Oracle Financial Services 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
8.1.2.8.0	August 2024	Added the following sections: • Create Filestore Directories in the Database Server for Graph • Assign Grants to Studio Schema to Access the File-store Directories • Upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0 • Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0 Added bug number for v8.1.2.8.0 in the Download the Installer Kit section. Added new parameters related to External Schema in the config.sh file. Added "GRANT EXECUTE ON SYS.DBMS_LOCK TO <GRAPH_SCHEMA>;" grant in the Assign Pre-installation Grants for Graph Schema section. Added note and NO_PROXY related to Quantifind in the config.sh file. Updated reinstall command for Compliance Studio in the Reinstall Compliance Studio with Updated Configuration section. Updated reinstall command for PGX service in the Configure the PGX Service section. Removed following parameters in the config.sh file: • COMPLIANCE_STUDIO_GATEWAY_ENABLED • COMPLIANCE_STUDIO_GATEWAY_PORT • AUDIT_DATASOURCE_NAME

Table of Contents

1   Preface

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

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

This section identifies additional resources to the OFS Compliance Studio. You can access additional documents from the Oracle Help Center.

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.
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

Table 3: Abbreviations

Abbreviation	Meaning
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.

Users can perform the following actions:

- Install a new instance of Compliance Studio with OFSAA (Oracle Financial Services Analytical Application). Here, OFSAA is with Behavior Detection (BD) or Enterprise Case Management (ECM).

  > **NOTE**   If you want to install Compliance Studio without OFSAA, contact My Oracle Support (MOS).

- If any issue occurs during installation, you can reinstall Compliance Studio with updated configuration.

- Upgrade Compliance Studio from CS 8.1.2.6.0 to CS 8.1.2.8.0 and CS 8.1.2.7.0 to CS 8.1.2.8.0.

The following use cases are supported in the Compliance Studio:

- **Entity Resolution**

- **Graph**

- **Investigation Hub Notebooks**

- **Automated Scenario Calibration (ASC)**

- **Behavioral Model**

- **Sanctions Event Scoring**

- **AML Event Scoring**

- **Customer Segmentation and Anomaly Detection**

- **Customer Risk Scoring**

- **Shell Account Detection Scenario for AML**

3   Installation

This section explains step-by-step process for installing the Compliance Studio.

3.1   Prerequisites

Ensure your system meets the minimum hardware and software requirements and has the necessary environment and ports configured in the system before you begin installing the Compliance Studio.

Make sure that the application architecture is configured appropriately for the use cases of interest as outlined in the OFS Compliance Studio Architecture Guide.

3.1.1   Hardware and Software Requirements

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

Table 4 lists the Hardware and Software Requirements.

Table 4: Hardware and Software Requirements

Hardware / Software Category	Component Version	Use Case
Browser	Chrome	Applicable for all use cases
Java Version	JDK 11.0.18	Applicable for all use cases
Processing Server	RHEL 7.6+ and 8+	Applicable for all use cases
Database Server	• 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	Applicable for all use cases
PGX (Graph) Server	• RHEL 7.4+ • Minimum gcc library v4.8.2	Applicable for Graph use case only
OpenSearch Version	Version: **2.3.0** **NOTE:** OpenSearch is not required in case **MATCHING_MECHANISM** parameter is set to **OT**.	Applicable for Entity Resolution and Graph use cases
Logstash Version	Version: 7.16.3 Logstash should be downloaded from the link. **NOTE:** Logstash is not required in case **MATCHING_MECHANISM** parameter is set to **OT**.	Applicable for Entity Resolution and Graph use cases

Table 4: Hardware and Software Requirements

Hardware / Software Category	Component Version	Use Case
Oracle Instant Client	instantclient-basic-linux.x64-19.8.0.0.0 **NOTE:** The version should be the same as the Database version, and this should be present in the processing server.	Applicable for all use cases
Oracle Database Client	Download the LINUX.X64_193000_client_home.zip file.	Applicable for all use cases

3.1.2   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 5 lists the Environmental Settings.

Table 5: Environmental Settings

Category	Expected Value
Java Settings	PATH in the `.profile/.bash_profile` file must be set to include the Java Runtime Environment (JDK 11) absolute path. **Supported version**: jdk 11.0.18 **NOTE**: Ensure the absolute path to `JDK/bin` is set at the beginning of the PATH variable. For example: `PATH=/scratch/fccstudio/jdk-11.0.18/bin:$PATH` Ensure no SYMBOLIC links to Java installation are set in the PATH variable.
Oracle Database Settings	**Oracle Processing Server** `ORACLE_HOME` must be set in the `.profile` file pointing to the appropriate Oracle DB Client installation. PATH in the `.profile` file must be set to include the appropriate `$ORACLE_HOME/bin` directory.
Download Directory	Indicates the directory where the product installer zip file is downloaded or copied. The user permission must be set to 755 for this directory.
Installation Directory	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. **NOTE:** The Installation and the Download Directory can be the same if the product installer zip file is not copied separately to another directory.

Table 5: Environmental Settings

Category	Expected Value
OS Locale	Linux: `en_US.utf8` Execute the following command to check the locale: `locale -a | grep -i 'en_US.utf'` The locale is displayed.
Oracle Instant client	Install oracle instant client in the server where compliance Studio is installed and provide the configuration `LD_LIBRARY_PATH` in `config.sh`

3.1.3 System Configuration

To configure the system, follow these steps:

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`

3.1.4 Port Numbers for Application

To view default port number for available services in the application, follow these steps:

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

2. Open `install.sh` file and view list of ports as mentioned in the Table 6.

   Table 6: List of Ports for Services

Service	Port Number
AUTH_SERVICE_PORT	7041
BATCH_SERVICE_PORT	7043
BE_PORT	7002
DATAPIPELINE_GATEWAY_SERVICE_PORT	7063
DATA_PIPELINE_UI_SERVICE_PORT	7067
ER_SERVICE_PORT	7051
FCC_UI_PORT	7061
GRAPH_SERVICE_PORT	7059
JDBC_EVENT_PORT	7031

Table 6: List of Ports for Services

Service	Port Number
JDBC_PORT	7011
LOAD_TO_OS_SERVICE_PORT	7053
MATCHING_SERVICE_PORT	7049
META_SERVICE_PORT	7045
PIPELINE_UI_SERVICE_PORT	7065
PYTHON_DEFAULT_EVENT_PORT	7030
PYTHON_DEFAULT_PORT	7010
PYTHON_DEFAULT_REST_PORT	7077
PYTHON_ML4AML_EVENT_PORT	7036
PYTHON_ML4AML_PORT	7016
PYTHON_ML4AML_REST_PORT	7097
PYTHON_SANE_EVENT_PORT	7037
PYTHON_SANE_PORT	7017
PYTHON_SANE_REST_PORT	7087
SCHEMA_PORT	7003
SESSION_SERVICE_PORT	7047
STUDIO_SERVICE_PORT	7008
UI_PORT	7001

NOTE	To change port number in the **install.sh** file for respective service(s), see Change Port Numbers for Applicable Services section in the Appendix.

3.2   Preparing for Installation

3.2.1   Download the Installer Kit

To download the software as `.zip` folders, download the latest installer **36987750** for the **v8.1.2.8.0** release from the My Oracle Support (MOS).

After downloading the installer kit (`OFS_COMPLIANCE_STUDIO_8.1.2.8.0_LINUX.zip`), unzip the file. It contains two folders as follows:

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

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

You have to rename the two folders as follows:

1. `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-1of2.zip`

2. `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-2of2.zip`

3.2.2 Extract the Installer Kit

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

1. Extract the `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-1of2.zip` file from the installer in the download directory using the following command:

   ```
   unzip -a OFS_COMPLIANCE_STUDIO-8.1.2.8.0-1of2.zip
   ```

2. The `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-2of2.zip` file should be placed in the same directory where `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-1of2.zip` file is extracted.

   > **NOTE**   You do not need to unzip the `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-2of2.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 Pre-Installation

This section 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.

3.3.1 Create Tablespace

Tablespace is required to manage and allocate space for its database objects efficiently. It plays crucial role in efficient database management, performance optimization, and scalability which are essential for the effective functioning of Compliance Studio.

To create a tablespace in the Oracle Database use the scripts as described in the Table 7.

Table 7: Create Tablespace

User	Script
AIF_USER_TEMP_TS	CREATE TABLESPACE AIF_USER_TEMP_TS DATAFILE '<Datafile Path>' SIZE <size in byte> REUSE AUTOEXTEND ON NEXT <size in megabyte> MAXSIZE UNLIMITED;

Table 7: Create Tablespace

User	Script
AIF_USER_TS	CREATE TABLESPACE AIF_USER_TS DATAFILE '<Datafile Path>' SIZE <size in byte> REUSE AUTOEXTEND ON NEXT <size in megabyte> MAXSIZE UNLIMITED;
<STUDIO TABLESPACE>	CREATE TABLESPACE <STUDIO TABLESPACE> DATAFILE '<Datafile Path>' SIZE <size in byte> REUSE AUTOEXTEND ON NEXT <size in megabyte> MAXSIZE UNLIMITED;
<GRAPH_SCHEMA_TS>	CREATE TABLESPACE <GRAPH_SCHEMA_TS> DATAFILE '<Datafile Path>' SIZE <size in byte> REUSE AUTOEXTEND ON NEXT <size in megabyte> MAXSIZE UNLIMITED;

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

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. 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;
```

3.3.2   Create the Studio Schema

The studio schema stores all the metadata information related to Compliance Studio.

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.

3.3.3   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>;`

3.3.4   Create Sandbox Schema

> **NOTE**   This section is applicable to all use cases with the exception of ASC. For ASC, the sandbox should be a valid prod-parallel BD schema.

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.
> - The tablespace and quota sizes should be defined based on the size of the data.

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

3.3.5   Assign Grants to Sandbox Schema

> **NOTE**   This section is not applicable for ASC use case.

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>;
```

3.3.6 Create Graph Schema

> **NOTE** This section is applicable only for Graph use case.

Graph schema is a database schema where business data from either BD/ECM are extracted, transformed, and loaded (ETL) after the graph pipeline execution. The Compliance Studio installer requires the graph schema during the installation process; hence user should create the graph schema before the installation process.

If you are generating graph from business data of the BD application, then it is called as BD graph and similarly; if you are generating graph from business data of the ECM application, then it is called as ECM graph.

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.

3.3.7 Assign Pre-installation Grants for Graph Schema

> **NOTE** This section is applicable only for Graph use case.

Grant the following permissions to the newly created graph schema.

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

  ```
  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 only when MATCHING_MECHANISM is set to OT in the `config.sh` file.

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

GRANT EXECUTE ON SYS.DBMS_LOCK 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>;
```

3.3.8 Create Filestore Directories in the Database Server for Graph

> **NOTE**   This section is applicable only for Graph use case.

To create filestore directories in the database server, follow these steps:

1. Log in as DB user in your DB server.

2. Create a new directory with preferred reference name (for example, datapipeline) at the preferred location.

3. Execute the following commands in putty session of the DB server:

   ■ Create a directory for the external table to write the logs

```
mkdir -p ##<Location of the Created Directory>##/file_store/fs_list/
logs
```

- Create a directory to hold a pre-processor script used to list files in the directory and this requires read-execute permissions

```
mkdir -p ##<Location of the Created Directory>##/file_store/fs_list/
script
```

- Create a directory to hold files to control which directories can be listed and this requires read permissions

```
mkdir -p ##<Location of the Created Directory>##/file_store/fs_list/
control
```

- Create a directory to hold files to control which directories can be listed and this requires read permissions

```
mkdir -p ##<Location of the Created Directory>##/file_store/fs_list/
fccm-data
```

3.3.9 Assign Grants to Studio Schema to Access the Filestore Directories

NOTE	This section is applicable only for Graph use case.

Grant the following permissions to Studio Schema to access filestore directories.

```
CREATE OR REPLACE DIRECTORY fs_list_logs_dir AS '<Location of the Created
Directory>/file_store/fs_list/logs/';

GRANT READ, WRITE ON DIRECTORY fs_list_logs_dir TO $STUDIO_DB_USERNAME;

CREATE OR REPLACE DIRECTORY fs_list_script_dir AS '< Location of the Created
Directory >/file_store/fs_list/script/';

GRANT READ, EXECUTE ON DIRECTORY fs_list_script_dir TO $STUDIO_DB_USERNAME;

CREATE OR REPLACE DIRECTORY fs_list_control_dir AS '<Location of the Created
Directory >/file_store/fs_list/control/';

GRANT READ ON DIRECTORY fs_list_control_dir TO $STUDIO_DB_USERNAME;

CREATE OR REPLACE DIRECTORY external_tables_dir AS '<Location of the Created
Directory >/file_store/fs_list/fccm-data/';

GRANT READ ON DIRECTORY external_tables_dir TO $STUDIO_DB_USERNAME;
```

3.4 Application User Access and Provisioning

NOTE	**Prerequisites**: 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

3.4.1 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 1: Configure Instance Access Token
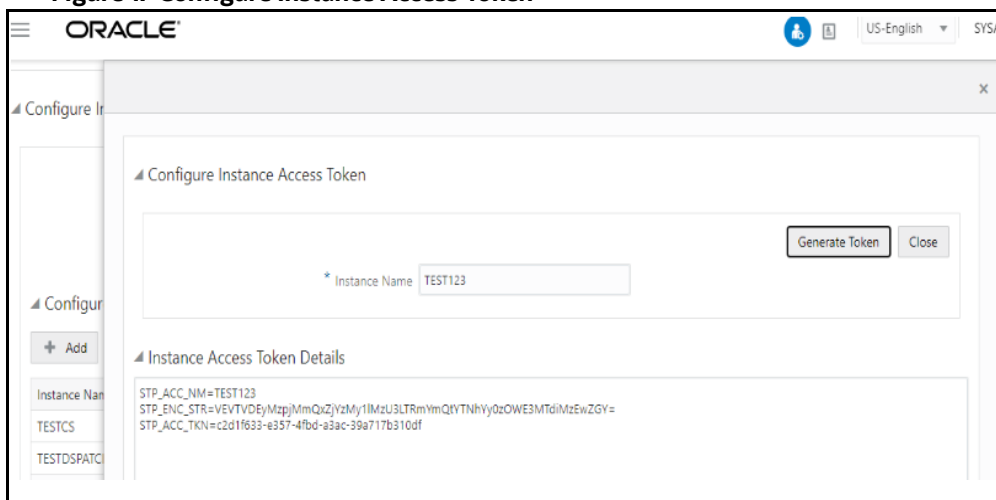
4. Provide the **Instance Name.**
5. Click **Generate token**. The Configure Instance Access Token Details are displayed.
6. Copy the **STP_ACC_NM** and **STP_ACC_TKN** for configuration.
7. Click **Close** to exit the screen.

3.4.2 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 8.

Table 8: Parameters of config.sh file

Parameter	Significance	Value
AUTH_REALM	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. The Compliance Studio application can be accessed using the following realms: **FCCMRealm** Value=AAI **FCCSamlRealm** Value=SAML	SAML **NOTE:** This parameter is mandatory.
SAML_DESTINATION	Indicates the SAML IDP URL that the Identity Provider provides after creating the SAML Application.	Provide the IDCS-SSO URL. **NOTE:** This parameter is mandatory.
SAML_ROLE_ATTRIBUTE	Indicates the SAML client identifier provided by the SAML Administrator for the Role and Attributes information while creating the SAML application for Compliance Studio.	Provide the group name. **NOTE:** This parameter is mandatory.
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.	Provide the IDCS-SLO URL. **NOTE:** This parameter is mandatory.
AAI_URL	The Application URL of ECM/BD application. URL: http://<Server Hostname>:<Application URL PORT>/ <Context Path>	The value will be BD/ECM application where the USER-GROUP map/authentication is present. **NOTE:** This parameter is mandatory.

3. Reinstall Compliance Studio with updated configuration.

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 9.

Table 9: 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 Generating the Bearer Token section.
aai.client.secret	Provide the Bearer token (STP_ACC_TKN). To get the secret, see the Generating the Bearer Token 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.

3.4.3 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 10.

Table 10: Parameters of config.sh file

Parameter	Significance	Value
AUTH_REALM	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. The Compliance Studio application can be accessed using the following realms: **FCCMRealm** Value=AAI **FCCSamlRealm** Value=SAML	SAML
SAML_DESTINATION	Indicates the SAML IDP URL that the Identity Provider provides after creating the SAML Application.	Provide the IDCS-SSO URL

Table 10: Parameters of config.sh file

Parameter	Significance	Value
SAML_ROLE_ATTRIBUTE	Indicates the SAML client identifier provided by the SAML Administrator for the Role and Attributes information while creating the SAML application for Compliance Studio.	Provide the group name
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.	Provide the IDCS-SLO URL

3. Reinstall Compliance Studio with updated configuration.

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 11.

   Table 11: 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 **NOTE:** 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.

3.5 Database User Access

3.5.1 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.

User should create schema for pre-installation and post-installation activities as mentioned in the Table 12.

Table 12: Types of Schema for Installation Activity

Schema	Required for Pre-installation	Required for Post-installation
Studio Schema	Yes	Yes (It is already created in the pre-installation process)
Graph Schema	Yes	Yes (It is already created in the pre-installation process)
ECM/BD Atomic Schema	Yes	Yes (It is already created in the pre-installation process)
ER/FSDF Schema	No	Yes
Sandbox Schema	No	Yes

3.5.2 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 2: Wallet Creation

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 3: Location of the Created Wallet Folder

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

6. In the `<wallet_location>` directory, configure the **tnsnames.ora** file to include the entry for each alias name to be set up.

Figure 4: Snapshot of the tnsnames.ora file

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.

7. 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
```

3.5.3   Verify the Connectivity of the Wallet

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

1. 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>"
```

3.5.4 Create a wallet for ER/FSDF schema

To create 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.

3.5.5 Create Wallet for Graph Schema

To create a wallet, 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 and it is applicable only for Graph use case.

3.6 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 as mentioned in the Table 13.

Table 13: 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.

Table 13: Required File Structure

Parameters	Validation
Compliance Studio Schema Wallet Details	You can verify the Wallet details by reviewing the steps in Verify the Connectivity of the Wallet.
Atomic Wallet Detail	You can verify the Wallet details by reviewing the steps in Setup Password Stores with Oracle Wallet.

3.7 Installation

This section explains step-by-step process to install Compliance Studio after completing the pre-installation activity.

3.7.1 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 Setup the Password Stores for Database User Accounts section:

    — `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
```

3.7.2 Generate Public and Private Keys

The Public and Private keys are JSON Web Tokens (JWT) that are generated for Authentication in the 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 Compliance Studio with updated configuration.

To generate the keys, follow these steps:

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 `private.key` and `public.key` files from the following paths:

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

   `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/batchservice/conf`

   `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/mmg-load-to-graph/graph-service/conf`

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

3.7.3 Generate API token for CS API User

To generate the API token, follow these steps:

1. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/bin` directory.

2. Run the following shell script:

   `./ token-generator.sh CS_API_USER`

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

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

3.7.4 Generate Compliance Studio Server SSL Configuration

You can generate signed and self-signed certificates for SSL configuration in the Compliance Studio.

3.7.4.1 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.

3.7.4.2   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 `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`

3.7.5 Import the certificate to JDK security

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 /<COMPLI-
ANCE_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.

3.7.6 Place the Key Store File for Secure Batch Service

Place the `.jks` and `.p12` files generated from the Generate Compliance Studio Server SSL Configuration section and place them in the batch service `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/batchservice/conf` path.

NOTE	If you have signed p12 certificate then `.jks` file is not required.

3.7.7 Configure config.sh File

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 for reference.

Figure 5: 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_OFSAA: Accepted values: true or false
export NON_OFSAA=false

## GRAPH_SOURCE Expected value : BD or ECM. This is source of data for ETL.
export GRAPH_SOURCE=ECM
export ECM_SCHEMA_NAME=
export FCDM_SCHEMA=ECM

## SSL Configuration
## Please place the SSL file after renaming it in 'COMPLIANCE_STUDIO_INSTALLATION_PATH/datastudio/server/conf' as file 'studio_server.p12'
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=in.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: ECM-IH 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 14 lists configuration parameters of the `config.sh` file.

Table 14: config.sh file

Parameter	Significance	Value
COMPLIANCE_STUDIO_INSTALLATION_PATH	Indicates the path where the Compliance Studio installer file is extracted.	Provide the path where the new installer is extracted. For example, `/ scratch/ testuser/ OFS_COMPLIANCE_STUDIO`
MINICONDA_INSTALLATION_HOME	Indicates configured path for miniconda installation. By default, the value is set to $HOME, which refers to the user's home directory.	By default, the value is $HOME
NON_OFSAA	To install Compliance Studio with OFSAA, enter "**false**" To install Compliance Studio without OFSAA, enter "**true**"	Enter the value as **false**. For example, NON_OFSAA=false
GRAPH_SOURCE		

Table 14: config.sh file

Parameter	Significance	Value
GRAPH_SOURCE	Indicates the source database for Compliance Studio.	Enter the value as **BD** **NOTE:** This is a legacy ETL parameter, and the value should always be BD. This will not impact the Graph pipeline functionality with ECM.
ECM_SCHEMA_NAME	Indicates the name of the ECM Atomic Schema.	The value should be name of the ECM Atomic Schema. For example, ATOM8125 **NOTE:** If Legacy Graph (ETL connector job using Hadoop) is not required, then set the value as **NA**.
FCDM_SCHEMA	This indicates the datasource for the Production workspace. The available options are **ECM** and **BD**.	The value of this parameter should be provided either **BD** or **ECM**. For example, ECM
SSL Configuration		
STUDIO_SERVER_SSL_SECRET	Indicates the password for Studio Server P12 that is required for HTTPS configuration.	Enter the password created for studio_server.p12 file. For example, password
STUDIO_SERVER_SSL_ALIAS	Indicates the alias name for P12 for the Studio Server.	Enter alias name of the P12 file for the studio server. For example, studio_server
Authentication Realm		

Table 14: config.sh file

Parameter	Significance	Value
AUTH_REALM	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. Compliance Studio uses realm-based authorization and authentication for its users. The Compliance Studio application can be accessed using the following realms: **FCCMRealm** Value=AAI **FCCSamlRealm** Value=SAML	Enter AUTH_REALM value as SAML or AAI. For example, SAML
COOKIE_DOMAIN	The domain of the server where Compliance Studio is installed.	Enter the domain of the server where Compliance Studio is installed. For example, in.oracle.com
AAI related configuration		
AAI_URL	The Application URL of ECM/BD application. URL: http://<Server Hostname>:<Applic ation URL PORT>/ <Context Path>	Enter Application URL of ECM/BD. For example, http://testserver.in.oracle. com:4000/BDTEST **NOTE:** This parameter is applicable only if AUTH_REALM is **AAI**.
SAML Related Configuration The SAML-related parameters are applicable only if SAMLRealm is used in the Realm parameter. In the case of SAML Realm, the certificate from IDP (**key.cert** file) is required. The certificate that is obtained from the IDP must be renamed to key.cert and placed in the `<COMPLIANCE_STUDIO _INSTALLATION_PATH>/mmg-home/mmg-studio/conf` directory. This certificate is used to identify the trust of the SAML response from the Identity Provider. Specify the Role Attribute name from IDP, in which the User Roles are present in the SAML response.		
SAML_DESTINATION	Indicates the SAML IDP URL that the Identity Provider provides after creating the SAML Application.	Enter the SAML Identity Provider URL. For example, http://<IDCS_APP_SSO_URL> **NOTE:** This parameter is applicable only if AUTH_REALM is **SAML.**

Table 14: config.sh file

Parameter	Significance	Value
SAML_ROLE_ATTRIB UTE	Indicates the SAML client identifier provided by the SAML Administrator for the Role and Attributes information while creating the SAML application for Compliance Studio.	Enter the SAML client identifier. For example, group **NOTE:** This parameter is applicable only if AUTH_REALM is **SAML**.
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.	Enter the Logout URL for SAML application. For example, http:// <IDCS_APP_SLO_URL> **NOTE:** This parameter is applicable only if AUTH_REALM is **SAML.**
Integrate with other Products For example, ECM-IH integration		
API_USERS	Retain the default value	Retain the default value. In case of ECM-IH integration, add one more value to the parameter. i.e., ECM_API_USER. The values should be comma separated. For example, CS_API_USER, ECM_API_USER
VALID_ROLES	Retain the default value	Retain the default value. For example, DSADMIN and DSUSER
BATCH_ROLE	Retain the default value	Retain the default value. For example, DSBATCH
MMG Service Configurations		
SESSION_TOKEN_CREDENTIALS	Retain the default value	Retain the default value
FCC_API_USER	Retain the default value	Retain the default value. For example, CS_API_USER
SSO_TOKEN	This is the API token for FCC_API_USER.	Enter the API token for FCC_API_USER. For token value, see the Generate API token for CS API User section.
MMG_DATASOURCE_MAX_POOL _SIZE	Maximum connection pool size allowed for Config Data Source.	Enter the maximum connection pool size for Config Data Source. For example, 50

Table 14: config.sh file

Parameter	Significance	Value
MMG_DATASOURCE_IDLE_TIMEOUT	Idle timeout for Config Data Source in a millisecond.	Enter Idle timeout for Config Data Source in a millisecond. For example, 30000
MMG_DATASOURCE_CONN_TIMEOUT	Connection timeout for Config Data Source in milliseconds.	Enter connection timeout for Config Data Source in milliseconds. For example, 30000
EXT_DATASOURCE_MAX_POOL_SIZE	Maximum connection pool size allowed for Meta/Data Schemas.	Enter maximum connection pool size allowed for Meta/Data Schemas. For example, 50
EXT_DATASOURCE_IDLE_TIMEOUT	Idle timeout for Meta/Data Schemas in milliseconds.	Enter Idle timeout for Meta/Data Schemas in milliseconds. For example, 30000
EXT_DATASOURCE_CONN_TIMEOUT	Connection timeout for Meta/Data Schemas in milliseconds.	Enter Connection timeout for Meta/Data Schemas in milliseconds. For example, 30000
SERVER_COOKIE_TIMEOUT	Connection timeout for server cookie in milliseconds.	Enter connection timeout for server cookie in milliseconds. For example, 86400
DATASTUDIO_CSP_FRAME_ANCESTORS	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 DATASTUDIO_CSP_FRAME_ANCESTORS parameter as follows: https://<Hostname>:<Compliance_Studio_Gateway_Port>,http://<ecm_webserver_hostname>:<ecm_ui_port> For example, DATASTUDIO_CSP_FRAME_ANCESTORS=https://testCSserver.oraclevcn.com:7071,http:// testECMserver:8019
DB Details for Studio Schema 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.	Enter hostname of the database where the Compliance Studio schema is created. For example, <testserver>.oraclevcn.com

Table 14: config.sh file

Parameter	Significance	Value
STUDIO_DB_PORT	Indicates the port number where the Compliance Studio schema is created.	Enter port number where the Compliance Studio schema is created. For example, 1521
STUDIO_DB_SERVICE _NAME	Indicates the service name of the database where the Studio schema is created.	Enter service name of the database where the Studio schema is created. For example, fccmdb
STUDIO_DB_SID	Indicates the SID of the database where the Studio schema is created.	SID of the database where the Studio schema is created. For example, fccmdb **NOTE:** Set this field as blank if there is no SID for Database.
STUDIO_DB_USERNAME	Indicates the username of the Compliance Studio Schema	Enter username of the Compliance Studio Schema (newly created Oracle Schema). For example, CS8127_XXX_XX
DB Details of Atomic Schema		
ATOMIC_DB_HOSTNAME	The hostname of the database where Atomic schema is present	Enter hostname of the database where Atomic schema is present (BD/ECM config). For example, <testserver>.oraclevcn.com
ATOMIC_DB_PORT	Port number of database where Atomic schema is present	Enter Port number of database where Atomic schema is present. For example, 1521
ATOMIC_DB_SERVICE _NAME	The service name of the database where Atomic schema is present	Enter service name of the database where Atomic schema is present. For example, fccmdb
ATOMIC_DB_SID	Service id of database where Atomic schema is present. **NOTE:** Set this field as blank if there is no SID for Database.	Enter Service id of database where Atomic schema is present. For example, fccmdb **NOTE:** Set this field as blank if there is no SID for Database.
ATOMIC_DB_USERNAME	Username of the Atomic schema	Enter Username of the Atomic schema. For example, XXX_ATOM8125

Table 14: config.sh file

Parameter	Significance	Value
Wallet Details		
For information on creating a wallet, see Setup Password Stores with Oracle Wallet.		
WALLET_LOCATION	Indicates the Compliance Studio's wallet location.	Enter wallet location of the Compliance Studio. For example, <COMPLIANCE_STUDIO_INSTALLATION_PATH>/wallet
TNS_ADMIN_PATH	Indicates the path of the tnsnames.ora file where an entry for the STUDIO_ALIAS_NAME is present.	Enter the path of the tnsnames.ora file where an entry for the STUDIO_ALIAS_NAME is present. For example, <COMPLIANCE_STUDIO_INSTALLATION_PATH>/wallet
STUDIO_ALIAS_NAME	Indicates the Studio alias name.	Enter Studio alias name. For example, CS8127_XXX_XX_alias **NOTE:** Enter the alias name that was created during wallet creation.
ATOMIC_ALIAS_NAME	Indicates alias name of FCDM source atomic schema given in wallet.	Enter alias name of FCDM source atomic schema given in wallet. For example, XXX_ATOM8125_alias **NOTE:** If Legacy Graph (ETL connector job using Hadoop) is not required, then set the value as **NA**.
Logstash		
Logstash is a supporting software for data ingestion to the OpenSearch.		
LOGSTASH_HOME	Indicates the Logstash home.	Enter the path where Logstash is configured. For example, `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/` Logstash/logstash- 7.16.3" **NOTE:** If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as **NA**.

Table 14: config.sh file

Parameter	Significance	Value
Graph Schema Configuration **NOTE:** **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	Enter the server name where the Graph Database is installed. For example, <testserver>.com
GRAPH_DB_PORT	Indicates the Graph Database server port	Enter the Graph Database server port. For example, 1521
GRAPH_DB_SERVICE _NAME	Indicates the Graph Database service name	Enter the Graph Database service name. For example, fccmdb
GRAPH_KEYSTORE_PASSWORD	Indicates the password of the keystore file, which stores the password of the graph schema.	Enter the password of the keystore file, which stores the password of the graph schema. For example, passwordXXX **NOTE:** If Graph Pipeline functionality is not required, then set the value as **NA**.
GRAPH_SCHEMA_DB_SCHEMA_ NAME	Indicates the Database schema name of the graph schema.	Enter the Database schema name of the graph schema. For example, GSCS8127_XXX_XX
GRAPH_SCHEMA_WALLET_ALIA S	Indicates the wallet alias of the graph schema.	Enter the wallet alias of the graph schema. For example, GSCS8127_XXX_XX_alias
GRAPH_SCHEMA_WALLET_LOCA TION	Indicates the wallet location of the graph schema.	Enter the wallet location of the graph schema. For example, <COMPLIANCE_STUDIO_INSTAL LATION_PATH>/wallet
GRAPH_SCHEMA_TNS_ADMIN_P ATH	Indicates the TNS admin path of the graph schema.	Enter the TNS admin path of the graph schema. For example, <COMPLIANCE_STUDIO_INSTAL LATION_PATH>/wallet

Table 14: config.sh file

Parameter	Significance	Value
PGX_ENABLE_CP	It is used to enable or disable connection pooling for sub graph loading.	Set it to true for enabling the connection pooling for sub graph loading. The value for 'PGX_ENABLE_CP' is "true" or "false". For example, PGX_ENABLE_CP=true
PGX_CP_INITIAL_SIZE	Indicates the initial number of connections that are created when the pool is started.	Enter the initial number of connections that are created when the pool is started. For example, 5
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.	Enter the maximum number of active connections that can be allocated from this pool at the same time or negative for no limit. For example, 25
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.	Enter the maximum number of connections that can remain idle in the pool, without extra ones being released or negative for no limit. For example, 10
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.	Enter the minimum number of connections that can remain idle in the pool, without extra ones being created, or zero to create none. For example, 5
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.	Enter 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. For example, 3000
PGX_CP_MIN_EVICTABLE_IDLE_TIME	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.	Enter 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. For example, PT30M

Table 14: config.sh file

Parameter	Significance	Value
PGX_CP_SOFT_MIN_EVICTABLE_ _IDLE_TIME	Indicates the minimum amount of time a connection may sit idle in the pool before it is closed and a new connection is created.	Enter the minimum amount of time a connection may sit idle in the pool before it is closed and a new connection is created. For example, PT8H **NOTE:** 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.
Default Connection Pooling Configuration for External Schema The following parameters are applicable for enabling connection pool in graph service for any external schema. **NOTE**: These parameters are required for generating PDF in Investigation Hub notebooks.		
EXT_SCHEMA_ENABLE_CP	It is used to enable or disable connection pooling from any external schema.	The value is either true or false. If it is set to true, then configure the following parameters related to External Schema. If it is set to false, then configure the following parameters related to External Schema as NA.
EXT_SCHEMA_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.	Enter the maximum number of connections that can remain idle in the pool, without extra ones being released or negative for no limit. For example, 5
EXT_SCHEMA_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.	Enter the minimum number of connections that can remain idle in the pool, without extra ones being created, or zero to create none. For example, 2
EXT_SCHEMA_CP_INITIAL_SIZE	Indicates the initial number of connections that are created when the pool is started.	Enter the initial number of connections that are created when the pool is started. For example, 1

Table 14: config.sh file

Parameter	Significance	Value
EXT_SCHEMA_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.	Enter the maximum number of active connections that can be allocated from this pool at the same time or negative for no limit. For example, 10
EXT_SCHEMA_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.	Enter 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. For example, 3000
EXT_SCHEMA_CP_MIN_EVICTABLE_IDLE_TIME	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 EXT_SCHEMA_CP_MIN_IDLE.	Enter 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 EXT_SCHEMA_CP_MIN_IDLE. For example, PT30M
EXT_SCHEMA_CP_SOFT_MIN_EVICTABLE_IDLE_TIME	Indicates the minimum amount of time a connection may sit idle in the pool before it is closed and a new connection is created.	Enter the minimum amount of time a connection may sit idle in the pool before it is closed and a new connection is created. For example, PT6H **NOTE:** The values lesser than EXT_SCHEMA_CP_MIN_EVICTABLE_IDLE_TIME will close all the idle connection and create connection to match EXT_SCHEMA_CP_MIN_IDLE.
PGX_ZEPPELIN_SCHEDULER_THREADPOOL_SIZE	Indicates the threadpool size of the PGX interpreter.	Enter the threadpool size of the PGX interpreter. For example, 200
ENABLE_MATCHING_FOR_GRAPH	It is used to enable or disable matching for the graph.	The value is either true or false. For example, ENABLE_MATCHING_FOR_GRAPH=true
Quantifind Details The following parameters are related to Quantifind Integration with Investigation Hub and these are **optional**. **NOTE**: The parameters related to Quantifind are applicable only when you are using Investigation Hub notebooks (v8.1.2.6.1).		

Table 14: config.sh file

Parameter	Significance	Value
ENABLE_QUANTIFIND	It is used to enable or disable the quantifind integration	Enable to integrate with quantifind. The value is "true" or "false". For example, Y
QUANTIFIND_URL	Indicates the quantifind API URL	Enter the quantifind API URL. For example, https://testserver.quantifind.com **NOTE**: In Studio Schema, update Quantifind URL in V_URL column of the CS_IH_EXT_SRVC_APP_DETAILS table.
QUANTIFIND_TOKEN	Indicates the quantifind API token	Enter the quantifind API token **NOTE**: In Studio Schema, update Quantifind API token in V_REQ_HDR_VALUE column of the CS_IH_EXT_SRVC_REQ_HEADERS table where V_REQ_HDR_KEY is X-QF-App-Token.
QUANTIFIND_APPNAME	Indicates the quantifind App Name	Enter the quantifind App Name. For example, OracleIntegrationTest **NOTE**: In Studio Schema, update Quantifind App name in V_REQ_HDR_VALUE column of the CS_IH_EXT_SRVC_REQ_HEADERS table where V_REQ_HDR_KEY is X-QF-App-Name.
HTTPS_PROXY_HOST	Indicates the proxy host that is used	Enter the proxy host that is used. For example, testproxyserver.com
HTTPS_PROXY_PORT	Indicates the proxy port that is used.	Enter the proxy port that is used. For example, 80
HTTP_PROXY_USERNAME	Indicates the proxy username used, if there is any.	Enter the proxy username used, if there is any. For example, NA
HTTP_PROXY_PASSWORD	Indicates the proxy password used if there is any.	Enter the proxy password used if there is any. For example, NA

Table 14: config.sh file

Parameter	Significance	Value
NO_PROXY	Indicates URLs with these domains and IP will be accessed without PROXY. **NOTE**: Configure this parameter when Quantifind is enabled.	The default value is "\\"*.$(hostname - d)\|localhost\|$(hostname - i)|127.0.0.1|0.0.0.0\\""
PGX Server Configuration PGX (Parallel Graph AnalytiX) is a graph toolkit from Oracle that provides graph analysis on large scale graphs, to extract insights hidden in the connections across datasets between entities. Using built-in and custom graph algorithms, graph-pattern matching queries, and other enhanced graph analytics features, PGX helps investigators in conducting meaningful investigations and making actionable recommendations. **NOTE**: The parameter related to PGX server is applicable only for Graph use case.		
NUM_CACHED_RESULTSET	Indicates the cached result set.	Enter the cached result set. For example, 0
RESULTSET_EXPIRATION_TIME_SECS	Indicates the Result set expiration time.	Enter the Result set expiration time. For example, 3600
MAX_TOTAL_SHARED_DATA_MEMORY_SI ZE	The absolute memory limit of shared data (includes published graphs and pinned non-referenced graphs).	Enter the absolute memory limit of shared data (includes published graphs and pinned non-referenced graphs). For example, 20G
MAX_TOTAL_PRIVATE_DATA_MEMORY_SI ZE	The memory limit of private data (includes non-published graphs and PGQL results) relative to the total PGX engine memory limit.	Enter the memory limit of private data (includes non-published graphs and PGQL results) relative to the total PGX engine memory limit. For example, 8G
MAX_PER_SESSION_DATA_MEMORY_SIZE	Absolute memory limit for any one session of the PGX engine.	Enter the Absolute memory limit for any one session of the PGX engine. For example, 700M
MAX_DATA_MEMORY_SIZE_DSUSRGRP	Absolute memory limit for any user of the PGX engine whose role is DSUSRGRP.	Enter the Absolute memory limit for any user of the PGX engine whose role is DSUSRGRP. For example, 2G
MAX_DATA_MEMORY_SIZE_DSBATCH	Absolute memory limit for any user of the PGX engine whose role is DSBATCH.	Enter the Absolute memory limit for any user of the PGX engine whose role is DSBATCH. For example, 10G

Table 14: config.sh file

Parameter	Significance	Value
MAX_DATA_MEMORY_SIZE_DSINTER	Absolute memory limit for any user of the PGX engine whose role is DSINTER.	Enter the Absolute memory limit for any user of the PGX engine whose role is DSINTER. For example, 5G
MAX_DATA_MEMORY_SIZE_DSAPPROVER	Absolute memory limit for any user of the PGX engine whose role is DSAPPROVER.	Enter the Absolute memory limit for any user of the PGX engine whose role is DSAPPROVER. For example, 5G
MAX_DATA_MEMORY_SIZE_DSUSER	Absolute memory limit for any user of the PGX engine whose role is DSUSER.	Enter the Absolute memory limit for any user of the PGX engine whose role is DSUSER. For example, 5G
MAX_DATA_MEMORY_SIZE_IHUSRGRP	Absolute memory limit for any user of the PGX engine whose role is IHUSRGRP.	Enter the Absolute memory limit for any user of the PGX engine whose role is IHUSRGRP. For example, 10G
Service URLs		
PGX_SERVER_URL	Indicates the URL of the PGX server.	Enter URL of the PGX server. **NOTE:** If SSL is enabled, the URL should be provided with **https**. If SSL is disabled, the URL should be provided with **http**. Ensure to provide the correct hostname for the URL of the PGX service. If Legacy Graph (ETL connector job using Hadoop) and Graph Pipeline functionalities are not required, then set the value as **NA**.
R interpreter settings		
RS_CONF_PATH	Absolute path to Rserve.conf file for running Rserve. Example: /scratch/ users/mmg-studio/ conf/Rserve.conf	Retain the default value
RS_KEYSTORE	Absolute path for the Keystore file made for Rserve.conf. Example: / scratch/ users/mmg-studio/ conf/ rinterpreterkeystore	Retain the default value

Table 14: config.sh file

Parameter	Significance	Value
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.	Retain the default value
Additional Environment variables		
LD_LIBRARY_PATH	Indicates the Oracle Instant client path.	Enter the Oracle Instant client path. For example, /opt/ oracle/ instantclient_19_8/ :$LD_LIBRARY_PATH
Matching Mechanism		
MATCHING_MECHANISM	Indicates the matching mechanism for Entity Resolution and Graph.	Enter the value that will be used for matching mechanism for Entity Resolution and Graph. The options 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. By default, the value of the parameter is **OT**. **NOTE:** For MATCHING_MECHANISM = OT, no additional installation/ configuration is required as it is part of the Oracle Database.
OpenSearch Cluster Details OpenSearch is a distributed search and analytics engine. Compliance Studio leverages the search feature offered by OpenSearch. **NOTE:** The parameter related to OpenSearch is applicable for Entity Resolution and Graph use cases when **MATCHING_MECHANISM** is set to **OS**.		
OPEN_SEARCH_HOSTNAME	Indicates the hostname of the server where the OpenSearch service is installed.	Enter the hostname of the server where the OpenSearch service is installed. For example, <testserver>.com **NOTE:** If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as **NA**.

Table 14: config.sh file

Parameter	Significance	Value
OPEN_SEARCH_PORT	Indicates the port number where the OpenSearch service is installed.	Enter the port number where the OpenSearch service is installed. For example, 9202 **NOTE:** If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as **NA**.
OPEN_SEARCH_HADOOP_CREDENTIAL_PATH	Indicates the open search hadoop credential path.	Enter the value as NA
OPEN_SEARCH_USERNAME	Indicates the OpenSearch Username.	Enter the OpenSearch Username. (It is Not Applicable when https enabled is false and authentication is not supported). For example, admin **NOTE:** If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as **NA**.
OPEN_SEARCH_ENCRYPTED_PASSWORD	Indicates the Encrypted password of the OpenSearch	Enter the Encrypted password. (It is Not Applicable when https enabled is false and authentication is not supported). **NOTE:** To generate an encrypted password, see Generate an Encrypted Password for OpenSearch section in the Appendix. If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as **NA**.
OPEN_SEARCH_HADOOP_PASSWORD_ALIAS	Indicates the password alias for OpenSearch	Enter the value as NA

Table 14: config.sh file

Parameter	Significance	Value
OPEN_SEARCH_HTTPS_ENABLED	True (If OS is https enabled, else false)	Set it to True when Open Search is https enabled. **NOTE:** If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as **false**.
OPEN_SEARCH_TRUSTSTORE_FILE_NAME	The filename of the OpenSearch keystore that contains the certificates of OS host to trust. (Not Applicable, if https enabled is false).	Enter the filename of the OpenSearch keystore that contains the certificates of OS host to trust. (Not Applicable, if https enabled is false). For example, admin.p12 **NOTE:** If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as **NA**.
OPEN_SEARCH_TRUSTSTORE_SECRET	The password of the OpenSearch keystore file. (Not Applicable, if https enabled is false).	Enter the password of the OpenSearch keystore file. (Not Applicable, if https enabled is false). **NOTE:** If Graph Pipeline and Entity Resolution functionalities are not required, then set the value as **NA**.
OPEN_SEARCH_KEYSTORE_HADOOP_CREDENTIAL_ALIAS	Indicates the password alias for OpenSearch. (Not applicable if OS OPEN_SEARCH_HT TPS_ENABLED is false).	Enter the value as NA
ES Cluster Details Configuration is not required for the parameters related to Elastic Search as it is deprecated.		
Additional MMG Configuration Configuration is not required for these DATACATALOG_SERVICE_URL, SPARK_HOME, EST_ENABLED, and EST_UI_URL parameters.		

Table 14: config.sh file

Parameter	Significance	Value
All Services		
Set the value of the parameter, DEPLOY_ALL_SERVIC E, as **true** for starting all services and **false** for starting the selected services. For 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.		
DEPLOY_ALL_SERVICE	Indicates the service to be started	Set the value as true or false. Set it to true for starting all services. If it is false, then enable the following services based on the use case.
Services		
METASERVICE_ENABLED	This service has to be enabled for all use cases	Set the value as true
BATCHSERVICE_ENABLED	This service has to be enabled for all use cases	Set the value as true
GRAPH_SERVICE_ENABLED	This service has to be enabled for Graph use case	Set the value as true
FCC_UI_ENABLED	This service has to be enabled for Entity Resolution and Graph use cases	Set the value as true
CANDIDATE_SELECTION_ENABL ED	This service has to be enabled for Entity Resolution and Graph use cases when MATCHING_MECHANISM is set to **OT**	Set the value as true
FCC_PYTHON_ENABLED	This service has to be enabled for all use cases	Set the value as true
JDBC_ENABLED	This service has to be enabled for all use cases	Set the value as true
PGX_ENABLED	This service has to be enabled for Graph use case	Set the value as true
ENTITY_RESOLUTION_ENABLED	This service has to be enabled for Entity Resolution use case	Set the value as true
MATCHING_SERVICE _ENABLED	This service has to be enabled for Entity Resolution and Graph use cases	Set the value as true
LOAD_TO_OPEN_SEARCH_ENAB LED	This service has to be enabled for Entity Resolution and Graph use cases when MATCHING_MECHANISM is set to **OS**	Set the value as true

Table 14: config.sh file

Parameter	Significance	Value
MMG_SERVICE_ENABLED	This service has to be enabled for all use cases	Set the value as true

3.7.8 Run the Compliance Studio Installer

This section provides information about how to install, start, restart and stop the Compliance Studio 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.

3.7.8.1 Trigger Installation

For 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`

3.7.8.2   Start 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.

3.7.8.3   Stop Compliance Studio

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

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

3.7.8.4   Restart Compliance Studio

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

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

3.8   Post-Installation

After successful installation of Compliance Studio, you must complete the following post-installation configurations based on the use cases.

3.8.1   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.

3.8.2 Access Compliance Studio Application

3.8.2.1 Access Compliance Studio Application when Gateway is Enabled

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.

By default, COMPLIANCE_STUDIO_GATEWAY_ENABLED is set to **true** and COMPLIANCE_STUDIO_GATEWAY_PORT is **7071** in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin/install.sh` directory**.**

> **NOTE**   Make sure that COMPLIANCE_STUDIO_GATEWAY_PORT and Datastudio default port should be opened in the firewall.

The Compliance Studio URL when gateway is enabled should be `https:// <Hostname>:<COMPLIANCE_STUDIO_GATEWAY_PORT>/cs/home`.

3.8.2.1.1 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`.

3.8.2.2 Access Compliance Studio when Gateway is Disabled

NOTE	This section is applicable only when COMPLIANCE_STUDIO_GATEWAY_ENABLED is set to **false** in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin/install.sh` directory.

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 6: Compliance Studio Application Login Page
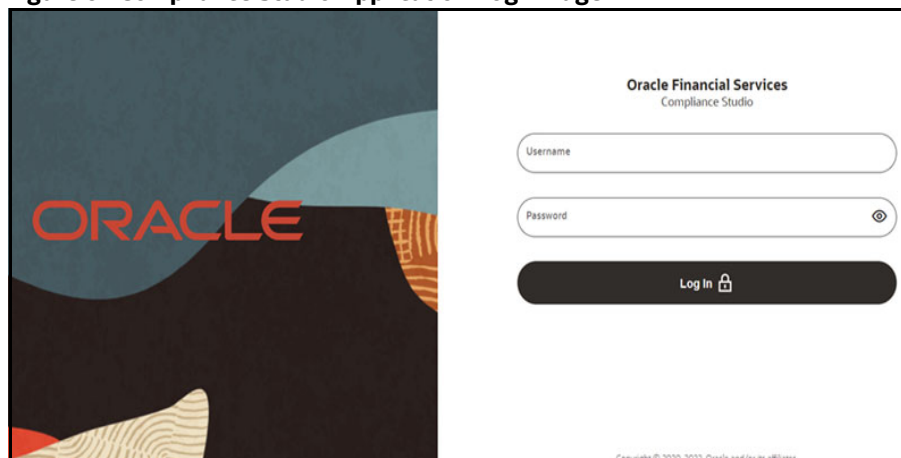
2. Enter the Username and Password.

    For Creating Users, Groups, and Mappings in AAI. See Create Users, Groups, and Mappings section in the Appendix.

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).

3.8.3 Entity Resolution Use Case

3.8.3.1 Create Entity Resolution Schema

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.

3.8.3.2 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>;

3.8.3.3   Uploading FSDF

Entity Resolution requires a set of pre-staging tables to be available in the OFSAA staging area and the pre-configured FSDF staging model.

The table definitions are available in terms of a data model file which can be uploaded to OFSAA with the help of AAI's Data model management.

NOTE	The `ER_81280.ODM` file is applicable only for Behavior Detection 8.1.2.8.0 version and CSA_8128 pipeline.

To upload the data model, follow these steps:

1. Copy `ER_81280.ODM` from `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/entity-resolution/datamodels` to `<AAI Application Server>/<FSDF_STG_INFODOM>/erwin/erwinXML`.

2. Model Upload Using **JSON/Erwin XML**.

3. Select Upload Mode as **Sliced**.

4. Select **Object Registration Mode** as **Incremental Object Registration**.

5. Select **Upload File Type** as **JSON**.

6. Select the **erwin XML** or **Database XML** or **ODM** file for upload from the drop-down list.

   Other options can be set to default and proceed to Upload.

For more information on uploading the Data Model, see the **Upload Business Model** section in the OFS Analytical Applications Infrastructure User Guide.

3.8.3.4   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;
    ```

3.8.3.5   Run ER in different workspaces

1. The ER Data Schema and Compliance Studio Schema should be in the same wallet.

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 81280:
      — 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 81280:**
      — 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

3.8.3.6 Creating Thesaurus for Entity Resolution

The thesaurus is required to execute the 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.

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.

3.8.4 Graph Use Case

3.8.4.1 Importing OOB Graph Definition and related Metadata

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

3.8.4.1.1 Creating the Graph Data Store

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

1. Log in to the Compliance Studio UI.

Figure 7: CS Workspace
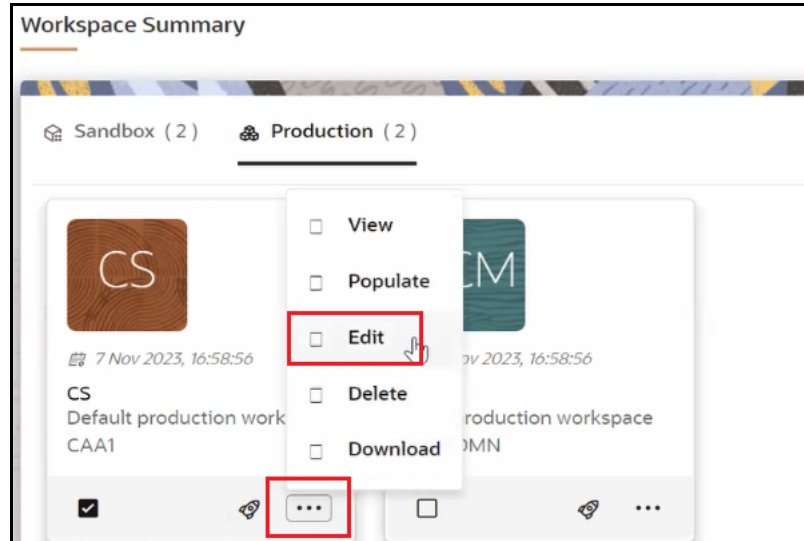
2. On the CS workspace, click the **Action** icon.

3. Click **Edit**. The **Basic Details** pane is displayed.

Figure 8: Basic Details Pane
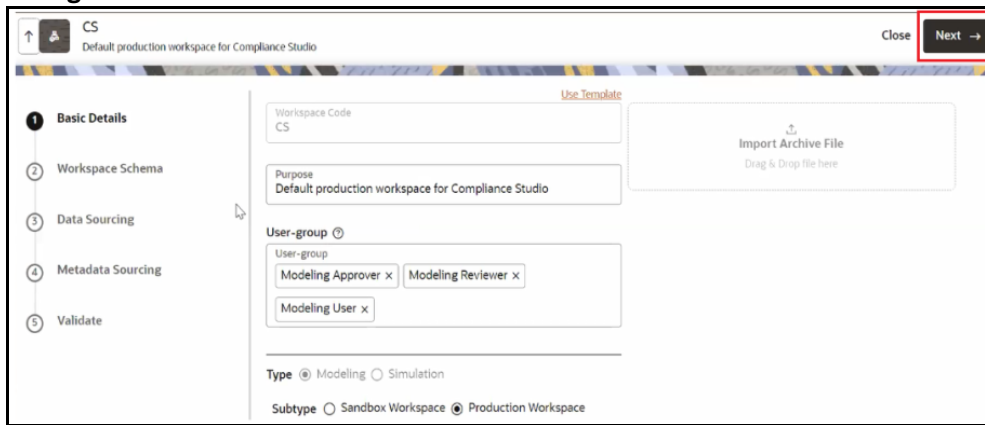
4. Click **Next**. The **Workspace Schema** pane is displayed.

Figure 9: Workspace Schema Pane
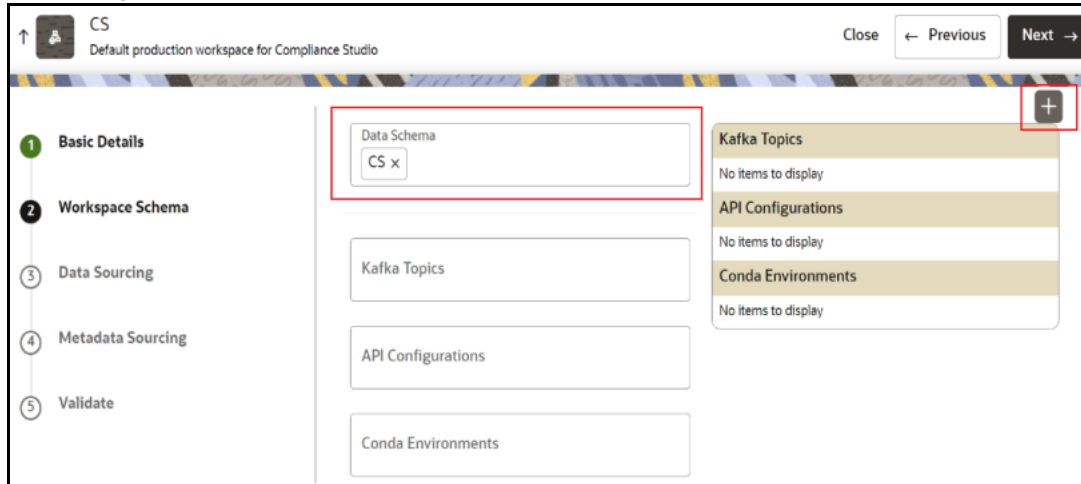
> **NOTE**   By default, studio schema is mapped to the workspace and you need to map graph schema and graph data store respectively for using graph functionality.

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

Figure 10: 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 11: Data Schema Drop-down List
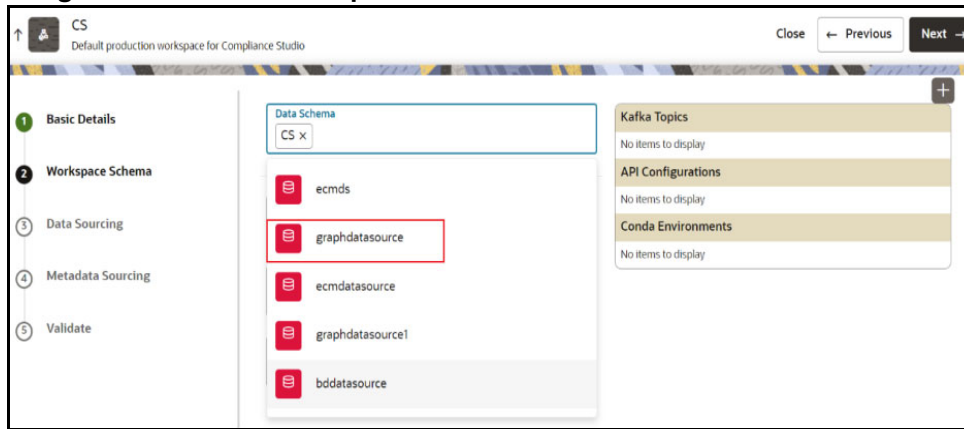
11. Select graph data store from the **Data Schema** drop-down list.

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.

NOTE	If you 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.
	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.

3.8.4.1.2 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.

3.8.4.1.3   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 12: Graph Summary
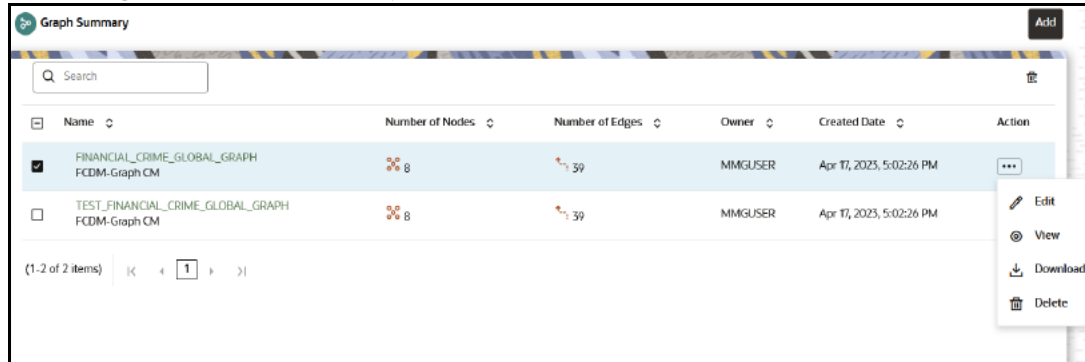
3. On any graph, click the **Action** icon [···] and select **Edit** to view the graph.

Figure 13: Graph Model
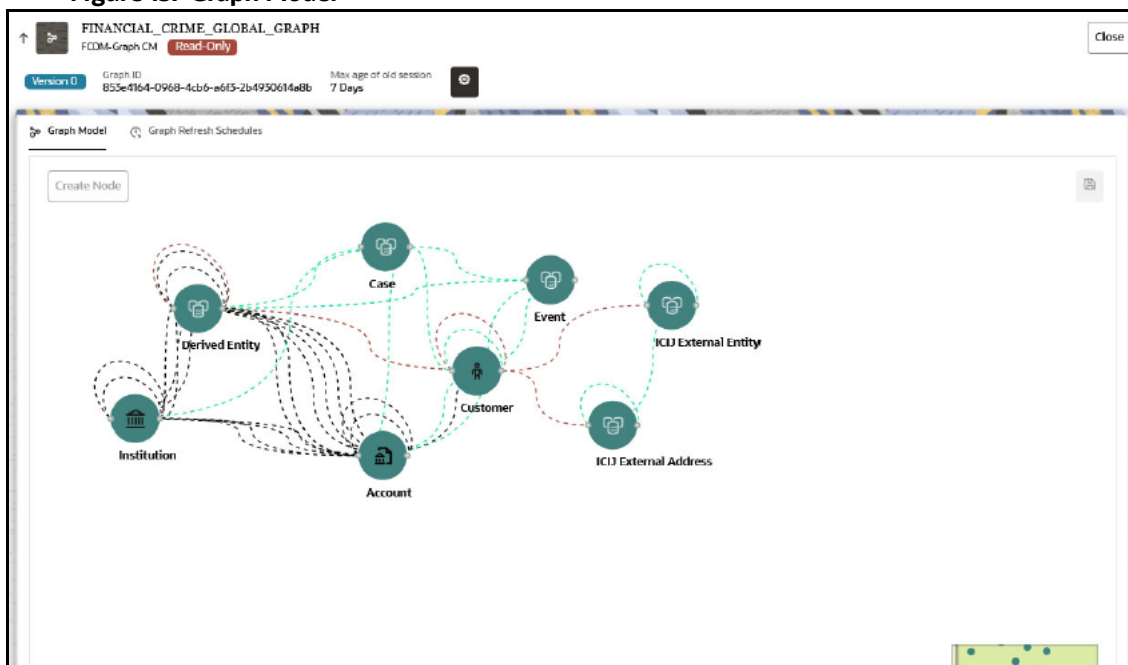
4. To edit the Node, hover over the **Node** icon and click **Edit**. The Node Details page is displayed.

Figure 14: Node Details
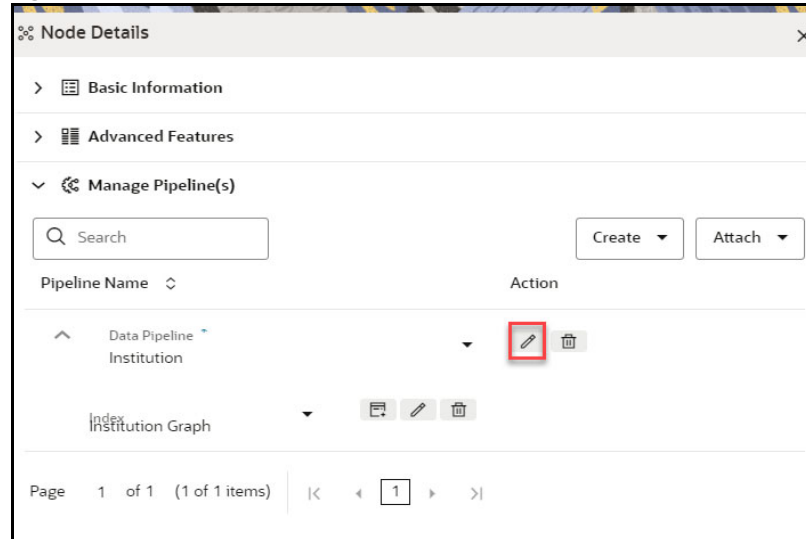
5. Expand Manage Pipeline(s) and click **Edit** icon on the data pipeline to view the Pipeline Designer page.

Figure 15: Pipeline Designer Page
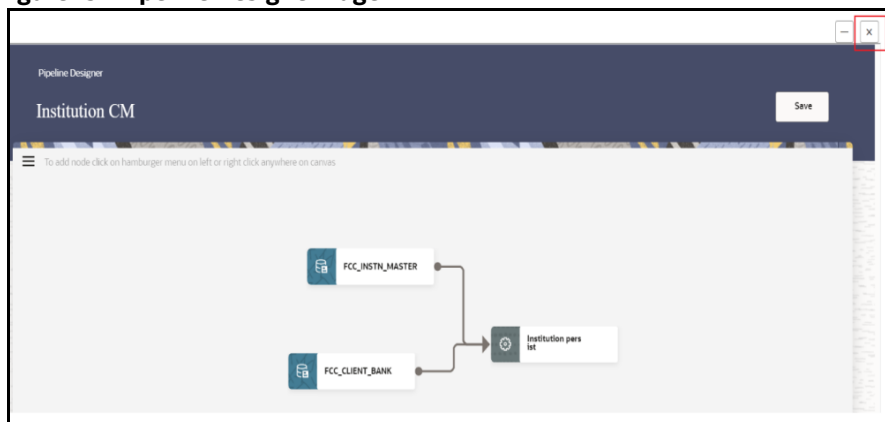
6. You need to wait for the UI to load, **Close** Pipeline Designer page and then **Close** the graph panel.

3.8.4.1.4 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. |

3.8.4.1.5 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>
   ```

3.8.4.1.6 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` |

3.8.4.1.7 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>
   ```

   > **NOTE**　The Data source value for BD atomic schema should be in exact same case where it was created while editing workspace from the UI.

   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 Data source value for BD atomic schema should be in exact same case where it was created while editing workspace from the UI.

   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
```

NOTE	The Data source value for BD atomic schema should be in exact same case where it was created while editing workspace from the UI.

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>
```

NOTE	The Data source value for ECM atomic schema should be in exact same case where it was created while editing workspace from the UI.

(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
```

3.8.4.1.8 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.

3.8.4.2   Assign Post-installation Grants for Graph Schema

Grant the following permissions to the newly created graph schema.

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

```
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**

```
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**

```
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>;
```

3.8.4.3   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.

3.8.4.4   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 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.

3.8.4.5   Configure the PGX Service

> **NOTE**   This section is applicable for both fresh installation and upgrade activity.

PGX (Parallel Graph AnalytiX) is a graph toolkit from Oracle that provides graph analysis on large scale graphs, to extract insights hidden in the connections across datasets between entities. Using built-in and custom graph algorithms, graph-pattern matching queries, and other enhanced graph analytics features, PGX helps investigators in conducting meaningful investigations and making actionable recommendations.

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:

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`

    ■   `graph-keystore.p12`

    ■   `public.key`

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. Navigate to the `<PGX_HOME>/pgx-server/bin` directory and configure the `config.sh` file as described in the Table 15.

    Table 15: 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	

Table 15: Config.sh file for PGX

Interaction Variable Name	Significance
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.
PGX_SERVER_KEYSTORE_PASSWORD	It Indicates the password created while generating a Self-signed server keystore for PGX.
Advance Configuration	
SHUTDOWN_GRACE_PERIOD	It indicates the grace period in minutes for the graceful shutdown of the PGX Server. To set value, uncomment and set the value. **NOTE:** ● 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.

5. 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 16: PGX start service

6. Start the PGX service.

    To start the PGX service, follow these steps:

    a. Navigate to the path where the PGX service is installed.

    b. Navigate to the following directory where the start service for PGX is located:

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

    c. Run any one of the following commands:

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

    Or

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

7. 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
    ```

8. 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
    ```

9. Restart the PGX service.

    To restart the pgx server, run any one of the following commands:

    ```
    ./pgx-server.sh --restart
    ```

    Or

    ```
    ./pgx-server.sh -r
    ```

10. Reinstall PGX service with updated configuration.

To update configuration in PGX service in case of wrong configuration, run any one of the following commands:

```
./pgx-server.sh --update
```

Or

```
./pgx-server.sh -u
```

3.8.4.6 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.

3.8.4.6.1 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

3.8.4.6.2 Configuring PGX Server

Users need to update `config.sh` file for configuring the PGX server. For more information, see the Table 15.

3.8.4.6.2.1 *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.

3.8.4.6.3 Configuring Compliance Studio Server

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

3.8.4.6.3.1 *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 with updated configuration.

   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.

3.8.4.7   Creating Thesaurus for Graph

The thesaurus is required to execute the Graph 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.

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.

3.8.5 Common for both Entity Resolution and Graph Use Cases

The following post installation configuration steps are required for both entity resolution and graph use cases.

3.8.5.1 Configure the OpenSearch Component

OpenSearch is a distributed search and analytics engine. Compliance Studio leverages the search feature offered by OpenSearch.

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 16 lists the parameters of `opensearch.yml` file.

   Table 16: 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 17 lists Interaction variable names for Configure jvm.options file.

Table 17: Configure jvm.options File

Interaction Variable Name	Significance
-Xms4g -Xmx4g	- 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. **NOTE:** -Xms4g represents 4GB. - The value for -Xms and -Xmx should be same.

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
```

3.8.5.1.1   Enable SSL Configuration and Authentication

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

3.8.5.1.1.1   *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.

3.8.5.1.1.2   *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>
```

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

```
openssl x509 -outform der -in <path to/admin.pem> -out ca.crt
```

7.   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
```

8.   Copy the `ca.crt` file and place in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/logstash/config` directory.

9.   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 Generate an Encrypted Password for OpenSearch section in the Appendix.

10.   Install the Compliance Studio.

3.8.5.1.2   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.

3.8.5.2   Place admin.p12 file in the Installation Directories

To place `admin.p12` file in the required locations when https is enabled for OpenSearch, then follow these steps:

1.   Copy `admin.p12` file from `<OpenSearch_Installation_path>//config` directory.

2.   Place the `admin.p12` file in `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/matching-service/conf` directory.

3.   Place the `admin.p12` file in `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/load-to-open-search/conf` directory.

3.8.5.3   Add Synonyms and Stopword files in OpenSearch

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.

3.8.5.4   Configure Logstash

Logstash is a supporting software for data ingestion to the OpenSearch.

To configure logstash, follow these steps:

1. Create a folder "logstash" inside the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>`.

2. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/Logstash`.

3. Download Logstash tar file from the link.

4. Untar contents of the tar file.

5. 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.

3.8.5.5 Registering the Conda Environment

> **NOTE**   The User should not delete the pre-seeded conda environment.

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`

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

- `default_<CS Version>`
- `sane_<CS Version>`
- `ml4aml_<CS Version>`

3.8.5.6 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 placeholder:
> - <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.
> - ##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##.

3.8.5.7   ECM Patch

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**)

4   Upgrade

The process of upgrading Compliance Studio is akin to performing a fresh installation. During this upgrade, the user is required to follow these steps:

- **Unzip the CS (8.1.2.x.x) Installer**: Obtain the new installer package, which contains all the necessary files for the latest version of Compliance Studio. Extract these files to a designated location on your system.

- **Configuration**: Proceed with the setup by configuring the new installation. This involves entering various configuration settings, which include server details, database connections, and other relevant parameters.

- **Reuse Details from Previous Version**: While most of the setup is done from scratch, certain specific details from the previous version of Compliance Studio can be reused. These details typically include configuration settings that have not changed between versions, such as database connection strings, user credentials, and possibly some custom settings or scripts.

  In essence, although the upgrade requires a fresh setup of the new version, it allows for the reuse of essential configuration details from the previous version to streamline the process and maintain continuity.

4.1   Upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0

4.1.1   Prerequisites

The upgrade environment should have the following:

- Hardware and Software Requirements
- Download the Installer Kit

4.1.2   Upgrade Steps

4.1.2.1   Extract the Installer Kit

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

1. Extract the `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-1of2.zip` file from the installer in the download directory using the following command:

   `unzip -a OFS_COMPLIANCE_STUDIO-8.1.2.8.0-1of2.zip`

NOTE	You should not extract CS 81280 installer in the same directory where previous version of Compliance Studio is installed.

2. The `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-2of2.zip` file should be placed in the same directory where `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-1of2.zip` file is extracted.

NOTE	You do not need to unzip the `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-2of2.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 this `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.

4.1.2.2   Public and Private Keys

The `private.key` and `public.key` files can be reused from the previous version of Compliance Studio instance.

Copy `private.key` and `public.key` files from previous version of the Compliance Studio instance and paste in the same path where current version is installed.

File Path:

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

`<COMPLIANCE_STUDIO_INSTALLATION_PATH>/batchservice/conf`

`<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/mmg-load-to-graph/graph-service/conf`

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

4.1.2.3   API token for CS API User

The SSO_TOKEN value can be reused from the previous version of Compliance Studio instance.

To copy the SSO_TOKEN value, follow these steps:

1. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/bin` directory.

    > **NOTE**   This path refers to the previous version of Compliance Studio.

2. Open the `token.out` file and copy the SSO_TOKEN value.

3. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory.

    > **NOTE**   This path refers to the current version of Compliance Studio.

4. Open the `config.sh` file and update the copied value in the SSO_TOKEN parameter.

4.1.2.4   SSL Configuration

The `.p12` and `studio_server.p12` files can be reused from the previous version of Compliance Studio instance.

Copy `.p12` and `studio_server.p12` files from previous version of the Compliance Studio instance and paste in the same path where current version is installed.

File Path for .p12 and studio_server.p12:

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

4.1.2.5 Import SSL Certificate to JDK Security

> **NOTE** This section is applicable only when you are upgrading java during the upgrade activity.

For upgrade, see the Import the certificate to JDK security section.

4.1.2.6 Place Key Store File for Secure Batch Service

The `studio_server.p12` file can be reused from the previous version of Compliance Studio instance.

Copy `studio_server.p12` file from the previous version of Compliance Studio instance and paste in the same path where current version is installed.

File path: `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/batchservice/conf`.

4.1.2.7 Grants for Studio Schema

During the upgrade activity, make sure that the following grants are assigned to the 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>;`

4.1.2.8 Entity Resolution Use Case

4.1.2.8.1 Grants for ER Schema

During the upgrade activity, make sure that the following grants are assigned to the Entity Resolution 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>;`

4.1.2.8.2 Compliance Studio Configuration for OpenSearch

The `admin.p12` file can be reused from the previous version of Compliance Studio instance.

Copy `admin.p12` file from previous version of the Compliance Studio instance and paste in the same path where current version is installed.

File Path:

```
<COMPLIANCE_STUDIO_INSTALLATION_PATH>/load-to-open-search/conf

<COMPLIANCE_STUDIO_INSTALLATION_PATH>/matching-service/conf
```

4.1.2.9 Graph Use Case

4.1.2.9.1 Prerequisites

- Create filestore directories in the database server. To create filestore directories, see the Create Filestore Directories in the Database Server for Graph section.

- Assign grants to Studio Schema to access the file store directories. To assign grants, see the Assign Grants to Studio Schema to Access the Filestore Directories section.

4.1.2.9.2 Pre-installation Grants for Graph Schema

During the upgrade activity, make sure that the following grants are assigned to the graph schema.

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

```
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 only 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>;
```

4.1.2.9.3 Graph-keystore.p12 File

The `graph-keystore.p12` file can be reused from the previous version of Compliance Studio instance.

Copy `graph-keystore.p12` file from previous version of the Compliance Studio instance and paste in the same path where current version is installed.

File Path:

```
<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-load-to-graph/
graph-service/conf
```

```
<PGX_HOME>/pgx/pgx-server/conf
```

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 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.

4.1.2.9.4 PGX Service

Upgrade for PGX service is same process as fresh configuration. To configure, see the Configure the PGX Service section.

4.1.2.9.5 Stop 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 `<PGX_Installation_Path>/pgx/pgx-server/bin` directory where the start service for PGX is located.

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

4.1.2.10 Config.sh File

The parameters in `config.sh` file can be reused from the previous version of Compliance Studio instance.

Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory and update parameter as mentioned in the Table 18.

Table 18: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0
COMPLIANCE_STUDIO_INSTALLATION_PATH	Provide the path where the new installer is extracted. For example, `/ scratch/testuser/ OFS_COMPLIANCE_STUDIO`
MINICONDA_INSTALLATION_HOME	By default, the value is $HOME
NON_OFSAA	Enter the value as **false**
GRAPH_SOURCE	
GRAPH_SOURCE	Enter the value as **BD**
ECM_SCHEMA_NAME	Reuse value from previous version of the Compliance Studio
FCDM_SCHEMA	Reuse value from previous version of the Compliance Studio
SSL Configuration	

Table 18: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0
STUDIO_SERVER_SSL_SECRET	Reuse value from previous version of the Compliance Studio
STUDIO_SERVER_SSL_ALIAS	Reuse value from previous version of the Compliance Studio
Authentication Realm	
AUTH_REALM	Reuse value from previous version of the Compliance Studio
COOKIE_DOMAIN	Reuse value from previous version of the Compliance Studio
AAI related configuration	
AAI_URL	Reuse value from previous version of the Compliance Studio
SAML Related Configuration	
SAML_DESTINATION	Reuse value from previous version of the Compliance Studio
SAML_ROLE_ATTRIB UTE	Reuse value from previous version of the Compliance Studio
SAML_LOGOUT_URL	Reuse value from previous version of the Compliance Studio
Integrate with other Products	
API_USERS	Reuse value from previous version of the Compliance Studio
VALID_ROLES	Reuse value from previous version of the Compliance Studio
BATCH_ROLE	Reuse value from previous version of the Compliance Studio
MMG Service Configurations	
SESSION_TOKEN_CREDENTIALS	Reuse value from previous version of the Compliance Studio
FCC_API_USER	Reuse value from previous version of the Compliance Studio
SSO_TOKEN	Reuse value from previous version of the Compliance Studio
MMG_DATASOURCE_MAX_POOL_SIZE	Reuse value from previous version of the Compliance Studio
MMG_DATASOURCE_IDLE_TIMEOUT	Reuse value from previous version of the Compliance Studio

Table 18: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0
MMG_DATASOURCE_CONN_TIMEOUT	Reuse value from previous version of the Compliance Studio
EXT_DATASOURCE_MAX_POOL_SIZE	Reuse value from previous version of the Compliance Studio
EXT_DATASOURCE_IDLE_TIMEOUT	Reuse value from previous version of the Compliance Studio
EXT_DATASOURCE_CONN_TIMEOUT	Reuse value from previous version of the Compliance Studio
SERVER_COOKIE_TIMEOUT	Reuse value from previous version of the Compliance Studio
DATASTUDIO_CSP_FRAME_ANCESTORS	In case of ECM-IH integration use case, update the DATASTUDIO_CSP_FRAME_A NCESTORS parameter as follows: https:// <Hostname>:<Compliance_St udio_Gateway_Port>,http:// <ecm_webserver_hostname>: <ecm_ui_port> For example, DATASTUDIO_CSP_FRAME_A NCESTORS=https:// testCSserver.oraclevcn.com:7 071,http:// testECMserver:8019 **NOTE**: This parameter is available only after applying the patch 36804835 (v8.1.2.6.13).
DB Details for Studio Schema You must be logged in as **SYSDBA** to perform these configurations.	
STUDIO_DB_HOSTNAME	Reuse value from previous version of the Compliance Studio
STUDIO_DB_PORT	Reuse value from previous version of the Compliance Studio
STUDIO_DB_SERVICE _NAME	Reuse value from previous version of the Compliance Studio
STUDIO_DB_SID	Reuse value from previous version of the Compliance Studio
STUDIO_DB_USERNAME	Reuse value from previous version of the Compliance Studio
DB Details of Atomic Schema	
ATOMIC_DB_HOSTNAME	Reuse value from previous version of the Compliance Studio
ATOMIC_DB_PORT	Reuse value from previous version of the Compliance Studio

Table 18: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0
ATOMIC_DB_SERVICE _NAME	Reuse value from previous version of the Compliance Studio
ATOMIC_DB_SID	Reuse value from previous version of the Compliance Studio
ATOMIC_DB_USERNAME	Reuse value from previous version of the Compliance Studio
Wallet Details	
WALLET_LOCATION	Reuse value from previous version of the Compliance Studio
TNS_ADMIN_PATH	Reuse value from previous version of the Compliance Studio
STUDIO_ALIAS_NAME	Reuse value from previous version of the Compliance Studio
ATOMIC_ALIAS_NAME	Reuse value from previous version of the Compliance Studio
Logstash	
LOGSTASH_HOME	Reuse value from previous version of the Compliance Studio
Graph Service	
GRAPH_DB_SERVER_ NAME	Reuse value from previous version of the Compliance Studio
GRAPH_DB_PORT	Reuse value from previous version of the Compliance Studio
GRAPH_DB_SERVICE _NAME	Reuse value from previous version of the Compliance Studio
GRAPH_KEYSTORE_PASSWORD	Reuse value from previous version of the Compliance Studio
GRAPH_SCHEMA_DB_SCHEMA_NAME	Reuse value from previous version of the Compliance Studio
GRAPH_SCHEMA_WALLET_ALIAS	Reuse value from previous version of the Compliance Studio
GRAPH_SCHEMA_WALLET_LOCATION	Reuse value from previous version of the Compliance Studio
GRAPH_SCHEMA_TNS_ADMIN_PATH	Reuse value from previous version of the Compliance Studio
PGX_ENABLE_CP	Reuse value from previous version of the Compliance Studio

Table 18: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0
PGX_CP_INITIAL_SIZE	Reuse value from previous version of the Compliance Studio
PGX_CP_MAX_TOTAL	Reuse value from previous version of the Compliance Studio
PGX_CP_MAX_IDLE	Reuse value from previous version of the Compliance Studio
PGX_CP_MIN_IDLE	Reuse value from previous version of the Compliance Studio
PGX_CP_MAX_WAIT_MILLIS	Reuse value from previous version of the Compliance Studio
PGX_CP_MIN_EVICTABLE_IDLE_TIME	Reuse value from previous version of the Compliance Studio
PGX_CP_SOFT_MIN_EVICTABLE__IDLE_TIME	Reuse value from previous version of the Compliance Studio
Default Connection Pooling Configuration for External Schema The following parameters are applicable for enabling connection pool in graph service for any external schema. **NOTE**: These parameters are required for generating PDF in Investigation Hub notebooks.	
EXT_SCHEMA_ENABLE_CP	The value is either true or false. If it is set to true, then configure the following parameters related to External Schema. If it is set to false, then configure the following parameters related to External Schema as NA.
EXT_SCHEMA_CP_MAX_IDLE	Enter the maximum number of connections that can remain idle in the pool, without extra ones being released or negative for no limit. For example, 5
EXT_SCHEMA_CP_MIN_IDLE	Enter the minimum number of connections that can remain idle in the pool, without extra ones being created, or zero to create none. For example, 2
EXT_SCHEMA_CP_INITIAL_SIZE	Enter the initial number of connections that are created when the pool is started. For example, 1
EXT_SCHEMA_CP_MAX_TOTAL	Enter the maximum number of active connections that can be allocated from this pool at the same time or negative for no limit. For example, 10

Table 18: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0
EXT_SCHEMA_CP_MAX_WAIT_MILLIS	Enter 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. For example, 3000
EXT_SCHEMA_CP_MIN_EVICTABLE_TIME	Enter 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 EXT_SCHEMA_CP_MIN_IDLE. For example, PT30M
EXT_SCHEMA_CP_SOFT_MIN_EVICTABLE_IDLE_TIME	Enter the minimum amount of time a connection may sit idle in the pool before it is closed and a new connection is created. For example, PT6H **NOTE:** The values lesser than EXT_SCHEMA_CP_MIN_EVICTABLE_IDLE_TIME will close all the idle connection and create connection to match EXT_SCHEMA_CP_MIN_IDLE.
PGX_ZEPPELIN_SCHEDULER_THREADPOOL_SIZE	Enter the threadpool size of the PGX interpreter. For example, 200
ENABLE_MATCHING_FOR_GRAPH	Reuse value from previous version of the Compliance Studio
Quantifind Details The following parameters are related to Quantifind Integration with Investigation Hub and these are **optional**. **NOTE**: The parameters related to Quantifind are applicable only when you are using Investigation Hub notebooks (v8.1.2.6.1).	
ENABLE_QUANTIFIND	Enable to integrate with quantifind. The value is "true" or "false". For example, Y
QUANTIFIND_URL	Enter the quantifind API URL. For example, https://testserver.quantifind.com **NOTE**: In Studio Schema, update Quantifind URL in V_URL column of the CS_IH_EXT_SRVC_APP_DETAILS table.
QUANTIFIND_TOKEN	Enter the quantifind API token. **NOTE**: In Studio Schema, update Quantifind API token in V_REQ_HDR_VALUE column of the CS_IH_EXT_SRVC_REQ_HEADERS table where V_REQ_HDR_KEY is X-QF-App-Token.

Table 18: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0
QUANTIFIND_APPNAME	Enter the quantifind App Name. For example, OracleIntegrationTest **NOTE**: In Studio Schema, update Quantifind App name in V_REQ_HDR_VALUE column of the CS_IH_EXT_SRVC_REQ_HEADERS table where V_REQ_HDR_KEY is X-QF-App-Name.
HTTPS_PROXY_HOST	Reuse value from previous version of the Compliance Studio
HTTPS_PROXY_PORT	Reuse value from previous version of the Compliance Studio
HTTP_PROXY_USERNAME	Reuse value from previous version of the Compliance Studio
HTTP_PROXY_PASSWORD	Reuse value from previous version of the Compliance Studio
NO_PROXY	The default value is "\"*.$(hostname -d)|localhost|$(hostname -i)|127.0.0.1|0.0.0.0\""
PGX server configuration	
NUM_CACHED_RESULTSET	Reuse value from previous version of the Compliance Studio
RESULTSET_EXPIRATION_TIME_SECS	Reuse value from previous version of the Compliance Studio
MAX_TOTAL_SHARED_DATA_MEMORY_SIZE	Reuse value from previous version of the Compliance Studio
MAX_TOTAL_PRIVATE_DATA_MEMORY_SIZE	Reuse value from previous version of the Compliance Studio
MAX_PER_SESSION_DATA_MEMORY_SIZE	Reuse value from previous version of the Compliance Studio
MAX_DATA_MEMORY_SIZE_DSUSRGRP	Reuse value from previous version of the Compliance Studio
MAX_DATA_MEMORY_SIZE_DSBATCH	Reuse value from previous version of the Compliance Studio
MAX_DATA_MEMORY_SIZE_DSINTER	Reuse value from previous version of the Compliance Studio
MAX_DATA_MEMORY_SIZE_DSAPPROVER	Reuse value from previous version of the Compliance Studio
MAX_DATA_MEMORY_SIZE_DSUSER	Reuse value from previous version of the Compliance Studio

Table 18: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0
MAX_DATA_MEMORY_SIZE_IHUSRGRP	Enter the Absolute memory limit for any user of the PGX engine whose role is IHUSRGRP. For example, 10G
Service URLs	
PGX_SERVER_URL	Reuse value from previous version of the Compliance Studio
R interpreter settings	
RS_CONF_PATH	Retain the default value
RS_KEYSTORE	Retain the default value
RS_KS_SECRET	Retain the default value
Additional Environment variables	
LD_LIBRARY_PATH	Reuse value from previous version of the Compliance Studio
Matching Mechanism	
MATCHING_MECHANISM	From CS 8.1.2.6.0 (OpenSearch) to CS 8.1.2.8.0 (OpenSearch) the value should be **OS**.
OpenSearch Cluster Details **NOTE:** The parameter related to OpenSearch is applicable only when **MATCHING_MECHANISM** is **OS**.	
OPEN_SEARCH_HOSTNAME	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_PORT	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_HADOOP_CREDENTIAL_PATH	Enter the value as NA
OPEN_SEARCH_USERNAME	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_ENCRYPTED_PASSWORD	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_HADOOP_PASSWORD_ALIAS	Enter the value as NA
OPEN_SEARCH_HTTPS_ENABLED	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_TRUSTSTORE_FILE_NAME	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_TRUSTSTORE_SECRET	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_KEYSTORE_HADOOP_CREDENTIAL_ALIAS	Enter the value as NA

Table 18: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0
ES Cluster Details	
Configuration is not required for the parameters related to Elastic Search as it is deprecated.	
Additional MMG Configuration	
Configuration is not required for these DATACATALOG_SERVICE_URL, SPARK_HOME, EST_ENABLED, and EST_UI_URL parameters.	
All Services	
Set the value of the parameter, DEPLOY_ALL_SERVIC E, as **true** for starting all services and **false** for starting selected services. For 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.	
DEPLOY_ALL_SERVICE	Set the value as true or false. Set it to true for starting all services. If it is false, then enable the following services based on the use case.
Services	
METASERVICE_ENABLED	Set the value as true and it has to be enabled for all use cases
BATCHSERVICE_ENABLED	Set the value as true and it has to be enabled for all use cases
GRAPH_SERVICE_ENABLED	Set the value as true and it has to be enabled for Graph use case
FCC_UI_ENABLED	Set the value as true and it has to be enabled for Entity Resolution and Graph use cases
CANDIDATE_SELECTION_ENABLED	Set the value as true and it has to be enabled for Entity Resolution and Graph use cases when MATCHING_MECHANISM is set to **OT**
FCC_PYTHON_ENAB LED	Set the value as true and it has to be enabled for all use cases
JDBC_ENABLED	Set the value as true and it has to be enabled for all use cases
PGX_ENABLED	Set the value as true and it has to be enabled for Graph use case
ENTITY_RESOLUTIO N_ENABLED	Set the value as true and it has to be enabled for Entity Resolution use case
MATCHING_SERVICE _ENABLED	Set the value as true and it has to be enabled for Entity Resolution and Graph use cases
LOAD_TO_OPEN_SEARCH_ENABLED	Set the value as true and it has to be enabled for Entity Resolution and Graph use cases when MATCHING_MECHANISM is set to **OS**

Table 18: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0
MMG_SERVICE_ENA BLED	Set the value as true and it has to be enabled for all use cases

4.1.2.11 Run Compliance Studio Installer

> **NOTE**   Before proceeding with this section, you should stop previous instance of the Compliance Studio.

To run, see the Run the Compliance Studio Installer section.

4.1.2.12 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.

4.1.2.13 Access Compliance Studio

To access the Compliance Studio, see the Access Compliance Studio Application section.

4.1.3 Post Upgrade Steps

4.1.3.1 Common for All Use Cases

4.1.3.1.1 Configure Conda Environment

To configure conda environment, see the Registering the Conda Environment section.

4.1.3.2 Graph Use Case

4.1.3.2.1 Post-installation Grants for Graph Schema

During the upgrade activity, make sure that the following grants are assigned to the graph schema.

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

  ```
  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**

  ```
  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**

```
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>;
```

4.1.3.2.2   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.

4.1.3.2.3   Start 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. |

4.1.3.2.4 Reinitialize Graph Schema

To reinitialize the graph schema, follow these steps:

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

2. Execute the following command:

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

4.1.3.2.5 Changes in Similarity Edges

After upgrade from CS 8.1.2.6.0 to CS 8.1.2.8.0, 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 8.1.2.6.0 graph, these similarity edge providers should be added manually to the graph definition of CS 8.1.2.8.0.

To add Similarity Edge manually, follow these steps:

1. Log in to Compliance Studio UI.

2. In the Mega menu, click **Modeling** and select **Graphs**.

3. Click **FINANCIAL_CRIME_GLOBAL_GRAPH** and click on the Node to create a relationship between them. The **Edge Details** pane is displayed.

4. Enter Edge name in the **Logical Name** field.

5. Enter Edge description in the **Logical Description** field.

6. Enable **Is Similarity Edge** in the Edge Modeler Attributes section to add the pre-defined set of attributes available in the edge.

7. In Manage Pipeline(s), click **Attach** drop-down list and select **Match Rules**.

8. Click **OK**. The new edge will be created and added to the respective nodes.

4.1.3.3 Entity Resolution Use Case

4.1.3.3.1 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 8.1.2.8.0.

   For any clarifications, contact My Oracle Support (MOS).

4.1.3.3.2 Upload Data Model

To upload the data model, see the Uploading FSDF section.

4.1.3.3.3 Upgrade Steps for Entity Resolution

ATTENTION	• This section is applicable only 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 8.1.2.8.0.
	• If you are upgrading from MATCHING_MECHANISM = OS in CS 8.1.2.6.0 to MATCHING_MECHANISM = OT in CS 8.1.2.8.0, then contact My Oracle Support (MOS).

4.1.3.3.3.1 *Upgrade metadata from CS 8.1.2.7.0*

To update metadata schema, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/ficdb/upgrade/8.1.2.7.0/UpgradeMetaSchema`.

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.

4.1.3.3.3.2 Upgrade ER/FSDF from CS 8.1.2.7.0

To update ER/FSDF schema, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/ficdb/upgrade/8.1.2.7.0/ UpgradeFSDFSchema`.

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.

> **NOTE**
> - Manual action cannot be performed from **Merge and Split Global Entities** UI after performing steps mentioned in the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/ficdb/ upgrade/8.1.2.7.0` directory.
> - Manual action can be performed after execution of ER jobs on the next day.

4.1.3.3.3.3 Upgrade ER/FSDF from CS 8.1.2.8.0

To update ER/FSDF schema, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/ficdb/upgrade/8.1.2.8.0/ UpgradeFSDFSchema`.

2. Log in to ER/FSDF schema.

3. Execute `Update_created_runskey_for_GId.sql` script.

   This script will add created runskey value for existing global parties in n_created_run_skey column in the FCC_ER_MAPPING table.

4.1.3.4 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**.

4.1.3.5 Upgrade Steps for Scenario Conversion Utility

For upgrade steps, see **Using Scenario Conversion Utility for ASC** section in the OFS Compliance Studio Administration and Configuration Guide.

4.2 Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0

4.2.1 Prerequisites

The upgrade environment should have the following:

- Hardware and Software Requirements
- Download the Installer Kit

4.2.2 Upgrade Steps

4.2.2.1 Extract the Installer Kit

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

1. Extract the `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-1of2.zip` file from the installer in the download directory using the following command:

   ```
   unzip -a OFS_COMPLIANCE_STUDIO-8.1.2.8.0-1of2.zip
   ```

   > **NOTE** You should not extract CS 81280 installer in the same directory where previous version of Compliance Studio is installed.

2. The `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-2of2.zip` file should be placed in the same directory where `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-1of2.zip` file is extracted.

   > **NOTE** You do not need to unzip the `OFS_COMPLIANCE_STUDIO-8.1.2.8.0-2of2.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 this `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.

4.2.2.2 Public and Private Keys

The `private.key` and `public.key` files can be reused from the previous version of Compliance Studio instance.

Copy `private.key` and `public.key` files from previous version of the Compliance Studio instance and paste in the same path where current version is installed.

File Path:

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

`<COMPLIANCE_STUDIO_INSTALLATION_PATH>/batchservice/conf`

`<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/mmg-load-to-graph/graph-service/conf`

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

4.2.2.3 API token for CS API User

The SSO_TOKEN value can be reused from the previous version of Compliance Studio instance.

To copy the SSO_TOKEN value, follow these steps:

1. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/mmg-home/bin` directory.

   > **NOTE**   This path refers to the previous version of Compliance Studio.

2. Open the `token.out` file and copy the SSO_TOKEN value.

3. Navigate to the `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory.

   > **NOTE**   This path refers to the current version of Compliance Studio.

4. Open the `config.sh` file and update the copied value in the SSO_TOKEN parameter.

4.2.2.4 SSL Configuration

The `.p12` and `studio_server.p12` files can be reused from the previous version of Compliance Studio instance.

Copy `.p12` and `studio_server.p12` files from previous version of the Compliance Studio instance and paste in the same path where current version is installed.

File Path for .p12 and studio_server.p12:

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

4.2.2.5 Import SSL Certificate to JDK Security

> **NOTE** This section is applicable only when you are upgrading java during the upgrade activity.

For upgrade, see the Import the certificate to JDK security section.

4.2.2.6 Place Key Store File for Secure Batch Service

The `studio_server.p12` file can be reused from the previous version of Compliance Studio instance.

Copy `studio_server.p12` file from the previous version of Compliance Studio instance and paste in the same path where current version is installed.

File path: `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/batchservice/conf.`

4.2.2.7 Grants for Studio Schema

During the upgrade activity, make sure that the following grants are assigned to the 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>;`

4.2.2.8   Entity Resolution Use Case

4.2.2.8.1   Grants for ER Schema

During the upgrade activity, make sure that the following grants are assigned to the Entity Resolution 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>;`

4.2.2.9   Graph Use Case

4.2.2.9.1   Prerequisites

- Create filestore directories in the database server. To create filestore directories, see the Create Filestore Directories in the Database Server for Graph section.
- Assign grants to Studio Schema to access the file store directories. To assign grants, see the Assign Grants to Studio Schema to Access the Filestore Directories section.

4.2.2.9.2   Pre-installation Grants for Graph Schema

During the upgrade activity, make sure that the following grants are assigned to the graph schema.

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

```
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 only 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>;
```

4.2.2.9.3   Graph-keystore.p12 File

The `graph-keystore.p12` file can be reused from the previous version of Compliance Studio instance.

Copy `graph-keystore.p12` file from previous version of the Compliance Studio instance and paste in the same path where current version is installed.

File Path:

```
<COMPLIANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-load-to-graph/
graph-service/conf
```

```
<PGX_HOME>/pgx/pgx-server/conf
```

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 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.

4.2.2.9.4 PGX Service

Upgrade for PGX service is same process as fresh configuration. To configure, see the Configure the PGX Service section.

4.2.2.9.5 Stop 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 `<PGX_Installation_Path>/pgx/pgx-server/bin` directory where the start service for PGX is located.

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

4.2.2.10 Config.sh File

The parameters in `config.sh` file can be reused from the previous version of Compliance Studio instance.

Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/bin` directory and update parameter as mentioned in the Table 19.

Table 19: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0
COMPLIANCE_STUDIO_INSTALLATION_PATH	Provide the path where the new installer is extracted. For example, `/scratch/testuser/OFS_COMPLIANCE_STUDIO`
MINICONDA_INSTALLATION_HOME	By default, the value is $HOME
NON_OFSAA	Enter the value as **false**
GRAPH_SOURCE	
GRAPH_SOURCE	Enter the value as **BD**
ECM_SCHEMA_NAME	Reuse value from previous version of the Compliance Studio
FCDM_SCHEMA	Reuse value from previous version of the Compliance Studio
SSL Configuration	

Table 19: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0
STUDIO_SERVER_SSL_SECRET	Reuse value from previous version of the Compliance Studio
STUDIO_SERVER_SSL_ALIAS	Reuse value from previous version of the Compliance Studio
Authentication Realm	
AUTH_REALM	Reuse value from previous version of the Compliance Studio
COOKIE_DOMAIN	Reuse value from previous version of the Compliance Studio
AAI related configuration	
AAI_URL	Reuse value from previous version of the Compliance Studio
SAML Related Configuration	
SAML_DESTINATION	Reuse value from previous version of the Compliance Studio
SAML_ROLE_ATTRIB UTE	Reuse value from previous version of the Compliance Studio
SAML_LOGOUT_URL	Reuse value from previous version of the Compliance Studio
Integrate with other Products	
API_USERS	Reuse value from previous version of the Compliance Studio
VALID_ROLES	Reuse value from previous version of the Compliance Studio
BATCH_ROLE	Reuse value from previous version of the Compliance Studio
MMG Service Configurations	
SESSION_TOKEN_CREDENTIALS	Reuse value from previous version of the Compliance Studio
FCC_API_USER	Reuse value from previous version of the Compliance Studio
SSO_TOKEN	Reuse value from previous version of the Compliance Studio
MMG_DATASOURCE_MAX_POOL_SIZE	Reuse value from previous version of the Compliance Studio
MMG_DATASOURCE_IDLE_TIMEOUT	Reuse value from previous version of the Compliance Studio

Table 19: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0
MMG_DATASOURCE_CONN_TIMEOUT	Reuse value from previous version of the Compliance Studio
EXT_DATASOURCE_MAX_POOL_SIZE	Reuse value from previous version of the Compliance Studio
EXT_DATASOURCE_IDLE_TIMEOUT	Reuse value from previous version of the Compliance Studio
EXT_DATASOURCE_CONN_TIMEOUT	Reuse value from previous version of the Compliance Studio
SERVER_COOKIE_TIMEOUT	Reuse value from previous version of the Compliance Studio
DATASTUDIO_CSP_FRAME_ANCESTORS	In case of ECM-IH integration use case, update the DATASTUDIO_CSP_FRAME_A NCESTORS parameter as follows: https:// <Hostname>:<Compliance_St udio_Gateway_Port>,http:// <ecm_webserver_hostname>:<ecm_ui_port> For example, DATASTUDIO_CSP_FRAME_A NCESTORS=https:// testCSserver.oraclevcn.com:7 071,http:// testECMserver:8019 **NOTE**: This parameter is available only after applying the patch 36804835 (v8.1.2.7.3).
DB Details for Studio Schema You must be logged in as **SYSDBA** to perform these configurations.	
STUDIO_DB_HOSTNAME	Reuse value from previous version of the Compliance Studio
STUDIO_DB_PORT	Reuse value from previous version of the Compliance Studio
STUDIO_DB_SERVICE _NAME	Reuse value from previous version of the Compliance Studio
STUDIO_DB_SID	Reuse value from previous version of the Compliance Studio
STUDIO_DB_USERNAME	Reuse value from previous version of the Compliance Studio
DB Details of Atomic Schema	
ATOMIC_DB_HOSTNAME	Reuse value from previous version of the Compliance Studio
ATOMIC_DB_PORT	Reuse value from previous version of the Compliance Studio

Table 19: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0
ATOMIC_DB_SERVICE _NAME	Reuse value from previous version of the Compliance Studio
ATOMIC_DB_SID	Reuse value from previous version of the Compliance Studio
ATOMIC_DB_USERNAME	Reuse value from previous version of the Compliance Studio
Wallet Details	
WALLET_LOCATION	Reuse value from previous version of the Compliance Studio
TNS_ADMIN_PATH	Reuse value from previous version of the Compliance Studio
STUDIO_ALIAS_NAME	Reuse value from previous version of the Compliance Studio
ATOMIC_ALIAS_NAME	Reuse value from previous version of the Compliance Studio
Logstash	
LOGSTASH_HOME	Reuse value from previous version of the Compliance Studio
Graph Service	
GRAPH_DB_SERVER_ NAME	Reuse value from previous version of the Compliance Studio
GRAPH_DB_PORT	Reuse value from previous version of the Compliance Studio
GRAPH_DB_SERVICE _NAME	Reuse value from previous version of the Compliance Studio
GRAPH_KEYSTORE_PASSWORD	Reuse value from previous version of the Compliance Studio
GRAPH_SCHEMA_DB_SCHEMA_NAME	Reuse value from previous version of the Compliance Studio
GRAPH_SCHEMA_WALLET_ALIAS	Reuse value from previous version of the Compliance Studio
GRAPH_SCHEMA_WALLET_LOCATION	Reuse value from previous version of the Compliance Studio
GRAPH_SCHEMA_TNS_ADMIN_PATH	Reuse value from previous version of the Compliance Studio
PGX_ENABLE_CP	Reuse value from previous version of the Compliance Studio

Table 19: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0
PGX_CP_INITIAL_SIZE	Reuse value from previous version of the Compliance Studio
PGX_CP_MAX_TOTAL	Reuse value from previous version of the Compliance Studio
PGX_CP_MAX_IDLE	Reuse value from previous version of the Compliance Studio
PGX_CP_MIN_IDLE	Reuse value from previous version of the Compliance Studio
PGX_CP_MAX_WAIT_MILLIS	Reuse value from previous version of the Compliance Studio
PGX_CP_MIN_EVICTABLE_IDLE_TIME	Reuse value from previous version of the Compliance Studio
PGX_CP_SOFT_MIN_EVICTABLE__IDLE_TIME	Reuse value from previous version of the Compliance Studio
Default Connection Pooling Configuration for External Schema The following parameters are applicable for enabling connection pool in graph service for any external schema. **NOTE**: These parameters are required for generating PDF in Investigation Hub notebooks.	
EXT_SCHEMA_ENABLE_CP	The value is either true or false. If it is set to true, then configure the following parameters related to External Schema. If it is set to false, then configure the following parameters related to External Schema as NA.
EXT_SCHEMA_CP_MAX_IDLE	Enter the maximum number of connections that can remain idle in the pool, without extra ones being released or negative for no limit. For example, 5
EXT_SCHEMA_CP_MIN_IDLE	Enter the minimum number of connections that can remain idle in the pool, without extra ones being created, or zero to create none. For example, 2
EXT_SCHEMA_CP_INITIAL_SIZE	Enter the initial number of connections that are created when the pool is started. For example, 1
EXT_SCHEMA_CP_MAX_TOTAL	Enter the maximum number of active connections that can be allocated from this pool at the same time or negative for no limit. For example, 10

Table 19: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0
EXT_SCHEMA_CP_MAX_WAIT_MILLIS	Enter 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. For example, 3000
EXT_SCHEMA_CP_MIN_EVICTABLE_TIME	Enter 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 EXT_SCHEMA_CP_MIN_IDLE. For example, PT30M
EXT_SCHEMA_CP_SOFT_MIN_EVICTABLE_IDLE_TIME	Enter the minimum amount of time a connection may sit idle in the pool before it is closed and a new connection is created. For example, PT6H **NOTE:** The values lesser than EXT_SCHEMA_CP_MIN_EVICTABLE_IDLE_TIME will close all the idle connection and create connection to match EXT_SCHEMA_CP_MIN_IDLE.
PGX_ZEPPELIN_SCHEDULER_THREADPOOL_SIZE	Enter the threadpool size of the PGX interpreter. For example, 200 **NOTE**: This parameter can be configured after applying this patch 36752689 (v8.1.2.7.2) only.
ENABLE_MATCHING_FOR_GRAPH	Reuse value from previous version of the Compliance Studio
Quantifind Details The following parameters are related to Quantifind Integration with Investigation Hub and these are **optional**. **NOTE**: The parameters related to Quantifind are applicable only when you are using Investigation Hub notebooks (v8.1.2.6.1).	
ENABLE_QUANTIFIND	Enable to integrate with quantifind. The value is "true" or "false". For example, Y **NOTE**: This parameter can be configured after applying this patch 36752689 (v8.1.2.7.2) only.
QUANTIFIND_URL	Enter the quantifind API URL. For example, https://testserver.quantifind.com **NOTE**: In Studio Schema, update Quantifind URL in V_URL column of the CS_IH_EXT_SRVC_APP_DETAILS table. This parameter can be configured after applying this patch 36752689 (v8.1.2.7.2) only.

Table 19: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0
QUANTIFIND_TOKEN	Enter the quantifind API token. **NOTE**: In Studio Schema, update Quantifind API token in V_REQ_HDR_VALUE column of the CS_IH_EXT_SRVC_REQ_HEADERS table where V_REQ_HDR_KEY is X-QF-App-Token. This parameter can be configured after applying this patch 36752689 (v8.1.2.7.2) only.
QUANTIFIND_APPNAME	Enter the quantifind App Name. For example, OracleIntegrationTest **NOTE**: In Studio Schema, update Quantifind App name in V_REQ_HDR_VALUE column of the CS_IH_EXT_SRVC_REQ_HEADERS table where V_REQ_HDR_KEY is X-QF-App-Name. This parameter can be configured after applying this patch 36752689 (v8.1.2.7.2) only.
HTTPS_PROXY_HOST	Reuse value from previous version of the Compliance Studio
HTTPS_PROXY_PORT	Reuse value from previous version of the Compliance Studio
HTTP_PROXY_USERNAME	Reuse value from previous version of the Compliance Studio
HTTP_PROXY_PASSWORD	Reuse value from previous version of the Compliance Studio
NO_PROXY	The default value is "\"*.$(hostname -d)\|localhost\|$(hostname -i)|127.0.0.1|0.0.0.0\""
PGX server configuration	
NUM_CACHED_RESULTSET	Reuse value from previous version of the Compliance Studio
RESULTSET_EXPIRATION_TIME_SECS	Reuse value from previous version of the Compliance Studio
MAX_TOTAL_SHARED_DATA_MEMORY_SIZE	Reuse value from previous version of the Compliance Studio
MAX_TOTAL_PRIVATE_DATA_MEMORY_SIZE	Reuse value from previous version of the Compliance Studio
MAX_PER_SESSION_DATA_MEMORY_SIZE	Reuse value from previous version of the Compliance Studio
MAX_DATA_MEMORY_SIZE_DSUSRGRP	Reuse value from previous version of the Compliance Studio

Table 19: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0
MAX_DATA_MEMORY_SIZE_DSBATCH	Reuse value from previous version of the Compliance Studio
MAX_DATA_MEMORY_SIZE_DSINTER	Reuse value from previous version of the Compliance Studio
MAX_DATA_MEMORY_SIZE_DSAPPROVER	Reuse value from previous version of the Compliance Studio
MAX_DATA_MEMORY_SIZE_DSUSER	Reuse value from previous version of the Compliance Studio
MAX_DATA_MEMORY_SIZE_IHUSRGRP	Enter the Absolute memory limit for any user of the PGX engine whose role is IHUSRGRP. For example, 10G
Service URLs	
PGX_SERVER_URL	Reuse value from previous version of the Compliance Studio
R interpreter settings	
RS_CONF_PATH	Retain the default value
RS_KEYSTORE	Retain the default value
RS_KS_SECRET	Retain the default value
Additional Environment variables	
LD_LIBRARY_PATH	Reuse value from previous version of the Compliance Studio
Matching Mechanism	
MATCHING_MECHANISM	From CS 8.1.2.7.0 (OpenSearch) to CS 8.1.2.8.0 (Oracle Text) the value should be **OT**.
OpenSearch Cluster Details **NOTE:** The parameter related to OpenSearch is applicable only when **MATCHING_MECHANISM** is **OS**.	
OPEN_SEARCH_HOSTNAME	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_PORT	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_HADOOP_CREDENTIAL_PATH	Enter the value as NA
OPEN_SEARCH_USERNAME	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_ENCRYPTED_PASSWORD	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_HADOOP_PASSWORD_ALIAS	Enter the value as NA

Table 19: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0
OPEN_SEARCH_HTTPS_ENABLED	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_TRUSTSTORE_FILE_NAME	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_TRUSTSTORE_SECRET	Reuse value from previous version of the Compliance Studio
OPEN_SEARCH_KEYSTORE_HADOOP_CREDENTIAL_ALIAS	Enter the value as NA
ES Cluster Details	
Configuration is not required for the parameters related to Elastic Search as it is deprecated.	
Additional MMG Configuration	
Configuration is not required for these DATACATALOG_SERVICE_URL, SPARK_HOME, EST_ENABLED, and EST_UI_URL parameters.	
All Services	
Set the value of the parameter, DEPLOY_ALL_SERVIC E, as **true** for starting all services and **false** for starting selected services.	
For 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.	
DEPLOY_ALL_SERVICE	Set the value as true or false. Set it to true for starting all services. If it is false, then enable the following services based on the use case.
Services	
METASERVICE_ENABLED	Set the value as true and it has to be enabled for all use cases
BATCHSERVICE_ENABLED	Set the value as true and it has to be enabled for all use cases
GRAPH_SERVICE_ENABLED	Set the value as true and it has to be enabled for Graph use case
FCC_UI_ENABLED	Set the value as true and it has to be enabled for Entity Resolution and Graph use cases
CANDIDATE_SELECTION_ENABLED	Set the value as true and it has to be enabled for Entity Resolution and Graph use cases when MATCHING_MECHANISM is set to **OT**
FCC_PYTHON_ENAB LED	Set the value as true and it has to be enabled for all use cases
JDBC_ENABLED	Set the value as true and it has to be enabled for all use cases
PGX_ENABLED	Set the value as true and it has to be enabled for Graph use case

Table 19: Update Parameter in config.sh file for Upgrade

Parameter	Value for Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0
ENTITY_RESOLUTIO N_ENABLED	Set the value as true and it has to be enabled for Entity Resolution use case
MATCHING_SERVICE _ENABLED	Set the value as true and it has to be enabled for Entity Resolution and Graph use cases
LOAD_TO_OPEN_SEARCH_ENABLED	Set the value as true and it has to be enabled for Entity Resolution and Graph use cases when MATCHING_MECHANISM is set to **OS**
MMG_SERVICE_ENA BLED	Set the value as true and it has to be enabled for all use cases

4.2.2.11 Run Compliance Studio Installer

> **NOTE**   Before proceeding with this section, you should stop previous instance of the Compliance Studio.

To run, see the Run the Compliance Studio Installer section.

4.2.2.12 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.

4.2.2.13 Access Compliance Studio

To access the Compliance Studio, see the Access Compliance Studio Application section.

4.2.3 Post Upgrade Steps

4.2.3.1 Common for All Use Cases

4.2.3.1.1 Configure Conda Environment

To configure conda environment, see the Registering the Conda Environment section.

4.2.3.2 Graph Use Case

4.2.3.2.1 Post-installation Grants for Graph Schema

During the upgrade activity, make sure that the following grants are assigned to the graph schema.

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

    ```
    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**

```
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**

```
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>;
```

4.2.3.2.2 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.

4.2.3.2.3 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.

4.2.3.2.4   Reinitialize Graph Schema

To reinitialize the graph schema, follow these steps:

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

2. Execute the following command:

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

4.2.3.2.5   Changes in Similarity Edges

After upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0, 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 8.1.2.7.0 graph, these similarity edge providers should be added manually to the graph definition of CS 8.1.2.8.0.

To add Similarity Edge manually, follow these steps:

1. Log in to Compliance Studio UI.

2. In the Mega menu, click **Modeling** and select **Graphs**.

3. Click **FINANCIAL_CRIME_GLOBAL_GRAPH** and click on the Node to create a relationship between them. The **Edge Details** pane is displayed.

4. Enter Edge name in the **Logical Name** field.

5. Enter Edge description in the **Logical Description** field.

6. Enable **Is Similarity Edge** in the Edge Modeler Attributes section to add the pre-defined set of attributes available in the edge.

7. In Manage Pipeline(s), click **Attach** drop-down list and select **Match Rules**.

8. Click **OK**. The new edge will be created and added to the respective nodes.

4.2.3.3   Entity Resolution Use Case

4.2.3.3.1   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.

Upgrade
Upgrade from CS 8.1.2.7.0 to CS 8.1.2.8.0

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 8.1.2.8.0.

   For any clarifications, contact My Oracle Support (MOS).

4.2.3.3.2 Upload Data Model

To upload the data model, see the Uploading FSDF section.

4.2.3.3.3 Upgrade Steps for Entity Resolution

ATTENTION	• This section is applicable only when Entity Resolution batches are executed in the previous version of the Compliance Studio.
	• If you are upgrading from MATCHING_MECHANISM = OS in CS 8.1.2.7.0 to MATCHING_MECHANISM = OT in CS 8.1.2.8.0, then contact My Oracle Support (MOS).

To update ER/FSDF schema, follow these steps:

1. Navigate to `<COMPLIANCE_STUDIO_INSTALLATION_PATH>/ficdb/upgrade/8.1.2.8.0/UpgradeFSDFSchema`.

2. Log in to ER/FSDF schema.

3. Execute `Update_created_runskey_for_GId.sql` script.

   This script will add created runskey value for existing global parties in n_created_run_skey column in the FCC_ER_MAPPING table.

4.2.3.4 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**.

4.2.3.5 Upgrade Steps for Scenario Conversion Utility

For upgrade steps, see **Using Scenario Conversion Utility for ASC** section in the OFS Compliance Studio Administration and Configuration Guide.

5   Reinstall Compliance Studio with Updated Configuration

This section provides information about reinstall Compliance Studio with updated configuration settings when an incorrect configuration was applied or when new configuration details need to be implemented in the existing setup.

To reinstall Compliance Studio with updated configuration, follow these steps:

1. Stop Compliance Studio. To stop, execute the following command:

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

2. Update the `config.sh` file. Do not forget to reconfigure the sensitive details which were removed earlier.

3. To update configuration in the application, you can pass argument '-u' or '--update'

   ```
   ./compliance-studio.sh --update
   ```

   Once reinstallation is done, you can start the application.

6   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.

6.1   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.PgqlInterpreter.interpret(PgqlInterprete
r.java:131) at
oracle.datastudio.interpreter.pgx.PgxInterpreter.interpret(PgxInterprete
r.java:120) at
org.apache.zeppelin.interpreter.LazyOpenInterpreter.interpret(LazyOpenIn
terpreter.java:103) at
org.apache.zeppelin.interpreter.remote.RemoteInterpreterServer$Interpret
Job.jobRun(RemoteInterpreterServer.java:632) at
org.apache.zeppelin.scheduler.Job.run(Job.java:188) at
org.apache.zeppelin.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 -

e. Export the "Manual Decision" Notebook

f. Add the link parameter just below Description

    For example, "link": "manual Decision",

Figure 17: link parameter

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

g. Truncate the table "fcc_er_paragraph_manual" in Studio Schema.

h. 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 18: Interpreter zeppelin parameter

zeppelin.interpreter.output.limit

102,400
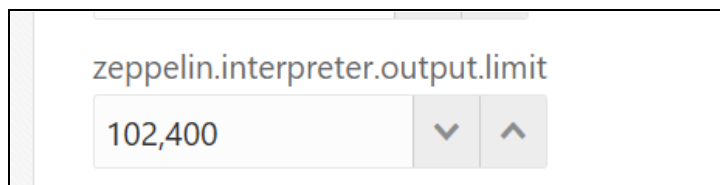
d. Set the value to the required size.

   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 `<COMPLI-`
        `ANCE_STUDIO_INSTALLATION_PATH>/deployed/mmg-home/mmg-studio/inter-`
        `preter-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 cli-
            ent 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:

a. Login to the Linux server as a root user where Compliance Studio is installed.

b. Open `/etc/security/limits.conf` file.

c. 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

d. Save the file.

e. 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
```

a. Stop the PGX server.

b. 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_STU-DIO_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.proper-ties` **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.SequencerDAOImp
l.getQueries(SequencerDAOImpl.java:152) ~[classes!/:?]

 at
com.oracle.fccm.amlxe.dataPipelineService.sequencer.impl.SequencerDAOImp
l$$FastClassBySpringCGLIB$$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$CglibMethodInvocation.pr
oceed(CglibAopProxy.java:749) ~[spring-aop-5.2.5.RELEASE.jar!/
:5.2.5.RELEASE]
 at
org.springframework.aop.framework.CglibAopProxy$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.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$CglibMethodInvocation.pr
oceed(CglibAopProxy.java:749) ~[spring-aop-5.2.5.RELEASE.jar!/
:5.2.5.RELEASE]
 at
org.springframework.aop.framework.CglibAopProxy$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$$Enhancer
BySpringCGLIB$$3277859b.executePipeline(<generated>) ~[classes!/:?]

 at
com.oracle.fccm.amlxe.dataPipelineService.services.ExecutorService.execu
tePipeline(ExecutorService.java:154) ~[classes!/:?]

 at sun.reflect.GeneratedMethodAccessor112.invoke(Unknown Source) ~[?:?]

 at
sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessor
Impl.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(I
nvocableHandlerMethod.java:190) ~[spring-web-5.2.5.RELEASE.jar!/
:5.2.5.RELEASE]

 at
org.springframework.web.method.support.InvocableHandlerMethod.invokeForR
equest(InvocableHandlerMethod.java:138) ~[spring-web-5.2.5.RELEASE.jar!/
:5.2.5.RELEASE]

 at
org.springframework.web.servlet.mvc.method.annotation.ServletInvocableHa
ndlerMethod.invokeAndHandle(ServletInvocableHandlerMethod.java:105)
~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]

 at
org.springframework.web.servlet.mvc.method.annotation.RequestMappingHand
lerAdapter.invokeHandlerMethod(RequestMappingHandlerAdapter.java:879)
~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]

 at
org.springframework.web.servlet.mvc.method.annotation.RequestMappingHand
lerAdapter.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(DispatcherS
ervlet.java:1040) ~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]

 at
org.springframework.web.servlet.DispatcherServlet.doService(DispatcherSe
rvlet.java:943) ~[spring-webmvc-5.2.5.RELEASE.jar!/:5.2.5.RELEASE]

 at
org.springframework.web.servlet.FrameworkServlet.processRequest(Framewor
kServlet.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(FrameworkServle
t.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.j
ava: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.ja
va: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$1(HttpChannel.java:38
3) ~[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]
 at org.eclipse.jetty.server.HttpChannel.dispatch(HttpChannel.java:547)
[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]
 at org.eclipse.jetty.server.HttpChannel.handle(HttpChannel.java:375)
[jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]
 at
org.eclipse.jetty.server.HttpConnection.onFillable(HttpConnection.java:2
70) [jetty-server-9.4.26.v20200117.jar!/:9.4.26.v20200117]
 at
org.eclipse.jetty.io.AbstractConnection$ReadCallback.succeeded(AbstractC
onnection.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(SslC
onnection.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:16
1) [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(EatWhatYou
Kill.java:336) [jetty-util-9.4.26.v20200117.jar!/:9.4.26.v20200117]
 at
org.eclipse.jetty.util.thread.strategy.EatWhatYouKill.doProduce(EatWhatY
ouKill.java:313) [jetty-util-9.4.26.v20200117.jar!/:9.4.26.v20200117]
```

```
  at
org.eclipse.jetty.util.thread.strategy.EatWhatYouKill.tryProduce(EatWhat
YouKill.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$ReservedThread.run(
ReservedThreadExecutor.java:388) [jetty-util-9.4.26.v20200117.jar!/
:9.4.26.v20200117]
  at
org.eclipse.jetty.util.thread.QueuedThreadPool.runJob(QueuedThreadPool.j
ava:806) [jetty-util-9.4.26.v20200117.jar!/:9.4.26.v20200117]
  at
org.eclipse.jetty.util.thread.QueuedThreadPool$Runner.run(QueuedThreadPo
ol.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(DelegatingMetho
dAccessorImpl.java:43) ~[?:?] at
java.lang.reflect.Method.invoke(Method.java:566) ~[?:?] at
org.springframework.web.method.support.InvocableHandlerMethod.doInvoke(I
nvocableHandlerMethod.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 Public and Private Keys section.

    b. Replace the keys in the paths as mentioned in the Generate 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 19: Snapshot of startup.sh file

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 20: Snapshot of shutdown.sh file

> **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-interpreter 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:

a. Find the entry for the failed pipeline in the **FCC_M_EXTERNALSERVICE_RUN** table of this **_C_TABLELIST_** column.

b. 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.

7   Appendix

7.1   Change Port Numbers for Applicable Services

> **NOTE**   This section is applicable only if you want to update port number for the service(s).

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.

7.1.1   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"`

7.1.2   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.

7.1.3   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.

7.1.4   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**.

7.1.5 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**.

7.1.6 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**.

7.1.7 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**.

7.2 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 listof user
groups or ALL> <infodom> <segment>
```

Sample Commands:

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

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

Table 20 list the pre-configured groups in the Compliance Studio.

Table 20: 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.

Table 20: Pre-configured Group

User Group	Description
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.
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.

7.3   Generate an Encrypted Password for OpenSearch

Encrypted password is required during configuration.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.

7.4 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.

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