Oracle Financial Services Analytical Applications

Cloning Guide

Release 8.1.x

November 2022





OFS Analytical Applications Cloning Reference Guide

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Document Control

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1 Preface

The purpose of this document is to serve as the reference material to the OFSAA administrators. This document contains detailed steps to set up an OFSAA Instance Clone for the 8.1.x.x.x releases.

Topics:

- Background
- Assumptions
- <u>Audience</u>
- Conventions
- Typographic Conventions
- Abbreviations

1.1 Background

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

1.2 Assumptions

The assumptions made in this document are:

- A working source OFSAA 8.1.x instance is in place.
- An appropriate target system exists for the new OFSAA setup.

1.3 Audience

This reference guide is for the administrators and implementation consultants responsible for the cloning of an OFSAA instance.

1.4 Conventions

The following text conventions are used in this document:

Table 1: Conventions Used in this Guide

Conventions	Description
8.1.x	The OFSAA 8.1.x release.
Atomic Schema	The Database Schema where the application data model is uploaded.

Conventions	Description
Configuration Schema (Config Schema)	The Database Schema which contains setup related configurations and metadata.
Source	The source OFSAA system.
Target	The target OFSAA system.

1.5 Typographic Conventions

The following typographic conventions are used in this document:

Table 2: Typographic Conventions Used in this Guide

Conventions	Description	
Boldface	The boldface font type indicates graphical user interface elements associated with an action or terms defined in text or the glossary.	
Configuration Schema (Config Schema)	The Database Schema which contains setup related configurations and metadata.	
Italic	The italic font type indicates book titles, emphasis, or placeholder variables for which you supply particular values.	
Monospace	The monospace font type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.	

1.6 Abbreviations

The following table lists the abbreviations used in this document:

Table 3: Abbreviations Used in this Guide

Abbreviations	Description
OS	Operating System
UI	User Interface of the application

2 Set Up an OFSAA Instance Clone for the 8.1.x Release

This chapter contains information about the prerequisites, cloning, and post-cloning configurations for the 8.1.x release when setting up an OFSAA Instance Clone.

Topics:

- Prerequisites
- Cloning Process

2.1 Prerequisites

To set up an OFSAA Instance Clone for the 8.1.x release, complete the following prerequisites:

- 1. General Requirements
- 2. Source System Requirements
- 3. Target System Requirements

NOTE

Complete the prerequisites and then perform the procedures mentioned in the <u>Cloning Process</u> section.

2.1.1 General Requirements

The following general requirements must be matched before you begin the Cloning Process:

- 1. The minimum OFSAA version must be Release 8.1.0.0.0.
- **2.** The FTP/SFTP Service is running on the OFSAA Target System and the User Credentials are available before you begin the cloning activities.
- The Oracle Wallet credentials information must be available if the OFSAA setup is configured with Oracle Wallet.

2.1.2 Source System Requirements

In the source system, complete the following requirements:

- **1.** All the OFSAA services are stopped.
- **2.** Database connection details such as the RAC/NON-RAC URL, the SID/Service Name, and the user credentials are available.

2.1.3 Target System Requirements

In the target system, complete the following requirements:

All the basic software required for the installation of OFSAA applications (including
infrastructure) are installed and working on the machine identified as the Target OFSAA
instance. You can use the Environment Check utility to verify system readiness. For details on
how to use the Environment Check Utility, see the OFS Analytical Applications Environment
Check Utility Guide.

For details on the software and hardware requirements, see the *Hardware and Software Requirements* section in the <u>OFS AAAI Application Pack Installation and Configuration Guide</u>.

NOTE

- Upgrade the Target OS version to the same version as that of the Source OS. Binaries are OS version-specific and cloning requires that there is no mismatch of library files.
- OFS AAI is not required to be installed in the Target Instance before you begin the Cloning Process.
- See the Hardware and Software Requirements Section in the required Application Pack Installation Guides for a detailed list of the prerequisites.
- 2. The web server and the web application server are configured. For details on how to configure web servers, see the *Configuring Web Server* section in the *OFS AAAI Application Pack Installation and Configuration Guide*.
- The OFSAA installation directory is set as \$FIC_HOME with the 750 permission.
 For example, /scratch/ofsaanew/OFSAA
- **4.** The OFSAA staging/metadata repository directory is set as ftpshare with the 775 permission. For example, /scratch/ofsaanew/ftpsharenew
- **5.** The database connection details such as the RAC/NON-RAC URL, the SID/Service Name, and the user credentials are available.

NOTE

- **1.** Create a new database instance that is different from the database instance used in the Source OFSAA instance.
- **2.** Ensure that the Target Server can connect to the Source Database so that you can run **Portc.jar**. If not, the following error will occur:

```
$java -jar PortC.jar DMP
java.sql.SQLRecoverableException: IO Error:
Unknown host specified
```

6. The web server and the web application server identified for the deployment of the OFSAA applications are installed and configured on the machine which is identified as the web server and web application server.

NOTE

If you intend to use the same web application server, then create a separate profile (WebSphere) or a domain (WebLogic).

7. The details of the WebSphere profile or the WebLogic domain or the Tomcat context are available.

NOTE

Before executing the utility, ensure to configure the RevLog4jConfig.xml file with the default log paths.

2.2 Cloning Process

Before initiating the cloning process, perform these steps to retrieve the schema names:

- 1. Log in to the Source Config Schema.
- 2. Execute the following query to retrieve the Config Schema name and Atomic Schema name. select dbuserid from db_master;

In the expdp and impdp database utilities, you can use the schema names in the SCHEMAS attribute.

Subsequent steps for cloning are described in the subsections in this topic and Table 4 acts as a quick start with a summary view of the cloning process.

Table 4: Quickstart for Cloning

Sl. No.	Cloning Process (click the links to go to the specified steps in the document)
1.	Export the complete Configuration and Atomic Schemas from the source environment.
2.	Restore the complete exported schema dumps into the target environment database. • Restore the complete exported schema dumps into the target environment database with a different database user name (schema).
3.	Provide grants and set passwords using the SysDBA user login: a. Provide the select grants permission on the sys.V_\$parameter view to the Config and Atomic Schemas of the target environment database. b. When you import into different schema names, set the passwords for the Config and Atomic Schemas of the target environment database same as that of the password in the source.
4.	Copy and restore the OFSAA file system.
5.	Modify files in the path \$FIC_HOME when you import the files into different schemas.
6.	Run the Port Changer utility.
7.	Perform the post-cloning configurations.

Sl. No.	Cloning Process (click the links to go to the specified steps in the document)	
8.	Create and deploy the .ear/.war files.	
9.	Access the UI.	

2.2.1 Export the Complete Configuration and Atomic Schemas From the Source Environment

Export all the Configuration and Atomic Schemas from the Source environment.

For example:

expdp SYSTEM/oracle@OFSA12C2DB DIRECTORY=data_pump_dir
DUMPFILE=ofsaaconf_ofsaaatm_%U.dmp filesize=2G SCHEMAS=ofsaaconf,ofsaaatm
LOGFILE=ofsaaconf ofsaaatm exp.log

NOTE

Running the preceding command creates data dumps in the files in multiples of 2 GB. You can use any other equivalent commands/tools to archive the schemas.

2.2.2 Restore the Complete Exported Schema Dumps into the Target Environment Database

Restore all the exported dumps into the Target Environment Database.

For example:

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

NOTE

- Restoring the exported dumps creates the Config and Atomic Schemas with the same user credentials as that of the user credentials in the Source, along with the existing grants.
- Restore the Oracle Wallet directory from the Source Environment along with the modifications in the tnsentries .ora file if the Source Environment is configured with Oracle Wallet.

2.2.2.1 Restore the Complete Exported Schema Dumps into the Target Environment Database with a Different Database User Name (Schema)

Restore all the exported dumps into the Target Environment Database with a different Database User Name (schema).

For Example:

impdp SYSTEM/oracle@OFSA12nDB DIRECTORY=data_pump_dir
DUMPFILE=ofsaaconf_ofsaaatm_%U.dmp REMAP_SCHEMA=
ofsaaconf:newofsaaconf,ofsaaatm:newofsaaatm
LOGFILE=new ofsaaconf ofsaaatm imp.log

NOTE

- Restoring the exported dumps creates the Config and Atomic Schemas with the users mentioned under the REMAP_SCHEMA attribute. The REMAP_SCHEMA attribute is replaced as that of the Source along with the existing grants as in the Source Environment.
- Ignore the ORA-39082 object type created with the compilation errors. You can rectify this later in the subsequent steps.
- Restore the Oracle Wallet Directory from the Source Environment and update the Oracle Wallet Schema Credentials to point to the Target Schema Credentials along with the modifications in the tnsentries
 ora file if the Source Environment is configured with Oracle Wallet.

2.2.3 Provide Grants and Set Passwords Using the SysDBA User Login

Restoring the complete exported dumps into the Target environment database with a different database User Name (Schema) does not provide the select grants permission. You must log in with the SysDBA user role to provide the select grants permission and set the passwords. The following subsections provide the instructions.

2.2.3.1 Provide the Select Grants Permission on the sys.v_\$parameter View to the Config and Atomic Schemas of the Target Environment Database

Provide the select grants permission on the $sys.V_\$parameter$ view to the Config and Atomic Schemas of the Target environment database.

For example:

Log in as sys user and run the following commands:

SQL> GRANT SELECT ON SYS.V_\$PARAMETER TO ofsaaconf;

Grant succeeded

SQL> GRANT SELECT ON SYS.V_\$PARAMETER TO ofsaaatm;

Grant succeeded

2.2.3.2 Set the Passwords for the Config and Atomic Schemas of the Target Environment Database with Different Schema Names

When you import the Config and Atomic Schemas into the Target Environment Database with different schema names, set the passwords for the Config and Atomic Schemas the same as that in the Source Environment Database.

NOTE

If this section does not apply, ignore it, and proceed to the next section.

For example:

Log in as sys user and run the following commands:

```
SQL> ALTER USER newofsaaconf IDENTIFIED BY welcome1;
User Altered
SQL> ALTER USER newofsaaatm IDENTIFIED BY welcome1;
User Altered
```

2.2.4 Copy and Restore the OFSAA File System

To copy and restore the OFSAA File System, follow these steps:

- 1. Navigate to the \$FIC_HOME/utility/Clone/bin directory in the Source Environment and grant the 750 permission to all the files present in the directory.
- 2. Execute the command:

```
./OFSAA Archive.sh
```

This step creates zipped files for the \$FIC_HOME and FTPSHARE directories in their respective locations in the Source.

For example:

```
<FIC_HOME>.zip
<FTPSHARE>.zip
```

- **4.** The OFSAA installer creates entries in the *.profile* file of the Source. Copy the entries to the *.profile* file of the Target in their respective locations.
- **5.** To extract the archive file, navigate to the directory where the zipped directory is present in the Target Environment and execute the following command:

```
unzip -a <<Zipped_file>>
```

For example:

```
unzip -a ftpshare.zip
```

Perform this step for both the <FIC_HOME> and <FTPSHARE> archive files. Extracts both the files in their respective locations in the Target Environment.

6. Give the 750 permission recursively to the \$FIC_HOME directory and the 775 permission to the FTPSHARE directory extracted in the Target Environment.

For example:

```
chmod -R 750 $FIC_HOME
chmod -R 775 FTPSHARE
```

7. In the .profile file of the Target Environment, modify the variables FIC_HOME, JAVA_BIN, PATH, ORACLE_HOME, TNS_ADMIN, ORACLE_SID, and OFSAA_LOG_HOME in the entries made by the installer according to the required values of the Target Environment.

For example, change the path of the Java Runtime in the <code>JAVA_BIN</code> variable according to the Java Runtime installation on the Target Environment and also modify the Java installed paths in the <code>LD_LIBRARY_PATH</code> and <code>PATH</code> occurrences. Ensure that all these paths are accessible.

NOTE

Set the following parameters for Oracle Wallet In the .profile file if the OFSAA setup is configured with Oracle Wallet:

```
OFS_ORA_WAL_ENABLED=TRUE

export OFS_ORA_WAL_ENABLED

WALLET_HOME=<PATH_TO_THE_DIRECTORY_WHERE_THE_WALLET

RELATED FILES EXIST>

export WALLET HOME
```

- **8.** Execute the *.profile* file in the Target Environment.
- **9.** Edit the tnsnames.ora file present in the \$TNS_ADMIN Directory to add or edit the connection details to the OFSAA Schemas of the Target Environment.

2.2.5 Run the Port Changer Utility

Before running the Port Changer utility, complete the following prerequisites:

• Ensure that the RevLog4jConfig.xml of the \$FIC_HOME/conf and the AAI_SETUP_PROPS Table of the Config Schema for the param name LOGHOME is configured with the default log paths before executing the utility.

The default log path for RevLog4jConfig.xml is \$FIC_HOME/logs and the default log path to be set for the AAI_SETUP_PROPS Table of the Config Schema for the param name LOGHOME is <deployed area of web server>/logs.

- For more information, see *How to Find and Maintain OFSAA and OFSAAI Log and Configuration Files (Doc ID 1095315.1)* available in My Oracle Support.
- This utility connects to the Config Schema to collect all the configurations. Therefore, in the \$FIC HOME/conf directory, you must edit the DynamicServices.xml file for the

DEFAULT_CONNECTION_URL attribute. Ensure that the VALUE is a qualified JDBC URL of the Target database.

To run the Port Changer utility, follow these steps:

- 1. Navigate to the \$FIC_HOME/utility/PortC/bin directory in the Target.
- **2.** Run the PortC.sh utility using the command:

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

This command creates a file with the name <code>DefaultPorts.properties</code> in the <code>\$FIC_HOME</code> directory. The directory contains the information related to the ports, IPs, and paths currently in use.

The following illustration is of OFSAA in a WebLogic setup. You can update the parameters as shown in the illustration.



NOTE

It is mandatory to run the Port Changer utility using the DMP parameter each time before you execute the utility using the UPD command.

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

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

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

5. Execute the .profile file and create the EAR/WAR file. Then restart the OFSAA services and redeploy to the configured web application server.

2.2.6 Perform the Post-Cloning Configurations

Perform the post-cloning configurations as mentioned in the *Post Installation Configurations* section in the <u>OFS AAAI Application Pack Installation and Configuration Guide</u>.

NOTE

- After the Cloning Process is complete, the Load Balancer IP or Host Name and the Port values may change.
- Ensure PARAMVALUE column in the Configuration table is updated with the target environment path, corresponding to the PARAMNAME column like DeFiHome, REV_IMG_PATH and EMBEDDED JSP JS PATH.
- Ensure that you apply the Oracle recommended configuration mentioned in the Configure Referrer Header Validation section in the Oracle Financial Services Analytical Applications Security Guide to update the information.

2.2.7 Create and Deploy the .ear/.war files

To create and deploy the .ear/.war files, follow these steps:

- **1.** Navigate to the \$FIC WEB HOME directory in the Target environment.
- 2. Delete the OFSAA application *.war/*.ear file present in this directory.
- **3.** Execute the command:
 - ./ant.sh
- **4.** Copy the generated .ear/.war file to the web application server identified for this OFSAA instance.
- **5.** Modify all the database connection resources done on the web application server that is mapped to the new JDBC URL and database user credentials. Verify the test connection to validate.
- **6.** Deploy the .ear/.war file using the web application server Admin console.

2.2.7.1 Access the UI

Access the OFS AAI UI by using the new IP Address/Host Name, the new Port, and the new Context Name.

For example:

http://<IP ADDRESS/ HOSTNAME>:<PORT>/<CONTEXT NAME>/login.jsp

Post Cloning Tasks 2.3

If you want the change the password for config and atomic schema of a target environment, refer to Modify OFSAA Infrastructure Config Schema Password in a Non Wallet-Based Setup and Modify **OFSAA Infrastructure Atomic Schema Password** sections in a Non Wallet-Based Setup in Oracle Financial Services Advanced Analytical Applications Infrastructure Application Pack Installation and Configuration Guide for the specific release at the Oracle Help Center.

NOTE

The information in this section applies to OFSAAI v8.1.1.0.0 and later versions.

3 Appendix A

Manually modify the occurrences of the Source database user name with a new Target database user name (see the REMAP_SCHEMA attribute mentioned in the Restore the Complete Exported Dumps Into the Target Environment Database subsection).

1. Log in to the newly imported Config Schema and update the column values as mentioned in the following table (ignore if there are no rows found).

Table 5: Update Config Schema Columns

Sl. No.	TABLE NAME	COLUMN NAMES
1.	DB_MASTER	DBUSERID and DBNAME
2.	AAI_DB_AUTH_ALIAS	V_AUTH_USERNAME and V_AUTH_ALIAS
3.	AAI_DB_DETAIL	V_SCHEMA_NAME and V_DB_NAME
4.	AAI_DMT_SOURCE	V_TABLE_OWNER and V_DB_NAME
5.	AAI_ETL_SOURCE	V_TABLE_OWNER and V_DB_NAME
6.	ETLSOURCEDETAILS	V_SCHEMA
7.	DSNMASTER	DBNAME, V_INFO_DB_NAME, and CREATEDUSR
8.	AAI_DB_PROPERTY	V_PROPERTY_VALUE and V_DB_NAME
9.	METADATA_ELEMENT_MASTER	V_ELEMENT_VALUE
10.	VIEW_DERIVED_ENTITY_TPOSE	SCHEMA_NAME
11.	I18NMASTER	REVCONTEXT

NOTE

V_DB_NAME and **DBNAME** column name values are TNS aliases for Atomic Schema and must not contain underscores.

For example, if the Target Schema Name is PROD_OFSAAATMNEW, then the value for V_DB_NAME must be entered as PRODOFSAAATMNEW.

2. Manually modify the occurrences of the Source Config database user name with the new Target Config database user name. See the following table for details:

Table 6: Source and Target Config Database User Name Files

Sl. No.	Directory Path	File Name
1.	\$FIC_HOME/conf/	Reveleus.SEC
2.	\$FIC_HOME/utility/OFSAAGenerateRepository/conf/	Reveleus.SEC
3.	\$FIC_HOME/conf/	DynamicServices.xml
4.	\$FIC_HOME/MigrationUtilities/Migration_LDAP/conf/	DynamicServices.xml
5.	\$FIC_HOME/utility/OFSAAGenerateRepository/conf/	DynamicServices.xml

Sl. No.	Directory Path	File Name
6.	\$FIC_HOME/ficweb/webroot/conf/	DynamicServices.xml
7.	\$FIC_HOME/EXEWebService/Tomcat/ROOT/conf/	DynamicServices.xml
8.	\$FIC_HOME/EXEWebService/WebSphere/ROOT/conf/	DynamicServices.xml
9.	\$FIC_HOME/EXEWebService/weblogic/ROOT/conf/	DynamicServices.xml
10.	\$FIC_HOME/commonscripts/	ofs_aai_create_atomic.ora

NOTE

- Based on the Web Application Server, choose the relevant directory path from Sl. No. 7, 8, or 9 in Table 6.
- The ofs_aai_create_atomic.ora file in Table 3 does not apply to new installations (that are not upgrade installations from previous versions) of the OFS AAI v8.1.0 and higher.
- The DynamicServices.xml and ofs_aai_create_atomic.ora files in Table 3 do not apply to the OFS CFE and OFS ALM applications.
- **3.** Execute scripts on the Atomic Schemas to update the new Target Config database user name as mentioned in the following steps:

NOTE

This step is not applicable for new installations (that are not upgrade installations from previous versions) of the OFS AAI versions 8.1.0 and higher.

- a. Navigate to the \$FIC HOME/commonscripts/directory on the OFS AAI server.
- **b.** Create a copy of the ofs_aai_create_atomic.ora file as ofs_aai_create_atomic_<INFODOM>.ora.
- **c.** Replace the \$INFODOM placeholder with the actual infodom name in the ofs_aai_create_atomic_<INFODOM>.ora file.

NOTE

Enclose the actual infodom name within a single quote.

INFODOM is associated with each Atomic Schema. Therefore, you must create individual files for each Atomic Schema.

You can fetch the INFODOM value associated with each Atomic Schema by executing the following query in the newly modified Config Schema.

```
SQL> select h.dbuserid, g.dsnid from dsnmaster g, db_master h where g.dbname = h.dbname and h.dbname <> 'CONFIG';
```

- **d.** Connect to the Atomic Schemas using the sqlplus utility present in the <code>\$ORACLE_HOME/bin</code> directory.
- e. Execute the ofs_aai_create_atomic_<INFODOM>. ora file and ignore the ORA-00001, ORA-02292, and ORA-00955 errors in the log file. If there are other errors, contact My Oracle Support.

```
SQL> spool aai_create_<INFODOM>.log
SQL> @ofs_aai_create_atomic_<INFODOM>.ora
SQL> spool off
SQL> exit;
```

NOTE

Repeat this step for all the Atomic Schemas.

```
After the execution, delete all the files created as ofs_aai_create_atomic_<INFODOM>.ora.
```

f. Log in to the newly imported Atomic Schemas. Perform the following steps on each Atomic Schema to modify the interdependent object:

Execute the following query to verify invalid object status:

```
select object_type, object_name from user_objects
where object_type in ('FUNCTION','PACKAGE','PACKAGE
BODY','PROCEDURE','TRIGGER','VIEW') and status = 'INVALID'
order by object type , object name;
```

If the preceding query lists out the objects, then you can compile the invalid objects and enable the object registration elements by following these steps:

i. Run the following anonymous block to compile the invalid objects:

```
FOR cur_rec IN ( select object_type, object_name from user_objects

where object_type in ('FUNCTION','PACKAGE','PACKAGE
BODY','PROCEDURE','TRIGGER','VIEW') and status = 'INVALID'

order by object_type , object_name )

LOOP

BEGIN

IF cur_rec.object_type = 'PACKAGE BODY' THEN

EXECUTE IMMEDIATE 'ALTER PACKAGE ' | | ' "' | |

cur_rec.object_name | | '" COMPILE BODY';

ELSE

EXECUTE IMMEDIATE 'ALTER ' | | cur_rec.object_type | | ' "' | |

cur rec.object_name | | '" COMPILE';
```

```
COMMIT;
END IF;
EXCEPTION
WHEN OTHERS THEN NULL;
END;
END LOOP;
END;
```

ii. Run the following scripts to enable the object registration elements:

```
spool <Validpath>/restore owner.log
alter table REV TABLES TL disable constraint FK REV TABLES TL 1
alter table REV TABLE CLASS ASSIGNMENT disable constraint
FK V TABLE CLASS ASSIGNMENT 2
alter table REV TAB COLUMNS disable constraint
FK REV TAB COLUMNS 1
alter table REV TABLE LOG CLASS ASMNT disable constraint
FK V TABLE CLASS LOG ASMNT 2
alter table REV TAB CONSTRAINTS disable constraint
FK REV TAB CONSTRAINTS
alter table REV TAB CONSTRAINT COLUMNS disable constraint
FK REV TAB CONST COLUMNS
alter table REV TAB INDEXES disable constraint
FK REV TAB INDEXES
update FSI DB INFO set owner=USER
update REV COLUMN PROPERTIES set owner=USER
update REV DESCRIPTION TABLES set owner=USER ,
DESCRIPTION TABLE OWNER=USER
update REV TABLES B set owner=USER
update REV TABLES TL set owner=USER
```

```
update REV TABLE CLASS ASSIGNMENT set owner=USER
update REV TAB COLUMNS set owner=USER
update REV TAB COLUMNS MLS set owner=USER
update REV VIRTUAL TABLES set owner=USER
update REV VIRTUAL TABLES MLS set owner=USER
update REV VIRTUAL TABLES TL set owner=USER
update REV TAB CONSTRAINTS set owner=USER
update REV SYNONYMS set table owner=USER
update REV TABLE LOG CLASS ASMNT set owner=USER
update REV TAB CONSTRAINT COLUMNS set owner=USER
update REV TAB INDEXES set owner=USER
update REV TAB REF CONSTRAINTS set owner=USER
alter table REV TABLE LOG CLASS ASMNT enable constraint
FK V TABLE CLASS LOG ASMNT 2
alter table REV TAB CONSTRAINTS enable constraint
FK REV TAB CONSTRAINTS
alter table REV TAB CONSTRAINT COLUMNS enable constraint
FK REV TAB CONST COLUMNS
alter table REV TAB INDEXES enable constraint FK REV TAB INDEXES
alter table REV TAB COLUMNS enable constraint
FK REV TAB COLUMNS 1
```

```
alter table REV_TABLE_CLASS_ASSIGNMENT enable constraint
FK_V_TABLE_CLASS_ASSIGNMENT_2

/
alter table REV_TABLES_TL enable constraint FK_REV_TABLES_TL_1

/
commit
/
spool off
exit;
```

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