

Oracle Financial Services Compliance Studio

Installation Guide

Release 8.1.2.7.0

July 2024

F48800-01

ORACLE®

Financial Services

OFS Compliance Studio Installation Guide

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Document Control

Table 1 lists the document control of this guide.

Table 1: Document Control

Version Number	Revision Date	Change Log
8.1.2.7.3	July 2024	<p>Added the DATASTUDIO_CSP_FRAME_ANCESTORS parameter in the Table 15.</p> <p>The note related to v8.1.2.7.3 has been updated in the Access the Compliance Studio Application when Gateway is Enabled section.</p> <p>Added patch number for v8.1.2.7.3 in the Download the Installer Kit section.</p>
8.1.2.7.2	July 2024	<p>Added new parameters such as PGX_ZEPPELIN_SCHEDULER_THREADPOOL_SIZE, AUDIT_DATASOURCE_NAME and related to Quantifind details in the Table 15.</p> <p>Added patch number for v8.1.2.7.2 in the Download the Installer Kit section.</p>
8.1.2.7.1	July 2024	<p>Added COMPLIANCE_STUDIO_GATEWAY_ENABLED and COMPLIANCE_STUDIO_GATEWAY_PORT parameters in the config.sh file.</p> <p>Added the following sections:</p> <ul style="list-style-type: none">• Access the Compliance Studio Application when Gateway is Enabled• User Provisioning <p>Added patch number for v8.1.2.7.1 in the Download the Installer Kit section.</p>
8.1.2.7.0	May 2024	<p>The Big Data Setup and ETL parameters are removed in the config.sh file.</p>
8.1.2.7.0	March 2024	<p>Added "Oracle Database Client" in the Table 7.</p> <p>Oracle Text (OT) grants are added in the Assign Grants for ER Schema and Create Graph Schema and Grant Permission sections.</p> <p>The parameters such as MINICONDA_INSTALLATION_HOME, MATCHING_MECHANISM, FCC_UI_ENABLED, CANDIDATE_SELECTION_ENABLED are added in the Table 15.</p>

Table 1: Document Control

Version Number	Revision Date	Change Log
8.1.2.7.0	March 2024	<p>Added the following sections:</p> <ul style="list-style-type: none">• Configuring Transliteration• Assign Grants for ER Schema• Creating the Thesaurus• Uploading FSDF• Configure the PGX Service (Table 20) <p>Added a “FCC_GRAPH_M_TRXN_VIEWS” grant for Post-installation Grants for ECM Graph in the Create Graph Schema and Grant Permission section.</p> <p>Added upgrade steps in the Upgrade Steps for Entity Resolution section.</p> <p>The Configure the resources.xml for Multiple ER Schemas and Configure the resources.xml for Graph Schema sections are removed as these functionalities are deprecated.</p>

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1 Preface

This section provides the Oracle Financial Services (OFS) Compliance Studio Installation Guide information.

Topics:

- [Audience](#)
- [Related Documents](#)
- [Conventions](#)
- [Abbreviations](#)

1.1 Audience

OFS Compliance Studio Installation Guide is intended for System Engineers who are responsible for installing and maintaining the application.

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

- UNIX commands
- Database concepts
- Big Data concepts

1.2 Related Documents

You can strive to keep this and all other related documents updated regularly; visit the [OHC Documentation Library](#) to download the latest version available there. The list of related documents is provided here.

- [Oracle Financial Services Compliance Studio Administration and Configuration Guide](#)
- [Oracle Financial Services Compliance Studio User Guide](#)
- [Oracle Financial Services Compliance Studio Matching Guide](#)
- [Oracle Financial Services Compliance Studio Data Model Guide](#)
- [Oracle Financial Services Compliance Studio Release Notes](#)
- [Oracle Financial Services Compliance Studio Use Case Guide](#)

1.3 Conventions

[Table 2](#) lists text conventions are used in this document.

Table 2: Document Conventions

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.

Table 2: Document Conventions

Convention	Meaning
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, file names, text on the screen, or text you enter.
Hyperlink	Hyperlink type indicates the links to external websites and internal document links to sections.

1.4 Abbreviations

Table 3 lists the abbreviations used in this document.

Table 3: Abbreviations

Abbreviation	Meaning
OFS	Oracle Financial Services
Compliance Studio	Oracle Financial Services Compliance Studio
OFSAA	Oracle Financial Services Analytical Application
BD	Behavior Detection
FCDM	Financial Crime Data Model
ICIJ	International Consortium of Investigative Journalists
IDCS	Oracle Identity Cloud Service
ECM	Enterprise Case Management
SSO	Single Sign-On
SSH	Secure Shell

2 Introduction

OFS Compliance Studio is an advanced analytics application that supercharges anti-financial crime programs for better customer due diligence, transaction monitoring, and investigations by leveraging the latest innovations in artificial intelligence, open-source technologies, and data management. It combines Oracle's Parallel Graph Analytics (PGX), Machine Learning for AML, Entity Resolution, and notebook-based code development. It enables Contextual Investigations in one platform with complete and robust model management and governance functionality.

This chapter provides the information required to understand the installation of the OFS Compliance Studio application.

This release (v8.1.2.7.0) of Compliance Studio can be used for the following:

- To install a new instance of Compliance Studio as follows:
 - Compliance Studio with OFSAA (Oracle Financial Services Analytical Application). Here, OFSAA is with Behavior Detection (BD) or Enterprise Case Management (ECM).
 - Compliance Studio without OFSAA

To upgrade an existing instance of Compliance Studio as follows:

- Upgrade Compliance Studio from v8.1.2.6.0 onwards to Compliance Studio v8.1.2.7.0.

Topics:

- [Installation Checklist when Studio is installed with OFSAA](#)
- [Installation Checklist when Studio is installed without OFSAA](#)

2.1 Installation Checklist when Studio is installed with OFSAA

To complete the installation process, you must perform the steps listed in the [Table 4](#) checklist. Use this checklist to verify whether these steps are completed or not. Click the reference link to go to the topic.

Table 4: Installation Checklist

Sl. No.	Activity	Mandatory	Description
Pre-installation Steps			
1	Install all the prerequisite Hardware and Software Requirements .	Yes	-
2	Setup the environmental settings (System Configuration).	Yes	-

Table 4: Installation Checklist

3	Download the Big Data Files	No	It is required for graph analytics and leverages fragmented data or as a datasource for models. NOTE: This prerequisite is deprecated for Legacy ETL feature.
4	Configure the OpenSearch Component	No	It is required for graph analytics and leverage fragmented data or for matching service and Entity Resolution
5	Configure the Interpreter Settings	Yes	-
6	Create the Studio Schema	Yes	-
7	Assign Grants for Studio Schema	Yes	-
8	Setup Password Stores with Oracle Wallet	Yes	-
9	Create the Credential Keystore	No	It is required for graph analytics and leverages fragmented data or as a datasource for models
10	Download the Installer Kit	Yes	-
Installation Steps			
1	Extract the Installer Kit	Yes	-
2	Place Files in the Installation Directories	Yes	-
3	Generate the Public and Private Keys	Yes	-
4	Generate API token for CS API User	Yes	-
5	Place the Key Store File for Secure Batch Service	Yes	-
6	Add the Studio Service (SSL) to PGX Configuration	Yes	-
7	Configure the Extract Transfer and Load (ETL) Process	No	It is required for graph analytics and leveraging fragmented data. NOTE: This step is not applicable as Legacy ETL feature is deprecated.
8	Configure the config.sh File	Yes	-
9	Run the Compliance Studio Installer	Yes	-
10	Configure the PGX Service	Yes	-

Table 4: Installation Checklist

Post-Installation Steps			
1	Verify the Installation	Yes	-
2	Start the PGX Service	Yes	-
3	Access the Compliance Studio Application when Gateway is Disabled	Yes	-
4	Perform the OFSAA Configuration for Batch Execution	No	It is required if leverage OFSAA's scheduling and executing capability.
5	Configure and Run Published Notebooks	No	It is required if leveraging OFSAA's batch execution.

2.2 Installation Checklist when Studio is installed without OFSAA

To complete the installation process, you must perform the steps listed in the [Table 5](#) checklist. Use this checklist to verify whether these steps are completed or not. Click the reference link to go to the topic.

Table 5: Installation Checklist

Sl. No.	Activity	Mandatory	Details
Pre-installation Steps			
1	Install all the prerequisite Hardware and Software Requirements .	Yes	-
2	Setup the environmental settings (System Configuration).	Yes	-
3	Configure the Interpreter Settings	Yes	-
4	Create the Studio Schema	Yes	-
5	See the Configure the resources.xml for Multiple ER Schemas section for more details.	Yes	-
6	Setup Password Stores with Oracle Wallet	Yes	-
7	Create the Credential Keystore	Yes	-
8	Download the Installer Kit	Yes	-
Installation Steps			
1	Extract the Installer Kit	Yes	-
2	Place Files in the Installation Directories	Yes	-
3	Generate the Public and Private Keys	Yes	-
4	Generate API token for CS API User	Yes	-
5	Place the Key Store File for Secure Batch Service	Yes	-

Table 5: Installation Checklist

6	Configure the config.sh File	Yes	-
7	Run the Compliance Studio Installer	Yes	-
Post-Installation Steps			
1	Verify the Installation	Yes	-
2	Access the Compliance Studio Application when Gateway is Disabled	Yes	-

3 Pre-installation

This chapter provides information about the tasks that must be performed before installing Compliance Studio. To install Compliance Studio with OFSAA, ensure the Behavior Detection (BD) or the Enterprise Case Management (ECM) application pack is installed.

The following patches are required only when integrating with old versions for ECM:

- On top of ECM 8.0.8.0.0, apply the following ECM patch for ML-ECM integrations.
8.0.8.0.28 (BUG: **31497997**)
- On top of ECM 8.0.8.1.0, apply the following ECM patch for ML-ECM integrations.
8.0.8.1.4 (BUG: **33395125**)

NOTE From ECM 8.1.1.0.0 and later versions, the above patches are not required for ML-ECM integrations.

- On top of ECM 8.1.2.0.0, apply the following ECM patch for ECM-IH integration.
8.1.2.0.8 (BUG: **34337520**)
- On top of ECM 8.1.2.4.0, apply the following ECM patch for ECM-IH integration.
8.1.2.4.5 (BUG: **35456951**)

Verify the **AIF_USER_TS** and **AIF_USER_TEMP_TS** are available in the BD production database server. If not, then you need to create a tablespace. For information about how to create a tablespace, see [Create the Tablespace](#) section.

After creating a tablespace, you need to provide a quota on the tablespace **AIF_USER_TS** and **AIF_USER_TEMP_TS**.

For example:

```
ALTER USER <BD ATOMIC SCHEMA USER> QUOTA <size in megabyte> ON AIF_USER_TS;  
ALTER USER <BD ATOMIC SCHEMA USER> QUOTA <size in megabyte> ON  
AIF_USER_TEMP_TS;
```

3.1 Download the Installer Kit

To download the software as .zip files, download the latest installer **36363042** for the **v8.1.2.7.0** release from the [My Oracle Support \(MOS\)](#).

After downloading the installer kit (**OFS_COMPLIANCE_STUDIO_8.1.2.7.0_LINUX.zip**), unzip the file. It contains two files as follows:

1. <p36363042_81200_Linux-x86-64>-1of2.zip
2. <p36363042_81200_Linux-x86-64>-2of2.zip

You have to rename the two files as follows:

1. OFS_COMPLIANCE_STUDIO-8.1.2.7.0-1of2.zip
2. OFS_COMPLIANCE_STUDIO-8.1.2.7.0-2of2.zip

Apply the following patches on top of v8.1.2.7.0 as mentioned in the [Table 6](#).

Table 6: Additional Patch Details

Patch Number	Patch Version
36537907	v8.1.2.7.1
36752689	v8.1.2.7.2
36804828	v8.1.2.7.3

3.2 Extract the Installer Kit

To extract the downloaded .zip files, follow these steps:

1. Extract the `OFS_COMPLIANCE_STUDIO-8.1.2.7.0-1of2.zip` file from the installer in the download directory using the following command:

```
unzip -a OFS_COMPLIANCE_STUDIO-8.1.2.7.0-1of2.zip
```

2. The `OFS_COMPLIANCE_STUDIO-8.1.2.7.0-2of2.zip` file should be placed in the same directory where `OFS_COMPLIANCE_STUDIO-8.1.2.7.0-1of2.zip` file is extracted.

NOTE You no need to unzip the `OFS_COMPLIANCE_STUDIO-8.1.2.7.0-2of2.zip` file.

3. Navigate to the download directory where the installer archive is extracted, and assign execute permission to the installer directory using the following command:

```
chmod -R 0755 OFS_COMPLIANCE_STUDIO
```

After extracting .zip files, the folder structure should be as follows:

```
OFS_COMPLIANCE_STUDIO
```

```
OFS_COMPLIANCE_STUDIO-<version>-1of2.zip
```

```
OFS_COMPLIANCE_STUDIO-<version>-2of2.zip
```

The Compliance Studio installer file is extracted, and the `OFS_COMPLIANCE_STUDIO` directory is obtained and is referred to as `<COMPLIANCE_STUDIO_INSTALLATION_PATH>`.

WARNING Do not rename the application installer directory name after extraction from the archive.

3.3 Hardware and Software Requirements

The following hardware and software are required for this version of Compliance Studio. The installation environment or setup must have these requirements for an application to run smoothly and efficiently.

[Table 7](#) lists the Hardware and Software Requirements:

Table 7: Hardware and Software Requirements

Hardware or Software Category	Component Version
-------------------------------	-------------------

Table 7: Hardware and Software Requirements

Browser	<ul style="list-style-type: none"> • Chrome
Java Version	JDK 11.0.18
Processing Server	<ul style="list-style-type: none"> • RHEL 7.6+ and 8+
Database Server	<ul style="list-style-type: none"> • Oracle Database Release 19c (19.3+)Enterprise Edition • Oracle Machine Learning for R (OML4R) (formerly ORE) 1.5.1 with Open source R or Oracle R Distribution 3.6.1
PGX (Graph) Server	<ul style="list-style-type: none"> • RHEL 7.4+ • Minimum gcc library v4.8.2
OpenSearch Version	<p>2.3.0</p> <p>NOTE: OpenSearch is not required in case the MATCHING_MECHANISM parameter is set to OT.</p>
Logstash Version	<ul style="list-style-type: none"> • 7.16.3 • Logstash should be downloaded from the link. <p>NOTE: Logstash is not required in case the MATCHING_MECHANISM parameter is set to OT.</p>
Oracle Instant Client	<p>instantclient-basic-linux.x64-19.8.0.0.0</p> <p>NOTE: The version should be the same as the Database version, and this should be present in the processing server.</p>
Oracle Database Client	Download the LINUX.X64_193000_client_home.zip file.
<p>Big Data</p> <p>NOTE:</p> <p>This is the prerequisite for legacy ETL which is deprecated in this release and will be removed in the next release. For Spark interpreter, this prerequisite may be required.</p> <p>You can use either Cloudera or open-source Apache for a big data cluster.</p> <p>If you are using a Graph pipeline, skip this section. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.</p>	

Table 7: Hardware and Software Requirements

Hadoop and Spark	<ul style="list-style-type: none"> ● Kerberos authentication must be enabled for Big Data. ● Apache Hadoop Version 3.0.0 ● Apache Hive Version 2.1.1 ● Apache Spark Version 2.4.0 ● Apache Sqoop Version 1.4.7 ● The .profile file must be present with the SPARK_HOME and PYTHON_HOME parameters already set. <p>NOTE: This is the prerequisite for legacy ETL which is deprecated in this release and will be removed in the next release. For Spark interpreter, this prerequisite may be required.</p> <p>The product is certified for Apache-Hadoop, and any vendor-specific Hadoop distributions have to confirm compliance with Apache-Hadoop standards, and if not, the vendor the customer chooses to work with for Hadoop should ensure compliance to Apache-Hadoop standards. Any issue raised on vendor-specific distributions will be fixed only if the issue is reproducible on Apache-Hadoop, Apache-Hive, and Apache-Spark.</p>
Hive Connectors	<p>Hive JDBC Connectors V 2.5.15</p> <p>NOTE: This is the prerequisite for legacy ETL which is deprecated in this release and will be removed in the next release. For Spark interpreter, this prerequisite may be required.</p>
Apache	<ul style="list-style-type: none"> ● Kerberos 1.19.1 ● Hadoop Version 3.0.0 ● Hive Version 3.1.2 ● Spark Version 2.4.8 (with Hadoop) ● Sqoop Version 1.4.7 <p>NOTE:</p> <ul style="list-style-type: none"> ● This is the prerequisite for legacy ETL which is deprecated in this release and will be removed in the next release. For Spark interpreter, this prerequisite may be required. ● The .profile file must be present with the SPARK_HOME and PYTHON_HOME parameters already set.

Table 7: Hardware and Software Requirements

Apache	<ul style="list-style-type: none"> • Kerberos authentication must be enabled for the above services and ensure these services are Apache standards. • The product is certified for Apache-Hadoop, and any vendor-specific Hadoop distributions must confirm compliance with Apache-Hadoop standards. If not, the vendor, the customer, who chooses to work with Hadoop should comply with the Apache-Hadoop standards. Any issue raised on vendor-specific distributions will be fixed only if the issue is reproducible on Apache-Hadoop, Apache-Hive, and Apache-Spark.
Hadoop Security Protocol	<ul style="list-style-type: none"> • Kerberos 5 • Apache Sentry-2.1.0 <p>NOTE: This is the prerequisite for legacy ETL which is deprecated in this release and will be removed in the next release. For Spark interpreter, this prerequisite may be required.</p>

3.3.1 System Configuration

1. Log in to the server as a root user.
2. Navigate to UNIX file path `/etc/security/limits.conf` to edit the file.
3. Add the following values at the end of the file for Compliance Studio:

```
<Username> hard nproc 65536
```

```
<Username> soft nproc 65536
```

For example,

```
compliancestudio hard nproc 65536
```

```
compliancestudio soft nproc 65536
```

3.3.2 Port Numbers for Application

You can see default port numbers for services in the `install.sh` files in `<Compliance Studio Installation Path>/bin`. To change the port number for service(s) in `install.sh` and in respective service(s) directories, see [Appendix A - Change Port Numbers for the Applicable Services](#) section.

3.3.3 Prerequisite Environmental Settings

The following prerequisite environmental settings must be set before beginning the installation of Compliance Studio. These settings are the configuration that a system must have for an application to run smoothly and efficiently.

Table 8 lists the Prerequisite Environmental Settings:

Table 8: Prerequisite Environmental Settings

Category	Expected Value
Java Settings	<p>PATH in the <code>.profile/.bash_profile</code> file must be set to include the Java Runtime Environment (JDK 11) absolute path.</p> <p>Supported version: jdk 11.0.18</p> <p>NOTE:</p> <p>Ensure the absolute path to <code>JDK/bin</code> is set at the beginning of the PATH variable. For example: <code>PATH=/scratch/fccstudio/jdk1.8.0_261/bin:\$PATH</code></p> <p>Ensure no SYMBOLIC links to Java installation are set in the PATH variable.</p>
PGX Server	<p>The following packages must be installed or present in the server where the PGX service is installed:</p> <pre>krb5-libs krb5-workstation procps-ng nc</pre> <p>Execute the following command to install the packages as mentioned above:</p> <pre>yum install -y krb5-libs krb5-workstation procps-ng nc</pre> <p>NOTE:</p> <ul style="list-style-type: none"> • This is the prerequisite for legacy ETL which is deprecated in this release and will be removed in the next release. For Spark interpreter, this prerequisite may be required. • If you are using a Graph pipeline, skip this configuration/kerberos packages. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.
Oracle Database Settings	<p>Oracle Processing Server</p> <p>ORACLE_HOME must be set in the <code>.profile</code> file pointing to the appropriate Oracle DB Client installation.</p> <p>PATH in the <code>.profile</code> file must be set to include the appropriate <code>\$ORACLE_HOME/bin</code> directory.</p>
Download Directory	<p>Indicates the directory where the product installer zip file is downloaded or copied. The user permission must be set to 755 for this directory.</p>
Installation Directory	<p>Indicates the directory where the product installer zip file is extracted, and the installation files are placed. The user permission must be set to 755 for this directory.</p> <p>NOTE:</p> <p>The Installation and the Download Directory can be the same if the product installer zip file is not copied separately to another directory.</p>
OS Locale	<p>Linux: <code>en_US.utf8</code></p> <p>Execute the following command to check the locale:</p> <pre>locale -a grep -i 'en_US.utf'</pre> <p>The locale is displayed.</p>

Table 8: Prerequisite Environmental Settings

Category	Expected Value
Oracle Instant client	Install oracle instant client in the server where compliance Studio is installed and provide the configuration <code>LD_LIBRARY_PATH</code> in <code>config.sh</code>

3.3.4 Download the Big Data Files

Download the following configuration files from the Big Data server or contact the Big Data Administrator:

NOTE

- This section is deprecated in the current release and will be removed in the future release.
- These files must be kept ready and provided in the following file structure used during Compliance Studio installation.
- If you are using a Graph pipeline, skip this section. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.

Table 9 lists the required file structure:

Table 9: Required File Structure

File Category	File Names
Hadoop Cluster	<ul style="list-style-type: none"> • <code>core-site.xml</code> • <code>hive-env.sh</code> • <code>hive-site.xml</code> • <code>hadoop-env.sh</code> • <code>hdfs-site.xml</code> • <code>mapred-site.xml</code> • <code>yarn-site.xml</code> • <code>redaction-rules.json</code> • <code>log4j.properties</code> • <code>ssl-client.xml</code> • <code>topology.map</code> • <code>topology.py</code>
Kerberos Files	<ul style="list-style-type: none"> • <code>krb5.conf</code> • keytab file name as mentioned in the <code>config.sh</code> file.

Table 9: Required File Structure

Additional Jars	<ul style="list-style-type: none"> • <code>hive-exec-*.jar</code>. • <code>HiveJDBC4.jar</code>. • <code>hive-metastore-*.jar</code>. • <code>hive-service-*.jar</code>. <p>NOTE:</p> <ul style="list-style-type: none"> • The version of the jars is client or user-specific. These jars can be obtained from the existing jars of the Cloudera installation. • The <code>HiveJDBC4.jar</code> file is not available in the Cloudera installation setup. You must download the same from the Cloudera website. This is applicable only for Cloudera Cluster. • For additional jars, see the Appendix C – Additional Jars – PGX and Appendix D – Additional Jars – Batch Service.
OS-Hadoop Jars	<p><code>opensearch-spark-20_2.11-2.3.0.jar</code></p> <p>To download the <code>opensearch-spark-20_2.11-2.3.0.jar</code> file, follow these steps:</p> <ol style="list-style-type: none"> 1. Download the ZIP file from OpenSearch 2.3.0 2. Extract the downloaded file. 3. Navigate to the <code>dist</code> directory and download the <code>opensearch-spark-20_2.11-2.3.0.jar</code> <p>NOTE: The version should be the same as the OpenSearch version.</p>

3.3.5 Validation Checklist

The Validation Checklist section provides you with the parameters that you can validate to avoid installation issues. This section explains the validation and actions that can be taken for some of the common parameters that are used in the `config.sh` file for the installation. The parameters that can be validated are as follows:

NOTE If you are using a Graph pipeline, skip Cloudera parameters. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.

Table 10 lists the required file structure:

Table 10: Required File Structure

Parameters	Validation
External Service (OFSAA_SERVICE URL)	The OFSAA_Service URL can be validated by clicking the URL for verification.
DB Details for Studio Schema	You can log in to SQL developer and verify the DB Details for Studio Schema.
Compliance Studio Schema Wallet Details	You can verify the Wallet details by reviewing the steps in Verify the Connectivity of the Wallet .

Table 10: Required File Structure

Atomic Wallet Detail	You can verify the Wallet details by reviewing the steps in Setup Password Stores with Oracle Wallet .
Cloudera	You can verify the Cloudera details and validate them by reviewing the steps in Create the Credential Keystore . NOTE: This is the parameter for legacy ETL which is deprecated in this release and will be removed in the next release. For Spark interpreter, this parameter may be required.
Cloudera (SSH Connection)	Run the command <code>ssh <hostname of the Cloudera machine></code> . You must run this command from the host where the Studio is installed. NOTE: This is the parameter for legacy ETL which is deprecated in this release and will be removed in the next release. For Spark interpreter, this parameter may be required.
Cloudera (Keytab)	Run the command <code>kinit -V <KERBEROS_PRINCIPAL> -k -t <KEYTAB_FILEPATH></code> to verify the keytab. NOTE: This is the parameter for legacy ETL which is deprecated in this release and will be removed in the next release. For Spark interpreter, this parameter may be required.

3.3.6 Configure the OpenSearch Component

To configure the OpenSearch component, follow these steps:

NOTE

- Ensure that a minimum of 4GB free RAM space is available for OpenSearch. If RAM is low, the shards of the OpenSearch fail, and the correct result is not fetched.
- You must manually clean the cache if facing a performance issue.
- **Prerequisites**
 - Download the analysis-icu and analysis-phonetic plugins. You can download the plugins from the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/opensearch` directory.
 - Java version should be 11 and above.

1. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/opensearch` directory.
2. Untar the OpenSearch by executing the below command:

```
tar -xvzf opensearch-${<version>}.tar.gz
```

3. Install the following plugins:

```
<OPEN_SEARCH_EXTRACTED_PATH>/opensearch/opensearch-<version>/bin/  
opensearch-plugin install file:///<PATH>/analysis-icu-<version>.zip  
  
<OPEN_SEARCH_EXTRACTED_PATH>/opensearch/opensearch-<version>/bin/  
opensearch-plugin install file:///<PATH>/analysis-phonetic-  
<version>.zip
```

Where PATH specifies location of the plugins.

NOTE

- You can also install OpenSearch and the plugins on a different machine other than where the Compliance Studio is installed.
- The OpenSearch can be extracted in any directory outside the Compliance Studio path as well.

4. Navigate to the <OPEN_SEARCH_EXTRACTED_PATH>/opensearch/opensearch-<version>/config directory.

5. Configure the opensearch.yml with the following variables:

Table 11 lists the parameters of opensearch.yml file:

Table 11: opensearch.yml File

Interaction Variable Name	Significance
cluster.name	Indicates the name of the cluster.
node.name	Indicates the name given for the node.
path.data	Indicates the directory where you want to store the data.
path.logs	Indicates the directory where you want to store the logs.
network.host	Indicates the hostname of the machine where you want to install the OpenSearch service.
http.port	Indicates the port number where the OpenSearch service is installed.
discovery.seed_hosts	(Optional) Indicates the hostnames of the nodes of the cluster.
cluster.initial_cluster_manager_nodes	(Optional) Indicates the number given to the nodes of the cluster.

6. Configure the jvm.options file as follows:

Table 12 lists Interaction variable names for Configure jvm.options File.

Table 12: Configure jvm.options File

Interaction Variable Name	Significance
-Xms4g	<ul style="list-style-type: none"> Set the value for these parameters. The maximum value set can be up to 50% of the RAM size of the machine. Recommended value: Less than 32GB. <p>NOTE:</p> <ul style="list-style-type: none"> -Xms4g represents 4GB. The value for -Xms and -Xmx should be same.
-Xmx4g	

7. After configuration changes, navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/opensearch/opensearch-<version>/bin` directory.

8. To start OpenSearch, execute the following command:

```
nohup ./opensearch &
```

9. To check the OpenSearch logs, execute the following command:

```
tail -f nohup.out
```

3.3.6.1 Enable SSL Configuration and Authentication

To enable SSL and Authentication for OpenSearch, configuration is required at both OpenSearch and Compliance Studio.

3.3.6.1.1 OpenSearch Configuration

To configure OpenSearch, follow these steps:

1. **Download** the opensearch-security plugin zip file.

For information about how to configure OpenSearch, see the [OpenSearch](#) documentation.

3.3.6.1.2 Compliance Studio Configuration

To configure Compliance Studio, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory.

2. Change the following property in the `config.sh` file:

```
OPEN_SEARCH_USERNAME=admin
```

3. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/ficdb /bin` directory and encrypt the password (`./FCCM_Studio_Base64Encoder.sh --admin`) using `FCCMBASEENCODER64`.

4. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/opensearch/opensearch-<version>/config` directory.

5. To generate `admin.p12` file, execute the following command:

```
openssl pkcs12 -export -out admin.p12 -inkey <path to/admin-key.pem> -in <path to/admin.pem>
```

- To generate `ca.crt` file, execute the following command:

```
openssl x509 -outform der -in <path to/admin.pem> -out ca.crt
```
- Copy the `admin.p12` file and place in the following directories:

```
<COMPLIANCE_STUDIO_INSTALLATION_PATH>/load-to-open-search/conf  
<COMPLIANCE_STUDIO_INSTALLATION_PATH>/matching-service/conf
```
- Copy the `ca.crt` file and place in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/logstash/config` directory.
- Configure the following parameters under **OpenSearch Cluster details** in the `config.sh` file:

```
OPEN_SEARCH_ENCRYPTED_PASSWORD='##ENCRYPTED_PASSWORD##'  
OPEN_SEARCH_HTTPS_ENABLED=true  
OPEN_SEARCH_TRUSTSTORE_FILE_NAME=admin.p12  
OPEN_SEARCH_TRUSTSTORE_PASSWORD=password
```

NOTE To generate an encrypted password, see the [Appendix F - Generate an Encrypted Password for OpenSearch](#) section.

- Install the Compliance Studio.

3.3.6.2 Cleanup for OpenSearch Indexes

To clean up the OpenSearch indexes, run the following command:

```
curl -XDELETE http://<FULLY QUALIFIED HOSTNAME OF STUDIO SERVER>:<PORT  
of Load To Open Search Service>/load-to-open-search/idx/deleteIndex/  
<INDEX NAME>
```

For example,

```
curl -XDELETE http://testserver.in.oracle.com:7053/load-to-open-search/  
idx/deleteIndex/test_index
```

NOTE This command will work only if Compliance Studio is installed and all services are running.

3.3.7 Configure Logstash

- Create a folder "logstash" inside the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>`.
- Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/Logstash`.
- Download Logstash tar file from the [link](#).
- Untar contents of the tar file.
- Provide this folder path for the parameter "Logstash_Home" in `config.sh` file. The Compliance Studio installer will automatically configure the Logstash properties where necessary.

NOTE The `ca.crt` file should be copied from the open search server into the `Logstash_Home/config` path when https is enabled in OpenSearch.

3.3.8 Configure the Interpreter Settings

Before installing Compliance Studio, you must configure the interpreter settings for the following interpreters.

NOTE Ensure to configure the settings only for the interpreters that you require.

Table 13 lists the Pre-installation Interpreter Settings:

Table 13: Pre-installation Interpreter Settings

Interpreter	Prerequisite Settings
jdbc	For the required configuration, see jdbc Interpreter section in the OFS Compliance Studio Administration and Configuration Guide .
md	No additional configuration is required.
pgql	No additional configuration is required.
pgx-algorithm	No additional configuration is required.
pgx-java	No additional configuration is required.
pgx-python	No additional configuration is required. You can point to any other python virtual environment.
pyspark	For the required configuration, see Configure the PySpark Interpreter .
spark	For the required configuration, see Configure the Spark Interpreter .
fcc-python	No additional configuration is required. NOTE: From 8126, virtual environments will no longer be shipped with Compliance Studio and instead conda environment functionality will be used. These python interpreters (fcc-python, fcc-python-ml4aml, and fcc-python-sane) will be deprecated and removed in the future release but will remain in case of upgrades.

3.3.8.1 Configure the Spark Interpreter

3.3.8.1.1 Prerequisites for using the Spark Interpreter

To configure Spark Interpreter, you must download the desired spark distribution from [Spark's official website](#).

For example, spark-2.4.0-bin-hadoop2.7.tgz from the [website](#).

[Configure the Spark Interpreter](#) can be used in several situations as follows:

- Connecting to remote spark cluster
 - With/without Kerberos
 - Custom Hadoop client configuration
 - Custom libraries
- Spark in local mode.

In case you want to connect to a remote spark cluster, then obtain the following files:

- Hadoop or Hive client configuration as per your use case
- Kerberos files (if applicable)
 - `krb5.conf`
 - `keytab` file

3.3.8.1.2 Setting up spark-interpreter

The spark interpreter requires spark distribution to start. If you do not intend to use a spark-interpreter, disable the interpreter by performing the following steps:

NOTE If you do not intend to use a spark interpreter, disable the interpreter. You can perform the following steps.

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory.
2. Open the `config.sh` file and set `export SPARK_ENABLED=false`.

The default configuration of Spark is configured for yarn-client deployment mode with Kerberos enabled remote spark cluster. For local mode, skip this section and follow below.

3.3.8.1.3 Spark Interpreter with remote spark cluster

The Spark Interpreter with remote spark cluster can be performed for the following:

- Configuration with Kerberos enabled remote spark cluster:
 - **`krb5.conf`**
 - **`*.keytab`** (For example, `fccstudio.keytab`)
- Configuration with Kerberos disabled remote spark cluster

3.3.8.1.3.1 Configuration with Kerberos enabled remote spark cluster

1. Move the obtained Kerberos files to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/batchservice/user/conf` directory.

NOTE

- These are the same Kerberos files used for ETL.
- If `extralibs` directory does not exist in this path `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmgstudio/interpreter-server/spark-interpreter-<version>/extralibs`, then create it.

2. Place the `spark-<version>-bin-hadoop<version>` files to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/interpreter-server/spark-interpreter-<version>/extralibs` directory.
For example, `spark-2.4.0-bin-hadoop2.7`
3. Create a folder and name as “**conf**” in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/interpreter-server/spark-interpreter-<version>/extralibs` directory.

- Place the Hadoop or Hive client configuration files to
`<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/interpreter-server/spark-interpreter-<version>/extralibs/conf` directory.

NOTE Do not remove the `spark-env.sh` file.

- Create `spark-default.conf` and update the spark configurations accordingly. See the [Sample spark-default.conf Configuration File](#) section for more information.
- Update `spark.yarn.dist.files` and `spark.executorEnv.PYTHONPATH`.

NOTE The path must be the same as the path given for the downloaded spark distribution. For example: path for `spark-2.4.0-bin-hadoop2.7` spark distribution.

- Update the `spark.driver.host`.
- Update the `spark.yarn.keytab`.
- Update the `spark.yarn.principal`.
- If required, you can add an additional spark configuration.

3.3.8.1.3.2 Configuration with Kerberos disabled remote spark cluster:

- Place the Hadoop or Hive client configuration files to
`<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/interpreter-server/spark-interpreter-<version>/extralibs/conf` directory.

NOTE Do not remove the `spark-env.sh` file.

- Create `spark-default.conf` and update the spark configurations accordingly. See the [Sample spark-default.conf Configuration File](#) section for more information.
- Update `spark.yarn.dist.files` and `spark.executorEnv.PYTHONPATH`.

NOTE The path must be the same as the path given for the downloaded spark distribution. For example: path for `spark-2.4.0-bin-hadoop2.7` spark distribution.

- Update the `spark.driver.host`.
- Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/interpreter-server/spark-interpreter-<version>/extralibs/conf` directory.
- Open `spark-default.conf` file and update `spark.driver.defaultJavaOptions` by removing:

```

"-Dsun.security.krb5.debug=false -
Djavax.security.auth.useSubjectCredsOnly=false -
Djava.security.krb5.conf=<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/
batchservice/user/conf/krb5.conf"

```

3.3.8.1.4 Spark Interpreter in local mode

1. Navigate to <COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/interpreter-server/spark-interpreter-<version> /extralibs/conf directory.
2. Create spark-default.conf and update the spark configurations accordingly. See the [Sample spark-default.conf Configuration File](#) section for more information.
3. Open spark-default.conf file and update spark.driver.defaultJavaOptions by removing:


```

-Dsun.security.krb5.debug=false -
Djavax.security.auth.useSubjectCredsOnly=false -
Djava.security.krb5.conf=<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/
batchservice/user/conf/krb5.conf"

```
4. Set spark.master as local[*] in interpreter configuration file.

3.3.8.1.4.1 Starting spark interpreter in local mode

To start spark interpreter in the local mode, follow these steps:

1. Navigate to <COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/bin directory.
2. Open startup.sh file and add following line before the line containing “counter=1”;


```

nohup "$DIR"/../interpreter-server/spark-interpreter-<version>/bin/
spark-interpreter &>> <path_to_save_the_logs>/<log_file_name>.log &

```

Figure 1: Snapshot of startup.sh file

```

#export PLAINR_INTERPRETER_OPTS="$PLAINR_INTERPRETER_OPTS -DAPP_BASE_NAME='plainr-i
#nohup "$DIR"/../interpreter-server/plainr-interpret
# To start Spark interpreter
nohup "$DIR"/../interpreter-server/spark-interpreter-23.4.0/bin/spark-interpreter &
counter=1;
while [[ $counter -lt 20 ]]
do
  dsHealth=`curl -s --insecure https://ofss-mum-1779.snbomprshared1.gbucdsint02bc

```

3. Save and close the file.
 4. Open shutdown.sh file and add following line before the line containing “SL=”.
- ```

I7014=`ps -eaf | grep java | grep RemoteInterpreterServer | grep 7014 |
awk '{print $2}'`
if [["" != "$I7014"]];
then kill -9 $I7014;
fi

```



**Figure 2: Snapshot of shutdown.sh file**

```
To shutdown Spark interpreter
I7014=`ps -eaf | grep java | grep RemoteInterpreterServer | grep 7014 | awk '{print $2}'`
if ["" != "$I7014"];
then kill -9 $I7014;
fi

SL=`ps -eaf | grep java | grep oracle.datastudio.starter.App | awk '{print $2}'`
if ["" != "$SL"];
then kill -9 $SL;
fi
```

**NOTE** In the above step, the port number for the spark interpreter is assumed to be 7014, the default port that comes with the installer. If a different port is used, then change the configuration accordingly.

5. Save and close the file.
6. Navigate to <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/bin directory.
7. Restart Compliance Studio using the following command:  

```
./compliance-studio.sh -restart
```
8. Verify if the spark-interpreter has started using the following command:  

```
netstat -nltp | grep 7014
```

### 3.3.8.1.5 Configuration

The Spark interpreter configuration can be divided into the following categories:

- Configuration related to deployment  
These properties can be set either in the Spark libraries, for example, the `spark-defaults.conf` file, or through the system environment variable, **SPARK\_CONF**.  
For example, `SPARK_CONF="--conf spark.driver.memory=2g"`.

**NOTE** These properties cannot be changed when the Spark interpreter is running.

- Configuration related to Spark runtime control.  
These properties can be set from the Interpreters page of the Compliance Studio application UI. This includes properties such as a `spark.executor.memory`.

**NOTE** The properties related to the driver cannot be set during runtime and are considered deployment configurations. The properties related to the executors can be set during runtime. Hence, the latter option of runtime control configuration is preferred.

A list of possible properties is available in the [Spark Official Documentation](#). All the properties prefixed with the term "zeppelin" listed in the [Zeppelin Spark Configuration Document](#) can also be set from the Interpreters page of the Compliance Studio application UI.

### 3.3.8.2 Configure the PySpark Interpreter

Compliance Studio uses PySpark 2.4.0. Before you begin the configurations, check the prerequisites depending on your operation mode.

### 3.3.8.2.1 Prerequisites

The PySpark interpreter has the same prerequisites as that as the Spark Interpreter. For more information, see [Configure the Spark Interpreter](#). Also, all Spark components must be configured to use the same Python version.

### 3.3.8.2.2 Configuration

The PySpark interpreter can be configured through the Spark interpreter, with the only exception being the Python version used. By default, the Python version is set to 3 that can be changed either in the interpreter JSON files before the startup or from the **Interpreters** page of the Compliance Studio application UI during runtime by changing the following properties:

To change the value of the `spark.pyspark.python` property before installing the Compliance Studio, follow these steps:

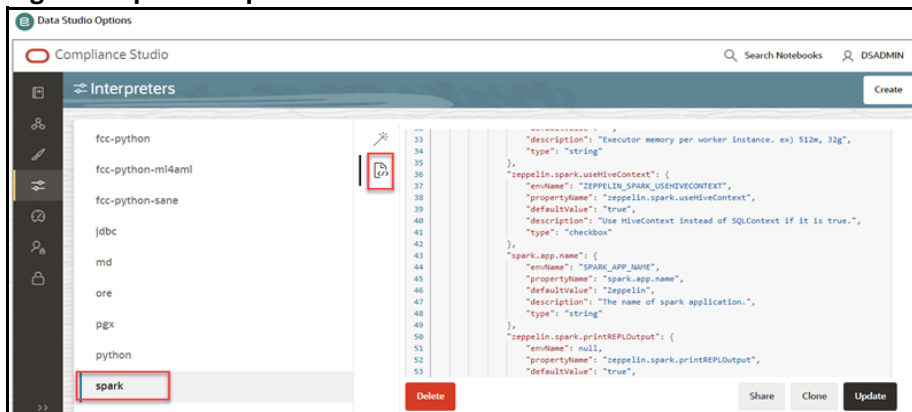
1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/server/builtin/interpreters/spark.json` directory.
2. Update the value in `spark.pyspark.python` property of the `spark.json` file.

To change the value of the `spark.pyspark.python` property after installing the Compliance Studio, follow these steps:

1. Login to the Compliance Studio application.
2. Launch the **CS Production** Workspace.
3. Click on the **User Profile** drop-down list and select **Data Studio Options**.
4. Click **Interpreters**.

By default, the Interpreters page lists all the available interpreters on the LHS.

**Figure 3: Spark Interpreter**



5. Click **spark** interpreter on the LHS and then click **Plain Configuration** on the RHS.
6. Update the value in the `spark.pyspark.python` property and click **Update**.

In the **Spark Interpreter Settings** page of the Compliance Studio application UI (or `spark.json` file), change the value of the `spark.pyspark.python` property to the Python executable path that is to be used by the Spark executors.

In the **PySpark Interpreter Settings** page of the Compliance Studio application UI (or `pyspark.json` file), change the value of the `zeppelin.pyspark.python` property to the Python executable path that is to be used by the Spark driver.

### 3.3.8.2.3 Use the Python Virtual Environments with PySpark

To ensure that the two Python versions match, in case your components run on different machines, you must use the Python virtual environments with PySpark.

#### 3.3.8.2.3.1 Create a Virtual Environment with Conda

**NOTE** You can also use **virtualenv** to create your virtual environment instead of **conda**.

To create a virtual environment with Conda, follow these steps:

1. Ensure that you have conda and conda-Pack installed.

**NOTE** To check if conda is installed, then execute the following command:  
`"conda --version"`

2. Create your virtual environment using the following command:

```
conda create -y -n <environment-name> python=<python-version>
<additional-packages>
```

**NOTE** The <environment-name> can be chosen freely and subsequently has to be substituted in further commands.

3. Activate your virtual environment using the following command:

```
conda activate <environment-name>
```

4. Execute the following to obtain the path to your virtual environment:

```
which python
```

The obtained result is referred to as <environment-abs-path>.

5. Compress your virtual environment using the following command:

```
conda pack -n <environment-name> -o <environment-abs-path>/<environment-
name>.tar.gz
```

#### 3.3.8.2.3.2 Update the Interpreter Properties

The interpreter properties can either be configured in the interpreter JSON files or from the Interpreters page of the Compliance Studio application UI after starting the Compliance Studio application.

- In the **Spark Interpreter Settings** page of the Compliance Studio application UI (or `spark.json`), change the following:
  - Change the value of the `spark.yarn.dist.archives` property to `<environment-abs-path>/<environment-name>.tar.gz#<environment-name>`
  - Change the value of the `spark.pyspark.python` property to `./<environment-name>/bin/python`

- In the **PySpark Interpreter Settings** page of the Compliance Studio application UI (or `pyspark.json`), change the value of the `zeppelin.pyspark.python` parameter to `<environment-abs-path>/bin/python`.

### 3.3.9 Create the Hive Schema

**NOTE**

- **This section is deprecated in the current release and will be removed in the future release.**
- If you are using a Graph pipeline, skip this section. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.

To create a hive schema, perform the following steps:

1. Login to the server where **cloudera/hive** is installed.
2. Open a hive session in the command prompt.

```
hive
```

3. Create a new hive schema using the following script:

```
create database <hive schema name>;
```

4. Use the hive schema that is created by the following command:

```
Use <hive schema name>
```

A new hive schema is created.

### 3.3.10 Create the Tablespace

To create a tablespace in the Oracle Database use the scripts as described in the [Table 14](#).

**Table 14: Create Tablespace**

| User                | Script                                                                                                                                                                                         |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AIF_USER_TEMP_TS    | <pre>CREATE TABLESPACE AIF_USER_TEMP_TS   DATAFILE '&lt;Datafile Path&gt;'   SIZE &lt;size in byte&gt;   REUSE   AUTOEXTEND ON NEXT &lt;size in megabyte&gt; MAXSIZE UNLIMITED;</pre>          |
| AIF_USER_TS         | <pre>CREATE TABLESPACE AIF_USER_TS   DATAFILE '&lt;Datafile Path&gt;'   SIZE &lt;size in byte&gt;   REUSE   AUTOEXTEND ON NEXT &lt;size in megabyte&gt; MAXSIZE UNLIMITED;</pre>               |
| <STUDIO TABLESPACE> | <pre>CREATE TABLESPACE &lt;STUDIO TABLESPACE&gt;   DATAFILE '&lt;Datafile Path&gt;'   SIZE &lt;size in byte&gt;   REUSE   AUTOEXTEND ON NEXT &lt;size in megabyte&gt; MAXSIZE UNLIMITED;</pre> |

**Table 14: Create Tablespace**

| User              | Script                                                                                                                                                                                       |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <GRAPH_SCHEMA_TS> | <pre>CREATE TABLESPACE &lt;GRAPH_SCHEMA_TS&gt;   DATAFILE '&lt;Datafile Path&gt;'   SIZE &lt;size in byte&gt;   REUSE   AUTOEXTEND ON NEXT &lt;size in megabyte&gt; MAXSIZE UNLIMITED;</pre> |

**NOTE** The tablespace size should be defined based on the size of the data.

### 3.3.11 Create the Studio Schema

To create a studio schema, create a new Oracle Database schema user using the following script:

```
CREATE USER <STUDIO SCHEMA USER> IDENTIFIED BY <PASSWORD> DEFAULT
TABLESPACE <STUDIO TABLESPACE>;
ALTER USER <STUDIO SCHEMA USER> QUOTA 2000M ON <STUDIO TABLESPACE>;
ALTER USER <STUDIO SCHEMA USER> QUOTA <SIZE IN MEGABYTE> ON AIF_USER_TS;
```

For example;

```
ALTER USER CS812_USER QUOTA 500M ON AIF_USER_TS;
```

**NOTE** The tablespace and quota sizes should be defined based on the size of the data.

A new Oracle Database schema (Studio schema) is created.

### 3.3.12 Assign Grants for Studio Schema

Grant the following permissions to the newly created Oracle Database studio schema:

- GRANT CREATE SESSION TO <STUDIO SCHEMA USER>;
- GRANT CREATE TABLE TO <STUDIO SCHEMA USER>;
- GRANT CREATE VIEW TO <STUDIO SCHEMA USER>;
- GRANT CREATE ANY TRIGGER TO <STUDIO SCHEMA USER>;
- GRANT CREATE ANY PROCEDURE TO <STUDIO SCHEMA USER>;
- GRANT CREATE SEQUENCE TO <STUDIO SCHEMA USER>;
- GRANT EXECUTE ON DBMS\_RLS TO <STUDIO SCHEMA USER>;
- GRANT EXECUTE ON SYS.DBMS\_SESSION TO <STUDIO SCHEMA USER>;
- GRANT CREATE SYNONYM TO <STUDIO SCHEMA USER>;
- GRANT EXECUTE ON DBMS\_REDEFINITION TO <STUDIO SCHEMA USER>;
- GRANT REDEFINE ANY TABLE TO <STUDIO SCHEMA USER>;
- GRANT CREATE MATERIALIZED VIEW TO <STUDIO SCHEMA USER>;
- GRANT SELECT ON SYS.V\_\$PARAMETER TO <STUDIO SCHEMA USER>;

- GRANT SELECT ON SYS.DBA\_FREE\_SPACE TO <STUDIO SCHEMA USER>;
- GRANT SELECT ON SYS.DBA\_TABLES TO <STUDIO SCHEMA USER>;
- GRANT SELECT ON SYS.DBA\_TAB\_COLUMNS TO <STUDIO SCHEMA USER>;
- GRANT CREATE RULE TO <STUDIO SCHEMA USER>;
- GRANT DROP ANY TRIGGER TO <STUDIO SCHEMA USER>;
- GRANT SELECT ON SYS.DBA\_RECYCLEBIN TO <STUDIO SCHEMA USER>;
- GRANT CREATE JOB TO <STUDIO SCHEMA USER>;
- GRANT EXECUTE ON DBMS\_LOCK TO <STUDIO SCHEMA USER>;
- GRANT EXECUTE ON DBMS\_STATS TO <STUDIO SCHEMA USER>;
- GRANT ANALYZE ANY TO <STUDIO SCHEMA USER>;
- GRANT CREATE TYPE TO <STUDIO SCHEMA USER>;
- GRANT EXECUTE ON CTXSYS.CTX\_DDL TO <STUDIO SCHEMA USER>;

**NOTE**

The following grants should be revoked after the successful installation of Compliance Studio:

- REVOKE SELECT ON SYS.DBA\_RECYCLEBIN FROM <STUDIO SCHEMA USER>;
- REVOKE SELECT ON SYS.DBA\_FREE\_SPACE FROM <STUDIO SCHEMA USER>;

### 3.3.13 Assign Grants for ER Schema

Grant the following permissions to the newly created Oracle Database ER schema:

- GRANT CREATE SESSION TO <ER SCHEMA USER>;
- GRANT CREATE TABLE TO <ER SCHEMA USER>;
- GRANT CREATE VIEW TO <ER SCHEMA USER>;
- GRANT CREATE ANY TRIGGER TO <ER SCHEMA USER>;
- GRANT CREATE ANY PROCEDURE TO <ER SCHEMA USER>;
- GRANT CREATE SEQUENCE TO <ER SCHEMA USER>;
- GRANT EXECUTE ON DBMS\_RLS TO <ER SCHEMA USER>;
- GRANT EXECUTE ON SYS.DBMS\_SESSION TO <ER SCHEMA USER>;
- GRANT CREATE SYNONYM TO <ER SCHEMA USER>;
- GRANT EXECUTE ON DBMS\_REDEFINITION TO <ER SCHEMA USER>;
- GRANT REDEFINE ANY TABLE TO <ER SCHEMA USER>;
- GRANT CREATE MATERIALIZED VIEW TO <ER SCHEMA USER>;
- GRANT SELECT ON SYS.V\_\$PARAMETER TO <ER SCHEMA USER>;
- GRANT SELECT ON SYS.DBA\_FREE\_SPACE TO <ER SCHEMA USER>;
- GRANT SELECT ON SYS.DBA\_TABLES TO <ER SCHEMA USER>;

- GRANT SELECT ON SYS.DBA\_TAB\_COLUMNS TO <ER SCHEMA USER>;
- GRANT CREATE RULE TO <ER SCHEMA USER>;
- GRANT DROP ANY TRIGGER TO <ER SCHEMA USER>;
- GRANT SELECT ON SYS.DBA\_RECYCLEBIN TO <ER SCHEMA USER>;
- GRANT CREATE JOB TO <ER SCHEMA USER>;
- GRANT EXECUTE ON DBMS\_LOCK TO <ER SCHEMA USER>;
- GRANT EXECUTE ON DBMS\_STATS TO <ER SCHEMA USER>;
- GRANT ANALYZE ANY TO <ER SCHEMA USER>;
- GRANT CREATE TYPE TO <ER SCHEMA USER>;
- GRANT EXECUTE ON CTXSYS.CTX\_DDL TO <ER SCHEMA USER>;

**NOTE** The following grants are applicable when MATCHING\_MECHANISM is set to OT in the `config.sh` file.

- GRANT EXECUTE ON CTXSYS.CTX\_THES TO <ER SCHEMA USER>;
- GRANT MANAGE SCHEDULER TO <ER SCHEMA USER>;
- GRANT EXECUTE ON DBMS\_MVIEW TO <ER SCHEMA USER>;

**NOTE** The following grants should be revoked after the successful installation of Compliance Studio:

- REVOKE SELECT ON SYS.DBA\_RECYCLEBIN FROM <ER SCHEMA USER>;
- REVOKE SELECT ON SYS.DBA\_FREE\_SPACE FROM <ER SCHEMA USER>;

### 3.3.14 Create the Sandbox Schema

**NOTE** This section is applicable for ML4AML features except ASC.

To create a sandbox schema, create a new Oracle Database sandbox schema user using the following script:

```
create user <SANDBOX SCHEMA USER>
IDENTIFIED BY <PASSWORD>
default tablespace AIF_USER_TS
temporary tablespace TEMP
profile DEFAULT
quota unlimited on AIF_USER_TS
```

```
quota unlimited on AIF_USER_TEMP_TS
```

**NOTE**

- The sandbox will always be on a different database other than the production schema.
- After creating a user for the sandbox schema, you must create a sandbox workspace. To create a sandbox workspace, see **Creating a Sandbox Workspace** section in the [OFS Compliance Studio Administration and Configuration Guide](#).
- The tablespace and quota sizes should be defined based on the size of the data.

A new Oracle Database schema (Sandbox schema) is created.

### 3.3.15 Assign Grants for the Sandbox Schema

Grant the following permissions to the newly created Oracle Database sandbox schema:

```
GRANT CONNECT TO <SANDBOX SCHEMA USER>;
GRANT CREATE SESSION TO <SANDBOX SCHEMA USER>;
GRANT CREATE PROCEDURE TO <SANDBOX SCHEMA USER>;
GRANT CREATE SEQUENCE TO <SANDBOX SCHEMA USER>;
GRANT CREATE TABLE TO <SANDBOX SCHEMA USER>;
GRANT CREATE TRIGGER TO <SANDBOX SCHEMA USER>;
GRANT CREATE VIEW TO <SANDBOX SCHEMA USER>;
GRANT CREATE MATERIALIZED VIEW TO <SANDBOX SCHEMA USER>;
GRANT CREATE SYNONYM TO <SANDBOX SCHEMA USER>;
GRANT CREATE RULE TO <SANDBOX SCHEMA USER>;
GRANT CREATE ANY TRIGGER TO <SANDBOX SCHEMA USER>;
GRANT DROP ANY TRIGGER TO <SANDBOX SCHEMA USER>;
GRANT CREATE ANY TYPE TO <SANDBOX SCHEMA USER>;
```

### 3.3.16 Graph Schema

#### 3.3.16.1 Create Graph Schema and Grant Permission

To create a Graph schema, create a new Oracle Database schema user using the following script:

```
CREATE USER <GRAPH SCHEMA USER> IDENTIFIED BY <PASSWORD> DEFAULT TABLESPACE
<GRAPH_SCHEMA_TS>;
ALTER USER <GRAPH SCHEMA USER> QUOTA 2000M ON <GRAPH_SCHEMA_TS>;
```



For example;

```
ALTER USER GRAPH_SCHEMA_USER QUOTA 500M ON GRAPH_SCHEMA_TS;
```

**NOTE** The tablespace and quota sizes should be defined based on the size of the data.

A new Oracle Database schema (Graph schema) will be created.

To assign grants, run the following:

- **Pre-installation Grants for both BD and ECM Graphs**

Change the <GRAPH\_SCHEMA> to the graph schema created in the [Create Graph Schema and Grant Permission](#) section.

```
GRANT ANALYZE ANY TO <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 EXECUTE ON DBMS_ISCHED TO <GRAPH_SCHEMA>;
GRANT EXECUTE ON DBMS_PARALLEL_EXECUTE TO <GRAPH_SCHEMA>;
GRANT EXECUTE ON DBMS_STATS TO <GRAPH_SCHEMA>;
```

**NOTE** The following grant is applicable when MATCHING\_MECHANISM is set to OT in the `config.sh` file.

```
GRANT EXECUTE ON CTXSYS.CTX_THES TO <GRAPH_SCHEMA>;
```

- **Pre-installation Grants for BD Graph**

Change the <BD\_ATOMIC\_SCHEMA> to the underlying schema of the data source of the BD graph pipeline.

**NOTE** The following grants are applicable for the Out-of-the-box graph pipeline only. If the user has to execute the custom graph, the same permissions have to be provided for the input tables referred in Custom Graph Pipeline.

```
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.ACCT TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.CUST_ACCT TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.ACCT_BAL_POSN_SMRY TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.CUST TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.BACK_OFFICE_TRXN TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.EMP TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.CUST_CUST TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.KDD_CAL TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.KDD_REVIEW TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.EMP_ACCT TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.ACCT_SMRY_MNTH TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.ACCT_ADDR TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.EXTERNAL_ENTITY TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.CUST_EMAIL_ADDR TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.CUST_PHON TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.CUST_ADDR TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.CASH_TRXN TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.LINK_STAGE TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.WIRE_TRXN TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.MI_TRXN TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.INSTN_MASTER TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.EXTERNAL_ENTITY_ADDR TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.DERIVED_ADDRESS TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.CLIENT_BANK TO <GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.EXTERNAL_ENTITY_LINK TO
<GRAPH_SCHEMA>;
GRANT ANALYZE ANY TO <GRAPH_SCHEMA>;
```

- **Pre-installation Grants for ECM Graph**

Change the <ECM\_ATOMIC\_SCHEMA> to the underlying schema of the data source of the ECM graph pipeline.

```
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_ACCT TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_CUST_ACCT TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_ACCT_BAL_POSN_SMRY TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_CUST TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_BACK_OFFICE_TRXN TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_EMP TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_CUST_CUST TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_EMP_ACCT TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_ACCT_SMRY_MNTH TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_ACCT_ADDR TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_EXTERNAL_ENTITY TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_CUST_EMAIL_ADDR TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_CUST_PHON TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_CUST_ADDR TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_CASH_TRXN TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_WIRE_TRXN TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_MI_TRXN TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_INSTN_MASTER TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_EXTERNAL_ENTITY_ADDR TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_DERIVED_ADDRESS TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_CLIENT_BANK TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_EXTERNAL_ENTITY_LINK TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.KDD_CASES TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.KDD_CASE_ACCOUNTS TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_SCENARIO_MASTER TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_EVENTS TO <GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_EVENT_DETAILS TO <GRAPH_SCHEMA>;
```

```
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_EVENT_ENTITY_MAP TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_PRECASE_CASE_MAP TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.KDD_CASE_CUSTOMERS TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.KDD_CASE_EXTERNAL_ENTITY TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.KDD_CASE_INSTN_MASTER TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_CORRELATION_EVENT_MAP TO
<GRAPH_SCHEMA>;
GRANT EXECUTE ON DBMS_SCHEDULER TO <ECM_ATOMIC_SCHEMA>;
GRANT EXECUTE ON DBMS_ISCHED TO <ECM_ATOMIC_SCHEMA>;
GRANT EXECUTE ON DBMS_PARALLEL_EXECUTE TO <ECM_ATOMIC_SCHEMA>;
GRANT CREATE JOB TO <ECM_ATOMIC_SCHEMA>;
```

- **Post-installation Grants for BD Graph**

**NOTE** The following grants should be added after completing the steps mentioned in the [Importing OOB Graph Definition and related Metadata](#) section.

```
GRANT EXECUTE ON <BD_ATOMIC_SCHEMA>.P_FCC_CS_BD_EXTERNAL_ENTITY TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.FCC_CS_BD_EXTERNAL_ENTITY TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <BD_ATOMIC_SCHEMA>.FCC_CS_BD_DERIVED_GROUP TO
<GRAPH_SCHEMA>;
```

- **Post-installation Grants for ECM Graph**

**NOTE** The following grants should be added after completing the steps mentioned in the [Importing OOB Graph Definition and related Metadata](#) section.

```
GRANT EXECUTE ON <ECM_ATOMIC_SCHEMA>.P_FCC_CS_CM_EXTERNAL_ENTITY TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_CS_CM_EXTERNAL_ENTITY TO
<GRAPH_SCHEMA>;
GRANT SELECT ON <ECM_ATOMIC_SCHEMA>.FCC_CS_CM_DERIVED_GROUP TO
<GRAPH_SCHEMA>;
GRANT DELETE ON <ECM_ATOMIC_SCHEMA>.FCC_GRAPH_M_TRXN_VIEWS TO
<GRAPH_SCHEMA>;
```

- **Post-installation Grants for both BD and ECM Graphs**

**NOTE** The following grants should be added after completing the steps mentioned in the [Importing OOB Graph Definition and related Metadata](#) section.

```
GRANT SELECT, INSERT, UPDATE, DELETE ON
<STUDIO_SCHEMA>.FCC_GRAPH_M_TRXN_VIEWS TO <GRAPH_SCHEMA>;

GRANT SELECT ON <STUDIO_SCHEMA>.FCC_M_TABLES TO <GRAPH_SCHEMA>;

GRANT SELECT ON <STUDIO_SCHEMA>.FCC_M_COLUMNS TO <GRAPH_SCHEMA>;

GRANT SELECT ON <STUDIO_SCHEMA>.FCC_M_ATTRIBUTE TO <GRAPH_SCHEMA>;

GRANT SELECT ON <STUDIO_SCHEMA>.FCC_M_ATTRIBUTE_COLUMN_MAP TO
<GRAPH_SCHEMA>;

GRANT SELECT ON <STUDIO_SCHEMA>.FCC_M_COLUMNS_DETAILS TO <GRAPH_SCHEMA>;

GRANT SELECT ON <STUDIO_SCHEMA>.FCC_M_MAP TO <GRAPH_SCHEMA>;

GRANT SELECT ON <STUDIO_SCHEMA>.MMG_GRAPH_SCHEMA TO <GRAPH_SCHEMA>;

GRANT EXECUTE ON SYS.DBMS_LOCK TO <GRAPH_SCHEMA>;

GRANT EXECUTE ON CTXSYS.CTX_DDL TO <GRAPH_SCHEMA>;

GRANT EXECUTE ON CTX_THES TO <GRAPH_SCHEMA>;
```

### 3.3.16.2 Create Wallet for Graph Schema

See **step 4** in the [Setup the Password Stores for Database User Accounts](#) section.

**NOTE**

- Graph schema must be in the same database where Compliance Studio Schema is exists.
- You can refer only one Graph schema in Compliance Studio.

## 3.3.17 Entity Resolution

### 3.3.17.1 Create Entity Resolution Schema and Grant Permission

**NOTE** ER schema is nothing but FSDF schema and creation of ER schema can be skipped if the FSDF schema is already available. The grants mentioned in this section are required.

To create ER schema, create a new Oracle Database schema user using the following script:

```
CREATE USER <ER_SCHEMA_USERNAME> IDENTIFIED BY <PASSWORD>;
```

A new Oracle Database schema (ER schema) will be created.

To assign grants, see the [Assign Grants for ER Schema](#) section.

### 3.3.17.2 Create a wallet for ER/FSDF schema

See **step 4** in the [Setup the Password Stores for Database User Accounts](#) section.

**NOTE**

- ER schema can be in the same database where CS is installed or a different database.
- You can create multiple ER schemas.

### 3.3.17.3 Uploading FSDF

To upload the data model, see the [Creating Pre-Staging Tables in FSDF](#) section in the [OFS Compliance Studio Administration and Configuration Guide](#).

### 3.3.17.4 Configure ER schema Profile

Set the SESSIONS\_PER\_USER limit to UNLIMITED for ER Schema by executing the below steps:

1. Get the ER schema profile by executing the below query:

```
select profile from dba_users where username = '<ER SCHEMA USERNAME>';
```

2. Change the profile which is obtained from the step 1 by executing the below query:

```
ALTER PROFILE <profile> LIMIT SESSIONS_PER_USER UNLIMITED;
```

## 3.4 Setup Password Stores with Oracle Wallet

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.

A password store for the application and application server user accounts must also be installed; however, the installer takes care of this entire process.

### 3.4.1 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. 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 [Oracle Database Security Guide](#).

**NOTE**

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

To create a wallet, follow these steps:

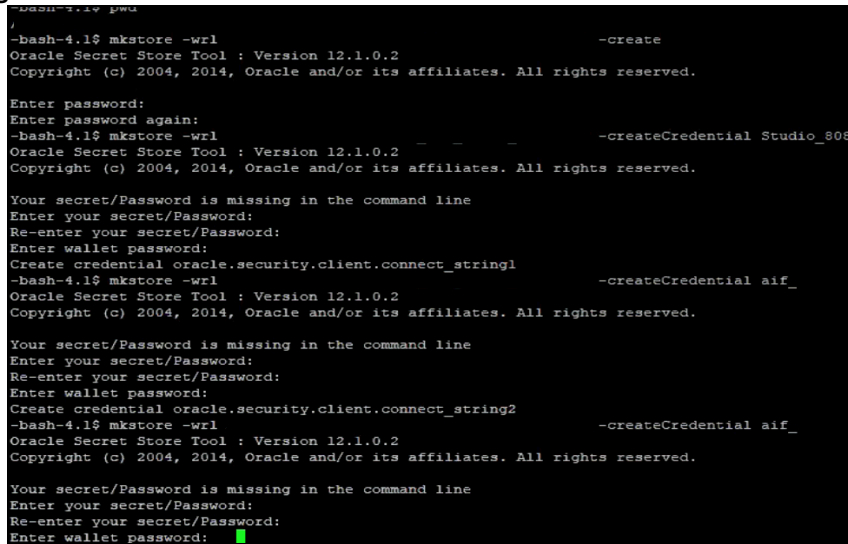
1. Log in to the server as a Linux user.
2. Create a wallet in the <wallet\_location> using the following command:

```
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.

**Figure 4: Wallet Creation**



```
bash-4.1$ pwd
/
-bash-4.1$ mkstore -wrl <wallet_location> -create
Oracle Secret Store Tool : Version 12.1.0.2
Copyright (c) 2004, 2014, Oracle and/or its affiliates. All rights reserved.

Enter password:
Enter password again:
-bash-4.1$ mkstore -wrl <wallet_location> -createCredential Studio_808
Oracle Secret Store Tool : Version 12.1.0.2
Copyright (c) 2004, 2014, 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:
Create credential oracle.security.client.connect_string1
-bash-4.1$ mkstore -wrl <wallet_location> -createCredential aif_
Oracle Secret Store Tool : Version 12.1.0.2
Copyright (c) 2004, 2014, 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:
Create credential oracle.security.client.connect_string2
-bash-4.1$ mkstore -wrl <wallet_location> -createCredential aif_
Oracle Secret Store Tool : Version 12.1.0.2
Copyright (c) 2004, 2014, 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 studio schema/ER Schema alias using the following command:

```
mkstore -wrl <wallet_location> -createCredential <alias-name> <database-user-name>
```

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.


5. Create the database connection credentials for the atomic schema alias using the following command:

```
mkstore -wrl <wallet_location> -createCredential <alias-name> <database-user-name>
```

**NOTE** Creating an atomic schema is not required when installing Compliance Studio without OFSAA.

In this manner, create a wallet and associated database connection credentials for all the database user accounts.

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](#).

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

**Figure 5: Location of the Created Wallet Folder**

| Name                  | Size | Changed             | Rights   | Owner      |
|-----------------------|------|---------------------|----------|------------|
| wallet_808_██████████ |      | 12-08-2020 14:52:49 | rwx----- | ██████████ |

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

- In the <wallet\_location> directory, configure the **tnsnames.ora** file to include the entry for each alias name to be set up.

**Figure 6: Snapshot of the tnsnames.ora file**

```
Studio_808_██████████ =
 (DESCRIPTION =
 (ADDRESS_LIST =
 (ADDRESS = (PROTOCOL = TCP) (HOST = ██████████) (PORT = 1521))
)
 (CONNECT_DATA =
 (SERVICE_NAME = ██████████)
)
)
)
)
)
)

aif_██████████ =
 (DESCRIPTION =
 (ADDRESS_LIST =
 (ADDRESS = (PROTOCOL = TCP) (HOST = ██████████) (PORT = 1521))
)
 (CONNECT_DATA =
 (SERVICE_NAME = ██████████)
)
)
)
)
)
)

aif_██████████ =
 (DESCRIPTION =
 (ADDRESS_LIST =
 (ADDRESS = (PROTOCOL = TCP) (HOST = ██████████) (PORT = 1521))
)
 (CONNECT_DATA =
 (SERVICE_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.

- 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
```

### 3.4.2 Verify the Connectivity of the Wallet

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

- 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
```

2. 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>"
```

### 3.4.3 Create the Credential Keystore

- NOTE**
- This section is deprecated in the current release and will be removed in the future release.
  - If you are using a Graph pipeline, skip this section. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.

Credential keystore must be created for the Behavior Detection (BD) or Enterprise Case Management (ECM) **Atomic schema** and **Compliance Studio Schema**. To create a credential keystore, follow these steps:

1. Login as HDFS Superuser.
2. Create a credential keystore on HDFS using the following command:

```
hadoop credential create mydb.password.alias -provider jceks://hdfs/
user/root/oracle.password.jceks
```

3. Verify the credential keystore file using the following command:

```
hadoop credential list -provider jceks://hdfs/user/root/
oracle.password.jceks
```

4. Grant Read permission to the keystore file using the following command:

```
hadoop fs -chmod 744 /user/root/oracle.password.jceks
```

**NOTE** Ensure the credential keystore file path and the alias are correctly mentioned in the `config.sh` file.

### 3.4.3.1 Copying and Adding Files

**NOTE**

- **This section is deprecated in the current release and will be removed in the future release.**
- If you are using a Graph pipeline, skip this section. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.

To copy the jar files, follow these steps:

1. Create the folder in the `GRAPH_FILES_PATH` parameter in a node of the big data cluster.
2. Create a folder called `jars` inside the folder that is created in the previous step.
3. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/ficdb/etlJars` directory and copy all the jars in this directory into the big data node inside the folder `jars`.
4. Perform this step if `https` is enabled for OpenSearch:
  - a. Create a new folder with the name as **conf** in the `GRAPH_FILES_PATH` parameter in a node of the big data cluster.
  - b. Place the **admin.p12** file in the **conf** folder.

**NOTE** To use the OS-Hadoop connector, **download** the `commons-httpclient-3.0.1.jar` and `opensearch-spark-20_2.11-2.3.0.jar` (depending on which OpenSearch version is used) files and place them in the `jars` folder. This is applicable only in the case of ETL for Graph.

### 3.4.3.2 Create Credential Keystore for OpenSearch

Credential keystore must be created for the OpenSearch if `https` is enabled for OpenSearch.

**NOTE**

- **This section is deprecated in the current release and will be removed in the future release.**
- If you are using a Graph pipeline, skip this section. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.

To create a credential keystore, follow these steps:

1. Login as HDFS Superuser.
2. Create a credential keystore on HDFS using the following command:

```
hadoop credential create open.password.alias -value <Open search
password> \
-provider jceks://hdfs/user/fccstudio/open/open.password.jceks
hadoop credential create open.keystore.password.alias -value password \

```

```
-provider jceks://hdfs/user/fccstudio/open/open.password.jceks
```

Where,

- `open.password.alias` is the OpenSearch password alias name
- `open.keystore.password.alias` is the OpenSearch keystore password alias name
- `<open search password>` is OpenSearch password
- `password` is OpenSearch keystore password
- `hdfs/user/fccstudio/open/open.password.jceks` is the file path of the credential keystore

3. Verify the credential keystore file using the following command:

```
hadoop credential list -provider jceks://hdfs/user/fccstudio/open/
open.password.jceks.
```

4. Grant Read permission to the keystore file using the following command:

```
hadoop fs -chmod 744 /user/fccstudio/open/open.password.jceks
```

---

**NOTE**

- Ensure the credential keystore file path and the alias are correctly mentioned in the `config.sh` file.
- The version of the open search jar should be the same as the version of OpenSearch installed.

## 4 Installation

Perform the following steps to complete the installation.

- Place Files in the Installation Directories
- Add Synonyms and Stopword files in OpenSearch
- Place Files in Wallet
- Generate the Public and Private Keys
- Generate API token for CS API User
- Generate Compliance Studio Server SSL Configuration Mandatory File
- Import the certificate to JDK security
- Place the Key Store File for Secure Batch Service
- Add the Studio Service (SSL) to PGX Configuration
- Configure the Extract Transfer and Load (ETL) Process
- Apply Fine-Grained access control and Redaction Changes for Compliance Studio
- Configure the config.sh File
- User Provisioning
- Run the Compliance Studio Installer
- Generate the graph-keystore.p12 File
- Configure the PGX Service
- Run ER in different workspaces

### 4.1 Place Files in the Installation Directories

**NOTE** If you are using a Graph pipeline, skip **steps 1** and **2**. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.

To place the required jars and Kerberos files in the required locations, follow these steps:

1. To place the additional jar files, follow these steps:

**NOTE** This step is deprecated in the current release and will be removed in the future **release**.

- a. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/batchservice/user/lib` directory.
- b. Place the following additional jar files:
  - `hive-exec-*.jar`. For example, `hive-exec-1.1.0.jar`.
  - `HiveJDBC4.jar`
  - `hive-metastore-*.jar`. For example, `hive-metastore-1.1.0.jar`.
  - `hive-service-*.jar`. For example, `hive-service-1.1.0.jar`.

For additional jars, see the [Appendix C – Additional Jars – PGX](#) and [Appendix D – Additional Jars – Batch Service](#) sections.

- NOTE**
- The version of the jars is client or user-specific. These jars can be obtained from the existing jars of the Cloudera installation.
  - The `HiveJDBC4.jar` file is not available in the Cloudera setup. You must download the same from the [Cloudera](#) website.
  - **For upgrade scenario:** The libraries available in the previous version of Compliance Studio can be copied and placed in the new location. To place the libraries, follow step 1.

2. To place the Kerberos files, follow these steps:

**NOTE** This step is deprecated in the current release and will be removed in the future **release**.

- a. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/batchservice/user/conf` directory.
- b. Place the following Kerberos files:
  - `krb5.conf`
  - keytab file name as mentioned in the `config.sh` file.

**NOTE** **For upgrade scenario:** The files available in the previous version of Compliance Studio can be copied and placed in the new location. To place the files, follow step 2.

3. Perform this step if https is enabled for OpenSearch:
  - a. Copy `admin.p12` file from `<OpenSearch_Installation_path>/config` directory.
  - b. Place the `admin.p12` file in `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/matching-service/conf` directory.
  - c. Place the `admin.p12` file in `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/load-to-open-search/conf` directory.

## 4.2 Add Synonyms and Stopword files in OpenSearch

**NOTE** **For upgrade scenario:** The Synonyms and Stopword files can be re-utilized from the previous Compliance Studio version.

To consider the similarity when performing the OpenSearch, you can add the synonyms and stopword files in the OpenSearch.

To add synonyms and stopword files in OpenSearch, perform the following steps:

1. Create a folder in the name of “analysis” in the `<OpenSearch_Installation_path>/config` directory.
2. You can add your synonyms and stopwords to these files and place the files in the analysis folder:

- Cardinal\_ordinal.txt
- Country.txt
- Gender.txt
- Namestop.txt
- Name\_synonym.txt
- Organisation\_strip.txt
- Organisation\_suffix.txt
- Synonym.txt
- Title.txt

**NOTE**

- User can decide to provide any data in the Stopword or Synonym files.
- Each Stopword must be provided in a separate line.
- All related synonyms must be provided in the same line, separated by a comma.
- All the synonyms must be provided in the same line and ensure that there are no repetitions of the synonym. For Example, rob, robi, robie, roby, robbi.

## 4.3 Place Files in Wallet

To place the files in the wallet in the required locations, follow these steps:

1. To place the files in the wallet, follow these steps:
  - a. Navigate to <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>.
  - b. Create a folder 'wallet' and place the following files.
  - c. Navigate to <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/wallet.
  - d. Place the following files, which are being generated from the <wallet\_directory> in the section [Setup the Password Stores for Database User Accounts](#):

- tnsnames.ora
- ewallet.p12
- cwallet.sso
- ewallet.p12.lck
- cwallet.sso.lck

**NOTE**

This folder path will be referred to as "WALLET LOCATION" and "TNS\_ADMIN\_PATH" in `config.sh` while configuring Compliance Studio. If you want to maintain `tnsname.ora` in a different folder, then "TNS\_ADMIN\_PATH" will be that folder location.

2. Place the `sqlnet.ora` file into the wallet and update the path for the current wallet location.

```
WALLET_LOCATION =
```

```
(SOURCE =
 (METHOD = FILE)
 (METHOD_DATA =
 (DIRECTORY = <wallet location>)
)
)
SQLNET.WALLET_OVERRIDE = TRUE
```

## 4.4 Generate the Public and Private Keys

The Public and Private keys are JSON Web Tokens (JWT) that are generated for Authentication from Compliance Studio.

**NOTE** If there is a need to regenerate public and private keys for any reason. The API token for CS API user has to be generated again, and the API token's new value must be provided in the **SSO\_TOKEN** parameter of the config.sh file and reinstall the Compliance Studio.

To generate the keys, follow these steps:

**NOTE** The following steps are mandatory for the first-time Compliance Studio installation.

1. Navigate to the <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/mmg-home/bin directory.
2. Run the Shell Script ./key-generator.sh from the directory.

The Public and Private Keys are generated and available in the <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/mmg-home/conf directory.

3. Copy the private.key and public.key files to the following paths:
  - <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/mmg-home/mmg-studio/conf directory.
  - <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/batchservice/conf directory.
  - <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/mmg-home/mmg-load-to-graph/graph-service/conf directory.
  - <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/mmg-home/mmg-ui/conf directory.

These files also be required in the [Configure the PGX Service](#) section.

## 4.5 Generate API token for CS API User

**NOTE** In case SSO\_TOKEN is regenerated and Compliance Studio is reinstalled with a new value of SSO\_TOKEN, then user has to manually update the SSO\_TOKEN record in the **NEXTGENEMF\_CONFIG** table of the Studio Schema.

To generate the API token, follow these steps:

1. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/bin` directory.
2. Run the shell script: `./token-generator.sh CS_API_USER`

This will generate the API token in the same directory as `token.out`.

The generated token that is required while configuring `config.sh` file in the path `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin`.

## 4.6 Generate Compliance Studio Server SSL Configuration Mandatory File

Topics:

- [Generate Self-signed Certificate](#)
- [Generate Signed Certificate](#)

### 4.6.1 Generate Self-signed Certificate

To generate the self-signed certificate, follow these steps:

1. Run the following `jks` command in the Studio Server:

```
keytool -J-Dkeystore.pkcs12.legacy -genkey -alias <alias> -keyalg RSA -keystore <alias>.jks -dname "CN=<hostname>, OU=OR, O=OR L=OR, ST=OR, C=OR" -ext "SAN=IP:<ip address 1>,IP:<ip address 2>"
```

**NOTE**

- `ip address 2` is optional and `hostname` is the fully qualified host name.
- You must use the same password and alias that is provided in the `config.sh` file.

2. Specify the keystore password.
3. When generating the `keytool` ensure to provide the hostname in the first name. For example:

**Question:** What is your first and last name?

**Answer:** Provide the fully qualified studio server hostname.

For example, `<hostname>.<domain name>`

4. Specify any name for the other questions.
5. Specify the keystore password. The `jks` file is created in the Studio Server.

**NOTE**

You must use the same password and alias that is provided in the `config.sh` file.

6. Run the following `jks` command in the Studio Server to generate the `.p12` file using the `.jks` file:



```
keytool -J-Dkeystore.pkcs12.legacy -importkeystore -srckeystore
<alias>.jks -destkeystore <alias_name>.p12 -srcalias <alias> -
srcstoretype jks -deststoretype pkcs12
```

7. Specify the keystore password. The .p12 file is created in the Studio Server.
8. Copy the .p12 files and place in the <COMPLIANCE\_STUDIO\_INSTALLATION\_PATH>/mmg-home/mmg-studio/conf directory.

## 4.6.2 Generate Signed Certificate

To generate the signed certificate, follow these steps:

1. Log in to the server as a Linux user.
2. Generate the CSR file that describes the certificate requested and needed by the signing authority.
3. Openssl default configuration does not include subject alternative names by default.
4. SANs should be updated in `cert.conf` file. Additional SANs or IPs can be added through properties such as DNS.2, DNS.3, IP.1, and IP.2 in the [alt\_names] section.
5. Once the configuration file is placed, generate the CSR file and associated private key by running the following command:

```
openssl req -new -newkey rsa:2048 -nodes -keyout server.key -out
server.csr -config cert.conf
```

6. Provide the requested entries, and some entries can be left blank.

---

**NOTE**

- You can check the CSR contains SANs by running the following command:  

```
openssl req -text -noout -verify -in server.csr
```
- This step is optional only.

7. Request certificate from the signing authority. Once the certificate is received, convert the `server.cer` into PEM format if required by running the following command:

```
openssl x509 -in server.cer -out server.pem -outform PEM
```

---

**NOTE**

- You can check the contents of the certificate to make sure that the SANs are included by running the following command:  

```
openssl x509 -in server.pem -text
```
- This step is optional only.

8. Create .p12 keystore.

**NOTE**

- The `-name` parameter must match the value of the **STUDIO\_SERVER\_SSL\_ALIAS** variable from the path `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin/config.sh`
- To store the password, run the following command:  

```
openssl pkcs12 -export -out studio_server.p12 -inkey server.key -in server.pem -name studio_alias
```
- The password must match the value of the **STUDIO\_SERVER\_SSL\_PASSWORD** variable from `<COMPLIANCE_STUDIO_INSTALLATION_PATH >/bin/config.sh`
- To check the keystore, run the following command:  

```
openssl pkcs12 -export -out studio_server.p12 -inkey server.key -in server.pem -name studio_alias
```
- This step is optional only.

9. Copy the `cp studio_server.p12` file and place in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/mmg-studio/conf/studio_server.p12` and `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/conf/studio_server.p12` directories.

10. Restart Compliance Studio. To do this, navigate to the

`<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory and run the `./compliance-studio.sh restart`

## 4.7 Import the certificate to JDK security

**NOTE**

This section is required for both signed and self-signed certificates.

To import .p12 and .jks files, follow these steps:

1. Execute the following command to convert .p12 file into .cer format.

```
keytool -exportcert -keystore <Path of .p12 file >/<filename>.p12 -storetype PKCS12 -alias <alias> -file <Path where studiop.cer file should be created>/studiop.cer
```

For example,

```
keytool -exportcert -keystore /<COMPLIANCE_STUDIO_INSTALLATION_PATH>/studio_server.p12 -storetype PKCS12 -alias studio_server -file /<COMPLIANCE_STUDIO_INSTALLATION_PATH>/studiop.cer
```

2. Execute the following command to import `.cer` file into jdk security.

```
keytool -importcert -keystore <JAVA_HOME>/lib/security/cacerts -
storepass changeit -alias studio_server -file <Path of studiop.cer file
created from about command>/studiop.cer
```

For example,

```
keytool -importcert -keystore /Home/fccstudio/jdk-11.0.18/lib/security/
cacerts -storepass changeit -alias studio_server -file /<COMPLIANCE_STU-
DIO_INSTALLATION_PATH>/studiop.cer
```

**NOTE**

If you need to delete certificate from the JDK then execute the following command:

```
keytool -delete -noprompt -alias studio_server -keystore
"<JAVA_HOME>/lib/security/cacerts" -storepass "changeit"
```

This could be helpful if you need to re-import a new certificate in the JDK.

## 4.8 Place the Key Store File for Secure Batch Service

**NOTE**

**For upgrade scenario:** The files can be re-utilized from the previous version of Compliance Studio. If you are upgrading from 8.1.2.0.\* to CS 8.1.2.7.0, then `.jks` and `.p12` files have to be generated newly by performing the steps mentioned in the section.

Place the `.jks` and `.p12` files generated from the [Generate Compliance Studio Server SSL Configuration Mandatory File](#) section and place them in the path (batch service) `<Compliance_Studio_Installation_Path>/batchservice/conf`.

**NOTE**

The `.jks` file is not required if you have signed p12 certificate. To generate signed certificate, see the [Generate Signed Certificate](#) section.

## 4.9 Add the Studio Service (SSL) to PGX Configuration

Adding the Studio Service (SSL) to PGX Trust Store facilitates you to apply redaction on the graph batch service and connect with PGX.

To add the Studio Service to PGX Trust Store, copy the `.p12` file from `<Compliance_Studio_Installation_path>/mmg-studio/conf` directory to the `<PGX_Server_path>/pgx-server/conf` directory.

After generating the `.p12` file and adding the Studio service to the PGX trust store.

## 4.10 Configure the Extract Transfer and Load (ETL) Process

### NOTE

- **This section is deprecated in the current release and will be removed in the future release.**
- If you are using a Graph pipeline, skip this section. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.

Extract Transfer and Load (ETL) is the procedure of copying data from one or more sources into a destination system that represents the data differently from the source or in a different context. Data movement and graph loading is performed using ETL.

To configure the Data Movement and Graph Load, copy the applicable `FCCM_Studio_SqoopJob.sh` files from the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/ficdb/bin` directory and add in the `<FIC_HOME of OFSAA_Installed_Path>/ficdb/bin` directory.

For more information, see the **Configure ETL** and **Execute ETL** sections in the [OFS Compliance Studio Administration and Configuration Guide](#).

### NOTE

Before running the sqoop job, ensure that the correct values are the `server-config.properties` file from the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/batchservice/conf` directory.

### 4.10.1 Loading Graphs

Loading graphs to Compliance Studio can be based on the following scenarios:

#### 4.10.1.1 Loading sample graph without running ETL

### NOTE

- **This section is deprecated in the current release and will be removed in the future release.**
- If you are using a Graph pipeline, skip this section. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.

To load the sample graph without running ETL, perform the following steps:

1. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/sample-graph` folder.
2. Unzip the contents of the `sample-graph-8.*.zip` file in the same folder.
3. Copy the entire path of the folder `sample-graph`.
4. Open the `sample-graph-8.*.json` file and paste the copied `<sample-graph folder path>` into the placeholder `<SERVER_PATH>` under the parameter `"uris"`.

### NOTE

Ensure to replace all the placeholders with the copied path of the folder `sample-graph`.

5. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/pgx/pgx-server/conf` directory and modify the `pgx.conf` file for the highlighted parameters:

```



```

6. Restart the PGX server.

#### 4.10.1.2 Loading the graph generated from ETL

##### NOTE

- **This section is deprecated in the current release and will be removed in the future release.**
- If you are using a Graph pipeline, skip this section. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.

You can load a graph generated from ETL based on the following:

PGX fails until you have a graph generated from ETL on the HDFS. Once the graph is generated, and then as soon as the PGX server pods restart, the graph is pre-loaded to the Compliance Studio.

- Create a backup of `pgx.conf`. The backup can be used when the graph is generated from ETL.
- At the time of deployment, you must delete the following lines from the `pgx.conf` file.

```



```

```
],
```

- The following lines must be delete multiple times.

```
,

 {
 "preloaded_graph": "##PGX_GLOBAL_GRAPH_NAME##",
 "grant": "manage"
 }
```

- Proceed with the Compliance Studio deployment.
- Once the graph is generated, perform the following:
  - Replace the existing `pgx.conf` file with the backed up `pgx.conf` file
- Restart Compliance Studio.

### 4.10.1.3 Loading the graph generated from the Graph Pipeline

#### NOTE

- **This section is deprecated in the current release and will be removed in the future release.**
- If you are using a Graph pipeline, skip this section. This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.

You can load a graph generated from the Graph pipeline based on the following:

1. To configure the PGX service, see the [Configure the PGX Service](#) section.
2. In the `config.sh` file set the `LOAD_GRAPH_FROM_HDFS` parameter to load the graph:  
If **True**, both the graph pipeline and legacy ETL will be loaded.  
If **False**, the graph pipeline only will be loaded.
3. Start/restart the PGX service.
4. To refresh the graph, see the [Creating a Population Schedule](#) section in the [OFS Compliance Studio User Guide](#) and perform the steps from **10** to **12**.  
The graph will be loaded.
5. To verify the loaded graph details, kindly create a new notebook and query the graph using `pgql`.

## 4.11 Apply Fine-Grained access control and Redaction Changes for Compliance Studio

### NOTE

- This section is deprecated in the current release and will be removed in the future release.
- This is applicable for the graph which is generated by Legacy ETL, i.e., with BigData cluster.

After generating the key store file and adding the batch service to the PGX trust store, you must configure the user mapping for the changes made in the database. For more information about configuring user mapping, see the [OFS Compliance Studio Administration and Configuration Guide](#).

## 4.12 Configure the config.sh File

### NOTE

**For upgrade scenario:** The value of highlighted parameters from the `config.sh` file has to be re-utilized from the previous version of Compliance Studio. If you upgrade from 8.1.2.0.\* to CS 8.1.2.7.0, the additional parameters can be configured as mentioned in this section.

To configure the `config.sh` file for installing Compliance Studio, follow these steps:

1. Login to the server as a non-root user.
2. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory.
3. Configure the applicable `config.sh` attributes are shown in the following table.

A sample `config.sh` file is shown below.

Figure 7: Snapshot of config.sh file

```
#!/usr/bin/env bash
COMPLIANCE_STUDIO_INSTALLATION_PATH path is absolute path including folder, 'OFS_COMPLIANCE_STUDIO'.
Example: /home/compliancestudio/OFS_COMPLIANCE_STUDIO
export COMPLIANCE_STUDIO_INSTALLATION_PATH=
NON_OFSSAA: Accepted values: true or false
export NON_OFSSAA=false
GRAPH_SOURCE Expected value : ED or ECH. This is source of data for ETL.
export GRAPH_SOURCE=ECH
export ECH_SCHEMA_NAME=
export FCIM_SCHEMA=ECH
SSL Configuration
Please place the SSL file after renaming it in 'COMPLIANCE_STUDIO_INSTALLATION_PATH/datastudio/server/conf' as file 'studio_server.pl1'
export STUDIO_SERVER_SSL_PASSWORD=
export STUDIO_SERVER_SSL_ALIAS=
Keystore file name and password for batchservice's certificate. Please place the certificate in 'COMPLIANCE_STUDIO_INSTALLATION_PATH/batchservice/conf'.
export KEYSTORE_FILE_NAME=
export KEYSTORE_PASS=
Authentication Realm. Values are: SAML or AAI
export AUTH_REALM=SAML
export COOKIE_DOMAIN=cn.oracle.com
AAI related configuration
export AAI_URL=NA
SAML related Configuration
export SAML_DESTINATION=
export SAML_ROLE_ATTRIBUTE=group
export SAML_LOGOUT_URL=
In case of integration of Compliance Studio with another product, example: ECH-IN integration, update the API_USERS with '.' value of API Users
export API_USERS=CS_API_USER,BATCH_USER
```

### NOTE

- You must manually set the parameter value in the `config.sh` file. If a value is not applicable, enter NA and ensure that the value is not entered as **NULL**.
- If the parameter `STUDIO_DB_SERVICE_NAME` has been filled, the parameter `STUDIO_DB_SID` should be left **blank**, and vice versa.
- If the parameter `ATOMIC_DB_SERVICE_NAME` has been filled, the parameter `ATOMIC_DB_SID` should be left **blank**, and vice versa.

Table 15 lists configuration parameters of the `config.sh` file.

**Table 15: config.sh file**

| Parameter                           | Significance                                                                                                                                                                                                                 | Installing with OFSAA (Mandatory)                        | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                                                                                             | Installing without OFSAA (Mandatory)    | Upgrading without OFSAA (Mandatory)     |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------|
| COMPLIANCE_STUDIO_INSTALLATION_PATH | Indicates the path where the Compliance Studio installer file is extracted. For example, <code>/scratch/testuser/OFS_COMPLIANCE_STUDIO</code> .                                                                              | Yes                                                      | Yes. Provide the path where the new installer is extracted. For example, <code>/scratch/testuser/OFS_COMPLIANCE_STUDIO</code> .                                                                                                                                                              | Yes                                     | Yes                                     |
| MINICONDA_INSTALLATION_HOME         | Indicates configured path for miniconda installation. By default, the value is set to <code>\$HOME</code> , which refers to the user's home directory.                                                                       | Yes                                                      | Yes                                                                                                                                                                                                                                                                                          | Yes                                     | Yes                                     |
| NON_OFSAA                           | To install Compliance Studio with OFSAA, enter " <b>false</b> ".<br>To install Compliance Studio without OFSAA, enter " <b>true</b> ".                                                                                       | Yes<br>Enter the value as <b>false</b> .                 | Yes<br>Enter the value as <b>false</b> .                                                                                                                                                                                                                                                     | Yes<br>Enter the value as <b>true</b> . | Yes<br>Enter the value as <b>true</b> . |
| <b>GRAPH_SOURCE</b>                 |                                                                                                                                                                                                                              |                                                          |                                                                                                                                                                                                                                                                                              |                                         |                                         |
| GRAPH_SOURCE                        | Indicates the source database for Compliance Studio.<br>Enter the value as <b>BD</b> .<br>This is a legacy ETL parameter, and the value should always be BD. This will not impact the Graph pipeline functionality with ECM. | Yes<br>The value of this parameter should be <b>BD</b> . | Yes<br>The value of this parameter should be <b>BD</b> . Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter according to the BD Graph source. | Yes<br>Enter the value as <b>NA</b> .   | Yes<br>Enter the value as <b>NA</b> .   |



Table 15: config.sh file

| Parameter                | Significance                                                                                                                                                        | Installing with OFSAA (Mandatory)                                                      | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                                                                                                         | Installing without OFSAA (Mandatory)  | Upgrading without OFSAA (Mandatory)   |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------|
| ECM_SCHEMA_NAME          | Indicates the name of the ECM Atomic Schema.<br><b>NOTE:</b><br>If Legacy Graph (ETL connector job using Hadoop) is not required, then set the value as <b>NA</b> . | Yes<br>The value should be name of the ECM Atomic Schema.                              | Yes<br>The value should be name of the ECM Atomic Schema. Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly.                                 | Yes<br>Enter the value as <b>NA</b> . | Yes<br>Enter the value as <b>NA</b> . |
| FCDM_SCHEMA              | This indicates the datasource for the Production workspace. The available options are <b>ECM</b> and <b>BD</b> .                                                    | Yes<br>The value of this parameter should be provided either <b>BD</b> or <b>ECM</b> . | Yes<br>The value of this parameter should be provided either <b>BD</b> or <b>ECM</b> .<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes<br>Enter the value as <b>NA</b> . | Yes<br>Enter the value as <b>NA</b> . |
| <b>SSL Configuration</b> |                                                                                                                                                                     |                                                                                        |                                                                                                                                                                                                                                                                                                          |                                       |                                       |
| STUDIO_SERVER_SSL_SECRET | Indicates the password for Studio Server P12 that is required for HTTPS configuration.                                                                              | Yes                                                                                    | Yes. This file has to be generated newly. To create a file, see the <a href="#">Generate Compliance Studio Server SSL Configuration Mandatory File</a> section.                                                                                                                                          | Yes                                   | Yes                                   |

Table 15: config.sh file

| Parameter                   | Significance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                        | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| STUDIO_SERVER_SSL_ALIAS     | Indicates the alias name for P12 for the Studio Server.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Yes                               | Yes.<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly . | Yes                                  | Yes                                 |
| <b>Authentication Realm</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                   |                                                                                                                                                                                                                         |                                      |                                     |
| AUTH_REALM                  | <p>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; realms do not give its owner or participant's additional privileges.</p> <p>Compliance Studio uses realm-based authorization and authentication for its users. For more information, see the Realm Based Authorization section in the <a href="#">OFS Compliance Studio Administration and Configuration Guide</a>. The Compliance Studio application can be accessed using the following realms:</p> <p><b>FCCMRealm</b> Value=AAI<br/><b>FCCSamlRealm</b> Value=SAML</p> | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly.   | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                        | Significance                                                                                                                                                                                                                                                                                                 | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                      | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| AUTH_REALM                       | If <b>SAML</b> is selected as <b>FCCSamlRealm</b> Value, see the <b>User Provisioning</b> section for additional configuration.                                                                                                                                                                              | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |
| COOKIE_DOMAIN                    | The domain of the server where Compliance Studio is installed. Example: in.oracle.com                                                                                                                                                                                                                        | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |
| <b>AAI related configuration</b> |                                                                                                                                                                                                                                                                                                              |                                   |                                                                                                                                                                                                                       |                                      |                                     |
| AAI_URL                          | The Application URL of ECM/BD application.<br>URL: <code>http://&lt;Server Hostname&gt;:&lt;Application URL PORT&gt;/&lt;Context Path&gt;</code><br>For example, <code>http://testserver.in.oracle.com:4000/BDTEST</code><br><b>NOTE:</b><br>This parameter is applicable only if AUTH_REALM is <b>AAI</b> . | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | No                                   | No                                  |

Table 15: config.sh file

| Parameter                                                                                                              | Significance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                                 | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| <p><b>SAML</b></p> <p>The SAML-related parameters are applicable only if SAMLRealm is used in the Realm parameter.</p> | <p>In the case of SAML Realm, the certificate from IDP (<b>key.cert</b> file) is required.</p> <p>The certificate that is obtained from the IDP must be renamed to key.cert and placed in the</p> <pre>&lt;COMPLIANCE_STUDIO _INSTALLATION_PATH&gt;/ mmg-home/mmg-studio/ conf directory.</pre> <p>This certificate is used to identify the trust of the SAML response from the Identity Provider.</p> <p>Specify the Role Attribute name from IDP, in which the User Roles are present in the SAML response.</p> |                                   |                                                                                                                                                                                                                                  |                                      |                                     |
| SAML_DESTINATION                                                                                                       | <p>Indicates the SAML IDP URL that the Identity Provider provides after creating the SAML Application.</p> <p><b>NOTE:</b></p> <p>This parameter is applicable only if AUTH_REALM is <b>SAML</b>.</p>                                                                                                                                                                                                                                                                                                             | Yes                               | <p>Yes</p> <p>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly.</p> | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                            | Significance                                                                                                                                                                                                                                                   | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                      | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| SAML_ROLE_ATTRIBUTUTE                | Indicates the SAML client identifier provided by the SAML Administrator for the Role and Attributes information while creating the SAML application for Compliance Studio.<br><b>NOTE:</b><br>This parameter is applicable only if AUTH_REALM is <b>SAML</b> . | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |
| SAML_LOGOUT_URL                      | Indicates the SAML client identifier provided by the SAML Administrator for the Logout URL information while creating the SAML application for Compliance Studio.<br><b>NOTE:</b><br>This parameter is applicable only if AUTH_REALM is <b>SAML</b> .          | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |
| <b>Integrate with other products</b> |                                                                                                                                                                                                                                                                |                                   |                                                                                                                                                                                                                       |                                      |                                     |
| API_USERS                            | Retain the default settings.                                                                                                                                                                                                                                   | Yes                               | Yes<br>Retain Default Settings.                                                                                                                                                                                       | Yes                                  | Yes                                 |
| VALID_ROLES                          | Retain the default settings.                                                                                                                                                                                                                                   | Yes                               | Yes<br>Retain Default Settings.                                                                                                                                                                                       | Yes                                  | Yes                                 |
| BATCH_ROLE                           | Retain the default settings.                                                                                                                                                                                                                                   | Yes                               | Yes<br>Retain Default Settings.                                                                                                                                                                                       | Yes                                  | Yes                                 |
| <b>MMG Service Configurations</b>    |                                                                                                                                                                                                                                                                |                                   |                                                                                                                                                                                                                       |                                      |                                     |
| SESSION_TOKEN_CREDENTIALS            | Retain the default settings.                                                                                                                                                                                                                                   | Yes                               | Yes<br>Retain Default Settings.                                                                                                                                                                                       | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                    | Significance                                                                                                                   | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                      | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| FCC_API_USER                 | Retain the default settings.                                                                                                   | Yes                               | Yes<br>Retain Default Settings.                                                                                                                                                                                       | Yes                                  | Yes                                 |
| SSO_TOKEN                    | This is the API token for FCC_API_USER.<br>See the <a href="#">Generate API token for CS API User</a> section for token value. | Yes                               | Yes<br>See the <a href="#">Generate API token for CS API User</a> section for token value.                                                                                                                            | Yes                                  | Yes                                 |
| MMG_DATASOURCE_MAX_POOL_SIZE | Maximum connection pool size allowed for Config Data Source. 50                                                                | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |
| MMG_DATASOURCE_IDLE_TIMEOUT  | Idle timeout for Config Data Source in a millisecond.<br>30000                                                                 | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                    | Significance                                                     | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                      | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|------------------------------|------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| MMG_DATASOURCE_CONN_TIMEOUT  | Connection timeout for Config Data Source in milliseconds. 30000 | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |
| EXT_DATASOURCE_MAX_POOL_SIZE | Maximum connection pool size allowed for Meta/Data Schemas. 50   | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |
| EXT_DATASOURCE_IDLE_TIMEOUT  | Idle timeout for Meta/Data Schemas in milliseconds. 30000        | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                                                        | Significance                                                                          | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                      | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| EXT_DATASOURCE_CONN_TIMEOUT                                      | Connection timeout for Meta/Data Schemas in milliseconds. 30000                       | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |
| SERVER_COOKIE_TIMEOUT                                            | Connection timeout for server cookie in milliseconds. 86400                           | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |
| <b>DB Details for Studio Schema</b>                              |                                                                                       |                                   |                                                                                                                                                                                                                       |                                      |                                     |
| You must be logged in as SYSDBA to perform these configurations. |                                                                                       |                                   |                                                                                                                                                                                                                       |                                      |                                     |
| STUDIO_DB_HOSTNAME                                               | Indicates the hostname of the database where the Compliance Studio schema is created. | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio.                                                                                                                          | Yes                                  | Yes                                 |
| STUDIO_DB_PORT                                                   | Indicates the port number where the Compliance Studio schema is created.              | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio.                                                                                                                          | Yes                                  | Yes                                 |



Table 15: config.sh file

| Parameter                          | Significance                                                                                                                                      | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                             | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| STUDIO_DB_SERVICE_NAME             | Indicates the service name of the database where the Studio schema is created.                                                                    | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio. | Yes                                  | Yes                                 |
| STUDIO_DB_SID                      | Indicates the SID of the database where the Studio schema is created.<br><b>NOTE:</b><br>Set this field as blank if there is no SID for Database. | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio. | Yes                                  | Yes                                 |
| STUDIO_DB_USERNAME                 | Indicates the username of the Compliance Studio Schema (newly created Oracle Schema).                                                             | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio. | Yes                                  | Yes                                 |
| <b>DB Details of Atomic Schema</b> |                                                                                                                                                   |                                   |                                                                                              |                                      |                                     |
| ATOMIC_DB_HOSTNAME                 | The hostname of the database where Atomic schema is present (BD/ECM config).                                                                      | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio. | Yes                                  | Yes                                 |
| ATOMIC_DB_PORT                     | Port number of database where Atomic schema is present.                                                                                           | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio. | Yes                                  | Yes                                 |
| ATOMIC_DB_SERVICE_NAME             | The service name of the database where Atomic schema is present.                                                                                  | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio. | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                                                                                            | Significance                                                                                                                       | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                             | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| ATOMIC_DB_SID                                                                                        | Service id of database where Atomic schema is present.<br><b>NOTE:</b><br>Set this field as blank if there is no SID for Database. | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio. | Yes                                  | Yes                                 |
| ATOMIC_DB_USERNAME                                                                                   | Username of the Atomic schema                                                                                                      | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio. | Yes                                  | Yes                                 |
| <b>Wallet Details</b>                                                                                |                                                                                                                                    |                                   |                                                                                              |                                      |                                     |
| For information on creating a wallet, see <a href="#">Setup Password Stores with Oracle Wallet</a> . |                                                                                                                                    |                                   |                                                                                              |                                      |                                     |
| WALLET_LOCATION                                                                                      | Indicates the Compliance Studio wallet location.                                                                                   | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio. | Yes                                  | Yes                                 |
| TNS_ADMIN_PATH                                                                                       | Indicates the path of the tnsnames.ora file where an entry for the STUDIO_ALIAS_NAME is present.                                   | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio. | Yes                                  | Yes                                 |
| STUDIO_ALIAS_NAME                                                                                    | Indicates the Studio alias name.<br><b>NOTE:</b><br>Enter the alias name that was created during wallet creation.                  | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio. | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                                                                                                                                                                                                                                                                                       | Significance                                                                                                                                                                                                                                                                                  | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                      | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| ATOMIC_ALIAS_NAME                                                                                                                                                                                                                                                                               | Indicates alias name of FCDM source atomic schema given in wallet.<br><b>NOTE:</b><br>If Legacy Graph (ETL connector job using Hadoop) is not required, then set the value as <b>NA</b> .                                                                                                     | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio.                                                                                                                          | Yes                                  | Yes                                 |
| <b>Logstash</b>                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                               |                                   |                                                                                                                                                                                                                       |                                      |                                     |
| LOGSTASH_HOME                                                                                                                                                                                                                                                                                   | Logstash home Example: "/<COMPLIANCE_STUDIO_INSTALLATION_PATH>/Logstash/logstash- 7.16.3"<br><b>NOTE:</b><br>See the section <a href="#">Configure Logstash</a> for more details. If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as <b>NA</b> . | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |
| <b>Graph Schema Configuration</b>                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                               |                                   |                                                                                                                                                                                                                       |                                      |                                     |
| <b>NOTE:</b><br>The following parameters for graph service are mandatory for successful Compliance Studio installation, and the parameters cannot be set as blank or NA. If you do not want to use graph pipeline functionality, studio schema details should be provided for these parameters. |                                                                                                                                                                                                                                                                                               |                                   |                                                                                                                                                                                                                       |                                      |                                     |
| GRAPH_DB_SERVER_NAME                                                                                                                                                                                                                                                                            | Indicates the Graph Database server name.                                                                                                                                                                                                                                                     | Yes                               | Yes                                                                                                                                                                                                                   | Yes                                  | Yes                                 |
| GRAPH_DB_PORT                                                                                                                                                                                                                                                                                   | Indicates the Graph Database server port.                                                                                                                                                                                                                                                     | Yes                               | Yes                                                                                                                                                                                                                   | Yes                                  | Yes                                 |
| GRAPH_DB_SERVICE_NAME                                                                                                                                                                                                                                                                           | Indicates the Graph Database service name.                                                                                                                                                                                                                                                    | Yes                               | Yes                                                                                                                                                                                                                   | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                    | Significance                                                                                                                                                                                      | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                      | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| GRAPH_KEYSTORE_PASSWORD      | Indicates the password of the keystore file, which stores the password of the graph schema.<br><b>NOTE:</b><br>If Graph Pipeline functionality is not required, then set the value as <b>NA</b> . | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | Yes                                  | Yes                                 |
| GRAPH_SCHEMA_DB_SCHEMA_NAME  | Indicates the Database schema name of the graph schema.                                                                                                                                           | Yes                               | Yes                                                                                                                                                                                                                   | Yes                                  | Yes                                 |
| GRAPH_SCHEMA_WALLET_ALIAS    | Indicates the wallet alias of the graph schema.                                                                                                                                                   | Yes                               | Yes                                                                                                                                                                                                                   | Yes                                  | Yes                                 |
| GRAPH_SCHEMA_WALLET_LOCATION | Indicates the wallet location of the graph schema.                                                                                                                                                | Yes                               | Yes                                                                                                                                                                                                                   | Yes                                  | Yes                                 |
| GRAPH_SCHEMA_TNS_ADMIN_PATH  | Indicates the TNS admin path of the graph schema.                                                                                                                                                 | Yes                               | Yes                                                                                                                                                                                                                   | Yes                                  | Yes                                 |
| PGX_ENABLE_CP                | It is used to enable or disable connection pooling for sub graph loading.<br>The value for 'PGX_ENABLE_CP' is "true" or "false".<br>For example,<br>PGX_ENABLE_CP=true                            | Yes                               | Yes                                                                                                                                                                                                                   | Yes                                  | Yes                                 |
| PGX_CP_INITIAL_SIZE          | Indicates the initial number of connections that are created when the pool is started.<br>For example, 5                                                                                          | Yes                               | Yes                                                                                                                                                                                                                   | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter              | Significance                                                                                                                                                                                                                 | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory) | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------|--------------------------------------|-------------------------------------|
| PGX_CP_MAX_TOTAL       | Indicates the maximum number of active connections that can be allocated from this pool at the same time or negative for no limit.<br>For example, 25                                                                        | Yes                               | Yes                              | Yes                                  | Yes                                 |
| PGX_CP_MAX_IDLE        | Indicates the maximum number of connections that can remain idle in the pool, without extra ones being released or negative for no limit.<br>For example, 10                                                                 | Yes                               | Yes                              | Yes                                  | Yes                                 |
| PGX_CP_MIN_IDLE        | Indicates the minimum number of connections that can remain idle in the pool, without extra ones being created, or zero to create none.<br>For example, 5                                                                    | Yes                               | Yes                              | Yes                                  | Yes                                 |
| PGX_CP_MAX_WAIT_MILLIS | Indicates the maximum number of milliseconds that the pool will wait (when there are no available connections) for a connection to be returned before throwing an exception or -1 to wait indefinitely.<br>For example, 3000 | Yes                               | Yes                              | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                 | Significance                                                                                                                                                                                                                                                                                                     | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory) | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------|--------------------------------------|-------------------------------------|
| PGX_CP_MIN_EVICTABLE_IDLE | Indicates the minimum amount of time a connection may sit idle in the pool before it is closed and a new connection is created if count of connections is less than PGX_CP_MIN_IDLE.<br>For example, PT30M                                                                                                       | Yes                               | Yes                              | Yes                                  | Yes                                 |
| PGX_CP_SOFT_MIN_EVICTABLE | Indicates the minimum amount of time a connection may sit idle in the pool before it is closed and a new connection is created.<br>For example, PT8H<br><b>NOTE:</b><br>The values lesser than PGX_CP_MIN_EVICTABLE_IDLE_TIME will close all the idle connection and create connection to match PGX_CP_MIN_IDLE. | Yes                               | Yes                              | Yes                                  | Yes                                 |
| ENABLE_MATCHING_FOR_GRAPH | It is used to enable or disable matching for the graph.<br>The value for is “true” or “false”.<br>For example,<br>ENABLE_MATCHING_FOR_GRAPH=true                                                                                                                                                                 | Yes                               | Yes                              | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                                                                                                     | Significance                                                                                                                                                                                                                                                                        | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory) | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------|--------------------------------------|-------------------------------------|
| PGX_ZEPPELIN_SCHE<br>DULER_THREADPOO<br>L_SIZE                                                                | Indicates the threadpool size of the PGX interpreter.<br>For example, 200<br><b>NOTE:</b> This parameter can be configured after applying this patch 36752689 (v8.1.2.7.2) only.                                                                                                    | No                                | No                               | No                                   | No                                  |
| <b>Datasource Details</b>                                                                                     |                                                                                                                                                                                                                                                                                     |                                   |                                  |                                      |                                     |
| AUDIT_DATASOURCE_<br>NAME                                                                                     | Indicates the datasource name which points to the database schema where IHub audit log is saved.<br>For example, GS is the datasource name which points to the Graph Schema.<br><b>NOTE:</b> This parameter can be configured after applying this patch 36752689 (v8.1.2.7.2) only. | No                                | No                               | No                                   | No                                  |
| <b>Quantifind Details</b>                                                                                     |                                                                                                                                                                                                                                                                                     |                                   |                                  |                                      |                                     |
| The following parameters are related to Quantifind Integration with Investigation Hub and these are optional. |                                                                                                                                                                                                                                                                                     |                                   |                                  |                                      |                                     |
| ENABLE_QUANTIFIND                                                                                             | It is used to enable or disable the quantifind integration.<br>The value is “true” or “false”.<br><b>NOTE:</b> This parameter can be configured after applying this patch 36752689 (v8.1.2.7.2) only.                                                                               | No                                | No                               | No                                   | No                                  |

Table 15: config.sh file

| Parameter           | Significance                                                                                                                                                                               | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory) | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------|--------------------------------------|-------------------------------------|
| QUANTIFIND_URL      | Indicates the quantifind API URL.<br>For example, https://testserver.quantifind.com<br><b>NOTE:</b> This parameter can be configured after applying this patch 36752689 (v8.1.2.7.2) only. | No                                | No                               | No                                   | No                                  |
| QUANTIFIND_TOKEN    | Indicates the quantifind API token.<br><b>NOTE:</b> This parameter can be configured after applying this patch 36752689 (v8.1.2.7.2) only.                                                 | No                                | No                               | No                                   | No                                  |
| QUANTIFIND_APPNAME  | Indicates the quantifind App Name.<br><b>NOTE:</b> This parameter can be configured after applying this patch 36752689 (v8.1.2.7.2) only.                                                  | No                                | No                               | No                                   | No                                  |
| HTTPS_PROXY_HOST    | Indicates the proxy host that is used.<br>For example, test-proxyserver.com                                                                                                                | No                                | No                               | No                                   | No                                  |
| HTTPS_PROXY_PORT    | Indicates the proxy port that is used.<br>For example, 80                                                                                                                                  | No                                | No                               | No                                   | No                                  |
| HTTP_PROXY_USER     | Indicates the proxy username used, if there is any.                                                                                                                                        | No                                | No                               | No                                   | No                                  |
| HTTP_PROXY_PASSWORD | Indicates the proxy password used if there is any.                                                                                                                                         | No                                | No                               | No                                   | No                                  |



Table 15: config.sh file

| Parameter                                                                | Significance                                                                                                               | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                      | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| <b>PGX server configuration</b><br>i.e., Interpreter, data memory limits |                                                                                                                            |                                   |                                                                                                                                                                                                                       |                                      |                                     |
| NUM_CACHED_RESULTSET                                                     | Indicates the cached result set.<br>For example, 0                                                                         | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | No                                   | No                                  |
| RESULTSET_EXPIRATION_TIME_SECS                                           | Indicates the Result set expiration time.<br>For example, 3600.                                                            | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | No                                   | No                                  |
| MAX_TOTAL_SHARED_DATA_MEMORY_SIZE                                        | The absolute memory limit of shared data (includes published graphs and pinned non-referenced graphs).<br>For example: 20G | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | No                                   | No                                  |

Table 15: config.sh file

| Parameter                          | Significance                                                                                                                                     | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                      | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| MAX_TOTAL_PRIVATE_DATA_MEMORY_SIZE | The memory limit of private data (includes non-published graphs and PGQL results) relative to the total PGX engine memory limit. For example, 8G | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | No                                   | No                                  |
| MAX_PER_SESSION_DATA_MEMORY_SIZE   | Absolute memory limit for any one session of the PGX engine. For example: 700M                                                                   | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | No                                   | No                                  |
| MAX_DATA_MEMORY_SIZE_DSUSRGRP      | Absolute memory limit for any user of the PGX engine whose role is DSUSRGRP.<br>For example: 2G                                                  | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | No                                   | No                                  |

Table 15: config.sh file

| Parameter                       | Significance                                                                                      | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                      | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|---------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| MAX_DATA_MEMORY_SIZE_DSBATCH    | Absolute memory limit for any user of the PGX engine whose role is DSBATCH.<br>For example: 10G   | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | No                                   | No                                  |
| MAX_DATA_MEMORY_SIZE_DSINTER    | Absolute memory limit for any user of the PGX engine whose role is DSINTER.<br>For example: 5G    | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | No                                   | No                                  |
| MAX_DATA_MEMORY_SIZE_DSAPPROVER | Absolute memory limit for any user of the PGX engine whose role is DSAPPROVER.<br>For example: 5G | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | No                                   | No                                  |

Table 15: config.sh file

| Parameter                   | Significance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                                                                                                                                      | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| MAX_DATA_MEMORY_SIZE_DSUSER | Absolute memory limit for any user of the PGX engine whose role is DSUSER.<br>For example, 5G                                                                                                                                                                                                                                                                                                                                                                                                                     | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | No                                   | No                                  |
| <b>Service URLs</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                   |                                                                                                                                                                                                                       |                                      |                                     |
| PGX_SERVER_URL              | Indicates the URL of the PGX server.<br><b>NOTE:</b><br>If SSL is enabled, the URL should be provided with <b>https</b> . To enable, see the <a href="#">Add the Studio Service (SSL) to PGX Configuration</a> section.<br>If SSL is disabled, the URL should be provided with <b>http</b> .<br>Ensure to provide the correct hostname for the URL of the PGX service.<br>If Legacy Graph (ETL connector job using Hadoop) and Graph Pipeline functionalities are not required, then set the value as <b>NA</b> . | Yes                               | Yes<br>Enter the value of this parameter from the previous version of the Compliance Studio <code>config.sh</code> file. If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly. | No                                   | No                                  |

Table 15: config.sh file

| Parameter                        | Significance                                                                                                                                                                                     | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory) | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------|--------------------------------------|-------------------------------------|
| COMPLIANCE_STUDIO_GATEWAY_ENABLE | <p>True: Indicates the Compliance Studio Gateway is enabled.</p> <p><b>NOTE:</b> This parameter is available only after applying the patch 36537907 (v8.1.2.7.1).</p>                            | Yes                               | Yes                              | Yes                                  | Yes                                 |
| COMPLIANCE_STUDIO_GATEWAY_PORT   | <p>Indicates the Compliance Studio gateway port that is used.</p> <p>For example, 7071.</p> <p><b>NOTE:</b> This parameter is available only after applying the patch 36537907 (v8.1.2.7.1).</p> | Yes                               | Yes                              | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                      | Significance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory) | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------|--------------------------------------|-------------------------------------|
| DATASTUDIO_CSP_FRAME_ANCESTORS | <p>This parameter allows Datastudio UI to be embedded as iFrame in any external application and this controls the allowed origins where datastudio UI can be embedded.</p> <p>In case of ECM-IH integration use case, update the DATASTUDIO_CSP_FRAME_ANCESTORS parameter as follows:</p> <pre>https:// &lt;Hostname&gt;:&lt;Compliance_Studio_Gateway_Port&gt;,http:// &lt;ecm_webserver_hostname&gt;: &lt;ecm_ui_port&gt;</pre> <p>For example,<br/> DATASTUDIO_CSP_FRAME_ANCESTORS=https://testCSserver.oraclevcn.com:7071,http://testECMserver:8019</p> <p><b>NOTE:</b> This parameter is available only after applying the patch 36804828 (v8.1.2.7.3).</p> | Yes                               | Yes                              | Yes                                  | Yes                                 |
| <b>R interpreter settings</b>  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                   |                                  |                                      |                                     |

Table 15: config.sh file

| Parameter                               | Significance                                                                                                                                                                                                                            | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory) | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------|--------------------------------------|-------------------------------------|
| RS_CONF_PATH                            | Absolute path to Rserve.conf file for running Rserve.<br>Example: /scratch/ users/ mmg-studio/ conf/ Rserve.conf<br><b>NOTE:</b><br>If required, then configure the parameter.                                                          | No                                | No                               | No                                   | No                                  |
| RS_KEYSTORE                             | Absolute path for the Keystore file made for Rserve.conf.<br>Example: /scratch/ users/ mmg-studio/ conf/ rinterpreterkeystore<br><b>NOTE:</b><br>If required, then configure the parameter.                                             | No                                | No                               | No                                   | No                                  |
| RS_KS_SECRET                            | Keypass for rinterpreterkeystore Example: Change it. If the target AAI is https, then the certificate of the target machine needs to be imported to the DS Java keystore.<br><b>NOTE:</b><br>If required, then configure the parameter. | No                                | No                               | No                                   | No                                  |
| <b>Additional Environment variables</b> |                                                                                                                                                                                                                                         |                                   |                                  |                                      |                                     |
| LD_LIBRARY_PATH                         | Oracle Instant client path<br>For example: /opt/ oracle/ instantclient_19_8/ :\$LD_LIBRARY_PATH                                                                                                                                         | Yes                               | Yes                              | Yes                                  | Yes                                 |
| <b>Matching Mechanism</b>               |                                                                                                                                                                                                                                         |                                   |                                  |                                      |                                     |

Table 15: config.sh file

| Parameter                         | Significance                                                                                                                                                                                                                                                                                                                                                                                      | Installing with OFSAA (Mandatory)                                      | Upgrading with OFSAA (Mandatory)                                                                             | Installing without OFSAA (Mandatory)            | Upgrading without OFSAA (Mandatory)             |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| MATCHING_MECHANISM                | <p>Indicates the matching mechanism for Entity Resolution and Graph.</p> <p>The values are OS, ES, and OT. Where OS refers to OpenSearch, ES refers to Elastic Search, and OT refers to Candidate Selection with Oracle Text matching.</p> <p><b>NOTE:</b><br/>For <b>MATCHING_MECHANISM = OT</b>, no additional installation/configuration is required as it is part of the Oracle Database.</p> | <p>Yes</p> <p>By default, the value of the parameter is <b>OT</b>.</p> | <p>Yes</p> <p>By default, the value of the parameter is <b>OT</b>.</p>                                       | <p>Yes</p> <p>Enter the value as <b>NA</b>.</p> | <p>Yes</p> <p>Enter the value as <b>NA</b>.</p> |
| <b>OpenSearch Cluster Details</b> |                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                        |                                                                                                              |                                                 |                                                 |
| OPEN_SEARCH_HOSTNAME              | <p>Indicates the hostname of the server where the OpenSearch service is installed.</p> <p><b>NOTE:</b><br/>If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as <b>NA</b>.</p>                                                                                                                                                                         | <p>Yes</p>                                                             | <p>Yes</p> <p>The value of this parameter has to be created newly based on the OpenSearch configuration.</p> | <p>Yes</p>                                      | <p>Yes</p>                                      |
| OPEN_SEARCH_PORT                  | <p>Indicates the port number where the OpenSearch service is installed.</p> <p><b>NOTE:</b><br/>If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as <b>NA</b>.</p>                                                                                                                                                                                    | <p>Yes</p>                                                             | <p>Yes</p> <p>The value of this parameter has to be created newly based on the OpenSearch configuration.</p> | <p>Yes</p>                                      | <p>Yes</p>                                      |



Table 15: config.sh file

| Parameter                           | Significance                                                                                                                                                                                                                                                                                                                                                                                                                                           | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                             | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| OPEN_SEARCH_HAD_OOP_CREDENTIAL_PATH | <p>Indicates the open search hadoop credential path. For information about path, see the <a href="#">Create Credential Keystore for OpenSearch</a> section.</p> <p><b>NOTE:</b><br/> <b>This parameter is deprecated in the current release and will be removed in the future release.</b></p> <p>It is applicable only for legacy ETL. If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as <b>NA</b>.</p> | Yes                               | <p>Yes</p> <p>The value of this parameter has to be created newly based on the OpenSearch configuration.</p> | Yes                                  | Yes                                 |
| OPEN_SEARCH_USER_NAME               | <p>OpenSearch Username (Not Applicable, if https enabled is false and authentication is not supported).</p> <p><b>NOTE:</b><br/>           If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as <b>NA</b>.</p>                                                                                                                                                                                              | Yes                               | <p>Yes</p> <p>The value of this parameter has to be created newly based on the OpenSearch configuration.</p> | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                         | Significance                                                                                                                                                                                                                                                                                                                                                                        | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                             | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| OPEN_SEARCH_ENCRYPTED_PASSWORD    | <p>Encrypted password (Not Applicable, if https enabled is false and authentication is not supported).</p> <p><b>NOTE:</b><br/>To generate an encrypted password, see the <a href="#">Appendix F - Generate an Encrypted Password for OPenSearch</a> section.</p> <p>If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as <b>NA</b>.</p> | Yes                               | <p>Yes</p> <p>The value of this parameter has to be created newly based on the OpenSearch configuration.</p> | Yes                                  | Yes                                 |
| OPEN_SEARCH_HADOOP_PASSWORD_ALIAS | <p>Indicates the password alias for OpenSearch (Not applicable if OS_OPEN_SEARCH_HADOOP_ENABLED is false).</p> <p><b>NOTE:</b><br/><b>This parameter is deprecated in the current release and will be removed in the future release.</b></p> <p>If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as <b>NA</b>.</p>                      | Yes                               | <p>Yes</p> <p>The value of this parameter has to be created newly based on the OpenSearch configuration.</p> | Yes                                  | Yes                                 |

Table 15: config.sh file

| Parameter                       | Significance                                                                                                                                                                                                                                                           | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                  | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| OPEN_SEARCH_HTTPS_ENABLED       | True (If OS is https enabled, else false).<br><b>NOTE:</b><br>If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as <b>false</b> .                                                                                           | Yes                               | Yes<br>The value of this parameter has to be created newly based on the OpenSearch configuration. | Yes                                  | Yes                                 |
| OPEN_SEARCH_TRUSTSTORE_FILENAME | The filename of the OpenSearch keystore that contains the certificates of OS host to trust (Not Applicable, if https enabled is false).<br><b>NOTE:</b><br>If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as <b>NA</b> . | Yes                               | Yes<br>The value of this parameter has to be created newly based on the OpenSearch configuration. | Yes                                  | Yes                                 |
| OPEN_SEARCH_TRUSTSTORE_SECRET   | The password of the OpenSearch keystore file. (Not Applicable, if https enabled is false).<br><b>NOTE:</b><br>If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as <b>NA</b> .                                              | Yes                               | Yes<br>The value of this parameter has to be created newly based on the OpenSearch configuration. | Yes                                  | Yes                                 |

**Table 15: config.sh file**

| Parameter                                                                                                                                                              | Significance                                                                                                                                                                                                                                                                                                                                                                                                         | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory)                                                                             | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|
| OPEN_SEARCH_KEYS<br>TORE_HADOOP_CREDENTIAL_ALIAS                                                                                                                       | <p>Indicates the password alias for OpenSearch (Not applicable if OS_OPEN_SEARCH_HTPS_ENABLED is false).</p> <p><b>NOTE:</b><br/><b>This parameter is deprecated in the current release and will be removed in the future release.</b></p> <p>It is applicable only for legacy ETL. If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as <b>NA</b>.</p>                   | Yes                               | <p>Yes</p> <p>The value of this parameter has to be created newly based on the OpenSearch configuration.</p> | Yes                                  | Yes                                 |
| <p><b>Additional MMG Configuration</b></p> <p>Configuration is not required for these DATACATALOG_SERVICE_URL, SPARK_HOME, EST_ENABLED, and EST_UI_URL parameters.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   |                                                                                                              |                                      |                                     |
| <b>All Services</b>                                                                                                                                                    | <p>Set the value of the parameter, DEPLOY_ALL_SERVICE, as :</p> <p><b>true</b> for starting all services<br/><b>false</b> for starting selected services.</p> <p>Example: Compliance Studio independent of OFSAA: set "false" for service(s): entity resolution, matching service, and load-to-open Compliance Studio lite: set "false" for service(s): fcc-pgql, fcc-pgx-algorithm, fcc-pgx-java and pgx-server</p> |                                   |                                                                                                              |                                      |                                     |

Table 15: config.sh file

| Parameter                     | Significance                                    | Installing with OFSAA (Mandatory) | Upgrading with OFSAA (Mandatory) | Installing without OFSAA (Mandatory) | Upgrading without OFSAA (Mandatory) |
|-------------------------------|-------------------------------------------------|-----------------------------------|----------------------------------|--------------------------------------|-------------------------------------|
| DEPLOY_ALL_SERVICE            | True: Indicates that all services are deployed. | Yes                               | Yes                              | Yes                                  | Yes                                 |
| <b>Services</b>               |                                                 |                                   |                                  |                                      |                                     |
| METASERVICE_ENABLED           | True: Indicates that the service is enabled.    | Yes                               | Yes                              | Yes                                  | Yes                                 |
| BATCHSERVICE_ENABLED          | True: Indicates that the service is enabled.    | Yes                               | Yes                              | Yes                                  | Yes                                 |
| GRAPH_SERVICE_ENABLED         | True: Indicates that the service is enabled.    | Yes                               | Yes                              | Yes                                  | Yes                                 |
| FCC_UI_ENABLED                | True: Indicates that the service is enabled.    | Yes                               | Yes                              | Yes                                  | Yes                                 |
| CANDIDATE_SELECTION_ENABLED   | True: Indicates that the service is enabled.    | Yes                               | Yes                              | Yes                                  | Yes                                 |
| FCC_PYTHON_ENABLED            | True: Indicates that the service is enabled.    | Yes                               | Yes                              | Yes                                  | Yes                                 |
| JDBC_ENABLED                  | True: Indicates that the service is enabled.    | Yes                               | Yes                              | Yes                                  | Yes                                 |
| PGX_ENABLED                   | True: Indicates that the service is enabled.    | Yes                               | Yes                              | Yes                                  | Yes                                 |
| ENTITY_RESOLUTION_ENABLED     | True: Indicates that the service is enabled.    | Yes                               | Yes                              | Yes                                  | Yes                                 |
| MATCHING_SERVICE_ENABLED      | True: Indicates that the service is enabled.    | Yes                               | Yes                              | Yes                                  | Yes                                 |
| LOAD_TO_OPEN_SEQUENCE_ENABLED | True: Indicates that the service is enabled.    | Yes                               | Yes                              | Yes                                  | Yes                                 |
| MMG_SERVICE_ENABLED           | True: Indicates that the service is enabled.    | Yes                               | Yes                              | Yes                                  | Yes                                 |

## 4.13 User Provisioning

**NOTE** **Prerequisites:** Apply the patch (36537907) to enable this functionality. Pre-configure the REALM type as SAML for authentication.

The User Provisioning feature enables users and groups to be provisioned to Compliance Studio using REALM type. The types are:

- SAML for Authentication and AAI for Authorization
- SAML for Authentication and SAML for Authorization

### 4.13.1 SAML for Authentication and AAI for Authorization

If the REALM type is selected as **SAML for authentication and AAI for authorization**, configure these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory.
2. Open the `config.sh` file and set the parameters as described in the [Table 16](#).

**NOTE** For parameter description, see the [Configure the config.sh File](#) section.

**Table 16: Parameters of config.sh file**

| Parameter           | Value                                                                                                                                    |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| AUTH_REALM          | SAML<br><b>NOTE:</b><br>This parameter is mandatory.                                                                                     |
| SAML_DESTINATION    | Provide the IDCS-SSO URL.<br><b>NOTE:</b><br>This parameter is mandatory.                                                                |
| SAML_ROLE_ATTRIBUTE | Provide the group name.<br><b>NOTE:</b><br>This parameter is mandatory.                                                                  |
| SAML_LOGOUT_URL     | Provide the IDCS-SLO URL.<br><b>NOTE:</b><br>This parameter is mandatory.                                                                |
| AAI_URL             | The value will be BD/ECM application where the USER-GROUP map/authentication is present.<br><b>NOTE:</b><br>This parameter is mandatory. |

3. Reinstall Compliance Studio.
4. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-ui/conf` directory.

5. Open the `application.properties` file and add the following lines at the last:

```
#Fetching User-Groups from AAI using Bearer Token
```

```
aai.client.id=#client#
```

```
aai.client.secret=#secret#
```

```
aai.enable.fetchgroups=#true#/#false#
```

6. Replace the placeholder value as described in the [Table 17](#).

**Table 17: Parameter of application.properties file**

| Parameter              | Value                                                                                                                                          |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| aai.client.id          | Provide Instance Name (STP_ACC_NM) of the Bearer Token. To get the instance name, see the <a href="#">Generating the Bearer Token</a> section. |
| aai.client.secret      | Provide the Bearer token (STP_ACC_TKN). To get the secret, see the <a href="#">Generating the Bearer Token</a> section.                        |
| aai.enable.fetchgroups | Set the value as true for AAI authorization                                                                                                    |
| aai.auth.url           | Provide the AAI_URL.                                                                                                                           |

7. Perform [Step 5](#) and [Step 6](#) in `application.properties` file in the below location to take care of configuration whenever reinstall is required.

```
<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/mmg-ui/conf
```

8. Restart Compliance Studio.

## 4.13.2 SAML for Authentication and SAML for Authorization

If the REALM type is selected as **SAML for authentication and SAML for authorization**, configure these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory.
2. Open the `config.sh` file and set the parameters as described in the [Table 18](#).

**NOTE** For parameter description, see the [Configure the config.sh File](#) section.

**Table 18: Parameters of config.sh file**

| Parameter           | Value                     |
|---------------------|---------------------------|
| AUTH_REALM          | SAML                      |
| SAML_DESTINATION    | Provide the IDCS-SSO URL. |
| SAML_ROLE_ATTRIBUTE | Provide the group name.   |
| SAML_LOGOUT_URL     | Provide the IDCS-SLO URL. |

3. Reinstall Compliance Studio.
4. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-ui/conf` directory.
5. Open the `application.properties` file and add the following lines at the last:  

```
#Fetching User-Groups from AAI using Bearer Token
```

```
aai.client.id=#client#
```

```
aai.client.secret=#secret#
```

```
aai.enable.fetchgroups=#true#/#false#
```

6. Replace the placeholder value as described in the [Table 19](#).

**Table 19: Parameter of application.properties file**

| Parameter              | Value                                                                                         |
|------------------------|-----------------------------------------------------------------------------------------------|
| aai.client.id          | Retain the placeholder as it is                                                               |
| aai.client.secret      | Retain the placeholder as it is                                                               |
| aai.enable.fetchgroups | Set the value as false for SAML authorization<br><b>NOTE:</b><br>This parameter is mandatory. |

7. Perform [Step 5](#) and [Step 6](#) in `application.properties` file in the below location to take care of configuration whenever reinstall is required.

```
<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/mmg-ui/conf
```

8. Restart Compliance Studio.

### 4.13.3 Generating the Bearer Token

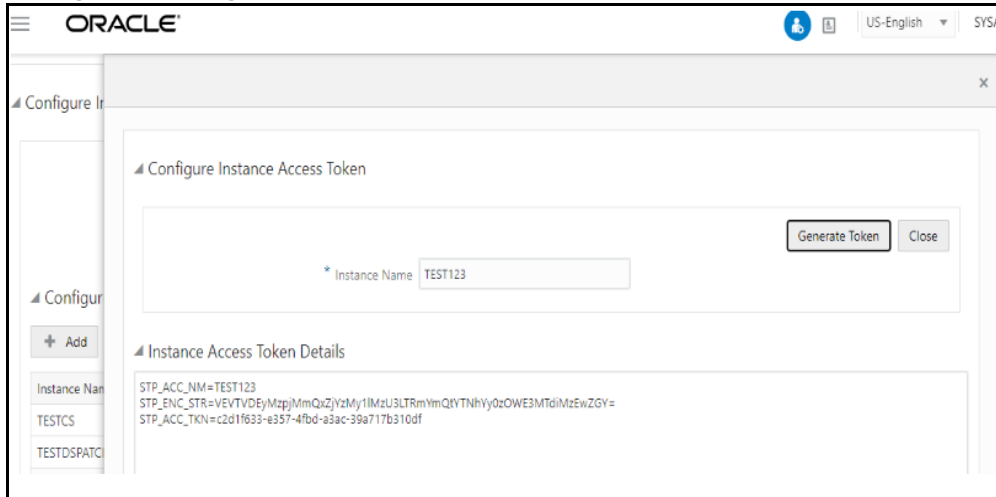
Bearer Token is required to configure the Compliance Studio for authentication and authorization.

To generate the bearer token, follow these steps:

1. Login to the BD/ECM application as **sysadmin**.
2. Select **Configure Instance Access Token** from the **System Configuration**.
3. Click **Add**. The Configure Instance Access Token window is displayed.



**Figure 8: Configure Instance Access Token**



4. Provide the **Instance Name**.
5. Click **Generate token**. The Configure Instance Access Token Details are displayed.
6. Copy the **STP\_ACC\_NM** and **STP\_ACC\_TKN** for configuration.
7. Click **Close** to exit the screen.

## 4.14 Run the Compliance Studio Installer

This section provides the install, reinstall, start, restart and stop of the services.

The Compliance Studio application is installed with or without OFSAA, depending on the configuration provided in the `config.sh` file. The Compliance Studio application and all the interpreters are started.

After completing the Compliance Studio installation, the script displays a URL that can be used to access the Compliance Studio Application.

### 4.14.1 Installing for first time

For first-time installation, you can pass argument `'-i'` or `'--install'`.

To run the Compliance Studio installer, follow these steps:

1. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory.
2. Run the following command with a Linux user where Compliance Studio is installed:

```
./compliance-studio.sh -i
```

Or

```
./compliance-studio.sh --install
```

This will copy the whole compliance studio into the folder 'deployed' and then replaces the placeholders. Now, you can start Compliance Studio.

- NOTE**
- Run these commands only from  
`<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin.`
  - It should not be run  
from `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/  
bin.`
  - Upon executing `./compliance-studio.sh -i` command. A  
deployed folder is created that copies all the folders. And replaces  
placeholders inside the deployed folder.

Congratulations! Your installation is complete.

- NOTE**
- For any help on installation commands, Run
- ```
./compliance-studio.sh --help
```

4.14.2 Starting Compliance Studio

- NOTE**
- If any service fails to start, you need to wait 10 minutes to see the log file for the failure reason. After 20 minutes, the console will display the message as “Compliance Studio may have partially initiated or has encountered a startup failure,” in meantime you should not stop any activities.

- Switch to the Compliance Studio UNIX user home directory and run the user profile.
- Switch to Compliance Studio installed bin directory and run the following command:

```
./compliance-studio.sh --start
```

This will start the application and, on successful installation, will make the sensitive details blank in `config.sh`.

- NOTE**
- If any of the services are not started/running and failed due to lock, perform the following:
1. Log in to Studio schema.
 2. Run the following command to Truncate tables:

```
TRUNCATE TABLE DATABASECHANGELOGLOCK;  
TRUNCATE TABLE DATABASECHANGELOGLOCK_MMG;
```
 3. Log in to BD/ECM schema.
 4. Run the following command to Truncate tables:

```
TRUNCATE TABLE DATABASECHANGELOGLOCK;
```
 5. Start the Compliance Studio.

4.14.3 Stopping Compliance Studio

To stop the application, you can run pass argument '-k' or '--stop'. Example:

```
./compliance-studio.sh --stop
```

4.14.4 Restarting Compliance Studio

To restart the application, you can run pass argument '-r' or '--restart'. Example:

```
./compliance-studio.sh --restart
```

4.14.5 Reinstalling Compliance Studio

NOTE Reinstalling Compliance Studio removes the value of SSO_TOKEN from the NEXTGENEMF_CONFIG table in the Studio Schema. After reinstallation is completed, replace value in the table manually and then start Compliance Studio.

In case if you need to reinstall compliance Studio due to the wrong configuration or need to update configuration details. Then:

- Stop the Compliance Studio
- Update the `config.sh` file. Do not forget to reconfigure the sensitive details which were removed earlier.

To restart the application, you can run pass argument '-R' or '--reinstall'. Example:

```
./compliance-studio.sh --reinstall
```

Once reinstallation is done, you can start the application.

4.15 Generate the graph-keystore.p12 File

NOTE Before creating the `graph-keystore.p12` file, ensure that the graph service is up and running.

To generate the `graph-keystore.p12` file, follow these steps;

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-load-to-graph/graph-service/utility/bin` directory.
2. Execute the following command:

```
./CreatePasswordlessKeystore.sh
```
3. You need to enter the following values:
 - a. **Wallet Alias:** Enter the wallet alias of graph schema.
 - b. **Password:** Enter the graph schema password.
 - c. **Keystore Alias:** Enter an alias name for keystore.
4. The `graph-keystore.p12` file is generated and available in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-load-to-graph/graph-service/conf` directory.

5. Copy the `graph-keystore.p12` file and place in the `<PGX_HOME>/pgx/pgx-server/conf` directory.

- NOTE**
- If you do not have any graph schema then create an empty file with a name “`graph-keystore.p12`” and place it in the `<PGX_HOME>/pgx/pgx-server/deployed/conf` directory.
 - The path where the `pgx-server-<version>.zip` file is unzipped is referred to as `<PGX_HOME>`.
 - If you are updating credentials then copy the updated `graph-keystore.p12` file and place in the `<PGX_HOME>/pgx/pgx-server/conf` directory.

4.16 Configure the PGX Service

- NOTE** PGX service can be configured on the same server where Compliance Studio is installed or on a different server.

To install PGX service, follow these steps:

- NOTE** If you are using a Graph pipeline, skip [Step 4](#), [Step 5](#), and [Step 6](#). This is applicable only in the case of legacy Graph ETL, which requires a Big Data cluster.

1. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/pgx/pgx-server/` directory.
2. Perform the following:
 - If PGX service is to be installed on the same server where Compliance Studio is installed, extract the `pgx-server-<version>.zip` file.
 - If PGX service is to be installed on a different server, follow these steps:
 - Copy the `pgx-server-<version>.zip` file to the PGX server.
 - Extract the `pgx-server-<version>.zip` file.

- NOTE** The path where the `pgx-server-<version>.zip` file is unzipped and it is referred to as `<PGX_HOME>`.

3. Navigate to the `<PGX_HOME>/pgx-server/conf` directory and copy the following files:
 - `studio_server.p12` file, for more information where to obtain this file, see the [Generate Compliance Studio Server SSL Configuration Mandatory File](#) section.
 - `graph-keystore.p12` file, for more information where to obtain this file, see the [Generate the graph-keystore.p12 File](#) section.

- `public.key` file, for more information where to obtain this file, see the Generate the Public and Private Keys section.

NOTE

If applicable, configure the following properties.

In the `server.conf` file, configure the following properties:

- **`enable_tls: false`**
- **`enable_client_authentication: false`**
- **The property value is true by default, which means that the SSL certificate is enabled and recommended. Change to false only if you do not have the SSL certificate enabled.**

4. Replace the following Kerberos Files in the `<PGX_HOME>/pgx-server/conf/kerberos` directory:

`krb5.conf`

keytab file name as mentioned in the `config.sh` file.

NOTE

This step is deprecated in the current release and will be removed in the future release.

For upgrade scenario: Use files from the previous version of CS.

5. Replace the following Hadoop configuration files in the `<PGX_HOME>/pgx-server/conf/hadoop_cluster` directory:

- `core-site.xml`
- `hadoop-env.sh`
- `hdfs-site.xml`
- `log4j.properties`
- `ssl-client.xml`
- `topology.map`
- `topology.py`
- `hive-site.xml`
- `yarn-site.xml`
- `redaction-rules.json`
- `hive-env.sh`
- `mapred-site.xml`

For additional jars, see [Appendix C – Additional Jars – PGX](#) section. Contact your administrator to get the files.

NOTE

This step is deprecated in the current release and will be removed in the future release.

For upgrade scenario: Use files from the previous version of CS.

6. Copy all the obtained jars into <PGX_HOME>/pgx-server/conf/hdfs_libs directory.

NOTE This step is deprecated in the current release and will be removed in the future release.

For upgrade scenario: Use files from the previous version of CS.

7. Navigate to the <PGX_HOME>/pgx-server/bin directory and configure the config.sh file as described in the [Table 20](#).

Table 20: Config.sh file for PGX

Interaction Variable Name	Significance
PGX Server Memory Configuration	
PGX_SERVER_OFF_HEAP_MB	Indicates the maximum off-heap memory size in megabytes (mainly used for storing graphs except for their string properties) that PGX tries to respect. Recommended Value: 42% of the PGX server memory limit size above.
PGX_SERVER_ON_HEAP_MB	Indicates the maximum and minimum heap memory size (mainly used for storing graphs' string properties) for the Java process of PGX. Recommended Value: 58% of the PGX server memory limit size above.
PGX_SERVER_YOUNG_SPACE_MB	Indicates the amount of young space (new space) configured for the java heap.
External Service Configuration	
GRAPH_SERVICE_URL	It indicates external service configuration where the Graph service is available. For example, https://<Compliance Studio fully qualified hostname>:7059/graph-service
GRAPH_KEYSTORE_PASSWORD	Indicates the password of the keystore file, which stores the password of the graph schemas.
PGX SSL Configuration	
PGX_SERVER_SSL_ENABLED	By default, the property value is true which means the SSL certificate is enabled and recommended. NOTE: Change it to false only if you do not required the SSL certificate.
PGX_SERVER_KEYSTORE_ALIAS	It indicates the alias name provided when generating a self-signed server keystore for PGX.
PGX_SERVER_KEYSTORE_FILE_PATH	It indicates the absolute path of the server_keystore.jks file, which is generated during Generating a Self-Signed Server Keystore for PGX.

Table 20: Config.sh file for PGX

Interaction Variable Name	Significance
PGX_SERVER_KEYSTORE_PASSWORD	It Indicates the password created while generating a Self-signed server keystore for PGX.
Advance Configuration	
SHUTDOWN_GRACE_PERIOD	<p>It indicates the grace period in minutes for the graceful shutdown of the PGX Server. To set value, uncomment and set the value.</p> <p>NOTE:</p> <ul style="list-style-type: none"> The value should be an integer. If the value is less than 1, then force shutdown is triggered immediately.

NOTE

- You can generate `graph-keystore.p12` file after starting the Compliance Studio.
- For upgrade scenario:** Enter the value of this parameter from the previous version of Compliance Studio `config.sh` file (PGX service). If you are upgrading from 8.1.2.0.* to CS 8.1.2.7.0, then update this parameter accordingly.

- Navigate to the `<PGX_Installation_Path>/pgx-server/bin` directory and run any one of the following commands:

```
./pgx-server.sh -install
```

Or

```
./pgx-server.sh -i
```

Figure 9: PGX start service

```
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for an explanation.
SLF4J: Actual binding is of type [org.apache.logging.slf4j.Log4jLoggerFactory]
Oct 08, 2021 11:01:34 AM org.apache.coyote.AbstractProtocol init
INFO: Initializing ProtocolHandler ["http-nio-7007"]
Oct 08, 2021 11:01:34 AM org.apache.catalina.core.StandardService startInternal
INFO: Starting service [Tomcat]
Oct 08, 2021 11:01:34 AM org.apache.catalina.core.StandardEngine startInternal
INFO: Starting Servlet engine: [Apache Tomcat/9.0.44]
Oct 08, 2021 11:01:37 AM org.apache.catalina.startup.ContextConfig getDefaultWebXmlFragment
INFO: No global web.xml found
Oct 08, 2021 11:01:54 AM org.apache.jasper.servlet.TldScanner scanJars
INFO: At least one JAR was scanned for TLDs yet contained no TLDs. Enable debug logging for this logger to get unneeded JARs during scanning can improve startup time and JSP compilation time.
SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/tmp/pgx_server7325961773484200210/ROOT/WEB-INF/lib/log4j-slf4j-impl-1.7.12.jar!/org/apache/logging/log4j-core/Log4jLoggerFactory.class]
SLF4J: Found binding in [jar:file:/opt/OFS_COMPLIANCE_STUDIO/pgx-server/bin/pgx-server.jar!/org/apache/logging/log4j-core/Log4jLoggerFactory.class]
SLF4J: Found binding in [jar:file:/opt/OFS_COMPLIANCE_STUDIO/pgx-server/bin/pgx-server.jar!/org/apache/logging/log4j-core/Log4jLoggerFactory.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for an explanation.
SLF4J: Actual binding is of type [org.apache.logging.slf4j.Log4jLoggerFactory]
Oct 08, 2021 11:02:20 AM org.apache.coyote.AbstractProtocol start
INFO: Starting ProtocolHandler ["http-nio-7007"]
```

- Start the PGX service.

To start the PGX service, follow these steps:

- Navigate to the path where the PGX service is installed.
- Navigate to the following directory where the start service for PGX is located:

```
<PGX_Installation_Path>/pgx-server/bin
```

- Run any one of the following commands:

```
./pgx-server.sh --start
```

Or

```
./pgx-server.sh -s
```

10. Stop the PGX service.

To stop the PGX service, run any one of the following commands:

```
./pgx-server.sh --stop
```

Or

```
./pgx-server.sh -k
```

11. Force stop the PGX service.

To force stop the PGX service, run any one of the following commands:

```
./pgx-server.sh --force-stop
```

Or

```
./pgx-server.sh -f
```

12. Restart the PGX service.

13. Reinstall the PGX service.

To reinstall the PGX service, run any one of the following commands:

```
./pgx-server.sh -reinstall
```

Or

```
./pgx-server.sh -R
```

4.17 Generating Certificate for PGX Server

We recommend getting a certificate issued by a certificate authority (CA), which is trusted by your organization for the Linux server where the PGX server will be installed. If a CA certificate is not available, then generate it. To generate the certificate for PGX Server, see the Generating a Self-Signed Server Keystore section.

4.17.1 Generating a Self-Signed Server Keystore

To generate a self-signed server keystore by executing the following command:

1. `keytool -genkey -alias pgx -keyalg RSA -keystore server_keystore.jks`
2. Provide the requested details.

For example:

Enter keystore password:

Re-enter new password:

What is your first and last name?

[Unknown]: my.hostname.domain.com

What is the name of your organizational unit?

[Unknown]: OU

What is the name of your organization?

[Unknown]: MyOrganization

What is the name of your City or Locality?

[Unknown]: MyTown

What is the name of your State or Province?

[Unknown]: MyState

What is the two-letter country code for this unit?

[Unknown]: US

Is CN= my.hostname.domain.com, OU=OU, O=MyOrganization, L=MyTown, ST=MyState, C=US correct?

[no]: yes

4.17.2 Configuring PGX Server

Users need to update `config.sh` file for configuring the PGX server. For more information, see the [Table 20](#).

4.17.2.1 Trust Compliance Studio's SSL certificate

To trust Compliance Studio's SSL certificate, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/conf` directory.
2. Obtain the Compliance Studio's SSL certificate, "studio_server.p12".
3. Generate the certificate in '.cer' format using "studio_server.p12" by executing the following command:

```
keytool -exportcert -keystore <keystore path> -storepass <keystore password> -storetype PKCS12 -alias studio_server -file <ca_cert_dir>/studio_server.cer
```

4. Import the generated certificate to JAVA CA certs by executing the following command:

```
keytool -importcert -keystore $JAVA_HOME/lib/security/cacerts -storepass changeit -alias studio_server -file <ca_cert_dir>/studio_server.cer
```

NOTE

Replace `<keystore path>` with the absolute path of "studio_server.p12" and replace `<ca_cert_dir>` with the directory where studio_server.cer should be generated.

4.17.3 Configuring Compliance Studio Server

Users need to trust PGX Server's certificate for configuring the Compliance Studio server.

4.17.3.1 Trust PGX Server's certificate

To trust PGX Server's certificate, follow these steps:

1. Copy the "ca_certificate.pem" from the PGX server to the Compliance Studio server.
2. Import the copied certificate to the java ca certs by executing the following command:

```
keytool -import -trustcacerts -keystore $JAVA_HOME/lib/security/cacerts  
-storepass changeit -alias pgx -file /path/of/ca_certificate.pem -  
noprompt
```

NOTE Replace /path/of/ca_certificate.pem " with the path where the certificate is copied.

3. If the PGX server keystore is generated, copy the "server_keystore.jks" from the PGX server to the Compliance Studio server.
4. Import the copied keystore to the java ca certs by executing the following command:

```
keytool -importkeystore -srckeystore /path/of/server_keystore.jks -  
destkeystore $JAVA_HOME/lib/security/cacerts -deststorepass changeit -  
srcstorepass <keystore password> -noprompt
```

NOTE Replace <keystore password> with the password generated while creating the pgx server keystore.

5. Update the PGX URL to set it as "https" using the following steps:
 - a. Navigate to <COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin directory.
 - b. Open the config.sh file and update the "PGX_SERVER_URL" as https://<FQDN of PGX Server>:7007
 - c. Reinstall Compliance Studio.

OR

To Update the PGX URL in an alternative way as follows:

- a. Navigate to <COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-load-to-graph/graph-service/conf directory.
 - b. Open the application.yml and update the PGX_SERVER_URL.
 - c. Navigate to <COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/server/builtin/interpreters directory.
 - d. Open the pgx.json and update the PGX URL in the pgx interpreter's JSON file.
6. Restart Compliance Studio.

4.18 Run ER in different workspaces

1. The ER Data Schema and Compliance Studio Schema should be in the same wallet. For more information on how to create a wallet, see [Create a wallet for ER/FSDf schema](#) section.
2. Update the following details for ER schema in the resources.xml file. The file can be found in: <COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/ficdb/conf.

Example:

```
<Resource
    id="ER2_CSA_ABCD"
    name="jdbc/erdataschema"
    auth="Container"
    type="javax.sql.DataSource"
    driverClassName="oracle.jdbc.OracleDriver"
    url="jdbc:oracle:thin:@ER2_CSA_ABCD"
    connectionProperties= "oracle.net.wallet_location
=<WALLET_PATH/ABCD>;
oracle.net.tns_admin=<WALLET_PATH/ABCD>;"
    maxTotal="5"
    maxIdle="0"
    maxWaitMillis="-1" >
</Resource>
```

NOTE Log in as either an SYS user or DBA user and grant these permissions to the ER schema created.

3. Ensure that the pre-staging and output tables are present in the given ER Data Schema.
 - a. The following are the pre-staging table names by version:
 - i. **FSDf 81270:**
 - STG_PARTY_MASTER_PRE
 - STG_PARTY_DETAILS_PRE
 - STG_DELETED_PARTIES_PRE
 - STG_CUSTOMER_IDENTIFCTN_DOC_PRE
 - STG_ADDRESS_MASTER_PRE
 - STG_PARTY_ADDRESS_MAP_PRE
 - STG_PARTY_PHONE_MAP_PRE
 - STG_PARTY_EMAIL_MAP_PRE
 - FCC_ER_MAPPING
 - FCC_ER_MANUAL_MAPPING
 - b. The following are the output table names by version:
 - ii. **FSDf 81270:**
 - STG_PARTY_MASTER
 - STG_PARTY_DETAILS
 - STG_PARTY_EMAIL_MAP

- STG_ADDRESS_MASTER
- STG_PARTY_ADDRESS_MAP
- STG_PARTY_PHONE_MAP
- STG_CUSTOMER_IDENTIFCTN_DOC
- FCC_ER_MAPPING
- FCC_ER_OUTPUT

5 Post-installation Steps when OFSAA is installed

On successful installation of Compliance Studio, you must perform the following post-installation configurations.

ATTENTION For the utility shell script and patch for [Security Alert CVE-2021-44228](#), see [Appendix E – Apache Log4j Security Alert CVE-2021-44228 Patch Details](#) section.

Topics:

- [Verify the Installation](#)
- [Access the Compliance Studio Application when Gateway is Disabled](#)
- [Access the Compliance Studio Application when Gateway is Enabled](#)
- [Perform the OFSAA Configuration for Batch Execution](#)
- [Configure and Run Published Notebooks](#)
- [Importing OOB Graph Definition and related Metadata](#)
- [Additional Grants for Graph Schema](#)
- [Registering the Conda Environment](#)
- [Configuring Transliteration](#)
- [Creating the Thesaurus](#)

NOTE Before running the post-installation steps, an SSH connection to the Big Data server must be configured.

5.1 Verify the Installation

To verify the Compliance Studio installation with OFSAA, check the log files in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/logs` directory. If all the servers are up and running, it indicates that the installation is complete.

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

If the installation of Compliance Studio is unsuccessful, you must reinstall the application after performing the cleanup tasks. For more information, see [Reinstalling Compliance Studio](#).

5.2 Access the Compliance Studio Application when Gateway is Disabled

To access the Compliance Studio UI when gateway is disabled, follow these steps:

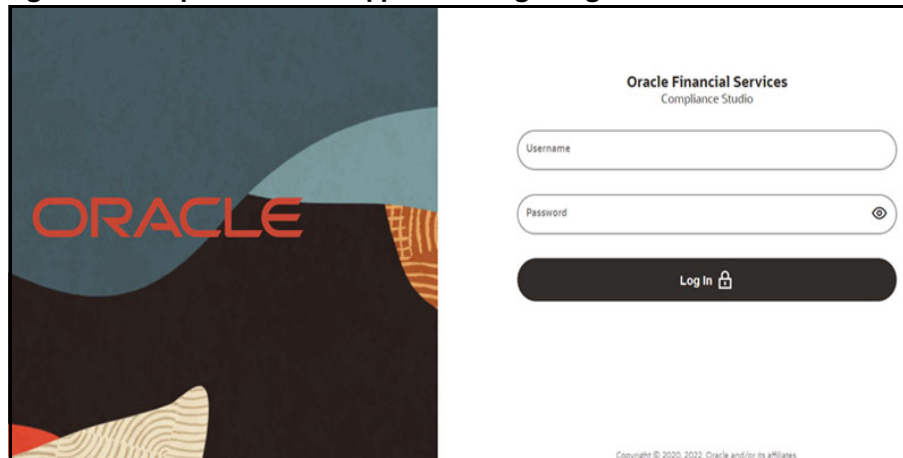
1. Enter the URL in the following format in the web browser:

```
https://<Host_Name>:<Port_Number>/cs/home
```

Here `<Port_Number>` is 7001 for the Compliance Studio application installed on-premise.

The Compliance Studio application login page is displayed.

Figure 10: Compliance Studio Application Login Page



2. Enter the Username and Password.

For Creating Users, Groups, and Mappings in AAI. See [Appendix E – Create Users, Groups, and Mappings](#) section.

3. Click **Login**.

After you access the application, you can view the ready-to-use notebooks. To check if you have been assigned any roles, create a notebook. If you cannot create a notebook, contact [My Oracle Support \(MOS\)](#).

5.3 Access the Compliance Studio Application when Gateway is Enabled

ATTENTION

- **Prerequisites:** Apply the patch 36537907 (v8.1.2.7.1) to enable this functionality.
- This section is not applicable after applied this patch 36804828 (v8.1.2.7.3).

The Compliance Studio Gateway serves as the central routing point for accessing the UI, ensuring a consistent origin for the Compliance Studio UIs. The introduction of the gateway addresses the security risks and inconsistencies by centralizing access and enhancing security.

This implementation, achieved via Spring Cloud Gateway, consolidates all UI access through a single port. By doing so, the gateway enforces security headers to mitigate clickjacking vulnerabilities. Specifically, it sets the Content Security Policy (CSP) with the frame-ancestors 'self' directive, ensuring that the UI can only be embedded within the same origin.

NOTE

Make sure that `COMPLIANCE_STUDIO_GATEWAY_PORT` and `Datastudio` default port should be opened in the firewall.

To access the Compliance Studio UI when gateway is enabled, follow these steps:

The following steps are mandatory whenever reinstall is triggered in the Compliance Studio.

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-ui/conf` directory.

ATTENTION Make sure that you have taken backup of this `application.properties` file before updating any changes.

2. Open the `application.properties` file and update value for `mmg.datastudio.ui.url` as `https://<hostname>:<Datastudio Port>/cs`.

For example, `https://testserver.com:7008/cs`

3. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-gateway/conf/routes` directory.

ATTENTION Make sure that you have taken backup of this `mmg-routes.csv` file before updating any changes.

4. Open `mmg-routes.csv` file and remove this line
"`datastudio_route,datastudio,cs,https://<Hostname>:<Datastudio Port>/cs/`".
5. **Save** the file.
6. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/conf` directory.

ATTENTION Make sure that you have taken backup of this `application.yml` file before updating any changes.

7. Open the `application.yml` file and update the directives parameter as follows:

```
"frame-ancestors 'self' https://  
<Hostname>:<Compliance_Studio_Gateway_Port>"
```

This parameter allows Datastudio UI to be embedded as iFrame in any external application and this controls the allowed origins where datastudio UI can be embedded.

In case of ECM-IH integration use case, update the directives parameter as follows:

```
"frame-ancestors 'self' https://  
<Hostname>:<Compliance_Studio_Gateway_Port> http://  
<ecm_webserver_hostname>:<ecm_ui_port>"
```

8. Restart Compliance Studio services.

After restart, the Compliance Studio URL will be `https://<Hostname>:<COMPLIANCE_STUDIO_GATEWAY_PORT>/cs/home`.

5.3.1 Configure SAML Authentication

NOTE This section is applicable only when AUTH_REALM is SAML.

To configure SAML Authentication, follow these steps:

1. Navigate to the following directories:

```
<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-ui/conf
```

```
<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/mmg-ui/conf
```

2. Open the `application.properties` file and update port number in the following parameters:

```
saml.auth.sp.entity=https://<Hostname>:<COMPLIANCE_STUDIO_GATEWAY_PORT>/cs
```

```
saml.auth.consumerserviceurl=https://<Hostname>:<COMPLIANCE_STUDIO_GATEWAY_PORT>/cs/home
```

For example,

```
saml.auth.sp.entity=https://<Hostname>:7071/cs
```

```
saml.auth.consumerserviceurl=https://<Hostname>:7071/cs/home
```

3. In IDCS configurations for Compliance Studio UI, update the Assertion consumer URL as `https://<Hostname>:<COMPLIANCE_STUDIO_GATEWAY_PORT>/cs/home`.

For example, Assertion consumer URL: `https://<Hostname>:7071/cs/home`.

NOTE For Datastudio UI, keep the existing configuration as it is.

4. Restart Compliance Studio services.

After restart, the Compliance Studio URL will be `https://<Hostname>:<COMPLIANCE_STUDIO_GATEWAY_PORT>/cs/home`.

5.4 Perform the OFSAA Configuration for Batch Execution

- NOTE**
- This section is deprecated in the current release and will be removed in the future release.
 - This configuration is not applicable for Compliance Studio installed without OFSAA.

To perform OFSAA configuration for batch execution, follow these steps:

1. Copy the files in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/ficdb/bin` directory to the server where the BD or ECM pack is installed and to the `$FIC_DB_HOME/bin` directory of the OFSAA setup.

2. Execute the following command to grant Execute permission to the files:

```
chmod +x <filenames>
```

3. Copy all the files from the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/ficdb/lib` directory into the `$FIC_DB_HOME/lib` directory.

See the [OFS Compliance Studio Administration and Configuration Guide](#) for running Compliance Studio Batches.

5.5 Configure and Run Published Notebooks

NOTE

- This is deprecated in the current release and will be removed in the future release.
- This configuration is not applicable for Compliance Studio installed without OFSAA.

To perform the configuration required to run published notebooks, copy the required `FCCM_Studio_NotebookExecution.sh` file from the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/ficdb/bin` directory into the `<FIC_HOME of OFSAA_Installed_Path>/deployed/ficdb/bin` directory.

For information on running published notebooks, see the Executing Published Notebook section in the [OFS Compliance Studio Administration and Configuration Guide](#).

5.6 Importing OOB Graph Definition and related Metadata

To import the OOB graph definition and related metadata, follow the sections:

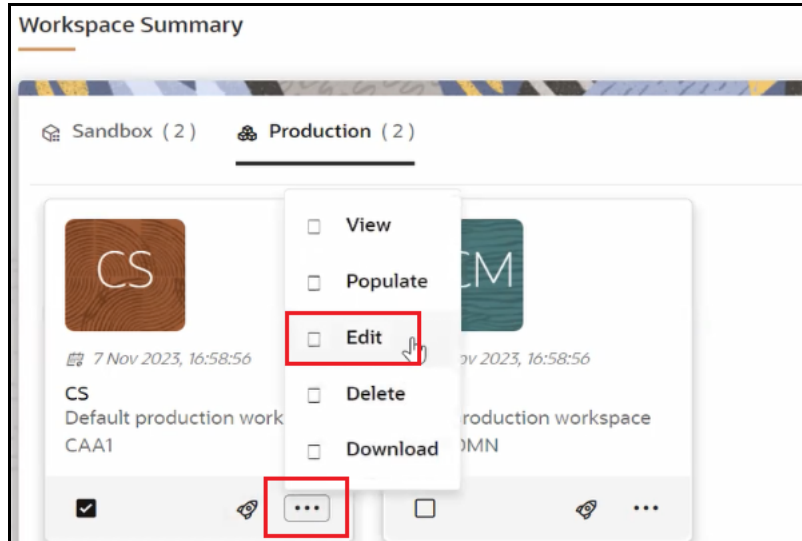
- [Creating the Graph Data Store](#)
- [Importing OOB Graphs](#)
- [Registering Graph Data Store](#)
- [Initializing Metadata Indexes](#)
- [Initializing Schemas](#)
- [Starting OpenSearch](#)
- [Initializing OOB Graph Batch Schedules](#)
- [Creating Passwordless Keystore File](#)
- [Start the PGX Service](#)

5.6.1 Creating the Graph Data Store

To create a data store of the graph, follow these steps:

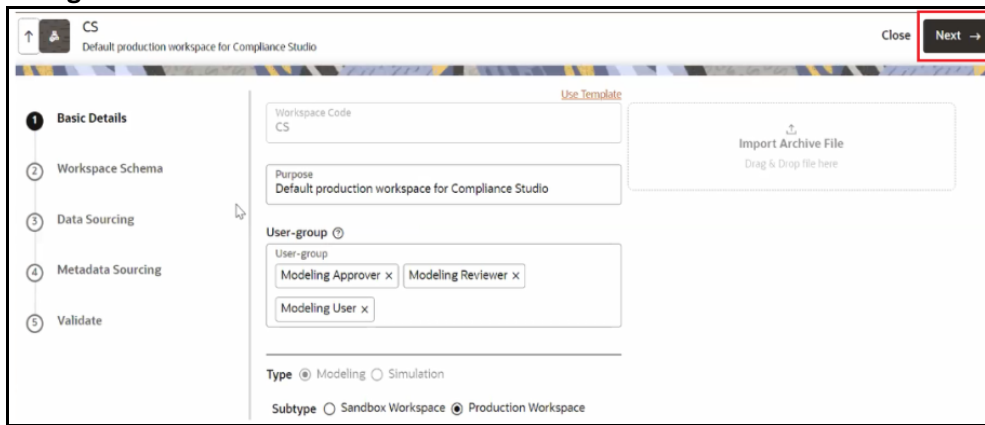
1. Log in to the Compliance Studio UI.

Figure 11: CS Workspace



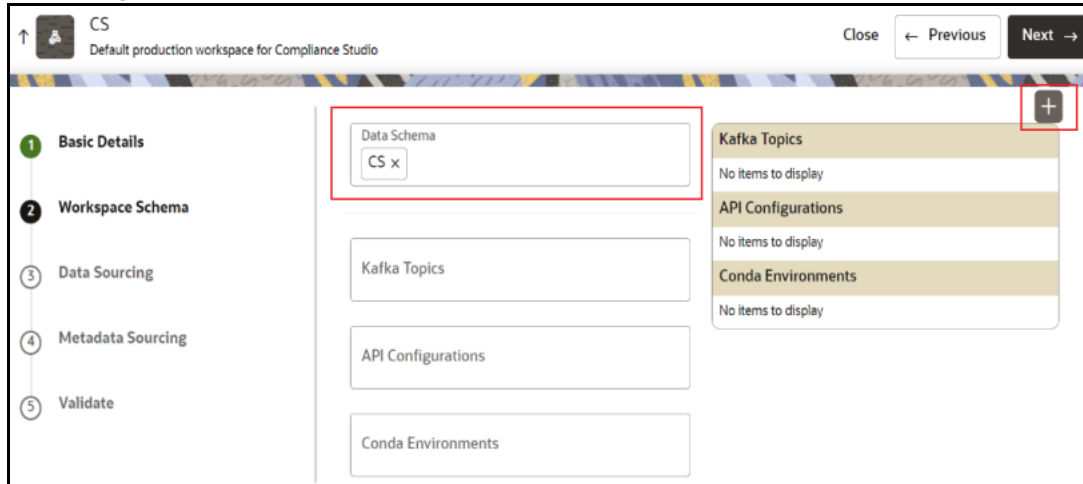
2. On the CS workspace, click the **Action** icon.
3. Click **Edit**. The **Basic Details** pane is displayed.

Figure 12: Basic Details Pane



4. Click **Next**. The **Workspace Schema** pane is displayed.

Figure 13: Workspace Schema Pane



NOTE By default, studio schema is mapped to the workspace and you need to map graph schema and graph data store respectively for using graph functionality.


5. Click **Create Data Store** . The **Add Data Store** pane is displayed.

Figure 14: Add Data Store

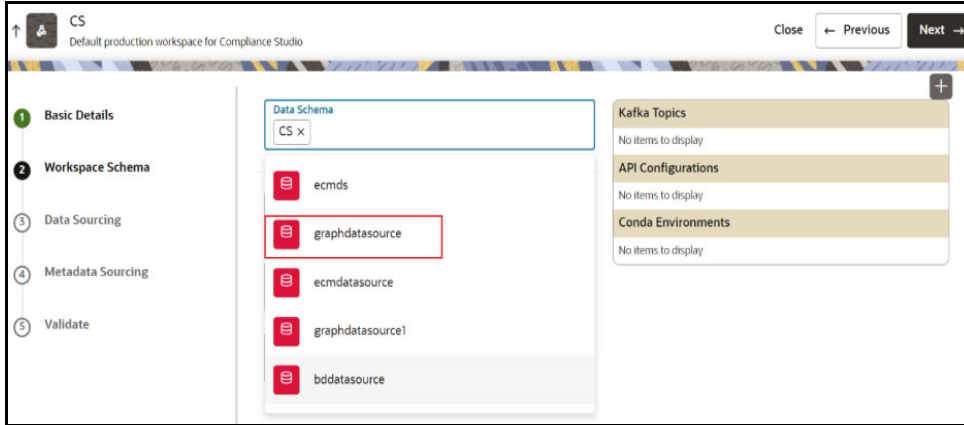
6. Enter the **Name** and **Description** of the data store for the graph.

NOTE Retain default settings in the **File Availability** and **Database Type** drop-down lists.

7. Enter the **Wallet Alias**.
8. Enter the Oracle Database schema name in the **Table Owner**.

9. Click **Test Connection**.
A **Success** confirmation message is displayed.
10. Click **Create**. The Data Store is saved successfully.

Figure 15: Data Schema Drop-down List



11. Select graph data store from the **Data Schema** drop-down list.
12. Click **Next**. The **Data Sourcing** pane is displayed.
13. Click **Next**. The **Metadata Sourcing** pane is displayed.
14. Click **Update**. The data store for the graph is updated successfully in the CS workspace.
15. Click **Close** to exit the process.

5.6.1.1 Creating Data Store for OOB graphs

If users are planning to use the OOB graph "FINANCIAL_CRIME_GLOBAL_GRAPH" based on the ECM data model or "FINANCIAL_CRIME_GLOBAL_GRAPH_BEHAVIOUR_DETECTION" based on the BD data model, then create the additional data store.

For "FINANCIAL_CRIME_GLOBAL_GRAPH," create the additional data store for ECM's Atomic Schema. This will be required later in the schedule part. To create additional data store, see the [Creating the Graph Data Store](#) section.

For "FINANCIAL_CRIME_GLOBAL_GRAPH_BEHAVIOUR_DETECTION," create the additional data store for BD's Atomic Schema. This will be required later in the schedule part. To create additional data store, see the [Creating the Graph Data Store](#) section.

NOTE This is not applicable in case of v81250.

5.6.2 Importing OOB Graphs

- NOTE**
- If you want to import both graphs, execute the following command:
`./importGraph.sh`
 - If you need any help about graphs, execute the following command:
`./importGraph.sh -h`

To import OOB graphs, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/ficdb/graph-metadata/bin` directory.
2. If **ENABLE_MATCHING_FOR_GRAPH** parameter is set to “false” in the `config.sh` file, then import the graph as follows:
 - a. If you are importing "FINANCIAL_CRIME_GLOBAL_GRAPH_BEHAVIOUR_DETECTION" OOB graph, then execute the following command:

```
./importGraph.sh -b
```
 - b. If you are importing "FINANCIAL_CRIME_GLOBAL_GRAPH" OOB graph, then execute the following command:

```
./importGraph.sh -e
```
3. If **ENABLE_MATCHING_FOR_GRAPH** parameter is set to “true” in the `config.sh` file, then import the graph as follows:
 - a. If you are importing "FINANCIAL_CRIME_GLOBAL_GRAPH_BEHAVIOUR_DETECTION" OOB graph with matching component enabled, then execute the following command:

```
./importGraph.sh -b
```

(OR)

If you are importing "FINANCIAL_CRIME_GLOBAL_GRAPH_BEHAVIOUR_DETECTION" OOB graph with matching component disabled, then execute the following command:

```
./importGraph.sh -b -sm
```
 - b. If you are importing "FINANCIAL_CRIME_GLOBAL_GRAPH" OOB graph with matching component enabled, then execute the following command:

```
./importGraph.sh -e
```

(OR)

If you are importing "FINANCIAL_CRIME_GLOBAL_GRAPH" OOB graph with matching component disabled, then execute the following command:

```
./importGraph.sh -e -sm
```

NOTE If you want to import both graphs with matching component disabled, execute the following command:

```
./importGraph.sh -sm
```

The OOB graphs are imported to the Compliance Studio UI.

5.6.2.1 Importing OOB Graphs through Compliance Studio UI

NOTE This section is optional.

Users can also import OOB graphs through Compliance Studio UI as well.

To import OOB graph through Compliance Studio UI, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/ficdb/graph-metadata/graph` directory.

2. Download zip file from the ECM and BD folders.

NOTE

- If **ENABLE_MATCHING_FOR_GRAPH** parameter is set to “true” in the **config.sh** file, then navigate to the “with_matching” directory.
- If **ENABLE_MATCHING_FOR_GRAPH** parameter is set to “false” in the **config.sh** file, then navigate to the “without_matching” directory.

Import graph from the graph summary screen in the Compliance Studio workspace. For more information, see **Adding a Graph Pipeline** section in the **OFS Compliance Studio User Guide**.

NOTE

Customization in OOB Graph Definition

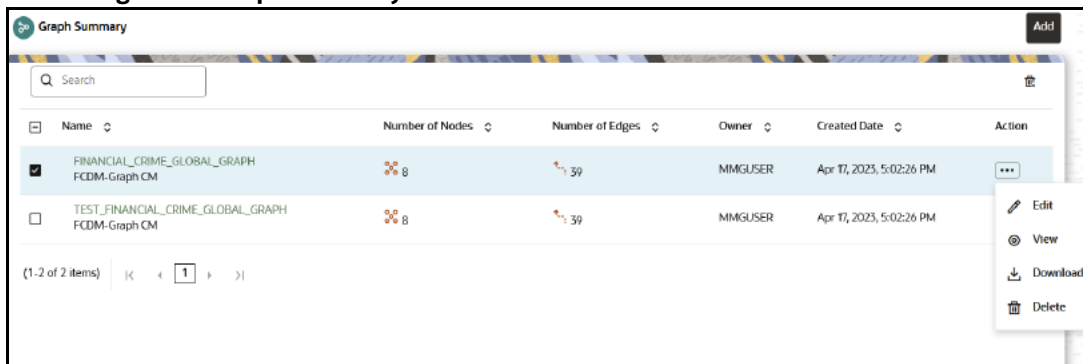
If any manual customization is applied before the upgrade, then recheck and evaluate whether these changes are still in place after the upgrade. If changes are not available, reapply the customization wherever required.

5.6.3 Registering Graph Data Store

To register graph data store, follow these steps:

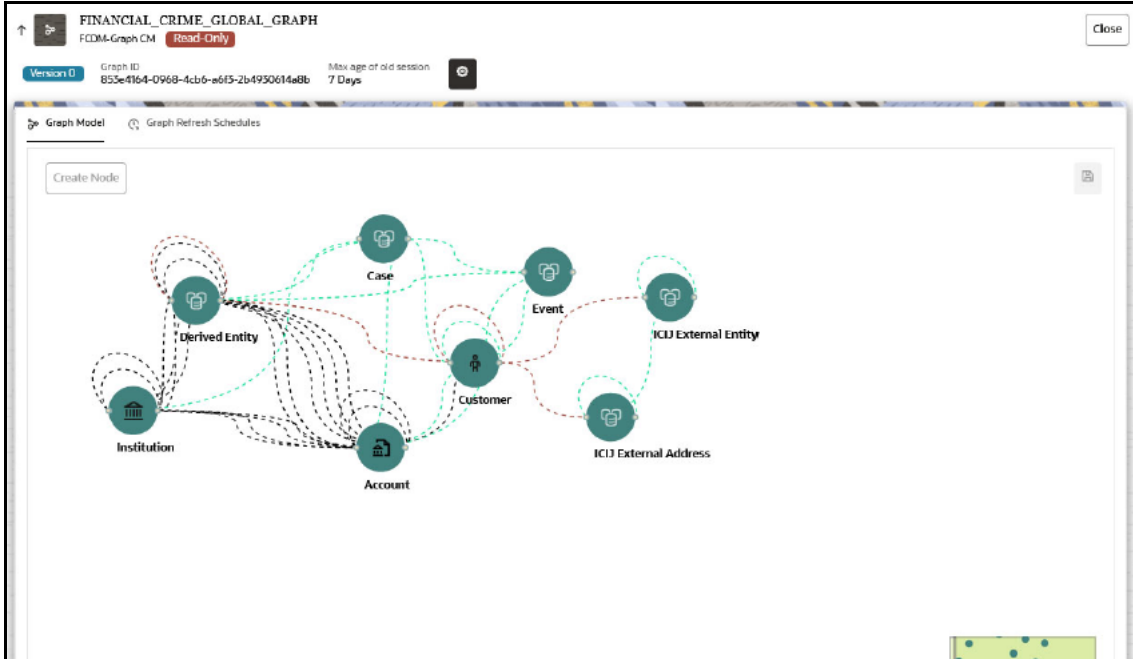
1. Log in to the Compliance Studio and navigate to the workspace summary.
2. On the **Modeling** menu, click **Graphs**. The Graph Summary page is displayed.

Figure 16: Graph Summary



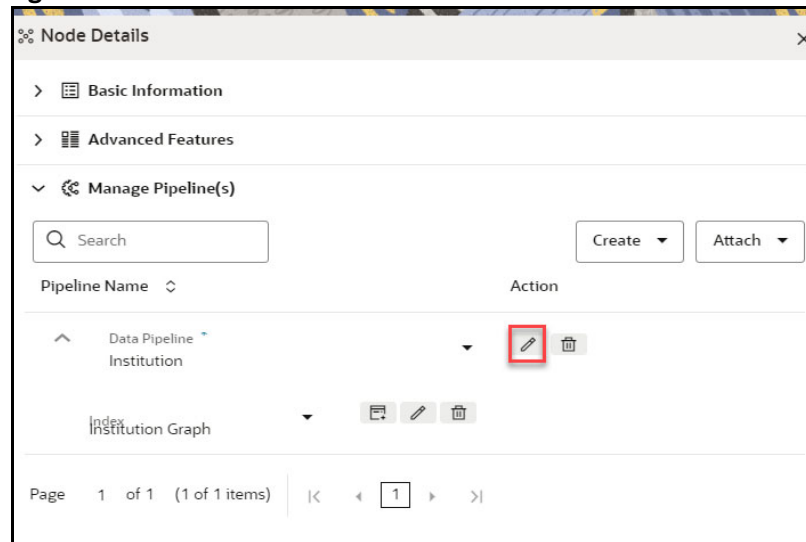
3. On any graph, click the **Action** icon **...** and select **Edit** to view the graph.

Figure 17: Graph Model



4. To edit the Node, hover over the **Node** icon and click **Edit**. The Node Details page is displayed.

Figure 18: Node Details



5. Expand Manage Pipeline(s) and click **Edit** icon on the data pipeline to view the Pipeline Designer page.

Figure 19: Pipeline Designer Page



6. You need to wait for the UI to load, **Close** Pipeline Designer page and then **Close** the graph panel.

5.6.4 Initializing Metadata Indexes

NOTE Before executing the script, OpenSearch should be up and running.

To initialize metadata indexes, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/ficdb/graph-metadata/bin` directory.
2. Execute the following command:

```
./CreateMetadataIndexes.sh
```

The metadata indexes will be created.

- NOTE**
- If **ENABLE_MATCHING_FOR_GRAPH** parameter is set to "false" in the `config.sh` file, then skip the [Step 2](#).
 - Before executing the command, if metadata indexes are available for OpenSearch, then it will not be updated until `F_IS_RECENTLY_CHANGED` column values are set to "Y" in the `FCC_IDX_M_LOOKUP` table.

5.6.5 Initializing Schemas

To initialize schemas, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/ficdb/graph-metadata/bin` directory.
2. If you are using "FINANCIAL_CRIME_GLOBAL_GRAPH_BEHAVIOUR_DETECTION" OOB graph, then execute the following command:

```
./InitializeBDSchema.sh -bdw <bd_atomic_wallet_alias>
```

3. If you are using "FINANCIAL_CRIME_GLOBAL_GRAPH" OOB graph, then execute the following command:

```
./InitializeECMSchema.sh -w <ecm_schema_wallet_alias>
```


4. To initialize graph schema based on the selected OOB graphs, execute the following commands:

For initializing FINANCIAL_CRIME_GLOBAL_GRAPH_BEHAVIOUR_DETECTION,

```
./InitializeGraphSchema.sh -gw <graph_wallet_alias> -bs <bd_schema_name>
```

For initializing FINANCIAL_CRIME_GLOBAL_GRAPH,

```
./InitializeGraphSchema.sh -gw <graph_wallet_alias> -es  
<ecm_schema_name>
```

For initializing FINANCIAL_CRIME_GLOBAL_GRAPH_BEHAVIOUR_DETECTION and FINANCIAL_CRIME_GLOBAL_GRAPH in the **same** graph schema,

```
./InitializeGraphSchema.sh -gw <graph_wallet_alias> -es  
<ecm_schema_name> -bs <bd_schema_name>
```

5.6.6 Starting OpenSearch

To start OpenSearch, follow these steps;

1. Navigate to the <OPEN_SEARCH_EXTRACTED_PATH>/opensearch/opensearch-<version>/bin directory.
2. Execute the following command:

```
nohup ./opensearch &
```

NOTE To check the OpenSearch logs, execute the following command:

```
tail -f nohup.out
```

5.6.7 Initializing OOB Graph Batch Schedules

NOTE If you want help on the graph batch schedule, then execute the following commands:

```
./InitializeOOBGraphBatchScheduleECM.sh -h
```

```
./InitializeOOBGraphBatchScheduleBD.sh -h
```

To initialize OOB graph batch schedules, follow these steps:

1. Navigate to <COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/ficdb/graph-metadata/bin directory.
2. If **ENABLE_MATCHING_FOR_GRAPH** parameter is set to “false” in the **config.sh** file, then initialize the graph batch schedule as follows:

- a. If you are initializing "FINANCIAL_CRIME_GLOBAL_GRAPH_BEHAVIOUR_DETECTION" schedule, then execute the following command:

```
./InitializeOOBGraphBatchScheduleBD.sh -bw <datasource name of the BD  
atomic schema> -s <start_date> -e <end_date> -gd <graph_datasource> -  
u <complianceStudioUserName>
```

- b. If you are initializing "FINANCIAL_CRIME_GLOBAL_GRAPH" schedule, then execute the following command:

```
./InitializeOOBGraphBatchScheduleECM.sh -ew <datasource name of the  
ECM atomic schema> -s <start_date> -e <end_date> -gd <graph_data-  
source> -u <complianceStudioUserName>
```

NOTE

The format of start date and end date should be yyyy_mm_dd.

The dates present in the batch schedule are only used to filter transaction edges. All the nodes are considered irrespective of the dates, and the dates are used to control the volume of transactions to be processed in a batch.

For example, if a customer has millions of transactions for each date, then instead of one batch that processes the complete date range, they can execute multiple batches in slices (let's say 3 months) for better performance, monitoring, and less resource constraint, etc.

By default, the graph has a retention period of 1 year which means transactions with a date older than 1 year will be ignored by the graph. So, if you want all the older transactions in the graph, then edit the OOB graph and update the retention period of transaction edges (pluggable edges) accordingly before executing the graph batch.

3. If **ENABLE_MATCHING_FOR_GRAPH** parameter is set to "true" in the `config.sh` file, then initialize the graph batch schedule as follows:

- a. If you are initializing "FINANCIAL_CRIME_GLOBAL_GRAPH_BEHAVIOUR_DETECTION" schedule with matching component enabled, then execute the following command:

```
./InitializeOOBGraphBatchScheduleBD.sh -bw <datasource name of the BD  
atomic schema> -s <start_date> -e <end_date> -gd <graph_datasource> -  
u <complianceStudioUserName>
```

(OR)

If you are initializing "FINANCIAL_CRIME_GLOBAL_GRAPH_BEHAVIOUR_DETECTION" schedule with matching component disabled, then execute the following command:

```
./InitializeOOBGraphBatchScheduleBD.sh -bw <datasource name of the BD  
atomic schema> -s <start_date> -e <end_date> -gd <graph_datasource> -  
u <complianceStudioUserName> -sm
```

- b. If you are initializing "FINANCIAL_CRIME_GLOBAL_GRAPH" schedule with matching component enabled, then execute the following command:

```
./InitializeOOBGraphBatchScheduleECM.sh -ew <datasource name of the  
ECM atomic schema> -s <start_date> -e <end_date> -gd <graph_data-  
source> -u <complianceStudioUserName>
```

(OR)

If you are initializing "FINANCIAL_CRIME_GLOBAL_GRAPH" schedule with matching component disabled, then execute the following command:

```
./InitializeOOBGraphBatchScheduleECM.sh -ew <datasource name of the  
ECM atomic schema> -s <start_date> -e <end_date> -gd <graph_data-  
source> -u <complianceStudioUserName> -sm
```

5.6.8 Creating Passwordless Keystore File

To create a passwordless keystore file, see the [Generate the graph-keystore.p12 File](#) section.

5.6.9 Start the PGX Service

To start the PGX service, follow these steps;

1. Navigate to the `<PGX_INSTALLATION_PATH>/pgx/pgx-server/bin` directory.
2. Execute the following command:

```
./pgx-server.sh -s
```

The PGX service is up and running.

NOTE To verify if PGX service is up, check the logs.

5.7 Additional Grants for Graph Schema

For post-installation grants of the graph schema, see the [Create Graph Schema and Grant Permission](#) section.

5.8 Registering the Conda Environment

NOTE The User should not delete the seeded conda environment.

The Compliance Studio installer has three pre-configured conda environments as follows:

- `default_8.1.2.7.0`
- `sane_8.1.2.7.0`
- `ml4aml_8.1.2.7.0`

These conda environment must be registered to see them for a user.

To register the conda environment, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory.
2. Execute the following command:

```
./compliance-studio.sh -e
```

(OR)

```
./compliance-studio --enroll
```

NOTE

- You can also register a conda environment in the Compliance Studio UI. For more information on registering a conda environment, see the **Registering a Conda Environment** section in the [OFS Compliance Studio User Guide](#).
- Map the functions and roles for the conda environment. For more information, see the **Functions and Roles required to perform CRUD operations for Conda** section in the [OFS Compliance Studio Administration and Configuration Guide](#).

5.9 Configuring Transliteration

NOTE

- This section is applicable only when APPLY_TRANSLITERATION flag is set to True and MATCHING_MECHANISM is set to OT.
- There is no additional configuration required for OpenSearch.

Prerequisites

Make sure that JAVAVM is added before loading the jar, class, or any java-related files.

To add JAVAVM, follow these steps:

1. Login to Sys/Admin.
2. Execute the following SQL script:

```
SELECT status FROM DBA_REGISTRY
WHERE comp_id = 'JAVAVM';
```

```
---O/P
```

```
--- Status
```

```
--- Valid
```

```
SELECT dbms_java.get_jdk_version
FROM DUAL;
```

```
---O/P
```

```
---JDK Version
```

```
---1.8.0_351
```

You can go once you get the corresponding O/P showing JAVAVM is installed.

3. If you are not getting the corresponding O/P, then execute the following SQL script:

```
BEGIN
    DBMS_CLOUD_ADMIN.ENABLE_FEATURE (
        feature_name => 'JAVAVM' );
END;
```

4. Provide the create procedure permission grant and execute the following grant to the user/schema(AMLDD):

```
GRANT CREATE PROCEDURE TO <DATA_SCHEMA_NAME>
```

To configure transliteration, follow these steps:

NOTE

Users should execute the following steps in a separate terminal.

1. Download the [Oracle Client zip](#) file.

2. Unzip the Oracle client zip in a separate folder.

NOTE The path where the `LINUX.X64_193000_client_home.zip` file is unzipped and it is referred to as "ORACLE_CLIENT_PATH".

3. Set the `ORACLE_HOME`.

NOTE `ORACLE_HOME` refers to the path where oracle database client is unzipped.

4. Navigate to the `ORACLE_CLIENT_PATH` directory and modify the load java by executing the following command:

```
sed -i -e "s|/scratch/app/user/product/19.0.0/  
clienthome_1|##ORACLE_CLIENT_PATH##|g" bin/loadjava
```

5. To compile the java class with the icu4j plugin, execute the following command:

```
##ORACLE_CLIENT_PATH##/jdk/bin/javac -cp ##ICU4j_PATH##  
##TRANSLATOR_JAVA_PATH##
```

NOTE `##ICU4j_PATH##` refers to path where icu4j jar is placed and `##TRANSLATOR_JAVA_PATH##` refers to the path where Translator.java file is placed.

These files are available in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/candidate-selection/utility/transliteration` directory.

6. Navigate to the `ORACLE_CLIENT_PATH/bin` directory and perform loadjava operation by executing the following command:

```
./loadjava -thin -user <Username>/  
<Password>@<Hostname>:<Port>:<ServiceName> -resolve -verbose -force  
##ICU4j_PATH## ##TRANSLATOR_CLASS_PATH##
```

NOTE Replace the following placeholders:

- `<Username>` specifies the username of the data schema. For example, username of the ER schema or Graph schema.
- `<Username>` specifies the username of the data schema. For example, username of the ER schema or Graph schema.
- `<Password>` specifies the password of the ER schema or graph schema.
- `<Hostname>` specifies the database server's hostname of the data schema.
- `<Port>` specifies the database port.
- `<ServiceName>` specifies the service parameter of the database.
- `##ICU4j_PATH##` refers to this `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/candidate-selection/utility/transliteration/icu4j-72.1.jar` path.

NOTE

- `##TRANSLATOR_CLASS_PATH##` refers to this `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/candidate-selection/utility/transliteration/Translator.java` path.

7. If you use a Data Schema wallet from this `ORACLE_CLIENT_PATH/bin` directory, perform `loadjava` operation by executing the following command.

```
./loadjava -thin -user <Username>/<Password>@##WALLET_ALIAS## -resolve -verbose -force ##ICU4j_PATH## ##TRANSLATOR_CLASS_PATH##
```

NOTE

This step is optional and Set export `TNS_ADMIN=##WALLET_ALIAS_PATH##`.

5.10 Creating the Thesaurus

A thesaurus is required to execute the Graph and Entity Resolution batches.

NOTE

- This section is applicable when `MATCHING_MECHANISM` is set to `OT`.
- There is no additional configuration required for OpenSearch.
- For a fresh installation, there is no thesaurus available in the database.

For Graph

To create a thesaurus in the graph schema, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/ficdb/graph-metadata/bin` directory.

2. Execute the following command:

```
./CreateDBThesaurus.sh -h
```

The script has two options:

- **Create:** This option helps to generate the pre-seeded thesaurus in the database.
- **Reset:** This option helps the user to update the pre-existing thesaurus. If there is any change in the data, the user can run the script with a reset flag, and the thesaurus will be updated.

If it is `CREATE` mode, refer to the example below.

```
./CreateDBThesaurus.sh -c -gd <GRAPH_DATASOURCE_NAME>
```

If it is `RESET` mode, refer to the example below.

```
./CreateDBThesaurus.sh -r -gd <GRAPH_DATASOURCE_NAME>
```

NOTE

- If you want to verify whether thesaurus is created or not, then execute the following command:

```
select * from ctx_user_thesauri;
```
- If thesaurus is created, you can see it in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/workspace/dbThesaurus` directory.
- To DELETE thesaurus, execute the following command in the data schema:

```
BEGIN  
CTX_THES.DROP_THESAURUS ('THESAURUS_NAME');  
END
```
- Users need to delete/drop the thesaurus from the database manually. You can find all the thesaurus details, including thesaurus owner and name, inside the `ctx_thesauri` table in the data schema. Only the owner of that thesaurus can drop/delete it.
- Only one thesaurus can be created in one Database server with the specified thesaurus name.

For Entity Resolution

To create a thesaurus in the ER schema, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/candidate-selection/utility/bin` directory.
2. Execute the following command:

```
./CreateDBThesaurus.sh <DATA_SCHEMA_ALIAS> <PATH TO STORE PRE-PROCESSED  
FILES GENERATED BY UTILITY> <MODE>
```

For example: `./CreateDBThesaurus.sh ER_SCHEMA_ALIAS /user/thesaurusFiles
CREATE`

The script has two options:

- **Create:** This option helps to generate the pre-seeded thesaurus in the database.
- **Reset:** This option helps the user to update the pre-existing thesaurus. If there is any change in the data, the user can run the script with a reset flag, and the thesaurus will be updated.

NOTE

Only one thesaurus can be created in one Database server with the specified thesaurus name.

6 Post-installation Steps when OFSAA is Not Installed

On successful installation of Compliance Studio, you must perform the following post-installation configurations.

ATTENTION For the utility shell script and patch for [Security Alert CVE-2021-44228](#), see [Appendix E – Apache Log4j Security Alert CVE-2021-44228 Patch Details](#) section.

Topics:

- [Verify the Installation](#)
- [Start the PGX Service](#)
- [Access the Compliance Studio Application](#)

NOTE Before running the post-installation steps, an SSH connection to the Big Data server must be configured.

6.1 Verify the Installation

To verify the Compliance Studio installation without OFSAA, check the log files in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/logs` directory. If all the servers are up and running, it indicates that the installation is complete. Also, ensure all the interpreters are displayed and the JDBC interpreter is working on the Compliance Studio application home page.

WARNING If you notice any errors in the log files, do not proceed further. For additional information, see the [Frequently Asked Questions in Compliance Studio](#) section first and [Contact My Oracle Support \(MOS\)](#) provide the applicable error code and log files.

If the installation of Compliance Studio is unsuccessful, you must reinstall the application after performing the cleanup tasks. For more information, see [Reinstalling Compliance Studio](#).

6.2 Start the PGX Service

To start the PGX service, follow these steps:

1. Navigate to the path where the PGX service is installed.
2. Navigate to the following directory where the start service for PGX is located:

```
<PGX_Installation_Path>/pgx-server/bin
```

3. Run the following command:

```
./pgx-server.sh --start
```

For more information, see the [OFS Compliance Studio Administration and Configuration Guide](#).

6.3 Access the Compliance Studio Application

To access Compliance Studio, follow these steps:

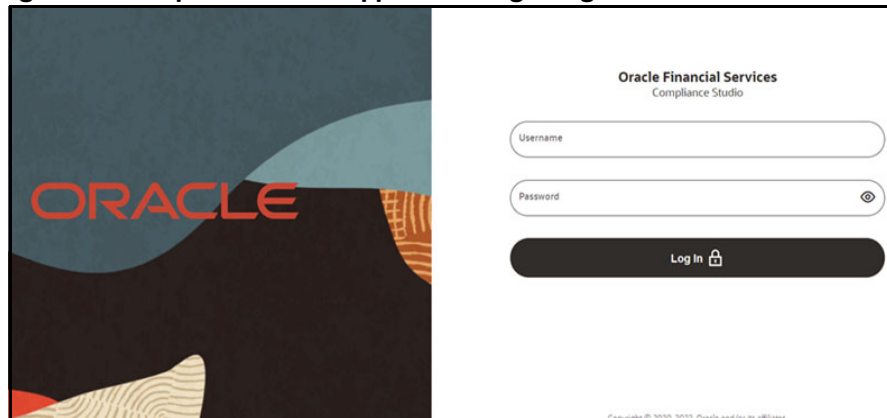
1. Enter the URL in the following format in the web browser:

`https://<Host_Name>:<Port_Number>/cs/home`

Here <Port_Number> is **7001** for the Compliance Studio application installed on-premise.

The Compliance Studio application login page is displayed.

Figure 20: Compliance Studio Application Login Page



2. Enter the **Username** and **Password**.
3. Click **Login**.

After you access the application, you can view the ready-to-use notebooks. To check if you have been assigned any roles, create a notebook. If you cannot create a notebook, contact [My Oracle Support \(MOS\)](#).

7 Upgrade

Follow these steps to upgrade an existing instance of Compliance Studio.

Topics:

- [Pre-upgrade Steps](#)
- [Upgrade Steps with OFSAA](#)
- [Cleanup for Upgrade](#)
- [Stop the PGX Service](#)
- [Stop the Compliance Studio Installer](#)
- [Upgrade Steps without OFSAA](#)
- [Configure Python Interpreter Settings](#)
- [Configure Interpreters after Upgrade](#)
- [Upgrade Steps for Graph Pipeline](#)
- [Upgrade Steps for Scenario Conversion Utility](#)
- [Changes in OOB Match Ruleset after Upgrade](#)

Customization in Entity Resolution

If any customization is applied before the upgrade, then re-check and evaluate whether these changes are still in place after the upgrade. If changes are not available, re-apply the customization wherever required.

Out-of-the-box rules should not be edited for customizations. If there are any customizations, create a copy of out-of-the-box pipeline definitions to apply any customizations otherwise the customizations will not persist when upgraded.

If out-of-the-box pipeline definitions are modified for any customizations, follow these steps to preserve the customizations:

1. Before upgrade, create a copy of the modified/customized pipeline definitions.
2. Merge the customizations into upgraded out-of-the-box pipeline definitions appropriately after the successful upgrade of Compliance Studio 8.1.2.7.0.

For any clarifications, contact [My Oracle Support \(MOS\)](#).

7.1 Pre-upgrade Steps

To do pre-upgrade, follow these steps:

1. Stop the existing Compliance Studio service. To stop, see the [Stopping Compliance Studio](#) section.
2. Stop the pgx server. To stop, see the [Stop the PGX Service](#) section.

7.2 Upgrade Steps with OFSAA

This section describes generic steps for the upgrade. For specific upgrades, see [Cleanup for Upgrade](#) section.

Table 16 provides the steps to upgrade Compliance Studio with OFSAA.

Table 21: Upgrade Steps with OFSAA

Sl. No.	Activity
Pre-installation Steps	
1	Hardware and Software Requirements
2	Download the Installer Kit
Installation Steps	
1	Extract the Installer Kit
2	Configure the OpenSearch Component
3	Add Synonyms and Stopword files in OpenSearch
4	Place Files in the Installation Directories
5	Generate the Public and Private Keys
6	Generate API token for CS API User
7	Generate Compliance Studio Server SSL Configuration Mandatory File
8	Import the certificate to JDK security
9	Place the Key Store File for Secure Batch Service
10	Configure the Extract Transfer and Load (ETL) Process NOTE: This step is deprecated in the current release and will be removed in the future release.
11	Additional Grants for Studio Schema (See Assign Grants for Studio Schema)
12	Additional Grants for ER Schema (See Assign Grants for Studio Schema)
13	Create Graph Schema and Grant Permission
14	Configure the config.sh File
15	Generate the graph-keystore.p12 File
16	Configure the PGX Service
17	Run the Compliance Studio Installer
Post-Installation Steps	
1	Verify the Installation
2	Cleanup for Upgrade

Table 21: Upgrade Steps with OFSAA

3	Generate Compliance Studio Server SSL Configuration Mandatory File
4	Stop the PGX Service
5	Stop the Compliance Studio Installer
6	Configure the SSH Connection – See OFS Compliance Studio Administration and Configuration Guide
7	Configure the Schema Creation – See OFS Compliance Studio Administration and Configuration Guide . NOTE: This is applicable only if you want to load a graph using the Legacy ETL, i.e., the Hadoop cluster.
8	Configure the ICIJ Data – See OFS Compliance Studio Administration and Configuration Guide . NOTE: This is applicable only if you want to load a graph using the Legacy ETL, i.e., the Hadoop cluster.
9	Start the PGX Service
10	Starting Compliance Studio
11	Configure the Graph Pipeline (Importing OOB Graph Definition and related Metadata)
12	Configure the Entity Resolution
13	Uploading FSDF
14	Access the Compliance Studio Application

7.3 Cleanup for Upgrade

This section provides cleanup steps for the upgrade.

7.3.1 Perform Extract Transfer and Load (ETL) Cleanup

NOTE This section is deprecated in the current release and will be removed in the future release.

To perform the ETL cleanup, follow these steps:

- Extract the contents of the installer archive file in the download directory using the `unzip -a <Compliance_Studio_Installer_Archive_File>.zip`. The Compliance Studio installer file is extracted in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>` directory.
- Configure the applicable parameters in the `config.sh` file. For more information, see [Configure the config.sh File](#).
- Generate the keystore file. For more information, see [Generate Compliance Studio Server SSL Configuration Mandatory File](#).

7.3.2 Perform Cleanup for Templates

NOTE This is applicable only if you want to use the new FCGM Default Template. Otherwise, the template will not be updated.

To delete the templates, perform the following:

1. Log in to the Compliance Studio application.
2. Launch the **CS Production** Workspace.
3. Click on the **User Profile** drop-down list and select **Data Studio Options**.
4. Click **Templates**.

By default, the Templates page lists all the available templates.

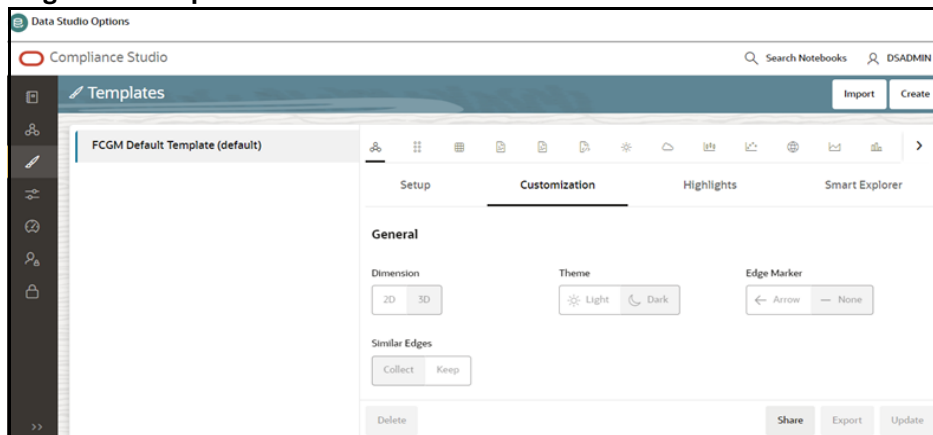
You can see the following templates among all the templates:

- FCGM Default Template (default)
- FCGM Default Template

You should delete the **FCGM Default Template** that is without **(default)**.

5. Click the **FCGM Default Template** on the LHS. The default details are displayed on the RHS:

Figure 21: Template screens



6. Click **Delete** on the RHS. A confirmation message is displayed for deletion.
7. Click **Delete**. The template will be deleted.

7.3.3 Perform Cleanup for Interpreters

NOTE

- Ensure that the following interpreters are deleted:
 - fcc-jdbc
 - fcc-ore
 - fcc-pyspark
 - fcc-spark-scala
 - fcc-spark-sql
- For 8.1.2.0.0 and later versions, you can rename the fcc interpreter variants in all cases except for the different Python Virtual Environments, so simpler interpreter's names will be used.
- The steps in this section explain removing the fcc versions before installing the generic versions

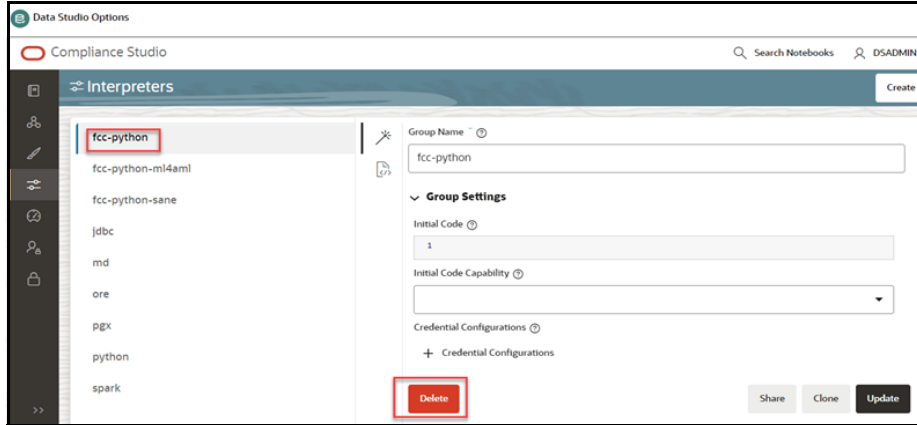
NOTE

- See **Create an Interpreter Variant** in the [OFS Compliance Studio Administration and Configuration Guide](#) on creating new interpreter variants if you want to use the notebooks that use the deleted interpreter name.
- For example, if the notebook has an **fcc-jdbc** paragraph, and these paragraphs' interpreter cannot be replaced with **jdbc**, you can create/clone an interpreter variant of jdbc with the name **fcc-jdbc**.

To delete the interpreter, perform the following:

1. Log in to the Compliance Studio application.
2. Launch the **CS Production** Workspace.
3. Click on the **User Profile** drop-down list and select **Data Studio Options**.
4. Click **Interpreters**.
5. By default, the Interpreters page lists all the available interpreters.
6. Click the **fcc-jdbc** interpreter on the LHS. The default configured interpreter variant is displayed on the RHS:

Figure 22: fcc-jdbc interpreter screen



7. Click **Delete** on the RHS. A confirmation message is displayed for deletion.
8. Click **Delete**. The template will be deleted.
9. Repeat the steps **4**, **5**, and **6** for the following interpreters:
 - fcc-ore,
 - fcc-pyspark,
 - fcc-spark-scala
 - fcc-spark-sql

7.3.4 Perform Cleanup for Entity Resolution

You can follow the approach based on the following scenario:

In case of resetting Entity Resolution completely, see the **Resetting Entity Resolution Back to Day 0** section in the [OFS Compliance Studio Administration and Configuration Guide](#).

In case of detailed cleanup steps to continue with Entity Resolution, you can contact [My Oracle Support \(MOS\)](#).

7.3.5 Perform Cleanup in the Manual Decisioning UI

To load graph in the Manual Decisioning UI after upgrade, follow these steps:

1. Log in to Compliance Studio schema.
2. Truncate the **FCC_ER_PARAGRAPH_MANUAL** table.

This will delete all records which contains the paragraph IDs.

7.4 Stop the PGX Service

To stop the PGX service, follow these steps:

1. Navigate to the path where the PGX service is installed.
2. Navigate to the following directory where the start service for PGX is located:

<PGX_Installation_Path>/pgx/pgx-server/bin

3. Run `./pgx-server.sh --stop`.

7.5 Stop the Compliance Studio Installer

To stop the Compliance Studio installer, follow these steps:

1. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin/directory`.
2. Run `./compliance-studio.sh -k`

7.6 Upgrade Steps without OFSAA

Table 22 lists the steps to upgrade Compliance Studio without OFSAA.

Table 22: Upgrade Steps without OFSAA

Sl. No.	Activity
Pre-installation Steps	
1	Download the Installer Kit
Installation Steps	
1	Extract the Installer Kit
2	Place Files in the Installation Directories
3	Generate API token for CS API User
4	Generate the Public and Private Keys
5	Place the Key Store File for Secure Batch Service
6	Configure the config.sh File
7	Run the Compliance Studio Installer
Post-Installation Steps	
1	Stop the Compliance Studio Installer
2	Add the Python Packages to Compliance Studio - See OFS Compliance Studio Administration and Configuration Guide
3	Configure the SSH Connection – See OFS Compliance Studio Administration and Configuration Guide
4	Starting Compliance Studio
5	Access the Compliance Studio Application

7.7 Configure Python Interpreter Settings

To use a python interpreter in an upgraded environment, you need to configure the following:

Zeppelin.python:


```
<COMPLIANCE STUDIO INSTALLATION PATH>/deployed/python-packages/  
defaultVirtualEnv/bin/python3
```

Initialization:

```
import os; os.environ['TNS_ADMIN'] = '<WALLET_LOCATION>';  
from ds_interpreter_client.context.ds_context import PyDataStudioContext  
ds = PyDataStudioContext()
```

To configure, perform the following:

1. Login to the Compliance Studio application.
2. Launch the **CS Production** Workspace.
3. Click on the **User Profile** drop-down list and select **Data Studio Options**.
4. Click **Interpreters**.

By default, the Interpreters page lists all the available interpreters.

5. Click the **fcc-python** interpreter on the LHS. The default configured interpreter variant is displayed on the RHS:

Figure 23: fcc-python interpreter screen

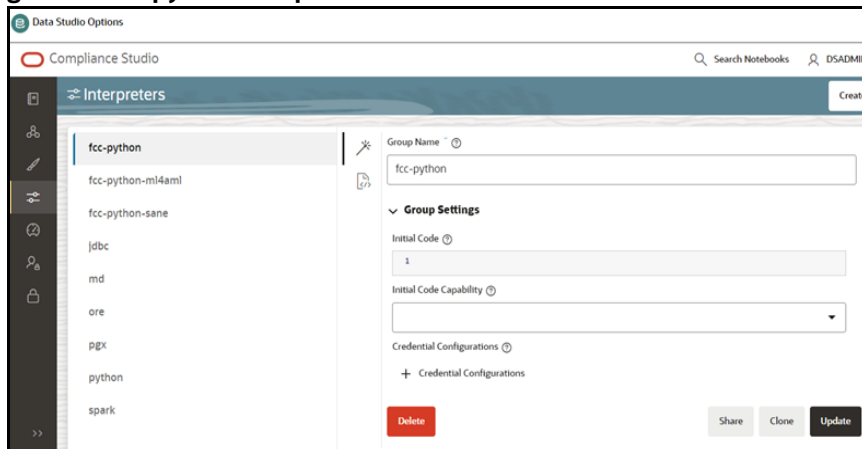
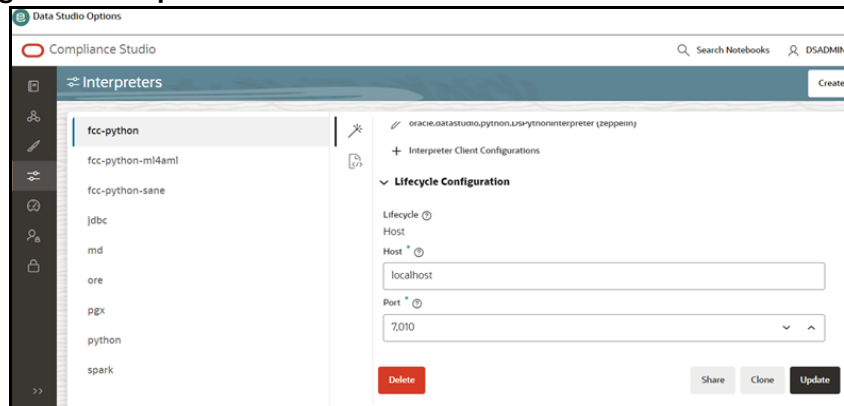


Figure 24: Interpreters



7.8 Configure Interpreters after Upgrade

To change port numbers after the upgrade, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/server/builtin/interpreters` directory.

The interpreter's `.json` files are available.

For example,

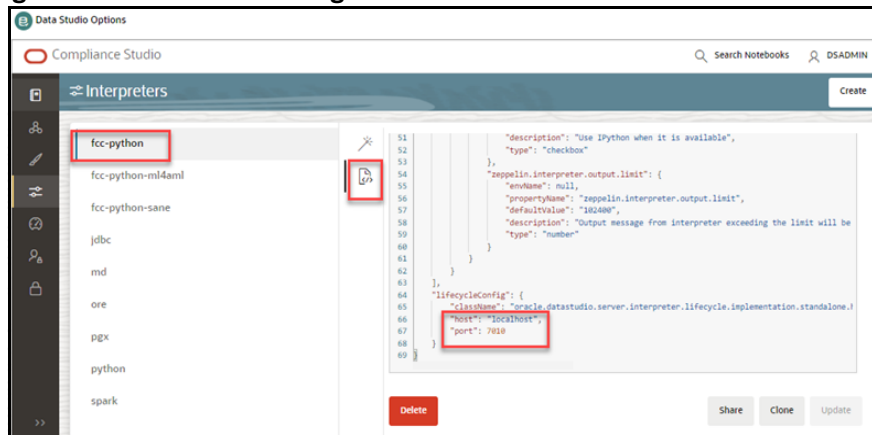
2. Click the `fcc-python.json` file to view the port number which has to be modified in the Compliance Studio application.

To configure interpreters after the upgrade, perform the following:

1. Login to the Compliance Studio application.
2. Launch the **CS Production** Workspace.
3. Click on the **User Profile** drop-down list and select **Data Studio Options**.
4. Click **Interpreters**.

By default, the Interpreters page lists all the available interpreters on the LHS.

Figure 25: Port Number Configuration



5. Click **fcc-python** interpreter on the LHS and then click **Plain Configuration** on the RHS.
6. Update the port number as per the `fcc-python.json` file.

Similarly, modify all the port numbers available on the Interpreters page with respect to JSON files.

7.8.1 Configuring Conda Environment

To configure conda environment, see the [Registering the Conda Environment](#) section.

7.8.2 Manual Steps for Configuring Python Interpreter

To configure python interpreter (**fcc-python**, **fcc-python-ml4aml**, and **fcc-python-sane**) manually, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed` directory where v8.1.2.5.0 is installed.
2. Copy **python-packages** folder and place it in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed` directory where v8.1.2.7.0 is installed.

3. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-service/conf` directory.
4. Open the `application.properties` file and update the `mmg.python_interpreter` property as `fcc-python,fcc-python-ml4aml,python`.
For example, `mmg.python_interpreter=fcc-python,fcc-python-ml4aml,python`
5. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/bin` directory.
6. Open the `config.sh` file and update the `MMG_PYTHON_INTERPRETER` property as `fcc-python,fcc-python-ml4aml,python`.
For example, `MMG_PYTHON_INTERPRETER=fcc-python,fcc-python-ml4aml,python`
7. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory.
8. Open the `install.sh` file and update the `MMG_PYTHON_INTERPRETER` property as `fcc-python,fcc-python-ml4aml,python`.
For example, `MMG_PYTHON_INTERPRETER=fcc-python,fcc-python-ml4aml,python`
9. Restart Compliance Studio.

7.8.3 Download Supported Version for Spark and Pyspark Interpreters

After upgrade, you can [download](#) supported version for spark and pyspark interpreters.

NOTE	The supported version for spark and pyspark interpreters is 3.0.3 and above .
-------------	---

7.8.4 Updating PGQL and PGX-algorithm Interpreters

After upgrade, you need to update class for pgql and pgx-algorithm interpreters.

To update the class for pgql and pgx-algorithm interpreters, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/server/builtin/interpreters` directory.
2. Open the `pgx.json` file.
3. Update "CLASS" for pgql interpreter as follows:
`"CLASS": "oracle.datastudio.interpreter.PgqlInterpreter"`
4. Update "CLASS" for pgx-algorithm interpreter as follows:
`"CLASS": "oracle.datastudio.interpreter.PgxAlgorithmInterpreter"`
5. Restart Compliance Studio.

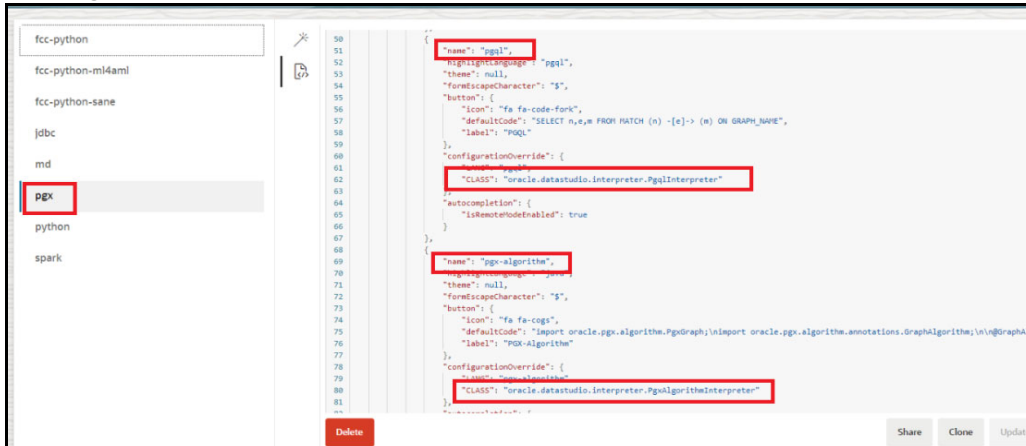
After restarting, if these interpreters are not working then you need to update class manually in the Compliance Studio UI.

To update class for pgql and pgx-algorithm interpreters in the Compliance Studio UI, follow these steps:

1. Login to the Compliance Studio application.
2. Launch the **CS Production** Workspace.

3. Click on the **User Profile** drop-down list and select **Data Studio Options**.
4. Click **Interpreters**.
By default, the Interpreters page lists all the available interpreters on the LHS.

Figure 26: Update the Class Path



5. Click **pgx** interpreter on the LHS and then click **Plain Configuration** on the RHS.
6. Update “CLASS” for pgql interpreter as follows:
`"CLASS": "oracle.datastudio.interpreter.PgqlInterpreter"`
7. Update “CLASS” for pgx-algorithm interpreter as follows:
`"CLASS": "oracle.datastudio.interpreter.PgxAlgorithmInterpreter"`
8. Click **Update**.
9. Restart Compliance Studio.

7.9 Upgrade Steps for Graph Pipeline

NOTE If the graph is executed on the version v8.1.2.5.0, then you need to execute the OOB graph batch schedule. To execute OOB graph batch schedule, see the [Initializing OOB Graph Batch Schedules](#) section.

To upgrade the graph pipeline, follow these steps:

ATTENTION When upgrading from v8.1.2.4.0 to v8.1.2.6.0, the following steps are required.

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/ficdb/GraphPipeline-Cleanup-Scripts` directory.
2. Cleanup the existing graph using the following scripts:

```
GraphPipeline_cleanup_day0_in_studioschema.sql
```

It should be executed from the Compliance Studio schema.

```
GraphPipeline_cleanup_day0_in_graphschema.sql
```

It should be executed from the graph schema. For more information, see the **Resetting Graph Pipeline Back to Day 0** section in the [OFS Compliance Studio Administration and Configuration Guide](#).

```
cleanup_es_indexes.sh
```

It should be executed from previous version (v8.1.2.1.0 or v8.1.2.3.0) of the Compliance Studio.

3. Navigate to <COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/ficdb/graph-metadata/upgrade directory.
4. Execute the following command to upgrade the new graph model:

```
update-oob-graph.sh
```

5. Restart PGX server.
6. Login to Compliance Studio.
 - a. Launch the **CS Production** Workspace.
 - b. Under **Modeling**, click **Graphs**.

The new OOB graph pipeline is displayed in the graph summary page.

Figure 27: Graph

Name	Number of Nodes	Number of Edges	Owner	Created Date	Action
DumGraph DumGraph	1	0	MMGADMIN	Jan 3, 2023, 3:00:28 PM	...
FINANCIAL_CRIME_GLOBAL_GRAPH FCDM-Graph BD	15	46	MMGADMIN	Feb 17, 2023, 4:15:54 PM	...
Graph1 Graph1	0	0	MMGADMIN	Feb 17, 2023, 2:50:10 PM	...
Graph1_001 Graph1_001	0	0	MMGADMIN	Feb 17, 2023, 2:28:18 PM	...
Graph1V1 Graph1V1	0	0	MMGADMIN	Feb 8, 2023, 8:22:21 PM	...

- c. Update the OOB graph refresh schedules for the new graph pipeline.

To create a Graph Refresh Schedules, see **Creating Graph Refresh Schedules** section in the [OFS Compliance Studio User Guide](#).

7.9.1 Changes in Similarity Edges after Upgrade

After the upgrade from v8.1.2.5.0 to v8.1.2.7.0, the following Similarity Edges are not available in the Compliance Studio graph.

- Cust is similar to Cust
- Cust is similar to Derived Entity
- Derived Entity is similar to Derived Entity

NOTE

If the above three similarity edge providers are utilized in CS 8.1.2.5.0 graph pipelines, then after the upgrade, these similarity edge providers should be added manually to the graph definition of CS 8.1.2.7.0. To add graph definition manually, see **Creating an Edge** section (refer to step 8) in the [OFS Compliance Studio User Guide](#).

7.9.2 Upgrade Steps for BD Graph

After upgrading to CS 8.1.2.7.0, the user needs to cleanup the CS 8.1.2.5.0 graph. Import graph definition of CS 8.1.2.7.0 and then begin graph pipeline execution from day 0. For more information, see the [Importing OOB Graph Definition and related Metadata](#) section.

7.10 Upgrade Steps for Entity Resolution

ATTENTION

- This section is applicable when Entity Resolution batches are executed in the previous version of the Compliance Studio and upgrading from MATCHING_MECHANISM = OS in CS 8.1.2.6.0 to MATCHING_MECHANISM = OS in CS 8.1.2.7.0.
- If you upgrade from MATCHING_MECHANISM = OS in CS 8.1.2.6.0 to MATCHING_MECHANISM = OT in CS 8.1.2.7.0, you should contact [My Oracle Support \(MOS\)](#).

To update metadata schema, follow these steps:

1. Navigate to <COMPLIANCE_STUDIO_INSTALLATION_PATH>/ficdb/upgrade/8.1.2.7.0/UpgradeMetaSchema.

NOTE

The following steps are applicable to the below case:

- Compliance Studio is upgraded to 8.1.2.7.0 and users want to perform Entity resolution batches in 8.1.2.7.0.

The following steps are not applicable to the below case:

- If it is a Standalone installation of Compliance Studio 8.1.2.7.0.

2. Log in to metadata schema.

NOTE

Add the customized columns in C_CREATE_FULL_TABLE_QUERY.sql before executing the script as per the match rule.

3. Execute C_CREATE_FULL_TABLE_QUERY.sql script.

This script will create the full table in the C_CREATE_FULL_TABLE_QUERY column in the FCC_STUDIO_ER_QUERIES table.

4. Add the following scripts in the V_MAKE_TABLE_QUERIES column in the FCC_STUDIO_ER_QUERIES table.

```

DECLARE V_EXISTS NUMBER;

BEGIN

    SELECT COUNT (1) INTO V_EXISTS FROM USER_INDEXES WHERE
TABLE_NAME = 'FCC_ER_FULL' AND INDEX_NAME =
'FCC_ER_FULL_CONCAT_NAME_IND';

    IF V_EXISTS >0 THEN

        EXECUTE IMMEDIATE 'DROP INDEX FCC_ER_FULL_CONCAT_NAME_IND ';

    END IF;

```

```

END;

&&

DECLARE V_EXISTS NUMBER;

BEGIN

    SELECT COUNT (1) INTO V_EXISTS FROM USER_INDEXES WHERE
TABLE_NAME = 'FCC_ER_FULL' AND INDEX_NAME = 'IND_UI_SEARCH';

    IF V_EXISTS = 0 THEN

        EXECUTE IMMEDIATE 'create index IND_UI_SEARCH on
fcc_er_full(CONCAT_NAME)

        indextype is ctxsys.context

        parameters (''datastore CTXSYS.DEFAULT_DATASTORE LEXER mylex
wordlist kgram SYNC( ON COMMIT)'' ) parallel 8';

    END IF;

END;

```

NOTE Add the customized columns in UPDATE_QUERIES.sql before executing the script as per the match rule.

5. Execute the UPDATE_QUERIES.sql script.

This script will create an idx view table in the QUERIES column in the FCC_STUDIO_ER_QUERIES table.

To update ER/FSDf schema, follow these steps:

1. Navigate to <COMPLIANCE_STUDIO_INSTALLATION_PATH>/ficdb/upgrade/8.1.2.7.0/UpgradeFSDfSchema.

NOTE The following steps are applicable to the below case:

- Compliance Studio is upgraded to 8.1.2.7.0 and users want to perform Entity resolution batches in 8.1.2.7.0.

The following steps are not applicable to the below case:

- If it is a Standalone installation of Compliance Studio 8.1.2.7.0.

2. Log in to ER/FSDf schema.
3. Execute UPGRADE_ER_SCHEMA.sql script.

This script will add additional text columns for incorporating the date and dob columns in FCC_ER_FULL table.

4. Execute the DROP_FCC_ER_FULL_CONCAT_NAME_IND.sql script.

This script will drop FCC_ER_FULL_CONCAT_NAME_IND index from the FCC_ER_FULL table.

7.11 Upgrade Steps for Scenario Conversion Utility

For upgrade steps of the Scenario Conversion Utility, see **Using Scenario Conversion Utility** section in the [OFS Compliance Studio User Guide](#).

7.12 Changes in OOB Match Ruleset after Upgrade

After the upgrade, the user can see the following new OOB match rulesets in the Match Ruleset UI.

- Customer to External Entity ICIJ Match CM
- Customer to External Entity ICIJ Match BDG
- Customer To External Address ICIJ Match CM
- Customer To External Address ICIJ Match BDG

NOTE

- The ICIJ match rulesets from CS 8.1.2.5.0 will have no impact on the graph batches whether they are enabled/disabled.
- The remaining rulesets on the Match Ruleset UI are not functional and these rulesets' functionality will be replaced by External Entity ICIJ and External Address ICIJ rulesets, respectively.
For example, all the external entities' matches use External Entity ICIJ match and all the external entities' address matches use External Address ICIJ match.

7.13 ASC Use Case

- The installer will handle all cases required for an upgrade. No mandatory manual cleanup is required.
- Any folders created under the previous version of Compliance Studio will be visible to the user. The notebooks in this folder cannot be executed. You may choose to clean up this folder.

8 Reinstall Compliance Studio for Cleanup of Studio and BD/Atomic Schema

NOTE All the user data created after Compliance Studio installation, such as notebooks and customization will be cleaned.

If the installation of Compliance Studio is unsuccessful, you must reinstall the application after performing the required cleanup tasks.

To reinstall Compliance Studio for cleanup of Studio and BD/Atomic schema, follow these steps:

1. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory to update `config.sh` file.
2. Perform the database cleanup for the following schemas:

[Table 23](#) lists Schemas applicable for cleanup.

Table 23: Schemas applicable for cleanup

Schema	Applicable for Compliance Studio with OFSAA	Applicable for Compliance Studio without OFSAA
Clean up for Compliance Studio Schema	Yes	Yes
Cleanup for BD or ECM Atomic Schema	Yes	No

3. Run the following command:
`./compliance-studio.sh -k` and `./compliance-studio.sh -R`
4. Reinstall Compliance Studio.

Topics:

- [Clean up for Compliance Studio Schema](#)
- [Cleanup for BD or ECM Atomic Schema](#)

8.1 Clean up for Compliance Studio Schema

To clean up the Studio schema, follow these steps:

1. Drop the existing Compliance Studio schema and create a new Studio schema.

NOTE The username and password credentials of the Compliance Studio Schema in the wallet files must be updated accordingly. (If applicable)

2. Grant permission to the newly created Oracle Database Schema. For more information about grant, see the [Assign Grants for Studio Schema](#) section.

NOTE Note that the tablespace size can be as per the user's requirement.

8.2 Cleanup for BD or ECM Atomic Schema

To clean up the BD or ECM Atomic schema, follow these steps:

1. Login to the BD or ECM Atomic Schema.
2. Truncate the `DATABASECHANGELOG` and `DATABASECHANGELOGLOCK` tables using the following command:

```
TRUNCATE TABLE DATABASECHANGELOGLOCK;
```

```
TRUNCATE TABLE DATABASECHANGELOG;
```

9 Frequently Asked Questions (FAQs) and Error Dictionary

This section consists of resolutions to the frequently asked questions and error codes noticed during the Compliance Studio installation.

The Compliance Studio installer performs all the pre-requisite validation checks during installation. Any error encountered in the process is displayed with an appropriate Error Code. You can refer to the Error Dictionary to find the exact cause and resolution to rectify the error.

9.1 Frequently Asked Questions in Compliance Studio

You can refer to the Frequently Asked Questions, which are developed with interest to help you resolve some of the Compliance Studio Installation and configuration issues. This intends to share problem resolution knowledge to a few of the known issues. This is not an official support document and just attempts to share problem resolution knowledge to a few known issues.

1. Why does my console show an unsuccessful message during wallet creation?

You can 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 config 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 Config 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 config 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 Compliance 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.

According to the log details, you can fix the failure and rerun the same batch.

7. 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 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 \(MOS\)](#).

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

```
java.lang.IllegalStateException: Unable to create  
PgxSessionWrapperjava.lang.IllegalStateException: Unable to create  
PgxSessionWrapper at  
oracle.datastudio.interpreter.pgx.CombinedPgxDriver.getOrCreateSession(C  
ombinedPgxDriver.java:147) at
```

```
oracle.pgx.graphviz.driver.PgxDriver.getGraph(PgxDriver.java:334) at
oracle.pgx.graphviz.library.QueryEnhancer.createEnhancer(QueryEnhancer.j
ava:223) at
oracle.pgx.graphviz.library.QueryEnhancer.createEnhancer(QueryEnhancer.j
ava:209) at
oracle.pgx.graphviz.library.QueryEnhancer.query(QueryEnhancer.java:150)
at
oracle.pgx.graphviz.library.QueryEnhancer.execute(QueryEnhancer.java:136
) at
oracle.pgx.graphviz.interpreter.PgsqlInterpreter.interpret(PgsqlInterprete
r.java:131) at
oracle.datastudio.interpreter.pgx.PgxInterpreter.interpret(PgxInterprete
r.java:120) at
org.apache.zepplin.interpreter.LazyOpenInterpreter.interpret(LazyOpenIn
terpreter.java:103) at
org.apache.zepplin.interpreter.remote.RemoteInterpreterServer$Interpret
Job.jobRun(RemoteInterpreterServer.java:632) at
org.apache.zepplin.scheduler.Job.run(Job.java:188) at
org.apache.zepplin.scheduler.FIFOScheduler$1.run(FIFOScheduler.java:140
) at java.base/
java.util.concurrent.Executors$RunnableAdapter.call(Executors.java:515)
at java.base/java.util.concurrent.FutureTask.run(FutureTask.java:264) at
java.base/
java.util.concurrent.ScheduledThreadPoolExecutor$ScheduledFutureTask.run
(ScheduledThreadPoolExecutor.java:304) at java.base/
java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.jav
a:1128) at java.base/
java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.ja
va:628) at java.base/java.lang.Thread.run(Thread.java:834) Caused by:
java.util.concurrent.ExecutionException:
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 java.base/
java.util.concurrent.CompletableFuture.reportGet(CompletableFuture.java:
395) at java.base/
java.util.concurrent.CompletableFuture.get(CompletableFuture.java:1999)
at oracle.pgx.api.PgxFuture.get(PgxFuture.java:99) at
oracle.pgx.api.ServerInstance.getSession(ServerInstance.java:670) at
oracle.datastudio.interpreter.pgx.CombinedPgxDriver.getOrCreateSession(C
ombinedPgxDriver.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(
ExceptionMarshaler.java:107) at
oracle.pgx.common.marshalers.ExceptionMarshaler.unmarshal(ExceptionMarsh
aler.java: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$10.request(RemoteControlImpl.java:31
```

```
3) at
oracle.pgx.client.RemoteControlImpl$ControlRequest.request (RemoteControl
Impl.java:119) at
oracle.pgx.client.RemoteControlImpl$ControlRequest.request (RemoteControl
Impl.java: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.jav
a:296) at
oracle.pgx.api.ServerInstance.lambda$getSessionInfoAsync$14 (ServerInstan
ce.java:490) at java.base/
java.util.concurrent.CompletableFuture.uniComposeStage (CompletableFuture
.java:1106) at java.base/
java.util.concurrent.CompletableFuture.thenCompose (CompletableFuture.jav
a:2235) at oracle.pgx.api.PgxFuture.thenCompose (PgxFuture.java:158)
```

You can perform the following steps as a workaround -

- d. Export the "Manual Decision" Notebook
- e. Add the link parameter just below Description

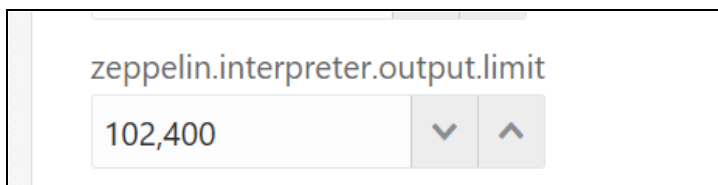
For example, "link": "manual Decision",

Figure 28: link parameter

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

- f. Truncate the table "fcc_er_paragraph_manual" in Studio Schema.
 - g. Import the modified notebook again.
9. What should I do when the result set is truncated if the size goes above '102400' bytes?
- a. Perform the following steps:
 - b. Login to Compliance Studio.
 - c. Navigate to interpreter zeppelin.interpreter.output.limit.

Figure 29: Interpreter zeppelin parameter



- d. Set the value to the required size.

- e. Restart the Studio Application.
10. What should I do when the spark interpreter is not working?
- a. Log in to the server where Compliance Studio is installed.
 - b. Navigate to \$SPARK_HOME directory. If the path is not set, then navigate to <COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/interpreter-server/spark-interpreter-<version>/extralibs directory.
 - c. Export the following environment variables:

```
export HADOOP_CONF_DIR=<HADOOP Configuration Directory path>
export SPARK_HOME=<SPARK CLIENT DIRECTORY path>
export SPARK_CONF_DIR=<spark-defaults.conf directory path >
export SPARK_SUBMIT_OPTS="-Djava.security.krb5.conf=<kerberos
directory path>/krb5.conf"
```
 - d. Run the following commands for specific cases:
 - The result of the following command should be Pie value. (It ensures that the client is configured successfully).

```
./bin/run-example --master yarn SparkPi 10
```
 - The result of the following command is displayed as a Pie value. (It ensures that the client can successfully connect to the remote cluster)

```
./bin/spark-submit --class org.apache.spark.examples.SparkPi --
master yarn <SPARK_HOME/examples/jars/>/spark-examples_<Ver-
sion>.jar 10
```

For example, in case of spark 2.11-2.4.0, the command is as follows:

```
./bin/spark-submit --class org.apache.spark.examples.SparkPi --
master yarn <SPARK_HOME/examples/jars/>/spark-examples_2.11-
2.4.0.jar 10
```
 - The result of the following command displays the list of databases that exist in HIVE.

```
./bin/spark-submit --class org.apache.spark.sql.hive.thrifts-
erver.SparksQLCLIDriver --master yarn -e "Show databases"
```
 - The result of the following command ensures that the client can query from the HIVE schema.

```
./bin/spark-submit --class org.apache.spark.sql.hive.thrifts-
erver.SparksQLCLIDriver --master yarn -e "select * from
<hiveSchema>.<tableName> limit 10"
```
11. How can I increase the memory of entity resolution and matching services?
- For more information on increasing memory of entity resolution and matching services, see the **Appendix - Setting Memory of Entity Resolution and Matching Services** in the [OFS Compliance Studio Administration and Configuration Guide](#).
12. What should I do when a runtime error occurs while executing a paragraph in Compliance Studio?
- When Compliance Studio is just started (restart/upgrade/fresh installation), every interpreter gives a runtime error for the first time. Re-run the paragraph to get a result.

In addition, a user with admin privileges has to run a dummy notebook with a simple paragraph of all the used interpreters once.

13. What should I do if I encounter an error on the login?

If you log in to Compliance Studio for the first time, log out and log back in to resolve the error.

14. How can I retain the logs after restarting the Compliance Studio?

- a. Log in to the Compliance Studio.
- b. Navigate to <COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin directory.
- c. Open the `compliance-studio.sh` file and modify the following for service(s) as per your requirement:

Search with "**\$LOGS_FOLDER**" text for each service and add > (Greater than) special character and space before the text as specified below:

```
"$DEPLOY_APP_HOME"/<service name>/bin/<service name> >>
"$LOGS_FOLDER"/<service name>.log
```

For example, batchservice, entity-resolution

```
function start_services() {
    service=$1
    case $service in
        batchservice)
            export JAVA_OPTS="-Djavax.net.ssl.trustStore=$DEPLOY_APP_HOME/
mmg-home/mmg-studio/conf/<studio server>
-Djavax.net.ssl.trustStorePassword=$STUDIO_SERVER_SSL_PASSWORD"
            sh "$DEPLOY_APP_HOME"/batchservice/bin/batchservice >>
"$LOGS_FOLDER"/batchservice.log 2>&1 &
            unset JAVA_OPTS
            ;;
        entity-resolution)
            export JAVA_OPTS=<JAVA Options>
            export ER_LOG_PATH="$COMPLIANCE_STUDIO_INSTALLATION_PATH/
deployed"
            export ER_LOG_LEVEL=INFO
            export LD_LIBRARY_PATH="$COMPLIANCE_STUDIO_INSTALLATION_PATH/
deployed/python-packages/saneVirtualEnv/lib/python<version>/site-
packages/jep:$COMPLIANCE_STUDIO_INSTALLATION_PATH/deployed/python-
packages/saneVirtualEnv/lib/":$LD_LIBRARY_PATH
            export PATH_ORG=$PATH
            export PATH=$DEPLOY_APP_HOME/python-packages/saneVirtualEnv/
bin:$PATH
            export TNS_ADMIN=$TNS_ADMIN_PATH
            export PYTHONPATH_ORG=$PYTHONPATH
```



```

    export PYTHONPATH="$DEPLOY_APP_HOME"/python-packages/
    saneVirtualEnv/lib/python<version>/site-packages:$PYTHONPATH_ORG
    sh "$DEPLOY_APP_HOME"/entity-resolution/bin/entity-resolution >>
    "$LOGS_FOLDER"/entity-resolution.log &
    unset JAVA_OPTS
    export PATH=$PATH_ORG
  ;;

```

- d. For load to OpenSearch, you need to add one more > (Greater than) special character as specified below:

```

sh "$DEPLOY_APP_HOME"/load-to-open-search/bin/load-to-open-search
>>"$DEPLOY_APP_HOME"/logs/load-to-open-search.log &

```

- e. Restart Compliance Studio. To do this, run the following command:

```
./compliance-studio.sh -restart
```

Or

```
./compliance-studio.sh -r script
```

15. What should I do if the following error message is displayed while starting Compliance Studio services?

```
Java Memory error: unable to create new native thread
```

The user should perform the following steps:

- Login to the Linux server as a root user where Compliance Studio is installed.
- Open `/etc/security/limits.conf` file.
- Add the following parameters in the file:

```

soft nofile 65536
hard nofile 65536
<linux username> soft nproc 10240
@svrtech soft memlock 500000
@svrtech hard memlock 500000

```

- Save the file.
- Restart the Compliance Studio.

16. What should I do when unable to refresh Graph and fail due to the following error?

```
Failed to load graph '<Graph name>' in PGX server: http://
<hostname>:7007
```

```
08:22:54.878 [se-nio-7059-exec-1] ERROR
s.fccm.graphService.service.GraphExecutorService - Failed to refresh PGX
Graph, <Graph name>, in all PGX servers
```

- Stop the PGX server.
- Log in to Studio schema.

- c. Delete the entries that are related to the graph in the tables - **fcc_graph_m_config_json** and **fcc_pgx_m_config**
- d. Start the PGX server.
- a. Re-execute the Batch for the Graph pipeline or Refresh the Graph task. See the **Managing Graph Pipeline** section in the [OFS Compliance Studio User Guide](#).

17. What should I do if there is a below error in the umm-service logs?

```
[29-06-22 07:30:48,095 GMT AM] [INFO ] [WEB] [UMM] [NA]
[GETUSERSESSION] Exception occurred while getting x-auth-token in
initSession method of GetUserSession classjavax.net.ssl.SSLKeyException:
Hostname verification failed:
HostnameVerifier=weblogic.security.utils.SSLWLSHostnameVerifier,
hostname=129.80.90.202.
```

Perform the steps provided in the <https://docs.oracle.com/middleware/1213/wls/WLACH/taskhelp/security/DisableHostNameVerification.html> link.

18. What should I do when upgrading the version JDK 11.0.13 to 11.0.15 using shell script?

To upgrade bundled JDK, perform the following steps:

- a. Use the `wget` command to download jdk 11.0.15 from the <https://www.oracle.com/java/technologies/javase/jdk11-archive-downloads.html> link.
 - b. Change the directory where mmg-studio is installed and navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/interpreter-server/pgx-interpreter-bundledJRE-<version>`.
 - c. Run the `./update-jdk.sh [-j JDK11_HOME] [-o OUTPUT_DIR]` script. `<JDK11_HOME>` specifies the downloaded JDK11 path, and `<OUTPUT_DIR>` specifies where the updated interpreter is saved.
 - d. Replace the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/interpreter-server/pgx-interpreter-bundledJRE-<version>` directory with the `<OUTPUT_DIR>/pgxjava`.
19. What should I do when unable to update the SSO token to the latest value while reinstalling the Compliance Studio?

The user should perform the following steps:

- a. Log in to Studio schema.
- b. Edit the table NEXTGENEMF_CONFIG and change the SSO token to the proper value.
- c. Commit the changes.
- d. Restart the Compliance Studio.

20. What should I do if it is a time-out issue observed in the Graph Pipeline?

The user should perform the following steps:

- a. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-pipeline/pipeline/data-pipeline-service-<version>/conf/application.properties` directory.
- b. Change the value from 1200000 to 120000000 in the `server.jetty.connection-idle-timeout=` property file.

- c. **Navigate to** <COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-pipeline/pipeline/pipeline-service-<version>/conf/application.properties **directory**
- d. **Change the value from 1200000 to 120000000 in the** server.jetty.connection-idle-timeout= **property file.**

21. What should I do if there is a below error in the Graph Pipeline?

```
08/Aug/2022 10:21:26,761- [LoggerConnection] LoggerConnection: Trying to
fetch connection for log.
```

```
08/Aug/2022 10:21:26,761- [LoggerConnection] LoggerConnection: isJNDI
value retrieved is true
```

```
08/Aug/2022 10:21:26,769- [LoggerConnection] LoggerConnection: Trying
to fetch connection for log.
```

```
08/Aug/2022 10:21:26,769- [LoggerConnection] LoggerConnection: isJNDI
value retrieved is true
```

```
08/Aug/2022 10:21:26,760- [DatabaseLogger] ExecutionLogger: Exception
while executing queries
```

```
java.lang.Exception:
at
com.oracle.fccm.amlxe.dataPipelineService.sequencer.impl.SequencerDAOImpl
.getQueries(SequencerDAOImpl.java:152) ~[classes!/:?]
at
com.oracle.fccm.amlxe.dataPipelineService.sequencer.impl.SequencerDAOImpl
$$FastClassBySpringCGLIB$$7e36e608.invoke(<generated>) ~[classes!/:?]
at
org.springframework.cglib.proxy.MethodProxy.invoke(MethodProxy.java:218)
~[spring-core-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
at
org.springframework.aop.framework.CglibAopProxy$CglibMethodInvocation.in
vokeJoinpoint(CglibAopProxy.java:771) ~[spring-aop-5.2.5.RELEASE.jar!/:
5.2.5.RELEASE]
at
org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(Ref
lectiveMethodInvocation.java:163) ~[spring-aop-5.2.5.RELEASE.jar!/:
5.2.5.RELEASE]
at
org.springframework.aop.framework.CglibAopProxy$CglibMethodInvocation.pr
oceed(CglibAopProxy.java:749) ~[spring-aop-5.2.5.RELEASE.jar!/:
5.2.5.RELEASE]
at
org.springframework.dao.support.PersistenceExceptionTranslationIntercept
or.invoke(PersistenceExceptionTranslationInterceptor.java:139) ~[spring-
tx-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
at
org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(Ref
lectiveMethodInvocation.java:186) ~[spring-aop-5.2.5.RELEASE.jar!/:
5.2.5.RELEASE]
```

```
at
org.springframework.aop.framework.CglibAopProxy$CglibMethodInvocation.pro
ceed(CglibAopProxy.java:749) ~[spring-aop-5.2.5.RELEASE.jar!/:
5.2.5.RELEASE]

at
org.springframework.aop.framework.CglibAopProxy$DynamicAdvisedIntercepto
r.intercept(CglibAopProxy.java:691) ~[spring-aop-5.2.5.RELEASE.jar!/:
5.2.5.RELEASE]

at
com.oracle.fccm.amlxe.dataPipelineService.sequencer.impl.SequencerDAOImp
l$$EnhancerBySpringCGLIB$$c38b7c42.getQueries(<generated>) ~[classes!/:
:]

at
com.oracle.fccm.amlxe.dataPipelineService.impl.ExecutorDAOImpl.executePi
peline(ExecutorDAOImpl.java:247) ~[classes!/::]

at
com.oracle.fccm.amlxe.dataPipelineService.impl.ExecutorDAOImpl$$FastClas
sBySpringCGLIB$$14f27fdb.invoke(<generated>) ~[classes!/::]

at
org.springframework.cglib.proxy.MethodProxy.invoke(MethodProxy.java:218)
~[spring-core-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]

at
org.springframework.aop.framework.CglibAopProxy$CglibMethodInvocation.in
vokeJoinpoint(CglibAopProxy.java:771) ~[spring-aop-5.2.5.RELEASE.jar!/:
5.2.5.RELEASE]

at
org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(Ref
lectiveMethodInvocation.java:163) ~[spring-aop-5.2.5.RELEASE.jar!/:
5.2.5.RELEASE]

at
org.springframework.aop.framework.CglibAopProxy$CglibMethodInvocation.pro
ceed(CglibAopProxy.java:749) ~[spring-aop-5.2.5.RELEASE.jar!/:
5.2.5.RELEASE]

at
org.springframework.dao.support.PersistenceExceptionTranslationIntercepto
r.invoke(PersistenceExceptionTranslationInterceptor.java:139) ~[spring-
tx-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]

at
org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(Ref
lectiveMethodInvocation.java:186) ~[spring-aop-5.2.5.RELEASE.jar!/:
5.2.5.RELEASE]

at
org.springframework.aop.framework.CglibAopProxy$CglibMethodInvocation.pro
ceed(CglibAopProxy.java:749) ~[spring-aop-5.2.5.RELEASE.jar!/:
5.2.5.RELEASE]

at
org.springframework.aop.framework.CglibAopProxy$DynamicAdvisedIntercepto
```

```
r.intercept(CglibAopProxy.java:691) ~[spring-aop-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
com.oracle.fccm.amlxe.dataPipelineService.impl.ExecutorDAOImpl$$EnhancerBySpringCGLIB$$3277859b.executePipeline(<generated>) ~[classes!/:?]
    at
com.oracle.fccm.amlxe.dataPipelineService.services.ExecutorService.executePipeline(ExecutorService.java:154) ~[classes!/:?]
    at sun.reflect.GeneratedMethodAccessor112.invoke(Unknown Source) ~[?:?]
    at
sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43) ~[?:1.8.0_321]
    at java.lang.reflect.Method.invoke(Method.java:498) ~[?:1.8.0_321]
    at
org.springframework.web.method.support.InvocableHandlerMethod.doInvoke(InvocableHandlerMethod.java:190) ~[spring-web-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
org.springframework.web.method.support.InvocableHandlerMethod.invokeForRequest(InvocableHandlerMethod.java:138) ~[spring-web-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
org.springframework.web.servlet.mvc.method.annotation.ServletInvocableHandlerMethod.invokeAndHandle(ServletInvocableHandlerMethod.java:105) ~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
org.springframework.web.servlet.mvc.method.annotation.RequestMappingHandlerAdapter.invokeHandlerMethod(RequestMappingHandlerAdapter.java:879) ~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
org.springframework.web.servlet.mvc.method.annotation.RequestMappingHandlerAdapter.handleInternal(RequestMappingHandlerAdapter.java:793) ~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
org.springframework.web.servlet.mvc.method.AbstractHandlerMethodAdapter.handle(AbstractHandlerMethodAdapter.java:87) ~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
org.springframework.web.servlet.DispatcherServlet.doDispatch(DispatcherServlet.java:1040) ~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
org.springframework.web.servlet.DispatcherServlet.doService(DispatcherServlet.java:943) ~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
org.springframework.web.servlet.FrameworkServlet.processRequest(FrameworkServlet.java:1006) ~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
```

```
at
org.springframework.web.servlet.FrameworkServlet.doPost (FrameworkServlet
.java:909) ~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
  at javax.servlet.http.HttpServlet.service (HttpServlet.java:652)
  ~[tomcat-embed-core-9.0.37.jar!/:4.0.FR]
  at
  org.springframework.web.servlet.FrameworkServlet.service (FrameworkServlet
.java:883) ~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at javax.servlet.http.HttpServlet.service (HttpServlet.java:733)
    ~[tomcat-embed-core-9.0.37.jar!/:4.0.FR]
    at
    org.eclipse.jetty.servlet.ServletHolder.handle (ServletHolder.java:755)
    ~[jetty-servlet-9.4.26.v20200117.jar!/:9.4.26.v20200117]
    at
    org.eclipse.jetty.servlet.ServletHandler$CachedChain.doFilter (ServletHan
dler.java:1617) ~[jetty-servlet-9.4.26.v20200117.jar!/:9.4.26.v20200117]
    at
    org.springframework.web.filter.RequestContextFilter.doFilterInternal (Req
uestContextFilter.java:100) ~[spring-web-5.2.5.RELEASE.jar!/:
:5.2.5.RELEASE]
    at
    org.springframework.web.filter.OncePerRequestFilter.doFilter (OncePerRequ
estFilter.java:119) ~[spring-web-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
    org.eclipse.jetty.servlet.ServletHandler$CachedChain.doFilter (ServletHan
dler.java:1604) ~[jetty-servlet-9.4.26.v20200117.jar!/:9.4.26.v20200117]
    at
    org.springframework.web.filter.FormContentFilter.doFilterInternal (FormCo
ntentFilter.java:93) ~[spring-web-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
    org.springframework.web.filter.OncePerRequestFilter.doFilter (OncePerRequ
estFilter.java:119) ~[spring-web-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
    org.eclipse.jetty.servlet.ServletHandler$CachedChain.doFilter (ServletHan
dler.java:1604) ~[jetty-servlet-9.4.26.v20200117.jar!/:9.4.26.v20200117]
    at
    org.springframework.boot.actuate.metrics.web.servlet.WebMvcMetricsFilter
.doFilterInternal (WebMvcMetricsFilter.java:109) ~[spring-boot-actuator-
2.2.6.RELEASE.jar!/:2.2.6.RELEASE]
    at
    org.springframework.web.filter.OncePerRequestFilter.doFilter (OncePerRequ
estFilter.java:119) ~[spring-web-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]
    at
    org.eclipse.jetty.servlet.ServletHandler$CachedChain.doFilter (ServletHan
dler.java:1604) ~[jetty-servlet-9.4.26.v20200117.jar!/:9.4.26.v20200117]
```

```
at
org.springframework.web.filter.CharacterEncodingFilter.doFilterInternal(
CharacterEncodingFilter.java:201) ~[spring-web-5.2.5.RELEASE.jar!/:
:5.2.5.RELEASE]

at
org.springframework.web.filter.OncePerRequestFilter.doFilter(OncePerRequ
estFilter.java:119) ~[spring-web-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]

at
org.eclipse.jetty.servlet.ServletHandler$CachedChain.doFilter(ServletHan
dler.java:1604) ~[jetty-servlet-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.servlet.ServletHandler.doHandle(ServletHandler.java:54
5) ~[jetty-servlet-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.handler.ScopedHandler.handle(ScopedHandler.java
:143) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.security.SecurityHandler.handle(SecurityHandler.java:5
90) ~[jetty-security-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.handler.HandlerWrapper.handle(HandlerWrapper.ja
va:127) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.handler.ScopedHandler.nextHandle(ScopedHandler.
java:235) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.session.SessionHandler.doHandle(SessionHandler.
java:1607) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.handler.ScopedHandler.nextHandle(ScopedHandler.
java:233) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.handler.ContextHandler.doHandle(ContextHandler.
java:1297) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.handler.ScopedHandler.nextScope(ScopedHandler.j
ava:188) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.servlet.ServletHandler.doScope(ServletHandler.java:485
) ~[jetty-servlet-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.session.SessionHandler.doScope(SessionHandler.j
ava:1577) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.handler.ScopedHandler.nextScope(ScopedHandler.j
ava:186) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]
```

```
at
org.eclipse.jetty.server.handler.ContextHandler.doScope (ContextHandler.java:1212) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.handler.ScopedHandler.handle (ScopedHandler.java:141) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.handler.HandlerWrapper.handle (HandlerWrapper.java:127) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at org.eclipse.jetty.server.Server.handle (Server.java:500) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.HttpChannel.lambda$handle$1 (HttpChannel.java:383) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at org.eclipse.jetty.server.HttpChannel.dispatch (HttpChannel.java:547) [jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at org.eclipse.jetty.server.HttpChannel.handle (HttpChannel.java:375) [jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.server.HttpConnection.onFillable (HttpConnection.java:270) [jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.io.AbstractConnection$ReadCallback.succeeded (AbstractConnection.java:311) [jetty-io-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at org.eclipse.jetty.io.FillInterest.fillable (FillInterest.java:103) [jetty-io-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.io.ssl.SslConnection$DecryptedEndPoint.onFillable (SslConnection.java:543) [jetty-io-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.io.ssl.SslConnection.onFillable (SslConnection.java:398) [jetty-io-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.io.ssl.SslConnection$2.succeeded (SslConnection.java:161) [jetty-io-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at org.eclipse.jetty.io.FillInterest.fillable (FillInterest.java:103) [jetty-io-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at org.eclipse.jetty.io.ChannelEndPoint$2.run (ChannelEndPoint.java:117) [jetty-io-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.util.thread.strategy.EatWhatYouKill.runTask (EatWhatYouKill.java:336) [jetty-util-9.4.26.v20200117.jar!/:9.4.26.v20200117]

at
org.eclipse.jetty.util.thread.strategy.EatWhatYouKill.doProduce (EatWhatYouKill.java:313) [jetty-util-9.4.26.v20200117.jar!/:9.4.26.v20200117]
```



```
at
org.eclipse.jetty.util.thread.strategy.EatWhatYouKill.tryProduce (EatWhatYouKill.java:171) [jetty-util-9.4.26.v20200117.jar!/:9.4.26.v20200117]
at
org.eclipse.jetty.util.thread.strategy.EatWhatYouKill.run (EatWhatYouKill.java:129) [jetty-util-9.4.26.v20200117.jar!/:9.4.26.v20200117]
at
org.eclipse.jetty.util.thread.ReservedThreadExecutor$ReservedThread.run (ReservedThreadExecutor.java:388) [jetty-util-9.4.26.v20200117.jar!/:9.4.26.v20200117]
at
org.eclipse.jetty.util.thread.QueuedThreadPool.runJob (QueuedThreadPool.java:806) [jetty-util-9.4.26.v20200117.jar!/:9.4.26.v20200117]
at
org.eclipse.jetty.util.thread.QueuedThreadPool$Runner.run (QueuedThreadPool.java:938) [jetty-util-9.4.26.v20200117.jar!/:9.4.26.v20200117]
at java.lang.Thread.run (Thread.java:750) [?:1.8.0_321]
08/Aug/2022 10:21:26,786- [LoggerConnection] LoggerConnection: Trying to fetch connection for log.
08/Aug/2022 10:21:26,786- [LoggerConnection] LoggerConnection: isJNDI value retrieved is true
```

Re-execute the failed graph pipeline from the scheduler service. To execute the Graph pipeline, see the **Using Scheduler Service** section in the [OFS Compliance Studio User Guide](#).

22. What should I do if there is a below error while executing the ER job 2 - ./ER_Run_Bulk_Similarity_Job.sh in the matching-service.log?

```
ERROR ss.fccm.matchingservice.service.BulkQueryService - Exception occurred in bulk processingERROR
ss.fccm.matchingservice.service.BulkQueryService - Exception occurred in bulk processingjava.lang.IndexOutOfBoundsException: Index 1 out of bounds for length 1 at
jdk.internal.util.Preconditions.outOfBounds (Preconditions.java:64)
~[?:?] at
jdk.internal.util.Preconditions.outOfBoundsCheckIndex (Preconditions.java:70) ~[?:?] at
jdk.internal.util.Preconditions.checkIndex (Preconditions.java:248)
~[?:?] at java.util.Objects.checkIndex (Objects.java:372) ~[?:?] at
java.util.ArrayList.get (ArrayList.java:459) ~[?:?] at
com.oracle.ofss.fccm.matchingservice.service.BulkQueryService.preProcess (BulkQueryService.java:159) [classes!/:?] at
com.oracle.ofss.fccm.matchingservice.controller.BulkUsingApiController2.executeAsyncBulkQueryMatch (BulkUsingApiController2.java:76) [classes!/:?] at
jdk.internal.reflect.GeneratedMethodAccessor164.invoke (Unknown Source) ~[?:?] at
jdk.internal.reflect.DelegatingMethodAccessorImpl.invoke (DelegatingMethodAccessorImpl.java:43) ~[?:?] at
java.lang.reflect.Method.invoke (Method.java:566) ~[?:?] at
org.springframework.web.method.support.InvocableHandlerMethod.doInvoke (InvocableHandlerMethod.java:205) [spring-w
```

- This error is displayed only when the OpenSearch index does not have the proper data.
- a. Fix the data in the pre tables and cleanup the ER schema.
 - b. Re-run the job again. To run the job, see **Perform Matching** section in the [OFS Compliance Studio Administration and Configuration Guide](#).
23. What should I do if interpreter settings are changed after restarting the Compliance Studio?
- To retain the interpreter settings, follow these steps:
- a. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/conf` directory.
 - b. Open the `application.yml` file and change the value of **overwrite-builtin** to **false** in the interpreter parameter.

NOTE While upgrading Compliance Studio, you should change the value to **true**.

- c. Restart Compliance Studio.
24. How to upgrade the python virtual environment for the fcc-python interpreter?
- To upgrade, follow these steps:
- a. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory.
 - b. Open the `compliance-studio.sh` file and modify the **PYTHONPATH** variable in the default fcc-python interpreter as per your requirement:

For example,

```
export PYTHONPATH=<absolute/path/to/virtual-environment-or-python-  
installation-folder/lib/python<version>>/site-  
packages:$PYTHONPATH_ORG
```

25. What should I do if ER Bulk similarity job fails due to metadata indices?
- To load the indices, follow these steps:
- a. Execute the following cleanup scripts:
 - `ER_Run_Bulk_Similarity_Job.sh`
 - `ER_Create_And_Load_Data_Into_Index.sh`
 - b. Delete the indices.
 - c. Verify that the indices are deleted completely.
 - d. Set the **F_IS_RECENTLY_CHANGED** flag to **Y** in the **fcc_idx_m_lookup**, and **fcc_idx_m_matching_lookup** tables.
 - e. Execute `ER_Create_And_Load_Data_Into_Index.sh`.
 - f. Ensure all the indices are created (Generally, it should create 19).
 - g. If all the indices are available, then execute the `ER_Run_Bulk_Similarity_Job.sh`.
26. Unable to open UI (Ruleset details, Manual Decisioning and Merge and Split Global Entities) in the Firefox browser?
- The reason could be:
- a. Compliance Studio UI does not open in the Firefox browser if self-signed certificates are used while installation.

27. The UI (Ruleset details, Manual Decisioning and Merge and Split Global Entities) takes more time to load in other browsers?

The reason could be:

- a. The Compliance Studio UI screens are not cached if self-signed certificates are used and it takes time to load screen every time.

28. What should I do if the workspaces are not displayed and below error is encountered in the `server.log`?

```
12:02:16.272 [se-nio-7008-exec-2] ERROR  
er.network.base.exception.ExceptionHandlerAdvice - Internal server  
error.
```

```
io.jsonwebtoken.security.SignatureException: JWT signature does not  
match locally computed signature. JWT validity cannot be asserted and  
should not be trusted.
```

To resolve the error, follow these steps:

- a. Generate the public and private keys. For more information, see the [Generate the Public and Private Keys](#) section.
 - b. Replace the keys in the paths as mentioned in the [Generate the Public and Private Keys](#) section.
 - c. Generate the SSO (API) token. For more information, see the [Generate API token for CS API User](#) section.
 - d. Replace token in the `config.sh` file. For more information, see parameter “SSO_TOKEN” in the [Table 14](#).
 - e. Stop Compliance Studio.
 - f. Reinstall Compliance Studio.
 - g. Replace the value of SSO_TOKEN in the `nextgenemf_config` table in the studio schema.
 - h. Start Compliance Studio.
29. What should I do if a particular patch version is not applied to the CS build?

To apply the patch, follow the step:

- a. You must manually delete the entry for that particular patch version from the **FCC_COMPLIANCE_STUDIO_PATCHES** table in the Studio Schema.

30. How to configure a new/cloned interpreter?

To configure a new/cloned interpreter, follow these steps:

- a. Create a new/clone an existing interpreter in the UI.
- b. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/bin` directory.
- c. Open `startup.sh` file and add following line before the line containing “counter=1”;

```
nohup <path_to_interpreter_binary_file> &>> <path_to_save_the_logs>/  
<log_file_name>.log &
```

Figure 30: Snapshot of startup.sh file

```
#export PLAINR_INTERPRETER_OPTS="$PLAINR_INTERPRETER_OPTS -DAPP_BASE_NAME='plainr-i
#nohup "$DIR"/../interpreter-server/plainr-interpret
# To start Spark interpreter
nohup "$DIR"/../interpreter-server/spark-interpret
counter=1;
while [[ $counter -lt 20 ]]
do
    dsHealth=`curl -s --insecure https://ofss-mum-1779.snbomprshared1.gbucdsint02bc
```

d. Save and close the file.

e. Open shutdown.sh file and add following line before the line containing “SL=”.

```
I8004=`ps -eaf | grep java | grep RemoteInterpreterServer | grep 8004
| awk '{print $2}'`
if [[ "" != "$I8004" ]];
then kill -9 $I8004;
fi
```

Figure 31: Snapshot of shutdown.sh file

```
# To shutdown Spark interpreter
I8004=`ps -eaf | grep java | grep RemoteInterpreterServer | grep 8004 | awk '{print $2}'`
if [[ "" != "$I8004" ]];
then kill -9 $I8004;
fi
SL=`ps -eaf | grep java | grep oracle.datastudio.starter.App | awk '{print $2}'`
if [[ "" != "$SL" ]];
then kill -9 $SL;
fi
```

NOTE In the above steps, the port number for the new/cloned interpreter is assumed to be 8004, the default port that comes with the installer. If a different port is used, then change the configuration accordingly.

f. Save and close the file.

g. Navigate to <COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin directory.

h. Restart Compliance Studio using the following command:

```
./compliance-studio.sh -restart
```

i. Verify if the spark-interpret has started using the following command:

```
netstat -nltp | grep 8004
```

31. What should I do if import failed in the Graph Pipeline?

After installation, query the table FCC_M_PIPELINE_IMPORT_LOG to check the imported pipeline status. The _V_IMPORT_STATUS_ column denotes the status and should be 'SUCCESS' for all the imported pipelines.

If any pipelines have the status of 'FAILED,' perform the following steps to reimport:

- Find the entry for the failed pipeline in the **FCC_M_EXTERNALSERVICE_RUN** table of this **_C_TABLELIST_** column.
- Remove that entry from the table. If the entry is not there, skip this step.

- c. **Navigate to** <COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-pipeline/pipeline/data-metadata-job-<version>/bin **directory.**
 - d. **Run the** `import_metadata.sh` **shell script using the following command:**
`./import_metadata.sh`
 - e. **Once the script is executed, verify the status in the** **FCC_M_PIPELINE_IMPORT_LOG** **to ensure that the status is a success.**
32. **How do I update the BE_PORT value after reinstalling the Compliance Studio?**
To update the BE_PORT value, follow these steps:
- a. **Login to Compliance Studio schema.**
 - b. **Open the** **NEXTGENEMF_CONFIG** **table.**
 - c. **Verify the V_NAME columns** (**EMFSTUDIO_SERVICE_URL** and **BASE_URL**).
If “BE_PORT” is not replaced, change V_VALUE to the required port number or set it to the default port value. i.e., **7002**.
 - d. **Restart the Compliance Studio.**
33. **What should I do if delta matches are not reflected in the sub graph (OOB)?**
To reflect delta matches in the sub graph, follow these steps:
- a. **Re-run the Refresh Graph task.**
 - b. **Restart the PGX and then load the sub graph.**

10 Appendix A - Change Port Numbers for the Applicable Services

Change the port number in the applicable files as shown in the following sections. And also, update the respective port numbers in the **install.sh** in `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin`.

WARNING You must re-install and restart Compliance Studio after changing the service(s) with the new port number.

NOTE Only follow this if you want to update the port number of the service(s).

Topics:

- [Server](#)
- [Batchservice and Metaservice](#)
- [Interpreter Service](#)
- [PGX Service](#)
- [Graph Service](#)
- [Matching Service](#)
- [Entity Resolution Service](#)

10.1 Server

To change the port number for the server, go to the **application.yml** file in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/mmg-studio/conf/` directory and edit the following values with the new port, for example, 7008:

- `authserviceUrl: "http://<hostname>:<port>/authservice"`
- `metaserviceUrl: "http://<hostname>:<port>/metaservice"`
- `erserviceUrl: "http://<hostname>:<port>"`
- `batchserviceUrl: "https://<hostname>:<port>/batchservice"`
- `mmgServiceUrl: "https://<hostname>:<port>/cs"`

10.2 Batchservice and Metaservice

To change the port number for the Batchserviceserver, go to the `server-config.properties` file in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/batchservice/conf/` directory and edit the following values with the new port.

- `server.http.port:7043`
- `server.shutdownPort:7044`

Follow this step to make the same changes to the Metaservice server.

10.3 Interpreter Service

To change the port number for the Interpreter service, follow these steps:

1. Navigate to the `install.sh` file in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory and edit the port number of the required service.
2. Reinstall and restart the service.

10.4 PGX Service

To change the port number for the PGX service, go to the `server.conf` file in the `<PGX installation Path>/pgx-server/conf/` directory and update the new port number as **7007**.

10.5 Graph Service

To change the port number for the Graph service, go to the `application.yml` file in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/mmg-load-to-graph/graph-service/conf` directory and update the new port number. By default, it is set as **7059**.

10.6 Matching Service

To change the port number for the matching service, go to the `application.yml` file in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/matching-service/conf` directory and update the new port number as **7049**.

10.7 Entity Resolution Service

To change the port number for the entity resolution service, go to the `application.yml` file in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/entity-resolution/conf` directory and update the new port number **7051**.

11 Appendix B – Spark or PySpark Interpreter

This section provides additional details for Spark or PySpark Interpreter.

Topics:

- [Spark Interpreter User Impersonation](#)
- [Sample spark-default.conf Configuration File](#)

To set up an additional Spark or PySpark interpreter, for example, to connect to two different external clusters at the same time, follow these steps:

1. Create a start-script for the second Spark interpreter.

NOTE This is an optional step.

- a. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/interpreters/bin` directory and create a new start-script called `start-spark2-interpreter.sh` using the following command:

```
cp start-spark-interpreter.sh start-spark2-interpreter.sh
```

- b. Edit the `start-spark2-interpreter.sh` file in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/interpreters/bin/` directory to update:
 - i. Port number to a new port number that is not in use (for example, 7030)
 - ii. Rename the log file, search for the text, `.log` and give a new name to the log (for example, from `spark.log` to `spark2.log`).
- c. Edit the `start-all-interpreters.sh` file in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/interpreters/bin/` directory as follows:
 - i. Search for the text `sh "$DEPLOY_APP_HOME"/interpreters/bin/start-spark-interpreter.sh &`
 - ii. Add an additional entry with `sh "$DEPLOY_APP_HOME"/interpreters/bin/start-spark2-interpreter.sh &`

NOTE For the **2nd Spark** interpreter variant, use `start-spark2-interpreter.sh`, when configuring for a 3rd variant, use as `start-spark3-interpreter.sh` etc.

2. Create the interpreter JSON for the additional Spark interpreter.
 - a. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/interpreters/conf` directory and create the new interpreter JSON called `spark2.json` using the following command:


```
cp spark.json spark2.json
```
 - b. Edit the `spark2.json` file in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/interpreters/conf/` directory as follows:
 - i. Update the following parameter values:


```
group: <new-spark-interpreter-name>,
name: <new-spark-interpreter-name>,
groupSettings.initialCodeCapability: <new-spark-interpreter-name>,
```



```

    port: 7030 (the port chosen in the step 1),
    capabilities.name: <new-spark-interpreter-name>,
    capabilities.button.label: <new-spark-interpreter-name>,

```

3. After the update, the file will look like the following:

```

[
  {
    "group": "spark",
    "name": "spark",
    "className": "org.apache.zepelin.spark.SparkInterpreter",
    "groupSettings": {
      "initialCode": "1+1",
      "initialCodeCapability": "spark"
    },
    "host": "localhost",
    "port": 7017,
    "capabilities": [
      {
        "name": "spark",
        "highlightLanguage": "scala",
        "formEscapeCharacter": "@",
        "button": {
          "defaultCode": "println(\"Hello, world\")",
          "icon": "fa fa-fw fa-building-o",
          "label": "Spark"
        }
      }
    ],
    "defaultInterpreter": true,
    "properties": {
      "spark.executor.memory": {
        "envName": null,
        "propertyName": "spark.executor.memory",
        "defaultValue": "",
        "description": "Executor memory per worker instance. ex) 512m,
32g",
        "type": "string"
      }
    }
  }
]

```

```
    },
    "args": {
      "envName": null,
      "propertyName": null,
      "defaultValue": "",
      "description": "spark commandline args",
      "type": "textarea"
    },
    },
    "zeppelin.spark.useHiveContext": {
      "envName": "ZEPPELIN_SPARK_USEHIVECONTEXT",
      "propertyName": "zeppelin.spark.useHiveContext",
      "defaultValue": true,
      "description": "Use HiveContext instead of SQLContext if it is
true.",
      "type": "checkbox"
    },
    },
    "spark.app.name": {
      "envName": "SPARK_APP_NAME",
      "propertyName": "spark.app.name",
      "defaultValue": "Zeppelin",
      "description": "The name of spark application.",
      "type": "string"
    },
    },
    "spark.pyspark.python": {
      "envName": null,
      "propertyName": "spark.pyspark.python",
      "defaultValue": "python3",
      "description": "Python command to run pyspark workers with",
      "type": "string"
    },
    },
    "zeppelin.spark.printREPLOutput": {
      "envName": null,
      "propertyName": "zeppelin.spark.printREPLOutput",
      "defaultValue": true,
      "description": "Print REPL output",
      "type": "checkbox"
    }
  }
}
```

```
    },
    "spark.cores.max": {
      "envName": null,
      "propertyName": "spark.cores.max",
      "defaultValue": "",
      "description": "Total number of cores to use. Empty value uses
all available core.",
      "type": "number"
    },
    "zeppelin.spark.maxResult": {
      "envName": "ZEPPELIN_SPARK_MAXRESULT",
      "propertyName": "zeppelin.spark.maxResult",
      "defaultValue": "1000",
      "description": "Max number of Spark SQL result to display.",
      "type": "number"
    },
    "spark.master": {
      "envName": "MASTER",
      "propertyName": "spark.master",
      "defaultValue": "yarn",
      "description": "Spark master uri. ex) spark://masterhost:7077",
      "type": "string"
    },
    "spark.yarn.archive": {
      "envName": null,
      "propertyName": "spark.yarn.archive",
      "defaultValue": "",
      "description": "An archive containing needed Spark jars for
distribution to the YARN cache",
      "type": "string"
    },
    "spark.driver.bindAddress": {
      "envName": "DRIVER_BIND_ADDRESS",
      "propertyName": "spark.driver.bindAddress",
      "defaultValue": "0.0.0.0",
      "description": "Hostname or IP address where to bind listening
sockets.",
```

```
    "type": "string"
  },
  "zeppelin.spark.enableSupportedVersionCheck": {
    "envName": null,
    "propertyName": "zeppelin.spark.enableSupportedVersionCheck",
    "defaultValue": true,
    "description": "Do not change - developer only setting, not for
production use",
    "type": "checkbox"
  },
  "zeppelin.spark.uiWebUrl": {
    "envName": null,
    "propertyName": "zeppelin.spark.uiWebUrl",
    "defaultValue": "",
    "description": "Override Spark UI default URL",
    "type": "string"
  },
  "zeppelin.spark.useNew": {
    "envName": null,
    "propertyName": "zeppelin.spark.useNew",
    "defaultValue": true,
    "description": "Whether use new spark interpreter
implementation",
    "type": "checkbox"
  },
  "zeppelin.spark.ui.hidden": {
    "envName": null,
    "propertyName": "zeppelin.spark.ui.hidden",
    "defaultValue": false,
    "description": "Whether to hide spark ui in zeppelin ui",
    "type": "checkbox"
  },
  "zeppelin.interpreter.output.limit": {
    "envName": null,
    "propertyName": "zeppelin.interpreter.output.limit",
    "defaultValue": "102400",
```

```

        "description": "Output message from interpreter exceeding the
limit will be truncated",
        "type": "number"
    }
},
"initialCode": [],
"editor": {
    "language": "scala",
    "editOnDbClick": false
}
}
]

```

4. Create the interpreter JSON for the second PySpark interpreter.

- a. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/interpreters/conf` directory and create the new interpreter JSON called `pyspark2.json` using the following command:

```
cp pyspark.json pyspark2.json
```

- b. Edit the `pyspark2.json` file in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/interpreters/conf/` directory as follows:

- i. Update the following parameter values:

```

group: <new-spark-interpreter-name>,
name: <new-spark-interpreter-name>,
groupSettings.initialCodeCapability: <new-spark-interpreter-name>,
port: 7030 (the port chosen in the step 1),
capabilities.name: <new-spark-interpreter-name>,
capabilities.button.label: <new-spark-interpreter-name>,

```

5. After the update, the file will look like the following:

```

[
  {
    "group": "spark",
    "name": "pyspark",
    "className": "org.apache.zeppelin.spark.PySparkInterpreter",
    "host": "localhost",
    "port": 7017,
    "capabilities": [
      {
        "name": "pyspark",

```

```
    "highlightLanguage": "python",
    "button": {
      "defaultCode": "print('Hello World')",
      "icon": "icon-python",
      "label": "PySpark"
    },
    "formEscapeCharacter": "$"
  }
],
"properties": {
  "zeppelin.pyspark.python": {
    "envName": "PYSPARK_PYTHON",
    "propertyName": null,
    "defaultValue": "python3",
    "description": "Python executable to run pyspark with",
    "type": "string"
  },
  "zeppelin.pyspark.useIPython": {
    "envName": null,
    "propertyName": "zeppelin.pyspark.useIPython",
    "defaultValue": false,
    "description": "whether use IPython when it is available",
    "type": "checkbox"
  },
  "zeppelin.interpreter.output.limit": {
    "envName": null,
    "propertyName": "zeppelin.interpreter.output.limit",
    "defaultValue": "102400",
    "description": "Output message from interpreter exceeding the
limit will be truncated",
    "type": "number"
  }
},
"initialCode": []
}
```

NOTE If you try to connect two interpreters to different external clusters when setting the environment variables, `SPARK_HOME` and `HADOOP_CONF_DIR`, as part of providing custom Spark libraries in Yarn Mode, ensure that you append the environment variables to the respective Spark interpreter start-scripts.

- Restart Compliance Studio. To do this, navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin/` directory and run the `./compliance-studio.sh -restart` or `./compliance-studio.sh -r script`

11.1 Spark Interpreter User Impersonation

Configure the Spark cluster and Studio to allow proxy users.

Add the below properties and values in `core-site.xml` in the Spark cluster as well as Studio and restart the Spark cluster and Studio:

```
<property>
  <name>hadoop.proxyuser.zepelin.groups</name>
  <value>*</value>
</property>
<property>
  <name>hadoop.proxyuser.zepelin.hosts</name>
  <value>*</value>
</property>
```

Configure the Spark interpreter to run the spark-submit job as the currently logged-in user.

Add the below property in `spark.json`:

```
"zeppelin.spark.run.asLoginUser": {
  "envName": null,
  "propertyName": "zeppelin.spark.run.asLoginUser",
  "defaultValue": true,
  "description": "Whether run spark job as the zeppelin login user, it is only applied when running spark job in hadoop yarn cluster and shiro is enabled",
  "type": "checkbox"
}
```

NOTE There will be only a single keytab used by all Spark interpreter runs.

11.2 Sample spark-default.conf Configuration File

Here is the sample code block for creating `spark-default.conf` file:

```
spark.driver.port 30303

spark.blockManager.port 31313

spark.driver.bindAddress 0.0.0.0

spark.yarn.dist.files <COMPLIANCE STUDIO INSTALLTION PATH>/deployed/mmg-home/
mmg-studio/interpreter-server/spark-interpreter-<version>/extralibs/spark-
<version>-bin-hadoop<version>/python/lib/pyspark.zip,<COMPLIANCE STUDIO
INSTALLTION PATH>/deployed/mmg-home/mmg-studio/interpreter-server/spark-
interpreter-<version>/extralibs/spark-<version>-bin-hadoop<version>/python/
lib/py4j-0.10.7-src.zip

spark.executorEnv.PYTHONPATH pyspark.zip:py4j-0.10.7-src.zip

spark.driver.defaultJavaOptions "-Dsun.security.krb5.debug=false -
Djavax.security.auth.useSubjectCredsOnly=false -
Djava.security.krb5.conf=<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/
batchservice/user/conf/krb5.conf"

spark.driver.host <FQDN_HOSTNAME>

spark.yarn.keytab <COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/
batchservice/user/conf/fccstudio.keytab

spark.yarn.principal <KRBS_PRINCIPAL>

spark.yarn.kerberos.relogin.period 1m
```

NOTE

- **FQDN_HOSTNAME** stands for compliance Studio Fully Qualified hostname, and **KRBS_PRINCIPAL** stands for Kerberos principal.
- For example, the Spark version is **spark-2.4.0-bin-hadoop2.7**.

12 Appendix C – Additional Jars – PGX

PGX-Server does not include Hadoop-client for reading graphs from HDFS.

NOTE

- **This section is deprecated in the current release and will be removed in the future release.**
- This section can be skipped if the deployer intends to use only ready to use sample-graph or PGX server without ETL.

When deploying Studio, you must obtain the following libraries. These libraries can be obtained from your existing big data cluster or the internet. The following list of jars is for **Hadoop-client 3.0.0-cdh6.3.0**. These libraries are referred to as '**hdfs-libs**'.

NOTE

The following Jar files for your reference. you can use the similar **hdfs-libs** jars based on your Big Data cluster.

Table 24 lists required libraries:

Table 24: List of libraries

accessors-smart-1.2.jar	jaxb-api-2.2.11.jar
aopalliance-1.0.jar	jaxb-impl-2.2.3-1.jar
asm-5.0.4.jar	jcip-annotations-1.0-1.jar
avro-1.8.2-cdh6.3.1.jar	jersey-client-1.19.jar
commons-beanutils-1.9.4.jar	jersey-core-1.19.jar
commons-cli-1.2.jar	jersey-guice-1.19.jar
commons-codec-1.11.jar	jersey-json-1.19.jar
commons-collections-3.2.2.jar	jersey-server-1.19.jar
commons-compress-1.18.jar	jersey-servlet-1.19.jar
commons-configuration2-2.1.1.jar	jettison-1.1.jar
commons-io-2.6.jar	jetty-security-9.3.25.v20180904.jar
commons-lang-2.6.jar	jetty-servlet-9.3.25.v20180904.jar
commons-lang3-3.7.jar	jetty-util-9.3.25.v20180904.jar
commons-logging-1.2.jar	jetty-webapp-9.3.25.v20180904.jar
commons-math3-3.1.1.jar	jetty-xml-9.3.25.v20180904.jar
commons-net-3.1.jar	jline-0.9.94.jar
curator-client-2.12.0.jar	json-smart-2.3.jar

Table 24: List of libraries

curator-framework-2.12.0.jar	jsp-api-2.1.jar
curator-recipes-2.12.0.jar	jsr305-3.0.0.jar
gson-2.2.4.jar	jsr311-api-1.1.1.jar
guava-16.0.1.jar	kerb-admin-1.0.0.jar
guice-4.0.jar	kerb-client-1.0.0.jar
hadoop-annotations-3.0.0-cdh6.3.1.jar	kerb-common-1.0.0.jar
hadoop-auth-3.0.0-cdh6.3.1.jar	kerb-core-1.0.0.jar
hadoop-client-3.0.0-cdh6.3.1.jar	kerb-crypto-1.0.0.jar
hadoop-common-3.0.0-cdh6.3.1.jar	kerb-identity-1.0.0.jar
hadoop-hdfs-client-3.0.0-cdh6.3.1.jar	kerb-server-1.0.0.jar
hadoop-mapreduce-client-common-3.0.0-cdh6.3.1.jar	kerb-simplekdc-1.0.0.jar
hadoop-mapreduce-client-core-3.0.0-cdh6.3.1.jar	kerb-util-1.0.0.jar
hadoop-mapreduce-client-jobclient-3.0.0-cdh6.3.1.jar	kerby-asn1-1.0.0.jar
hadoop-yarn-api-3.0.0-cdh6.3.1.jar	kerby-config-1.0.0.jar
hadoop-yarn-client-3.0.0-cdh6.3.1.jar	kerby-pkix-1.0.0.jar
hadoop-yarn-common-3.0.0-cdh6.3.1.jar	kerby-util-1.0.0.jar
htrace-core4-4.1.0-incubating.jar	kerby-xdr-1.0.0.jar
httpClient-4.5.3.jar	log4j-1.2.17.jar
httpcore-4.4.6.jar	netty-3.7.0.Final.jar
jackson-annotations-2.9.9.jar	nimbus-jose-jwt-4.41.1.jar
jackson-core-2.9.9.jar	okhttp-2.7.5.jar
jackson-core-asl-1.9.13.jar	okio-1.6.0.jar
jackson-databind-2.9.9.3.jar	paranamer-2.8.jar
jackson-jaxrs-1.9.2.jar	protobuf-java-2.5.0.jar
jackson-jaxrs-base-2.9.9.jar	re2j-1.1.jar
jackson-jaxrs-json-provider-2.9.9.jar	slf4j-api-1.7.25.jar
jackson-mapper-asl-1.9.13-cloudera.1.jar	slf4j-log4j12-1.7.25.jar
jackson-module-jaxb-annotations-2.9.9.jar	snappy-java-1.1.4.jar
jackson-xc-1.9.2.jar	stax2-api-3.1.4.jar
javax.activation-api-1.2.0.jar	woodstox-core-5.0.3.jar
javax.inject-1.jar	xz-1.6.jar
javax.servlet-api-3.1.0.jar	zookeeper-3.4.8.jar

13 Appendix D – Additional Jars – Batch Service

When deploying Studio, you must obtain the following files for Batch Service.

NOTE

- **This section is deprecated in the current release and will be removed in the future release.**
- The following Jar files for your reference. you can use the similar **hdfs-libs** jars based on your Big Data cluster.

Table 25 lists the required files:

Table 25: List of Files

accessors-smart-1.2.jar	jersey-server-1.19.jar
activation-1.1.jar	jersey-servlet-1.19.jar
asm-5.0.4.jar	jettison-1.1.jar
avro-1.8.2-cdh6.3.1.jar	jetty-http-9.3.25.v20180904.jar
commons-beanutils-1.9.4.jar	jetty-io-9.3.25.v20180904.jar
commons-cli-1.2.jar	jetty-security-9.3.25.v20180904.jar
commons-codec-1.11.jar	jetty-server-9.3.25.v20180904.jar
commons-collections-3.2.2.jar	jetty-servlet-9.3.25.v20180904.jar
commons-compress-1.18.jar	jetty-util-9.3.25.v20180904.jar
commons-configuration2-2.11.jar	jetty-webapp-9.3.25.v20180904.jar
commons-io-2.6.jar	jetty-xml-9.3.25.v20180904.jar
commons-lang-2.6.jar	jline-0.9.94.jar
commons-lang3-3.7.jar	jsch-0.1.54.jar
commons-logging-1.2.jar	json-smart-2.3.jar
commons-math3-3.1.1.jar	jsp-api-2.1.jar
commons-net-3.1.jar	jsr305-3.0.0.jar
curator-client-2.12.0.jar	jsr311-api-1.1.1.jar
curator-framework-2.12.0.jar	kerb-admin-1.0.0.jar
curator-recipes-2.12.0.jar	kerb-client-1.0.0.jar
gson-2.2.4.jar	kerb-common-1.0.0.jar
guava-16.0.1.jar	kerb-core-1.0.0.jar
hadoop-annotations-3.0.0-cdh6.3.1.jar	kerb-crypto-1.0.0.jar
hadoop-auth-3.0.0-cdh6.3.1.jar	kerb-identity-1.0.0.jar
hadoop-common-3.0.0-cdh6.3.1.jar	kerb-server-1.0.0.jar
hive-exec-1.1.0-cdh5.13.0.jar	kerb-simplekdc-1.0.0.jar

Table 25: List of Files

HiveJDBC4.jar	kerb-util-1.0.0.jar
hive-metastore-1.1.0-cdh5.13.0.jar	kerby-asn1-1.0.0.jar
hive-service-1.1.0-cdh5.13.0.jar	kerby-config-1.0.0.jar
htrace-core4-4.1.0-incubating.jar	kerby-pkix-1.0.0.jar
httpclient-4.5.3.jar	kerby-util-1.0.0.jar
httpcore-4.4.6.jar	kerby-xdr-1.0.0.jar
jackson-annotations-2.9.0.jar	log4j-1.2.17.jar
jackson-core-2.9.9.jar	netty-3.7.0.Final.jar
jackson-core-asl-1.9.13.jar	nimbus-jose-jwt-4.41.1.jar
jackson-databind-2.9.9.3.jar	paranamer-2.8.jar
jackson-jaxrs-1.9.2.jar	protobuf-java-2.5.0.jar
jackson-mapper-asl-1.9.13-cloudera.1.jar	re2j-1.1.jar
jackson-xc-1.9.2.jar	slf4j-api-1.7.25.jar
javax.activation-api-1.2.0.jar	slf4j-log4j12-1.7.25.jar
javax.servlet-api-3.1.0.jar	snappy-java-1.1.4.jar
jaxb-api-2.2.2.jar	stax2-api-3.1.4.jar
jaxb-impl-2.2.3-1.jar	stax-api-1.0-2.jar
jcip-annotations-1.0-1.jar	woodstox-core-5.0.3.jar
jersey-core-1.19.jar	xz-1.6.jar
jersey-json-1.19.jar	zookeeper-3.4.8.jar

14 Appendix E – Create Users, Groups, and Mappings

This AAI User Provisioning SQL Scripts Generator Utility allows you to use AAI for authN in the Compliance Studio. Identity administrators can create new user groups/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 config schema to create the required metadata.

You must execute this script multiple times against each username. Also, generate the merge scripts accordingly.

Execute the following command from `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/<mmg-home>/bin` directory.

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

Sample Commands:

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

Table 26 list the pre-configured groups in the Compliance Studio.

Table 26: Pre-configured Group

User Group	Description
IDNTYADMN	Identity Administrator group
IDNTYAUTH	Identity Authorizer group
MDLREV	The Modeling Reviewer Group. Users mapped to this group have access to the menu items in the application that are related to model review activities.
MDLAPPR	The Modeling Approver Group. 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. Users mapped to this group have access to create and populate workspaces. For viewing the landing page this group is required.
MDLUSR	The Modeling User Group. Users mapped to this group have access to all the menu items in the application that is related to model creation.
DSUSRGRP	Data Studio User Group . This User Group provide access to modify Interpreter configurations.

Table 26: Pre-configured Group

User Group	Description
GRPADMIN	The Graph Administrator Group. Users mapped to this group have access to all the menu items in the application related to graph as well as Pipeline/Refresh graphs related health services.
GRPUSR	The Graph User Group. Users mapped to this group have access to all the menu items in the application related to graph as well as Pipeline/Refresh graphs related health services.
DSREDACTGRP	Roles for applying redaction in graph. This group will be applicable to only those users for whom graph redaction is required. NOTE: This group has to be created manually in AAI and map it to the users.
ERADMIN	Entity resolution admin group. NOTE: This group has to be created manually in AAI and map it to the users.
ERUSER	Entity resolution user group. NOTE: This group has to be created manually in AAI and map it to the users.

NOTE

For more information on adding, updating, and deleting Users through AAI realm method, see the **System Configuration and Identity Management** section in the [OFSAAI User Guide](#).

15 Appendix F - Generate an Encrypted Password for OpenSearch

To generate encrypted passwords required during configuration, i.e., while configuring encrypted passwords. For example, `OPEN_SEARCH_ENCRYPTED_PASSWORD`.

To generate an encrypted password, follow these steps:

1. Set the export `FIC_DB_HOME` path in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/ficdb` directory.
2. Run the `echo $FIC_DB_HOME` command.
3. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/ficdb/bin` directory and run the `./FCCM_Studio_Base64Encoder.sh <password to be encrypted>` command.

16 Appendix G - Disable Initialization in fcc-python-sane Interpreter

To disable the fcc-python-sane interpreter, follow these steps:

1. Navigate to the following directories and update the **MMG_PYTHON_INTERPRETER** property as `MMG_PYTHON_INTERPRETER=fcc-python,fcc-python-ml4aml`
 - `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin/install.sh`
 - `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/bin/config.sh`
 - `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-service/bin/config.sh`
2. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-service/conf/application.properties` directory.
3. Update the **mmg.python_interpreter** property as `mmg.python_interpreter=fcc-python,fcc-python-ml4aml`.
4. Restart Compliance Studio.

OFSAA Support

Raise a Service Request (SR) in [My Oracle Support \(MOS\)](#) for queries related to OFSAA applications.

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