Oracle Financial Services Analytical Applications Infrastructure

Installation and Configuration Guide

Release 8.1.2.0.0

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Financial Services

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OFS Analytical Applications Infrastructure Installation and Configuration Guide

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Document Control

Version Number	Revision Date	Change Log
2.2	September 2024	Added information on Oracle Linux's suitability for Oracle applications in terms of performance, stability, and security.
2.1	November 2023	Updated Java tool options to be included in the .profile file for all versions JDK 11.0.20 and above updates (36018169)
2.0	October 2023	1. Updated tables are granted privileges after installing OFSAA automatically (35813418).
1.9	August 2023	2. Updated the FIC_SERVLET_PORT information details in AAI_SETUP_PROPS . For more information, refer EAR/WAR File - Build Once and Deploy Across Multiple OFSAA Instances (35751177). 3. Added steps to Update Weblogic server to 14.1.1 and include required Java option entry to disable HTTP2.
1.8	March 2023	Replaced/deleted references to include Apache big data in the relevant sections.
1.7	March 2023	• Updated prerequisite for FICserver in How to Run the Generate JSON Utility
1.6	March 2023	• Updated the list of files to be HTTPS enabled in OFSAAI FAQs (33841737). • Updated Schema name format details in .Configure the OFS_<App Pack>_SCHEMA_IN.xml File (34835911)
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1.3	April 2022	Updated the Configure Operating System and File System Settings Section (Doc 33679099).
1.2	February 2022	Updated the Configure Password Changes Section (Doc 33858601).
1.1	December 2021	• Updated the Copy Jars to the OFSAA Installation Directory Section (32391102). • Updated the document for 33663417 Mandatory Patch instructions (Doc 33668822). • Updated the document for Installer Patch Download Number (Doc 33666242).
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1 Preface

This section provides information about the Oracle Financial Services Advanced Analytical Application Infrastructure (OFSAAAI) Installation and Configuration Guide.

Topics:

- What is New in this Release of OFSAAAI Application Pack
- Audience
- Related Documents
- Conventions
- Abbreviations

1.1 What is New in this Release of OFSAAAI Application Pack

This section lists new features and changes in the OFSAAAI Application Pack.

1.1.1 New Features in Release 8.1.2.0.0

This section lists the new features described in this Installation Guide.

Table 1: New features in the OFSAAAI Application Pack Release 8.1.2.0.0

Feature	Description
Common Library Upgrade	The following commonly used libraries are upgraded in OFSAA for the 8.1.2.0.0 Release: • ant 1.10.11 • Batik 1.14 • guava 2.29.0 • spring-xml-3.0.10.RELEASE.jar • spring-ws-core-3.0.10.RELEASE.jar • spring-ws-security-3.0.10.RELEASE.jar • xmlsec 2.2.3

For more details, see the Oracle Financial Services Advanced Analytical Applications Infrastructure Release 8.1.2.0.0 Readme.

1.1.2 Deprecated Features

There are no Deprecated Features in this release.

1.1.3 Desupported Features

There are no Desupported Features in this release.

1.2 Audience

OFSAAI Installation and Configuration Guide is intended for administrators and implementation consultants who are responsible for installing and maintaining the application pack components.

This document assumes that you have experience in installing Enterprise components and basic knowledge about the following:

- OFSAAI components
- OFSAA Architecture
- UNIX Commands
- Database Concepts
- Web server or web application server

1.3 Related Documents

We strive to keep this and all other related documents updated regularly; visit the OHC Documentation Library to download the latest version available there. The list of related documents is provided here.

- *OFSAAAI Application Security Guide*
- *Oracle Financial Services Analytical Applications Technology Matrix*
- *Oracle Financial Services Analytical Applications Infrastructure Environment Check Utility Guide*
- *Oracle Financial Services Analytical Applications Infrastructure Cloning Guide*

1.4 Conventions

The following text conventions are used in this document:

Table 2: Conventions Used in this Guide

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, file names, text that appears on the screen, or text that you enter.
Hyperlink	Hyperlink type indicates the links to external websites, internal document links to sections.

1.5 Abbreviations

The following table lists the abbreviations used in this document:

Table 3: Abbreviations Used in this Guide

Abbreviation	Meaning
BDP	Big Data Processing
DBA	Database Administrator
DDL	Data Definition Language
DEFQ	Data Entry Forms and Queries
DML	Data Manipulation Language
EAR	Enterprise Archive
EJB	Enterprise JavaBean
ERM	Enterprise Resource Management
FTP	File Transfer Protocol
HDFS	Hadoop Distributed File System
HTTPS	Hypertext Transfer Protocol Secure
J2C	J2EE Connector
J2EE	Java 2 Enterprise Edition
JCE	Java Cryptography Extension
JDBC	Java Database Connectivity
JDK	Java Development Kit
JNDI	Java Naming and Directory Interface
JRE	Java Runtime Environment
JVM	Java Virtual Machine
LDAP	Lightweight Directory Access Protocol
LHS	Left Hand Side
MFA	Multi-Factor Authentication
MOS	My Oracle Support
OFSAA	Oracle Financial Services Analytical Applications
OFSAAI	Oracle Financial Services Analytical Application Infrastructure
OFSAAAI	Oracle Financial Services Advanced Analytical Applications Infrastructure Application Pack
OHC	Oracle Help Center
OLAP	On-Line Analytical Processing

Abbreviation	Meaning
OLH	Oracle Loader for Hadoop
ORAAH	Oracle R Advanced Analytics for Hadoop
OS	Operating System
RAM	Random Access Memory
RDBMS	Relational Database Management System
RHEL	Red Hat Enterprise Linux
SFTP	Secure File Transfer Protocol
SID	System Identifier
SSL	Secure Sockets Layer
TNS	Transparent Network Substrate
URL	Uniform Resource Locator
VM	Virtual Machine
WAR	Web Archive
XML	Extensible Markup Language

Part I

Topics:

- Pre-installation
- Installation
- Post-installation

2 Introduction

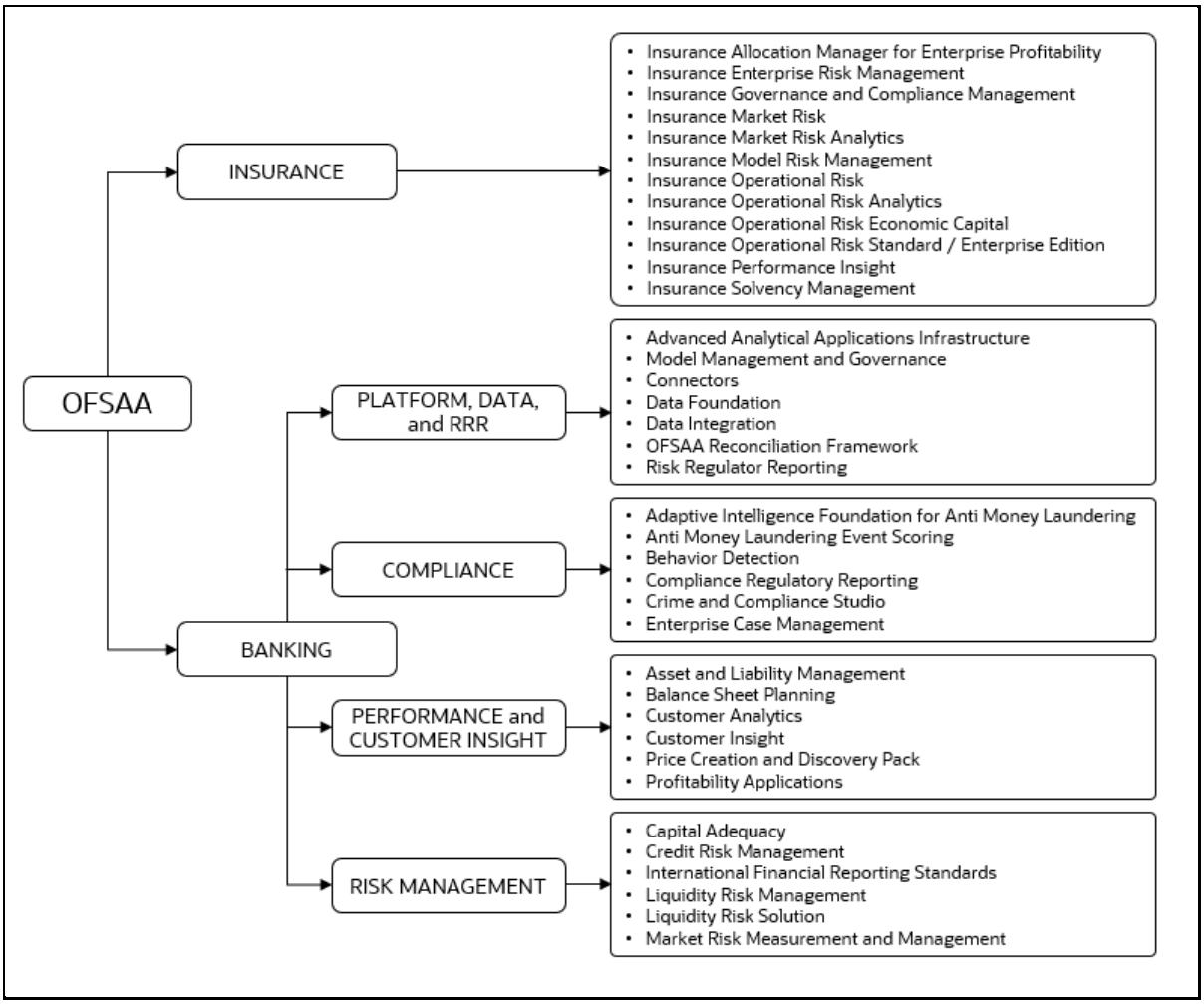
In today's turbulent markets, financial institutions require a better understanding of their risk-return, while strengthening competitive advantage and enhancing long-term customer value. Oracle Financial Services Analytical Applications (OFSAA) enable financial institutions to measure and meet risk-adjusted performance objectives, cultivate a risk management culture through transparency, lower the costs of compliance and regulation, and improve insight into customer behavior.

OFSAA uses industry-leading analytical methods, shared data models, and applications architecture to enable integrated risk management, performance management, customer insight, and compliance management. OFSAA actively incorporates risk into decision making, enables to achieve a consistent view of performance, promote a transparent risk management culture, and provide pervasive intelligence.

Oracle Financial Services Analytical Applications delivers a comprehensive, integrated suite of financial services analytical applications for both banking and insurance domains.

The following figure depicts the various application packs that are available across the OFSAA Banking and Insurance domains.

Figure 1: Application Packs of OFSAA



Topics:

- Oracle Financial Services Analytical Applications Infrastructure (OFS AAI)
- About Oracle Financial Services Advanced Analytical Applications Infrastructure (OFSAAAI) Application Pack
- About Oracle Financial Services Analytical Applications Infrastructure Extension Pack
- Installation and Upgrade Scenarios
- Installation Check List

2.1 Oracle Financial Services Analytical Applications Infrastructure (OFSAAI)

Oracle Financial Services Analytical Applications Infrastructure (OFSAAI) powers the Oracle Financial Services Analytical Applications family of products to perform the processing, categorizing, selection and manipulation of data and information required to analyze, understand and report on specific performance, risk, compliance and customer insight issues by providing a strong foundation for the entire family of Oracle Financial Services Analytical Applications across the domains of Risk, Performance, Compliance and Customer Insight.

Topics:

- Components of OFS AAI
- OFSAA Infrastructure High Availability
- Deployment Topology

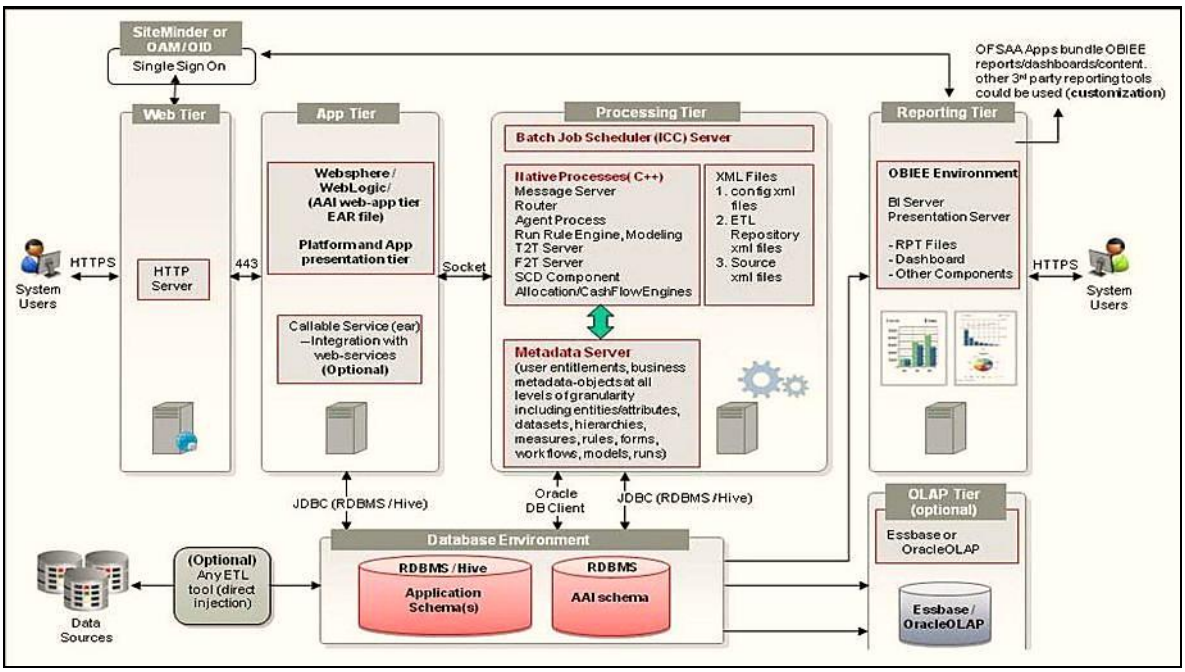
2.1.1 Components of OFSAAI

The OFSAA Infrastructure includes frameworks that operate on and with the Oracle Financial Services Analytical Applications Data Model and forms the array of components within the infrastructure.

The OFSAA Infrastructure components/frameworks are installed as two layers; primarily, the metadata server and Infrastructure services run on one layer, while the UI and presentation logic runs on the other. The UI and presentation layer is deployed on any of the supported J2EE Servers.

The following figure depicts the various frameworks and capabilities that make up the OFSAA Infrastructure.

Figure 2: Components of OFSAAI



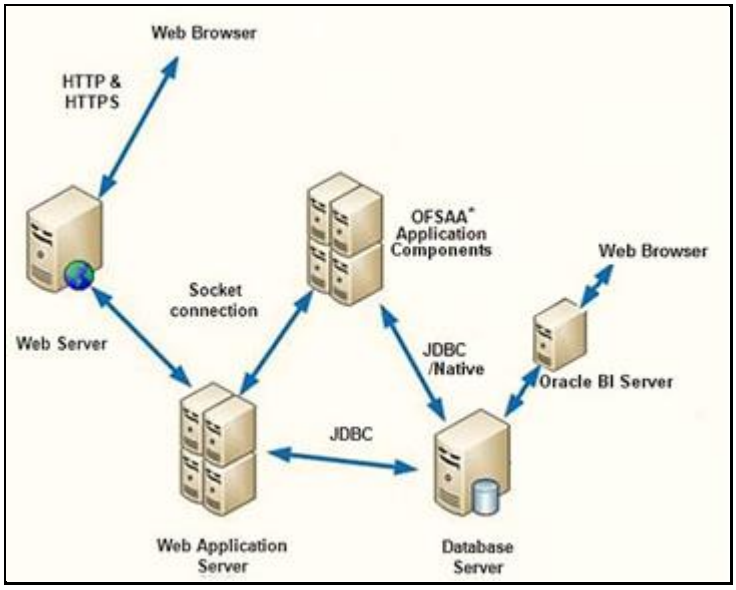
2.1.2 OFSAA Infrastructure High Availability

The current release of the OFSAA Infrastructure supports only the "Single Instance" installation for the Infrastructure components. However, the High Availability (HA) for the Database Server and/ or the Web application server clustering and deployment are supported in this release.

This release supports the Active-Passive model of implementation for OFSAAI components. For more information, see Oracle Financial Services Analytical Applications Configuration for High Availability Best Practices Guide.

2.1.3 Deployment Topology

Figure 3: The logical architecture implemented for OFSAAAI Application Pack



2.2 About Oracle Financial Services Advanced Analytical Applications Infrastructure (OFSAAAI) Application Pack

Oracle Financial Services Advanced Analytical Applications Infrastructure (OFSAAAI) Application Pack provides integrated stress testing and modeling capabilities that you can readily apply across multiple risk areas enabling institutions to devise appropriate enterprise-wide and holistic risk and economic capital strategies.

OFSAAAI enables you to comply with regulatory requirements on stress testing, enables advanced customer and portfolio analytics, utilize multiple industry-standard techniques, test and model with complete data integrity.

OFSAAAI Application Pack includes the following applications:

Financial Services Analytical Applications Infrastructure: This application powers the Oracle Financial Services Analytical Applications family of products to perform the processing, categorizing, selection and manipulation of data and information required to analyze, understand and report on specific performance, risk, compliance and customer insight issues by providing a strong foundation for the entire family of Oracle Financial Services Analytical Applications across the domains of Risk, Performance, Compliance and Customer Insight.

Financial Services Enterprise Modeling: This application helps banking institutions to identify the business opportunities and to measure the risk prevailing in the competitive market to safeguard the regulatory and economic capital of banks.

Financial Services Big Data Processing: This option introduces, into the OFSAA platform (OFSAAI), the capability to run analytics on data stored in Hadoop Distributed File System (HDFS).

With the Big Data Processing (BDP) add-on option, all core data management frameworks within OFSAA such as Data Management Framework (T2T/ F2T), Data Quality Framework, and Rules framework are enhanced to operate on both Oracle RDBMS data sources as well as Apache Hive data sources. An OFSAA Run definition can contain tasks that transform data held in the Hive. OFSAA applications that use these platform frameworks for expressing application logic automatically gain the ability to manage data held in the Hive. The OFSAA platform leverages HiveQL and Map Reduce to process data directly in the Hadoop cluster without having to stage data in a relational database.

Financial Services Inline Processing Engine: This application provides real-time monitoring, detection and interdiction of single and complex fraud events across multiple channels and lines of business.

2.3 About Oracle Financial Services Analytical Applications Infrastructure Extension Pack

The Oracle Financial Services Analytical Applications Infrastructure Extension (OFS AAIE) Pack adds a set of new advanced features for 8.1.2.0.0 Release across OFSAA applications. This pack can be installed on an OFSAA instance having one or more OFSAA application packs.

The Oracle Financial Services Analytical Applications Infrastructure Extension Pack includes the following advanced features and functionalities:

- Distributed Processing Capabilities
- Analytic Pipeline and Process models
- Attribution Analysis
- Content Management Interoperability Services

> **NOTE** The pack is enabled by procurement of an additional license. For more information, see the OFS AAIE Release Notes and Installation Guide on the OHC.

2.4 Installation and Upgrade Scenarios

Release 8.1.2.0.0 of OFSAAI supports various installation and upgrade scenarios. A high-level overview of the possible scenarios is provided in the following table. Detailed procedural steps are provided in the succeeding sections of this document.

Table 4: Release 8.1.2.0.0 Installation and Upgrade Scenarios

Scenario	Installation and Upgrade Instructions
New Installation Installing Release 8.1.2.0.0 application pack for the first time (new installation).	1. Prepare for the Installation. 2. Execute the Schema Creator Utility. 3. Install the OFSAAI Application Pack.

Upgrade Installation Upgrade an already installed application pack from v8.1.1.0.0 or later Example: You are using release v8.1.1.1.0 and now want to upgrade to Release 8.1.2.0.0.	1. Run the Environment Check Utility tool and ensure that the hardware and software requirements are installed as per the Oracle Financial Services Analytical Applications 8.1.2.0.0 Technology Matrix. 2. Prepare for Upgrade. 3. Download the installer. 4. Extract the software. 5. Trigger the installation.
Upgrade OFS AAAI from Linux 7 to Linux 8 If your OFS AAAI instance is on Linux 7 Operating System and you want to install OFS AAAI on Linux 8.	1. Clone your existing environment to the Oracle Financial Services Analytical Applications 8.1.2.0.0 Technology Matrix. 2. Run the upgrade installer in the cloned environment.
Upgrade from OFS AAAI Release v8.0.x on AIX or Solaris x86 Operating System	Release v8.1.2.0.0 of OFS AAAI is not certified for IBM AIX and Oracle Solaris x86 Operating Systems. If you are currently running OFSAA v8.0.x on AIX or Solaris x86 Operating Systems and plan to upgrade to Release v8.1.2.0.0, then you must migrate from AIX or Solaris x86 to Oracle Linux or Oracle Solaris SPARC. See the My Oracle Support Doc ID 2700084.1 for details.

2.5 Installation Check List

To complete the installation process, you must perform the following steps listed in the Pre-install Checklist. Use this checklist to verify whether these steps are completed or not.

Table 5: Installation Checklist

	Sl. No.	Activity
Pre-installation Steps	1	Install all the prerequisite *hardware and software* as per the Oracle Financial Services Analytical Applications 8.1.2.0.0 Technology Matrix.
	2	Verify the System Environment using the Environment Check Utility.
	3	Configure the Database Instance settings.
	4	Install and configure the web application server.
	5	Configure the HTTP settings on the web server.
	6	(Optional) Install and configure for Big Data/Hive.
	7	Create the Installation, Download, and Metadata Repository Directories: • Installation directory • Temporary directory • Staging Area/Metadata Repository • Download directory
	8	Configure the following Operating System and File System settings: • File Descriptor • Total number of processes

	Sl. No.	Activity
		• Port(s) • `.profile` file permissions • Add FTP/SFTP configuration for file transfer (to access staging area and metadata directory)
	9	Update the following Environment Settings as required for the installation in the `.profile` file: Java Settings • Oracle Database Server and Client Settings • Add TNS entries in the `TNSNAMES.ORA` file • Oracle Essbase Settings • Time Zone Settings
	10	(Optional) Install and configure Oracle R/ Oracle R Enterprise.
	11	Download the installer kit.
Installation Steps	12	Extract the installer kit.
	13	Configure the `OFS_<App pack>_PACK.xml` file.
	14	Configure the `OFS_<App pack>_SCHEMA_IN.xml` file.
	15	(Optional) Configure the `<App pack>_SCHEMA_BIGDATA_IN.xml` file.
	16	Execute the Schema Creator Utility in Online, Offline, or TCPS modes and verify the log file.
	17	Configure the `OFSAAI_InstallConfig.xml` file.
	18	Trigger the application installation.
Post-Installation Steps	19	Verify the installation logs.
	20	Verify that all patches are successfully installed.
	21	Backup the OFS_<PACK>_SCHEMA_IN .xml and OFS_<PACK>_SCHEMA_OUTPUT.xml files.
	22	Stop the OFSAA Infrastructure services.
	23	Create and deploy EAR or WAR files.
	24	Assign Grants for schemas.
	25	Start the OFSAA Infrastructure services.
	26	Access the OFSAA Application.
	27	Configure the excludeURLList.cfg file.
	28	(Optional) Configure Big Data Processing.
	29	Create Application Users.
	30	Map Application User(s) to User Groups.
	31	Add TNS entries in the `TNSNAMES.ORA` file.
	32	Set TDE and Data Redaction in OFSAAI.
	33	Implement Data Protection in OFSAAI.

	Sl. No.	Activity
Additional Configuration	34	Configure the web server.
	35	Configure Resource Reference in web servers.
	36	Configure Work Manager in web application servers.
	37	Add FTP/SFTP Configuration for File Transfer.
	38	Configure Infrastructure Server Memory.
	39	Retrieve Patch Information.
	40	Change IP/Hostname, Ports, Deployed Paths of the OFSAA Instance.
	41	Set Infrastructure LDAP Configuration.
	42	Configure OFSAAI Web Services.
	43	Configure Message Details in Forms Designer.
	44	Configure Password Changes.
	45	Configure Java Virtual Machine.
	46	Configure Internal Service.

3 Hardware and Software Requirements

See the Oracle Financial Services Analytical Applications 8.1.2.0.0 Technology Matrix for the hardware and software required for OFSAAI Release 8.1.2.0.0.

Table 6: Recommended Software Combination

Operating System	Database	Web Application Server	Web Server
Oracle Linux	Oracle Database	Oracle WebLogic Server/ Apache Tomcat Server	Oracle HTTP Server/ Apache HTTP Server
Oracle Solaris	Oracle Database	Oracle WebLogic Server/ Apache Tomcat Server	Oracle HTTP Server/ Apache HTTP Server

NOTE Oracle Applications are developed and tested on Oracle Linux, which is optimized for performance, stability, and security.

Topics:

- License Information
- Verify System Environment

3.1 License Information

For details on the third-party software tools used, see the OFSAA Licensing Information User Manual Release 8.1.2.0.0.

For information about OFSAA Product Licenses after installation of Application Packs, see the **View OFSAA Product Licenses After Installation of Application Pack** section in the Oracle Financial Services Advanced Analytical Applications Infrastructure User Guide.

3.2 Verify System Environment

To verify your system environment meets the minimum requirements for the installation, a Pre-Install Check utility is available within the Install Kit archive file. This utility can also be obtained separately by contacting Oracle Support Services.

Though the system environment verification is an integral and automated part of the installation of this software product, Oracle strongly recommends running this utility before beginning the installation as part of your organization's "Installation Readiness Verification Process".

For more details on download and usage of this utility, see the Oracle Financial Services Analytical Applications Infrastructure Environment Check Utility Guide.

4 Pre-installation

Topics:

- Oracle Database Instance Settings
- Web Application Server Settings
- Web Server Settings
- Big Data Settings
- Create the Installation, Download, and Metadata Repository Directories
- Configure the OS File System Settings and Environment Settings in the .profile File
- Install Oracle R distribution and Oracle R Enterprise (ORE)
- Download the OFSAAAI Applications Pack Installer and Mandatory Patches
- Extract the Software

4.1 Oracle Database Instance Settings

Ensure that the following database instance settings are configured:

- NLS_CHARACTERSET to AL32UTF8
- NLS_LENGTH_SEMANTICS to BYTE
- OPEN CURSORS limit to greater than 1000

4.2 Web Application Server Settings

Ensure that the web application server is installed and the profile (when using WebSphere) or domain (when using WebLogic) is created.

Note the path values as shown in the following table as you will be prompted to enter the WebSphere Profile path, the WebLogic Domain path, or the Tomcat Deployment path during OFSAAI installation.

Table 7: Web Application Server Settings

Description	Example Value
For WebSphere, specify the WebSphere path as `<WebSphere profile directory>/installedApps/<NodeCellName>`.	`/data2/test//WebSphere/AppServer/profiles/<Profile_Name>/installedApps/aiximfNode01Cell`, where aix-imf is the Host name.
For WebLogic, specify the WebLogic home directory path.	`/<WebLogic home directory path>/bea/wlserver_10.3`
For Tomcat, specify the Tomcat directory path till `/webapps`.	`/oradata6/ revwb7/tomcat/webapps/`

> **NOTE** See Configure the Web Server for WebSphere Profile and WebLogic Domain creation.

4.3 Web Server Settings

This is an optional requirement. If you have installed an HTTP Server, then configure the appropriate HTTP server settings:

Table 8: Web Server Settings

Description	Example Value
Apache HTTP Server/ Oracle HTTP Server/ IBM HTTP Server	Configure the HTTP Server and note down the IP/ Hostname and Port details as you will be prompted to enter these details during installation. **Note:** See Configure the Web Server for web server configuration.

4.4 Big Data Settings

This is an optional step and required only if you intend to install OFSAA Big Data Processing.

Install Big Data components from Apache . For version information, see the Hardware and Software Requirements section.

4.5 Create the Installation, Download, and Metadata Repository Directories

To install OFSAAI, create the following directories:

- **OFSAA Download Directory (Optional)**: This is the directory where the downloaded installer/ patches can be copied. Create a download directory and copy the OFSAA Application Pack Installer File (archive). Assign 755 permission to this directory.
- **Temporary Directory**: Default temporary directory where the installation files are stored for a short time to support faster installation. Configure adequate space on the `/tmp` directory. It is recommended that you allocate more than 10 GB of space. Assign 755 permission to this directory with NOEXEC option disabled.

> **NOTE** If NOEXEC option is enabled, the extraction of files by the installer into the `/tmp` directory is prevented and the binaries will not execute in the directory, which will fail the installation.

- **OFSAA Installation Directory (Mandatory)**: Create an installation directory where the product binaries are installed. Assign 755 user permission to the installation directory.

- **OFSAA Staging/Metadata Directory (Mandatory)**: A directory to hold the application metadata artifacts and additionally act as the staging area for the flat files. This directory is also referred to as "FTPSHARE". Create a Staging/Metadata Repository Directory to copy data files, save data extracts, and so on.

  The directory must exist on the same system as the OFSAA Installation. This directory can be configured on a different mount or under a different user profile. However, the owner of the installation directory must have RWX (775) permissions to this directory.

> **NOTE** Ensure the OFSAA staging directory is not set to the same path as the OFSAA installation directory and is not a subdirectory inside the OFSAA installation directory.

4.6 Configure the OS File System Settings and Environment Settings in the .profile File

A `.profile` file is a start-up file of a UNIX user. Create the `.profile` file at the home directory of the logged-in user if it is not already available. The user must have 755 permission on the file to execute it. This file consists of various parameters for Environment Settings, OS, and File System Settings.

To set the parameters for the `.profile` file, login as a non-root user, and configure the environment settings.

> **WARNING** Do not modify any other parameters other than the parameters mentioned in the following subsections.

4.6.1 Configure Operating System and File System Settings

Table 9: Configure Operating System and File System Settings

Parameter	Configuration Action
Installation Directory	In the `.profile` file, set the variable FIC_HOME to point to the OFSAA Installation Directory.
File Descriptor Settings	In the `sysctl.conf` file, to change the number of file descriptors, do the following as the root user: 1. Edit the following line in the `/etc/sysctl.conf` file: fs.file-max = <value> where <value> is greater than 15000 2. Apply the change by running the following command: # /sbin/ sysctl -p **Note:** The value specified here is the minimum value to be set for the installation process to go forward. For other modules, this value may depend on the available resources and the number of processes executed in parallel.

Parameter	Configuration Action
Total Number of Process Settings	In the `sysctl.conf` File set the value to greater than 15000. **Note:** The value specified here is the Minimum Value to be set for the Installation Process to go forward. For other modules, this value may depend on the available resources and the number of processes executed in parallel.
Port Settings	Default port numbers to be enabled on the system are 6500, 6501, 6505, 6507, 6509, 6510, 6666, 9999, and 10101.

4.6.2 Configure the Environment Settings

4.6.2.1 Java Settings

Table 10: Java Settings

Description	Example Value
In the `.profile` file, set PATH to include the Java Runtime Environment (JRE) absolute path. Ensure that SYMBOLIC links to JAVA installation are not set in the PATH variable.	For example: `PATH=/usr/java/jre1.8.0_221/bin:$ORACLE_ HOME/bin:$PATH` `export PATH` **Note:** OFSAA does not support OpenJDK and JRE.

In the `.profile` file, set PATH to include the Java Runtime Environment bin path.	`JAVA_BIN=/scratch/<<version>>/jre/bin`
	For example:
	`PATH=/usr/java/jre1.8.0_221/bin:$ORACLE_ HOME/bin:$PATH`

In the `.profile` file, set the Java tool options for all versions JDK 11.0.20 and above updates	`JAVA_TOOL_OPTIONS=" -Djdk.util.zip.disableZip64ExtraFieldValidation=true"` `export JAVA_TOOL_OPTIONS`

Description	Example Value
Enable unlimited cryptographic policy for Java.	For more information, see the section *Enabling Unlimited Cryptographic Policy* from the OFS Analytical Applications Infrastructure Administration Guide.

4.6.2.2 Oracle Database Server and Client Settings

Table 11: Oracle Database Server and Client Settings

Description	Example Value
In the `.profile` file, set TNS_ADMIN pointing to the appropriate `tnsnames.ora` file.	`TNS_ADMIN=$HOME/tns`
In the `.profile` file, set ORACLE_HOME pointing to the appropriate Oracle Client installation.	`ORACLE_HOME=/scratch/oraofss/app_client18c/product/18.0.0/client_1`
In the `.profile` file, set PATH to include the appropriate `$ORACLE_HOME/bin` path.	`PATH=$JAVA_HOME/bin:$ORACLE_HOME/bin`

4.6.2.3 TNS entries in the TNSNAMES.ORA file for Non-TCPS and TCPS

4.6.2.3.1 Non-TCPS

Table 12: TNS entries in the TNSNAMES.ORA file for Non-TCPS

Description	Example Value
Ensure that an entry (with SID/ SERVICE NAME) is added in the `tnsnames.ora` file on the OFSAA server.	`<SID_NAME> = DESCRIPTION =(ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCP)(HOST = <HOST_NAME>.in.oracle.com)(PORT = 1521)))(CONNECT_DATA = (SERVICE_NAME = <SID_NAME>)))<ATOMIC_SCHEMA_NAME> = (DESCRIPTION =(ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCP)(HOST = <HOST_NAME>.in.oracle.com)(PORT = 1521)))(CONNECT_DATA = (SERVICE_NAME = <SID_NAME>)))`

```
<SID NAME> =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP)(HOST = <HOST NAME>)(PORT = <PORT
NUMBER>))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = <SID NAME>)
    )
  )

<ATOMICSCHEMANAME> =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP)(HOST = <HOST NAME>)(PORT = <PORT
NUMBER>))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = <SID NAME>)
    )
  )
```

NOTE The ATOMIC SCHEMA NAME must be the same as defined in the `OFS_<App Pack>_SCHEMA_IN.xml` file.

4.6.2.3.2 TCPS

Table 13: TNS entries in the TNSNAMES.ORA file for TCPS

Description	Example Value
Ensure that an entry (with SID/ SERVICE NAME) is added in the `tnsnames.ora` file on the OFSAA server.	`<SID_NAME> = DESCRIPTION =(ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCPS)(HOST = <HOST_NAME>.in.oracle.com)(PORT = 1521)))(CONNECT_DATA = (SERVICE_NAME = <SID_NAME>)))<ATOMIC_SCHEMA_NAME> = (DESCRIPTION =(ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCPS)(HOST = <HOST_NAME>.in.oracle.com)(PORT = 1521)))(CONNECT_DATA = (SERVICE_NAME = <SID_NAME>)))(security=(ssl_server_cert_dn=CN=<HOST_NAME>))))`
Ensure that an entry (with WALLET_HOME and wallet parameters) is added in the `sqlnet.ora` file on the OFSAA server must be same as Oracle database server running with TCPS.	`NAMES.DIRECTORY_PATH= (TNSNAMES, EZCONNECT)WALLET_LOCATION = (SOURCE = (METHOD = FILE) (METHOD_DATA = (DIRECTORY = <PATH TO WALLET DIRECTORY>)))SQLNET.WALLET_OVERRIDE = TRUE SSL_CLIENT_AUTHENTICATION = FALSE SQLNET.AUTHENTICATION_SERVICES = (TCPS,NTS,BEQ) SSL_CIPHER_SUITES = (SSL_RSA_WITH_AES_256_CBC_SHA, SSL_RSA_WITH_3DES_EDE_CBC_SHA)`

```
<SID NAME> =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCPS)(HOST = <HOST NAME>)(PORT = <PORT
NUMBER>))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = <SID NAME>)
(security=(ssl_server_cert_dn=CN=<HOST NAME>))
    )
  )

<ATOMICSCHEMANAME> =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCPS)(HOST = <HOST NAME>)(PORT = <PORT
NUMBER>))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = <SID NAME>)

(security=(ssl_server_cert_dn=CN=<HOST NAME>))    )
  )
```

> **NOTE** The ATOMIC SCHEMA NAME must be the same as defined in the `OFS_<App Pack>_SCHEMA_IN.xml` file, which also includes prefix without underscore. For example, DEVOFSAAATM.

4.6.2.4 Oracle Wallet Settings for Installation in TCPS Mode

In the `.profile` file, set the following parameters for Oracle Wallet if you want to run the installer in the TCPS mode:

```
OFS_ORA_WAL_ENABLED=TRUE
export OFS_ORA_WAL_ENABLED
WALLET_HOME=<PATH_TO_THE_DIRECTORY_WHERE WALLET RELATED FILES EXIST>
export WALLET_HOME
```

NOTE

- Installation in TCPS mode with Oracle Wallet requires Config and Atomic Schema credentials in Oracle Wallet along with certificates.
- If you do not configure this variable, the system defaults to `OFS_ORA_WAL_ENABLED=FALSE`.
- For information on Creating and Managing Oracle Wallet, see https://blogs.oracle.com/dev2dev/ssl-connection-to-oracle-db-using-jdbc,-tlsv12,-jks-or-oracle-wallets and https://blogs.oracle.com/weblogicserver/weblogic-jdbc-use-of-oracle-wallet-for-ssl.

4.6.2.5 Oracle Essbase Settings

In the `.profile` file, set the following parameters if you want to use Oracle Hyperion Essbase OLAP features.

Table 14: Oracle Essbase Settings

Description	Example Value
ARBORPATH to point to an appropriate Oracle Essbase Client installation.	`PATH=$PATH:$ARBORPATH/bin`
ESSBASEPATH to point to an appropriate Oracle Essbase Client installation.	`ESSBASEPATH=/scratch/essps3/Oracle/MiddlewareHome/EPMSystem11R1/common/EssbaseRTC-64/11.1.2.0` `export ESSBASEPATH`

HYPERION_HOME to point to an appropriate Oracle Essbase Client installation.	`HYPERION_HOME=/scratch/essps3/Oracle/MiddlewareHome/EPMSystem11R1/common/EssbaseRTC-64/11.1.2.0`
	
	`export HYPERION_HOME`

4.6.2.6 Time Zone Settings

In the `.profile` file, set the Time Zone parameter to indicate the time zone of your region/ location.

Table 15: Time Zone Settings

Description	Example Value
Time Zone	TZ=Asia/Calcutta

4.7 Install Oracle R distribution and Oracle R Enterprise (ORE)

This is an optional step and required only if you intend to use Oracle R scripting in the Oracle Financial Services Enterprise Modeling Application.

Install Oracle R Distribution and Oracle R Enterprise (Server Components) on the Oracle Database server. See the Oracle R Enterprise Installation and Administration Guide for Linux and Solaris in the Oracle R Enterprise Documentation Library. For supported versions of ORD and ORE, see the Oracle Financial Services Analytical Applications 8.1.2.0.0 Technology Matrix.

NOTE If you use ORE 1.4.1 with Oracle Financial Services Enterprise Modeling, you must set the session time zone in `R_HOME/etc/Rprofile.site` file on the database server, where `R_HOME` is the home directory of the R instance on which ORE server packages are installed. Alternatively, you can set the session time zone in scripts registered within OFS EM by using the `Sys.env(TZ=<time zone>)` R function.

4.8 Download the OFSAAAI Applications Pack Installer and Mandatory Patches

To download the OFSAAAI Applications Pack Installer Release 8.1.2.0.0, follow these steps:

1. Log in to My Oracle Support and search for **32791983** in the **Patches & Updates** Tab.
2. Download the installer archive and copy (in Binary mode) to the download directory that exists in the OFSAAAI installation setup.

NOTE Select the required archive files for either Solaris SPARC or Linux based on the operating system of your OFSAAAI.

3. Log in to My Oracle Support, search for the **33663417** Mandatory Patch in the **Patches & Updates** Tab and download it.

ATTENTION On the 10th of December 2021, Oracle released Security Alert CVE-2021-44228 in response to the disclosure of a new vulnerability affecting Apache Log4J before version 2.15. The application of the **33663417** Mandatory Patch fixes the issue.

For details, see the My Oracle Support Doc ID 2827801.1.

Ensure that you reapply the **33663417** Mandatory Patch whenever you install or upgrade the application, or apply an incremental patch.

4.9 Extract the Software

You must be logged in to the UNIX operating system as a non-root user to perform the following steps. To extract the software, follow these steps:

1. Download the unzip utility (OS-specific) `unzip_<os>.Z` and copy it in Binary mode to the directory that is included in your PATH variable.

   If you already have an unzip utility to extract the contents of the downloaded archive, skip this step. Uncompress the unzip installer file with the command:

   ```
   uncompress unzip_<os>.Z
   ```

   > **NOTE** If an error message "uncompress: not found [No such file or directory]" is displayed, contact your UNIX administrator.

2. Assign execute (751) to the file with the following command:

   ```
   chmod 751 unzip_<OS>
   ```

   For example: `chmod 751 unzip_sparc`

3. Extract the contents of the OFSAAAI Application Pack Release 8.1.2.0.0 installer archive file in the download directory with the following command:

   ```
   unzip OFS_AAAI_PACK.zip
   ```

4. Navigate to the download directory and assign execute permission to the installer directory with the following command:

   ```
   chmod -R 750 OFS_AAAI_Pack
   ```

5 Installation

Topics:

- Configure the OFS_<App pack>_PACK.xml File
- Configure the Schema Creator Utility
- Execute the Schema Creator Utility
- Configure the OFSAAI_InstallConfig.xml File
- Install the OFSAAI Application Pack

5.1 Configure the OFS_<App pack>_PACK.xml File

The `OFS_<APP PACK>.xml` file holds details on the various products that are packaged together in OFS <App pack>.

To configure the `OFS_<APP PACK>.xml` file, follow these steps:

1. Navigate to the `OFS_<APP PACK>/conf` directory.
2. Open the `OFS_<APP PACK>.xml` file in a text editor.
3. Configure the `OFS_<APP PACK>.xml` file as mentioned in the following table.

Figure 4: Sample OFS_AAAI_PACK.xml File

```
<APP_PACK_CONFIG>
   <APP_PACK_ID>OFS_AAAI_PACK</APP_PACK_ID>
   <IS_OPT_INSTALL VALUE="TRUE" />
   <APP_PACK_NAME>Financial Services Advanced Analytical Applications Infrastructure Application Pack</APP_PACK_NAME>
   <APP_PACK_DESCRIPTION>Applications for Advanced Analytics using Oracle R, Modeling and Stress Testing Framework and Inline Processing Engine
   </APP_PACK_DESCRIPTION>
   <VERSION>8.1.2.0.0</VERSION>
   <APP>
      <APP_ID PREREQ="" DEF_SEL_FLG="YES" ENABLE="YES">OFS_AAI</APP_ID>
      <APP_NAME>Financial Services Analytical Applications Infrastructure</APP_NAME>
      <APP_DESCRIPTION>Base Infrastructure for Analytical Applications Infrastructure</APP_DESCRIPTION>
      <VERSION>8.1.2.0.0</VERSION>
   </APP>
   <APP>
      <APP_ID PREREQ="OFS_AAI" DEF_SEL_FLG="YES" ENABLE="YES">OFS_AAIB</APP_ID>
      <APP_NAME>Financial Services Analytical Applications Infrastructure Big Data Processing</APP_NAME>
      <APP_DESCRIPTION>Add-On Option for Big Data Processing</APP_DESCRIPTION>
      <VERSION>8.1.2.0.0</VERSION>
   </APP>
   <APP>
      <APP_ID PREREQ="OFS_AAI" ENABLE="YES">OFS_AAAI</APP_ID>
      <APP_NAME>Financial Services Enterprise Modeling</APP_NAME>
      <APP_DESCRIPTION>Add-On Option for Advanced Analytical Applications</APP_DESCRIPTION>
      <VERSION>8.1.2.0.0</VERSION>
   </APP>
   <APP>
      <APP_ID PREREQ="OFS_AAI" ENABLE="YES">OFS_IPE</APP_ID>
      <APP_NAME>Financial Services Inline Processing Engine</APP_NAME>
      <APP_DESCRIPTION>Add-On Option for Inline Processing Engine</APP_DESCRIPTION>
      <VERSION>8.1.2.0.0</VERSION>
   </APP>
</APP_PACK_CONFIG>
```

Table 16: OFS_<APP PACK>.xml File Parameters

Tag Name/ Attribute Name	Description	Mandatory (Y/ N)	Comments
APP_PACK_ID	Unique Application Pack Identifier	Y	Unique Seeded Value. Do not modify this value.

Tag Name/ Attribute Name	Description	Mandatory (Y/ N)	Comments
IS_OPT_INSTALL VALUE="TRUE"	Unique Application Entry	Y	Unique Seeded Value. Do not modify this value.
APP_PACK_NAME	Unique Application Pack Name	Y	Unique Seeded Value. Do not modify this value.
APP_PACK_DESCRIPTION	Unique Application Pack Description	Y	Unique Seeded Value. Do not modify this value.
VERSION	Unique release version	Y	Unique Seeded Value. Do not modify this value.
APP	Unique Application Entries	Y	Unique Seeded Value. Do not modify this value.
APP_ID	Unique Application Identifier	Y	Unique Seeded Value. Do not modify this value.
APP_ID/ PREREQ	Prerequisite Application/ Product	Y	Unique Seeded Value. For most applications, OFSAAAI is the prerequisite set. For all other applications, the default Application ID is set to none. You can set it for the applications you want to install. Do not modify this value.
APP_ID/ DEF_SEL_FLAG	Default Selected Flag	Y	In all Application Packs, Infrastructure requires this value to be set to "YES". Do not modify this value.
APP_ID/ ENABLE	Enable Application/ Product	Y	• Default YES for Infrastructure • NO for Others Set this attribute-value to YES against every APP_ID which is licensed and must be enabled for use. **Note: The** Application/Product cannot be disabled once enabled. Only Applications/Products which are enabled are installed. In order to enable other licensed Applications/Products, you must reinstall by making the flag as Y for the App_ID. However, in case of a reinstallation, to enable the other Applications/Products, skip the execution of the schema creation utility if it does not include any additional sandboxes to be created.

Tag Name/ Attribute Name	Description	Mandatory (Y/ N)	Comments
APP_NAME	Unique Application/ Product Name	Y	Unique Seeded Value. Do not modify this value.
APP_DESCRIPTION	Unique Application/ Product Name	Y	Unique Seeded Value. Do not modify this value.
VERSION	Unique release version	Y	Unique Seeded Value. Do not modify this value.

5.2 Configure the Schema Creator Utility

Creating database users/schemas (RDBMS) is one of the primary steps in the complete OFSAAAI installation process. The Schema Creator utility enables you to quickly get started with the installation by creating Database User(s)/ Schema(s) (RDBMS), assigning the necessary GRANT(s), creating the required entities in the schemas and so on.

The schema creator utility must be configured and executed before the installation of any OFSAA Application Pack.

Topics:

- Prerequisites
- Configure Schema Creator Utility for RDBMS Installation
- Configure Schema Creator Utility for HDFS Schema

5.2.1 Prerequisites

Ensure you have the following before configuring the Schema Creator Utility:

- Oracle User ID/Password with SYSDBA privileges
- JDBC Connection URL for RAC/Non RAC database
- The HOSTNAME/IP of the server on which OFSAA is getting installed.

In the case of the HIVE installation, you must also have the following:

- HIVE connection credentials (For example: Kerberos connection properties).
- Hostname/IP of the HIVE Server installation

5.2.2 Configure the Schema Creator Utility for RDBMS Installation

If the installation is being performed for RDBMS, provide the Pack specific schema details in the `OFS_<App Pack>_SCHEMA_IN.xml` file.

You can configure the following types of schemas:

- **CONFIG**: This schema holds the entities and other objects required for OFSAA setup configuration information. There can be only one CONFIG schema per OFSAA instance
- **ATOMIC**: This schema holds the data model entities. One ATOMIC schema is attached to one Information Domain. There can be multiple ATOMIC schemas per OFSAA Instance.

5.2.2.1 Configure the OFS_<App Pack>_SCHEMA_IN.xml File

Creating database schemas, objects within schemas, and assigning appropriate grants are the primary steps in the installation process of OFSAA Applications.

The `OFS_<APP PACK>_SCHEMA_IN.xml` file contains details of the various application schemas. Update the values of the various tags and parameters available in this file before executing the schema creator utility.

This file must be configured only if the database is RDBMS.

To configure the `<APP PACK>_SCHEMA_IN.xml` file, follow these steps:

1. Log in to the system as a non-root user.
2. Navigate to the `<OFS_AAAI_PACK>/schema_creator/conf` directory.
3. Edit the `<OFS_AAAI>_SCHEMA_IN.xml` file using a text editor and configure the values as mentioned in the following table.
4. Save the file.

Table 17: OFS_<APP PACK>_SCHEMA_IN.xml file Parameters

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
<APP_PACK_ID>	Seeded unique ID for the OFSSAA Application Pack	Y	Seeded	Do not modify this value.
<IS_TCPS>	Enter if the TCPS configuration is required.	Y	Seeded, with FALSE as the default value.	Modify this to TRUE if you require the installer to uptake the configuration.
<JDBC_URL>	Enter the JDBC URL. **Note:** You can enter the following JDBC URL types: 1. RAC/ NON-RAC enabled database connectivity URL. 2. TCPS RAC/ NON-RAC enabled database connectivity URL provided the <IS_TCPS> tag value is TRUE. 3. Wallet-enabled JDBC URL.	Y	Example: jdbc:oracle:thin:@< DBSERVER IP/ HOST/ IP>:<PORT>:<SID> or jdbc:oracle:thin:@//[HOS T][:PORT]/ SERVICE or jdbc:oracle:thin:@(DESCRI PTION=(ADDRESS_ LIST=(ADDRESS=(PROT OCOL=TCP)(HOST=[HO ST])(port=[PORT]))(ADD RESS=(PROTOCOL=TCP) (HOST=[HOST])(PORT=[PORT]))(LOAD_ BALANCE=yes)(FAILOV ER=yes))(CONNECT_ DATA=(SERVICE_ NAME=[SERVICE]))) For example: jdbc:oracle:thin:@//dbhos t.server.com:1521/service 1 or jdbc:oracle:thin:@//dbsho st.server.com:1521/scan-1 or jdbc:oracle:thin:@(DESCRI PTION=(ADDRESS_ LIST=(ADDRESS=(PROT OCOL=TCP)(HOST=dbhost1.server.com) (port=1521))(ADDRESS=(PROTOCOL=TCP)(H OST=dbhost2.s erver.com)(PORT=1521))(	Ensure to add an entry (with SID/ SERVICE NAME) in the `tnsnames.ora` file on the OFSAA server. The entry must match with the SID/ SERVICE NAME used in the JDBC URL. Ensure that you have configured: 1. The correct Oracle Wallet with the credentials for stored Sys, Config, and Atomic Users. 2. The JDBC URL as follows: `jdbc:oracle:thin:/@` For more information on how to configure Oracle Wallets for OFSAA Installation and Data Sources, see the OFS Analytical Applications Infrastructure Administration Guide.

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
			LOAD_BALANCE=yes)(FAILOVER=yes))(CONNECT_DATA=(SERVICE_NAME=service1))) or <JDBC_URL>jdbc:oracle:thin:@(DESCRIPTION = (ADDRESS = (PROTOCOL =TCPS)(HOST = dbhost.server.com)(PORT = 2484)) (CONNECT_DATA =(SERVER = DEDICATED) (SERVICE_NAME=SERVICEID))(security=(ssl_server_cert_dn=CN=dbhost))) or jdbc:oracle:thin:/@	
<JDBC_DRIVER>	This driver's name is seeded by default.	Y	Example: oracle.jdbc.driver.OracleDriver	Only JDBC Thin Driver is supported. Do not modify this value.
<HOST>	Enter the Host name/ IP Address of the system on which you are installing the OFSAA components.	Y	Host Name/ IP Address	
<SETUPINFO>/PREFIX_SCHEMA_NAME	Identifies whether the value specified in <SETUPINFO>/NAME attribute must be prefixed to the schema name.	N	YES or NO	The default value is YES.

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
<SETUPINFO>/NAME	Enter the acronym for the type of implementation. This information is displayed in the OFSAA Home Page. On executing the schema creator utility, this value is prefixed with each schema name. For example: dev_ofsaaconf, uat_ofsaatm.	Y	Accepts strings with a minimum length of two and a maximum of four. Example: DEV, SIT, PROD You can enter any alphanumeric value with a maximum length of 4 characters.	This name appears in the OFSAA Landing Page as "Connected To: xxxx". The schemas that are created get this prefix. For example, dev_ofsaaconf, uat_ofsaaconf, uat1_ofsaaconf and so on.
<PASSWORD>/ DEFAULT*	Enter the password if you want to set a default password for all schemas. You also must set the APPLYSAME- FORALL attribute as Y to apply the default password for all the schemas.	N	The maximum length allowed is 30 characters. Special characters are not allowed. Password cannot begin with a number.	On successful execution of the utility, the entered password in the `OFS_<APP PACK>_SCHEMA_IN.xml` file is cleared.
<PASSWORD>/ APPLYSAMEFORALL	If you have entered Y in APPLYSAME- FORALL attribute and also have specified individual passwords for all the schemas, then the specified individual passwords will take precedence.	Y	Default N Permissible: Y or N Enter Y if you want to apply the password specified in the DEFAULT attribute for all the schemas. If you enter as N, you must provide individual passwords for all schemas.	Setting this attribute value is mandatory if the DEFAULT attribute is set.

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
<SCHEMA>/TYPE	The different types of schemas that are supported in this release are ATOMIC, CONFIG, SANDBOX, and ADDON. By default, the schemas types are seeded based on the Application Pack.	Y	ATOMIC/CONFIG/SANDBOX/ADDON SANDBOX and ADDON schemas do not apply to OFSAAI.	Only One CONFIG schema can exist in the file. Do not edit this attribute value. This schema identifies as the CONFIGURATION schema that holds the OFSAA setup detains and other Metadata information. Multiple ATOMIC/ SANDBOX/ADDON schemas can exist in the file.
<SCHEMA>/NAME	The schemas' names are seeded based on the Application Pack by default. You can edit the schema names if required. The Schema Name will have a prefix of the SETUPINFO/ NAME attribute. SCHEMA NAME must be the same for all the ATOMIC Schemas of the applications within an Application Pack.	Y	The permissible length is 15 characters and only alphanumeric characters are allowed. No special characters allowed except underscore '_'.	SETUPOINFO/NAME attribute value is prefixed to the schema name being created. For example, if a name is set as 'ofsaatm' and setupinfo as 'uat', then schema being created is 'uat_ofsaatm'. NAME must be the same where APP_GRP=1 for all SCHEMA tags (Not applicable for this Application Pack).
<SCHEMA>/PASSWORD	Enter the password of the schema to be created. If this attribute is left blank, then the password specified in the <PASSWORD>/DEFAULT attribute is applied as the Schema Password.	N	The maximum length allowed is 30 characters. Special characters are not allowed. Password cannot begin with a number.	It is mandatory to enter the password if you have set the <PASSWORD>/ APPLYSAMEFORALL attribute as N.

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
<SCHEMA>/APP_ID	The Application ID is seeded based on the Application Pack by default.	Y	Unique Seeded Value	Identifies the Application/ Product for which the schema is being created. Do not edit this attribute value. Do not modify this value.
<SCHEMA>/DEFAULTTABLESPACE	Enter the available default tablespace for DB User. If this attribute is left blank, then USERS is set as the default tablespace.	N	Default USERS Permissible Any existing valid tablespace name.	Modify this value to associate any valid tablespace with the schema.
<SCHEMA>/TEMPTABLESPACE	Enter the available temporary tablespace for DB User. If this attribute is left bank, TEMP is set as the default tablespace.	N	Default TEMP Permissible Any existing valid temporary tablespace name.	Modify this value to associate any valid tablespace with the schema.
<SCHEMA>/QUOTA	Enter the quota to be set on the DEFAULTTABLESPACE attribute for the schema/ user. By default, the quota size is set to 500M. Minimum: 500M or Unlimited on default Tablespace.	N	Example: 600M/ m 20G/ g UNLIMITED/ unlimited	Modify this value to grant the specified quota on the mentioned tablespace to the user.

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
<SCHEMA>/ INFODOM	Enter the name of the Information Domain to associate this schema. The schema creator utility automatically derives an Information Domain Name based on the Application Pack if no value is specified for this attribute.	N	Permissible length is 16 characters and only alphanumeric characters are allowed. No special characters are allowed.	
<ADV_SEC_OPTIONS> /	Parent tag to hold Advance Security Options.	N		Uncomment the tag and edit if you want to add security options. For example, TDE and Data Redact. For details, see the example in the comments for the <TABLESPACE>/ENCRYPT tag.
<ADV_SEC_OPTIONS> /TDE	Tag to enable/disable TDE.	N	The default is FALSE. To enable TDE, set this to TRUE.	Ensure this tag is not commented if you have uncommented <ADV_SEC_OPTIONS>
<ADV_SEC_OPTIONS> /DATA_REDACT	Tag to enable/disable the Data Redaction feature.	N	The default is FALSE. To enable DATA_REDACT, set this to TRUE	Ensure this tag is not commented if you have uncommented<ADV_SEC_OPTIONS>
<TABLESPACES>	Parent tag to hold <TABLESPACE> elements	N	NA	Uncomment the tag and edit. ONLY if tablespaces are to be created as part of the installation. For details, see the example following the table. When TDE is TRUE in ADV_SEC_OPTIONS, then it is mandatory for the <TABLESPACES> tag to be present in the XML file.
<TABLESPACE>/NAME	Logical Name of the tablespace to be created.	Y		Name, if specified, must be referred in the <SCHEMA DEFAULTTABLESPACE= "##NAME##"> attribute. Note the ## syntax.

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
<TABLESPACE>/VALUE	Physical Name of the tablespace to be created.	Y	NA	Value, if specified, is the actual name of the TABLESPACE.
<TABLESPACE>/DATAFILE	Specifies the location of the data file on the server.	Y	NA	Enter the absolute path of the file to be created.
<TABLESPACE>/AUTOEXTEND	Specifies if the tablespace must be extensible or have a hard limit.	Y	ON or OFF	Set to ON to ensure that the tablespace does not run out of space when full.

<TABLESPACE>/ENCRYPT	Specifies if the tablespace(s) must be encrypted using TDE.	Y	ON or OFF	Set to ON to ensure that the tablespaces when created are encrypted using TDE.
				Note: Encryption of tablespaces requires enabling Transparent Data Encryption (TDE) on the Database Server.
				Example: The following snippet shows that TDE is enabled and hence the tablespace is shown with encryption ON.
				`<ADV_SEC_OPTIONS>`
				`<OPTION NAME="TDE" VALUE="FALSE"/>`
				`<OPTION NAME="DATA_REDACT" VALUE="FALSE" />`
				`</ADV_SEC_OPTIONS>`
				`<TABLESPACES>`
				`<TABLESPACE NAME="OFS_AAI_TBSP_1" VALUE="TS_USERS1" DATAFILE="/scratch/ora19c/app/oracle/oradata/OFSPQA19cDB/ts_users1.dbf" SIZE="500M" AUTOEXTEND="ON" ENCRYPT="ON" />`
				`<TABLESPACE NAME="OFS_AAI_TBSP_2" VALUE="TS_USERS2" DATAFILE="/scratch/ora19c/app/oracle/oradata/OFSPQA19cDB/ts_users2.dbf"`

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
				SIZE="500M" AUTOEXTEND="ON" ENCRYPT="ON" /> </TABLESPACES> <SCHEMAS> <SCHEMA TYPE="CONFIG" NAME="ofsaaconf" PASSWORD="" APP_ID="OFS_AAI" DEFAULTTABLESPACE="##OFS_AAI_TBSP_1##" TEMPTABLESPACE="TEMP" QUOTA="unlimited"/> <SCHEMA TYPE="ATOMIC" NAME="ofsaaatm" PASSWORD="" APP_ID="OFS_AAAI" DEFAULTTABLESPACE="##OFS_AAI_TBSP_2##" TEMPTABLESPACE="TEMP" QUOTA="unlimited" INFODOM="OFSAAAIINFO"/> </SCHEMAS>

5.2.3 Configure the Schema Creator Utility for HDFS Schema

If the installation is being performed for Big Data, provide the Pack specific schema details in the `<APP Pack>_SCHEMA_BIGDATA_IN.xml` file.

The types of schemas that you can configure are:

- **CONFIG**: This schema holds the entities and other objects required for OFSAA setup configuration information. There can be only one CONFIG schema per OFSAA instance. This schema is created only in RDBMS.
- **METADOM**: This schema holds the data model entities. One METADOM schema is attached to one Information Domain. There can be multiple DATADOM schemas per OFSAA Instance. This schema is created only in RDBMS. It has only platform entities that hold the metadata details. However, it does not hold the data model entities.
- **DATADOM**: This schema holds data model entities. One DATADOM schema is attached to one Information Domain. There can be multiple DATADOM schemas per OFSAA Instance.

5.2.3.1 Configure the <APP Pack>_SCHEMA_BIGDATA_IN.xml File

Creating HIVE schemas and objects within the schemas are the primary steps in the installation process of OFSAA Applications.

The `<APP PACK>_SCHEMA_BIGDATA_IN.xml` file contains details of the various application schemas. Update the values of the various tags and parameters available in this file before executing the schema creator utility.

This file must be configured only if the installation is for HDFS. This file is not required to be configured for an RDBMS ONLY target installation.

Table 18: <APP Pack>_SCHEMA_BIGDATA_IN.xml file Parameters

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
<APP_PACK_ ID>	Seeded unique ID for the OFSAA Application Pack	Y	Seeded	DO NOT modify this value.
<IS_TCPS>	Enter if the TCPS configuration is required.	Y	Seeded, with FALSE as the default value.	Modify this to TRUE if you require the installer to uptake the configuration.
<JDBC_URL>	Enter the JDBC URL **Note:** You can enter RAC/ NON-RAC enabled database connectivity URL.	Y	Example: jdbc:oracle:thin:@<HOST/ IP>:<PORT>:<SID> or jdbc:oracle:thin:@//[HOST][:PORT]/ SERVICE For an HDFS ONLY target installation, this URL must be of the RDBMS instance that hosts the Application's METADOM. or jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS_ LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=[HOST])(port=[PORT]))(ADDRESS=(PROTOCOL=TCP)(HOST=[HOST])(PORT=[PORT]))(LOAD_ BALANCE=yes)(FAILOVER=yes))(CONNECT_ DATA=(SERVICE_ NAME=[SERVICE]))) For example, jdbc:oracle:thin:@// dbhos t.server.com:1521/service 1 or	

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
			jdbc:oracle:thin:@//dbshost.server.com:1521/scan-1 or jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=dbhost1.server.com)(port=1521))(ADDRESS=(PROTO-COL=TCP)(HOST=dbhost2.s erver.com)(PORT=1521))(LOAD_BALANCE=yes)(FAILOVER=yes))(CONNECT_DATA=(SERVICE_NAME=service1)))	
<JDBC_ DRIVER>	By default, this driver's name is seeded.	Y	Example, oracle.jdbc.driver.OracleDriver	Only JDBC Thin Driver is supported. DO NOT modify this value.
<HOST>	Enter the Hostname/ IP Address of the system on which you are installing the OFSAA components.	Y	Host Name/ IP Address	
<SETUPINFO>/ PREFIX_ SCHEMA_ NAME	Identifies if the value specified in <SETUPINFO>/ NAME attribute must be prefixed to the schema name.	N	YES or NO	The default value is YES.
<SETUPINFO>/ NAME	Enter the acronym for the type of implementation. This information is displayed in the OFSAA Home Page.	Y	Accepts strings with a minimum length of two and a maximum of four.	This name appears in the OFSAA Landing Page as "Connected To: xxxx" **Note:** On executing the schema creator utility, this value is prefixed with each

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
			Example, DEV, SIT, PROD	schema name. For example: dev_ ofsaaconf, uat_ofsaaatm.
<PASSWORD>/ DEFAULT*	Enter the password if you want to set a default password for all schemas. **Note:** You also must set the APPLYSAMEFORALL attribute as Y to apply the default password for all the schemas.	N	The maximum length allowed is 30 characters. Special characters are not allowed.	Applies only to the RDBMS type METADOM schema(s).
<PASSWORD>/ APPLYSAMEFORALL	Enter as Y if you want to apply the password specified in the DEFAULT attribute for all the schemas. If you enter as N, you must provide individual passwords for all schemas. **Note:** If you have entered Y in the APPLYSAME- FORALL attribute and also have specified individual passwords for all the schemas, then the specified individual passwords will take precedence.	Y	Default N Permissible Y or N	Setting this attribute value is mandatory If the DEFAULT attribute is set. Applies only to the RDBMS type METADOM schema(s).
<SCHEMAS>/TYPE=RDBMS	Identifies the RDBMS schema details.	Y	Default names for schemas within the pack are derived in absence of any value specified.	In an HDFS ONLY target installation, the Application's METADOM (that hosts the metadata) for an application is stored in RDBMS schema and the data model entities of the application are stored in the DATADOM (which are on Hive).
<SCHEMA>/ TYPE	The different types of schemas that are supported in this release are ATOMIC,	Y	ATOMIC/CONFIG/SANDBOX/ADDON **Note:** The SANDBOX AND ADDON schemas do not	Only One CONFIG schema can exist in the file. This schema identifies as the CONFIGURATION schema that holds the

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
	CONFIG, SANDBOX, and ADDON. By default, the schemas types are seeded based on the Application Pack. **Note:** Do not edit this attribute value.		apply to the OFSAAAI Application Pack.	OFSAA setup details and other metadata information. Multiple ATOMIC/ SANDBOX/ ADDON schemas can exist in the file. ATOMIC schema refers to the METADOM within the Information Domain schema. SANDBOX schema refers to the SANDBOX schema. ADDON schema refers to another miscellaneous schema (not applicable for this Application Pack).
<SCHEMA>/ NAME	By default, the schema's names are seeded based on the Application Pack. You can edit the schema names if required.	Y	The permissible length is 15 characters and only alphanumeric characters allowed. No special characters allowed except underscore '_'.	The Schema Name will have a prefix of the SETUPINFO/ NAME attribute. SCHEMA NAME must be the same for all the ATOMIC Schemas of applications within an Application Pack. For example, if the name is set as 'ofsaaatm' and setupinfo as 'uat' then the schema being created would be 'uat_ofsaaatm'. NAME must be the same where APP_GRP=1 for all SCHEMA tags (Not applicable for this Application Pack).
<SCHEMA>/PASSWORD	Enter the password of the schema to be created. **Note:** If this attribute is left blank, then the password specified in the <PASSWORD>/DEFAULT attribute is applied as the Schema Password.	N	The maximum length allowed is 30 characters. Special characters are not allowed.	It is mandatory to enter the password if you have set the <PASSWORD>/ APPLYSAMEFORALL attribute as N.
<SCHEMA>/APP_ID	By default, the Application ID is seeded based on the Application Pack.	Y	Unique Seeded Value	Identifies the Application/ Product for which the schema is being created. **Note:** Do not edit this attribute value.

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
<SCHEMA>/DEFAULTTABLESPACE	Enter the available default tablespace for DB User. **Note:** If this attribute is left blank, then USERS is set as the default tablespace.	N	Default USERS Permissible Any existing valid tablespace name.	Modify this value to associate any valid tablespace with the schema.
<SCHEMA>/ TEMPTABLESPACE	Enter the available temporary tablespace for the DB User. **Note:** If this attribute is left blank, then TEMP is set as the default tablespace.	N	Default TEMP Permissible Any existing valid temporary tablespace name.	Modify this value to associate any valid tablespace with the schema.
<SCHEMA>/ QUOTA	Enter the quota to be set on DEFAULTTABLESPACE attribute for the schema/ user. By default, the quota size is set to 500M. Minimum: 500M or Unlimited on default Tablespace.	N	Example, 600M/m 20G/g UNLIMITED/unlimited	Modify this value to grant the specified quota on the mentioned tablespace to the user.
<SCHEMA>/ INFODOM	Enter the name of the Information Domain to associate this schema. The schema creator utility automatically derives an Information Domain Name based on the Application Pack if no value is specified for this attribute.	N	Permissible length is 16 characters and only alphanumeric characters allowed. No special characters allowed.	
<SCHEMAS>/TYPE=HDFS	Type of schemas being created.	Y		Refers to the DATADOM of the Application Pack being installed.
<HIVE_ SERVER_ HOST>	IP/HostName of the server where HIVE is installed.	Y		
<HIVE_LIB_ PATH>	The directory path where the HIVE related drivers/jar files are copied.	Y		Manually copy the jars mentioned in the Copy_Jars_to_OFSAA_Installation_Folder and

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
				Copy KEYTAB and KRB5 Files in OFSAAI sections. **Note:** Select the appropriate versions of the files.
<SCHEMA>/NAME	By default, the schema names are seeded based on the Application Pack. You can edit the schema names if required. **Note:** The Schema Name will have a prefix of the SETUPINFO/ NAME attribute.	Y	The permissible length is 20 characters and only alphanumeric characters allowed.	The Schema Name must not be the same as the Schema Name specified for the ATOMIC Schema Type.
<SCHEMA>/TYPE	Identifies the type of schema where the data model entities reside.	Y	By default, the TYPE attribute in this tag is set to DATADOM.	DO NOT modify this value.
<SCHEMA>/DB TYPE	Identifies the type of driver to be used for the connection.	Y	By default, the only supported type is HIVE in this release.	In upcoming releases, the type value can be HIVE/ IMPALA, etc.
<SCHEMA>/<PROPERTY>/COMMENT	COMMENTS for the HIVE schema.	N		
<SCHEMA>/<PROPERTY>/LOCATION	You can optionally specify a location for the table data.	N		
<CONNECTION_PROPERTIES>/<PROPERTY>/ JDBC_DRIVER	HIVE JDBC driver details.	Y	org.apache.hive.jdbc.HiveDriver	The default Hive Server 2 driver name.
<CONNECTION_PROPERTIES>/<PROPERTY>/ JDBC_URL	Enter the HIVE JDBC URL.	Y	Valid Hive JDBC URL to be specified.	Specify the Hive JDBC URL to connect to the Hive Server. For Example: jdbc:hive2://ofss-****:10000/default;principal=hive/ofss-xxx@xxx.COM

Tag Name/Attribute Name	Description	Mandatory (Y/ N)	Default Value/ Permissible Value	Comments
<CONNECTION_PROPERTIES>/<PROPERTY>/AUTH_TYPE	Authentication Type.	Y	Permissible values: KERBEROS_WITH_KEYTAB	Only "Kerberos with keytab" based authentication supported in this release.
<CONNECTION_PROPERTIES>/<PROPERTY>/ AUTH_ALIAS	Alias name for authentication credentials.	Y		An Alias name mapping to a principal and password combination specified in the following tags.
<CONNECTION_PROPERTIES>/<PROPERTY>/PRINCIPAL	Authentication principal name	Y		Principal name used in authentication to connect to the Hive Server. For Example: hive/ofss-xxx@xxx.COM
<CONNECTION_PROPERTIES>/<PROPERTY>/PASSWORD	Authentication password	Y		Password used in authentication to connect to the Hive Server.
<CONNECTION_PROPERTIES>/<PROPERTY>/KRB_GSSJAAS_FILE_NAME	A keytab file containing pairs of Kerberos principals and an encrypted copy of that principal's key.	Y		This file must be copied to the location specified in <HIVE_LIB_PATH>.
<CONNECTION_PROPERTIES>/<PROPERTY>/KRB_REALM_FILE_NAME	REALM configuration file.	Y		This file must be copied to the location specified in <HIVE_LIB_PATH>.

5.3 Execute the Schema Creator Utility

Depending on the option selected to run the OFSAA Application Pack installer, you must select the appropriate schema creator utility execution option from the following options:

- Execute the Schema Creator Utility in Offline Mode
- Execute the Schema Creator Utility in Online Mode
- Execute the Schema Creator Utility in TCPS Mode
- Execute the Schema Creator Utility while Installing Subsequent Applications Pack

After creating the schema, proceed to Configure the OFSAAI_InstallConfig.xml File.

5.3.1 Execute the Schema Creator Utility in Offline Mode

In the Offline mode, the utility generates an SQL script with all the required DDLs for Users, Objects, and Grants. This script must be executed by the DBA on the appropriate database identified for OFSAA usage. If you do not have the SYSDBA privileges, you can execute the Schema Creator Utility in Offline mode and generate the script file that contains the Schemas, Objects, and Grants information. Subsequently, a SYSDBA user can execute the script file manually. To run the OFSAA Application Pack installer in Silent mode, it is mandatory to execute the schema creator utility with -s option.

To execute the utility in Offline mode, you must have a database user with the following GRANTS (alternatively, you can also connect as a user with SYSDBA privileges):

- SELECT ON DBA_ROLES
- SELECT ON DBA_USERS
- SELECT ON DBA_DIRECTORIES
- SELECT ON DBA_TABLESPACES
- CREATE SESSION

> **NOTE** Explicit Grants to the user are required. Grants assigned through Roles are not supported.

To execute the schema creator utility in the offline mode, follow these steps:

1. Log in to the system as a non-root user.
2. Navigate to the following path: `OFS_AAAI_PACK/schema_creator/bin`.
3. Execute the `osc.sh` file using the following command:

   ```
   ./osc.sh -s -o
   ```

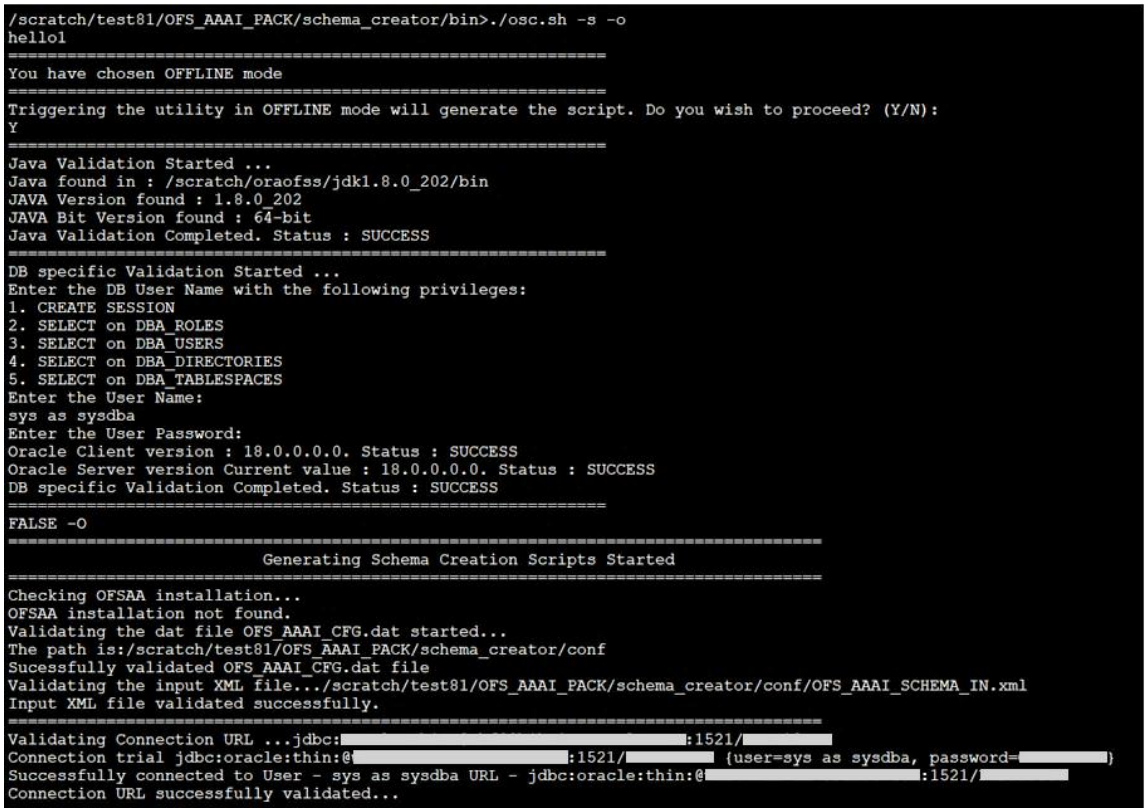
4. The following message is displayed:

   You have chosen OFFLINE mode. Triggering the utility in OFFLINE mode will generate the script. Do you wish to proceed? (Y/y or N/n).

5. Enter `Y` to proceed.

6. Enter the DB Username with SELECT privileges.
7. Enter the User Password.

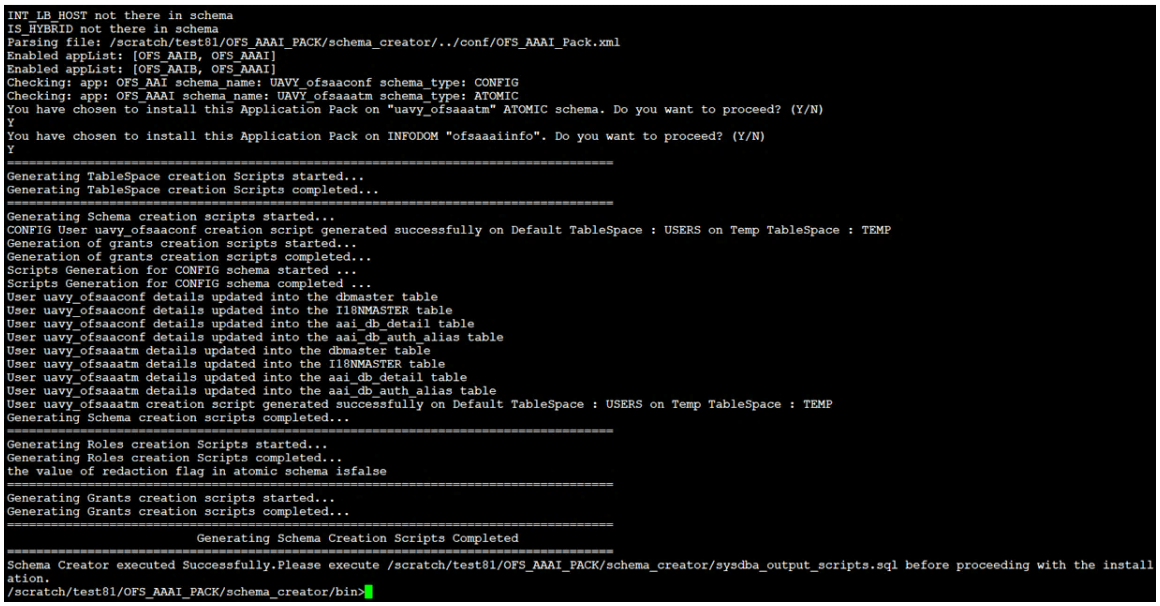
Figure 5: Schema Creation in Offline Mode



8. The console runs the initial validation checks and displays the following message:

   You have chosen to install this Application Pack on <Name of the Atomic Schema> ATOMIC schema. Do you want to proceed? (Y/N).

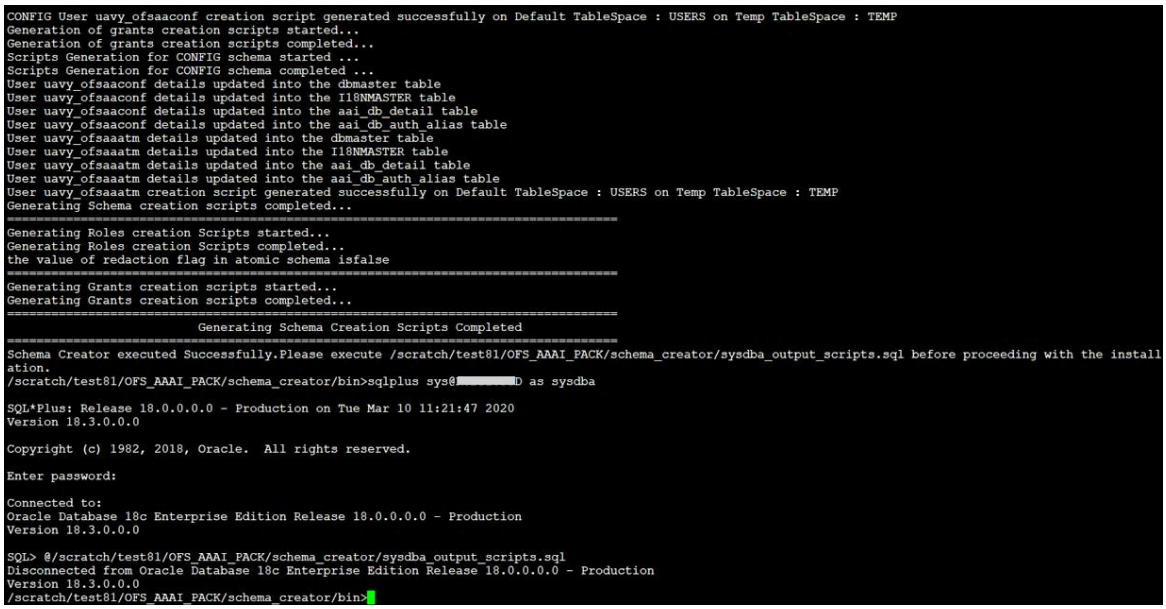
Figure 6: Schema Creation in Offline Mode Script Generation



9. Enter `Y` to start the script generation. The following message is displayed:

You have chosen to install this Application Pack on <Name of the Infodom>. Do you want to proceed? (Y/N).

Figure 7: Schema Creation in Offline Mode Successful



On successful execution of the schema creator utility, the console displays the following status message:

Schema Creator executed successfully. Execute `/scratch/ofsaaapp/OFS_AAAI_PACK/schema_creator/sysdba_output_scripts.sql` before proceeding with the installation.

Additionally, if you have configured the `<<APP PACK>>_SCHEMA_BIGDATA_ IN.xml` file, a file called `hive_output_scripts.hql` is also created in the `/scratch/ofsaaapp/OFS_AAAI_PACK/schema_creator` directory.

> **NOTE** If there are any errors during the SQL script execution, reconfigure the `<<APP Pack>>_SCHEMA_IN.xml` and/or `<<APP Pack>>_SCHEMA_ BIGDATA_IN.xml` files and repeat steps in this procedure to execute the utility. This regenerates the scripts with the correct information.

10. Navigate to the `OFS_AAAI_PACK/schema_creator` directory.
11. Log in to SQLPLUS as a user having SYSDBA Privileges.

Figure 8: Schema Creation in Offline Mode – Execute sysdba_output_scripts.sql

```
SQL*Plus: Release 18.0.0.0.0 - Production on Tue Mar 10 10:50:36 2020
Version 18.3.0.0.0

Copyright (c) 1982, 2018, Oracle.  All rights reserved.

Enter user-name: sys
Enter password:
ERROR:
ORA-12162: TNS:net service name is incorrectly specified


Enter user-name: TESTDB
Enter password:
ERROR:
ORA-12162: TNS:net service name is incorrectly specified


Enter user-name: sys
Enter password:
ERROR:
ORA-12162: TNS:net service name is incorrectly specified


SP2-0157: unable to CONNECT to ORACLE after 3 attempts, exiting SQL*Plus
/scratch/test81/OFS_AAAI_PACK/schema_creator>sys@RUBY18STD as sysdba
-ksh: sys@RUBY18STD: not found [No such file or directory]
/scratch/test81/OFS_AAAI_PACK/schema_creator>sqlplus sys@RUBY18STD as sysdba

SQL*Plus: Release 18.0.0.0.0 - Production on Tue Mar 10 10:53:24 2020
Version 18.3.0.0.0

Copyright (c) 1982, 2018, Oracle.  All rights reserved.

Enter password:

Connected to:
Oracle Database 18c Enterprise Edition Release 18.0.0.0.0 - Production
Version 18.3.0.0.0

SQL> @/scratch/test81/OFS_AAAI_PACK/schema_creator/sysdba_output_scripts.sql
Disconnected from Oracle Database 18c Enterprise Edition Release 18.0.0.0.0 - Production
Version 18.3.0.0.0
/scratch/test81/OFS_AAAI_PACK/schema_creator>
```

12. Execute the `sysdba_output_scripts.sql` file using the following command:

    `SQL>@sysdba_output_scripts.sql`

Alternatively, you can copy the `sysdba_output_scripts.sql` file and `SQLScripts` directory to a remote server and execute the `sysdba_output_scripts.sql` file, after providing appropriate execute permissions.

13. Log in to the Hue Browser with System Administrator privileges. Execute the script mentioned under `hive_output_scripts.hql` (omitting the slash ('/')) in the HIVE Query Editor. For example:

    ```
    CREATE SCHEMA IF NOT EXIST <<HIVE SCHEMA NAME>>
    ```

> **NOTE** See the sysdba_output_scripts.log file for execution status. If there are any errors, contact My Oracle Support. If there are no errors in the execution, the log file is empty.

The result of this task is that the <PACK>_SCHEMA_OUT.XML file is generated. Do not modify this file.

After creating the schema, proceed to Configure the OFSAAI_InstallConfig.xml File.

5.3.2 Execute the Schema Creator Utility in Online Mode

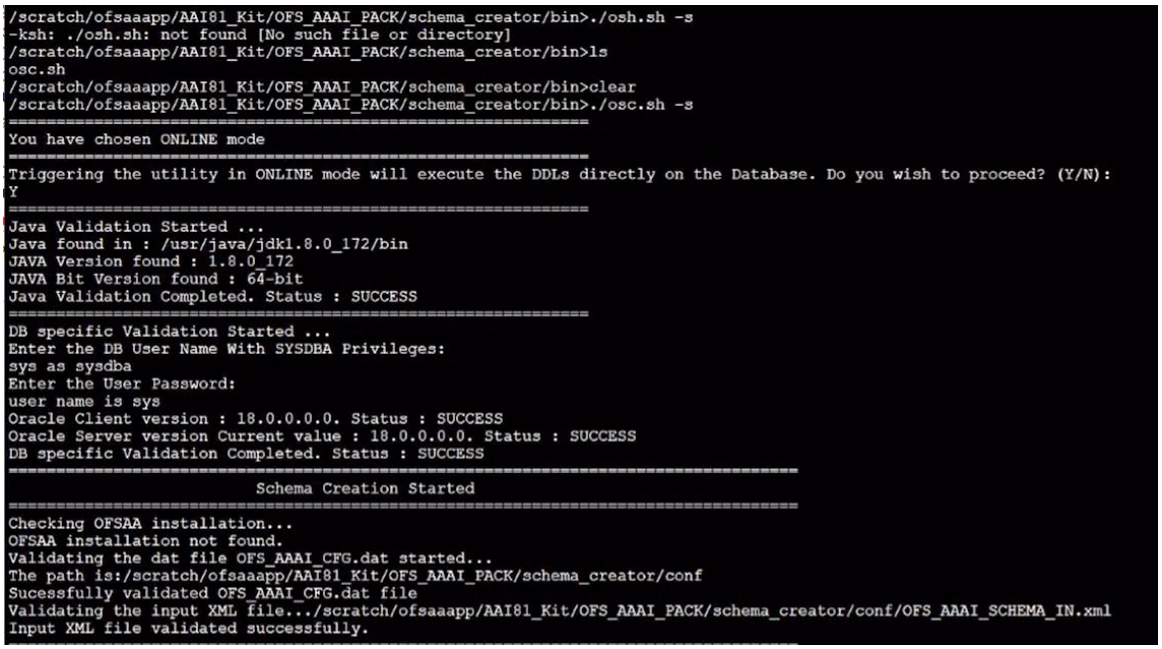
In Online mode, the utility connects to the database and executes the DDLs for Users, Objects, and Grants. If you have SYSDBA privileges you can execute the Schema Creator Utility in Online mode and thereby create the Users, Objects, and Grants during the execution process. To execute the utility in the Online mode, you must connect as "<User> AS SYSDBA".

If you want to run the OFSAA Application Pack Installer in Online mode, it is mandatory to execute the schema creator utility with -s option.

To execute the utility with -s option in online mode, follow these steps:

1. Edit the file `OFS_AAAI_PACK/schema_creator/conf/OFS_<APP PACK>_SCHEMA_IN.xml` in a text editor. See Configure OFS_<App Pack>_SCHEMA_IN.xml for values to modify in the XML file.
2. Execute the utility with -s option. For Example: `./osc.sh -s`

Figure 9: Schema Creation in Online Mode

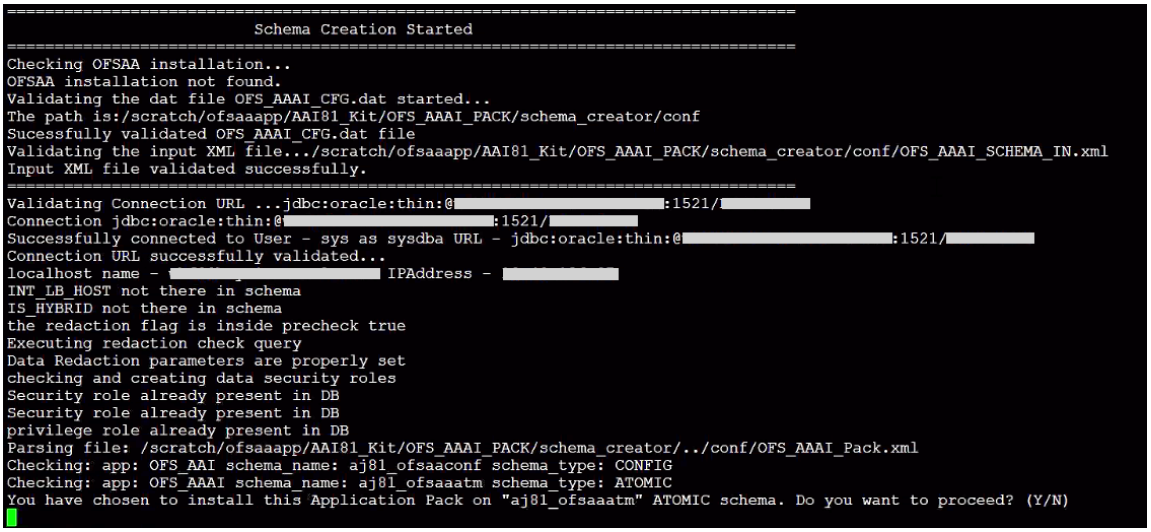


3. The following message is displayed:

   You have chosen ONLINE mode. Triggering the utility in ONLINE mode will execute the DDLs directly on the Database. Do you wish to proceed? (Y/y or N/n).

4. Enter `Y` to proceed.

Figure 10: Schema Creation in Online Mode – DDL Execution

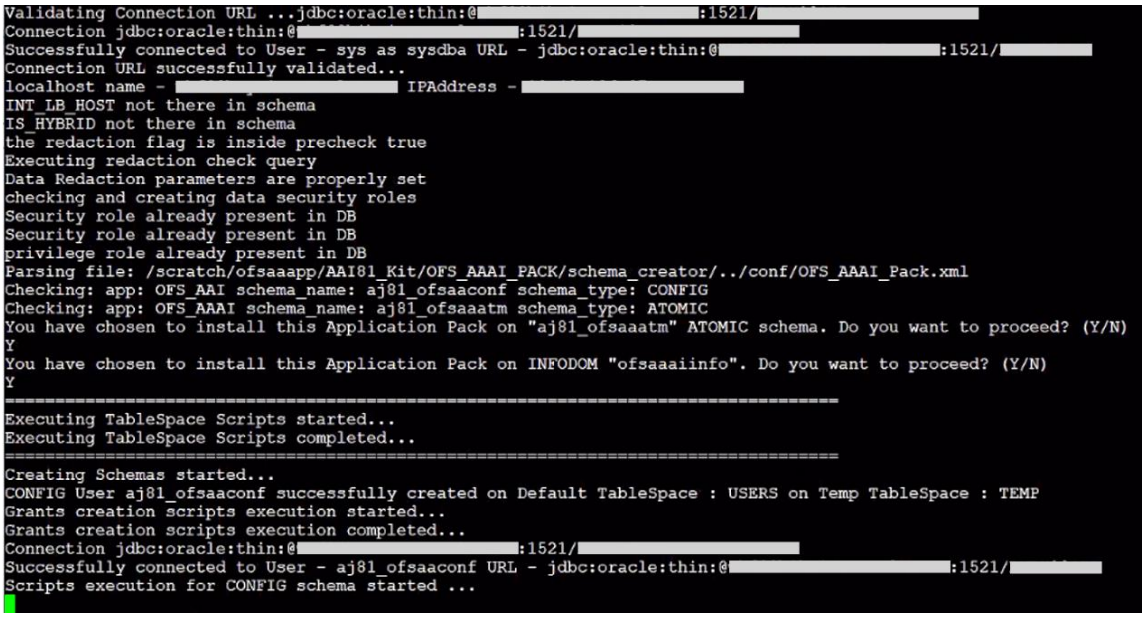


5. The following message is displayed:

   You have chosen to install this application pack on INFODOM "<INFODOM_NAME>". Do you wish to proceed? (Y/y or N/n).

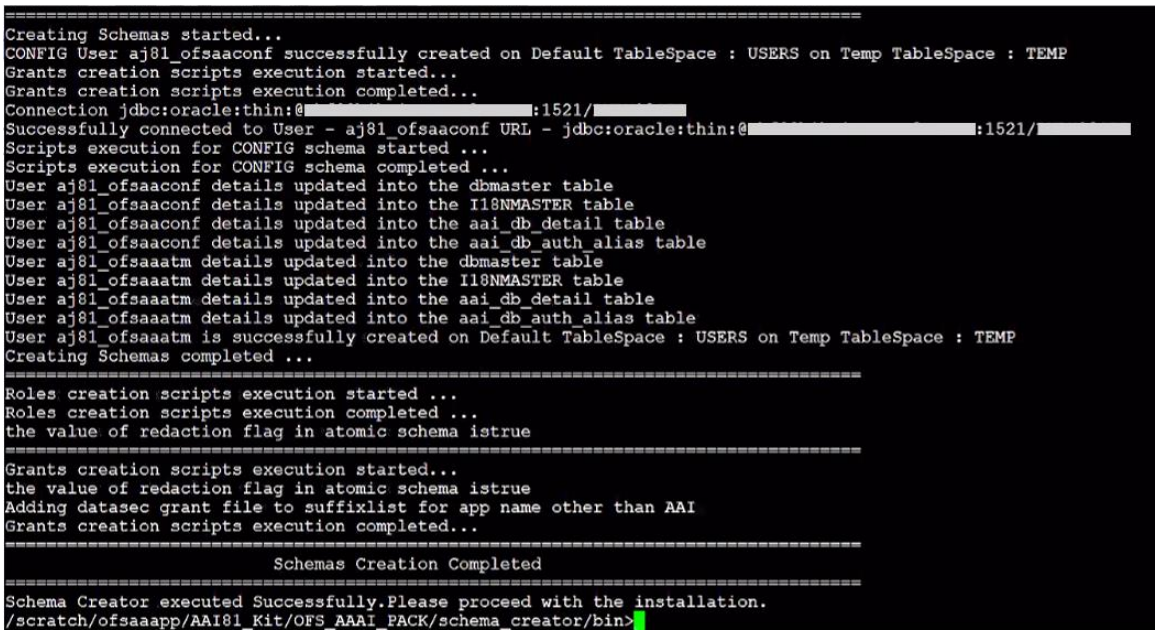
6. Enter `Y` to proceed.

Figure 11: Schema Creation in Online Mode – Infodom Confirmation



7. After Schema creation is successful, proceed to Configure the OFSAAI_InstallConfig.xml File.

Figure 12: Schema Creation in Online Mode –Successful



The result of this task is that the <PACK>_SCHEMA_OUT.XML file is generated. Do not modify this file.

5.3.3 Execute the Schema Creator Utility in TCPS Mode

If you intend to run the OFSAAAI Application Pack Installer in TCPS mode, it is mandatory to execute the schema creator utility with -s option and in online mode.

5.3.3.1 Prerequisites

The following are the prerequisites for this configuration:

1. UNIX user credentials with which OFSAA was installed.
2. UNIX user credentials with which Web Application Server (Oracle WebLogic (WLS)/Apache Tomcat/ IBM WebSphere) was installed.
3. OFSAAI version should be 8.1.2.0.0 and later.
4. Ensure OFSAA installed and deployed is having JAVA 8 (Java version must support Java unlimited cryptographic policy. Java version 1.8.0_161+ supports unlimited cryptographic policy.)
5. Create Oracle Wallet on the OFSAA processing tier.

   For information on Creating and Managing Oracle Wallet, see https://blogs.oracle.com/dev2dev/ssl-connection-to-oracle-db-using-jdbc,-tlsv12,-jks-or-oracle-wallets and https://blogs.oracle.com/weblogicserver/weblogic-jdbc-use-of-oracle-wallet-for-ssl.
6. Configure the Oracle Wallet with trusted certificates between the database server with TCPS configured and the database client to enable communication through the SSL protocol.For example, all the database utils such as sqlplus, tnsping, and sqlldr must work between the Client and the Server.
7. Configure OFSAA to Store Config Schema, Atomic Schema, and SysDBA Credentials with Oracle Wallet. For details, see the Configure OFSAA to Store Config Schema, Atomic Schema, and SysDBA Credentials with Oracle Wallet section.

5.3.3.1.1 Configure OFSAA to Store Config Schema, Atomic Schema, and SysDBA Credentials with Oracle Wallet

To configure the OFSAA to store the Config and Atomic schema credentials with Oracle Wallet, follow these steps:

1. Log in as a UNIX user with the permission to modify the Oracle Wallet.
2. Execute the following command to configure Config Schema credentials. Enter the password to store the credentials in the Wallet when prompted.

   ```
   $ORACLE_HOME/bin/mkstore -wrl <WALLET_HOME> -createCredential  -nologo
   CONFIG  <CONFIG_DATABASE_USERNAME>  <CONFIG_DATABASE_PASSWORD>
   ```
3. Execute the following command to configure the Atomic Schema credentials, Enter the password to store the credentials in the Wallet when prompted.

   ```
   $ORACLE_HOME/bin/mkstore -wrl <WALLET_HOME> -createCredential  -nologo
   <ATOMICALIASNAME>  <ATOMIC_DATABASE_USERNAME>
   <ATOMIC_DATABASE_PASSWORD>
   ```
4. Configure SysDBA credentials. Execute the following command to configure SysDBA Schema credentials. Enter the password to store the credentials in the Wallet when prompted.

   ```
   $ORACLE_HOME/bin/mkstore -wrl <WALLET_HOME> -createCredential  -nologo
   SYS  <SYS_DATABASE_USERNAME>  <SYS_DATABASE_PASSWORD>
   ```

> **NOTE** ATOMICALIASNAME value is a TNS alias for Atomic Schema and must not contain underscores.
>
> For example, if the Atomic Schema Name is PROD_OFSAAATM, then the value for ATOMICALIASNAME must be entered as PRODOFSAAATM.

5.3.3.2 Execute the Utility

To execute the utility, follow these steps:

1. Edit the file `OFS_AAAI_PACK/schema_creator/conf/OFS_AAAI_SCHEMA_IN.xml` in the text editor. See the tables in Configure OFS_<App Pack>_SCHEMA_IN.xml for values to modify in the XML file.
2. Execute the utility with -s option.

   `./osc.sh -s TCPS <WALLET_HOME>`

   For example: `$ ./osc.sh -s TCPS /scratch/oraofss/wallet`

Figure 13: Schema Creation in the TCPS Mode

```
/scratch/aai81ssl>cd /scratch/aai81ssl/OFS_AAAI_PACK/schema_creator/bin
/scratch/aai81ssl/OFS_AAAI_PACK/schema_creator/bin>./osc.sh TCPS /scratch/aai81ssl/wallet
Error: - Please provide proper arguments
/scratch/aai81ssl/OFS_AAAI_PACK/schema_creator/bin>./osc.sh -s TCPS /scratch/aai81ssl/wallet
-S
TCPS
/scratch/aai81ssl/wallet
-Doracle.net.tns_admin=/scratch/aai81ssl -Doracle.net.wallet_location=(SOURCE=(METHOD=file)(METHOD_DATA=(DIRECTORY=/scratc
h/aai81ssl/wallet))) -Doracle.net.ssl_server_dn_match=true -Djavax.net.ssl.trustStoreType=SSO -Djavax.net.ssl.trustStore=c
wallet.sso -Doracle.net.ssl_version=1.2
exporting wallet FALSE
##Entries created by schema creator ##
============================================================
You have chosen ONLINE mode
============================================================
Triggering the utility in ONLINE mode will execute the DDLs directly on the Database. Do you wish to proceed? (Y/N):
Y
```

3. The following message is displayed:

   Triggering the utility in ONLINE mode will execute the DDLS directly on the Database. Do you wish to proceed? (Y/y or N/n).

4. Enter `Y` to proceed.
5. The following message is displayed:

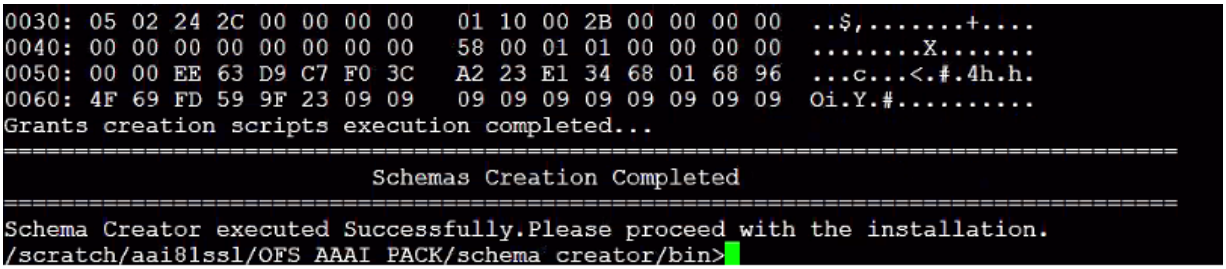
   You have chosen to install this application pack on "<ATOMIC_SCHEMA_NAME>" ATOMIC schema. Do you wish to proceed? (Y/y or N/n).

Figure 14: Schema Creation in the TCPS Mode – Install on Atomic Schema

```
0430: 58 8D 05 B2 02 0F 2D 01   0C 00 00 00 00 00 00 04  X.....-.........
0440: 01 01 02 23 E4 00 02 05   7B 00 00 01 0C 01 0E 03  ...#............
0450: 00 00 00 00 00 00 00 00   00 00 00 00 10 00 01 01  ................
0460: 00 00 00 00 02 05 7B 00   19 4F 52 41 2D 30 31 34  ........ORA-014
0470: 30 33 3A 20 6E 6F 20 64   61 74 61 20 66 6F 75 6E  03: no data foun
0480: 64 0A 61 1D D5 6D 51 10   60 C1 A6 85 B4 88 52 0F  d.a..mQ.`.....R.
0490: A4 F8 CA 1B 2C F2 09 09   09 09 09 09 09 09 09 09  ....,...........
You have chosen to install this Application Pack on "t81s_ofsaaatm" ATOMIC schema. Do you want to proceed? (Y/N)
Y
```

6. Enter `Y` to proceed.
7. After Schema creation is successful, proceed to Configure the OFSAAI_InstallConfig.xml File.

Figure 15: Schema Creation in the TCPS Mode



The result of this task is that the <PACK>_SCHEMA_OUT.XML file is generated. Do not modify this file.

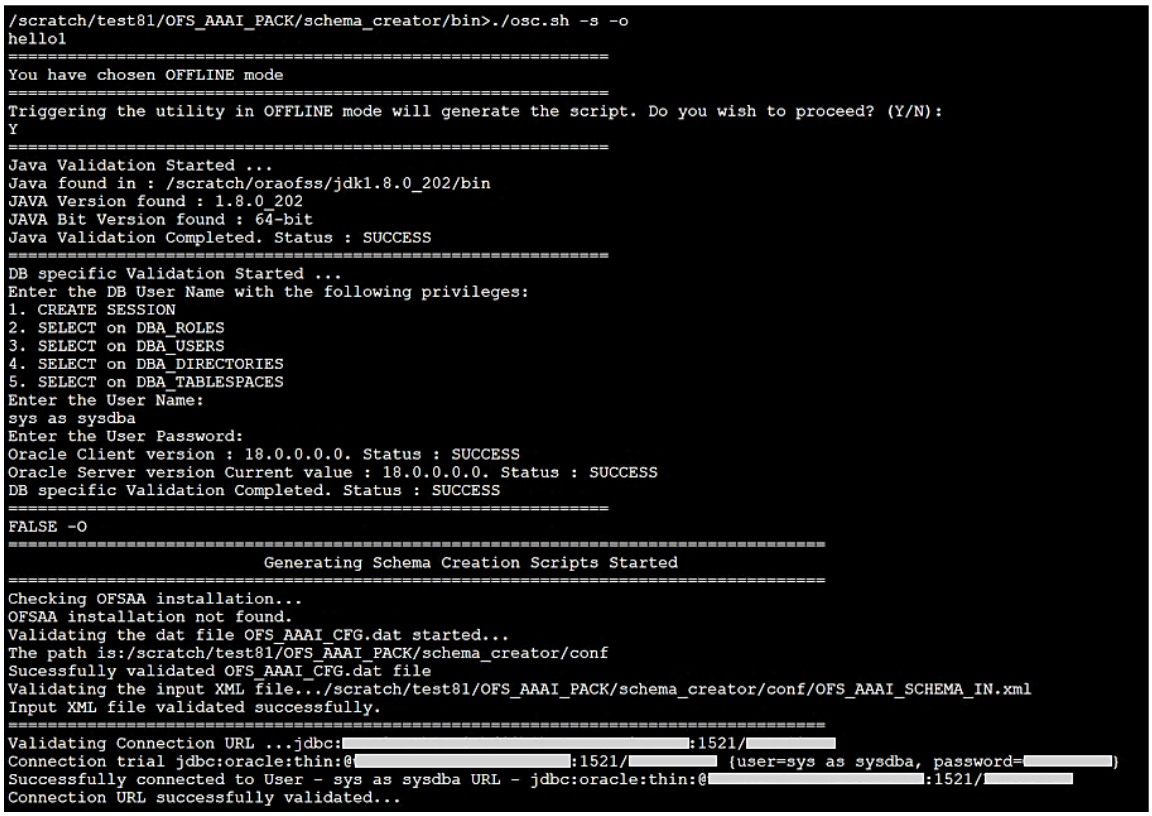
5.3.4 Execute the Schema Creator Utility while Installing Subsequent Applications Pack

When executing the schema creator utility during the installation of a subsequent Applications Pack, you can choose to install the pack either on the same Information Domain /Atomic Schema of the existing application pack or on a new Information Domain / Atomic Schema. You can execute the schema creator utility either in Online or Offline mode.

To execute the schema creator utility while installing OFSAAAI Application Pack over an existing Application Pack, follow these steps:

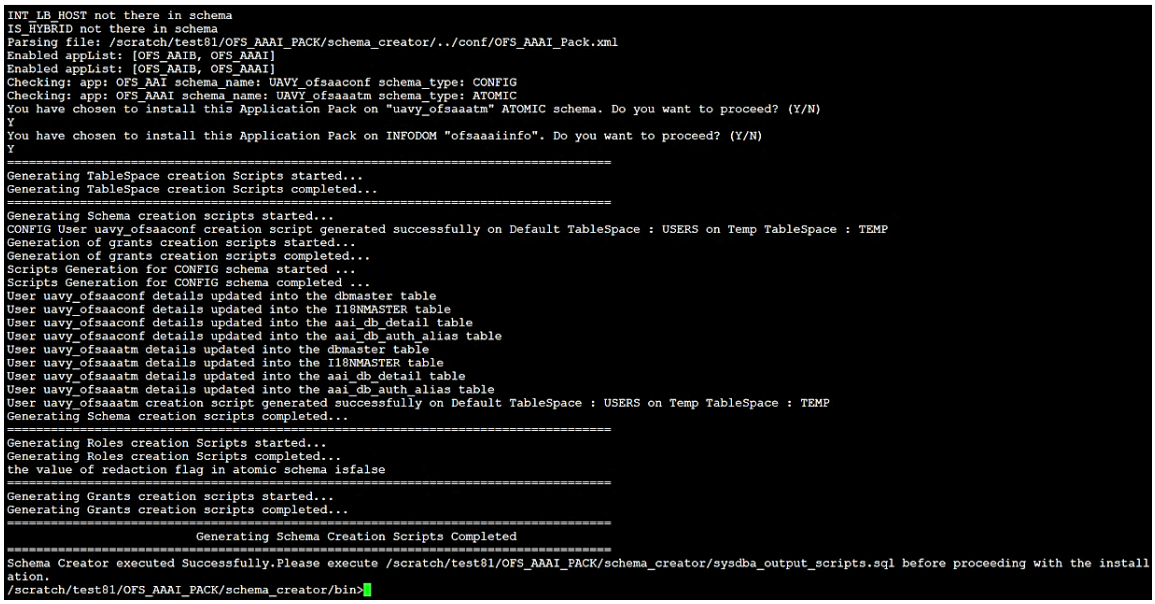
1. Edit the file `OFS_AAAI_PACK/schema_creator/conf/OFS_<APP PACK>_SCHEMA_IN.xml` in a text editor. See Configure OFS_<App Pack>_SCHEMA_IN.xml for values to modify in the XML file.
2. Execute the utility with -s option. For Example: `./osc.sh -s -o`

Figure 16: Execute the Schema Creator Utility to Install Subsequent Applications Pack



After successful schema creation, execute the `sysdba_output_scripts.sql` file

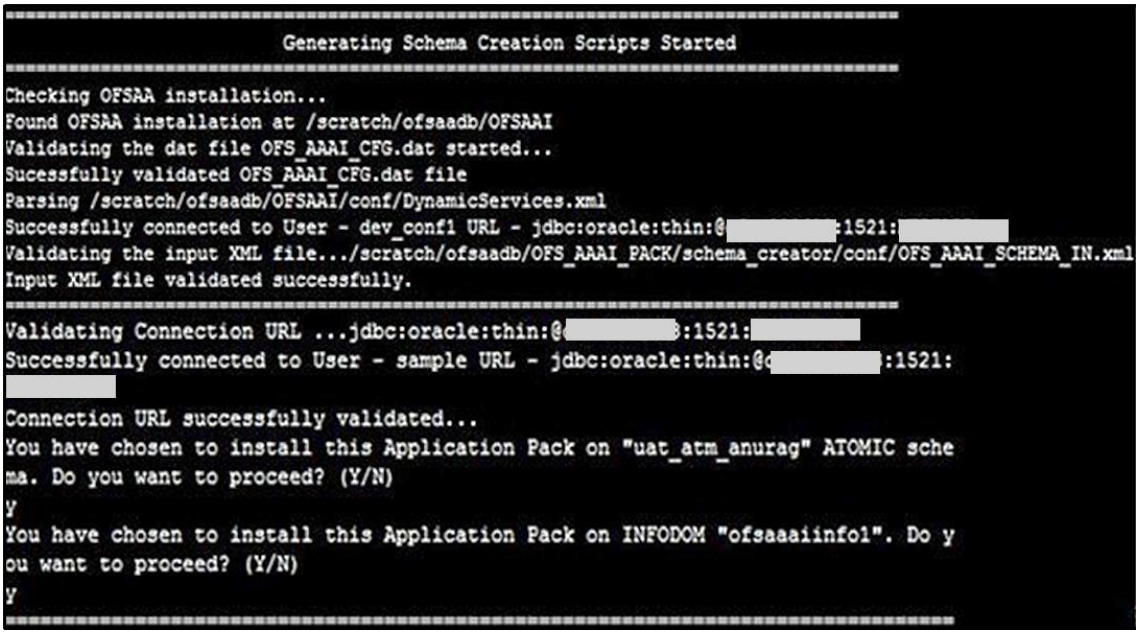
Figure 17: Install Subsequent Applications Pack– Execute sysdba_output_scripts.sql



> **NOTE** You must use the same config schema user name as the previous Application Pack.

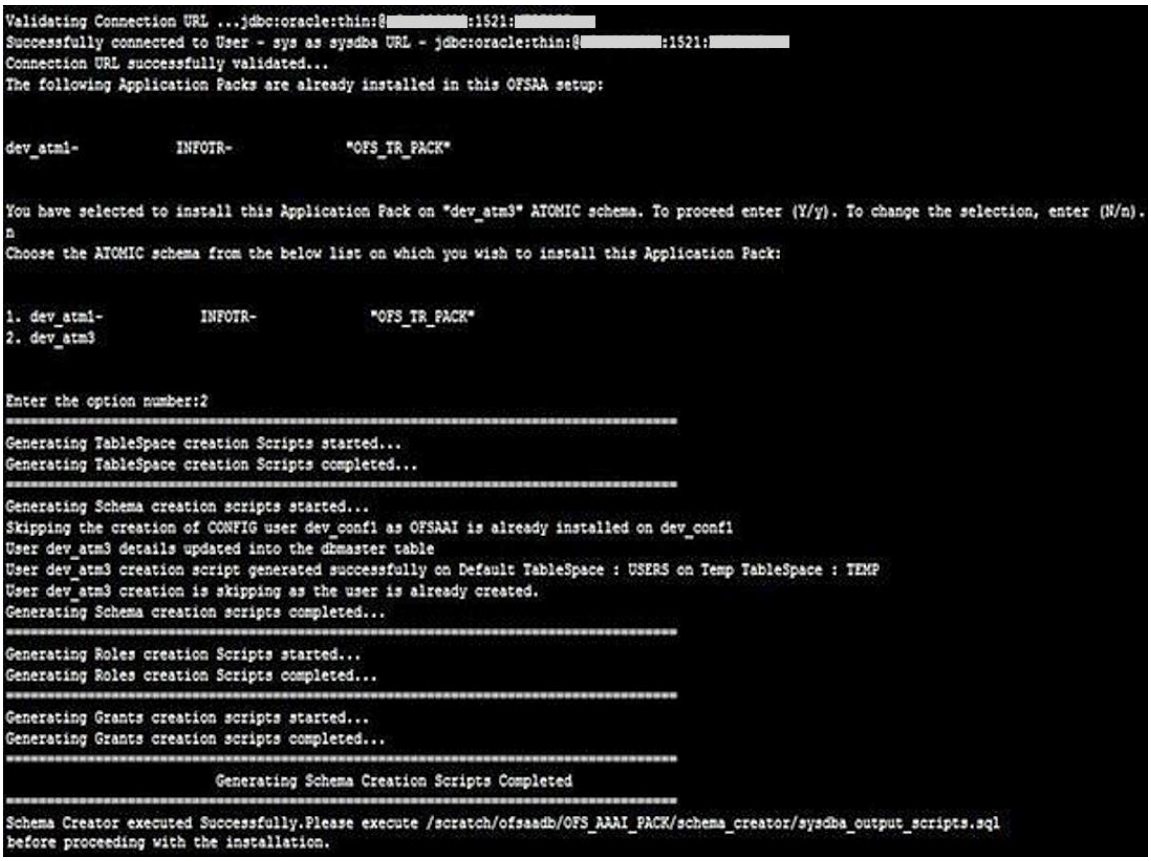
3. The utility identifies the Application Packs that are already installed on the current OFSAA setup and displays the following on the console:
   - Atomic schema of the existing Application Pack
   - Information Domain Name of the existing Pack
   - List of Installed Application Packs

Figure 18: Install Subsequent Applications Pack– Select Atomic Schema and Infodom



4. Select the Atomic User on which you want to install the Application Pack.

Figure 19: Install Subsequent Applications Pack– Select Atomic Schema and Infodom



On successful execution of schema creator utility, the console displays the following status message:

```
Success. Please proceed with the installation.
```

NOTE

1. See the log file in `OFS_AAAI_PACK/schema_creator/logs` directory for execution status.
2. See the log file `sysdba_output_scripts.log` for execution status if executed in offline mode. This log will be empty if there are no errors in the execution.
3. If there are any errors, contact My Oracle Support.

5.4 Configure the OFSAAI_InstallConfig.xml File

To configure the `OFS_InstallConfig.xml` file, follow these steps:

1. Navigate to the `OFS_AAAI_PACK/OFS_AAI/conf/` directory.
2. Open the `OFSAAI_InstallConfig.xml` file in a text editor.
3. Configure the `OFSAAI_InstallConfig.xml` file as mentioned in the following table.

You must manually set the InteractionVariable parameter values as mentioned in the table. If a value is not applicable, enter NA. Ensure that the value is not entered as NULL.

Table 19: OFSAA Infrastructure Installation Tasks and Descriptions

InteractionVariable Name	Significance and Expected Value	Mandatory
<Layer name="GENERAL">		
InteractionGroup name="WebServerType"		
WEBAPPSERVERTYPE	Identifies the web application server on which the OFSAA Infrastructure web components are deployed. Set the following numeric value depending on the type of web application server: • Apache Tomcat = 1 • IBM WebSphere Application Server = 2 • Oracle WebLogic Server = 3 For example, `<InteractionVariable name="WEBAPPSERVERTYPE">3</InteractionVari able>`	Yes
InteractionGroup name="OFSAA Infrastructure Server Details"		
DBSERVER_IP	Identifies the host name or IP address of the system on which the Database Engine is hosted. **Note:** For RAC Database, the value must be NA. For example, `<InteractionVariable name="DBSERVER_IP">14.15.16.17</InteractionVariable>` or `<InteractionVariable name="DBSERVER_IP">dbhost.server.com</InteractionVariable>`	Yes
InteractionGroup name="Database Details"		
ORACLE_SID/SERVICE_NAME	Identifies the Oracle DB Instance SID or SERVICE_NAME **Note:** The `Oracle_SID` value must be exactly the same as it is mentioned in `JDBC_URL`. For example, `<InteractionVariable name="ORACLE_SID/SERVICE_NAME">ofsaser</InteractionVariable>`	Yes
ABS_DRIVER_PATH	Identifies the directory where the JDBC driver (`ojdbc<version>.jar`) exists. This is typically the `$ORACLE_HOME/jdbc/lib` directory. For example, `<InteractionVariable name="ABS_DRIVER_PATH">">/oradata6/revwb7/ oracle </InteractionVariable>` **Note:** See Hardware and Software Requirements to identify the correct `ojdbc<version>.jar` file version to be copied.	Yes
InteractionGroup name="OLAP Detail		

OLAP_SERVER_ IMPLEMENTATION	Identifies whether the OFSAA Infrastructure OLAP component must be configured. It depends on whether you intend to use the OLAP feature. The following numeric value must be set depending on the choice: • YES: 1 • NO: 0 **Note:** If the value for `OLAP_SERVER_IMPLEMENTATION` is set to 1, the installer checks if the following environment variables are set in the `.profile` file: • ARBORPATH • HYPERION_HOME • ESSBASEPATH	No
InteractionGroup name="SFTP Details"		
SFTP_ENABLE	Identifies if the SFTP (Secure File Transfer Protocol) feature is to be enabled. The following numeric value must be set depending on the choice: • SFTP: 1 • FTP: 0	Yes
Note: The default value for `SFTP_ENABLE` is **1**, which signifies that SFTP is used. Oracle recommends using SFTP instead of FTP because SFTP is more secure. However, you can ignore this recommendation and use FTP by setting `SFTP_ENABLE` to **0**. You can change this selection later from the OFSAAI administration interface. Set `SFTP_ENABLE` to **-1** to configure ftpshare and weblocal path as a local path mounted for the OFSAAI server.		
FILE_TRANSFER_PORT	Identifies the port used for the file transfer service. The default value specified is **22** (SFTP). Specify the value as **21** or any other PORT value if the value for `SFTP_ENABLE` is **0**. For example, `<InteractionVariable name="FILE_TRANSFER_ PORT">21</InteractionVariable>`	Yes
InteractionGroup name="Locale Detail"		
LOCALE	Identifies the locale information to be used during the installation. This release of the OFSAA Infrastructure supports only US English. For example, `<InteractionVariable name="LOCALE">en_US</InteractionVariable>`	Yes
InteractionGroup name="OFSAA Infrastructure Communicating ports" **Note:** The following ports are used internally by the various OFSAA Infrastructure services. The default values mentioned are set in the installation. If you intend to specify a different value, update the parameter value accordingly, ensure that the port value is in the range 1025 to 65535, and the respective port is enabled.		
JAVAPORT	9999	Yes
NATIVEPORT	6666	Yes
AGENTPORT	6510	Yes
ICCPORT	6507	Yes
ICCNATIVEPORT	6509	Yes
OLAPPORT	10101	Yes

MSGPORT	6501	Yes
ROUTERPORT	6500	Yes
AMPORT	6505	Yes
InteractionGroup name="Web Details" **Note:** If the value for `HTTPS_ENABLE` is set to **1**, ensure that you have a valid certificate available from a trusted CA and it is configured on your web application server.		
HTTPS_ENABLE	Identifies whether the UI must be accessed using HTTP or HTTPS scheme. The default value is set to **0**. The numeric value must be set depending on the following options: • YES: 1 • NO: 0 For example, `<InteractionVariable name="HTTPS_ENABLE">0</InteractionVariable>`	Yes
WEB_SERVER_IP	Identifies the HTTP Server IP/ Host name or Web application server IP/ Host name, to be used to access the UI. This IP is typically the HTTP Server IP. If a separate HTTP Server is not available, then the value must be Web application server IP/Host name. For example, `<InteractionVariable name="WEB_SERVER_IP">10.11.12.13</InteractionVariable>` or `<InteractionVariable name="WEB_SERVER_IP">myweb.server.com</InteractionVariable>`	No
WEB_SERVER_PORT	Identifies the Web Server Port, which is typically 80 for non SSL and 443 for SSL. If a separate HTTP Server exists, the port value must be the value configured for the Web Server. **Warning:** The installer will not accept the port value as: • 80, if the `HTTPS_ENABLE` variable is 1 • 443, if the `HTTPS_ENABLE` variable is 0 For example, `<InteractionVariable name="WEB_SERVER_PORT">80</InteractionVariable>`	No

CONTEXT_NAME	Identifies the web application context name which is used to build the URL to access the OFSAA application. You can identify the context name from the following URL format:
	`<scheme>://<host>:<port>/<context-name>/login.jsp`
	The following is an example:
	`https://myweb:443/ofsaadev/login.jsp`
	For example, <InteractionVariable name="CONTEXT_NAME">ofsaadev</InteractionVariable>
		Yes

WEBAPP_CONTEXT_PATH	Identifies the absolute path of the exploded EAR file on the web application server. • For Tomcat, specify the Tomcat directory path till `/webapps`. For example, `/oradata6/ revwb7/tomcat/webapps/`.	Yes

	• For WebSphere, specify the WebSphere path as <WebSphere profile directory>/installedApps/<NodeCellName>. For example, /data2/test//WebSphere/AppServer/profiles/<Profile_Name>/installedApps/aiximfNode01Cell, where aix-imf is the Host name. • For WebLogic, specify the WebLogic home directory path. For example, /<WebLogic home directory path>/bea/wlserver_10.3 **Note:** For WebLogic, the value specified for this attribute is ignored and the value provided against the attribute WEBLOGIC_DOMAIN_HOME is considered.	
WEB_LOCAL_PATH	Identifies the absolute path to any directory on the web application server that can hold temporary files, which are uploaded as part of the usage of the application. Set this in the FTPSHARE location. **Note:** During a clustered deployment, ensure that this path and the directory are the same on all the nodes.	Yes
InteractionGroup name="Weblogic Setup Details"		
WEBLOGIC_DOMAIN_HOME	Identifies the WebLogic Domain Home. For example, <InteractionVariable name="WEBLOGIC_DOMAIN_HOME">/home/weblogic/bea/user_ projects/domains/mydomain</InteractionVariable>	Yes. Specify the value only if WEBAPPSERVERTYPE is set as 3 (WebLogic)
InteractionGroup name="OFSAAI FTP Details"		
OFSAAI_FTPSHARE_PATH	Identifies the absolute path of the directory that is identified as the file system stage area. **Note:** The directory must exist on the same system on which the OFSAA Infrastructure is being installed (can be on a separate mount). The user mentioned in the APP_SFTP_USER_ID parameter in the following example must have RWX permission on the directory. For example, <InteractionVariable name="APP_FTPSHARE_PATH">">/oradata6/revwb7/ftpshare</ InteractionVariable>	Yes
OFSAAI_SFTP_USER_ID	Identifies the user who has RWX permissions on the directory identified for the parameter APP_FTPSHARE_PATH.	Yes
OFSAAI_SFTP_PRIVATE_KEY	Identifies the SFTP private key for OFSAAI. For example, <InteractionVariable name="OFSAAI_SFTP_PRIVATE_KEY">/home/ofsaapp/.ssh/id_rsa</InteractionVariable> By default, the value is **NA**, which indicates that, for authentication, you are prompted to enter the password for the user <OFSAAI_SFTP_USER_ID>.	No

	For more information on how to generate an SFTP Private key, see the Set Up SFTP Private Key section.	
OFSAAI_SFTP_PASSPHRASE	Identifies the passphrase for the SFTP private key for OFSAAI. For example, `InteractionVariable name="OFSAAI_SFTP_PASSPHRASE">enter a pass phrase here</InteractionVariable>` By default, the value is **NA**. If the `OFSAAI_SFTP_PRIVATE_KEY` value is given and the `OFSAAI_SFTP_PASSPHRASE` value is **NA**, then the passphrase is identified as empty.	No
InteractionGroup name="Hive Details" The default value set for the interaction variables under this group is NA. **Note:** The following values are required only for Hive Configuration.		
HIVE_SERVER_PORT	Identifies the port used for the file transfer service. The default value is **22** (SFTP). To use this port for FTP, set this value to **21**. For example, `<InteractionVariable name="HIVE_SERVER_PORT">22</InteractionVariable>`	Yes
HIVE_SERVER_FTPDRIVE	Identifies the absolute path to the directory identified as file system stage area of the HIVE server. For example, `<InteractionVariable name="HIVE_SERVER_FTPDRIVE">/scratch/ofsaa/ftpshare</InteractionVariable>`	Yes
HIVE_SERVER_FTP_USERID	Identifies the user who has RWX permissions on the directory identified under the parameter `HIVE_SERVER_FTPDRIVE`. For example, `<InteractionVariable name="HIVE_SERVER_FTP_USERID">ofsaa</InteractionVariable>`	Yes
HIVE_SERVER_FTP_PROTOCOL	If the `HIVE_SERVER_PORT` is 21, then set the value to **FTP**. If not, set it to **SFTP**. For example, `<InteractionVariable name="HIVE_SERVER_FTP_PROTOCOL">SFTP</InteractionVariable>`	Yes
HIVE_SFTP_PRIVATE_KEY	Identifies the SFTP private key for the HIVE server. For example, `<InteractionVariable name="HIVE_SFTP_PRIVATE_KEY">/scratch/testuser/.ssh/id_rsa</InteractionVariable>` By default, the value is **NA**, which indicates that, for authentication, you are prompted to enter the password for the user <HIVE_SERVER_FTP_USERID>.	

	For more information on generating SFTP Private key, see the Set Up SFTP Private Key section.	
HIVE_SFTP_PASSPHRASE	Identifies the passphrase for the SFTP private key for HIVE. For example, `<InteractionVariable name="HIVE_SFTP_ PASSPHRASE">NA</InteractionVariable>` By default, the value is **NA**. If the `HIVE_SFTP_PRIVATE_KEY` value is **NA**, then the passphrase is identified as empty.	

5.4.1 Set Up the SFTP Private Key

Log in to OFSAA UNIX user using the Putty tool, where you plan for installation and generate a pair of authentication keys using the `ssh-keygen` command. If required, set passphrase. Otherwise, the OFSAAI_SFTP_PASSPHRASE tag must be set to NA.

To generate a private key, enter the commands as shown:

```
ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/ofsaapp/.ssh/id_rsa):
Created directory '/home/ofsaapp/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/ofsaapp/.ssh/id_rsa.
Your public key has been saved in /home/ofsaapp/.ssh/id_rsa.pub.
The key fingerprint is:
3e:4f:05:79:3a:9f:96:7c:3b:ad:e9:58:37:bc:37:e4
ofsaapp@OFSASERVER:~> cat /home/ofsaapp/.ssh/id_rsa.pub >>
/home/ofsaapp/.ssh/authorized_keys
```

Ensure the following permissions exist for the given directories:

- permissions of .ssh must be 700
- permissions of .ssh/authorized_keys must be 640
- permission of .ssh/id_rsa must be 400
- Permission of UNIX User created must be 755

5.5 Install the OFSAAI Application Pack

ATTENTION Before you begin the installation, configure and execute the following files:

1. Configure the OS File System Settings and Environment Settings in the .profile File
2. Configure OFS_<App pack>_PACK.xml File
3. Configure OFS_<App Pack>_SCHEMA_IN.xml File
4. Configure <APP Pack>_SCHEMA_BIGDATA_IN.xml File
5. Configure OFSAAI_InstallConfig.xml File (Do not configure this file if an installation of OFSAAI 8.1 already exists.)
6. Execute the Schema Creator Utility

To install the OFSAAI Application Pack, follow these steps:

1. Log in to the system as a non-root user.
2. Identify a directory for installation and set the same in the user `.profile` file as follows:

   ```
   FIC_HOME=<OFSAA Installation Directory>
   export FIC_HOME
   ```

3. Execute the user `.profile` file.
4. Navigate to the `OFS_AAAI_PACK` directory.
5. Rename the `OFS_AAAI_PACK/schema_creator/conf/OFS_AAAI_SCHEMA_IN.xml.Template` file to `OFS_AAAI_PACK/schema_creator/conf/OFS_AAAI_SCHEMA_IN.xml`.
6. If the installation is for Big Data, then rename the `OFS_AAAI_ PACK/schema_creator/conf/OFS_AAAI_SCHEMA_BIGDATA_IN.xml.Template` file to `OFS_AAAI_PACK/schema_creator/conf/OFS_AAAI_SCHEMA_BIGDATA_IN.xml`.

   ATTENTION Do not install the new applications in the same segment if the preinstalled applications use run management.

7. Enter the following command in the console to execute the application pack installer with the Silent option.

   ```
   ./setup.sh SILENT
   ```

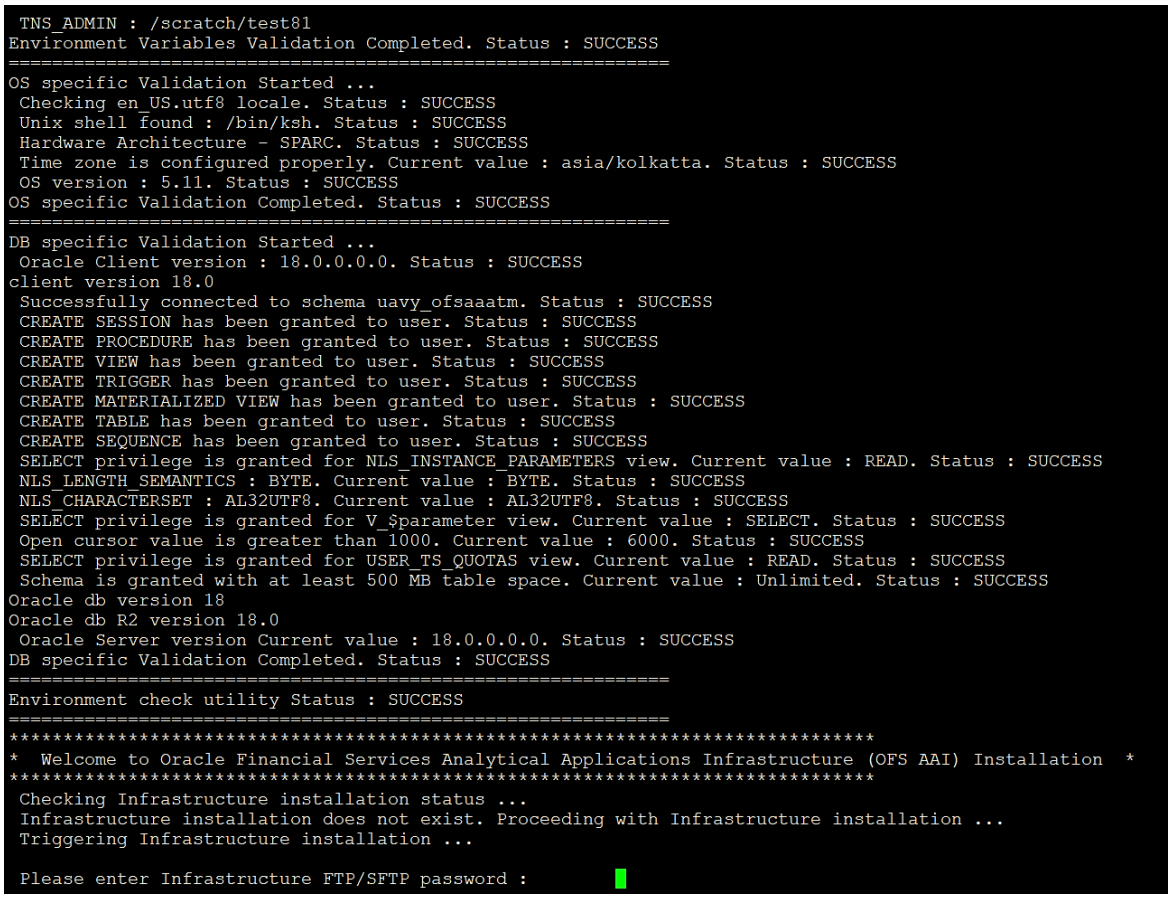
8. The installer proceeds with Pre-Installation Checks.

Figure 20: Silent Mode of Installation

```
/scratch/test81/OFS_AAAI_PACK/bin>./setup.sh SILENT
Current OS Type ----  SunOS
 FIC_HOME : /scratch/test81/OFSAAI_81FULL
Environment check utility started...
============================================================
Java Validation Started ...
 Java found in : /scratch/oraofss/jdk1.8.0_202/bin
JCE IS true
 JAVA Version found : 1.8.0_202
 JAVA Bit Version found : 64-bit
Java Validation Completed. Status : SUCCESS
============================================================
Environment Variables Validation Started ...
 ORACLE_HOME : /scratch/oraofss/app/product/18.3.0/client_1
 TNS_ADMIN : /scratch/test81
Environment Variables Validation Completed. Status : SUCCESS
============================================================
OS specific Validation Started ...
 Checking en_US.utf8 locale. Status : SUCCESS
 Unix shell found : /bin/ksh. Status : SUCCESS
 Hardware Architecture - SPARC. Status : SUCCESS
 Time zone is configured properly. Current value : asia/kolkatta. Status : SUCCESS
 OS version : 5.11. Status : SUCCESS
OS specific Validation Completed. Status : SUCCESS
============================================================
DB specific Validation Started ...
 Oracle Client version : 18.0.0.0.0. Status : SUCCESS
client version 18.0
 Successfully connected to schema uavy_ofsaaatm. Status : SUCCESS
 CREATE SESSION has been granted to user. Status : SUCCESS
 CREATE PROCEDURE has been granted to user. Status : SUCCESS
 CREATE VIEW has been granted to user. Status : SUCCESS
 CREATE TRIGGER has been granted to user. Status : SUCCESS
 CREATE MATERIALIZED VIEW has been granted to user. Status : SUCCESS
 CREATE TABLE has been granted to user. Status : SUCCESS
 CREATE SEQUENCE has been granted to user. Status : SUCCESS
 SELECT privilege is granted for NLS_INSTANCE_PARAMETERS view. Current value : READ. Status : SUCCESS
 NLS_LENGTH_SEMANTICS : BYTE. Current value : BYTE. Status : SUCCESS
 NLS_CHARACTERSET : AL32UTF8. Current value : AL32UTF8. Status : SUCCESS
 SELECT privilege is granted for V_$parameter view. Current value : SELECT. Status : SUCCESS
 Open cursor value is greater than 1000. Current value : 6000. Status : SUCCESS
 SELECT privilege is granted for USER_TS_QUOTAS view. Current value : READ. Status : SUCCESS
 Schema is granted with at least 500 MB table space. Current value : Unlimited. Status : SUCCESS
Oracle db version 18
```

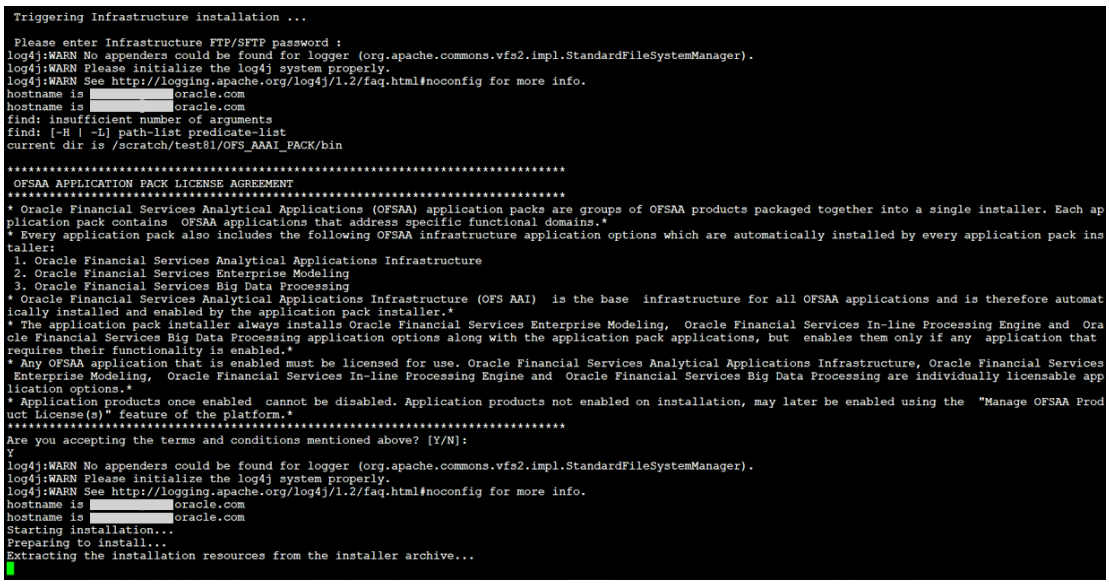
9. Enter the OFSAA Processing Tier FTP/SFTP password value and proceed, when prompted in the command prompt.

Figure 21: OFSAA Processing Tier FTP/SFTP Password Prompt



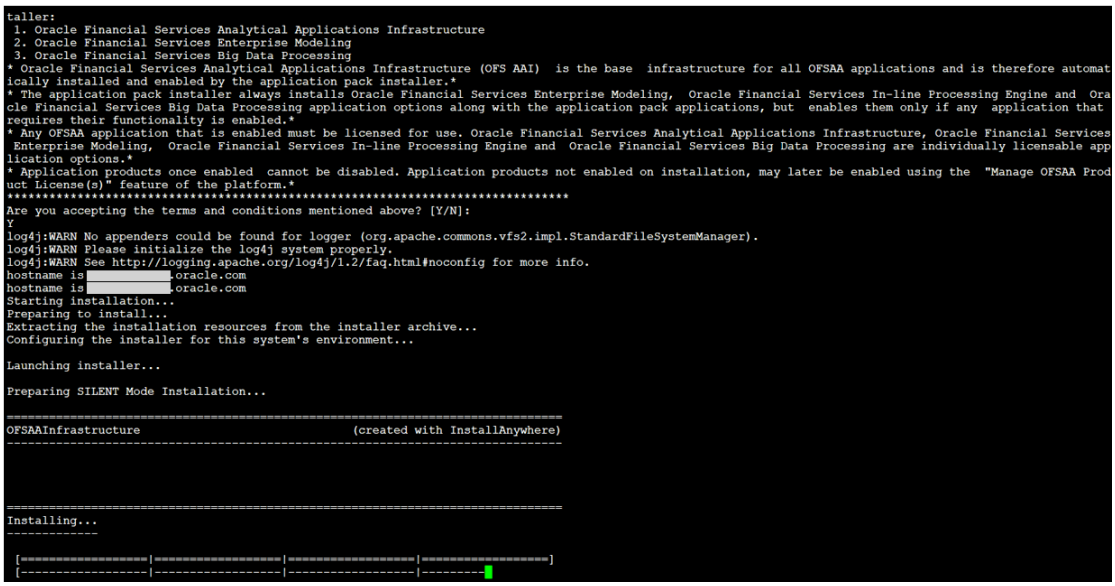
10. The process displays the OFSAA License. Enter **Y** and proceed.

Figure 22: Accept the OFSAA License Agreement



11. The installer installs the AAI application.

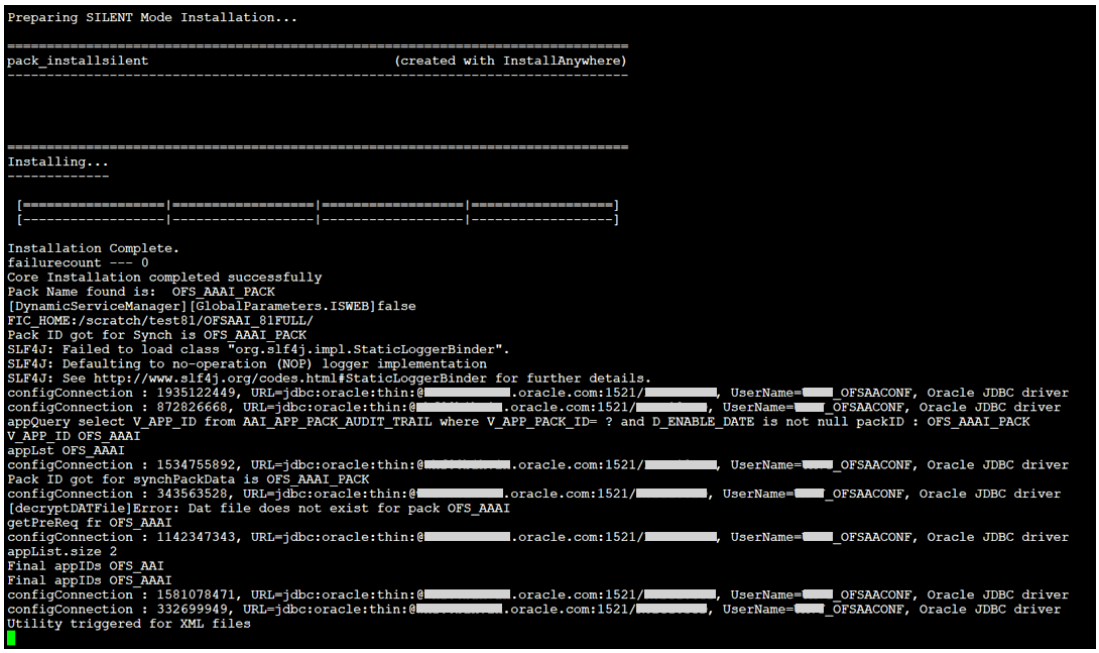
Figure 23: OFS AAAI Silent Mode Installation



Data Model Upload may take several hours to complete. You can check the installation logs in the following location: `OFS_AAAI_PACK/OFS_AAI/logs`

12. The OFSAA Infrastructure installation performs a post-install check automatically on the successful installation of the product.

Figure 24: Silent Mode Installation In Progress



Congratulations! Your installation is complete.

5.5.1 Verify the Log File Information

See the following logs files for more information:

- Infrastructure installation log files in the `OFS_AAAI_PACK/OFS_AAI/logs/` directory.
- `OFSAAInfrastucture_Install.log` file in the `$FIC_HOME` directory.

After the installation OFSAAAI 8.1.2.0.0 is successful, complete the required Post-installation steps.

6 Post-installation

Perform the required post-installation steps after completing the installation of OFSAAAI 8.1.2.0.0.

Topics:

- Patch OFSAA Infrastructure Installation
- Backup the OFS_<PACK>_SCHEMA_IN.xml and OFS_<PACK>_SCHEMA_OUTPUT.xml Files
- Stop the Infrastructure Services
- Configure Referrrer Header Validation
- Create and Deploy the EAR or WAR Files
- EAR or WAR File - Build Once and Deploy Across Multiple OFSAA Instances
- Assign Grants for Schemas
- Start the Infrastructure Services
- Access the OFSAA Application
- OFSAA Landing Page
- Configure the excludeURLList.cfg File
- Configure Oracle R Distribution and Oracle R Enterprise (ORE)
- Configure Big Data Processing
- Enable Financial Services Enterprise Modeling on Another Application Pack
- Create Application Users
- Map Application User(s) to User Group
- Add TNS entries in the TNSNAMES.ORA File
- Configure Transparent Data Encryption (TDE) and Data Redaction in OFSAA

6.1 Patch OFSAA Infrastructure Installation

Oracle strongly recommends installing the latest available patch set to be up-to-date with the various releases of the OFSAA product.

After the installation of OFSAAAI 8.1.2.0.0, apply the following mandatory patch:

- 33663417

ATTENTION	On the 10th of December 2021, Oracle released Security Alert CVE-2021-44228 in response to the disclosure of a new vulnerability affecting Apache Log4J before version 2.15. The application of the **33663417** Mandatory Patch fixes the issue. For details, see the My Oracle Support Doc ID 2827801.1.

Ensure that you reapply the **33663417** Mandatory Patch whenever you install or upgrade the application, or apply an incremental patch.

For patch download information, see the **Download the OFSAAAI Applications Pack Installer and Patches** section in Pre-installation for a new installation and in Upgrade for an upgrade installation.

See My Oracle Support for more information on the latest release.

6.2 Backup the OFS_<PACK>_SCHEMA_IN.xml and OFS_<PACK>_SCHEMA_OUTPUT.xml Files

Backup the `OFS_<PACK>_SCHEMA_IN.xml`, `OFS_<PACK>_SCHEMA_OUTPUT.xml` files to reuse these files in the future to upgrade existing Apps, or to install new Apps.

Table 20: Directory of Files to Backup

File Name	Directory
`OFS_<PACK>_SCHEMA_IN.xml`	`<OFS_AAAI_PACK>/schema_creator/conf`
`OFS_<PACK>_SCHEMA_OUTPUT.xml`	`<OFS_AAAI_PACK>/schema_creator/`

6.3 Stop the Infrastructure Services

To stop Infrastructure services, follow these steps:

1. On the machine where the Infrastructure Application components are installed, navigate to the `$FIC_APP_HOME/common/FICServer/bin` directory, and execute the following command:

   `./stopofsaai.sh`

2. To stop the ICC server on the machine where the Infrastructure Default Application components are installed, navigate to the `$FIC_HOME/ficapp/icc/bin` directory, and execute the following command:

   `./iccservershutdown.sh`

   NOTE Only the Infrastructure Default Application Server will hold the ICC component.

3. To stop the Back-end server on the machine where the Infrastructure database components are installed, navigate to the `$FIC_DB_HOME/bin` directory, and execute the following command:

   `./agentshutdown.sh`

6.4 Configure Referrer Header Validation

Referrer Header Validation protects against CSRF attacks by allowing validated host URLs.

To configure Referrer Header validation, follow these steps:

1. Navigate to the `web.xml` file in the `$FIC_HOME/ficweb/webroot/WEB-INF/` directory.
2. Add the following tag:

```
<filter>
<filter-name>FilterServlet</filter-name>
<filter-class>com.iflex.fic.filters.FilterServlet</filter-class>
<init-param>
  <param-name>AllowHosts</param-name>
  <param-value><URL1>/ <URL2>/</param-value>
</init-param>
</filter>
```

NOTE

1. Separate <URL1> and <URL2> with a single space. Adding the URLs without a space between them or adding two or more spaces between them results in errors. Make sure that <URL> ends with a forward slash (**/**).
2. If you choose to set **Referrer-Policy no-referrer**, then follow these steps. The above steps to configure Referrer Header validation are not required.
   a. Open the `web.xml` file in the `$FIC_HOME/ficweb/webroot/WEB-INF/` directory. The **REFERRER_POLICY_FLAG** is set to **TRUE** by default in the `web.xml` file as shown in the following tag:

```
<context-param>
<param-name>REFERRER_POLICY_FLAG</param-name>
<param-value>TRUE</param-value>
</context-param>
```

   b. Modify the referrer policy in the `web.xml` file to **FALSE**.

6.5 Create and Deploy the EAR/WAR Files

This section covers the following topics:

- Create the EAR or WAR File
- Explode the EAR File
- Deploy the EAR or WAR File

6.5.1 Create the EAR/WAR File

The EAR/WAR files are automatically generated during the new installation. However, see this section if you have to create EAR/WAR files after installation or upgrade.

- Non-TCPS Installed Setup
- TCPS Installed Setup

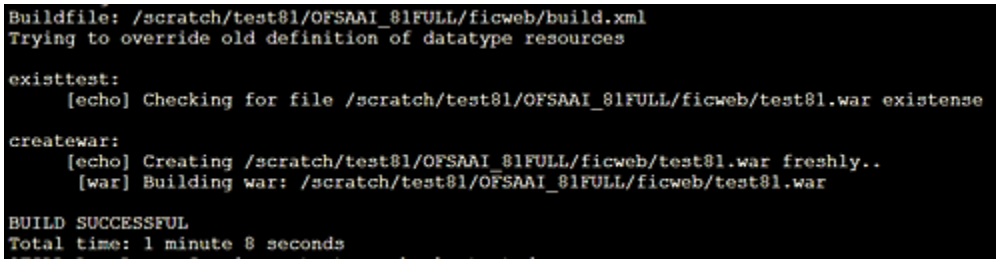
6.5.1.1 Non-TCPS Installed Setup

To create the EAR/WAR File in a non-TCPS installed setup, follow these steps:

1. Navigate to the `$FIC_WEB_HOME` directory on the OFSAA Installed server.
2. Execute the `./ant.sh` command to trigger the creation of the EAR/WAR file.
3. The EAR/WAR (`<contextname>.ear/ .war)` is created.

   The "BUILD SUCCESSFUL" and "Time taken" message is displayed.

Figure 25: Creating EAR/ WAR File



NOTE

- The `<contextname>` is the name given during installation. This process overwrites any existing version of the EAR file that exists in the path.
- For OFSAA configured on Tomcat installation, <contextname>.war file is created.
- Ignore ANT warning(s) for the `tools.jar` file while executing `./ant.sh` command.

6.5.1.2 TCPS Installed Setup

To create the EAR/WAR File in a TCPS installed setup, follow these steps:

1. Navigate to the `$FIC_WEB_HOME/webroot/WEB-INF/lib` directory on the OFSAA Installed server and delete the `ojdbc7.jar` file if it exists in the directory.
2. Navigate to the `$FIC_HOME/utility/AppPckMastSynch/bin` directory and execute the App Pack Mast Sync utility by running the `AppPckMastSynch.sh` command.
3. Navigate to the `$FIC_WEB_HOME` directory and execute the `./ant.sh` command to trigger the creation of the EAR/WAR file.
4. The EAR/WAR (`<contextname>.ear/ .war)` is created.

   The "BUILD SUCCESSFUL" and "Time taken" message is displayed.

Figure 26: Creating EAR/ WAR File

NOTE

- The `<contextname>` is the name given during installation. This process overwrites any existing version of the EAR file that exists in the path.
- For OFSAA configured on Tomcat installation, <contextname>.war file is created.
- Ignore ANT warning(s) for the `tools.jar` file while executing `./ant.sh` command.

6.5.2 Explode the EAR File

To explode the EAR file, follow these steps:

1. Create the "applications" directory under the domain name directory.

   For example, "`/Bea/user_ projects/domains/ <Domain _name>/applications`".

2. Create the `<context_name>.ear` directory under the applications directory.
3. Copy the `<$FIC_WEB_HOME/<context_name>.ear` file to the `<WEBLOGIC_INSTALL_ DIR>/ Bea/user_projects/domains/<DOMAIN_NAME>/applications/<context_ name>.ear` directory.
4. Explode the `<context_name>.ear` file by executing the following command:

   ```
   jar -xvf <context_name>.ear
   ```

5. Delete the `<context>.ear` and `<context>.war` files <WEBLOGIC_ INSTALL_DIR>/Bea/user_projects/domains/<DOMAIN_ NAME>/applications/

   `<context_name>.ear`

6. Create a directory `<context_name>.war` under the `<WEBLOGIC_INSTALL_ DIR>/Bea/ user_projects/domains/<DOMAIN_ NAME>/applications/<context>.ear./<context>.war` directory.
7. Copy the `<$FIC_WEB_HOME/<context_name>.war` file to `<WEBLOGIC_INSTALL_ DIR>/ Bea/user_projects/domains/<DOMAIN_NAME>/applications/<context_ name>.ear/<context_name>.war` directory.
8. Explode the <context_name>.war file by executing the following command to get the directory structure:

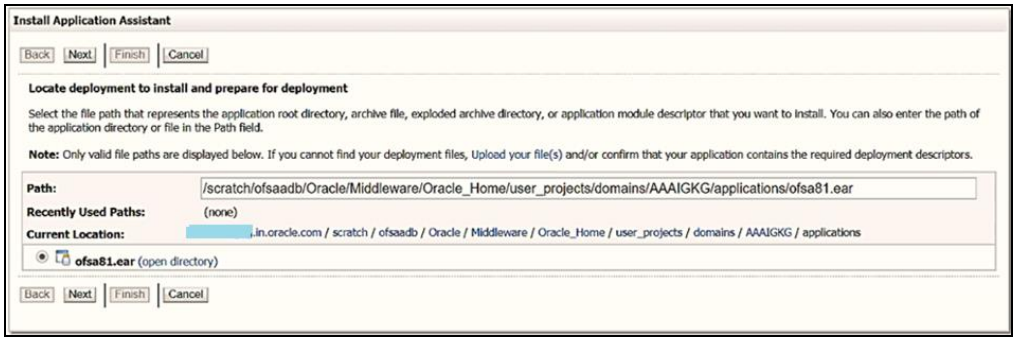
   ```
   jar -xvf <context_name>.war
   ```

6.5.2.1 Install Application

To install the Application, follow these steps:

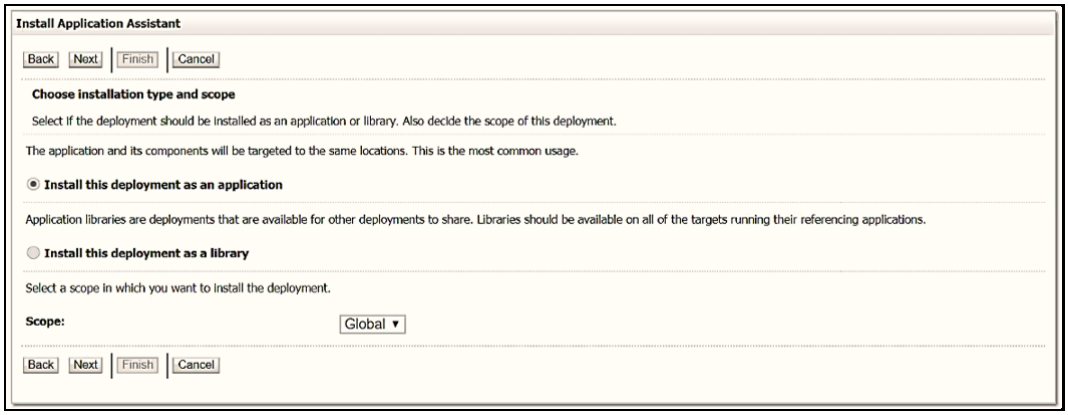
1. Select **Install Application Assistant** from the Navigation Tree to display the window.

Figure 27: Install Application Assistant



2. Click Next.

Figure 28: Install Application Assistant

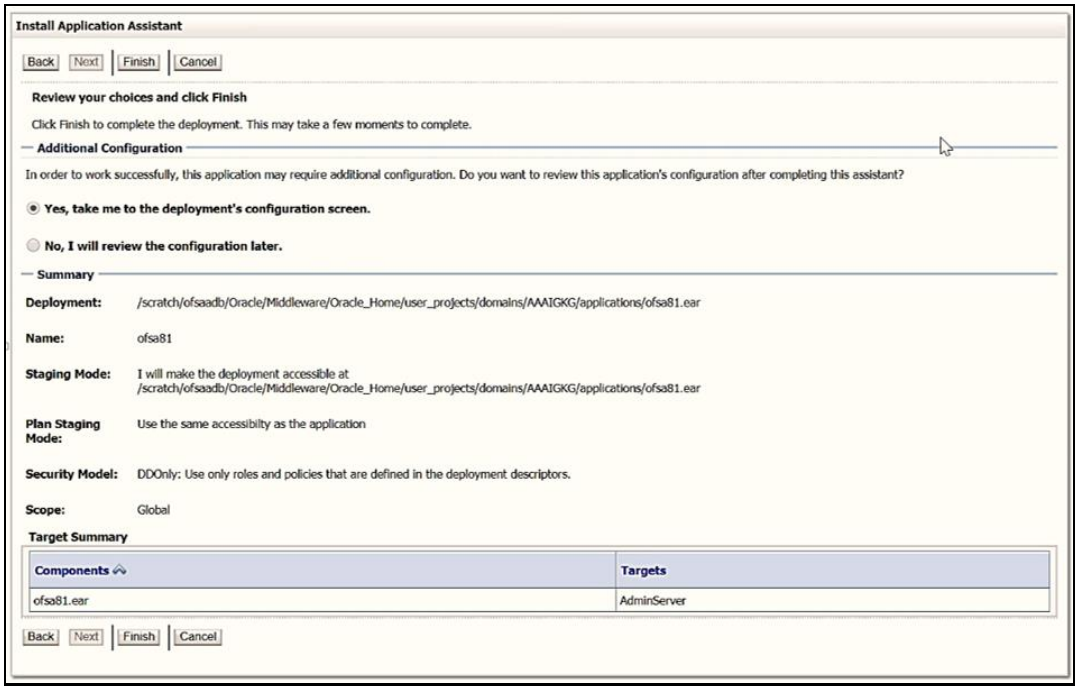


3. From the *Choose targeting style* section, select **Install this deployment as an application,** and click Next. The Optional Settings window is displayed.

Figure 29: Optional Settings

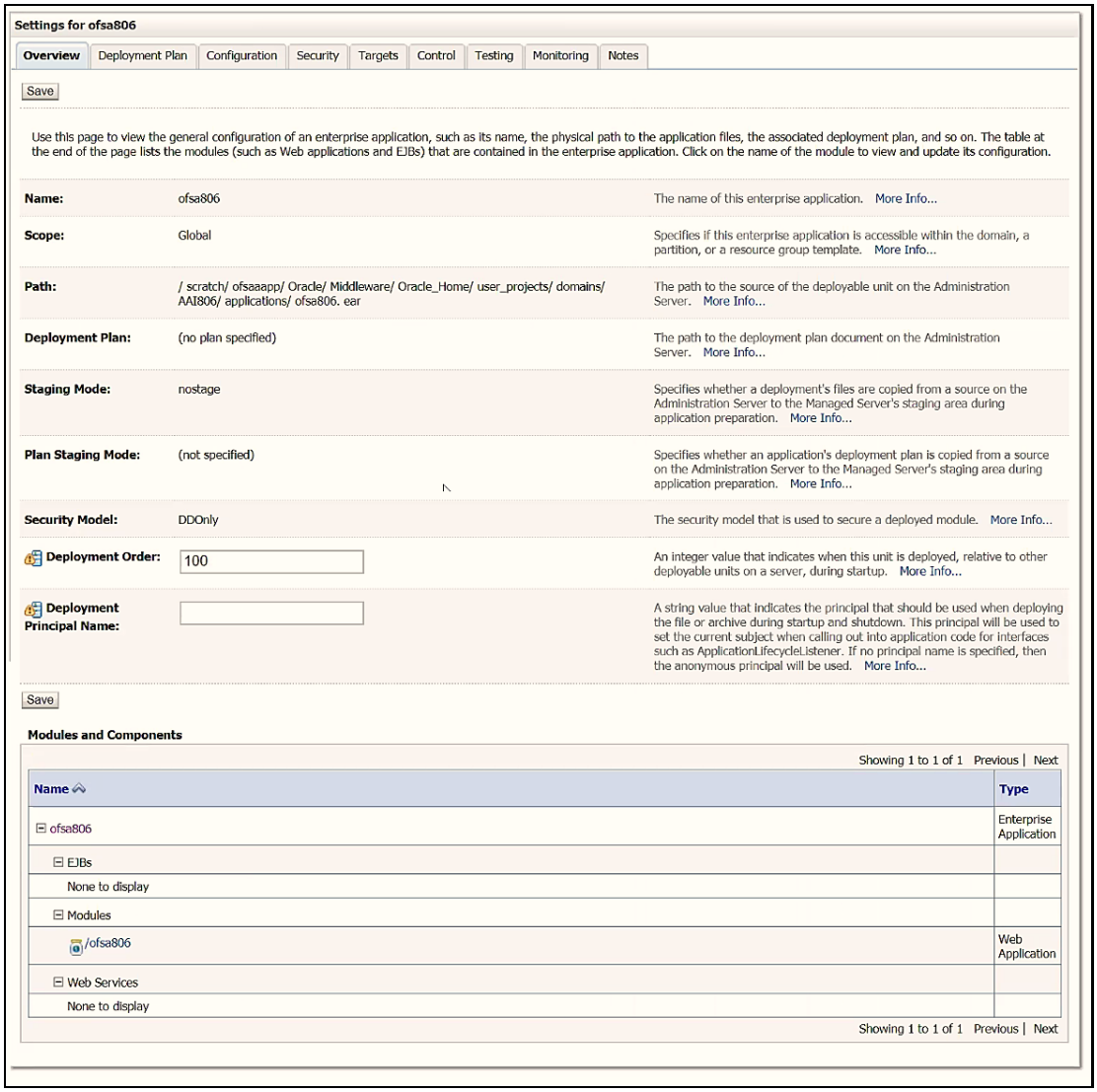
4. Enter a Name for the deployment if required.
5. Under the **Security** section, select the **DD Only: Use only roles and policies that are defined in the deployment descriptors** option.
6. Select **I will make the deployment available from the following location** under the *Source accessibility* section.
7. Click Next to display the Deployment Summary window.

Figure 30: Deployment Summary



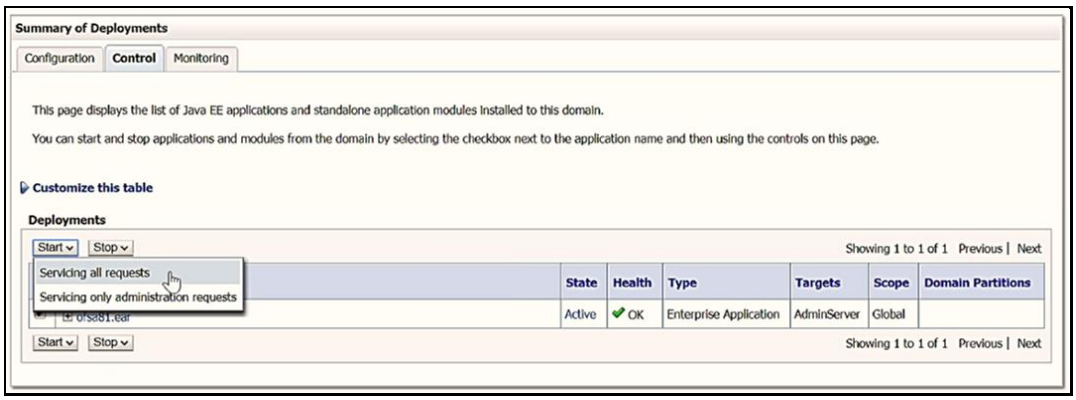
8. Select **Yes**, take me to the **deployment's configuration** screen.
9. Click **Finish** to display the Settings for <Deployment Name> window.

Figure 31: Settings for <Deployment Name>



10. Review the general configuration details of the deployment. You can also update the configuration of the deployment in this window. In the **Overview** tab, you can view the complete deployment configuration.
11. Click **Save** to update the changes, if any.
12. From the navigation tree, click **Deployments** to display the **Summary of Deployments** window.

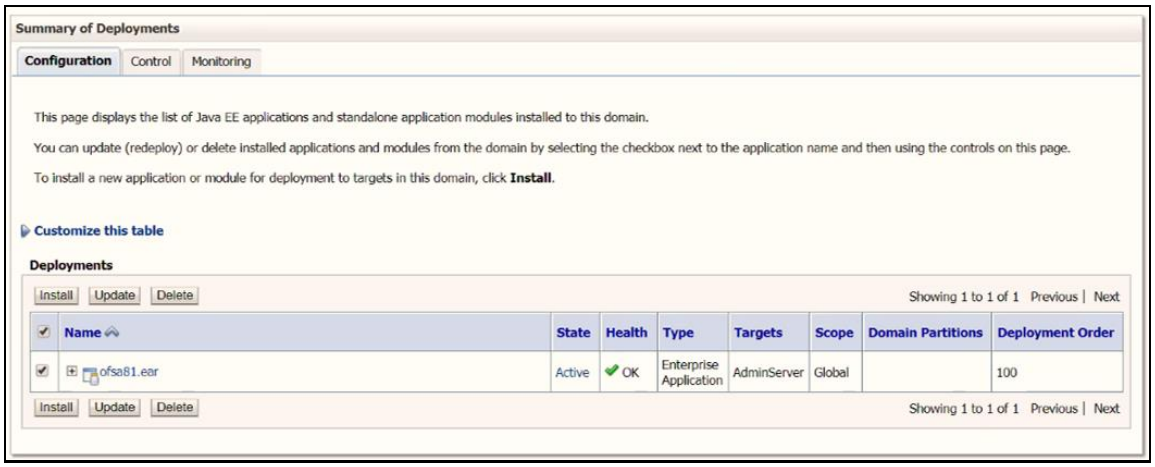
Figure 32: Summary of Deployments



13. Select the newly deployed Infrastructure application.
14. Click **Start** and then select **Servicing all requests**.

> **ATTENTION** Verify that the Infrastructure server is up and running. For more information, see Start the Infrastructure Services.

Figure 33: Summary of Deployments



15. The state of the deployed application is displayed as **Active** if started successfully.

6.5.3 Deploy the EAR/WAR File

This section covers the following topics:

- Clear the Application Cache
- Deploy the EAR or WAR Files on WebSphere
- Deploy the EAR or WAR Files for WebLogic
- Deploy WAR Files on Tomcat

> **NOTE** You must clear the application cache before deploying the Applications Pack Web archive. This applies to all Web Servers (WebSphere, WebLogic, and Tomcat). For more information, see the Clear the Application Cache section.

6.5.3.1 Clear the Application Cache

Ensure to clear the application cache before the deployment of Applications Pack Web Archive. This applies to all Web Servers (WebSphere, WebLogic, and Tomcat).

Before the deployment of the Infrastructure, Application Service Packs, or one-off patches, navigate to the following path depending on the WebServer configured and clear the cache:

- Tomcat

  `<Tomcat installation directory>/work/Catalina/localhost/<Application name>/org/apache/jsp`

- WebLogic

  `<Weblogic installation location>/domains/<Domain name>/servers/<Server name>/tmp/_WL_user/<Application name>/qaelce/jsp_servlet`

- WebSphere

  `<Websphere installation directory>/AppServer/profiles/<Profile name>/temp/<Node name>/server1/<Application name>/<.war file name>`

6.5.3.2 Deploy the EAR/WAR Files on WebSphere

To deploy the Infrastructure application in WebSphere, follow these steps:

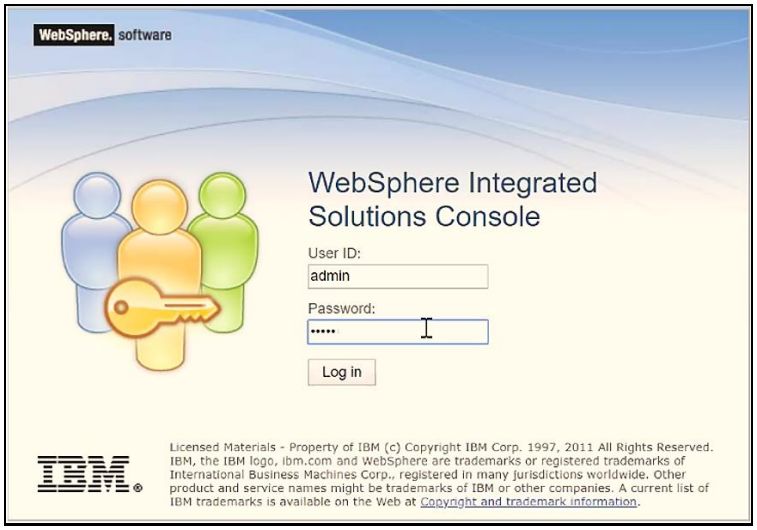
1. Navigate to the "`/<Websphere_Installation_ Directory>/IBM/WebSphere/AppServer/profiles/<Profile_Name>/bin/`" directory
2. Start the WebSphere Profile by executing the following command:

   `./startServer.sh server1`

3. Open the following URL in a browser to display the *Login* window:

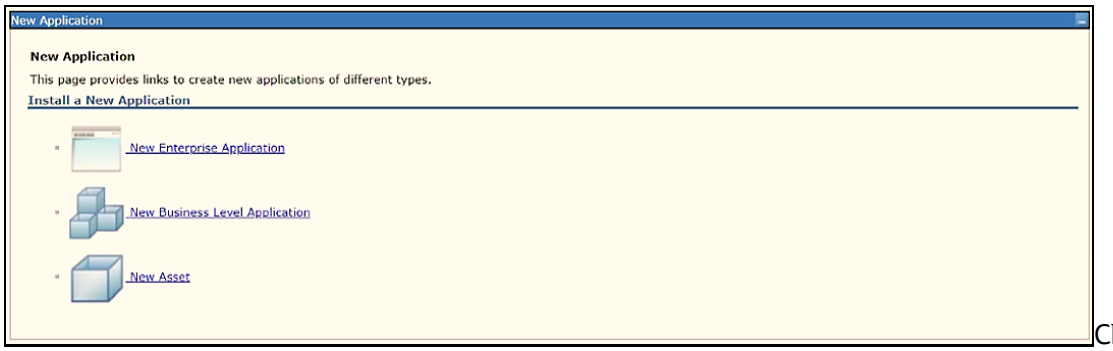
   `http://<ipaddress>:<Administrative Console Port>/ibm/console` (https, if SSL is enabled)

Figure 34: WebSphere Login Window



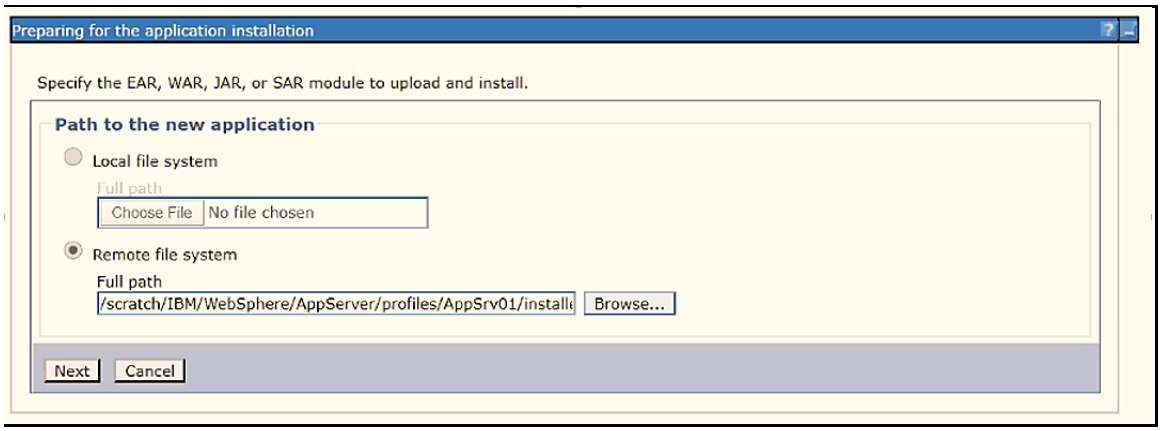
4. Enter the user credentials with administrator rights and click Log in.
5. From the Navigation Tree, select **Applications**, and then select New Application to display the New Application window.

Figure 35: New Application



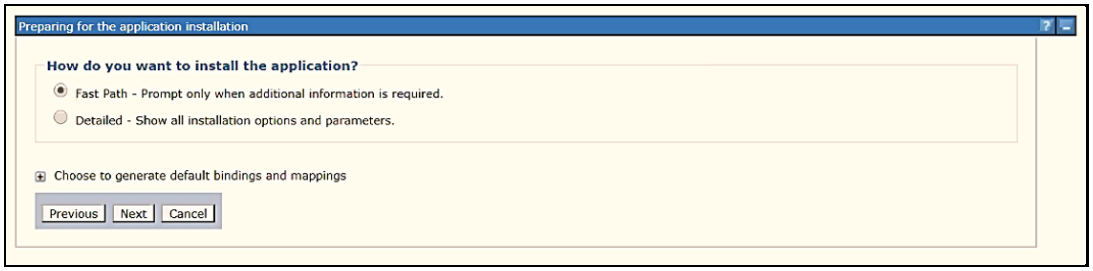
6. Click New Enterprise Application to display the Preparing for the application installation window.

Figure 36: Preparing for the application installation



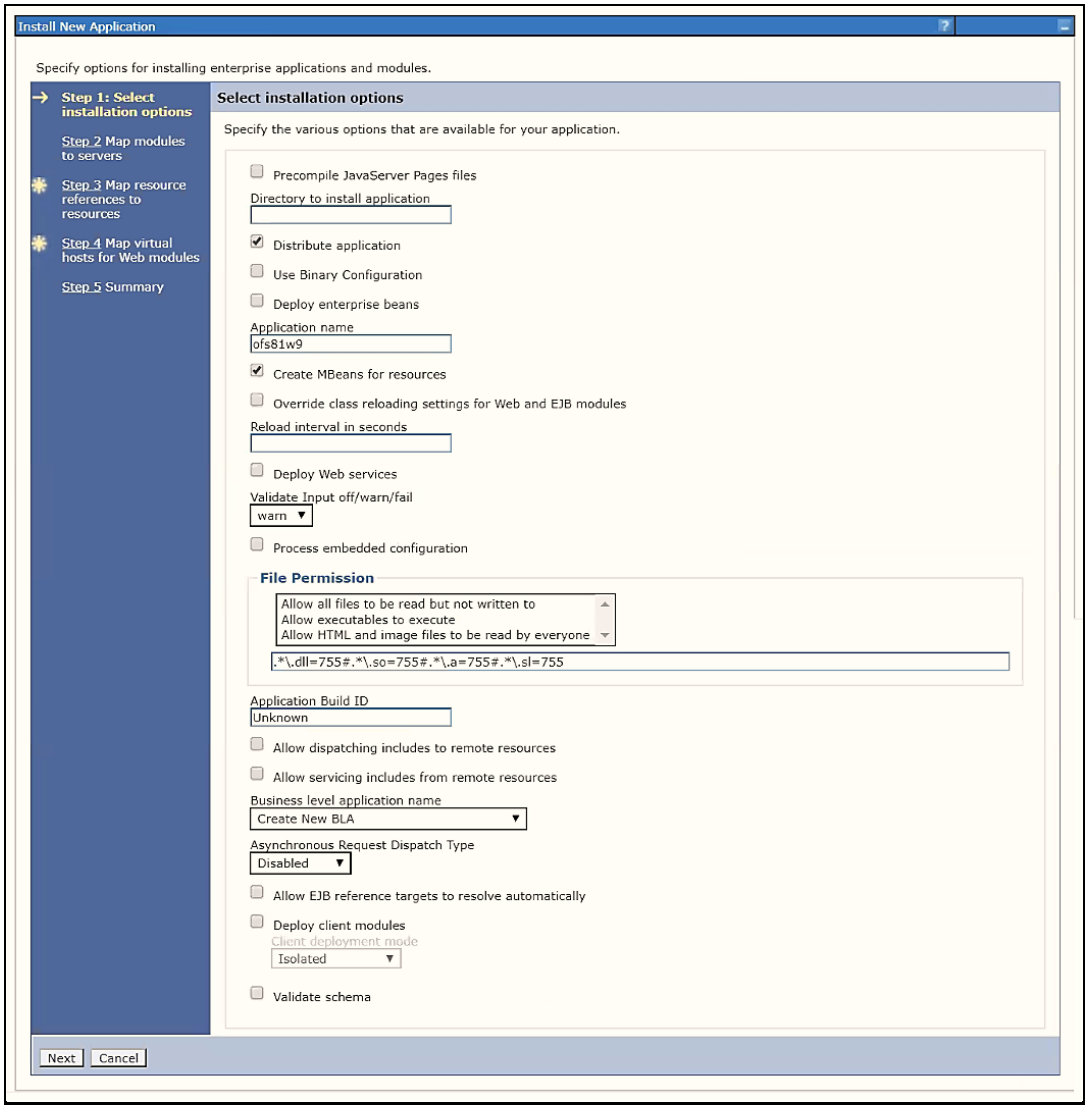
7. Select the Remote File System and click Browse.
8. Select the EAR file (generated for OFSAAI) to upload and install. Click Next.

Figure 37: Installation Options



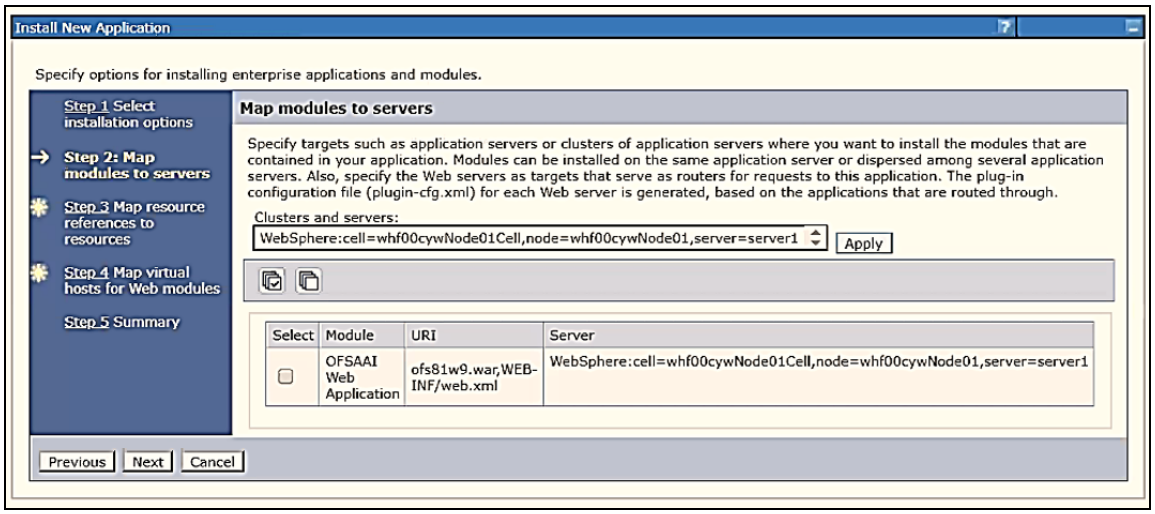
9. Select the Fast Path option and click Next to display the Install New Application window.

Figure 38: Install New Application



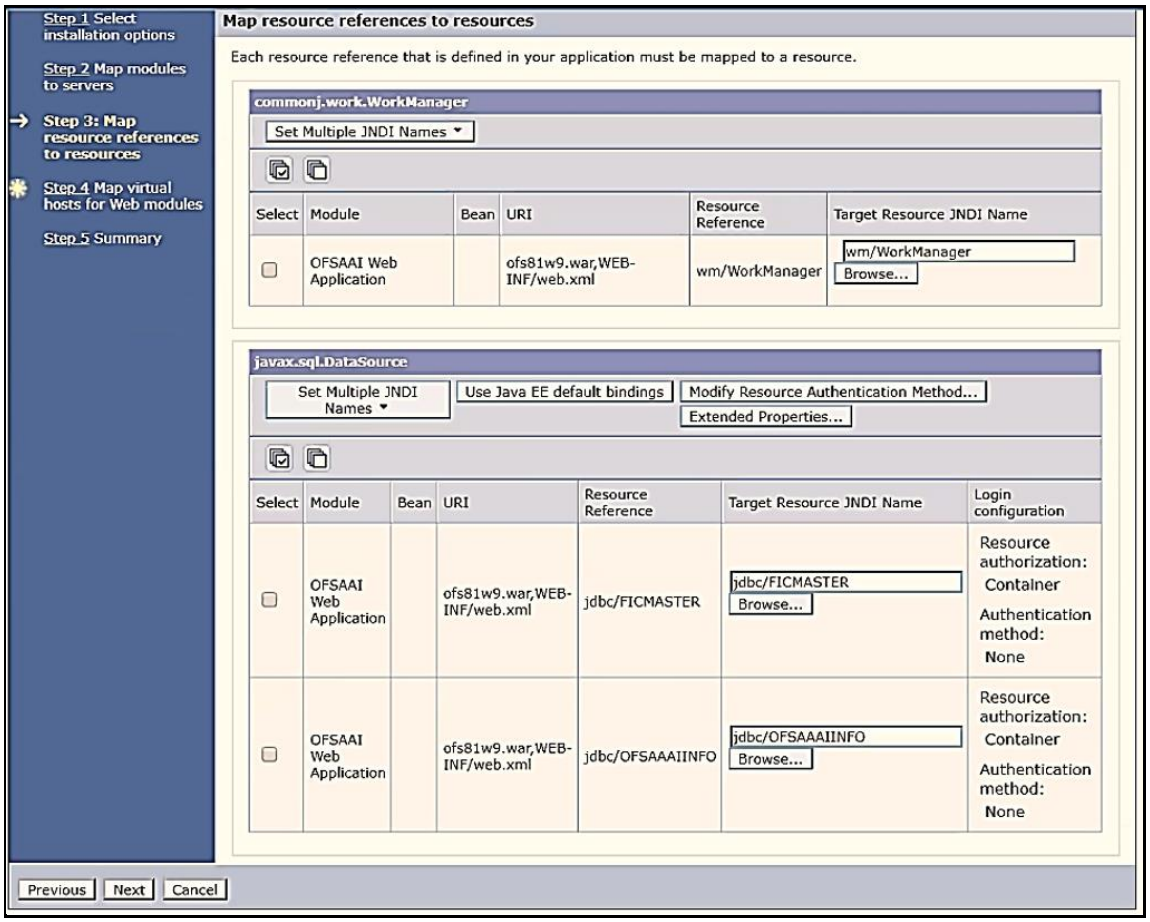
10. Enter the required information and click Next to display the Map Modules to the Servers window.

Figure 39: Map Modules to Servers



11. Select the Web Application and click Next to display the Map Resource References to Resources window.

Figure 40: Map Resource References to Resources

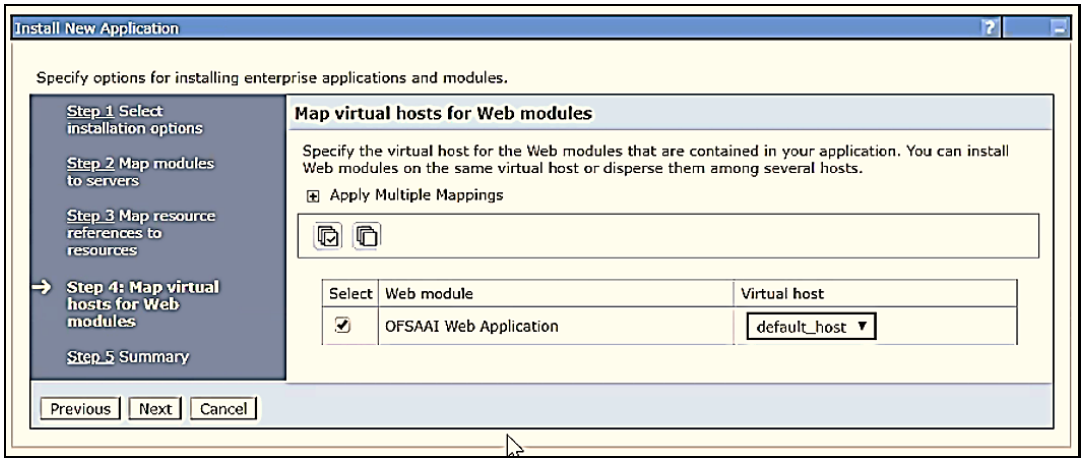


12. Map each resource defined in the application to a resource JNDI name defined earlier.
13. Click Modify Resource Authentication Method and specify the authentication method created earlier.

> **NOTE** Specify "config" for FICMASTER resource or "atomic" for the atomic resource as the authentication method.

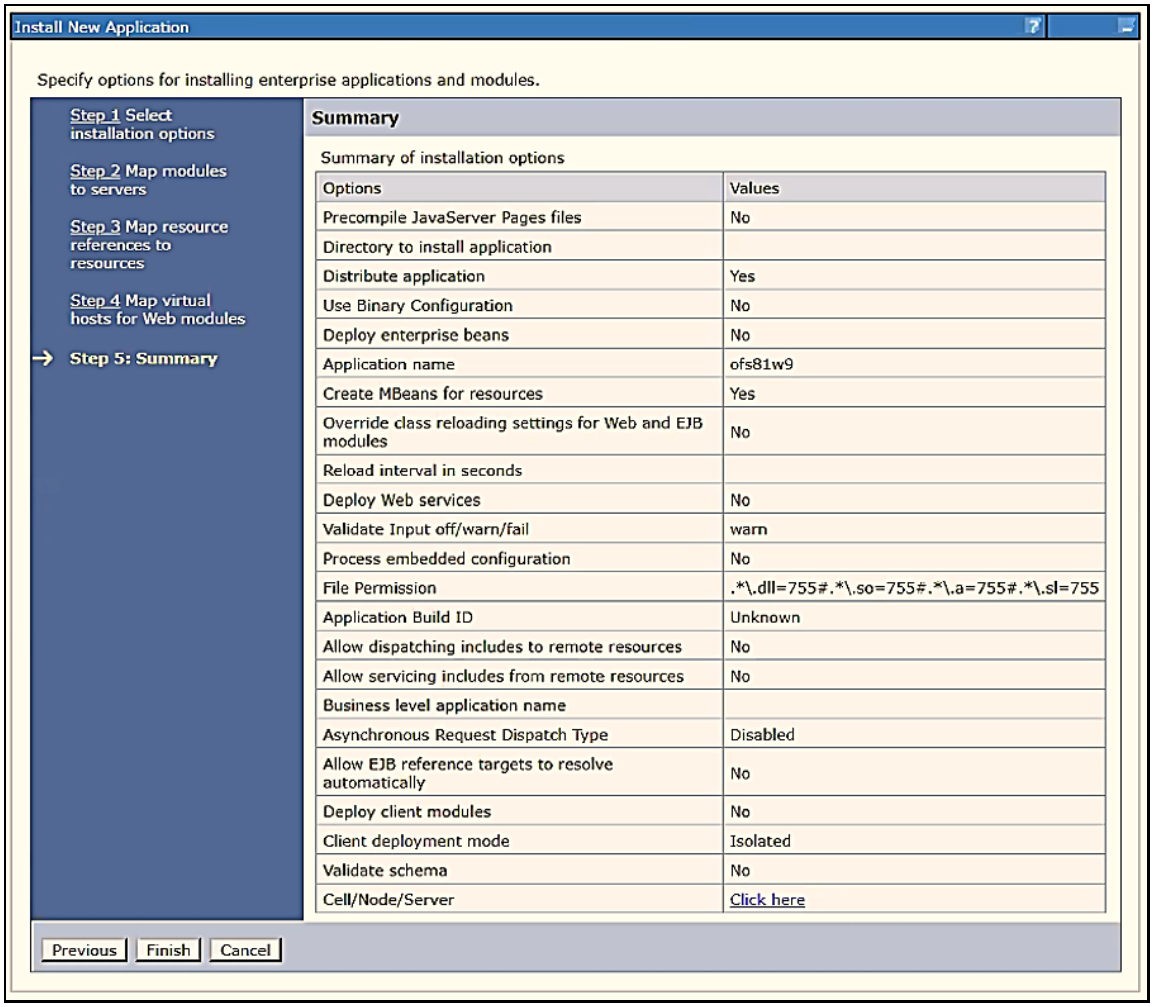
14. Select OFSAAI Web Application and click Next to display the Map Virtual hosts for Web Modules window.

Figure 41: Map Virtual host for Web Modules



15. Select OFSAAI Web Application and click Next to display the Summary window.

Figure 42: Summary



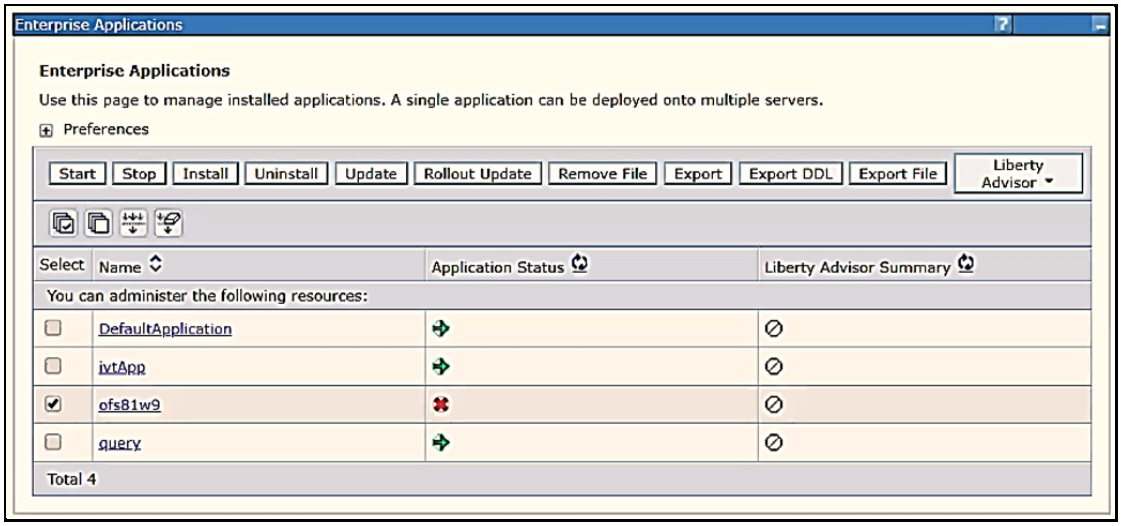
16. Click Finish to deploy the Infrastructure Application on WebSphere. On successful installation, a message is displayed.
17. Click Save to save the master file configuration. The details are displayed in the Master File Configuration window.

6.5.3.2.1 Start the Application

To start the application, follow these steps:

1. Expand Applications > Application Type > WebSphere enterprise applications to display the Enterprise Applications window.

Figure 43: Enterprise Applications Window



2. Select the installed application and click Start.

NOTE

- <profile name> is the name given during the WebSphere profile creation.
- <cell name> is the cell name given during profile creation.
- <contextname> is the context name given during installation.

6.5.3.3 Deploy the EAR/WAR Files for WebLogic

To deploy the OFSAAI EAR (ofaai and tflt) files, follow these steps:

1. Navigate to the `<WebLogic Installation directory>/user_projects/domains/<domain name>/bin` directory in the machine in which WebLogic is installed.
2. Start WebLogic by executing the command:

   `./startWebLogic.sh`
3. Open the following URL in a browser window:

   `http://<ipaddress>:<admin server port>/ console (https, if SSL is enabled).`

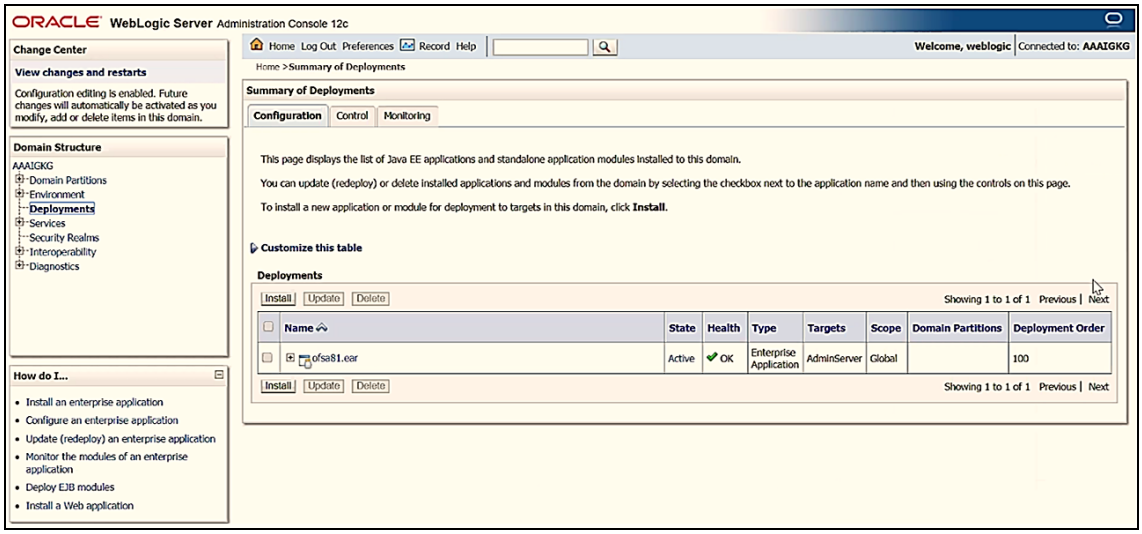
   The Login window of the WebLogic Server Administration Console is displayed.

NOTE

Ensure that you have started the Infrastructure Server by executing "`./ startofsaai.sh`" as mentioned in the Start the Infrastructure Services section.

4. Log in to the WebLogic Server by entering the user credentials with privileges to deploy the EAR file.
5. From the Domain Structure navigation tree, click Deployments to display the Summary of Deployments window.

Figure 44: Summary of Deployments



6. Click **Install** to display the Install Application Assistant window.
7. Navigate to the location where the Exploded EAR directory exists and select it.
8. Click **Next**.

   After the installation is complete, proceed with the following steps to enable your deployment.
9. Go to **Summary of Deployments, click Control tab**
10. Select Deployment and click **"Servicing all requests"**
    This will enable the Deployment and set it to **ACTIVE** status from **PREPARED** status.

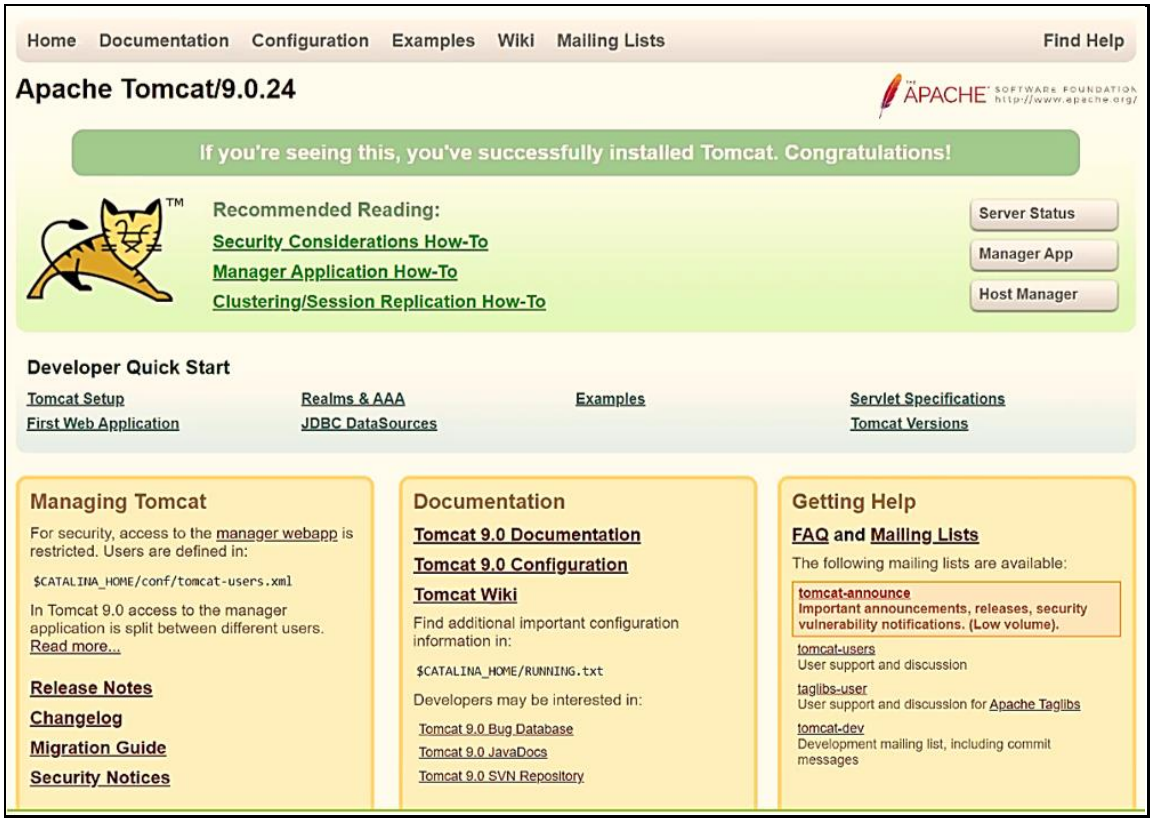
6.5.3.4 Deploy WAR Files on Tomcat

Before deploying the WAR files, ensure that the previously deployed applications of Infrastructure are uninstalled. See Uninstall Previously Deployed WAR Files in Tomcat for the procedure to uninstall the previously deployed Infrastructure war files.

To deploy Infrastructure application on the machine that hosts Tomcat, follow these steps:

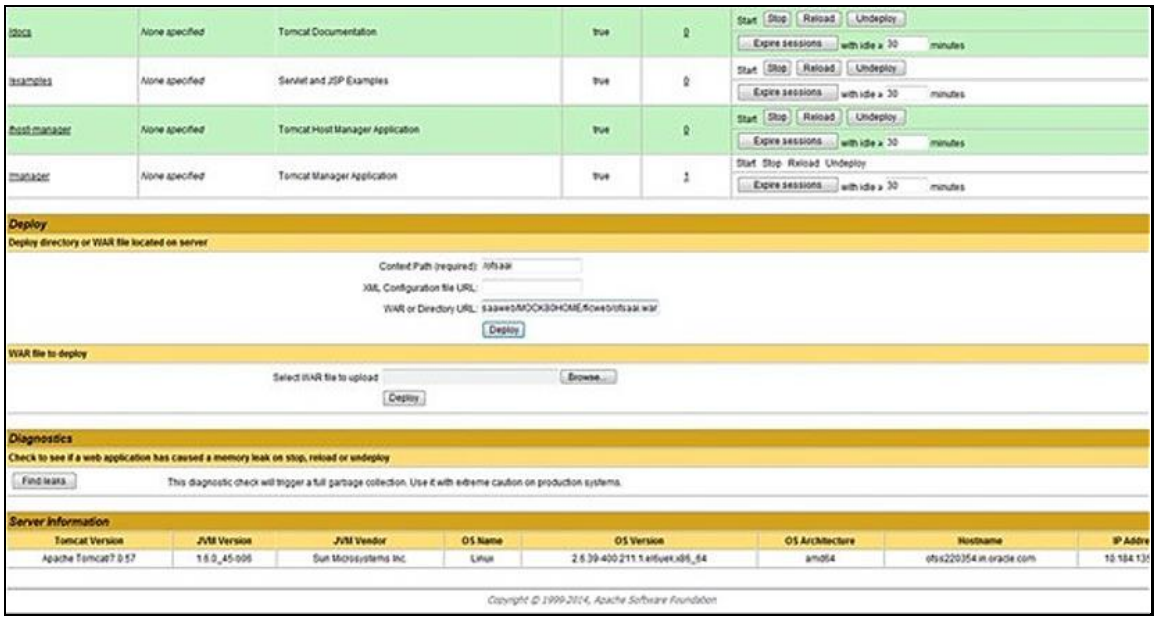
1. Copy the `<context-name>.war` file from `$FIC_WEB_HOME/<context-name.war>` directory to the `<Tomcat Installation Directory>/webapps/` directory.

Figure 45: Tomcat Home window



2. Click Manager App to display the Connect to dialog box.
3. Enter the User ID and Password with admin rights and click OK. The Tomcat Web Application Manager window is displayed with the list of all the applications deployed. (For user creation in Tomcat, see Tomcat User Administration.)

Figure 46: Tomcat Web Application Manager



4. In the Deploy section, enter the Context Path provided during the installation as "/<context-name>".
5. Enter the path where the <context-name>.war file resides (by default $FIC_WEB_HOME/<context-name.war>) in WAR or Directory URL and click Deploy.

   On successful application deployment, a confirmation message is displayed.
6. Start the Tomcat server. For more information, see Start the Infrastructure Services.

6.6 EAR/WAR File - Build Once and Deploy Across Multiple OFSAA Instances

OFSAA 8.1.2.0.0 supports a single archive deployment model. You can build the EAR/WAR file once and deploy it across multiple OFSAA instances on the same release version.

Prerequisites:

1. The web server type must be the same across all OFSAA instances.
2. The information domain must be the same across all OFSAA instances.

The following updates are done for this feature:

1. The path of the deployed area log files is in the AAI_SETUP_PROPS database table in the Config Schema.
2. The following parameters are moved from the FICWEB.cfg file to the AAI_SETUP_PROPS table with tier as WEB. The file is removed and the respective parameters are set in the servlet context.
   - FIC_SERVLET_PORT reconfigured as FIC_WEBSERVER_PORT
   - ICC_SERVER_PORT
   - CSS_LOGGER_PATH
3. The following values for the AAI servlet config parameters in the web.xml file is moved to the AAI_SETUP_PROPS table:
   - FIC_WEBPROTOCOL
   - FIC_PHYSICAL_HOME_LOC
   - FIC_WEBSERVER_PORT
   - FIC_HOME
   - FIC_WEBSERVER_IP
4. OFSAA environment details used to establish communication between the web and app layer now moved from the LookupServices.xml and DynamicServices.xml file to the following database tables:
   - aai_dyn_svcs_params
   - aai_dyn_svcs_servers
   - aai_lkp_svcs_servers

> **NOTE** This change to the configuration XML files is done only at the web layer deployment location.

6.7 Assign Grants for Schemas

This section discusses the various grants required for the Atomic and Sandbox schemas.

Topics:

- Assign Grants for Atomic Schema
- Assign Grants for Config Schema
- Assign Grants for Config Schema Entities for Atomic Users

6.7.1 Assign Grants for Atomic Schema

Atomic Schema creation requires certain grants for object creation present in the `$FIC_HOME/privileges_atomic_user.sql` file.

To assign grants for the Atomic Schema, follow these steps by executing in the SQL Plus console:

```
grant create SESSION to &database_username
/
grant create PROCEDURE to &database_username
/
grant create SEQUENCE to &database_username
/
grant create TABLE to &database_username
/
grant create TRIGGER to &database_username
/
grant create VIEW to &database_username
/
grant create MATERIALIZED VIEW to &database_username
/
grant select on SYS.V_$PARAMETER to &database_username
/
grant create SYNONYM to &database_username
/
```

6.7.2 Assign Grants for Config Schema

Config Schema creation requires certain grants for object creation present in the `$FIC_HOME/privileges_config_user.sql` file.

To assign grants for the Config Schema, follow these steps by executing in the SQL Plus console:

```
grant create SESSION to &database_username
/
grant create PROCEDURE to &database_username
/
grant create SEQUENCE to &database_username
/
grant create TABLE to &database_username
/
grant create TRIGGER to &database_username
/
grant create VIEW to &database_username
/
grant create MATERIALIZED VIEW to &database_username
/
grant olap_user to &database_username
/
grant select on SYS.V_$PARAMETER to &database_username
/
grant create SYNONYM to &database_username
/
```

6.7.3 Assign Grants for Config Schema Entities for Atomic Users

Atomic Schema creation requires certain grants for config schema object access present in the `$FIC_HOME/config_table_privileges_for_atomic_user.sql` file.

To assign grants for the Config Schema entities for Atomic Users, execute the following commands in the SQL tool console:

6.8 Start the Infrastructure Services

Start the infrastructure servers after the installation and the post-installation steps are completed. Log on to each machine and execute the `.profile` file. Start all the servers mentioned from the same shell encoding.

```
accept atomic_db_user char prompt 'Enter the username for the atomic
database : '
grant select on CSSMS_USR_PROFILE to &atomic_db_user;
```

```
grant select on CSSMS_ROLE_MAST to &atomic_db_user;
grant select on CSSMS_GROUP_MAST to &atomic_db_user;
grant select on CSSMS_FUNCTION_MAST to &atomic_db_user;
grant select on CSSMS_USR_GROUP_MAP to &atomic_db_user;
grant select on CSSMS_USR_GROUP_DSN_SEG_MAP to &atomic_db_user;
grant select on CSSMS_ROLE_FUNCTION_MAP to &atomic_db_user;
grant select on cssms_usr_attrib to &atomic_db_user;
grant select on AAI_DB_DETAIL to &atomic_db_user;
grant select on CSSMS_GROUP_ROLE_MAP to &atomic_db_user;
grant select on CSSMS_SEGMENT_MAST to &atomic_db_user;
grant select on BATCH_TASK to &atomic_db_user;
grant select on CSSMS_USR_DSN_SEG_MAP to &atomic_db_user;
grant select on CSSMS_USR_ROLE_MAP to &atomic_db_user;
grant select on CSSMS_METADATA_SEGMENT_MAP to &atomic_db_user;
grant select on BATCH_RUN to &atomic_db_user;
grant select on PR2_FILTERS to &atomic_db_user;
grant select on PR2_TASK_FILTER_DETAIL to &atomic_db_user;
grant select on ST_STRESS_MASTER to &atomic_db_user;
grant select on BATCH_MASTER to &atomic_db_user;
grant select on ICC_MESSAGELOG to &atomic_db_user;
grant select on MF_MODEL_SCRIPT_MASTER to &atomic_db_user;
grant select on MF_INPUT_VALUES to &atomic_db_user;
grant select on MF_MODEL_OUTPUT_VALUES to &atomic_db_user;
grant select on DB_MASTER to &atomic_db_user;
grant select on DSNMASTER to &atomic_db_user;
grant select on pr2_rule_map to &atomic_db_user;
grant select on FORMS_LOCALE_MASTER to &atomic_db_user;
grant ALL PRIVILEGES on pr2_rule_map_pr to &atomic_db_user;
grant ALL PRIVILEGES on pr2_rule_map_pr_tmp to &atomic_db_user;
grant select on pr2_rule_map_exclude to &atomic_db_user;
grant ALL PRIVILEGES on pr2_rule_map_exclude_pr to &atomic_db_user;
grant ALL PRIVILEGES on pr2_rule_map_exclude_pr_tmp to &atomic_db_user;
grant select on pr2_run_object to &atomic_db_user;
grant select on pr2_run_object_member to &atomic_db_user;
grant select on pr2_run_map to &atomic_db_user;
grant select on pr2_run_execution_b to &atomic_db_user;
grant select on AAI_BACKDATED_EXEC_INFO to &atomic_db_user;
grant select on pr2_run_execution_filter to &atomic_db_user;
grant select on pr2_firerun_filter to &atomic_db_user;
grant select on pr2_filters to &atomic_db_user;
grant select on configuration to &atomic_db_user;
grant select on batch_parameter to &atomic_db_user;
grant select on component_master to &atomic_db_user;
grant select on MDB_OBJECT_TYPE_ATT_LAYOUT to &atomic_db_user;
grant select on REV_OBJECT_ATTRIBUTE_DTL to &atomic_db_user;
grant select on mdb_object_dependencies to &atomic_db_user;
grant select on REV_STAT_DATA to &atomic_db_user;
grant select on REV_OBJECT_REPOSITORY_B to &atomic_db_user;
grant select on REV_OBJECT_REPOSITORY_TL to &atomic_db_user;
grant select on REV_OBJECT_ATTRIBUTE_DTL_MLS to &atomic_db_user;
grant select on REV_OBJECT_APPLICATION_MAP to &atomic_db_user;
grant select on MDB_OBJ_EXPR_DETAILS to &atomic_db_user;
grant select on MDB_EXECUTION_DETAILS to &atomic_db_user;
grant select on REV_OBJECT_TYPES_CD to &atomic_db_user;
grant select on REV_OBJECT_TYPES_MLS to &atomic_db_user;
grant select on REV_APPLICATIONS_CD to &atomic_db_user;
grant select on REV_APPLICATIONS_MLS to &atomic_db_user;
```

```
grant select on METADATA_BROWSER_LOCALE to &atomic_db_user;
grant select on MDB_STAT_DATA to &atomic_db_user;
grant select on MDB_OBJECT_TYPE_LAYOUT to &atomic_db_user;
grant select on ofsa_md_id_ref to &atomic_db_user;
grant select on MDB_ETL_MAPPING to &atomic_db_user;
grant select on setupinfo to &atomic_db_user;
grant select on LOCALEREPOSITORY to &atomic_db_user;
grant select on MF_MODEL_MASTER to &atomic_db_user;
grant select on MF_SANDBOX_MASTER to &atomic_db_user;
grant select on MF_VARIABLE_MASTER to &atomic_db_user;
grant select on MF_TECHNIQUE_MASTER to &atomic_db_user;
grant select on MDB_RULE_SOURCE_HEADER to &atomic_db_user;
grant select on MDB_RULE_TARGET_HEADER to &atomic_db_user;
grant select on MDB_RULE_TARGET_MEMBER_HEADER to &atomic_db_user;
grant select on MDB_RULE_GRID_DATA to &atomic_db_user;
grant select on MDB_MODEL_MAPPING to &atomic_db_user;
grant delete on AAI_MAP_MAPPER to &atomic_db_user;
grant insert on AAI_MAP_MAPPER to &atomic_db_user;
grant update on AAI_MAP_MAPPER to &atomic_db_user;
grant select on AAI_MAP_MAPPER to &atomic_db_user;
grant select on infodom_patches to &atomic_db_user;
grant select on MDB_OBJECTS_GROUP_MASTER to &atomic_db_user;
grant select on MDB_OBJECTS_GROUPING to &atomic_db_user;
grant select on aai_wf_filter_exec_map to &atomic_db_user;
grant select,insert,update on aai_wf_request_queue to &atomic_db_user;
grant select,insert,update on aai_wf_request_queue_hist to &atomic_db_user;
grant select,insert,update on aai_wf_request_parameter to &atomic_db_user;
grant select,insert,update on aai_wf_request_parameter_hist to
&atomic_db_user;
grant select,insert,update on AAI_WF_APP_REGISTRATION to &atomic_db_user;
---------------Attribution Analaysis-----------------------------------
grant select on AAI_WF_ATTR_ANALYSIS_DETAILS to &atomic_db_user;
grant select on AAI_WF_ATTR_COMPONENT to &atomic_db_user;
grant select on AAI_WF_RUNSKEY_MAPPING to &atomic_db_user;
grant select on AAI_WF_ATTR_VAR_MAPPING to &atomic_db_user;
grant select on AAI_WF_ATTR_COMP_VAR_MAPPING to &atomic_db_user;
grant select on AAI_WF_ATTR_EXECUTION to &atomic_db_user;
grant select on AAI_WF_ATTR_VAR_EXEC_INST to &atomic_db_user;
grant select on AAI_WF_RUN_EXEC_PARAMS to &atomic_db_user;
---------------Attribution Analaysis-----------------------------------
grant select on cssms_usr_group_map_view to &atomic_db_user;
grant execute on checkEnvForDataRedaction to &atomic_db_user;
-----  Begin ABC 8.1 grant Scripts----------
grant select,references on AAI_ABC_DIM_PURPOSE to &atomic_db_user;
grant select,references on AAI_ABC_DIM_SB_EFFECTIVE to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_TYPE to &atomic_db_user;
grant select,references on AAI_ABC_DIM_STATUS_QTNR to &atomic_db_user;
grant select,references on AAI_ABC_DIM_STATUS_QTNR_MLS to &atomic_db_user;
grant select,references on AAI_ABC_DIM_SIGNOFF_TYPES to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_APP_TYPES to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTN_SEL_TYPE to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTN_TYPE to &atomic_db_user;
grant select,insert,update,delete,references on AAI_ABC_DIM_QTN_CATEGORY to
&atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_RESP_TYPE to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_DEPUTE_TYPE to &atomic_db_user;
grant select,references on AAI_ABC_DIM_RESULT_SET_CAT_OPT to
```

```
&atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_CRITICALITY to &atomic_db_user;
grant select,references on AAI_ABC_SETUP_COMPONENTS to &atomic_db_user;
grant select,references on AAI_ABC_SETUP_QTN_CONF_TYP to &atomic_db_user;
grant select,references on AAI_ABC_SETUP_QTN_CONF_TYP_MLS to
&atomic_db_user;
grant select,references on AAI_ABC_FCT_QTNR_CONF to &atomic_db_user;
grant select,references on AAI_ABC_DIM_PURPOSE_MLS to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_TYPE_MLS to &atomic_db_user;
grant select,references on AAI_ABC_DIM_EMPLOYEE to &atomic_db_user;
grant select,insert,update,delete,references on AAI_ABC_DIM_QTN_CATEGORY_MLS
to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTN_SEL_TYPE_MLS to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTN_TYPE_MLS to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_APP_TYPES_MLS to
&atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_CRITICAL_MLS to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTN_DEPUT_TYPE_MLS to
&atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_RESP_TYPE_MLS to
&atomic_db_user;
grant select,references on AAI_ABC_DIM_RESSET_CAT_OPT_MLS to
&atomic_db_user;
grant select,references on AAI_ABC_DIM_SB_EFFECTIVE_MLS to &atomic_db_user;
grant select,references on AAI_ABC_DIM_SIGNOFF_TYPES_MLS to &atomic_db_user;
grant select,references on AAI_ABC_FCT_QTNR_ENTITY_MAP to &atomic_db_user;
grant select,references on AAI_ABC_SETUP_COMPONENTS_MLS to &atomic_db_user;
grant select,references on AAI_ABC_ENTITY_DOCUMENT_MAP to &atomic_db_user;
grant select,references on AAI_ABC_DIM_OR_STATUS_MLS to &atomic_db_user;
grant select,references on MESSAGES_EN_US to &atomic_db_user;
grant select,references on AAI_ABC_DIM_FREQUENCY to &atomic_db_user;
grant select,references on AAI_ABC_SETUP_PURPOSE_PROC_MAP to
&atomic_db_user;
grant select,references on AAI_ABC_DIM_FREQUENCY_MLS to &atomic_db_user;
grant select,references on AAI_ABC_SETUP_DOCUMENT_CLASS to &atomic_db_user;
grant select,references on AAI_ABC_SETUP_DOC_CLASS_MLS to &atomic_db_user;
grant select,references on AAI_ABC_DIM_OR_STATUS to &atomic_db_user;
grant select,references on DOCUMENT_MASTER to &atomic_db_user;
grant select,references on AAI_ABC_DIM_COND_OPERATORS to &atomic_db_user;
grant select,references on AAI_ABC_DIM_COND_OPERATORS_MLS to
&atomic_db_user;
grant select,references on AAI_ABC_DIM_OPT_COND_SCOPE to &atomic_db_user;
grant select,references on AAI_ABC_DIM_OPT_COND_SCOPE_MLS to
&atomic_db_user;
grant select,references on AAI_ABC_DIM_QTN_OPT_TYPES to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTN_OPT_TYPES_MLS to &atomic_db_user;
grant select,references on AAI_APP_TL to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTN_DT_RST_CAT to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTN_DT_RST_CAT_MLS to
&atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_AUDIT_STATUS to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_AUDIT_STS_MLS to
&atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_ERROR_CODE to &atomic_db_user;
grant select,references on AAI_ABC_DIM_QTNR_ERROR_COD_MLS to
&atomic_db_user;
grant select on AAI_WF_APP_REGISTRATION to &atomic_db_user;
```

```
grant select on CSSMS_PROFILE_HOLIDAY_MAP to &atomic_db_user;
grant select on CSSMS_PROFILE_MAST to &atomic_db_user;
grant select on WEB_SERVER_INFO to &atomic_db_user;
grant select,references on AAI_APP_B to &atomic_db_user;
grant select,references on AAI_USR_PREFERENCE_DETAIL to &atomic_db_user;
grant select on RTI_UI_EXCLUDE_PDM_LIST  to &atomic_db_user;
grant select on RTI_VIR_PHY_TBL_NAME  to &atomic_db_user;
grant select on RTI_DOMAIN  to &atomic_db_user;
commit;
----  End ABC 8.1 grant Scripts----------
```

ATTENTION The servers mentioned in this section are dependent on each other. It is mandatory to maintain the order in which the servers are started. Allow each of the servers to initialize completely before starting the next server.

1. On the machine where the Infrastructure Application components are installed, navigate to the `$FIC_APP_HOME/common/FICServer/bin` directory, and execute the following command to start the Infrastructure Server:

   ```
   ./startofsaai.sh
   ```

NOTE

1. You can also start the Infrastructure Server by executing the command "`nohup ./ startofsaai.sh &`". Starting the process using "nohup" and "&" returns the command prompt without having to wait until the process completes. However, this command cannot be used when you are starting the server for the first time or starting after changing the user password in the configuration database schema.
2. When you start the server, the following error is displayed:

   ```
   java.io.FileNotFoundException:

   /ftpshare/<INFODOM>/erwin/fipxml/<INFODOM>_DATABASE.XML
   (No such file or directory)
   ```

   Ignore this error.

2. Start the ICC server.

   On the machine where the Infrastructure Default Application components are installed, navigate to the `$FIC_HOME/ficapp/icc/bin` directory, and execute the following command to start the "ICC server":

   ```
   ./iccserver.sh
   ```

NOTE Only the Infrastructure Default Application Server holds the ICC component.

3. Start the Backend Services using one of the following options:

- On the machine where Infrastructure Database components are installed, navigate to the `$FIC_DB_HOME/bin` directory, and execute the following command to start the "Agent server":

  `./agentstartup.sh`

- Using nohup execute the following command:

  `nohup ./agentstartup.sh &`

> **NOTE** This agent internally starts the Router, Message Server, OLAP Data Server, and AM Services.

6.8.1 Start the Web Application Servers

Start the Web application server depending on the type from the following table:

Table 21: Start the Web Application Servers

Startup Option	Description
Start WebSphere Profile	On the machine where WebSphere is installed: 1. Navigate to the `[Webshpere_Installation_Directory] /AppServer/<profiles>/<profile name>/bin directory`. 2. Execute the following command: `./startServer.sh server1`
Start WebLogic Domain	On the machine where WebLogic is installed: 1. Navigate to the `<WebLogic Installation Directory>/user_ projects/domains/<domain name>/bin` directory 2. Execute the following command: `startWebLogic.sh -d64` **Note:** If WebLogic is already running, access the WebLogic Admin Console. Stop and start the application `<context name>.ear` file.
Start Tomcat Application	On the machine where Tomcat is installed: 1. Navigate to the `<Tomcat_Install_ Directory>/bin` directory. 2. Execute the following command: `./catalina.sh run`

6.9 Access the OFSAA Application

To access the OFSAA application, follow these steps:

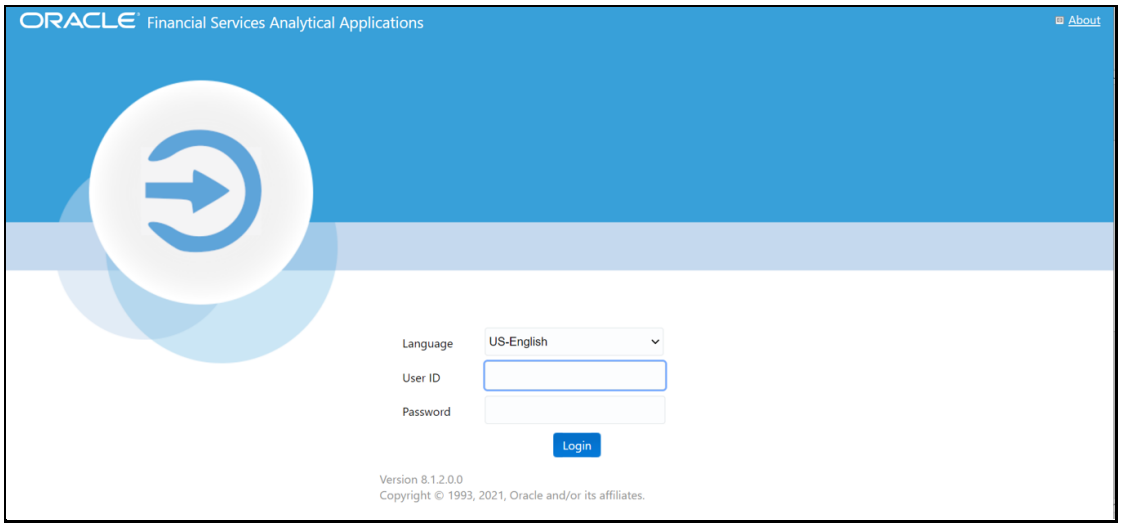
1. Open a browser and enter the URL in the following format:

```
<scheme>://<IP address/ hostname>:<port>/<context-name>/login.jsp
```

For example, `https://192.0.2.2/ofsaa/login.jsp`

The OFSAA Login window is displayed.

Figure 47: OFSAA Login Window



With the installation of every OFSAA Application Pack, there are two seeded user profiles configured in the system:

- SYSADMN System Administrator
- SYSAUTH System Authorizer

The SYSADMN and SYSAUTH users are configured with a default password, which you will require to login for the first time. See the MOS Doc ID: 2691681.1 for the password.

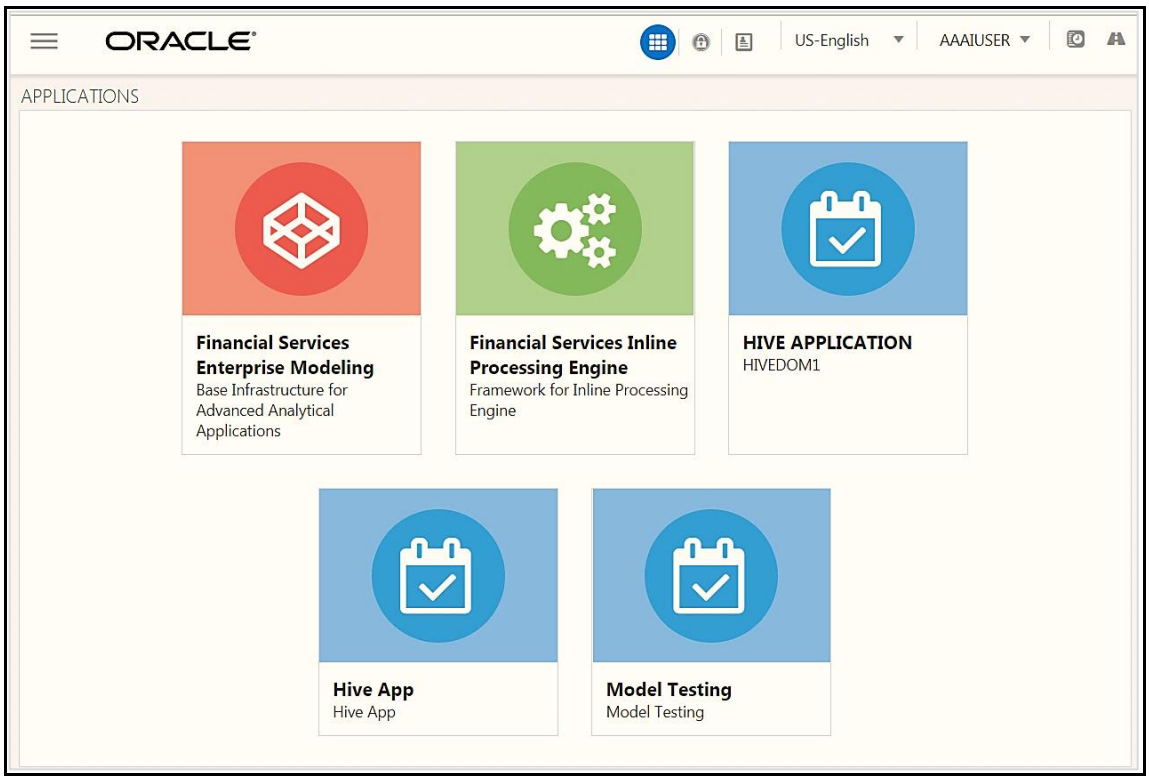
2. Log in to the application using the "SYSADMN" User ID and the default password. After the first login, you are prompted to change the password.

> **ATTENTION** The password change is required only for a new installation scenario and not for upgrade scenarios.

6.10 OFSAA Landing Page

On successful login, the *OFSAA Landing* screen is displayed.

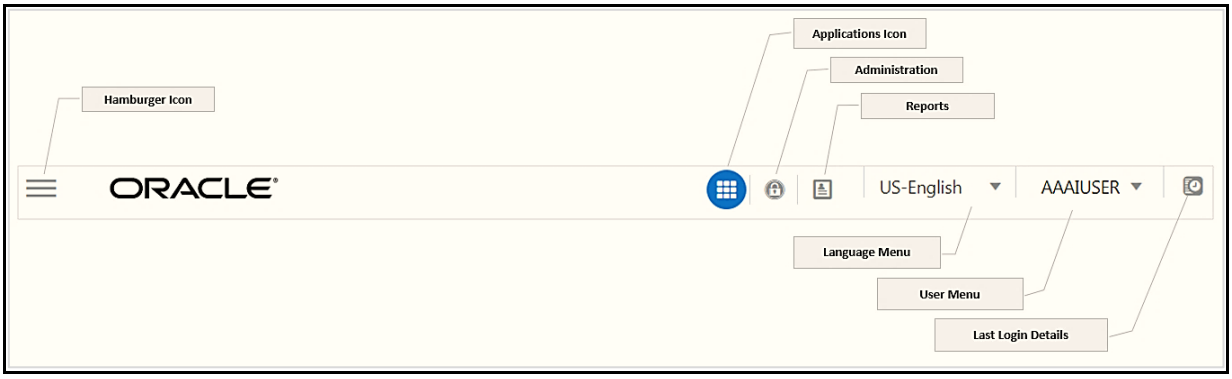
Figure 48: OFSAA Landing screen



OFSAA Landing screen shows the available Applications as tiles, for which a user has access to. Clicking the respective Application tile launches that particular Application. You can change the landing page based on your preference.

6.10.1 Masthead

Figure 49: User Interface Components

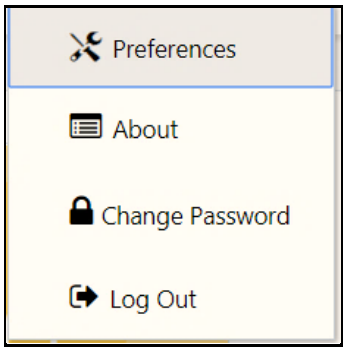


- **Hamburger Icon**- This icon is used to trigger the Application Navigation Drawer.
- **Application Icon**- This icon is used to show the available Applications installed in your environment at any time.
- **Administration Icon**- This icon is used to go to the *Administration* window. The *Administration* window displays modules like System Configuration, Identity Management, Database Details,

Configure Email Configuration, Manage OFSAA Product Licenses, Create New Application, Information Domain, Translation Tools, and process Modelling Framework as Tiles.

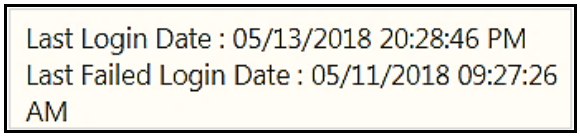
- **Reports Icon**- This icon is used to launch various User Reports such as user Status Report, User Attribute Report, User Admin Activity Report, User Access Report, and Audit Trial Report.
- **Language Menu**- It displays the language you selected in the OFSAA Login Screen. The language options displayed in the Language Menu are based on the language packs installed in your OFSAA instance. Using this menu, you can change the language at any point in time.
- **User Menu**- Clicking this icon displays the following menu:

Figure 50: User Menu



  - **Preferences**- To set the OFSAA Landing Page.
  - **Change Password**- To change your password. For more information, see the *Change Password* section in the OFS AAI User Guide. This option is available only if SMS Authorization is configured.
  - **Log Out**- To log out from OFSAA applications.
  - **Last Login Details** - This displays the last login details as shown:

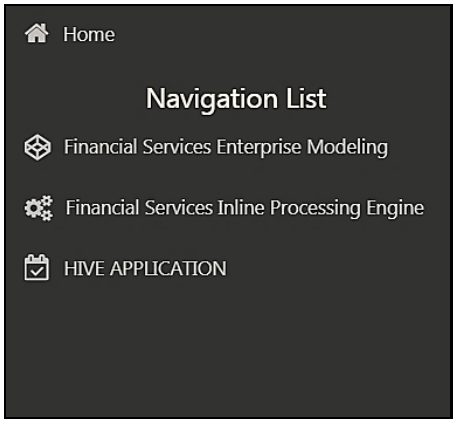
Figure 51: Last Login Details



6.10.2 Navigation Drawer

1. Click **Hamburger Icon** to launch the Navigation Drawer as shown:

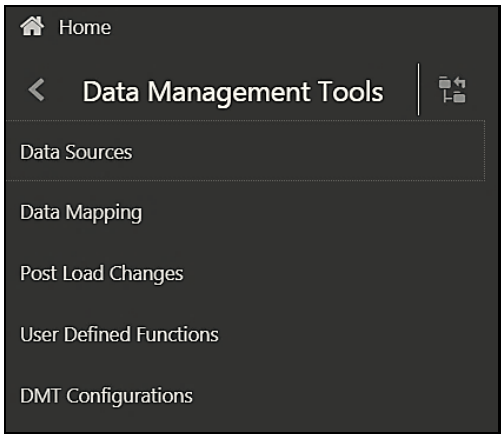
Figure 52: Navigation Drawer



Here the navigation items appear as a list. The First Level menu shows the installed applications. Clicking an application displays the second-level menu with the application name and Common tasks menu. The arrangement of the menu depends on your installed application.

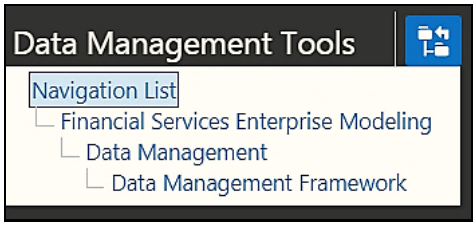
2. Clicking an item in the menu displays the next level sub-menu and so on. For example, to display Data Sources, click Financial Services Enterprise Modeling>Data Management>Data Management Framework>Data Management Tools>Data Sources.

Figure 53: Navigation Drawer Menus and Submenus



3. Click **Hierarchical Menu** to display the navigation path of the current sub-menu as shown:

Figure 54: Navigation Submenu



4. The RHS Content Area shows the Summary page of Data Sources. Click anywhere in the Content Area to hide the Navigation Drawer. To launch it back, click the Hamburger icon .

5. Click **Home** to display the OFSAA Landing Screen.

6.10.3 System Configuration

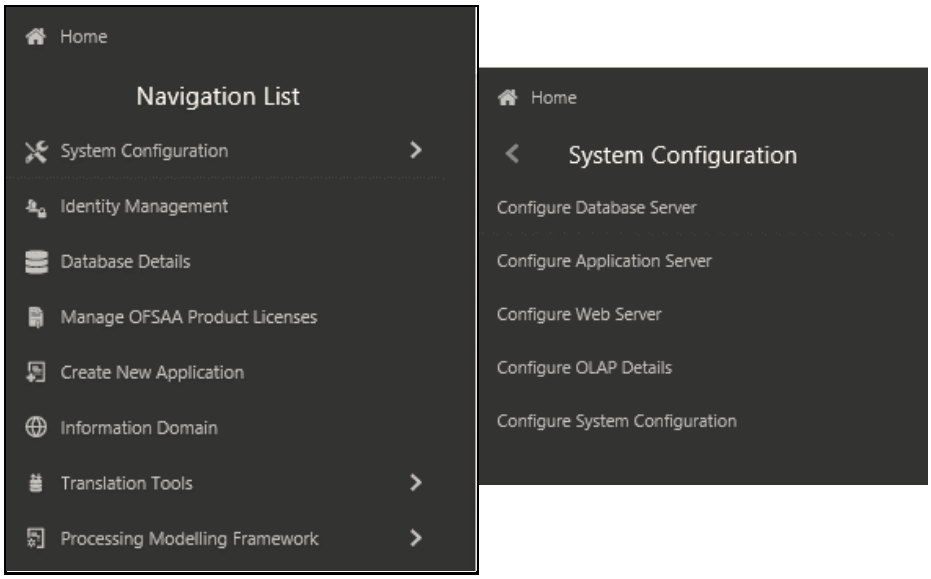
The Administration and Configuration section allows the System Administrators to configure the Server details, Database details, OLAP details, and Information Domain along with the other Configuration process such as segment and metadata mapping, and mapping segment to security. System Configuration is mostly an onetime activity which helps the System administrator to make the Infrastructure system operational for usage.

6.10.3.1 Navigate to System Configuration

Click from the header to display the Administration tools in the Tiles menu. Click **System Configuration** from the Tiles menu to view a submenu list.

> **NOTE** After you have accessed a tool from the submenu, the options are also available in the Navigation List to the left. Click button to access the Navigation List.

Figure 55: System Configuration Submenu



You (System Administrator) must have full access rights to ftpshare directory with appropriate User ID and password to add and modify the server details.

6.10.3.2 Components of System Configuration

System Configuration consists of the following sections.

- Database Server
- Application Server
- Web Server

- Database Details
- OLAP Details
- Email Configuration
- View OFSAA Product Licenses
- Information Domain
- Configuration
- Create Application

6.11 Configure the excludeURLList.cfg File

To configure the `excludeURLList.cfg` file, follow these steps:

1. Go to `$FIC_WEB_HOME/webroot/conf`.
2. Create a backup of the file `excludeURLList.cfg`.
3. Edit the following details in `excludeURLList.cfg` file:

   ```
   [SQLIA]./dataIntegrator/ to [ALL]./dataIntegrator/
   [SQLIA]./ETLExtractionServlet to [ALL]./ETLExtractionServlet
   ```

4. Go to `$FIC_WEB_HOME`.
5. Backup the existing ear/war files.
6. Delete `<app>.ear` and `<app>.war` files.
7. Re-create the ear/war files by running `ant.sh`.
8. Use the new ear/war files and re-deploy them.
9. Re-start the OFSAA environment.

6.12 Configure Oracle R Distribution and Oracle R Enterprise (ORE)

This section is applicable only if OFS Enterprise Modeling is licensed and enabled in your OFSAA instance.

1. Install OFSAAIRunner Package. For more information, see Install OFS_AAAI_Runner_Package. If you have already installed the OFSAAIRunner package (as part of a previous installation), uninstall it. (For more information, see Uninstall_OFSAAI_Runner_Package, and reinstall the latest available OFSAAIRunner package.
2. Log in to the database with dba privileges and provide the following privilege to Configuration Schema:

   ```
   RQADMIN by executing the command:
   GRANT RQADMIN TO <config_schema>;
   ```

3. Log in to the database with dba privileges and provide the following privileges to Atomic Schema:

```
CREATE UNLIMITED TABLESPACE privilege by executing the command: GRANT
CREATE UNLIMITED TABLESPACE TO <atomic_schema>;

CREATE MINING MODEL privilege (to execute the Data Mining models) by
executing the command:

GRANT CREATE MINING MODEL TO <atomic_schema>;
```

6.12.1 Install OFSAAAI Runner Package

OFSAAIRunner is an R package built by the OFS Enterprise Modeling Application. It is a prerequisite for executing models developed using R scripts. This package helps in:

- Initializing inputs
- Mapping framework variables to R objects
- Configuring possible outputs of the script
- Storing results back to the Database

OFSAAIRunner package (`OFSAAIRunner_1.0.0.tar.gz`) is available in the `$FIC_DB_ HOME/lib` directory.

6.12.1.1 Prerequisite

Oracle R and ORE must be installed on the Oracle Database server before installing the OFSAAIRunner package.

Refer to the following instructions to install OFSAAIRunner package:

1. Log in to the OFSAA Server. Navigate to the directory `$FIC_DB_HOME/lib`.
2. Copy the file `OFSAAIRunner_1.0.0.tar.gz` in Binary mode to the Oracle Database Server.
3. Log in to the Oracle Database Server with the user using which Oracle Database Server installation is done.
4. Navigate to the directory where the file `OFSAAIRunner_1.0.0.tar.gz` is copied.
5. Install the package by executing the command:

   ```
   ORE CMD INSTALL OFSAAIRunner_1.0.0.tar.gz
   ```

6. Successful installation is indicated in the installation log as:

   ```
   * DONE (OFSAAIRunner)

   Making packages.html ... done
   ```

   NOTE The OFSAAIRunner package is installed in the `/usr/lib64/R/library directory.`

7. Navigate to the directory `$ORACLE_HOME/R/library` and check whether OFSAAIRunner package is listed thereby executing the command:

   `>library(OFSAAIRunner)>OFSAAIRunner::` and press TAB twice.

   This lists out all the functions.

6.12.2 Uninstall OFSAAI Runner Package

Perform the following instructions to uninstall the OFSAAIRunner package:

1. Log in to the Oracle Database Server with the same username, using which Oracle Database Server installation is done.
2. Enter ORE in command prompt and execute the command:

   ```
   #ORE
   >remove.packages("OFSAAIRunner")
   ```

3. To save the workspace image, enter the command:

   ```
   >q()
   ```

4. Enter y when prompted to save the workspace image. Save workspace image? [y/n/c]: y
5. Navigate to the directory `$ORACLE_HOME/R/library` and verify the package is not listed thereby executing the command:

   ```
   ls -l
   ```

6.12.3 Configure ORE Execution

Perform the following step: to configure ORE execution:

1. Add a TNS entry in the `tnsnames.ora` file with tns name same as that of the value set for ORACLE_SID in the database server.

> **NOTE** For the RAC database, follow the preceding configuration in all the machines.

6.12.4 Configure Tomcat

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

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

1. Navigate to `tomcat/conf` directory.
2. Edit the `web.xml` file as follows:
3. 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>
   ```

6.13 Configure Big Data Processing

This section is not applicable if you have enabled Financial Services Big Data Processing during the installation of OFSAAI 8.1.2.0.0 full installer. Follow instructions in this section if you intend to enable Big Data Processing.

Topics:

- Copy Jars to OFSAA Installation Directory
- Copy KEYTAB and KRB5 Files in OFSAAI
- Enable Big Data

6.13.1 Copy Jars to the OFSAA Installation Directory

1. Copy the following Jars <Apache Installation Directory>/jars directory based on the Apache version to the location `$FIC_HOME/ext/lib`

```
woodstox-core-5.0.3.jar
stax2-api-3.1.4.jar
log4j-1.2.17.jar
libthrift-0.9.3.jar
httpcore-4.4.4.jar
httpclient-4.5.2.jar
hive-exec-3.1.2.jar
hadoop-auth-3.1.1.jar
commons-configuration2-2.1.1.jar
zookeeper-3.4.9.jar
slf4j-log4j12-1.7.25.jar
slf4j-api-1.7.25.jar
libfb303-0.9.3.jar
hive-service-3.1.2.jar
hive-metastore-3.1.2.jar
hive-jdbc-3.1.2.jar
hadoop-common-3.1.1.jar
curator-client-2.12.0.jar
commons-logging-1.0.4.jar
commons-io-2.4.jar
commons-collections-3.2.2.jar
```

> **NOTE** For Installation purpose, copy the below jars to the locationed mentioned in the 5.2.3.1 Configure the <APP Pack>_SCHEMA_BIGDATA_IN.xml File section to the location <HIVE_LIB_PATH> .

6.13.2 Copy KEYTAB and KRB5 Files in OFSAAI

A Keytab is a file containing pairs of Kerberos principals and encrypted keys (these are derived from the Kerberos password). The krb5.conf file contains Kerberos configuration information, including the locations of KDCs and admin servers for the Kerberos realms of interest, defaults for the current realm, and Kerberos applications, and mappings of hostnames onto Kerberos realms.

If the Authentication is configured as KERBEROS_WITH_KEYTAB for the Hive database, then you must use the Keytab file to login to Kerberos. The Keytab and Kerberos files must be copied to `$FIC_HOME/conf` and `$FIC_WEB_ HOME/webroot/conf` of the OFSAAAI installation directory.

Generate the application EAR/WAR file and redeploy the application onto your configured web application server.

Restart the Web application server and the OFSAAAI Application Server. For more information, see the Start the Infrastructure Services section.

6.13.3 Enable Big Data

To enable Big Data option, follow these steps:

1. Download the OFSAAAI Applications Pack Installer
2. Extract the Software
3. Configure OFS_<App pack>_PACK.xml File
4. Enable the option as YES for the App ID OFS_AAIB as shown in the following illustration:

Figure 56: Enable Big Data

```
<APP_PACK_CONFIG>
   <APP_PACK_ID>OFS_AAAI_PACK</APP_PACK_ID>
   <IS_OPT_INSTALL VALUE="TRUE" />
   <APP_PACK_NAME>Financial Services Advanced Analytical Applications Infrastructure Application Pack</APP_PACK_NAME>
   <APP_PACK_DESCRIPTION>Applications for Advanced Analytics using Oracle R, Modeling and Stress Testing Framework and Inline Processing Engine
   </APP_PACK_DESCRIPTION>
   <VERSION>8.1.2.0.0</VERSION>
   <APP>
      <APP_ID PREREQ="" DEF_SEL_FLG="YES" ENABLE="YES">OFS_AAI</APP_ID>
      <APP_NAME>Financial Services Analytical Applications Infrastructure</APP_NAME>
      <APP_DESCRIPTION>Base Infrastructure for Analytical Applications Infrastructure</APP_DESCRIPTION>
      <VERSION>8.1.2.0.0</VERSION>
   </APP>
   <APP>
      <APP_ID PREREQ="OFS_AAI" DEF_SEL_FLG="NO" ENABLE="YES">OFS_AAIB</APP_ID>
      <APP_NAME>Financial Services Analytical Applications Infrastructure Big Data Processing</APP_NAME>
      <APP_DESCRIPTION>Add-On Option for Big Data Processing</APP_DESCRIPTION>
      <VERSION>8.1.2.0.0</VERSION>
   </APP>
   <APP>
      <APP_ID PREREQ="OFS_AAI" ENABLE="YES">OFS_AAAI</APP_ID>
      <APP_NAME>Financial Services Enterprise Modeling</APP_NAME>
      <APP_DESCRIPTION>Add-On Option for Advanced Analytical Applications</APP_DESCRIPTION>
      <VERSION>8.1.2.0.0</VERSION>
   </APP>
    <APP>
      <APP_ID PREREQ="OFS_AAI" ENABLE="YES">OFS_IPE</APP_ID>
      <APP_NAME>Financial Services Inline Processing Engine</APP_NAME>
      <APP_DESCRIPTION>Add-On Option for Inline Processing Engine</APP_DESCRIPTION>
      <VERSION>8.1.2.0.0</VERSION>
   </APP>
</APP_PACK_CONFIG>
```

5. Install the OFSAAI Application Pack

6.14 Enable Financial Services Enterprise Modeling on Another Application Pack

To enable Enabling Financial Services Enterprise Modeling on another Application Pack, follow these steps:

1. Download the OFSAAAI Applications Pack Installer
2. Extract the Software
3. Configure OFS_<App pack>_PACK.xml File
4. Enable the option as YES for the App ID OFS_AAAI as shown in the following illustration:

Figure 57: Enable Financial Services Enterprise Modeling

```
<APP_PACK_CONFIG>
   <APP_PACK_ID>OFS_AAAI_PACK</APP_PACK_ID>
   <IS_OPT_INSTALL VALUE="TRUE" />
   <APP_PACK_NAME>Financial Services Advanced Analytical Applications Infrastructure Application Pack</APP_PACK_NAME>
   <APP_PACK_DESCRIPTION>Applications for Advanced Analytics using Oracle R, Modeling and Stress Testing Framework and Inline Processing Engine
   </APP_PACK_DESCRIPTION>
   <VERSION>8.1.2.0.0</VERSION>
   <APP>
      <APP_ID PREREQ="" DEF_SEL_FLG="YES" ENABLE="YES">OFS_AAI</APP_ID>
      <APP_NAME>Financial Services Analytical Applications Infrastructure</APP_NAME>
      <APP_DESCRIPTION>Base Infrastructure for Analytical Applications Infrastructure</APP_DESCRIPTION>
      <VERSION>8.1.2.0.0</VERSION>
   </APP>
   <APP>
      <APP_ID PREREQ="OFS_AAI" DEF_SEL_FLG="NO" ENABLE="YES">OFS_AAIB</APP_ID>
      <APP_NAME>Financial Services Analytical Applications Infrastructure Big Data Processing</APP_NAME>
      <APP_DESCRIPTION>Add-On Option for Big Data Processing</APP_DESCRIPTION>
      <VERSION>8.1.2.0.0</VERSION>
   </APP>
   <APP>
      <APP_ID PREREQ="OFS_AAI" ENABLE="YES">OFS_AAAI</APP_ID>
      <APP_NAME>Financial Services Enterprise Modeling</APP_NAME>
      <APP_DESCRIPTION>Add-On Option for Advanced Analytical Applications</APP_DESCRIPTION>
      <VERSION>8.1.2.0.0</VERSION>
   </APP>
    <APP>
      <APP_ID PREREQ="OFS_AAI" ENABLE="YES">OFS_IPE</APP_ID>
      <APP_NAME>Financial Services Inline Processing Engine</APP_NAME>
      <APP_DESCRIPTION>Add-On Option for Inline Processing Engine</APP_DESCRIPTION>
      <VERSION>8.1.2.0.0</VERSION>
   </APP>
</APP_PACK_CONFIG>
```

5. Install the OFSAAI Application Pack

6.15 Create Application Users

Create the application users in the OFSAA setup before use. For more information, see the *User Administrator* section in the Oracle Financial Services Analytical Applications Infrastructure User Guide.

> **NOTE** This step may not be required if you have already set up users in the OFSAA setup.

6.16 Map Application User(s) to User Group

Starting the OFSAA 8.1 release, with the installation of every OFSAA Application Pack, pre-configured application user groups are seeded. These user groups are unique to every OFSAA Application Pack and have application roles pre-configured.

User Groups seeded with the OFSAAAI Application Pack are listed in the Seeded User Groups Table

Table 22: Seeded User Groups

Name	Description
Modeler Group	A user mapped to this group has access to all the menu items for Enterprise modeling but does not have authorization rights for sandbox population, model deployment, and modeling technique authorization.
Modeling Administrator Group	A user mapped to this group has access to all the menu items for Enterprise modeling and has authorization rights for the sandbox population, model deployment, and modeling technique authorization.

Name	Description
Business Administrator	A user mapped to this group has access to all the menu items and actions for the advanced operations of metadata objects.
Business Authorizer	A user mapped to this group has access to all the menu items and actions for authorization of changes to metadata objects.
Business Owner	A user mapped to this group has access to all the menu items and actions for read and write of metadata objects
Business User	A user mapped to this group has access to all the menu items and actions for access and read of metadata objects.
Identity Administrator	A user mapped to this group has access to all the menu items for managing User entitlements, User Group Entitlements, and Access Management configurations.
Identity Authorizer	A user mapped to this group has access to all the menu items for authorizing User entitlements, User Group Entitlements, and Access Management configurations.
System Administrator	A user mapped to this group has access to all menu items for managing the setup configurations.
Object Administrator	A user mapped to this group has access to all menu items for managing object migration and metadata traceability using the metadata browser.
Guest Group	A user mapped to this group has access to certain menu items with only access privileges.

Map the application user (s) to the respective Application User Group (s) and subsequently authorize the entitlements by logging in as SYSAUTH (System Authorizer) user.

For more information, see the *Mapping/Unmapping Users* section from the Oracle Financial Services Analytical Applications Infrastructure User Guide.

6.17 Add TNS entries in the TNSNAMES.ORA File

Add TNS entries in the `tnsnames.ora` file for every schema created for the Application Pack.

To find the tnsname for the entries, follow these steps:

1. Log in to the application using System Administrator privileges.
2. Navigate to System Configuration & Identity Management tab.

3. Click Administration and Configuration, select System Configuration, and click Database Details.
4. Expand Name to get the list of TNS entry names.

   Alternatively, you can connect to the CONFIG schema and execute the following query:

   ```
   select dbname from db_master where dbname !='CONFIG'
   ```

6.18 Configure or Verify SFTP Details Across App Server and Web Server

6.19 Configure Transparent Data Encryption (TDE) and Data Redaction in OFSAA

Two features comprise of Oracle Advanced Security: Transparent Data Encryption and Oracle Data Redaction.

This section details the configurations required in case you want to enable TDE or Data Redaction in OFSAA applications.

- Prerequisites
- Transparent Data Encryption (TDE)
- Data Redaction

6.19.1 Prerequisites

Ensure the required Oracle Database Server versions are installed:

- Oracle Database Server Enterprise Edition 18c Release 3 - 64 bit RAC/Non-RAC with/without partitioning option, Advanced Security Option.
- Oracle Database Server Enterprise Edition 19c Release 3 - 64 bit RAC/Non-RAC with/without partitioning option, Advanced Security Option.

6.19.2 Transparent Data Encryption (TDE)

Transparent Data Encryption (TDE) enables you to encrypt sensitive data, such as Personally Identifiable Information (PII), that you store in tables and tablespaces. After the data is encrypted, this data is transparently decrypted for authorized users or applications when they access this data. To prevent unauthorized decryption, TDE stores the encryption keys in a security module external to the database, called a Keystore. For more details on TDE, see the Database Advanced Security Guide.

TDE tablespace encryption enables you to encrypt all of the data stored in a tablespace. To control the encryption, you use a Keystore and TDE master encryption key. Oracle Database supports both software keystores and hardware, or HSM-based, keystores. A software keystore is a container for the TDE master encryption key, and it resides in the software file system.

To configure TDE for OFSAA, follow these steps:

1. Create a new PDB (19c)/ instance (18c) on the same or different Database Server for TDE. For more information, see Configure Software Keystore and Encrypted Tablespace Creation.
2. Shutdown the OFSAAI Services.
3. Export all Configuration, Atomic, and Sandbox Schemas as per the applications installed in your OFSAA instance.

   For example:

   ```
   expdp SYSTEM/oracle@OFSA19c2DB DIRECTORY=data_pump_dir
   DUMPFILE=ofsaaconf_ ofsaaatm_%U.dmp filesize=2G
   SCHEMAS=ofsaaconf,ofsaaatm LOGFILE=ofsaaconf_ ofsaaatm_exp.log
   ```

   NOTE The above command will create data dumps as files of 2GB size each (multiples). Any other commands/ tools as appropriate may be used to archive the schemas.

4. Import all schemas that are exported using the above command, into the new DB instance.

   For example:

   ```
   impdp SYSTEM/oracle@OFSA12nDB DIRECTORY=data_pump_dir
   DUMPFILE=ofsaaconf_ ofsaaatm_%U.dmp SCHEMAS=ofsaaconf,ofsaaatm
   LOGFILE=ofsaaconf_ofsaaatm_ imp.log
   ```

   NOTE
   - Restoring the exported dumps creates Configuration and Atomic Schema(s) with the same user credentials as that of the source, along with the existing grants.
   - If schemas are restored using a tool/ mechanism other than as mentioned in Steps 1 and 2, retain the user credentials of Configuration and Atomic Schemas the same as in the Source environment, along with the Schema grants.

5. Provide select grants on `sys.V_$parameter` to view Configuration and Atomic Schemas of Target Environment database.

   For example:

   ```
   Log in as sys user:
   SQL> GRANT SELECT ON SYS.V_$PARAMETER TO ofsaaconf;
   Grant succeeded
   SQL> GRANT SELECT ON SYS.V_$PARAMETER TO ofsaaatm;
   Grant succeeded
   ```

6. Update `.profile` for ORACLE_SID environment variable with new ORACLE_ SID.
7. Update JDBC URL by executing Port Changer utility. For details on how to execute Port Changer utility, see *Changing IP/Hostname, Ports, Deployed paths, Protocol of the OFSAA Instance*

section under Generic Configurations chapter in OFS Analytical Applications Infrastructure Administration Guide.

8. Navigate to the `$FIC_WEB_HOME` directory and execute the following command to trigger the creation of the EAR/WAR file:

   `./ant.sh`

9. The EAR/WAR file - <contextname>.ear/.war - is created in the `$FIC_WEB_HOME` directory.
10. On completion of the EAR/WAR file creation, the message "BUILD SUCCESSFUL" is displayed.
11. Edit the existing Connection Pool settings to point to the new JDBC URL and verify connections.
12. Clear the webserver cache and redeploy the application onto your configured web application server.
13. Restart the OFSAA Services. For more information, see Start the Infrastructure Services.

6.19.2.1 Configure a Software Keystore and Encrypted Tablespace Creation

A software keystore is a container for the TDE master encryption key, and it resides in the software file system. You must define a location for the key in the `sqlnet.ora` file so that the database locates the keystore (one per database) by checking the keystore location in the `sqlnet.ora` file. After defining the location, create the keystore and open it. Set the TDE master key after opening it and then encrypt the data.

To find whether a wallet is already existing, check the following entries:

1. The location specified by the ENCRYPTION_WALLET_LOCATION parameter in the `sqlnet.ora` file.
2. The location specified by the WALLET_LOCATION parameter in the `sqlnet.ora` file.

   Encrypted tablespaces can share the default database wallet. However, Oracle recommends that you use a separate wallet for transparent data encryption functionality by specifying the ENCRYPTION_WALLET_LOCATION parameter in the `sqlnet.ora` file.

> **NOTE** You must have the required privileges to perform the following actions.

To configure the software keystore, follow the instructions in the following sections:

1. Set the Software Keystore Location in the sqlnet.ora File
2. Create the Software Keystore
3. Open the Software Keystore
4. Set the Software TDE Master Encryption Key
5. Encrypting your Data

6.19.2.1.1 Set the Software Keystore Location in the sqlnet.ora File

The first step is to designate a location for the software keystore in the `sqlnet.ora` file. The Oracle Database will check the `sqlnet.ora` file for the directory location of the keystore to determine whether it is a software keystore or a hardware module security (HSM) keystore.

NOTE

- Ensure that the directory location which you want to set for software keystore exists beforehand. Preferably, this directory must be empty.
- In a multitenant environment, the keystore location is set for the entire multitenant container database (CDB), not for individual pluggable databases (PDBs).
- By default, the `sqlnet.ora` file is located in the `ORACLE_HOME/network/admin` directory or the location set by the TNS_ADMIN environment variable. Ensure that you have properly set the TNS_ADMIN environment variable to point to the correct `sqlnet.ora` file.

To create a software keystore on a regular file system, use the following format when you edit the `sqlnet.ora` file:

```
ENCRYPTION_WALLET_LOCATION= (SOURCE=(METHOD=FILE)
(METHOD_DATA=(DIRECTORY=<<path to keystore>>)))
```

Examples:

- For a regular file system in which the database name is orclb:

  ```
  ENCRYPTION_WALLET_LOCATION= (SOURCE=(METHOD=FILE)
  (METHOD_DATA=(DIRECTORY=/etc/ORACLE/WALLETS/orcl)))
  ```

- When multiple databases share the `sqlnet.ora` file:

  ```
  ENCRYPTION_WALLET_LOCATION= (SOURCE=(METHOD=FILE)
  (METHOD_DATA=(DIRECTORY=/etc/ORACLE/WALLETS/orcl)))
  ```

- When Oracle Automatic Storage Management (ASM) is configured:

  ```
  ENCRYPTION_WALLET_LOCATION= (SOURCE=(METHOD=FILE)
  (METHOD_DATA=(DIRECTORY=+disk1/mydb/wallet)))
  ```

- For ASM Diskgroup:

  ```
  ENCRYPTION_WALLET_LOCATION= (SOURCE=(METHOD=FILE)
  (METHOD_DATA=(DIRECTORY=+ASM_file_path_of_the_diskgroup)))
  ```

6.19.2.1.2 Create the Software Keystore

There are three types of Software Keystores:

- Password-based Software Keystores
- Auto-login Software Keystores
- Local Auto-login Software Keystores

Perform the following steps to create a software keystore:

1. Log in as sysdba or user with ADMINISTER KEY MANAGEMENT or SYSKM privilege.
2. Use the following command to create password-based software keystore:

```
CONN sys/password@serviceid AS SYSDBA

ADMINISTER KEY MANAGEMENT CREATE KEYSTORE 'keystore_location'
IDENTIFIED BY

software_keystore_password;
```

   - keystore_location is the path of the keystore directory you want to create
   - software_keystore_password is the password of the keystore that you want to create.

     For example, to create the keystore in the `/etc/ORACLE/WALLETS/orcl` directory:

     ```
     ADMINISTER KEY MANAGEMENT CREATE KEYSTORE /etc/ORACLE/WALLETS/orcl'
     IDENTIFIED BY password;
     ```

     After you run this statement, the `ewallet.p12` file, which is the keystore, appears in the keystore location.
   - Alternatively, you can create an Auto-Login or Local-Login Keystore to avoid opening the Keystore manually every time. Use the following command:

     ```
     ADMINISTER KEY MANAGEMENT CREATE [LOCAL] AUTO_LOGIN KEYSTORE FROM
     KEYSTORE 'keystore_location' IDENTIFIED BY keystore_password;
     ```
   - LOCAL enables you to create a local auto-login software keystore. Otherwise, omit this clause if you want the keystore to be accessible by other computers.

     After you run this statement, the `cwallet.sso` file appears in the keystore location.

> **NOTE** It is important to remember the master key password (<keystore_password>) used during the creation of the keystore. There are no ways to retrieve the password if forgotten.

6.19.2.1.3 Open the Software Keystore

Depending on the type of keystore you create, you must manually open the keystore before you can use it.

You must not manually open auto-login or local auto-login software keystores. These keystores are automatically opened when it is required, that is when an encryption operation must access the key. If necessary, you can explicitly close any of these types of keystores. You can check the status of whether a keystore is open, closed, open but with no master key, or open but with an unknown master key by querying the STATUS column of the V$ENCRYPTION_ WALLET view.

After you open a keystore, it remains open until you manually close it. Each time you restart a database instance, you must manually open the password keystore to re-enable encryption and decryption operations.

Perform the following steps to open the software wallet:

1. Log in as sysdba or user with ADMINISTER KEY MANAGEMENT or SYSKM privilege.
2. Use the following command to open password-based software keystore:

```
CONN sys/password@serviceid AS SYSDBA

ADMINISTER KEY MANAGEMENT SET KEYSTORE OPEN IDENTIFIED BY
software_keystore_password [CONTAINER = ALL | CURRENT];
```

   - `software_keystore_password` is the same password that you used to create the keystore in "Step 2: Create the Software Keystore".
   - `CONTAINER` is for use in a multitenant environment. Enter ALL to set the keystore in all of the PDBs in this CDB, or CURRENT for the current PDB.

> **NOTE**
> - In a CDB, open the Keystore in the ROOT (CDB$ROOT) container and in all the associated PDBs, where TDE is enabled.
> - You must not manually open auto-login or local auto-login software Keystores.

6.19.2.1.4 Set the Software TDE Master Encryption Key

Once the keystore is open, you can set a TDE master encryption key for it. The TDE master encryption key is stored in the keystore. This key protects the TDE table keys and tablespace encryption keys. By default, the TDE master encryption key is a key that Transparent Data Encryption (TDE) generates.

In a multitenant environment, you can create and manage the TDE master encryption key from either the root or the PDB.

Ensure that the database OPEN_MODE is set as READ WRITE. To find the status for a non-multitenant environment, query the OPEN_MODE column of the V$DATABASE dynamic view. If you are using a multitenant environment, then query the V$PDBS view. (If you cannot access these views, then connect as SYSDBA and try the query again. To connect as SYSKM for this type of query, you must create a password file for it. See Oracle Database Administrator's Guide for more information.)

Perform the following steps to set the encryption key:

1. Log in as sysdba or user with ADMINISTER KEY MANAGEMENT or SYSKM privilege.
2. Use the following command to set the encryption key:

```
CONN sys/password@serviceid AS SYSDBA

ADMINISTER KEY MANAGEMENT SET KEY [USING TAG 'tag'] IDENTIFIED BY
password [WITH BACKUP [USING 'backup_identifier']] [CONTAINER = ALL |
CURRENT];
```

   - `tag` is the associated attributes and information that you define. Enclose this setting in single quotation marks (' ').
   - `password` is the mandatory keystore password that you created when you created the keystore in Create the Software Keystore.
   - `WITH BACKUP` creates a backup of the keystore. You must use this option for password-based keystores. Optionally, you can use the USING clause to add a brief description of the

backup. Enclose this description in single quotation marks (' '). This identifier is appended to the named keystore file (for example, ewallet_time_stamp_emp_key_backup.p12, with emp_key_ backup being the backup identifier). Follow the file naming conventions that your operating system uses.

- `CONTAINER` is for use in a multitenant environment. Enter ALL to set the key in all of the PDBs in this CDB, or CURRENT for the current PDB.

  For example,

  ```
  ADMINISTER KEY MANAGEMENT SET KEY IDENTIFIED BY password WITH
  BACKUPUSING 'emp_key_backup';
  ```

6.19.2.1.5 Encrypt your Data

After completing the keystore configuration, encrypt the data. You can encrypt individual columns in a table or entire tablespaces. OFSAA recommends encrypting entire tablespaces and the description in this section covers encrypting entire tablespaces.

> **NOTE** The following restrictions on using Transparent Data Encryption when you encrypt a tablespace:
>
> - Transparent Data Encryption (TDE) tablespace encryption encrypts or decrypts data during read and write operations, as compared to TDE column encryption, which encrypts and decrypts data at the SQL layer. This means that most restrictions that apply to TDE column encryption, such as data type restrictions and index type restrictions, do not apply to TDE tablespace encryption.
> - To perform import and export operations, use Oracle Data Pump.

Encrypting data involves the following steps:

1. Set the COMPATIBLE Initialization Parameter for Tablespace Encryption
2. Set the Tablespace TDE Master Encryption Key
3. Create the Encrypted Tablespace

Set the COMPATIBLE Initialization Parameter for Tablespace Encryption

Prerequisite: You must set the COMPATIBLE initialization parameter for the database to 12.2.0.0 or later. Once you set this parameter to 12.2.0.0, the change is irreversible.

To set the `COMPATIBLE` initialization parameter, follow these steps:

1. Log in to the database instance. In a multitenant environment, log into the PDB.
2. Check the current setting of the `COMPATIBLE` parameter.

   For example:

   ```
   SHOW PARAMETER COMPATIBLE
   NAME                                 TYPE             VALUE
   ```

```
------------------          -----------       --------------------
compatible                  string            12.0.0.0
noncdbcompatible            BOOLEAN           FALSE
```

3. If you want to change the `COMPATIBLE` parameter, perform the following steps:
   - Locate the initialization parameter file for the database instance.

     UNIX systems: This file is in the `ORACLE_HOME/dbs` directory and is named `initORACLE_SID.ora` (for example, `initmydb.ora`).
   - In SQL*Plus, connect as a user who has the **SYSDBA** administrative privilege, and then shut down the database.

     For example:

     ```
     CONNECT /AS SYSDBA
     SHUTDOWN
     ```
   - Edit the initialization parameter file to use the correct COMPATIBLE setting.

     For example:

     ```
     COMPATIBLE = 12.2.0.0
     ```
   - In SQL*Plus, ensure that you are connected as a user who has the **SYSDBA** administrative privilege, and then start the database.

     For example:

     ```
     CONNECT /AS SYSDBA
     STARTUP
     ```
   - If tablespace encryption is in use, then open the keystore at the database mount. The keystore must be open before you can access data in an encrypted tablespace.

     ```
     STARTUP MOUNT;
     ADMINISTER KEY MANAGEMENT SET KEYSTORE OPEN IDENTIFIED BY password;
     ALTER DATABASE OPEN;
     ```

Set the Tablespace TDE Master Encryption Key

Make sure that you have configured the TDE master encryption key as shown in the Set the Software TDE Master Encryption Key. section.

Create the Encrypted Tablespace

After you have set the `COMPATIBLE` initialization parameter, you are ready to create the encrypted tablespace.

See the following reference link for details on manually creating encrypted tablespaces:

https://docs.oracle.com/cloud/latest/db121/ASOAG/asotrans_config.htm#ASOAG9555.

6.19.2.2 Test the Encryption

Test the encryption by checking if a tablespace is encrypted or not. Execute the following query to check:

```
SELECT tablespace_name, encrypted FROM dba_tablespaces;
```

The following result is displayed, which indicates whether the TABLESPACE is encrypted or not in the ENCRYPTED column.

Table 23: Testing the Encryption

TABLESPACE_NAME	ENCRYPTED
SYSTEM	NO
SYSAUX	NO
UNDOTBS1	NO
TEMP	NO
USERS	NO
ENCRYPTED_TS	YES

The above example indicates TABLESPACE `ENCRYPTED_TS` is created with Encryption ON.

6.19.3 Data Redaction

OFSAA is enhanced to enable masking of sensitive data and Personal Identification Information (PII) to adhere to Regulations and Privacy Policies. Oracle Data Redaction provides selective, on-the-fly redaction of sensitive data in database query results before display by applications so that unauthorized users cannot view the sensitive data. The stored data remains unaltered, while displayed data is transformed into a pattern that does not contain any identifiable information.

To enable Data Redaction, perform the following steps:

1. Log in as SYSDBA into the database.
2. Execute the `$FIC_HOME/utility/data_security/scripts/create_data_sec_roles.sql` file only once per database (PDB in case of 18c/19c).
3. Execute the following SQL statement to find out the list of atomic users from the table:

   select v_schema_name from aai_db_detail where V_DB_NAME <> 'CONFIG' AND V_DB_ TYPE = 'ORACLE'
4. Execute the `$FIC_HOME/utility/data_security/scripts/grant_data_sec_roles.sql` file for all atomic users found in the previous step.
5. From the Configuration window in the System Configuration module, select the Allow Data Redaction checkbox.
6. Run the Data Redaction utility.

   For more details on enabling Data Redaction, see the *Data Redaction* section in the *Data Security and Data Privacy* topic in the OFS Analytical Applications Infrastructure Administration Guide.

7 Remove OFSAA Infrastructure

Topics:

- Uninstall the OFSAA Infrastructure
- Uninstall the EAR Files
- Clean Up the Environment

7.1 Uninstall the OFSAA Infrastructure

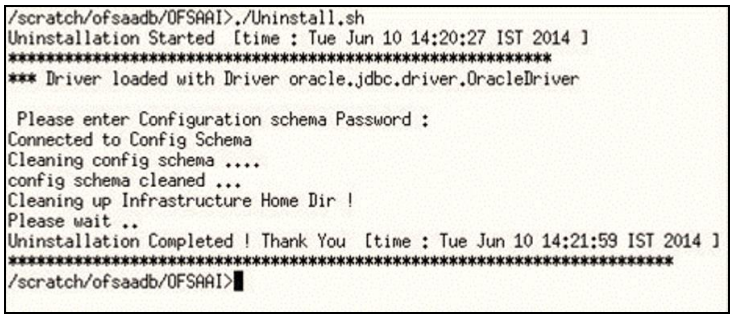
To uninstall the OFSAA Infrastructure, follow these steps:

> **ATTENTION** Before you start the uninstallation process, ensure that no open connections exist to the OFSAA Infrastructure Config and Atomic Schemas and Stop the Infrastructure Services.

1. Log in to the system as a non-root user.
2. Navigate to the `$FIC_HOME` directory and execute the following command:

   `./Uninstall.sh`
3. Enter the password for the OFSAAI Configuration Schema when prompted:

Figure 58: OFSAAI Configuration Schema Prompt



7.2 Uninstall the EAR Files

Topics:

- Uninstall the EAR Files in WebSphere
- Uninstall the EAR Files in WebLogic
- Uninstall the EAR Files in Tomcat

7.2.1 Uninstall the EAR Files in WebSphere

To uninstall a previously deployed application from a WebSphere application server, follow these steps:

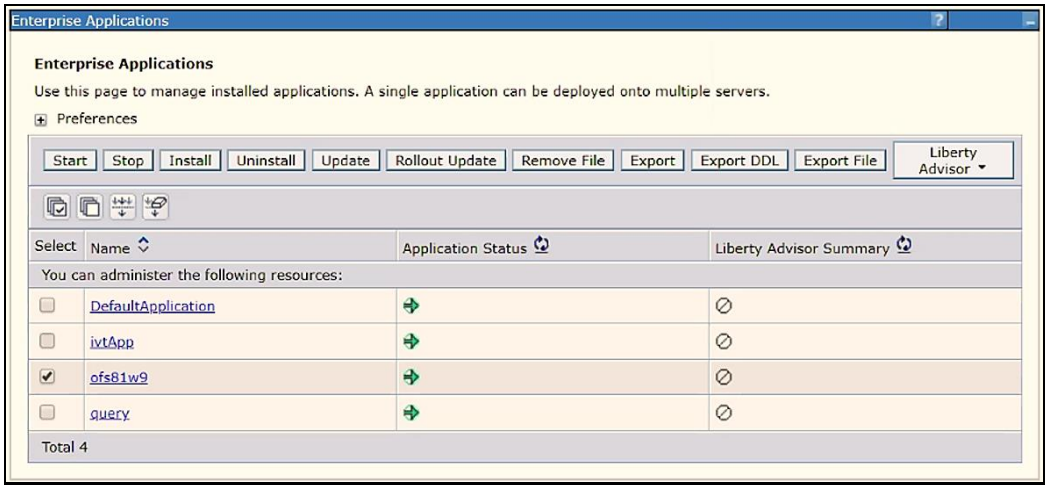
1. Open the URL in a browser window:

   `http://<ipaddress>:<Administrative Console Port>/ibm/console` (https if SSL is enabled).

   The login window for the *WebSphere Application Server Administration Console* is displayed.

2. Log in with the user ID that has admin rights.
3. From the Navigation Tree, select **Applications**, select **Application Types**, and then select **WebSphere enterprise applications**. The *Enterprise Applications* window with all the previously deployed applications is displayed.

Figure 59: Enterprise Applications Window - Previously Deployed Applications



4. Select the check box adjacent to the application that you want to uninstall and click **Stop**.
5. Click **Uninstall** to display the *Uninstall Application* window.

Figure 60: Uninstall Application window

6. Click **OK** to confirm.
7. Click **Save** to save the master file configuration.

7.2.2 Uninstall the EAR Files in WebLogic

To uninstall a previously deployed application from the WebLogic application server, follow these steps:

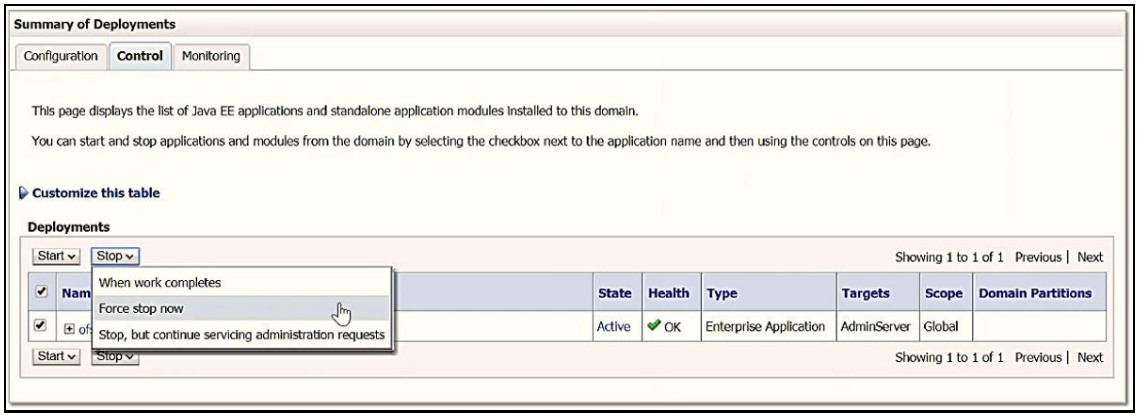
1. Open the URL in a browser window:

   `http://<ipaddress>:<admin server port>/console` (https if SSL is enabled).

   The login window of the *WebLogic Server Administration Console* is displayed.

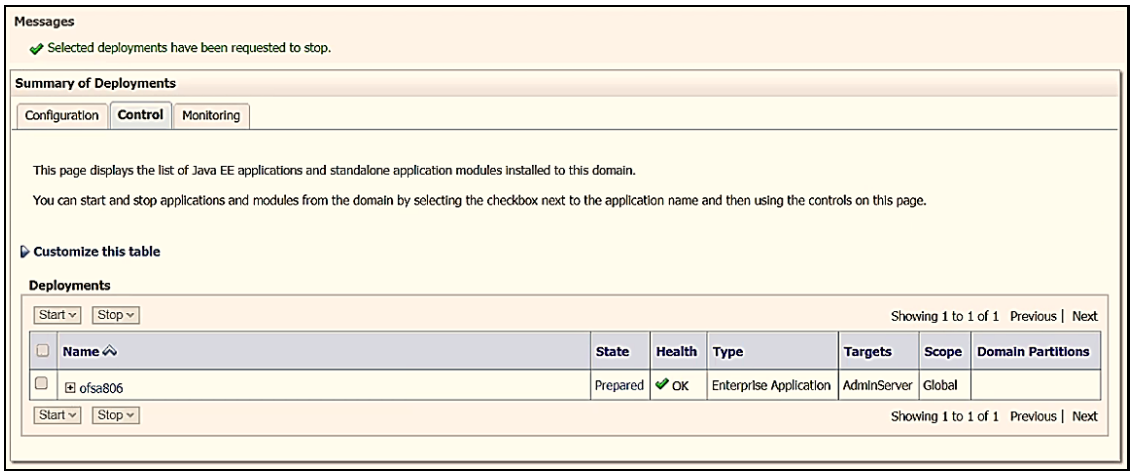
2. Log in with the WebLogic user credentials having administrator privileges.
3. From the Navigation Tree for Domain Structure, select **Deployments** to display the *Summary of Deployments* window.

Figure 61: Summary of Deployments Window



4. Select the check box adjacent to the application that you want to uninstall, click **Stop**, and then select **Force Stop Now**.
5. Click **Yes** in the confirmation dialog to stop the selected deployment.

Figure 62: Stop the Selected Deployment



6. Select the check box adjacent to the application and click **Delete** to delete the selected deployment.

7. Click **Yes** in the confirmation dialog to remove the selected deployment from the domain configuration.

7.2.3 Uninstall the EAR Files in Tomcat

To uninstall a previously deployed application from Tomcat server, follow these steps:

1. Comment out the Context path section from the `server.xml` file in the `$CATALINA_HOME/conf` directory to avoid conflict during undeploying and re-deploying the WAR file.

   Place comment <! > in between the context path section. For example:

   ```
   <!--
   <Context path ="/pr2test" docBase="/home/perfuser/tomcat-
   7.0.19/webapps/ pr2test" debug="0" reloadable="true"
   crossContext="true">
   <Resource auth="Container" name="jdbc/PR2ATM"
   type="javax.sql.DataSource"
   driverClassName="oracle.jdbc.driver.OracleDriver" username="pr2atm"
   password="pr2atm" url="jdbc:oracle:thin:@<HOST_NAME>:1521:PERFTEST"
   maxTotal="100"
   maxIdle="30" maxWaitMillis="10000"/>
   </Context>
   -->
   ```

2. To restart the Tomcat service, follow these steps:
   a. Log in to the "UNIX server" through a terminal emulator.
   b. Navigate to the `$catalina_home/bin` directory.
   c. Stop the Tomcat services using the following command:

      ```
      ./shutdown.sh
      ```

   d. Start the Tomcat services using the following command:

      ```
      ./startup.sh
      ```

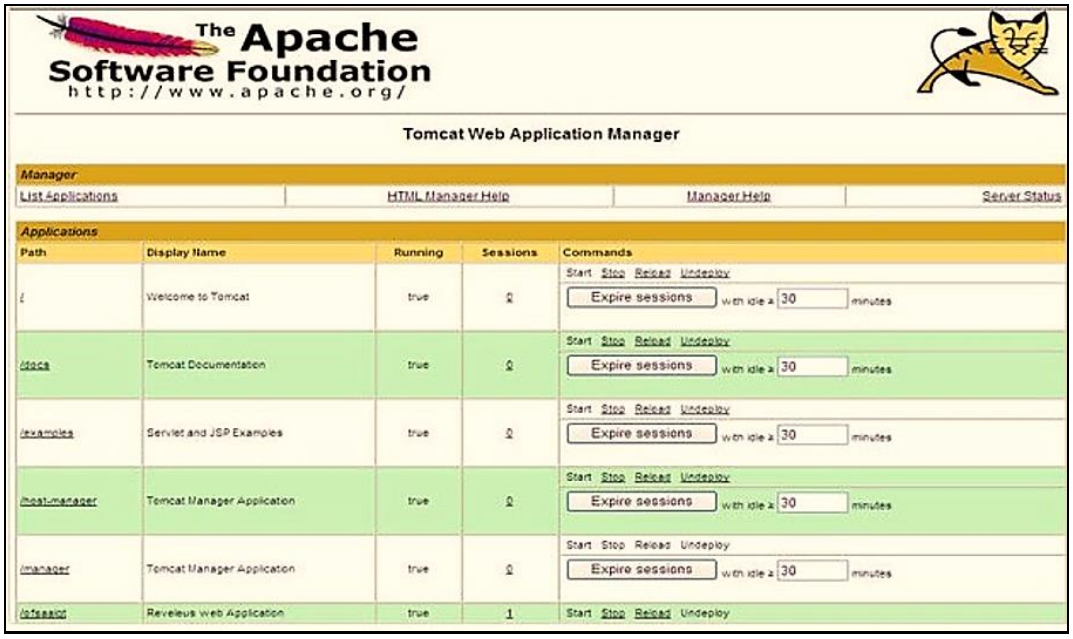
3. Open the URL in a browser window:

   `http://<IP address>:<Tomcat server port>` (https if SSL is enabled).

   The *Tomcat home* window is displayed.

4. Click **Manager App** to display the *Connect to* window.
5. Log in with the user credentials having admin rights. The *Tomcat Web Application Manager* window is displayed with the list of all applications deployed in Tomcat.

Figure 63: Tomcat Web Application Manager Window



6. Click the **Undeploy** link corresponding to the deployed Infrastructure application. A confirmation message is displayed.

7.3 Clean Up the Environment

To clean up the Infrastructure environment, follow these steps:

1. Uninstallation does not remove the Infrastructure application from the Web application server. Manually remove the Infrastructure application.
2. Remove the entries in the `.profile` file.
3. Navigate to the ftpshare directory and delete the infodom files and directories under the file system staging area (ftp share) by executing the following command:

   ```
   $ rm -rf <INFODOM>
   ```

4. Drop config and atomic schemas from the database. Drop all the database objects from the Atomic Schemas manually.

Part II

Topics:

- Upgrade

8 Upgrade

In this scenario, you are upgrading the application pack from Release 8.1.1.0.0 or later to Release 8.1.2.0.0.

Example: You are on release 8.1.1.0.0 and now want to upgrade to Release 8.1.2.0.0.

1. Run the Environment Check Utility tool and ensure that the hardware and software requirements are installed as per the Oracle Financial Services Analytical Applications 8.1.2.0.0 Technology Matrix.
2. Trigger the installation.

Topics:

- Prepare for Upgrade
- Extract the Software
- Trigger the Installation
- Verify the Log File Information
- Post Installation Steps
- Upgrade OFS AAAI from Linux 7 to Linux 8

> **NOTE** If you want to upgrade from Release v8.0.x of OFS AAAI on AIX or Solaris x86 Operating System, skip the other upgrade topics in this guide and see the instructions in the Migration Guide.

8.1 Prepare for Upgrade

Before you plan to install/upgrade any of your application packs to Release 8.1.2.0.0, ensure that all the application packs in your current OFSAA instance are available in the Release 8.1.2.0.0 version. Contact My Oracle Support for more information about the release version details.

> **ATTENTION** The minimum supported version is 8.0.6.1.0. If you are upgrading from a release before v8.0.6.1.0, then first upgrade to v8.0.6.1.0 or later. After this step, you can upgrade to v8.1.2.0.0 or later.

1. Backup the following in the OFS AAAI environment:
   - The Database
   - The following environment files from the `<OFS_AAAI_PACK>/schema_creator/conf` directory:
     - `OFS_<App pack>.xml`
     - `OFS_<PACK>_SCHEMA_IN.xml`

```
— OFSAAI_InstallConfig.xml
```

2. See the Oracle Financial Services Analytical Applications 8.1.2.0.0 Technology Matrix for the hardware and software required to upgrade to OFS AAAI Release 8.1.2.0.0.
3. Enable unlimited cryptographic policy for Java. For more information, see the *Enabling Unlimited Cryptographic Policy* section in the OFS Analytical Applications Infrastructure Administration Guide.
4. Clone your environment. For more information, see the OFSAA Cloning Reference Guide.
5. Execute the following SQL query on the Atomic Schema:

```
update rev_tables_b set version=0 where version is null;
commit;
```

8.2 Download the OFSAAAI Applications Pack Installer and Mandatory Patches

To download the OFSAAAI Applications Pack Installer Release 8.1.2.0.0, follow these steps:

1. Log in to My Oracle Support and search for **32791983** in the **Patches & Updates** Tab.
2. Download the installer archive and copy (in Binary mode) to the download directory that exists in the OFSAAAI installation setup.

> **NOTE** Select the required archive files for either Solaris SPARC or Linux based on the operating system of your OFSAAAI.

3. Log in to My Oracle Support, search for the **33663417** Mandatory Patch in the **Patches & Updates** Tab and download it.

> **ATTENTION** On the 10th of December 2021, Oracle released Security Alert CVE-2021-44228 in response to the disclosure of a new vulnerability affecting Apache Log4J before version 2.15. The application of the **33663417** Mandatory Patch fixes the issue.
>
> For details, see the My Oracle Support Doc ID 2827801.1.
>
> Ensure that you reapply the **33663417** Mandatory Patch whenever you install or upgrade the application, or apply an incremental patch.

8.3 Extract the Software

You must be logged in to the UNIX operating system as a non-root user to perform the following steps. To extract the software, follow these steps:

1. Download the unzip utility (OS-specific) `unzip_<os>.Z` and copy it in Binary mode to the directory that is included in your PATH variable.

If you already have an unzip utility to extract the contents of the downloaded archive, skip this step. Uncompress the unzip installer file with the command:

```
uncompress unzip_<os>.Z
```

> **NOTE** If an error message "uncompress: not found [No such file or directory]" is displayed, contact your UNIX administrator.

2. Assign execute (751) to the file with the following command:

   ```
   chmod 751 unzip_<OS>
   ```

   For example: `chmod 751 unzip_sparc`

3. Extract the contents of the OFSAAAI Application Pack Release 8.1.2.0.0 installer archive file in the download directory with the following command:

   ```
   unzip OFS_AAAI_PACK.zip
   ```

4. Navigate to the download directory and assign execute permission to the installer directory with the following command:

   ```
   chmod -R 750 OFS_AAAI_Pack
   ```

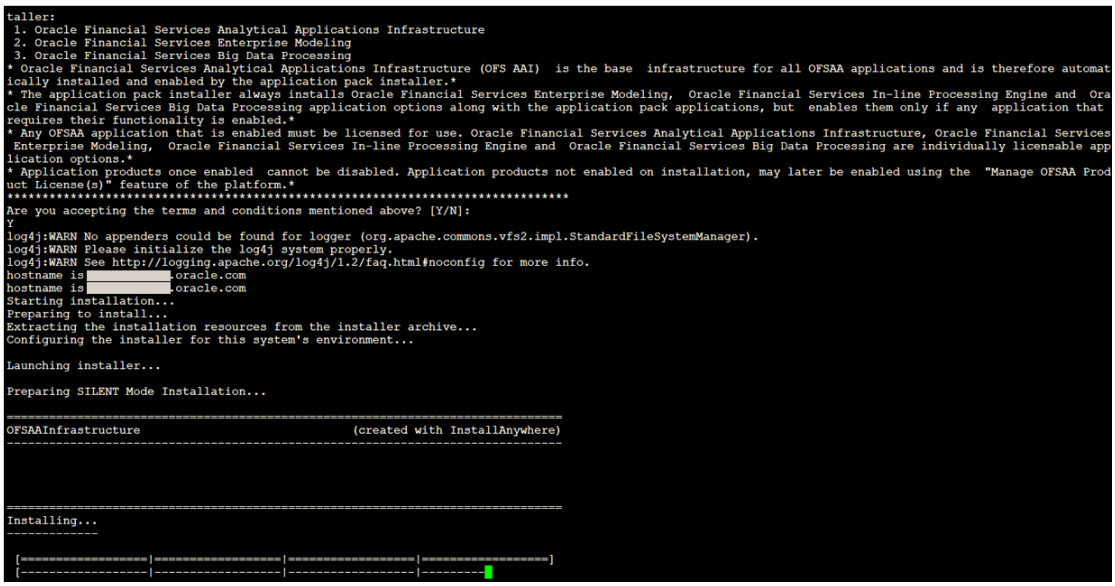
8.4 Trigger the Installation

1. Enter the following command in the console to execute the application pack installer with the Silent option.

   ```
   ./setup.sh SILENT
   ```

2. The installer proceeds with the pre-installation checks and starts the upgrade installation process.
3. The OFS AAAI installation begins.

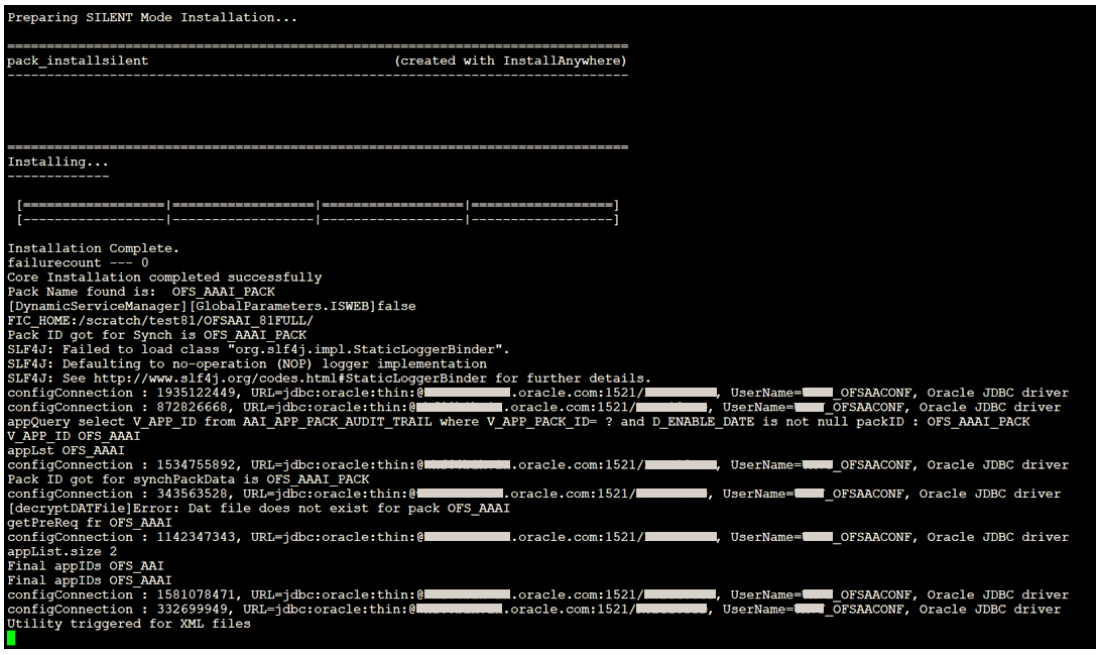
Figure 64: OFS AAAI Silent Mode Installation



Data Model Upload may take several hours to complete. You can check the installation logs in the following location: `OFS_AAAI/OFS_AAAI/logs`

4. The OFSAA Infrastructure installation performs a post-install check automatically on the successful installation of the product.

Figure 65: Silent Mode Installation In Progress



Congratulations! Your installation is complete.

8.5 Verify the Log File Information

See the `Pack_Install.log` file in the `OFS_AAI/logs/` directory for installation status and errors.

Ignore the error codes ORA-00001, ORA-00955, ORA-01430, and ORA-02292 in the log file. For any other error, contact My Oracle Support.

8.6 Post Installation Steps

Follow the steps mentioned in the Post Installation Steps section.

8.7 Upgrade OFS AAAI from Linux 7 to Linux 8

If your OFS AAAI instance is on Linux 7 Operating System and you want to install OFS AAAI on Linux 8.

To upgrade the OFS AAAI environment from Linux 7 to Linux 8, follow these steps:

1. Clone your existing environment to the Oracle Financial Services Analytical Applications 8.1.2.0.0 Technology Matrix.
2. Run the upgrade installer in the cloned environment.

   For detailed steps, see the sections 8.2 to 8.6.

Part III

Topics:

- Configure the Web Server
- Configure Resource Reference in Web Servers
- Configure Work Manager in Web Application Servers

9 Configure the Web Server

This step assumes the installation of a web server exists as per the prerequisites.

Refer to the product-specific installation guide to install and configure the web server. If an installation already exists, skip, and proceed to the next step.

NOTE

- See the Oracle Financial Services Analytical Applications Infrastructure Security Guide for configurations to secure your web server.
- You must enable a sticky session/affinity session configuration on the web server. See the respective product-specific Configuration Guide for more details. Additionally, you also must enable the sticky session/ affinity session configuration at the Load Balancer level if you have configured a Load Balancer in front of the web server.

This step assumes the installation of a web application server exists as per the prerequisites. To configure the Web application server for OFSAA Deployment refer to the following sections.

Topics:

- Configure WebSphere Application Server for Application Deployment
- Configure WebLogic for Application Deployment
- Configure Apache Tomcat Server for Application Deployment
- Additional Configurations for Web Servers

NOTE

- Make a note of the IP Address/ Hostname and Port of the web application server. This information is required during the installation process (required if the web server is not configured).
- Add umask 0027 in the `.profile` of the UNIX account which manages the WEB server to ensure restricted access permissions.
- See the OFSAA Secure Configuration Guide/ Security Guide mentioned in the Related Documents section for additional information on securely configuring your web server.

9.1 Configure WebSphere Application Server for Application Deployment

You can deploy multiple OFSAA applications on different profiles of a stand-alone WebSphere application server. To create multiple WebSphere "Profiles" in a stand-alone server, use the command line option as explained in the following section. A profile is the set of files that define the runtime environment. At least one profile must exist to run the WebSphere Application Server.

This section covers the following topics:

- Create a New Profile in WebSphere
- Manage IBM WebSphere SDK Java Technology Edition Versions
- Manage Applications in WebSphere
- Configure WebSphere Application Server to Initialize Filters before Initializing Load-On Startup Servlets
- Configure WebSphere Application Server Persistence to JPA Specification 2.0
- Configure WebSphere Application Server to Use a Load Balancer or Proxy Server
- Delete WebSphere Profiles
- Configure WebSphere HTTPS
- Configure WebSphere Memory Settings
- Configure WebSphere for Rest Services Authorization

9.1.1 Create a New Profile in WebSphere

The Profile is created in WebSphere through the command line using the `manageprofiles.sh` that resides in the `<WebSphere Install directory>/AppServer/bin` directory.

Use the following command to create a profile without admin security through the command line:

```
"manageprofiles.sh -create -profileName <profile> -profilePath <profile_
path> -templatePath <template_path> -nodeName <node_name> -cellName

<cell_ name> -hostName <host_name>"
```

Example:

```
$usr/home>./manageprofiles.sh -create -profileName mockaix

-profilePath/websphere/webs64/Appserver/profiles/mockaix

-templatePath/websphere/webs64/Appserver/profileTemplates/default

-nodeName ipa020dorNode04 cellName ipa020dorNode04Cell -hostName ipa020dor
```

The command to create a profile with admin security through command line is as follows:

```
"manageprofiles.sh -create -profileName <profile> -profilePath <profile_
path> -templatePath <template_path> -nodeName <node_name> -cellName

<cell_name> -hostName <host_name> -enableAdminSecurity true -
adminUserName<Admin User Name> -adminPassword < Admin User Password> -
samplespassword<sample User Password>"
```

Example:

```
$usr/home>./manageprofiles.sh -create -profileName mockaix
-profilePath/websphere/webs64/Appserver/profiles/mockaix
-templatePath/websphere/webs64/Appserver/profileTemplates/default
-nodeName ipa020dorNode04 -cellName ipa020dorNode04Cell -hostName ipa020dor
-enableAdminSecurity true -adminUserName ofsaai -adminPassword ofsaai -
samplespassword ofsaai"
```

NOTE While using the `manageprofiles.sh` command to create a New Profile in WebSphere, you can also use "`-validatePorts`" to validate if the specified ports are not reserved or in use. Additionally, you can specify new ports with "`-startingPort <base port>`" which specifies the starting port number to generate and assign all ports for the profile. For more information on using these ports, refer to WebSphere `manageprofiles` command.

9.1.2 Manage IBM WebSphere SDK Java Technology Edition Versions

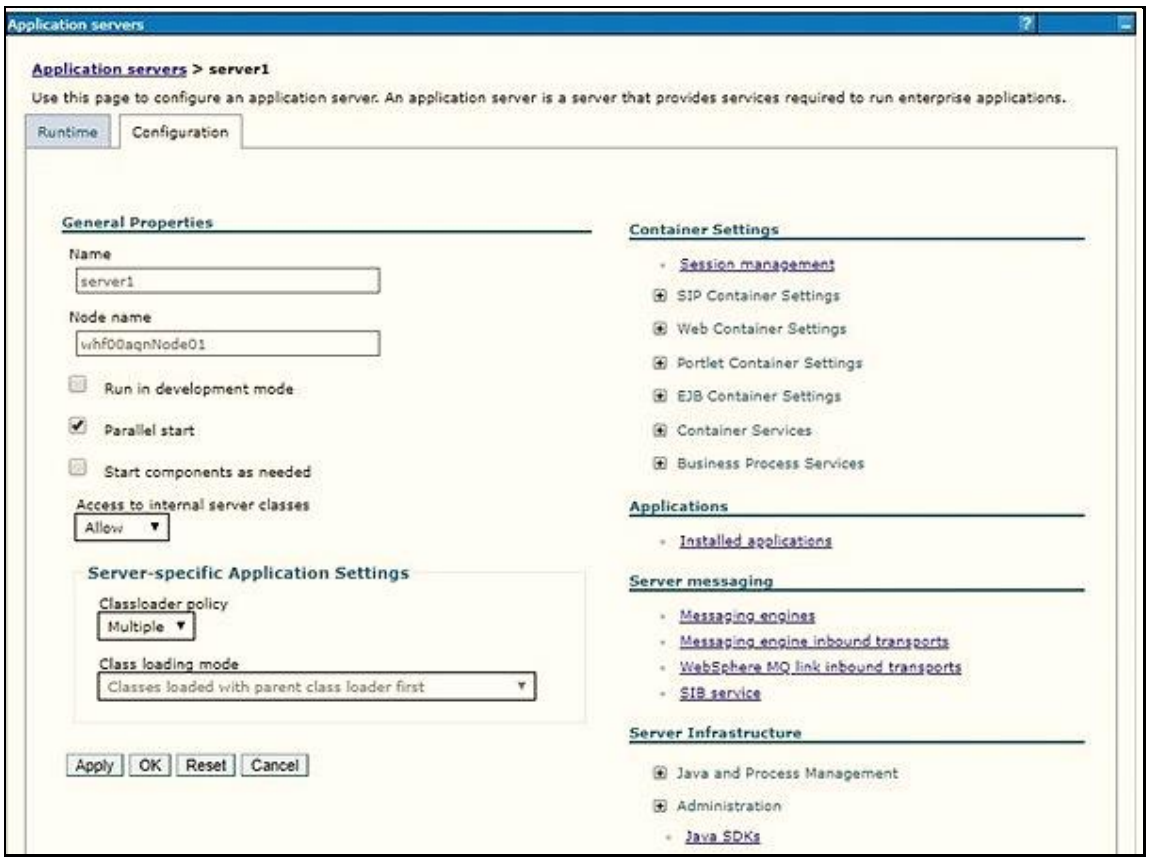
Follow these steps to check the java version and set it to JAVA 8.X SDK:

1. Enter the WebSphere URL in the format http://HOST_NAME:PORT_ NUMBER/ibm/console

(use https if SSL is enabled.). For example, http://192.168.1.0:9000/ibm/console.

2. Log in with your administrator user ID and password.
3. From the LHS menu, click **Servers** to expand and view the menu.
4. Click **Server Types** to expand the menu further and then click **WebSphere Enterprise Application Servers** to view the Application servers window.
5. On the Application servers window, click the required Application Server link. For example, server1 in the following figure:

Figure 66: Application Server Java SDKs



6. Click the Java SDKs link from the Server Infrastructure section to view the list of Java SDKs.

Figure 67: Application Server List of Java SDKs

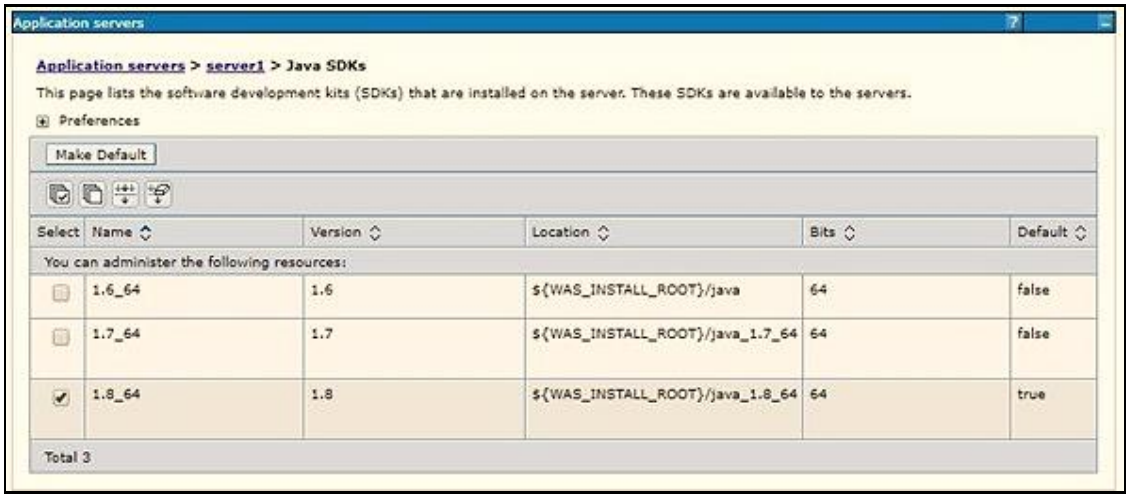
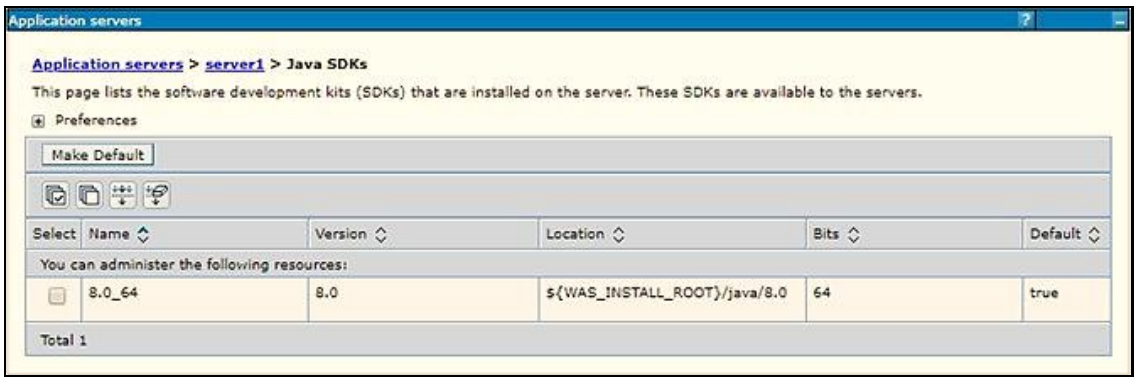


Figure 68: Application Server List of Java SDKs



7. Select 8.0_64.
8. Click **Make Default** and save to master repository.
9. Restart the WebSphere Application Server to apply the changes to the IBM application profile.

9.1.3 Manage Applications in WebSphere

To manage the installed applications in WebSphere, follow these steps:

1. Open the administrator console using the following URL:

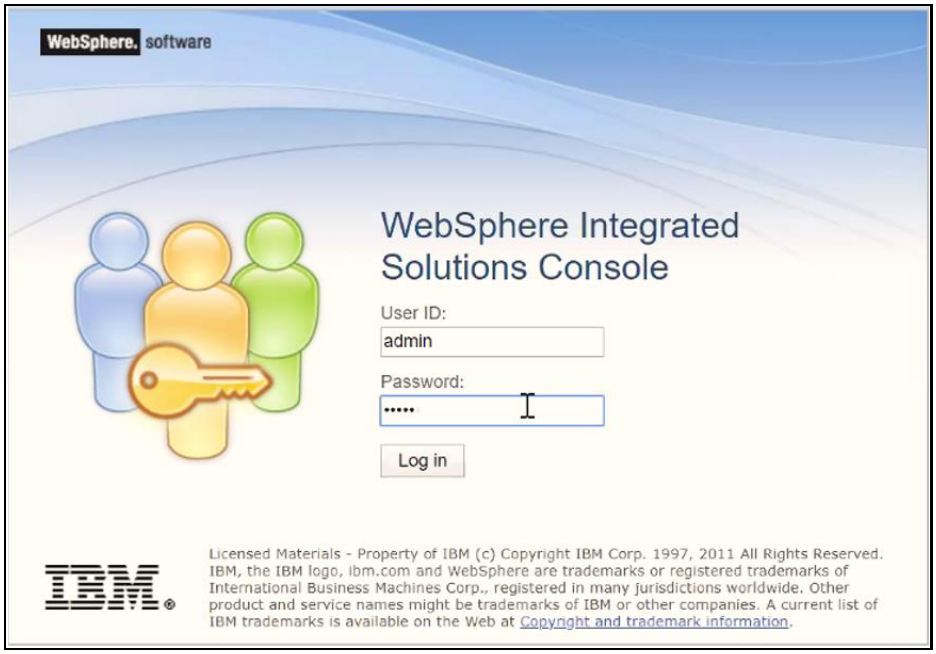
   `http://<ipaddress>:<Administrative Console Port>/ibm/console`

   For example: `http://10.111.222.333:9003/ibm/console` (https if SSL is enabled.)

> **NOTE** Administrative Console Port value is available in the `serverindex.xml` file within the `<WebSphere Profile Directory>/config/cells/<Node Cell>/nodes/<Node Name>` directory.

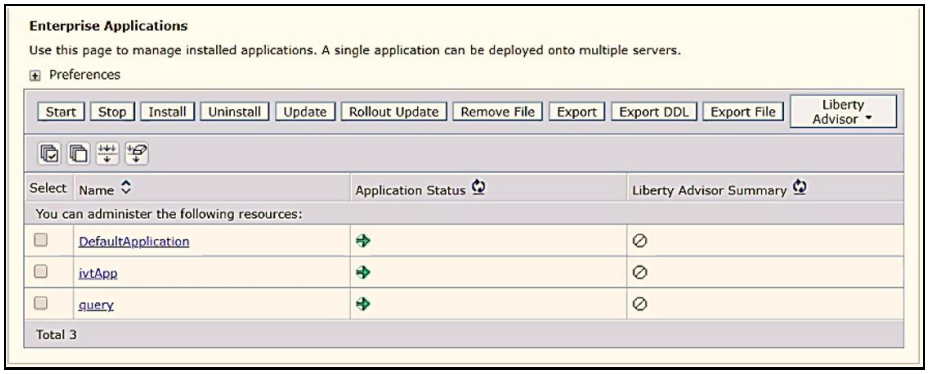
The Integrated Solutions Console Login window is displayed.

Figure 69: Integrated Solutions Console Login



2. Log in with the **User ID** provided with admin rights.
3. From the LHS menu, expand the **Applications > Application Type> WebSphere Enterprise Applications** to display the Enterprise Applications window.

Figure 70: Enterprise Applications



This Enterprise Applications window helps you to:

- Install new application
- Uninstall existing applications
- Start or Stop the installed applications

9.1.4 Configure WebSphere Application Server to Initialize Filters before Initializing Load-On-Startup Servlets and Allowing Empty Servlets Maps

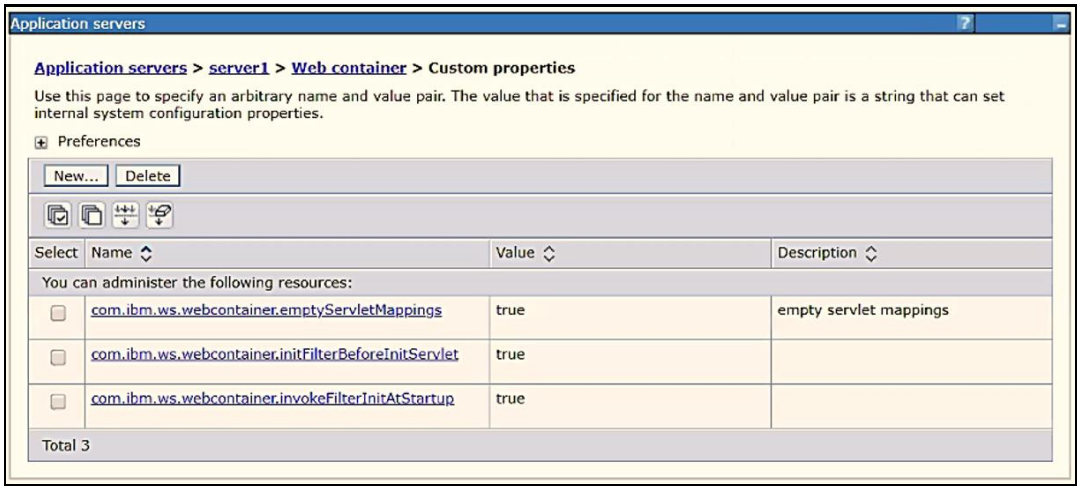
The custom configuration information in this section initializes the filters before initializing load-onstartup servlets and allows empty servlet maps when you start an application.

> **NOTE** This is a mandatory configuration for OFSAA with WebSphere for both fresh and upgrade installation.

To configure custom properties for filters, follow these steps:

1. Enter the WebSphere URL in the format http://HOST_NAME:PORT_ NUMBER/ibm/console (use https if SSL is enabled.). For example, http://192.168.1.0:9000/ibm/console.
2. Log in with your administrator user ID and password.
3. From the left menu, click **Servers** to expand the menu.
4. Click **Server Types** to expand the menu further and then click **WebSphere Enterprise Application Servers** to view the Application servers window.
5. On the Application servers window, click the required Application Server link.
6. Click **Web Container Settings** and then **Custom Properties** to view the Custom Properties window. The following illustration is an example:

Figure 71: Web Container Initialize Filters Before Servlet



7. Click **New** and enter the following properties:
   - `com.ibm.ws.webcontainer.initFilterBeforeInitServlet` to true
   - `com.ibm.ws.webcontainer.invokeFilterInitAtStartup` to true
   - `com.ibm.ws.webcontainer.emptyServletMappings` to true.
8. Click **OK** and then click **Save** on the Console to save the customized configurations.
9. Restart the WebSphere Application Server to apply the changes.

9.1.5 Configure WebSphere Application Server Persistence to JPA Specification 2.0

The persistence configuration information in this section sets JPA 2.0 specification in WebSphere over the default JPA 2.1 specification.

> **NOTE** This is a mandatory configuration for OFSAA with WebSphere for both fresh and upgrade installation.

To set the JPA 2.0 as the default persistence provider, follow these steps:

1. Enter the WebSphere URL in the format http://HOST_NAME:PORT_ NUMBER/ibm/console (use https if SSL is enabled.). For example, http://192.168.1.0:9000/ibm/console.
2. Log in with your administrator user ID and password.
3. From the LHS menu, click **Servers** to expand the menu.
4. Click **Server Types** to expand the menu further and then click WebSphere Enterprise Application Servers to view the Application servers window.
5. On the Application servers window, click the required Application Server link.
6. Click **Container Services** and then click **Default Java Persistence API settings** to display the Configuration window:

Figure 72: Default Java Persistence Settings JPA Specification 2.0

7. From the **JPA Specification** drop-down, select **2.0** to change the default JPA Specification from 2.1 to 2.0.
8. Click **OK** and then click **Save** on the Console to save the customized configurations.
9. Restart the WebSphere Application Server to apply the changes.

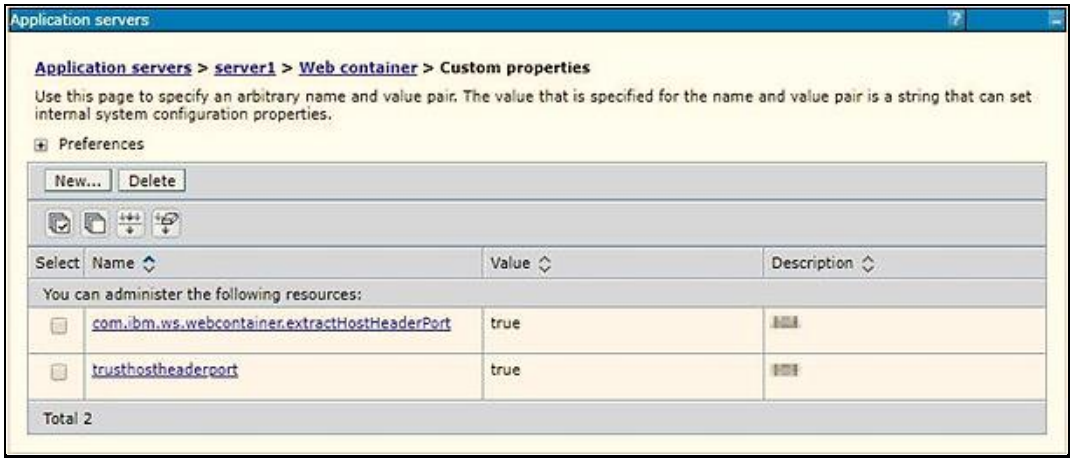
9.1.6 Configure WebSphere Application Server to Use a Load Balancer or Proxy Server

The configuration prevents the process server from redirecting to an internal port when using a load balancer or proxy server.

The following steps describe the configuration:

1. Enter the WebSphere URL in the format http://HOST_NAME:PORT_NUMBER/ibm/console (use https if SSL is enabled.). For example, http://192.168.1.0:9000/ibm/console.
2. Log in with your administrator user ID and password.
3. From the LHS menu, click **Servers** to expand and view the menu.
4. Click **Server Types** to expand the menu further and then click W**ebSphere Enterprise Application Servers** to view the Application servers window.
5. On the Application servers window, click the required **Application Server** link. For example, **server1**.
6. Click **Web Container Settings** and then **Custom Properties** to view the Custom Properties window.

Figure 73: Application Servers Load Balancer Proxy Server



7. Click **New** and enter the following properties:
   - com.ibm.ws.webcontainer.extractHostHeaderPort: true
   - Trusthostheaderport: true
8. Click **OK** and then click **Save** on the Console to save the customized configurations.
9. Restart the WebSphere Application Server to apply the changes.

9.1.7 Delete WebSphere Profiles

To delete a WebSphere profile, follow these steps:

1. Select the check box adjacent to the required application and click **Stop**.
2. **Stop** the WebSphere profile to be deleted.
3. Navigate to WebSphere directory:

   ```
   <WebSphere_Installation_Directory>/AppServer/bin/
   ```
4. Execute the command:

   ```
   manageprofiles.sh -delete -profileName <profile_name>
   ```
5. Delete the profile directory.

Example: `<WebSphere_Installation_Directory>/AppServer/profiles/<profile_name>`

6. Execute the command:

```
manageprofiles.sh -validateAndUpdateRegistry
```

9.1.8 Configure WebSphere HTTPS

To configure an HTTPS Transport on WebSphere, follow these steps:

1. Create a profile using the Profile Creation Wizard in WebSphere.

> **NOTE** Record the https port specified during this process and use it as a servlet port or web server port during OFSAAI installation.

2. To enable https configuration on Infrastructure, assign value 1 to "HTTPS_ ENABLE" in `OFSAAI_InstallConfig.xml` for Silent mode OFSAAI installation.

9.1.9 Configure WebSphere Memory Settings

To configure the WebSphere Memory Settings, follow these steps:

1. Navigate to **WebSphere applications server > Application servers > server1 > Process definition > Java Virtual Machine**.
2. Change the memory setting for Java Heap:
   - Initial heap size = 512
   - Maximum heap size = 3072

9.1.10 Configure WebSphere for Rest Services Authorization

For more information, see the OFS Analytical Applications Infrastructure Administration Guide.

9.2 Configure WebLogic for Application Deployment

You can deploy multiple Infrastructure applications on different domains of a stand-alone WebLogic application server. To create multiple WebLogic "Domains" in a stand-alone server, you can use the Domain Creation wizard. A domain is the set of files that define the runtime environment. At least one domain must exist to run the WebLogic Application Server.

This section covers the following topics:

- Update Weblogic server
- Create Domain in WebLogic Server
- Delete Domain in WebLogic
- Configure WebLogic Memory Settings

9.2.1 Update Weblogic Server

Before proceeding with the domain creation, download and install the one-off Patch 32077936 or the latest WLS PSU for 14.1.1 from My oracle Support (Doc ID 2806740.2).

After applying this patch, set the java option flag `-Dweblogic.http.disablehttp2=true` before starting servers.

9.2.2 Create Domain in WebLogic Server

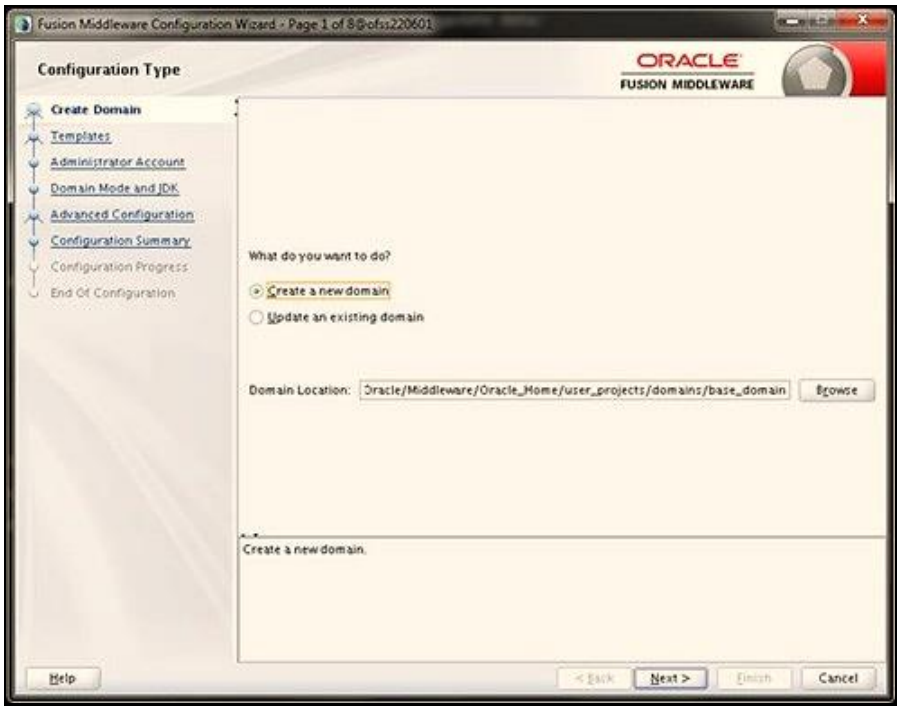
To create a new domain using Configuration Wizard in WebLogic, follow these steps:

1. Navigate to the directory `<WLS_HOME>/wlserver/common/bin` and execute the command:

   `./config.sh`

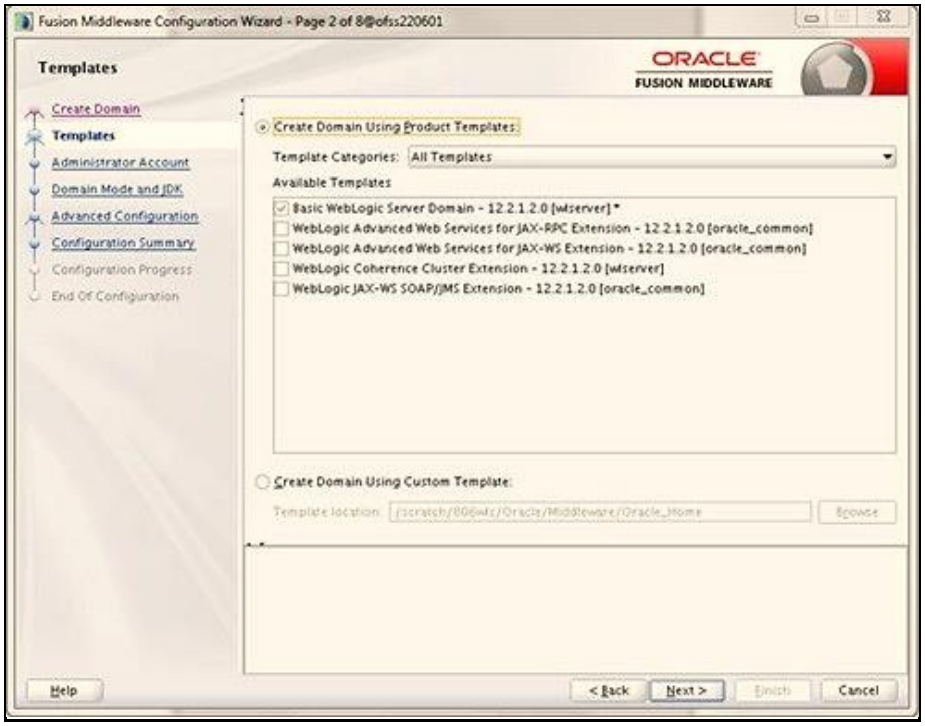
   The Welcome window of the Configuration Wizard is displayed.

Figure 74: Configuration Type



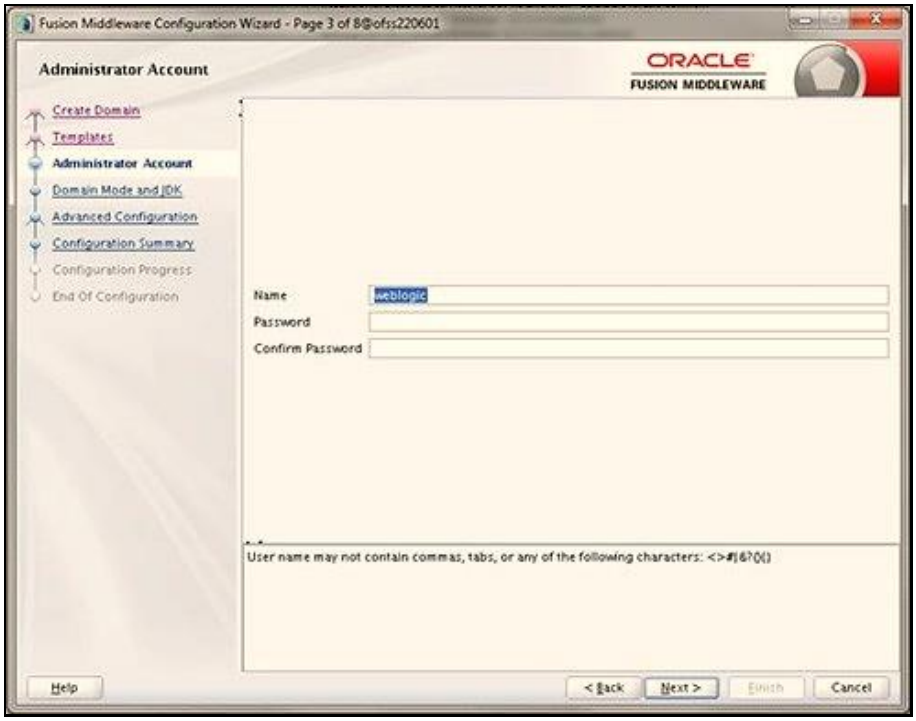
2. Select **Create a new domain** option and click **Nex**t to the **Templates** window.

Figure 75: Templates



3. Select the **Create Domain Using Product Templates** option and click **Next** to display the Administrator Account window.

Figure 76: Administrator Account



4. Enter the user name to be assigned to the administrator, the password, and confirm the password. Click **Next** to the Domain Mode and JDK window.

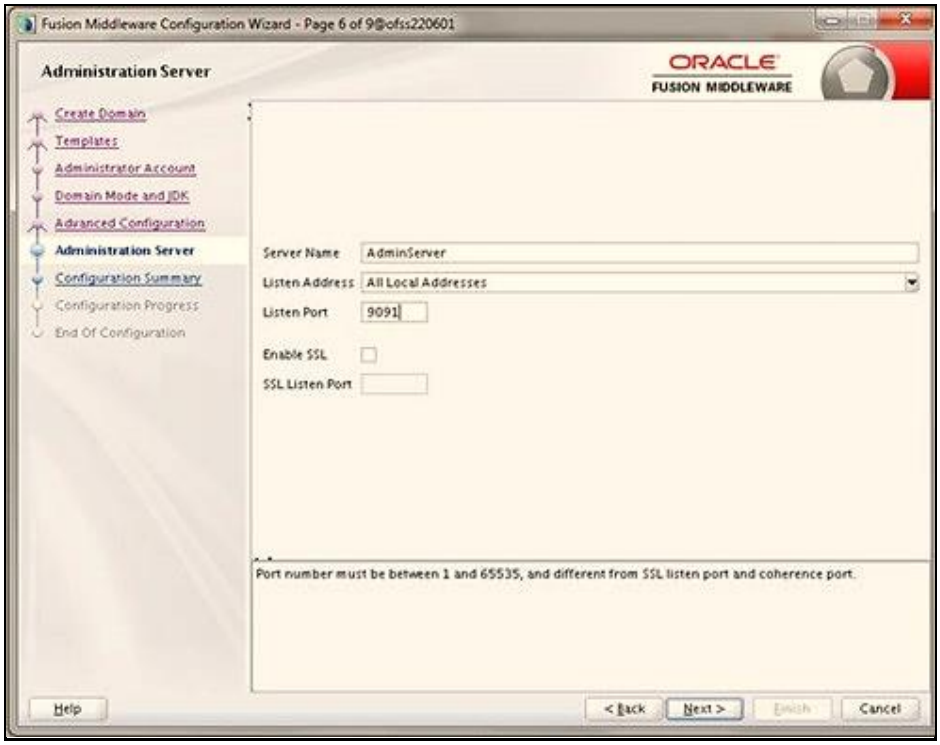
Figure 77: Domain Mode and JDK

5. Select from the following options:
   - In the Domain Mode section, select the required mode (Development or Production).
   - In the JDK section, select the required option. If you select **Other JDK Location**, click **Browse**, navigate to the JDK location, and select. Click **Next** to display the Advanced Configuration window.

Figure 78: Advanced Configuration

6. Select the **Administration Server**. A WebLogic Server domain must have an Administration Server. You can also select **Manages Servers**, **Clusters and Machines,** and **RDBMS Security Store** if required. Click **Next** to display the Administration Server window.

Figure 79: Administration Server



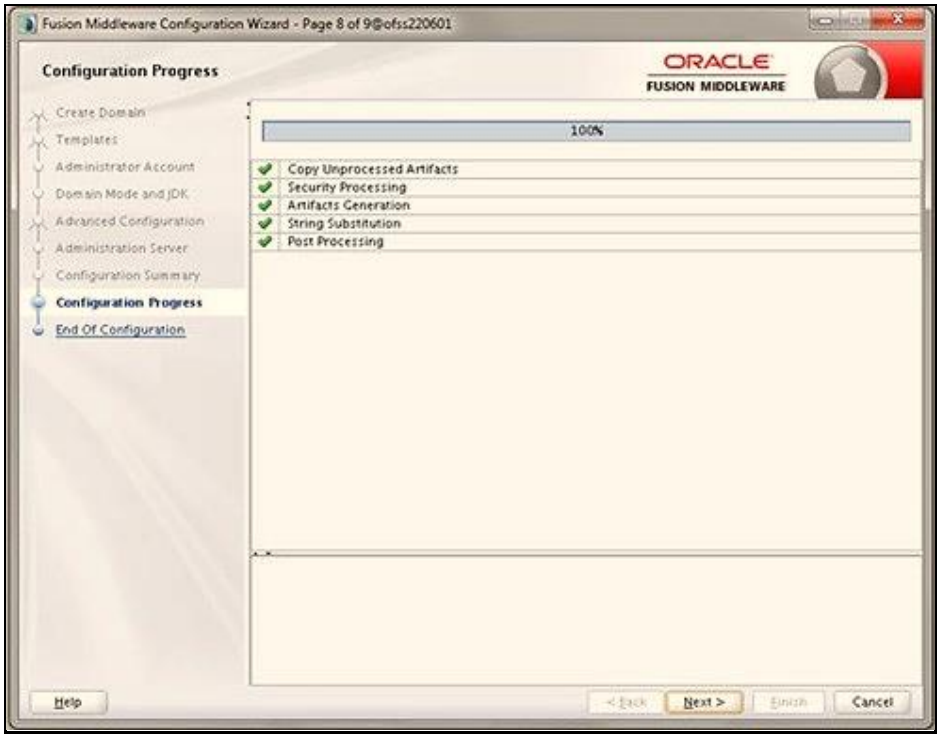
7. Enter Administration Server details such as the **Server Name**, **Listen address**, **Listen Port**, **Enable SSL** (for secure login using https, select this check box), and **SSL Listen Port**. Click **Next** to display the Configuration Summary window.

> **NOTE** Make a note of the Listen Port or SSL Listen Port value (for example: 7007) since the same has to be re-entered in the Servlet port field during Infrastructure installation.

Figure 80: Configuration Summary

8. Verify the configuration details of the WebLogic domain and click **Create** to display the Configuration Progress window with the status indication of the domain creation process.

Figure 81: Creating Domain



9. Click **Next** when 100% of the activity is complete. The End of Configuration window is displayed.

Figure 82: End of Configuration

10. Click **Finish**. The domain server is created enabling the deployment of multiple Infrastructure applications on a single WebLogic.

NOTE

- Record the HTTPS port specified during this process and use it as a servlet port or web server port during OFSAAI Installation.
- To enable https configuration on Infrastructure, assign value 1 to "HTTPS_ENABLE" in `OFSAAI_InstallConfig.xml` for silent mode OFSAAI installation.

11. Add a java option entry `-DUseSunHttpHandler=true` in the `WLS_HOME/bin/"setDomainEnv.sh"` file (Required only if a self-signed certificate is used).
12. Add a Java option entry `-Dweblogic.http.disablehttp2=true` in the `WLS_HOME/bin/"setDomainEnv.sh"` file , to ensure that the HTTP2 is disabled and only HTTP 1.1 is used as a protocol.

9.2.3 Delete Domain in WebLogic

To delete a domain in WebLogic, follow these steps:

1. Navigate to the following directory:

   ```
   <WebLogic Installation directory>/user_projects/domains/<domain name>/bin
   ```

2. Execute `stopWebLogic.sh` to stop the Weblogic domain.
3. Delete the Weblogic domain.

9.2.4 Configure WebLogic Memory Settings

To configure the WebLogic Memory Settings, follow these steps:

1. Change the memory setting for Java Heap to `-Xms512m -Xmx3072m` in the `setDomainEnv.sh` file, which resides in the `<DOMAIN_HOME>/bin` directory and the `CommEnv.sh` file which resides in the `common/bin` directory
2. Edit this file for customizing memory settings and garbage collector settings depending on the available hardware configuration.

   Example 1:

   ```
   if [ "${JAVA_VENDOR}" = "Sun" ] ; then WLS_MEM_ARGS_64BIT="-Xms512m -Xmx1024m"
   export WLS_MEM_ARGS_64BIT WLS_MEM_ARGS_32BIT="-Xms512m -Xmx1024m"
   export WLS_MEM_ARGS_32BIT else WLS_MEM_ARGS_64BIT="-Xms512m -Xmx1024m"
   export WLS_MEM_ARGS_64BIT WLS_MEM_ARGS_32BIT="-Xms512m -Xmx1024m"
   export WLS_MEM_ARGS_32BIT
   ```

   Example 2:

   ```
   JAVA_VM=
   ```

```
MEM_ARGS="-Xms256m -Xmx1024m"
```

9.3 Configure Apache Tomcat Server for Application Deployment

This section is applicable only when the Web application server type is Tomcat. This section includes the following topics:

- Tomcat User Administration
- Configure Servlet Port
- Configure SSL Port
- Configure Apache Tomcat Memory Settings
- Configure Tomcat for User Group Authorization
- Uninstall WAR Files in Tomcat

9.3.1 Tomcat User Administration

The Tomcat administration and manager application does not provide a default login. You are required to edit "`$CATALINA_HOME/conf/tomcat-users.xml`" as follows:

This file contains an XML <user> for each user that will display the username and password used by the admin to log in to Tomcat and the role names to which the admin user is associated with.

For example, <user name="admin" password="admin" roles="standard,manager" />

1. Add the manager role to any one of the existing username/password combinations as shown in the preceding example.
2. Use the same username/password to which the manager role is assigned to access the Tomcat Application Manager.
3. If the Tomcat server is already running, it requires a re-start after the preceding configuration is done.

9.3.2 Configure Servlet Port

The default servlet port configured for the Tomcat installation is 8080. Ignore this section if you must use the default port.

If you must use a different port number, you must first configure the port in the `server.xml` file in the conf directory of the Tomcat Installation directory. To configure the Servlet Port, follow these steps:

1. Navigate to `$CATALINA_HOME/conf. Open server.xml` and locate the tag: "`Define a non-SSL HTTP/1.1 Connector on port 8080`"

   Against this tag, a parameter is specified '`Connector port = "8080"`'. Edit this value to the new port number that was used during the Infrastructure installation process.
2. Save your changes in the `server.xml` file.

NOTE Make a note of the servlet port configured. This information is required during the installation of the OFSAA Application Pack.

9.3.3 Configure SSL Port

If you must configure and access your OFSAA setup for HTTPS access, ensure that the following connect tag under Define a SSL HTTP/1/1 Connector on port 8443 in the `<Tomcat_installation_directory>/conf/server.xml` file is uncommented for SSL Configuration. (By default, it is commented).

```
<Connector port="8443" protocol="HTTP/1.1" SSLEnabled="true"
maxThreads="150" scheme="https" secure="true" clientAuth="false"
sslProtocol="TLS"
```

NOTE

- Make a note of the servlet port configured. This information is required during the installation of the OFSAA Application Pack.
- To enable https configuration on Infrastructure, assign value 1 to "HTTPS_ENABLE" in the `OFSAAI_InstallConfig.xml` file for SILENT mode OFSAAI installation.

For more information related to SSL Configuration on Tomcat, see http://tomcat.apache.org/.

9.3.4 Configure Apache Tomcat Memory Settings

To configure the Apache Tomcat Memory Settings, follow these steps:

1. Locate the `catalina.sh` file that resides in the <CATALINA_HOME>/bin directory.
2. Edit this file for customizing the memory settings and garbage collector settings depending on the available hardware configuration.
3. Add the memory setting for Java Heap to -Xms512m -Xmx1024m. For example:

```
if [ -z "$LOGGING_MANAGER" ]; then JAVA_OPTS="$JAVA_OPTS -Xms512m -
Xmx1024m
-Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager" else
JAVA_OPTS="$JAVA_OPTS -Xms512m -Xmx1024m $LOGGING_MANAGER"
fi
```

9.3.5 Configure Tomcat for User Group Authorization

Users with system authorization roles can access User Group Authorization. However, to make it available on the Tomcat web server, you must follow these configuration steps:

1. Navigate to the `$CATALINA_HOME/conf` directory and open the `web.xml` file.

2. Enter the following in the `web.xml` file.

```
<init-param>
<param-name>mappedfile</param-name>
<param-value>false</param-value>
</init-param>
```

3. Save and close the file.

9.3.6 Uninstall WAR Files in Tomcat

To uninstall WAR files in Tomcat, refer to Uninstalling WAR Files in Tomcat.

9.4 Additional Configurations for Web Servers

This section provides information for additional configuration required for the web servers on OFSAAAI.

> **NOTE** The instructions in this section are applicable if you are upgrading from an earlier version of OFSAAI to 8.1.2.0.0.

Configuration for WebSphere: To configure WebSphere, see the Configure WebSphere Application Server for Application Deployment section. Additionally, configure for REST services. For details, see the *Configuring WebSphere for REST Services Authorization* section in the OFS Analytical Applications Infrastructure Administration Guide.

- Additionally, you must configure the Work Manager in WebSphere and map it to the OFSAA instance. For details, see the *Work Manager Configurations* section in the OFS Analytical Applications Infrastructure Administration Guide.
- **Configuration for WebLogic**: To configure WebLogic, see the Configure WebLogic for Application Deployment section. Additionally, configure for REST services. For details, see the *Configuring WebLogic for REST Services Authorization* section in the OFS Analytical Applications Infrastructure Administration Guide.
- Additionally, you must configure the Work Manager in WebLogic. For details, see the *Work Manager Configurations* section in the OFS Analytical Applications Infrastructure Administration Guide.
- **Configuration for Tomcat**: For the successful execution of Data Mapping in Tomcat, perform the configurations mentioned in the Configuration for Tomcat section in the OFS Analytical Applications Infrastructure Administration Guide.

  For additional configurations, see the Configure Apache Tomcat Server for Application Deployment section.

9.4.1 Configure Application Security in WebSphere

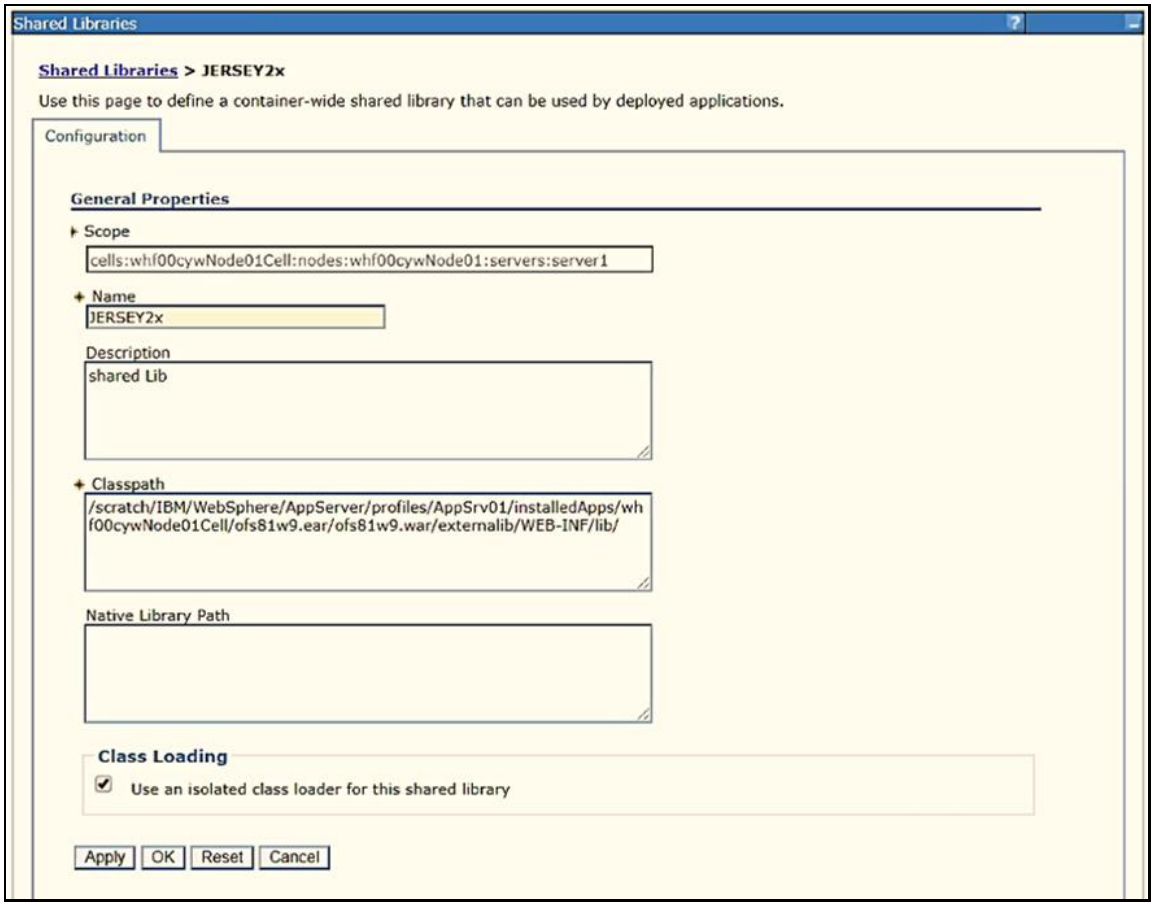
This is a mandatory security procedure for WebSphere to restrict the unauthorized access of configuration files in directories. For detailed information, see the Oracle Financial Services Analytical Applications Infrastructure Security Guide.

9.4.2 Configure WebSphere Shared Library to Support Jersey 2x and Jackson 2.9x Libraries

Perform the following configuration to set WebSphere shared library to support jersey 2x and Jackson 2.9x libraries.

1. Click **Environment** from the menu on the left to expand and view the list. Click **Shared Libraries** to open the Shared Libraries window.

Figure 83: WebSphere Shared Libraries

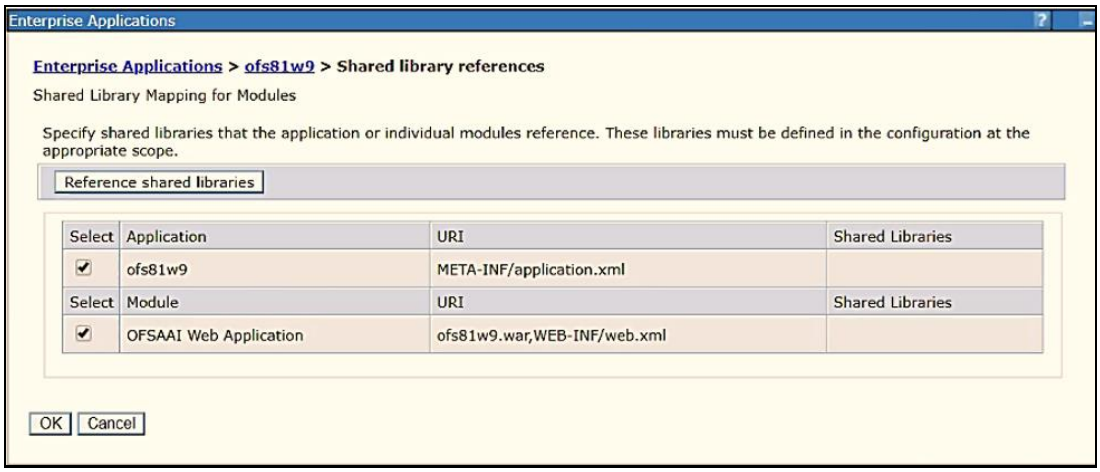


2. Enter the following details:
   - **Name**: Enter a uniquely identifiable name.
   - **Description**: Enter a valid description.
   - **Classpath**: Enter the absolute path where the JARs related to Jersey 2.x and Jackson 2.9x are copied. These jars are available in the `<OFSAA_HOME>/ficweb/webroot/externallib/WEBINF/lib/` directory after creation

of the EAR file. Another format of representation of the path is `<ofsaa_deployed_area_location>/externallib/WEBINF/lib/`.

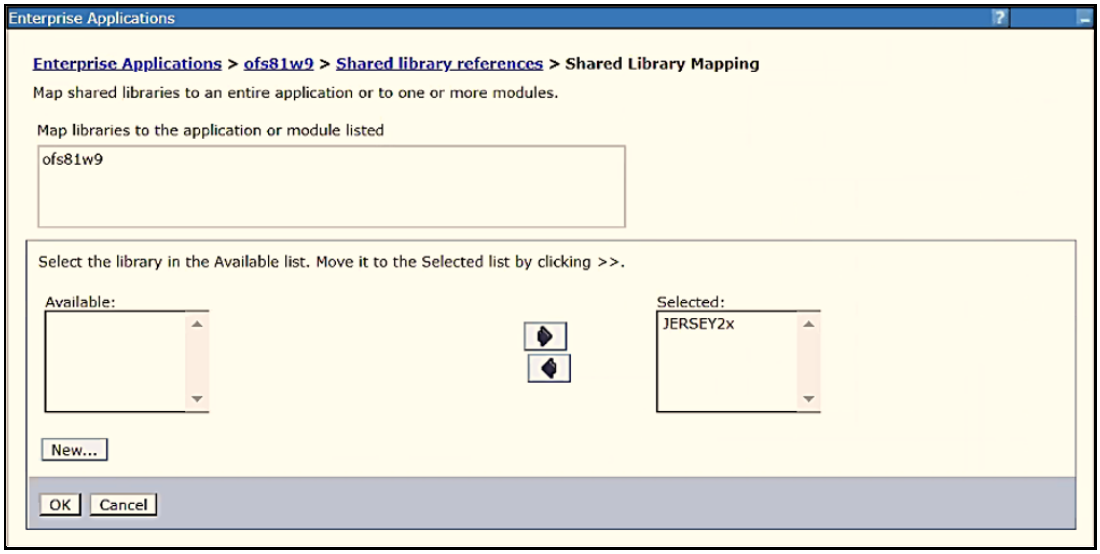
3. Select Use an isolated class loader for this library.
4. Click **OK** to save to master configuration.
5. Select the application or module and map the shared libraries. Click OK. In the following figure, **ofsa** is selected.

Figure 84: WebSphere Shared Library References



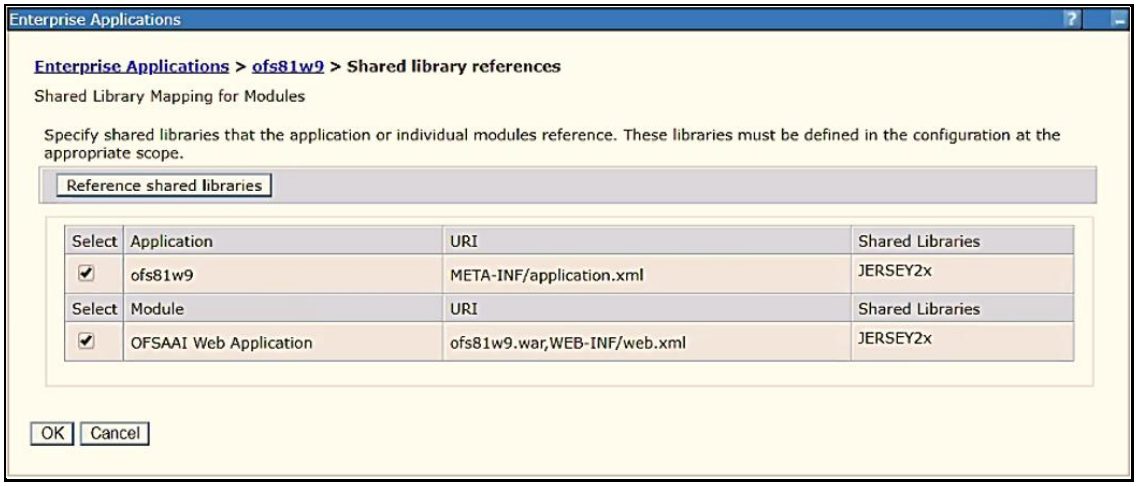
6. From the Shared Library Mapping window, move the required shared libraries from **Available** to **Selected**. In the following figure, JERSEY2x is selected.

Figure 85: WebSphere Shared Libraries Mapping Selection



7. Click **OK**.
8. Similarly, select the next application or module and repeat the procedure from steps 5 to 7.

Figure 86: WebSphere Shared Libraries Select Next Application



9. Disable the built-in JAX-RS via JVM property.
   a. Navigate to the WebSphere admin console in **Servers > WebSphere Application Servers > yourServerName**.
   b. In the Server Infrastructure section, go to Java and **Process Management > Process definition> Java Virtual Machine > Custom properties**.
   c. Add the following property:

      com.ibm.websphere.jaxrs.server.DisableIBMJAXRSEngine=true
10. Restart the application.

10 Configure Resource Reference in Web Servers

Topics:

- Configure Resource Reference in WebSphere Application Server
- Configure Resource Reference in WebLogic Application Server
- Configure Resource Reference in Tomcat Application Server

10.1 Configure Resource Reference in WebSphere Application Server

This section is applicable only when the Web application server type is WebSphere.

Topics:

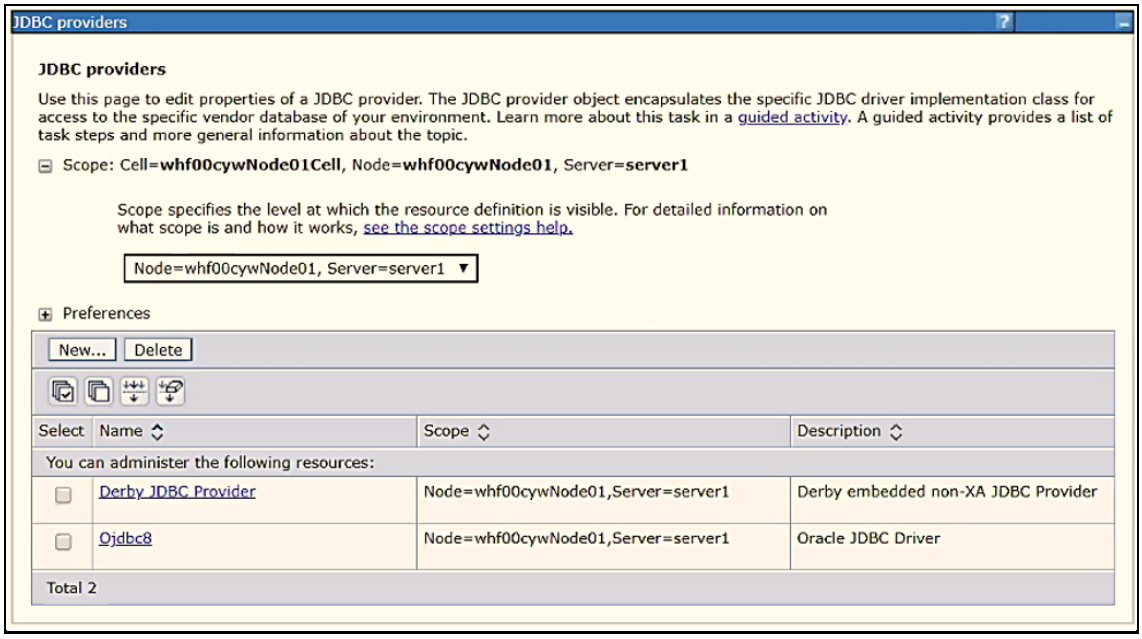
- Create a JDBC Provider
- Create Data Source
- Create J2C Authentication Details
- Define JDBC Connection Pooling

10.1.1 Create a JDBC Provider

To create the JDBC Provider in WebSphere Application Server, follow these steps:

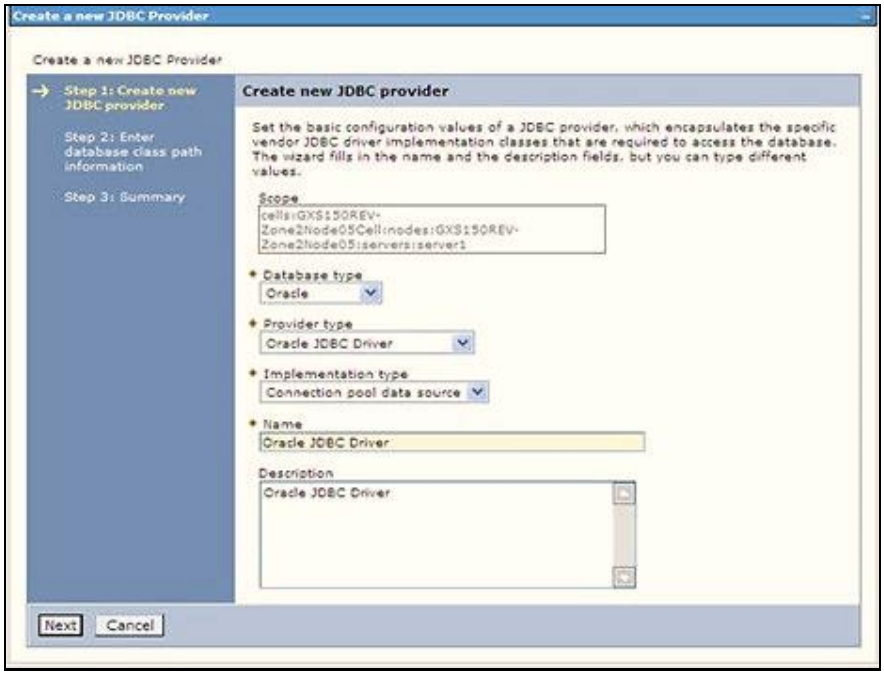
1. Open the WebSphere admin console in the browser window: http://<ipaddress>:<administrative console port>/ibm/console (https, if SSL is enabled). The Login window is displayed.
2. Log in with the user ID that has admin rights.
3. Expand the **Resources** option in the LHS menu and click **JDBC > JDBC Providers** to display the JDBC Providers window.

Figure 87: JDBC Providers



4. Select the **Scope** from the drop-down list. The Scope specifies the level at which the resource definition is visible.
5. Click **New** to add the new JDBC Provider under the Preferences section. The Create new JDBC Provider window is displayed.

Figure 88: Create a new JDBC Provider

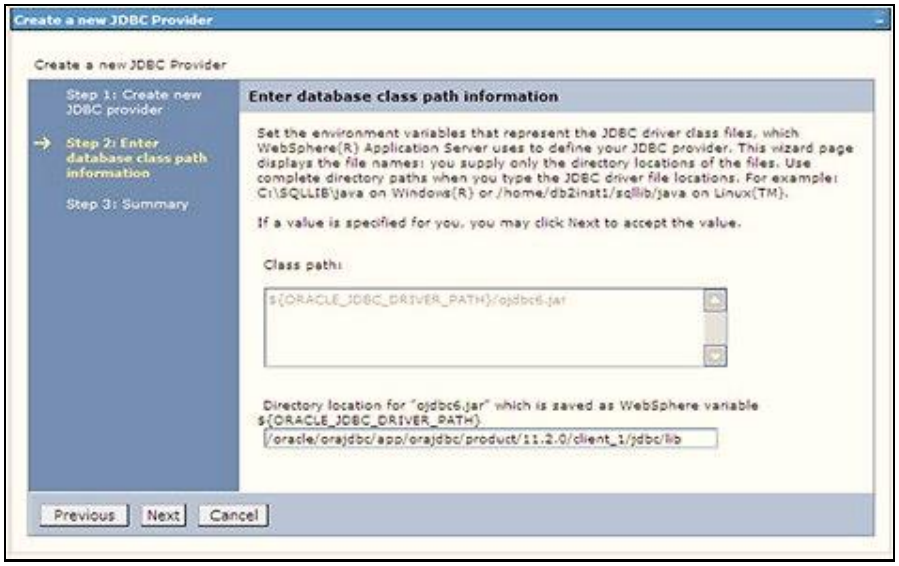


6. Enter the following details:
   - **Database Type**: Oracle

- **Provider Type**: Oracle JDBC Driver
- **Implementation Type**: Connection pool data source
- **Name**: The required display name for the resource.
- **Description**: The optional description for the resource.

7. Click **Next**.

Figure 89: Enter database class path information



8. Specify the directory location for the `ojdbc<version>.jar` file. Do not use the trailing slash file separators.

   The Oracle JDBC driver can be downloaded from the following Oracle Download site:

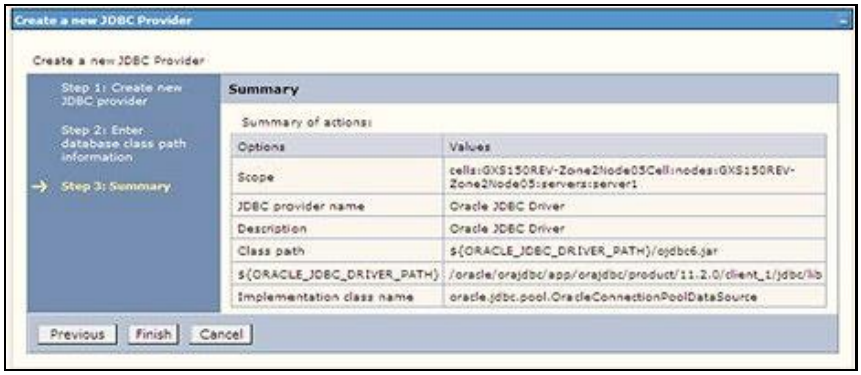
   - Oracle Database 18cg Release 3 JDBC Drivers
   - Oracle Database 19c Release 3 JDBC Drivers

   After downloading, you must copy the file in the required directory on the server.

> **NOTE** See Hardware and Software Requirements to identify the correct `ojdbc<version>.jar` file version to be copied.

9. Click **Next** to display the Summary window.

Figure 90: Summary



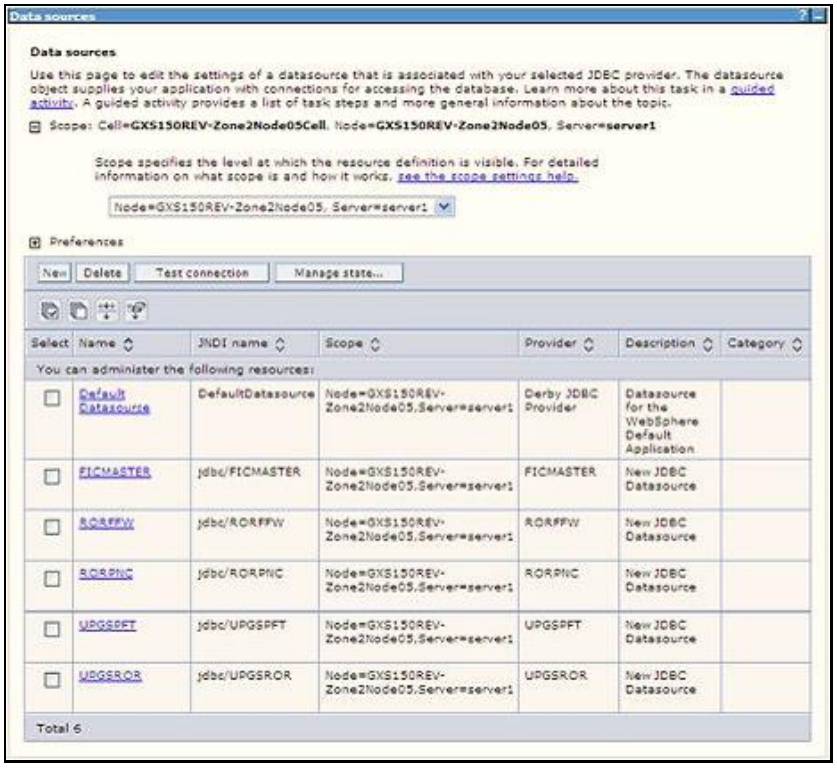
10. Verify the details and click **Finish** to create the JDBC Provider.
11. The options to **Save** and **Review** are displayed. Click **Save**.

10.1.2 Create Data Source

The following steps apply to both config and atomic data source creation. To create the data source, follow these steps:

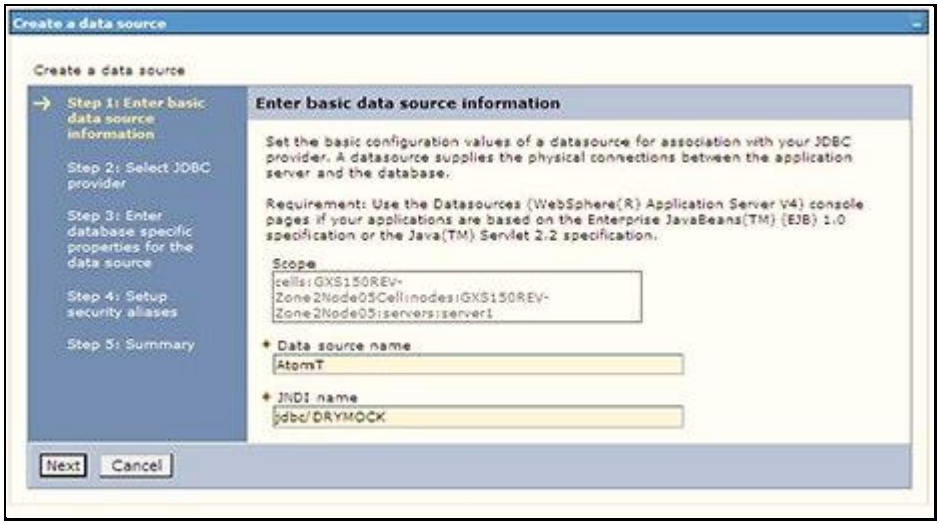
1. Open the following URL in the browser window: http://<ipaddress>:<administrative console port>/ibm/console (https if SSL is enabled). The Login window is displayed.
2. Log in with the user ID that has admin rights.
3. Expand the **Resources** option in the LHS menu and click **JDBC > Data sources** to display the Data sources window.

Figure 91: Data Sources



4. Select the **Scope** from the drop-down list. The scope specifies the level at which the resource definition is visible.
5. Click **New** to display the Create a Data Source window.

Figure 92: Create Data Source



6. Specify the **Data source name** and **JNDI name** for the new "Data Source".
7. The **JNDI name** and **Data source name** are case sensitive and ensure that JNDI name is the same as the "Information Domain" name.
8. Click **Next** to display the Select JDBC provider window.

Figure 93: Select JDBC provider

9. Select the option **Select an Existing JDBC Provider** and select the required JDBC provider from the drop-down list. Click **Next**.

Figure 94: Enter database specific properties

10. Specify the database connection URL.

    For example: `jdbc:oracle:thin:@<DB_SEREVER_IP>:<DB_SERVER_PORT>:<SID>`

11. Select **Data Store Helper Class Name** from the drop-down list and ensure that the **Use this data source in container managed persistence (CMP)** check box is selected.

> **NOTE** For RAC configuration, provide the RAC URL specified during installation.

Example:

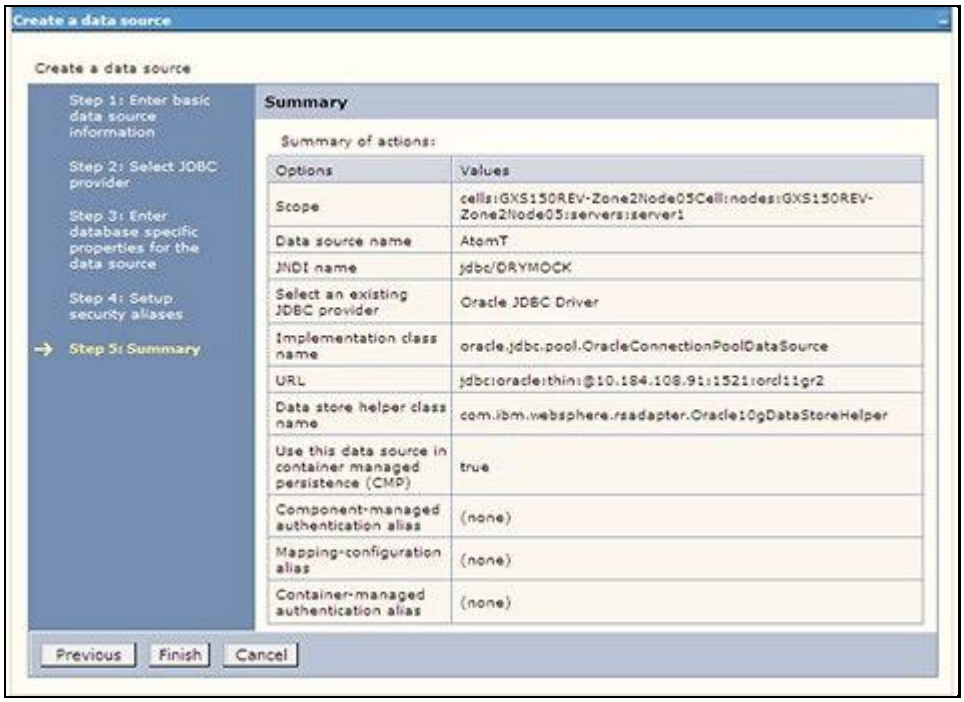
jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS_
LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=10.11.12.13)(port=1521))(ADDRESS=(PRO
TOCOL=TCP)(HOST=10.11.12.14)(PORT=1521))(LOAD_
BALANCE=no)(FAILOVER=yes))(CONNECT_DATA=(SERVICE_NAME=pqadb)))

12. Click **Next**.

Figure 95: Enter Database specific properties

13. Map the J2C authentication alias, if already created. If not, you can create a new J2C authentication alias by accessing the link given (**Global J2C authentication alias**) or you can continue with the data source creation by clicking **Next** and then **Finish**.

Figure 96: Summary



You can also create and map J2C authentication alias after creating the data source.

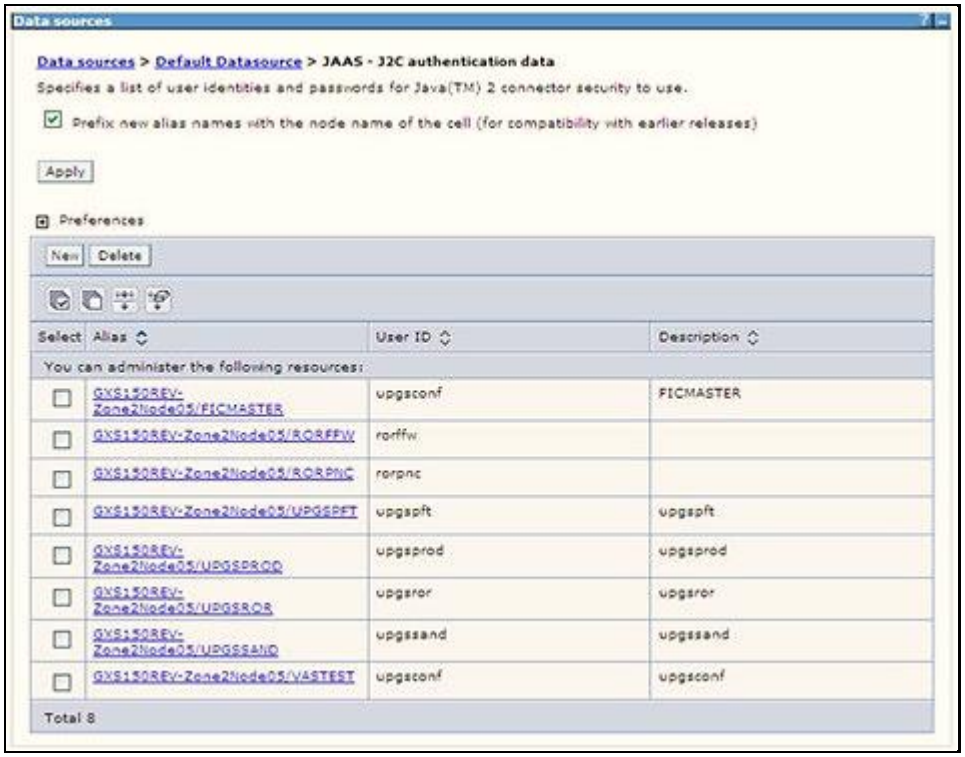
14. You must create another Data source by following the same procedure with jdbc/FICMASTER as JNDI name pointing to the "configuration schema" of Infrastructure.

10.1.3 Create J2C Authentication Details

The following steps apply to create both config and atomic J2C Authentication. To create J2C Authentication details, follow these steps:

1. Select the newly created Data Source and click **JAAS J2C authentication data** link under **Related** Items.

Figure 97: JAASJ2C authentication data



2. Click **New** under the **Preferences** section.

Figure 98: JAASJ2C authentication data New

3. Enter the **Alias**, **User ID**, **Password**, and **Description**. Verify that the user ID is the Oracle user ID created for the respective Config and Atomic Schema for the "Information Domain".

Specify the Config database user ID and password information for the jdbc/FICMASTER data source, and the Atomic database user ID and password information for the Atomic schema data source that you created earlier.

4. Click **Apply** and save the details.

10.1.4 Define JDBC Connection Pooling

To define the JDBC connection pooling, ensure that you have created JDBC Provider and Data source to access the data from the database.

1. Expand the **Resources** option in the LHS menu and click **JDBC > Data sources** option to display the Data sources window.
2. Click the newly created Data Source $DATA_SOURCE$ and navigate to the path **Data sources > GAFUSION DATA_SOURCE > Connection pools**.

Figure 99: Connection pools

3. Set the following values:
   - **Connection timeout**: 0
   - **Maximum connections**: 100
   - **Minimum connections**: 10

   You can also define **Reap time**, **Unused timeout**, and **Aged timeout** as required.

10.2 Configure Resource Reference in WebLogic Application Server

This section applies only when the Web application server type is WebLogic. This section includes the following topics:

- Create Data Source
- Create GridLink Data Source
- Configure Multi Data Sources
- Configure Advanced Settings for Data Source
- Configure JDBC Connection Pooling
- Create WorkManager

In the WebLogic server, you can create a "Data Source" in the following ways:

- For a non-RAC Database instance, a Generic Data Source must be created. See Create Data Source.
- For a RAC Database instance, a Gridlink Data Source must be created. See Create GridLink Data Source.
- When Load Balancing/Fail over is required, a Multi Data Source must be created. See Configure Multi Data Sources.

10.2.1 Create Data Source

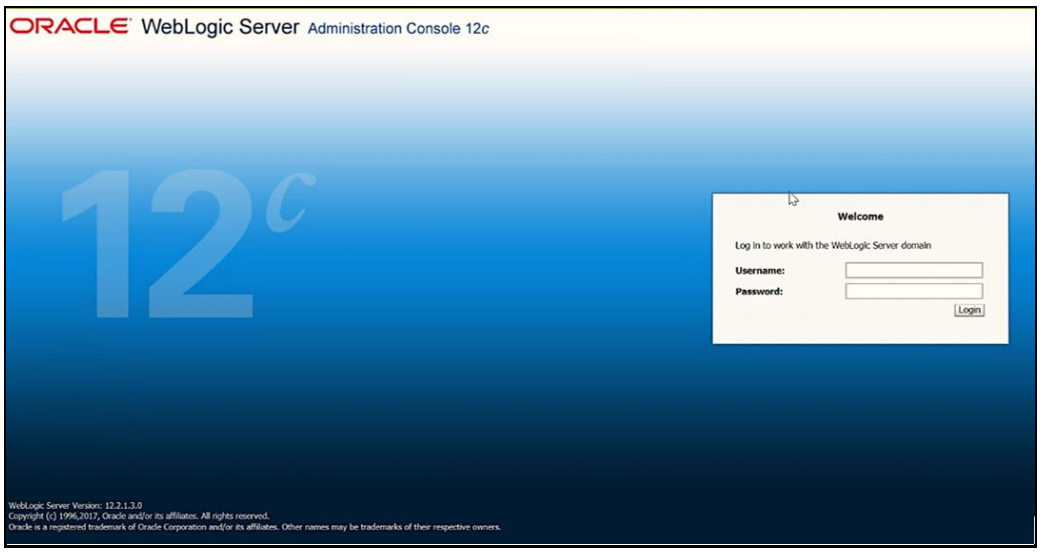
The following steps apply to both config and atomic data source creation.

1. Open the following URL in the browser window:

   http://<ipaddress>:<administrative console port>/console. (https, if SSL is enabled). The Welcome window is displayed.

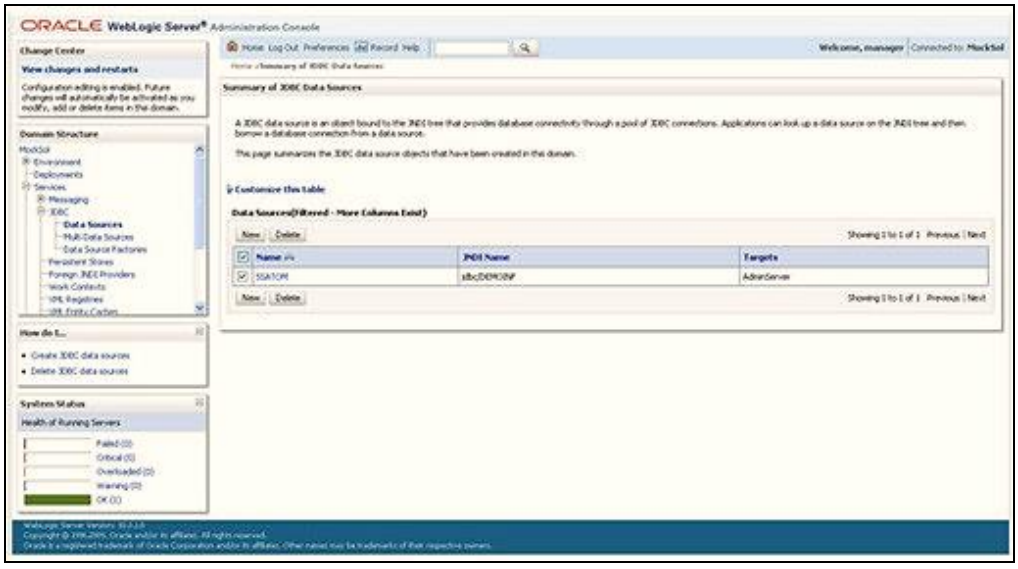
2. Log in with the Administrator **Username** and **Password**.

Figure 100: Welcome



3. From the LHS menu (Domain Structure), click **Services > Data Sources** to display the Summary of JDBC Data Sources window.

Figure 101: Summary of JDBC Data Sources

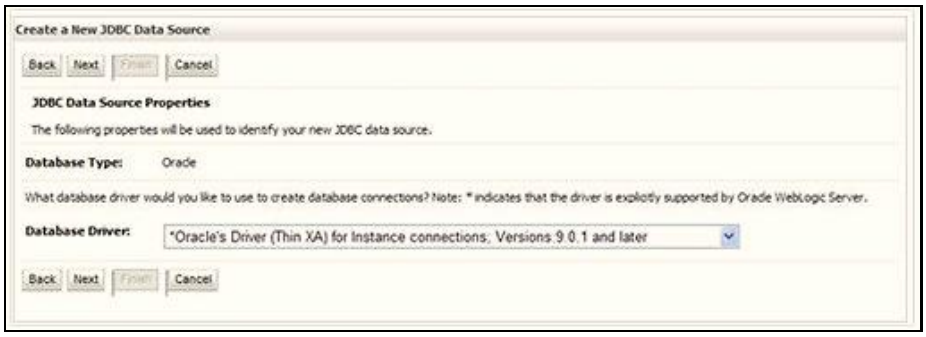


4. Click **New** and select **Generic Data Source** to display the Create a New JDBC Data Source window.

Figure 102: Create a New JDBC Data Source

You can also select **GridLink Data Source** or **Multi Data Source** while creating a Data Source. For more information, see Create Data Source or Configure Multi Data Sources.

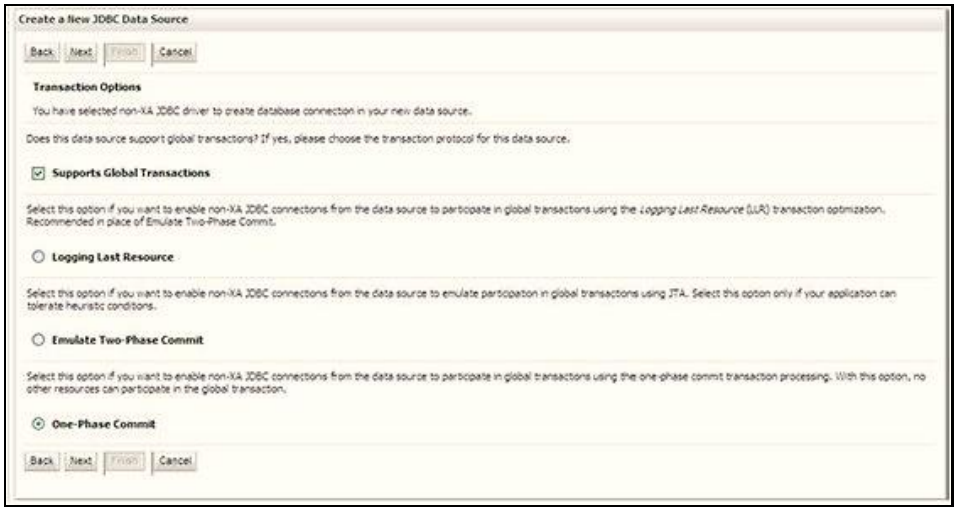
Figure 103: JDBC Data Source Properties



5. Enter JDBC data source Name, JNDI Name, and select the Database Type from the drop-down list.
6. Ensure the following:
   - The JNDI Name field must be in the format jdbc/informationdomain
   - The same steps must be followed to create a mandatory data source pointing to the "configuration schema" of infrastructure with jdbc/FICMASTER as JNDI name.
   - JNDI Name is the same as mentioned in the `web.xml` file of OFSAAI Application.
   - Required "Database Type" and "Database Driver" must be selected.

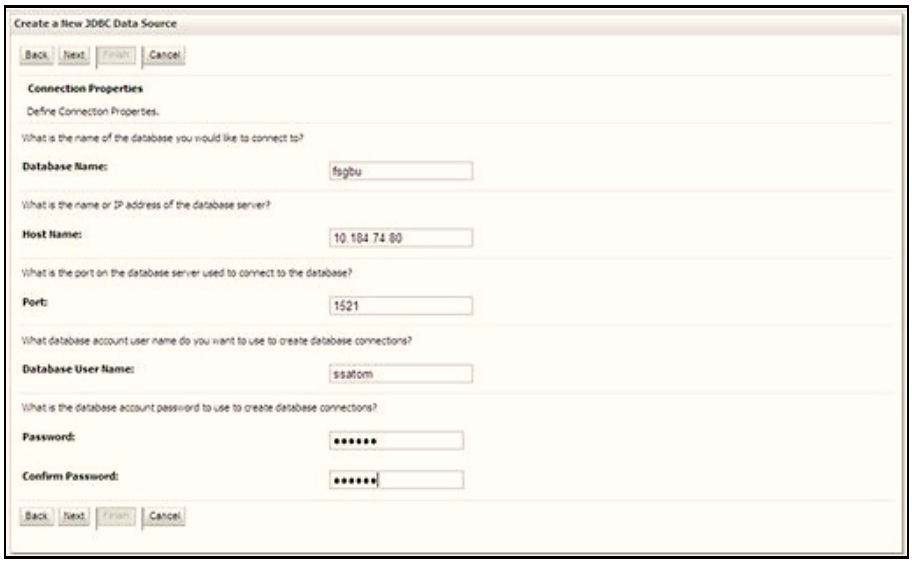
   Data sources must be created for atomic and atomiccnf schemas following the same steps.
7. Click **Next**.

Figure 104: Transaction Options



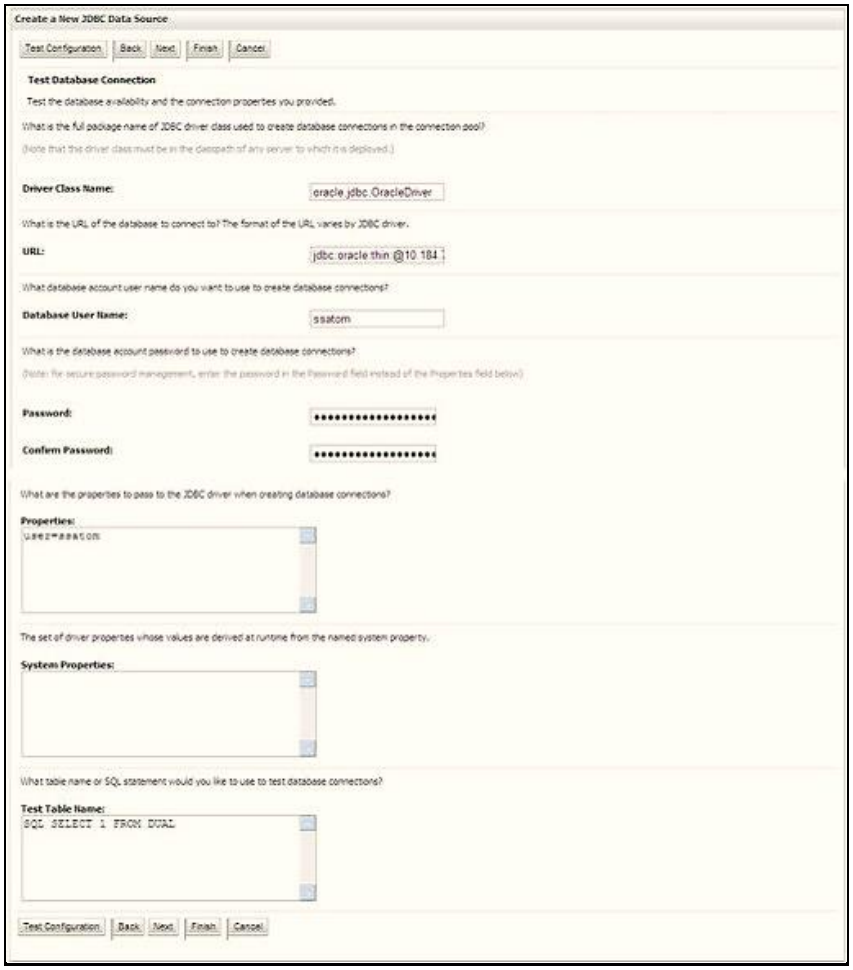
8. Select the **Database Driver** from the drop-down list. You must select the Database Driver depending on database setup, that is, with or without RAC. Click **Next**.

Figure 105: Database Name



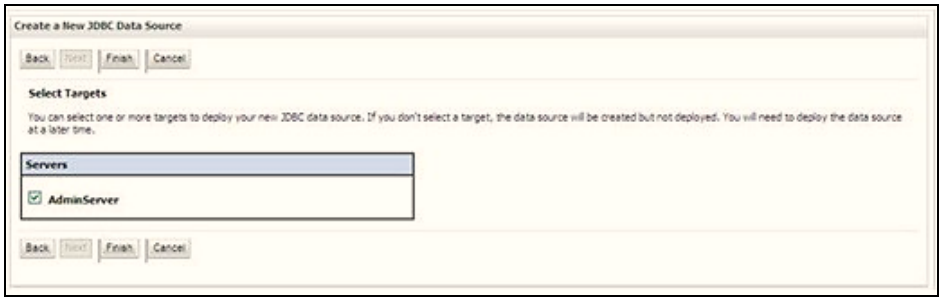
9. Select the **Supports Global Transactions** check box and the **One-Phase Commit** option.
10. Click **Next** to display the Connection Properties window.

Figure 106: Database Details



11. Enter the required details such as the **Database Name**, **Host Name**, **Port**, **Oracle User Name**, **Password,** and **Confirm Password**.
12. Click **Next** to display the Test Database Connection window.

Figure 107: Select Targets



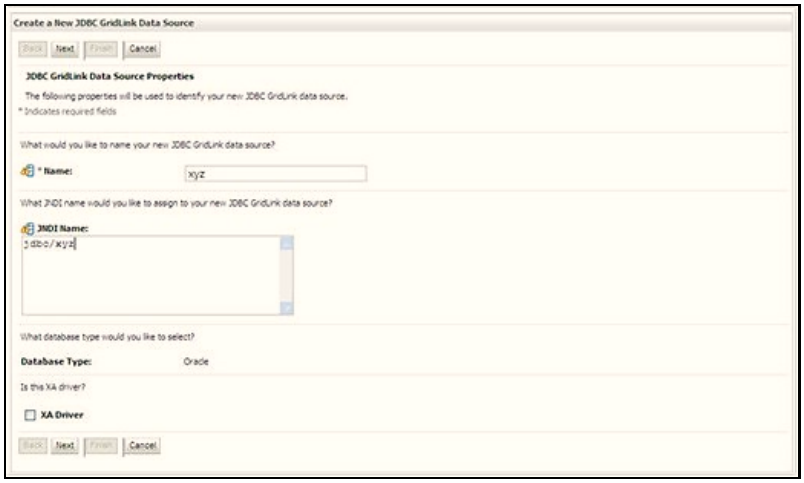
13. Verify the details and click **Test Configuration** and test the configuration settings. A confirmation message is displayed stating "Connection test succeeded."
14. Click **Finish**. The created "Data Source" is displayed in the list of Data Sources.

NOTE

- "User ID" is the Oracle user ID that is created for the respective "Information Domain".
- "User ID" specified for a data source with "FICMASTER" as "JNDI" name must be the Oracle user ID created for the "configuration schema".

15. Select the new **Data Source** and click the **Targets** tab.

Figure 108: Data Source

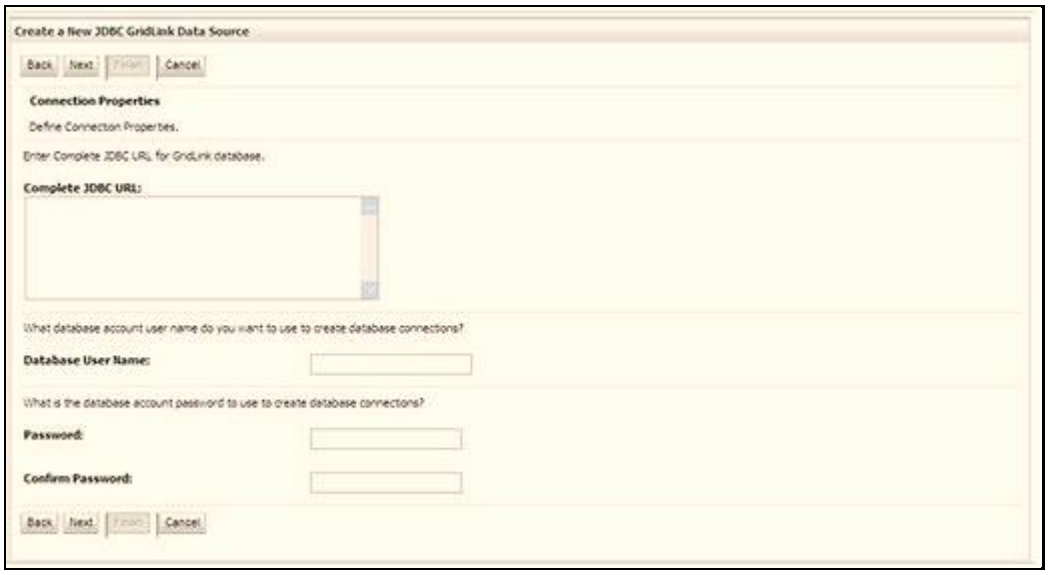


16. Select the **AdminServer** option and click **Finish**.

10.2.2 Create GridLink Data Source

If you have selected the option, New > GridLink Data Source while creating the "Data Source", you can directly specify the JDBC URL as indicated.

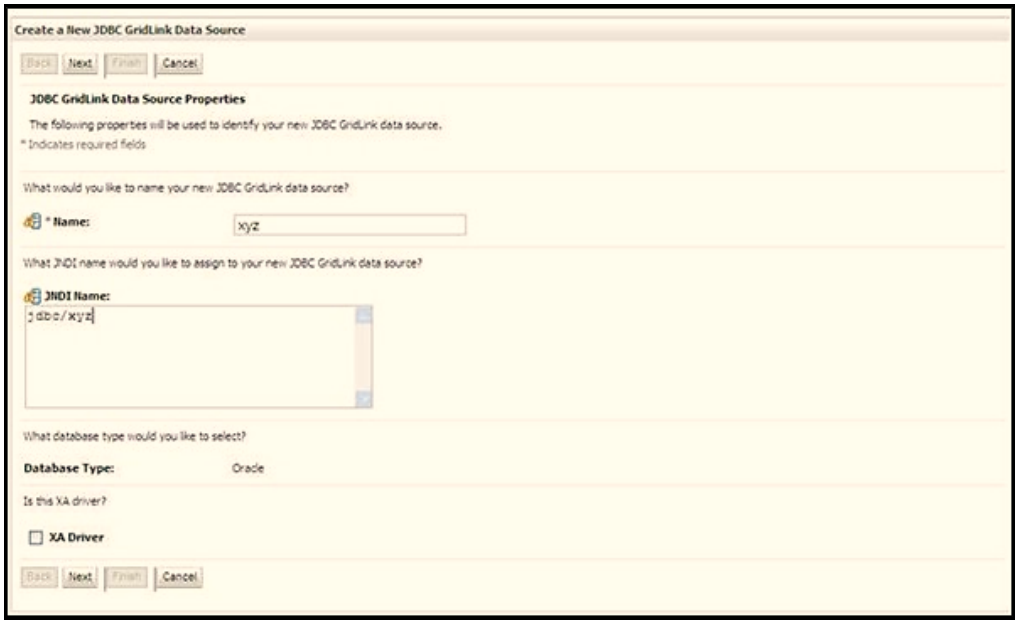
Figure 109: GridLink Data Source



1. Enter the Data Source **Name** and **JNDI Name**.

   Ensure that the "JNDI Name" field is specified in the format "jdbc/infodomname" and the XA Driver check box is not selected. Click Next.

Figure 110: JNDI Name



2. Specify **Complete JDBC URL**, **Database User Name**, and **Password**. Click **Finish**. The created "Data Source" is displayed in the list of Data Sources.

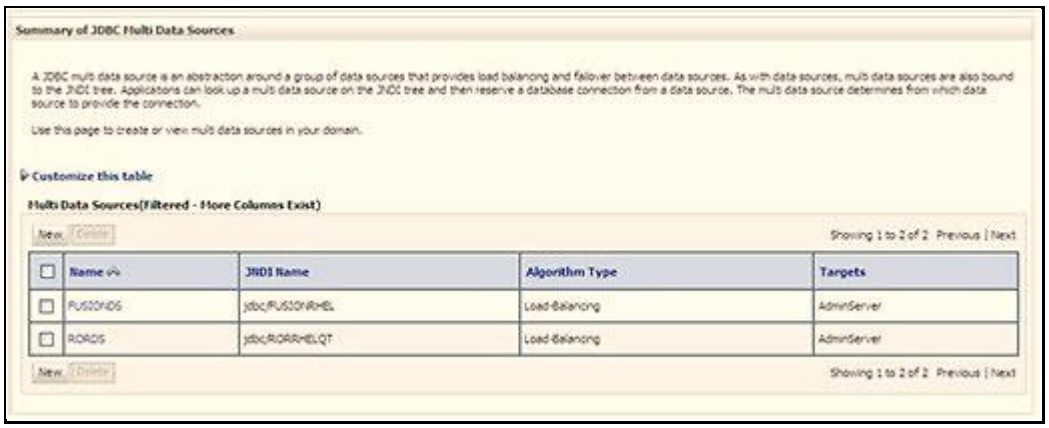
10.2.3 Configure Multi-data Sources

A JDBC multi-data source is an abstraction around a group of data sources that provides load balancing and failover between data sources. As with data sources, multi-data sources are also bound to the JNDI tree. Applications can look up a multi-data source on the JNDI tree and then reserve a database connection from a data source. The multi-data source determines from which data source to provide the connection.

When the database used is Oracle RAC (Real Application Clusters), which allows Oracle Database to run across a set of clustered servers, then a group of data sources can be created for instances running on a set of clustered servers and a JDBC multi-data source can be created so that applications can look up a multi-data source on the JNDI tree to reserve database connection. If a clustered server fails, Oracle continues running on the remaining servers.

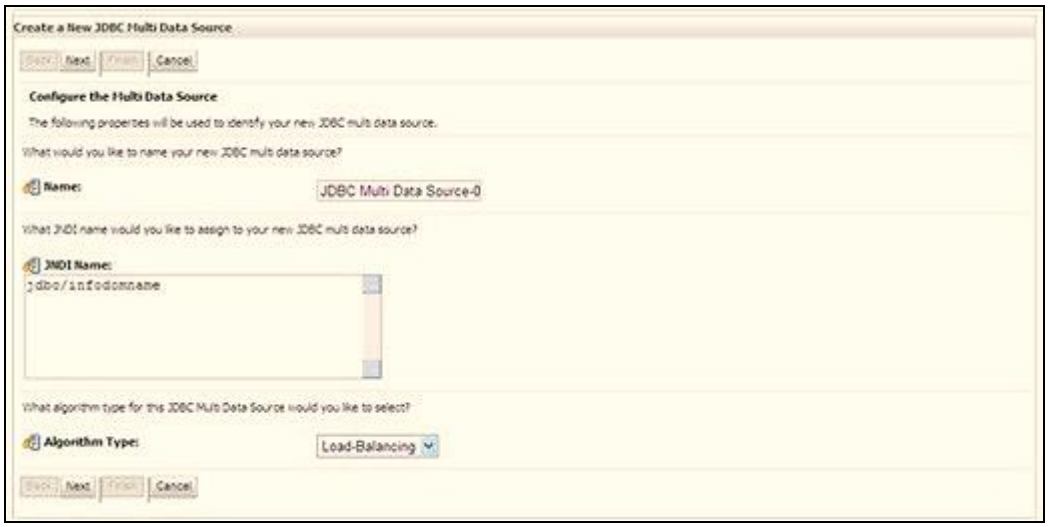
1. Open the WebLogic Admin Console in the browser window: http://<ipaddress>:<administrative console port>/console. (https if SSL is enabled). The Login window is displayed.
2. Login with the **User ID** that has admin rights.
3. In the LHS menu (Domain Structure), select **Services > JDBC > Multi Data Sources** to display the Summary of JDBC Multi Data Sources window.

Figure 111: Multi Data Sources



4. Click **New** to display the New JDBC Multi Data Source window.

Figure 112: Configure Multi Data Source



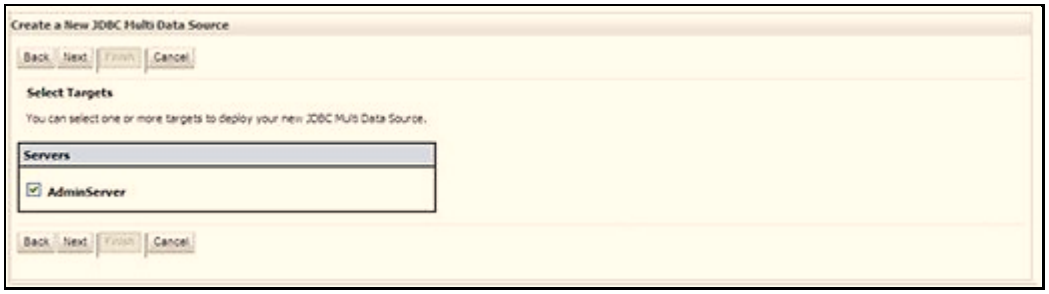
> **NOTE** Ensure that the Data Sources which must be added to the new JDBC Multi Data Source are created.

5. Enter the JDBC Source **Name**, **JNDI name**, and select the **Algorithm Type** from the drop-down list. Click **Next**.

NOTE

- The JNDI Name must be specified in the format jdbc/infodomname.
- The JNDI Name of the Data Sources that is added to the new JDBC Multi data source must be different from the JNDI name specified during Multi Data Source.
- The same steps must be followed to create a mandatory data source pointing to the "configuration schema" of infrastructure with jdbc/FICMASTER as JNDI name for Data Source.
- The JNDI Name provided in the multi-data source must be the same name that is mentioned in the `web.xml` file of OFSAAI Application.
- You can select the **Algorithm Type** as **Load-Balancing**.

Figure 113: Select Targets

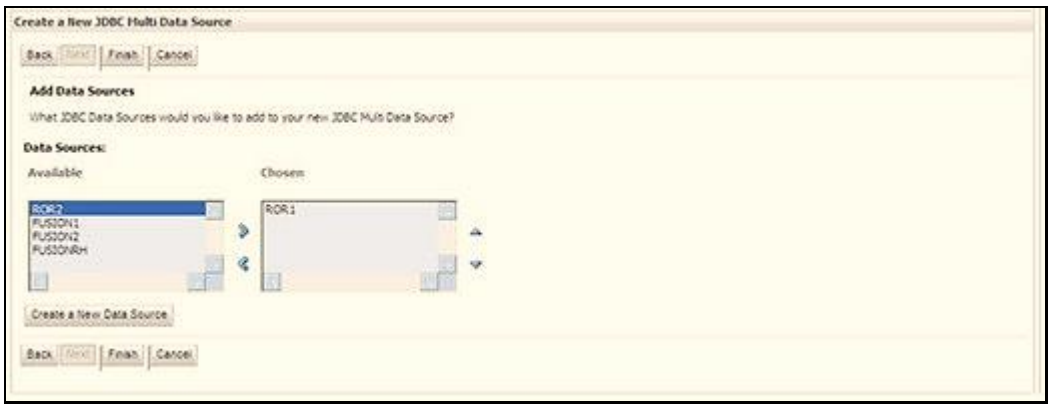


6. Select the **AdminServer** check box and click **Next**.

Figure 114: Select Data Source Type

7. Select the type of data source to add to the new JDBC Multi Data Source. Click **Next**.

Figure 115: Add Data Sources



8. Map the required Data Source from the **Available** Data Sources. Click **Finish**. The New JDBC Multi Data Source is created with added data sources.

10.2.4 Configure Advanced Settings for Data Source

To configure the advanced setting for the data source, follow these steps:

1. Click the new Data Source from the Summary of JDBC Data Sources window to display the Settings for <Data Source Name> window.
2. Select the Connection Pooling tab given under Configuration.
3. Navigate to the Advanced option at the bottom of the window, and check the Test Connection of Reserve check box (enables WebLogic Server to test a connection before giving it to a client).

   To verify if the data source is valid, select "Data Source Name". For example, FICMASTER.
4. Select the server and click Test Data Source. A message is displayed indicating that the test was successful.

   After the "Data Source" is created successfully, the following messages are displayed: All changes are activated. No restart is necessary.

   Settings updated successfully.

If not, follow these same steps to recreate the data source.

10.2.5 Configure JDBC Connection Pooling

To define the JDBC connection pooling, ensure that you have created the **JDBC Provider** and **Data Source** to access the data from the database.

1. Click the newly created Data Source $DATA_SOURCE$ and navigate to the path **Home >Summary of Services: JDBC >Summary of JDBC Data Sources >JDBC Data Source-<INFODDOM_NAME>**.
2. Set the following values:
   - **Initial Capacity**: 10
   - **Maximum Capacity**: 100
   - **Capacity Increment**: 1

- **Statement Cache Type**: LRU
- **Statement Cache Size**: 10

3. Click **Save**.

10.2.6 Create Workmanager

A Workmanager is used to re-trigger failed messages. To create a Workmanager, follow these steps:

- The **Name** field must have the value `wm/WorkManager-TFLT`
- The **Type** field must have the value `Work Manager`.
- The **Targets** field must have the value `AdminServer`
- The **Scope** field must have the value `Global`
- The **Stuck Thread Action** field must have the value `Ignore stuck threads` Click **Save**.

Figure 116: WorkManager Screen 1

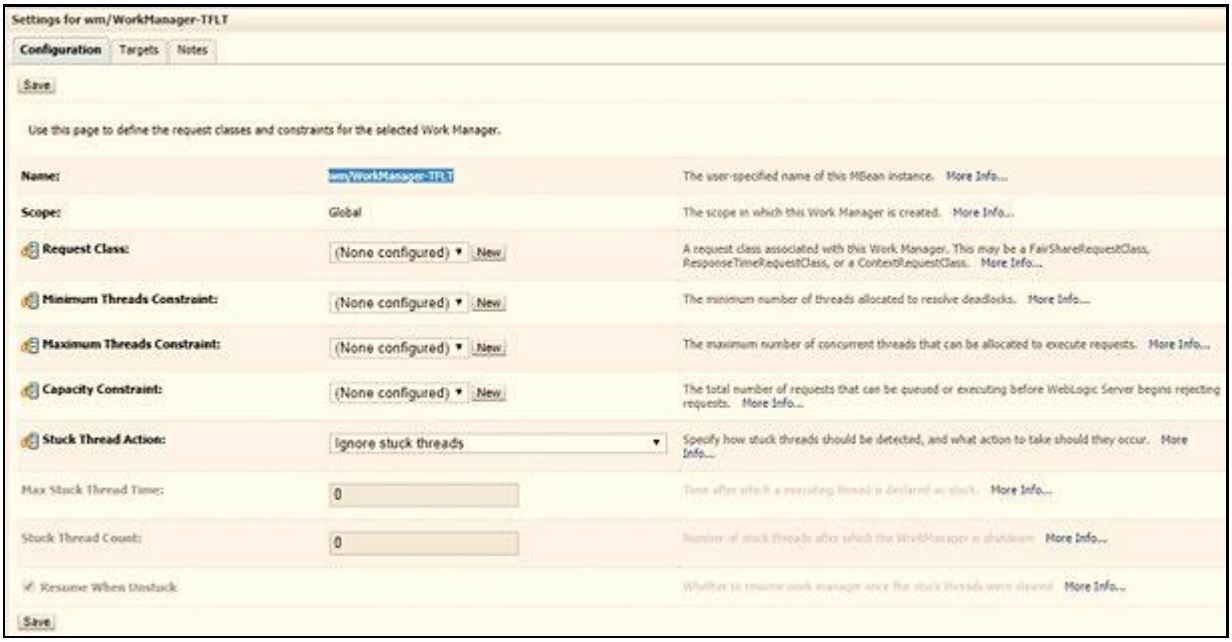
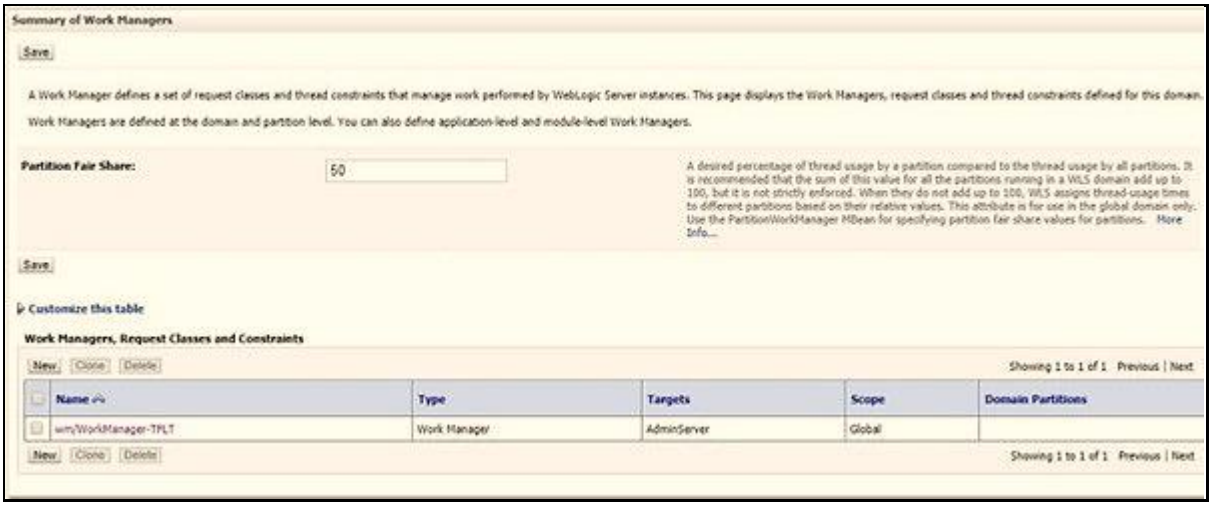


Figure 117: Workmanager screen Screen 2



10.3 Configure Resource Reference in Tomcat Application Server

This section is applicable only when the Web application server type is Tomcat and includes the following topics:

- Create Data Source
- Define JDBC Connection Pooling
- Configure ClassLoader for Apache Tomcat

Copy the Oracle JDBC driver file, `ojdbc<version>.jar` from `<Oracle Home>/jdbc/lib` and place it in `<Tomcat Home>/lib`.

See Hardware and Software Requirements to identify the correct `ojdbc<version>.jar` file version to be copied.

10.3.1 Create Data Source

To create a "data source" for Infrastructure application, navigate to `<Tomcat Home>/conf` directory and edit the following block of text by replacing the actual values in the `server.xml` file.

> **NOTE** The User-IDs for configuration/ atomic schemas have the prefix of setup info depending on the value set for PREFIX_SCHEMA_NAME in the `<<APP Pack>>_SCHEMA_IN.XML file` of the Schema Creator Utility.
>
> For example: If the value set for PREFIX_SCHEMA_NAME is DEV and the schema name is mentioned as ofsaaconf, then the actual schema created in the database is DEV_ofsaaconf.

```
<Context path ="/<context name>" docBase="<Tomcat Installation
Directory>/webapps/<context name>" debug="0" reloadable="true"
crossContext="true">

<Resource auth="Container" name="jdbc/FICMASTER" type="javax.sql.DataSource"
driverClassName="oracle.jdbc.driver.OracleDriver" username="<user id for the
configuration schema>" password="<password for the above user id>"
url="jdbc:oracle:thin:@<DB engine IP address>:<DB Port>:<SID>"
maxActive="100" maxIdle="30" maxWait="10000"/>

<Resource auth="Container"

name="jdbc/< INFORMATION DOMAIN NAME >"

type="javax.sql.DataSource"
driverClassName="oracle.jdbc.driver.OracleDriver" username="<user id for the
atomic schema>" password="<password for the above user id>"

url="jdbc:oracle:thin:@<DB engine IP address>:<DB Port>:<SID>"
maxActive="100" maxIdle="30" maxWait="10000"/>

</Context>
```

NOTE

- The <Resource> tag must be repeated for each Information Domain created.
- After the configuration, the "WAR" file must be created and deployed in Tomcat.

10.3.2 Define JDBC Connection Pooling

To define the JDBC connection pooling, follow these steps:

1. Copy the `$ORACLE_HOME/jdbc/lib/ojdbc<version>.jar` file to the path `$TOMCAT_DIRECTORY/lib/` directory.

   See Hardware and Software Requirements to identify the correct `ojdbc<version>.jar` file version to be copied.

2. Edit the `server.xml` file present under the `$TOMCAT_DIRECTORY/conf/` directory with the following changes, which is required for connection pooling.

   ```
   <Context path="/ $CONTEXTNAME$" docBase=" $APP_DEPLOYED_PATH$ "
   debug="0" reloadable="true" crossContext="true">

   <Resource auth="Container" name="jdbc/ $INFODOM_NAME$"
   type="javax.sql.DataSource"

   driverClassName="oracle.jdbc.driver.OracleDriver" username="
   $ATOMICSCHEMA_USERNAME$" password="$ATOMICSCHEMA_PASSWORD$"
   url="$JDBC_CONNECTION_URL"

   maxTotal="300" maxIdle="30" maxWaitMillis="10000"
   removeAbandonedOnBorrow="true" removeAbandonedTimeout="60"
   logAbandoned="true"/>

   </Context>
   ```

NOTE

- $APP_DEPLOYED_PATH$ must be replaced by the OFSAAI application deployed path.
- $INFODOM_NAME$ must be replaced by Infodom Name.
- $ATOMICSCHEMA_USERNAME$ must be replaced by an Atomic schema database user name.
- $ATOMICSCHEMA_PASSWORD$ must be replaced by an Atomic schema database password.
- $JDBC_CONNECTION_URL must be replaced by JDBC connection string jdbc:Oracle:thin:<IP>:<PORT>:<SID>.

  For example,

  ```
  jdbc:oracle:thin
  192.168.0.1:1521:soluint
  ```

The User-IDs for configuration/ atomic schemas have the prefix of setupinfo depending on the value set for PREFIX_SCHEMA_NAME in the `<<APP Pack>>_ SCHEMA_IN.XML` file of Schema Creator Utility.

For example: if the value set for PREFIX_SCHEMA_NAME is DEV and the schema name is mentioned as ofsaaconf, then the actual schema created in the database is DEV_ofsaaconf.

10.3.3 Configure ClassLoader for Apache Tomcat

To configure the ClassLoader for Apache Tomcat, follow these steps:

1. Edit the `server.xml` file available in `$TOMCAT_HOME/conf/` directory.
2. Add the tag <Loader delegate="true" /> within the <Context> tag, above before the <Resource> tag. This is applicable only when the web application server is Apache Tomcat 8.

11 Configure Work Manager in Web Application Servers

The process Modelling framework requires creating a Work Manager and mapping it to the OFSAA instance. This configuration is required for WebSphere and WebLogic Web application server types.

This section covers the following topics:

- Configure Work Manager in WebSphere Application Server
- Configure Work Manager in WebLogic Application Server

11.1 Configure Work Manager in WebSphere Application Server

Topics:

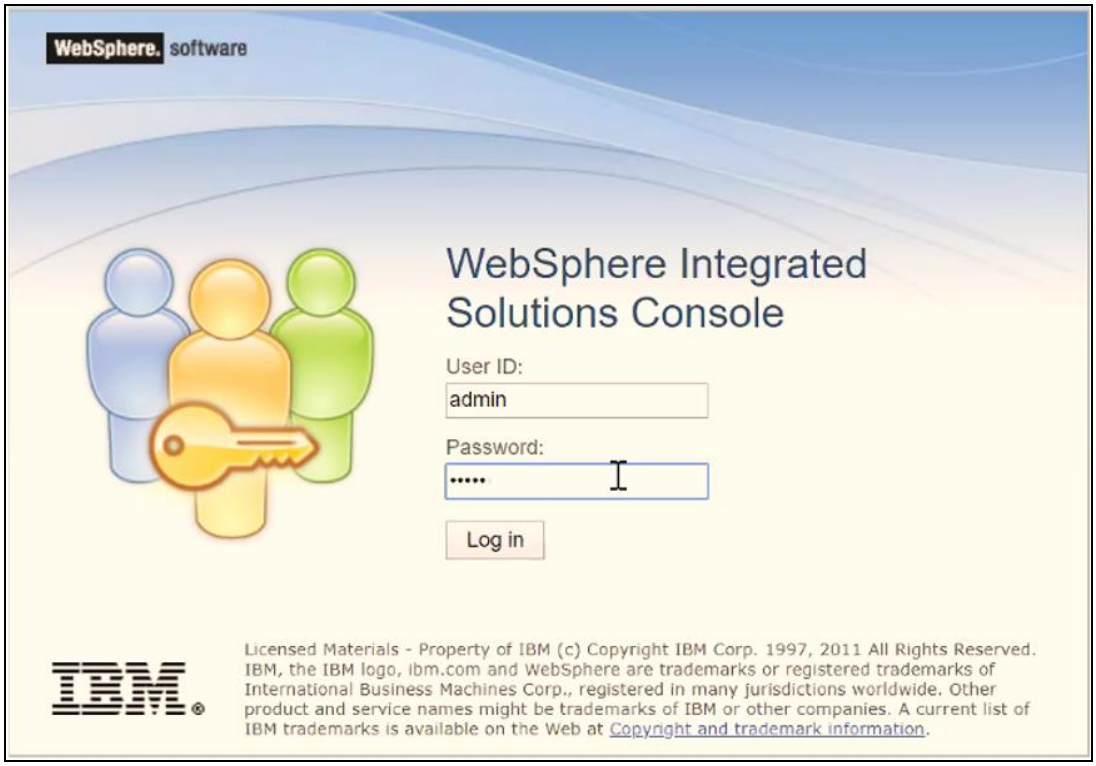
- Creating Work Manager
- Mapping Work Manager to OFSAA WebSphere Instance

11.1.1 Create Work Manager

To create the Work Manager, follow these steps:

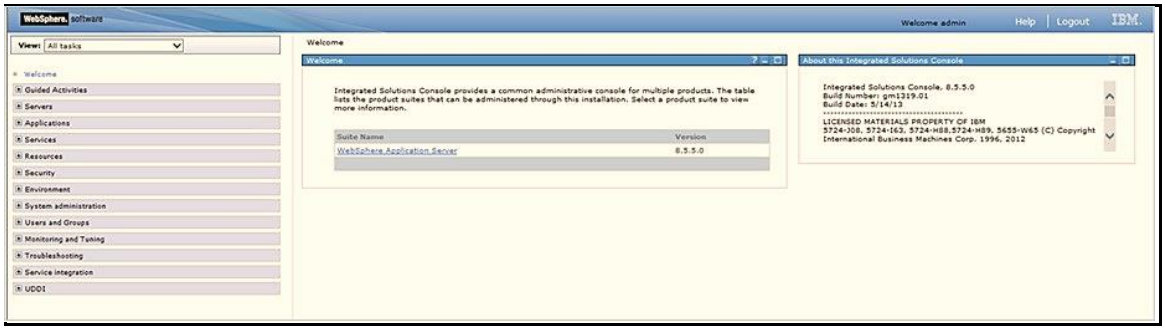
1. Open the WebSphere admin console in the browser window: http://<ipaddress>:<administrative console port>/ibm/console. (https if SSL is enabled). The Login window is displayed.

Figure 118: WebSphere Login page



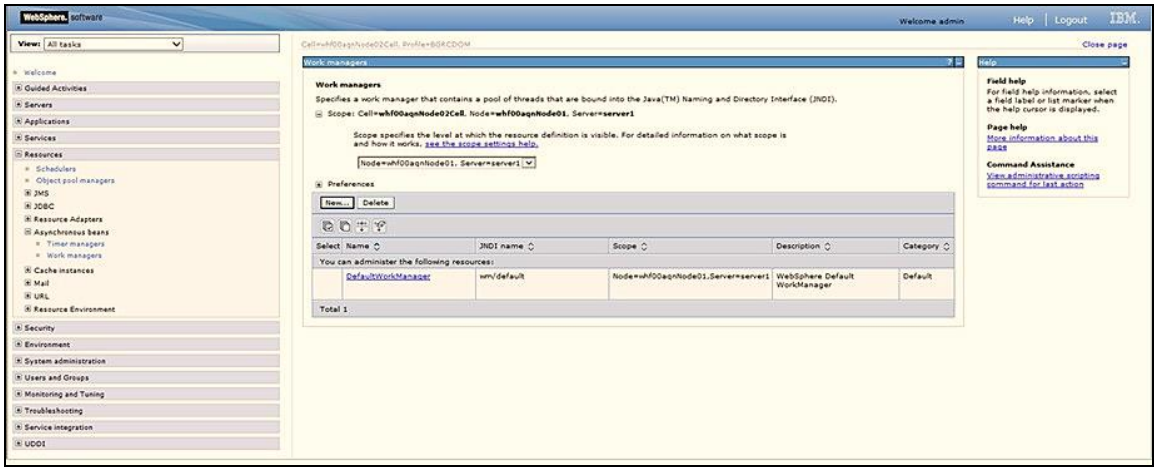
2. Log in with the user ID which has admin rights.

Figure 119: Home page



3. From the LHS menu, expand R**esources > Asynchronous beans** and select **Work Managers**.

Figure 120: Work Managers

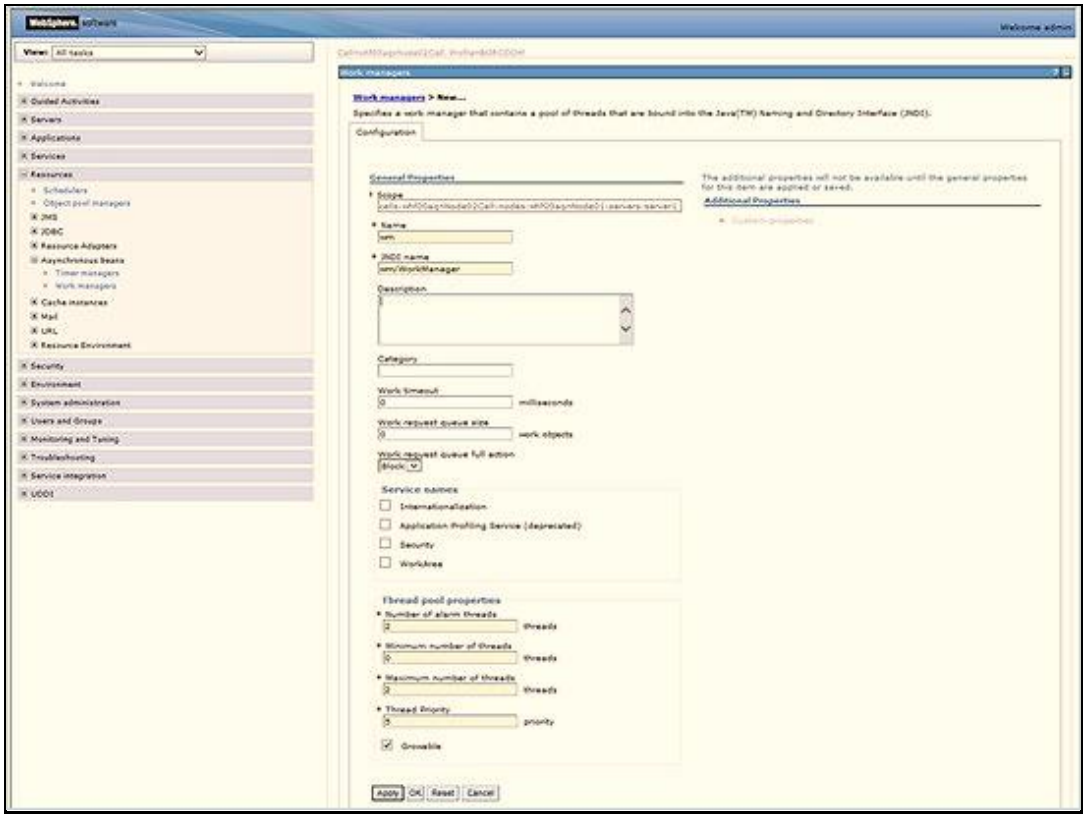


4. Select the required Scope from the drop-down list.

   For example, Node=whf00aqnNode01, Server=server1.

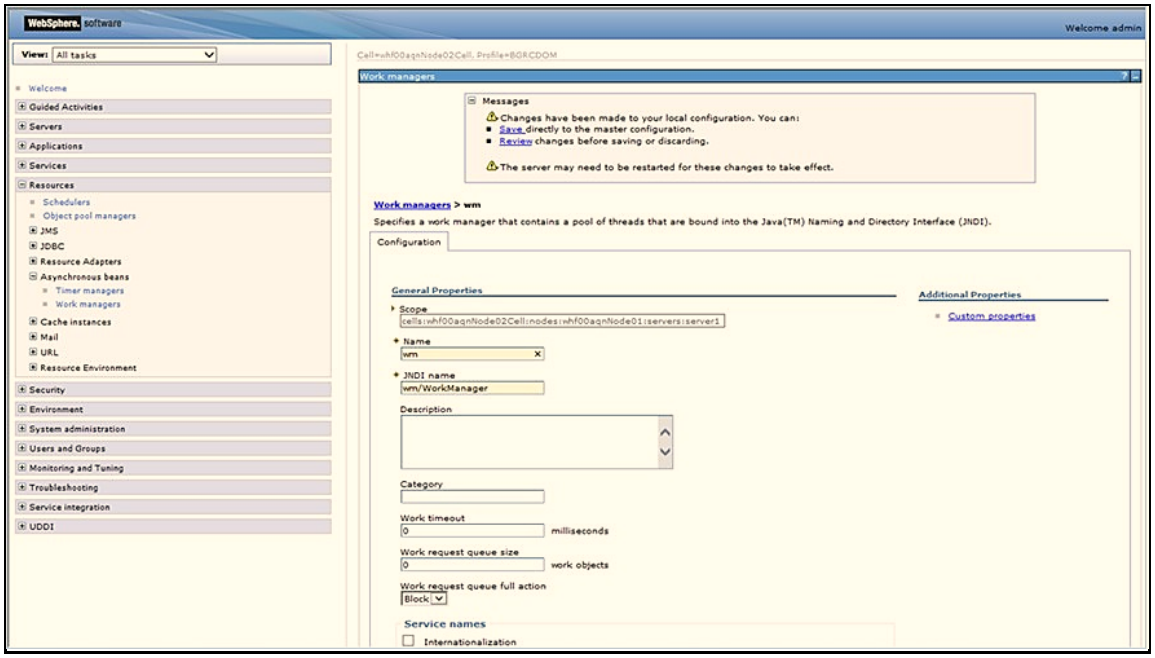
5. Click **New** in the **Preferences** section.

Figure 121: New Work Managers



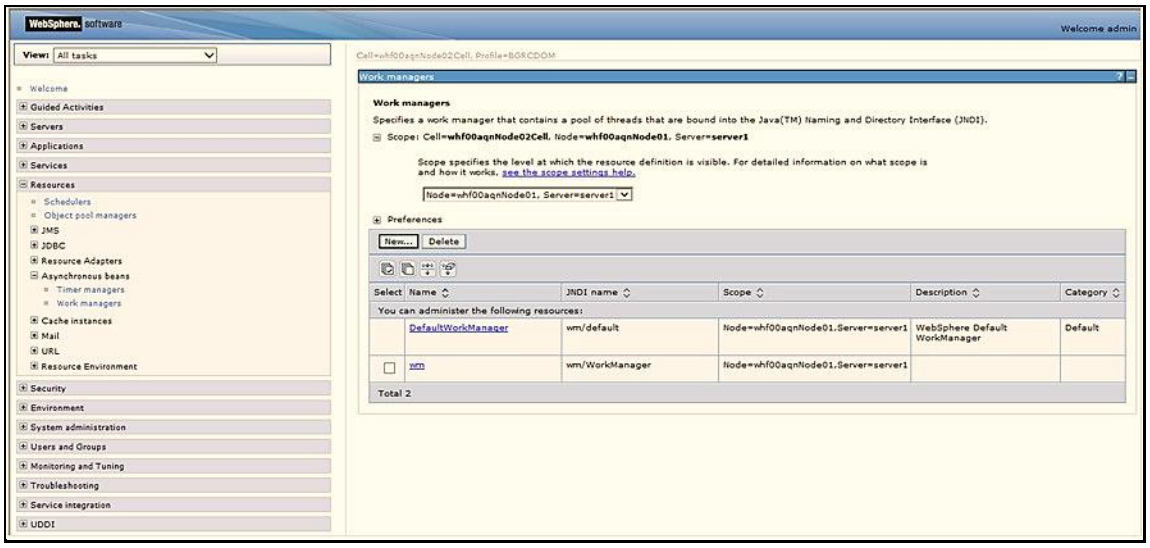
6. Enter the **Name** as 'wm' and JNDI name as 'wm/WorkManager ' in the respective fields.
7. Enter the **Thread pool properties**.
8. Click **Apply**.

Figure 122: Configure Work Managers



9. Click **Save**.

Figure 123: Work Managers Preferences



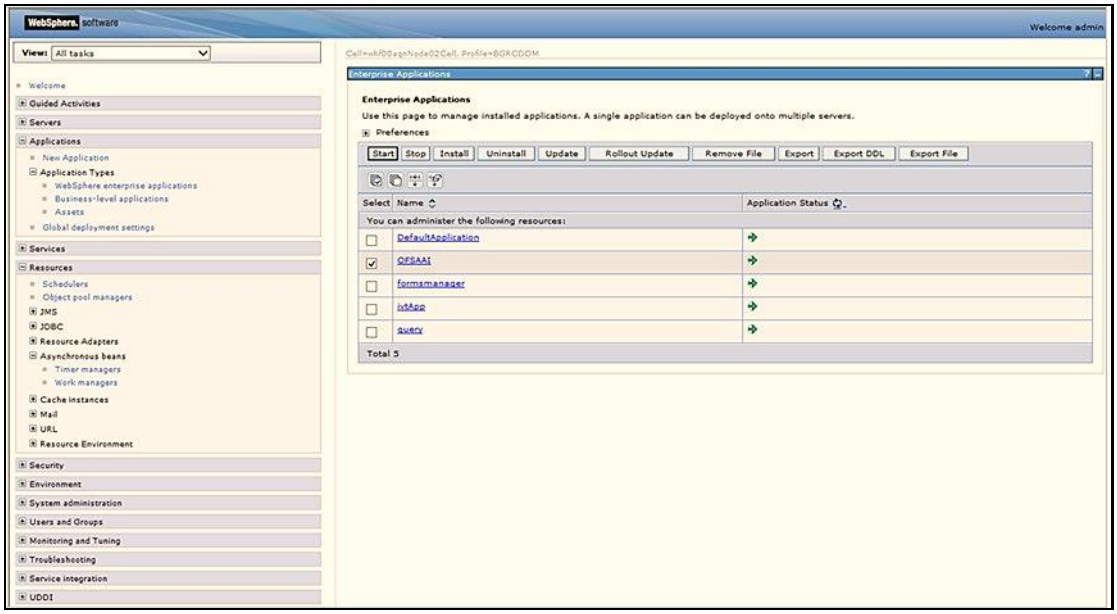
After creating the work manager, you must map it to an OFSAA instance.

11.1.2 Map Work Manager to OFSAA WebSphere Instance

To map the Work Manager to an OFSAA WebSphere Instance, follow these steps:

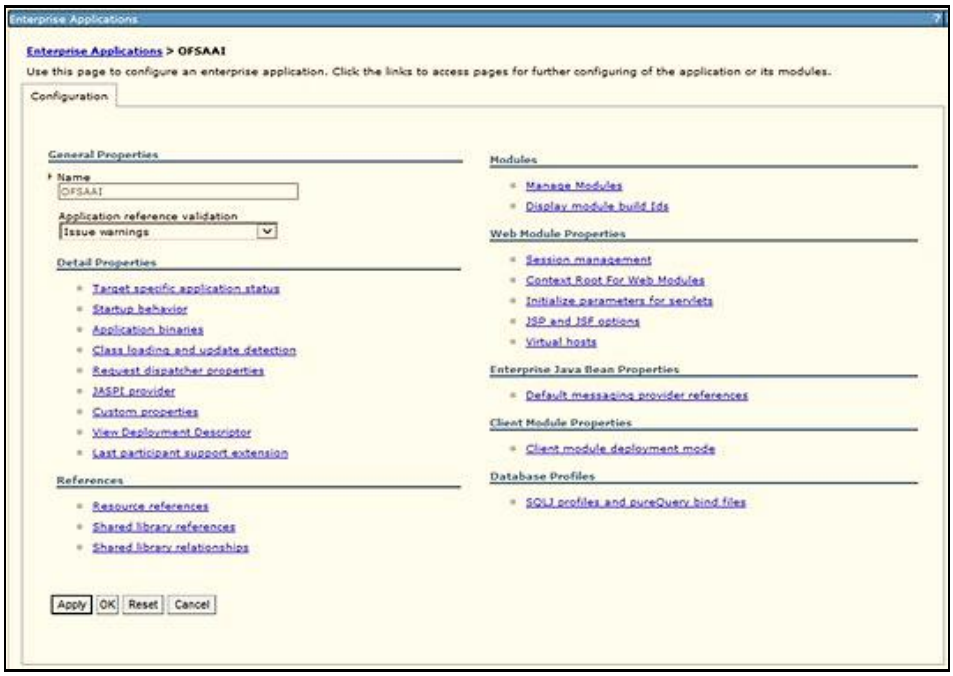
1. From the LHS menu, expand **Applications > Application Types** and click WebSphere enterprise applications.

Figure 124: Enterprise Applications



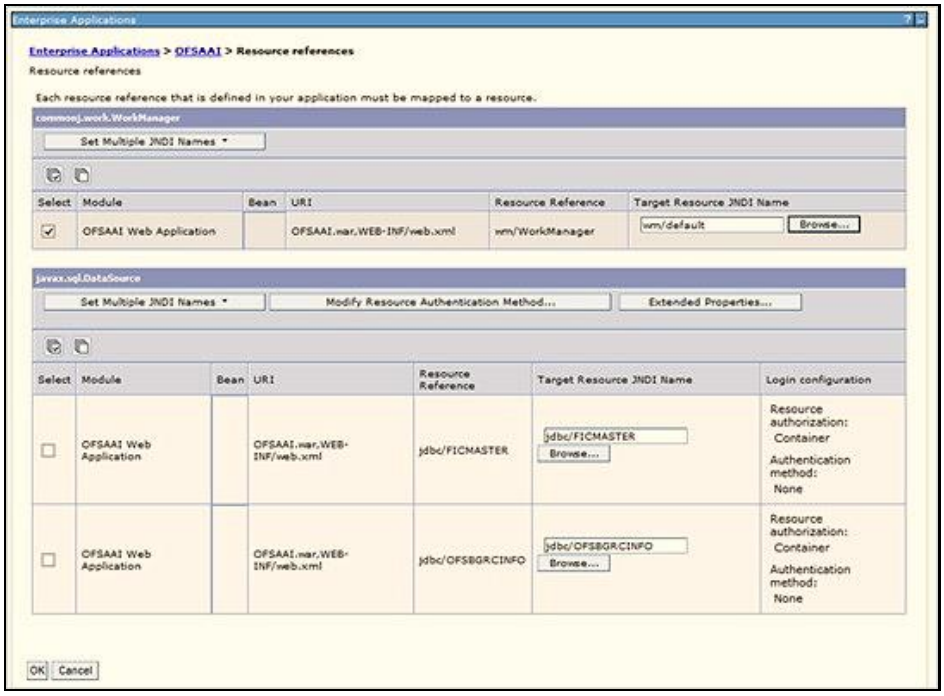
2. Click OFSAAI instance hyperlink.

Figure 125: OFSAAI



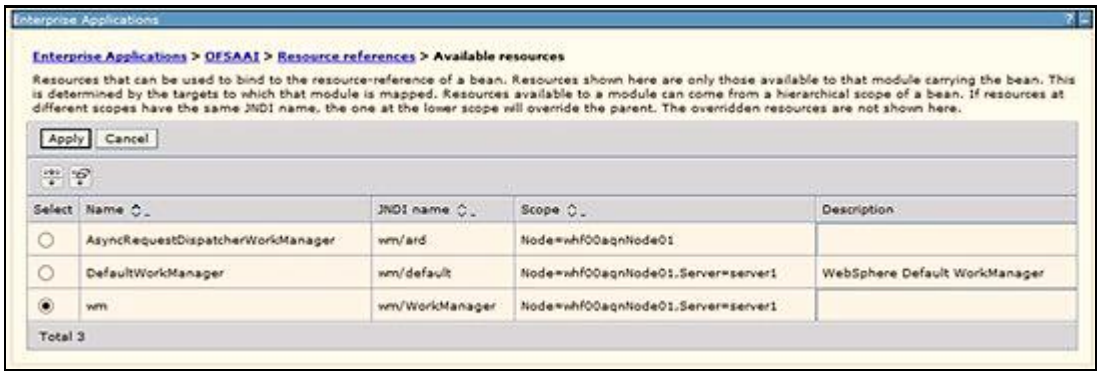
3. Click the **Resource references** link under the **References** section.

Figure 126: Resource References



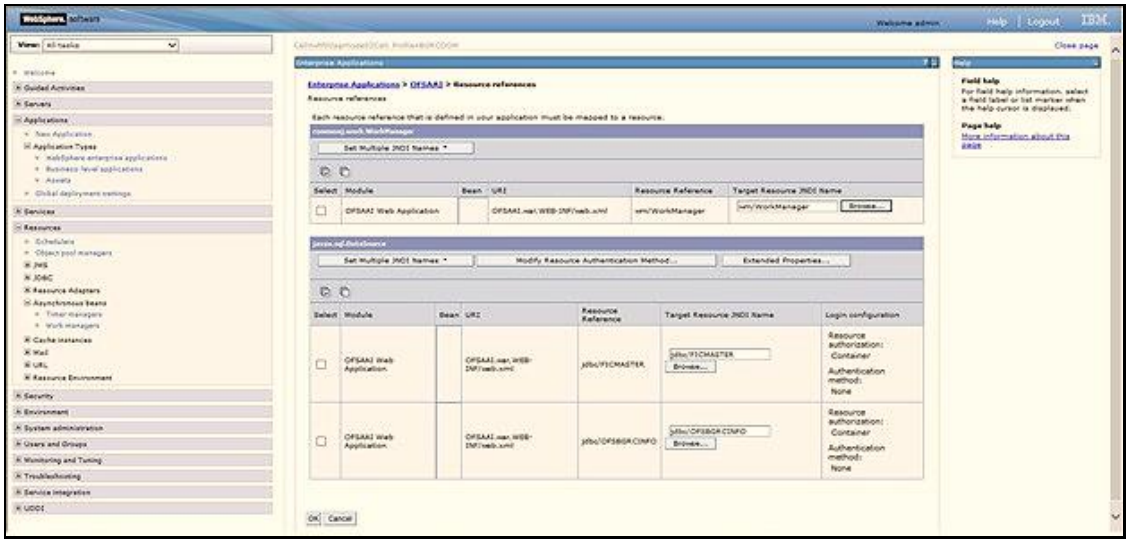
4. Click **Browse** corresponding to the **Work Manager Resource Reference**. The available resources are displayed.

Figure 127: Available Resources



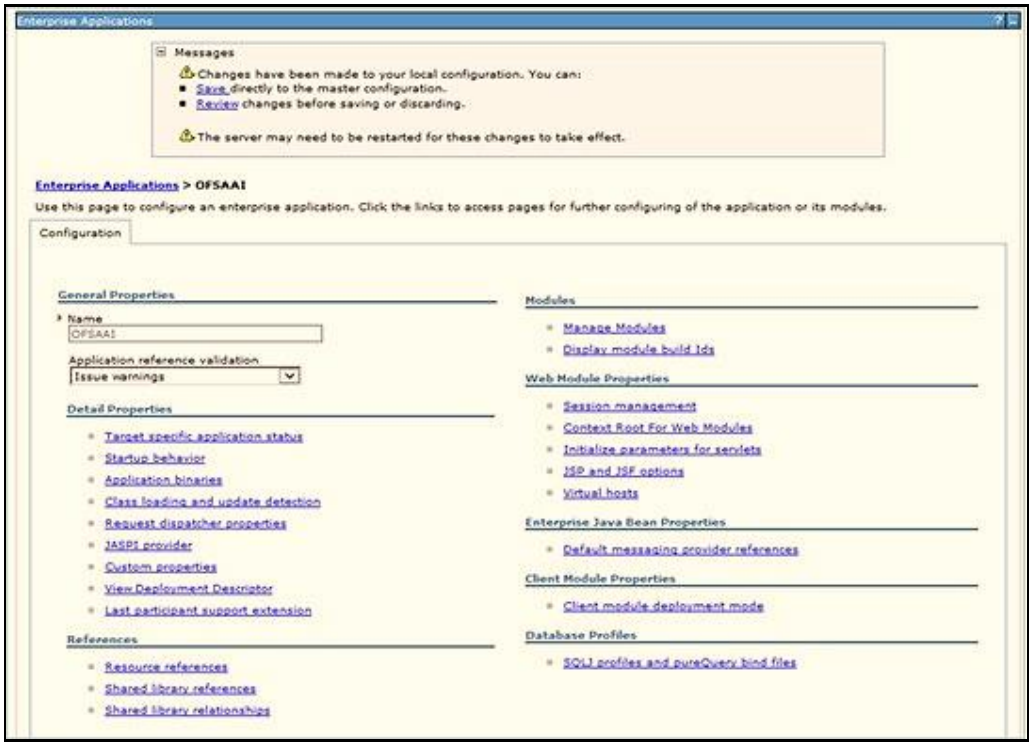
5. Select the newly created Work Manager ('wm') and click **Apply**.

Figure 128: Select Work Manager



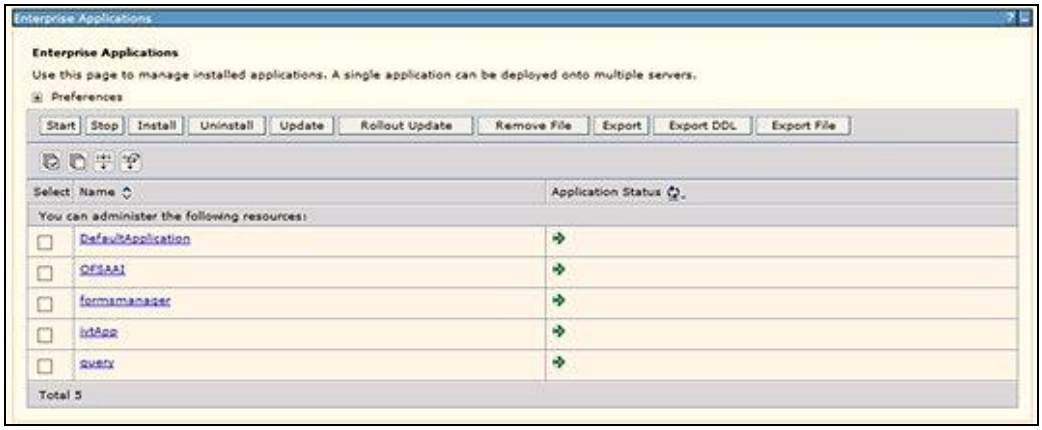
6. Select the Work Manager ('wm/WorkManager') and click **OK**.

Figure 129: OFSAAI Configuration



7. Click **Save**.

Figure 130: Enterprise Applications Preferences

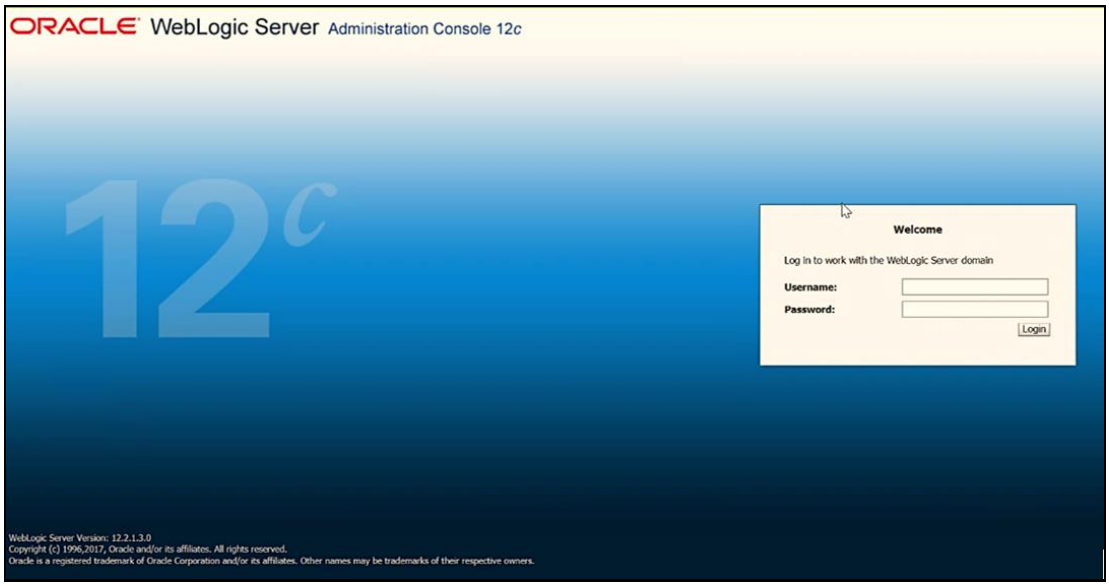


11.2 Configure Work Manager in WebLogic Application Server

To create the Work Manager in WebLogic application server, follow these steps:

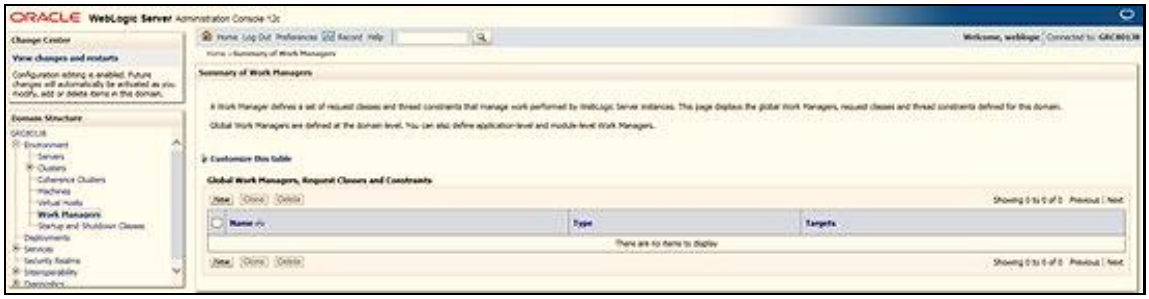
1. Open the WebLogic admin console in the browser window: http://<ipaddress>:<administrative console port>/console. (https if SSL is enabled). The Welcome window is displayed.

Figure 131: WebLogic Login page



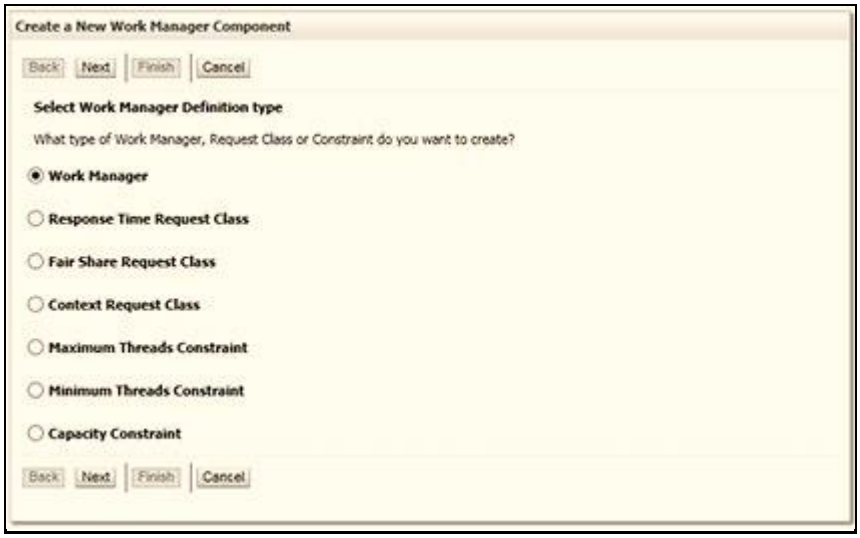
2. Log in with the user ID that has admin rights.
3. From the **Domain Structure** menu in the LHS, expand Environment and select **Work Managers** to display the Summary of Work Managers window.

Figure 132: Work Manager



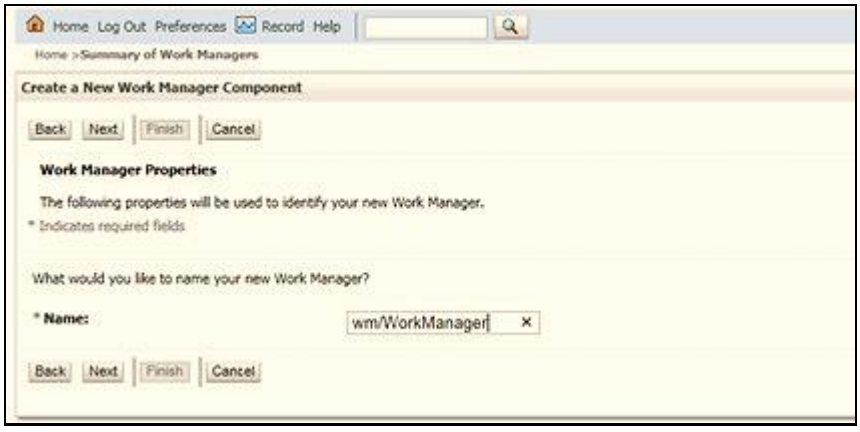
4. Click **New** to create a new Work Manager component.

Figure 133: New Work Manager



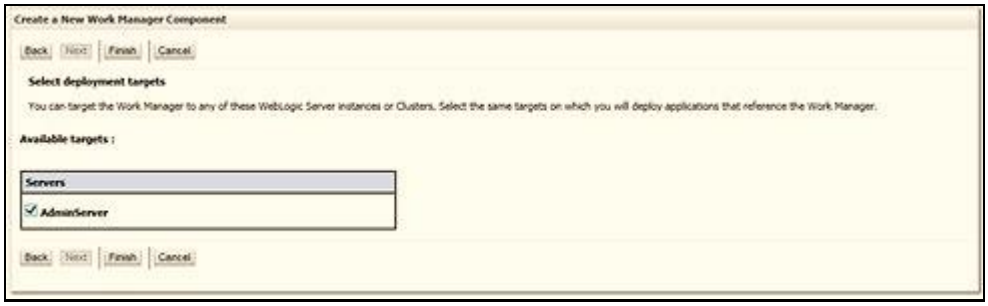
5. Select the Work Manager and click **Next**.

Figure 134: Work Manager



6. Enter the Name as 'wm/WorkManager' and click **Next**.

Figure 135: Select Deployment Targets



7. Select the required deployment target and click **Finish**.

Figure 136: Summary of Work Managers

Part IV

Topics:

- Additional Configurations for Application Packs
- Additional Information
- Migrate Excel Upload Functionality
- FAQs

12 Additional Configurations for Application Packs

This section provides information for additional configurations required for the OFSAA application packs.

Topics:

- Configurations for Enterprise Modeling
- Configurations for Process Modeling Framework

12.1 Configurations for Enterprise Modeling

This section is applicable only if OFS Enterprise Modeling is licensed and enabled in your OFSAA instance. See the OFS Analytical Applications Infrastructure Administration Guide for information on additional configurations.

Perform the following configurations before you start using Enterprise Modeling framework:

1. Install the OFSAAAI Runner package in the database server to execute ORE models. This is a mandatory step and you can find the Runner package in the `$FIC_ HOME/ficdb/lib` directory. For more information, refer to the section Install OFSAAAI Runner Package.
2. Configure ORE 1.5 to load the Cairo library in Oracle Linux/RHEL 7 by creating a symbolic link from libtiff.so.3 to libtiff.so.5 for the ORE executions to succeed. Follow the steps given below to create a symbolic link:
   a. Log in as root and change directory to `/usr/lib64`.
   b. Execute the following command:

```
ln -s libtiff.so.5 libtiff.so.3
```

> **NOTE** Contact My Oracle Support if you require further assistance on ORE 1.5

3. Execute Variable Migration Utility to migrate the variables defined in previous versions to 8.1.2.0.0 version. For more details, see the Variable Migration utility section in OFS Analytical Applications Infrastructure Administration Guide.

12.1.1 Sandbox Resave Utility

A utility is provided to regenerate the CONSTRAINTS.XML as per the changes done as part of Update Constraints utility. The constraint XML is required for the sandbox data population which will store the foreign key names of all the tables.

The XML files to be regenerated are:

```
ftpshare/<SANDBOXINFODOM>/erwin/scripts/sandbox/CONSTRAINTS.xml
ftpshare/<SANDBOXINFODOM>/erwin/scripts/sandbox/<TABLE_NAME>.xml
```

12.1.1.1 Prerequisites

Update Constraints utility must be run successfully on all the sandbox and production Infodoms.

12.1.1.1.1 How to Run the Utility

To run the utility:

1. Navigate to the `$FIC_HOME/utility/sandboxutil/bin` directory and grant RWX (755) permissions for all executables (`.sh` files).
2. Execute the utility using the following command:

   `./updatesandbox.sh`
3. Verify logs from the `$FIC_HOME/utility/sandboxutil/logs/Update.log` directory.
4. If the process is successful, verify the following references for new constraint names:

   `ftpshare/<SANDBOXINFODOM>/erwin/scripts/sandbox/CONSTRAINTS.xml`
   `ftpshare/<SANDBOXINFODOM>/erwin/scripts/sandbox/<TABLE_NAME>.xml`
5. In case of failure, refer the utility's log and restore the backups for the file system.
6. Execute the utility for the failed infodoms one by one using the following command:

   `$FIC_HOME/utility/sandboxutil/bin/updatesandbox.sh $INFODOM.`

> **NOTE** The utility does the backup of `ftpshare/<SANDBOXINFODOM>/erwin/scripts/sandbox` directory as `ftpshare/<SANDBOXINFODOM>/erwin/scripts/sandbox_bkp`, but restore is not done. Restore must be done manually in case of any failure. The backup directory will be created in the app `ftpshare` area. In case of any failure, the backup has to be replaced in the database ftpshare area also.
>
> For queries, contact My Oracle Support.

12.1.1.2 Model Resave Utility

If you upgrade OFSAAI to 8.1.2.0.0 from an older version, you have to resave all ORE based models. To resave, you have to use the utility `modelresave.sh`, which is available in the directory `$FIC_DB_HOME/bin`.

> **NOTE** You cannot trigger the model resave utility if the RQADMIN role is not granted to Configuration Schema. For more information on granting the role, refer to the section Configure Oracle R distribution and Oracle R Enterprise (ORE).

To run the utility from the console:

1. Navigate to the `$FIC_DB_HOME/bin` directory and grant RWX (755) permissions for all executables (`.sh` files).
2. Execute the utility using the following command:

   `./modelresave.sh`

   This will resave all the available ORE models.
3. Provide the following parameter if you want to resave ORE models that are present in a particular information domain:

   INFODOM - Specify the information domain name if you want to resave the models only in a particular information domain.

   For example, `./modelresave.sh <infodom>`

> **NOTE** You can find the logs in `$FIC_DB_HOME/log/migration.log`.

12.2 Configure Process Modeling Framework

See the OFS Analytical Applications Infrastructure Administration Guide for information on configuration for the Process Modeling Framework.

12.3 Generate JSON Utility

The JSON Utility reads the Object Registration tables and generates entity-wise JSONs that are registered into the **AAI_DMM_METADATA** table.

From the OFS AAI v8.1.2.0.0 release, the model upload processing is done through the JSON format.

> **NOTE** The JSON utility is triggered as part of the OFSAA Application upgrade installation.
>
> The generation of JSONs is done automatically during an upgrade installation. Run this utility only in the event of a failure to generate the JSONs during an upgrade installation.

For information on how it is used in the application, see the **Model Upload Using JSON** section in the Oracle Financial Services Analytical Applications Infrastructure User Guide.

12.3.1 How to Run the Generate JSON Utility

Before running the JSON utility, ensure that the FICServer is up and running.

To run the Generate JSON Utility, follow these steps:

1. Navigate to the `$FIC_HOME/utility/GenerateJSON/bin/` directory and grant **RWX (755)** permissions to all the executables (.sh files).

2. Run the utility for each of the failed information domains as follows:

   `$FIC_HOME/utility/GenerateJSON/bin/generatejson.sh $INFODOM`

   Where the Infodom name in the `./generatejson.sh` file is as shown in the following:

   `./generatejson.sh <INFODOM_NAME>`

3. After the process is successful, verify the following references for the JSON files:
   - All the entity JSONs are generated in the **ftpshare/<INFODOM>/json/fipjson** directory.
   - The **AAI_DMM_METADATA** table must be registered with all the generated JSON.
   - The **V_FLAG_VALUE** parameter in the **AAI_DMM_UTIL_UPDATE_JSON** table in the Config Schema is updated to **Y** for the selected Infodom.

NOTE

1. If the Utility fails to generate, check the Utility's log and identify the cause of the failure. Resolve the issues and run the Utility again.
2. If the Utility fails to generate because the Table Version is empty and the Entities were created (Tables created through Batches) outside the Model, update the Version to **0** and re-run the utility.
3. If the JSON Utility fails to generate because of the inconsistent constraints present in the existing environment, run the Update Constraints Utility and make the constraints consistent before running the JSON Utility again.
   See the Execute the Update Constraints Utility Section for more details.

For any queries, contact Oracle Support Services.

12.3.2 Execute the Update Constraints Utility

Execute the Update Constraints Utility to make the constraints consistent before running the JSON Utility again after it fails.

NOTE This Utility applies only in an Upgrade Scenario.

To execute the Update Constraints Utility, follow these steps:

1. Update the **aai_mu_util_update_cons.v_flag_value** to **N** for the Problematic Infodom in the Config Schema.
2. Drop the following Tables (if they exist) from the Atomic Schema. These Tables were created previously by the Update Constraints Utility.
   - `rev_tab_constraints_u`
   - `rev_tab_ref_constraints_u`

- rev_tab_constraint_columns_u

3. Create a backup of the existing db.xml file.
4. Insert a dummy record into the **aai_table_uid_map** Table with **n_table_id** as **maxvalue + 1**.
5. Create a backup of the **aai_table_uid_map** Table and truncate the data except for the dummy record.
6. Execute execute.sh for the specific Infodom as follows:

```
cd $FIC_HOME/utility/UpdateConstraints/bin
./execute.sh <infodom_name>
```

7. Verify the log files generated in the $FIC_HOME/utility/UpdateConstraints/logs directory.

13 Additional Information

Topics:

- Add FTP/SFTP Configuration for File Transfer
- Configure Infrastructure Server Memory
- Retrieve Patch Information
- Set OLAP Data Server Configuration
- Change IP Address or Hostname, Ports, Deployed Paths of the OFSAA Instance
- Set Infrastructure LDAP Configuration
- Configure OFSAAI Web Services
- Enable Parallel Execution of DML Statements
- Configure Message Details in Forms Designer
- Clear Application Cache
- Configure Password Changes
- Configure Java Virtual Machine
- Configure Internal Service (Document Upload or Download)
- Update the OFSAA 8.1.2.x Java 8 Instance to Java 11

13.1 Add FTP/SFTP Configuration for File Transfer

In OFSAA, certain modules require the transfer of files from the web application server to the OFSAA server over SSH.

Follow these steps to ensure the OFSAA server recognizes the web application server during file transfers.

1. Log in to the web application server.
2. Type `sftp <user>@<OFSAA Server>`.
3. Specify **Yes** when prompted for permission.

   Are you sure you want to continue connecting (Yes/No)?

   This will add an entry into the "known_hosts" file.
4. A confirmation message is displayed:

   Permanently added <OFSAA Server> RSA) to the list of known hosts.

13.2 Configure Infrastructure Server Memory

The memory settings for Infrastructure Application Server, Tomcat, WebSphere, and WebLogic can be edited for customizing memory settings and garbage collector settings depending on the available hardware configuration as explained in the following section. These settings are the bare minimum

and have to be incremented considering the deployment metrics into account. The increments are usually handled in multiples of 128 MB for heap and 64 MB for the stack.

You can configure the Infrastructure Application Memory settings as follows:

1. Locate the `.profile` file.
2. Edit `X_ARGS` field in this file for customizing memory settings and garbage collector settings depends on the hardware configuration.

   This has a default value X_ARGS="-Xms200m" X_ARGS=" "$X_ARGS" $DELIM -Xmx2048m"

> **NOTE** Modify X_ARGS_APP variable in the `.profile` file to customize Java Memory Settings for Model Upload based on the Data Model size.

For Run and Rule executions, the following value is recommended:

```
X_ARGS_RNEXE="-Xms1g -Xmx1g -XX:+UseAdaptiveSizePolicy
-XX:MaxPermSize=512M -XX:+UseParallelOldGC
-XX:+DisableExplicitGC"
X_ARGS_RLEXE="-Xms1g -Xmx1g -XX:+UseAdaptiveSizePolicy
-XX:MaxPermSize=512M -XX:+UseParallelOldGC
-XX:+DisableExplicitGC"
```

13.3 Retrieve Patch Information

To identify the list of patches installed on your OFSAA setup, follow these steps:

1. Log in to the OFSAA application as a user with Object AdminAdvanced Role.
2. Navigate to Object Administration tab, expand Utilities, and click Patch Information.
3. The window displays the list of patches installed on the OFSAA setup across Applications/Platforms.

13.4 Set OLAP Data Server Configuration

This section is applicable if you are using the OLAP feature of OFSAAI.

The following parameters must be set to ensure that the system limitations are not exceeded at any stage. The values for these OS parameters must be specified based on the expected load at each implementation site.

For example:

- Process Memory: Limit Max Thread Stack Size
- Max Number of Threads per Process
- Sort Buffer settings: This must be set at the Essbase application level appropriate to the anticipated load.

- Shutdown and Restart: During the shutdown of the OFSAAI Server that has an instance of Data Services that is communicating with an OLAP Data Server, it is imperative to ensure that the cleanup of the old instance is completed on the OLAP Data Server before restarting the OFSAAI Server. Pause for a period based on the load the system is subjected to, before restarting the Data Services subsystem.

13.5 Change IP/ Hostname, Ports, Deployed Paths of the OFSAAInstance

For information on this section, see OFS Analytical Applications Infrastructure Administration User Guide.

13.6 Set Infrastructure LDAP Configuration

For more information on LDAP configuration, see OFSAAI Administration Guide.

13.7 Configure OFSAAI Web Services

Web Services in OFSAAI is meant for exposing a web service to "asynchronously" or "synchronously" execute requested tasks offered by OFSAAI. The following configuration steps are to be done only if you are using the Web Services feature of OFSAAI.

13.7.1 Configure DynamicWSConfig.xml File

For each third-party web service that must be accessed using the OFSAAI Web services framework and the operations to be invoked, corresponding entries are to be made in the `DynamicWSConfig.xml` template file.

The variable <WebServer> denotes any one of the application servers, that is, WebSphere, WebLogic, or Tomcat.

The `DynamicWSConfig.xml` file is available in the `<OFSAAI Installation Directory>/EXEWebService/ <WebServer>/ROOT/conf` directory. This file can be placed in any directory that is accessible by the application and this location must be specified in the `web.xml` file, as WSCONFIGFILE parameter.

The `DynamicWSConfig.xml` template file is in the `<WebServer Deployment Path>/EXEWebService.ear/EXEWebService.war/conf` directory.

This template is as follows:

```
<XML>

<WEBSERVICES>

<WEBSERVICE CODE="$CODE"

ENDPOINT="$ENDPOINT" TARGETNAMESPACE="$TARGETNAMESPACE"
XMLNS_XSD="$XMLNS_XSD" ENCODINGSTYLE="$ENCODINGSTYLE"
SERVICENAME="$SERVICENAME" PORTTYPENAME="$PORTTYPENAME"
SESSION_MAINTAIN_PROPERTY="$SESSION_MAINTAIN_PROPERTY" USERNAME="$USERNAME"
```

```
PASSWORD="$PASSWORD" STYLE="$WEBSERVICESTYLE"
STUBIMPLEMENTATION="$STUBIMPLEMENTATION">

<OPERATION CODE="$CODE" NAME="$NAME" SOAPACTION="$SOAPACTION" STYLE="$STYLE"
PACKAGENAME="$PACKAGENAME">

<INPUT ORDER="$ORDER" PARAMNAME="$PARAMNAME" ARGTYPE="$ARGTYPE"
CLASSNAME="$CLASSNAME"/>

<OUTPUT PARAMNAME="$PARAMNAME" RETURNTYPE="$RETURNTYPE"
CLASSNAME="$CLASSNAME"/>

</OPERATION>

</WEBSERVICE>

</WEBSERVICES>

</XML>
```

The `DynamicWSConfig.xml` file has the placeholders as shown in the following table. These have to be updated depending on the web service chosen and the mode of accessing it. For each Web service to be accessed, the entire webservice tag in the `DynamicWSConfig.xml` file must be repeated. The placeholders tabulated as follows must be set per the parameters published in the third party wsdl files (webservices) to be accessed. The stub class specified must implement the "com.iflex.Oracle Reveleus.execution.webservice.EXEWebIF" interface.

Attributes of WEBSERVICE tag

Table 24: WEBSERVICE tag Attributes

Placeholder	Description
$CODE	A unique number within the XML file and cannot be 999 or 0.
$ENDPOINT	soap: address location in the wsdl: service name tag of the wsdl file.
$TARGETNAMESPACE	The attribute value for the targetNamespace of the wsdl: definitions tag.
$XMLNS_XSD	The attribute value for the xmlns:s of the wsdl:definitions tag
$ENCODINGSTYLE	The attribute value for the xmlns:soapenc of the wsdl:definitions tag.
$SERVICENAME	Name of the service found under the wsdl:service name tag of the wsdl file.
$PORTTYPENAME	wsdl port type name as mentioned in the wsdl file.
$SESSION_MAINTAIN_PROPERTY	This can be given as "" also.
$USERNAME	User name to access web services. Enter "" if no user name is required.
$PASSWORD	The password to access the web services. Enter "" if no password is required.
$WEBSERVICESTYLE	This can take either "rpc" in case of Dll mode of invoking web services or "stub" in case of static mode. This is a mandatory parameter.
$STUBIMPLEMENTATION	Fully qualified class name (package name.classname).

Attributes of OPERATION tag

Ensure that the OPERATION tag attributes are repeated for each of the OPERATION tags.

Table 25: OPERATION tag Attributes

Placeholder	Description
$CODE	It must be unique within the Webservice tag.
$NAME	The name of the Function that is to be called by the wsdl file.
$SOAPACTION	The URL for the Operation to access. This is associated with the Operation tag of the wsdl file.
$STYLE	This can take "rpc" if the web services invoking is in DII mode or "stub" if it is in static mode. This is a mandatory parameter.
$PACKAGENAME	Represents the JAXB package of the input object.

Attributes of the INPUT tag

Table 26: INPUT tag Attributes

Placeholder	Description
$ORDER	The sequential number of the INPUT tag. It must start from 0. This is in line with the input order of the arguments that the API accepts which is called by this operation.
$PARAMNAME	The input parameter name to be called by the wsdl file.
$ARGTYPE	Input Parameter Data Type. If the input argument type is a complex object, specify $ARGTYPE as "xmlstring".
$CLASSNAME	Represents the class name of the input object parameter.

Attributes of OUTPUT tag

Table 27: OUTPUT tag Attributes

Placeholder	Description
$PARAMNAME	The output parameter name to be returned by the web service.
$RETURNTYPE	Output parameter Data Type. If the web service response is a complex object, then specify $RETURNTYPE as "object".

$CLASSNAME	Represents the class name of the output object parameter.

Adding web.xml Entries

This step is optional and required only if the web application server used is Tomcat. In case of any other application server, skip and proceed with next step.

1. Navigate to the `$FIC_HOME/webroot/WEB-INF/` and edit the `web.xml` file. Set parameter value DOCSERVICEAPP to EXEWebServiceAXIS.
2. Navigate to the `<OFSAAI Installation Directory>/EXEWebService/<WebServer>/ROOT/WEB-INF/` and edit the `web.xml` file as follows:

13.7.2 Configure WSConfig File

The WSCONFIG (`DynamicWSConfig.xml`) file is available in the `<WebServer Deployment Path>/EXEWebService.ear/EXEWebService.war/conf` directory. This file can be placed in any directory that is accessible by the application.

The path where the WSCONFIG file is placed must be specified in place of $WSCONFIGFILELOCATION$ in the following block of text in the `web.xml` file.

```
<context-param>
<description>WebServices Configuration File</description>
<param-name>WSCONFIGFILE</param-name>
<param-value>$WSCONFIGFILELOCATION$</param-value>
<!--Specify the Location of DynamicWSConFig.xml-->
</context-param>
```

13.7.3 Configure Proxy Settings

Replace the following <param-value> text in the `web.xml` file with appropriate values.

If no values are required, leave the <param-value> blank.

```
<context-param>
<description>http Proxy Host</description>
<param-name>http.proxyHost</param-name>
<param-value>$PROXYHOST$</param-value>

<!-- Specify the IP address or hostname of the http proxy server-->
</context-param>
<context-param>
<description>http Proxy Port</description>
<param-name>http.proxyPort</param-name>
```

```
<param-value>$PROXYPORT$</param-value>

<!--Port Number for the Proxy Server-->
</context-param>
<context-param>
<description>http proxy UserName</description>
<param-name>http.proxyUserName</param-name>
<param-value>$PROXYUSERNAME$</param-value>

<!-- User ID To get authenticated by proxy server-->
</context-param>
<context-param>
<description>http proxy Password</description>
<param-name>http.proxyPassword</param-name>
<param-value>$PROXYPASSWORD$</param-value>

<!-- User Password To get authenticated by proxy server-->
</context-param>
<context-param>
<description>http non-ProxyHosts</description>
<param-name>http.nonProxyHosts</param-name>
<param-value>$NONPROXYHOST$</param-value>
<!--Hosts for which the proxy settings should get by-passed (Note: Separate
them by "|" symbol) -->
</context-param>
```

13.7.4 Configure OFSAAI Home Entry

This entry must point to the Application layer / Web layer of the OFSAAI installation and must be accessible.

Replace `$FIC_HOME$` in the following block of text in the `web.xml` file with <WebServer Deployment Path>/EXEWebService.ear/EXEWebService.war.

```
<context-param>
<description>OFSAAI Web Home</description>
<param-name>FIC_HOME</param-name>
<param-value>$FIC_HOME$</param-value>

<!--OFSAAI Installation Directory-->
</context-param>
```

```
<context-param>
<description>OFSAAI Web Home</description>
<param-name>FIC_PHYSICAL_HOME</param-name>
<param-value>$FIC_HOME$</param-value>
<!--OFSAAI Installation Directory-->
</context-param>
```

13.7.5 Configure DynamicWSConfig.xml File

For each third-party web service that must be accessed using the OFSAAI Web services framework and the operation to be invoked, make corresponding entries into this file. This file is to be placed in the location that is specified in the `web.xml`, as WSCONFIGFILE parameter.

13.7.6 Deploy OFSAAI Web Services

You can deploy OFSAAI Web Services separately if you had not configured OFSAAI Web Services as part of the installation.

1. Complete the manual configuration of OFSAAI Web Services.
2. Navigate to <OFSAAI Installation Directory>/EXEWebService/<WebServer> and execute the command:

   `./ant.sh`

   This will trigger the EAR/WAR file creation, which is required for the deployment.
3. Deploy the generated EXEWebService.EAR/EXEWebService.WAR file into the WebServer.

   If you have already configured OFSAAI Web Services as part of the installation, deploy the generated EXEWebService.EAR/ EXEWebService.WAR file into the OFSAAI Deployment area in WebServer profile.

13.8 Enable Parallel Execution of DML statements

A configuration file, OracleDB.conf is introduced to accommodate any configurable parameter related to operations on the oracle database. If you do not want to set a parameter to a specific value, then the respective parameter entry can be removed/commented off form the `OracleDB.conf` file that resides in the path `$FIC_ DB_HOME/conf`.

As of now, the `OracleDB.conf` file has only one parameter namely CNF_DEGREE_OF_ PARALLELISM. This parameter indicates the degree of parallelism to be used for a DML operation if parallel DML is explicitly enabled in the session with the ENABLE PARALLEL DML clause of the ALTER SESSION statement. 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.

13.9 Configure Message Details in Forms Designer

You can configure the Message Details in Forms Designer under Data Entry Forms and Queries module by updating the details of the mail server in the `NotificationConfig.cfg` file that resides in the path `$FIC_APP_HOME/common/FICServer/conf`.

Ensure that the "authorized User details" for whom you must configure the Message details are included in Administration > Security Management > User Administrator > User Maintenance window.

Update the following parameters in the "NotificationConfig.cfg" file:

Table 28: NotificationConfig.cfg File Attributes

Parameter	Description
SMTP_SERVER_IP	Specify the hostname or IP address of the SMTP Server.
SMTP_DEBUG_MODE	To run SMTP service in Debug mode, set value to 'true', otherwise set value to 'false'.
SMTP_AUTHORIZATION	Set to 'true' if the SMTP server requires the client to be authenticated, otherwise set to 'false'.
SMTP_USERNAME	Username required for logging into the SMTP server, if authentication is not required use a dummy value.
SMTP_PASSWORD	Password required for logging into the SMTP server. If authentication is not required, use false value.
SMTP_MAILID	If the Messages must go from a Particular ID that ID must be added. The exchange server forces you to set a valid ID that is there in the exchange server. (Based on Security settings)

13.10 Clear Application Cache

This is applicable to all Web Servers (that is, WebSphere, WebLogic, and Tomcat).

Prior to the deployment of Infrastructure or Application Service Packs / One-off patches, navigate to the following path depending on the WebServer configured and clear the cache:

- Tomcat: `<Tomcat installation directory>/work/Catalina/localhost/<Application name>/org/apache/jsp`
- WebLogic: `<Weblogic installation location>/domains/<Domain name>/servers/<Server name>/tmp/_WL_user/<Application name>/qaelce/jsp_servlet`
- WebSphere: `<Websphere installation directory>/AppServer/profiles/<Profile name>/temp/<Node name>/server1/<Application name>/<.war file name>`

13.11 Configure Password Changes

This section explains about how to modify the OFSAA Infrastructure Config Schema and Atomic Schema passwords for non Wallet-based and Wallet-based setups.

13.11.1 Modify OFSAA Infrastructure Config Schema Password in a Non Wallet-Based Setup

To change the Config Schema password, perform the following steps:

1. Shutdown the OFSAAI App service:

   ```
   cd $FIC_APP_HOME/common/FICServer/bin
   ./stopofsaai.sh
   ```

2. Change the Config Schema User Password in the database.
3. Delete the `$FIC_HOME/conf/Reveleus.SEC` file.
4. Navigate to the `$FIC_HOME/utility/updateatomicpwd/bin` Directory and execute the Utility as shown in the following:

   Syntax:

   ```
   ./rotateAtomicDBPwd.sh <CONFIG/ATOMICALIASNAME> <DB_USER> <DB_PASS>
   ```

   For example,

   ```
   ./rotateAtomicDBPwd.sh CONFIG acte_ofsaaconf password123
   ```

   The execution of the Utility generates the `Reveleus.SEC` File in the `$FIC_HOME/conf/` Directory and a new Encrypted Schema Password is reflected in the **DB_MASTER** and **AAI_DB_AUTH_ALIAS** Tables in the row which displays the Config Schema.

   > **NOTE** If you do not delete the existing `Reveleus.SEC` File, then a backup of the file is saved with the `Reveleus.SEC_cfgbkp` name before generating the new `Reveleus.SEC` File.

5. Restart the Infrastructure Server.
6. If you are using Apache Tomcat as the Web server, update the <Context> -> Resource tag details in the `Server.xml` file from the `$CATALINA_HOME/conf` directory. For Tomcat, both Config Schema (FICMASTER resource) and Atomic Schema (<INFODOM_NAME> resource) exist.

   If you are using WebSphere as a Web Server:

   a. Log in to the WebSphere Administration Console, from the left side menu.
   b. Navigate to Resources >JDBC >Data Sources. A list of data sources are populated on the right side.
   c. Select the appropriate Data Source and edit the connection details. (In this case, both Config and Atomic Data Sources must be modified).

   If you are using WebLogic as a Web Server:

   a. Log in to the WebLogic Administration Console, from the left side menu
   b. Under Domain Structure list box, expand the appropriate Domain and navigate to Services > JDBC >Data Sources. A list of data sources are populated on the right side.

c. Select the appropriate Data Source and edit the connection details. (In this case, both Config and Atomic Data Sources must be modified).

7. Post successful startup of the service, if required, the Infrastructure Server may be shut down and restarted in the background using nohup mode.

13.11.2 Modify OFSAA Infrastructure Atomic Schema Password in a Non Wallet-Based Setup

To change the Atomic Schema Password, perform the following steps:

1. Change the Atomic schema User Password in the database.
2. Log in to the application from the browser using the SYSADMN account or any user id, which has a System Administrator role mapped.
3. Navigate to System Configuration > Database Details window. Modify the password as explained in the following steps:
   a. From the Database Master window, select the connection whose password you want to modify and click the button from the toolbar.
   b. Click the button corresponding to the Alias Name. The Alias Details window is displayed.
   c. Modify the password in the Auth String field.

   Alternatively, the steps 1, 2, and 3 can be done using the rotateAtomicDBPwd.sh Utility with the Servers down.
4. Shutdown the OFSAAI App service:

   ```
   cd $FIC_APP_HOME/common/FICServer/bin
   ./stopofsaai.sh
   ```
5. Change the Atomic Schema User Password in the database.
6. Navigate to the `$FIC_HOME/utility/updateatomicpwd/bin` Directory and execute the Utility as shown in the following:

   ```
   ./rotateAtomicDBPwd.sh <CONFIG/ATOMICALIASNAME> <DB_USER> <DB_PASS>
   ```

   For example,

   ```
   ./rotateAtomicDBPwd.sh acteofsaaatm acte_ofsaaatm password123
   ```

   A new Encrypted Schema Password is reflected in the **DB_MASTER** and **AAI_DB_AUTH_ALIAS** Tables in the row which displays the Atomic Schema.

> **NOTE** ATOMICALIASNAME value is a TNS alias for Atomic Schema and must not contain underscores.
>
> For example, if the Atomic Schema Name is PROD_OFSAAATM, then the value for ATOMICALIASNAME must be entered as PRODOFSAAATM.

After you have completed either of the methods mentioned above, proceed with the following steps:

1. Restart the Infrastructure Server.

2. If you are using Apache Tomcat as the Web server, update the <Context> -> Resource tag details in the `Server.xml` file from the `$CATALINA_HOME/conf` directory. For Tomcat, both Config Schema (FICMASTER resource) and Atomic Schema (<INFODOM_NAME> resource) exist.

   If you are using WebSphere as Web server:

   a. Log in to the WebSphere Administration Console, from the left side menu.

   b. Navigate to Resources >JDBC >Data Sources. A list of data sources are populated on the right side.

   c. Select the appropriate Data Source and edit the connection details. (In this case, both Config and Atomic data sources must be modified).

   If you are using WebLogic as Web server:

   a. Log in to the WebLogic Administration Console, from the left side menu

   b. Under Domain Structure list box, expand the appropriate Domain and navigate to Services > JDBC >Data Sources. A list of data sources are populated on the right side.

   c. Select the appropriate Data Source and edit the connection details. (In this case, both Config and Atomic data sources must be modified).

3. Restart the OFSAAI services.

13.11.3 Modify the OFSAA Infrastructure Config Schema Password in a Wallet-Based Setup

To change the Config Schema Password in a Wallet-Based setup, follow these steps:

1. Shutdown all the OFSAAI Services and Web Servers.
2. Change the Config Schema User Password in the Database.
3. Log in as a UNIX user with the permission to modify the Oracle Wallet.
4. Execute the following command to configure Config Schema credentials.

   ```
   $ORACLE_HOME/bin/mkstore -wrl <WALLET_HOME> -modifyCredential  -nologo
   CONFIG  <CONFIG_DATABASE_USERNAME>  <CONFIG_DATABASE_NEWPASSWORD>
   ```

5. Enter the password to store the credentials in the Wallet when prompted.
6. Start all the OFSAAI Services excluding Web Servers.
7. If you use Apache Tomcat, WebSphere, or WebLogic as the Web Server, update the associated Wallet Directory with the new Config Schema User Password.
8. Start the associated Web Servers.

13.11.4 Modify the OFSAA Infrastructure Atomic Schema Password in a Wallet-Based Setup

To change the Atomic Schema Password in a Wallet-Based setup, follow these steps:

1. Shutdown all the OFSAAI Services and Web Servers.
2. Change the Atomic Schema User Password in the Database.

3. Log in as a UNIX user with the permission to modify the Oracle Wallet.
4. Execute the following command to configure the Atomic Schema credentials.

```
$ORACLE_HOME/bin/mkstore -wrl <WALLET_HOME> -modifyCredential  -nologo
<ATOMICALIASNAME>  <ATOMIC_DATABASE_USERNAME>
<ATOMIC_DATABASE_NEWPASSWORD>
```

> **NOTE** ATOMICALIASNAME value is a TNS alias for Atomic Schema and must not contain underscores.
>
> For example, if the Atomic Schema Name is PROD_OFSAAATM, then the value for ATOMICALIASNAME must be entered as PRODOFSAAATM.

5. Enter the password to store the credentials in the Wallet when prompted.
6. Start all the OFSAAI Services excluding Web Servers.
7. If you use Apache Tomcat, WebSphere, or WebLogic as the Web Server, update the associated Wallet directory with the new Atomic Schema User Password.
8. Start the associated Web Servers.

13.12 Configure Java Virtual Machine

While running several database intensive tasks in parallel, fetching the database connection from the connection pool may face an error. To ensure no such error is encountered, add the line securerandom.source=file:/dev/./urandom in the java.security configuration file available in $JAVA_HOME/jre/lib/security/ path.

This must be configured on all the machines or virtual machines where the OFSAAI database components (ficdb layer) are installed.

13.13 Configure Internal Service (Document Upload/ Download)

This step can be ignored if it has already been configured as part of any previous IR/ML installation.

The Document Upload /Download feature has changed and can now be configured to use Internal service for document upload/download instead of the earlier ExeWebService.

To facilitate internal service for document upload/ download, perform the following configurations:

1. Create the directories download, upload, TempDocument, and Temp in the local path of the Web application server and provide Read/Write permission.
   - To find the exact location, execute the following query in the CONFIG schema:

     ```
     select localpath from web_server_info
     ```

   - To create directories with Read/Write permission, execute the command:

     ```
     mkdir -m 777 download upload TempDocument Temp
     ```

2. Create `DocStorage` directory in the FTPSHARE location of APP tier and provide Read/Write permission.
   - To find the exact location, execute the query in the CONFIG schema:
     ```
     select ftpdrive from app_server_info
     ```
   - To create a directory with Read/Write permission, execute the command:
     ```
     mkdir -m 777 DocStorage
     ```

By default, the parameter DOCUMENT_SERVICE_TYPE_EXTERNAL value is set to FALSE in the Configuration table in CONFIG schema and hence the application "ExeWebService" will not be used. It is recommended that the value be set to FALSE and use the Internal service for document upload/ downloads. If you intend to continue using the External ExeWebService, set the value to TRUE.

Navigate to `$FIC_HOME/EXEWebService/<WEBSERVER_TYPE>` directory of WEB tier and type `./ant.sh`. This triggers the creation of the EAR/WAR file `EXEWebService.ear/.war`. The EAR/WAR file `EXEWebService.ear/.war` is created in the `$FIC_HOME/EXEWebService/<WEBSERVER_TYPE>` directory of WEB tier. Redeploy the generated EAR/WAR file onto your configured web application server.

13.14 Update the OFSAA 8.1.2.x Java 8 Instance to Java 11

This section explains the configurations required to update an existing OFSAA 8.1.2.x Java 8 instance to Java 11.

Topics:

- Prerequisites
- Update the OFSAA 8.1.2.x Java 8 Instance to Java 11
- Apply OFSAA Generic Configurations
- Configure the Web Application Server
- Configure OFSAA for the New Web Application Server Installation

13.14.1 Prerequisites

The following prerequisites must be matched before you can update the OFSAA 8.1.2.x Java 8 instance to Java 11:

1. Java 11 must be installed on the OFSAA server and Web Application Server.
2. OFS AAI Release **8.1.2.0.0**. must be the minimum version installed.

13.14.2 Update the OFSAA 8.1.2.x Java 8 Instance to Java 11

To update the OFSAA 8.1.2.x Java 8 instance to Java 11, follow these steps:

1. Configure the OFSAA instance to Java 11. See Apply OFSAA Generic Configurations.
2. Configure Web Application Server to Java 11. See Configure the Web Application Server.

> **NOTE** For a newly installed Web Application Server, see Configure OFSAA for the New Web Application Server Installation.

3. Generate the application EAR/WAR file and redeploy the application on your configured Web Application Server.

   For more information on generating and deploying EAR/WAR files, see Create and Deploy the EAR/WAR Files.

4. Restart the OFSAA services. See Start the Infrastructure Services.

13.14.3 Apply OFSAA Generic Configurations

This section consists of the following topics:

- Configure User '.profile' Settings
- Configure Java 11

13.14.3.1 Configure User '.profile' Settings

Perform the following configurations:

1. Log in to the OFSAA server as a non-root user.
2. Edit the user `.profile`. Update the value for the PATH variable from JRE 1.8 to JDK 11.

   For example,

   ```
   PATH=/usr/java/ jdk-11.0.11
   JAVA_BIN=/usr/java/ jdk-11.0.11/bin
   LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/usr/java/jdk-11.0.11/lib/server
   ```

13.14.4 Configure the Web Application Server

This section describes the changes that are to be made in the Web Application Server. The following are the options to configure Web Application Server Configurations:

- Update the existing Web Application Server installation to Java 11
- Install a new instance of the Web Application Server with Java 11

This section consists of the following topics:

- Upgrade Java 8 to Java 11 for Oracle WebLogic Server 14.1.1.0
- Upgrade Java 8 to Java 11 for Apache Tomcat Server

13.14.4.1 Upgrade Java 8 to Java 11 for Oracle WebLogic Server 14.1.1.0

To upgrade Java 8 to Java 11 for WebLogic Server 14.1.1.0, follow these steps:

1. Navigate to the `<WLS_HOME>/Middleware/Oracle_Home/user_projects/domains/<domain>/bin` directory.

Update `SUN_JAVA_HOME, DEFAULT_SUN_JAVA_HOME, JAVA_HOME` in the `setDomainEnv.sh` file to point to the new Java path.

For example,

```
SUN_JAVA_HOME="/usr/java/jdk-11.0.11"
DEFAULT_SUN_JAVA_HOME="/usr/java/jdk-11.0.11"
JAVA_HOME="/usr/java/jdk-11.0.11"
```

2. Clear the Application cache. Navigate to the following path and delete the files:

```
<Weblogic installation location>/domains/<Domain name>/servers/<Server name>/tmp/_WL_user/<Application name>/qaelce/jsp_servlet
```

If you wish to install a new instance of the Oracle WebLogic Server, follow these steps:

1. Install Oracle WebLogic Server 14.1.1.0 and later on Java 11.
2. Perform the configurations for the newly installed WebLogic server.

   For more information, see Configure Resource Reference in WebLogic Application Server.

NOTE

- While creating the WebLogic Domain, the Listen Port must be set the same as that of the existing Domain.
- Note down the new Domain path to perform OFSAA Configurations.

13.14.4.2 Upgrade Java 8 to Java 11 for Apache Tomcat Server

To upgrade Java 8 to Java 11 for Apache Tomcat Server, follow these steps:

1. Log in to the Apache Tomcat Server as a non-root user.
2. Update the value for JAVA_HOME from JRE 1.8 to JRE 1.11 in the user `.profile`.

   For Example,

   ```
   JAVA_HOME=/usr/java/ jdk-11.0.11
   ```

3. Clear the Application cache. Navigate to the following path and delete the files:

   ```
   <Tomcat installation folder>/work/Catalina/localhost/<Application name>/org/apache/jsp
   ```

If you wish to install a new instance of the Apache Tomcat Server, follow these steps:

1. Install Apache Tomcat Server 9.0.x with Java 11.
2. Perform the configurations for the newly installed Tomcat server.

   For more information, see Configure Resource Reference in Tomcat Application Server.

NOTE

- Update the Connector Port in `/apache-tomcat-9.0.24/conf/server.xml` file to that of the existing Tomcat instance.
- Note down the new deployment path to perform OFSAA Configurations.

13.14.5 Configure OFSAA for the New Web Application Server Installation

The configuration in this section is required only if you have freshly installed Oracle WebLogic 14.1.1.0 and later, or Apache Tomcat Server 9.0.x.

To configure, follow these steps:

1. Modify the following parameters in the **Configuration** Table present in the Config Schema with the new Domain Path if the webserver is WebLogic or with the new deployment path if the webserver is Tomcat:
   - `DeFiHome`
   - `REV_IMG_PATH`
   - `EMBEDDED_JSP_JS_PATH`
2. Modify the following parameters in the **AAI_SETUP_PROPS** Table present in the Config Schema with the new Domain Path if the webserver is WebLogic or with the new deployment path if the webserver is Tomcat:
   - `FIC_PHYSICAL_HOME_LOC`
   - `FIC_HOME`
   - `CSS_LOGGER_PATH`
   - `LOG_HOME_PATH`

14 Migrate Excel Upload Functionality

This section provides detailed instructions to migrate excel upload functionality.

Topics:

- Prerequisites
- Migrate Excel Upload

14.1 Prerequisites

The following are the prerequisites for migration.

- The data model in ATOMIC schemas must be the same on the source and target setups.
- OFSAAI (platform) patch level version must be the same on the source and target setups.
- PL/SQL Developer to connect and query the database.
- WinSCP to connect and access the server file system.

14.2 Migrate Excel Upload

To migrate, follow these steps:

1. Open PL/SQL Developer and logon to the source setup's configuration (CONFIG) schema by entering the appropriate username and password.
2. In a new SQL window, query the data of table EXCEL_MAPPING_MASTER.
3. Open a new session in the PL/SQL developer and logon to the target setup's configuration (CONFIG) schema by entering the appropriate username and password.
4. Insert the records from Step 1 into this table.
5. In the V_INFODOM column of the EXCEL_MAPPING_MASTER table, update the infodom name with the target infodom name.

> **NOTE** If all the mappings can work out of the single target Infodom, update the same Infodom value across all rows. If only a few mappings will work out of the target infodom, update the infodom value for selective records. Excel upload mappings will work only if the target infodom has the same data model entities as used in the mappings defined on the source setup.

6. Update the V_CREATED_BY column with the name of any user present in the target setup that has appropriate roles to perform Excel Upload tasks.

> **NOTE** It is mandatory to update values for V_INFODOM and V_CREATED_BY columns.

7. Open WinSCP and log in a new session by entering the host name, port number, user name, and password to access the source setup.
8. Navigate to the directory referred to as FTPSHARE.
9. Copy the `excel-entity mapping xml` file(s) which are located in this directory according to their directory structure on to your desktop.

   For example:
   `/ftpshare/STAGE/ExcelUpload/$SOURCE_INFODOM_NAME/$EXCEL_FILE_NAME.xml`

> **NOTE** The actual file name of the Excel Sheet is mentioned in the V_EXCEL_ NAME column of the EXCEL_MAPPING_MASTER table.

10. Copy the excel templates (.xls/ .xlsx) file(s) which are located in this directory according to their directory structure on to your desktop. For example:

    /ftpshare/STAGE/ExcelUpload/TEMPLATE/*.xls or *.xlsx

> **NOTE** xls/.xlsx files must be copied to the path as per the local path given in your webserverinfo table of config schema. Ignore this step if files are not present at the location.

11. Log into a new session in WinSCP by entering the host name, port number, user name, and password to access the target setup.
12. Copy the XML file(s) from Step 3 to the following location in the target setup.

    For example: `/ftpshare/STAGE/ExcelUpload/$TARGET_INFODOM_NAME/$EXCEL_FILE_NAME.xml`.

> **NOTE** $TARGET_INFODOM_NAME must be target setup infodom in which you have uploaded the appropriate data model and the name must be the same as the V_INFODOM column value updated in EXCEL_ MAPPING_MASTER table.

13. Copy the xls/ xlsx file(s) from Step 3 to the following location in target setup.

    For example: `/ftpshare/STAGE/ExcelUpload/TEMPLATE/*.xls or *.xlsx`.

> **NOTE** Ignore this step if files are not present at the location.

15 Frequently Asked Questions (FAQs) and Error Dictionary

This section consists of resolution to the frequently asked questions and error codes noticed during OFSAAI installation.

- Frequently Asked Questions
- Error Dictionary

15.1 Frequently Asked Questions

You can refer to the Frequently Asked Questions which is developed with the interest to help you resolve some of the OFSAAI Installation and configuration issues. This intends to share the knowledge of problem resolution to a few of the known issues. This is not an official support document and just attempts to share the knowledge of problem resolution to a few of the known issues.

15.1.1 OFSAAI FAQs

1. **What are the different components that get installed during OFSAAI?**

   The different components of OFSAAI are illustrated in Components of OFSAAI.

2. **What are the different modes of OFSAAI installation?**

   OFSAAI can be installed only in Silent Mode.

3. **Can the OFSAA Infrastructure components be installed on multi-tier?**

   No.

   OFSAA Infrastructure components (ficapp, ficweb, ficdb) cannot be installed on multi-tier. By default, they are installed on a single-tier. However, OFSAA Infrastructure can be deployed within the n-Tier architecture where the Database, Web Server, and Web application server is installed on separate tiers.

4. **Is the JDK (Java Development Kit) required during the installation of OFSAA? Can it be uninstalled after the OFSAA installation?**

   JDK is not required during the installation of OFSAA and only a runtime is needed. For details, see Hardware and Software Requirements,

   Only JRE (Java Runtime Environment) is required during the installation of OFSAA and cannot be uninstalled as the JRE is used by the OFSAA system to work.

5. **How do I know what are the Operating system, web servers, and other software versions that OFSAA supports?**

   See the Oracle Financial Services Analytical Applications 8.1.2.0.0 Technology Matrix.

6. **What are the different files required to install OFSAAI?**

   The following files are required:

   - `setup.sh`.
   - `envCheck.sh`

- preinstallcheck.sh
- VerInfo.txt
- OFSAAInfrastructure.bin
- validatedXMLinputs.jar
- MyResources_en_US.properties
- log4j.xml
- OFSAAI_InstallConfig.xml
- privileges_config_user.sqlprivileges_atomic_user.sql

7. **What should I do if I get the following error message during installation:**

   "Execute Permission denied"? Check whether all the files provided for OFSAAI installation has execute permissions.

   To give execute permissions, navigate to the directory path where the Installation files are extracted and execute the following command:

   ```
   chmod –R 755 OFS_AAAI_PACK
   ```

8. **"No Java virtual machine could be..."**

   If the error message reads "No Java virtual machine could be found from your PATH environment variable. You must install a VM before running this program", then

   - Check whether the "java path" is set in the PATH variable. See the Hardware and Software Requirements section in this document.
   - Check whether sufficient temporary space is available.
   - Ensure that the movement of OFSAAI Installer text files to the target system is done in the Text mode so that the `setup.sh` file does not contain control line feed characters (^M).

9. **What should I do if I get the following error message during installation, "OracleDriver Files Not Found, Please Choose the Right Path To Continue"?**

   Check whether the provided path for Oracle Driver files is correct and whether the user has permission to access the files.

10. **The installation of OFSAAI was completed successfully! What next?**

    Post the successful completion of the OFSAAI installation, one has to perform the Post Installation steps. See Post-installation.

11. **What is to be done when OFSAAI Installation is unsuccessful?**

    OFSAAI installer generates the log file `OFSAAInfrastructure_Install.log` in the Infrastructure Installation Directory. There are also other log files created in the directories:

    - `< directory path where the Installation files are extracted >/OFS_AAAI_PACK/logs`
    - `< directory path where the Installation files are extracted >/OFS_AAAI_PACK/OFS_AAI/logs`

    If the logs of any of these reported Warnings, Non Fatal Errors, Fatal Errors, or Exceptions, they must be brought to the notice of the OFSAAI My Oracle Support. It is recommended not to proceed until the reported problems are adequately addressed.

12. **How do I completely uninstall OFSAAI?**

    OFSAAI can be completely uninstalled by performing the steps provided in the Uninstall OFSAA Infrastructure section in this guide.

13. **Can OFSAAI config and atomic schemas be on different databases?**

    OFSAAI requires both config and atomic schemas to be present on the same database instance.

14. **How do I grant privileges if a new information domain is created?**

    If you are creating a new information domain, provide a set of privileges (database permissions) to the new Atomic schema.

    a. Log into the database as sys and connect as sysdba user.

    b. Execute the `privileges_atomic_user.sql` file available under the `$FIC_HOME` directory.

    c. Enter the database schema for which you want to grant privileges.

15. **When should I run the MLS utility?**

    See the Multiple Language Support (MLS) Utility section in the OFS Analytical Applications Infrastructure Administration Guide.

16. **What should I do if I get the following error message on the UNIX System terminal while executing ./setup.sh, "Insert New Media. Please insert Disk1 or type its location"?**

    a. Log in as root user on the UNIX machine where OFSAAI is getting installed.

    b. Navigate to the path /etc/security/.

    c. Edit the file limits.conf to add/edit a row for the UNIX user installing OFSAA:

    ```
    <Unix User> soft nofile 15000
    ```

    d. After saving the changes, log in as UNIX user with which OFSAAI is getting installed and execute the command:

    ```
    ulimit -n
    ```

    e. The command must return the value 15000.

17. **How do I verify if the system environment is ready for OFSAAI installation?**

    To verify the system environment meets the minimum requirements for the installation, a Pre-Install Check utility is available within the Install Kit archive file. This utility can also be obtained separately by contacting My Oracle Support.

    See Verifying System Environment section for additional information.

18. **How do I know if the installation is completed successfully?**

    The OFSAA Infrastructure installation performs a post-install health check automatically on the successful installation of the product.

19. **What should I do if there are any exceptions or errors in installation and how to proceed?**

    a. See the Verify the Log File Information section for log file information.

    b. Backup the installation logs.

    c. Share the backup logs with My Oracle Support.

20. **What should I do if I get the following error message during OFSAAI installation on Solaris 11 system?**

    ```
    "Error: OFSAAI-1108
    ORA-00604: error occurred at recursive SQL level 1
    ORA-01882: timezone region not found"
    ```

    Or

    ```
    "Time zone cannot be set as null or 'localtime' "
    ```

    This happens if the time zone is not set, that is NULL or it is set as 'localtime'. Set the environment variable TZ to a valid time zone region in the .profile file. For example,

    TZ=Asia/Calcutta

    export TZ

21. **What should I do if the installation process is abruptly terminated or aborted?**

    If the installation process is abruptly terminated, then the installation is incomplete. To recover from this, follow these steps:

    a. Drop the DB objects in the config and atomic schemas created by OFSAAI installation.

    b. Open the `.profile` and remove the entries made by the OFSAAI installation which are made between the comment statements, #Beginning of entries by OFSAA Infrastructure installation, and #End of entries by OFSAA Infrastructure installation.

    c. Delete the OFSAA install and FTP Share directories created by the OFSAAI installer.

    d. Perform the OFSAAI installation again. See Pre-installation

22. **Does OFSAA support any other web server types, other than the ones stated in the Oracle Financial Services Analytical Applications 8.1.2.0.0 Technology Matrix and Installation Guide?**

    No, all the supported software and versions are stated in the Oracle Financial Services Analytical Applications 8.1.2.0.0 Technology Matrix.

23. **What should I do if the database connection from the connection pool displays the following error message, "java.sql.SQLRecoverableException: IO Error: Connection reset"?**

    This happens while running several database intensive tasks in parallel. To correct this error, add the line securerandom.source=file:/dev/./urandom in the java.security configuration file available in $JAVA_HOME/jre/lib/security/ path.

    > **NOTE** This must be configured on all the machines or VMs where the OFSAAI components are installed.

    If the issue is not resolved even with the preceding settings, check the MTU(Maximum Transmission Unit) settings on the Linux box. For details on MTU settings and updating them, contact your system administrator.

24. **What should I do when I get syntax errors/file not found error messages while invoking setup.sh file from my install archive?**

This can mostly happen due to the following reasons:

- When the installer is not extracted correctly or corrupted during the unzip utility process.
- `setup.sh` file which resides within the install archive is not transferred in ASCII or text mode, which can corrupt the file.

To correct this, follow the steps:

a. Copy the installer (in BINARY mode) to the system on which the OFSAA Infrastructure components will be installed.

b. Unzip the installer using the command:

```
unzip <OFSAAI_Installer>.zip
```

The corrupted `setup.sh` file would have introduced certain ^M characters into the file. You can remove ^M characters from the `setup.sh` file by following these steps:

a. Log in to the server where the installer is copied.

b. Navigate to the directory `< directory path where the Installation files are extracted >/OFS_AAAI_PACK/bin`.

c. Open the `setup.sh` file in the vi editor using the command: `vi setup.sh`.

d. Inside vi editor in Esc mode, type: `%s/^M//g`

> **NOTE** To enter ^M, hold the CTRL key then press V and M in succession.

e. Save the `setup.sh` file by typing: `wq!`

25. **What should I do if I get the following error message while executing ./startofsaai.sh file on the UNIX System terminal "./startofsaai.sh: /java: Execute permission denied"?**

    - Ensure the JAVA_BIN environment variable path is set on the "UNIX user" terminal from where the `startofsaai.sh` file is invoked.
    - Ensure that the `.profile` file, where the environment/ path settings are made, is executed successfully.

26. **What should I do if the OFSAAI Application Server does not proceed even after providing the system password?**

    Ensure that, the System Password provided when prompted during installation is correct. Also, check whether the connection to the "configuration schema" can be established through sqlplus.

27. **Although the OFSAAI installation has completed successfully, when OFSAAI servers are started, and the application URL is accessed, it gives an error message "the page cannot be found or displayed" or "Could not retrieve the list of languages from Server. Please contact the system administrator". What should one do?**

    Ensure OFSAAI servers are started and are running successfully. For details on startup parameter options, see Start the Infrastructure Services section.

For more details on the issue, refer to the logs under `$FIC_HOME /logs` directory.

28. **Is it necessary to provide the specified grants to the Oracle schema user before installation? If yes, can it be revoked after completing the installation?**

    The "Oracle schema" user requires the necessary grants specified before, during, and after the installation process. Grants provided must never be revoked as the application makes use of these grants all the time.

29. **Can we have a distributed OFSAAI Application Server for load balancing?**

    OFSAAI Application server can be scaled out/distributed across different JVM's (machines) based on the various services and Information Domains, in other words, Load balancing can be achieved with the distribution of services.

30. **Why do we need FTPSHARE on all the layers? Can we have ftpshare on another server other than the server where OFSAAI is installed?**

    FTPSHARE is a Metadata Repository directory. All the metadata related files used in Infrastructure are stored in the FTPSHARE directory. The ftpshare contains directories for each Information Domain, with each Information Domain directories holding Erwin, log, and scripts directory. The transfer of data among the Web, Application, and Database servers in Infrastructure takes place through FTP/SFTP.

    You must configure FTP/SFTP and enable communication between the servers by providing App server's FTP/SFTP credentials to the Web server and DB server users.

    Yes, you can have FTPSHARE as a common local storage mount point which can be mounted where OFSAAI is installed.

31. **Is it mandatory to provide the FTP/SFTP password?**

    Yes, OFSAAI needs credentials of the user who has complete permissions on the FTPSHARE directory, and the user must be able to independently log in to the UNIX server.

    For more information, see the Configure OFSAAI_InstallConfig.xml File section.

32. **What are the permissions required for FTPSHARE and when should I give them?**

    It is recommended to provide permissions on FTPSHARE in case of installations done across different machines or VMs (multitier installation).

    In the case of a single-tier installation, 770 permissions can be provided if the UNIX users of OFSAAI and web servers belong to the same UNIX group.

    Additionally, any new file that is created in the FTPSHARE directory of any installation layer must be granted specific/explicit permission.

33. **How to modify the port number currently being used by the Infrastructure application?**

    Port Changer utility can be used to have the Port number modified, which is currently being used by the Infrastructure application. For more information, refer to the *Change IP/ Hostname, Ports, Deployed Paths of the OFSAA Instance* section in the OFS Analytical Applications Infrastructure Administration User Guide.

34. **Are there any in-built system administration users within OFSAAI Application?**

    The two in-built system administration users are provided to configure and setup OFSAAI.

    - SYSADMN

- SYSAUTH

35. **Does OFSAAI Application support both FTP and SFTP?**

    OFSAAI supports both FTP and SFTP configuration.

36. **Is it necessary to enable the FTP/SFTP services to use the OFSAAI?**

    Yes, enabling of FTP/SFTP services and its ports is a pre-requisite step towards using the OFSAAI.

37. **OFSAAI Configuration: Unable to save the server details?**

    - Ensure the input User ID, Password, and Share Name are correct.
    - Ensure FTP/SFTP services are enabled.
    - Have a test FTP/SFTP connection made and confirm if they are successful.

38. **What should I do if I get the following message while creating Information Domain, "Please create a database and then create the information domain"?**

    Information Domain is mapped to only one Database; and thus before the creation of Information Domain, at least one database details must exist.

39. **What should I do if I get the following message during the startup of the backend engine message server, "ConnectToDatabase: FatalError, could not connect to the DB server"?**

    - Verify whether a connection to the Configuration Schema can be established through SQL*PLUS.
    - Verify the Configuration Schema password is modified post-installation.
    - Ensure Oracle Database Alias Name created for Oracle Instance and Oracle Service Name are the same.

40. **What should I do if I get the following message during the startup of the backend engine message server, "Fatal Error, failed to get the user ID from LibSmsConnect"?**

    Ensure the `Reveleus.SEC` file exists under the `$FIC_HOME/conf` directory where the Database components are installed.

41. **Does OFSAAI Application support LDAP authentication?**

    OFSAAI supports LDAP configuration and authentication.

42. **Does OFSAAI support multiple languages?**

    Yes, OFSAAI supports multiple languages.

43. **Does OFSAAI provide any data back-up features?**

    OFSAAI does not have a built-in backup facility. External Storage Infrastructure is recommended for back-up.

44. **What kind of security features does the OFSAAI provide?**

    See the Security Guide for more information.

45. **Does OFSAAI have the ability to enforce periodic password change?**

OFSAAI provides configurable parameters to define the number of days after which the user password must expire and then the user is forced to change the password after the expiration period.

46. **What is the password policy followed in OFSAAI?**

    OFSAAI enforces a minimum password length with a combination of Upper and Lower case characters and alphanumeric strings.

47. **Which version of Erwin Data Modeller does OFSAAI support?**

    See the Hardware and Software Requirements section for more information.

48. **Does OFSAAI provide the mechanism to upload Business Data model?**

    OFSAAI provides two mechanisms for business data model upload:

    - Easy to use GUI based Model upload mechanism to upload the Business Data Model through Data Model Management -->Data Model Maintenance --> Import Model.
    - OFSAAI also provides a model upload utility "`upload.sh`" for uploading the business data model through the command line parameter by executing this shell script file under the path <FIC_HOME>/ficapp/common/FICServer/bin.

    For more details, see the *Model Upload Utility* section of the OFS Analytical Applications Infrastructure User Guide.

49. **How do I apply the incremental change to the existing model when the Business Data model changes?**

    The modified data model can be uploaded into the system and OFSAAI can compare the changes within the data model concerning the one already present in the system and enables propagation of incremental changes in a consistent manner.

50. **What are the different types of uploading a business data Model?**

    OFSAAI supports uploading of the business data model from client desktop and also by picking up the data model from the server location.

51. **Can the OFSAAI Configuration Schema password be modified post-installation?**

    The OFSAAI Configuration Schema password can be modified post-installation. OFSAAI application stores the password in the database and few configuration files, thus any changes to the Configuration Schema password will require updating in those files. For more information, see Modify OFSAAInfrastructure Config Schema Password.

52. **Can the OFSAAI Atomic Schema password be modified?**

    The OFSAAI Atomic Schema password can be modified. OFSAAI application stores the atomic schema password in the database and few configuration files, thus any change to the atomic schema password will require updating those files.

    To change the Atomic Schema password, follow the steps:

    a. Log in to OFSAA.

    b. Navigate to System Configuration > Database Details window. Select the appropriate connection, provide the modified password, and save.

    c. Based on the Web Server installed, follow the steps:

- If you are using Apache as Web server:
  - Update the <Context> -> Resource tag details in the `server.xml` file from the `$CATALINA_HOME/conf` directory. (In case of Tomcat only Atomic <Resource> will exist).
- If you are using WebSphere as Web server:
  - Log in to the WebSphere Administration Console from the left side menu.
  - Navigate to Resources >JDBC > Data Sources. A list of data sources are populated on the right side.
  - Select the appropriate Data Source and edit the connection details. (In this case, both Config and Atomic data sources must be modified).
- If you are using WebLogic as Web server:
  - Log in to the WebLogic Administration Console from the left side menu.
  - Under Domain Structure list box, expand the appropriate Domain and navigate to Services > JDBC >Data Sources. A list of data sources are populated on the right side.
  - Select the appropriate Data Source and edit the connection details. (In this case, both Config and Atomic data sources must be modified).

d. Restart the OFSAAI services

> **NOTE** If the modified passwords are not updated, OFSAAI logs display the message ORA-28000: the account is locked.

53. Does the upload of the Business Data model depend on Java Memory?

Business data model upload through OFSAAI depends on the Java memory settings on the client and server machines. Java memory setting varies with the data model size and the available RAM. Contact My Oracle Support for more details.

54. Why do the Business Metadata Management screens (Business Processors screen) in User Interface take more time to load than other screens?

The Log file in `DynamicServices.xml` which resides in the `$FIC_HOME/conf` directory is continuously being updated/refreshed to cache metadata. This can be observed when you are starting `startofsaai.sh` and if any of the log files (For example, `SMSService.log`) in `DynamicServices.xml` is being continuously refreshed for a longer time.

By default, the Metadata Logfile cache size is set to 1000. If in case the log is being updated beyond this limit, retrospectively the preceding entries are overwritten. For example, the 1001st entry is overwritten by deleting the first entry. This results in the application window taking a longer time to load.

Increase the cache size limit in `Dynamicservices.xml` located at `<FIC_HOME>/conf`, depending on the currently logged count for the specific metadata.

a. Generate the Log report by executing the following query in the config schema.

```
select count(1), t.metadata_name, m.dsn_id from metadata_master m,
metadata_type_master t where m.metadata_type = t.metadata_type
```

```
group by t.metadata_name, m.dsn_id
```

b. The preceding query returns a list of codes with their respective metadata count. You can refer to the "metadata_type_master" table to identify the metadata name.

c. View the log report to identify the metadata which is being updated/refreshed beyond the specified cache size limit. Accordingly, increase the cache size limit in `Dynamicservices.xml` depending on the currently logged count for the specific metadata.

For example, if the "MEASURE_CACHE_SIZE" is set to 1000 and the total measure reported in the log is 1022, increase the limit to 2000 (approximately).

d. Restart Reveleus/OFSAAI servers (Web and APP) and check the issue.

55. What should I do if I get OutOfMemoryError while deploying the EAR file in the WebSphere application server?

The Java memory must be increased in the `ejbdeploy.sh` file which is present under `<WebSphere Install directory>/AppServer/deploytool/itp`. For example,

```
$JAVA_CMD \
-Xbootclasspath/a:$ejbd_bootpath \ Xms256m -Xmx1024m \
```

56. What is the default memory setting configured by the installer?

During OFSAAI installation, the X_ARGS_APP parameter in the `.profile` file is set as given:

```
X_ARGS_APP="-Xms200m -Xmx8g -XX:+UseAdaptiveSizePolicy -
XX:MaxPermSize=1024M -XX:+UseParallelOldGC  -XX:+DisableExplicitGC
```

During the application installation, if 10 times the data model size (data model size*10) is greater than the default Xmx value of 8g (8GB), the installer automatically updates the Xmx value to 10 times the data model size.

57. What configurations should I ensure if my data model size is greater than 2GB?

Ensure the Xmx value in the X_ARGS_APP parameter in the `.profile` file is set as 10 times the data model size.

For example, if it is 2GB, set it as:

```
X_ARGS_APP="-Xms200m –Xmx20g -XX:+UseAdaptiveSizePolicy -
XX:MaxPermSize=1024M -XX:+UseParallelOldGC  -XX:+DisableExplicitGC
```

Then execute the `.profile` file.

58. What should I do if my Hierarchy filter is not reflecting correctly after I make changes to the underlying Hierarchy?

In some cases, the Hierarchy Filters do not save the edits correctly if the underlying Hierarchy is changed. This can occur in hierarchy maintenance, where you have moved a member to another hierarchy branch, and that member is explicitly selected in the Filter and is now a child of a node that is already selected in the Filter. Refer Support Note for the workaround.

59. Can I install an Application Pack on an existing Atomic schema/ Information Domain created manually?

No, you cannot install an Application Pack on existing Atomic schema/Information Domain created manually. Application Packs can be installed only on Atomic Schemas/Information Domain created using schema creator utility and/ or the Application Pack installer.

60. **What should I do if I get the following exception while trying to view the model outputs in Model Outputs screen, "Exception ->Local Path/STAGE/Output file name (No such file or directory)"?**

    Ensure you have created a directory "STAGE" under the path mentioned as "Local Path" in the web server details window. This directory must be created under the local path on every node, in case of web application server clustering.

61. **What should I do if I get the following exception during OFSAA services startup, "Exception in thread "main" java.lang.UnsatisfiedLinkError: net (Not a directory)"?**

    Ensure the JRE referred in `.profile` is not a symbolic link. Correct the path reference to point to a physical JRE installed.

62. **How do you turn off unused Information Domains (Infodoms) from caching?**

    Follow these steps to turn off unused infodoms from caching:

    a. Navigate to `$FIC_HOME/conf` in the APP layer of your OFSAAI installation.

    b. In the `DynamicServices.xml` file, identify the section for <Service code="20">.

    c. Modify the value of parameter CACHE_ON_STARTUP to 0 (default is 1).

    d. Update the same details in the table Aai_Dyn_Svcs_Params of Config Schema for the parameter CACHE_ON_STARTUP. Set the value as 0 and commit the change.

    e. Restart the OFSAAI Services (APP and WEB). For more information, refer to the Start the Infrastructure Services section.

> **NOTE** This setting helps cache the Infodom metadata only for the infodoms that are accessed after the user login. Infodoms which are not accessed, are not cached.

Sample code is as follows:

```
<SERVICE CODE="20"
CLASS="com.iflex.fic.metadata.services.MetadataServiceProvider"
NAME="BMD"
SERVERID="DEFAULT" PATH=" " LOGGERNAME="UMMLOGGER" LOGGERLEVEL="10">
<PARAMETERS>
<PARAMETER NAME="CACHE_ON_STARTUP" VALUE="0" />
<PARAMETER NAME="BACKUP_XML" VALUE="1" />
<PARAMETER NAME="MAX_BACKUP_XML" VALUE="2" />
<PARAMETER NAME="PC_NONBI_BI_SWITCH" VALUE="2048" />
<PARAMETER NAME="HIERARCHY_NODE_LIMIT" VALUE="2000" />
<PARAMETER NAME="ALIAS_CACHE_SIZE" VALUE="1000" />
```

```
<PARAMETER NAME="DATASET_CACHE_SIZE" VALUE="2000" />
<PARAMETER NAME="MEASURE_CACHE_SIZE" VALUE="2000" />
<PARAMETER NAME="HIERARCHY_CACHE_SIZE" VALUE="2000" />
<PARAMETER NAME="DIMENSION_CACHE_SIZE" VALUE="2000" />
<PARAMETER NAME="HIERARCHYATTRIBUTE_CACHE_SIZE" VALUE="1000" />
<PARAMETER NAME="CUBE_CACHE_SIZE" VALUE="1000" />
<PARAMETER NAME="RDM_CACHE_SIZE" VALUE="1000" />
<PARAMETER NAME="BUSINESSPROCESSOR_CACHE_SIZE" VALUE="2000" />
<PARAMETER NAME="DERIVEDENTITY_CACHE_SIZE" VALUE="1000" />
<PARAMETER NAME="LOG_GET_METADATA" VALUE="false" />
<PARAMETER NAME="METADATA_PARALLEL_CACHING" VALUE="0" />
</PARAMETERS>
</SERVICE>
```

63. **While creating an Excel Mapping, after specifying the excel worksheet, the target table, and mapping each column in the worksheet to a target table, I click Save and nothing happens. But when I click Cancel, a message pops up informing me that all changes will be discarded", what is to be done.**

    Check if the version of the browser and JRE Plugin are as mentioned in the Hardware and Software Requirements section of this manual. If not, use the qualified versions as mentioned.

64. **Can multiple OFSAA Infrastructure instances share the same Config Schema?**

    No, only one OFSAA environment can be installed using one Config Schema.

65. **Can Atomic Schema be shared?**

    Yes, it can be shared between two OFSAA instances.

    While setting a firewall, which ports must be opened for communication between the Web Server (Apache HTTP Server/ Oracle HTTP Server/ IBM HTTP Server) and the Web application server (WebSphere/ WebLogic/ Tomcat) for OFSAAI to operate properly?

    The OFSAA Servlet port which is the same as the Web server port must be open. Also, the web application port must be open.

66. **Can I install an already installed application in a different infodom?**

    No, it is not possible to install the same application in two different infodoms.

67. **How can I configure the OFSAA application for High Availability?**

    OFSAA can have active-passive high availability. For more details, refer Configuration for High Availability- Best Practices Guide.

68. **During OFSAA installation should I provide a web application server's IP /Hostname and port or web server's IP/Hostname and port, if the Apache HTTP Server/ Oracle HTTP Server/ IBM HTTP Server are configured?**

    In case the web server is configured, you must enter the Web Server IP Address/Hostname and Port details during OFSAA installation. Here the Servlet port must be the same as the Web Server port.

If Web Server is not configured, the Web application server's IP Address/ Hostname and Port are required during the installation process. Here the Servlet port must be the same as the Web application server port.

69. Is "ReveleusAdminConsoleAgent" applicable for OFSAAI 8.1.2.0.0 and higher versions?

No, ReveleusAdminConsoleAgent is not applicable starting OFSAAI 7.3.3.0.0. There is a change in the way agentservers are managed through `agentstartup.sh` and `agentshutdown.sh`.

70. What should I do when the message server process does not open and I get the following error message, "CI18NProvider::CI18NProvider, Error, unable to connect to the config database"?

This error is displayed due to the following reasons:

- The Config Schema password is already expired.
- If the Config Schema password is going to expire soon and the message like "ORA-28002: the password will expire within 6 days" displays while connecting to Config Schema through SQLPlus.
- The Config Schema password is modified.

To resolve the error, re-set the Config Schema password to the old password. Else, if the Config Schema password is modified to something else then follow these steps:

a. Delete the `$FIC_HOME/conf/Reveleus.SEC` file.

b. Shutdown the `OFSAAI App service: cd $FIC_APP_ HOME/common/FICServer/bin ./stopofsaai.sh`

c. Start the Infrastructure Server in foreground directly on the server or through XWindows software using the command: `./startofsaai.sh`

d. Enter System Password.

e. Enter the new Config schema password. The service starts and initializes if it can successfully connect to the DB and generates the `Reveleus.SEC` file.

f. Post successful startup of the service, if required, the Infrastructure server may be shut down and restarted in the background using nohup mode.

71. What is the mechanism of log file sizing, changing the log file path, and creating backups of the log files?

OFSAAI Log files created under `$FIC_APP_HOME/common/FICServer/logs and <OFSAAI_DEPLOYED_AREA>/<CONTEXT.war>/logs` is configurable in `RevLog4jConfig.xml`.

The default size of the log files (MaxFileSize) is set to 5000kb and the number of maximum backup log files (MaxBackupIndex) retained is set to 5, both of which are configurable. Increasing these parameters to a higher value must depend on the server hardware configurations and may reduce the performance.

To configure the Logs file size on the OFSAA Application server, follow these steps:

a. Navigate to `$FIC_HOME/conf` where OFSAA is installed.

b. Edit the following parameters in the `RevLog4jConfig.xml` file:

- param name="fileName" : Enter the path where the Logs are to be generated.
- param name="size" : Provide the required file size.
- param name="max" : Provide the required number of backup files to be created.

Example:

```
<RollingFile name="REVSERVERAPPENDER"
fileName="<Path_exists>/logs/RevAppserver.log"
      filePattern="<Path_exists>/logs/RevAppserver-%i.log" >
        <PatternLayout>
            <Pattern> [%d{dd-MM-yy HH:mm:ss,SSS zzz aa}{GMT}] [%-
5level] [APP]  [REVELEUS] %m%n</Pattern>
        </PatternLayout>
        <Policies>
           <SizeBasedTriggeringPolicy size="5000 KB" />
        </Policies>
       <DefaultRolloverStrategy max="5">  <!-- number of backup
files -->
       </DefaultRolloverStrategy>
    </RollingFile>
```

c. Navigate to `$FIC_HOME/ficweb/webroot/conf` and configure the deployed area logs. Edit the following parameters in the `RevLog4jConfig.xml` file:

- param name="file": Do not change this value.
- param name="MaxFileSize" : Provide the required file size.
- param name="MaxBackupIndex" : Provide the required number of backup files to be created.

Example:

```
<RollingFile name="REVSERVERAPPENDER"
fileName="${sys:LOG_HOME}/logs/RevAppserver.log"
      filePattern="${sys:LOG_HOME}/logs/RevAppserver-%i.log" >
        <PatternLayout>
            <Pattern> [%d{dd-MM-yy HH:mm:ss,SSS zzz aa}{GMT}] [%-
5level] [WEB]  [REVELEUS] %m%n</Pattern>
        </PatternLayout>
        <Policies>
           <SizeBasedTriggeringPolicy size="5000 KB" />
        </Policies>
       <DefaultRolloverStrategy max="5">  <!-- number of backup
files -->
       </DefaultRolloverStrategy>
```

```
</RollingFile>
```

To configure the deployed area log file path, modify the value in the **LOG_HOME_PATH** parameter in the **aai_setup_props** table.

72. Can I point the environment with HTTP enabled to HTTPS after installation and vice versa?

Follow these steps:

a. Create SSL related certificates and import to respective servers.

b. Enable SSL on a desired Port (example 9443) on your existing and already deployed web application servers.

c. Replace the protocol as https and new ssl port (FIC_SERVLET_PORT) configured and in all the URLs specified on the following files:

- `$FIC_HOME/ficapp/common/FICServer/conf/FICWeb.cfg`
- `$FIC_HOME/ficapp/icc/conf/WSMREService.properties`
- `$FIC_HOME/ficdb/conf/MDBPublishExecution.properties`
- `$FIC_HOME/ficdb/conf/ObjAppMap.properties`
- `$FIC_HOME/utility/Migration/conf/WSMigration.properties`
- `$FIC_HOME/utility/WSExecution/conf/WSExecution.properties`

d. XML attribute/Node values are now moved to the config schema table AAI_SETUP_PROPS where v_prop_name in ('FIC_WEBSERVER_PORT', 'FIC_WEBPROTOCOL').

- `FIC_WEBSERVER_PORT=9443`
- `FIC_WEBPROTOCOL=https`
- `$FIC_HOME/conf/LookUpServices.xml and $FIC_HOME/ficweb/webroot/conf/LookUpServices.xml`
- `PORT="9443"  PROTOCOL="https:"`

e. Log in to Config Schema and execute the following SQL command to replace protocol and SSL port.

```
SQL> update configuration cn set cn.paramvalue='9443' where
cn.paramname='SERVLET_ENGINE_PORT';

SQL> update configuration cn set
cn.paramvalue=replace(cn.paramvalue,'http:','https:') where
cn.paramname='FormsManagerCacheReload';

SQL> update web_server_info ws      set
ws.servletport='9443',ws.servletprotocol='https';
```

f. Create EAR/WAR file and Re-Deploy.

73. What should I do if my schema creator log has the following exception:

```
Failed to detect a valid hadoop home directory java.io.IOException:
HADOOP_HOME or hadoop.home.dir are not set. at
org.apache.hadoop.util.Shell.checkHadoopHome(Shell.java:302)
```

```
at org.apache.hadoop.util.Shell.<clinit>(Shell.java:327) at
org.apache.hadoop.util.StringUtils.<clinit>(StringUtils.java:79) at
org.apache.hadoop.security.Groups.parseStaticMapping(Groups.java:130)
at org.apache.hadoop.security.Groups.<init>(Groups.java:94) at
org.apache.hadoop.security.Groups.<init>(Groups.java:74) at
org.apache.hadoop.security.Groups.getUserToGroupsMappingService(Groups.
java:30     3) at
org.apache.hadoop.security.UserGroupInformation.initialize(UserGroupInf
ormation.ja va:283) at
org.apache.hadoop.security.UserGroupInformation.setConfiguration(UserGr
oupInfor mation.java:311) at HdfsDbUtil.connect(HdfsDbUtil.java:162) at
SchemaParserUtil.validateHiveConnection(SchemaParserUtil.java:1359) at
SchemaParserUtil.checkAllPreChecks(SchemaParserUtil.java:1011) at
Main.execute(Main.java:317) at Main.main(Main.java:145) This occurs
when HADOOP_HOME environment variable is not set.
```

You can ignore this exception since we do not mandate to install HIVE where OFSAA is installed.

74. What should I do if the sliced data model upload takes a long time to complete?

If the metadata cache size is set to a lower value than the actual count of each metadata type (hierarchy, dataset, dimension etc), then it gets into performance degrade issues. We have to increase the cache size for each metadata type according to the count in the environment.

Following are the parameters in `DynamicServices.xml` to be configured depends on the metadata count in your environment.

```
<PARAMETER NAME="HIERARCHY_NODE_LIMIT" VALUE="2000"/>

<PARAMETER NAME="ALIAS_CACHE_SIZE" VALUE="1000"/>

<PARAMETER NAME="DATASET_CACHE_SIZE" VALUE="2000"/>

<PARAMETER NAME="MEASURE_CACHE_SIZE" VALUE="3000"/>

<PARAMETER NAME="HIERARCHY_CACHE_SIZE" VALUE="2000"/>

<PARAMETER NAME="DIMENSION_CACHE_SIZE" VALUE="2000"/>

<PARAMETER NAME="CUBE_CACHE_SIZE" VALUE="1000"/>

<PARAMETER NAME="BUSINESSPROCESSOR_CACHE_SIZE" VALUE="2000"/>

<PARAMETER NAME="DERIVEDENTITY_CACHE_SIZE" VALUE="1000"/>

Metadata count can be derived based on the following queries:

select count(1) from metadata_master where metadata_version=0  --- for
all metadata

select count(1) from metadata_master where metadata_version=0  and
metadata_type=1      --- for measure

select count(1) from metadata_master where metadata_version=0  and
metadata_type=2      --- for Dimension

select count(1) from metadata_master where metadata_version=0  and
metadata_type=3      --- for HCY

select count(1) from metadata_master where metadata_version=0  and
metadata_type=4      --- for DATASET

select count(1) from metadata_master where metadata_version=0 and
metadata_type=59     --- for BP's
```

```
select count(1) from metadata_master where metadata_version=0 and
metadata_type=54     --- for Alias

select count(1) from metadata_master where metadata_version=0 and
metadata_type=5      --- for CUBES

select count(1) from metadata_master where metadata_version=0 and
metadata_type=856    --- for Derived Entity
```

75. **For LDAP authentication, which server connects with the LDAP server, the Application server (where ofsaai is installed), or Web application server (where EAR is deployed)?**

    For LDAP authentication, the Application server (ficapp) connects with the LDAP server.

76. **The LDAP server in the setup listens on secure protocol ldaps (port 636). I have the root certificate of the LDAP server for SSL, and would like to know where to offload this certificate?**

    You must import the certificate into the JDK/JVM used by Reveleus server in ficapp layer.

77. **How to relocate FTPSHARE directory, change IP HOST name, and deployed area in OFSAA?**

    You can run the `PortC.jar` utility. For more details, refer *Change IP/ Hostname, Ports, Deployed Paths of the OFSAA Instance* section in the OFS Analytical Applications Infrastructure Administration Guide.

78. **How do we identify the list of ports that are used by/configured in an OFSAA environment?**

    a. Navigate to `$FIC_HOME` directory on Target.

    b. Refer to the `PortsDef.log` file.

79. **What should I do if I get the following error message, "Error while fetching open cursor value Status : FAIL"?**

    This error occurs while executing `envCheck.sh` because the user does not have access to the V$parameter. This error does not occur due to sysdba or non sysdba privileges provided they have access/grants to the V$parameter.

80. **What should I do when an entity containing many attributes (>100 columns) is selected as a Source entity and the Data Mapping (T2T definition) save operation takes longer than expected with the hourglass in the UI continuously rotating?**

    a. Locate the `webserver deployed area webroot/conf/excludeURLList.cfg` file.

    b. Modify the following entries:

    ```
    [SQLIA]./dataIntegrator/ to [ALL]./dataIntegrator/

    [SQLIA]./ETLExtractionServlet to

    [ALL]./ETLExtractionServlet
    ```

    c. Save the changes and restart the webserver.

    d. Resave the definition.

81. **What should I do if I get the following error message when I try to start the OLAP server:**

    ```
    ./olapdataserver: error while loading shared libraries: libessapinu.so:

    cannot open shared object file: No such file or directory FATAL ERROR
    :- OLAP DATA SERVER start up failed.
    ```

This error occurs when the OLAP component is not configured and the OLAP feature in OFSAA is not used. However, this error can be ignored.

82. What should I do if I get the error "FATAL ERROR-Problem with OFSAA Service" during the OFS_AAAI_PACK installation?

Increase the sleep counter (default value is 80) to a higher value in the following section of the `OFS_AAAI_PACK/OFSAAIUpdate.sh` file:

```
if [ $count -eq 0 ] ; then sleep 80;
count=` grep -i "FICServer Initialization Complete"
$FIC_HOME/ficapp/common/FICServer/bin/nohup.out|wc -l ` fi
if [[ $count -gt 0 ]] ; then echo OFSAA Service - OK
else
fi
echo FATAL ERROR-Problem with OFSAA Service exit 1
```

83. What should I do if I get the below errors while applying one-off patch on TCPS environment? "

- Error: `Could not find or load main class.`

  For example
  `-Doracle.net.wallet_location=.scratch.oraofss.app.wallet"`

  Solution: `X ARGS GEN` variable assignments should **be written in one** single line in `.profile` file. Copy the following code snippet and paste it in your editor.

  ```
  X_ARGS_GEN="-Doracle.net.tns_admin=$TNS_ADMIN-
  Doracle.net.wallet_location=$wallet_loc-
  Doracle.net.ssl_server_dn_match=true -
  Djavax.net.ssl.trustStoreType=SSO-
  Djavax.net.ssl.trustStore=cwallet.sso -Doracle.net.ssl_version=1.2"
  ```

- IO Error: `IO Error sun.security.validator.ValidatorException: PKIX path building failed: sun.security.provider.certpath.SunCertPathBuilderException: unable to find valid certification path to requested target, Authentication lapse 0 ms.`

  Solution: Make sure that all the following Java properties have valid values:

  - `oracle.net.tns_admin`
  - `oracle.net.wallet_location`
  - `oracle.net.ssl_server_dn_match`
  - `javax.net.ssl.trustStoreType`
  - `javax.net.ssl.trustStore`
  - `oracle.net.ssl_version`

15.1.2 Application Pack 8.1.2.0.0 FAQs

1. What is an Application pack?

An Application Pack is a suite of products. For more information, refer About Oracle Financial Services Analytical Applications (OFSAA) Application Packs.

2. **Can I get a standalone installer for OFSAAI 8.1?**

   No. AAI is part of every application pack and installs automatically.

3. **Where can I download OFSAA 8.1.2.0.0 Application Pack?**

   You can download the OFSAAI 8.1.2.0.0 Application Pack from Oracle Software Delivery Cloud (OSDC).

4. **What are the minimum system and software requirements for the OFSAA 8.1 Application Pack?**

   Refer to Hardware and Software Requirements for more information.

5. **Is my environment compatible with OFSAA 8.1.2.0.0 Application Pack?**

   Environment Check utility performs the task. It is part of the install and can also be run separately.

6. **Does the OFSAA 8.1.2.0.0 Application Pack support all Operating systems?**

   Refer to the Hardware and Software Requirements section.

7. **How can I install the OFSAA 8.1.2.0.0 Application Pack?**

   Refer to Oracle Financial Services Advanced Analytical Infrastructure Installation And Configuration Guide.

8. **Does this installation require any Third-party Softwares?**

   For details on the third-party software tools used, see the *OFSAA Licensing Information User Manual Release 8.1.2.0.0* available in the OHC Documentation Library.

9. **What languages are supported during the OFSAA 8.1.2.0.0 Application Pack installation?**

   US English is the language supported.

10. **What mode of installations OFSAA Application Pack supports? [that is., Silent, GUI]**

    OFSAA Application Packs support only Silent Mode.

11. **Does OFSAA 8.1.2.0.0 Application Pack support Multi-tier Installations?**

    OFSAA 8.1.2.0.0 supports only a single-tier installation. For more information refer to the OFS AAI FAQs section.

12. **Does this Application Pack validate all prerequisites required for this installation like Memory, Disk Space, and so on?**

    Yes. The pre-requisite checks are done by the respective application pack installer.

13. **What happens if it aborts during the installation of any application/products within an Application pack?**

    You must restore the system and retrigger the installation

14. **Does this Application pack 'Roll Back' if any application installation fails due to errors?**

    The rollback of installation is not supported.

15. **Does the Application pack install all applications bundled?**

Only Application pack system which are enabled are installed. In order to enable other licensed Applications, you need to reinstall by making the flag as Y. See the Table 15: OFS_<APP PACK>.xml File Parameters, APP_ID/ ENABLE attribute for information on how to enable. However, in case of reinstallation to enable the other Applications, execution of the schema creation utility must be skipped if it does not include any additional sandboxes to be created.

16. **Can I re-install any of the Application Packs?**

    You can retrigger in case of failure.

17. **Does this Application pack allow enabling/disabling any of the applications installed?**

    Yes, you can enable but you cannot disable once the product is enabled in an environment.

18. **I have installed one application in an Application pack, can I install any of the new applications within the Application pack later?**

    Yes, the installation of additional applications is done by setting the flag as **Y**. See the Table 15: OFS_<APP PACK>.xml File Parameters, APP_ID/ ENABLE attribute for information on how to enable. However, in case of a reinstallation, to enable the other Applications, skip the execution of the schema creation utility if it does not include any additional sandboxes to be created.

19. **How many OFSAA Infrastructures can be installed in a single server?**

    There are no issue in installing separate OFSAAI installations, each with their own PFT/FTP installations and separate associated database instances and separate Web Server installations on the same server as long as adequate memory is allocated for each instance and as long as each OFSAAI installation is installed using a separate UNIX user and profile. Care must be taken when running multiple OFSAAI installations on a single server. Adequate memory is required for each installation as several OFSAAI processes (model upload, DEFQ services, etc) take significant amounts of memory. So it depends on your server's memory.

20. **Is it possible to install OFSAA 8.1.2.0.0 Application pack on an existing 'Infodom' where another OFSAA 8.1.2.0.0 application is installed?**

    Yes. However, the Behavioral Detection Application Pack and Compliance Regulatory Reporting Application pack are the exceptions. They must be installed in a different Infodom.

21. **Can I select an Infodom for the Application pack during installation?**

    Yes. You can select or change the required infodom.

22. **Can I install all Application Packs in a 'Single Infodom'?**

    Yes. But, the Behavioral Detection Application Pack and Compliance Regulatory Reporting Application Pack are the exceptions. They must be installed in a different Infodom.

23. **Is it possible to install applications on different Infodom within the Application pack? (For example, I want to install LRM and MR in two infodoms)**

    Applications within the application pack have to be installed in the same information domain in the same environment.

24. **How many Infodoms can be created over a single OFSAA Infrastructure of 8.1.2.0.0?**

    You can install only one infodom during installation. But after installation, you can create multiple infodoms.

25. **Is the 'Data Model' bundled specifically to an Application pack or an individual application?**

A merged data model for all applications within the application pack is bundled and uploaded.

26. **Is it possible to install OFS Enterprise Modeling later?**

    OFS Enterprise Modeling is a separate product and can be enabled as an option later from any application pack that bundles Enterprise Modeling. For more information, see Enable Financial Services Enterprise Modeling on Another Application Pack.

27. **Does the Application pack create a sandbox automatically for the required applications?**

    Yes, Sandbox creation is part of the application install process.

28. **Are upgrade Kits available for individual applications or the complete Application Pack?**

29. Maintenance Level (ML) Release / Minor Release upgrades are available across all applications.

30. **Can I upgrade AAI only?**

    Yes, you can upgrade AAI alone.

31. **Can I upgrade one application within the Application Pack? (For example, I want to upgrade LRM in the Treasury Application pack, but not MR.)**

    No, an upgrade is applied to all applications in the application pack.

32. **Is it possible to uninstall any Application from the Application pack?**

    No, it is not possible to uninstall any Application from the Application Pack.

33. **Can I uninstall the entire Application Pack?**

    No, you cannot uninstall the Application Pack.

34. **Is it possible to uninstall only the application and retain AAI in the installed environment?**

    No, you cannot uninstall only the application and retain AAI in the installed environment.

35. **Does Application Pack contain all Language Packs supported?**

    Language Packs must be installed on the application packs.

36. **Can I install an Application Pack over another Application Pack (that is the same infodom or different infodom)?**

    Yes, you can install an Application Pack over another Application Pack in the same information domain or different information domain. But Behavioral Detection Application Pack and Compliance Regulatory Reporting Application Pack, Asset Liability Management Application Pack, and Profitability Application Pack are the exceptions. They must be installed in a different Infodom.

37. **What should I do if I get the following error message while running the schema creator utility, "HostName in input xml is not matching with the local hostname"?**

    One possible reason can be the machine is configured for zonal partitioning. Ensure all the known IP Addresses of the machine are present in the `/etc/hosts` file.

38. **What are the Java versions supported in OFSAAAI Application Pack version 8.1.2.0.0?**

    See the Hardware and Software Requirements section.

39. **Is OFSAAAI Application Pack version 8.1.2.0.0 supported on Java 9 and Java 11?**

For information about supported Java versions, see the Hardware and Software Requirements section.

40. **What should I do when I get "[ERROR] - Error : APP Setup bin file failed." message during OFS_Application_PACK installation?**

    This is a generic error message that appears during application installation failure. You must check the installation log files for more information about what failed the installation.

    However, if the message is displayed and the log files are not generated, this can be a temp directory issue. The resolution is that your UNIX administrator has to disable the NOEXEC option. The installers extract the installation files into the `/tmp` directory, and if NOEXEC is enabled, the execution of binaries will not happen in the directory and the installation fails. Re-run the installer after the configuration is changed. For detailed information, see the support note at https://support.oracle.com/epmos/faces/DocumentDisplay?id=2340045.1.

15.2 Error Dictionary

The contents of this section are created with the interest to help you resolve the installation issues if any. There is a compilation of all the possible errors that might arise during the installation process with the possible cause and the resolution to quickly fix the issue and proceed further with the installation.

OFSAAI installer performs all the pre-requisite validation check during installation. Any errors encountered in the process is displayed with an appropriate Error Code. You can refer to the Error Dictionary to find the exact cause and resolution to rectify the error.

This section includes the following topics:

- Access the Error Dictionary
- Error Code Dictionary

15.2.1 Access the Error Dictionary

Instead of scrolling through the document to find the error code, you can use the pdf search functionality. In the "Find" dialog available in any of the Adobe Acrobat version that you are using to view the pdf document, follow these instructions to quickly find the error resolution:

1. With the Installation pdf open, press Ctrl+F or select Edit > Find. The Find dialog is displayed as indicated.
2. Enter the error code that is displayed on the screen during Infrastructure installation.
3. Press Enter. The search results are displayed and highlighted.
4. View the details of the issues, its cause, and resolution specific to the error code. Repeat the step to find an answer to any other errors that you notice during installation. If you are not able to resolve the issue even after following the steps provided in the resolution, you can contact support.oracle.com along with log files and appropriate screenshots.

15.2.2 Error Code Dictionary

Table 29: Error Code Dictionary

Error Code	Cause	Resolution
OFSAAI-1001	UNIX shell is not "korn" shell.	Change the shell type to "korn". Use the chsh UNIX command to change the SHELL type. Shell type can also be changed by specifying the shell path for the UNIX user in the /etc/passwd file. **Note:** The chsh command is not available in Solaris OS.
OFSAAI-1002	No proper arguments are available	Provide proper arguments. Invoke the `Setup.sh` file using SILENT. Example: `./Setup.sh SILENT`
OFSAAI-1004	File `.profile` is not present in $HOME.	Create the `.profile` file in the `$HOME` directory, that is, in the home directory of the user.
OFSAAI-1005	`OFSAAInfrastructure.bin` file is not present in the current directory.	Copy the `OFSAAInfrastructure.bin` file into the installation kit directory.
OFSAAI-1006	`CustReg.DAT` file is not present in the current directory.	Copy the `CustReg.DAT` file into the installation kit directory.
OFSAAI-1007	`OFSAAI_InstallConfig.xml` file is not present in the current directory.	Copy the `OFSAAI_InstallConfig.xml` file into the installation kit directory.
OFSAAI-1008	`validateXMLInputs.jar` file is not present in the current directory.	Copy the `validateXMLInputs.jar` file into the installation kit directory.
OFSAAI-1009	`log4j.xml` file is not present in the current directory.	Copy the `log4j.xml` file into the installation kit directory.
OFSAAI-1010	An unknown error occurred.	Make sure to provide a proper argument (SILENT) to the `Setup.sh` file.
OFSAAI-1011	XML validation failed.	Check the InfrastructurePreValidations.Log file for more details.
OFSAAI-1012	Property file with locale name does not exist.	Copy the `MyResources_en_US.properties` file to the setup kit directory and keep en_US in the LOCALE tag of the `OFSAAI_InstallConfig.xml` file.
OFSAAI-1013	`OFSAAI_InstallConfig.xml/OFSAAI_PostInstallConfig.xml` file not found.	Copy the `OFSAAI_InstallConfig.xml/OFSAAI_PostInstallConfig.xml` file to the setup kit directory.
OFSAAI-1014	XML node value is blank.	Make sure all node values except SMTPSERVER, PROXYHOST, PROXYPORT, PROXYUSERNAME, PROXYPASSWORD, NONPROXYHOST, or RAC_URL are not blank.

Error Code	Cause	Resolution
OFSAAI-1015	XML is not well-formed.	Execute the command dos2unix `OFSAAI_InstallConfig.xml` file to convert a plain text file from DOS/MAC format to UNIX format. OR Ensure that the `OFSAAI_InstallConfig.xml` file is valid. Try to open the file through a web browser for a quick way to check validity. If it is not getting opened, create a new `OFSAAI_InstallConfig.xml` file using the `XML_Utility.jar` file.
OFSAAI-1016	The user installation directory contains blank spaces.	Provide an installation path that does not contain spaces. Check the tag USER_INSTALL_DIR in the `OFSAAI_InstallConfig.xml` file. This path must not contain any spaces.
OFSAAI-1017	The user installation directory is invalid.	Provide a valid installation path. Check if you can create the directory mentioned in the `USER_INSTALL_DIR` tag value of the `OFSAAI_InstallConfig.xml` file. See the My Oracle Support reference document for a workaround on this issue: https://mosemp.us.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=192791484383909&id=2412630.1&_afrWindowMode=0&_adf.ctrl-state=u2t2m1rei_4.

OFSAA Support

Raise a Service Request (SR) in My Oracle Support for queries related to OFSAA applications.

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