Table of Contents

[Install APEX 2](#_Toc53945160)

[Install Tomcat on Linux 5](#_Toc53945161)

[Configure ORDS 6](#_Toc53945162)

[References 8](#_Toc53945163)

# Install APEX

1. Download APEX

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

1. Upload to database server, and unzip

#Example: upload to /u01/media

cd /u01/media

mkdir -p /u01/apex

unzip apex\_20.1.zip -d /u01/

1. Oracle 12c introduced the multitenant architecture. This means that you can have one “container” database (CDB) containing multiple “pluggable” databases (PDBs). You can choose to install APEX in the container database or install it in one of the pluggable databases. This way you can have multiple versions of APEX in the same database, something that was not possible before.

You can find the name of the pluggable database with the following command:

SQL> conn / as sysdba

Connected.

SQL> select name from v$containers;

NAME

------------------------------------------------------------------

CDB$ROOT

PDB$SEED

XEPDB1

* 1. Change default user profile

First, we are going to change the password expiration date to UNLIMITED for the DEFAULT user profile. This will make sure that no APEX database accounts will expire after 180 days (which is the default setting), making your installation inaccessible.

$ sqlplus /nolog

SQL> conn / as sysdba

Connected.

SQL> **alter session set container=XEPDB1;**

Session altered.

SQL> **alter profile DEFAULT limit password\_life\_time UNLIMITED;**

Profile altered.

* 1. Install APEX

# **navigate to the folder with installation file**s, e.g. /u01/apex

$ sqlplus /nolog

SQL> conn / as sysdba

Connected.

SQL> ALTER SESSION SET CONTAINER=XEPDB1;

Session altered.

**SQL> @apexins.sql SYSAUX SYSAUX TEMP /i/**

Installation takes about 10 mins, you’ll see lots of output, output looks like

The structure of the link to the Application Express administration services is as follows:

http://host:port/pls/apex/apex\_admin (Oracle HTTP Server with mod\_plsql)

http://host:port/apex/apex\_admin (Oracle XML DB HTTP listener with the embedded PL/SQL gateway)

http://host:port/apex/apex\_admin (Oracle REST Data Services)

The structure of the link to the Application Express development interface is as follows:

http://host:port/pls/apex (Oracle HTTP Server with mod\_plsql)

http://host:port/apex (Oracle XML DB HTTP listener with the embedded PL/SQL gateway)

http://host:port/apex (Oracle REST Data Services)

timing for: Phase 3 (Switch)

Elapsed: 00:00:13.03

timing for: Complete Installation

Elapsed: 00:10:33.61

PL/SQL procedure successfully completed.

APEX should have created a number of database accounts during the installation. To verify that the accounts have been installed in the correct PDB, run the following command:

SQL> alter session set container=XEPDB1;

Session altered.

SQL> select username from dba\_users order by username asc;

USERNAME

--------------------------------------------------------------------

ANONYMOUS

APEX\_200100

APEX\_INSTANCE\_ADMIN\_USER

APEX\_PUBLIC\_USER

* 1. Create APEX Instance Administration account.

This is the superuser that is needed to configure the APEX instance and create new workspaces, users etc.

$ sqlplus /nolog

SQL> conn / as sysdba

Connected.

SQL> alter session set container=XEPDB1;

Session altered.

SQL> **@apxchpwd.sql**

...set\_appun.sql

===================================================================

This script can be used to change the password of an Application Express

instance administrator. If the user does not yet exist, a user record will be

created.

===================================================================

Enter the administrator's username [ADMIN] **ADMIN**

User "ADMIN" does not yet exist and will be created.

Enter ADMIN's email [ADMIN]

Enter ADMIN's password []

Created instance administrator ADMIN.

* 1. Unlock APEX\_PUBLIC\_USER

As next step, we need to unlock and change the password of the **APEX\_PUBLIC\_USER**database account. This is one of the crucial accounts that is used to connect the web listener to the database.

$ sqlplus /nolog

SQL> conn / as sysdba

Connected.

SQL> alter session set container=XEPDB1;

Session altered.

**SQL> alter user APEX\_PUBLIC\_USER account unlock;**

**User altered.**

**SQL> alter user APEX\_PUBLIC\_USER identified by "<password>";**

* 1. Configure RESTful Service

$ sqlplus /nolog

SQL> conn / as sysdba

Connected.

SQL> alter session set container=XEPDB1;

Session altered.

**SQL> @apex\_rest\_config.sql**

PL/SQL procedure successfully completed.

PL/SQL procedure successfully completed.

Enter a password for the APEX\_LISTENER user []

Enter a password for the APEX\_REST\_PUBLIC\_USER user []

...set\_appun.sql

Procedure created.

Session altered.

Call completed.

Call completed.

Session altered.

Procedure dropped.

...create APEX\_LISTENER and APEX\_REST\_PUBLIC\_USER users

PL/SQL procedure successfully completed.

User altered.

Grant succeeded.

Grant succeeded.

PL/SQL procedure successfully completed.

* 1. Disable PLSQL Gateway

$ sqlplus /nolog

SQL> conn / as sysdba

Connected.

SQL> alter session set container=XEPDB1;

Session altered.

SQL> **exec dbms\_xdb.sethttpport(0);**

SQL> **exec dbms\_xdb.setftpport(0);**

# Install Tomcat on Linux

In this document, we’re installing Tomcat version 8.5 on Linux

1. Download Tomcat

mkdir -p /u01/tomcat

groupadd tomcat

useradd -s /bin/false -g tomcat -d /u01/tomcat tomcat

cd /u01/media

wget https://apache.mirror.digitalpacific.com.au/tomcat/tomcat-8/v8.5.57/bin/apache-tomcat-8.5.57.zip

1. Check user accounts status

Check the SYS user and common public users are unlocked, and you know their passwords. Remember to lock the SYS user when the installation is complete.

Unlock if needed.

CONN / AS SYSDBA

ALTER USER SYS IDENTIFIED BY $Password$ ACCOUNT UNLOCK;

--ALTER USER SYS IDENTIFIED BY $Password$ACCOUNT UNLOCK CONTAINER=ALL;

--ALTER SESSION SET CONTAINER = pdb1;

ALTER USER APEX\_LISTENER IDENTIFIED BY $Password$ ACCOUNT UNLOCK;

ALTER USER APEX\_PUBLIC\_USER IDENTIFIED BY $Password$ ACCOUNT UNLOCK;

ALTER USER APEX\_REST\_PUBLIC\_USER IDENTIFIED BY $Password$ ACCOUNT UNLOCK;

-- The next one will fail if you've never installed ORDS before. Ignore errors.

ALTER USER ORDS\_PUBLIC\_USER IDENTIFIED BY $Password$ ACCOUNT UNLOCK;

1. Install Tomcat

unzip apache-tomcat-8.5.57.zip

mv apache-tomcat-8.5.57/\* /u01/tomcat

chmod -Rf 755 /u01/tomcat/bin/

chown -hR tomcat:tomcat /u01/tomcat

1. Create tomcat.service file

# create a new file

vim /etc/systemd/system/tomcat.service

# add the following

[Unit]

Description=Apache Tomcat 8 Servlet Container

After=syslog.target network.target

[Service]

User=tomcat

Group=tomcat

Type=forking

Environment=CATALINA\_PID=/u01/tomcat/tomcat.pid

Environment=CATALINA\_HOME=/u01/tomcat

Environment=CATALINA\_BASE=/u01/tomcat

ExecStart=/u01/tomcat/bin/startup.sh

ExecStop=/u01/tomcat/bin/shutdown.sh

Restart=on-failure

[Install]

WantedBy=multi-user.target

1. Allow Tomcat to access /u01/ords/config

su – root

chown -R tomcat:tomcat /u01/ords/config

1. Config Tomcat

# set dir access

chmod 755 /u01/tomcat/bin

# Set tomcat to auto start

systemctl daemon-reload

systemctl start tomcat

systemctl enable tomcat

# check tomcat status

systemctl status tomcat

1. Firewall

We also need to punch a hole in the local firewall running on the VM to allow traffic through to port 8080.

firewall-cmd --permanent --zone=public --add-port=8080/tcp

firewall-cmd --reload

# Configure ORDS

When installing on XE database, the user is “xepdb1” not “XE”

1. Download ORDS from Oracle

mkdir -p /u01/ords

unzip /u01/media/ords-XX.X.X.XXX.XXXX.zip -d /u01/ords/

1. Update Connection Limit

e.g. /u01/ords/config/ords/defaults.xml

the max concurrent connection has to be adjusted based on **production** load.

<entry key="jdbc.InitialLimit">10</entry>

<entry key="jdbc.MinLimit">10</entry>

<entry key="jdbc.MaxLimit">**60**</entry>

1. Install ORDS

$ **java -jar ords.war install advanced**

This Oracle REST Data Services instance has not yet been configured.

Please complete the following prompts

Enter the location to store configuration data:

Enter the name of the database server [localhost]:**localhost** if same server

Enter the database listen port [1521]:**1521**

Enter 1 to specify the database service name, or 2 to specify the database SID [1]:**1**

Enter the database service name:**xepdb1**

Enter 1 if you want to verify/install Oracle REST Data Services schema or 2 to skip this step [1]:**1**

Enter the database password for ORDS\_PUBLIC\_USER:

Confirm password:

Requires to login with administrator privileges to verify Oracle REST Data Services schema.

Enter the administrator username:**SYS AS SYSDBA**

Enter the database password for SYS AS SYSDBA:

Confirm password:

Retrieving information.

Enter the default tablespace for ORDS\_METADATA [SYSAUX]:

Enter the temporary tablespace for ORDS\_METADATA [TEMP]:

Enter the default tablespace for ORDS\_PUBLIC\_USER [USERS]:

Enter the temporary tablespace for ORDS\_PUBLIC\_USER [TEMP]:

Enter 1 if you want to use PL/SQL Gateway or 2 to skip this step.

If using Oracle Application Express or migrating from mod\_plsql then you must enter 1 [1]:**1**

Enter the PL/SQL Gateway database user name [APEX\_PUBLIC\_USER]:

Enter the database password for APEX\_PUBLIC\_USER:

Confirm password:

Enter 1 to specify passwords for Application Express RESTful Services database users (APEX\_LISTENER, APEX\_REST\_PUBLIC\_USER) or 2 to skip this step [1]:**1**

Enter the database password for APEX\_LISTENER:

Confirm password:

Enter the database password for APEX\_REST\_PUBLIC\_USER:

Confirm password:

INFO: reloaded pools: []

Installing Oracle REST Data Services

... Verified database prerequisites

... Created Oracle REST Data Services proxy user

... Created Oracle REST Data Services schema

... Granted privileges to Oracle REST Data Services

... Created Oracle REST Data Services database objects

... Log file written to

... Log file written to

Completed installation for Oracle REST Data Services. Elapsed time: 00:00:32.815

Enter 1 if you wish to start in standalone mode or 2 to exit [1]:**2**

1. Copy APEX static files to Tomcat

mkdir -p /u01/tomcat/webapps/apex/i/

cp -a /u01/apex/images/\* /u01/**tomcat/webapps/apex/i/**

1. Deploy ORDS to Tomcat

cp -a /u01/ords/ords.war /u01/**tomcat/webapps/**

## Restart Tomcat

systemctl restart tomcat

# References

[Install APEX 19.2 on XE Database](https://matthiashoys.wordpress.com/2019/12/12/installation-of-apex-19-2-on-oracle-18c-xe-express-edition/)

[Install ORDS on Tomcat](https://oracle-base.com/articles/misc/oracle-rest-data-services-ords-installation-on-tomcat)