

# Oracle® Banking Corporate Lending Installer Zero Downtime Database Setup and Operational Guide



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## 1 Installer Zero Downtime Database Setup

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# Preface

This topic contains the following sub-topics:

- [Purpose](#)
- [Audience](#)
- [Documentation Accessibility](#)
- [Critical Patches](#)
- [Diversity and Inclusion](#)
- [Related Resources](#)
- [Conventions](#)
- [Screenshot Disclaimer](#)
- [Acronyms and Abbreviations](#)

## Purpose

This guide is designed to help acquaint you setup the Zero Downtime Database using application installer. This guide provides steps to configure Zero Downtime Database for both Patchset and Base edition for Oracle Banking Corporate Lending installation.

## Audience

This manual is intended for the following User/User Roles:

**Table 1 Audience**

| Role                       | Function  |
|----------------------------|---|
| <b>Administrator</b>       | Who controls the system and application parameters and ensures smooth functionality and flexibility of the banking application. |
| <b>Implementation team</b> | Implementation of Oracle Banking Corporate Lending Solution   |
| <b>Pre-sales team</b>      | Install Oracle Banking Corporate Lending for demo purpose   |
| <b>Bank personnel</b>      | Who installs Oracle Banking Corporate Lending   |

The user of this manual is expected to have basic understanding of Oracle Banking Application installation.

## Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <https://www.oracle.com/corporate/accessibility/>.

## Access to Oracle Support

Oracle customer access to and use of Oracle support services will be pursuant to the terms and conditions specified in their Oracle order for the applicable services.

## Critical Patches

Oracle advises customers to get all their security vulnerability information from the Oracle Critical Patch Update Advisory, which is available at [Critical Patches, Security Alerts and Bulletins](#). All critical patches should be applied in a timely manner to ensure effective security, as strongly recommended by [Oracle Software Security Assurance](#).

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Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

## Related Resources

For more information on any related features, refer to the following documents:

- Oracle Banking Corporate Lending User Guides.
- Oracle Banking Corporate Lending Installation Guides.

## Conventions

The following text conventions are used in this document:

**Table 2 Conventions**

| Convention             | Meaning  |
|------------------------|--|
| <b>boldface</b>        | Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.         |
| <i>italic</i>          | Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.                          |
| <code>monospace</code> | Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter. |

## Screenshot Disclaimer

Personal information used in the interface or documents is dummy and does not exist in the real world. It is only for reference purposes.

# Acronyms and Abbreviations

The acronyms and abbreviations are listed in this below table:

**Table 3 Acronyms and Abbreviations**

| Abbreviations or Acronyms | Definition                              |
|---------------------------|---|
| DSN                       | Data Source Name                        |
| IP                        | Internet Protocol                       |
| JDK                       | Java Development Kit                    |
| JDBC                      | Java Database Connectivity              |
| RAC                       | Real Application Clusters               |
| TNS                       | Transaction Network Services Preface vi |

# 1

## Installer Zero Downtime Database Setup

This topic contains the following sub-topics:

- [Introduction](#)  
This describes the overview of Zero Downtime Installer database setup.
- [Pre-Requisite](#)  
This topic explains the per-requisites for the zero downtime database installer.
- [Zero Downtime Database Setup](#)  
This topic explains the Installer commands and Operational steps required to be done in the same order as specified to achieve Zero Downtime Patch Database Compilation and Application management.
- [Connection Routing to Domains using Oracle Traffic Director](#)  
This topic explains the routing connections to domains using the Oracle Traffic Director.
- [Additional Integration Source Compilation](#)  
This topic describes the additional integrations source compilation.
- [Operational Recommendations on Other Application Components](#)  
Use the following recommendations on other application components.
- [Operational Issues and Troubleshooting](#)  
This topic describes on the common issues and its troubleshooting methods.

### 1.1 Introduction

This describes the overview of Zero Downtime Installer database setup.

Patch set Installation with Zero downtime (ZDT) requires Installer to use Editions in a Database Schema.

Installer is enhanced to use Database Schema Editions and apply the Patch set DB compilation in patch set edition and then Base edition in a staggered manner to achieve Zero Downtime.

Installer support establishing JDBC connections through Application, Gateway, ATM etc. To be pointing to a specific edition.

The approach is discussed in detail in the following topics.

### 1.2 Pre-Requisite

This topic explains the per-requisites for the zero downtime database installer.

The following privilege must be provided to the Database Schema from the SYS Database User.

- `ALTER USER <SCHEMA NAME> ENABLE EDITIONS [FORCE];`
- `GRANT CREATE ANY EDITION TO <SCHEMA NAME>;`
- `GRANT DROP ANY EDITION TO <SCHEMA NAME>;`

- GRANT ALTER SESSION TO <SCHEMA NAME>;
- GRANT EXECUTE on DBMS\_SESSION TO <SCHEMA NAME>;

Refer to the *Operational Issues and Troubleshooting* topic in this user guide.

1. For the Pre-Installation configuration, refer to the sample entries in the **env.properties** file. The **env.properties** file displays.

**Figure 1-1 Sample Entries in env.properties**

```

1 #Wed Aug 04 12:56:23 IST 2021
2 GW_PROPERTIES_PATH=C:/exec/FCU
3 PATCHSET_INSTALLATION=Y
4 ZDT_PATCHING=Y
5 BASE_EDITION=ORA$BASE
6 PATCHSET_EDITION=E1

```

Refer to the table below for more information on sample entries in the **env.properties** file.

**Table 1-1 Sample Entries in env.properties**

| Entries                                   | Description   |
|---|---|
| <b>ZDT_PATCHING</b>                       | Set this property to <b>Y</b> if ZDT patching is required and <b>N</b> if the application is taken offline when patching is done.   |
| <b>BASE_EDITION</b>                       | Indicates the Base Edition. For example, ORA\$BASE.   |
| <b>PATCHSET_EDITION</b>                   | This property is used to specify the Edition that would be used as the alternate Edition during ZDT Patch-set Installation. For example, E1.  |
| <b>ZDT_OBJECTS_ACTUALIZATION_REQUIRED</b> | This property used to specify whether the actualization of objects from Base edition to Patchset Edition is required or not. It is recommended to give as Y for a smooth Zero Downtime patch set application process.                                     |
| <b>ZDT_OBJECTS_COMPILE_THREAD</b>         | This property used to specify the number of threads used to compile during actualization of objects from Base Edition to Patch-set Edition. Please give a numeric value greater than zero. For example 5.   |
| <b>NUMBER_OF_CPU_CORES_FOR_ZDT_RECOMP</b> | This property used to specify the number of parallel threads the system can utilize for recompilation of invalids during the actualization of objects. This value depend on the number of CPU cores. Please give a numeric value. For example 4 or above. |
| <b>PATCHSET_INSTALLATION</b>              | Displays the value <b>Y</b> for patch set installation process.   |

Refer to the *Installer Property File* user guide for more information to create property file.

2. For the Application Domain creation, refer the below per-requisites:
  - a. Two application domains – <Domain1>, <Domain2> are required. These domains are integrated and controlled with Oracle Traffic Director to support Zero downtime Patching.
  - b. By default, <Domain2> will remain inactive (Standby mode), and all JDBC connections to Database (Schema) routed to <Domain1>.



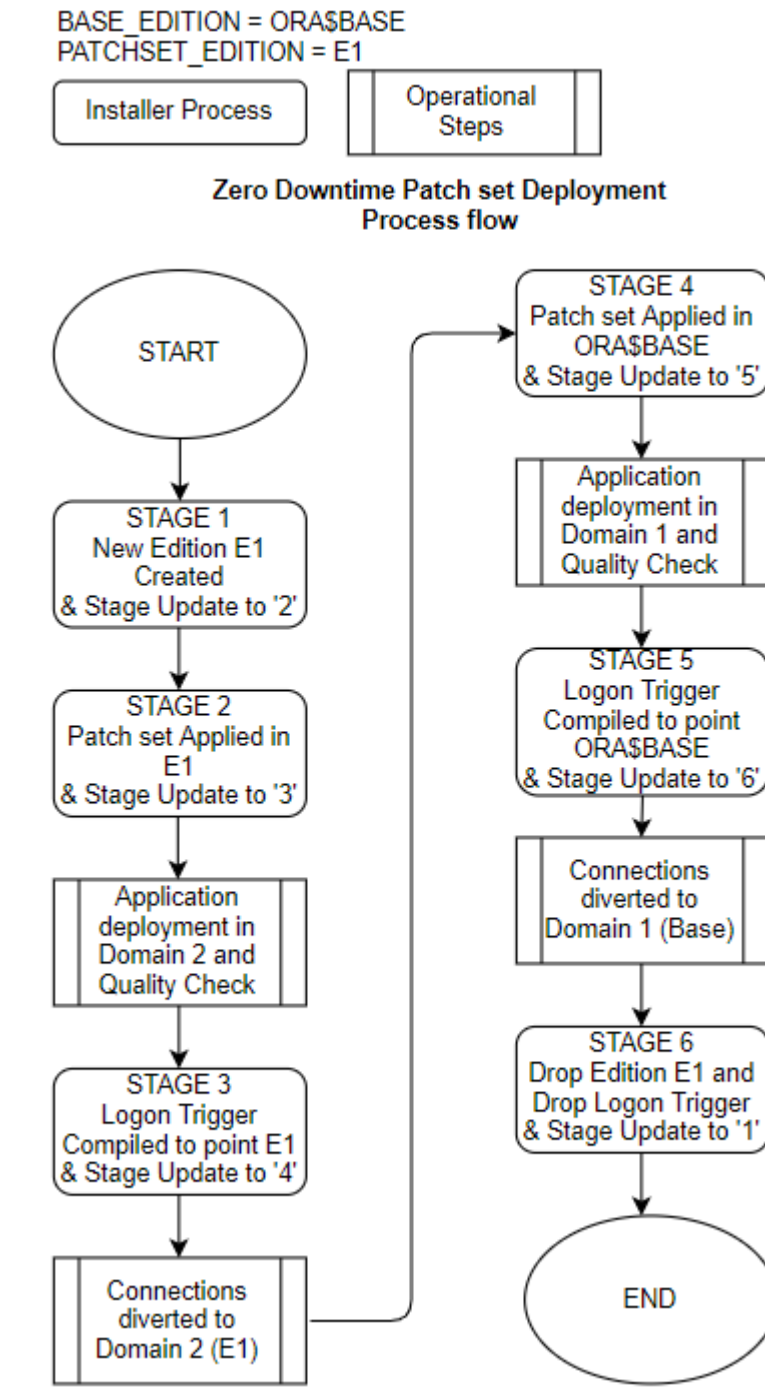
For any Bulk upload processing, Batch processing (including End of Day operations) must be planned either to be completed before the start or after completion of the Patch Set Compilation/Deployment.

## 1.3 Zero Downtime Database Setup

This topic explains the Installer commands and Operational steps required to be done in the same order as specified to achieve Zero Downtime Patch Database Compilation and Application management.

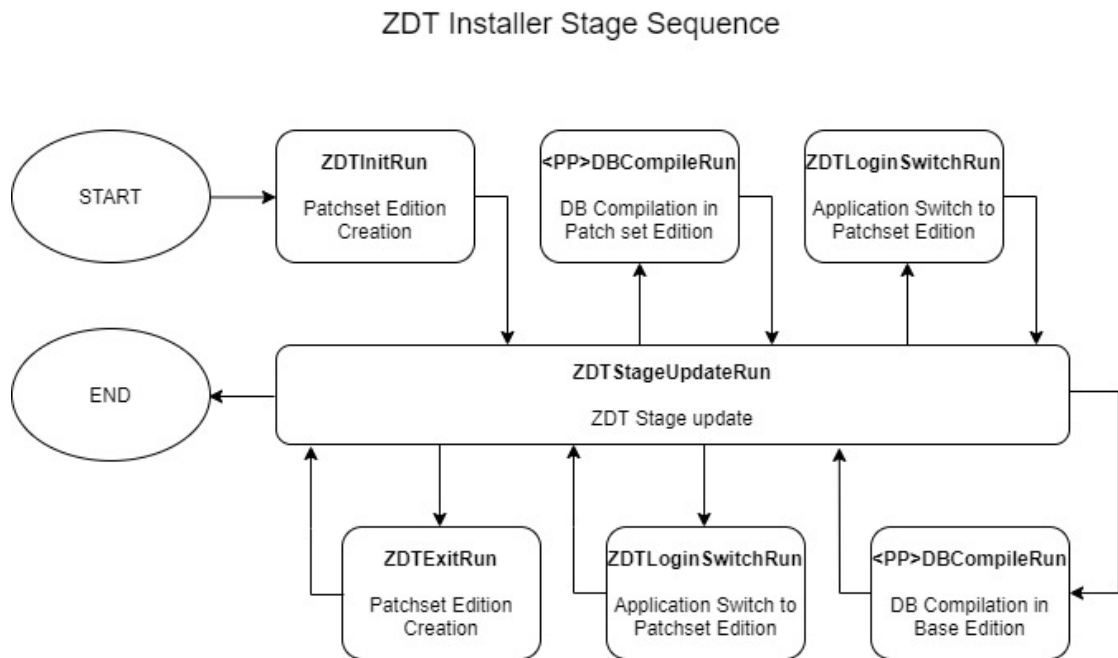
### Patch set Database Compilation Process Flow

**Figure 1-2 Patch set Database Compilation Process Flow**



## ZDT Installer Stage Sequence Flow

Figure 1-3 ZDT Installer Stage Sequence Flow



This topic contains the following sub-topics:

- [Create Patch set Edition](#)  
This topic provides the systematic instructions to create Patch set Edition.
- [Setup Database in Patch set Edition](#)  
This topic provides the systematic instructions to setup database for Patch set Edition.
- [Application Deployment in Patch set Edition](#)  
This topic provides the systematic instructions application deployment in Patch set Edition.
- [Edition Switch in Patch set Edition](#)  
This topic provides the systematic instructions to setup Edition Switch in Patch set Edition.
- [Application Management in Patch set Edition](#)  
This topic provides the systematic instructions to setup application management in Patch set Edition.
- [Setup Database in Base Edition](#)  
This topic provides the systematic instructions to setup database in Base Edition.
- [Application Deployment in Base Edition](#)  
This topic provides the systematic instructions to application deployment in Base Edition.
- [Edition Switch in Base Edition](#)  
This topic provides the systematic instructions to setup Edition Switch in Base Edition.
- [Application Management in Base Edition](#)  
This topic provides the systematic instructions to setup application management in Base Edition.
- [Drop Patch set Edition](#)  
This topic provides the systematic instructions to setup Drop Patch set Edition.

## 1.3.1 Create Patch set Edition

This topic provides the systematic instructions to create Patch set Edition.

The Patch set Edition is created using Silent Installer.

1. At the start of the Zero downtime Database setup process, run **ZDTInitRun.bat** in Windows (**ZDTInitRun.sh** for Linux)

A new Edition is created with the name configured in **env.properties** file for the property **PATCHSET\_EDITION**.

Also the Base edition objects were actualized to the new Edition if the property **ZDT\_OBJECTS\_ACTUALIZATION\_REQUIRED** is **Y** in the env.properties.

2. Run **ZDTStageUpdateRun.bat** in Windows (**ZDTStageUpdateRun.sh** for Linux) to move the process to the next stage operation.

## 1.3.2 Setup Database in Patch set Edition

This topic provides the systematic instructions to setup database for Patch set Edition.

Using Silent Installer to setup DDL Compilation, Object Compilation, and Static Data Loading database in the backend.

1. Run the **SMSDBCompileRun.bat** in Windows (**SMSDBCompileRun.sh** in Linux) for SMS schema (DB) compilation.
2. Run the **<Product Processor>DBCompileRun.bat** to complete DDL Compilation, Object Compilation, and Static Data load.

For Example: FCUBS INSTALLATION:

- Run **ROFCDBCompileRun.bat** in Windows (**ROFCDBCompileRun.sh** in Linux) and make sure that the Invalid count is zero.

The Database Backend Setup is done in Patch set Edition of the Schema.

3. Run **ZDTStageUpdateRun.bat** in Windows (**ZDTStageUpdateRun.sh** for Linux) to move the process to the next stage operation.

## 1.3.3 Application Deployment in Patch set Edition

This topic provides the systematic instructions application deployment in Patch set Edition.

For the Application setup in <Domain 2>, refer the below steps:

1. Generate Application/Gateway Ears and deploy in <Domain2> Application.
2. <Domain 2> to be in inactive state (Standby mode).

For more information on EAR building steps, refer to the *EAR building* user guide.

## 1.3.4 Edition Switch in Patch set Edition

This topic provides the systematic instructions to setup Edition Switch in Patch set Edition.

1. Run **ZDTLoginSwitchRun.bat** for Windows (**ZDTLoginSwitchRun.sh** for Linux).

The BAT/SH file execution ensures all new JDBC connections from application points to the new Edition created (as maintained by the property **PATCHSET\_EDITION**).

2. Run **ZDTStageUpdateRun.bat** for Windows (**ZDTStageUpdateRun.sh** for Linux) to move the process to the next stage operation.

### 1.3.5 Application Management in Patch set Edition

This topic provides the systematic instructions to setup application management in Patch set Edition.

Refer to the below steps for the <Domain 2> application sanity and to activate for live transaction traffic. For more information, refer to the *Operational recommendations on Other Application Components* topic in this user guide.

1. Start the <Domain 2> Application.
2. Sanity Check of Patch set in <Domain 2> Application.
3. All incoming transactions traffic routed to <Domain 2> using Oracle Traffic Director.
4. <Domain 1> to be made inactive status (Standby mode), once all the existing transactions in process in <Domain 1> completes its process.

### 1.3.6 Setup Database in Base Edition

This topic provides the systematic instructions to setup database in Base Edition.

Using Silent Installer to setup DDL Compilation, Object Compilation, and Static Data Loading database in the backend.

1. Run the **SMSDBCompileRun.bat** in windows (**SMSDBCompileRun.sh** in Linux) for SMS schema (DB) compilation.
2. Run the **<Product Processor>DBCompileRun.bat** to complete DDL Compilation, Object Compilation and Static Data load.

For Example: In case of FCUBS INSTALLATION:

- Run **ROFCDBCompileRun.bat** in Windows (**ROFCDBCompileRun.sh** in Linux) and check for the Invalid Count and make sure that the Invalid count is zero.

The Database Backend Setup is done in Base Edition of the Schema.

3. Run **ZDTStageUpdateRun.bat** in Windows (**ZDTStageUpdateRun.sh** for Linux) to move the process to the next stage operation.

### 1.3.7 Application Deployment in Base Edition

This topic provides the systematic instructions to application deployment in Base Edition.

For the Application setup in <Domain 1>, refer the below steps:

1. Generate Application/Gateway Ears and deploy in <Domain1> Application.
2. <Domain 1> to be in inactive state (Standby mode).

For more information on EAR building steps, refer to the *EAR building* user guide.

### 1.3.8 Edition Switch in Base Edition

This topic provides the systematic instructions to setup Edition Switch in Base Edition.

1. Run **ZDTLoginSwitchRun.bat** for Windows (**ZDTLoginSwitchRun.sh** for Linux).

The BAT/SH file execution ensures all new JDBC connections from application points to the Base Edition (as maintained by the property BASE\_EDITION).

2. Run **ZDTStageUpdateRun.bat** for Windows (**ZDTStageUpdateRun.sh** for Linux) to move the process to the next stage operation.

### 1.3.9 Application Management in Base Edition

This topic provides the systematic instructions to setup application management in Base Edition.

Refer to the below steps for the <Domain 1> application sanity and to activate for live transaction traffic. For more information, refer to the *Operational recommendations on Other Application Components* topic in this user guide.

1. Start the <Domain 1> Application.
2. Sanity Check of Patch set in <Domain 1> Application.
3. All incoming transactions traffic routed to <Domain 1> using Oracle Traffic Director.
4. <Domain 2> to be made inactive status (Standby mode), once all the existing transactions in process in <Domain 2> completes its process.

### 1.3.10 Drop Patch set Edition

This topic provides the systematic instructions to setup Drop Patch set Edition.

1. At the end of the Zero downtime Database Setup process, run **ZDTEExitRun.bat** in Windows (**ZDTEExitRun.sh** for Linux).

The Patch Set Edition (as maintained by the property PATCHSET\_EDITION) is dropped.

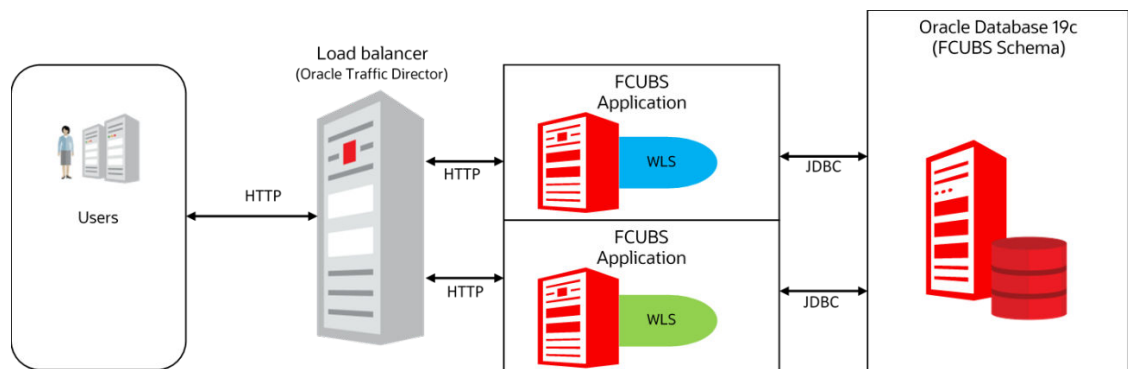
2. Run **ZDTStageUpdateRun.bat** in Windows (**ZDTStageUpdateRun.sh** for Linux) to move the process to the next stage of operation.

## 1.4 Connection Routing to Domains using Oracle Traffic Director

This topic explains the routing connections to domains using the Oracle Traffic Director.

The <Domain 1> is denoted as Green and <Domain 2> is denoted as Blue in the below image.

**Figure 1-4 Oracle Traffic Director**



The Blue-Green deployment process uses two identical environments, Blue and Green. Only one environment is active at a time, serving all the traffic with the load balancer, and the other is in standby mode.

**For example**, consider that Blue is on standby and Green is active. When the updates are completed in the Blue environment, you can use the load balancer to switch the traffic to the Blue environment.

Once the traffic is diverted and directed to the Blue environment using the Load balancer, health checks are performed for all the currently active Blue environment components with traffic.

## 1.5 Additional Integration Source Compilation

This topic describes the additional integrations source compilation.

- If OFSAA Integration exists in the environment, run the **<Product Processor>\_OFSAADBCompileRun.bat** file to complete DDL Compilation, Object Compilation, and Static Data load.
- The above OFSAA compilation must be run before the **<Product Processor>\_DBCompileRun.bat**. Refer to the topics **Database Setup in Patch set Edition** and **Database Setup in Base Edition** for more information.

For Example: In case of FCUBS INSTALLATION:

- Run **ROFC\_OFSAADBCompileRun.bat** in Windows (**ROFC\_OFSAADBCompileRun.sh** in Linux)
- Then run **ROFCDBCompileRun.bat** in windows (**ROFCDBCompileRun.sh** in Linux).

## 1.6 Operational Recommendations on Other Application Components

Use the following recommendations on other application components.

Follow the below operational steps/setup recommended to complete the Zero Downtime patch set deployment:

- Remote **SOA/BPEL** setup is recommended.
- **Standalone Scheduler** Application is recommended.
- As part of Application Management, Refer to the *Application Management in Patch set Edition* and *Application Management in Base Edition* topics.
  - ATM instances are to be restarted one by one, so that it points to the respective Application domain (<Domain2> or <Domain1>).
  - Scheduler jobs to be paused or stopped as a prerequisite before diverting the transactions traffic from one domain to another using Oracle Traffic Director.
  - Scheduler jobs must be started again once the transaction traffic is diverted to the specific domain.

## 1.7 Operational Issues and Troubleshooting

This topic describes on the common issues and its troubleshooting methods.

1. If there are objects with a version number other than one and while enabling editions for the User <Schema name> in the topic *Pre-Requisite* will result with the error  
ERROR at line 1:ORA-38820: user has evolved object type

Solution:

The below query will list the objects with a version number other than one.

*Select type\_name,owner, version# from dba\_type\_versions where  
owner='&SCHEMA\_NAME' and VERSION# !='1';*

The below query's result to be executed in SQL command prompt to reset the version to one.

*Select 'ALTER TYPE ' ||TYPE\_NAME|| ' RESET;' FROM dba\_type\_versions where  
owner='&SCHEMA\_NAME' AND VERSION# !='1';*

2. Patch set edition will not be dropped in the topic *Drop Patch Set Edition*, if active connections to the schema point to Patch set Edition.  
Exception in dropping edition java.sql.SQLException: ORA-38805: edition is in use.

Solution:

Clear such sessions and topic *Drop Patch Set Edition* to process again to get the Patch set Edition dropped.

3. The below query would help to list all editions in the Schema. At the end of the process, *Drop Patch Set Edition*, only Base Edition, should present.

Solution:

*Select \* FROM all\_editions*