Form where server side rule is being executed with Type as "REVELEUS_RULE" you need to manually update the Type as "FIRERUN".

For example, the `RiskRecalculate.xml` having server side rule is used to re-calculate the risk. Here the Type needs to be changed as suggested below.

Replace the following attribute Type value:

```
    <RULESET ID="110" TYPE="REVELEUS_RULE">
```

With

```
    <RULESET ID="110" TYPE="FIRERUN">
```
4 Operations

This section is applicable only from OFS AAAI 8.0.5.0.0 version.

This chapter details about the configurations required in the Operations module.

4.1 Distributed Activation Manager (AM) Based Processing

Distributed AM based processing feature allows you to configure AM engines to run on multiple OFSAA nodes and then ICC Batch Tasks can be configured to get distributed across AM engines on multiple nodes to enable distributed/ parallel task executions. Distributed AM based processing is achieved in OFSAA by two mechanisms.

1. Configuring OFSAA processing tier through Load Balancer where Batch Tasks are distributed across multiple AM nodes

2. Manually configuring Batch tasks to run on specific AM nodes

For the both mentioned mechanisms, you should configure the Secondary AM server. For details, see the following section.

4.1.1 Setting Up of Secondary AM Server

Prerequisites

- For information on hardware and software requirements for setting up of secondary AM server, see Hardware and Software Requirements section in OFSAA Application Pack Installation Guide.

- Execute the following SQL script on Configuration Schema by replacing `<NEWAMIPADDRESS>` with the IP address/Hostname of the new AM node you want to set up and `<EXISTINGAMIPADDRESS>` with the IP address/IP address of the existing AM server:

```sql
INSERT INTO ficsysmaster

(Webipaddress, Appipaddress, DBIPADDRESS, ETLAPPHOME, NOOFCPUS, VMEMORY, PMEMORY, CACHE, NOOFTHREADS, IOTransfer, MAXTRANSERSEC, DISKSDBSTRIPING, DISKSFILESTRIPING, MAXFILESIZE, MAXFTPFILESIZE, MAXFILENAMELEN, OSDATABLOCKSIZE, DATASETTYPE, STAGEPATH, DBFTPSHARE, DBFTPUSERID, DBFTPPASSWD, DBFTPPORT, DBFTPDRIVE, APPFTPSHARE, APPFTPPORT, APPTUSERID, APPFTPSSWD, WEBFTPSHARE, WEBFTPPORT, WEBFTPUSERID, WEBFTPDRIVE, WEBFTPPASSWD, OSTYPE, SOCKETSERVERPORT, SEC_SHARE_NAME, SEC_USERID, SEC_PASSWD, F_ISPRIMARY, N_PRECEDENCE)

SELECT

Webipaddress, Appipaddress, '<NEWAMIPADDRESS>', ETLAPPHOME, NOOFCPUS, VMEMORY, PMEMORY, CACHE, NOOFTHREADS, IOTransfer, MAXTRANSERSEC, DISKSDBSTRIPING, DISKSFILESTRIPING, MAXFILESIZE, MAXFTPFILESIZE, MAXFILENAMELEN, OSDATABLOCKSIZE, DATASETTYPE, STAGEPATH, DBFTPSHARE, DBFTPUSERID, DBFTPPASSWD, DBFTPPORT, DBFTPDRIVE, APPFTPSHARE, APPFTPPORT, APPTUSERID, APPFTPSSWD, WEBFTPSHARE, WEBFTPPORT, WEBFTPUSERID, WEBFTPDRIVE, WEBFTPPASSWD, OSTYPE, SOCKETSERVERPORT, SEC_SHARE_NAME, SEC_USERID, SEC_PASSWD, F_ISPRIMARY, N_PRECEDENCE)
```
YPE, STAGEPATH, DBFTPSHARE, DBFTPUSERID, DBFTPPASSWD, DBFTPPORT, DBFTPDRIVE, APPFTPSHARE, APPFTPPORT, APPFTPDRIVE, APPFTPUSERID, APPFTPPASSWD, WEBFTPSHARE, WEBFTPPORT, WEBFTPUSERID, WEBFTPDRIVE, WEBFTPPASSWD, OSTYPE, SOCKETSERVERPORT, SEC_SHARE_NAME, SEC_USERID, SEC_PASSWD, F_ISPRIMARY, N_PRECEDENCE FROM ficsysmaster
WHERE DBIPADDRESS='<EXISTINGAMIPADDRESS>'

To set the newly added AM node as primary node, execute the following SQL script by replacing `<NEWAMIPADDRESS>` with the IP address/Hostname of the newly added AM node:

UPDATE FICSYSMASTER SET F_ISPRIMARY = 'Y', N_PRECEDENCE=200 WHERE DBIPADDRESS = '<NEWAMIPADDRESS>'

Following are the steps involved in setting up of secondary AM servers:

1. Copy the following folders to the secondary AM server from the primary OFSAA server:
   - $FIC_HOME/conf
   - Entire ficdb and its sub-directories
   - .profile file from $HOME directory of primary OFSAA server

2. Perform the following configurations in the secondary AM server:
   h) Modify the following variables in the .profile file:
      i) Set FIC_HOME variable to the directory which is created as OFSAA home (should contain ficdb and conf folders).

   ii) Set FIC_DB_HOME variable to the directory where the /ficdb folder is copied under secondary AM server.

   AM_HOME=$FIC_HOME/ficdb
   export AM_HOME
   AM_CONF_FILE=$FIC_DB_HOME/conf/am.conf
   export AM_CONF_FILE
   FICTEMP=$FIC_DB_HOME/conf
   export FICTEMP

   iii) Ensure the following variables are pointed to valid hostname/IP address on which Message Server and Router server and Router engines are running.

   MESSAGE_SERVER_HOST=10.XXX.XXX.XXX
export MESSAGE_SERVER_HOST
MESSAGE_SERVER_PORT=6666
export MESSAGE_SERVER_PORT
FIC_ROUTER_HOST=10.XXX.XXX.XXX
export FIC_ROUTER_HOST
FIC_ROUTER_PORT=7777
export FIC_ROUTER_PORT

iv) Set JARPATH variable to $FIC_DB_HOME/lib.
v) Ensure ORACLE_SID variable is pointed to correct Oracle Instance and user can successfully connect to this instance from the Secondary AM server using sql/plus.
i) Update secondary AM node details in the AM.conf file present under $FIC_HOME/ficdb/conf path.

<AM_HOST>’<Secondary AM node host name/IP Address>’
<AM_PORT>’<Secondary AM node Port number>’

NOTE: Do not alter <ROUTER_NAME> and <ROUTER_PORT> values.

3. Modify the logger XML files such as MFLogger.xml, OFSAALogger.xml, DQLogger.xml, and PR2Logger.xml available under $FIC_DB_HOME/conf folder with the secondary AM Server $FIC_HOME path.

4.1.2 Configuring OFSAA Instance through Load Balancer to Distribute Batch Tasks on Multiple AM Nodes


NOTE: Message Server should be running in all the nodes where AM servers are configured.
4.1.3 Executing Batches on Multiple AM Nodes

While defining a Task in a Batch from the Task Definition window in the Operations module, you can choose on which node each task needs to be executed. The Primary IP for Runtime Processes drop-down list in the New Task Definition window displays all the registered AM Server nodes. Select the IP address of the AM node where you want the task to be executed. For more information on how to define a Batch, see OFS Analytical Applications Infrastructure User Guide 8.0.5.0.0.

NOTE: Crash handling of backend servers is supported. For more information, see Crash Handling of Backend Servers section in OFS Analytical Applications Infrastructure User Guide 8.0.5.0.0.
5 Unified Analytical Metadata Configurations

This chapter details about the configurations required in the Unified Analytical Metadata module. It consists of the following sections:

- Hierarchy Node Internationalization
- Data Element Filters Classification

5.1 Hierarchy Node Internationalization

Hierarchy Node Internationalization is a feature available for Business Hierarchies in Oracle Financial Services Analytical Applications Infrastructure. This feature is introduced to internationalize the node description of Regular Business Intelligence Enabled (BI) and Parent Child (PC) Hierarchies and to display them in Hierarchy Browser.

Each Node has a description. Previously, the node descriptions were fetched from the Description column of the Dimension table to facilitate the node description generation in REV_LOCALE_HIER table. Hierarchy node Internationalization feature changes the way in which these descriptions are stored in the REV_LOCALE_HIER table. The locale specific node descriptions are fetched from Multi Language Support table (MLS table). This table holds the node descriptions in all the installed locales, that is, in the locales in which OFSAAI is available.

5.1.1 Scope

The scope of this enhancement is limited to the Hierarchy Browser window. The hierarchies defined are displayed in Hierarchy Browser and the Hierarchy Browser is used in modules such as Unified Metadata Manager, Rules Framework, Metadata Browser, Map Maintenance, Forms Framework, and Hierarchy Maintenance.

5.1.2 Prerequisites

Following are the prerequisites for creating a Hierarchy with Multi Language Support Descriptions:

- The Hierarchy under creation should be either Regular Business Intelligence Enabled (BI) or Parent Child (PC).
- The Multi Language Support table MLS should be created either through Data Model Upload or manually in atomic schema. For more information on MLS table and structure, refer to Multi Language Support (MLS) Table.
- The Description columns used for node generation should be of Varchar / Varchar2 data type.
5.1.3 Multi Language Support (MLS) Table

The MLS table which is meant to provide multi language support can have any name as per Oracle database nomenclature and details of this table need to be configured for further usage. More details about the configuration are explained below:

NOTE: The insertion of data into MLS tables should be performed manually.

5.1.3.1 MLS Table Structure

Following points must be taken care during MLS table creation:

- Description columns on which the Hierarchy definition is based should also be present in the MLS table.
- A column of data type `Varchar / Varchar2` should be present in the MLS table. This column should contain the information about the locale (such as `fr_FR`, `ko_KR`). Refer to the MLS Table Configuration section for more details.
- Going forward Dimension related information will be maintained in OFSAAI tables. Before proceeding with the configuration of Dimension and its MLS table, the following master tables need to have data.
  - `CSSMS_SEGMENT_MAST`:
    This table holds information about the segments present in OFSAAI and an entry needs to be present in this table for mapping a dimension to a segment/folder. The Dimension data to be seeded into AAI tables can be mapped to the folder/segment 'DEFAULT'. So the entry for 'DEFAULT' folder needs to be included in this table.
  - `AAI_OBJ_TYPE_B`:
    This table holds information about various object types supported in OFSAAI such as Dataset, Business Measure, and so on. For Dimension management, the object type will be DIMENSION.
  - `AAI_OBJ_TYPE_TL`:
    This table holds locale specific information about various object types present in OFSAAI. Locale specific information about the object type 'DIMENSION' needs to be added here.
  - `AAI_OBJ_SUBTYPE_B`:
    This table holds information about different objects' sub types supported in OFSAAI. The different sub types associated with a 'DIMENSION' object will be mentioned in this table.
  - `AAI_OBJ_SUBTYPE_TL`:
    This tables hold locale specific information about various object sub types present in OFSAAI and information on the subtypes of 'DIMENSION' are maintained in this table.
NOTE: Refer to the HNL Data for more information on the sample data. The data provided in each of these tables is not exhaustive and has been provided as per requirements of Hierarchy Node Localization only.

5.1.3.2 MLS Table Configuration

Consider a Hierarchy "Income" defined on a dimension table "DIM_INCOME". The table structure is as indicated in the following table:

<table>
<thead>
<tr>
<th>Column Name</th>
<th>Primary Key</th>
<th>Datatype</th>
</tr>
</thead>
<tbody>
<tr>
<td>N_CUST_INCOME_BAND_CODE</td>
<td>PK</td>
<td>Number(5,0)</td>
</tr>
<tr>
<td>FIC_MIS_DATE</td>
<td></td>
<td>Date</td>
</tr>
<tr>
<td>V_CUST_INCOME_SHORT_DESC</td>
<td></td>
<td>Varchar2(80)</td>
</tr>
<tr>
<td>V_INCOME_DESC</td>
<td></td>
<td>Varchar2(80)</td>
</tr>
<tr>
<td>N_D_INCOME_UPPER_VALUE</td>
<td></td>
<td>Number(22,3)</td>
</tr>
<tr>
<td>N_D_INCOME_LOWER_VALUE</td>
<td></td>
<td>Number(22,3)</td>
</tr>
</tbody>
</table>

The primary key of DIM_INCOME table is PK_DIM_INCOME and is enforced on the column N_CUST_INCOME_BAND_CODE.

An MLS table with name, say "DIM_INCOME_LANG" can be created in the atomic schema to provide MLS support for DIM_INCOME. The structure of this table can be as indicated in the following table:

<table>
<thead>
<tr>
<th>Column Name</th>
<th>Primary Key</th>
<th>Datatype</th>
</tr>
</thead>
<tbody>
<tr>
<td>N_INCOME_BAND_CODE</td>
<td>PK</td>
<td>Number(5,0)</td>
</tr>
<tr>
<td>LOCALE_CD</td>
<td></td>
<td>Varchar2(10)</td>
</tr>
<tr>
<td>V_CUST_INCOME_SHORT_DESC</td>
<td></td>
<td>Varchar2(80)</td>
</tr>
</tbody>
</table>

The following figure represents the Income Hierarchy definition:
The MLS table corresponding to the Dimension DIM_INCOME can be created as follows:

- Create a table to provide MLS support for the Dimension DIM_INCOME. For example, assume the name of the table is DIM_INCOME_LANG. This table which is to provide MLS related information for DIM_INCOME, needs to be configured:
  - **AAI_OBJECT_B**
    
    This table registers information about an AAI object. Since Dimension is considered as an AAI object, the data corresponding to the Dimension DIM_INCOME needs to be maintained in this table.
  - **AAI_OBJECT_TL**
    
    This table holds locale specific information about an object in AAI. So locale specific information pertaining to the Dimension, DIM_INCOME, needs to be maintained in this table.
  - **AAI_DIMENSION**
    
    This table will provide further information about the DIMENSION table. Information such as whether the data in dimension table is in PC structure, whether the members are acquired in the dimension, and so on are maintained in this table.
  - **AAI_DIM_META_TABLE**
    
    This is the metadata table for a DIMENSION. Information about the table such as the MLS table meant for the Dimension, the hierarchy table, the attribute table, and so on will be maintained in this table.
AAI_DIM_META_COLUMN

This table provides information about various columns that will be used for a Dimension table. From Hierarchy Node Localization perspective, the name of the locale column which will hold locale information needs to be maintained here.

AAI_DIM_META_JOIN

This table holds information about the columns that will be used for joining the Dimension table with other tables such as the MLS table, Hierarchy table, Attribute table, and so on. Here multiple join conditions can be specified as well. Refer to HNL_Data excel for further information on providing joining columns information with respect to Hierarchy Node Localization.

The following table displays sample data which can be populated in DIM_INCOME_MLS table in a setup where there are 2 locales installed say, English (en_US) and Chinese (zh_CN).

<table>
<thead>
<tr>
<th>N_CUST_BAND_CODE</th>
<th>V_INCOME_DESC</th>
<th>LOCALE_CD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AAA</td>
<td>en_US</td>
</tr>
<tr>
<td>2</td>
<td>BBB</td>
<td>en_US</td>
</tr>
<tr>
<td>1</td>
<td>CCC</td>
<td>zh_CN</td>
</tr>
<tr>
<td>2</td>
<td>DDD</td>
<td>zh_CN</td>
</tr>
</tbody>
</table>

Note the following:

- In Regular BI enabled and PC Hierarchies, the Level Description expression should not contain columns with Number or Date data types. The inclusion of such a column in the Level Description expression would prevent the Business Hierarchy from generating nodes.

- There is no concept of default locale. Whenever a Hierarchy is saved, the translated node descriptions present in MLS table are saved in the corresponding columns of the REV_LOCALE_HIER table depending on the availability of translated values in the MLS table.

- The inclusion or exclusion of nodes from a Hierarchy will be reflected in Forms once the Hierarchy is resaved.

5.1.4 Node Generation Process

During Hierarchy definition, the nodes get generated depending on the structure of the Hierarchy. Node generation is possible in the following two scenarios:

- Node Generation when <DIM>_MLS Table is Present & Configured
- Node Generation when <DIM>_MLS Table is Not Present or Not Configured
5.1.4.1  **Node Generation when MLS Table is Present and Configured**

When MLS table is present, the nodes are generated by fetching the Description from the MLS table. Thus, entry in the Description columns of MLS table is mandatory.

5.1.4.2  **Node Generation when MLS Table is Not Present or Not Configured**

When MLS table is not present, by default the nodes are generated by fetching the Description from the Dimension table.

5.1.5  **Configure Mapper for Multiple Locales**

This step is optional and is required if Node Generation Process explained in the previous section is done.

To configure mapper for multiple locales:

1. Duplicate the data in REVELEUS_MASTER table with different locales in LOCALE_ID column.
2. Translate V_OBJECT_DESC column in REVELEUS_MASTER table to the desired locale.
3. Duplicate data in LOCALE_ID column in REV_MAST_MAP_ITEMS table for different LOCALE_ID.

**Example:**

An existing mapper namely Mapper A (created in any locale) can be translated into other locales as indicated in the following example:

1. Login to the configuration schema and duplicate the data in REVELEUS_MASTER table by changing the locale in LOCALE_ID column.
2. Change V_OBJECT_DESC for the corresponding locale in REVELEUS_MASTER table.
3. Duplicate the data in REV_MAST_MAP_ITEMS table by changing locale in LOCALE_ID column.

**NOTE:** 2nd and 3rd steps need to be performed for all the locales to which you wish to translate mapper A.

5.1.6  **Update Nodes in Existing Regular BI and PC Hierarchies**

Currently, the node description is generated only for one locale on which the Hierarchy is saved. With the introduction of Hierarchy Node Internationalization, the nodes will be generated in all the installed locales.

To generate the localized node descriptions for the existing Hierarchies, you need to edit and re-save the Hierarchies post MLS table creation and configuration. You can also mass update the
existing Hierarchies from Administration > Save Metadata section. The node description data for all the installed locales will be populated in REV_LOCALE_HIER table.

**NOTE:** If an SCD (Slowly Changing Dimension) is configured on a Dimension table, synchronize the new entries with the corresponding MLS table also.

### 5.1.7 Limitations

If the Hierarchies are accessed via Modeling Framework module, the node descriptions of the same will be displayed only in English, despite the locale you have logged in to the application.

### 5.2 Data Element Filters Classification

This section explains the option to categorize “Filter classification Types” as **Classified**, **UnClassified**, or **All** which can be used to define Data Element filters on Business Metadata Management objects.

To classify the tables available for a Filter in an existing information domain, perform a Model upload (Incremental / Sliced / Complete) to trigger object registration, which in turn will populate all the necessary entries to the registration tables. This is an optional one-time activity required to register all the tables, so that the tables without classification code are also made available in the Data Element filters.

During Model upload, Object Registration is done for all Tables and columns.

- Tables with the classification code will continue to have entry in REV_TABLE_CLASS_ASSIGNMENT with the appropriate classification code.
- Tables without classification code will also have entry in REV_TABLE_CLASS_ASSIGNMENT with the value as 1000 (UnClassified).

Once tables are registered successfully, you can go to the Filter screen to Define Data Element Filters on any tables and columns. Based on the Classification, the appropriate Classification type option has to be selected in the Data Element Selection screen to list the tables.
Note the following:

- If the field value in `CLASSIFICATION_FLG` column of `REV_TABLE_CLASSIFICATION_B` table is set to ‘1’, then it is considered as a **Classified** table.

  By Default, the classification codes 20, 200, 210, 310, 370, 50, 300, and 500 will have the `CLASSIFICATION_FLG` set to “1”.

- The `REV_TABLE_CLASSIFICATION_TL` table will have an entry `TABLE_CLASSIFICATION_CD = "1000", TABLE_DESCRIPTION = "UnClassified"` to identify UnClassified Tables (that is, tables which are not classified in the ERwin through UDP).

- The category “All” option will select all the tables available in the infodom, irrespective of whether table is classified or not.

  Since the previous option doesn’t check the classification type, even the table which has `CLASSIFICATION_FLG = Blank`, in the `REV_TABLE_CLASSIFICATION_B` table will also be listed. These tables will not be displayed under Classified or Unclassified Category.

### 5.2.1 Limitations

Following are the limitations with Data Element Filters classification:

- While defining Data Element Filter/Group Filter, it is not recommended to use features like using an Expression in a Filter and Macro Columns, since the generated SQL query for these features is unresolved.

- Defining Hierarchy/Attribute Filter is not recommended using BMM objects since the underlying Dimension and Hierarchy data are more specific to EPM Apps, and data will be available only if EPM Apps are installed in same Information Domain.

- Dependency check is not available when any of the BMM objects uses Filters. To maintain dependency between parent and child objects, an appropriate entry has to be added in to the `REV_OBJECT_DEPENDENCIES` table. Since the BMM object definition details are stored in Config schema, and do not populate entry into the `FSI_M_OBJECT_DEPENDENCY_B/TL` tables, the dependency check will not happen especially while deleting a Filter.
6 Enterprise Modeling Framework Configurations

This chapter details about the configurations which are required only if OFS Enterprise Modeling is licensed and enabled in the OFSAA instance on which this release is being installed. This chapter includes the following sections:

- Configuration of Oracle R distribution and Oracle R enterprise (ORE)
- Configurations for OFSAAI Remote Invocation of Scripted Models Using Standard R Distributions
  - Configurations for Open-R with HDFS
  - Support for Scripts which work on HDFS Files Directly
  - User Configurable Execution Implementation
  - Configuration for Parallel Execution of Models
  - Configurations for ORE Execution
  - Configuring the 8.0.6.0.0 Variable Migration Utility

6.1 Configuration of Oracle R distribution and Oracle R enterprise (ORE)

You can refer the Oracle Financial Services Advanced Analytical Applications Infrastructure Application Pack Installation and Configuration Guide for information on configuration of Oracle R distribution and Oracle R Enterprise.

6.2 Configurations for OFSAAI Remote Invocation of Scripted Models Using Standard R Distributions

This is applicable from OFSAAI version 8.0.1.0.0.

OFSAAI Remote invocation of “R” distribution (Open-R, Revo-R & others) is an enhancement to the framework which enables execution of “R” scripted Models to be executed on a remote “R” server instance (node). By configuring the OFSAAI with a run time parameter, models can be executed on any node. You can distribute the models for execution on multiple nodes. The settings are applicable for the entire OFSAAI installation.

**NOTE:** The reference implementation provided by Oracle is for Open-R distribution. Any other distribution would require custom plug-in based well-published interface spec to interchange data/parameters and output handling.

6.2.1 Prerequisite

1. Following packages should be installed along with R (R version 3.0.1):
   - rJava - version 0.9-8
- RJDBC - version 0.2-5
- DBI - version 0.4-1
- Cairo - version 1.5-9

The packages are available to download from https://cran.r-project.org/

- Rserve – version 1.8-x (download link - http://rforge.net/Rserve/files/)

2. If you want to execute R scripted models, ensure that the Rserve related jar files such as REngine.jar and RserveEngine.jar are copied into the $FICDB_HOME/lib folder.

### 6.2.2 Configurations

Following configurations are required for Rserve in remote nodes where Open-R engine is installed:

1. Create Rserv.conf file in /etc and make following entries:

   - workdir /tmp/Rserv
   - pwdfile /etc/Rserveusers
   - remote enable
   - auth enable
   - plaintext enable
   - port 6311
   - maxsendbuf 0
   - interactive no

   For more details, refer the link: http://rforge.net/Rserve/doc.html.

**NOTE:** The user who starts the R Server should have the read-write permissions on the R directories.

2. Set the Environment variables for R:

   - JAVA_HOME={java home path}
   - JAVA_BIN={java bin path}
   - LD_LIBRARY_PATH={LD library path}

   Note the following:

   - If RJDBC connection is required, copy the ojdbc6.jar file to the lib directory in the remote file path configured.
   - The lib and conf folders have to be created under the path mentioned in <REMOTE_FILE_PATH> tag.
   - For the Kerberos authentication the required jaas-conf, krb-conf and keytab files have to be placed under conf folder. The jaas-conf file name should be same as that of the keytab file name. It should be placed under the conf folder in the read-

---

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write path in remote machine or in the \$FIC\_DB\_HOME/conf folder in case of local executions. The krb5 conf file name should be same as the name configured in the table.

- Hive and Hadoop related jars should be copied to the lib folder mentioned in the \<REMOTE\_FILE\_PATH\> tag.

### 6.2.3 Framework Specific Configurations

Following tags should be updated with appropriate values in ModelingFramework.xml located at /webroot/conf (WEB layer) and /ficdb/conf (in DB layer). By default, the XML configuration comes with pre-configured for R scripts for data frame and HDFS based executions.

\<Target id = "\$HOST\$" PRIMARY\_NODE = "\$TRUE/FALSE\$" LANGUAGE = "R" EXE\_ENV = "Standard R Engine" INPUT\_DATA\_TYPE = "DF / HDFS" NAME = "\$Logical Name for the target\$" >

- **Target id** = Replace $HOST$ with IP address / host name of remote machine where Rserve is running.

- **PRIMARY\_NODE** = set as TRUE to indicate this is the primary node where execution will happen if host is not passed as a runtime execution parameter.

- **LANGUAGE** = Enter the language in which the script is written. The supported languages are Standard R and ORE.

- **EXE\_ENV** = Enter the execution engine in which the script should be executed. The supported execution engines are Standard R and ORE.

- **INPUT\_DATA\_TYPE** = Enter the data type format as DF or HDFS. In case the type is 'HDFS' user has to configure the \<HDFS\_LOCATION\> tag.

- **NAME** = a unique name for the combination of language, execution engine and input data type.

\<REMOTE\_FILE\_PATH\>$FILE\_PATH\$</REMOTE\_FILE\_PATH>

- Replace $FILE\_PATH$ with the path in Remote Machine/Server which has got complete access rights to all users.

  (Output of the executions will be created under this configured directory)

  In this case, Remote Machine/server refers to the execution engine like Rserve.

  Configured path should end with a directory separator at the end.

  Format : \<REMOTE\_FILE\_PATH\>/user1/OFSAA/R/</REMOTE\_FILE\_PATH>

\<IS\_OUTPUT\_REQ\_IN\_OFSAA\>N</IS\_OUTPUT\_REQ\_IN\_OFSAA>

The flag value indicates whether the outputs have to be written back to framework tables.
The flag value indicates whether the outputs has to be written in the .csv format in the machine in which the model is executed.

The flag value indicates whether to delete the output files (only the files will be deleted not the folders) from the machine in which the model is executed.

**NOTE:** Once the configurations are done in FIC_DB_LAYER, copy the same to the deployed path webroot/conf folder or copy the file to $FIC_WEB_HOME/webroot/conf folder and re-deploy.

### 6.2.4 Configurations for R Script

By default, OFSAA pre-script will be considered. If you want your own pre-script, it needs to be configured with this tag.

By default, OFSAA post script will be considered. If you want your own post-script, it needs to be configured with this tag.

Replace $PORT$ with the port configured for Rserve. (The default Rserve port is 6311.)

Replace $USERNAME$ and $PASSWORD$ with the credentials of the user who can connect to Rserve. It should be same as the entry made in the Rserveusers file.

The password should be in encrypted format. To encrypt the password, do the following steps:

1. Go to $FIC_DB_HOME/bin and execute the command:
   ```bash
   .\hostconfig.sh
   ```
2. Provide the unique name given in the `ModelingFramework.xml` in the 'NAME' attribute of 'TARGET' tag and password. Once these values are provided the password will be stored in the encrypted format in `ModelingFramework.xml`.

### 6.2.5 Structure of the `gss-jass.conf` File

- If sun JDK for Linux is used:
  ```java
  com.sun.security.jgss.initiate {
    com.sun.security.auth.module.Krb5LoginModule required
    useKeyTab=true
    useTicketCache=false
    doNotPrompt=true
    keyTab="<KeyTab File Path>"
    debug=true;
  }
  ```

- If IBM JDK for Linux is used:
  ```java
  com.ibm.security.jgss.initiate {
    com.ibm.security.auth.module.Krb5LoginModule required
    credsType=both
    useKeytab="<KeyTab File Path>"
    debug=true;
  }
  ```

- If the cloudera jdbc connector version is 2.5.x:
  ```java
  Client {
    com.sun.security.auth.module.Krb5LoginModule required
    useKeyTab=true
    useTicketCache=false
    doNotPrompt=true
    keyTab=""
    debug=true;
  }
  ```
6.3 Configurations for Open-R with HDFS

This is applicable from OFSAAI version 8.0.3.0.0.

Oracle R Advanced Analytics for Hadoop (ORAAH)/Oracle R Connector for Hadoop (ORCH) is the default approach for running Open-R on HDFS.

6.3.1 Prerequisites

Following are the installation requirements for external dependencies:

- CDH (Version: OFSAAI qualified CDH version)
- ORAAH – Versions supported: 2.6.0 and 2.7.0.

For more information on installation and configuration of ORAAH, see ORAAH Installation Guide.

**Note:** ORAAH 2.7.0 is compatible only with OFSAAI 8.0.5.0.0 and later versions.

- Cairo - The package is available to download from [https://cran.r-project.org/](https://cran.r-project.org/). Download and transfer it to Rserve box. Install the package using the following command:

  R CMD INSTALL Cairo_Package_Name
  Or
  install.packages( "Cairo", dependencies = T) #using R session

6.3.2 Installing OFSAAIRunnerHDFS Package

OFSAAIRunnerHDFS is an R package required for executing models in Open-R Framework with HDFS Option. This package (OFSAAIRunnerHDFS_1.0.0.tar.gz) is available under $FIC_DB_HOME/lib. This package needs to be installed on a machine which is running Rserve or client R Engine.

Refer to the following instructions to install OFSAAIRunner package:

1. Log in to the OFSAA Server. Navigate to the folder $FIC_DB_HOME/lib.
2. Copy the file OFSAAIRunnerHDFS_1.0.0.tar.gz in default mode to Rserve box (node where Rserve is installed/running).

**NOTE:** UNIX root login is required.

3. Navigate to the directory where the file OFSAAIRunnerHDFS_1.0.0.tar.gz is copied.
4. Install the package by executing the command as root user:

   R CMD INSTALL OFSAAIRunnerHDFS_1.0.0.tar.gz
NOTE: The OFSAAIRunnerHDFS package is installed in /usr/lib64/R/library.

5. Navigate to the directory $R_HOME/library and check whether OFSAAIRunnerHDFS package is listed there by executing the command as root user:
   
   `ls -l`

### 6.3.3 Framework Specific Configurations

Following are the additional tags in ModelingFramework.xml applicable for ORAAH:

- `<HIVE_HOST>$HIVE_HOST$</HIVE_HOST>`
  
  Replace $HIVE_HOST$ with Hive server Host Name or IP Address.

- `<HIVE_PORT>$HIVE_PORT$</HIVE_PORT>`
  
  Replace $HIVE_PORT$ with Hive server running port.

- `<HIVE_PRINCIPAL>$HIVE_PRINCIPAL$</HIVE_PRINCIPAL>`
  
  Replace $HIVE_PRINCIPAL$ with the Kerberos server principal for the host where the HiveServer2 is running.

- `<DFS_NAME_NODE>$DFS_NAME_NODE$</DFS_NAME_NODE>`
  
  Replace $DFS_NAME_NODE$ with default HDFS Name-node to use when converting HDFS object into RDD object.

- `<SPRK_MEMORY_PER_PROCESS>2G</SPRK_MEMORY_PER_PROCESS>`
  
  Amount of memory to use per executor process, in the same format as JVM memory strings (for example 512m, 2g). Or in byte if specified as integer. Default is 2 G.

### Pre/Post Script Tags

- `<PRE_SCRIPT_FILE>REXEC_PREFIX_HDFS,REXECUTION_PREFIX_2</PRE_SCRIPT_FILE>`
  
  By default, OFSAA pre-script will be considered. If you want your own pre- script, it needs to be configured with this tag.

- `<POST_SCRIPT_FILE>REXECUTION_SUFFIX_0,REXECUTION_SUFFIX</POST_SCRIPT_FILE>`
  
  By default, OFSAA post script will be considered. If you want your own post- script, it needs to be configured with this tag.

### 6.3.4 Additional Configurations for ORAAH Executions

The following configurations are mandatory for model executions using ORAAH.
Set the following environment variables in $R_HOME/etc/Renviron.site file:

- HIVE_HOME, SPARK_HOME, HADOOP_HOME with the respective paths
- HIVE_CONF_DIR, HADOOP_CONF_DIR, YARN_CONF_DIR, SPARK_CONF_DIR with their respective configuration directory paths
- CLASSPATH and HADOOP_CLASSPATH with all the hadoop/hdfs/yarn/hive jars, Hadoop configuration directory (HADOOP_CONF_DIR) and spark configuration directory (SPARK_CONF_DIR)
  For example,
  CLASSPATH=$HADOOP_CONF_DIR:$SPARK_CONF_DIR:All_hadoop_jars

- SPARK_JAVA_OPTS variable with $R_HOME/lib
  For example, SPARK_JAVA_OPTS="-Djava.library.path=/usr/lib64/R/lib"

- For Kerberos enabled cluster, initializing the ticket should be done in Renviron/Renviron.site file.

6.4 Support for Scripts which work on HDFS Files Directly

The framework supports scripts which work directly on the HDFS files. In the technique registration UI and model definition UI there will be a provision to specify what is the input data type – data-frame or HDFS file.

The default pre-script and post-script which comes with the patch set will work only with data frame approach. For the script to work on HDFS files, custom pre and post scripts have to be written and configured in the ModelingFramework.xml. Also, the HDFS location has to be configured in the XML.

The HDFS location should have complete access and the necessary packages should have been installed in the server.

6.5 User Configurable Execution Implementation

If you want your own implementation to execute the scripts, you can configure the <CLASS_NAME> tag in the ModelingFramework.xml with the java class name to be instantiated. Also, the jar file containing this class file should be placed in $FIC_DB_HOME/lib folder.

6.6 Configuration for Parallel Execution of Models

If Rserve version is 1.8.x and above, the control feature should not be enabled for parallel execution of models. You should remove the tag control enable/disable entry from the Rserv.conf file in the /etc folder.
6.7 Configurations for ORE Execution

This is an optional step and required only if you have installed and configured Oracle R distribution and Oracle R Enterprise:

1. Log in to the Oracle Database Server.

2. Add an entry in `tnsnames.ora` file with same name as that of the value set for `ORACLE_SID`.

**NOTE:** For a RAC database, follow the aforementioned configuration in all nodes of the RAC cluster.
7    Process Modeling Framework Configurations

This is applicable from OFSAAI version 8.0.2.0.0. In 8.0.2.0.0, it was called Workflow and Process Orchestration.

This chapter details about the configurations required for Process Modeling Framework module. It includes the following sections:

- SMTP Server Configurations
- Work Manager Configurations

7.1 SMTP Server Configurations

Task notifications can be sent as Email to the assigned users. To receive notifications as email, perform the following configurations:

1. Add the following entries in AAI_EMAIL_CONFIG table:

   V_PROTOCOL - SMTP
   V_HOST – SMTP/ Mail Server ID
   V_PORT - SMTP Server Port
   V_AUTHENTICATION - Either False or True
   V_USER_NAME - Login name to SMTP/ Mail Server ID from which mail will be triggered. This is required if V_AUTHENTICATION is set as True.
   V_PASSWORD - Password to login into SMTP/ Mail Server. This is required if V_AUTHENTICATION is set as True.
   V_SECURITY -

2. Add the following entries in the AAI_USER_PREFERENCE table:

   In this table, you can set the user preference of how to receive the notification mails.

<table>
<thead>
<tr>
<th>V_USER_ID</th>
<th>N_EMAIL_NOTIF_REQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>USER1</td>
<td>1</td>
</tr>
<tr>
<td>USER2</td>
<td>2</td>
</tr>
</tbody>
</table>

- 0 – To receive no notification mails
- 1 – To get mails instantly
- 2 – To get bulk mail (Additionally, you need to set V_BULK_MAIL_TRIGGER value to Y in the AAI_WF_BULK_MAIL_TRIGGER table). A single mail will be sent with all the pending notifications from last trigger, as a PDF attachment. Once the bulk mail is sent, V_BULK_MAIL_TRIGGER value is automatically set to N.
3. To get mail with attachment

3. Add the email id of the user, to which the notification mails need to be sent, in the CSSMS_USR_PROFILE table.

<table>
<thead>
<tr>
<th>V_USR_ID</th>
<th>V_EMAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>USER1</td>
<td><a href="mailto:user1@oracle.com">user1@oracle.com</a></td>
</tr>
<tr>
<td>USER2</td>
<td><a href="mailto:user2@oracle.com">user2@oracle.com</a></td>
</tr>
</tbody>
</table>

4. Add the following entries in the AAI_WF_EMAIL_TEMPLATE table:

- V_MAIL_FROM: Email id from which the mail is sent
- V_MAIL_MESSAGE: Email message template
- V_MAIL_SUBJECT: Subject of the mail
- V_APP_PACKAGE_ID: Application package ID
- V_MAIL_TYPE: Email type. For example, task, bulk task, and single.
- N_TEMPLATE_ID: A unique Email Template ID
- V_TEMPLATE_NAME: Email Template name

5. Set the V_EMAIL_REQUIRED value to Y in AAI_WF_APP_PACKAGE_B (for app level setting), AAI_WF_APP_REGISTRATION (for entity type level setting) and AAI_WF_ACTIVITY_TASK_B (for task level setting) tables.
7.2 Work Manager Configurations

This is applicable from OFSAAI version 8.0.3.0.0.

Process Modelling framework requires creation of Work Manager and mapping it to OFSAA instance. This configuration is required for Web Application Server type as WebSphere and WebLogic.

7.2.1 Creating Work Manager in WebSphere Application Server

1. Open the WebSphere admin console in the browser window:
   http://<ipaddress>:<administrative console port>/ibm/console. (https if SSL is enabled).
   The Login window is displayed.

2. Login with the user id that has admin rights.

3. From the LHS menu, expand Resources > Asynchronous beans and select Work Managers.
4. Select the required **Scope** from the drop-down list. For example, Node=whf00aqnNode01, Server=server1.

5. Click **New** in the **Preferences** section.

6. Enter the **Name** as ‘wm’ and **JNDI name** as ‘wm/WorkManager’ in the respective fields.

7. Enter the **Thread pool properties**.

8. Click **Apply**.
9. Click **Save**.

After creating work manager successfully, you have to map it to OFSAA instance.
7.2.2 Mapping Work Manager to OFSAA WebSphere Instance

1. From the LHS menu, expand Applications > Application Types and select WebSphere enterprise applications.

2. Click OFSAAI instance hyperlink.

3. Click Resource references link under References section.
4. Click **Browse** corresponding to the Work Manager Resource Reference. The available resources are displayed.

5. Select the newly created Work Manager ('wm') and click **Apply**.
6. Select the Work Manager (‘wm/WorkManager’) and click OK.

7. Click Save.
7.2.3 Creating Work Manager in WebLogic Application Server

1. Open the WebLogic admin console in the browser window:
   
   http://<ipaddress>:_<administrative console port>/console. (https if SSL is enabled). The Welcome window is displayed.

2. Login with the user id that has admin rights.

3. From the Domain Structure menu in the LHS, expand Environment and select Work Managers. The Summary of Work Managers window is displayed.

4. Click New to create a new work manager component.
5. Select **Work Manager** and click **Next**.

6. Enter the **Name** as ‘wm/WorkManager’.

7. Click **Next**.

8. Select the required deployment target and click **Finish**.
### 7.3 Configuring Attributes for Attribute Expression Application Rule

This section explains how to configure attributes for creating Decision Rules on those attributes for application specific workflows. Each application and its respective components can have many attributes configured. Each attribute is identified with an ID `app_comp_attr_map_id`, based on which the values for attributes can be fetched.

Enter attribute information in the `AAI_AOM_APP_COMP_ATTR_MAPPING` table. Enter values as tabulated:

<table>
<thead>
<tr>
<th>Column Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APP_COMP_ATTR_MAP_ID</td>
<td>ID of the attribute</td>
</tr>
<tr>
<td>V_ATTR_CODE</td>
<td>Name of the attribute</td>
</tr>
<tr>
<td>N_ATTR_TYPE_ID</td>
<td>ID of the attribute type. The values of the attributes are fetched based on attribute type.</td>
</tr>
<tr>
<td></td>
<td>1001 - Static</td>
</tr>
<tr>
<td></td>
<td>1002 - Query</td>
</tr>
<tr>
<td></td>
<td>1003 - JavaAPI</td>
</tr>
<tr>
<td></td>
<td>For more information, see <a href="#">Attribute Types</a>.</td>
</tr>
<tr>
<td>V_ATTRIBUTE_VALUE1</td>
<td>Values to be fetched for the attribute. Based on the attribute type, you need to pass the values.</td>
</tr>
<tr>
<td>V_ATTRIBUTE_VALUE2</td>
<td>Application code for which the current attribute is configured.</td>
</tr>
<tr>
<td>N_APP_ID</td>
<td>Component code for which the attribute is configured.</td>
</tr>
<tr>
<td>V_UDP_CODE</td>
<td>Special property used by applications (user defined). For example, 'GET_STATUS' --to get the status for the workflow.</td>
</tr>
</tbody>
</table>

For more information, see [Attribute Types](#).
7.3.1 Attribute Types

The values of attributes are fetched based on the attribute types. Following are the attribute types with their IDs:

<table>
<thead>
<tr>
<th>Attribute Type ID</th>
<th>Attribute Type Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1001</td>
<td>Static</td>
</tr>
<tr>
<td>1002</td>
<td>Query</td>
</tr>
<tr>
<td>1003</td>
<td>JavaAPI</td>
</tr>
</tbody>
</table>

- **1001 (Static)** - Store attribute values in the `AAI_AOM_STATIC` table as `V_STATIC_ID` and `V_STATIC_VAL`.

- **1002 (Query)** - Enter the SQL query in `V_ATTRIBUTE_VALUE1` in the `AAI_AOM_APP_COMP_ATTR_MAPPING` table, which has to be fired to fetch the attribute values.

- **1003 (JavaAPI)** – Enter the method that is configured for `V_ATTRIBUTE_VALUE1` for the required attribute. The configured method in the class path is invoked to get the attribute values in this case.

7.4 Enabling Proxy for Webservices Rule

This is applicable from OFSAAI version 8.0.5.2.0 onwards.

This section explains how to configure the Proxy details if it is required for the Webservices/Rest Service Application Rule.

Add the following entries in the `AAI_WF_GLOBAL_SETTINGS` table:

<table>
<thead>
<tr>
<th>V_PARAM_NAME</th>
<th>V_PARAM_VALUE</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROXY_SERVER_IP</td>
<td>For example, <a href="http://www.proxy.myserver.com">www.proxy.myserver.com</a></td>
<td>Provide the IP address of the Proxy server.</td>
</tr>
<tr>
<td>PROXY_SERVER_PORT</td>
<td>For example, 80</td>
<td>Provide the port number of the Proxy server.</td>
</tr>
</tbody>
</table>
8 Inline Processing Engine Configurations

You should create an additional resource reference as JDBC/<INFODOMNAME> pointing to the same infodom in which IPE is installed. For information on creating resource reference, see Appendix B of the OFS AAI Application Pack Installation and Configuration Guide.
9 Forms Manager Configurations

9.1 Creating EAR/WAR File

To create the EAR/WAR file, follow these steps:

1. Navigate to the $FIC_HOME/FMStandalone directory on the OFSAA Installed server.
2. Execute ./ant.sh to trigger the creation of EAR/WAR file.
3. On completion of the EAR files creation, the "BUILD SUCCESSFUL" and "Time taken" messages are displayed and you will be returned to the prompt.

The EAR/WAR file - formsmanager.ear/.war - is created.

**NOTE:** This process overwrites any existing version of EAR file that exists in the path. If OFSAA is configured on Tomcat installation, formsmanager.war will be created.

9.2 Deploying Ear/WAR File

Deployment of the formsmanager.ear/war file is similar to the deployment of the OFSAA ear/war file. To deploy the formsmanager.ear/war file, follow the steps mentioned in Appendix C of OFSAAI Installation and Configuration Guide.

**NOTE:** Apply the respective Application patches for Forms Manager if any other application is running in 8.0.2.0.0, before redeploying FM 2.0.

9.3 Migrating from FM 1.0 to FM 2.0

This is applicable from OFSAAI version 8.0.3.0.0.

Follow the step to migrate from FM 1.0 to FM 2.0:

Execute the following script in Configuration Schema:

```sql
DECLARE
  n VARCHAR2(50);
BEGIN
  pkg_createfrm_pages.createPagesInConfig('<appId>','<sourcedsnId>','<targetdsnId>',n);
  DBMS_OUTPUT.PUT_LINE('DONE');
END;
```

where appId refers to Application ID, sourcedsnId refers to source dsnId and targetdsnId refers to target Id.

**NOTE:** Apply the respective Application patches for Forms Manager before migrating from FM 1.0 to FM 2.0.
10 Forms Framework Configurations

This is applicable from OFSAAI 8.0.5.2.0 version.

10.1 Content Management Integration

CMIS (Content Management Interoperability Services) is an OASIS standard enabling information sharing between different Content Management Systems. Forms Framework has been enhanced to support doc upload to CMIS repository.

Perform the following configurations:

1. Set the following parameters in the configuration table in the Config Schema to enable CMIS:
   a) Set the value of IS_CMIS_ENABLED parameter to TRUE. If this is set to FALSE, document upload will happen on ftpshare.
   b) Update the value of CMIS_ATOMPUB_URL parameter with the repository URL. Make sure the URL is up & running.

   For example: http://192.0.2.1:7777/service/cmis

2. Modify the property file INFODOM_cmis.properties, which is available inside $FIC_HOME/ficweb/webroot/conf folder.
   a) Rename the file by replacing the INFODOM with actual name of Infodom. For example if Infodom name is “OFSAAINFO”, rename the file to OFSAINFO_cmis.properties.
   b) The property file will contain the following entries. Update them as per the CMIS URL.

   REPOSITORY_ID=5
   USER=admin
   PASSWORD=password
   DEFAULTPATH=/Default
   DOC_OBJ_TYPE_ID=cmis:document
   FLDR_OBJ_TYPE_ID=cmis:folder

3. Redeploy the application onto your configured web application server. For more information on generating and deploying the EAR/WAR file, refer to the Post Installation Configuration section in the Oracle Financial Services Analytical Applications Infrastructure Installation & Configuration Guide 8.0.2.0.0.

4. Restart all the OFSAAI services. For more information, refer to the Start/Stop Infrastructure Services section in the Oracle Financial Services Analytical Applications Infrastructure Installation & Configuration Guide 8.0.2.0.0.
11 Flexible KBD Configurations

This is applicable from OFSAAI version 8.0.2.0.0.

Perform the following configurations required for Flexible KBD utility:

1. Add entries to the following tables to create the tree structure according to the application requirements:
   - aai_menu_b
   - aai_menu_tl
   - aai_menu_tree
   - insert_aai_obj_type_action_func_map
   - insert_aai_obj_type_b
   - insert_aai_obj_type_tl

2. Map the required User Groups to the respective User Roles to provide access to KBD Preference module. The User Roles mapped to KBD Preference module are:
   - F_KBDACC - Flex KBD Access
   - F_KBDAUTH- Flex KBD Authorize
   - F_KBDREAD- Flex KBD Read
   - F_KBDWRITE- Flex KBD Write

If you already have User Group Role mapping, map your user group to FlexKBD folder. For more information, see the Identity Management section in OFS Analytical Applications Infrastructure User Guide. You can also populate the following tables to seed the appropriate user function mapping to FlexKBD folder:

   - insert_cssms_function_mast
   - insert_cssms_group_role_map
   - insert_cssms_role_function_map
   - insert_cssms_role_mast
   - cssms_folder_function_map

If data is seeded into the system, then the sequences for the following tables should be reinitialized:

   - flexkbd_ctrl_loc
   - flexkbd_dim_info
   - flexkbd_pref_master
Following table describes the column name for the corresponding Table and Sequence that needs to be reinitialized:

<table>
<thead>
<tr>
<th>Sequence name</th>
<th>Table name</th>
<th>Column name</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLEXKBD_CTRL_LOC_SEQ</td>
<td>flexkbd_ctrl_loc</td>
<td>CONTROL_ID</td>
</tr>
<tr>
<td>FLEXKBD_DIM_INFO_SEQ</td>
<td>flexkbd_dim_info</td>
<td>KBDID</td>
</tr>
<tr>
<td>FLEXKBD_PREF_MASTER_SEQ</td>
<td>flexkbd_pref_master</td>
<td>PREF_ID</td>
</tr>
</tbody>
</table>
12 Questionnaire Setup and Configuration Details

The information in this section is applicable for OFSAAI Release 8.0.4.0.0 and later.

This section provides details to set up Questionnaire in your system environment and map groups to roles, which lets you access the feature.

You have to launch the Questionnaire menu and map it to roles. The following subsections provide details for the procedures:

- Launching Questionnaire Menu
- Mapping Roles to Access Questionnaire
- Configuring Components, Dimensions, and Static Options

12.1 Launching Questionnaire Menu

You can configure Questionnaire to appear in any relevant menu of your choice in the application. For example, you can configure Questionnaire to appear in the PMF menu or in the Common Tasks menu.

The following menus are available for Questionnaire:

1. **OFS_ABC_QTNR_CONF** – You can access the Questionnaire Configuration screen from this menu. It is used to define components and attributes, which are used to create a Questionnaire.

2. **OFS_ABC_QTNR_DEFN** – You can access the Questionnaire Library screen from this menu.

3. **OFS_ABC_QTN_DEFN** – You can access the Questions Library screen from this menu.

Add the menus mentioned in the preceding list to the aai_menu_tree table to enable the Questionnaire menus to appear in the OFSAAI LHS menu.

After you have launched the menu, follow the instructions described in the section Mapping Roles to Access Questionnaire.

12.2 Mapping Roles to Access Questionnaire

Access to Questionnaire requires mapping groups to roles. The step-by-step description of the procedure is in the following list:

1. Login to OFSAAI with your system administrator credentials.

2. Click the System Administrator & Identity Management tab and click Identity Management.

3. Click User Group Role Map from the User Administrator LHS menu. The User Group Role Map window is displayed.
4. Map users to User or Approver roles.

   a) Users of applications mapped to groups can access the Questionnaire menu by mapping the groups to following roles:

<table>
<thead>
<tr>
<th>Number</th>
<th>Role Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>QTNRADMNRL</td>
<td>ABC Questionnaire Administrator</td>
</tr>
<tr>
<td>2</td>
<td>QUESTMATRL</td>
<td>ABC Questionnaire Maintenance</td>
</tr>
<tr>
<td>3</td>
<td>QTNRCONFRL</td>
<td>Questionnaire Configuration Execute</td>
</tr>
</tbody>
</table>

   b) Users of applications can be configured to be approvers by mapping their group to the QLOCAUTHRL role.

5. Authorize the user groups and role mapping. (You or another user with authorizer role (sysauth) has to login to OFSAA and authorize the mapping).

Configured users can login with the credentials created and access Questionnaire with the roles assigned. The Questionnaire window is displayed as shown.

NOTE: In the preceding illustration, the Questionnaire window is configured to appear in Application Builder Component in Common Tasks. Similarly, you can configure Questionnaire to appear in the menu item of your choice. For example, you can configure it to appear in the Know Your Customer (KYC) menu list.
12.3 Configuring Components, Dimensions, and Static Options

Users have to configure the data in the drop down fields such as Components, Dimensions and Static options on the Questionnaire window. The following subsections provide configuration information for the various options.

12.3.1 Configuring Components for Questionnaire

Component is a drop down list. Seed the data for Components in the tables DIM_COMPONENT_INFO and DIM_COMPONENT_INFO_MLS. For table details, see the spreadsheet AAI_Questionnaire_Data_Model_Sheet.xlsm.

12.3.2 Configuring Dimensions for Questionnaire

Dimensions is a drop down list. Seed the data for Dimensions in the tables QTNR_DIM_SRC and QTNR_DIM_SRC_MLS. For table details, see the spreadsheet AAI_Questionnaire_Data_Model_Sheet.xlsm.

12.3.3 Configuring Static Options for Questionnaire

Static Options is a drop down list. Seed the data for Static Options in the following tables and in the order specified:

1. QTNR_STATIC_GRP
2. QTNR_STATIC_GRP_MLS
3. QTNR_STATIC_SRC
4. QTNR_STATIC_SRC_MLS

For table details, see the spreadsheet AAI_Questionnaire_Data_Model_Sheet.xlsm.

12.4 Registering and Invoking your Application's Customized Workflow

You can define customized workflows in your application and apply in Questionnaire by registering it. Questionnaire has a workflow definition seeded by AAI, where object type is defined as QTNR. If you choose not to define your workflow, Questionnaire defaults to the workflow defined by AAI.

Perform the following steps in your application to register the customized workflow:

1. Create a new package in the table aai_wf_app_package_b.
   **Note:** Name OBJECT_TYPE for workflow definition in the convention $APP_CODE_QTNR.
   For example, if your APP_CODE is OFS_KYC, name the Object Type as OFS_KYC_QTNR.

2. Register a new object V_OBJECT_TYPE in the table aai_wf_app_registration.

3. Create a new process or copy it to the PMF application.
4. Add the entry with the object V_OBJECT_TYPE in the table aai_wf_app_definition_map.

Questionnaire validates the Object Type before invoking the workflow. If the naming convention of the workflow definition matches with the naming convention defined in the preceding steps, it invokes the registered workflow from your application. However, if the naming convention does not match the registered workflow, Questionnaire invokes the default reference workflow with object type QTNR.

To check for the creation of the new process, perform the following steps:

1. Create a new questionnaire in Draft status.
2. Check in the Process Monitor that the Questionnaire is running in the new process.
13 Generic Configurations

This chapter describes about generic configurations required for OFS AAAI Application pack. It consists of the following sections:

- Query Performance Optimization
- Multiple Language Support (MLS) Utility
- Transferring Batch Ownership
- Database Password Reset/ Change
- Changing IP/ Hostname, Ports, Deployed paths of the OFSAA Instance
- Configure Stylesheet
- LDAP Configuration
- Using X-Frame-Options to Embed OFSAA Content on your Site
- Configuration for Tomcat
- Configuring WebLogic
- SSO Authentication (SAML) Configuration
- Public Key Authentication
- Enable and Disable Users
- Password Reset
- Configuring OFSAA OIM Connector
- Using REST APIs for user management from third-party IDMs
- Configuring the Logout URL for OBIEE in OFSAA

13.1 Query Performance Optimization

A configuration file, OracleDB.conf has been introduced to accommodate any configurable parameter related to operations for Oracle database. If you do not want to set a parameter to a specific value, then the respective parameter entry can be removed/commented from the OracleDB.conf file which resides in the path $FIC_DB_HOME/conf.

The following table details the configurable OFSAA parameters in OracleDB.conf file with its purpose and the way it maps to Oracle Database Parallelism settings.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNF_PARALLEL_DEGREE_POLICY</td>
<td>Sets the parallel degree policy. Possible values – MANUAL, LIMITED, or AUTO.</td>
</tr>
<tr>
<td></td>
<td>Query fired on the database - ALTER SESSION SET PARALLEL_DEGREE_POLICY=&lt;&lt;CNF_PARALLEL_DEGREE_POLIC Y&gt;&gt;</td>
</tr>
<tr>
<td>CNF_PARALLEL_QUERY</td>
<td>Sets parallelism for queries. Possible values – DISABLE, ENABLE, or FORCE.</td>
</tr>
<tr>
<td></td>
<td>Query fired on the database - ALTER SESSION &lt;&lt;CNF_PARALLEL_QUERY&gt;&gt; PARALLEL QUERY</td>
</tr>
<tr>
<td>CNF_PARALLEL_DML</td>
<td>Sets parallelism for DML operations. Possible values – DISABLE, ENABLE, or FORCE.</td>
</tr>
<tr>
<td></td>
<td>Query fired on the database - ALTER SESSION &lt;&lt;CNF_PARALLEL_QUERY&gt;&gt; PARALLEL DML</td>
</tr>
<tr>
<td>CNF_DEGREE_OF_PARALLELISM</td>
<td>Sets the degree of parallelism. Possible values – Value can be any positive integer.</td>
</tr>
<tr>
<td></td>
<td>The default mode of a session is DISABLE PARALLEL DML. If CNF_DEGREE_OF_PARALLELISM is not set, then the default degree, as decided by Oracle will be used.</td>
</tr>
<tr>
<td></td>
<td>Queries fired on the database - ALTER SESSION &lt;&lt;CNF_PARALLEL_QUERY&gt;&gt; PARALLEL QUERY PARALLEL &lt;&lt;CNF_DEGREE_OF_PARALLELISM&gt;&gt; ALTER SESSION &lt;&lt;CNF_PARALLEL_QUERY&gt;&gt; PARALLEL DML PARALLEL &lt;&lt;CNF_DEGREE_OF_PARALLELISM&gt;&gt;</td>
</tr>
</tbody>
</table>

For more information, see the Using Parallel Execution section in Oracle Database VLDB and Partitioning Guide.

### 13.2 Multiple Language Support (MLS) Utility

Multiple Language Support (MLS) refers to the ability to run multiple languages in the same Application instance. MLS provides multiple language architecture, while specific language packs provide the individual language translations.

Multiple Language Support (MLS) is supported for the following objects:

- Unified Metadata Manager - All Objects.
- Run Rule Framework - Run, Process and Rule definitions.
- Financial Services Applications - Dimension Management - Attributes, Members, Hierarchies; Filters, Expressions and Object Migration.

The MLS Utility can be invoked through the execution of the following steps with an appropriate parameter. The purpose and the parameters are listed below.

To execute the MLS utility, perform the following steps:

1. Navigate to $FIC_HOME/MLS_ofsaaia directory of OFSAAI APP tier.
2. Execute the MLS utility <Command> <parameter>
Available Parameters

MES

You need to invoke the utility with this parameter for population of seeded text such as menu labels and popup messages.

You need to execute this utility with this parameter only after you install an OFSAA language pack, where the language pack has a version lower than the installed OFSAAI software version. For example, you are installing the OFSAA 8.0.0.0.0 LP on an OFSAA setup where the OFSAA version is 8.0.1.0.0.

There are additional labels and messages that have been added or modified as part of previous release. In order to update/ populate the messages_<locale> table with delta records, you need to run the utility with this parameter. Running this utility will copy the incremental set of text to the language-specific messages_<locale> tables as a placeholder, so you will see an American English message (default for base install) until the translation is available in language packs.

For example, if you are on OFSAA 8.0.1.0.0 and have installed OFSAA 8.0.0.0.0 language packs for French and Spanish (since the latest 8.0.x language pack may not yet be available), running the utility with the MES parameter will duplicate the incremental labels and messages from the messages_en_US table to the language specific tables for French and Spanish Command:

./MLS_ofsaaai.sh MES

MLS

You need to execute the MLS utility with this parameter in order to pseudo-translate the translatable attributes of user-defined metadata objects. For example, this will copy Names and Descriptions as placeholders in rows for other installed languages.

See the above list of MLS-enabled OFSAAI object types. After installation of 8.0.0.0.0 release for any application, the base metadata and translatable data for these object types will have rows for US (American English) only. Executing the utility with the MLS parameter will duplicate the translatable attributes of the metadata objects for other installed locales.

Command:

./MLS_ofsaaai.sh MLS

Multilingual Support (MLS) architecture has been enabled by segregation of the metadata definitions into non-translatable content (such as Codes), and translatable content (such as Names and Descriptions) for the en_US and other installed languages. The object information has been organized with a single row of base information (containing non-translatable attributes) and multiple associated language rows for holding translatable content (one for each language including a row for en_US.).
For example, you have a Hierarchy which has been defined in en_US (US English) language and then you install 8.0.0.0.0 language packs for 2 more languages, say fr-FR (French), and es-ES (Spanish). Post execution of the utility with the MLS parameter, the same Hierarchy rule will be available in the two additional languages that you have installed. You can then log into each locale (language) and edit the Hierarchy definition to enter translated text for the Hierarchy Name and Description.

Before you run the utility, you will have only one row for English, for example:

```
LANGUAGE=US, Description="Organization Hierarchy – Level 1", SOURCE_LANG=US
```

After you run the utility, you will have two more rows: One for French, and one for Spanish:

```
LANGUAGE=FR, Description="Organization Hierarchy – Level 1", SOURCE_LANG=US
LANGUAGE=ES, Description="Organization Hierarchy – Level 1", SOURCE_LANG=US
```

That is, the utility has created a copy of the source row for each target language. The source language in each row is American English (US), the Description data is American English, and the LANGUAGE column contains the target language code. The Hierarchy rule will be available when you log in with any of the above languages. For example, if you log in with French, you can select and edit the object definition, then update the Name and Description to a French translation of the text.

**NOTE:** As in the above example, running with MLS is necessary for objects (such as a Hierarchy rule) that exist in OFSAAI 8.0.0.0.0 (or later release) prior to applying a language pack for a new locale. If you create a Hierarchy after you apply the language pack, OFSAAI will automatically replicate text (such as Name and Description) into the new locale.

### 13.2.1 AAPII.sh Utility

AAPII.sh utility can be executed instead of executing MLS utility with different parameters. This utility will internally call the MLS utility in the following order:

```
./MLS_ofsaai.sh MIG
./MLS_ofsaai.sh MLS
./MLS_ofsaai.sh MES
```

To execute this utility:

1. Navigate to $FIC_HOME/Post_AAI_Migration directory of OFSAAI APP tier.
2. Execute command:

```
./aaipi.sh
```
You can find the log file Post_AAI_Migration.log in the following location
$FIC_HOME/Post_AAI_Migration/logs/.

13.3 Transferring Batch Ownership

A procedure called TRANSFER_BATCH_OWNERSHIP is available in Configuration Schema to
transfer the batch ownership of specific batches in an information domain or across information
domains.

To execute the procedure:

1. Login to Configuration Schema.
2. Execute the procedure TRANSFER_BATCH_OWNERSHIP by entering following command:

   begin
   AAI_TRANSFER_BATCH_OWNER.TRANSFER_BATCH_OWNERSHIP
   ('<fromuser>', '<touser>', '<batchid>', '<infodom>');
   end;

   <fromuser> - Specify the ID of the user whose batch ownership you want to transfer.
   <touser> - Specify the ID of the user to whom the ownership has to be transferred.
   <batchid> - This is an optional parameter. Specify the ID of the batch whose ownership you
   want to transfer. If <batchid> is not specified, all batches owned by the <fromuser> will be
   transferred to the <touser>.
   <infodom> - This is an optional parameter. Specify the information domain name if ownership
   of all batches in that information domain needs to be transferred to the <touser>. If
   <infodom> is not specified, ownership of batches across all information domains will be
   transferred.

   For example,

   To transfer a single batch ownership, execute the following command:

   begin
   AAI_TRANSFER_BATCH_OWNER.TRANSFER_BATCH_OWNERSHIP
   ('<fromuser>', '<touser>', '<batchid>');
   end;

   To transfer all batch ownerships across infodoms, execute the following command:

   begin
   AAI_TRANSFER_BATCH_OWNER.TRANSFER_BATCH_OWNERSHIP
   ('<fromuser>', '<touser>');
   end;

   To transfer all batches in a specific infodom, execute the following command:
begin
AAI_TRANSFER_BATCH_OWNER.TRANSFER_BATCH_OWNERSHIP
  ('<fromuser>','<touser>','','<infodom>');
end;

13.4 Database Password Reset/Change

The database password for config schema and atomic schema should be changed periodically for security. The following configurations are required on changing the database passwords:

For changing CONFIG schema password:
1. Log in to the database and change the config schema password.
2. Log in to the OFSAA server.
3. Stop all OFSAA services.
4. Delete Reveleus.sec from FIC_HOME/conf.
5. Restart OFSAA service in foreground (without the nohup option).
6. Enter the latest config schema password when you are prompted at the console.

For changing the ATOMIC schema password:
1. Ensure the OFSAA services are running and application can be accessed.
2. Log in to the database and change the ATOMIC schema password.
3. Log in to the OFSAA application as any user with System Administrator privilege.
4. Navigate to System Configuration and Identity Management > Administration and Configuration > Database Details.
5. Modify the Password field with the new password and click Save. For more information, see OFSAAI User Guide.
6. Navigate to Data Management Framework > Data Sources.
7. Select the appropriate Data Source pointing to the ATOMIC Schema for which the password was reset from the Data Sources tree.
8. Click Edit.
9. Modify the Password field with the new password and click Save. For more information, see OFSAAI User Guide.
Resource Reference/ JNDI connection details

On change of the CONFIG/ ATOMIC schema passwords, the corresponding Resource Reference/ JNDI connection entries made in the Web Application Servers need to be updated.

- For Tomcat Web Server.
  - Stop the Tomcat Server.
  - Update the Server.xml file present in $CATALINA_HOME/conf with the latest config schema and atomic schema passwords.

- For WebSphere / WebLogic
  - Access the server specific “Admin” console.
  - Log in to the server with Administrative privileges.
  - Update DataSources with the latest config schema and atomic schema passwords. For more information, refer the Configuring Resource Reference sections in Appendix B in OFS AAII Application Pack Installation and Configuration Guide available in OHC Documentation Library.

13.5 HTTPS Protocol

HTTP Secure (HTTPS) is an extension of the Hypertext Transfer Protocol (HTTP) for secure communication over a network.

To change protocol from HTTP to HTTPS, follow these steps:

1. Create SSL related certificates and import to respective servers.
2. Enable SSL on a desired Port (example 9443) on your existing and already deployed web application servers.
3. Execute PortC Utility to change the Servlet port to hold new SSL port and Servlet Protocol from http to https. For details, see Changing IP/ Hostname, Ports, Deployed paths, Protocol of the OFSAA Instance.
4. When SSL/TLS is configured on Java 7, navigate to $FIC_HOME/utility/Migration/bin path and modify the ObjectMigration.sh file as given:

   $JAVA_BIN/java $X_ARGS_OBJMIG -Dhttps.protocols=TLSv1.2 -classpath $_CLASSPATH $MAIN_JAVA_CLASS $MIGRATION_HOME>$LOG_FILE

   NOTE: For more information, see the link: https://bugs.openjdk.java.net/browse/JDK-8151387.
13.6 Changing IP/Hostname, Ports, Deployed paths of the OFSAA Instance

The Port Changer utility can be used to change IP/Hostname, Ports, and Deployed paths of the OFSAA instance.

Prerequisite

- You should have minimum version as OFSAAI 8.0.
- Ensure `RevLog4jConfig.xml` is configured with default log paths before executing the utility. For more information, see *How to Find and Maintain OFSAA and OFSAAI Log and Configuration Files* (Doc ID 1095315.1) available in *My Oracle Support*.

Running Port Changer Utility

**NOTE:** The instructions in this section are not applicable to OFSAAI 8.0.2.2.0, 8.0.3.3.0, 8.0.4.2.0 and 8.0.5.1.0. For information on Running Port Changer Utility for the versions mentioned previously, see *Running Port Changer Utility for 8.0.2.2.0, 8.0.3.3.0, 8.0.4.2.0, and 8.0.5.1.0*.

1. Navigate to `$FIC_HOME` folder on Target.
2. Run the `PortC.jar` utility using command:

   ```
   java -jar PortC.jar DMP
   ```

   A file with the name `DefaultPorts.properties` will be created under `$FIC_HOME` directory which will contain the ports, IPs and paths currently being used.

   **NOTE:** It is mandatory to run the Port Changer utility using the DMP parameter every time before executing the utility using UPD command.

3. Make the necessary changes to those ports, IPs, and paths in the `DefaultPorts.properties` file as per the Target environment. Save the changes.
4. Run the `PortC.jar` utility using the command:

   ```
   java -jar PortC.jar UPD
   ```

   This will change the ports, IPs and paths in `.profile` (under home directory), all files under `$FIC_HOME` directory, and tables in the database according to the values mentioned in `DefaultPorts.properties` file.

Running Port Changer Utility for 8.0.2.2.0, 8.0.3.3.0, 8.0.4.2.0 and 8.0.5.1.0

1. Navigate to `$FIC_HOME/utility/PortC/bin` folder on Target.
2. Run the `PortC.sh` utility using command:

   ```
   ./PortC.sh DMP
   ```

   A file with the name `DefaultPorts.properties` will be created under `$FIC_HOME` directory which will contain the ports, IPs and paths currently being used.
NOTE: It is mandatory to run the Port Changer utility using the DMP parameter every time before executing the utility using UPD command.

3. Make the necessary changes to those ports, IPs, and paths in the DefaultPorts.properties file as per the Target environment. Save the changes.

4. Run the PortC.sh utility using the command:

```bash
./PortC.sh UPD
```

This will change the ports, IPs and paths in .profile (under home directory), all files under $FIC_HOME directory, and tables in the database according to the values mentioned in DefaultPorts.properties file.

### 13.7 Configure Stylesheet

You will have two stylesheets theme or UI skin as mentioned below:

- Default Existing Blue theme (stylesheetAAI)
- New White & Red Theme (stylesheetAAI2) - This is configurable.

By default, the existing Blue theme is selected.

The steps to configure the new white & red theme are as follows:

1. Set the paraname key DEFAULT_AAICSS_INFO in the Configuration table to ‘stylesheetAAI2’. The paraname value for default theme is ‘stylesheetAAI’.
2. Restart the OFSAAI services.

### 13.8 LDAP Configuration

This section is not applicable for Release 8.0.4.0.0 and later. The functionality is now available from the user – interface of the OFSAAI application and you can see the LDAP Configuration section in the OFSAAI User Guide 8.0.4.0.0 for more information.

This section details about the configuration required if you want to use LDAP (Lightweight Directory Access Protocol) authentication for logging on to Infrastructure.

Before doing the following configuration, it is required to select the Authentication Type as LDAP Authentication and SMS Authorization in the Configuration window of Infrastructure. For more information, see Configuration section in the OFSAAI User Guide.

#### 13.8.1 Prerequisites

- LDAP system should be installed successfully.
- One set of LDAP User credentials which can perform search on complete LDAP system and retrieve user details.
**NOTE:** Password for this user should never expire.

- Ensure the following entries are present in the Configuration Schema:

<table>
<thead>
<tr>
<th>PARAMNAME</th>
<th>Description</th>
<th>PARAM Value Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTHENTICATIONTYPE</td>
<td>Authentication type</td>
<td>3 - AUTHENTICATIONTYPE value must be 3 for LDAP.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This is populated from the value entered in the Authentication Type drop-down list in the Configuration window.</td>
</tr>
<tr>
<td>ROOTCONTEXT</td>
<td>The Root Context for the LDAP Directory.</td>
<td>dc=&lt;OFSAI&gt;, dc=com</td>
</tr>
<tr>
<td>ROOTDN</td>
<td>The Root dn for LDAP directory</td>
<td>cn=&lt;Manager&gt;, dc=&lt;Reveleus&gt;, dc=com</td>
</tr>
<tr>
<td>ROOTPASS</td>
<td>Password for the Root</td>
<td>&lt;secret&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This is populated from the value entered in the LDAP Password field in the Configuration window.</td>
</tr>
<tr>
<td>LDAPURL</td>
<td>LDAP URL</td>
<td><a href="">ldap://192.0.2.1:1234/</a></td>
</tr>
<tr>
<td>LDAPSERVERURL</td>
<td>LDAP Server URL</td>
<td><a href="">ldap://192.0.2.2:1234/</a></td>
</tr>
<tr>
<td>LDAP_SSL_MODE</td>
<td>LDAP in SSL Mode</td>
<td>N for non-SSL and Y for SSL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This is populated from the value selected for the LDAP SSL Mode checkbox in the Configuration window.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> If LDAP_SSL_Mode is Y, SSL certificate needs to be imported to the JVM used by OFSAAI Server.</td>
</tr>
<tr>
<td>PARAMNAME</td>
<td>Description</td>
<td>PARAM Value Example</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>HASHPASS</td>
<td>Should the user password be Hashed</td>
<td>FALSE or TRUE. When HASHPASS is set as FALSE, we need to have the ROOTDN value as &quot;uid=ORCLADMIN, ou =Users, dc=OFSAAI, dc=com&quot;. ORCLADMIN is a dummy user, it will be replaced dynamically with the logged in user. When HASHPASS is set as TRUE, we need to have the ROOTDN value as &quot;cn=orcladmin, cn=Users, dc=i-flex,dc=com&quot; and proper ORCLADMIN LDAP password as ROOTPASS. First OFSAAI connects to LDAP directory using orcladmin user and fetches the login user details and verifies the entered password.</td>
</tr>
<tr>
<td>RETRIEVE_DN</td>
<td>To retrieve Distinguished Name</td>
<td>TRUE RETRIEVE_DN value can be FALSE if both login user id and CN value in LDAP system are the same, and all LDAP users are present under same directory structure.</td>
</tr>
</tbody>
</table>

**NOTE:** ROOTCONTEXT, ROOTDN, and ROOTPASS entries should be same as in the slapd.conf file.

### 13.8.2 Configure LDAP Properties File

The LDAPProperties.properties file is present in the $FIC_HOME/ficapp/common/FICServer/conf folder. Modify the following parameters in the Properties file:

- **GROUPDN_USER** – Should be ROOTCONTEXT value.
- **USER** - Should be User/Person (LDAP User Object Class).
- **USER_ID** – Should be uid/cn/sAMAccountName (which LDAP user attribute is equivalent of OFSAAI login user id).
- **USER_NAME** - Should be name/givenName/displayName (Which LDAP user attribute is equivalent of OFSAAI login user name).
• DISTINGUISHED_NAME - Should be dn/distinguishedName. (Which LDAP user attribute represents distinguished name).

13.8.3 Configure OpenLDAP Files


2. Copy the Domains.ldif and Reveleus.ldif files from <Infrastructure Installation Directory>/ficapp/common/FICServer/conf/LDAP_LDIF folder to OpenLDAPServer folder.

NOTE: Make sure that the ROOTCONTEXT in the Domains.ldif and Reveleus.ldif files are the same as slapd.conf file.

3. Provide the appropriate entries for ROOTDN, ROOTPASS, and ROOTCONTEXT in slapd.conf file in the OpenLDAPServer folder.

4. Add the text "include schema/reveleusSchema.schema" as the first line of the slapd.conf file

NOTE: The aforementioned steps of the configuration are for OpenLDAP Server only. If you need to configure Infrastructure for any other LDAP Server, you will have to make the changes appropriately.

5. In the command prompt, navigate to the LDAP installation directory and execute the following command:

   ldapadd -D"ROOTDN" -w ROOTPASS -f/data/Reveleus.ldif

This is for creating the entries for Users, User Groups, Functions, Profiles, Segments, Domains, Roles, and HolidayMaster in the Data information Tree of LDAP.

6. Make an entry in the Domains.ldif file for each Information Domain that is created through the Infrastructure UI.

7. To add an entry corresponding to the new Information Domain to the Domains.ldif file, add the following block of text with the appropriate values:

   NOTE: DSNID refers to Information Domain name.

   dn: DSNID=<DSN ID>,ou=Domains,@LDAP_DIRECTORY_ROOTCONTEXT@
   changetype: add
   mappedsegments: <Mapped segments/>
   dsnid: <DSN ID>
   infodomname: < Information Domain Name>
   objectClass: Infodom
objectClass: top
infodomdescription: < Information Domain Description>

Example:

dsni: DSNID=FUSIONMOCK, ou=Domains, dc=FTP1,dc=com
mappedsegments: ~
sni: FUSIONMOCK
infodomname: FUSIONMOCK
objectClass: Infodom
objectClass: top
infodomdescription: FUSIONMOCK

8. Navigate to LDAP installation directory and execute the following command:

```
D"ROOTDN" -w ROOTPASS -f/data/Domains.ldif
```

**NOTE:** You can add entries for multiple Information Domains at the same time.

### 13.8.4 Migrate Data from CSSMS tables to LDAP server and from LDAP to SMS

If you are using LDAP authentication, it is required to migrate all the details from the CSSMS table, which contains the information entered using the Infrastructure Identity Management module to the LDAP Server. Similarly, you can migrate the details from LDAP to SMS.

To migrate data from the CSSMS tables to LDAP server and vice versa:

1. **Invoke the LDAP_Migration.sh file in**
   `$FIC_HOME/MigrationUtilities/Migration_LDAP/bin` folder. The *Select Source & Destination for Migration* window is displayed with the option to migrate the data from SMS to LDAP and vice versa.

   ![Select Source & Destination for Migration](select-source-destination.png)

2. Select the **SMS to LDAP** option to migrate from SMS to LDAP or select the **LDAP To SMS** option to migrate from LDAP to SMS and click **OK**. The *Select Entities to Migrate* window is displayed.
You can select the data that you wish to migrate such as Users, User Groups, Functions, Roles, Segment, Profiles, Holiday Master, Function Role Maps, User - User Group Maps, User Group Role Map, and User Group- Domain Map.

3. Select the entities that you wish to migrate and click **Migrate**. The data is migrated and a confirmation dialog is displayed.

You can verify the data migrated to LDAP server through the LDAP Browser and the data migrated to SMS in the OFSAAI tables.

**NOTE:** You should also enter the passwords for all the users since the passwords are not migrated in migration process.

### 13.9 Using X-Frame-Options to Embed OFSAA Content on your Site

By default, the OFSAA configuration does not allow you to embed OFSAA content on your site. However, you can modify the web.xml file to enable this option. For more information about X-Frame-Options, see [https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/X-Frame-Options](https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/X-Frame-Options).

#### 13.9.1 Knowing the Prerequisites

The following are the prerequisites to configure X-Frame-Options to embed OFSAA content on your site:

1. You can embed the OFSAA content only on the following browsers that support X-Frame-Options headers:

<table>
<thead>
<tr>
<th>Number</th>
<th>Browser</th>
<th>DENY and SAMEORIGIN Support</th>
<th>ALLOW-FROM Support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Introduced Version</td>
<td>Introduced Version</td>
</tr>
</tbody>
</table>

| Introduced Version |

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### 13.9.2 Enabling or Disabling X-Frame-Options in the web.xml File

You have to change the default OFSAA setting for X-Frame-Options from **SAMEORIGIN** to **ALLOW-FROM** in the `web.xml` file to embed OFSAA content on your site.

The following is the procedure to modify the `web.xml` file:

1. Open the `web.xml` file in an editor.
2. Search for the following tag:
   ```xml
   <filter>
     <filter-name>FilterServlet</filter-name>
     <filter-class>com.iflex.fic.filters.FilterServlet</filter-class>
   </filter>
   ```
3. Add the following tag before the tag shown in the preceding step:
   ```xml
   <filter>
     <filter-name>FilterServletAllowFrom</filter-name>
     <filter-class>com.iflex.fic.filters.FilterServlet</filter-class>
     <init-param>
       <param-name>mode</param-name>
       <param-value>ALLOW-FROM https://example.com/</param-value>
     </init-param>
   </filter>
   ```
4. Replace `https://example.com/` with the URL of your site and replace `/url1` with the OFSAA relative URL. This embeds OFSAA content on your site.
13.10 Configuration for Tomcat

To stop generating static content with one print statement per input line, you need to configure the web.xml file.

To configure web.xml file, perform the following steps:

1. Navigate to tomcat/conf folder.
2. Edit web.xml file as explained below:
   
   Set the mapped file parameter to False in the servlet tag mentioned with
   <servlet-name>jsp</servlet-name>.
   
   <init-param>
   <param-name>mappedfile</param-name>
   <param-value>false</param-value>
   </init-param>

13.11 Configuring WebLogic

This section provides information for generic configurations required for OFSAA deployed on WebLogic server.

13.11.1 Knowing the Prerequisites for OFSAA on WebLogic

Download and install the one-off patch 25343603 from My Oracle Support if OFSAA is deployed on Oracle WebLogic Server version 12.2.x. See the Readme available with the patch for further instructions on installing the patch.

NOTE: See the Technology Matrix for a list of supported servers for OFSAAI 8.x.

13.11.2 Configuring WebLogic for REST Services Authorization

Configure the following in WebLogic to enable REST API authorization by OFSAA:

1. Open the config.xml file located in the domain where OFSAA is deployed.
2. Directory: <domain_home>/config/config.xml
3. Add the following in the security-configuration tag:
   
   4. <enforce-valid-basic-auth-credentials>false</enforce-valid-basic-auth-credentials>

5. Disable Encrypt Login Password on the Configuration screen.
NOTE: To disable Encrypt Login Password, see the Configuration section in the OFS Analytical Applications Infrastructure User Guide.

13.12 SSO Authentication (SAML) Configuration

This feature has been introduced in 8.0.3.0.0 release.

OFSAI can be configured as “Service Provider” using SAML 2.0 protocol. Following is the configuration required if you want to register OFSAI as Service Provider.

To register OFSAI as Service Provider, update sp_metadata.xml file which is located in $FIC_HOME/conf/ folder.

```xml
<md:EntityDescriptor xmlns:md="urn:oasis:names:tc:SAML:2.0:metadata" entityID="$ENTITYID$">
  <md:SPSODescriptor protocolSupportEnumeration="urn:oasis:names:tc:SAML:2.0:protocol">
    <md:NameIDFormat>urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified</md:NameIDFormat>
    <md:AssertionConsumerService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST" Location="$CONSUMERSERVICEURL$" index="0"/>
  </md:SPSODescriptor>
</md:EntityDescriptor>

- $ENTITYID$ - OFSAI URL till context name.
  
  For example, http(s)://hostname:port/<context>

- $CONSUMERSERVICEURL$ - OFSAI login URL
  
  For example, http(s)://hostname:port/<context>/login.jsp

- $LOGOUTSERVICEURL$ - OFSAI logout URL
  
  For example, http(s)://hostname:port/<context>/logout.jsp

OFSAI generated SAMLRequest is unsigned and sent to "Identity Provider (IdP)" using "HTTP Redirect" method. "Identity Provider (IdP)" sends back SAMLResponse using "HTTP POST" method. Authenticated user can be sent as one of the attribute (e.g. "uid") in SAMLResponse or in "Subject".
If user is sent in attribute, same user attribute has to be specified in “SAML User Attribute” in OFSAAI Configuration screen.

If user is sent in subject, then NameID format in SAML response should be “urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified”.

13.13 Public Key Authentication

This section is applicable for versions 8.0.4.0.0 and later.

This section is meant for users who want to configure Public Key Authentication for OFSAAI on UNIX machine.

13.13.1 Prerequisite

You have a working SSH server and client installed.

13.13.2 Setting Up Public Key Authentication on Client Server

Setting up public key authentication to access a particular remote host is a one-time procedure comprising of three steps.

Step 1: Generate a public/private key pair on your webserver.

Use the ssh-keygen command to generate public/private key pair. The key-type flag -t is mandatory, accepting either "rsa" or "dsa" as an argument. In the example given, the -f option is also used to override the default name and location for the resulting private key file.

When prompted for a passphrase, you can enter appropriate phrase or keep it empty.

$ ssh-keygen -t dsa -f ./<KEY_NAME>

The command produces two text files in current folder: The <KEY_NAME> folder contains the private key, and <KEY_NAME>.pub folder contains the public key. The private key must be kept secret. Accordingly, access to private key is restricted to the file owner and its contents are encrypted using the passphrase.

You can recreate <KEY_NAME>.pub from <KEY_NAME> by executing the following command:

$ ssh-keygen -y -f ./<KEY_NAME> > <KEY_NAME>.pub

Step 2: Install the public key on the remote host to which you want to connect.

1. Copy mykey.pub to your home directory on the remote host and append its contents to the authorized_keys file in the .ssh directory. If authorized_keys file is not present in .ssh directory, you can create it manually by executing the following command:

$ scp <key_name>.pub <remote_user>@<remote_host>:<Remote_PATH>

Here, <remote_host> is the IP address of the remote server. <remote_user> is the user name of the <remote_host> to which you want to connect.
2. Log in to remote host by executing the following command:

   $ ssh -l <remote_user> <remote_host>

3. Append public key by executing the command on remote host (Server) to append public key.

   $ cat <KEY_NAME>.pub >> $HOME/.ssh/authorized_keys

   For example:

   $ cat ofsa.pub >> $HOME/.ssh/authorized_keys

   The private key is not installed on any remote host.

   **NOTE:** Set the following permissions on App Server:

   $ chmod -R 755 <remote_user_home>
   $ chmod 700 .ssh
   $ chmod 755 authorized_keys

   **NOTE:** Set the following permissions required on Web Server:

   $ chmod 600 <PRIVATE_KEY>

Step 3: Verify whether Public Key authentication works from Web Server

Public Key authentication is invoked by using the -i flag with the ssh command, specifying <PRIVATE_KEY_PATH> as the flag's argument.

Execute the following command from Web Server to check remote App Server:

   $ ssh -x -l <REMOTE_USER> -i <PRIVATE_KEY_PATH> <REMOTE_HOST>

   For example:

   $ ssh -x -l ofsaaweb -i
   /scratch/oracle/Oracle/Middleware/Oracle_Home/user_projects/domains/AAI
   AKG/MYKey/ofsa whf00akg

   <PRIVATE_KEY_PATH> is the fully qualified name of the private key file.

   **NOTE:** If you see a password prompt instead of a passphrase prompt, the administrators of the remote host may have disallowed public key authentication.

13.13.3 Other SSH Software

Refer the documentation of SSH software for Configuration of Public Key Authentication.
If you want to use Public Key authentication on other SSH software such as Tectia, you have to convert private key file to OpenSSH format.

**NOTE:** You can use Tectia SSH if your application server and web server are running on the same machine. However, if they are on separate machines, you have to convert the private key file to OpenSSH format.

Use the following command to convert private key to OpenSSH format:

```
ssh-keygen -i -f [filename] (key must be unencrypted)
```

If key is encrypted, perform the following steps:

1. Convert private key to OpenSSH format.

2. Change passphrase using the following OpenSSH command:

   ```
   $ ssh-keygen -f <PRIVATE_KEY_PATH> -p
   <private_key_path> refers to path where private key is located including private key name.
   ```

### 13.13.4 Configurations Required in OFSAI Setup

1. Navigate to **System Configuration & Identity Management** tab, expand **Administration and Configuration > System Configuration** and select **Application Server**.

2. In the **Application Server Details** window, click **Modify**.

3. Select **Authentication Type** as **Publickey Auth.**

4. Click **Save**.

5. A confirmation message is displayed to inform that you need to provide the PKI details in the **Web Server Details** window. Click **OK**.
6. Click **Web Server** from the LHS menu. The *Web Server Details* window is displayed.

If you have selected **Authentication Type** as **Public Key Auth** in the *Application Server Details* window, the **PKA Details** check box gets automatically selected and the **PKI Details** pane is displayed.

7. Click **Modify**.

8. Enter **Private Key Path** and **Passphrase** which you created during Step 1.

9. Click **Save**.

### 13.14 Enable and Disable Users

*Note: This feature is applicable to OFSAA 8.0.4.0.0 and later releases.*

The users with System Administrator (sysadmn) and System Authorizer (sysauth) functional roles can be enabled or disabled using the command line prompt. Only users with the requisite administrator role to perform this action can disable or enable users with sysadmn and sysauth roles.

#### 13.14.1 Prerequisites

The following prerequisites must be met before you proceed with the password reset:

- Check if the Authentication Type selected is **SMS Authentication & Authorization**. Enabling and disabling users does not work for other authentication types. For more details, see the information on **Authentication Type** field in the **Configuration** subsection in **System Configuration** in the [OFS Analytical Applications Infrastructure User Guide](#).

- Check if Security Questions are enabled and configured. For more details, see the information on **Security Questions Enable** field in the **Configuration** subsection in **System Configuration** the [OFS Analytical Applications Infrastructure User Guide](#).
13.14.2 Enabling or Disabling Users with System Administrator and System Authorizer Roles

Perform the following procedure to enable or disable a sysadmn or sysauth user:

1. Open the Command Prompt window and go to the folder
   FIC_HOME/utility/useraction/bin.

2. Execute the following command:
   ./useraction.sh <ACTION ON USER> <OPERATION>
   For example:
   To disable a user:
   ./useraction.sh johnsmith disableuser
   To enable a user:
   ./useraction.sh johnsmith enableuser

3. A prompt (Please Enter Action by User) appears, which requires that you enter your
   User Id. Your User ID must have the requisite role with permissions to perform the
   enable or disable action. Enter the User ID and the three questions for authentication
   appear. Enter the correct answers to complete the password reset.

   The following illustration displays a disable user action:

   ![Illustration of user action]

13.15 Password Reset

Note: This feature is applicable for OFSAA 8.0.4.0.0 and later releases.

The password for users can be reset from the command prompt. Only users with the requisite
administrator role can perform this action.

13.15.1 Prerequisites

The following prerequisites must be met before you proceed with the password reset:

- Check if the Authentication Type selected is SMS Authentication & Authorization.
  Password reset does not work for other authentication types. For more details, see the
  information on Authentication Type field in the Configuration subsection in System
  Configuration in the OFS Analytical Applications Infrastructure User Guide.
• Check if Security Questions are enabled and configured. For more details, see the information on Security Questions Enable field in the Configuration subsection in System Configuration in the OFS Analytical Applications Infrastructure User Guide.

13.15.2 Resetting a User Password

Perform the following procedure to reset the password for a user:

1. Open the Command Prompt window and go to the folder
   FIC_HOME/utility/userpasswdreset/bin.
2. Execute the following command:
   ./resetpass.sh <ACTION ON USER>
   For example:
   ./resetpass.sh johnsmith
3. A prompt (Please Enter Action by User) appears, which requires that you enter your User ID. Your User ID must have the requisite role with permissions to perform the password reset action. Enter the User ID to display the three questions for authentication. Enter the correct answers to complete the password reset.
   The following illustration displays a password reset on the command prompt that was successful:

   ![Password Reset Successful](image)

   The following illustration displays a password reset that was not successful since the environment did not meet the authentication type prerequisite - SMS Authentication and Authorization:

   ![Password Reset Not Successful](image)
13.16 Configuring OFSAA OIM Connector

Note: This feature is applicable for OFSAA Release 8.0.4.1.0, 8.0.5.0.1 and 8.0.5.1.0.

OFSAA OIM Connector is used for provisioning users in the Oracle Financial Services Analytical Applications (OFSAA) from Oracle Identity Manager (OIM). For information on OIM, see http://www.oracle.com/technetwork/middleware/id-mgmt/overview/index-098451.html.

This section provides information to configure the OFSAA Connector with OIM. The connector supports OIM versions 11.1.2.2 and 11.1.2.3 on WebLogic Server. This section also provides information on configuring Entitlements.

13.16.1 Knowing the Prerequisites

The following are the prerequisites for this configuration:

1. You must have the user credentials with which you installed IDM Suite.
2. You must have the user credentials with which you installed OFSAA 8.0.4.1.0 AAI ML.
3. You must download and install the one-off patch 26531002 from My Oracle Support.

**NOTE:** The installation of the preceding one-off patch is required only for OFSAA Release 8.0.4.1.0. Skip this step for other releases.

4. You must have the host information for OIM and OFSAA server(s).

13.16.2 Configuring the Connector

This section provides information to configure the OFSAA Connector with OIM that enables mapping of policies from OFSAA and user configuration.

The following steps describe the procedure to configure the OFSAA OIM Connector:
1. Log in to the OFSAA host with your OFSAA user credentials.
   a. Navigate to $FIC_HOME/utlity.
   b. Copy the OFSCConnector directory to your local system.

2. Log in to the OIM host with OIM user credentials.

3. Copy the OFSCConnector directory from your local system to $OIM_ORACLE_HOME/connectors.

4. Check and ensure that the following environment variables are set in the OIM host:
   - JAVA_HOME= <Path to Java Dir>
     For example, /u01/java/jdk1.7.0_91
   - MW_HOME= <Middleware Home Path>
     For example, /u01/oracle/products/fmw/10.3.6
   - WL_HOME= <Weblogic Home Dir>
     For example, $MW_HOME/wlserver_10.3
   - LD_LIBRARY_PATH= <Webtier lib path>
     For example, /u01/oracle/products/fmw/Oracle_WT1/lib
   - APP_SERVER= <App server>
     For example, weblogic/websphere
   - OIM_ORACLE_HOME= <OIM install dir>
     For example, /u01/oracle/products/fmw/10.3.6/Oracle_IDM
   - DOMAIN_HOME= <OIM Domain path>
     For example, /u01/oracle/domains/idm_domain
   - ANT_HOME= <Ant Home>
     For example, $MW_HOME/modules/org.apache.ant_1.7.1
   - PATH= $JAVA_HOME/bin:$ANT_HOME/bin:$PATH:$OIM_ORACLE_HOME/OPatch

5. Generate wfullclient.jar by using the following procedure:
   a. Navigate to the $DOMAIN_HOME/bin directory and run the following command:
      ./setDomainEnv.sh
   b. Navigate to the $WL_HOME/server/lib directory and run the following command:
      java -jar wljarbuilder.jar
c. Copy the newly created \texttt{wlfullclient.jar} from \texttt{$WL\_HOME/server/lib} to the path \texttt{$OIM\_ORACLE\_HOME/designconsole/ext}.

6. Execute the following command from the \texttt{$OIM\_ORACLE\_HOME/server/bin} directory to upload the OFSAA connector to OIM:

\begin{verbatim}
sh UploadJars.sh -username << Xellerate admin username>> -password << admin password>> -serverURL << serverURL>> -ctxFactory << context>> -ICFBundle <<Full path of OFS connector>>
\end{verbatim}

\textbf{For example},

\begin{verbatim}
sh UploadJars.sh -username xelsysadm -password Welcome1 -serverURL t3://whf00aum:14000 -ctxFactory weblogic.jndi.WLInitialContextFactory -ICFBundle /scratch/software/weblogic10.3.6/iam/connectors/OFSConnector/org.identityconnectors.ofs-1.0.0.jar
\end{verbatim}

\textbf{Note}: \texttt{ctxFactory} value is \texttt{weblogic.jndi.WLInitialContextFactory} for WebLogic and \texttt{com.ibm.websphere.naming.WsnInitialContextFactory} for WebSphere.

7. Navigate to the \texttt{$OIM\_ORACLE\_HOME/server/plugin_utility} directory and set the following values in the \texttt{ant.properties} file:

\begin{verbatim}
wls.home=<Path to WebLogic Server Dir>
\end{verbatim}

\textbf{For example}, \texttt{/u01/oracle/products/fmw/10.3.6/wlserver_10.3}

\begin{verbatim}
oim.home=<OIM Home Path>
\end{verbatim}

\textbf{For example}, \texttt{/u01/oracle/products/fmw/10.3.6/Oracle_IDM/server}

\begin{verbatim}
login.config=<Login Configuration File Home Path>
\end{verbatim}

\textbf{For example}, \texttt{{$oim.home}/config/authwl.conf}

\begin{verbatim}
mw.home=<Middleware Home Path>
\end{verbatim}

\textbf{For example}, \texttt{/u01/oracle/products/fmw/10.3.6}

8. Execute the following command from the \texttt{$OIM\_ORACLE\_HOME/connectors/OFSConnector/} directory and upload the schedule task in OIM:

\begin{verbatim}
sh deploySchTask.sh -username << Xellerate admin username>> -password << admin password>> -serverURL <<oim_server_url>> -id <<OFSAA_ID>>
\end{verbatim}

\textbf{For example},

\begin{verbatim}
sh deploySchTask.sh -username xelsysadm -password Welcome1 -serverURL t3://whf00aum:14000 -id DEV
\end{verbatim}
9. Upload the OFSAA Connector metadata to OIM by executing the following command from the 
$OIM\_ORACLE\_HOME/\texttt{connectors/OFSC}onnector$ directory:
```
sh ImportMetadata.sh <xellerate admin username> <admin password> <oim_server_url> OFS-ConnectorConfig_<OIM\_VERSION>.xml <OFSAA\_ID> <OFS\_USER> <OFS\_PASSWD> <OFS\_URL>
```

**Note:**
1. For SSO, `<OFS\_USER >` is a valid OIM user. If the setup is non-SSO, then `<OFS\_USER>` is SYSADMN.
2. Based on the OIM version 11.1.2.2 or 11.1.2.3, select the appropriate version of the files to upload.

**For example,**
```
$OIM\_ORACLE\_HOME/\texttt{connectors/OFSC}onnector/ImportMetadata.sh xelsysadm
Welcome t3://whf00aum:14000 OFS-ConnectorConfig_11.1.2.2.xml DEV
sysadmn password http://whf00abc:7001/ofsa
```

If the file upload from the shell script is successful, the following message is printed:
```
File imported successfully: OFS-ConnectorConfig_11.1.2.2.xml
```

10. For other OFSAA environments such as DEV, UAT and PROD, use the following command to create IT Resource and Access Policy:
```
sh ImportMetadata.sh <xellerate admin username> <admin password> <oim_server_url> OFS-ITResource_<OIM\_VERSION>.xml <OFSAA\_ID> <OFS\_USER> <OFS\_PASSWD> <OFS\_URL>
```

**Note:**
1. For SSO, `<OFS\_USER >` is a valid OIM user. If the setup is non-SSO, then `<OFS\_USER>` is SYSADMN.
2. `<OFSAA\_ID>` should always be unique for each environment. For example, UAT01.
3. Based on the OIM version 11.1.2.2 or 11.1.2.3, select the appropriate version of the files to upload.

**For example,**
```
$OIM\_ORACLE\_HOME/\texttt{connectors/OFSC}onnector/ImportMetadata.sh xelsysadm
Welcome t3://whf00aum:14000 OFS-ITResource_11.1.2.2.xml UAT sysadmn password http://whf00xyz:7001/ofsa
```

11. Set the System Property `XL.AllowAPHarvesting` to TRUE. See the following steps for the procedure to set the property:
   a. Log in to the SYSADMIN console.
   b. Click System Configuration to view System Properties.
c. Enter **XL.AllowAPHarvesting** in **Search System Properties** and click to view the property name in the search results pane.

d. Click **Allows access policy based provisioning of multiple instances of a resource** in the results pane to view the **System Property Detail: Allows access policy based provisioning of multiple instances of a resource** window.

e. Enter **TRUE** in the **Value** field.

f. Click **Save**.

g. Restart the OIM Server.

![Image](image.png)

**NOTE:** Further instructions apply only if SSO is configured in OFSAA. If you use Native Authentication, skip these instructions and proceed to **Configuring Entitlements**.

12. Upload the OAM Policy file to set the authentication for REST APIs, which the OFSAA Connector uses. The following is the procedure to upload:

   a. Edit the **oam-policies.xml** file in a text editor. Replace the placeholders `${OHS_PORT}`, `${OHS_HOST}`, and `${IDM_HOST}` with the respective values of OHS Port, OHS Host Name, and IDM Host Name of the server where the IDM is hosted and the Oracle HTTP Server (OHS) is configured.

   b. Execute the command **wlst**. For example, `$OIM_ORACLE_HOME/common/bin/wlst.sh`

   c. Connect to the **OAM Admin server** using the following:

   ```
   wls:/offline
   connect(''<user_id>'','<password>'','t3://'<IDM_HOST>':<ADMIN_PORT>')
   ```

   d. Import the OAM Policies using the following:

   ```
   wls:/idm_domain/serverConfig
   importPolicy(pathTempOAMPolicyFile="/path/oam-policies.xml")
   ```

13. Perform OFSAA User Provisioning Configuration by applying Pre-authentication Advanced Rules to the basic Authorization Policy for users in the system. It is applied from the OAM console after IDM Provisioning and is done to switch to a form-based authentication scheme if the authorization header is not a basic scheme. Update the pre-authentication advanced rules to a form-based authentication scheme using the following steps:

   a. Log in to the **OAM Administrator Console**.
b. From the Launch Pad, click Application Domains from the Access Manager widget. The Application Domain window is displayed.

c. Search for the required application domain for which you want to switch the authentication scheme and click Name from the search results to display the details for the application domain.

d. Click the Authentication Policies tab to view the existing policies in the system.

e. Click Basic Authentication Policy from the list to view the details for the policy.
f. Click **Advanced Rules** tab to view the details for Pre-Authentication.

![Advanced Rules Tab](image)

<table>
<thead>
<tr>
<th>View</th>
<th>Rule Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>validate_header</td>
<td>If Authorization header is not Basic then switch to Form based authentication scheme from Basic scheme</td>
</tr>
</tbody>
</table>

g. Click the **Add** button and create a rule with the following information:

- **Rule Name**: validate_header
- **Description**: If Authorization header is not Basic then switch to Form based authentication scheme from Basic scheme
- **Condition**: `str(request.requestMap['Authorization']).lower().find('basic') == -1`
- **Switch Authentication Scheme to**: (select LDAPScheme from drop down)

h. Click **Apply** to save.

13.16.3 **Configuring Entitlements**

This section explains how you can provision Entitlements to users in OIM. Users are provisioned with Entitlements to enable them to be grouped for specific privileges, which allows them to perform certain restricted functions.
The subsections in this section provide information for the various operations required to configure Entitlements.

13.16.3.1 Performing User Group and User-User Group Mapping Reconciliation

Performing reconciliation activity creates accounts in OIM, and if a user exists, the OIM account is mapped to the user. If a user doesn’t exist, create the user profile in OIM, where the user login is the same as the user account. This maps the user to the OIM account created during reconciliation.

**NOTE:** If you use OFSAA Native Authentication (SMS), then the password policy for OIM and OFSAA should be the same.

If OFSAA is deployed on WebLogic, then add the following tag in the `security-configuration` tag in the `<domain_home>/config/config.xml` file to enable REST API authorization by OFSAA:

```xml
<enforce-valid-basic-auth-credentials>false</enforce-valid-basic-auth-credentials>
```

The following is the procedure to perform user group reconciliation, and user-user group mapping reconciliation:

1. Log in to OIM SYSADMIN Console.
2. Click Access Policies in Policies from the left menu to view the Manage Access Policies window.
3. Search for server access policy in the window and click the server access policy name to view the Access Policy Information window.
4. By default, **All Users** role is mapped to the server access policy. To create and map Roles to provision specific users, see [https://docs.oracle.com/cd/E40329_01/user.1112/e27151/role_mangmnt.htm#OMUSG3006](https://docs.oracle.com/cd/E40329_01/user.1112/e27151/role_mangmnt.htm#OMUSG3006).

5. Click **System Management** to view the window and click the **Scheduler** tab to view the **Scheduler** window.

6. Enter **OFS** in **Search Scheduled Jobs** and click to view the OFSAA group jobs.


8. Select from **Schedule Type**, the frequency at which you want to run the job. Select one from the following options:
a. **Periodic** - Select this option if you want to run the job at a specific time and on a recurring basis. Enter an integer value in the Run every field in the Job Periodic Settings section and select one of the following values:
   i. mins
   ii. hrs
   iii. days

b. **Cron** - Select this option if you want to run the job at a particular interval and on a recurring basis. For example, you can create a job that runs at 8:00 A.M. every Monday through Friday, or at 1:30 A.M. every last Friday of the month. Specify the recurrence of the job in the Cron Settings section. Select any of the following values in the Recurring Interval field:
   i. Daily
   ii. Weekly
   iii. Monthly on given dates
   iv. Monthly on given weekdays
   v. Yearly
      After selecting a value, you can enter an integer value in the Days between runs field.

c. **Single** - Select this option if you want to run the job only once at a specific start date and time.

d. **No pre-defined schedule** – Select this option if you do not want to create a schedule that triggers the job automatically. To trigger the job, click **Save and Run Now**.

9. Run **OFS {OFSA_ID} Group Search Reconciliation** and check for successful execution of the run.

10. Click **OFS {OFSA_ID} Lookup Search Reconciliation** to view the **OFS {OFSA_ID} Lookup Search Reconciliation** window.
11. Select from Schedule Type, the frequency at which you want to run the job. For description, see Schedule Type.

12. Run OFS (OFSAI_ID) Lookup Search Reconciliation and check for successful execution of the run.

13. Click OFS (OFSAI_ID) User Group Reconciliation to view the OFS (OFSAI_ID) User Group Reconciliation window. Reconcile existing user-group mapping from OFSAA to OIM based on the User Filter field on this window.

14. Select from Schedule Type, the frequency at which you want to run the job. For description, see Schedule Type.

15. Enter the login user name in User Filter to apply the user group reconciliation to. To add more than one user name, separate by using commas (,). Leave the field empty to apply to all users.

13.16.3.2 Provisioning Entitlement Requests

The following is the procedure to provision entitlement requests for Users:

1. Log in to OIM Identity Console.

2. Select the User and click Request Entitlements on the Entitlements window to display the Catalog window. Catalog displays a list of all OFSAA group as Entitlements.

3. Select User and click Add to Cart. Click Checkout to view the Cart Details window.

4. Click Submit. The request is processed for approval. See Approving Request Entitlements for more details.

5. Verify and confirm that the user group mapping is completed in OFSAA. Use the Summary Information window to check the stage that the request is in.
13.16.3.3 Removing Provisioned (Deprovisioning) Entitlements

Remove Entitlements provisioned to users if you want to update the system for changes in user's status.

The following is the procedure to remove entitlements:

1. Log in to OIM Identity Console.
2. Select the User to deprovision and check for status Provisioned to confirm that the User is assigned to an Entitlement. Click Remove Entitlements to display the Remove Entitlements window.
3. Click Submit. The request is processed for approval. See Approving Request Entitlements for more details.
13.16.3.4 Approving Request Entitlements

User submitted entitlement requests are processed for approval. Only a user with approver role can approve and activate the request in OFSAA.

The procedure to approve an entitlement request is in the following:

1. Log in to OIM Identity Console.
2. Click Inbox from the left menu to display the Inbox window with tasks assigned to you.
3. Select the task that requires you to approve and click the Actions drop-down list. Select Approve to approve the Request Entitlement.

13.17 Using REST APIs for user management from third-party IDMs

NOTE: The APIs listed in this topic are available from release 8.0.4.0.0 and later. However, in release 8.0.5 and later, “rest” has been modified to “rest-api” in the REST URLs.

OFSAI provides connectors which integrates with OIM. However, if you want to integrate OFSAI with any other Identity Management (IDM) system, then you have to use the APIs listed in this topic to develop connectors that can connect with OFSAI for user provisioning.

13.17.1 Knowing the Prerequisites

The following are the prerequisites to configure the REST APIs for third-party IDM solutions:

1. The REST APIs referred to in this topic are protected by Basic Authentication, it requires administrator user ID and password to access.
2. To access these services, administrator users should be mapped to the IDMGMTADVN role.
### 13.17.2 Understanding REST API Specifications

The following table provides details for the REST APIs:

<table>
<thead>
<tr>
<th>Number</th>
<th>Requirement</th>
<th>URL</th>
<th>Method</th>
<th>Request</th>
<th>Sample Request JSON</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Create user</td>
<td>/rest-api/idm/service/create/user</td>
<td>POST</td>
<td>JSON</td>
<td><code>{&quot;attributes&quot;:{&quot;user_id&quot;:&quot;user_id&quot;,&quot;user_name&quot;:&quot;user_name&quot;,&quot;user_password&quot;:&quot;password&quot;,&quot;user_start_date&quot;:&quot;start_date&quot;,&quot;user_end_date&quot;:&quot;End_date&quot;,&quot;user_is_authorized&quot;:true/false,&quot;user_is_enabled&quot;:true/false,&quot;user_logon_holiday&quot;:true/false}}</code></td>
<td>All FIELDS are mandatory. Date format is mm/dd/yyyy. If user_is_authorized is set to true, then user is authorized during creation.</td>
</tr>
<tr>
<td>Number</td>
<td>Requirement</td>
<td>URL</td>
<td>Method Type</td>
<td>Request</td>
<td>Sample Request JSON</td>
<td>Comments</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
<td>-----</td>
<td>-------------</td>
<td>---------</td>
<td>---------------------</td>
<td>----------</td>
</tr>
<tr>
<td>2</td>
<td>Update user</td>
<td>/rest-api/idm/service/update/user</td>
<td>POST</td>
<td>JSON</td>
<td>{ &quot;attributes&quot;: { &quot;user_id&quot;: &quot;user_id&quot;, &quot;user_name&quot;: &quot;user_name&quot;, &quot;user_password&quot;: &quot;password&quot;, &quot;user_start_date&quot;: &quot;start_date&quot;, &quot;user_end_date&quot;: &quot;End_date&quot;, &quot;user_is_authorized&quot;: true/false, &quot;user_is_enabled&quot;: true/false, &quot;user_logon_holiday&quot;: true/false } }</td>
<td>All FIELDS are mandatory. Date format is mm/dd/yyyy. If user_is_authorized is set to true, then user is authorized during creation.</td>
</tr>
<tr>
<td>3</td>
<td>Delete User</td>
<td>/rest-api/idm/service/delete/user</td>
<td>POST</td>
<td>TEXT</td>
<td>USERID</td>
<td>User ID is mandatory.</td>
</tr>
<tr>
<td>4</td>
<td>Authorize User</td>
<td>/rest-api/idm/service/authorize/user</td>
<td>POST</td>
<td>TEXT</td>
<td>USERID</td>
<td>User ID is mandatory.</td>
</tr>
<tr>
<td>5</td>
<td>Reinstate user</td>
<td>/rest-api/idm/service/reinstate/user</td>
<td>POST</td>
<td>TEXT</td>
<td>USERID</td>
<td>User ID is mandatory.</td>
</tr>
<tr>
<td>Number</td>
<td>Requirement</td>
<td>URL</td>
<td>Method</td>
<td>Request Type</td>
<td>Sample Request JSON</td>
<td>Comments</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------</td>
<td>----------------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>---------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>6</td>
<td>Map user to group</td>
<td>/rest-apl/idm/service/map/groupmembers</td>
<td>POST</td>
<td>JSON</td>
<td></td>
<td>Mapping of user id to groups.</td>
</tr>
</tbody>
</table>

13.18 Configuring the Logout URL for OBIEE in OFSAA

Note: This feature is applicable for OFSAA Release 8.0.2.2.0, 8.0.4.2.0 and 8.0.5.1.0.

Logging out from OFSAA does not logout a user from Oracle Business Intelligence Enterprise Edition (OBIEE) if the OBIEE Logout URL is not configured in OFSAA.

Perform the following configuration in OFSAA to enable logging out of OBIEE when you logout of OFSAA:

1. Log in to the OFSAA database with CONFIG user credentials:

2. In the database, update the configuration table with the script in the following format:

   ```
   update configuration set paramvalue = '<OBIEE_LOGOUT_URL>' where paramname = 'OBIEE_LOGOUT_URL_VAL';
   
   update configuration set paramvalue = '<IS_CROSSDOMAIN>' where paramname = 'OBIEE_CROSS_DOMAIN_VAL';
   ```

   Replace `<OBIEE_LOGOUT_URL>` with the OBIEE logout URL.

For example,

   ```
   update configuration set paramvalue = 'http://obieehost:port/analytics/saw.dll?Logoff' where paramname = 'OBIEE_LOGOUT_URL_VAL';
   ```

   and
Replace `<IS_CROSSDOMAIN>` with `true` if OBIEE is on another server.

For example,

```
update configuration set paramvalue = 'true' where paramname = 'OBIEE_CROSS_DOMAIN_VAL';
```