

Oracle® Financial Services

Stress Testing and Scenario Analytics

Installation Guide



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1

Preface

This section provides supporting information for the Oracle Financial Services Stress Testing and Scenario Analytics Installation Guide.

Before you begin the installation, ensure that you have access to [My Oracle Support](#) with the required login credentials to quickly notify us of any issues at any stage.

Audience

The OFS STSA Installation Guide is intended for administrators, business users, strategists, data analysts, and implementation consultants who are responsible for installing and maintaining the application pack components.

This document assumes that you have experience installing enterprise components and basic knowledge of the following:

- Oracle Financial Services Stress Testing and Scenario Analytics components
- OFSAA architecture
- UNIX commands
- Database concepts
- Web server or web application server

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Conventions

The following text conventions are used in this document.

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	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, text that appears on the screen, or text that you enter.

2

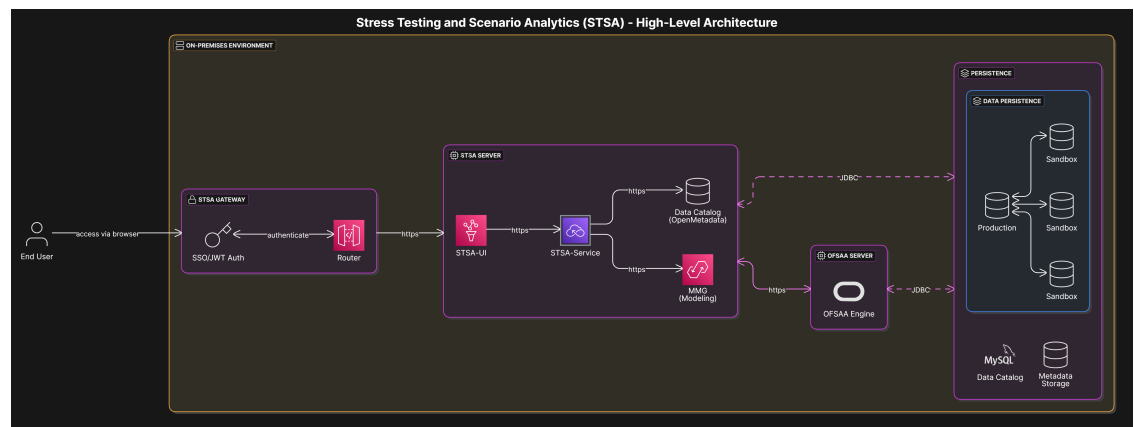
Introduction

Oracle Financial Service Stress Testing and Scenario Analytics (OFS STA) is a unified solution that empowers banks and financial institutions to define and perform enterprise-wide stress tests and scenario analysis in an integrated and centralized manner. The solution helps institutions to comply with their regulatory stress testing requirements and carry out adhoc impact assessments and embrace scenario analysis as part of their BAU processes and decision-making.

2.1 Deployment Topology

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

Figure 2-1 STSA Topology



2.2 Components of STSA

The following are the components of Oracle Financial Services Stress Testing and Scenario Analytics (STSA) Application:

- Data Catalog
- Configuration Manager
- Portfolio
- Metric
- Variable
- Model
- Process
- Analysis Configuration

- Scenario
- Project
- Model Management & Governance (MMG)

2.3 Installation Checklist

To complete the installation process:

1. [Install the OpenMetadata.](#)
2. Install Oracle Analytics Server version 7.0.
3. Install OFS STSA.
The OFS STSA installer is bundled with OFS MMG.

3

Hardware and Software Requirements

The following are the hardware and software requirements:

Table 3-1 Hardware and Software Requirements

Category	Version
Processor Type	Linux x86-64
OS Version	Oracle Linux Server release 8.4 and later versions
Java Version	OpenJDK 17.0.x
Database Server	Oracle Database 19c (19.3+) Enterprise Ed.
OpenMetadata (OM)	Version 1.7.5
Java	Version 17 and 21
MySQL	Version 8.0.0 and later versions
Oracle Analytics	Server version 7.6
Oracle Database	Version 19 and 23
Python	Version 3.10
Airflow	Version 2.8.4
OS	OEL9, OEL8 and Solaris

3.1 License Information

For details on the third-party software tools used, see the [OFSAALicensing Information User Manual Release 8.1.2.0.0](#).

4

Preinstallation

This section lists all the prerequisites to install OFS STSA.

4.1 Installing OpenMetadata

Install the following libraries, and softwares applications before installing OpenMetadata (OM):

Prerequisites

Install the following libraries, and softwares applications before installing OpenMetadata (OM):

1. Oracle Linux version 8.
2. Linux Libraries → "Development Tools" and gcc gcc-c++ sqlite-devel python39-devel cyrus-sasl-devel bzip2-devel libffi libffi-devel openssl-devel mysql mysql-devel
3. MySQL version 8.0.3.2
4. JDK version 17
5. Python version 3.10 or greater
6. Create the following databases in MySQL:

```
CREATE DATABASE openmetadata_db;
CREATE DATABASE airflow_db CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci;
CREATE USER 'openmetadata_user'@'%' IDENTIFIED BY 'openmetadata_password';
CREATE USER 'airflow_user'@'%' IDENTIFIED BY 'airflow_pass';
CREATE USER 'airflow_user'@'localhost' IDENTIFIED BY 'airflow_pass';
GRANT ALL PRIVILEGES ON openmetadata_db.* TO 'openmetadata_user'@'%' WITH
GRANT OPTION;
GRANT ALL PRIVILEGES ON airflow_db.* TO 'airflow_user'@'%' WITH GRANT
OPTION;
GRANT ALL PRIVILEGES ON airflow_db.* TO 'airflow_user'@'localhost' WITH
GRANT OPTION;
commit;
```

7. Install Apache Airflow Version 2.9.3. To do so:
 - a. (Optional) Set up a proxy, if your network requires it:

```
export http_proxy=<YOUR_PROXY_URL>
export https_proxy=<YOUR_PROXY_URL>
```

Note

Skip this step if a proxy is not required.

- b. Define the Airflow installation settings and environment variables. To do so:
 - i. Specify the installation directory (for example, /your/airflow/install/dir).
 - ii. Identify the MySQL host and port (for example, localhost, 3306).
 - iii. Provide the Airflow database name, database user, and password (for example, airflow_db, airflow_user, airflow_pass).
 - iv. Define the Airflow administrator username, password, and email address.

Example exports (replace the placeholders with values specific to your environment):

```
export INSTALL_DIR=<YOUR_INSTALL_DIR>
export AIRFLOW_HOME=$INSTALL_DIR/airflow
export MYSQL_DB_HOST=<YOUR_MYSQL_DB_HOST>
export MYSQL_DB_PORT=<YOUR_MYSQL_DB_PORT>
```

- c. Create the required Airflow directories. Run the following command:


```
mkdir -p "$AIRFLOW_HOME" chmod 755 -R "$AIRFLOW_HOME"
```
- d. Create and activate a Python virtual environment. Run the following command:


```
cd "$INSTALL_DIR" python3 -m venv venv source venv/bin/activate
```
- e. Upgrade pip to the latest version. Run the following command:


```
python3 -m pip install --upgrade pip
```
- f. Install the required dependencies. Adjust the versions as required to align with your compatibility matrix:

```
pip install "openmetadata-managed-apis~=1.7.7"
pip install "openmetadata-ingestion[all]~=1.7.7"
pip install "apache-airflow==2.9.3"
pip install "python-daemon>=3.0.0"
```

- g. (Optional) Remove unneeded Apache Airflow providers. Run the following command:


```
pip freeze | grep "apache-airflow-providers" | grep -v "docker|http" | xargs pip uninstall -y
```

Note

Run this step only if you want to prune unused providers.

- h. Configure the Airflow database connection. To do so:
 - i. Set the required environment variables:


```
export AIRFLOW_DB=<YOUR_DB_NAME>
export DB_USER=<YOUR_DB_USER>
export DB_PASSWORD=<YOUR_DB_PASSWORD>
export DB_SCHEME=mysql+pymysql

export AIRFLOW_ADMIN_USER=<ADMIN_USERNAME>
export AIRFLOW_ADMIN_PASSWORD=<ADMIN_PASSWORD>
export AIRFLOW_ADMIN_EMAIL=<ADMIN_EMAIL>
```
 - ii. Build and export the SQLAlchemy database connection string. Run the following command:

```
export AIRFLOW_DATABASE_SQL_ALCHEMY_CONN="mysql+pymysql://$
{DB_USER}:${DB_PASSWORD}@${MYSQL_DB_HOST}:${MYSQL_DB_PORT}/$
{AIRFLOW_DB}"
```

- i. Update `airflow.cfg` by running the following commands:

```
sed -i "s#(sql_alchemy_conn = \).*\1$
{AIRFLOW__DATABASE__SQL_ALCHEMY_CONN}#" $AIRFLOW_HOME/airflow.cfg
sed -i "s#(hostname_callable =
\).*\1socket.gethostname#" $AIRFLOW_HOME/airflow.cfg
sed -i "s#(auth_backends =
\).*\1airflow.api.auth.backend.basic_auth,airflow.api.auth.backend.sess
ion#" $AIRFLOW_HOME/airflow.cfg
sed -i "s#(executor = \).*\1LocalExecutor#" $AIRFLOW_HOME/airflow.cfg
```

- j. Initialize the Airflow database. Run the following command:

```
airflow db init
```

- k. Create an Administrator Account. To do so:

- i. Create the Airflow administrator user by running the following command:

```
airflow users create \ --username $AIRFLOW_ADMIN_USER \ --
firstname <ADMIN_FIRSTNAME> \ --lastname <ADMIN_LASTNAME> \
--role Admin \ --email $AIRFLOW_ADMIN_EMAIL \ --
password $AIRFLOW_ADMIN_PASSWORD
```

- ii. (Optional) Run the following command to apply any pending database migrations:

```
airflow db migrate
```

- l. Start Apache Airflow. To do so:

- i. Start Airflow in standalone mode:

```
airflow standalone
```

- ii. To run Airflow in the background, use the following command:

```
airflow standalone >> ./airflow.log 2>&1 &
```

- iii. Alternatively, start the webserver and scheduler as separate processes:

```
airflow webserver &
airflow scheduler &
```

Note

- Replace all `<...>` placeholders with values specific to your environment.
- Ensure that Python 3.10 and pip are installed, a MySQL instance is running and accessible, and access to PyPI and GitHub is available.
- Follow the steps in order, providing the necessary values at each point.

8. Install and Start OpenSearch:

- a. Navigate to your intended install directory. To do so, run the following command:

```
cd <OpenSearch Directory>
```

- b. Download OpenSearch installer version 2.7.0 from the following site:
<https://artifacts.opensearch.org/releases/bundle/opensearch/2.7.0/opensearch-2.7.0-linux-x64.tar.gz>

- c. Untar the release download and set permissions

```
chmod 777 opensearch-2.7.0-linux-x64.tar.gz

tar -xvf opensearch-2.7.0-linux-x64.tar.gz

rm -f opensearch-2.7.0-linux-x64.tar.gz

chmod -R 755 opensearch-2.7.0/

echo 'plugins.security.disabled: true' >> opensearch-2.7.0/
config/opensearch.yml
```

- d. Start OpenSearch as a background process. To do so, run the following command:
cd opensearch-2.7.0/ ./bin/opensearch -d -p pid

Note

Ensure that OpenSearch is fully started and operational before proceeding with the startup of OpenMetadata or any other dependent services.

- 9. Create and update the `set_env.env` environment variable file with the locations of the variables in the installation directory.
Provide the following details for each variable in the file:

```
OMD_INS_DIR=<OPEN METADATA INSTALLATION PATH>
LOCAL_REPO_DIR=<OPEN METADATA INSTALLATION PATH>/local_repo
AIRFLOW_HOME=<OPEN METADATA INSTALLATION PATH>/airflow
PYTHON_VENV_PATH=<PYTHON PATH>
HTTP_PROXY_URL=http://<PROXY HOST>:80
HTTPS_PROXY_URL=http://<PROXY HOST>:80
MYSQL_DB_PORT=<DATABASE HOST>MYSQL_DB_PORT=<DATABASE PORT>
AUTHENTICATION_CLIENT_ID=<AUTHENTICATION_CLIENT_ID>
AUTHENTICATION_AUTHORITY=<AUTHENTICATION_AUTHORITY>
```

Consider the following file as an example:

```
OMD_INS_DIR=/scratch/openmetadata-ins-dir
LOCAL_REPO_DIR=/scratch/openmetadata-ins-dir/local_repo
AIRFLOW_HOME=/scratch/openmetadata-ins-dir/airflow
PYTHON_INS_DIR=/scratch/openmetadata-ins-dir/python39
```

```
HTTP_PROXY_URL=http://www.proxy-alias7.us.oracle.com:80
HTTPS_PROXY_URL=http://www.proxy-alias7.us.oracle.com:80
```

- 10. Install OpenMetadata v1.7.7. To do so:

Note

Replace the example paths (such as /scratch/openmetadata-ins-dir) with your actual installation directories throughout the steps below.

- a. Create the OpenMetadata Database (MySQL). To do so:

Note

This step is typically completed as part of Step 6 in this section. If not already performed, complete it before proceeding.

Connect to your MySQL server and execute below commands:

```
CREATE DATABASE openmetadata_db;  
  
GRANT ALL PRIVILEGES ON openmetadata_db.* TO  
'openmetadata_user'@'%' IDENTIFIED BY '<YOUR_PASSWORD>' WITH  
GRANT OPTION;
```

Note

Replace <YOUR_PASSWORD> with your chosen password.

- b. Create a Working Directory. To do so, you must choose a directory location for installation.
- ```
mkdir openmetadata
cd openmetadata
```
- c. Download and Extract OpenMetadata. To do so:
- In the working directory created in the previous step, download the OpenMetadata 1.7.7 installation package and extract its contents.
  - Run the following command:  

```
wget https://github.com/open-metadata/OpenMetadata/releases/
download/1.7.7-release/openmetadata-1.7.7.tar.gz tar -xzf
openmetadata-1.7.7.tar.gz
```
- d. Configure openmetadata.yaml to connect to the MySQL database. To do so:
- Edit the following file:  
<OM Working Directory>/conf/openmetadata.yaml
  - Update the following placeholders for MySQL database connection to match your environment:

```
driverClass: ${DB_DRIVER_CLASS:-com.mysql.cj.jdbc.Driver}

user: ${DB_USER:-<YOUR_DB_USER>} # e.g., openmetadata_user

password: ${DB_USER_PASSWORD:-<YOUR_DB_PASSWORD>} # e.g.,
strongpassword

url: jdbc:${DB_SCHEME:mysql}://${DB_HOST:<YOUR_DB_HOST>}:$
```

```
{DB_PORT:<YOUR_DB_PORT>}/${OM_DATABASE:<YOUR_DB_NAME>}?${DB_PARAMS:-
allowPublicKeyRetrieval=true&useSSL=false&serverTimezone=UTC}
```

### Note

- <YOUR\_DB\_USER> – MySQL username with privileges for OpenMetadata
- <YOUR\_DB\_PASSWORD> – Password for the MySQL user
- <YOUR\_DB\_HOST> – Hostname or IP address of the MySQL server (for example, localhost)
- <YOUR\_DB\_PORT> – MySQL port number (default: 3306)
- <YOUR\_DB\_NAME> – Database name (default: openmetadata\_db)

- e. Set OpenSearch as the search type. To do so, run the following command:
 

```
sed i 's#(searchType: ${SEARCH_TYPE: ".*\1opensearch"})#' conf/
openmetadata.yaml
```
- f. Prepare the OpenMetadata Database and Indexes. To do so, run the following command:
 

```
cd <OM Working Directory>
./bootstrap/openmetadata-ops.sh drop-create
```

Example:

```
cd /scratch/openmetadata-ins-dir/openmetadata-1.7.7 # <==
Example; use your chosen path ./bootstrap/openmetadata-ops.sh
drop-create
```

11. Start Airflow, OpenSearch and Openmetadata services. To do so:

### Note

Replace all example paths shown below (for example, /scratch/openmetadata-ins-dir) with the base installation directory specific to your environment.

- a. Activate the python virtual environment by executing commands:

```
export OMD_INS_DIR=<your_installation_dir>
export PYTHON_INS_DIR=$OMD_INS_DIR/python310 <Python installed
directory>
export PYTHON_VENV_DIR=$PYTHON_INS_DIR/venv
export AIRFLOW_INS_DIR=$OMD_INS_DIR/airflow
export JAVA_HOME=$OMD_INS_DIR/jdk-17.0.2
export PATH="$JAVA_HOME/bin:$PATH"
java -version
export PATH="$PYTHON_INS_DIR/bin:$PATH"
python3 --version
source $PYTHON_VENV_DIR/bin/activate
```

- b. Start Airflow by executing below commands:

```
export AIRFLOW_HOME=$AIRFLOW_INS_DIR
airflow version
cd $OMD_INS_DIR
airflow standalone >> ./airflow.log 2>&1 & echo $! > airflow.pid
```

- c. Deactivate the python virtual environment by executing command:  
deactivate

- d. Start OpenSearch service by executing below commands:

```
cd $OMD_INS_DIR/opensearch-2.7.0/
./bin/opensearch -d -p pid
```

- e. Start OpenMetadata Service by executing below commands:

```
cd $OMD_INS_DIR/openmetadata-1.7.7/

./bin/openmetadata-server-start.sh conf/openmetadata.yaml >>
output.log 2>&1 & echo $! > output.pid
```

#### Note

- Ensure that Airflow and OpenSearch are fully started and running successfully before launching OpenMetadata.
- Run all commands as a user with appropriate permissions to access configuration files and log directories.
- Review output.log, airflow.log, and the OpenSearch logs for any startup errors or warnings.
- If an error occurs, verify all configuration paths, environment variable values, and service dependencies.
- If custom installation directories are used, ensure that all references to those paths are consistently updated across configuration files, environment variables, and command executions.

## 4.1.1 Upgrading Airflow and OpenMetadata

If OpenMetadata and Apache Airflow are already installed in earlier versions, perform the following steps to upgrade the environment.

### 4.1.1.1 Upgrading Airflow

This section provides information about upgrading Airflow

To upgrade Airflow, follow these steps:

1. Take a backup of your Airflow instance. To do so:
  - a. Back up the metadata database (using tools such as mysqldump or pg\_dump), along with project DAGs, configuration files, and any custom plugins.  
Example: `mysqldump -u root -p airflow_db > airflow_db_1.8.9.sql`

- b. Note your current Airflow version to manage the upgrade path.
2. Deactivate Any Running Airflow Services. To do so, stop all running Airflow processes, including the web server, scheduler, and workers by running the following command:  

```
killall -f airflow
```
3. Activate Your Airflow Virtual Environment (if using virtualenv). To do so, run the following command:  

```
source <YOUR_AIRFLOW_HOME>/venv/bin/activate
```

**Note**

Skip this step if you are not using a virtualenv.

4. Upgrade Airflow and Providers
  - a. To upgrade Airflow, install the desired Airflow version by running the following command:  

```
pip install --upgrade "apache-airflow==<NEW_VERSION>" \ --constraint "https://raw.githubusercontent.com/apache/airflow/constraints-<NEW_VERSION>/<PYTHON_VERSION>.txt"
```

**Note**

- Replace `<NEW_VERSION>` with the target Airflow version (for example, 2.9.3).
- Replace `<PYTHON_VERSION>` with the required Python version (for example, 3.9 for Python 3.9). If you are unsure, run `python --version` and use `cut -d. -f1,2` to extract the major and minor version.

- b. To Airflow Providers, run the following command:  

```
pip install --upgrade apache-airflow-providers-cncf-kubernetes \ apache-airflow-providers-docker
```

**Note**

For more information about additional/updated providers relevant to your DAGs, see [Airflow provider documentation](#).

5. Upgrade Custom or Linked Packages. To do so, upgrade custom dependencies such as OpenMetadata and ingestion tools by running the following commands:  

```
pip install --upgrade "openmetadata-managed-apis~=1.7.7"
pip install --upgrade "openmetadata-ingestion[all]~=1.7.7"
pip install --upgrade "python-daemon>=3.0.0"
```
6. Upgrade Airflow Metadata Database. To do so, run the database migration to update the schema for the new Airflow version:  

```
airflow db upgrade
or
airflow db migrate
```

7. Review and Update Airflow Configuration. To do so:
  - a. Review your *airflow.cfg* and update it to reflect any new, modified, or deprecated configuration settings as described in the [Airflow version upgrade notes](#).
  - b. If you use SQLAlchemy connection URIs or other custom configurations, adjust them as required.
8. Start or Restart Airflow Services. To do so, start the Airflow web server, scheduler, and any workers:  

```
airflow webserver & airflow scheduler &
```

or

```
airflow standalone >> ./airflow.log 2>&1 & echo $! > airflow.pid
```
9. Validate the Airflow Upgrade. To do so:
  - a. Verify the installed Airflow version:  

```
airflow version
```
  - b. Open the Airflow web UI and confirm that all DAGs load correctly.
  - c. Trigger a few test DAGs to ensure proper execution.
  - d. Review Airflow logs for any warnings or errors.
10. Clean Up. To do so:
  - a. Remove deprecated packages or old virtual environments that are no longer needed.
  - b. Monitor the system and DAG execution over the next few cycles to detect any unexpected issues.

### 4.1.1.2 Upgrading OpenMetadata

This section provides information about upgrading OpenMetadata (OM)

To upgrade OM, follow these steps:

1. Before you perform the upgrade, create a backup of the database to ensure data safety. To do so, run the following command:  

```
- mysqldump -u root -p openmetadata_db > openmetadata_db_backup_1.7.7.sql
```
2. Download the OpenMetadata v1.7.7 package and replace the existing OpenMetadata installation. To do so, run the following command:  

```
wget https://github.com/open-metadata/OpenMetadata/releases/download/1.7.7-release/openmetadata-1.7.7.tar.gz tar -xzf openmetadata-1.7.7.tar.gz
```
3. Migrate the Database Schema. To do so, run the following command:  

```
./bootstrap/openmetadata-ops.sh migrate
```
4. Reindex Metadata Data. To do so, run the following command:  

```
./bootstrap/openmetadata-ops.sh reindex
```

## 4.1.2 Configure SSO for OpenMetadata

To configure SSO in installed OpenMetadata (OM):

### Prerequisites:

- Ensure that you have access to the IDCS domain.
  - Note down the IP address or Host Name of the server where OM is installed.
1. Create a private application.
  2. Enable **Client credentials** and **Authorization Code grant flow** in the private application.

The following authorization grants must be enabled:

- **Implicit:**
  - **Authorization code**
  - **Client credentials**
3. Provide the **Redirect URL**, **Post-logout redirect URL** and **Logout URL** when configuring the private application.

For example:

- Redirect URL : `http(s)://<OM IP/FQDN>:8585/silent-callback http(s)://<OM IP/FQDN>:8585/callback`
  - Post Logout Url: `http(s)://<OM IP/FQDN>:8585/signin`
  - Logout URL: `http(s)://<OM IP/FQDN>:8585/api/v1/users/logout`
4. Enable client access in domain.
  5. Copy the **Client ID** and **Client Secret** from **General Information** section of the private application.

The Client ID and the Client Secret will be used during the installation for the following properties: `OPENMETADATA_IDCS_APPLICATION_CLIENT_ID` and `OPENMETADATA_IDCS_APPLICATION_CLIENT_SECRET`

6. Copy the **Domain URL** from the **Overview** section.
  7. Add relevant users to the private application.
- Ensure that STSA and OM are on the same SAML or IDCS domain.
8. Update the SSO Configuration. To do so:
    - a. If you are using Single Sign-On (SSO), locate the `authenticationConfiguration` section and configure the SSO provider details:

```
authenticationConfiguration:
 provider: ${AUTHENTICATION_PROVIDER:-"custom-oidc"}
 responseType: ${AUTHENTICATION_RESPONSE_TYPE:-id_token}
 providerName: ${CUSTOM_OIDC_AUTHENTICATION_PROVIDER_NAME:-"Oracle"}
 publicKeyUrls:
 - "https://idcs-
e1cc81fab76840ff92e07aa94c413b76.identity.pint.oc9qadev.com:443/
admin/v1/SigningCert/jwk"
 - "http(s)://xxx.xx.xx.xxx:8585/api/v1/system/config/jwks"
 authority: ${AUTHENTICATION_AUTHORITY:-https://idcs-
e1cc81fab76840ff92e07aa94c413b76.identity.pint.oc9qadev.com}
 clientId: $
${AUTHENTICATION_CLIENT_ID:-"e8e56537bb6047e7a0a70565a1f64239"}
 callbackUrl: ${AUTHENTICATION_CALLBACK_URL:-"http(s)://
xxx.xx.xx.xxx:8585/callback"}
 jwtPrincipalClaims: ${AUTHENTICATION_JWT_PRINCIPAL_CLAIMS:-
```

```
[email,preferred_username,sub]]
enableSelfSignup: ${AUTHENTICATION_ENABLE_SELF_SIGNUP:-true}
```

- b. Replace the placeholders with your provider-specific values, such as:
  - **AUTHENTICATION\_AUTHORITY:** The URL for your SSO provider.
  - **AUTHENTICATION\_CLIENT\_ID:** The client ID for your application.
  - **AUTHENTICATION\_CALLBACK\_URL:** The callback URL for your application.
9. Restart OM.

### 4.1.3 Enabling HTTPS and SSO for OpenMetadata

This section provides step-by-step instructions for configuring HTTPS and Single Sign-On (SSO) in OpenMetadata.

To enable HTTPS and SSO for OpenMetadata:

1. Generate or Obtain a Keystore.

For production environments, use an X.509 certificate from a trusted Certificate Authority (CA) and import it into a Java Keystore. For testing or development, you can create a self-signed certificate.

To create a self-signed certificate, run the following command:

```
keytool -ext SAN=<IP/HOST> -keystore openmetadata.keystore.jks -
alias <ALIAS> -keyalg RSA -keysize 2048 -sigalg SHA256withRSA -
genkey -validity 365
```

#### Note

- SAN (Subject Alternative Name): Ensure the SAN matches the host or IP.
- Alias: Use a meaningful alias for the certificate.
- Password: Choose a secure password.

#### Example:

```
keytool -ext SAN=IP:100.76.164.165 -keystore openmetadata.keystore.jks -
alias localhost -keyalg RSA -keysize 2048 -sigalg SHA256withRSA -genkey -
validity 365
```

2. Move the Keystore. After generating the keystore, move the file to the OpenMetadata configuration directory:

```
<OM-INSTALL-DIR>/openmetadata-1.3.0/conf
```

3. Export the Certificate. You can either create a certificate separately and add it to the keystore, or extract it directly from the keystore using this command:

```
keytool -exportcert -keystore openmetadata.keystore.jks -alias
<ALIAS> -file <CERT NAME>
```

Alternatively, use a UI tool for exporting the certificate.

4. Import the Certificate to the Java Truststore. To add the certificate to Java's cacerts truststore, run the following command:

```
keytool -importcert -file <cert-file> -cacerts -alias <ALIAS>
```

5. Update the OpenMetadata SSL Configuration. To do so:

- a. Modify the OpenMetadata configuration file located at:  
`<OM-INSTALL-DIR>/openmetadata-1.3.0/conf/openmetadata.yaml`
- b. In the server section, ensure the `applicationConnectors` section includes the following HTTPS configuration:

```
server:
 applicationConnectors:
 - type: https
 port: ${SERVER_PORT:-8585}
 keyStorePath: ./conf/openmetadata.keystore.jks
 keyStorePassword: password123
 keyStoreType: JKS
 certAlias: om_als
 supportedProtocols: [TLSv1.2, TLSv1.5]
 excludedProtocols: [SSL, SSLv2, SSLv2Hello, SSLv3]
```

**Note**

- `keyStorePath`: Ensure the path points to the correct keystore file.
- `keyStorePassword`: Enter the password for your keystore.

6. Update the SSO Configuration. To do so:

- a. If you are using Single Sign-On (SSO), locate the `authenticationConfiguration` section and configure the SSO provider details:

```
authenticationConfiguration:
 provider: ${AUTHENTICATION_PROVIDER:-"custom-oidc"}
 responseType: ${AUTHENTICATION_RESPONSE_TYPE:-id_token}
 providerName: ${CUSTOM_OIDC_AUTHENTICATION_PROVIDER_NAME:-"Oracle"}
 publicKeyUrls:
 - "https://idcs-
e1cc81fab76840ff92e07aa94c413b76.identity.pint.oc9qadev.com:443/
admin/v1/SigningCert/jwk"
 - "https://100.76.147.137:8585/api/v1/system/config/jwks"
 authority: ${AUTHENTICATION_AUTHORITY:-https://idcs-
e1cc81fab76840ff92e07aa94c413b76.identity.pint.oc9qadev.com}
 clientId: $
{AUTHENTICATION_CLIENT_ID:-"e8e56537bb6047e7a0a70565a1f64239"}
 callbackUrl: ${AUTHENTICATION_CALLBACK_URL:-"https://
100.76.147.137:8585/callback"}
 jwtPrincipalClaims: ${AUTHENTICATION_JWT_PRINCIPAL_CLAIMS:-
[email,preferred_username,sub]}
 enableSelfSignup: ${AUTHENTICATION_ENABLE_SELF_SIGNUP:-true}
```

- b. Replace the placeholders with your provider-specific values, such as:
  - **AUTHENTICATION\_AUTHORITY**: The URL for your SSO provider.
  - **AUTHENTICATION\_CLIENT\_ID**: The client ID for your application.
  - **AUTHENTICATION\_CALLBACK\_URL**: The callback URL for your application.

7. Update Pipeline Service Client Configuration for HTTPS. To do so:

- a. In the OpenMetadata configuration file, verify the `pipelineServiceClientConfiguration` section is updated for HTTPS:

```
pipelineServiceClientConfiguration:
 enabled: ${PIPELINE_SERVICE_CLIENT_ENABLED:-true}
 className: $
 {PIPELINE_SERVICE_CLIENT_CLASS_NAME: -"org.openmetadata.service.clients.p
 ipeline.airflow.AirflowRESTClient"}
 apiEndpoint: ${PIPELINE_SERVICE_CLIENT_ENDPOINT:-https://
 localhost:8080}
 metadataApiEndpoint: ${SERVER_HOST_API_URL:-https://
 100.76.147.137:8585/api}
 verifySSL: ${PIPELINE_SERVICE_CLIENT_VERIFY_SSL:-"validate"}
 sslConfig:
 certificatePath: ${PIPELINE_SERVICE_CLIENT_SSL_CERT_PATH:-"/scratch/
 openmetadata-ins-dir/openmetadata-1.3.0/conf/om.cer"}
```

- b. Ensure the following:

- **PIPELINE\_SERVICE\_CLIENT\_ENDPOINT:** Set to `https://`.
- **SERVER\_HOST\_API\_URL:** Points to the HTTPS API endpoint for OpenMetadata.
- **PIPELINE\_SERVICE\_CLIENT\_SSL\_CERT\_PATH:** Ensure the correct SSL certificate path is specified.

8. Update STSA Configuration. To do so, modify the OpenMetadata URL in the EST configuration file to use the HTTPS URL.

9. Start Services and Verify. To do so:

- a. After all configurations are updated, restart the OpenMetadata and STSA services.
- b. Verify that both the connection and integration are functioning correctly.

**Note**

If using a self-signed certificate, browsers may display a warning. For production environments, always use certificates signed by a trusted Certificate Authority (CA).

## 4.2 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

## 4.3 Creating Directories in DB

To create directories in DB:

1. Login to the database server and create the below directories:

2. Create a directory to store logs generated by the external table.

```
mkdir -p /file_store/fs_list/logs
```

3. Create a directory to store a preprocessor script for listing files. This directory requires read and execute permissions.

```
mkdir -p /file_store/fs_list/script
```

4. Create a directory to store control files that define accessible directories. This directory requires read permissions.

```
mkdir -p /file_store/fs_list/control
```

5. Create a directory to store CSV files.

```
mkdir -p /scratch/oraofss/fccm-data
```

6. Log in to the database as the SYS user and run the following commands. Replace <STSA/MMG App Schema> with the actual schema name created for the application.

```
CREATE OR REPLACE DIRECTORY fs_list_logs_dir AS '/file_store/fs_list/
logs/';
GRANT READ, WRITE ON DIRECTORY fs_list_logs_dir TO <STSA/MMG App Schema>;
```

```
CREATE OR REPLACE DIRECTORY fs_list_script_dir AS '/file_store/fs_list/
script/';
GRANT READ, EXECUTE ON DIRECTORY fs_list_script_dir TO <STSA/MMG App
Schema>;
```

```
CREATE OR REPLACE DIRECTORY fs_list_control_dir AS '/file_store/fs_list/
control/';
GRANT READ ON DIRECTORY fs_list_control_dir TO <STSA/MMG App Schema>;
```

```
CREATE OR REPLACE DIRECTORY external_tables_dir AS '/scratch/oraofss/fccm-
data/';
GRANT READ ON DIRECTORY external_tables_dir TO <STSA/MMG App Schema>;
```

```
GRANT CREATE TABLE TO <STSA/MMG App Schema>;
```

7. Create preprocessor script.

This script lists files in the directory referenced by the external table's LOCATION clause, formatting timestamps in a readable format.

```
cat > /file_store/fs_list/script/list_directory.sh <<EOF
#!/bin/bash
/usr/bin/ls -l --time-style="+%Y%m-%d:%H:%M:%S" "\$(/usr/bin/cat \$1)"
EOF
```

8. To view the script created and the contents of the file created from the previous step run the following command:

```
cat > /file_store/fs_list/control/trace.txt <<EOF
/scratch/oraofss/fccm-data
EOF
```

## 4.4 Create the Database Schema on Oracle Database

Create the following Database Schemas:

- [MMG Studio Schema](#)
- [MMG Graph Schema](#)

### Tablespace

You can either use the existing Tablespace or can create a new Tablespace during schema creation using the following script:

#### Permanent Tablespace

```
CREATE TABLESPACE <tablespace_name >
DATAFILE '<tablespace_name >.dat'
SIZE 1G
ONLINE;
```

#### Temporary Tablespace

```
CREATE TEMPORARY TABLESPACE <tablespace_name >
TEMPFILE '<tablespace_name >.dbf'
SIZE 100M;
```

### 4.4.1 Creating an Oracle User

You can create an Oracle user using the following script:

```
CREATE USER <oracle_user_name> IDENTIFIED BY <password> DEFAULT TABLESPACE USERS
TEMPORARY TABLESPACE TEMP QUOTA <quota_size>|UNLIMITED ON USERS
```

### 4.4.2 Creating the Application Configuration Schema

Create the application schema. You must create an Oracle User to create the application schema. For more details, see Creating an Oracle User section. This section discusses the various grants required for the Oracle Database User.

#### Assign the Grants

Assign the following grants to the workspace schema user.

```
grant create SESSION to <oracle_database_user>;
grant create PROCEDURE to <oracle_database_user>;
grant create SEQUENCE to <oracle_database_user>;
grant create TABLE to <oracle_database_user>;
grant create TRIGGER to <oracle_database_user>;
grant create VIEW to <oracle_database_user>;
grant create MATERIALIZED VIEW to <oracle_database_user>;
```

```
grant select on SYS.V_$PARAMETER to <oracle_database_user>;
grant create SYNONYM to <oracle_database_user>;
grant select on sys.v_$parameter to <oracle_database_user>;
grant select on sys.dba_free_space to <oracle_database_user>;
grant select on sys.dba_tables to <oracle_database_user>;
grant select on sys.Dba_tab_columns to <oracle_database_user>;
grant create RULE to <oracle_database_user>;
grant create any trigger to <oracle_database_user>;
grant drop any trigger to <oracle_database_user>;
grant select on SYS.DBA_RECYCLEBIN to <oracle_database_user>;
create or replace DIRECTORY fs_list_logs_dir AS '/file_store/fs_list/logs/';
grant read, write on DIRECTORY fs_list_logs_dir TO schema_name;
create or replace DIRECTORY fs_list_script_dir AS '/file_store/fs_list/script/';
grant read, execute on DIRECTORY fs_list_script_dir TO schema_name;
create or replace DIRECTORY fs_list_control_dir AS '/file_store/fs_list/
control/';
grant read on DIRECTORY fs_list_control_dir TO schema_name;

-- Directory creation and access grants
create or replace DIRECTORY fs_list_logs_dir AS '/file_store/fs_list/logs/';
grant read, write on DIRECTORY fs_list_logs_dir to &schemaname;

create or replace DIRECTORY fs_list_script_dir AS '/file_store/fs_list/
script/';
grant read, execute on DIRECTORY fs_list_script_dir to &schemaname;

create or replace DIRECTORY fs_list_control_dir AS '/file_store/fs_list/
control/';
grant read on DIRECTORY fs_list_control_dir to &schemaname;
```

In STSA v8.1.2.4.0, the following additional grants are required by OM:

```
grant SELECT ON DBA_CONSTRAINTS TO &schemaname;
grant SELECT ON DBA_CONS_COLUMNS TO &schemaname;
grant SELECT ON DBA_COL_COMMENTS TO &schemaname;
```

### 4.4.3 Create the MMG Studio Schema

You must create an Oracle User to create the MMG Studio Schema. For more details, see [Creating an Oracle User](#) section.

Assign the following grants:

```
GRANT CONNECT, CREATE TABLE, CREATE VIEW, CREATE SEQUENCE TO
<mmgstudio_schema_name>;
```

A new user group created in MMG which requires permission for Studio operations, is to be added in the following files:

- mmgstudio/conf/application.yml
- mmgstudio/conf/ofsaa-permissions.init.yml

**Note**

Make sure the groups are in upper case, as AAI groups are always in upper case.

## 4.4.4 Create MMG Graph Schema

Ensure that create an Oracle User to create the MMG Graph Schema. For more details, see [Creating an Oracle User](#) section.

### Assign Grants

This section discusses the various grants required for the Graph Schemas.

Assign the following grants for the schema:

**1. Pre-installation grants for Graph Schema:**

```
GRANT CREATE SESSION TO <GRAPH_SCHEMA>;
GRANT CREATE TABLE TO <GRAPH_SCHEMA>;
GRANT CREATE VIEW TO <GRAPH_SCHEMA>;
GRANT CREATE ANY PROCEDURE TO <GRAPH_SCHEMA>;
GRANT CREATE SEQUENCE TO <GRAPH_SCHEMA>;
GRANT CREATE JOB TO <GRAPH_SCHEMA>;
GRANT CREATE MATERIALIZED VIEW TO <GRAPH_SCHEMA>;
GRANT EXECUTE ON DBMS_SCHEDULER to <GRAPH_SCHEMA>;
GRANT EXECUTE ON DBMS_COMPARISON TO <GRAPH_SCHEMA>;
GRANT EXECUTE ON DBMS_RLS TO <GRAPH_SCHEMA>;
GRANT EXECUTE ON SYS.DBMS_SESSION TO <GRAPH_SCHEMA>;
GRANT EXECUTE ON DBMS_REDEFINITION TO <GRAPH_SCHEMA>;
GRANT REDEFINE ANY TABLE TO <GRAPH_SCHEMA>;
GRANT SELECT ON SYS.V_$PARAMETER TO <GRAPH_SCHEMA>;
GRANT SELECT ON <DATA_SOURCE_SCHEMA>.<TABLE_NAME> TO <GRAPH_SCHEMA>;
```

### Example:

Change the <DATA\_SOURCE\_SCHEMA> to the schema used in the Graph pipeline.

**Note**

If a user has to execute the custom graph, the same permissions have to be provided for the input tables referred in Custom Graph Pipeline.

## 4.5 Create the Installation, Download, and Metadata Repository Directories

To install the application, create the following directories:

- **OFS STSA Download Directory (Optional):** This is the directory where the downloaded installer or patches can be copied. Create a download directory and copy the OFS MMG Application Pack Installer File (archive). Assign 755 permission to this directory.
- **Temporary Directory:** This is the 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 to allocate more than 10 GB of space. Assign 755 permission to this directory and disable the NOEXEC option.

**Note**

If the 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, hence resulting in failure of the installation.

- **OFS STSA Installation Directory (Mandatory):** Create an installation directory where the product binaries are installed. Assign 755-user permission to the Installation Directory.
- **OFS STSA Staging/Metadata Directory (Mandatory):** This is 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 or Metadata Repository Directory to copy data files, save data extracts, and so on. You can configure this directory on a different mount or under a different user profile.

**Note**

Ensure that the OFS STSA Staging Directory is not set to the same path as the OFS STSA Installation Directory and is not a sub-directory inside the OFS STSA 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

To install the application, configure the operating system and file system settings refer the parameters and configuration actions.

**Table 4-1 Configure operating system and file system settings**

| Parameter                | Configuration Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| File Descriptor Settings | <p>In the <code>sysctl.conf</code> file, to change the number of file descriptors, do the following as the root user:</p> <ol style="list-style-type: none"><li>1. Edit the following line in the <code>/etc/sysctl.conf</code> file:<br/><br/><code>fs.file-max = &lt;value&gt;</code><br/>where <code>&lt;value&gt;</code> is greater than 15000</li></ol> <ul style="list-style-type: none"><li>• Apply the change by running the following command:<br/><code># /sbin/ sysctl -p</code></li></ul> |

**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.

**Table 4-1 (Cont.) Configure operating system and file system settings**

| Parameter                        | Configuration Action                                                      |
|----------------------------------|---------------------------------------------------------------------------|
| Total Number of Process Settings | In the <code>sysctl.conf</code> file, set the value to greater than 4096. |

**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.

## 4.6.2 Configure the Environment Settings

Environment Settings refers to values related to the current environment, like the Operating System or user sessions. To configure the environment settings refer the following topics.

### 4.6.2.1 Java Settings

To configure the Java Settings, refer the following table:

**Note**

In the application, Java 21 is supported.

**Table 4-2 Java Settings**

| Description                                                                                    | Example Value                     |
|------------------------------------------------------------------------------------------------|-----------------------------------|
| In the <code>.profile</code> file, set <code>JAVA_BIN</code> to include the JDK absolute path. | For example: <code>JAVA 17</code> |

**Table 4-3 Java Settings**

| Description                                                                                                                                                                                                                      | Example Value                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| In the <code>.profile</code> file, set the Java tool options for all versions JDK-17 and above updates. Ensure that <code>SYMBOLIC</code> links to <code>JAVA</code> installation are not set in the <code>PATH</code> variable. | <pre>JAVA_TOOL_OPTIONS="-Djdk.util.zip.disableZip64ExtraFieldValidation=true" export JAVA_TOOL_OPTIONS</pre> |

**Table 4-3 (Cont.) Java Settings**

| Description                                                          | Example Value                                                     |
|----------------------------------------------------------------------|-------------------------------------------------------------------|
| In the .profile file, set JAVA_BIN to include the JDK absolute path. | For example: JAVA_BIN=/usr/java/<br>jdk-17/bin<br>export JAVA_BIN |

## 4.6.2.2 Oracle Database Server and Client Settings

To configure the Oracle Database Server and Client Settings, refer to the following table:

**Table 4-4 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/<br>app_client19c/product/ 19.0.0/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

You must configure the TNS entries in the tnsnames.ora file for Non-TCPS.

### 4.6.2.3.1 Non-TCPS

To configure the TNS entries in the tnsnames.ora file for Non-TCPS, refer to the following table:

**Table 4-5 TNS entries in the TNSNAMES.ORA file for Non-TCPS**

| Description                                                                                            | Example Value                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ensure that an entry (with SID or 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>)
)
)
```

#### 4.6.2.4 Time Zone Settings

In the .profile file, set the Time Zone Parameter to indicate the time zone of your region or location.

**Table 4-6 Time Zone Settings**

| Description | Example Value    |
|-------------|------------------|
| Time Zone   | TZ=Asia/Calcutta |

## 4.7 Setup Password Stores with Oracle Wallet

This section describes the steps to create a wallet and the aliases for the database user accounts. For more information on configuring authentication and password stores, see the [Oracle Database Security Guide](#).

As part of an Application Installation, Administrators must set up password stores for Database User Accounts using Oracle Wallet. These password stores must be installed on the Application Database side. The Installer handles much of this process. The Administrators must perform some additional steps.

### 4.7.1 Setup the Password Stores for Database User Accounts

After the database is installed and the default Database User Accounts are set up, Administrators must set up a password store using the Oracle Wallet. This involves assigning an alias for the username and associated password for each Database User Account. The alias is used later during the application installation. This password store must be created on the system where the Application Server and database client are installed.

**Note**

In this section, <wallet\_location> is a placeholder text for illustration purposes. Before running the command, ensure that you have already created the <wallet\_location> directory where you want to create and store the wallet.

The wallet is created in the <wallet\_location> directory with the auto-login feature enabled. This feature enables the database client to access the wallet contents without using the password. For more information, see [Oracle Database Security Guide](#).

To create a wallet, follow these steps:

1. Login to the server as a Linux user.
2. Create a wallet in the <wallet\_location> using the following command:  
`mkstore -wrl <wallet_location> -create`

**Note**

The mkstore utility is included in the Oracle Database Client Installation.

3. After you run the command, a prompt appears. Enter a password for the Oracle Wallet in the prompt.  
A prompt appears to re-enter the password. Re-enter the password.

**Figure 4-1 Wallet Creation**

```
$ mkstore -wrl /scratch/ofsasftp/pgx_server/wallet -create
Oracle Secret Store Tool Release 19.0.0.0.0 - Production
Version 19.3.0.0.0
Copyright (c) 2004, 2019, Oracle and/or its affiliates. All rights reserved.

Enter password:
Enter password again:
$ mkstore -wrl /scratch/ofsasftp/pgx_server/wallet -createCredential MMGConfigSchema_Alias MMG_Config_Schema
Oracle Secret Store Tool Release 19.0.0.0.0 - Production
Version 19.3.0.0.0
Copyright (c) 2004, 2019, Oracle and/or its affiliates. All rights reserved.

Your secret/Password is missing in the command line
Enter your secret/Password:
Re-enter your secret/Password:
Enter your secret/Password:
Re-enter your secret/Password:
Enter wallet password:
$ mkstore -wrl /scratch/ofsasftp/pgx_server/wallet -createCredential MMGStudio_Schema_Alias MMG_Studio_Schema
Oracle Secret Store Tool Release 19.0.0.0.0 - Production
Version 19.3.0.0.0
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Your secret/Password is missing in the command line
Enter your secret/Password:
Re-enter your secret/Password:
Enter wallet password:
$ mkstore -wrl /scratch/ofsasftp/pgx_server/wallet -createCredential MMGGraphSchema_Alias MMG_Graph_Schema
Oracle Secret Store Tool Release 19.0.0.0.0 - Production
Version 19.3.0.0.0
Copyright (c) 2004, 2019, Oracle and/or its affiliates. All rights reserved.

Your secret/Password is missing in the command line
Enter your secret/Password:
Re-enter your secret/Password:
Enter wallet password:
$
```

4. Create the database connection credentials for the STSA Schema using the following command:  
`mkstore -wrl <wallet_location> -createCredential <alias-name> <mmg-schema-name>`

**Here, STSA Schema is the same as explained in Create the STSA Schema section.**

After you run the command, a prompt appears. Enter the password associated with the Database User Account in the prompt. You are prompted to re-enter the password. You are prompted for the wallet password used in Step 1.

**Note**

In this manner, create a wallet and associated database connection credentials for all the Database User Accounts including Graph and Studio Schema.

After the wallet is created, go to the <wallet\_location> directory and click Refresh to view the created wallet folder.

The wallet folder contains two files: **ewallet.p12** and **cwallet.sso**.

After you run the command, a prompt appears. Enter the password associated with the Database User Account in the prompt. You are prompted to re-enter the password. You are prompted for the wallet password used in Step 1.

**Note**

In this manner, create a wallet and associated database connection credentials for all the Database User Accounts including Graph and Studio Schema.

After the wallet is created, go to the <wallet\_location> directory and click Refresh to view the created wallet folder.

**Note**

In addition to creating wallet aliases for MMG Studio and Graph, you must also create wallet aliases for the production schemas; specifically, the config and atomic schemas. Ensure these aliases are added to the `tnsnames.ora` file.

The wallet folder contains two files: **ewallet.p12** and **cwallet.sso**.

5. In the <wallet\_location> directory, configure the `tnsnames.ora` file to include the entry for each alias name to be set up. Alias name can be renamed as wallet db alias name.

**Note**

- You can either update the existing `tnsnames.ora` file with the above details or create new `tnsnames.ora` file and add the required entries.
- <alias-name> is a user-defined value.

6. Create a `sqlnet.ora` file in the wallet directory using the following content:  
`WALLET_LOCATION = (SOURCE = (METHOD = FILE) (METHOD_DATA =  
(DIRECTORY = <Wallet_Location>))) ) SQLNET.WALLET_OVERRIDE=TRUE  
SSL_CLIENT_AUTHENTICATION=FALSE`

Here, <Wallet\_Location> should be in below format:

```
WALLET_LOCATION = (SOURCE = (METHOD = FILE) (METHOD_DATA =
(DIRECTORY = <WALLET_PATH>)))
```

## 4.7.2 Verify the Connectivity of the Wallet

To verify the connectivity of the wallet, follow these steps:

1. Test the connectivity using the following command:

### Note

The ORACLE\_HOME used with the wallet must be the same version or higher than the wallet created.

```
$ export WALLET_LOCATION=<wallet_location>

$ export TNS_ADMIN=<tnsnames.ora_location>. If you have created a new
tnsnames.ora file, provide the location of the new file.

$ sqlplus /@<alias_name>
```

The output is similar to:

```
SQL*Plus: Release 11
```

```
Connected to:
```

```
Oracle Database 12c
```

To verify if you are connected to the correct user:

```
SQL> show user
```

The output is similar to:

```
USER is "<database-user-name>"
```

# 5

## Installation

This section provides detailed steps to install the application.

### 5.1 Prerequisites

The list of prerequisites are as follows:

- Port Details  
MMG Studio uses the following ports by default, so make sure these are free:  
Graph Service: 7059  
Server: 7008  
Markdown-Interpreter: 7009, 7029  
Python-Interpreter: 7012, 7032, 6012  
Shell-Interpreter: 7013, 7033  
Plainr-Interpreter 7019, 7039, 6311 (Rserve port- configurable in plainr.Json)  
PGX Server: 7007  
PGX-Interpreter: 7022, 7042  
JDBC-Interpreter: 7011, 7031  
Coherence Cluster: 7574

#### Note

These are default ports provided in the installation kit. You can modify them in the configuration files if required to avoid conflicts with existing services.

#### Enhancements for Preinstall Check

Warning messages for below validations:

- To validate whether the given hostname is valid or not.
- To validate whether given hostname and hostname in keystore are matching.
- Error messages and failing the preinstall check for below validations.
- To check sso\_token is present or not.
- To check for public and private key are present in the mmghome/conf location.

### 5.2 Download the OFS STSA Installer Kit

To download the software as a .zip folder, download the mandatory minor release patch **38983972** from [My Oracle Support \(MOS\)](#).

Download the installer archive and copy (in Binary Mode) to the download directory that exists in the OFS STSA Installation Setup.

## 5.3 Extract the Software

Ensure that you log 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 binary kit, unzip the <os>.zip kit, and copy the extracted files in binary mode to a directory that is included in your PATH variable.

If you 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 this error message is displayed, then contact your UNIX Administrator:  
`uncompress: not found [No such file or directory]`

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 OFS STSA Application Pack installer archive file in the download directory with the following command:

```
unzip OFS_STSA_8.1.2.6.0_<OS>.zip
```

After unzipping the OFS\_STSA\_8.1.2.6.0 folder, the following zip folders are available:

- OFS\_STSA\_8.1.2.6.0\_Release\_Notes.html
- STSA-installer.zip

After unzipping the `stsa-installer.zip` folder, the following components are available:

- STSABI
- MMG
- stsa-ui
- stsa-ui-service
- stsa-service
- build-schema-creator
- bin

Navigate to the MMG folder and unzip the `OFS_MMG_26.0.0_LINUX.zip`. The OFS-MMG folder is available with the following files.

- mmg-installer.zip
- mmg-metadata-manager.zip
- mmg-pgx.zip
- OFSMMG\_26.0.0\_Readme.html

Unzip the `mmg-installer.zip` for the following components:

- bin
  - conf
  - lib
  - mmg-load-to-graph
  - mmg-pipeline
  - mmg-schema-creator
  - mmg-service
  - mmg-studio
  - mmg-ui
4. Navigate to the download directory and assign execute permission to the installer directory with the following command:  
  

```
chmod -R 750 OFS_STSA
```

## 5.4 Configure the config.sh file

To configure the config.sh file for installing the application, follow these steps:

1. Login to the server as a non-root user.
2. Navigate to the <installation directory>/OFS\_MMG/bin directory.
3. Configure the applicable config.sh attributes as shown here:

Sample config.sh files:

```
#!/bin/sh
```

```
MMG Configuration File
```

```
This file contains configuration settings for the MMG application.
```

```
Sections are grouped by function or purpose for better readability.
```

```
Placeholders are updated to reflect new variable names where applicable.
```

```
Traceability comments (# was OLD_NAME) are added for renamed keys.
```

```
Common Application Properties
```

```
General settings for the application, logging, and context.
```

```
export APPLICATION_NAME=##APPLICATION_NAME##
```

```
export APPLICATION_ID=##APPLICATION_ID##
```

```
export MMG_LOG_DIR=##MMG_LOG_DIR## # was LOG_HOME
```

```
export FTPSHARE_DIR=##FTPSHARE_DIR## # was FTPSHARE
```

```
export MMG_LOG_TIMEZONE=##MMG_LOG_TIMEZONE## # was LOG_TIMEZONE
```

```
export WEB_CONTEXT=##WEB_CONTEXT## # was CONTEXT_PATH
```

```
export
```

```
RESTRICT_UNMAPPED_DATASTORES_ACCESS=##RESTRICT_UNMAPPED_DATASTORES_ACCESS##
```

```
export MMG_API_USERNAME=##MMG_API_USERNAME## # was FCC_API_USER
```

```
export MMG_SESSION_SECRET=##MMG_SESSION_SECRET## # was
```

```
SESSION_TOKEN_CREDENTIALS
```

```
export MMG_UI_FAVICON_PATH=##MMG_UI_FAVICON_PATH## # was
```

```
APPLICATION_FAVICON_PATH
```

```
export
```

```
MMG_MODEL_PIPELINE_SANDBOX_DEFAULT_VIEW=##MMG_MODEL_PIPELINE_SANDBOX_DEFAULT_VIEW##
```

```
SMTP host and port parameters for email notifications
export EMAIL_SMTP_HOST=##EMAIL_SMTP_HOST## # was SMTP_HOST
export EMAIL_SMTP_PORT=##EMAIL_SMTP_PORT## # was SMTP_PORT

Database and Wallet Settings
Configurations for database connections, wallets, and schemas.

export MMG_DB_WALLET_PATH=##MMG_DB_WALLET_PATH## # was WALLET_LOCATION
export MMG_DB_TNS_ADMIN_PATH=##MMG_DB_TNS_ADMIN_PATH## # was
TNS_ADMIN_PATH
export MMG_DB_SCHEMA_WALLET_ALIAS=##MMG_DB_SCHEMA_WALLET_ALIAS## # was
WALLET_ALIAS

export DATASTUDIO_SCHEMA_WALLET_ALIAS=##DATASTUDIO_SCHEMA_WALLET_ALIAS##

export GRAPH_SCHEMA_WALLET_ALIAS=##GRAPH_SCHEMA_WALLET_ALIAS##
export GRAPH_SCHEMA_DB_SCHEMA_NAME=##GRAPH_SCHEMA_DB_SCHEMA_NAME##
export GRAPH_DB_SERVER_NAME=##GRAPH_DB_SERVER_NAME## # was
MMG_DB_SERVER_NAME
export GRAPH_DB_PORT=##GRAPH_DB_PORT## # was MMG_DB_PORT
export GRAPH_DB_SERVICE_NAME=##GRAPH_DB_SERVICE_NAME## # was
MMG_DB_SERVICE_NAME

Network and Port Configurations
Hostnames, ports for services, interpreters, and components.

export MMG_SERVICE_HOST=##MMG_SERVICE_HOST## # was BE_HOSTNAME
export MMG_SERVICE_PORT=##MMG_SERVICE_PORT## # was BE_PORT
export MMG_UI_PORT=##MMG_UI_PORT## # was UI_PORT
export MMG_SCHEMA_CREATOR_PORT=##MMG_SCHEMA_CREATOR_PORT## # was
SCHEMA_PORT

Following are the default ports 7008, 7009, 7012, -1. If needed, you can
change the port numbers other than the default values.
export DATASTUDIO_SERVER_PORT=##DATASTUDIO_SERVER_PORT##
export
DATASTUDIO_MARKDOWN_INTERPRETER_PORT=##DATASTUDIO_MARKDOWN_INTERPRETER_PORT
##
export
DATASTUDIO_PYTHON_INTERPRETER_PORT=##DATASTUDIO_PYTHON_INTERPRETER_PORT##
export DATASTUDIO_R_INTERPRETER_PORT=##DATASTUDIO_R_INTERPRETER_PORT##
export
DATASTUDIO_JDBC_INTERPRETER_PORT=##DATASTUDIO_JDBC_INTERPRETER_PORT##
export
DATASTUDIO_PYTHON_INTERPRETER_REST_SERVER_PORT=##DATASTUDIO_PYTHON_INTERPRE
TER_REST_SERVER_PORT##
export
DATASTUDIO_PGX_PYTHON_INTERPRETER_REST_SERVER_PORT=##DATASTUDIO_PGX_PYTHON_
INTERPRETER_REST_SERVER_PORT##
export
DATASTUDIO_THRIFT_EVENT_HANDLER_PORT=##DATASTUDIO_THRIFT_EVENT_HANDLER_PORT
##
export DATASTUDIO_PGX_INTERPRETER_PORT=##DATASTUDIO_PGX_INTERPRETER_PORT##

export
```

```
DATASTUDIO_SPARK_INTERPRETER_PORT=##DATASTUDIO_SPARK_INTERPRETER_PORT##

export MMG_COHERENCE_CLUSTER_PORT=##MMG_COHERENCE_CLUSTER_PORT##

export MMG_GATEWAY_PORT=##MMG_GATEWAY_PORT##

export GRAPH_SERVICE_PORT=##GRAPH_SERVICE_PORT##
export GRAPH_SERVICE_CACHE_SERVER_PORT=##GRAPH_SERVICE_CACHE_SERVER_PORT##

export DATAPIPELINE_SERVICE_PORT1=##DATAPIPELINE_SERVICE_PORT1##
export DATAPIPELINE_SERVICE_PORT2=##DATAPIPELINE_SERVICE_PORT2##
export
DATAPIPELINE_METADATA_IMPORT_SERVICE_PORT=##DATAPIPELINE_METADATA_IMPORT_SE
RVICE_PORT##
export
DATAPIPELINE_GATEWAY_SERVICE_PORT=##DATAPIPELINE_GATEWAY_SERVICE_PORT##
export
DATAPIPELINE_PIPELINE_UI_SERVICE_PORT=##DATAPIPELINE_PIPELINE_UI_SERVICE_PO
RT## # was PIPELINE_UI_SERVICE_PORT
export
DATAPIPELINE_DATA_PIPELINE_UI_SERVICE_PORT=##DATAPIPELINE_DATA_PIPELINE_UI_
SERVICE_PORT## # was DATA_PIPELINE_UI_SERVICE_PORT
export DATAPIPELINE_HAZELCAST_PORT=##DATAPIPELINE_HAZELCAST_PORT##

SSL and Security Settings
Settings for SSL, keystores, and security credentials.

export MMG_SSL_ENABLED=##MMG_SSL_ENABLED## # was SSL_ENABLED
export SSL_KEYSTORE_PATH=##SSL_KEYSTORE_PATH## # was SSL_KEYSTORE
export SSL_KEYSTORE_PASSWORD=##SSL_KEYSTORE_PASSWORD## # was SSL_KS_SECRET
export SSL_KEYSTORE_TYPE=##SSL_KEYSTORE_TYPE## # was SSL_KS_TYPE
export SSL_CERT_ALIAS=##SSL_CERT_ALIAS## # was SSL_KS_ALIAS
export GRAPH_KEYSTORE_PASSWORD=##GRAPH_KEYSTORE_PASSWORD##
export AUTH_MMG_KEYS_DIR=##AUTH_MMG_KEYS_DIR## # was MMG_KEYS_LOC

Authentication and Authorization
Configurations for authentication types, SAML, LDAP, AAI, and sessions.

export MMG_UI_AUTH_TYPE=##MMG_UI_AUTH_TYPE## # was UI_AUTH_TYPE
export MMG_SERVICE_AUTH_TYPE=public # was BE_AUTH_TYPE
export DATASTUDIO_AUTH_TYPE=##DATASTUDIO_AUTH_TYPE## # was
STUDIO_AUTH_TYPE
export DATASTUDIO_SHOW_LOGIN=##DATASTUDIO_SHOW_LOGIN## # was LOGIN_SHOW
export DATASTUDIO_SESSION_MODE=##DATASTUDIO_SESSION_MODE## # was
SESSION_MODE
export DATASTUDIO_AUTH_REALM=##DATASTUDIO_AUTH_REALM## # was STUDIO_REALM
export DATASTUDIO_AAI_URL=##DATASTUDIO_AAI_URL## # was OFSAA_URL
export DATASTUDIO_API_USERNAMES=##DATASTUDIO_API_USERNAMES## # was
API_USERS
export DATASTUDIO_VALID_ROLES_LIST=##DATASTUDIO_VALID_ROLES_LIST## # was
VALID_ROLES

AAI Authorization
Applicable for SAML/LDAP profiles.
export IS_USER_AUTHZ_FROM_AAI=##IS_USER_AUTHZ_FROM_AAI## # was
AAI_AUTHZ_ENABLED
```

```
export AUTH_AAI_AUTH_URL=##AUTH_AAI_AUTH_URL## # was AAI_AUTH_URL
export AUTH_AAI_OAUTH_CLIENT_ID=##AUTH_AAI_OAUTH_CLIENT_ID## # was
AAI_CLIENT_ID
export AUTH_AAI_OAUTH_CLIENT_SECRET=##AUTH_AAI_OAUTH_CLIENT_SECRET## #
was AAI_CLIENT_SECRET
export AUTH_AAI_COOKIE_DOMAIN=##AUTH_AAI_COOKIE_DOMAIN## # was
AAI_COOKIE_DOMAIN

SAML Configurations
export AUTH_SAML_IDP_URL=##AUTH_SAML_IDP_URL## # was SAML_IDP_URL
export AUTH_SAML_SP_ENTITY_URL=##AUTH_SAML_SP_ENTITY_URL## # was
SAML_SP_ENTITY
export AUTH_SAML_ACS_URL=##AUTH_SAML_ACS_URL## # was SAML_SRV_URL
export AUTH_SAML_LOGOUT_URL=##AUTH_SAML_LOGOUT_URL## # was SAML_LOGOUT_URL
export AUTH_SAML_SIGN_AUTHN_REQ=##AUTH_SAML_SIGN_AUTHN_REQ## # was
SAML_SIGN_AUTHN_REQ
export AUTH_SAML_SP_KEY_PATH=##AUTH_SAML_SP_KEY_PATH## # was
SAML_PRIVATE_KEY_PATH
export AUTH_SAML_SP_X509_CERT_PATH=##AUTH_SAML_SP_X509_CERT_PATH## # was
SAML_SP_X509_CERT_PATH
export AUTH_SAML_SIGN_ALGORITHM=##AUTH_SAML_SIGN_ALGORITHM## # was
SAML_SIGN_ALGORITHM
export AUTH_SAML_BINDING_TYPE=##AUTH_SAML_BINDING_TYPE## # was
AUTH_SAML_REQUEST_TYPE
export AUTH_SAML_INCLUDE_SP_CERT=##AUTH_SAML_INCLUDE_SP_CERT## # was
AUTH_SAML_INCLUDE_SP_CERT

export AUTH_SAML_DS_ISSUER=##AUTH_SAML_DS_ISSUER## # was SAML_ISSUER
export AUTH_SAML_DS_DESTINATION=##AUTH_SAML_DS_DESTINATION## # was
SAML_DESTINATION
export
AUTH_SAML_DS_ASSERTION_CONSUMER_URL=##AUTH_SAML_DS_ASSERTION_CONSUMER_URL##
was SAML_ASSERTION
export AUTH_SAML_DS_ROLE_ATTRIBUTE=##AUTH_SAML_DS_ROLE_ATTRIBUTE## # was
SAML_ROLE_ATTRIBUTE
export AUTH_SAML_DS_STUDIO_LOGOUT_URL=##AUTH_SAML_DS_STUDIO_LOGOUT_URL##
was SAML_STUDIO_LOGOUT_URL
export AUTH_SAML_DS_COOKIE_DOMAIN=##AUTH_SAML_DS_COOKIE_DOMAIN## # was
SAML_COOKIE_DOMAIN

LDAP Configurations
export AUTH_LDAP_URL=##AUTH_LDAP_URL## # was LDAP_URL
export AUTH_LDAP_SEARCH_BASE_DN=##AUTH_LDAP_SEARCH_BASE_DN## # was
LDAP_SEARCH_BASE
export AUTH_LDAP_USER_FILTER=##AUTH_LDAP_USER_FILTER## # was
LDAP_USER_FILTER
export AUTH_LDAP_USER_SEARCH_FILTER=##AUTH_LDAP_USER_SEARCH_FILTER## #
was LDAP_USER_SEARCH_FILTER
export AUTH_LDAP_GROUP_FILTER=##AUTH_LDAP_GROUP_FILTER## # was
LDAP_GROUP_SEARCH_FILTER
export AUTH_LDAP_GROUP_BASE_DN=##AUTH_LDAP_GROUP_BASE_DN## # was
LDAP_GROUP_SEARCH_BASE
export AUTH_LDAP_GROUP_MEMBER_ATTR=##AUTH_LDAP_GROUP_MEMBER_ATTR## # was
LDAP_GROUP_MEMBER

Cookie Settings
```

```
export
DATASTUDIO_SERVER_COOKIE_DOMAIN=##DATASTUDIO_SERVER_COOKIE_DOMAIN## # was
SERVER_COOKIE_DOMAIN
export DATASTUDIO_SERVER_COOKIE_NAME=##DATASTUDIO_SERVER_COOKIE_NAME## #
was SERVER_COOKIE_NAME
export
DATASTUDIO_SERVER_COOKIE_TIMEOUT=##DATASTUDIO_SERVER_COOKIE_TIMEOUT## #
was SERVER_COOKIE_TIMEOUT
export
DATASTUDIO_SERVER_COOKIE_IS_SECURE=##DATASTUDIO_SERVER_COOKIE_IS_SECURE##
was SERVER_COOKIE_IS_SECURE

HTTP and Connection Pooling
Settings for HTTP clients and datasource connection pools.

export MMG_HTTP_CLIENT_MAX_CONN=##MMG_HTTP_CLIENT_MAX_CONN## # was
MMG_HTTP_MAX_CONN
export
MMG_HTTP_CLIENT_MAX_CONN_PER_ROUTE=##MMG_HTTP_CLIENT_MAX_CONN_PER_ROUTE##
was MMG_HTTP_MAX_CONN_PER_ROUTE
export
MMG_HTTP_CLIENT_CONN_TIMEOUT_MS=##MMG_HTTP_CLIENT_CONN_TIMEOUT_MS## # was
MMG_HTTP_CONNECT_TIMEOUT
export
MMG_HTTP_CLIENT_READ_TIMEOUT_MS=##MMG_HTTP_CLIENT_READ_TIMEOUT_MS## # was
MMG_HTTP_READ_TIMEOUT

export
MMG_CONFIG_DATASOURCE_MAX_POOL_SIZE=##MMG_CONFIG_DATASOURCE_MAX_POOL_SIZE##
was MMG_DATASOURCE_MAX_POOL_SIZE
export MMG_CONFIG_DATASOURCE_MIN_IDLE=##MMG_CONFIG_DATASOURCE_MIN_IDLE## #
was MMG_DATASOURCE_MINIMUM_IDLE
export
MMG_CONFIG_DATASOURCE_IDLE_TIMEOUT_MS=##MMG_CONFIG_DATASOURCE_IDLE_TIMEOUT_
MS## # was MMG_DATASOURCE_IDLE_TIMEOUT
export
MMG_CONFIG_DATASOURCE_CONN_TIMEOUT_MS=##MMG_CONFIG_DATASOURCE_CONN_TIMEOUT_
MS## # was MMG_DATASOURCE_CONN_TIMEOUT

export
MMG_EXT_DATASOURCE_MAX_POOL_SIZE=##MMG_EXT_DATASOURCE_MAX_POOL_SIZE## #
was EXT_DATASOURCE_MAX_POOL_SIZE
export MMG_EXT_DATASOURCE_MIN_IDLE=##MMG_EXT_DATASOURCE_MIN_IDLE## # was
EXT_DATASOURCE_MINIMUM_IDLE
export
MMG_EXT_DATASOURCE_IDLE_TIMEOUT_MS=##MMG_EXT_DATASOURCE_IDLE_TIMEOUT_MS##
was EXT_DATASOURCE_IDLE_TIMEOUT
export
MMG_EXT_DATASOURCE_CONN_TIMEOUT_MS=##MMG_EXT_DATASOURCE_CONN_TIMEOUT_MS##
was EXT_DATASOURCE_CONN_TIMEOUT

Data Studio Hikari Pool
export DATASTUDIO_HIKARI_MAXPOOLSIZE=##DATASTUDIO_HIKARI_MAXPOOLSIZE##
export
DATASTUDIO_HIKARI_CONN_TIMEOUT_MS=##DATASTUDIO_HIKARI_CONN_TIMEOUT_MS##
export DATASTUDIO_HIKARI_MINIMUM_IDLE=##DATASTUDIO_HIKARI_MINIMUM_IDLE##
```

```

export DATASTUDIO_HIKARI_MAX_LIFE_TIME=##DATASTUDIO_HIKARI_MAX_LIFE_TIME##

External Schema Connection Pooling
export GRAPH_EXT_SCHEMA_ENABLE_CP=##GRAPH_EXT_SCHEMA_ENABLE_CP##
export GRAPH_EXT_SCHEMA_CP_MAX_IDLE=##GRAPH_EXT_SCHEMA_CP_MAX_IDLE##
export GRAPH_EXT_SCHEMA_CP_MIN_IDLE=##GRAPH_EXT_SCHEMA_CP_MIN_IDLE##
export
GRAPH_EXT_SCHEMA_CP_INITIAL_SIZE=##GRAPH_EXT_SCHEMA_CP_INITIAL_SIZE##
export GRAPH_EXT_SCHEMA_CP_MAX_TOTAL=##GRAPH_EXT_SCHEMA_CP_MAX_TOTAL##
export
GRAPH_EXT_SCHEMA_CP_MAX_WAIT_MILLIS=##GRAPH_EXT_SCHEMA_CP_MAX_WAIT_MILLIS##
export
GRAPH_EXT_SCHEMA_CP_MIN_EVICTABLE_IDLE_TIME=##GRAPH_EXT_SCHEMA_CP_MIN_EVICT
ABLE_IDLE_TIME##
export
GRAPH_EXT_SCHEMA_CP_SOFT_MIN_EVICTABLE_IDLE_TIME=##GRAPH_EXT_SCHEMA_CP_SOFT
_MIN_EVICTABLE_IDLE_TIME##

#Graph HikariCP Configuration Placeholders
export GRAPH_HIKARI_CP_MIN_IDLE=##GRAPH_HIKARI_CP_MIN_IDLE##
export GRAPH_HIKARI_CP_MAX_POOL_SIZE=##GRAPH_HIKARI_CP_MAX_POOL_SIZE##
export GRAPH_HIKARI_CP_IDLE_TIMEOUT=##GRAPH_HIKARI_CP_IDLE_TIMEOUT##
export GRAPH_HIKARI_CP_MAX_LIFETIME=##GRAPH_HIKARI_CP_MAX_LIFETIME##
export GRAPH_HIKARI_CP_TIMEOUT=##GRAPH_HIKARI_CP_TIMEOUT##

Data Studio Specific Settings
Configurations specific to Data Studio, including interpreters and
logging.

By default, Data Studio is assumed to run on the same server. If it's
running on a different host, uncomment the line below and provide the
appropriate URL.
#export DATASTUDIO_URL=##DATASTUDIO_URL##

export DATASTUDIO_LOG_LEVEL=##DATASTUDIO_LOG_LEVEL## # was
STUDIO_LOG_LEVEL
export DATASTUDIO_PYTHON_BINARY=##DATASTUDIO_PYTHON_BINARY## # was
PYTHON_HOME
export MMG_PYTHON_INTERPRETER_LIST=##MMG_PYTHON_INTERPRETER_LIST## # was
MMG_PYTHON_INTERPRETER
export DATASTUDIO_R_ENABLED=##DATASTUDIO_R_ENABLED## # was R_ENABLED
export DATASTUDIO_R_PYTHON_BINARY=##DATASTUDIO_R_PYTHON_BINARY## # was
R_PYTHON_HOME

Spark and R Configurations
Settings for Spark integration and R support.

export DATASTUDIO_SPARK_ENABLED=##DATASTUDIO_SPARK_ENABLED## # was
MMG_SPARK_ENABLED
export DATASTUDIO_SPARK_HOME=##DATASTUDIO_SPARK_HOME## # was SPARK_HOME
export DATASTUDIO_HADOOP_HOME=##DATASTUDIO_HADOOP_HOME## # was HADOOP_HOME
export DATASTUDIO_SPARK_MASTER=##DATASTUDIO_SPARK_MASTER## # was
SPARK_MASTER
export DATASTUDIO_SPARK_DEPLOY_MODE=##DATASTUDIO_SPARK_DEPLOY_MODE## #
was SPARK_DEPLOY_MODE

```

```

External Services and URLs
URLs and paths for external services, pipelines, and components.

export CS_AUTH_SERVICE_URL=##CS_AUTH_SERVICE_URL## # was AUTH_SERVICE_URL
export CS_META_SERVICE_URL=##CS_META_SERVICE_URL## # was META_SERVICE_URL
export CS_ER_SERVICE_URL=##CS_ER_SERVICE_URL## # was ER_SERVICE_URL
export CS_BATCH_SERVICE_URL=##CS_BATCH_SERVICE_URL## # was
BATCH_SERVICE_URL
export CS_TEMPLATE_CONFIG_PATH=##CS_TEMPLATE_CONFIG_PATH## # was
TEMPLATE_CONFIG_PATH
export CS_TEMPLATE_DEFAULT_LINK=##CS_TEMPLATE_DEFAULT_LINK## # was
TEMPLATE_DEFAULT_LINK

URLs for pipeline, ER and matching service. Leave as it is if not
applicable. Will impact the pipeline that could be added to a graph
export CS_MATCHRULE_BASE_URL=##CS_MATCHRULE_BASE_URL## # was
MATCHRULE_BASE_URL
export CS_LOADGRAPH_BASE_URL=##CS_LOADGRAPH_BASE_URL## # was
LOADGRAPH_BASE_URL
export CS_MATCHSRVC_UI_URL=##CS_MATCHSRVC_UI_URL## # was MATCHSRVC_UI_URL

URLs for index service. Leave as it is if not applicable. Will impact
the pipeline that could be added to a graph
export GRAPH_INDEX_BASE_URL=##GRAPH_INDEX_BASE_URL##
export GRAPH_LOAD_INDEX_UI_URL=##GRAPH_LOAD_INDEX_UI_URL## # was
LOADINDEX_UI_URL
export GRAPH_MATCHING_MECHANISM=##GRAPH_INDEX_MATCHING_MECHANISM## # was
MATCHING_MECHANISM
export
GRAPH_CANDIDATE_SELECTION_SERVICE_URL=##GRAPH_INDEX_CANDIDATE_SELECTION_SER
VICE_URL## # was CANDIDATE_SELECTION_SERVICE_URL
export GRAPH_LOAD_TO_OS_URL=##GRAPH_LOAD_TO_OS_URL## # was LOAD_TO_OS_URL

export EST_ENABLED=##EST_ENABLED##
export EST_UI_URL=##EST_UI_URL##
export EST_SERVICE_URL=##EST_SERVICE_URL##

export DATACATALOG_SERVICE_URL=##DATACATALOG_SERVICE_URL##

export
DATAPIPELINE_METADATA_ARCHIVE_PATH=##DATAPIPELINE_METADATA_ARCHIVE_PATH##

Graph and Advanced Features
Configurations for graph services, memory limits, and paths.

export GRAPH_INSTALLATION_PATH=##GRAPH_INSTALLATION_PATH##
export PGX_SERVER_URLS=##PGX_SERVER_URLS##
export
GRAPH_MAX_TOTAL_SHARED_DATA_MEMORY_SIZE=##GRAPH_MAX_TOTAL_SHARED_DATA_MEMOR
Y_SIZE## # was MAX_TOTAL_SHARED_DATA_MEMORY_SIZE
export
GRAPH_MAX_TOTAL_PRIVATE_DATA_MEMORY_SIZE=##GRAPH_MAX_TOTAL_PRIVATE_DATA_MEM
ORY_SIZE## # was MAX_TOTAL_PRIVATE_DATA_MEMORY_SIZE
export
GRAPH_MAX_PER_SESSION_DATA_MEMORY_SIZE=##GRAPH_MAX_PER_SESSION_DATA_MEMORY_
SIZE## # was MAX_PER_SESSION_DATA_MEMORY_SIZE

```

```

export
GRAPH_MAX_DATA_MEMORY_SIZE_DSUSRGRP=##GRAPH_MAX_DATA_MEMORY_SIZE_DSUSRGRP##
was MAX_DATA_MEMORY_SIZE_DSUSRGRP
export
GRAPH_MAX_DATA_MEMORY_SIZE_DSBATCH=##GRAPH_MAX_DATA_MEMORY_SIZE_DSBATCH##
was MAX_DATA_MEMORY_SIZE_DSBATCH
export
GRAPH_MAX_DATA_MEMORY_SIZE_DSINTER=##GRAPH_MAX_DATA_MEMORY_SIZE_DSINTER##
was MAX_DATA_MEMORY_SIZE_DSINTER
export
GRAPH_MAX_DATA_MEMORY_SIZE_DSAPPROVER=##GRAPH_MAX_DATA_MEMORY_SIZE_DSAPPROV
ER## # was MAX_DATA_MEMORY_SIZE_DSAPPROVER
export
GRAPH_MAX_DATA_MEMORY_SIZE_DSUSER=##GRAPH_MAX_DATA_MEMORY_SIZE_DSUSER## #
was MAX_DATA_MEMORY_SIZE_DSUSER
export
GRAPH_MAX_DATA_MEMORY_SIZE_IHUSRGRP=##GRAPH_MAX_DATA_MEMORY_SIZE_IHUSRGRP##
was MAX_DATA_MEMORY_SIZE_IHUSRGRP
export GRAPH_DOCUMENT_DOWNLOAD_PATH=##GRAPH_DOCUMENT_DOWNLOAD_PATH##

Graph Proxy Configurations
export GRAPH_NO_PROXY=##GRAPH_NO_PROXY##

GIT and Proxy Configurations
Properties for enabling git based import and export of model pipelines
set username and PAT(personal access token) to access private remote
repositories
set proxy url and port if you are behind a firewall

export GIT_ENV_ID=##GIT_ENV_ID##
export GIT_USERNAME=##GIT_USERNAME##
export GIT_PAT_SECRET=##GIT_PAT_SECRET##
export GIT_PROXY_URL=##GIT_PROXY_URL##
export GIT_PROXY_PORT=##GIT_PROXY_PORT##

Performance Tuning and Miscellaneous
Performance parameters, timeouts, and optional features.

The following property can be set to control the pages where MMG can be
embedded:
Set to 'self' to allow embedding only from the same origin (recommended
for most setups).
Set to 'all' or '*' to allow embedding from any origin. (less secure)
Set to a comma-separated list of origins to allow embedding from those
specified origins and from the same origin.
By default, this is set to 'self'.
export MMG_CSP_FRAME_ANCESTORS=##MMG_CSP_FRAME_ANCESTORS##

If the Gateway is enabled, this property can be set to control the pages
where Data Studio can be embedded:
Set to '*' to allow embedding from any origin (less secure).
Set to a comma-separated list of origins to allow embedding from those
specified origins and from the same origin.
By default, this is set to MMG Gateway URL.
If a load balancer or an external gateway is configured for MMG Gateway,
the URL must be included in the list of origins.

```

```

export DATASTUDIO_CSP_FRAME_ANCESTORS==DATASTUDIO_CSP_FRAME_ANCESTORS##

export
MMG_MODEL_ENDPOINT_RESTART_INTERVAL==MMG_MODEL_ENDPOINT_RESTART_INTERVAL##

export
DATASTUDIO_JOBS_INCOMPLETE_TIMEOUT==DATASTUDIO_JOBS_INCOMPLETE_TIMEOUT##
export
DATASTUDIO_JOBS_INCOMPLETE_SCHEDULED_CLEANUP_DELAY==DATASTUDIO_JOBS_INCOMP
LETE_SCHEDULED_CLEANUP_DELAY##
export
DATASTUDIO_SECURITY_SESSION_TIMEOUT_MS==DATASTUDIO_SECURITY_SESSION_TIMEOU
T_MS##
export
DATASTUDIO_SECURITY_ABSOLUTE_SESSION_TIMEOUT_MS==DATASTUDIO_SECURITY_ABSOL
UTE_SESSION_TIMEOUT_MS##
export
DATASTUDIO_INTERPRETER_EXECUTION_RUN_TIMEOUT==DATASTUDIO_INTERPRETER_EXECU
TION_RUN_TIMEOUT##
export
DATASTUDIO_INTERPRETER_IDLE_SESSION_TIMEOUT==DATASTUDIO_INTERPRETER_IDLE_S
ESSION_TIMEOUT##
export
DATASTUDIO_INTERPRETER_CLEANUP_ENABLED==DATASTUDIO_INTERPRETER_CLEANUP_ENA
BLED##
export
DATASTUDIO_INTERPRETER_CLEANUP_CRON=="DATASTUDIO_INTERPRETER_CLEANUP_CRON#
#"
export
DATASTUDIO_SERVER_ASYNC_THREADPOOL_SIZE==DATASTUDIO_SERVER_ASYNC_THREADPOO
L_SIZE##
export
DATASTUDIO_SERVER_SCHED_THREADPOOL_SIZE==DATASTUDIO_SERVER_SCHED_THREADPOO
L_SIZE##
export
DATASTUDIO_SERVER_TOMCAT_THREADS_MAX==DATASTUDIO_SERVER_TOMCAT_THREADS_MAX
##
export
DATASTUDIO_ZPLN_SCHED_THREADPOOL_SIZE==DATASTUDIO_ZPLN_SCHED_THREADPOOL_SI
ZE##

Optional Features
Uncomment and set to true/false as needed.

enabled by default
#export MMG_HTTP2_ENABLED==MMG_HTTP2_ENABLED##
#export MMG_SERVER_ACCESS_LOG_ENABLED==MMG_SERVER_ACCESS_LOG_ENABLED##

disabled by default
#export OJET_CDN_ENABLED==OJET_CDN_ENABLED##

DTP Integration Configuration

export DTP_PIPELINE_SERVICE_PORT==DTP_PIPELINE_SERVICE_PORT##
export DTP_PIPELINE_FILES==DTP_PIPELINE_FILES##
export DTP_DATA_PIPELINE_SERVICE_PORT==DTP_DATA_PIPELINE_SERVICE_PORT##

```

```

export
DTP_SCENARIO_PIPELINE_SERVICE_PORT=##DTP_SCENARIO_PIPELINE_SERVICE_PORT##
export DTP_SCENARIO_METADATA_JOB_PORT=##DTP_SCENARIO_METADATA_JOB_PORT##
export DTP_PIPELINE_SCHEMA_ALIAS=##DTP_PIPELINE_SCHEMA_ALIAS##

UI and Gateway ports for DTP services
export
DTP_DATA_PIPELINE_SERVICE_UI_PORT=##DTP_DATA_PIPELINE_SERVICE_UI_PORT##
export DTP_PIPELINE_SERVICE_UI_PORT=##DTP_PIPELINE_SERVICE_UI_PORT##
export
DTP_SCENARIO_PIPELINE_SERVICE_UI_PORT=##DTP_SCENARIO_PIPELINE_SERVICE_UI_PO
RT##
export DTP_GATEWAY_SERVICE_PORT=##DTP_GATEWAY_SERVICE_PORT##

Scheduler Timezone Properties. If either SCHEDULER_TIMEZONE or
SCHEDULER_TIMEZONE_DISPLAY_NAME is unset, a default value of UTC will be
applied during installation. #
Configured for aai-scheduler team.
export SCHEDULER_TIMEZONE=##SCHEDULER_TIMEZONE##
export SCHEDULER_TIMEZONE_DISPLAY_NAME=##SCHEDULER_TIMEZONE_DISPLAY_NAME##

#ENDOFFILE#

```

**Table 5-1** config.sh file

| Parameter                            | Description                                                                              | Is Mandatory | Comments                                                                                                                                                     |
|--------------------------------------|------------------------------------------------------------------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Common Application Properties</b> |                                                                                          |              |                                                                                                                                                              |
| ##APPLICATION_NAME##                 | Title of the application; if not replaced, default is : Model Management and Governance. | YES          | If not replaced, defaults to Model Management and Governance.                                                                                                |
| ##APPLICATION_ID##                   | Unique application identifier stored as app_id.                                          | YES          | Must match the APP_ID column in MMG_PATCHES table. No spaces allowed.                                                                                        |
| ##MMG_LOG_DIR##                      | Directory for MMG application logs.                                                      | YES          | Ensure that log folder is created before installation.                                                                                                       |
| ##FTPSHARE_DIR##                     | Writable directory for file transfer and metadata usage.                                 | YES          | /scratch/users/ftpshare<br>Ensure that ftpshare folder is created before installation.<br><br>This should be same as the metadata directory mentioned above. |

**Note**

Use double quotes if the name contains spaces.

Table 5-1 (Cont.) config.sh file

| Parameter                                   | Description                                                                                    | Is Mandatory | Comments                                       |
|---------------------------------------------|------------------------------------------------------------------------------------------------|--------------|------------------------------------------------|
| ##MMG_LOG_TIMEZONE##                        | Timezone used for logging.                                                                     | YES          | If not set, system timezone is used.           |
| ##WEB_CONTEXT##                             | Context path of the application.                                                               | YES          | mmg                                            |
| ##RESTRICT_UNMAPPED_DATASTORES_ACCESS##     | Restricts access to unmapped datastores.                                                       | YES          | Set to true/false as required.                 |
| ##MMG_API_USERNAME##                        | API user for MMG integration.                                                                  | YES          | Enter NA if not applicable.                    |
| ##MMG_SESSION_SECRET##                      | The password used to generate the Authorization header token to communicate with mmg-services. | YES          | Enter NA if not applicable.                    |
| ##MMG_UI_FAVICON_PATH##                     | Path to application favicon.                                                                   | NO           | Defaults to css/images/favicon.ico if not set. |
| ##MMG_MODEL_PIPELINE_SANDBOX_DEFAULT_VIEW## | Default sandbox view configuration.                                                            | NO           | Enabled by default unless overridden.          |
| ##EMAIL_SMTP_HOST##                         | SMTP host for email notifications.                                                             | YES          |                                                |
| ##EMAIL_SMTP_PORT##                         | SMTP port for email notifications.                                                             | YES          |                                                |
| <b>Database and Wallet Settings</b>         |                                                                                                |              |                                                |
| ##MMG_DB_WALLET_PATH##                      | Path containing wallet files (sqlnet.ora, .ss, .p12).                                          | YES          | /scratch/users/wallet                          |
| ##MMG_DB_TNS_ADMIN_PATH##                   | Path containing tnsnames.ora.                                                                  | YES          | /scratch/users/tns                             |
| ##MMG_DB_SCHEMA_WALLET_ALIAS##              | Wallet alias for MMG Config schema.                                                            | YES          | STSA_CONFIG                                    |
| ##DATASTUDIO_SCHEMA_WALLET_ALIAS##          | Wallet alias for Data Studio schema.                                                           | YES          | Required if wallet enabled for Studio.         |
| ##GRAPH_SCHEMA_WALLET_ALIAS##               | Wallet alias for Graph schema.                                                                 | YES          | Required for Graph integration.                |

**Note**

Ensure that you provide the same alias name as provided in the configForEST.sh file.

Table 5-1 (Cont.) config.sh file

| Parameter                              | Description                                                        | Is Mandatory | Comments                                              |
|----------------------------------------|--------------------------------------------------------------------|--------------|-------------------------------------------------------|
| ##GRAPH_SCHEMA_DB_SCHEMA_NAME#<br>#    | Graph schema name.                                                 | YES          | Used for Graph target schema.                         |
| ##GRAPH_DB_SERVER_NAME##               | Graph database server hostname.                                    | YES          |                                                       |
| ##GRAPH_DB_PORT#<br>#                  | Graph database port.                                               | YES          |                                                       |
| ##GRAPH_DB_SERVICE_NAME##              | Graph database service name.                                       | YES          |                                                       |
| <b>Network and Port Configurations</b> |                                                                    |              |                                                       |
| ##MMG_SERVICE_HOST##                   | Backend service hostname.                                          | YES          | Use Host IP or FQDN.                                  |
| ##LDAP_USER_FILTER##<br>R##            | LDAP User Filter<br>Will be used for<br>##UI_AUTH_TYPE## =<br>LDAP | YES          | "cn={0}"                                              |
| ##MMG_SERVICE_PORT##<br>T##            | Backend service port.                                              | YES          | Default: 7002                                         |
| ##MMG_UI_PORT##                        | UI service port.                                                   | YES          | Default: 7001                                         |
| ##MMG_SCHEMA_CREATOR_PORT##            | Schema Creator service port.                                       | YES          | Default: 7003                                         |
| ##DATASTUDIO_SERVER_PORT#              | Data Studio server port.                                           | NO           | Default: 7008                                         |
| ##MMG_COHERENCE_CLUSTER_PORT##         | Port for Coherence cluster (Notification service).                 | YES          | Default: 7574                                         |
| ##MMG_GATEWAY_PORT##                   | MMG Gateway port.                                                  | YES          | Mandatory if Gateway enabled.                         |
| ##GRAPH_SERVICE_PORT##                 | Graph service port.                                                | YES          | Default: 7059. Do not change if graphs already exist. |
| ##DATAPIPELINE_SERVICE_PORT1##         | Primary Data Pipeline service port.                                | YES          | Default: 18005                                        |
| ##DATAPIPELINE_SERVICE_PORT2##         | Secondary Data Pipeline service port.                              | YES          | Default: 18006                                        |
| <b>SSL and Security Settings</b>       |                                                                    |              |                                                       |
| ##MMG_SSL_ENABLE##<br>D##              | Enables HTTPS.                                                     | YES          | Example: true                                         |

Table 5-1 (Cont.) config.sh file

| Parameter                                                                                                                                                                                                                                                                                                                              | Description                                                                                                   | Is Mandatory | Comments                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------|
| ##SSL_KEYSTORE_PATH##                                                                                                                                                                                                                                                                                                                  | Absolute path to keystore file.                                                                               | YES          | ../conf/server.keystore.<br>Include the file name in the path. |
| <div>  <b>Note</b> <p>If ##SSL_ENABLED## is set to false, you must configure keystore for mmg-studio, as it is SSL-enabled by default. MMG application and MMG Studio can share the same SSL configuration if set up on the same server.</p> </div> |                                                                                                               |              |                                                                |
| ##SSL_KEYSTORE_PASSWORD##                                                                                                                                                                                                                                                                                                              | Keystore password.                                                                                            | YES          | Example: secret                                                |
| ##SSL_KEYSTORE_TYPE##                                                                                                                                                                                                                                                                                                                  | Keystore type<br>The value passed in the aforementioned command for -storetype<br>Can be either JKS or PKCS12 | YES          | Example: PKCS12                                                |
| ##SSL_CERT_ALIAS##                                                                                                                                                                                                                                                                                                                     | Keystore alias<br>The value passed in the aforementioned command for -alias                                   | YES          | Example: demoalias                                             |
| ##AUTH_MMG_KEYS_DIR##                                                                                                                                                                                                                                                                                                                  | Path of public/private MMG keys.                                                                              | YES          | Example:< MMG Installation Path> / OFS_MMG/conf                |
| <b>Authentication and Authorization</b>                                                                                                                                                                                                                                                                                                |                                                                                                               |              |                                                                |
| ##MMG_UI_AUTH_TYPE##                                                                                                                                                                                                                                                                                                                   | UI authentication type (aai, saml, ldap).                                                                     | YES          | Case-sensitive.                                                |
| ##MMG_SERVICE_AUTH_TYPE##                                                                                                                                                                                                                                                                                                              | Backend auth type.                                                                                            | YES          | Defaults to public.                                            |

Table 5-1 (Cont.) config.sh file

| Parameter                                                                                                                                                                                                                                                     | Description                                                                                                                                                                                        | Is Mandatory | Comments                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------|
| ##DATASTUDIO_AUTH_TYPE##                                                                                                                                                                                                                                      | Studio authentication type: <ul style="list-style-type: none"> <li>FCC_SSO – for SAMLRealm based authentication in FCC Studio</li> <li>MMG_AAI- AAI based authentication for MMG Studio</li> </ul> | YES          | Can be either MMG_AAI or FCC_SSO                                                          |
| ##DATASTUDIO_SHOW_LOGIN##                                                                                                                                                                                                                                     | Can be either <b>true/TRUE</b> or <b>false/FALSE</b> (all caps or all small)                                                                                                                       | YES          | It defaults to true.                                                                      |
| <div>  <b>Note</b><br/>           Set as true when the login screen of Studio is required. This property should be set as true if MMG application is non-SSL.         </div> |                                                                                                                                                                                                    |              |                                                                                           |
| ##DATASTUDIO_SESSION_MODE##                                                                                                                                                                                                                                   | Can be either NOTEBOOK or NOTEBOOK_USER.                                                                                                                                                           | YES          | If not set, it defaults to NOTEBOOK.                                                      |
| ##DATASTUDIO_AUTH_REALM##                                                                                                                                                                                                                                     | Can be either OFSAALealm or saml.OFSAASamlReal m                                                                                                                                                   | YES          | Can be either OFSAALealm or saml.OFSAASamlReal m                                          |
| ##AUTH_SAML_IDP_URL##                                                                                                                                                                                                                                         | This is the endpoint on the IDP side where SAML requests are posted. The Service Provider (SP) needs to obtain this information from the Identity Provider (IDP).                                  | YES          | http(s)://idcs-xxxx.com/fed/v1/idp/ssso<br>This is used only if ##UI_AUTH_TYPE## is SAML. |
| ##AUTH_LDAP_URL##                                                                                                                                                                                                                                             | LDAP URL<br>Will be used for ##UI_AUTH_TYPE## = LDAP                                                                                                                                               | YES          | ldap://whf00xyz:3060/                                                                     |

Table 5-1 (Cont.) config.sh file

| Parameter                                                                                                                                                                                                            | Description                                                              | Is Mandatory           | Comments                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------|
| ##DATASTUDIO_SERV<br>ER_COOKIE_DOMAIN<br>##                                                                                                                                                                          | The domain name.                                                         | YES                    | This should be the domain name of the host server.<br>Example: .in.xyz.com |
| <div>  <b>Note</b><br/>           If the MMG application is configured with the IP address, then provide the same.         </div> |                                                                          |                        |                                                                            |
| ##DATASTUDIO_SERV<br>ER_COOKIE_NAME##                                                                                                                                                                                | Cookie name.                                                             | YES                    | Defaults to ORA_OLD_SESSION if unset.                                      |
| <b>HTTP and Connection Pooling</b>                                                                                                                                                                                   |                                                                          |                        |                                                                            |
| ##MMG_HTTP_CLIEN<br>T_MAX_CONN##                                                                                                                                                                                     | Max HTTP connections across all routes.                                  | YES                    | Default: 20                                                                |
| ##MMG_HTTP_CLIEN<br>T_CONN_TIMEOUT_M<br>S##                                                                                                                                                                          | HTTP connection timeout (ms).                                            | YES                    | 0 = infinite timeout                                                       |
| ##MMG_CONFIG_DAT<br>ASOURCE_MAX_POO<br>L_SIZE##                                                                                                                                                                      | Config datasource max pool size.                                         | YES                    | Default: 10                                                                |
| ##MMG_EXT_DATASO<br>URCE_MAX_POOL_SI<br>ZE##                                                                                                                                                                         | External schema max pool size.                                           | NO                     | Default: 10                                                                |
| ##DATASTUDIO_HIKA<br>RI_MAXPOOLSIZE##                                                                                                                                                                                | Hikari pool max size for Studio.                                         | YES                    | Required for Studio DB performance tuning.                                 |
| <b>Graph and Advanced Features</b>                                                                                                                                                                                   |                                                                          |                        |                                                                            |
| ##GRAPH_INSTALLATI<br>ON_PATH##                                                                                                                                                                                      | Installation path of Graph service.                                      | YES                    | Required for L2G packaging.                                                |
| ##PGX_SERVER_URL<br>S##                                                                                                                                                                                              | PGX server resource path.                                                | YES (if PGX installed) | Skip if not installing PGX.                                                |
| ##GRAPH_MAX_TOTA<br>L_SHARED_DATA_ME<br>MORY_SIZE##                                                                                                                                                                  | Max shared data memory size.                                             | YES                    | Default: 20 GB                                                             |
| ##GRAPH_MAX_TOTA<br>L_PRIVATE_DATA_ME<br>MORY_SIZE##                                                                                                                                                                 | Max private data memory size.                                            | YES                    | Default: 8 GB                                                              |
| ##GRAPH_MAX_PER<br>SESSION_DATA_MEM<br>ORY_SIZE##                                                                                                                                                                    | Max memory per session.                                                  | YES                    | Default: 700 MB                                                            |
| <b>External Services and Integration</b>                                                                                                                                                                             |                                                                          |                        |                                                                            |
| ##CS_AUTH_SERVICE<br>_URL##                                                                                                                                                                                          | The AUTH service URL that is activated after the fccstudio.sh file runs. | NO                     | Example: https://<hostname>:7041/authservice                               |

**Table 5-1 (Cont.) config.sh file**

| Parameter                             | Description                                                             | Is Mandatory         | Comments                                     |
|---------------------------------------|-------------------------------------------------------------------------|----------------------|----------------------------------------------|
| ##CS_META_SERVICE_URL##               | The metaservice URL that is activated after the fccstudio.sh file runs. | NO                   | Example: https://<hostname>:7045/metaservice |
| ##EST_ENABLED##                       | Enables EST integration.                                                | YES                  | Default: FALSE                               |
| ##EST_SERVICE_URL##                   | STSA backend URL.                                                       | YES (if EST enabled) | Required if EST integrated.                  |
| ##DATACATALOG_SERVICE_URL##           | Used when EST integrated.                                               | NO                   | Optional integration.                        |
| <b>Gateway and Embedding Security</b> |                                                                         |                      |                                              |
| ##MMG_CSP_FRAME_ANCESTORS##           | Controls allowed embedding origins for MMG UI.                          | YES                  | Default: self                                |
| ##DATASTUDIO_CSP_FRAME_ANCESTORS##    | Controls embedding origins for Data Studio UI.                          | YES                  | Default: MMG Gateway URL                     |

**Note**

If changes are done directly on UI and then restart is done then in that case overwrite will not be triggered so configuration would not change, it is only dependent on file system JSON).

**Note**

- In case of `##OFSAA_URL##` and `##MMG_SVC_URL##`, do not add any ending '/' in the URLs
- If pool size, connection timeout and idle timeout are not configured, then it will proceed with default Hikari Configurations.
- The default session timeout is 3600 seconds (60 mins). You can configure timeout using `server.servlet.session.timeout` property.
- If the AUTH type specified is AAI, make sure the AAI System has appropriate user groups mapped for the users. WKSPADMIN, IDNTYADMIN, IDNTYAUTH need minimally to be present for a successful subsequent logins.
- The name for MMG Studio cookie is `ORA_OLDSESSION`.
- If the `##SSL_ENABLED##` is set to false, keystore configuration must be done for mmg-studio as it is SSL enabled by default. MMG application and MMG Studio can use the same SSL configuration if configured in the same server.
- The wallet is same for all the MMG services including MMG Studio. So, if you want to use the MMG Studio with wallet configurations, then configure in the same wallet.
- If the MMG Studio is remotely configured, then the MMG Application Configuration Schema wallet alias and `tnsnames.ora` file entries need to be added to the MMG Studio configured wallet and `tnsnames.ora` file.
- If MMG application is Non SSL, set the below property to "false" in the `application.yml` file inside the MMG Studio and restart the services.

security:

cookies:

secure: false

**Note****Setting both Timeouts**

Data Studio user login sessions to be logged out automatically after a set amount of time:

It is recommended to set both the relative and absolute session timeouts.

With the following properties, a user session will expire after one hour of inactivity or the maximum duration of 24 hours.

**Studio-Server:****Security:**

Absolute-session-timeout-ms: 86400000 // 24 hours

Session-timeout-ms: 3600000 // 1 hour

**Paragraph Execution Timeout**

Automatically cancel a paragraph execution after a set amount of time:

Studio-server:

Interpreter:

Execution:

Run-timeout: 24 hours

You can set the timeout to 0 to disable the timeout entirely. When the timeout is disabled, paragraphs will run either until they finish or are being manually cancelled.

With the following properties, a paragraph will be timed out after 24 hours.

**Synchronous Run Timeout**

Timeout for synchronous code running (this is used for pipeline executions in MMG):

Studio-server:

Rest:

Code:

Maximum Runtime sync: 20 minutes

With the following configuration, the synchronous run will be timed out after 20 minutes.

<https://datastudio.oraclecorp.com/docs/deployer/pages/configuration/server.html>

## 5.5 Configure the configForEST.sh file

To configure the configForEST.sh file:

1. Log in to the server as a Non-root user.
2. Navigate to the following path: /installation directory/OFS\_STSA/bin/directory .

For example, /scratch/ofsaaweb/EST\_HOME/OFS\_STSA/bin

### 3. Edit the applicable configForEST.sh attributes as shown here.

Sample configForEST.sh file

```
#!/bin/sh

Common properties
export EST_WALLET_LOCATION=<WALLET_LOCATION_PATH>
export EST_TNS_ADMIN_PATH=<TNS_ADMIN_PATH>
export EST_CONF_WALLET_ALIAS=<CONFIG_WALLET_ALIAS>
export EST_META_WALLET_ALIAS=<ATOMIC_WALLET_ALIAS>
export LOG_HOME=<LOG_DIRECTORY_PATH>
export FTPSHARE_PATH=<FTPSHARE_DIRECTORY_PATH>
with no '/' at end and no http:// or https://
export HOST_NAME=<HOST_NAME_OR_IP>

Path up to directory where all bin, conf, lib, mmg-ui folders are
present
export MMG_INSTALLATION_PATH=<MMG_INSTALLATION_PATH>

Application properties
export EST_SERVICE_SERVER_PORT=31101
export EST_UI_SERVICE_SERVER_PORT=31102
export EST_UI_SERVER_PORT=31103
export EST_SCHEMA_CREATOR_PORT=31104
export AAI_CONNECTION_ISMULTITENANT=true
export AAI_CONNECTION_MAXPOOLSIZE_OVERRIDE=4
export SPRING_MASTERDATASOURCE_WALLETENABLED=true
export
SPRING_MASTERDATASOURCE_WALLETURL=jdbc:oracle:thin:@<CONFIG_WALLET_ALIAS>
export SPRING_MASTERDATASOURCE_DRIVER_CLASS_NAME=oracle.jdbc.OracleDriver
export SPRING_MVC_PATHMATCH_MATCHING_STRATEGY=ant-path-matcher
export EST_SERVER_SERVLET_CONTEXT_PATH=estservice
export LOCALE=en-us
export ofs_tenant_id=<TENANT_ID>
export ofs_service_id=<SERVICE_ID>
export ofs_app_id=est
export ofs_cor_id=<CORRELATION_ID>

export FEIGN_CLIENT_CONFIG_DEFAULT_CONNECTTIMEOUT=160000000
export FEIGN_CLIENT_CONFIG_DEFAULT_READTIMEOUT=160000000

MMG Keys location
export EST_MMG_KEYS_LOC=<MMG_KEYS_PATH>

PMF Keys
export spring_main_allow_circular_references=true

Open Metadata Keys start
export OPENMETADATA_URL=http://<OPENMETADATA_HOST>:<PORT>
export OPENMETADATA_VERSION=v1
export OPENMETADATA_TOKEN=<TOKEN>
export OPENMETADATA_ADMINUSERNAME=<OM_ADMIN_USERNAME>
export OPENMETADATA_ADMINPASSWORD=<OM_ADMIN_PASSWORD>
export OPENMETADATA_SHOULDUSETOKEN=true
export OPENMETADATA_TOKENGENERATIONTIME=36000
```

```

export OPENMETADATA_IDCS_URL=
export OPENMETADATA_IDCS_APPLICATION_CLIENT_ID=<IDCS_CLIENT_ID>
export OPENMETADATA_IDCS_APPLICATION_CLIENT_SECRET=<IDCS_CLIENT_SECRET>
Open Metadata Keys end

SSL Configurations
export SERVER_SSL_KEY_STORE_TYPE=PKCS12
export SERVER_SSL_KEY_STORE=<KEYSTORE_PATH>
export SERVER_SSL_KEY_STORE_PASSWORD=<KEYSTORE_PASSWORD>
export SERVER_SSL_KEY_ALIAS=<KEY_ALIAS>
export SERVER_SSL_ENABLED=false

est-ui
export AAI_COOKIE_DOMAIN=<COOKIE_DOMAIN>
export LOGGING_LEVEL_ROOT=DEBUG
export SPRING_MVC_VIEW_PREFIX=/
export SPRING_MVC_VIEW_SUFFIX=.html
export SERVER_MAX_HTTP_HEADER_SIZE=32KB

Remove this line if deprecated:
export DATAPIPELINE_URL_FOR_UI=<URL> # (Remove if no longer used)

export DATACATALOG_BASE_URL=http://<DATACATALOG_HOST>:<PORT>/
<CONTEXT_PATH>/

export TOKEN_CLIENT_ID=<CLIENT_ID>
export TOKEN_SECRET=<CLIENT_SECRET>

export AAI_CONFIG_WALLET_ALIAS=<CONFIG_WALLET_ALIAS>

BI REPORT
export BI_REPORT_URL=http://<BI_REPORT_HOST>:<PORT>/dv

Log level for DI
export EST_DI_LOG_LEVEL=DEBUG
export EST_DI_DATEFORMAT=MM/dd/YYYY
#Path to pub and priv keys
export SSH_KEYS_PATH=##SFTP_SSH_KEYS_PATH##

```

Table 5-2 Details of attributes in the configforEST.sh file

| Parameter                 | Description                                                                                                                                    | Is Mandatory | Comments                                                                                              |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------|
| ##EST_WALLET_LOCATION##   | The location where the oracle wallet is created. For more information, see the <a href="#">Configuring Password Store with Oracle Wallet</a> . | YES          | /scratch/users/wallet                                                                                 |
| ##EST_TNS_ADMIN_PATH#     | The folder that contains the tnsnames.ora file.                                                                                                | YES          | /scratch/users/tns                                                                                    |
| ##EST_CONF_WALLET_ALIAS## | The wallet alias name configured for the STSA application configuration schema.                                                                | YES          | STSA_CONFIG<br><b>Note:</b> Ensure that this and alias name mentioned in config.sh file are the same. |

Table 5-2 (Cont.) Details of attributes in the configforEST.sh file

| Parameter                                | Description                                                                                                                                                                       | Is Mandatory | Comments                                                                                  |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------|
| ##EST_META_WALLET_ALIAS##                | The wallet alias name configured for the STSA application META schema.<br><b>Note:</b> The value is same as ##EST_CONF_WALLET_ALIAS##.                                            | YES          | STSA_CONFIG                                                                               |
| ##LOG_HOME##                             | A writable folder designated for storing application and liquibase logs                                                                                                           | YES          | scratch/users/logs                                                                        |
| #FTPSHARE_PATH#                          | This can be any writable folder accessible to the process owner. Grant 0775 permission                                                                                            | YES          | /scratch/users/ftpshare<br>Ensure that an ftpshare folder is created before installation. |
| ##HOST_NAME##                            | Hostname on which the all services run. Use the same hostname wherever applicable.<br><b>Note:</b> Do not add any protocol to host IP or Fully Qualified Domain Name (FQDN).      | YES          | HostIP or FQDN<br>Example:<br><hostname>.xyz.com                                          |
| ##MMG_INSTALLATION_PATH##                | Path where MMG is installed that contains (bin, mmg-ui, mmg-service and so on) folders. Required only when existing MMG is used and is already installed in the same environment. | NO           | Example:<br><MMG_INSTALLATION_DIRECTORY>/OFS_MMG                                          |
| ##EST_SERVICE_SERVER_PORT##              | Port number where the backend service (estservice) is running.                                                                                                                    | YES          | 3101                                                                                      |
| ##EST_UI_SERVICE_SERVER_PORT##           | Port number where the UI service (estui service) is running.                                                                                                                      | YES          | 3102                                                                                      |
| ##EST_UI_SERVER_PORT#                    | Port number where the UI ojet service (estui) is running.                                                                                                                         | YES          | 3103                                                                                      |
| ##EST_SCHEMA_CREATOR_PORT##              | Port number where the schema creator for STSA is running.                                                                                                                         | YES          | 3104                                                                                      |
| ##AAI_CONNECTION_ISMULTITENANT##         | This is the connection library to enable multi tenant connection. The default value is set to true.<br><b>Note:</b> Retain the value as is given in the configuration file.       | YES          | NA                                                                                        |
| ##AAI_CONNECTION_MAX_POOLSIZE_OVERRIDE## | This is a connection pool size across the services. The default value is set to 4.<br><b>Note:</b> Retain the value as is given in the configuration file.                        | YES          | NA                                                                                        |

Table 5-2 (Cont.) Details of attributes in the configforEST.sh file

| Parameter                                     | Description                                                                                                                                                                                                                                                                      | Is Mandatory | Comments                      |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------|
| ##SPRING_MASTERDATASOURCE_WALLETENABLED##     | Boolean property indicating if you have to use the wallet for the masterdatasource connection. The default value is set to true.<br><b>Note:</b> Retain the value as is given in the configuration file.                                                                         | YES          | NA                            |
| ##SPRING_MASTERDATASOURCE_WALLETURL##         | This is the jdbc url to connect to the wallet alias. Replace the placeholder with wallet alias name of configuration schema.                                                                                                                                                     | YES          | jdbc:oracle:thin:@STSA_CONFIG |
| ##SPRING_MASTERDATASOURCE_DRIVER_CLASS_NAME## | This is the class name of the JDBC driver that you use to communicate with the database. The default value is set as oracle.jdbc.OracleDriver. The value is same as ##EST_CONF_WALLET_ALIAS## attribute.<br><b>Note:</b> Retain the value as is given in the configuration file. | YES          | NA                            |
| ##SPRING_MVC_PATHMATCHING_STRATEGY##          | Choice of strategy for matching request paths against registered mappings. The default value is ant-path-matcher .<br><b>Note:</b> Retain the value as is given in the configuration file.                                                                                       | YES          | NA                            |
| ##EST_SERVER_SERVLET_CONTEXT_PATH##           | Context path of the application. The default value is estservice.                                                                                                                                                                                                                | YES          | NA                            |
| ##LOCALE##                                    | This is the property that defines the users language. The default value is en-US.<br><b>Note:</b> Retain the value as is given in the configuration file.                                                                                                                        | YES          | NA                            |
| ##ofs_tenant_id##                             | This is the default tenant id value. The default value is MMG1.<br><b>Note:</b> Retain the value as is given in the configuration file.                                                                                                                                          | YES          | NA                            |
| ##ofs_service_id##                            | This is a default service id value. The default value is OFSAA.<br><b>Note:</b> Retain the value as is given in the configuration file.                                                                                                                                          | YES          | NA                            |
| ##ofs_app_id##                                | This is a default application id. The default value is est.<br><b>Note:</b> Retain the value as is given in the configuration file.                                                                                                                                              | YES          | NA                            |

Table 5-2 (Cont.) Details of attributes in the configforEST.sh file

| Parameter                                  | Description                                                                                                                                                                                                                                         | Is Mandatory | Comments                                  |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------|
| ##ofs_cor_id##                             | This is a default correlation id value. The default value is TXN_523.<br><b>Note:</b> Retain the value as is given in the configuration file.                                                                                                       | YES          | NA                                        |
| FEIGN_CLIENT_CONFIG_DEFAULT_CONNECTTIMEOUT | The connection timeout prevents blocking the caller due to the long server processing time. The default value is 1600000000 MilliSeconds (ms).<br><b>Note:</b> Retain the value as is given in the configuration file.                              | YES          | < STSA Installation Path> / OFS_STSA/conf |
| FEIGN_CLIENT_CONFIG_DEFAULT_READTIMEOUT    | The read timeout is applied from the time of connection establishment and is triggered when returning the response time takes too long. The default value is 1600000000 ms.<br><b>Note:</b> Retain the value as is given in the configuration file. | YES          | NA                                        |
| ##EST_MMG_KEYS_LOC##                       | Provide the absolute path of the MMG public and private keys. MMG keys are generated in the MMG setup steps. See the mmg keys location in the <mmg configuration file> (MMG_KEYS_LOC property).                                                     | YES          | < MMG Installation Path> / OFS_MMG/conf   |
| spring_main_allow_circular_references      | This parameter checks whether to allow circular references between beans and automatically tries to resolve them. The default value is set to true.<br><b>Note:</b> Retain the value as is given in the configuration file.                         | YES          | NA                                        |
| ##OPENMETADATA_VERSION##                   | Version of the Openmetadata application. Ensure that this value is v1.                                                                                                                                                                              | YES          | Example: v1                               |
| ##OPENMETADATA_TOKEN##                     | Token for validating api calls made to openmetadata application.                                                                                                                                                                                    | YES          | NA                                        |
| ##OPENMETADATA_ADMIN_USERNAME##            | Administrator username for OM Application.<br>If the OPENMETADATA_SHOULD_USE_TOKEN attribute is set to true, then this parameter is mandatory.                                                                                                      | YES          | admin                                     |

### Table 5-2 (Cont.) Details of attributes in the configforEST.sh file

| <b>Parameter</b>                                      | <b>Description</b>                                                                                                                                                                                                               | <b>Is Mandatory</b> | <b>Comments</b>                                                                                                                                                                     |
|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ##OPENMETADATA_ADMIN<br>PASSWORD##                    | Administrator password for OM Application.<br>If the OPENMETADATA_SHOULD USETOKEN attribute is set to true, then this parameter is mandatory.                                                                                    | YES                 | admin                                                                                                                                                                               |
| ##OPENMETADATA_SHOUL<br>DUSETOKEN##                   | Set this value to true if you are using token based authentication.<br>Set this value to false if you are using SSO based authentication.                                                                                        | YES                 | Example: true                                                                                                                                                                       |
| ##OPENMETADATA_TOKEN<br>GENERATIONTIME##              | Token regeneration time for authentication.<br>If the OPENMETADATA_SHOULD USETOKEN attribute is set to false, then this parameter is mandatory.<br><b>Note:</b> If you do not set any value, the default value is taken from OM. | YES                 | Example: 360000 ms                                                                                                                                                                  |
| #OPENMETADATA_IDCS_U<br>RL#                           | The IDCS URL for OpenMetadata if authentication is configured through SSO.<br>If the OPENMETADATA_SHOULD USETOKEN attribute is set to false, then this parameter is mandatory.                                                   | NO                  | Example:<br><br><a href="https://fde1-8c9d7eaeaf0adfafeebccbfce.identity.authz.adobe.com/oauth2/v1/">https://fde1-8c9d7eaeaf0adfafeebccbfce.identity.authz.adobe.com/oauth2/v1/</a> |
| #OPENMETADATA_IDCS_A<br>PPLICATION_CLIENT_ID#         | The IDCS client ID from IDCS configuration for Openmetadata if authentication is configured through SSO.<br>If the OPENMETADATA_SHOULD USETOKEN attribute is set to false, then this parameter is mandatory.                     | YES                 |                                                                                                                                                                                     |
| #OPENMETADATA_IDCS_A<br>PPLICATION_CLIENT_SEC<br>RET# | The IDCS SECRET(TOKEN) from IDCS configuration for OpenMetadata if authentication is configured through SSO.<br>If the OPENMETADATA_SHOULD USETOKEN attribute is set to false, then this parameter is mandatory.                 | YES                 |                                                                                                                                                                                     |

Table 5-2 (Cont.) Details of attributes in the configforEST.sh file

| Parameter                         | Description                                                                                                                                    | Is Mandatory | Comments                                                                                  |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------|
| ##SERVER_SSL_KEY_STORE_TYPE##     | The value passed in the command for keystore creation for -storetype. The values can be either JKS or PKCS12.                                  | YES          | Example: PKCS12                                                                           |
| ##SERVER_SSL_KEY_STORE##          | Absolute path for the keystore file. Ensure to enter the same path as MMG SSL_KEYSTORE attribute value.                                        | YES          | Include the file name in the path. ../conf/server.keystore                                |
| ##SERVER_SSL_KEY_STORE_PASSWORD## | The password for the keystore file is same as SSL_KS_SECRET.                                                                                   | YES          |                                                                                           |
| ##SERVER_SSL_KEY_ALIAS##          | The value for the alias is same as SSL_KS_ALIAS.                                                                                               | YES          | Example: demoalias                                                                        |
| ##SERVER_SSL_ENABLED##            | Enables or disables the SSL protocol for the application.                                                                                      | YES          | Example: true                                                                             |
| ##AAI_COOKIE_DOMAIN##             | The domain of the server.                                                                                                                      | YES          | Example: in.xyz.com                                                                       |
| ##LOGGING_LEVEL_ROOT##            | Base level set for type of logs that are available in log file. The value options are: info, debug, and warn.                                  | YES          | Example: DEBUG                                                                            |
| ##SPRING_MVC_VIEW_PREFIX##        | It applies a prefix to the view name and then looks for a physical resource with that path in the servlet context. The default value is \.     | YES          | \                                                                                         |
| ##SPRING_MVC_VIEW_SUFFIX##        | It applies a suffix to the view name and then looks for a physical resource with that path in the servlet context. The default value is .html. | YES          | .html                                                                                     |
| ##SERVER_MAX_HTTP_HEADER_SIZE##   | Property to modify the max HTTP response header size in KB. Retain the value provided in configuration file.                                   | YES          | Example: 32KB                                                                             |
| ##DATACATALOG_BASE_URL##          | This is the base URL to datacatalog application for UI.                                                                                        | YES          | Format: http(s)://<HOST_NAME>:<EST_SERVICE_SERVER_PORT>/<EST_SERVER_SERVLET_CONTEXT_PATH> |
| ##TOKEN_CLIENT_ID##               | Client ID used for token generation for authentication. The value is ofsauser.                                                                 | YES          | Example: ofsauser                                                                         |
| ##TOKEN_SECRET##                  | Secret (Pass) used for token generation for authentication. Ensure that this value is secret.                                                  | YES          | Example: secret                                                                           |

Table 5-2 (Cont.) Details of attributes in the configforEST.sh file

| Parameter                   | Description                                                                                                                                                                                                                                                                                              | Is Mandatory | Comments                                                                                                            |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------------------------------------------------------------------------------------------------|
| ##AAI_CONFIG_WALLET_ALIAS## | Provide the wallet alias for configuration schema of production OFSAA application.                                                                                                                                                                                                                       | YES          | OFSAACNF                                                                                                            |
| ##BI_REPORT_URL##           | The URL to view BI reports after running the project.                                                                                                                                                                                                                                                    | YES          | http(s)://<br>BI_HOST_NAME:BI_PORT/dv                                                                               |
| ##EST_DI_LOG_LEVEL##        | The Log level to specify what level of Direct Ingestion logs are to be produced.                                                                                                                                                                                                                         | NO.          | If no level specified default logs will be of INFO level.                                                           |
| ##EST_DI_DATEFORMAT##       | The date format that will be used by Direct Ingestion utility to fetch records from external datasource                                                                                                                                                                                                  | NO           | If no format specified then default will be MM/dd/YYYY                                                              |
| ##SSH_KEYS_PATH##           | Specify the path to the public and private SSH keys used for connecting to remote machines. If the keys do not exist, generate them using the following command:<br>ssh-keygen -t rsa -b 4096 -f ~/.ssh/id_rsa<br>Copy the generated key pair to a different folder and provide the path to that folder. | Yes          | <STSA Installation Path>/SSH_KEYS<br>This property can be<br><br><STSA Installation Path>/OFS_STSA/MMG/OFS_MMG/conf |

## 5.6 Run the STSA Installer

To run the installer, follow these steps:

1. Navigate to following path:  
Go to <STSA\_INSTALLATION\_PATH>/bin directory.
2. Run the following command from the OFS\_STSA/bin path:  
./deploy.sh

### Note

When ./deploy.sh command is triggered, pre-installation utility validates install configurations such as availability of ports, ftpshare/log folders, database connections, and so on.

This step will install the configurations and has to be executed only once per deployment. This will also bring up the Schema Creator Service in nohup mode.

A message similar to following means a successful startup:

<EST\_INSTALLATION\_PATH>/OFS\_MMG/bin>./install.sh

PIPELINE\_HOME: <MMG\_INSTALLATION\_PATH>/OFS\_MMG/est-pipeline/pipeline

```
<MMG_INSTALLATION_PATH>/OFS_MMG/est-pipeline/pipeline
PIPELINE_HOME: <MMG_INSTALLATION_PATH>/OFS_MMG/est-pipeline/pipeline
Installing Pipeline Data Model. Please Wait ...
Pipeline Data Model installation finished.
Starting Gateway ...
Starting Pipeline UI Service ...
Starting Pipeline Service ...
Starting Data Pipeline UI Service ...
Starting Data pipeline services ...
Inserting DataMeta Data ...
***** Data Pipeline Deployment Done *****
Stopping Graph-Service service...
Graph-Service stopped.
Schema Creator executed successfully for config schema
Schema Creator for config executed successfully.
If Graph Schema is configured, the below message is displayed.
Now triggering for graph-schema
./../est-schema-creator/bin/startup.sh: line 70: 126438 Killed nohup java -jar -
Doracle.net.tns_admin=/scratch/ofsaadb -Doracle.net.wallet_location=/scratch/ofsaadb/
wallet -Dspring.config.location=../conf/ -Dspring.datasource.url=jdbc:oracle:thin:@conf_als
-Dspring.liquibase.change-log=file:../scripts/changelog-master.xml $JAVA_OPTS ../lib/est-
schema-creator.war > nohup.out 2>&1
Schema Creator executed successfully for graph schema
nohup: ignoring input and redirecting stderr to stdout
Stopping Graph-Service service...
Graph-Service stopped.
nohup: ignoring input and redirecting stderr to stdout
You can check build-schema-creator/bin/nohup.out to check if the service comes up
properly.
Started BuildSchemaCreatorApplication in 20.317 seconds (JVM running for 21.26)
```

**Note**

To check for installation logs, navigate to the `installation.log` file present in the following path: `OFS_STSA/bin`

**Warning**

If you notice any errors, do not proceed further. Contact [My Oracle Support \(MOS\)](#) and provide the applicable error code and log files.

3. Execute `shutdown.sh` and trigger `startup.sh` for the services to come up. For more details, refer to the below sections.

 **Note**

The STSA application is installed with or without OFSAA, depending on the configuration provided in the `config.sh` file.

Sample Console Messages During Installation:

```
STARTING STSA INSTALLATION Started
STSA Schema Creator execution
EST Schema Creator executed successfully
STSA Installation Complete
```

These messages help track installation progress. Ensure no errors appear in the console; otherwise, review the installation logs.

## 5.7 Starting STSA Services

To start the STSA service, run the following command:

- Navigate to `<STSA_INSTALLATION_PATH>/OFS_STSA/bin` directory. `./startup.sh`

To check if the UI service comes up correctly check the following log file:  
`<INSTALLATION_PATH/OFS_STSA>/est-ui-service/bin/nohup.out`

To check for any issues in MMG services, check the following log folder:  
`<Logs_Directory>/services`

After a successful startup, the following message is displayed:  
INFO Tomcat started on port(s): `<est-ui-port>` (http) with context path `'//estservice'`

To check if the backend service is up, check the following log folder:  
`<INSTALLATION_PATH/OFS_STSA>/est-service/bin/nohup.out`

After a successful startup, the following message is displayed:  
INFO Started AaiESTServiceApplication in 17.774 seconds (JVM running for 19.879)

After this, the application is installed and all the application services are started successfully.

 **Warning**

If you notice any errors, do not proceed further. Contact [My Oracle Support \(MOS\)](#) and provide the applicable error code and log files.

**Note**

Unset the https/http proxy details before starting the services.  
OR  
Add the relevant entries in no\_proxy with STSA hosted server details.

Sample Console Messages When Starting Services:

```
Starting STSA Services...
STSA Service <service_name> started successfully
```

If any service fails to start, the console will display a message such as:

```
Service <service_name> failed to start. Check error logs at: <log_path>
```

**Note**

Review the log files at the provided location to troubleshoot startup issues.

## 5.8 Stopping STSA Services

To stop the STSA services, run the following command: `./shutdown.sh`

## 5.9 Optional Installations for STSA

The following installations are optional to STSA application.

### 5.9.1 Installing Conda

Conda as a package manager helps you to find and install packages. With the capability of environment manager, you can set up a totally separate environment to run different versions of Python. In addition, you can continue to run your usual version of Python in your normal environment.

**Note**

The supported version is 4.14.0.

To install the Conda, perform the following:

1. Download the [miniconda](#).
2. Copy it to your server where the Conda needs to be installed.
3. Grant execute permission to the Conda folder.
4. Execute the following command: `$ ./Miniconda3-latest-Linux-x86_64.sh`
5. Update the PATH variable with miniconda installation path:

```
<install_path>/miniconda3/bin
```

**Note**

In the current release, the Conda feature is not supported in Solaris Operating System.

For more details on the Roles and privileges, see *MMG User Guide*.

## 5.9.2 Installing Python Library

This section provides detailed steps to install the Python Library.

### 5.9.2.1 Prerequisites

- Python 3.10.x and above

**Note**

Ensure the libraries, bzip2-devel, sqlite-devel, ncurses-devel, and xz-devel, libffi-devel are installed before you install the Python package.

For Example:

**Note**

Install the below libraries as a root user.

- **bzip2-devel:** Execute the command `yum install bzip2-devel`
- **sqlite-devel:** Install as a root user using the command `yum install sqlite-devel`
- **ncurses-devel:** Install as a root user using the command `yum install ncurses-devel`
- **xz-devel:** Install as a root user using the command `yum install xz-devel`
- **libffi-devel:** Install as a root user using the command `yum install libffi-devel`

**Note**

In order to download the latest python packages after MMG upgrade, the pip cache in the server user home directory needs to be cleared.  
Path: \$HOME/.cache/pip

**Note**

Documentation of Mandatory Parameter to be passed as part of Python environment install.sh Installation  
Now, parameters is supported as below for python-env-install.sh file:

The user needs to be passed in case the packages has to be installed at a user level. The above is not required in case of CONDA environment. In this case make sure the Python3 is pointed to proper Conda environments.

## 5.9.2.2 Procedure

1. Set system python3 to the one that is to be used. Navigate to bin folder.
2. To install the mmg library with dependencies from conf/requirements.txt, execute the following command:

```
./python-env-install.sh
```

The following parameter is supported for python-env-install.sh file:

--user need to be passed in case the packages has to be installed at user level.

This is not required in case of Conda environment but python3 must be configured to the appropriate Conda environments.

**Note**

Expose Python variables/functions to derive File Path when saving files directly from Notebook script (without using Save Widget).

3. To install the mmg library with flexible dependencies or using already installed dependent packages, execute the following command:

```
./python-env-install.sh -S
```

OR

```
./python-env-install.sh --skip
```

This will skip the installation of dependency based on the version mentioned in the conf/requirements.txt. The installation will be with whatever version available in the pypi server.

4. To install the Apache Flink packages, execute the following command:

```
./python-env-install.sh --include-flink
```

**Note**

```
Ignore the below error message during Apache Flink package installation.
ERROR: pip's dependency resolver does not currently take into account
all the

packages that are installed. This behavior is the source of the
following dependency conflicts.

modin 0.19.0 requires pandas==1.5.3, but you have pandas 1.3.5 which
is incompatible.

Successfully installed numpy-1.21.4 pandas-1.3.5 python-dateutil-2.8.0
Installing with dependencies

ERROR: pip's dependency resolver does not currently take into account
all the

packages that are installed. This behavior is the source of the
following dependency conflicts.

pemja 0.2.6 requires numpy==1.21.4, but you have numpy 1.24.2 which is
incompatible.

apache-flink 1.16.1 requires numpy<1.22.0,>=1.21.4;
python_full_version >=
"3.7", but you have numpy 1.24.2 which is incompatible.

apache-flink 1.16.1 requires pandas<1.4.0,>=1.3.0; python_full_version
>=
"3.7", but you have pandas 1.5.3 which is incompatible.

apache-flink 1.16.1 requires python-dateutil==2.8.0, but you have
python-dateutil 2.8.2 which is incompatible.

apache-beam 2.38.0 requires
numpy<1.23.0,>=1.14.3, but you have numpy
1.24.2 which is incompatible.
```

## 5.10 Multi Level Approval

Model Pipeline deployment process by default requires one level of approval for every stage including model pipeline acceptance, promotion to production, and so on.

The requestor is allowed to select Reviewer and Approver user groups. All the user groups with MDLREVIEW function mapped to them are displayed in the Reviewers selector field. Similarly, the user groups with the MDLAPPROVE function mapped to them are displayed in the Approvers selector field. Applicable Pending requests are shown in the Reviewer/Approver tabs.

To add multi level approvers or reviewers, perform the following:

1. Navigate to <installation directory>/MMG/OFMMG/conf/workflow/model-pipeline/default.yml

Following are the default values:  
workflow:

workflow-name: Default Workflow

num-approver-levels: 1

levels:

- level: 1

approvers:

escalation-approvers:

escalation-trigger-time: 0

lock-approver-selection: false

enable-approver-notification: true

2. Modify the approver levels based on your requirements as shown below.

**Figure 5-1 Multi level approval**

```
workflow:
 workflow-name: Default Workflow
 num-approver-levels: 2
 levels:
 - level: 1
 approvers: APPROVER1
 escalation-approvers: MDLAPPR
 - level: 2
 approvers: APPROVER2
 escalation-approvers: MDLAPPR
 escalation-trigger-time: 12
 enable-approver-notification: true
 lock-approver-selection: true
```

# 6

## Post-installation Steps

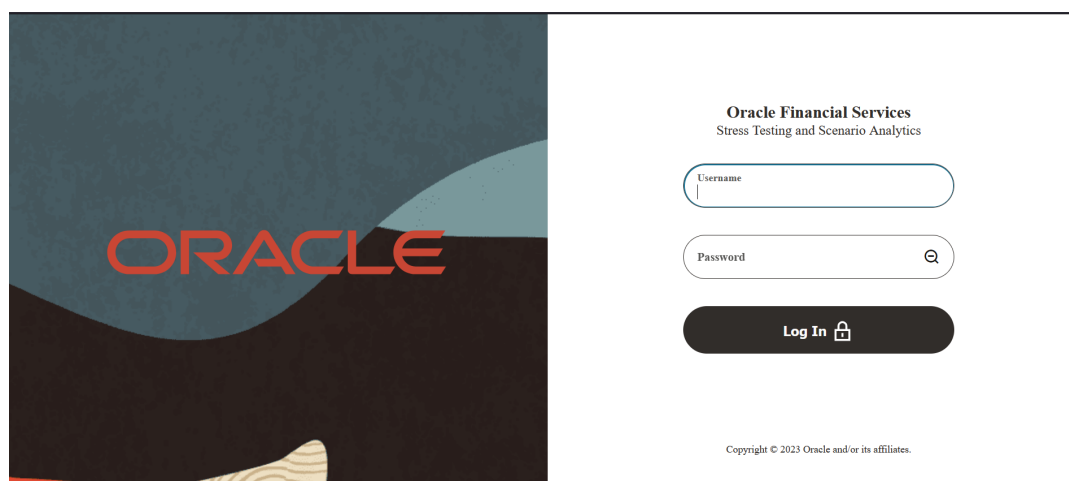
On successful installation of the application, refer to the below topics for post-installation procedures.

### 6.1 Access the Application

To access the application, follow these steps:

- Open a browser and enter the URL in the following format:  
`http(s)://est service host name: <MMG_GATEWAY_PORT>/<context_path>/home`  
For example:  
`https://xyz.com:4155/mmgservice/`

**Figure 6-1 Login window – AAI Authentication**



For more information, see the [User Access and Permissioning Management](#) section.

### 6.2 Create Application Users

Create the application users in the setup before starting to use the application. For more information, see the [User Access and Permissioning Management](#) section.

### 6.3 Map Application User(s) to User Group

User Groups seeded with the OFS MMG Application Pack are listed in the Seeded User Groups table.

**Note**

Run the following scripts manually for the user user-group mapping/unmapping in OFS AAI:

The following two flags must be added in the configuration table of the config schema:

```
MERGE INTO CONFIGURATION a USING (SELECT 1 FROM DUAL) b ON (a.PARAMNAME=
'ENB_CSTM_GRP') WHEN NOT MATCHED THEN INSERT (a.PARAMNAME,
a.PARAMVALUE,a.DESRIPTION) VALUES ('ENB_CSTM_GRP','true','Enable custom
group creation during JIT')
```

/

```
MERGE INTO CONFIGURATION a USING (SELECT 1 FROM DUAL) b ON (a.PARAMNAME=
'ENB_GRP_SYNC') WHEN NOT MATCHED THEN INSERT (a.PARAMNAME,
a.PARAMVALUE,a.DESRIPTION) VALUES ('ENB_GRP_SYNC','true','Enable
unmapping operation during JIT')
```

/

Two new flags are introduced in configuration table:

- **ENB\_CSTM\_GRP** - If this flag is set as *true*, then custom groups can be created. If this flag is set as *false*, then the user will not be able to create custom groups and assign it to the user.
- **ENB\_GRP\_SYNC** - If this flag is set as *true*, then the unmapping of users and groups are enabled. If this flag is set as *false*, then the user will not be able to unmap groups and users.

Based on these flags, unmapping of users with groups on user login is enabled.

**Table 6-1 Seeded User Groups**

| User Group Name | User Group Description                                                                                                                                                                                         |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MDLREV          | The Modeling Reviewer Group.<br>Users mapped to this group have access to the menu items in the OFS MMG Application that are related to model review activities.                                               |
| MDLAPPR         | The Modeling Approver Group.<br>Users mapped to this group have the rights to approve models created by the users.                                                                                             |
| MDLBATCHUSR     | The Modeling Batch User. Scheduler can use this Group for executing batches.                                                                                                                                   |
| WKSPADMIN       | The Workspace Administrator Group.<br>Users mapped to this group have access to all the menu items in the OFS MMG Application. Additionally, they have authorization rights to create and populate workspaces. |
| MDLUSR          | The Modeling User Group.<br>Users mapped to this group have access to all the menu items in the OFS MMG Application that is related to model creation.                                                         |

**Table 6-1 (Cont.) Seeded User Groups**

| User Group Name | User Group Description                                                                                                                                                                          |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DSUSRGRP        | General Role<br>Users mapped to this group have permission to access/modify MMG Studio Interpreter Configurations.                                                                              |
| DSREDACTGRP     | Roles for applying redaction in graph. This group will be applicable to only those users for whom graph redaction is required.                                                                  |
| OBJMIGADMIN     | Users mapped to this group have access to Object Migration links and UI to perform import or export of objects.                                                                                 |
| GRPADMIN        | The Graph Administrator Group.<br>Users mapped to this group have access to all the menu items in the OFS MMG Application related to graph and Pipeline/Refresh graphs related health services. |
| GRPUSR          | The Graph User Group.<br>Users mapped to this group have access to all the menu items in the OFS MMG Application related to graph and Pipeline/Refresh graphs related health services.          |

**Note**

Admin link in the application home page is accessible only if the below seeded groups are mapped to the user:

- IDNTYADMN
- IDNTYAUTH

## 6.4 .PEM file creation for Model Service

You must create **server.pem** file from **server.keystore** in the same path where server.keystore file is present using the below command:

```
openssl pkcs12 -in <Path_To_server.keystore> -out <Path_To_Server.pem> -nodes
```

For Example:

```
openssl pkcs12 -in
/scratch/users/ofsa/dev_home/config/server.keystore -out
/scratch/users/ofsa/dev_home/config/server.pem -nodes
```

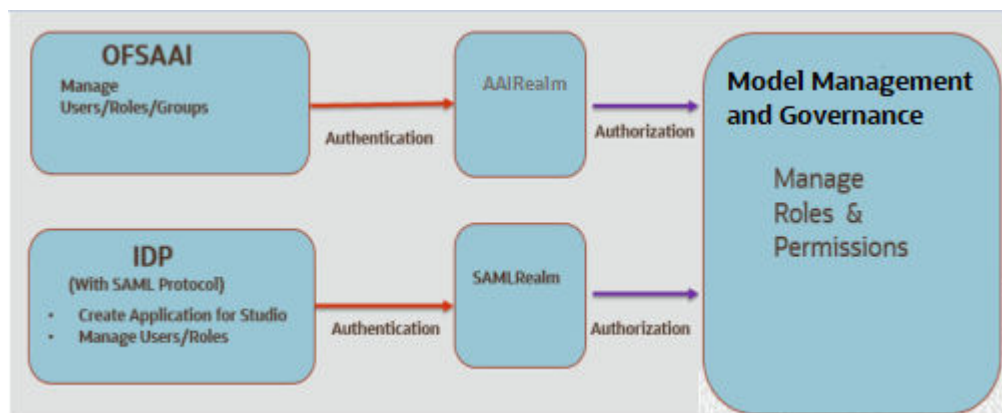
## 6.5 Access and Permissioning Management

The application uses a realm based on unique authentication and authorization for its users. Realm indicates the functional grouping of Database Schemas and roles that must be secured for an application. Realms protect data from access through system privileges and do not

provide its owner or participants additional privileges. Realm based authorization establishes a set of database accounts and roles that can manage, or access objects protected in realms and are authorized to use its system privileges. It provides a runtime mechanism to check logically if a user's command can access objects specified in the command and proceed with its execution. Realms (AAIRealm, SAMLRealm) are selected based on the Identity Provider (IDP) during the installation. For more information, see the OFS MMG Installation Guide. After you select the realms, you can register a set of schema objects or roles (secured objects) for realm protection and authorize a set of users or roles to access the secured objects. The Application is accessed using the following realms that you have selected during the installation of the Application:

- **AAIRealm:** This uses Oracle Financial Services Analytical Applications Infrastructure (OFSAAI) Identity Management System for User Authentication. Users, Roles, and Groups are created in the OFSAAI. The OFSAAI facilitates System Administrators to provide access, monitor, and administer users along with the infrastructure metadata operations. The required permissions to roles or groups are authorized in the application by using the Permission feature.
- **SAMLRealm:** The SAMLRealm uses an identity provider (IDP) Identity Management System for User Authentication. Security Assertion Markup Language (SAML) is an open standard that allows Identity Providers (IDP) to pass authorization credentials to Service Providers (SP). IDP acts as the Single Sign-On (SSO) service. Users and Roles are created in the IDP. The required permissions to Users and Roles are authorized in the application by using the Permission feature.

**Figure 6-2 Authentication and Authorization process in the application**



## 6.5.1 Access MMG using AAI Realm

This section provides information on creating users who can access MMG using the AAI Realm method of authentication through Oracle Financial Services Analytical Applications Infrastructure (OFSAAI). The users with SYSADMN and SYSAUTH roles in OFSAAI can create and authorize users, respectively.

Identity Management in the OFSAAI facilitates System Administrators to provide access, monitor, and administer users along with the infrastructure metadata operations. The Security Management System (SMS) component is incorporated with Password Encryption, Single Logon, Role and DataBased Security, Access Control, and Audit Trail feature to provide a highly flexible security envelope. Administrators can create, map, and authorize users defining a security framework that can restrict access to the data and meta-data in the warehouse, based on a fine-grained access control mechanism. These activities are done at the initial

stage and then on a required basis. For more information on creating and authorizing users in OFSAAI, see the Oracle Financial Services Analytical Applications Infrastructure User Guide. The following table describes the ready-to-use roles and the corresponding user groups who can access MMG using AAIRealm.

#### Note

Only in AAIRealm, users are mapped to user groups. The default permissions mapped to these users and user groups are available in the Permission section. However, these permissions can be added or modified.

### 6.5.1.1 Prerequisites

1. Configure WebLogic for REST Services Authorization.

To enable REST API authorization by OFSAA in WebLogic server, perform the following steps:

- a. Open the config.xml file located in the domain where OFSAA is deployed that is: `<domain_home>/config/config.xml`.
  - b. Add the following in the security-configuration tag:  
`<enforce-valid-basic-auth-credentials>false</enforce-valid-basic-authcredentials>`.
2. In OFSAA Application, **Allow user to log in from multiple machines** option must be enabled.

#### REST API Calls

There is need for Model Scripts to access input parameters passed by REST API Calls:

- a. The REST API optional parameters are mapped to runtime parameters , this mapping needs to be documented. It is not apparent from runtime parameter section.
- b. The mapped simple params can be accessed with script segment like below , but it is not supporting base64 encoding and/or json hp = '\${hyperparams}' cnf = '\${cnf}' 3.the enhancement against json is retracted as we can do base64 encrypted value passing {

```
"RUN_ID": 2,
"RUN_CODE": 200440,
"PARAM_SET": {
"CALL_TYPE": "PASS_THROUGH_RATE",
"BOLLINGER_PERIOD": 3,
"BOLLINGER_COEFFICIENT": 1,
"DATA_SNAP_FREQ": 1,
"DATA_SNAP_FREQ_MULTIPLIER": "D",
"MISSING_VALUE_TECH": "inpol",
"MISSING_THRESHOLD_PERCENTAGE": 30,
"START_DATE": 20230131,
"END_DATE": 20230431,
"EXECUTED_BY": "TESTUSR",
```

```

"REFRESH_DATA": "Yes"
},
"SLICE": [
{
"SEQ": 1,
"LOGICAL_PARTITION_NAME": "DEFAULT",
"TABLE_NAME": "FSI_I_NM_MLSTAGE"
}
],
"OUTPUT_DATA": {
"PLOTS_TAB": "FSI_O_NM_PLOTS",
"MILESTONE_TAB": "FSI_O_NM_MILESTONE",
"SCORE_TAB": "FSI_O_NM_MODEL"
}
}

```

**For example:** base64 encryption

3. Restart the WebLogic webserver.

## 6.5.2 Access MMG using SAMLRealm

This section provides information on managing users who can access MMG with Identity Provider (IdP or IDP). An Identity Provider (IdP) is a service that stores and verifies user identity. IdPs are cloud-hosted services, and they often work with single sign-on (SSO) providers to authenticate users. An Identity Provider stores and manages users' digital identities. An IdP checks user identities via username-password combinations and other factors, or it may simply provide a list of user identities that another Service Provider (like an SSO) checks. The following are the ready-to-use roles that can access MMG using SAMLRealm. To integrate MMG with IdP as the SSO Provider, follow these steps:

1. Create the following roles in the IDP System:

For MMG:

- IDNTYADMN
- IDNTYAUTH
- MDLREV
- MDLAPPR
- MDLBATCHUSR
- WKSPADMIN
- MDLUSR
- DSUSRGRP
- DSREDACTGRP
- GRPADMIN
- GRPUSR

**Note**

IDNTYADMIN role is required only if you need the Admin Access.

2. Map the user groups to the respective user based on the user roles. The default permissions mapped to these users are available in the Permission section. However, these permissions can be added or modified.

**Note**

It is recommended to use AAIRealm or SAMLRealm.

## 6.6 AAI User Provisioning SQL Scripts Generator Utility

This utility allows you to use AAI for authN in MMG. Identity administrators can create new user groups or roles, perform appropriate roles, usergroup and domain mapping, and so on.

This is provided as a SQL generator utility. This SQL scripts is executed in the AAI's configuration schema to create the required metadata.

Ensure that you run this script multiple times against each username. Additionally, generate the merge scripts accordingly.

Execute the following command from <mmg-home>/bin folder

```
./userprovisioning-script-generator.sh <user> <comma separated list of user groups
or ALL> <info dom> <segment>
```

**Sample Commands:**

```
./userprovisioning-script-generator.sh SCRIPTUSER ALL OFSAAIINFO EMFLD
```

```
./userprovisioning-script-generator.sh SCRIPTUSER MDLREV,MDLUSR,IDENTITY_ADMIN
OFSAAIINFO EMFLD
```

## 6.7 IDCS Server Configuration

To perform IDCS Server Configuration, follow these steps:

1. Navigate to SAML IDCS Admin.
2. Navigate to Details section and add the app details in IDCS Server as shown below:

**Figure 6-3 IDCS Server**

The screenshot displays the IDCS Server configuration interface. At the top, there is a header bar with a cloud icon and a blacked-out area. Below this, a navigation bar contains tabs for 'Details', 'SSO Configuration', 'Users', and 'Groups'. A 'Deactivate' button and a 'Remove' button are visible on the right. A green 'Save' button is located on the right side of the 'App Details' section. The 'App Details' section includes a dropdown for 'Application Type' set to 'SAML Application'. Below this, there are input fields for 'Name' and 'Description', both containing a URL. A tooltip for the 'Name' field indicates 'Enter 125 or fewer characters.' At the bottom, there is an 'Application Icon' section with a cloud icon and an 'Upload' button.

3. Navigate to SSO Configuration section and add the app details in IDCS Server as shown below:

Figure 6-4 SSO Configuration section

**General**

Use this section to define the required SSO attributes for the application and to upload the application's signing certificate.

\* Entity ID

\* Assertion Consumer URL

\* NameID Format

\* NameID Value

Signing Certificate

**Advanced Settings**

This section contains additional configuration options.

Signed SSO

Include Signing Certificate in Signature ☒

Signature Hashing Algorithm

Enable Single Logout ☒

\* Logout Binding

\* Single Logout URL

\* Logout Response URL

Encrypt Assertion ☐

**Attribute Configuration**

Use this section to add user attributes. This is useful if you want to send user information including group membership details as part of the assertion.

Attributes

| Name              | Format                             | Type                                        | Value                                          | Condition                               | Value                                                |
|-------------------|------------------------------------|---------------------------------------------|------------------------------------------------|-----------------------------------------|------------------------------------------------------|
| ofs_mapped_groups | <input type="text" value="Basic"/> | <input type="text" value="User Attribute"/> | <input type="text" value="Group Membersh..."/> | <input type="text" value="All Groups"/> | <input type="text" value="All Groups are selected"/> |

**Authentication and Authorization**

Use this section to define a more fine-grained authentication and authorization configuration.

Enforce Grants as Authorization ☒

**Figure 6-5 IDCS Server**

▸ Advanced Settings

▾ Attribute Configuration

Use this section to add user attributes. This is useful if you want to send user information including group membership details as part of the assertion.

Attributes +

| Name              | Format | Type           | Value             | Condition  | Value                   |   |
|-------------------|--------|----------------|-------------------|------------|-------------------------|---|
| username          | Basic  | User Attribute | Last Name         |            |                         | × |
| email             | Basic  | User Attribute | Primary Email     |            |                         | × |
| ofs_mapped_groups | Basic  | User Attribute | Group Membersh... | All Groups | All Groups are selected | × |

### **Note**

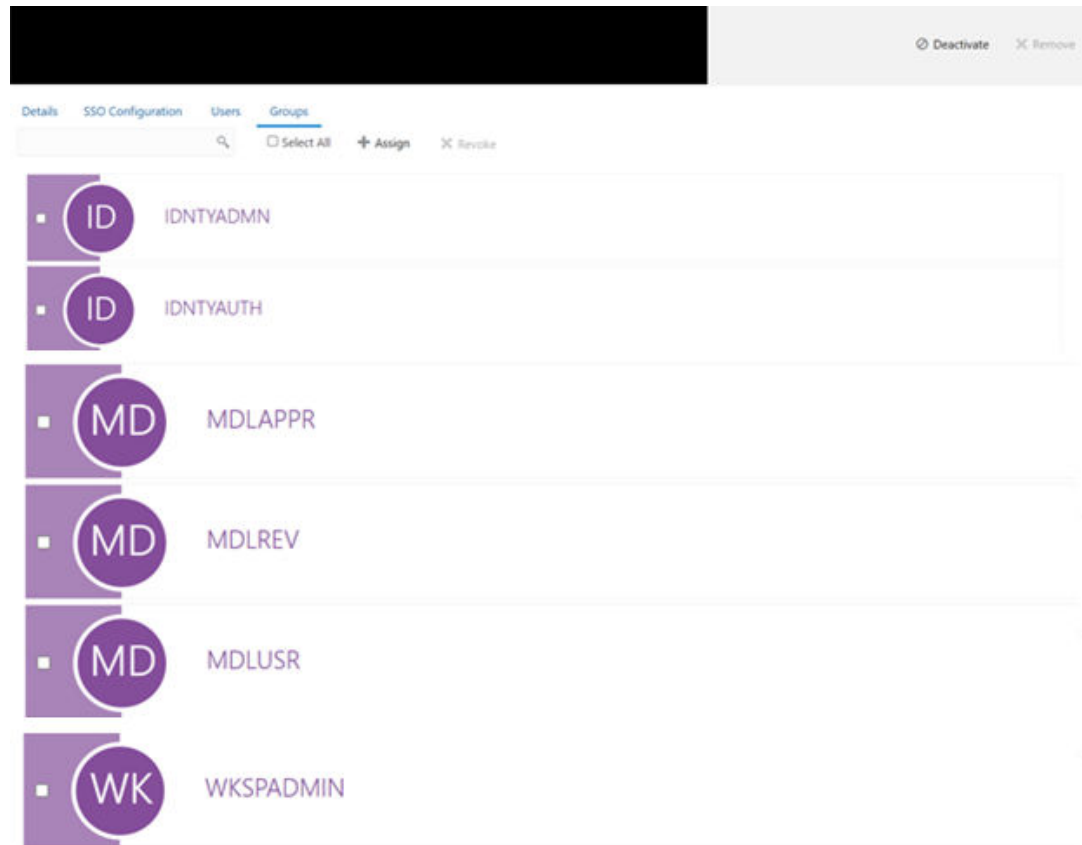
The following attributes such as username, email, and ofs\_mapped\_groups needs to configured as shown in the above image.

The user has to upload the certificate.

The user can generate the certificate by following these steps:

- Create .cer and .pem file from the below command.
- Upload the same .cer to the idcs Signing certificate option as well:  
openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout sp-privatekey.pem -out sp-certificate.cer

4. Navigate to Group section and Configure User Groups.

**Figure 6-6 Configure User Groups in Group section**

# 7

## Upgrading or Patching STSA

This section describes the steps to upgrade or patch the Oracle Financial Services Stress Testing and Scenario Analytics (STSA) application, including the bundled Model Management and Governance (MMG) components.

You can upgrade STSA in the following scenarios:

- When STSA and MMG are provisioned and upgraded together.
- When MMG is already installed and STSA was provisioned using the `SkipMMG` flag.

### 7.1 Upgrading STSA and MMG Together

If STSA and MMG are provisioned together, perform the following steps to upgrade both components:

1. Create a backup of the existing installed files. To do so, rename the existing `OFS_STSA` directory to `backup`.
2. Copy the new build archive to the server and place the new installer `.zip` file in the same or a different directory.
3. Extract the installer files and unzip the archive and complete all steps required for a fresh installation.
4. Update the configuration files. To do so:
  - a. Use the new `ConfigForEST.sh` and `config.sh` files.
  - b. Copy values from the existing files, retain previous settings, and provide values for newly introduced properties.
5. Retain critical path and port values. To do so, Ensure that `LOG_HOME`, `FTP SHARE`, `WALLET_LOCATION`, and all port numbers remain consistent with the earlier installation.
6. Generate the keys and token. To do so, complete the MMG prerequisites by generating keys and token, and apply the necessary database grants for Data Pipeline usage if applicable.
7. Run the deployment script. To do so, navigate to the STSA bin directory and run the following command to reinstall the application:  

```
./deploy.sh
```

#### Note

Before running the deployment script, ensure that both STSA and MMG services are shut down.

8. Run the update script to refresh database properties. To do so, execute the following command to update application properties and replace the token in the database:  

```
./deploy.sh -U
```

9. After successfully completing the previous step to upgrade the sandbox schemas with the latest changes, start all services by running `./start up.sh`.
10. After all services are up and running, log in to the application.
11. From the application home page, open **More Options** for the required sandbox.
12. Select **Details** to open the sandbox Details page.
13. Click **Sync Configuration** to start the sandbox upgrade process.
14. Verify that the process completes successfully by confirming the displayed success message.

## 7.2 Upgrading STSA with Existing MMG (SkipMMG Flag)

Use this procedure if MMG is already installed and STSA was initially provisioned using the SkipMMG flag. In this case, only the STSA components need to be upgraded, while MMG remains unchanged.

1. Back up the existing MMG and STSA installations. To do so, rename both directories or move them to a safe location.
2. Copy the new build archive to a common location. To do so, use a shared directory for the STSA `installer.zip` file.
3. Follow the same upgrade procedure. Complete all the steps described in [Upgrading STSA and MMG Together](#).

### Note

Reprovisioning the same version using these steps does not affect the installation.

# 8

## Cloning the MMG Instance

There is a consistent requirement for a faster and effective approach of replicating an existing MMG Instance for further project developments. The approach is to set up the MMG Instances that are exact copies of the current MMG Instance.

### 8.1 Copying the Directories

The Installation Directory structure in the base environment has to be replicated in the clone environment.

- Copy the MMG base directory (OFS\_MMG, by default) in the base environment with all of its contents to the clone environment.  
The base directory in the clone environment will have the following folders upon copying:
  - mmg-ui
  - mmg-studio
  - mmg-service
  - mmg-schema-creator
  - mmg-pipeline
  - lib
  - bin
  - conf

#### Note

You need to copy LOG and FTPSHARE directories to the cloned environment.

### 8.2 Copying the Database Schemas

To copy the Database Schemas:

1. Create a copy each of the MMG Config Schema and the Data Studio Schema.  
You may use Oracle Data Pump Export/Import or the Database Copy feature of Oracle SQL Developer. For more details, see [Database Copy using Oracle SQL Developer](#).  
The Cloned Schemas can be created either in the same database instance or in a different one.
2. Similarly, create copies of Workspace Schemas or other Data Source Schemas as required.

### 8.3 Configuring Password Store with Oracle Wallet

To configure the password store with Oracle Wallet:

- Setup an Oracle wallet in the clone environment. For more details, see [Setup Password Stores with Oracle Wallet](#).

#### ① Note

It is recommended to use the same wallet aliases used in the base environment.

#### Updating the WALLET\_LOCATION and TNS\_ADMIN\_PATH

Update the WALLET\_LOCATION and TNS\_ADMIN\_PATH values in config.sh file present in the following path: OFS\_MMG/bin with configured corresponding values of the cloned environment.

## 8.4 Updating the Host Details

Update the HOST and PORT values in config.sh file present in the following path: OFS\_MMG/bin with configured corresponding values of the cloned environment.

#### ① Note

It is recommended to use the same ports and context used in the base environment.

Replace the placeholders and update the host name in the MMG Config schema using the following command:

```
update NEXTGENEMF_CONFIG set V_VALUE =
'http(s)://##HOST_NAME##:##BE_PORT##/##CONTEXT##' where V_NAME in ('
BASE_URL', 'EMFSTUDIO_SERVICE_URL')
/
update NEXTGENEMF_CONFIG set V_VALUE =
'http(s)://##HOST_NAME##:7008/##CONTEXT##' where V_NAME = 'DATASTUDIO_URL'
/
update AAICL_SS_BATCH_URL set V_URL =
'http(s)://##HOST_NAME##:##BE_PORT##/##CONTEXT##' where V_URL_NAME in
('CS_SERVICE_URL', 'MMG_SERVICE_URL', 'WORKSPACE_URL')
/
```

## 8.5 Update LOG\_HOME and FTPSHARE

Update the LOG\_HOME and FTPSHARE values in config.sh file present in the following path:

OFS\_MMG/bin with configured corresponding values of the cloned environment.

Replace the `##LOG_HOME##` and `##FTP SHARE##` placeholders and update the `LOG_HOME` and `FTP SHARE` values in the MMG Config Schema using the following command:

```
update NEXTGENEMF_CONFIG set V_VALUE = '##LOG_HOME##' where V_NAME = 'LOG_HOME'
/

update NEXTGENEMF_CONFIG set V_VALUE = '##FTP SHARE##' where V_NAME = 'FTP SHARE'
/
```

## 8.6 Setting up the SSL Keystore

To run on HTTPS, you must create a Keystore for MMG Application. For more details, see the SSL Keystore in the Configure the config.sh file.

Update the Keystore path, Password and Storetype values in config.sh file present in the following path: `OFS_MMG/bin` with configured corresponding values of the cloned environment.

## 8.7 Updating Wallet Aliases for Oracle Schemas

### Note

It is recommended to use the same wallet aliases used in the base environment.

In case if the same wallet aliases cannot be used, perform the following:

1. Update the MMG Config Schema Wallet Alias values in config.sh file present in the following path: `OFS_MMG/bin` with configured corresponding values of the cloned environment.
2. Replace the placeholders and update the wallet alias for Workspace Schemas or other Oracle datasources using the following command:

```
update MMG_DB_MASTER set V_PROPERTY_VALUE = '##WALLET_ALIAS##' where
V_PROPERTY_NAME = 'WALLET_ALIAS' and V_DB_NAME = '##DATASOURCE NAME##'
/
```

## 8.8 Updating Context and Ports

### Note

It is recommended to use the same context and ports used in the base environment.

In case if the same context and ports aliases cannot be used, perform the following:

1. Update the references of context path and port values in config.sh file present in the following path: `OFS_MMG/bin` with configured corresponding values of the cloned environment.
2. Replace the `##CONTEXT##` and `##BE_PORT##` placeholders.

For more details, see [Updating the Host Details](#).

**Note**

For MMG authentication, port access should be enabled for MMG ports to access OFSAA ports.

## 8.9 Starting MMG Services

Post updating all the required parameters in the new `config.sh` file, start the services by using the following command: `./install.sh -u`

# 9

## Additional Configuration

### 9.1 RPD and Catalog Deployment

#### 9.1.1 Deploying STSA RPD File

To deploy the RPD, follow these steps:

1. Unzip `stsa-installer.zip` to extract the ESTBI component, which contains `Stress Testing and Scenario Analytics.rpd` and `Stress Testing and Scenario Analytics.catalog`.
2. Copy the `Stress Testing and Scenario Analytics.rpd` and `Stress Testing and Scenario Analytics.catalog` files to a folder on the server where OAS is installed.
3. Open the extracted `Stress Testing and Scenario Analytics.rpd` file in offline mode using the Oracle Analytics Administration Tool, and configure the required database connections. To do so:

#### Note

The Oracle Analytics Administration Tool requires a 64-bit Windows operating system.

- a. In the **Oracle Analytics Administration Tool**, go to the **File** menu and select **Open > Offline**.
- b. Select the `Stress Testing and Scenario Analytics.rpd` file.
- c. Enter the repository password to access the file.

#### Note

- The RPD file uses a default password for the initial login. Refer to the applicable My Oracle Support (MOS) document for the password.
- To change the password, select **File > Change Password**, then enter the current and new passwords.

4. Modify the connection pools in the RPD. To do so:
  - a. In the Physical layer, expand the `OFSAE_EST_Results Database`, then double-click `EST Connection Pool`.
  - b. Update the following fields:

**Table 9-1 Modifying the connection pools**

| Field                                                                                                                                                                                                                                                                 | Description                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Data source name                                                                                                                                                                                                                                                      | Enter the TNS entry name of the EST sandbox database instance. |
| <div>  <b>Note</b><br/>           You can find these details in the STSA wallet configured in <a href="#">Setup the Password Stores for Database User Accounts</a>.         </div> |                                                                |
| Username                                                                                                                                                                                                                                                              | Enter the EST schema username.                                 |
| Password                                                                                                                                                                                                                                                              | Enter and confirm the EST schema password.                     |

- c. Click **OK** to save the changes.
- d. Repeat steps a and b for the OFSAA\_EST\_PROCESSING\_INIT Connection Pool.
- e. From the **File** menu, select **Save** to save the RPD file. When the “Do you wish to check global consistency” dialog box appears, click **No**.
5. Upload the RPD file to the Oracle Analytics Server:
  - a. Open a terminal window on the server where OAS is installed.
  - b. Navigate to the following directory:  
`<OAS_DOMAIN_HOME>/bitools/bin`
  - c. Run the following command to upload the RPD file:  
`./datamodel.sh uploadrpd -I "<RPD Path>/Stress Testing and Scenario Analytics.rpd" -SI ssi -U weblogic -P <weblogic password>`
  - d. When prompted, enter the RPD file password to complete the upload.

## 9.1.2 Deploying the STSA Catalog File

To deploy the STSA Catalog file"

1. Paste the copied catalog files into a local folder.
2. Open the Oracle Analytics Server (OAS) URL in a browser and log in using your server credentials:  
`http://<ipaddress>:<port>/analytics`
3. Click the Catalog link in the top-right corner.
4. Once the catalog opens, a directory structure displays on the left-hand side. Do the following:
  - a. Select Catalog Root, then choose Shared Folders in the left-hand tree structure.
  - b. From the **File** menu, select **Unarchive**.  
 You will be prompted to provide the file path.
  - c. Use the **Browse** button to locate the archived catalog file in your local directory, and click **OK**.

**Note**

Ensure that the catalog is extracted into the **Shared Folders** directory for the reports to display correctly. A success message will be shown upon completion.

5. 5. Open the Data Visualization (DV) interface using the following URL: `http://<ipaddress>:<port>/dv/ui`.
6. Log in using your environment-specific credentials and verify that the reports are available.

# Frequently Asked Questions (FAQs) and Error Dictionary

This section consists of resolution to the Frequently Asked Questions and Error Codes noticed during the installation.

## Topics:

### Related Topics

- [Frequently Asked Questions](#)
- [Frequently Asked Questions \(FAQs\) and Error Dictionary](#)

## 10.1 Frequently Asked Questions

You can refer to the Frequently Asked Questions, which is developed with the interest to help you resolve some of the 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.

### 10.1.1 Frequently Asked Questions

1. Why does my console show an unsuccessful message during wallet creation?  
Please check if you have run the following commands correctly. For more information on wallet creation, see [Setup Password Stores with Oracle Wallet](#).
  - a. `mkstore -wrl <wallet_location> -create` //creates a wallet in the specified location.
  - b. `mkstore -wrl <wallet_location> -createCredential <alias-name> <database-user-name>` //creates an alias in the Studio Schema.
  - c. `mkstore -wrl <wallet_location> -createCredential <alias-name> <database-user-name>` //creates an alias in the Atomic Schema.
  - d. `mkstore -wrl <wallet_location> -createCredential <alias-name> <database-user-name>` //creates an alias in the configuration schema.

If your issue is still not resolved, contact [My Oracle Support \(MOS\)](#).

2. Where can I find my created wallet?  
Your wallet will be in the directory you have set as your wallet location.  
If your issue is still not resolved, contact [My Oracle Support \(MOS\)](#).
3. When should I create a Database link, and if yes, how do I do it?  
Create a Database link to connect the Atomic and Configuration Database Schemas to the Studio Database Schema if the databases are different. You must create the link in the Studio Database.

In the following example, a link has been created from the Configuration Schema to the Atomic Schema by running the following script:

```
create public database link <studio database link> connect to <Config Schema>
identified by password using ' (DESCRIPTION = ADDRESS_LIST = (ADDRESS =
(PROTOCOL = TCP) (HOST =<host name> (PORT = <port number>)) (CONNECT_DATA =
(SERVICE_NAME = <service name>))) ';
```

```
Config Schema : <Config Schema>/password ' (DESCRIPTION = ADDRESS_LIST =
(ADDRESS = (PROTOCOL = TCP) (HOST =<host name> (PORT = <port number>))
(CONNECT_DATA = (SERVICE_NAME = <service name>))) ';
```

After running the script, run the FCDM Connector and ICIJ Connector jobs.

4. Why does my installed studio setup not have any notebooks?  
Some default notebooks are ready to use when you install Compliance Studio. If you do not see any notebooks when you log in to the application, you may not be assigned any roles. Check the <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/deployed/logs directory to see if you have been assigned any roles, and if not, contact your Administrator. If your issue is still not resolved, contact [My Oracle Support \(MOS\)](#).
5. What can I do if the Schema Creation fails?  
If the Atomic Schema creation fails, login to the BD and ECM Atomic Schemas and run the following query: select \* from fcc\_orahive\_datatypemapping; The fcc\_orahive\_datatypemapping table must not have duplicate data types. If the Studio schema creation fails, login as a Studio user and run the following query: select \* from fcc\_datastudio\_schemaobjects Run the following query to replace all Y values with "": update fcc\_datastudio\_schemaobjects set SCHEMA\_OBJ\_GENERATED=" After the schema creation is successful, the value of the SCHEMA\_OBJ\_GENERATED attribute changes to Y. You can also check for errors in the application log file in the <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/deployed/logs directory. If your issue is still not resolved, contact My Oracle Support (MOS).
6. What can I do if the Import\_training\_model batch execution fails?  
Batch Execution Status always displays success in case of success or failure.  
  
You can also check for errors in the application log file in the <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/deployed/logs directory. You can fix the failure according to the log details and run the same batch again.
7. Why is the sqoop job not successful?  
The Sqoop job may fail if some of the applicable values are null or if the service name or SID value is not provided. Do one of the following:
  - Check if there are any null values for the applicable configurations in the config.sh and FCC\_DATASTUDIO\_CONFIG tables. If there are any null values, add the required value.
  - Check for any errors in the application log file in the <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/deployed/logs directory. If your issue is still not resolved, contact [My Oracle Support \(MOS\)](#).
8. Why am I getting the following error when I run the sqoop job:  
Error: Could not find or load main class  
com.oracle.ofss.fccm.studio.batchclient.client.BatchExecute  
  
Set the FIC\_DB\_HOME path in the <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/deployed/ficdb directory.  
  
You can also check for any errors in the application log file in the <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/deployed/logs directory.
9. 11. Why is the PGX server is not starting even though the graph service is up and running?  
Grant execution rights to the PGX folder to start the PGX server.
10. Why is the PGX Server not starting?

The PGX server starts only after the FCDM tables are created after the FCDM Connector Job is run. Check if all FCDM tables are created and then start the PGX Server. You can also check for any errors in the application log file in the <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/deployed/logs directory. If your issue is still not resolved, contact [My Oracle Support \(MOS\)](#).

**11. Why is the ICIJ Connector job failing?**

This can happen because of a missing csv file path in the FCC\_STUDIO\_ETL\_FILES table. Add the CSV file path. You can also check for any errors in the application log file in the <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/deployed/logs directory. If your issue is still not resolved, contact My Oracle Support (MOS).

**12. What should I do if there is a below Error while selecting edges in manual Decision UI?**

```
java.lang.IllegalStateException: Unable to create
PgxFSessionWrapperjava.lang.IllegalStateException: Unable to create
PgxFSessionWrapper at
oracle.datastudio.interpreter.pgxFCombinedPgxFDriver.getOrCreateSession(Combine
dPgxFDriver.java:147) at
oracle.pgxFgraphviz.driver.PgxFDriver.getGraph(PgxFDriver.java:334) at
oracle.pgxFgraphviz.library.QueryEnhancer.createEnhancer(QueryEnhancer.java:22
3) at
oracle.pgxFgraphviz.library.QueryEnhancer.createEnhancer(QueryEnhancer.java:20
9) at oracle.pgxFgraphviz.library.QueryEnhancer.query(QueryEnhancer.java:150)
at oracle.pgxFgraphviz.library.QueryEnhancer.execute(QueryEnhancer.java:136)
at
oracle.pgxFgraphviz.interpreter.PgxFSqlInterpreter.interpret(PgxFSqlInterpreter.java
:131) at
oracle.datastudio.interpreter.pgxFPgxFInterpreter.interpret(PgxFInterpreter.java
:120) at
org.apache.zepplin.interpreter.LazyOpenInterpreter.interpret(LazyOpenInterpre
ter.java:103) at
org.apache.zepplin.interpreter.remote.RemoteInterpreterServer$InterpretJob.jo
bRun(RemoteInterpreterServer.java:632) at
org.apache.zepplin.scheduler.Job.run(Job.java:188) at
org.apache.zepplin.scheduler.FIFO$Scheduler$1.run(FIFO$Scheduler.java:140) at
java.base/
java.util.concurrent.Executors$RunnableAdapter.call(Executors.java:515) at
java.base/java.util.concurrent.FutureTask.run(FutureTask.java:264) at
java.base/
java.util.concurrent.ScheduledThreadPoolExecutor$ScheduledFutureTask.run(Sched
uledThreadPoolExecutor.java:304) at java.base/
java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128
) at java.base/
java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628
) at java.base/java.lang.Thread.run(Thread.java:834)Caused by:
java.util.concurrent.ExecutionException:
oracle.pgxFcommon.auth.AuthorizationException: PgxFUser(FCCMDSADMIN) does not
own session 6007f00a-8305-4576-9a56-9fa0f061586f or the session does not exist
code: PGX-ERROR-CQAZPV67UM4H at java.base/
java.util.concurrent.CompletableFuture.reportGet(CompletableFuture.java:395)
at java.base/
java.util.concurrent.CompletableFuture.get(CompletableFuture.java:1999) at
oracle.pgxFapi.PgxFFuture.get(PgxFFuture.java:99) at
oracle.pgxFapi.ServerInstance.getSession(ServerInstance.java:670)
oracle.datastudio.interpreter.pgxFCombinedPgxFDriver.getOrCreateSession(Combine
dPgxFDriver.java:145) ... 17 moreCaused by:
```

```

oracle.pgx.common.auth.AuthorizationException: PgxUser(FCCMDSADMIN) does not
own session 6007f00a-8305-4576-9a56-9fa0f061586f or the session does not exist
code: PGX-ERROR-CQAZPV67UM4H at
oracle.pgx.common.marshalers.ExceptionMarshaler.toUnserializedException(Except
ionMarshaler.java:107) at
oracle.pgx.common.marshalers.ExceptionMarshaler.unmarshal(ExceptionMarshaler.j
ava:123) at
oracle.pgx.client.RemoteUtils.parseExceptionalResponse(RemoteUtils.java:130)
at
oracle.pgx.client.HttpRequestExecutor.executeRequest(HttpRequestExecutor.java:
198) at
oracle.pgx.client.HttpRequestExecutor.get(HttpRequestExecutor.java:165) at
oracle.pgx.client.RemoteControlImpl$request(RemoteControlImpl.java:313) at
oracle.pgx.client.RemoteControlImpl$ControlRequest.request(RemoteControlImpl.j
ava:119) at
oracle.pgx.client.RemoteControlImpl$ControlRequest.request(RemoteControlImpl.j
ava:110) at
oracle.pgx.client.AbstractAsyncRequest.execute(AbstractAsyncRequest.java:47)
at oracle.pgx.client.RemoteControlImpl.request(RemoteControlImpl.java:107) at
oracle.pgx.client.RemoteControlImpl.getSessionInfo(RemoteControlImpl.java:296)
at
oracle.pgx.api.ServerInstance.lambda$getSessionInfoAsync$14(ServerInstance.jav
a:490) at java.base/
java.util.concurrent.CompletableFuture.uniComposeStage(CompletableFuture.java:
1106) at java.base/
java.util.concurrent.CompletableFuture.thenCompose(CompletableFuture.java:2235
) at oracle.pgx.api.PgxFuture.thenCompose(PgxFuture.java:158)

```

Then, perform the below steps as a workaround -

Export the "Manual Decision" Notebook

Add the link parameter just below Description

for Ex - "link": "manualDecision",

**Figure 10-1 Manual Decision**

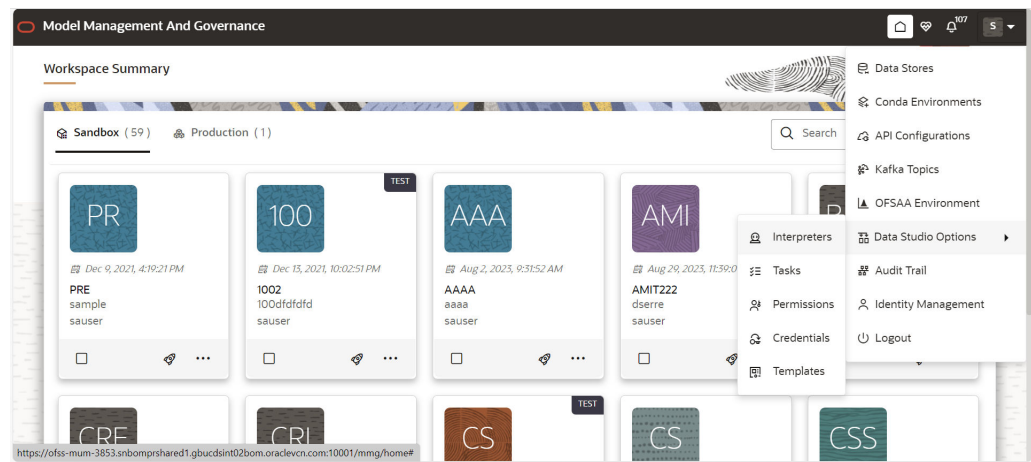
```

[{
 "name" : "manual Decision",
 "description" : null,
 "link": "manualDecision",
 "tags" : null,
 "version" : "5",
 "layout" : "zeppelin",
 "type" : "Default",
 "readOnly" : false,

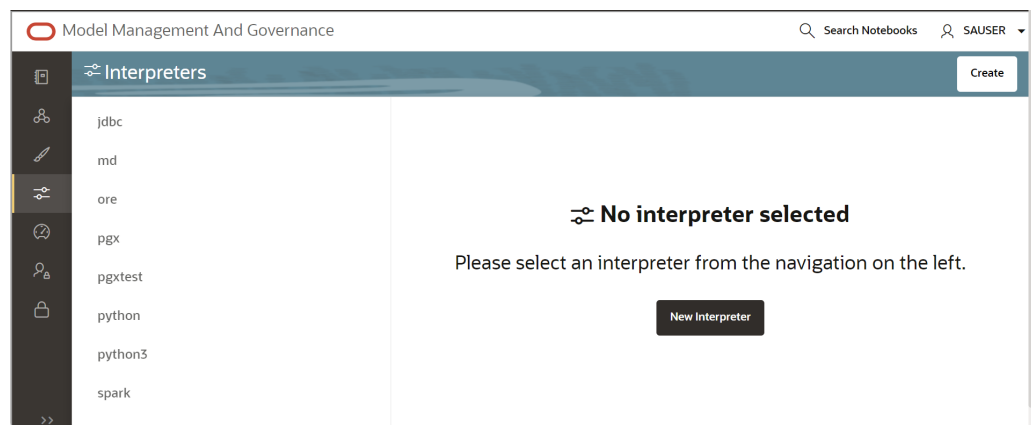
```

Truncate the table "fcc\_er\_paragraph\_manual" in Studio Schema. Import the modified notebook again.

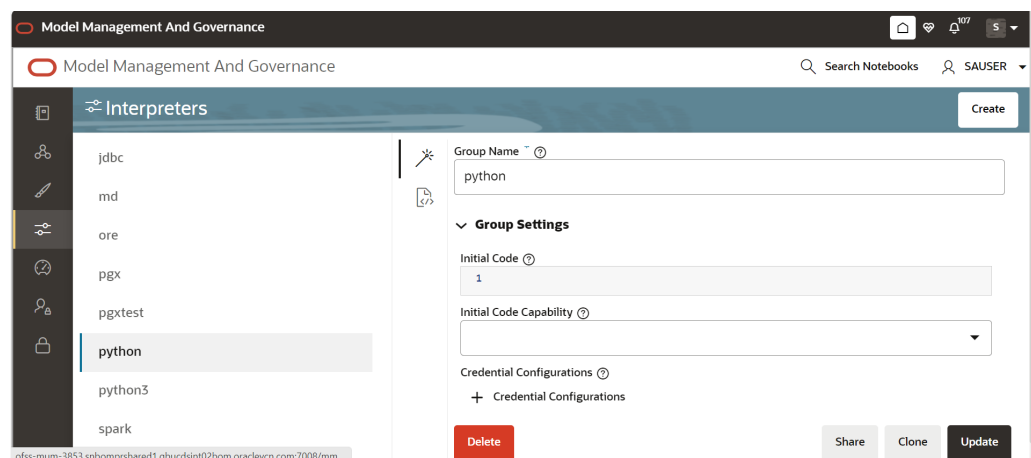
13. Data Extraction is truncated to default limit (Approx 197 records) in Python paragraph widget output in MMG. **Setting the ZEPPELIN\_LIMIT\_INTERPETER\_OUTPUT in Python Interpreter**
  - a. From UI: Using Wizard screen  
Go to Interpreters screen in MMG-Studio from Datastudio Options tab.

**Figure 10-2 Datastudio Options tab**

- b. Once on the interpreters option screen select the Python Interpreter for which we want to configure the `zeppelin.limit.interpreter.output`.

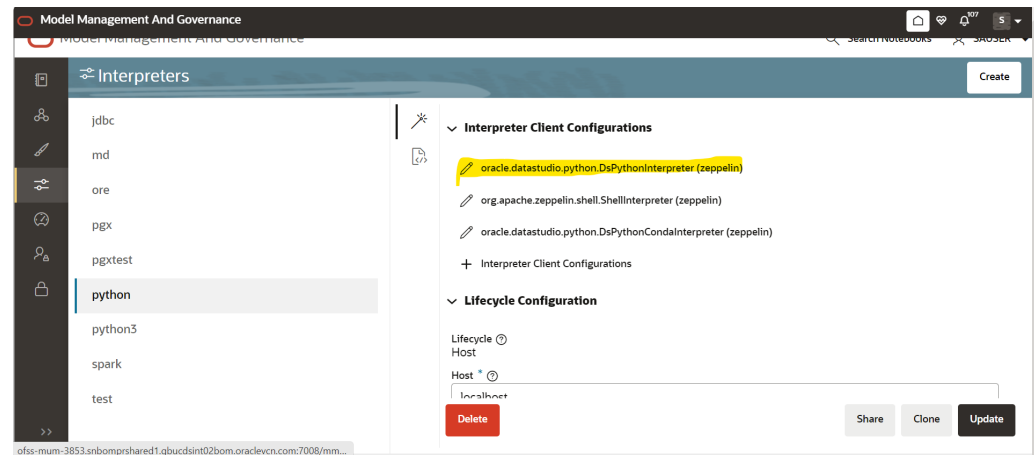
**Figure 10-3 Interpreter screen**

- c. Select python from the LHS options.

**Figure 10-4 Python Interpreter**

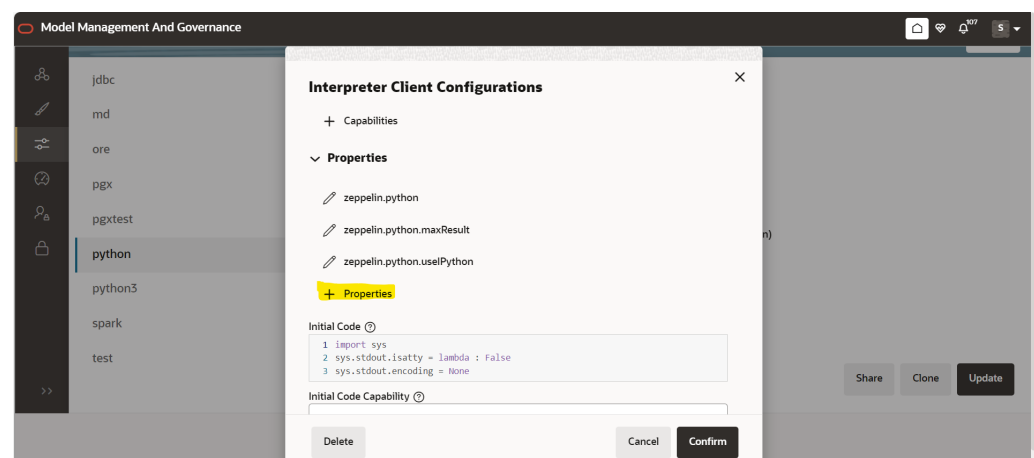
- d. Now scroll down in the RHS side and click on the `oracle.datastudio.python.DsPythonInterpreter` under Interpreter Client Configurations it will open a popup.

**Figure 10-5 Interpreter Client Configurations**



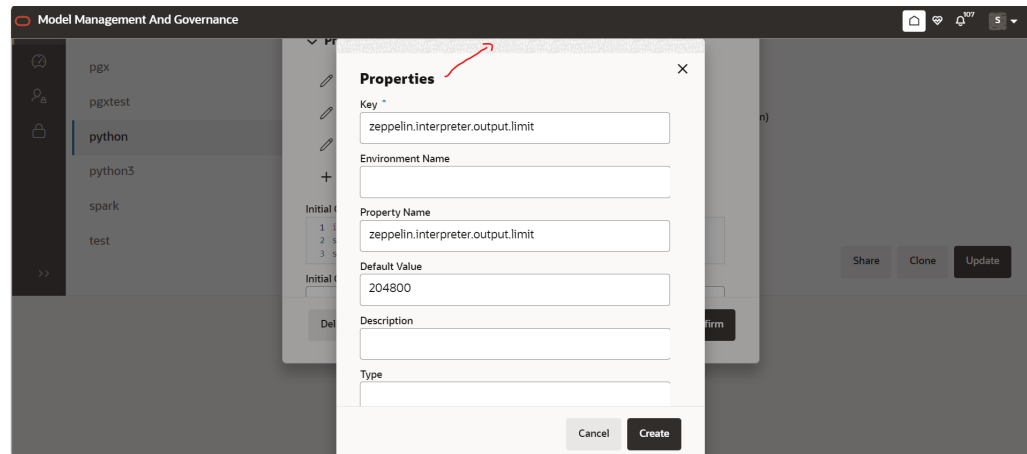
- e. In the popup scroll down and click on + Properties under Properties as shown:

**Figure 10-6 Properties screen**



- f. Another popup will open fill the options as shown and set the default value according to your needs if you are not able to see the Create and Cancel button, click on the part of the popup pointed by red arrow. The default value for `zeppelin.interpreter.output.limit` if not set is 102400 (in bytes).

Figure 10-7 Popup box

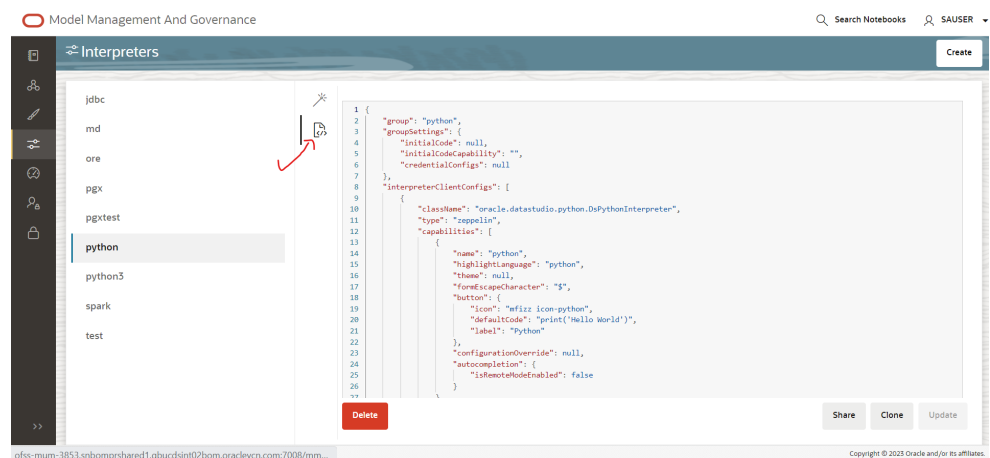


### Note

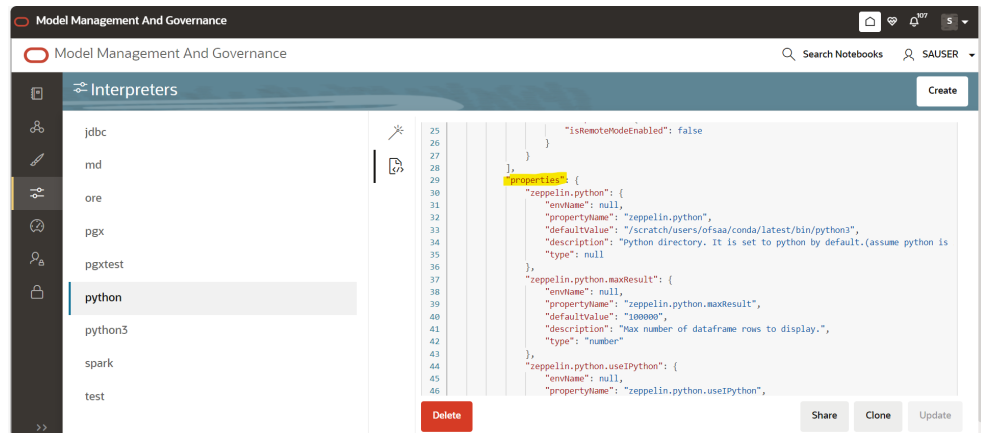
Increasing the default option from 102400 to some bigger value will slow down the rendering of outputs of python paragraphs.

- g. Once filled click on Create (you will see zeppelin.interpreter.output.limit under the Properties section), then click on **Confirm** (if you are not able to see the Confirm button on the UI, either click on the same shaded area on popup as highlighted in above image or zoom out in UI of browser) and then click on Update in the lower right side of the screen.
- h. After following all the above steps, restart the MMG-Studio for changes to reflect.
- a. Using JSON screen
  - i. Follow the steps i, ii and iii from above, then click on the following icon on UI pointed by red arrow and following json config view will open.

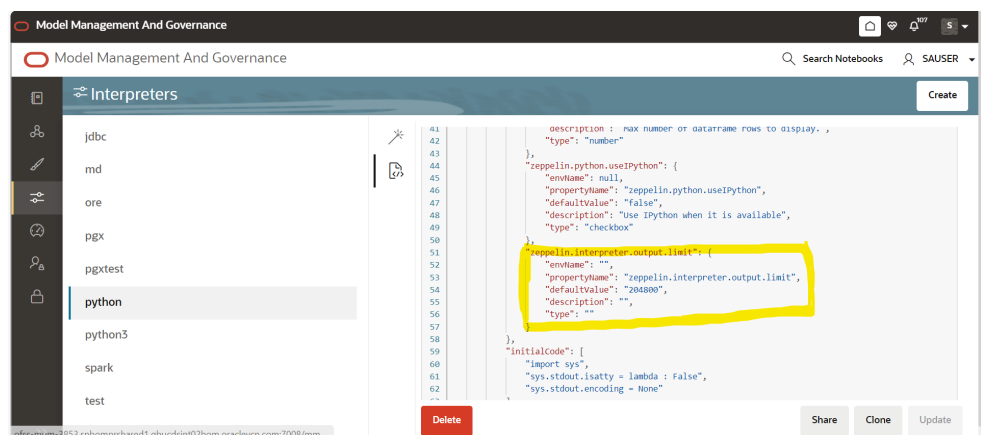
Figure 10-8 JSON Config View



- ii. Scroll down under interpreterClientConfigs with className oracle.datastudio.python.DsPythonInterpreter you will find following properties section with bunch of zeppelin configurations.

**Figure 10-9 Interpreter Client Config**

- iii. After the last entry in properties add the `zeppelin.interpreter.output.limit` also as shown in the following image:

**Figure 10-10 Properties screen**

- iv. After doing the change the Update button will get enabled in the bottom right corner click on it, you will get a message as "python interpreter updated".
  - v. Now restart the MMG-Studio service for changes to reflect.
- b. From filesystem: (Datastudio version 23.4.x onwards)
- i. Go to the Python Interpreter option as pointed out in From UI using wizard screen option above, if you have already ran the MMG services before you will see the python interpreter listed there. Delete it, if you are running the MMG Application for the first time on a fresh schema then you do not need to do this step.
  - ii. After deleting the Python Interpreter or if start has not been done yet, go to filesystem inside `mmg-home/mmg-studio/server/builtin/interpreters`, open `python.json` in a text editor.
  - iii. Scroll down under interpreter ClientConfigs with className `oracle.datastudio.python.DsPythonInterpreter` you will find following properties section with bunch of Zeppelin configurations. After the last entry in properties add the Zeppelin Interpreter.output.limit also as shown in step iii) of 1) From UI b) using JSON screen (last image of From UI way). Save the python.json with the desired default value and the changes done.

- iv. Now restart/start the MMG-Studio for your changes to reflect.

### Note

If you have configured the python environment for MMG-Studio (basically you have installed pandas and numpy which are subset of libraries required by MMG as pre-req), you can run the below script on python paragraph.

```
%python
import pandas as pd
import numpy as np
Create 1000 rows of random data for 20 columns
data = np.random.randn(1000, 20)
Create column names columns = [f"Column_{i+1}" for i in range(20)]
Create DataFrame df = pd.DataFrame(data, columns=columns)
Display the DataFrame
z.show(df)
Output in table view
```

**Figure 10-11 Output in table view**

| Column_1            | Column_2            | Column_3             | Column_4            | Column_5             | Column_6             | Column_7            | Column_8        |
|---------------------|---------------------|----------------------|---------------------|----------------------|----------------------|---------------------|-----------------|
| -0.8933910191898379 | 0.7613799878489635  | 0.75806146330438     | 1.2753426005586657  | -1.5934944618973514  | 0.5965222292150769   | 0.5829090157274303  | -0.197946806574 |
| -0.4792920585860974 | 0.6014851803485978  | -0.07350947398695965 | 0.06001880557421651 | -0.06466795427830368 | -0.44494929567260394 | -0.8361218782799762 | -1.418531248626 |
| 0.4790844079584656  | -1.34332772958042   | -1.2684080797668027  | 0.8988179711893556  | -0.709742130514913   | -1.9565143492049126  | 0.3481468677129027  | -0.419456821682 |
| 0.03732633828712172 | 0.33468022887354104 | -1.547544190292229   | -0.8939236490440552 | -0.7403558285426715  | -0.7646700982508163  | 1.7847515628537471  | 0.1669535658351 |
| 0.42289642019235335 | -1.626284936446582  | 0.7038916058037783   | 0.4856477230960553  | 0.8823036516706713   | 1.8401232449352867   | -1.4962853947932677 | -0.011098415694 |

Page 1 of 105 (1-5 of 521 Items) |< 1 2 3 4 5 ... 105 >| Load More

Output is truncated to 204800 bytes. Learn more about ZEPPELIN\_INTERPRETER\_OUTPUT\_LIMIT

You can see the ZEPPELIN\_INTERPRETER\_OUTPUT\_LIMIT value as warning if the table content is more than the set default value for `zeppelin.interpreter.output.limit` and accordingly you can modify the default value for same.

14. What should I do when the result set is truncated if the size goes above '102400' bytes? Perform the following steps:
  - a. Login to Compliance Studio.
  - b. Navigate to interpreter `zeppelin.interpreter.output.limit`.

**Figure 10-12 Zeppelin Interpreter**

- c. Set the value to the required size.
  - d. Restart the Studio Application.
15. What should I do if there is a below `KubernetesClientException` in `load-to-elastic-search.log`, `matching-service.log` files after Compliance Studio installation?
- ```
configServicePropertySourceLocator - Could not locate PropertySource: I/O
error on GET request for "http://localhost:8888/<Service Name>/default":
Connection refused (Connection refused); nested exception is
java.net.ConnectException: Connection refused (Connection
refused)onfigServicePropertySourceLocator - Could not locate PropertySource:
I/O error on GET request for "http://localhost:8888/<Service Name>/default":
Connection refused (Connection refused); nested exception is
java.net.ConnectException: Connection refused (Connection refused)20:04:55.686
[ main] WARN .cloud.kubernetes.config.ConfigMapPropertySource - Can't read
configMap with name: [<Service Name>] in namespace:[null].
Ignoring.io.fabric8.kubernetes.client.KubernetesClientException: Operation:
[get] for kind: [ConfigMap] with name: [<Service Name>] in namespace: [null]
failed. at
io.fabric8.kubernetes.client.KubernetesClientException.launderThrowable(Kubern
etesClientException.java:64) ~[kubernetes-client-4.4.1.jar!/:?] at
io.fabric8.kubernetes.client.KubernetesClientException.launderThrowable(Kubern
etesClientException.java:72) ~[kubernetes-client-4.4.1.jar!/:?] at
io.fabric8.kubernetes.client.dsl.base.BaseOperation.getMandatory(BaseOperation
.java:229) ~[kubernetes-client-4.4.1.jar!/:?] at
io.fabric8.kubernetes.client.dsl.base.BaseOperation.get(BaseOperation.java:162
) ~[kubernetes-client-4.4.1.jar!/:?] at
org.springframework.cloud.kubernetes.config.ConfigMapPropertySource.getData(Co
nfigMapPropertySource.java:96) ~[spring-cloud-kubernetes-
config-1.1.3.RELEASE.jar!/:1.1.3.
```
- You can ignore the error when the following message is displayed at the end of the log; if you do not see this message, contact [My Oracle Support \(MOS\)](#) and provide the applicable error code and log:
- ```
13:52:57.698 [main] INFO org.apache.catalina.core.StandardService - Starting
service [Tomcat] 13:52:57.699 [main] INFO
org.apache.catalina.core.StandardEngine - Starting Servlet engine: [Apache
Tomcat/9.0.43]
```
16. What happens if a new sandbox workspace is created?
- When a new sandbox workspace is created, the folders of the older workspace are by default being copied into the new workspace. Here, folder means the Model Objectives. The Model Objectives are global objects and will be visible across the workspaces. However, the models created within those objectives will be private. This has been done purposely as you expect multiple modelers working on the common objective in their private workspaces.

17. Not able to access any models in the copied folders in the new workspace – the folders are being copied as empty folders?  
Yes, you should not be able to access other workspace's private models. Also, as long as other users are working on the objective and have their models in there, you will not be able to delete the objectives.

18. What should you do when UI pages does not load due to less network speed?  
The default time to load all the modules of OJET/REDWOOD page is 1 minute. Reload the page to view the UI pages.

19. What are the Workspace parameters used in MMG Python Scripts?  
The following parameters are used:

- **workspace.list\_workspaces():** Used to fetch a list of all workspaces. This list is populated in the dropdown menu of datastudio.
- **workspace.check\_aif():** A method used to check if AIF is enabled or not
- **workspace.attach\_workspace("SANDBOX123"):** A method used to set workspace
- **workspace.get\_workspace():** Used to fetch the selected workspace (for example, SB1)
- **get\_mmg\_studio\_service\_url():** Used to fetch the base URL (for example, http://whf999yy:0000/mmg)
- **get\_user():** Used to fetch current user (for example, mmguser)

20. How to take connections for Data access?

You need access to the data to work on it. For the workspace, there are some underlying Data Schemas. You can also create a workspace that allows to select multiple underlying Data Schemas. You can use or remove multiple Data Schemas like multi combo box, where 1, 2, 3, and 4, 5 are schemas underlying. When you work with the models, you can access the notebook to fetch data for all these Data Schemas and create some data frames out of it. That can be used for model reading or other purposes.

This happens in workspace of the sandbox where you are building a Notebook. The same Notebooks gets promoted to production workspace. Therefore, the workspace production has its own set of underlying Data Schemas. When you build the model with getting connection for the underlying Schema 1 and 2, and getting the data and building, it makes rules work and will not be affected if the same Notebooks gets promoted to production or deployment is cloned.

Therefore, the Notebook needs to run which should not be fetching this data because it will be working on any 1 and 2 Schemas.

To avoid this issue, you can use connection feature to connect with a schema. This is a wrapper function where you can specify which workspace you are connecting to.

You can enter the workspace details to get the connection and that starts fetching the data.

When you create the Notebook to production, a script runs to not to connect the workspace. This also uses overloaded methods. This method tells how to get the connection. Simple get connection gets the primary connection as first Data Schema which you are using without any overload.

The second connection gets an ID as the name the Data Source which you are using and for the current one will passes as get connection 1.

In the sandbox, this script looks for 1 and it creates a connection and moves to production.

It will again look for an equivalent 1 and tries to get a connection.

Therefore, whatever you select first, becomes the first Data Schema, Second Schema, Third Schema, therefore, Primary, Secondary, Tertiary and so on. You can also pass the

number while getting the connection to get the first primary Data Schema as a secondary Data Schema. Therefore, when it runs in sandbox, it gets the Secondary Schema. When it runs in the production, it fetches a Secondary Data Schema of production.

**21. What are parameters to establish the Connection for data access?**

The following section lists the connection details such as the Data Sources and so on:  
`workspace.get_connection()`: fetches connection object for the Primary Data Source of the workspace. This is equivalent to executing `workspace.get_connection(1)`.  
`workspace.get_connection('id')`: fetches connection for the Data Source by name. For example, `workspace.getconnection('ws_data_1')` – here 'ws\_data\_1' is one of the underlying Data Source for the workspace. `workspace.get_connection(n)`: fetches connection for the Data Source by order. For example, `workspace.getconnection(2)` – this will fetch connection for the Secondary Data Source. The following section lists the workspace details: After a workspace is attached, we can list Data Sources related to that using: `workspace.list_datasources()`: will list Data Sources related to attached workspace with default order 1 For example, {'Data Source': [{'name': 'newdatasource1', 'order': '1'}]}  
`workspace.list_datasources("SB1")`: will list Data Sources related to SB1 workspace with default order 1 For example, {'Data Source': [{'name': 'ds1', 'order': '1'}]}  
`workspace.list_datasources("SB1", 1)`: will list Data Sources related to SB1 workspace with order 1 as passed in second argument For example, {'Data Source': [{'name': 'ds1', 'order': '1'}]} Note: This is applicable for Python and Python variants interpreters, and not on any other interpreters.

**22. What should I do if the Python installation displays the following error message, " If ModuleNotFoundError: No module named '\_lzma'?"**

You must install xz-devel library before installing the Python. For more details, see [Install MMG Python Library](#) section.

To install, perform the following step:

```
$yum install -y xz-devel.
```

**23. What should I do to reconfigure DS Studio server port and its interpreter's default port to available ports?**

**To reconfigure port numbers:**

- a. Run the command `install.sh -u` to change the current studio port to the desired port number in the configuration files/tables.
- b. Run the `startup.sh` script of Studio at the location: `OFS_MMG/mmg-studio/bin/` and modify the line numbers 24/25 of `OFS-MMG/mmg-studio/bin/startup.sh` to specify the interpreter name and port number.

**DS version 22.4.3**

```
nohup "$DIR"/datastudio --jdbc -1 --eventjdbc -1 --shell -1 --eventshell -1 --graalvm -1 --eventgraalvm -1 --pgx -1 --eventpgx -1 --external --port 8008 --jdbc 3011 --eventjdbc 3031 --python 3012 --eventpython 3032 --markdown 3009 --eventmarkdown 3029 --spark 3014 --eventspark 3034 &> "$DIR"/nohup.out &
```

For PGX Interpreter, modify: `OFS_MMG/mmg-studio/interpreter-server/pgx-interpreter-22.4.3/bin/pgx-interpreter` file `"${1:-7022}" "${2:-7042}"` values to `"${1:-3022}" "${2:-3042}"`

**DS version 23.3.5**

```
nohup "$DIR"/datastudio --jdbc -1 --shell -1 --external --port 8008 --jdbc 3011 --python 3012 --markdown 3009 --spark 3014 --pgx 3022 &> "$DIR"/nohup.out
```

**For event ports in DS 23.3.5**

Set the environment variables `DS_EVENT_HANDLER_HOST` and `DS_EVENT_HANDLER_PORT` before launching the interpreters, else, default values will be used. You can modify these ports in the `startup.sh` of the Studio.

**Example:**

```
export DS_EVENT_HANDLER_HOST=localhost
export DS_EVENT_HANDLER_PORT=3432
```

To change the ports configured for events in the Data Studio server, modify the following server configuration:

```
studio-server:
thrift-server:
enabled: true
port: <desired port -defaulted to 8432>
mode: TCP
```

**NOTE:**

\*\*\*\*\*

**Python Interpreter**

Beginning with Data Studio 21.4.0, 6012 is default port on which the REST server for the Python interpreter listens. To overwrite this, set the `STUDIO_INTERPRETER_PYTHON_INTERPRETER_REST_SERVER_PORT` environment variable.

**PGX-Python Interpreter**

Beginning with Data Studio 23.1.0, 6022 is the default port on which the REST server for the PGX-Python interpreter listens. To overwrite this, set the `STUDIO_INTERPRETER_PGX_PYTHON_INTERPRETER_REST_SERVER_PORT` environment variable.

Modify the `startup.sh` to:

```
export
STUDIO_INTERPRETER_PYTHON_INTERPRETER_REST_SERVER_PORT=3038
export
STUDIO_INTERPRETER_PGX_PYTHON_INTERPRETER_REST_SERVER_PORT=
3039
```

This configuration changes the default interpreter ports to new ports.

- c. Ports mentioned in the interpreter json files should be reconfigured. The interpreter file location is: "`OFS_MMG/mmg-studio/server/builtin/interpreters/<interpreter>.json`" file.
- d. Execute `startup.sh` and check the `studio/interpreter` ports.
- e. Similarly, execute `./datastudio.sh -help` from `OFS_MMG/mmg-studio/bin/` for all available options.

DS Studio Server port and its interpreters default port can be reconfigured to any available ports by following these steps:

- a. Change the Datastudio URL with the desired DS port. `install.sh -u` must be triggered to change the current studio port to 8008 in the configuration files/tables.
- b. After successful execution of `install.sh`. The ports can be updated by the user in the `startup.sh` of studio in the path `OFS_MMG/mmg-studio/bin/`.

- i. Edit line no 24/25 of OFS-MMG/mmg-studio/bin/startup.sh and change as below by specifying the interpreter name and port to be modified.
  - **In DS version 22.4.3**  
`nohup "$DIR"/datastudio --jdbc -1 --eventjdbc -1 --shell -1 --eventshell -1 --  
 graalvm -1 --eventgraalvm -1 --pgx -1 --eventpgx -1 --external --port 8008 --  
 jdbc 3011 --eventjdbc 3031 --python 3012 --eventpython 3032 --markdown  
 3009 --eventmarkdown 3029 --spark 3014 --eventspark 3034 &> "$DIR"/  
 nohup.out`  
**For PGX Interpreter**  
 Change it directly in the OFS\_MMG/mmg-studio/interpreter-server/pgx-  
 interpreter-22.4.3/bin/pgx-interpreter file "\${1:-7022}" "\${2:-7042}" values to  
 "\${1:-3022}" "\${2:-3042}"
  - **In DS version 23.3.5**  
`nohup "$DIR"/datastudio --jdbc -1 --shell -1 --external --port 8008 --jdbc 3011  
 --python 3012 --markdown 3009 --spark 3014 --pgx 3022 &> "$DIR"/nohup.out`  
 & For event ports in DS 23.3.5 You need to set the environment variables  
 DS\_EVENT\_HANDLER\_HOST and DS\_EVENT\_HANDLER\_PORT before  
 interpreters are launched. Otherwise, the default values are used. This can be  
 mentioned in the startup.sh of studio. example:
    - export DS\_EVENT\_HANDLER\_HOST=localhost
    - export DS\_EVENT\_HANDLER\_PORT=3432
 In order to change the port listening for events in the Data Studio server, adapt  
 following server configuration:
    - studio-server:
      - \* thrift-server:
        - \* enabled: true
        - \* port: <desired port -defaulted to 8432>
        - \* mode: TCP
  - **Generic Notes**  
**Python Interpreter**  
 Starting from Data Studio 21.4.0, the REST server for the Python interpreter  
 listens on port 6012 by default. One can overwrite this by setting the  
 STUDIO\_INTERPRETER\_PYTHON\_INTERPRETER\_REST\_SERVER\_POR  
 T environment variable.  
**PGX-Python Interpreter**  
 Starting from Data Studio 23.1.0, the REST server for the PGX-Python  
 interpreter listens on port 6022 by default. One can overwrite this by setting  
 the  
 STUDIO\_INTERPRETER\_PGX\_PYTHON\_INTERPRETER\_REST\_SERVER\_  
 PORT environment variable.  
 The above can be mentioned in the startup.sh of studio as export  
 STUDIO\_INTERPRETER\_PYTHON\_INTERPRETER\_REST\_SERVER\_POR  
 T=3038 export  
 STUDIO\_INTERPRETER\_PGX\_PYTHON\_INTERPRETER\_REST\_SERVER\_  
 PORT=3039

The above configuration will change the default interpreter ports and reconfigure to listen to the new ports. (For example: As mentioned in the below table).

- ii. Ports mentioned in the interpreter json files also needs to be reconfigured. The interpreter file locations can be found at "OFS\_MMG/mmg-studio/server/builtin/interpreters/<interpreter>.json" file.
- iii. Execute startup.sh and check the studio/interpreter ports.
- iv. Similarly you can execute as ./datastudio.sh --help from OFS\_MMG/mmg-studio/bin/ location for all the available options.

The above steps will reconfigure Server/Interpreter to these ports:

- Server/Interpreters Modified Port
  - DS Studio port 8008
  - Jdbc 3011
  - eventjdbc 3031
  - python 3012
  - eventpython 3032
  - markdown 3009
  - eventmarkdown 3029
  - spark 3014
  - eventspark 3034
  - pgx 3022
  - eventpgx 3042
24. Dataset issue with the latest version of pydantic package (2.18.7)  
Pydantic package (2.18.7) is incompatible with MMG functionality. So, when you reinstall the package the uninstall and reinstall pydantic package version 1.10.13.
- python3 -m pip uninstall pydantic
  - python3 -m pip install pydantic==1.10.13 --user
25. Installation of Python Packages from Local Repository  
In order to install the python dependencies in mmg-8.1.2.6.0.tar.gz from a local repository, use the following command.  
python3 -m pip install mmg-8.1.2.6.0.tar.gz --index-url <http://artifactory.XYZ.com/artifactory/api/pypi/XYZ-py-local/simple> --extra-index-url <http://artifactory.XYZ.com/artifactory/api/pypi/XYZ-py-local/simple> --trusted-host [artifactory.XYZ.com](http://artifactory.XYZ.com)

## 10.1.2 Application Pack 8.1.3.3.0 FAQs

1. **The the cx\_Oracle connection is failing in DS with the following error in OEL 8.**  
Fail to execute line 4: cx\_Oracle.connect(dsn=dsn\_alias)\nTraceback (most recent call last):\n File "/tmp/1638454321889-0/zeppelin\_python.py", line 163, in <module>\n exec(code, \_\_zUserQueryNameSpace)\n File "<stdin>", line 4, in <module>\n cx\_Oracle.DatabaseError: DPI-1047: Cannot locate a 64-bit Oracle Client library: "libnsl.so.1: cannot open shared object file: No such file or directory". Install the libnsl package as below: yum install libnsl or sudo yum install libnsl
2. **Python Interpreter fails with the `py4j` Error**

When running interpreters locally, they assume all the dependencies to be already installed and available. Python Interpreter needs `py4j` Package, exact steps to install it depend on the Operating System. If you use `pip`, it can be done with ``bash pip install --user py4j`` Install the package for all users, root user can run this command without `--user`.

**3. What is the reason for the http error code 401 when I successfully log in to the MMG Application while MMG Studio is down?**

If MMG Studio is not up during the MMG application login, the mmg-ui logs capture the http error code : 401 . Since the cookie creation is done during MMG application login, the user must re login to the MMG application once the Studio is up and running.

**4. What should I do when the following error message is displayed, and the SSL module is unavailable for Linux 8?**

urllib3.exceptions.SSLError: Can't connect to HTTPS URL because the SSL module is not available. During handling of the above expectation, another exception occurred:

- a. Install the compat-openssl10 module on Linux 8.
- b. Log in to the server as a root user where MMG Application is installed.
- c. Run the following Shell command: yum -y install compat-openssl10.

**5. Why do multiple commits/versions appear in my remote Git repository after my first push, even though I only pushed once?**

When you push a local git repository to a remote one for the first time, all the commits that exist in your local repository's history for the branch that is being pushed are transferred to the remote repository. This happens even if the remote is new or empty. This is standard git behavior. If your local repository was initialized earlier, or was linked to a different remote connection, then all its' commits will still remain in your local git history. When you add a new remote connection and perform a push action, git pushes the entire commit history, not just the most recent change. So the remote connection will reflect all your local commits.

**Key Points:**

- Git tracks the full commit history locally, regardless of remote connections.
- Pushing to a new remote connection brings the entire history of your pushed branch.
- If you want only specific commits in the new remote connection, you must create a new repository or filter your history before pushing.