

# Oracle® APEX Installation Guide



Release 22.1  
F51983-03  
June 2022



Oracle APEX Installation Guide, Release 22.1

F51983-03

Copyright © 2003, 2022, Oracle and/or its affiliates.

Primary Author: Terri Jennings

Contributors: David Bliss, Christina Cho, Hilary Farrell, Salim Hlayel, Christian Neumueller, Marc Sewtz, Jason Straub, Vlad Uvarov, Patrick Wolf

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs (including any operating system, integrated software, any programs embedded, installed or activated on delivered hardware, and modifications of such programs) and Oracle computer documentation or other Oracle data delivered to or accessed by U.S. Government end users are "commercial computer software" or "commercial computer software documentation" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, reproduction, duplication, release, display, disclosure, modification, preparation of derivative works, and/or adaptation of i) Oracle programs (including any operating system, integrated software, any programs embedded, installed or activated on delivered hardware, and modifications of such programs), ii) Oracle computer documentation and/or iii) other Oracle data, is subject to the rights and limitations specified in the license contained in the applicable contract. The terms governing the U.S. Government's use of Oracle cloud services are defined by the applicable contract for such services. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Inside are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Epyc, and the AMD logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

# Contents

## Preface

---

Audience	viii
Documentation Accessibility	viii
Diversity and Inclusion	viii
Related Documents	ix
Conventions	ix
Third-Party License Information	ix

## 1 Changes in Release 22.1 for Oracle APEX Installation Guide

---

## 2 Oracle APEX Installation Requirements

---

2.1 Oracle Database Requirements	2-1
2.1.1 Checking the MEMORY_TARGET of the Target Database	2-2
2.1.2 Checking the WORKAREA_SIZE_POLICY of the Target Database	2-3
2.2 Browser Requirements	2-4
2.3 Web Server Requirements	2-4
2.4 Disk Space Requirement	2-4
2.5 Oracle XML DB Requirement	2-4

## 3 Oracle APEX Installation Overview

---

3.1 About Oracle APEX Architecture	3-1
3.2 About Accessing Oracle APEX in Oracle Cloud	3-3
3.3 Understanding the Installation Process	3-3
3.3.1 About Planning Your Installation	3-4
3.3.2 About Patch Sets	3-4
3.3.3 About the Installation Scripts	3-5
3.3.4 About Accessing Oracle APEX	3-5
3.3.5 Requesting a Workspace from the Sign In Dialog	3-6
3.3.6 Resetting Your Password from the Sign In Page	3-8
3.3.7 Recovering Your Workspace Name	3-8

3.4	About the Oracle APEX Runtime Environment	3-9
-----	---	-----

## 4 Upgrading from a Previous Oracle APEX Release

---

4.1	About Release Numbering Conventions	4-2
4.2	Sample Upgrade Scenarios	4-2
4.3	Viewing the Oracle APEX Release Number	4-2
4.4	Viewing the Oracle REST Data Services Release Number	4-3
4.5	About Installing an Oracle APEX Release Included with the Oracle Database	4-3
4.6	About Upgrading Existing Applications	4-4
4.7	About Testing Requirements	4-4
4.8	About Cleaning Up Your Environment	4-4
4.9	About Reverting to a Previous Release	4-5

## 5 Utilizing the Multitenant Architecture in Oracle Database 12c or Later

---

5.1	Understanding the Installation Choices	5-1
5.2	Installing Oracle APEX into an Application Container	5-2
5.2.1	About Application Containers	5-2
5.2.2	Creating an Application Container	5-3
5.2.3	Installing or Upgrading Oracle APEX in an Application Container	5-3
5.2.4	Verifying the Application Container Installation	5-4
5.2.5	Creating an Application Seed	5-4
5.2.6	Creating an Application PDB from the Application Root Seed	5-5
5.2.7	Configure HTTP Access to the Application PDB	5-6
5.3	Installing Oracle APEX into Different PDBs	5-6
5.3.1	Uninstalling Oracle APEX from a CDB	5-7
5.3.2	Installing Oracle APEX Locally in a PDB	5-7
5.3.3	Installing Oracle APEX into a CDB	5-9
5.4	Plugging in a PDB When Oracle APEX Is Installed in the Root Container	5-11
5.4.1	Scenario 1: Plug-in Non-CDB with Oracle APEX	5-12
5.4.2	Scenario 2: Plug-in PDB with a Common APEX from Another CDB	5-12
5.4.3	Scenario 3: Plug-in PDB with a Local Oracle APEX from Another CDB	5-13
5.4.4	Scenario 4: Plug-in Non-CDB or PDB with No Oracle APEX	5-14
5.4.5	Working with Incompatible Oracle APEX Versions	5-14
5.4.5.1	Patching or Upgrading Oracle APEX in a CDB	5-14
5.4.5.2	Patching or Upgrading Oracle APEX in a PDB	5-15
5.5	Plugging in a PDB When Oracle APEX Is Not in the Root Container of the Target CDB	5-17
5.5.1	Scenario 1: Plug-in a Non-CDB or PDB with Locally Installed APEX	5-17
5.5.2	Scenario 2: Plug-in PDB with Common Oracle APEX from Another CDB	5-18
5.5.3	Scenario 3: Plug-in PDB with a Local Oracle APEX from Another CDB	5-18

## 6 Installing and Configuring Oracle APEX and Oracle REST Data Services

---

6.1	Performing Pre-installation Tasks for Oracle APEX	6-2
6.2	About SQLcl Support	6-3
6.3	Downloading and Installing Oracle APEX	6-3
6.3.1	Installing Oracle APEX	6-4
6.3.2	Creating or Updating Your Instance Administration Account	6-6
6.3.2.1	What Is an Instance Administrator?	6-7
6.3.2.2	About apxchpwd.sql	6-7
6.3.2.3	Running apxchpwd.sql	6-8
6.3.3	Restarting Processes	6-9
6.3.4	Configuring the APEX_PUBLIC_USER Account	6-9
6.3.4.1	About the APEX_PUBLIC_USER Account	6-9
6.3.4.2	Unlocking the APEX_PUBLIC_USER Account	6-9
6.3.4.3	Changing the Password for the APEX_PUBLIC_USER Account	6-10
6.3.4.4	About Password Expiration in Oracle Database 11g and Later	6-10
6.3.5	Configuring RESTful Services	6-11
6.4	Downloading and Installing Oracle REST Data Services	6-12
6.4.1	Downloading Oracle REST Data Services	6-12
6.4.2	About Configuring Oracle REST Data Services Behind a Reverse Proxy or Load Balancer	6-13
6.4.3	Web Server HTTP POST Request Limits	6-13
6.5	Configuring Oracle REST Data Services	6-14
6.5.1	Copying the Images Directory	6-14
6.5.2	Validating the Oracle REST Data Services Installation	6-15
6.5.3	Configuring Static File Support	6-15
6.5.4	Securing Oracle REST Data Service	6-15
6.6	Enabling Network Services in Oracle Database	6-15
6.6.1	When and Why Network Services Must be Enabled	6-16
6.6.2	Granting Connect Privileges in Oracle Database 12c or Later	6-17
6.6.3	Troubleshooting an Invalid ACL Error	6-17
6.7	Performing Security Tasks	6-18
6.8	Controlling the Number of Concurrent Jobs	6-19
6.8.1	About Managing the Number of Concurrent Jobs	6-19
6.8.2	Viewing the Number of JOB_QUEUE_PROCESSES	6-19
6.8.2.1	Viewing JOB_QUEUE_PROCESSES in the Installation Log File	6-19
6.8.2.2	Viewing JOB_QUEUE_PROCESSES in Oracle APEX	6-20
6.8.2.3	Viewing JOB_QUEUE_PROCESSES from SQL*Plus	6-20
6.8.3	Changing the Number of JOB_QUEUE_PROCESSES	6-20
6.9	About Running Oracle APEX in Other Languages	6-21

6.10	Installing Translated Versions of Oracle APEX	6-22
6.10.1	About Installing Translated Versions of Oracle APEX	6-22
6.10.2	Installing a Translated Version of Oracle APEX	6-23
6.11	Creating a Workspace and Adding Oracle APEX Users	6-24
6.11.1	About Workspaces and Users	6-24
6.11.2	Signing In To Administration Services	6-25
6.11.3	Creating a Workspace Manually	6-26
6.11.4	Creating Oracle APEX Users	6-27
6.11.5	Signing In to Your Workspace	6-29
6.12	Performing Post Installation Tasks for Upgrade Installations	6-30
6.12.1	About Removing Prior Oracle APEX Installations	6-30
6.12.2	Verifying if a Prior Installation Exists	6-30
6.12.3	Removing Schemas and SYS Objects from Prior Installations	6-31
6.12.4	Removing Schemas from Prior Installations in a CDB	6-32
6.12.5	Fixing Invalid ACL	6-32
6.13	About Performance Optimization Tasks	6-32
6.14	Converting Between Runtime and Full Development Environments	6-33
6.14.1	About Runtime and Full Development Environments	6-33
6.14.2	Converting a Runtime Environment to a Full Development Environment	6-34
6.14.3	Converting a Full Development Environment to a Runtime Environment	6-34

## A Automating the Oracle APEX Installation Process

---

A.1	About apxsilentins.sql	A-1
A.2	Running apxsilentins.sql	A-1

## B Maximizing Uptime During an Oracle APEX Upgrade

---

## C Oracle APEX Installation Troubleshooting

---

C.1	Reviewing a Log of an Installation Session	C-1
C.2	Verifying the Validity of an Oracle APEX Installation	C-1
C.3	Cleaning Up After a Failed Installation	C-2
C.3.1	Reverting to a Previous Release After a Failed Upgrade Installation	C-2
C.3.1.1	Verifying If You Have a Previous Release of Oracle APEX	C-2
C.3.1.2	Reverting the Images Directory	C-3
C.3.1.3	Reverting to a Previous Release	C-3
C.3.1.4	Removing the Oracle APEX Release Schema	C-45
C.3.2	Removing Oracle APEX from the Database	C-47
C.4	About Images Displaying Incorrectly in Oracle APEX	C-47

## D Upgrading Oracle APEX within Oracle Database Express Edition

---

## Index

---

# Preface

This guide explains how to install and configure Oracle APEX.

- [Audience](#)
- [Documentation Accessibility](#)
- [Diversity and Inclusion](#)
- [Related Documents](#)
- [Conventions](#)
- [Third-Party License Information](#)

## Audience

*Oracle APEX Installation Guide* is intended for anyone responsible for installing Oracle APEX.

To use this manual, you must have administrative privileges on the computer where you installed your Oracle database and familiarity with object-relational database management concepts.

## Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

### **Access to Oracle Support**

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

## Diversity and Inclusion

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 Documents

For more information, see these Oracle resources:

- *Oracle APEX Release Notes*
- *Oracle APEX App Builder User's Guide*
- *Oracle APEX End User's Guide*
- *Oracle APEX Administration Guide*
- *Oracle APEX SQL Workshop Guide*
- *Oracle APEX API Reference*
- *Oracle Database Concepts*
- *Oracle Database Administrator's Guide*
- *Oracle Database SQL Language Reference*
- *SQL\*Plus User's Guide and Reference*

## Conventions

The following text conventions are used in this document:

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.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

## Third-Party License Information

Oracle APEX contains third-party code. Please see the *Oracle APEX Licensing Information User Manual* for notices Oracle is required to provide.

Note, however, that the Oracle program license that accompanied this product determines your right to use the Oracle program, including the third-party software, and the terms contained in the following notices do not change those rights.

# 1

## Changes in Release 22.1 for *Oracle APEX Installation Guide*

All content in *Oracle APEX Installation Guide* has been updated to reflect release 22.1 functionality.

### **Deprecated and Desupported Features**

See *Deprecated Features and Desupported Features Oracle APEX Release Notes*.

# 2

## Oracle APEX Installation Requirements

Before installing Oracle APEX in a on-premises (or local) installation you must verify your configuration meets the minimum installation requirements.

- [Oracle Database Requirements](#)  
Oracle APEX release 22.1 requires an Oracle Database release 12.1.0.2 or later. Oracle APEX runs on all database editions, including Enterprise Edition (EE), Standard Edition (SE) and Express Edition (XE). Oracle APEX can be installed in single-instance database and in Oracle Real Application Clusters (Oracle RAC) database.
- [Browser Requirements](#)  
Oracle APEX requires a JavaScript-enabled browser and supports the current and prior major release of Google Chrome, Mozilla Firefox, Apple Safari, and Microsoft Edge.
- [Web Server Requirements](#)  
Oracle APEX requires Oracle REST Data Services (ORDS) 20.x or later.
- [Disk Space Requirement](#)  
Oracle APEX disk space requirements are described in this section.
- [Oracle XML DB Requirement](#)  
Oracle XML DB must be installed in the Oracle database that you want to use if you are installing a full development environment. If you are using a preconfigured database created either during an installation or by Database Configuration Assistant (DBCA), Oracle XML DB is already installed and configured.

### 2.1 Oracle Database Requirements

Oracle APEX release 22.1 requires an Oracle Database release 12.1.0.2 or later. Oracle APEX runs on all database editions, including Enterprise Edition (EE), Standard Edition (SE) and Express Edition (XE). Oracle APEX can be installed in single-instance database and in Oracle Real Application Clusters (Oracle RAC) database.

If you are upgrading an Oracle Database version 12.1 CDB, you must download from My Oracle Support the one off patch for bug 20618595. Search for **20618595** on the Patches tab.

- [Checking the MEMORY\\_TARGET of the Target Database](#)  
Oracle APEX requires the system global area (SGA) and program global area (PGA) to be at least 300 MB.
- [Checking the WORKAREA\\_SIZE\\_POLICY of the Target Database](#)  
For the Oracle APEX installation or upgrade process, the `WORKAREA_SIZE_POLICY` session parameter must be set to `AUTO`.

## 2.1.1 Checking the MEMORY\_TARGET of the Target Database

Oracle APEX requires the system global area (SGA) and program global area (PGA) to be at least 300 MB.

Databases typically use automatic memory management, where the memory can be controlled by the server parameter `MEMORY_TARGET`. If your database does not use automatic memory management, consult the *Oracle Database Administrator's Guide* to find out how to configure manual memory parameters (for example, `SGA_TARGET`, `PGA_AGGREGATE_TARGET`, `SHARED_POOL_SIZE`) instead, for a similar result.

To check the `MEMORY_TARGET` of the target database:

1. Start SQL\*Plus and connect to the database as `SYS` specifying the `SYSDBA` role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

2. Start the database:

```
SQL> STARTUP
```

3. If necessary, enter the following command to determine whether the system uses an initialization parameter file (`initsid.ora`) or a server parameter file (`spfiledbname.ora`):

```
SQL> SHOW PARAMETER PFILE;
```

This command displays the name and location of the server parameter file or the initialization parameter file.

4. Determine the current values of the `MEMORY_TARGET` parameter:

```
SQL> SHOW PARAMETER MEMORY_TARGET
```

5. If the value is 0, your database is using manual memory management. Consult the *Oracle Database Administrator's Guide* to learn how to configure an equivalent memory size using manual memory management, instead of continuing with the steps that follow.

If the system is using a server parameter file, set the value of the `MEMORY_TARGET` initialization parameter to at least 300 MB:

```
SQL> ALTER SYSTEM SET MEMORY_TARGET='300M' SCOPE=spfile;
```

6. If the system uses an initialization parameter file, change the value of the `MEMORY_TARGET` parameter to at least 300 MB in the initialization parameter file (`initsid.ora`).

7. Shut down the database:

```
SQL> SHUTDOWN
```

**8. Restart the database:**

```
SQL> STARTUP
```

**See Also:**

Using Automatic Memory Management in *Oracle Database Administrator's Guide*

## 2.1.2 Checking the WORKAREA\_SIZE\_POLICY of the Target Database

For the Oracle APEX installation or upgrade process, the `WORKAREA_SIZE_POLICY` session parameter must be set to `AUTO`.

To check the `WORKAREA_SIZE_POLICY` of the target database:

**1. Start SQL\*Plus and connect to the database as SYS specifying the SYSDBA role. For example:**

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

**2. Check the current value of the WORKAREA\_SIZE\_POLICY parameter:**

```
SQL> SHOW PARAMETER WORKAREA_SIZE_POLICY
```

**3. If the value of the parameter is MANUAL, change it to AUTO for the current database session. For example:**

```
SQL> ALTER SESSION SET WORKAREA_SIZE_POLICY = AUTO;
```

**4. Within the same database session, perform the installation or upgrade of Oracle APEX.****Note:**

If you are installing Oracle APEX in a CDB, `WORKAREA_SIZE_POLICY` must be set system-wide. For example:

```
SQL> ALTER SYSTEM SET WORKAREA_SIZE_POLICY=AUTO SCOPE=BOTH;
```

Then, if needed, change it back to `MANUAL` after Oracle APEX installation or upgrade.

**See Also:**

WORKAREA\_SIZE\_POLICY in *Oracle Database Reference*

## 2.2 Browser Requirements

Oracle APEX requires a JavaScript-enabled browser and supports the current and prior major release of Google Chrome, Mozilla Firefox, Apple Safari, and Microsoft Edge.

## 2.3 Web Server Requirements

Oracle APEX requires Oracle REST Data Services (ORDS) 20.x or later.

Oracle REST Data Services (ORDS) is Java-based web server. Oracle REST Data Services features the ability to emit RESTful web services, offers improved file upload capability, and is certified with Oracle WebLogic Server and Apache Tomcat.

**Tip:**

APEX-based REST Services were desupported in Oracle APEX release 22.1. Oracle REST Data Services (ORDS) release 21.4.2 now ships with migration scripts that enable you to upgrade any remaining APEX-based REST Services to ORDS-based Services. To learn more, see "Migration of Oracle APEX Restful Service Modules" in [Oracle REST Data Services Release Notes](#).

## 2.4 Disk Space Requirement

Oracle APEX disk space requirements are described in this section.

Oracle APEX disk space requirements are as follows:

- Free space for APEX software files on the file system: 310 MB if using English only download (`apex_22.1_en.zip`) and 705 MB if using full download (`apex_22.1.zip`).
- Free space in APEX tablespace: 220 MB
- Free space in `SYSTEM` tablespace: 100 MB
- Free space in APEX tablespace for each additional language (other than English) installed: 60 MB

## 2.5 Oracle XML DB Requirement

Oracle XML DB must be installed in the Oracle database that you want to use if you are installing a full development environment. If you are using a preconfigured

database created either during an installation or by Database Configuration Assistant (DBCA), Oracle XML DB is already installed and configured.

 **Tip:**

The installer does a prerequisite check for Oracle XML DB and will exit if it is not installed.

 **Tip:**

The installation of Oracle XML DB creates the user ANONYMOUS. In order for APEX workspace provisioning to work properly, the ANONYMOUS user must not be dropped from the database.

 **Tip:**

For more information about manually adding Oracle XML DB to an existing database, see Administration of Oracle XML DB in *Oracle XML DB Developer's Guide*

# 3

## Oracle APEX Installation Overview

*Oracle APEX Installation Guide* describes how to install Oracle APEX in a on-premises (or local) installation.

How you sign in and access Oracle APEX depends upon your user role and where Oracle APEX resides. Oracle APEX may reside in a local on-premises Oracle Database or in an Oracle Cloud Service.

- [About Oracle APEX Architecture](#)  
Oracle APEX uses a simple architecture in which pages are dynamically generated using metadata stored within the Oracle Database.
- [About Accessing Oracle APEX in Oracle Cloud](#)  
Learn about accessing Oracle APEX in Oracle Cloud.
- [Understanding the Installation Process](#)  
Installing Oracle APEX is a multiple step process. You follow the same instructions for new or upgrade installations.
- [About the Oracle APEX Runtime Environment](#)  
Learn about the Oracle APEX runtime environment.



### See Also:

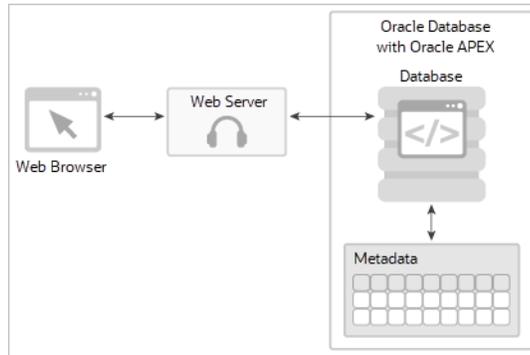
[Upgrading from a Previous Oracle APEX Release](#)

### 3.1 About Oracle APEX Architecture

Oracle APEX uses a simple architecture in which pages are dynamically generated using metadata stored within the Oracle Database.

#### About the Oracle APEX Architecture

The Oracle APEX architecture consists of a web browser, Oracle REST Data Services (the web server), and an Oracle Database containing Oracle APEX. The major advantage of this architecture is the separation of the mid-tier and the database tier.



The web server, Oracle REST Data Services, functions as a communications broker between the web browser and the Oracle APEX objects in the Oracle database by mapping browser requests into database stored procedure calls.

Once fully installed, a Uniform Resource Locator (URL) is defined for both developers and end users to access Oracle APEX. Users require only a web browser and the required URL. No additional client software is required.

### About Oracle REST Data Services

Oracle REST Data Services (ORDS) (formerly known as Oracle Application Express Listener) is a J2EE application which communicates with the Oracle Database by mapping browser requests to the Oracle APEX engine database over a SQL\*Net connection.

Oracle REST Data Services is fully supported against Oracle WebLogic Server and Apache Tomcat. In a production environment, you deploy Oracle REST Data Services web archive files to a supported Java EE application server, like Oracle Web Logic Server. Each deployment can be configured individually and serves the same purpose as a `mod_plsql` Database Access Descriptor, which is to communicate with an Oracle database.

#### Note:

There are licensing costs associated with Oracle WebLogic Server.

#### See Also:

- [Web Server Requirements](#)
- [Installing and Configuring Oracle APEX and Oracle REST Data Services](#)
- Introduction to Oracle REST Data Services in *Oracle REST Data Services Developer's Guide*
- Installing and Configuring Oracle REST Data Services in *Oracle REST Data Services Installation and Configuration Guide*

## 3.2 About Accessing Oracle APEX in Oracle Cloud

Learn about accessing Oracle APEX in Oracle Cloud.

Oracle APEX may reside in a local on-premises Oracle Database or in a hosted environment, such as a Oracle Cloud service. The sign in process differs depending where Oracle APEX resides.

In Oracle Cloud, Oracle APEX is installed and enabled in:

- Oracle APEX Application Development (APEX Service)
- Autonomous Database for Transaction Processing and Mixed Workloads
- Autonomous Database for Analytics and Data Warehousing

Oracle APEX is available in Exadata Cloud Service and Database Cloud Service in Oracle Cloud Infrastructure. However, you need to manually customize your databases to install and enable Oracle APEX by following the on-premises installation process or using cloud tooling such as Terraform.



### See Also:

- [Get an Environment](#)
- Welcome to Oracle APEX Application Development Service in *Getting Started with Oracle APEX Application Development*
- Creating Applications with Oracle Application Express on Autonomous Database in *Using Oracle Autonomous Database on Shared Exadata Infrastructure*

## 3.3 Understanding the Installation Process

Installing Oracle APEX is a multiple step process. You follow the same instructions for new or upgrade installations.

- [About Planning Your Installation](#)  
Learn about the steps needed to install Oracle APEX.
- [About Patch Sets](#)  
Patch sets provide bug fixes only. A point release includes bug fixes and incorporates all current patch sets.
- [About the Installation Scripts](#)  
You can install Oracle APEX or update from previous release using the same installation procedure and the installation scripts.
- [About Accessing Oracle APEX](#)  
You access the Oracle APEX development environment, by signing in to a shared work area called a workspace.
- [Requesting a Workspace from the Sign In Dialog](#)  
Request a workspace from the Sign In dialog.

- [Resetting Your Password from the Sign In Page](#)  
Reset your password by clicking a link on Oracle APEX Sign In page.
- [Recovering Your Workspace Name](#)  
Recover your workspace name from the Oracle APEX Sign In page.



**See Also:**

[Upgrading from a Previous Oracle APEX Release](#)

### 3.3.1 About Planning Your Installation

Learn about the steps needed to install Oracle APEX.

Oracle recommends you take the time to carefully plan your installation.

Installing Oracle APEX involves the following steps:

1. **Decide on a Full or Runtime Environment** - Determine whether to install a full development environment or runtime environment. A **full development** environment provides complete access to the App Builder development environment to develop applications. A **runtime environment** is the appropriate choice for production implementations in which you want to run applications that cannot be modified.  
  
See [About the Oracle APEX Runtime Environment](#).
2. **Verify installation requirements**- Before installing, verify your system meets the minimum requirements.  
  
See [Oracle APEX Installation Requirements](#) .
3. **Install the software** - Install or upgrade Oracle APEX by downloading a ZIP file from the Oracle APEX download page and then downloading and installing Oracle REST Data Services (ORDS) as described in [Installing and Configuring Oracle APEX and Oracle REST Data Services](#).



**See Also:**

[Upgrading from a Previous Oracle APEX Release](#)

### 3.3.2 About Patch Sets

Patch sets provide bug fixes only. A point release includes bug fixes and incorporates all current patch sets.

Patch sets are a mechanism for delivering fully tested and integrated product fixes. Patch sets provide bug fixes only. Patch sets typically do not include new functionality and they do not require certification on the target system. Patch sets include all of the libraries that have been rebuilt to implement the bug fixes in the set. All of the fixes in the patch set have been tested and are certified to work with each other.

In between major product releases, Oracle may offer a point release. A point release (for example Oracle APEX release 5.0.3) includes bug fixes and incorporates all current patch sets. Typically, point releases do not introduce new functionality.



#### See Also:

[Upgrading from a Previous Oracle APEX Release](#)

### 3.3.3 About the Installation Scripts

You can install Oracle APEX or update from previous release using the same installation procedure and the installation scripts.

The installation script checks for the latest existing Oracle APEX schema and automatically copies the instance metadata, workspaces, and applications from the previous schema into the current schema. The original schema associated with the previous release is left completely unaltered. Following best practices, Oracle recommends that you create new tablespaces for a new release of Oracle APEX and follow the appropriate installation instructions as outlined in this document.

### 3.3.4 About Accessing Oracle APEX

You access the Oracle APEX development environment, by signing in to a shared work area called a workspace.

How you sign in and access Oracle APEX depends upon your user role.

A workspace enables multiple users to work within the same Oracle APEX installation while keeping their objects, data, and applications private. Each workspace has a unique ID and name. An instance administrator can create a workspace manually within Oracle APEX Administration Services or have users submit requests. Oracle APEX Administration Services is a separate application for managing an entire Oracle APEX instance.

Users are divided into four primary roles:

- **Instance administrators** are *superusers* that manage an entire hosted instance using a separate application called Oracle APEX Administration Services. Instance administrators manage workspace provisioning, configure features and instance settings, and manage security.
- **Workspace administrators** can perform administrator tasks specific to a workspace such as configuring workspace preferences, managing user accounts, monitoring workspace activity, and viewing log files.
- **Developers** are users who sign in to a workspace and create and edit applications.
- **End users** can only run existing applications.

If you are a developer, an administrator must grant you access to shared work area called a workspace. If you are an Instance administrator, you must sign in to Oracle APEX Administration Services, determine whether to specify a provisioning mode, create a workspace, and then sign in to that workspace.

### About Specifying a Provisioning Mode

The Instance administrator determines how the process of provisioning (or creating) a workspace works for a specific Oracle APEX instance. To determine how provisioning works, an Instance Administrator selects a Provisioning Methods on the Instance Settings page:

- **Manual** - An Instance administrator creates new workspaces and notifies the Workspace administrator regarding the Sign In credentials.
- **Request** - Users request a workspace. Once an administrator approves the request, the user receives an email containing an email verification link. After the user clicks the email verification link, the workspace is created.
- **Automatic** - Works similar to **Request** except requests are automatically approved with no administrator review required

#### See Also:

About Specifying How Workspaces Are Created and Selecting a Workspace Provisioning Mode in *Oracle APEX Administration Guide*

### About Creating Workspaces and Users

Before you can develop or install applications, an administrator must create a workspace and add Oracle APEX users. To learn more contact your administrator, or see [Creating a Workspace and Adding Oracle APEX Users](#).

#### See Also:

- Creating Workspaces in Administration Services in *Oracle APEX Administration Guide*
- Making a Service Request in *Oracle APEX Administration Guide*
- Managing Requests in *Oracle APEX Administration Guide*

## 3.3.5 Requesting a Workspace from the Sign In Dialog

Request a workspace from the Sign In dialog.

#### Note:

This topic does not apply to Oracle APEX instances running in Oracle Cloud. See the documentation for your Oracle Cloud service.

Your administrator determines how you request a new workspace. If your administrator has set Provisioning Method to either **Request** or **Automatic** and has configured email, you can request a workspace on the Sign In dialog.

To request a workspace from the Sign In dialog:

1. Navigate to the Oracle APEX Sign in dialog.
2. Under Sign In, click **Request a Workspace**.  
The Request a Workspace Wizard appears.
3. For Identification:
  - a. First Name - Enter your first name.
  - b. Last Name - Enter your last name.
  - c. Email - Enter the email address. A link to activate your workspace will be sent to this email address.
  - d. Workspace - Enter a workspace name that name uniquely identifies your development environment.
  - e. Click **Next**.
4. If defined, review and accept the service agreement and click **Next**.
5. Verify your request and click **Submit Request**.

Once you complete the Identification form, the following events occur:

- a. You will receive an email containing a verification link.
- b. When you click the verification link, the workspace is created.
- c. You will receive another email containing Sign In credentials (that is, the workspace name, username, and password).

Once you complete the Identification form, the following events occur:

1. You will receive an email containing a verification link.
2. When you click the verification link, the workspace is created.
3. You will then receive another email containing Sign In credentials (that is, the workspace name, username, and password).



#### See Also:

About Specifying How Workspaces Are Created in *Oracle APEX Administration Guide*

## 3.3.6 Resetting Your Password from the Sign In Page

Reset your password by clicking a link on Oracle APEX Sign In page.



**Tip:**

To reset your password from the Sign In page, you must provide your email address and the workspace name.

To reset your password from the Sign In Page:

1. In a web browser, navigate to the Oracle APEX Sign In page.  
The Sign In page appears.
2. Under **Sign In**, click **Reset Password**.
3. In the Reset Password form, enter your email address, workspace name, and click **Reset Password**.

You will receive an email confirming your workspace name and username and containing a **Reset Password URL** link.

4. In the email, click the **Reset Password URL** link.
5. In the Change Password form:
  - a. **New Password** - Enter your new password.



**Tip:**

Passwords are case sensitive.

- b. **Confirm Password** - Enter your new password again.
- c. Click **Apply Changes**.



**Tip:**

You can also reset your password within Oracle APEX. See *Changing Your Profile or Password* in *Oracle APEX App Builder User's Guide*

## 3.3.7 Recovering Your Workspace Name

Recover your workspace name from the Oracle APEX Sign In page.

If you cannot remember your workspace name, you can request a list of all workspace names associated with your email address.

To find your workspace name:

1. In a web browser, navigate to the Oracle APEX Sign In page.

2. On the Sign In page, click **Reset Password**.
3. Click **Find My Workspace**.
4. Enter your email address and click **Find Workspace**.

You will receive an email listing all workspaces associated with the email address you provided.

## 3.4 About the Oracle APEX Runtime Environment

Learn about the Oracle APEX runtime environment.

As with any software development life cycle, Oracle strongly recommends that you have different environments for development, testing/QA, and production. For testing and production instances, Oracle APEX supports the ability to install just a runtime version of Oracle APEX. This runtime environment minimizes the installed footprint and privileges and improves application security since in a runtime instance developers cannot inadvertently update a production application.

An Oracle APEX runtime environment enables you to run production applications, but it does not provide a Web interface for administration. A runtime environment only includes the packages necessary to run your application, making it a more hardened environment. You administer the Oracle APEX runtime environment using SQL\*Plus or SQL Developer and the `APEX_INSTANCE_ADMIN` API.

### See Also:

About the Advantages of the Oracle APEX Runtime Environment in *Oracle APEX App Builder User's Guide*

Scripts are provided to remove or add the developer interface from an existing instance. To learn more, see one of the following for the corresponding type of installation:

### See also:

[Converting Between Runtime and Full Development Environments](#)

# 4

## Upgrading from a Previous Oracle APEX Release

Upgrading Oracle APEX creates new database objects in a new schema and migrates the application metadata to the new release.

If you have Oracle APEX release 20.x or earlier, following any of the installation scenarios in this guide upgrades your APEX instance to the current release, creates Oracle APEX 22.1 database objects in a new schema, and migrates the application metadata to the new release.

- [About Release Numbering Conventions](#)  
New releases of Oracle APEX correlate to the calendar year.
- [Sample Upgrade Scenarios](#)  
Review common upgrade scenarios including upgrading from a prior release and upgrading when an Oracle Database release includes Oracle APEX.
- [Viewing the Oracle APEX Release Number](#)  
View your Oracle APEX release number on the Workspace home page or on the About Oracle APEX page.
- [Viewing the Oracle REST Data Services Release Number](#)  
View the Oracle REST Data Services release number on the About Oracle APEX page.
- [About Installing an Oracle APEX Release Included with the Oracle Database](#)  
Learn about which Oracle Database releases include Oracle APEX and the importance of updating to the latest Oracle APEX release.
- [About Upgrading Existing Applications](#)  
Installing a new release of Oracle APEX, updates existing applications to the latest release, but does not alter application user interface or application components.
- [About Testing Requirements](#)  
Determining the appropriate amount of regression testing when upgrading Oracle APEX depends upon the complexity, size, and number of applications you are upgrading.
- [About Cleaning Up Your Environment](#)  
Following the successful upgrade of all of the environments to the latest release of Oracle APEX, you should clean-up the environments.
- [About Reverting to a Previous Release](#)  
You can revert to a previous release of Oracle APEX.



### See Also:

- [Understanding the Installation Process](#)
- [Maximizing Uptime During an Oracle APEX Upgrade](#)

## 4.1 About Release Numbering Conventions

New releases of Oracle APEX correlate to the calendar year.

In 2018 and starting with release 18.1 and 18.2, Oracle APEX introduced correlating the release number to the calendar year.

In addition, APEX now only offers full releases and no longer provides patch set releases (such as 5.1.1). Eliminating patch set releases reduces downtime when updating existing installations. APEX architecture also enables developers to revert releases if necessary.

Patch set exceptions (PSEs) may still be delivered for major defects. To learn more about PSEs, visit the [Oracle APEX 22.1 Known Issues](#) page or the [Prior Release Archives](#) for earlier releases.

## 4.2 Sample Upgrade Scenarios

Review common upgrade scenarios including upgrading from a prior release and upgrading when an Oracle Database release includes Oracle APEX.

[Table 4-1](#) lists common upgrade scenarios.

**Table 4-1 Sample Upgrade Scenarios**

Upgrade Scenarios	Action
Upgrade from a prior Oracle APEX release.	Download the most recent ZIP file from the <a href="#">Oracle APEX download page</a> and run a script to upgrade to the latest release. For details, see <a href="#">Installing Oracle APEX</a> .
You install an Oracle Database which includes Oracle APEX.	Download the most recent ZIP file from the <a href="#">Oracle APEX download page</a> and run a script to upgrade to the latest release. For details, see <a href="#">Installing Oracle APEX</a> .



### See Also:

[Downloading and Installing Oracle APEX](#)

## 4.3 Viewing the Oracle APEX Release Number

View your Oracle APEX release number on the Workspace home page or on the About Oracle APEX page.

You can view the Oracle APEX release number on the Workspace home page or on the About Oracle APEX page:

- Workspace home page:

- Sign in to Oracle APEX.  
On the Workspace home page, the current release number displays in the bottom right corner.
- About APEX page:
  - Sign in to Oracle APEX.
  - Click the **Help** menu in the upper right and select **About**.  
On the About APEX page, the release number appears next to **Product Build**.

## 4.4 Viewing the Oracle REST Data Services Release Number

View the Oracle REST Data Services release number on the About Oracle APEX page.

Oracle APEX requires access to the web server, Oracle REST Data Services (ORDS) 20.x or later.

To view the Oracle REST Data Services release number:

1. Sign in to Oracle APEX.
2. Click the **Help** menu in the upper right and select **About**.
3. Under the **CGI Environment** section, find `APEX_LISTENER_VERSION`.

## 4.5 About Installing an Oracle APEX Release Included with the Oracle Database

Learn about which Oracle Database releases include Oracle APEX and the importance of updating to the latest Oracle APEX release.

Oracle APEX is included with the following Oracle Database releases:

- Oracle Database 19c - Oracle Application Express Release 18.1.
- Oracle Database 18c - Oracle Application Express Release 5.1.
- Oracle Database 12c Release 2 (12.2) - Oracle Application Express Release 5.0.
- Oracle Database 12c Release 1 (12.1) - Oracle Application Express Release 4.2.
- Oracle Database 11g Release 2 (11.2) - Oracle Application Express Release 3.2.
- Oracle Database 11g Release 1 (11.1) - Oracle Application Express Release 3.0.

Since Oracle Database releases less frequently than Oracle APEX, Oracle recommends updating to the latest Oracle APEX release available. To learn more, see [Downloading and Installing Oracle APEX](#).



### Note:

If upgrading Oracle APEX from a release that ships with the database, do not alter any APEX files in the Oracle home directory (for example, `/u01/app/oracle/product/18.0.0/dbhome_1/apex`).

## 4.6 About Upgrading Existing Applications

Installing a new release of Oracle APEX, updates existing applications to the latest release, but does not alter application user interface or application components.

Once you upgrade an Oracle APEX instance from a previous release, existing applications will work without modification. However, to keep applications maintainable, up-to-date, and to leverage new functionality, developers should perform the steps outlined in Upgrading APEX Applications in *Oracle APEX App Builder User's Guide*.

## 4.7 About Testing Requirements

Determining the appropriate amount of regression testing when upgrading Oracle APEX depends upon the complexity, size, and number of applications you are upgrading.

You should include the majority of complex pages, particularly those that incorporate significant JavaScript or extensive PL/SQL computations or processes. Developers should ensure pages which they manually update based on the Upgrade Application or Advisor are also included in regression tests. Not all remaining pages have to be included in regression testing. Oracle recommends you include a good representation of different page types includes reports, charts, and forms. An application should always be included in regression testing if its compatibility mode was modified post-upgrade.

While regression testing of upgraded applications is imperative to minimize risk of disrupting the end users, it is important that testing is not drawn out for an extended period. As a general rule:

- Step 1: Upgrade your development environment first. Allow developers to review the applications and make initial updates as needed.
- Step 2: Upgrade your QA/Test environment.
- Step 3: Upgrade applications from development are built into this environment.
- Step 4: Upgrade your production environment.
- Step 5: Build upgraded applications into this environment.

## 4.8 About Cleaning Up Your Environment

Following the successful upgrade of all of the environments to the latest release of Oracle APEX, you should clean-up the environments.

Once you start developing with the newer release, the Oracle APEX schema associated with the prior release can be deleted. If you installed the prior release into a separate tablespace, you can simply drop the specific tablespace. Oracle recommends leaving the older Oracle APEX schema(s) for a few weeks and then remove them from the development, test, and production environments. This cleanup process releases disk space and ensures that no one accesses an outdated schema using tools such as SQL Developer or SQL\*Plus.

## 4.9 About Reverting to a Previous Release

You can revert to a previous release of Oracle APEX.

Because Oracle APEX creates a new schema for each major release, reverting back to a prior release is a relatively simple process. If you revert to a prior release, any modifications made in the current Oracle APEX instance are lost. The main task is to switch the public synonyms and grants to point at the previous schema instead of the new schema.



### See Also:

[Reverting to a Previous Release After a Failed Upgrade Installation](#)

# 5

## Utilizing the Multitenant Architecture in Oracle Database 12c or Later

Learn about installation choices and different scenarios associated with copying and moving pluggable databases introduced by the Oracle Database 12c or later multitenant architecture with respect to Oracle APEX.

- [Understanding the Installation Choices](#)  
Learn about the installation choices in Oracle APEX.
- [Installing Oracle APEX into an Application Container](#)  
Learn about the application container that stores data and metadata for application back ends.
- [Installing Oracle APEX into Different PDBs](#)  
You can install different versions of Oracle APEX into different PDBs.
- [Plugging in a PDB When Oracle APEX Is Installed in the Root Container](#)  
Learn about scenarios in which the target database has Oracle APEX installed into the root container, `CDB$ROOT` - the default installation option.
- [Plugging in a PDB When Oracle APEX Is Not in the Root Container of the Target CDB](#)  
The scenarios in this section describe when Oracle APEX is not installed in the root container, `CDB$ROOT`, by explicitly removing it as described in "Uninstalling Oracle APEX from a CDB."

### 5.1 Understanding the Installation Choices

Learn about the installation choices in Oracle APEX.

Oracle Database 12c Release 1 (12.1) introduces the multitenant architecture. This database architecture has a multitenant container database (CDB) that includes a root container, `CDB$ROOT`, a seed database, `PDB$SEED`, and multiple pluggable databases (PDBs). Each pluggable database is equivalent to a separate database instance in Oracle Database release 11g. The root container, `CDB$ROOT`, holds common objects that are accessible to every PDB utilizing metadata links or object links. The seed database, `PDB$SEED`, is used when creating a new PDB to seed the new database. The key benefit of the Oracle Database 12c or later multitenant architecture is that the database resources, such as CPU and memory, can be shared across all of the PDBs. This architecture also enables many databases to be treated as one for tasks such as upgrades or patches, and backups.

When configuring multitenant architecture, Oracle APEX is installed in the root container database by default in Oracle Database 12c Release 1 (12.1). In the default installation the root container, `CDB$ROOT`, includes the `APEX_040200` schema to store the common database objects for the APEX engine such as packages, functions, procedures and views. The seed database, `PDB$SEED`, also includes the `APEX_040200` schema to store the tables that are part of the APEX engine.

You can create a new PDB by copying `PDB$SEED`, which includes the `APEX_220100` schema if Oracle APEX release 22.1 is installed common in the CDB. As such there are multiple copies of the Oracle APEX engine tables and only single copies of the Oracle APEX engine

packages, functions, procedures and views. Each PDB will have the `APEX_220100` schema and have its own copy of the Oracle APEX engine's tables so that it can hold the metadata for the APEX applications defined within that PDB.

 **Tip:**

Oracle recommends removing Oracle APEX from the root container database for the majority of use cases, except for hosting companies or installations where all pluggable databases (PDBs) utilize Oracle APEX and they all need to run the exact same release and patch set of Oracle APEX.

 **See Also:**

[Installing Oracle APEX into Different PDBs](#)

## 5.2 Installing Oracle APEX into an Application Container

Learn about the application container that stores data and metadata for application back ends.

- [About Application Containers](#)  
An application container is a CDB component that stores data and metadata for application backends.
- [Creating an Application Container](#)  
To create a PDB within a CDB as an application container, you use the `AS APPLICATION CONTAINER` clause of the `create PDB` command.
- [Installing or Upgrading Oracle APEX in an Application Container](#)
- [Verifying the Application Container Installation](#)  
Verify the application container by inspecting the log file for `ORA-` or `PLS-` errors and compiling invalid objects.
- [Creating an Application Seed](#)  
An application seed is used to provision application PDBs with the application root's applications pre-installed.
- [Creating an Application PDB from the Application Root Seed](#)  
An application PDB is created by issuing the `CREATE PLUGGABLE DATABASE` statement from the application root.
- [Configure HTTP Access to the Application PDB](#)  
Configure a new application PDB for HTTP access.

### 5.2.1 About Application Containers

An application container is a CDB component that stores data and metadata for application backends.

Oracle APEX can be installed into an application container using the `apxappcon.sql` script. An application container consists of an application root where the application is

defined and one or more PDBs that share data and metadata about the application from the application root. You can have multiple application containers within a CDB and each container can have a different version of Oracle APEX.

Patching or upgrading Oracle APEX in an application container is simplified, because these actions are done against the application root. When an application PDB wishes to uptake the patch or upgraded version, it simply syncs with the application root. Oracle APEX continues to run in the application PDB at the existing version until the application PDB syncs with the application root.

## 5.2.2 Creating an Application Container

To create a PDB within a CDB as an application container, you use the `AS APPLICATION CONTAINER` clause of the `create PDB` command.

To create Application Container:

1. Use the `AS APPLICATION CONTAINER` clause of the `CREATE PLUGGABLE DATABASE` statement to create an application container.
2. Open the application container.

For Example:

```
CREATE PLUGGABLE DATABASE apex_aproot1 AS APPLICATION CONTAINER admin
user admin IDENTIFIED
    BY <admin_password> FILE_NAME_CONVERT=('pdbseed','apex_aproot1');
ALTER PLUGGABLE DATABASE apex_aproot1 open;
```

### Note:

`apex_aproot1` and the `admin` user in the previous example can be any valid ORACLE identifier.

## 5.2.3 Installing or Upgrading Oracle APEX in an Application Container

To install or upgrade Oracle APEX in an Application Container:

1. Connect to Application Container.
2. Run `apxappcon.sql`.

`apxappcon.sql` installs Oracle APEX as an application named `APEX` into the application root.

The script takes the exact same first four arguments as the `apexins.sql` script, with the addition of a fifth parameter which is the password to use for the `APEX_PUBLIC_USER` password. In an upgrade installation, the fifth argument is ignored because the `APEX_PUBLIC_USER` database user will already exist.

For example:

```
ALTER SESSION SET CONTAINER = apex_aproot1;

@apxappcon.sql SYS AUX SYS AUX TEMP /i/ P@ssw0rd!
```

## 5.2.4 Verifying the Application Container Installation

Verify the application container by inspecting the log file for `ORA-` or `PLS-` errors and compiling invalid objects.

To verify the Application Container installation:

1. Manually inspect the installation log file for `ORA-` or `PLS-` errors.
2. Compile invalid objects by running the following command:

For example:

```
ALTER SESSION SET CONTAINER=apex_aproot1;

begin
  sys.dbms_utility.compile_schema( 'APEX_220100', false );
  sys.dbms_utility.compile_schema( 'FLOWS_FILES', false );
end;
/
```

3. Query `dba_applications` and `dba_app_errors`.

```
SQL> select app_name, app_version, app_status from dba_applications
where app_name = 'APEX';
```

APP_NAME	APP_VERSION	APP_STATUS
APEX	22.1	NORMAL

```
SQL> select app_name, app_statement, errornum, errormsg from
dba_app_errors where app_name = 'APEX';
```

no rows selected

## 5.2.5 Creating an Application Seed

An application seed is used to provision application PDBs with the application root's applications pre-installed.

To create an Application Seed:

1. Connect to `CDB$ROOT` as `sysdba`.

2. Alter session and set container to the application root.
3. Use the `AS SEED` clause of the `CREATE PLUGGABLE DATABASE` statement to create an application seed.
4. Sync the APEX application with the application seed.
5. Compile invalid objects.
6. Open the application seed in read only mode.

For example:

```
ALTER SESSION SET CONTAINER=apex_apprroot1;

CREATE PLUGGABLE DATABASE as seed admin user admin identified by
<admin_password> file_name_convert=('pdbseed','apex_apprroot1_seed');

ALTER PLUGGABLE DATABASE apex_apprroot1$seed open;

ALTER SESSION SET CONTAINER=apex_apprroot1$seed;

ALTER PLUGGABLE DATABASE application APEX sync;

begin
  sys.dbms_utility.compile_schema( 'APEX_220100', false );
  sys.dbms_utility.compile_schema( 'FLOWS_FILES', false );
end;
/

ALTER PLUGGABLE DATABASE close immediate;

ALTER PLUGGABLE DATABASE open read only;
```

 **Note:**

`apex_apprroot1` and the `admin` user in the previous example can be any valid ORACLE identifier.

## 5.2.6 Creating an Application PDB from the Application Root Seed

An application PDB is created by issuing the `CREATE PLUGGABLE DATABASE` statement from the application root.

The `PLUGGABLE DATABASE` is created from the application container seed so the APEX application is already installed and ready for configuration.

To create an Application PDB from the Application Root Seed:

1. Connect to `CDB$ROOT` as `sysdba`.
2. Alter session and set container to the application root.
3. Use the `CREATE PLUGGABLE DATABASE` command to create a PDB from the application seed.

For example:

```
ALTER SESSION SET CONTAINER=apex_aproot1;

CREATE PLUGGABLE DATABASE apex_pdb1 admin user admin identified by
<admin password>
file_name_convert=('apex_aproot1_seed','apex_pdb1');

ALTER PLUGGABLE DATABASE apex_pdb1 open;

ALTER SESSION SET CONTAINER=apex_pdb1;

SQL> select app_name, app_version, app_status from dba_applications
where app_name = 'APEX';
```

APP_NAME	APP_VERSION	APP_STATUS
-----	-----	-----
APEX	21.1	NORMAL

 **Note:**

apex\_aproot1 and the admin user in the previous example can be any valid ORACLE identifier.

## 5.2.7 Configure HTTP Access to the Application PDB

Configure a new application PDB for HTTP access.

Configure the new application PDB for HTTP access by following the instructions starting with the section [Downloading and Installing Oracle REST Data Services](#).

## 5.3 Installing Oracle APEX into Different PDBs

You can install different versions of Oracle APEX into different PDBs.

Providing Oracle APEX is not installed in the container database, you can install a local Oracle APEX within each PDB as required. When APEX is installed locally there are no APEX metadata linked objects and all packages, views, and tables are created within the APEX\_220100 schema, within each PDB where APEX is installed.

- [Uninstalling Oracle APEX from a CDB](#)  
Learn how to uninstall Oracle APEX from a CDB.
- [Installing Oracle APEX Locally in a PDB](#)  
Learn how to install Oracle APEX locally in a PDB.
- [Installing Oracle APEX into a CDB](#)

## 5.3.1 Uninstalling Oracle APEX from a CDB

Learn how to uninstall Oracle APEX from a CDB.

To uninstall Oracle APEX from a CDB:



### Note:

Installing or removing Oracle APEX from a CDB requires a local connection to the database.

This section describes removing Oracle APEX from a CDB. If you wish to remove Oracle APEX from the CDB that shipped with Oracle Database 12.1, you should use `apxremov_con.sql` from either `$ORACLE_HOME/apex`, or from a 4.2.6 APEX distribution.

1. Change to the `apex` directory in the location where you unzipped the distribution.
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Run `apxremov.sql`.

For example:

```
@apxremov.sql
```



### Note:

If you run `apexremov.sql` after PDBs have been added to the CDB, then Oracle APEX uninstalls from all of the PDBs, as well as `CDB$ROOT` and `PDB$SEED`. Therefore, any applications defined in any of the PDBs will be removed.

## 5.3.2 Installing Oracle APEX Locally in a PDB

Learn how to install Oracle APEX locally in a PDB.

Once you have removed Oracle APEX from the container database by following the instructions in [Uninstalling Oracle APEX from a CDB](#), you can install APEX locally in a PDB.

To install Oracle APEX locally in a PDB:

1. Change the `apex` directory in the location where you unzipped the distribution.
2. Start SQL\*Plus and connect to the database where APEX is installed as SYS specifying the SYSDBA role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Set the container to the PDB you want to install APEX locally:

```
ALTER SESSION SET CONTAINER = <PDB_name>;
```

4. Select the appropriate installation option.

**Full development environment** provides complete access to the App Builder environment to develop applications. A **Runtime environment** enables users to run applications that cannot be modified.

Available installation options include:

- **Full development environment** - Run `apexins.sql` passing the following four arguments in the order shown:

```
@apexins.sql tablespace_apex tablespace_files tablespace_temp
images
```

Where:

- `tablespace_apex` is the name of the tablespace for the APEX application user.
- `tablespace_files` is the name of the tablespace for the APEX files user.
- `tablespace_temp` is the name of the temporary tablespace or tablespace group.
- `images` is the virtual directory for APEX images. To support future APEX upgrades, define the virtual image directory as `/i/`.

For example:

```
@apexins.sql SYSAUX SYSAUX TEMP /i/
```

- **Runtime environment** - Run `apxrtins.sql` passing the following four arguments in the order shown:

```
@apxrtins.sql tablespace_apex tablespace_files tablespace_temp images
```

Where:

- `tablespace_apex` is the name of the tablespace for the APEX application user.
- `tablespace_files` is the name of the tablespace for the APEX files user.

- `tablespace_temp` is the name of the temporary tablespace or tablespace group.
- `images` is the virtual directory for APEX images. To support future APEX upgrades, define the virtual image directory as `/i/`.

For example:

```
@apxrtins.sql SYS AUX SYS AUX TEMP /i/
```

#### 5. Complete the appropriate steps in .

When APEX installs, it creates the following database accounts:

- `APEX_220100` - This account owns the APEX schema and metadata.
- `FLows_FILES` - This account owns the APEX uploaded files.
- `APEX_PUBLIC_USER` - This minimally privileged account is used for APEX configuration with Oracle REST Data Services or Oracle HTTP Server and `mod_plsql`.

If you configured RESTful Web services, then these additional accounts are created:

- `APEX_REST_PUBLIC_USER` - The account used when invoking RESTful Services definitions stored in APEX.
- `APEX_LISTENER` - The account used to query RESTful Services definitions stored in APEX.

#### See Also:

- [Installing and Configuring Oracle APEX and Oracle REST Data Services](#)
- *Oracle Database SQL Language Reference* for more information about SQL\*Plus

## 5.3.3 Installing Oracle APEX into a CDB

To install Oracle APEX into a CDB:

#### Note:

Installing or removing Oracle APEX from a CDB requires a local connection to the database.

1. Change your working directory to the `apex` directory in the location where you unzipped the distribution.
2. Start SQL\*Plus and connect to `CDB$ROOT` of the database where APEX is installed as `SYS` specifying the `SYSDBA` role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog  
SQL> CONNECT SYS as SYSDBA  
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog  
SQL> CONNECT SYS as SYSDBA  
Enter password: SYS_password
```

3. Select the appropriate installation option.

**Full development environment** provides complete access to the App Builder environment to develop applications. A **Runtime environment** enables users to run applications that cannot be modified.

Available installation options include:

- **Full development environment.** Run `apexins.sql` passing the following four arguments in the order shown:

```
@apexins.sql tablespace_apex tablespace_files tablespace_temp  
images
```

Where:

- `tablespace_apex` is the name of the tablespace for the APEX application user.
- `tablespace_files` is the name of the tablespace for the APEX files user.
- `tablespace_temp` is the name of the temporary tablespace or tablespace group.
- `images` is the virtual directory for APEX images. To support future APEX upgrades, define the virtual image directory as `/i/`.

Example:

```
@apexins.sql SYSAUX SYSAUX TEMP /i/
```

- **Runtime environment.** Run `apxrtins.sql` passing the following arguments in the order shown:

```
@apxrtins.sql tablespace_apex tablespace_files tablespace_temp  
images
```

Where:

- `tablespace_apex` is the name of the tablespace for the APEX application user.
- `tablespace_files` is the name of the tablespace for the APEX files user.
- `tablespace_temp` is the name of the temporary tablespace or tablespace group.

- `images` is the virtual directory for APEX images. To support future APEX upgrades, define the virtual image directory as `/i/`.

Example:

```
@apxrtins.sql SYSAUX SYSAUX TEMP /i/
```

#### 4. Complete appropriate steps in .

When APEX installs, it creates the following database accounts:

- `APEX_220100` - This account owns the APEX schema and metadata.
- `FLows_FILES` - This account owns the APEX uploaded files.
- `APEX_PUBLIC_USER` - This minimally privileged account is used for APEX configuration with Oracle REST Data Services or Oracle HTTP Server and `mod_plsql`.

If you configured RESTful Web services, then these additional accounts are created:

- `APEX_REST_PUBLIC_USER` - The account used when invoking RESTful Services definitions stored in APEX.
- `APEX_LISTENER` - The account used to query RESTful Services definitions stored in APEX.

#### See Also:

- [Using SQL\\*Plus in SQL\\*Plus User's Guide and Reference](#)
- [Patching or Upgrading Oracle APEX in a CDB](#)
- [About the Oracle APEX Runtime Environment](#)
- [Installing and Configuring Oracle APEX and Oracle REST Data Services](#)

## 5.4 Plugging in a PDB When Oracle APEX Is Installed in the Root Container

Learn about scenarios in which the target database has Oracle APEX installed into the root container, `CDB$ROOT` - the default installation option.

This section describes scenarios in which the target database has Oracle APEX installed into the root container, `CDB$ROOT` - the default installation option. Note there are multiple scenarios related to where the database being plugged in originated from and how Oracle APEX was configured in the originating database.

- [Scenario 1: Plug-in Non-CDB with Oracle APEX](#)  
Plug-in Non-CDB with Oracle APEX.
- [Scenario 2: Plug-in PDB with a Common APEX from Another CDB](#)  
Plug-in a PDB with APEX from another CDB.
- [Scenario 3: Plug-in PDB with a Local Oracle APEX from Another CDB](#)  
Plug-in a PDB with a local Oracle APEX from another CDB.

- [Scenario 4: Plug-in Non-CDB or PDB with No Oracle APEX](#)  
Plug-in a Non-CDB or PDB if Oracle APEX is not installed.
- [Working with Incompatible Oracle APEX Versions](#)  
Learn how to work with the incompatible versions of Oracle APEX.

## 5.4.1 Scenario 1: Plug-in Non-CDB with Oracle APEX

Plug-in Non-CDB with Oracle APEX.

If you are upgrading from a previous Oracle Database release, then you first need to upgrade to a Oracle Database 12c non-CDB (or PDB with locally installed APEX) or and then plug the database into your CDB. Alternatively, if you have configured a non-CDB Oracle Database 12c or later (or PDB with locally installed APEX), you may now want to plug this database into a CDB. In both cases, the originating database has APEX installed and was not formerly a PDB.

As described in the *Oracle Database Installation Guide* for your operating system, when plugging in a standalone database you need to run the `$ORACLE_HOME/rdbms/admin/noncdb_to_pdb.sql` script. This script creates the necessary metadata linked objects, instead of local objects and recompiles the database objects for all common database options, including APEX.

After installing Oracle APEX, you need to configure the web server for the PDB.

If the version of Oracle APEX installed in the originating database (which is now a PDB) is different from what is installed into the root container of the target, an error will be raised when trying to open the PDB.

### See Also:

- [Installing and Configuring Oracle APEX and Oracle REST Data Services](#)
- [Working with Incompatible Oracle APEX Versions](#)

## 5.4.2 Scenario 2: Plug-in PDB with a Common APEX from Another CDB

Plug-in a PDB with APEX from another CDB.

If you are copying or moving a PDB from an existing Oracle Database 12c or later where the originating CDB had APEX installed in the root container, you will not need to perform any additional steps, other than configuring the web server for the PDB.

This scenario assumes APEX release 21.1 is installed and the `APEX_220100` schema within the PDB being plugged in already has the metadata linked objects defined and will compile without error against the metadata linked objects within the target CDB.

If the version of APEX installed in the originating database is different from what is installed in the root container of the target an error is raised when trying to open the PDB.

 **See Also:**

- [Installing and Configuring Oracle APEX and Oracle REST Data Services](#)
- [Working with Incompatible Oracle APEX Versions](#)

### 5.4.3 Scenario 3: Plug-in PDB with a Local Oracle APEX from Another CDB

Plug-in a PDB with a local Oracle APEX from another CDB.

If you are copying or moving a PDB from an existing Oracle Database 12c or later where APEX was not installed in the root container but is installed locally, then you need to perform additional steps before the PDB can be opened without errors.

This scenario assumes APEX release 22.1 is installed and the `APEX_220100` schema within the PDB being plugged in contains all of the APEX database objects and has no metadata linked objects. Therefore, you need to run `$ORACLE_HOME/rdbms/admin/apex_to_common.sql` to remove the common objects and create the metadata links for the packages, views and so forth.

To replace local objects with metadata links in the PDB:

1. Change your working directory to `$ORACLE_HOME/rdbms/admin`.
2. Start SQL\*Plus and connect to the database where APEX is installed as SYS specifying the SYSDBA role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Set the container to the PDB to be configured:

```
ALTER SESSION SET CONTAINER = <PDB_name>;
```

4. Run `apex_to_common.sql`. For example:

```
@apex_to_common.sql
```

If the version of Oracle APEX installed in the originating database is different from what is installed in the root container of the target an error is raised when trying to open the PDB.

 **See Also:**

- [Working with Incompatible Oracle APEX Versions](#)

## 5.4.4 Scenario 4: Plug-in Non-CDB or PDB with No Oracle APEX

Plug-in a Non-CDB or PDB if Oracle APEX is not installed.

In this scenario, the APEX schema, such as `APEX_220100` for Oracle APEX release 22.1, will not be present in the originating database or the PDB being plugged in. In order to open the PDB without issue and be able to run APEX within the new PDB, you must install APEX into the originating database or PDB before attempting to plug in to the target database. You should install the same version of Oracle APEX into the originating database or PDB as the version installed into the target database.

## 5.4.5 Working with Incompatible Oracle APEX Versions

Learn how to work with the incompatible versions of Oracle APEX.

If the version of Oracle APEX in the root container, `CDB$ROOT`, is not the same as the Oracle APEX version in the PDB then an error is raised every time the PDB is opened preventing normal database operations within the PDB. The PDB can only be opened in restricted mode by users with `RESTRICTED SESSION` privilege, until the versions are compatible.

- [Patching or Upgrading Oracle APEX in a CDB](#)  
Learn how to patch or upgrade Oracle APEX in the root container.
- [Patching or Upgrading Oracle APEX in a PDB](#)  
Learn how to patch or upgrade Oracle APEX in a PDB.

### 5.4.5.1 Patching or Upgrading Oracle APEX in a CDB

Learn how to patch or upgrade Oracle APEX in the root container.

If the version of Oracle APEX in the PDB is a later minor release version than the version of Oracle APEX in the root container (for example, the PDB contains Oracle APEX release 5.1.4 and the CDB contains Oracle APEX release 5.1.3) then you must patch the version of Oracle APEX in the root container to be able to open the PDB without error. If the major version of Oracle APEX in the PDB is higher than the version in the CDB (for example the PDB has Oracle APEX release 19.2 and the CDB has Oracle APEX release 18.1) then you must upgrade the version of Oracle APEX in the CDB to be able to open the PDB without error.

To patch Oracle APEX in the root container:

1. Download the appropriate patch from My Oracle Support.
2. Unzip and extract the installation files.
3. Change your working directory to where the installation files were extracted
4. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

5. Run `apxpatch_con.sql` for example:

```
@apxpatch_con.sql
```

6. Follow the instructions outlined in the Patch Set Notes for updating the images directory.



### See Also:

[Installing Oracle APEX into a CDB](#)

## 5.4.5.2 Patching or Upgrading Oracle APEX in a PDB

Learn how to patch or upgrade Oracle APEX in a PDB.

If the minor version of Oracle APEX in the PDB is lower than the version of Oracle APEX in the root container (for example the PDB has APEX release 4.2.0 and the CDB has APEX release 4.2.6) then it will be necessary to patch the version of APEX in the PDB. If the major version of Oracle APEX in the PDB is lower than the version in the root container (for example, the PDB has APEX release 4.2 and the CDB has APEX release 19.2) then the version of APEX in the PDB will need to be upgraded.

- [Patching Oracle APEX in a PDB](#)  
Learn how to patch Oracle APEX in a PDB.
- [Upgrading Oracle APEX in a PDB](#)  
Learn how to upgrade Oracle APEX in a PDB.

### 5.4.5.2.1 Patching Oracle APEX in a PDB

Learn how to patch Oracle APEX in a PDB.

To patch Oracle APEX in a PDB:

1. Download the appropriate patch from My Oracle Support.
2. Unzip and extract the installation files.
3. Change your working directory to where the installation files were extracted
4. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role. For example:
  - On Windows:
 

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```
  - On UNIX and Linux:
 

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```
5. Run `apxpatch.sql` using `catcon.pl` like the following example:

```
host &OH_HOME/perl/bin/perl -I

&OH_HOME/rdbms/admin &OH_HOME/rdbms/admin/catcon.pl -b apxpatch -c
'<PDB_name>' apxpatch.sql
```

Where:

- `&OH_HOME` represents the full path to the Oracle home
  - `<PDB_name>` is the name of the PDB you are patching
6. Follow the instructions outlined in the patch set notes for updating the images directory.

### 5.4.5.2.2 Upgrading Oracle APEX in a PDB

Learn how to upgrade Oracle APEX in a PDB.

To upgrade Oracle APEX in a PDB:

1. Unzip and extract the installation files.
2. Change your working directory to where the installation files were extracted
3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role. For example:
  - On Windows:
 

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```
  - On UNIX and Linux:
 

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```
4. Run `apexins_nocdb.sql` or `apxrtins_nocdb.sql` using `catcon.pl` like the following example:

```
host &OH_HOME/perl/bin/perl -I

&OH_HOME/rdbms/admin &OH_HOME/rdbms/admin/catcon.pl -b apexins -c
'<PDB_name>' apexins_nocdb.sql --pSYSAUX --pSYSAUX --pTEMP --p/i/ --
p1,2,3
```

Where:

- `&OH_HOME` represents the full path to the Oracle home
  - `<PDB_name>` is the name of the PDB you are patching
5. Follow the instructions outlined in the patch set notes for updating the images directory.

## 5.5 Plugging in a PDB When Oracle APEX Is Not in the Root Container of the Target CDB

The scenarios in this section describe when Oracle APEX is not installed in the root container, `CDB$ROOT`, by explicitly removing it as described in "Uninstalling Oracle APEX from a CDB."

In such cases, you can optionally install a Oracle APEX into each PDB independently. If Oracle APEX is installed into a PDB it is considered to be installed locally and has no metadata linked objects. There are multiple scenarios related to where the database being plugged in originated from and how Oracle APEX was configured in the originating database.

- [Scenario 1: Plug-in a Non-CDB or PDB with Locally Installed APEX](#)  
Plug-in a Non-CDB or PDB with locally installed APEX.
- [Scenario 2: Plug-in PDB with Common Oracle APEX from Another CDB](#)  
Plug-in a PDB with Oracle APEX from another CDB.
- [Scenario 3: Plug-in PDB with a Local Oracle APEX from Another CDB](#)  
Plug-in a PDB with local Oracle APEX from another CDB.
- [Scenario 4: Plug-in a Non-CDB or PDB with No Oracle APEX](#)  
Plug-in a Non-CDB or PDB if Oracle APEX is not installed.



### See Also:

[Uninstalling Oracle APEX from a CDB](#)

### 5.5.1 Scenario 1: Plug-in a Non-CDB or PDB with Locally Installed APEX

Plug-in a Non-CDB or PDB with locally installed APEX.

If you are upgrading from a previous Oracle Database release then you need to upgrade to Oracle Database 12c or later non-CDB (or or PDB with locally installed APEX) and then plug the database into your CDB. Alternatively you may have configured a non-CDB Oracle Database 12c or later (or PDB with locally installed APEX that you now want to plug into a CDB. In both cases, the originating database had Oracle APEX installed and was not formerly a PDB.

As described in the *Oracle Database Installation Guide* for your operating system, when plugging in a standalone database you need to run the `$ORACLE_HOME/rdbms/admin/noncdb_to_pdb.sql` script. This script creates the necessary metadata linked objects (instead of local objects) and recompiles the database objects for all common database options. However, because Oracle APEX has been removed from the root container, the script will not create any metadata links for any of the Oracle APEX objects. The script does not change the Oracle APEX installation from the originating database and no additional steps are needed other than configuring the web server.

**See Also:**

[Installing and Configuring Oracle APEX and Oracle REST Data Services](#)

## 5.5.2 Scenario 2: Plug-in PDB with Common Oracle APEX from Another CDB

Plug-in a PDB with Oracle APEX from another CDB.

If you are copying or moving a PDB from an existing Oracle Database 12c where the originating CDB had Oracle APEX installed in the root container, then an error is raised whenever you try to open the PDB. The error is due to the originating PDB included metadata links to objects in the originating root container which cannot be recompiled because the target root container does not include Oracle APEX. You will not be able to open the PDB unless you remove APEX from the PDB or if APEX is already installed in the target root container. Oracle does not support installing APEX in the root container if it contains PDBs with locally installed Oracle APEX.

## 5.5.3 Scenario 3: Plug-in PDB with a Local Oracle APEX from Another CDB

Plug-in a PDB with local Oracle APEX from another CDB.

If you are copying or moving a PDB from an existing Oracle Database 12c or later where the originating PDB had a local Oracle APEX installed (not in the CDB) then you do not need to perform any additional steps, other than configuring the web server in the PDB.

This scenario assumes Oracle APEX release 22.1 is installed and the 22.1 schema within the PDB being plugged in, already has all of the Oracle APEX objects defined locally and no metadata links.

**See Also:**

[Installing and Configuring Oracle APEX and Oracle REST Data Services](#)

## 5.5.4 Scenario 4: Plug-in a Non-CDB or PDB with No Oracle APEX

Plug-in a Non-CDB or PDB if Oracle APEX is not installed.

If you are plugging in a non-CDB, or copying or moving a PDB from another CDB, where Oracle APEX was not installed in the originating database or PDB then you do not need to perform any additional steps. There will be no Oracle APEX engine schema, such as `APEX_220100`, within the PDB, and the PDB can be started without error.

# 6

## Installing and Configuring Oracle APEX and Oracle REST Data Services

Install or upgrade Oracle APEX by downloading a ZIP file from the Oracle APEX download page and then downloading and installing Oracle REST Data Services (ORDS). These instructions apply to both new and upgrade installations.

- [Performing Pre-installation Tasks for Oracle APEX](#)  
Review and perform pre-installation tasks before installing Oracle APEX.
- [About SQLcl Support](#)  
Learn about Oracle SQL Developer Command Line support in Oracle APEX.
- [Downloading and Installing Oracle APEX](#)  
Learn about downloading and installing Oracle APEX.
- [Downloading and Installing Oracle REST Data Services](#)  
Learn about downloading and installing Oracle REST Data Services.
- [Configuring Oracle REST Data Services](#)  
Configuring Oracle REST Data Services requires that you copy the images directory, if you are using an older release validate the Oracle REST Data Services installation, configure static files support, and secure Oracle REST Data Services.
- [Enabling Network Services in Oracle Database](#)  
You must enable network services in Oracle Database to send outbound mail, use Web services, or use template-based PDF report printing with BI Publisher in Oracle APEX.
- [Performing Security Tasks](#)  
Oracle recommends configuring and using Secure Sockets Layer (SSL) to ensure that passwords and other sensitive data are not transmitted in clear text in HTTP requests.
- [Controlling the Number of Concurrent Jobs](#)  
Learn about specifying the number of concurrently running jobs.
- [About Running Oracle APEX in Other Languages](#)  
You can install a single instance of Oracle APEX with one or more of translated versions.
- [Installing Translated Versions of Oracle APEX](#)  
Learn about installing translated versions of Oracle APEX.
- [Creating a Workspace and Adding Oracle APEX Users](#)  
Before you can develop or install applications, you must create a workspace, add Oracle APEX users, and sign in to your workspace.
- [Performing Post Installation Tasks for Upgrade Installations](#)  
Once you have verified that your upgrade installation was successful and all upgraded applications function properly, you should remove schemas from prior Oracle APEX installations.
- [About Performance Optimization Tasks](#)  
Learn about performance optimization.
- [Converting Between Runtime and Full Development Environments](#)  
Learn about converting between runtime and full development environments.



**See Also:**

[Web Server Requirements](#)

## 6.1 Performing Pre-installation Tasks for Oracle APEX

Review and perform pre-installation tasks before installing Oracle APEX.

Before installing Oracle APEX, Oracle recommends that you complete the following steps:

1. Review and satisfy all Oracle APEX installation requirements.
2. If you are actively using Oracle APEX and upgrading the current installation, then shut down with normal or immediate priority the Oracle Database instances where you plan to install Oracle APEX. On Oracle Real Application Clusters (Oracle RAC) systems, shut down all instances on each node.

An alternative to shutting down the database, you can prevent all users from accessing Oracle APEX when upgrading your installation from a previous release of Oracle APEX. Oracle only recommends this option in high availability production environments where planned outages are not available. For all other scenarios, the database should be shut down.

To disable access to Oracle APEX when an existing installation is using Oracle REST Data Services, shut down the appropriate application server where Oracle REST Data Services is deployed.

Once you have prevented access from APEX users, log in to SQL\*Plus as SYS, connecting to the database where Oracle APEX is installed, and query `V$SESSION` to ensure there are no long running sessions which would interfere with the upgrade process.

3. Back up the Oracle Database installation.

Oracle recommends that you create a backup of the current Oracle Database installation before you install Oracle APEX. You can use Oracle Database Recovery Manager, which is included in the Oracle Database installation, to perform the backup.

4. Start the Oracle Database instance that contains the target database.

After backing up the system, you must start the Oracle instance that contains the target Oracle Database. Do not start other processes such as a web server. However, if you are performing a remote installation, make sure the web server for the remote database has started.



**Note:**

If you are connecting to a remote database, then start the web server.

 **See Also:**

- [Oracle APEX Installation Requirements](#)
- *Oracle Database Backup and Recovery User's Guide*

## 6.2 About SQLcl Support

Learn about Oracle SQL Developer Command Line support in Oracle APEX.

As an alternative to using SQL\*Plus, you can install Oracle APEX using Oracle SQL Developer Command Line (SQLcl) release 22.1 and later. To use SQLcl when installing, simply replace the `sqlplus` command with `sql`.

 **See Also:**

Working with SQLcl in *Oracle SQLcl User's Guide*

## 6.3 Downloading and Installing Oracle APEX

Learn about downloading and installing Oracle APEX.

How you install Oracle APEX depends upon by the type of database into which you are installing. This topic describes how to download and install Oracle APEX in self-managed databases, such as your laptop or your data center, or co-managed Cloud databases such as Database Cloud Service (DBaaS) and Exadata Cloud Service. In fully managed Cloud databases, such as an Autonomous Database or Oracle APEX Application Development (APEX Service), Oracle APEX is pre-installed and pre-configured. To learn more, refer to the documentation for your service.

- [Installing Oracle APEX](#)  
Install Oracle APEX by downloading a ZIP file from the Oracle APEX download page.
- [Creating or Updating Your Instance Administration Account](#)  
Learn how to create or update Instance Administrator account.
- [Restarting Processes](#)  
Restart the processes that you stopped before you began the installation.
- [Configuring the APEX\\_PUBLIC\\_USER Account](#)  
It is important to correctly configure the `APEX_PUBLIC_USER` account to enable proper operation of Oracle APEX.
- [Configuring RESTful Services](#)  
In a new installation of Oracle APEX, you must run the configuration script `apex_rest_config.sql` to configure RESTful Services.

 **See Also:**

- Welcome to Oracle APEX Application Development Service in *Getting Started with Oracle APEX Application Development*
- Creating Applications with Oracle Application Express on Autonomous Database in *Using Oracle Autonomous Database on Shared Exadata Infrastructure*
- [Utilizing the Multitenant Architecture in Oracle Database 12c or Later](#)

## 6.3.1 Installing Oracle APEX

Install Oracle APEX by downloading a ZIP file from the Oracle APEX download page.

 **Tip:**

Oracle APEX must be installed from a writable directory on the file system. See [Reviewing a Log of an Installation Session](#).

To install Oracle APEX:

1. For installations where the development will be in English only, download the file `apex_22.1_en.zip` from the Oracle APEX download page. If the development will include languages other than English, download `apex_22.1.zip` from the Oracle APEX download page. See:

<https://www.oracle.com/tools/downloads/apex-downloads.html>

Note that the actual file name may differ if a more recent release has shipped since this document was published.

2. Unzip downloaded zip file:
  - If English only, unzip `apex_22.1_en.zip` as follows, preserving directory names:
    - UNIX and Linux: `$ unzip apex_22.1_en.zip`
    - Windows: Double click the file `apex_22.1_en.zip` in Windows Explorer
  - If multiple languages, unzip `apex_22.1.zip` as follows, preserving directory names:
    - UNIX and Linux: `$ unzip apex_22.1.zip`
    - Windows: Double click the file `apex_22.1.zip` in Windows Explorer

 **Note:**

You should keep the directory tree where you unzip the files short and not under directories that contain spaces. For example, within Windows unzip to `C:\TEMP`.

3. Change your working directory to `apex`.
4. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

5. Disable any existing password complexity rules for the default profile.
6. Select the appropriate installation option.

**Full development environment** provides complete access to the App Builder environment to develop applications. A **Runtime environment** enables users to run applications that cannot be modified.

Available installation options include:

- **Full development environment.** Run `apexins.sql` passing the following four arguments in the order shown:

```
@apexins.sql tablespace_apex tablespace_files tablespace_temp images
```

Where:

- `tablespace_apex` is the name of the tablespace for the Oracle APEX application user.
- `tablespace_files` is the name of the tablespace for the Oracle APEX files user.
- `tablespace_temp` is the name of the temporary tablespace or tablespace group.
- `images` is the virtual directory for Oracle APEX images. For installations using EPG, `/i/` is the required value for the images argument. To support future Oracle APEX upgrades, define the virtual image directory as `/i/`.

Example:

```
@apexins.sql SYSAUX SYSAUX TEMP /i/
```

 **Note:**

If you receive the following error, exit SQL\*Plus and change your working directory to where you unzipped the installation file, for example `C:\TEMP` in Windows, before starting SQL\*Plus:

```
SP2-0310: unable to open file "apexins.sql"
```

- **Runtime environment.** Run `apxrtins.sql` passing the following arguments in the order shown:

```
@apxrtins.sql tablespace_apex tablespace_files tablespace_temp images
```

Where:

- `tablespace_apex` is the name of the tablespace for the Oracle APEX application user.
- `tablespace_files` is the name of the tablespace for the Oracle APEX files user.
- `tablespace_temp` is the name of the temporary tablespace or tablespace group.
- `images` is the virtual directory for Oracle APEX images. To support future Oracle APEX upgrades, define the virtual image directory as `/i/`.

Example:

```
@apxrtins.sql SYSAUX SYSAUX TEMP /i/
```

When Oracle APEX installs, it creates the following database accounts:

- `APEX_220100` - This account owns the Oracle APEX schema and metadata.
- `FLows_FILES` - This account owns the Oracle APEX uploaded files.
- `APEX_PUBLIC_USER` - This minimally privileged account is used for Oracle APEX configuration with Oracle REST Data Services or Oracle HTTP Server and `mod_plsql`.

If you configured RESTful Web services, then these additional accounts will be created:

- `APEX_REST_PUBLIC_USER` - The account used when invoking RESTful Services definitions stored in Oracle APEX.
- `APEX_LISTENER` - The account used to query RESTful Services definitions stored in Oracle APEXs.

If you are upgrading from a previous release, then `FLows_FILES` already exists and `APEX_PUBLIC_USER` is created if it does not already exist.

#### See Also:

- [About the Oracle APEX Runtime Environment](#)
- Configuring Password Protection in *Oracle Database Security Guide*
- *SQL\*Plus User's Guide and Reference* for more information about SQL\*Plus

## 6.3.2 Creating or Updating Your Instance Administration Account

Learn how to create or update Instance Administrator account.

This section describes how to create or update your Instance Administrator account.



**Tip:**

Skip this section if you are upgrading from a previous release of Oracle APEX. In an upgrade scenario, the Instance Administrator account and password is preserved and carried over from the prior release.

- [What Is an Instance Administrator?](#)  
Instance administrators are superusers that are responsible for managing an entire Oracle APEX instance, including managing workspace provisioning, configuring features and instance settings, and managing security.
- [About apxchpwd.sql](#)  
Running the `apxchpwd.sql` script enables you to create or update your Instance Administrator account.
- [Running apxchpwd.sql](#)  
Run the `apxchpwd.sql` script to create and update your Instance Administrator account.

### 6.3.2.1 What Is an Instance Administrator?

Instance administrators are superusers that are responsible for managing an entire Oracle APEX instance, including managing workspace provisioning, configuring features and instance settings, and managing security.

To perform these tasks, an Instance administrator signs in to the Oracle APEX Administration Services application.



**See Also:**

Oracle APEX Administration Services in *Oracle APEX Administration Guide*

### 6.3.2.2 About apxchpwd.sql

Running the `apxchpwd.sql` script enables you to create or update your Instance Administrator account.



**Note:**

The `apxchpwd.sql` script is not supported on Oracle Autonomous Database on Shared Exadata Infrastructure and Oracle APEX Application Development (APEX Service).

You must run the `apxchpwd.sql` script in the following scenarios:

- **New Oracle APEX installations** - Run `apxchpwd.sql` to create an Instance Administrator account and password.

- **Converting of a runtime environment to a development environment** - Run `apxchpwd.sql` to change the Instance Administrator account password.
- **Changing Your Instance Administrator Password** -Run `apxchpwd.sql` to change the password for an existing Instance Administrator account.
- **Unlocking Your Instance Administrator Account** - Run `apxchpwd.sql` to unlock an existing Instance Administrator account.

 **Tip:**

You do not need to run `apxchpwd.sql` when upgrading from a previous release of Oracle APEX. In an upgrade scenario, the Instance Administrator account password is preserved and carried over from the prior release.

### 6.3.2.3 Running `apxchpwd.sql`

Run the `apxchpwd.sql` script to create and update your Instance Administrator account.

To create or update your Instance Administrator account:

1. Change your working directory to the `apex` directory where you unzipped the installation software.
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Run `apxchpwd.sql`. For example:

```
@apxchpwd.sql
```

Follow the on-screen instructions. You will be prompted provide a username, password, and email address. If the account username does not exist, it will be created for you.

 **See Also:**

*SQL\*Plus User's Guide and Reference* for more information about SQL\*Plus

## 6.3.3 Restarting Processes

Restart the processes that you stopped before you began the installation.

After you install Oracle APEX, you must restart the processes that you stopped before you began the installation.

## 6.3.4 Configuring the APEX\_PUBLIC\_USER Account

It is important to correctly configure the APEX\_PUBLIC\_USER account to enable proper operation of Oracle APEX.

- [About the APEX\\_PUBLIC\\_USER Account](#)  
The APEX\_PUBLIC\_USER account is created with a random password in a new installation of Oracle APEX.
- [Unlocking the APEX\\_PUBLIC\\_USER Account](#)  
Unlock the APEX\_PUBLIC\_USER account by running a SQL statement.
- [Changing the Password for the APEX\\_PUBLIC\\_USER Account](#)  
Change the password for the APEX\_PUBLIC\_USER account by running a SQL statement.
- [About Password Expiration in Oracle Database 11g and Later](#)  
You can set PASSWORD\_LIFE\_TIME parameter to unlimited by altering APEX\_PUBLIC\_USER to prevent password expiration. To do this create another profile in which the PASSWORD\_LIFE\_TIME parameter is set to unlimited and alter the APEX\_PUBLIC\_USER account and assign it to the new profile.

### 6.3.4.1 About the APEX\_PUBLIC\_USER Account

The APEX\_PUBLIC\_USER account is created with a random password in a new installation of Oracle APEX.

You must change the password for this account before configuring the database access descriptor (DAD) in a new installation.

### 6.3.4.2 Unlocking the APEX\_PUBLIC\_USER Account

Unlock the APEX\_PUBLIC\_USER account by running a SQL statement.

**Tip:**

If you are upgrading from a prior release of Oracle APEX, this step is unnecessary.

To unlock the APEX\_PUBLIC\_USER account:

1. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role. If Oracle APEX is installed in the CDB, ensure you connect to CDB\$ROOT. For example:
  - On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

2. Run the following statement:

```
ALTER USER APEX_PUBLIC_USER ACCOUNT UNLOCK
```

### 6.3.4.3 Changing the Password for the APEX\_PUBLIC\_USER Account

Change the password for the APEX\_PUBLIC\_USER account by running a SQL statement.



#### Tip:

If you are upgrading from a prior release of Oracle APEX, this step is unnecessary.

To change the password for the APEX\_PUBLIC\_USER account:

1. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role. If Oracle APEX is installed in the CDB, ensure you connect to CDB\$ROOT. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

2. Run the following statement:

```
ALTER USER APEX_PUBLIC_USER IDENTIFIED BY new_password
```

Where `new_password` is the new password you are setting for APEX\_PUBLIC\_USER. You will use this password when creating the DAD in the sections that follow.

### 6.3.4.4 About Password Expiration in Oracle Database 11g and Later

You can set `PASSWORD_LIFE_TIME` parameter to unlimited by altering APEX\_PUBLIC\_USER to prevent password expiration. To do this create another profile in which the `PASSWORD_LIFE_TIME` parameter is set to unlimited and alter the APEX\_PUBLIC\_USER account and assign it to the new profile.

In the default profile in Oracle Database 11g or later, the parameter `PASSWORD_LIFE_TIME` is set to 180. If you are using Oracle Database 11g or later with Oracle APEX, this causes the password for APEX\_PUBLIC\_USER to expire in 180 days.

As a result, your Oracle APEX instance will become unusable until you change the password.

 **See Also:**

*Oracle Database Security Guide* for information on creating profiles and assigning them to database users

## 6.3.5 Configuring RESTful Services

In a new installation of Oracle APEX, you must run the configuration script `apex_rest_config.sql` to configure RESTful Services.

Once configured, the instance administrator can control the availability of the feature. If the instance administrator has disabled RESTful Services for this Oracle APEX instance, RESTful Services are not available for this instance and the RESTful Services icon does not display.

To configure RESTful Services in Oracle APEX:

1. Change your working directory to the `apex` directory where you unzipped the installation software.
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Run `apex_rest_config.sql`. For example:

```
@apex_rest_config.sql
```

When Prompted, enter a password for the `APEX_LISTENER` and `APEX_REST_PUBLIC_USER` accounts.

When configuring RESTful Services in Oracle APEX, it creates two new database accounts.

- `APEX_LISTENER` - The account used to query RESTful Services definitions stored in Oracle APEX.
- `APEX_REST_PUBLIC_USER` - The account used when calling RESTful Services definitions stored in Oracle APEX.

**See Also:**

Enabling RESTful Services for an Instance in *Oracle APEX Administration Guide*

## 6.4 Downloading and Installing Oracle REST Data Services

Learn about downloading and installing Oracle REST Data Services.

The Oracle APEX architecture requires a web server to proxy requests between a web browser and the APEX engine. Oracle REST Data Services meets the requirement but its use goes beyond that of Oracle APEX. Oracle REST Data Services simplifies the deployment process because there is no Oracle home required, as connectivity is provided using an embedded JDBC driver.

- [Downloading Oracle REST Data Services](#)  
Learn how to download Oracle REST Data Services.
- [About Configuring Oracle REST Data Services Behind a Reverse Proxy or Load Balancer](#)  
When Oracle APEX is running behind a reverse proxy or load balancer, it is important to communicate the original HTTP hostname and protocol as seen by the user's browser to the Oracle APEX engine.
- [Web Server HTTP POST Request Limits](#)  
Learn about Web Server HTTP POST request limits.

**See Also:**

- Introduction to Oracle REST Data Services in *Oracle REST Data Services Developer's Guide*
- Installing and Configuring Oracle REST Data Services in *Oracle REST Data Services Installation and Configuration Guide*

### 6.4.1 Downloading Oracle REST Data Services

Learn how to download Oracle REST Data Services.

**Tip:**

By default, the context root for accessing Oracle APEX through Oracle REST Data Services is `/ords`. If you wish to have a context root of `/apex` for accessing Oracle APEX, rename the `ords.war` file to `apex.war` before installing Oracle REST Data Services. See *Deploying and Monitoring Oracle REST Data Services in Oracle REST Data Services Installation and Configuration Guide*.

To download Oracle REST Data Services:

1. Download the latest release of Oracle REST Data Services from the [Oracle REST Data Services download page](#).
2. Unzip the downloaded zip file into a directory (or folder) of your choice:
  - UNIX and Linux: `unzip ords.version.number.zip`
  - Windows: Double-click the file `ords.version.number.zip` in Windows Explorer
3. Copy the images directory, `apex/images`, from the Oracle APEX software ZIP to a location on the file system where Oracle REST Data Services is installed.
4. Follow and complete all installation and configuration steps described in Installing and Configuring Oracle REST Data Services in *Oracle REST Data Services Installation and Configuration Guide*.
5. For Oracle Database 12c or later multitenant architecture, ensure that you configure the connection using the service name of the specific pluggable database (PDB) you want to access. Do not use the service name of the `CDB$ROOT` unless you are configuring Oracle REST Data Services to address PDBs through the URL. See Using the Multitenant Architecture with Oracle REST Data Services in *Oracle REST Data Services Installation and Configuration Guide* for more information.

## 6.4.2 About Configuring Oracle REST Data Services Behind a Reverse Proxy or Load Balancer

When Oracle APEX is running behind a reverse proxy or load balancer, it is important to communicate the original HTTP hostname and protocol as seen by the user's browser to the Oracle APEX engine.

The Oracle APEX engine uses this information to generate valid URLs in HTML responses and HTTP redirects that the user's browser can successfully follow. The exact configuration steps depend on your Java EE application server. For example, for Oracle WebLogic Server, this is accomplished using Oracle WebLogic Server Proxy Plug-Ins. To learn more, see your Java EE application server documentation.

## 6.4.3 Web Server HTTP POST Request Limits

Learn about Web Server HTTP POST request limits.

When running Oracle REST Data Services (ORDS) in standalone mode or within a Tomcat Java Container, size limits are being imposed on POST requests which are **not** file uploads. Oracle APEX users will encounter these limits when uploading data in SQL Workshop using copy and paste or when using copy and paste while building an application from spreadsheet.

- When running Oracle REST Data Services in **Standalone Mode**, the default limit is 200 KB for ORDS 19.4.6 and earlier. It is recommended to increase the limit as follows:

Set the Java System property

```
org.eclipse.jetty.server.Request.maxFormContentSize to a higher value in bytes.  
You can set this property upon startup of Oracle REST Data Services. For example: java  
-Dorg.eclipse.jetty.server.Request.maxFormContentSize=3000000 -jar ords.war
```

- When running on Apache Tomcat, the default limit is 2 megabytes. Adjust Apache Tomcat's `maxPostSize` parameter to change that limit.

 **See Also:**

<http://tomcat.apache.org/> for more information.

## 6.5 Configuring Oracle REST Data Services

Configuring Oracle REST Data Services requires that you copy the images directory, if you are using an older release validate the Oracle REST Data Services installation, configure static files support, and secure Oracle REST Data Services.

- **Copying the Images Directory**  
Whether you are loading a new installation or upgrading from a previous release, you must copy the images directory from the top level of the `apex\images` directory, for example `C:\TEMP`, to the location used by your Oracle REST Data Services installation.
- **Validating the Oracle REST Data Services Installation**  
In a new installation or upgrade of Oracle APEX and if you are using Oracle REST Data Services 21.2.1 or older, you must validate the Oracle REST Data Services installation.
- **Configuring Static File Support**  
For configuring static files, you must run `apex_rest_config.sql` after a new installation of Oracle APEX.
- **Securing Oracle REST Data Service**  
In a configuration for Oracle APEX, Oracle recommends setting the parameter `security.requestValidationFunction` to `wwv_flow_epg_include_modules.authorize`.

### 6.5.1 Copying the Images Directory

Whether you are loading a new installation or upgrading from a previous release, you must copy the images directory from the top level of the `apex\images` directory, for example `C:\TEMP`, to the location used by your Oracle REST Data Services installation.

During an upgrade, you overwrite your existing images directory. Before you begin the upgrade, to ensure that you can revert to the previous version, Oracle recommends that you create a copy of your existing images directory for Oracle APEX, indicating the release number of the images (for example, `images_5_1`).

 **See Also:**

*Oracle REST Data Services Installation, Configuration, and Development Guide*

## 6.5.2 Validating the Oracle REST Data Services Installation

In a new installation or upgrade of Oracle APEX and if you are using Oracle REST Data Services 21.2.1 or older, you must validate the Oracle REST Data Services installation.

For validating the Oracle REST Data Services installation in a new installation or upgrade of Oracle APEX, run the following command:

```
java -jar ords.war validate [--database <dbname>]
```

### See Also:

Repairing the Oracle REST Data Services Installation in *Oracle REST Data Services Installation and Configuration Guide*

## 6.5.3 Configuring Static File Support

For configuring static files, you must run `apex_rest_config.sql` after a new installation of Oracle APEX.

Oracle APEX enables application developers to include static files with their applications. Static files can be associated with a workspace, an application, a plug-in, or an application theme. When using Oracle REST Data Services as your web server, static files are served using RESTful service module built into Oracle APEX. Therefore, you must run `apex_rest_config.sql` after a new installation of Oracle APEX.

## 6.5.4 Securing Oracle REST Data Service

In a configuration for Oracle APEX, Oracle recommends setting the parameter `security.requestValidationFunction` to `wwv_flow_epg_include_modules.authorize`.

Set parameter `security.requestValidationFunction` to `wwv_flow_epg_include_modules.authorize` activates the white list of callable procedures which ships with Oracle APEX and prohibits calls to other procedures.

### See Also:

About Configuring Oracle REST Data Services with Oracle APEX in *Oracle APEX App Builder User's Guide*

## 6.6 Enabling Network Services in Oracle Database

You must enable network services in Oracle Database to send outbound mail, use Web services, or use template-based PDF report printing with BI Publisher in Oracle APEX.

- [When and Why Network Services Must be Enabled](#)  
Enabling network services enables support for sending outbound mail in Oracle APEX, use of Web services in APEX, and PDF report printing with BI Publisher.

- [Granting Connect Privileges in Oracle Database 12c or Later](#)  
Procedures `CREATE_ACL`, `ASSIGN_ACL`, `ADD_PRIVILEGE` and `CHECK_PRIVILEGE` in `DBMS_NETWORK_ACL_ADMIN` are deprecated in Oracle Database 12c. Oracle recommends to use `APPEND_HOST_ACE`.
- [Troubleshooting an Invalid ACL Error](#)  
Learn how to identify any invalid ACL error by running the query.

## 6.6.1 When and Why Network Services Must be Enabled

Enabling network services enables support for sending outbound mail in Oracle APEX, use of Web services in APEX, and PDF report printing with BI Publisher.

By default, the ability to interact with network services is disabled in Oracle Database 11g Release 2 or later. Therefore, if you are running Oracle APEX with Oracle Database 11g Release 2 or later, you must use the new `DBMS_NETWORK_ACL_ADMIN` package to grant connect privileges to any host for the `APEX_220100` database user. Failing to grant these privileges results in issues with:

- Sending outbound mail in Oracle APEX.  
Users can call methods from the `APEX_MAIL` package, but issues arise when sending outbound email.
- Consuming web services from APEX.
- Making outbound LDAP calls from APEX.
- PDF report printing with BI Publisher.

### Note:

When upgrading APEX on a database 12c or newer, based on the configuration of the old APEX version the upgrade automatically configures Network Services.

### Tip:

To run the examples described in this section, the compatible initialization parameter of the database must be set to at least 11.1.0.0.0. By default an 11g or 12c database will already have the parameter set properly, but a database upgraded to 11g or 12c from a prior version may not. For information about changing database initialization parameters, see *Specifying the Database Compatibility Level* in *Oracle Multitenant Administrator's Guide*.

### See Also:

About Report Printing in *Oracle APEX App Builder User's Guide*.

## 6.6.2 Granting Connect Privileges in Oracle Database 12c or Later

Procedures `CREATE_ACL`, `ASSIGN_ACL`, `ADD_PRIVILEGE` and `CHECK_PRIVILEGE` in `DBMS_NETWORK_ACL_ADMIN` are deprecated in Oracle Database 12c. Oracle recommends to use `APPEND_HOST_ACE`.

The following example demonstrates how to grant connect privileges to any host for the `APEX_220100` database user. This example assumes you connected to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role.

```
BEGIN
  DBMS_NETWORK_ACL_ADMIN.APPEND_HOST_ACE(
    host => '*',
    ace => xs$ace_type(privilege_list => xs$name_list('connect'),
                      principal_name => 'APEX_220100',
                      principal_type => xs_acl.ptype_db));
END;
/
```

The following example demonstrates how to provide less privileged access to local network resources. This example enables access to servers on the local host only, such as email and report servers.

```
BEGIN
  DBMS_NETWORK_ACL_ADMIN.APPEND_HOST_ACE(
    host => 'localhost',
    ace => xs$ace_type(privilege_list => xs$name_list('connect'),
                      principal_name => 'APEX_220100',
                      principal_type => xs_acl.ptype_db));
END;
/
```

## 6.6.3 Troubleshooting an Invalid ACL Error

Learn how to identify any invalid ACL error by running the query.

If you receive an `ORA-44416: Invalid ACL` error after running the previous script, use the following query to identify the invalid ACL:

```
REM Show the dangling references to dropped users in the ACL that is assigned
REM to '*'.
```

```
SELECT ACL, PRINCIPAL
       FROM DBA_NETWORK_ACLS NACL, XDS_ACE ACE
       WHERE HOST = '*' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL AND
              NACL.ACLID = ACE.ACLID AND
              NOT EXISTS (SELECT NULL FROM ALL_USERS WHERE USERNAME = PRINCIPAL);
```

Next, run the following code to fix the ACL:

```
DECLARE
  ACL_ID RAW(16);
  CNT NUMBER;
BEGIN
  -- Look for the object ID of the ACL currently assigned to '*'
  SELECT ACLID INTO ACL_ID FROM DBA_NETWORK_ACLS
  WHERE HOST = '*' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

  -- If just some users referenced in the ACL are invalid, remove just
  those
  -- users in the ACL. Otherwise, drop the ACL completely.
  SELECT COUNT(PRINCIPAL) INTO CNT FROM XDS_ACE
  WHERE ACLID = ACL_ID AND
  EXISTS (SELECT NULL FROM ALL_USERS WHERE USERNAME =
  PRINCIPAL);

  IF (CNT > 0) THEN

    FOR R IN (SELECT PRINCIPAL FROM XDS_ACE
              WHERE ACLID = ACL_ID AND
              NOT EXISTS (SELECT NULL FROM ALL_USERS
                          WHERE USERNAME = PRINCIPAL)) LOOP

      UPDATE XDB.XDB$ACL
      SET OBJECT_VALUE =
        DELETETEXTXML(OBJECT_VALUE,
                      '/ACL/ACE[PRINCIPAL="' || R.PRINCIPAL || '"]')
      WHERE OBJECT_ID = ACL_ID;
    END LOOP;

  ELSE
    DELETE FROM XDB.XDB$ACL WHERE OBJECT_ID = ACL_ID;
  END IF;

END;
/

REM commit the changes.

COMMIT;
```

Once the ACL has been fixed, you must run the first script in this section to apply the ACL to the `APEX_220100` user.

## 6.7 Performing Security Tasks

Oracle recommends configuring and using Secure Sockets Layer (SSL) to ensure that passwords and other sensitive data are not transmitted in clear text in HTTP requests.

Without the use of SSL, passwords could potentially be exposed, compromising security.

SSL is an industry standard protocol that uses RSA public key cryptography in conjunction with symmetric key cryptography to provide authentication, encryption, and data integrity.



**See Also:**

Configuring HTTP Protocol Attributes in *Oracle APEX Administration Guide*

## 6.8 Controlling the Number of Concurrent Jobs

Learn about specifying the number of concurrently running jobs.

- [About Managing the Number of Concurrent Jobs](#)  
Learn about managing maximum number of concurrently running jobs.
- [Viewing the Number of JOB\\_QUEUE\\_PROCESSES](#)  
You can view number of JOB\_QUEUE\_PROCESSES in three ways.
- [Changing the Number of JOB\\_QUEUE\\_PROCESSES](#)  
You can change the number of JOB\_QUEUE\_PROCESSES by running a SQL statement in SQL\*Plus.

### 6.8.1 About Managing the Number of Concurrent Jobs

Learn about managing maximum number of concurrently running jobs.

JOB\_QUEUE\_PROCESSES determine the maximum number of concurrently running jobs. In Oracle APEX transactional support and SQL scripts require jobs. If JOB\_QUEUE\_PROCESSES is not enabled and working properly, you cannot successfully execute a script.

### 6.8.2 Viewing the Number of JOB\_QUEUE\_PROCESSES

You can view number of JOB\_QUEUE\_PROCESSES in three ways.

- [Viewing JOB\\_QUEUE\\_PROCESSES in the Installation Log File](#)  
View JOB\_QUEUE\_PROCESSES in the installation log files.
- [Viewing JOB\\_QUEUE\\_PROCESSES in Oracle APEX](#)  
View the number of JOB\_QUEUE\_PROCESSES on the About Oracle APEX page.
- [Viewing JOB\\_QUEUE\\_PROCESSES from SQL\\*Plus](#)  
View the number of JOB\_QUEUE\_PROCESSES from SQL\*Plus.

#### 6.8.2.1 Viewing JOB\_QUEUE\_PROCESSES in the Installation Log File

View JOB\_QUEUE\_PROCESSES in the installation log files.



**See Also:**

[Reviewing a Log of an Installation Session](#)

## 6.8.2.2 Viewing JOB\_QUEUE\_PROCESSES in Oracle APEX

View the number of `JOB_QUEUE_PROCESSES` on the About Oracle APEX page.

To view the About Oracle APEX page:

1. Sign in to Oracle APEX.
2. Locate the Help menu at the top of the page.
3. From the Help menu, select **About**.

The About Oracle APEX page appears.

4. Scroll down and find `JOB_QUEUE_PROCESSES` at the bottom of the page.



### See Also:

[Signing In to Your Workspace](#)

## 6.8.2.3 Viewing JOB\_QUEUE\_PROCESSES from SQL\*Plus

View the number of `JOB_QUEUE_PROCESSES` from SQL\*Plus.

To view the number of `JOB_QUEUE_PROCESSES` from SQL\*Plus:

1. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

2. Run the appropriate SQL statement. For example:

```
SELECT VALUE FROM v$parameter WHERE NAME = 'job_queue_processes'
```

## 6.8.3 Changing the Number of JOB\_QUEUE\_PROCESSES

You can change the number of `JOB_QUEUE_PROCESSES` by running a SQL statement in SQL\*Plus.

To update the number of `JOB_QUEUE_PROCESSES`:

1. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

2. In SQL\*Plus run the following SQL statement:

```
ALTER SYSTEM SET JOB_QUEUE_PROCESSES = <number>
```

For example, running the statement `ALTER SYSTEM SET JOB_QUEUE_PROCESSES = 20` sets `JOB_QUEUE_PROCESSES` to 20.

## 6.9 About Running Oracle APEX in Other Languages

You can install a single instance of Oracle APEX with one or more of translated versions.

The Oracle APEX developer and admin interface is translated into the 9 standard languages: French, German, Italian, Japanese, Korean, Portuguese (Brazil), Simplified Chinese, Spanish, and Traditional Chinese. Developers can choose to run the Oracle APEX development environment in any of the installed languages by simply selecting the language from the App Builder log in screen or home page.

The Oracle APEX runtime engine which is used by developers to create applications is available in the following additional languages: Arabic, Brazilian Portuguese, Croatian, Czech, Danish, Dutch, Finnish, French, French - Canada, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese (Portugal) (pt), Romanian, Russian, Serbian - Cyrillic, Serbian - Latin, Simplified Chinese, Slovak, Slovenian, Spanish, Swedish, Thai, Traditional Chinese, and Turkish.

A single instance of Oracle APEX can be installed with one or more of these translated versions.

In order to install other languages you must use the `apex_22.1.zip` file which contains the extra files as described in [Installing Translated Versions of Oracle APEX](#). If you previously downloaded `apex_22.1_en.zip`, then you do not need to re-install Oracle APEX. Simply download `apex_22.1.zip` and unzip the file into the same directory where you unzipped `apex_22.1_en.zip`.

The translated version of Oracle APEX should be loaded into a database that has a character set that supports the specific language. If you attempt to install a translated version of Oracle APEX into a database that does not support the character encoding of the language, the installation may fail or the translated Oracle APEX instance may appear corrupt when run. The database character set `AL32UTF8` supports all the translated versions of Oracle APEX.

You can manually install translated versions of Oracle APEX using SQL\*Plus. The installation files are encoded in AL32UTF8.

**Note:**

Regardless of the target database character set, to install a translated version of Oracle APEX, you must set the character set value of the NLS\_LANG environment variable to AL32UTF8 before starting SQL\*Plus.

The following examples illustrate valid NLS\_LANG settings for loading Oracle APEX translations:

```
American_America.AL32UTF8  
Japanese_Japan.AL32UTF8
```

## 6.10 Installing Translated Versions of Oracle APEX

Learn about installing translated versions of Oracle APEX.

- [About Installing Translated Versions of Oracle APEX](#)  
Whether you are installing for the first time or upgrading from a previous release, you must run the `load_lang.sql` script to run a translated version of Oracle APEX.
- [Installing a Translated Version of Oracle APEX](#)  
Learn how to run the appropriate language specific script to install a translated version of Oracle APEX.

**See Also:**

Managing Application Globalization in *Oracle APEX App Builder User's Guide*

### 6.10.1 About Installing Translated Versions of Oracle APEX

Whether you are installing for the first time or upgrading from a previous release, you must run the `load_lang.sql` script to run a translated version of Oracle APEX.

The Oracle APEX developer and admin interface is translated into the 9 standard languages: French, German, Italian, Japanese, Korean, Portuguese (Brazil), Simplified Chinese, Spanish, and Traditional Chinese. Developers can choose to run the Oracle APEX development environment in any of the installed languages by simply selecting the language from the Sign In page or home page.

The Oracle APEX runtime engine which is used by developers to create applications is available in the following languages: Arabic, Brazilian Portuguese, Croatian, Czech, Danish, Dutch, Finnish, French, French - Canada, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese (Portugal) (pt), Romanian, Russian, Serbian - Cyrillic, Serbian - Latin, Simplified Chinese, Slovak, Slovenian, Spanish, Swedish, Thai, Traditional Chinese, and Turkish.

To support additional languages not covered in the above list, developers must provide their own translations. For example, if you develop a Bulgarian application and want to include report messages, such as pagination, in Bulgarian, you must translate the strings used in messages displayed in reports.

 **See Also:**

Translating Messages Used Internally by APEX in *Oracle APEX App Builder User's Guide*

## 6.10.2 Installing a Translated Version of Oracle APEX

Learn how to run the appropriate language specific script to install a translated version of Oracle APEX.

The installation scripts are located in subdirectories identified by a language code in the unzipped distribution `apex/builder`. For example, the German version is located in `apex/builder/de` and the Japanese version is located in `apex/builder/ja`. Within each directory, there is a language loading script identified by the language code (for example, `load_de.sql` or `load_ja.sql`).

 **Note:**

If you have applied a Patch Set and then install translations, you must re-execute the Patch Set to apply all fixes to the translations.

To install a translated version of Oracle APEX:

1. Set the `NLS_LANG` environment variable, making sure that the character set is `AL32UTF8`. For example:

- Bourne or Korn shell:

```
NLS_LANG=American_America.AL32UTF8
export NLS_LANG
```

- C shell:

```
setenv NLS_LANG American_America.AL32UTF8
```

- For Windows based systems:

```
set NLS_LANG=American_America.AL32UTF8
```

2. Navigate to the directory under `apex/builder` based on the language you need to install. For example for German, navigate to `apex/builder/de`. Start `SQL*Plus` and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Execute the appropriate language specific script. For example:

```
@load_lang.sql
```

Where `lang` is the specific language (for example, `load_de.sql` for German or `load_ja.sql` for Japanese).

## 6.11 Creating a Workspace and Adding Oracle APEX Users

Before you can develop or install applications, you must create a workspace, add Oracle APEX users, and sign in to your workspace.

- [About Workspaces and Users](#)  
A workspace enables multiple users to work within the same Oracle APEX installation while keeping their objects, data, and applications private.
- [Signing In To Administration Services](#)  
Sign in to Oracle APEX Administration Services using the Instance administrator account and password created or reset during the installation process.
- [Creating a Workspace Manually](#)  
Sign in to Oracle APEX Administration Services to create workspace manually.
- [Creating Oracle APEX Users](#)  
Create new users in Oracle APEX Administration Services.
- [Signing In to Your Workspace](#)  
Sign in to a workspace by navigating to the Oracle APEX Sign In page.

### 6.11.1 About Workspaces and Users

A workspace enables multiple users to work within the same Oracle APEX installation while keeping their objects, data, and applications private.

You access the Oracle APEX home page by logging in to a workspace using a JavaScript enabled Web browser.

Each workspace has a unique ID and name. An instance administrator can create a workspace manually within Oracle APEX Administration Services or have users submit requests. Oracle APEX Administration Services is a separate application for managing an entire Oracle APEX instance.

## 6.11.2 Signing In To Administration Services

Sign in to Oracle APEX Administration Services using the Instance administrator account and password created or reset during the installation process.

To manually create a workspace and user accounts, you sign in to a separate application for managing an entire Oracle APEX instance called Oracle APEX Administration Services.

To sign in to Oracle APEX Administration Services:

1. In a Web browser, navigate to the Administration Services Sign In page:

 **Tip:**

By default, the context root for accessing Oracle APEX through Oracle REST Data Services is `/ords`. If you wish to have a context root of `/apex` for accessing Oracle APEX, rename the `ords.war` file to `apex.war` before installing Oracle REST Data Services. See *Deploying and Monitoring Oracle REST Data Services* in *Oracle REST Data Services Installation and Configuration Guide*.

By default, Administration Services installs to the following location:

```
http://hostname:port/ords/apex_admin
```

Where:

- `hostname` is the name of the system where Oracle REST Data Services is installed.
  - `port` is the port number assigned when configuring Oracle REST Data Services. In a default installation, this number is 8080. To learn more, see *Installing and Configuring Oracle REST Data Services* in *Oracle REST Data Services Installation and Configuration Guide*.
  - `ords` is the service name defined when configuring Oracle REST Data Services.
2. On the Sign In page:
    - a. Username - Enter the Instance administrator account username specified in [Creating or Updating Your Instance Administration Account](#).
    - b. Password - Enter your Instance administrator account password.
    - c. Click **Sign In to Administration**.

Oracle APEX Administration Services appears.

Note that, depending on your setup, you might be required to change your password when you log in for the first time.

 **See Also:**

Oracle APEX Administration Services in *Oracle APEX Administration Guide*

## 6.11.3 Creating a Workspace Manually

Sign in to Oracle APEX Administration Services to create workspace manually.

To manually create a workspace you sign in, sign in to Oracle APEX Administration Services using the `ADMIN` account and password created or reset during the installation process.

To create an Oracle APEX workspace manually:

1. Access Oracle APEX Administration Services.  
Administration Services appears. Next, create a workspace.
2. Click **Manage Workspaces**.
3. Under Workspace Actions, click **Create Workspace**.  
The Create Workspace Wizard appears.
4. For Identify Workspace, enter the following:
  - a. Workspace Name - Enter a unique workspace name.
  - b. Workspace ID - Leave Workspace ID blank to have the new Workspace ID automatically generated. A Workspace ID must be a positive integer greater than 100000.
  - c. Workspace Description - Enter a workspace description.
  - d. Click **Next**.
5. For Identify Schema, specify whether you are re-using an existing schema or creating a new one.  
If you are using an existing schema:
  - a. For Re-use existing schema, select **Yes**.
  - b. Select a schema from the list.
  - c. Click **Next**.  
If you are creating a new schema:
  - a. For Re-use existing schema, select **No**.
  - b. Enter a schema name and password.
  - c. Specify a space quota.
  - d. Click **Next**.
6. For Identify Administrator, enter the Workspace administrator information and click **Next**.
7. Confirm your selections and click **Create Workspace**.

 **See Also:**

- Creating Workspaces in Administration Services in *Oracle APEX Administration Guide*
- Managing Existing Workspaces in *Oracle APEX Administration Guide*

## 6.11.4 Creating Oracle APEX Users

Create new users in Oracle APEX Administration Services.

Create new users by signing into the Oracle APEX Administration Services application using your Instance administrator password.

To create an APEX user account:

1. Sign in to Oracle APEX Administration Services.
2. Click **Manage Workspaces**.
3. Under Workspace Actions, click **Manage Developers and Users**.  
The Manage Developers and Users page appears.
4. Click **Create User**.
5. Under User Attributes, enter the appropriate information. Fields marked with an asterisk are required.

 **Tip:**

Most attributes in Oracle APEX include field-level Help. Attributes with field-level Help, have light gray icon that resembles a question mark (?). To view field-level Help, click the Help icon.

6. Under Account Privileges:
  - a. **Workspace** - Select a workspace from the list.
  - b. **Default Schema** - Specify the default schema used for this user  
When using workspaces that have more than one schema available, this schema is the default. This setting does not control security, only the user's preference.
  - c. **User is an administrator** - Specify if this user should have workspace administrator privileges.  
Administrators are given access to all components. Additionally, they can manage user accounts, groups, and development services. Components may not be available if they are switched off by Instance Administrators.
  - d. **User is a developer** - Specify if this user should have developer privileges.  
Developers must have access to either App Builder, SQL Workshop, or both. These components may not be available if they are switched off by the Instance Administrator.

- e. **App Builder Access** - Determines whether a developer has access to the App Builder.
  - f. **SQL Workshop Access** - Determines whether a developer has access to the SQL Workshop.
  - g. **Team Development Access** - Determines whether a developer has access to the Team Development.
  - h. **Set Account Availability** - Select **Locked** to prevent the account from being used. Select **Unlocked** to allow the account to be used.  

If the user has exceeded the maximum log in failures allowed, specified in Workspace Preferences, then their account will be locked automatically.
  - a. **Workspace** - Select a workspace in which to create the user.
  - b. **Default Schema** - Select the default schema for this user.
  - c. **Accessible Schemas (null for all)** - Enter a colon-delimited list of schemas for which this developer has permissions when using the SQL Workshop.  

The list of schemas you enter here restricts the user to a subset of the full set of schemas provisioned for the workspace and determines what schema names the user sees in SQL Workshop.
  - d. **User is an administrator** - Select **Yes** or **No** to specify if this user should have workspace administrator privileges.  

Administrators are given access to all components. Additionally, they can manage user accounts, groups, and development services. Components may not be available if they are switched off by an Instance Administrator.
  - e. **User is a developer** - Select **Yes** or **No** to specify if this user should have developer privileges.  

Developers must have access to either the App Builder, SQL Workshop, or both. Components may not be available if they are switched off by Instance Administrators.
  - f. **App Builder Access** - Determines whether a developer has access to App Builder
  - g. **SQL Workshop Access** - Determines whether a developer has access to the SQL Workshop.
  - h. **Team Development Access** - Determines whether a user has access to the Team Development.
  - i. **Account Availability** - Select **Locked** to prevent the account from being used. Select **Unlocked** to allow the account to be used.
7. Under Password:
- **Password** - Enter a case sensitive password.
  - **Confirm Password** - Enter the password again.
  - **Require Change of Password On First Use** - Select **No** to allow the user to use the same password until it expires. Select **Yes** to require the user to change the password immediately when logging in the first time.
8. Click **Create User** or **Create and Create Another**.



**See Also:**

Managing Users Across an Oracle APEX Instance in *Oracle APEX Administration Guide*

## 6.11.5 Signing In to Your Workspace

Sign in to a workspace by navigating to the Oracle APEX Sign In page.

After you create a workspace and APEX users, you can sign in to your workspace using your credentials (that is, your workspace name, user name and password).

To sign in to a workspace:

1. In a Web browser, navigate to the Oracle APEX Sign In page:

```
http://hostname:port/apex/
```

Where:

- *hostname* is the name of the system where Oracle REST Data Services is installed.
- *port* is the port number assigned when configuring Oracle REST Data Services. In a default installation, this number is 8080. To learn more, see *Installing and Configuring Oracle REST Data Services in Oracle REST Data Services Installation and Configuration Guide*.
- *apex* is the service name defined when configuring Oracle REST Data Services.

The Sign In page appears.

2. On the Sign In page, enter:
  - Workspace - Enter the name of your workspace.
  - Username - Enter your user name.
  - Password - Enter your case-sensitive password.
3. Click **Sign In**.

Note that, depending on your setup, you might be required to change your password when you log in for the first time.



**See Also:**

- Creating Workspaces in Administration Services in *Oracle APEX Administration Guide*
- Managing Requests in *Oracle APEX Administration Guide*

## 6.12 Performing Post Installation Tasks for Upgrade Installations

Once you have verified that your upgrade installation was successful and all upgraded applications function properly, you should remove schemas from prior Oracle APEX installations.

- [About Removing Prior Oracle APEX Installations](#)  
Learn about removing schemas from a prior installation by verifying if a prior installation exists.
- [Verifying if a Prior Installation Exists](#)  
Run the SQL query to verify if a prior Oracle APEX installation exists.
- [Removing Schemas and SYS Objects from Prior Installations](#)  
Start SQL\*Plus and connect to database and execute a statement to remove schemas and SYS objects.
- [Removing Schemas from Prior Installations in a CDB](#)  
Use `catcon.pl` to remove schemas of prior installations in a CDB.
- [Fixing Invalid ACL](#)  
Learn how to fix an invalid ACL.



### See Also:

[Upgrading from a Previous Oracle APEX Release](#)

### 6.12.1 About Removing Prior Oracle APEX Installations

Learn about removing schemas from a prior installation by verifying if a prior installation exists.

The database users associated with schemas from prior installations are privileged users and should be removed when they are no longer necessary. Removing schemas from a prior installation is a two step process. First you verify if a prior installation exists and then you remove the schemas.

### 6.12.2 Verifying if a Prior Installation Exists

Run the SQL query to verify if a prior Oracle APEX installation exists.

To verify if a prior installation exists:

1. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

2. Run the following query:

```
SELECT username
FROM dba_users
WHERE ( username LIKE 'FLOWS\_____' ESCAPE '\\'
OR username LIKE 'APEX\_____' ESCAPE '\\' )
AND username NOT IN ( SELECT schema
FROM dba_registry
WHERE comp_id = 'APEX' );
```

If the results contain entries in the form FLOWS\_XXXXXX or APEX\_XXXXXX where XXXXXX represents six numbers, those entries are candidates for removal.

## 6.12.3 Removing Schemas and SYS Objects from Prior Installations

Start SQL\*Plus and connect to database and execute a statement to remove schemas and SYS objects.

To remove schemas and SYS objects from prior installations:

1. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

2. Execute statements similar to the following example:

```
DROP USER APEX_210100 CASCADE;
DROP PACKAGE SYS.WWV_DBMS_SQL_APEX_210100;
```

## 6.12.4 Removing Schemas from Prior Installations in a CDB

Use `catcon.pl` to remove schemas of prior installations in a CDB.

To remove schemas and SYS objects from prior installations, run commands using the following example:

```
$ORACLE_HOME/perl/bin/perl -I $ORACLE_HOME/rdbms/admin $ORACLE_HOME/
rdbms/admin/catcon.pl -b drop_apex210100 -- --x'drop user APEX_210100
cascade'
$ORACLE_HOME/perl/bin/perl -I $ORACLE_HOME/rdbms/admin $ORACLE_HOME/
rdbms/admin/catcon.pl -b drop_wvw_dbms_sql -- --x'drop package
SYS.WWV_DBMS_SQL_APEX_210100'
```

## 6.12.5 Fixing Invalid ACL

Learn how to fix an invalid ACL.

After following the instructions in [About Removing Prior Oracle APEX Installations](#), you may need to fix an invalid ACL if you are running Oracle Database and you enabled network services for the prior Oracle APEX schema.

To fix an invalid ACL:

1. Change your working directory to the `apex` directory where you unzipped the installation software.
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Execute a statement similar to the following:

```
EXEC DBMS_NETWORK_ACL_ADMIN.DELETE_PRIVILEGE('power_users.xml',
'APEX_220100');
```

## 6.13 About Performance Optimization Tasks

Learn about performance optimization.

Performance of web applications heavily depends on their size and how often a browser has to request static content like images, CSS and JavaScript files. To

improve performance, most web servers support on-the-fly HTTP response compression and provide settings that enable you to configure on how long browsers can cache a file before requesting it again. The HTTP response compression is usually implemented using gzip encoding, while browser file caching is enabled by issuing Cache-Control HTTP response header.

Please see your web server documentation to learn how to enable response compression and browser file caching. For optimal performance of the Oracle APEX development environment and APEX applications, Oracle recommends enabling gzip compression of files in the virtual images directory (for example, `/i/`) and responses from the database access descriptor as well as allowing browsers to cache files from the virtual images directory for at least 12 hours.

## 6.14 Converting Between Runtime and Full Development Environments

Learn about converting between runtime and full development environments.

This section describes how to convert between runtime and full development environments.

- [About Runtime and Full Development Environments](#)  
An Oracle APEX runtime environment enables users to run a production application without supporting the ability to change or edit the application.
- [Converting a Runtime Environment to a Full Development Environment](#)  
Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role and run the `apxdvins.sql`.
- [Converting a Full Development Environment to a Runtime Environment](#)  
Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role and run the `apxdevrm.sql`.

### 6.14.1 About Runtime and Full Development Environments

An Oracle APEX runtime environment enables users to run a production application without supporting the ability to change or edit the application.

A runtime environment includes only the packages necessary to run your applications, making it a more hardened environment. It does not provide a web interface for administration.

You administer an Oracle APEX runtime environment using SQL\*Plus or SQL Developer and the `APEX_INSTANCE_ADMIN` API.

#### See Also:

- [About the Oracle APEX Runtime Environment](#)
- Installing Exported Applications into a Runtime Environment in *Oracle APEX Administration Guide*

## 6.14.2 Converting a Runtime Environment to a Full Development Environment

Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role and run the `apxdvins.sql`.

To convert an Oracle APEX runtime environment to a full development environment:

1. Change your working directory to the `apex` directory where you unzipped the installation software.
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Run `apxdvins.sql`. For example:

```
@apxdvins.sql
```

4. Follow the instructions in [Creating or Updating Your Instance Administration Account](#).



### See Also:

*SQL\*Plus User's Guide and Reference* for more information about SQL\*Plus

## 6.14.3 Converting a Full Development Environment to a Runtime Environment

Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role and run the `apxdevrm.sql`.

To convert an Oracle APEX full development environment to a runtime environment:

1. Change your working directory to the `apex` directory where you unzipped the installation software.
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog  
SQL> CONNECT SYS as SYSDBA  
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog  
SQL> CONNECT SYS as SYSDBA  
Enter password: SYS_password
```

3. Run `apxdevrm.sql`. For example:

```
@apxdevrm.sql
```



#### See Also:

*SQL\*Plus User's Guide and Reference* for more information about SQL\*Plus

# A

## Automating the Oracle APEX Installation Process

Automate the process of installing and configuring an Oracle APEX instance.

- [About apxsilentins.sql](#)  
Run the `apxsilentins.sql` script to automate the installation and configuration of an Oracle APEX instance.
- [Running apxsilentins.sql](#)  
Run the `apxsilentins.sql` script.

### A.1 About apxsilentins.sql

Run the `apxsilentins.sql` script to automate the installation and configuration of an Oracle APEX instance.

Traditionally you run the `apexins.sql` script to install Oracle APEX and then perform a multiple other steps to configure the `APEX_PUBLIC_USER` account. The `apxsilentins.sql` script simplifies the installation and configuration process. `apxsilentins.sql` accepts additional parameters so that passwords can be passed for following database users associated with the Oracle APEX schema: `APEX_PUBLIC_USER`, `APEX_LISTENER`, `APEX_REST_PUBLIC_USER` and the Oracle APEX Instance Administration user, `ADMIN`. You can also use these passwords for the configuration of middle tiers and other processes. `apxsilentins.sql` also completes other installation steps such as creating and setting the password for the Instance Administration user, `ADMIN`, configuring a network ACL, and configuring Oracle REST Data Services.

Running the `apxsilentins.sql` script, removes the need for completing the following topics:

- [Installing Oracle APEX](#)
- [Creating or Updating Your Instance Administration Account](#)
- [Configuring the APEX\\_PUBLIC\\_USER Account](#)
- [Enabling Network Services in Oracle Database](#)
- [Configuring Static File Support](#) (`apex_rest_config.sql`)

### A.2 Running apxsilentins.sql

Run the `apxsilentins.sql` script.

To run `apxsilentins.sql`:

1. Change your working directory to `apex`.
2. Start SQL\*Plus and connect as user `SYS` to the database where Oracle APEX is installed. You will need to specify the `SYSDBA` role. For example:
  - On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Disable any existing password complexity rules for the default profile.
4. Run apxsilentins.sql passing the following eight arguments in the order shown:

```
@apxsilentins.sql tablespace_apex tablespace_files tablespace_temp images
password_apex_pub_user password_apex_listener
password_apex_rest_pub_user
password_internal_admin
```

Where:

- *tablespace\_apex* is the name of the tablespace for the Oracle APEX application user.
- *tablespace\_files* is the name of the tablespace for the Oracle APEX files user.
- *tablespace\_temp* is the name of the temporary tablespace or tablespace group.
- *images* is the virtual directory for Oracle APEX images. For installations using EPG, */i/* is the required value for the images argument. To support future Oracle APEX upgrades, define the virtual image directory as */i/*.
- *password\_apex\_pub\_user* is the password for the `APEX_PUBLIC_USER` database account.
- *password\_apex\_listener* is the password for the `APEX_LISTENER` database account.
- *password\_apex\_rest\_pub\_user* is the password for the `APEX_REST_PUBLIC_USER` database account.
- *password\_internal\_admin* is the password for the Instance Administration ADMIN Oracle APEX account. This password must meet the following requirements:
  - Contain at least 6 characters.
  - Contain at least one numeric character (0123456789).
  - Contain at least one punctuation character (!"#\$%&()``\*+,-/;?\_).
  - Contain at least one uppercase alphabetic character.

For example:

```
@apxsilentins.sql SYSAUX SYSAUX TEMP /i/ Passw0rd!1 Passw0rd!2 Passw0rd!3
Passw0rd!4
```

Once apxsilentins.sql completes, you follow the steps in [Downloading and Installing Oracle REST Data Services](#) and [Configuring Oracle REST Data Services](#) (except for "Configuring Static File Support").

Use the passwords you supplied to `apxsilentins.sql` when completing these steps. Then, move on to [Creating a Workspace and Adding Oracle APEX Users](#).

# B

## Maximizing Uptime During an Oracle APEX Upgrade

Learn how to maximize uptime during an Oracle APEX upgrade.

Previously, Oracle APEX could only be upgraded by completely disabling application usage for an extended length of time. The following is an overview of the additional steps you can take to keep your applications usable for end users during most portions of an Oracle APEX upgrade.

This advanced procedure is an alternative to the following the topics in [Downloading and Installing Oracle APEX](#).

To upgrade the instance, administrators typically run these phases in one step by executing one of the following:

- For full development environment:

```
@apexins.sql tablespace_apex tablespace_files tablespace_temp images
```

- For runtime-only environment:

```
@apxrtins.sql tablespace_apex tablespace_files tablespace_temp images
```

Where:

- `tablespace_apex` is the name of the tablespace for the Oracle APEX application user.
- `tablespace_files` is the name of the tablespace for the Oracle APEX files user.
- `tablespace_temp` is the name of the temporary tablespace or tablespace group.
- `images` is the virtual directory for Oracle APEX images.

The upgrade of an Oracle APEX instance runs in four phases:

1. Create database schemas and database objects (tables, packages).
2. Migrate application metadata.
3. Migrate data that runtime applications modify and switch to the new version.
4. Migrate additional log and summary data.

Phases 1 and 4 do not disable end users using the instance. Phase 2 only affects developers who modify applications. Phase 3 affects all access to Oracle APEX.

Oracle now also provides alternative upgrade scripts to run the phases independently. Administrators can use these scripts instead of `apexins.sql` and `apxrtins.sql`, to reduce the effective downtime of an Oracle APEX instance from potentially hours to just a few minutes (depending on hardware performance).



### Note:

This feature is not supported when Oracle APEX is installed in `CDB$ROOT`.

Administrators must sequentially execute the following scripts to start phases 1, 2 and 3, respectively. At the end of phase 3, a scheduler job automatically starts to execute phase 4.

To reduce downtime during an Oracle APEX upgrade:

**1. Execute phase 1 script: Development and runtime usage is not affected.**

- For full development environment:

```
@apexins1.sql tablespace_apex tablespace_files tablespace_temp
images
```

- For runtime-only environment:

```
@apxrtins1.sql tablespace_apex tablespace_files tablespace_temp
images
```

**Example:** @apexins1.sql sysaux sysaux temp /i/

**2. Execute phase 2 script: Development is disabled, but runtime usage is not affected.**

- For full development environment:

```
@apexins2.sql tablespace_apex tablespace_files tablespace_temp
images
```

- For runtime-only environment:

```
@apxrtins2.sql tablespace_apex tablespace_files tablespace_temp
images
```

**Example:** @apexins2.sql sysaux sysaux temp /i/

**3. Disable web access for the web server, Oracle REST Data Services.**

**4. Execute phase 3 script: Oracle APEX can not be used.**

- For full development environment:

```
@apexins3.sql tablespace_apex tablespace_files tablespace_temp
images
```

- For runtime-only environment:

```
@apxrtins3.sql tablespace_apex tablespace_files tablespace_temp
images
```

**Example:** @apexins3.sql sysaux sysaux temp /i/

**5. Install images of the new Oracle APEX version in your web server. Administrators can do this while phase 3 is running or even earlier, if the new version's images directory is different to the previous Oracle APEX version's ( for example: /i212/ for the new version vs. /i211/ for the old version).**

For details refer to the installation instructions for Oracle REST Data Services.

**6. Re-enable web access for the web server and restart Oracle REST Data Services.**

After web access is restarted, developers and users can access the instance again, while phase 4 finishes in the background.



**See Also:**

[Installing and Configuring Oracle APEX and Oracle REST Data Services](#)

# C

## Oracle APEX Installation Troubleshooting

Learn about troubleshooting Oracle APEX Installation.

This section contains information on troubleshooting.

- [Reviewing a Log of an Installation Session](#)  
The `apexins.sql` script creates a log file in the `apex` directory using the naming convention `installYYYY-MM-DD_HH24-MI-SS.log`.
- [Verifying the Validity of an Oracle APEX Installation](#)  
Verify the validity of an Oracle APEX installation by running a query.
- [Cleaning Up After a Failed Installation](#)  
Learn about best practices for troubleshooting and cleaning up after a failed installation.
- [About Images Displaying Incorrectly in Oracle APEX](#)  
Learn about troubleshooting if images in Oracle APEX do not display correctly.
- [About Page Protection Violation](#)  
A page protection violation may be caused by manual alteration of protected page items.



### See Also:

[Upgrading from a Previous Oracle APEX Release](#)

### C.1 Reviewing a Log of an Installation Session

The `apexins.sql` script creates a log file in the `apex` directory using the naming convention `installYYYY-MM-DD_HH24-MI-SS.log`.

In a successful installation, the log file contains the following text:

```
Thank you for installing Oracle APEX.
```

```
Oracle APEX is installed in the APEX_220100 schema.
```

If the log file contains a few errors, it does not mean that your installation failed. Note that acceptable errors are noted as such in the log file.

### C.2 Verifying the Validity of an Oracle APEX Installation

Verify the validity of an Oracle APEX installation by running a query.

You can verify the validity of an Oracle APEX installation by running the following query:

```
SELECT STATUS FROM DBA_REGISTRY  
WHERE COMP_ID = 'APEX';
```

If the result is `VALID`, you can assume the installation was successful.

## C.3 Cleaning Up After a Failed Installation

Learn about best practices for troubleshooting and cleaning up after a failed installation.

In a successful installation the following banner displays near the end of the installation:

```
Thank you for installing Oracle APEX.  
Oracle APEX is installed in the APEX_220100 schema.
```

To reinstall, you must either drop the Oracle APEX database schemas, or run a script to completely remove Oracle APEX from the database, depending upon the installation type.

- [Reverting to a Previous Release After a Failed Upgrade Installation](#)  
Learn about reverting to Oracle APEX to a previous release in the case of a failed upgrade installation.
- [Removing Oracle APEX from the Database](#)  
Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role and execute the `SQL> @apxremov.sql` command.

### C.3.1 Reverting to a Previous Release After a Failed Upgrade Installation

Learn about reverting to Oracle APEX to a previous release in the case of a failed upgrade installation.

In the case of a failed upgrade installation, you may want to revert Oracle APEX to a previous release and then remove the schemas associated with the current release.

- [Verifying If You Have a Previous Release of Oracle APEX](#)  
Run a query to verify if you have previous release of Oracle APEX.
- [Reverting the Images Directory](#)  
If you altered your images directory, revert it back to the release you want to revert to. You must point the text alias `/i/` back to images directory for the release you want to revert to.
- [Reverting to a Previous Release](#)  
Learn how to revert to a previous release Oracle APEX.
- [Removing the Oracle APEX Release Schema](#)  
After you revert to the prior release, remove the Oracle APEX schema.

#### C.3.1.1 Verifying If You Have a Previous Release of Oracle APEX

Run a query to verify if you have previous release of Oracle APEX.

To verify whether you have a previous release of Oracle APEX:

1. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role. For example:
  - On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

2. Execute the following command in SQL\*Plus:

```
select username from dba_users
  where regexp_like(username, '(FLOWS|APEX)_\d{6}')
  and username <> (select table_owner from all_synonyms
  where synonym_name = 'WWV_FLOW'
  and owner = 'PUBLIC')
```

If the query above returns any rows, the database contains a previous release of Oracle APEX.

### C.3.1.2 Reverting the Images Directory

If you altered your images directory, revert it back to the release you want to revert to. You must point the text alias `/i/` back to images directory for the release you want to revert to.



#### See Also:

[Copying the Images Directory](#)

### C.3.1.3 Reverting to a Previous Release

Learn how to revert to a previous release Oracle APEX.

- [Reverting to Release 1.5](#)
- [Reverting to Release 1.6](#)
- [Reverting to Release 2.0](#)
- [Reverting to Release 2.2](#)
- [Reverting to Release 3.0](#)
- [Reverting to Release 3.1](#)
- [Reverting to Release 3.2](#)
- [Reverting to Release 4.0](#)
- [Reverting to Release 4.1](#)
- [Reverting to Release 4.2 in a non-CDB or PDB with Local APEX](#)
- [Reverting to Release 4.2 in a CDB](#)
- [Reverting to Release 5.0 in a non-CDB or PDB with Local APEX](#)
- [Reverting to Release 5.0 in a CDB](#)
- [Reverting to Release 5.1 in a non-CDB or PDB with Local APEX](#)

- [Reverting to Release 5.1 in a CDB](#)
- [Reverting to Release 18.1 in a non-CDB or PDB with Local APEX](#)
- [Reverting to Release 18.1 in a CDB](#)
- [Reverting to Release 18.2 in a non-CDB or PDB with Local APEX](#)
- [Reverting to Release 18.2 in a CDB](#)
- [Reverting to Release 19.1 in a non-CDB or PDB with Local APEX](#)
- [Reverting to Release 19.1 in a CDB](#)
- [Reverting to Release 19.2 in a non-CDB or PDB with Local APEX](#)
- [Reverting to Release 19.2 in a CDB](#)
- [Reverting to Release 20.1 in a non-CDB or PDB with Local APEX](#)
- [Reverting to Release 20.1 in a CDB](#)
- [Reverting to Release 20.2 in a non-CDB or PDB with Local APEX](#)
- [Reverting to Release 20.2 in a CDB](#)
- [Reverting to Release 21.1 in a non-CDB or PDB with Local APEX](#)
- [Reverting to Release 21.1 in a CDB](#)
- [Reverting to Release 21.2 in a non-CDB or PDB with Local APEX](#)
- [Reverting to Release 21.2 in a CDB](#)
- [Re-enabling the REST Administration Interface After Downgrading](#)

### C.3.1.3.1 Reverting to Release 1.5

To revert to Oracle APEX release 1.5:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Execute the following:

```
ALTER SESSION SET CURRENT_SCHEMA = FLOWS_010500;
exec
flows_010500.wvv_flow_upgrade.switch_schemas('APEX_220100','FLOWS_010500');
```

4. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

**See Also:**[Reverting the Images Directory](#)

### C.3.1.3.2 Reverting to Release 1.6

To revert to Oracle APEX release 1.6:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Execute the following:

```
ALTER SESSION SET CURRENT_SCHEMA = FLOWS_010600;
exec flows_010600.wv_flow_upgrade.switch_schemas('APEX_220100','FLOWS_010600');
```

4. Depending upon the release you are reverting to, execute the appropriate command in SQL\*Plus.
5. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

**See Also:**[Reverting the Images Directory](#)

### C.3.1.3.3 Reverting to Release 2.0

To revert to Oracle APEX release 2.0:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

**3. Execute the following:**

```
ALTER SESSION SET CURRENT_SCHEMA = FLOWS_020000;
exec
flows_020000.wv_flow_upgrade.switch_schemas('APEX_220100','FLOWS_020000');
```

**4. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).**



**See Also:**

[Reverting the Images Directory](#)

### C.3.1.3.4 Reverting to Release 2.2

To revert to Oracle APEX release 2.2:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

**3. Execute the following:**

```
ALTER SESSION SET CURRENT_SCHEMA = FLOWS_020200;
exec
flows_020200.wv_flow_upgrade.switch_schemas('APEX_220100','FLOWS_020200');
```

**4. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).**



**See Also:**

[Removing the Oracle APEX Release Schema](#)

### C.3.1.3.5 Reverting to Release 3.0

To revert to Oracle APEX release 3.0:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 3.0 source.
3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Execute the following:

```
set define '^'

@apexvalidate x x FLOWS_030000
ALTER SESSION SET CURRENT_SCHEMA = FLOWS_030000;
exec
flows_030000.wvw_flow_upgrade.switch_schemas('APEX_220100','FLOWS_030000')
;
ALTER SESSION SET CURRENT_SCHEMA = SYS;
declare
    l_apex_version varchar2(30);
begin
    sys.dbms_registry.set_session_namespace (namespace => 'DBTOOLS');
    l_apex_version := flows_030000.wvw_flows_release;
    dbms_registry.downgrading('APEX','Oracle Application
Express','validate_apex','FLOWS_030000');
    dbms_registry.downgraded('APEX',l_apex_version);
    validate_apex;
end;
/
```

5. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).



#### See Also:

[Reverting the Images Directory](#)

### C.3.1.3.6 Reverting to Release 3.1

To revert to Oracle APEX release 3.1:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex/core` in the 3.1 source.

3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

**On Windows:**

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

**On UNIX and Linux:**

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Execute the following commands:

```
@wwv_flow_val.plb
@wwv_dbms_sql.sql
@wwv_dbms_sql.plb
```

5. Change your working directory to apex in the 3.1 source.

6. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

**On Windows:**

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

**On UNIX and Linux:**

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

7. Execute the following:

```
set define '^'

@apexvalidate x x FLOWS_030100
ALTER SESSION SET CURRENT_SCHEMA = FLOWS_030100;
exec
flows_030100.wwv_flow_upgrade.switch_schemas('APEX_220100','FLOWS_030100');
ALTER SESSION SET CURRENT_SCHEMA = SYS;
declare
    l_apex_version varchar2(30);
begin
    sys.dbms_registry.set_session_namespace (namespace =>
'DBTOOLS');
    l_apex_version := flows_030100.wwv_flows_release;
    dbms_registry.downgrading('APEX','Oracle Application
Express','validate_apex','FLOWS_030100');
    dbms_registry.downgraded('APEX',l_apex_version);
    validate_apex;
end;
/
```

8. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

**See Also:**

[Reverting the Images Directory](#)

### C.3.1.3.7 Reverting to Release 3.2

To revert to Oracle APEX release 3.2:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex/core` in the 3.2 source.
3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Execute the following commands:

```
@wwv_flow_val.plb
@wwv_dbms_sql.sql
@wwv_dbms_sql.plb
```

5. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

6. Execute the following:

```
set define '^'

@apexvalidate x x APEX_030200
ALTER SESSION SET CURRENT_SCHEMA = APEX_030200;
exec
apex_030200.wwv_flow_upgrade.switch_schemas('APEX_220100','APEX_030200');
ALTER SESSION SET CURRENT_SCHEMA = SYS;
```

```
declare
  l_apex_version varchar2(30);
begin
  sys.dbms_registry.set_session_namespace (namespace =>
'DBTOOLS');
  l_apex_version := apex_030200.wv_flows_release;
  dbms_registry.downgrading('APEX','Oracle Application
Express','validate_apex','APEX_030200')
  dbms_registry.downgraded('APEX',l_apex_version);
  validate_apex;
end;
/
```

7. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).



#### See Also:

[Reverting the Images Directory](#)

### C.3.1.3.8 Reverting to Release 4.0

To revert to Oracle APEX release 4.0:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

3. Execute the following commands:

```
@wv_flow_val.sql
@wv_flow_val.plb
@wv_dbms_sql.sql
@wv_dbms_sql.plb
```

4. Change your working directory to apex in the 4.0 source.
5. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

6. Execute the following:

```
set define '^'

@apexvalidate x x APEX_040000
ALTER SESSION SET CURRENT_SCHEMA = APEX_040000;
exec
apex_040000.wvw_flow_upgrade.switch_schemas('APEX_220100','APEX_040000');
ALTER SESSION SET CURRENT_SCHEMA = SYS;
declare
    l_apex_version varchar2(30);
begin
    sys.dbms_registry.set_session_namespace (namespace => 'DBTOOLS');
    l_apex_version := apex_040000.wvw_flows_release;
    dbms_registry.downgrading('APEX','Oracle Application
Express','validate_apex','APEX_040000');
    dbms_registry.downgraded('APEX',l_apex_version);
    validate_apex;
end;
/
```

7. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).



**See Also:**

[Reverting the Images Directory](#)

### C.3.1.3.9 Reverting to Release 4.1

To revert to Oracle APEX release 4.1:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex/core` in the 4.1 source.
3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

**4. Execute the following commands:**

```
@wwv_flow_val.sql
@wwv_flow_val.plb
@wwv_dbms_sql.sql
@wwv_dbms_sql.plb
```

**5. Change your working directory to apex in the 4.1 source.****6. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:****On Windows:**

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

**On UNIX and Linux:**

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

**7. Execute the following:**

```
set define '^'

@apexvalidate x x APEX_040100
ALTER SESSION SET CURRENT_SCHEMA = APEX_040100;
exec
apex_040100.wwv_flow_upgrade.switch_schemas('APEX_220100','APEX_040100');
ALTER SESSION SET CURRENT_SCHEMA = SYS;
declare
    l_apex_version varchar2(30);
begin
    sys.dbms_registry.set_session_namespace (namespace =>
'DBTOOLS');
    l_apex_version := apex_040100.wwv_flows_release;
    dbms_registry.downgrading('APEX','Oracle Application
Express','validate_apex','APEX_040100');
    dbms_registry.downgraded('APEX',l_apex_version);
    validate_apex;
end;
/
```

**8. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).****See Also:**

[Reverting the Images Directory](#)

### C.3.1.3.10 Reverting to Release 4.2 in a non-CDB or PDB with Local APEX

To revert to Oracle APEX release 4.2 in a non-CDB or PDB with a locally installed APEX:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex/core` in the 4.2 source.
3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Execute the following commands:

```
alter session set current_schema = SYS;

@core_sys_views.sql

grant select on sys.wv_flow_gv$session to APEX_040200;

@wv_flow_val.sql
@wv_flow_val.plb
@wv_dbms_sql.sql
grant execute on wv_dbms_sql to APEX_040200;
@wv_dbms_sql.plb

begin
    dbms_utility.compile_schema('APEX_040200');
end;
/
```

5. Change your working directory to `apex` in the 4.2 source.
6. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

7. Execute the following:

```
set define '^'
```

```

@apexvalidate x x APEX_040200
ALTER SESSION SET CURRENT_SCHEMA = APEX_040200;
exec
apex_040200.wv_flow_upgrade.switch_schemas('APEX_220100','APEX_0402
00');
ALTER SESSION SET CURRENT_SCHEMA = SYS;
declare
    l_apex_version varchar2(30);
begin
    sys.dbms_registry.set_session_namespace (namespace =>
'DBTOOLS');
    l_apex_version := apex_040200.wv_flows_release;
    dbms_registry.downgrading('APEX','Oracle Application
Express','validate_apex','APEX_040200');
    dbms_registry.downgraded('APEX',l_apex_version);
    validate_apex;
end;
/

```

8. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).



#### See Also:

[Reverting the Images Directory](#)

### C.3.1.3.11 Reverting to Release 4.2 in a CDB

To revert to Oracle APEX release 4.2 in a CDB:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex/core` in the 4.2 source.
3. Create a new text file in that directory named `apx42dgrd1.sql` consisting of the following:

```

alter session set current_schema = SYS;

@core_sys_views.sql

grant select on sys.wv_flow_gv$session to APEX_040200;

@wv_flow_val.sql
@wv_flow_val.plb
@wv_dbms_sql.sql
grant execute on wv_dbms_sql to APEX_040200;
@wv_dbms_sql.plb

begin
    dbms_utility.compile_schema('APEX_040200');
end;
/

```

4. Create a second new text file in that directory named `apx42dgrd.sql` consisting of the following:

```

set define '^'

whenever sqlerror exit

column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)

set serverout on
begin
-- get oracle_home
  sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
  if length(:xe_home) = 0 then
    sys.dbms_output.put_line(lpad('-',80,'-'));
    raise_application_error (
      -20001,
      'Oracle Home environment variable not set' );
  end if;
end;
/
whenever sqlerror continue

set termout off
select :xe_home from sys.dual;
set termout on

host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/admin/catcon.pl
-b apx42dgrd apx42dgrd1.sql

```

5. Start SQL\*Plus and connect to `CDB$ROOT` of the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

On Windows:

```

SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

On UNIX and Linux:

```

$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

6. Execute the following commands:

```
@apx42dgrd.sql
```

7. Change your working directory to `apex` in the 4.2 source.

8. Create a new text file in that directory name `apx42dgrd1.sql` with the following contents:

```

set define '^'

ALTER SESSION SET CURRENT_SCHEMA = SYS;

@apexvalidate x x APEX_040200

ALTER SESSION SET CURRENT_SCHEMA = APEX_040200;
exec

```

```

apex_040200.wvw_flow_upgrade.switch_schemas('APEX_220100','APEX_0402
00');
ALTER SESSION SET CURRENT_SCHEMA = SYS;
declare
    l_apex_version varchar2(30);
begin
    sys.dbms_registry.set_session_namespace (namespace =>
'DBTOOLS');
    l_apex_version := apex_040200.wvw_flows_release;
    dbms_registry.downgrading('APEX','Oracle Application
Express','validate_apex','APEX_040200');
    dbms_registry.downgraded('APEX',l_apex_version);
    validate_apex;
end;
/

```

9. Create a second new text file in that directory named `apx42dgrd.sql` consisting of the following:

```

set define '^'

whenever sqlerror exit

column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)

set serverout on
begin
-- get oracle_home
    sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
    if length(:xe_home) = 0 then
        sys.dbms_output.put_line(lpad('-',80,'-'));
        raise_application_error (
            -20001,
            'Oracle Home environment variable not set' );
    end if;
end;
/
whenever sqlerror continue

set termout off
select :xe_home from sys.dual;
set termout on

host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/admin/
catcon.pl -b apx42dgrd apx42dgrd1.sql

```

10. Start SQL\*Plus and connect to CDB\$ROOT of the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

On Windows:

```

SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

**11. Execute the following:**

```
@apx42dgrd.sql
```

**12. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).**



**See Also:**

[Reverting the Images Directory](#)

### C.3.1.3.12 Reverting to Release 5.0 in a non-CDB or PDB with Local APEX

To revert to Oracle APEX release 5.0 in a non-CDB or PDB with a locally installed APEX:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex/core` in the 5.0 source.
3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Execute the following commands:

```
alter session set current_schema = SYS;

@wwv_flow_val.sql
@wwv_flow_val.plb

begin
    dbms_utility.compile_schema('APEX_050000');
end;
/

set define '^'
@validate_apex x x APEX_050000

begin
    for i in ( select owner, trigger_name
              from sys.dba_triggers
              where owner          = 'APEX_050000'
```

```

        and trigger_name like 'WWV_FLOW_UPGRADE_%'
        order by 1 )
    loop
        sys.dbms_output.put_line('Dropping trigger '||i.owner||'.'||
i.trigger_name);
        execute immediate 'drop trigger '||i.owner||'.'||i.trigger_name;
    end loop;
end;
/

ALTER SESSION SET CURRENT_SCHEMA = APEX_050000;
exec
apex_050000.wv_flow_upgrade.switch_schemas('APEX_220100','APEX_0500
00');
ALTER SESSION SET CURRENT_SCHEMA = SYS;
drop context APEX$SESSION;
create context APEX$SESSION using
APEX_050000.WWV_FLOW_SESSION_CONTEXT;
declare
    l_apex_version varchar2(30);
    l_schemas sys.dbms_registry.schema_list_t;
begin
    sys.dbms_registry.set_session_namespace (namespace =>
'DBTOOLS');
    l_apex_version := apex_050000.wv_flows_release;
    dbms_registry.downgrading('APEX','Oracle Application
Express','validate_apex','APEX_050000');
    dbms_registry.downgraded('APEX',l_apex_version);
    select username
        bulk collect into l_schemas
        from all_users
        where username in
('FLOWS_FILES','APEX_PUBLIC_USER','APEX_LISTENER','APEX_REST_PUBLIC_
USER','APEX_INSTANCE_ADMIN_USER')
        order by 1;
    sys.dbms_registry.update_schema_list('APEX', l_schemas);
    validate_apex;
end;
/

```

5. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).



#### See Also:

[Reverting the Images Directory](#)

### C.3.1.3.13 Reverting to Release 5.0 in a CDB

To revert to Oracle APEX release 5.0 in a CDB:

1. If you altered your images directory, revert it back to the release you want to revert to.

2. Change your working directory to `apex/core` in the 5.0 source.
3. Create a new text file in that directory named `apx50dgrd1.sql` consisting of the following:

```
alter session set current_schema = SYS;

@wwv_flow_val.sql
@wwv_flow_val.plb

begin
    dbms_utility.compile_schema('APEX_050000');
end;
/

set define '^'
@validate_apex x x APEX_050000

begin
    for i in ( select owner, trigger_name
              from sys.dba_triggers
              where owner      =    'APEX_050000'
                and trigger_name like 'WWV_FLOW_UPGRADE_%'
              order by 1 )
    loop
        sys.dbms_output.put_line('Dropping trigger '||i.owner||'.'||
i.trigger_name);
        execute immediate 'drop trigger '||i.owner||'.'||i.trigger_name;
    end loop;
end;
/

ALTER SESSION SET CURRENT_SCHEMA = APEX_050000;
exec
apex_050000.wwv_flow_upgrade.switch_schemas('APEX_220100','APEX_050000');
ALTER SESSION SET CURRENT_SCHEMA = SYS;
drop context APEX$SESSION;
create context APEX$SESSION using APEX_050000.WWV_FLOW_SESSION_CONTEXT;
declare
    l_apex_version varchar2(30);
    l_schemas sys.dbms_registry.schema_list_t;
begin
    sys.dbms_registry.set_session_namespace (namespace => 'DBTOOLS');
    l_apex_version := apex_050000.wwv_flows_release;
    dbms_registry.downgrading('APEX','Oracle Application
Express','validate_apex','APEX_050000');
    dbms_registry.downgraded('APEX',l_apex_version);
    select username
        bulk collect into l_schemas
        from all_users
        where username in
('FLOWS_FILES','APEX_PUBLIC_USER','APEX_LISTENER','APEX_REST_PUBLIC_USER',
'APEX_INSTANCE_ADMIN_USER')
        order by 1;
    sys.dbms_registry.update_schema_list('APEX', l_schemas);
```

```

        validate_apex;
end;
/

```

4. Create a second new text file in that directory named `apx50dgrd.sql` consisting of the following:

```

set define '^'
whenever sqlerror exit
column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)
set serverout on
begin
-- get oracle_home
sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
if length(:xe_home) = 0 then
    sys.dbms_output.put_line(lpad('-',80,'-'));
    raise_application_error (-20001,'Oracle Home environment variable not
set' );
end if;
end;
/
whenever sqlerror continue
set termout off
select :xe_home from sys.dual;
set termout on
host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/admin/
catcon.pl -b apx50dgrd apx50dgrd1.sql

```

5. Start SQL\*Plus and connect to `CDB$ROOT` of the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

On Windows:

```

SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

On UNIX and Linux:

```

$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

6. Execute the following commands:

```
@apx50dgrd.sql
```

7. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).



**See Also:**

[Reverting the Images Directory](#)

### C.3.1.3.14 Reverting to Release 5.1 in a non-CDB or PDB with Local APEX

To revert to Oracle APEX release 5.1 in a non-CDB or PDB with a locally installed APEX:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex/core` in the 5.1 source.
3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Execute the following commands:

```
alter session set current_schema = SYS;

@wwv_flow_val.sql
@wwv_flow_val.plb

begin
    dbms_utility.compile_schema('APEX_050100');
end;
/

set define '^'
@validate_apex x x APEX_050100

begin
    for i in ( select owner, trigger_name
              from sys.dba_triggers
              where owner          = 'APEX_050100'
                and trigger_name like 'WWV_FLOW_UPGRADE_%'
              order by 1 )
    loop
        sys.dbms_output.put_line('Dropping trigger '||i.owner||'.'||
i.trigger_name);
        execute immediate 'drop trigger '||i.owner||'.'||i.trigger_name;
    end loop;
end;
/

ALTER SESSION SET CURRENT_SCHEMA = APEX_050100;
exec
apex_050100.wwv_flow_upgrade.switch_schemas('APEX_220100','APEX_050100');
ALTER SESSION SET CURRENT_SCHEMA = SYS;
drop context APEX$SESSION;
create context APEX$SESSION using APEX_050100.WWV_FLOW_SESSION_CONTEXT;
declare
    l_apex_version varchar2(30);
    l_schemas sys.dbms_registry.schema_list_t;
```

```

begin
  sys.dbms_registry.set_session_namespace (namespace =>
'DBTOOLS');
  l_apex_version := apex_050100.www_flows_release;
  dbms_registry.downgrading('APEX','Oracle Application
Express','validate_apex','APEX_050100');
  dbms_registry.downgraded('APEX',l_apex_version);
  select username
    bulk collect into l_schemas
    from all_users
   where username in
('FLOWS_FILES','APEX_PUBLIC_USER','APEX_LISTENER','APEX_REST_PUBLIC_
USER','APEX_INSTANCE_ADMIN_USER')
   order by 1;
  sys.dbms_registry.update_schema_list('APEX', l_schemas);
  validate_apex;
end;
/

```

5. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).



#### See Also:

[Reverting the Images Directory](#)

### C.3.1.3.15 Reverting to Release 5.1 in a CDB

To revert to Oracle APEX release 5.1 in a CDB:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex/core` in the 5.1 source.
3. Create a new text file in that directory named `apx51dgrd1.sql` consisting of the following:

```

alter session set current_schema = SYS;

@wwv_flow_val.sql
@wwv_flow_val.plb

begin
  dbms_utility.compile_schema('APEX_050100');
end;
/

set define '^'
@validate_apex x x APEX_050100

begin
  for i in ( select owner, trigger_name

```

```

        from sys.dba_triggers
        where owner      = 'APEX_050100'
           and trigger_name like 'WWV_FLOW_UPGRADE_%'
        order by 1 )

loop
    sys.dbms_output.put_line('Dropping trigger '||i.owner||'. '||
i.trigger_name);
    execute immediate 'drop trigger '||i.owner||'. '||i.trigger_name;
end loop;
end;
/

ALTER SESSION SET CURRENT_SCHEMA = APEX_050100;
exec
apex_050100.wv_flow_upgrade.switch_schemas('APEX_220100','APEX_050100');
ALTER SESSION SET CURRENT_SCHEMA = SYS;
drop context APEX$SESSION;
create context APEX$SESSION using APEX_050100.WWV_FLOW_SESSION_CONTEXT;
declare
    l_apex_version varchar2(30);
    l_schemas sys.dbms_registry.schema_list_t;
begin
    sys.dbms_registry.set_session_namespace (namespace => 'DBTOOLS');
    l_apex_version := apex_050100.wv_flows_release;
    dbms_registry.downgrading('APEX','Oracle Application
Express','validate_apex','APEX_050100');
    dbms_registry.downgraded('APEX',l_apex_version);
    select username
        bulk collect into l_schemas
        from all_users
        where username in
('FLOWS_FILES','APEX_PUBLIC_USER','APEX_LISTENER','APEX_REST_PUBLIC_USER',
'APEX_INSTANCE_ADMIN_USER')
        order by 1;
    sys.dbms_registry.update_schema_list('APEX', l_schemas);
    validate_apex;
end;
/

```

4. Create a second new text file in that directory named `apx51dgrd.sql` consisting of the following:

```

set define '^'
whenever sqlerror exit
column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)
set serverout on
begin
-- get oracle_home
sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
if length(:xe_home) = 0 then
    sys.dbms_output.put_line(lpad('-',80,'-'));
    raise_application_error (-20001,'Oracle Home environment variable not set' );
end if;
end;
/
whenever sqlerror continue

```

```
set termout off
select :xe_home from sys.dual;
set termout on
host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/admin/
catcon.pl -b apx51dgrd apx51dgrd1.sql
```

5. Start SQL\*Plus and connect to CDB\$ROOT of the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

6. Execute the following commands:

```
@apx51dgrd.sql
```

7. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).



**See Also:**

[Reverting the Images Directory](#)

### C.3.1.3.16 Reverting to Release 18.1 in a non-CDB or PDB with Local APEX

To revert to Oracle APEX release 18.1 in a non-CDB or PDB with a locally installed APEX:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to apex in the 18.1 source.
3. Create a new text file in that directory named apxdwngrd.sql consisting of the following:

```
set define '^'
set concat on
set concat .
set verify off

set termout off
column foo new_val LOG
select 'apxdwngrd_' ||to_char(sysdate, 'YYYY-MM-DD_HH24-MI-SS') ||
'.log' as foo
  from sys.dual;
set termout on
spool ^LOG
```

```
@@core/scripts/set_appun.sql

whenever sqlerror exit
set serveroutput on size unlimited

declare
    l_cnt    number := 0;
begin
    select count(*) into l_cnt from sys.dba_users where username =
'^APPUN';
    if l_cnt = 0 then
        dbms_output.put_line('^APPUN not found in this database. ');
        raise program_error;
    end if;
end;
/
whenever sqlerror continue

prompt ...Create validate procedure in SYS schema and start registration
@@core/validate_apex.sql x x ^APPUN

grant inherit any privileges to ^APPUN;

prompt Installing SYS views

@@core/sys_core_views.sql

@@core/wwv_flow_val.sql
grant execute on sys.wwv_flow_val to ^APPUN.;

@@core/wwv_flow_val.plb

ALTER SESSION SET CURRENT_SCHEMA = ^APPUN;

exec sys.dbms_session.modify_package_state(sys.dbms_session.reinitialize);

begin
    ^APPUN..wwv_flow_upgrade.remove_jobs();
    ^APPUN..wwv_flow_upgrade.create_jobs('^APPUN');
    ^APPUN..wwv_flow_upgrade.create_public_synonyms('^APPUN');
    ^APPUN..wwv_flow_upgrade.grant_public_synonyms('^APPUN');
    ^APPUN..wwv_flow_upgrade.flows_files_objects_remove('^APPUN');
    ^APPUN..wwv_flow_upgrade.flows_files_objects_create('^APPUN');
end;
/

ALTER SESSION SET CURRENT_SCHEMA = SYS;

drop context APEX$SESSION;
create context APEX$SESSION using ^APPUN..WWV_FLOW_SESSION_CONTEXT;

alter package sys.wwv_dbms_sql_ ^APPUN. compile;
alter package sys.wwv_dbms_sql_ ^APPUN. compile body;
```

```

exec
sys.dbms_session.modify_package_state(sys.dbms_session.reinitialize)
;

set serveroutput on size unlimited

declare
    l_apex_version varchar2(30);
    l_schemas sys.dbms_registry.schema_list_t;
begin
    sys.dbms_registry.set_session_namespace (namespace =>
'DBTOOLS');
    execute immediate 'drop package ^APPUN..WWV_FLOW_DB_VERSION';
    l_apex_version := ^APPUN..wwv_flows_release;
    sys.dbms_registry.loading('APEX','Oracle Application
Express','validate_apex', '^APPUN');
    select username
        bulk collect into l_schemas
        from sys.all_users
        where username in
('FLOWS_FILES','APEX_PUBLIC_USER','APEX_LISTENER','APEX_REST_PUBLIC_
USER','APEX_INSTANCE_ADMIN_USER')
        order by 1;
    sys.dbms_registry.update_schema_list('APEX', l_schemas);
    sys.dbms_registry.loaded('APEX',l_apex_version);
    commit;
    sys.validate_apex;
end;
/

```

4. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

On Windows:

```

SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

On UNIX and Linux:

```

$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

5. Run the apxdwngrd.sql script:

```

SQL> @apxdwngrd.sql

```

6. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

**See Also:**[Reverting the Images Directory](#)

### C.3.1.3.17 Reverting to Release 18.1 in a CDB

To revert to Oracle APEX release 18.1 in a CDB:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 18.1 source.
3. Create a new text file in that directory named `apxdwngrd.sql` consisting of the following:

```
set define '^'
set concat on
set concat .
set verify off

set termout off
column foo new_val LOG
select 'apxdwngrd_' ||to_char(sysdate, 'YYYY-MM-DD_HH24-MI-SS') || '.log'
as foo
  from sys.dual;
set termout on
spool ^LOG

@@core/scripts/set_appun.sql

whenever sqlerror exit
set serveroutput on size unlimited

declare
  l_cnt    number := 0;
begin
  select count(*) into l_cnt from sys.dba_users where username =
'^APPUN';
  if l_cnt = 0 then
    dbms_output.put_line('^APPUN not found in this database. ');
    raise program_error;
  end if;
end;
/
whenever sqlerror continue

prompt ...Create validate procedure in SYS schema and start registration
@@core/validate_apex.sql x x ^APPUN

grant inherit any privileges to ^APPUN;

prompt Installing SYS views
```

```

@@core/sys_core_views.sql

@@core/wwv_flow_val.sql
grant execute on sys.wwv_flow_val to ^APPUN.;

@@core/wwv_flow_val.plb

ALTER SESSION SET CURRENT_SCHEMA = ^APPUN;

exec
sys.dbms_session.modify_package_state(sys.dbms_session.reinitialize)
;

begin
  ^APPUN..wwv_flow_upgrade.remove_jobs();
  ^APPUN..wwv_flow_upgrade.create_jobs('^APPUN');
  ^APPUN..wwv_flow_upgrade.create_public_synonyms('^APPUN');
  ^APPUN..wwv_flow_upgrade.grant_public_synonyms('^APPUN');
  ^APPUN..wwv_flow_upgrade.flows_files_objects_remove('^APPUN');
  ^APPUN..wwv_flow_upgrade.flows_files_objects_create('^APPUN');
end;
/

ALTER SESSION SET CURRENT_SCHEMA = SYS;

drop context APEX$SESSION;
create context APEX$SESSION using ^APPUN..WWV_FLOW_SESSION_CONTEXT;

alter package sys.wwv_dbms_sql_ ^APPUN. compile;
alter package sys.wwv_dbms_sql_ ^APPUN. compile body;

exec
sys.dbms_session.modify_package_state(sys.dbms_session.reinitialize)
;

set serveroutput on size unlimited

declare
  l_apex_version varchar2(30);
  l_schemas sys.dbms_registry.schema_list_t;
begin
  sys.dbms_registry.set_session_namespace (namespace =>
'DBTOOLS');
  execute immediate 'drop package ^APPUN..WWV_FLOW_DB_VERSION';
  l_apex_version := ^APPUN..wwv_flows_release;
  sys.dbms_registry.loading('APEX','Oracle Application
Express','validate_apex', '^APPUN');
  select username
    bulk collect into l_schemas
    from sys.all_users
   where username in
('FLOWS_FILES','APEX_PUBLIC_USER','APEX_LISTENER','APEX_REST_PUBLIC_
USER','APEX_INSTANCE_ADMIN_USER')
   order by 1;
  sys.dbms_registry.update_schema_list('APEX', l_schemas);

```

```

        sys.dbms_registry.loaded('APEX',l_apex_version);
        commit;
        sys.validate_apex;
end;
/

```

4. Create a second new text file in that directory named `apxdwngrd_cdb.sql` consisting of the following:

```

set define '^'
whenever sqlerror exit
column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)
set serverout on
begin
-- get oracle_home
sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
if length(:xe_home) = 0 then
    sys.dbms_output.put_line(lpad('-',80,'-'));
    raise_application_error (-20001,'Oracle Home environment variable not set' );
end if;
end;
/
whenever sqlerror continue
set termout off
select :xe_home from sys.dual;
set termout on
host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/admin/catcon.pl
-b apx181dgrd apxdwngrd.sql

```

5. Start SQL\*Plus and connect to `CDB$ROOT` of the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

On Windows:

```

SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

On UNIX and Linux:

```

$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

6. Run the `apxdwngrd_cdb.sql` script:

```

SQL> @apxdwngrd_cdb.sql

```

7. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).



**See Also:**

[Reverting the Images Directory](#)

### C.3.1.3.18 Reverting to Release 18.2 in a non-CDB or PDB with Local APEX

To revert to Oracle APEX release 18.2 in a non-CDB or PDB with a locally installed APEX:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 18.2 source.
3. Create a new text file in that directory named `apxdwngrd.sql` consisting of the following:

```

set define '^'
set concat on
set concat .
set verify off

set termout off
column foo new_val LOG
select 'apxdwngrd_' ||to_char(sysdate, 'YYYY-MM-DD_HH24-MI-SS') ||
'.log' as foo
  from sys.dual;
set termout on
spool ^LOG

@@core/scripts/set_appun.sql

whenever sqlerror exit
set serveroutput on size unlimited

declare
  l_cnt    number := 0;
begin
  select count(*) into l_cnt from sys.dba_users where username =
'^APPUN';
  if l_cnt = 0 then
    dbms_output.put_line('^APPUN not found in this database. ');
    raise program_error;
  end if;
end;
/
whenever sqlerror continue

prompt ...Create validate procedure in SYS schema and start
registration
@@core/validate_apex.sql x x ^APPUN

grant inherit any privileges to ^APPUN;

prompt Installing SYS views

@@core/sys_core_views.sql

@@core/wwv_flow_val.sql
grant execute on sys.wwv_flow_val to ^APPUN.;

@@core/wwv_flow_val.plb

```

```

ALTER SESSION SET CURRENT_SCHEMA = ^APPUN;

exec sys.dbms_session.modify_package_state(sys.dbms_session.reinitialize);

begin
  ^APPUN..wwv_flow_upgrade.remove_jobs();
  ^APPUN..wwv_flow_upgrade.create_jobs('^APPUN');
  ^APPUN..wwv_flow_upgrade.create_public_synonyms('^APPUN');
  ^APPUN..wwv_flow_upgrade.grant_public_synonyms('^APPUN');
  ^APPUN..wwv_flow_upgrade.flows_files_objects_remove('^APPUN');
  ^APPUN..wwv_flow_upgrade.flows_files_objects_create('^APPUN');
end;
/

ALTER SESSION SET CURRENT_SCHEMA = SYS;

drop context APEX$SESSION;
create context APEX$SESSION using ^APPUN..WWV_FLOW_SESSION_CONTEXT;

alter package sys.wwv_dbms_sql_^APPUN. compile;
alter package sys.wwv_dbms_sql_^APPUN. compile body;

exec sys.dbms_session.modify_package_state(sys.dbms_session.reinitialize);

set serveroutput on size unlimited

declare
  l_apex_version varchar2(30);
  l_schemas sys.dbms_registry.schema_list_t;
begin
  sys.dbms_registry.set_session_namespace (namespace => 'DBTOOLS');
  execute immediate 'drop package ^APPUN..WWV_FLOW_DB_VERSION';
  l_apex_version := ^APPUN..wwv_flows_release;
  sys.dbms_registry.loading('APEX', 'Oracle Application
Express', 'validate_apex', '^APPUN');
  select username
    bulk collect into l_schemas
  from sys.all_users
  where username in
('FLOWS_FILES', 'APEX_PUBLIC_USER', 'APEX_LISTENER', 'APEX_REST_PUBLIC_USER',
'APEX_INSTANCE_ADMIN_USER')
  order by 1;
  sys.dbms_registry.update_schema_list('APEX', l_schemas);
  sys.dbms_registry.loaded('APEX', l_apex_version);
  commit;
  sys.validate_apex;
end;
/

```

4. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

**On UNIX and Linux:**

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

**5. Run the apxdwngrd.sql script:**

```
SQL> @apxdwngrd.sql
```

**6. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).**



**See Also:**

[Reverting the Images Directory](#)

### C.3.1.3.19 Reverting to Release 18.2 in a CDB

To revert to Oracle APEX release 18.2 in a CDB:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 18.2 source.
3. Create a new text file in that directory named `apxdwngrd.sql` consisting of the following:

```
set define '^'
set concat on
set concat .
set verify off

set termout off
column foo new_val LOG
select 'apxdwngrd_' ||to_char(sysdate, 'YYYY-MM-DD_HH24-MI-SS') ||
'.log' as foo
  from sys.dual;
set termout on
spool ^LOG

@@core/scripts/set_appun.sql

whenever sqlerror exit
set serveroutput on size unlimited

declare
  l_cnt  number := 0;
begin
  select count(*) into l_cnt from sys.dba_users where username =
```

```

'^APPUN';
    if l_cnt = 0 then
        dbms_output.put_line('^APPUN not found in this database. ');
        raise program_error;
    end if;
end;
/
whenever sqlerror continue

prompt ...Create validate procedure in SYS schema and start registration
@@core/validate_apex.sql x x ^APPUN

grant inherit any privileges to ^APPUN;

prompt Installing SYS views

@@core/sys_core_views.sql

@@core/wwv_flow_val.sql
grant execute on sys.wwv_flow_val to ^APPUN.;

@@core/wwv_flow_val.plb

ALTER SESSION SET CURRENT_SCHEMA = ^APPUN;

exec sys.dbms_session.modify_package_state(sys.dbms_session.reinitialize);

begin
    ^APPUN..wwv_flow_upgrade.remove_jobs();
    ^APPUN..wwv_flow_upgrade.create_jobs('^APPUN');
    ^APPUN..wwv_flow_upgrade.create_public_synonyms('^APPUN');
    ^APPUN..wwv_flow_upgrade.grant_public_synonyms('^APPUN');
    ^APPUN..wwv_flow_upgrade.flows_files_objects_remove('^APPUN');
    ^APPUN..wwv_flow_upgrade.flows_files_objects_create('^APPUN');
end;
/

ALTER SESSION SET CURRENT_SCHEMA = SYS;

drop context APEX$SESSION;
create context APEX$SESSION using ^APPUN..WWV_FLOW_SESSION_CONTEXT;

alter package sys.wwv_dbms_sql_ ^APPUN. compile;
alter package sys.wwv_dbms_sql_ ^APPUN. compile body;

exec sys.dbms_session.modify_package_state(sys.dbms_session.reinitialize);

set serveroutput on size unlimited

declare
    l_apex_version varchar2(30);
    l_schemas sys.dbms_registry.schema_list_t;
begin
    sys.dbms_registry.set_session_namespace (namespace => 'DBTOOLS');

```

```

execute immediate 'drop package ^APPUN..WWV_FLOW_DB_VERSION';
l_apex_version := ^APPUN..wwv_flows_release;
sys.dbms_registry.loading('APEX','Oracle Application
select username
      bulk collect into l_schemas
      from sys.all_users
      where username in
('FLOWS_FILES','APEX_PUBLIC_USER','APEX_LISTENER','APEX_REST_PUBLIC_
USER','APEX_INSTANCE_ADMIN_USER')
      order by 1;
sys.dbms_registry.update_schema_list('APEX', l_schemas);
sys.dbms_registry.loaded('APEX',l_apex_version);
commit;
sys.validate_apex;
end;
/

```

4. Create a second new text file in that directory named `apxdwngrd_cdb.sql` consisting of the following:

```

set define '^'
whenever sqlerror exit
column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)
set serverout on
begin
-- get oracle_home
sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
if length(:xe_home) = 0 then
      sys.dbms_output.put_line(lpad('-',80,'-'));
      raise_application_error (-20001,'Oracle Home environment variable not
set' );
end if;
end;
/
whenever sqlerror continue
set termout off
select :xe_home from sys.dual;
set termout on
host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/admin/
catcon.pl -b apx182dgrd apxdwngrd.sql

```

5. Start SQL\*Plus and connect to `CDB$ROOT` of the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

On Windows:

```

SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

On UNIX and Linux:

```

$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

6. Run the `apxdwngrd_cdb.sql` script:

```

SQL> @apxdwngrd_cdb.sql

```

7. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

**See Also:**

[Reverting the Images Directory](#)

### C.3.1.3.20 Reverting to Release 19.1 in a non-CDB or PDB with Local APEX

To revert to Oracle APEX release 19.1 in a non-CDB or PDB with a locally installed APEX:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 19.1 source.
3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Run the `apxdwngrd.sql` script:

```
SQL> @apxdwngrd.sql
```

5. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

### C.3.1.3.21 Reverting to Release 19.1 in a CDB

To revert to Oracle APEX release 19.1 in a CDB:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 19.1 source.
3. Create a script in the `apex` directory called `apxdwngrd_cdb.sql` with the following contents:

```
set define '^'
whenever sqlerror exit
column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)
set serverout on
begin
-- get oracle_home
```

```

sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
if length(:xe_home) = 0 then
    sys.dbms_output.put_line(lpad('-',80,'-'));
    raise_application_error (-20001,'Oracle Home environment
variable not set' );
end if;
end;
/
whenever sqlerror continue
set termout off
select :xe_home from sys.dual;
set termout on
host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/
admin/catcon.pl -b apx191dgrd apxdwngrd.sql

```

4. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```

SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

- On UNIX and Linux:

```

$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

5. Run the apxdwngrd\_cdb.sql script:

```

SQL> @apxdwngrd_cdb.sql

```

6. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

### C.3.1.3.22 Reverting to Release 19.2 in a non-CDB or PDB with Local APEX

To revert to Oracle APEX release 19.2 in a non-CDB or PDB with a locally installed APEX:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to apex in the 19.2 source.
3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```

SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Run the `apxdwngrd.sql` script:

```
SQL> @apxdwngrd.sql
```

5. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

### C.3.1.3.23 Reverting to Release 19.2 in a CDB

To revert to Oracle APEX release 19.2 in a CDB:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 19.2 source.
3. Create a script in the `apex` directory called `apxdwngrd_cdb.sql` with the following contents:

```
set define '^'
whenever sqlerror exit
column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)
set serverout on
begin
-- get oracle_home
sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
if length(:xe_home) = 0 then
    sys.dbms_output.put_line(lpad('-',80,'-'));
    raise_application_error (-20001,'Oracle Home environment variable not
set' );
end if;
end;
/
whenever sqlerror continue
set termout off
select :xe_home from sys.dual;
set termout on
host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/admin/
catcon.pl -b apx192dgrd apxdwngrd.sql
```

4. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

5. Run the `apxdwngrd_cdb.sql` script:

```
SQL> @apxdwngrd_cdb.sql
```

6. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

### C.3.1.3.24 Reverting to Release 20.1 in a non-CDB or PDB with Local APEX

To revert to Oracle APEX release 20.1 in a non-CDB or PDB with a locally installed APEX:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 20.1 source.
3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Run the `apxdwngrd.sql` script:

```
SQL> @apxdwngrd.sql
```

5. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

### C.3.1.3.25 Reverting to Release 20.1 in a CDB

To revert to Oracle APEX release 20.1 in a CDB:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 20.1 source.

3. Create a script in the apex directory called `apxdwngrd_cdb.sql` with the following contents:

```
set define '^'
whenever sqlerror exit
column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)
set serverout on
begin
-- get oracle_home
sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
if length(:xe_home) = 0 then
    sys.dbms_output.put_line(lpad('-',80,'-'));
    raise_application_error (-20001,'Oracle Home environment variable not
set' );
end if;
end;
/
whenever sqlerror continue
set termout off
select :xe_home from sys.dual;
set termout on
host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/admin/
catcon.pl -b apx201dgrd apxdwngrd.sql
```

4. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

5. Run the `apxdwngrd_cdb.sql` script:

```
SQL> @apxdwngrd_cdb.sql
```

6. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

### C.3.1.3.26 Reverting to Release 20.2 in a non-CDB or PDB with Local APEX

To revert to Oracle APEX release 20.2 in a non-CDB or PDB with a locally installed APEX:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 20.2 source.

3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Run the apxdwngrd.sql script:

```
SQL> @apxdwngrd.sql
```

5. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

### C.3.1.3.27 Reverting to Release 20.2 in a CDB

To revert to Oracle APEX release 20.2 in a CDB:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to apex in the 20.2 source.
3. Create a script in the apex directory called apxdwngrd\_cdb.sql with the following contents:

```
set define '^'
whenever sqlerror exit
column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)
set serverout on
begin
-- get oracle_home
sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
if length(:xe_home) = 0 then
    sys.dbms_output.put_line(lpad('-',80,'-'));
    raise_application_error (-20001,'Oracle Home environment
variable not set' );
end if;
end;
/
whenever sqlerror continue
set termout off
select :xe_home from sys.dual;
set termout on
host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/
admin/catcon.pl -b apx202dgrd apxdwngrd.sql
```

4. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

5. Run the `apxdwngrd_cdb.sql` script:

```
SQL> @apxdwngrd_cdb.sql
```

6. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

### C.3.1.3.28 Reverting to Release 21.1 in a non-CDB or PDB with Local APEX

To revert to Oracle APEX 21.1 in a non-CDB or PDB with a locally installed APEX:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 21.1 source.
3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Run the `apxdwngrd.sql` script:

```
SQL> @apxdwngrd.sql
```

5. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

### C.3.1.3.29 Reverting to Release 21.1 in a CDB

To revert to Oracle APEX release 21.1 in a CDB:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 21.1 source.
3. Create a script in the apex directory called `apxdwngrd_cdb.sql` with the following contents:

```

set define '^'
whenever sqlerror exit
column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)
set serverout on
begin
-- get oracle_home
sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
if length(:xe_home) = 0 then
    sys.dbms_output.put_line(lpad('-',80,'-'));
    raise_application_error (-20001,'Oracle Home environment
variable not set' );
end if;
end;
/
whenever sqlerror continue
set termout off
select :xe_home from sys.dual;
set termout on
host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/
admin/catcon.pl -b apx211dgrd apxdwngrd.sql

```

4. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```

SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

- On UNIX and Linux:

```

$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password

```

5. Run the `apxdwngrd_cdb.sql` script:

```

SQL> @apxdwngrd_cdb.sql

```

6. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

### C.3.1.3.30 Reverting to Release 21.2 in a non-CDB or PDB with Local APEX

To revert to Oracle APEX 21.2 in a non-CDB or PDB with a locally installed APEX:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 21.2 source.
3. Start SQL\*Plus and connect to the database where Oracle APEX is installed as `SYS` specifying the `SYSDBA` role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Run the `apxdwngrd.sql` script:

```
SQL> @apxdwngrd.sql
```

5. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

### C.3.1.3.31 Reverting to Release 21.2 in a CDB

To revert to Oracle APEX release 21.2 in a CDB:

1. If you altered your images directory, revert it back to the release you want to revert to.
2. Change your working directory to `apex` in the 21.2 source.
3. Create a script in the `apex` directory called `apxdwngrd_cdb.sql` with the following contents:

```
set define '^'
whenever sqlerror exit
column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)
set serverout on
begin
-- get oracle_home
sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
if length(:xe_home) = 0 then
    sys.dbms_output.put_line(lpad('-',80,'-'));
    raise_application_error (-20001,'Oracle Home environment variable not
set' );
end if;
end;
/
whenever sqlerror continue
set termout off
select :xe_home from sys.dual;
set termout on
```

```
host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/  
admin/catcon.pl -b apx212dgrd apxdwngrd.sql
```

4. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog  
SQL> CONNECT SYS as SYSDBA  
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog  
SQL> CONNECT SYS as SYSDBA  
Enter password: SYS_password
```

5. Run the apxdwngrd\_cdb.sql script:

```
SQL> @apxdwngrd_cdb.sql
```

6. Remove the Oracle APEX release schema. See [Removing the Oracle APEX Release Schema](#).

### C.3.1.3.32 Re-enabling the REST Administration Interface After Downgrading

If the REST Administration Interface was used before the upgrade attempt, you must re-create the APEX\_INSTANCE\_ADMIN\_USER. If the REST Administration Interface was not used, skip this step.

To re-create the APEX\_INSTANCE\_ADMIN\_USER:

1. Change your working directory to apex in the, XX.X release source (where XX.X is the release number you reverted to).
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog  
SQL> CONNECT SYS as SYSDBA  
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog  
SQL> CONNECT SYS as SYSDBA  
Enter password: SYS_password
```

3. If the no authentication was used, run the following:

```
create user apex_instance_admin_user no authentication
```

4. If the authentication was used, run the following:

```
create user apex_instance_admin_user identified by <random-password>  
password expire
```

### C.3.1.4 Removing the Oracle APEX Release Schema

After you revert to the prior release, remove the Oracle APEX schema.

- [Removing the APEX Release 22.1 Schema from a Non-CDB](#)  
Start SQL\*Plus and connect to the database and execute `DROP USER APEX_220100 CASCADE;` command.
- [Removing the Oracle APEX Release 22.1 Schema from a CDB](#)  
Create text files, start SQL\*Plus and connect to the database execute `@remove_apx221_usr.sql`.

#### C.3.1.4.1 Removing the APEX Release 22.1 Schema from a Non-CDB

Start SQL\*Plus and connect to the database and execute `DROP USER APEX_220100 CASCADE;` command.

To remove the release 22.1 schema from a non-CDB:

1. Start SQL\*Plus and connect to the database where APEX is installed as `SYS` specifying the `SYSDBA` role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog  
SQL> SQL> CONNECT SYS as SYSDBA  
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog  
SQL> SQL> CONNECT SYS as SYSDBA  
Enter password: SYS_password
```

2. Execute the following command:

```
DROP USER APEX_220100 CASCADE;
```

Once you have removed the Oracle APEX 22.1 schema, you can now attempt the upgrade again.

#### C.3.1.4.2 Removing the Oracle APEX Release 22.1 Schema from a CDB

Create text files, start SQL\*Plus and connect to the database execute `@remove_apx221_usr.sql`.

To remove the release 22.1 schema from a CDB:

1. Create a new text file named `remove_apx221_usr1.sql` with the following contents:

```
alter session set current_schema = SYS;
drop user APEX_220100 cascade;
```

2. Create a second new text file named `remove_apx221_usr.sql` with the following contents:

```
set define '^'
whenever sqlerror exit
column :xe_home new_value OH_HOME NOPRINT
variable xe_home varchar2(255)

set serverout on
begin
-- get oracle_home
  sys.dbms_system.get_env('ORACLE_HOME',:xe_home);
  if length(:xe_home) = 0 then
    sys.dbms_output.put_line(lpad('-',80,'-'));
    raise_application_error (
      -20001,
      'Oracle Home environment variable not set' );
  end if;
end;
/
whenever sqlerror continue

set termout off
select :xe_home from sys.dual;
set termout on
host ^OH_HOME/perl/bin/perl -I ^OH_HOME/rdbms/admin ^OH_HOME/rdbms/
admin/catcon.pl -b
  remove_apx221_usr remove_apx221_usr.sql
```

3. Start SQL\*Plus and connect to the database where APEX is installed as SYS specifying the SYSDBA role:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

4. Execute the following command:

```
@remove_apx221_usr.sql
```

Once you have removed the APEX 22.1 schema, you can now attempt the upgrade again.

## C.3.2 Removing Oracle APEX from the Database

Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role and execute the `SQL> @apxremov.sql` command.

This section describes how to remove the Oracle APEX schema, synonyms, and users from the database without deleting the database.

### Note:

Do NOT follow these steps if you have upgraded your database from a prior release, and still want to use the prior release of Oracle APEX. For information about reverting to a prior release, see [Reverting to a Previous Release](#). If you are not sure whether you have completed a new installation or an upgrade installation, review [Cleaning Up After a Failed Installation](#) to verify if a previous release of Oracle APEX exists in the database.

To remove Oracle APEX from the database:

1. Change your working directory to the `apex` directory where you unzipped the Oracle APEX software.
2. Start SQL\*Plus and connect to the database where Oracle APEX is installed as SYS specifying the SYSDBA role:
  - On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```
  - On UNIX and Linux:

```
$ sqlplus /nolog
SQL> SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```
3. Execute the following command:

```
SQL> @apxremov.sql
```
4. After successfully removing Oracle APEX using `apxremov.sql`, you must exit your current SQL\*Plus session and reconnect before attempting another install using `apexins.sql`.

## C.4 About Images Displaying Incorrectly in Oracle APEX

Learn about troubleshooting if images in Oracle APEX do not display correctly.

If images in Oracle APEX do not display correctly, you may have more than one definition of the `/i/` alias. To address this issue:

- If possible, rename the first instance of `/i/` to a different alias name.
- Alternatively, copy the images from the directory where Oracle APEX was downloaded or the images copied for Oracle REST Data Services (ORDS) to the directory defined by the first `/i/` alias.

## C.5 About Page Protection Violation

A page protection violation may be caused by manual alteration of protected page items.

If this error occurs after installation when trying to log into Oracle APEX, then stop and start Oracle REST Data Services. If you are unsure of what caused this error, contact the application administrator for assistance.

# D

## Upgrading Oracle APEX within Oracle Database Express Edition

Learn how to upgrade Oracle APEX included with Oracle Database Express Edition (XE) .

### Tip:

Upgrading Oracle APEX does not change the Oracle Support policy for Oracle Database XE. Oracle Database XE is only supported on the Oracle OTN forums. Oracle Support will not answer questions about Oracle APEX on Oracle Database XE.

### Tip:

To learn more about Oracle Database XE, see <https://www.oracle.com/database/technologies/appdev/xe.html>

- [Upgrading to the Latest Oracle APEX Release](#)  
Learn how to the latest Oracle APEX release.

## D.1 Upgrading to the Latest Oracle APEX Release

Learn how to the latest Oracle APEX release.

To upgrade to the latest Oracle APEX release:

1. Download the latest version of Oracle APEX from the download page. See:  
<http://www.oracle.com/technetwork/developer-tools/apex/downloads/index.html>
2. Unzip downloaded zip file:
  - UNIX and Linux: `$ unzip filename.zip`
  - Windows: Double click `filename.zip` in Windows Explorer

### Tip:

Keep the directory tree where you unzip the files short and not under directories that contain spaces. For example, within Windows unzip to `C:\`.

3. Change your working directory to `apex`.

4. Start SQL\*Plus and connect to the Oracle Database XE where Oracle APEX is installed as SYS specifying the SYSDBA role. For example:

- On Windows:

```
SYSTEM_DRIVE:\ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```

- On UNIX and Linux:

```
$ sqlplus /nolog
SQL> CONNECT SYS as SYSDBA
Enter password: SYS_password
```



**Tip:**

Keep the directory tree where you unzip the files short and not under directories that contain spaces. For example, within Windows unzip to C:\.

5. Install Oracle APEX:

```
@apexins.sql tablespace_apex tablespace_files tablespace_temp images
```

Where:

- *tablespace\_apex* is the name of the tablespace for the Oracle APEX application user.
- *tablespace\_files* is the name of the tablespace for the Oracle APEX files user.
- *tablespace\_temp* is the name of the temporary tablespace or tablespace group.
- *images* is the virtual directory for Oracle APEX images. To support future Oracle APEX upgrades, define the virtual image directory as /i/.

Example

```
@apexins.sql SYSAUX SYSAUX TEMP /i/
```

6. Configure ORDS for HTTP(s) access. See [Installing and Configuring Oracle APEX and Oracle REST Data Services](#).
7. Upgrade the Oracle APEX password by running `apxchpwd.sql`:

```
@apxchpwd.sql
```

When prompted, enter a password for the ADMIN account.

8. Navigate to the Oracle APEX Administration Services application:

- a. In a Web browser, navigate to:

```
http://hostname:port/apex/apex_admin
```

Where:

*hostname* is the name of the system where Oracle XML DB Protocol server is installed.

*port* is the port number assigned to HTTP on the Oracle XML DB Protocol server. In a default installation, this number is 8080. If you are using the Oracle Database 12c or later multitenant architecture, then each pluggable database (PDB) will have a distinct port number.

*apex* is the database access descriptor (DAD) defined in the configuration file.

**b.** On the Sign In page:

- Username - Enter `admin`.
- Password - Enter the Oracle APEX administrator account password you specified in step 4.
- Click **Sign In to Administration**.

Note that, depending on your setup, you might be required to change your password when you log in for the first time.

# Index

## A

---

### ACL

fixing invalid, [6-32](#)

### Administration Services

signing in, [6-25](#)

### APEX

accessing in Oracle Cloud, [3-3](#)

architecture, [3-1](#)

getting started, [6-24](#)

XML DB requirement, [2-4](#)

### APEX\_PUBLIC\_USER account

about, [6-9](#)

changing password, [6-10](#)

configuring, [6-9](#)

expiration in Oracle Database 11g, [6-10](#)

unlocking, [6-9](#)

### apexins.sql

running, [6-4](#)

### application container

about, [5-2](#)

### applications

upgrading, [4-4](#)

### apxchpwd.sql, [6-8](#), [D-2](#)

changing Instance Administrator account

password, [6-7](#)

creating Instance Administrator account, [6-7](#)

running, [6-8](#)

unlockin Instance Administrator account, [6-7](#)

updating Instance Administrator account, [6-7](#)

### apxdevrm.sql, [6-35](#)

### apxdvins.sql, [6-34](#)

### apxrtins.sql

running, [6-4](#)

## B

---

### browser

requirement, [2-4](#)

## C

---

### CDB

application container, [5-3](#)

### CDBs

patching Oracle APEX, [5-14](#)

uninstalling, [5-7](#)

### CDBs reinstalling Oracle APEX, [5-9](#)

common APEX from another CDB, [5-18](#)

### configure

HTTP access, [5-6](#)

### creating

application PDB, application root seed, [5-5](#)

application seed, [5-4](#)

## D

---

### database requirement

Oracle APEX, [2-1](#)

### development environment

changing to runtime, [6-34](#)

### disk space

requirements, [2-4](#)

## E

---

environment, configuring, [3-5](#)

## F

---

### full development environment

about, [6-33](#)

converting to runtime, [6-34](#)

installing in, [6-4](#)

## G

---

### getting started

APEX, [6-24](#)

## I

---

### installation

downloading Oracle REST Data Services,  
[6-12](#)

enabling network services, [6-15](#)

installing in other languages, [6-21](#)

managing JOB\_QUEUE\_PROCESSES, [6-19](#)

installation (*continued*)  
 Oracle APEX, [6-3](#)  
 Oracle REST Data Services, [6-12](#)  
 overview, [3-5](#)  
 patch sets, [3-4](#)  
 performing security tasks, [6-18](#)  
 planning, [3-4](#)  
 point releases, [3-4](#)  
 process, [3-5](#)  
 requirements, [2-1](#), [3-4](#)  
 restart processes, [6-9](#)  
 signing in, [6-24](#)  
 understanding, [3-3](#)  
 verifying validity, [C-1](#)

installation option  
 full development environment, [6-5](#)  
 runtime environment, [6-5](#)

installing  
 failures, [C-2](#)  
 in application container, [5-3](#)  
 Oracle APEX, [6-3](#)  
 Oracle REST Data Services, [6-12](#)  
 other languages, [6-21](#)

Instance administrator account  
 about, [6-7](#)  
 creating, [6-6](#)  
 running apxchpwd.sql, [6-7](#)  
 updating, [6-6](#)

Instance Administrator account  
 changing password, [6-7](#)  
 creating, [6-7](#)  
 creating password, [6-7](#)  
 unlocking, [6-7](#)

## J

---

JOB\_QUEUE\_PROCESSES, [6-19](#)  
 changing number of, [6-20](#)  
 viewing from SQL\*Plus, [6-20](#)  
 viewing in installation log, [6-19](#)  
 viewing number of, [6-19](#)  
 viewing on About page, [6-20](#)

## L

---

log file, [C-1](#)  
 login credentials  
 recovering workspace name, [3-8](#)

## M

---

MEMORY\_TARGET  
 checking, [2-2](#)  
 Multitenant Architecture, [5-1](#)

## N

---

network services  
 enabling, [6-15](#)  
 granting connect privileges, Oracle Database  
 12c, [6-17](#)  
 invalid ACL error, [6-17](#)

non-CDB  
 installing in, [6-4](#)

## O

---

Oracle APEX  
 about users, [6-24](#)  
 about workspaces, [6-24](#)  
 Administration Services, [6-25](#)  
 browser requirement, [2-4](#)  
 configuring, [6-1](#)  
 configuring your environment, [3-5](#)  
 creating users, [6-27](#)  
 creating workspace manually, [6-26](#)  
 database requirement, [2-1](#)  
 disk space requirements, [2-4](#)  
 download and install in non-CDB, [6-4](#)  
 download and install locally, [6-4](#)  
 downloading, [6-3](#)  
 incompatible versions, [5-14](#)  
 installing, [6-1](#), [6-3](#)  
 installing translated versions, [6-22](#)  
 patching in CDBs, [5-14](#)  
 patching in PDBs, [5-15](#), [5-16](#)  
 pre-installation tasks, [6-2](#)  
 reinstalling in CDBs, [5-9](#)  
 release number, [4-2](#)  
 releases included with Oracle Database, [4-3](#)  
 signing in to workspace, [6-29](#)  
 uninstalling in CDBs, [5-7](#)

Oracle APEX Administration Services, [6-26](#)

Oracle APEX Application Development  
 accessing APEX, [3-3](#)

Oracle APEX Clusters (Oracle RAC)  
 shutting down instances, [6-2](#)

Oracle Autonomous Database  
 accessing Oracle APEX, [3-3](#)

Oracle Cloud  
 accessing APEX, [3-3](#)

Oracle Database  
 Oracle APEX included, [4-3](#)

Oracle REST Data Services  
 configuring, [6-1](#), [6-14](#)  
 configuring behind load balancer, [6-13](#)  
 configuring behind reverse proxy, [6-13](#)  
 configuring RESTful Services, [6-11](#)  
 Copying the Images Directory, [6-14](#)  
 downloading, [6-12](#)

Oracle REST Data Services (*continued*)  
 installing, [6-1](#), [6-12](#)  
 release number, [4-3](#)  
 Validating the Oracle REST Data Services  
 Installation, [6-15](#)  
 Web Server HTTP POST Request Limits,  
[6-13](#)  
 Oracle SQL Developer Command Line  
 support, [6-3](#)  
 ords.version.number.zip, [6-12](#)  
 overview, [3-5](#)

## P

---

password  
 resetting from Sign In page, [3-8](#)  
 patch sets, [3-4](#)  
 PDB  
 application container, [5-3](#)  
 PDBs  
 patching APEX, [5-15](#)  
 patching Oracle APEX, [5-15](#), [5-16](#)  
 performance  
 optimizing, [6-32](#)  
 performance optimization  
 about, [6-32](#)  
 expired header attribute, [6-32](#)  
 gzip compression, [6-32](#)  
 Plug-in non-CDB, [5-14](#)  
 Plug-in PDB, [5-14](#)  
 plugging in non-CDB or PDB with locally installed  
 APEX, [5-12](#), [5-17](#)  
 plugging in PDBs  
 APEX from another CDB, [5-12](#)  
 APEX in root, [5-11](#)  
 APEX not contained root, [5-18](#)  
 APEX not in the root of CDB, [5-17](#)  
 APEX root another CDB, [5-13](#)  
 not in the root container of the target CDB  
 non-CDB or PDB with no APEX, [5-18](#)  
 when not contained in the root container  
 local APEX from another CDB, [5-18](#)  
 point releases, [3-4](#)  
 post-installation tasks  
 installing other languages, [6-21](#)  
 pre-installation tasks, [6-2](#)  
 prior installations  
 removing when upgrading, [6-30](#)

## R

---

release number  
 Oracle REST Data Services, [4-3](#)  
 viewing, [4-2](#)

release numbering  
 convention, [4-2](#)  
 removing schemas from prior installation, [6-32](#)  
 requirements, [2-1](#)  
 browser, [2-4](#)  
 database, [2-1](#)  
 disk space, [2-4](#)  
 MEMORY\_TARGET, [2-2](#)  
 Oracle XML DB, [2-4](#)  
 WORKAREA\_SIZE\_POLICY, [2-3](#)  
 RESTful Services  
 configuring, [6-11](#)  
 reverting to previous release, [4-5](#)  
 running  
 apexins.sql, [6-4](#)  
 apxchpwd.sql, [6-8](#), [D-2](#)  
 apxdevrn.sql, [6-35](#)  
 apxdvins.sql, [6-34](#)  
 runtime environment  
 about, [3-9](#), [6-33](#)  
 converting to development environment, [6-34](#)  
 installing in, [6-4](#)

## S

---

Secure Sockets Layer (SSL), [6-18](#)  
 Sign In dialog  
 requesting a workspace, [3-6](#)  
 SQLcl  
 support, [6-3](#)  
 SSL, [6-18](#)

## T

---

translated version  
 installing, [6-21](#)  
 translated versions  
 about installing, [6-22](#)  
 troubleshooting, [C-1](#)  
 cleaning up after failed installation, [C-2](#)  
 images, [C-47](#)  
 reviewing log file, [C-1](#)

## U

---

upgrade post installation tasks, [6-30](#)  
 fixing invalid ACL, [6-32](#)  
 removing prior installation, [6-30](#)  
 removing schemas from prior installation,  
[6-31](#)  
 verifying prior installation, [6-30](#)  
 upgrading  
 about, [4-1](#)  
 environment clean-up, [4-4](#)

upgrading (*continued*)  
existing applications, [4-4](#)  
in application container, [5-3](#)  
reverting, [4-5](#)  
sample scenarios, [4-2](#)  
testing, [4-4](#)  
user accounts  
creating, [6-27](#)

## V

---

verifying  
application container installation, [5-4](#)

## W

---

Web browser  
requirements, [2-4](#)

Web browser (*continued*)  
web server  
Oracle REST Data Services, [2-4](#), [3-1](#)  
requirements, [2-4](#)  
WORKAREA\_SIZE\_POLICY  
checking, [2-3](#)  
workspace  
creating, [6-26](#)  
recovering workspace name, [3-8](#)  
requesting from Sign In dialog, [3-6](#)  
signing in, [6-29](#)  
workspace name  
recovering, [3-8](#)

## X

---

XML DB  
requirement, [2-4](#)