GENERAL

application express installation guide

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Application Express Installation Guide

Oracle Application Express, commonly known as **APEX**, is a powerful, low code development platform that enables developers to build scalable, secure, and responsive web applications directly inside the Oracle Database. Whether you are a seasoned DBA or a budding developer, installing APEX is the first step toward harnessing the full potential of Oracle's cloud ready architecture.

This guide walks you through every stage of the process—from checking system prerequisites to troubleshooting common pitfalls—so you can get your APEX environment up and running in no time. By the end, you'll have a fully functional installation ready for creating, testing, and deploying applications.

Understanding Oracle Application Express

Before diving into the installation steps, it's helpful to grasp what APEX actually is and why it matters:

- Low Code Platform: APEX allows rapid application development using declarative components, templates, and built in UI elements.
- Database Centric: All data, logic, and configuration live inside the Oracle Database, eliminating the need for separate web servers.
- Responsive Design: APEX automatically adapts to desktops, tablets, and smartphones.
- Security: Built in authentication, authorization, and data masking features align with Oracle's security best practices.

Because APEX is tightly integrated with the database, the installation process focuses primarily on database configuration, package compilation, and web server integration.

Prerequisites

Before you start, confirm that your environment satisfies the following requirements:

1. Oracle Database

APEX supports Oracle Database 19c, 21c, 23c, and the latest 24c releases. Ensure that:

- The database is installed and running.
- You have administrative privileges (SYS or SYSTEM account) to execute PL/SQL scripts.
- The database instance is configured to allow REMOTE PROCEDURE CALLS (i.e., ALTER SYSTEM SET remote_initiation=TRUE).

2. Operating System

APEX can be installed on Windows, Linux, and macOS. Verify that:

- The OS supports the Oracle client libraries you plan to use.
- You have sufficient disk space (at least 500 /MB for APEX files plus the database storage).
- Environment variables (e.g., ORACLE_HOME, LD_LIBRARY_PATH) are correctly set.

3. Web Server (Optional)

While APEX can run on Oracle's internal HTTP server (Oracle HTTP Server), many production environments prefer external web servers like Apache, Nginx, or IIS. If you choose an external server, ensure:

- The server is installed and configured to forward requests to the Oracle database.
- You have access to the server's configuration files (e.g., httpd.conf for Apache).

4. Oracle REST Data Services (ORDS) (Optional but Recommended)

ORDS is Oracle's RESTful web service framework that serves as the web listener for APEX. Installing ORDS simplifies deployment and provides additional features such as OAuth2 authentication.

5. Network Connectivity

Confirm that the database listener is reachable from the machine where you'll run the installation scripts. Use tnsping or a simple SQL*Plus connection test.

Downloading the Installation Files

Oracle APEX is distributed as a ZIP archive containing PL/SQL scripts, UI templates, and optional ORDS components. Follow these steps to obtain the latest version:

1. Visit the official Oracle APEX Download Page.
2. Choose the version that matches your database release (e.g., APEX 23.2 for Oracle 23c).
3. Accept the license agreement and download the ZIP file.
4. Transfer the ZIP archive to the server where the database is running.

Installing Oracle APEX

The installation process consists of several phases: extraction, database package loading, web listener configuration, and post installation tasks. The following steps assume you are working on a Linux environment, but the logic applies to Windows as well.

1. Extract the ZIP Archive

Open a terminal session and run:

cd /opt\nsudo unzip apex_23.2.zip -d apex\n\n\nThis extracts the contents into the /opt/apex directory.

2. Connect to the Database as SYS

Use SQL*Plus or another database client to connect with the SYS account:

sqlplus / as sysdba\n\n\nOnce connected, set the session to use the SYS schema:

alter session set current_schema=SYS;\n\n\n3. Run the APEX Installation Script

The core installation script is apexins.sql. It creates the necessary tablespaces, users, and PL/SQL packages.

@/opt/apex/apexins.sql SYSAUX SYSAUX 9999\n\n\nThe parameters are:

- First two arguments: the tablespace names for data and temporary objects.
- The third argument: the maximum number of APEX users (default 9999).

After the script completes, you'll see a success message. If you encounter errors, verify that the tablespaces exist and that the user has the required privileges.

4. Compile the APEX Packages

Next, compile the PL/SQL packages that APEX relies on:

@/opt/apex/apex_compiles.sql\n\n\nThis step ensures that all dependencies are resolved and that the APEX code compiles successfully.

5. Install the APEX User and Roles

Run the script that creates the APEX_PUBLIC_USER and APEX_SESSION users, as well as the necessary roles:

@/opt/apex/apex_user.sql\n\n\nThese accounts are essential for the web listener to interact with the database.

6. Configure the Web Listener (ORDS)

If you plan to use ORDS, you'll need to set up the listener. Download the latest ORDS ZIP from the Oracle website, extract it, and run the configuration wizard. Here's a concise overview:

1. Extract ORDS:

unzip ords-23.2.zip -d ords\n\n\n\nNavigate to the ORDS directory and run the installer:\n

cd ords\njava -jar ords.war\n\n\nThe wizard will prompt you for database credentials, the location of the APEX installation, and the web server type. For an Apache setup, you'll generate an ords.war file and deploy it to /var/www/html or an equivalent directory.

After configuration, restart your web server to apply the changes.

7. Verify the Installation

Open a web browser and navigate to http://your-server:8080/ords/ (replace the port and hostname as appropriate). You should see the APEX login screen. Log in using the default credentials: username ADMIN and password ADMIN. Immediately change the password for security.

Post Installation Tasks

Once the core installation is complete, you'll want to fine tune the environment for production use. Below are some recommended steps.

1. Create the APEX Workspace

A workspace is a logical container for applications, users, and data. To create a workspace, execute the following script as SYS:

@/opt/apex/apex_workspace.sql\n\n\nFollow the prompts to specify the workspace name, owner, and administrative settings.

2. Assign Workspace Privileges

Grant necessary privileges to the workspace owner:

grant apex_workspace_admin, apex_workspace_user to ;\n\n\n3. Configure Email Settings

APEX can send system notifications, password resets, and application emails. Configure the mailer by editing apex_mailer.sql or by using the APEX Administration Services.

4. Set Up SSL (Optional but Recommended)

For secure communication, configure HTTPS on your web server. For Apache, add the following to your virtual host configuration:

<VirtualHost *:443>\n ServerName your-domain.com\n DocumentRoot /var/www/html\n\n SSLEngine on\n SSLCertificateFile /etc/ssl/certs/your_cert.pem\n SSLCertificateKeyFile /etc/ssl/private/your_key.key\n\n ProxyPass /ords/ http://localhost:8080/ords/\n ProxyPassReverse /ords/ http://localhost:8080/ords/\n</VirtualHost>\n\n\n5. Backup the APEX Installation

Regular backups safeguard your development environment. Use Oracle RMAN or your preferred backup tool to capture the APEX tablespaces and the APEX_PUBLIC_USER schema.

Common Issues & Troubleshooting

Even with careful preparation, you may encounter hiccups. Below are common problems and how to resolve them.

1. “ORA-00942: table or view does not exist”

This error often indicates that the APEX tablespaces were not created or that the user lacks privileges. Verify tablespace existence and grant the necessary CREATE TABLESPACE and CREATE TABLE privileges to SYS.

2. “ORA-01031: insufficient privileges”

Ensure you are connected as SYS or SYSTEM with the SYSDBA role. Some scripts require GRANT ALL PRIVILEGES to the APEX user.

3. “ORA-14224: cannot find a user for the specified workspace”

During workspace creation, the specified owner might not exist. Create the user first, then run the workspace creation script again.

4. Web Listener Not Responding

Check that the ORDS service is running and that the web server forwards requests correctly. Verify the ORDS logs (ords.log) for detailed error messages.

5. SSL Certificate Errors

Ensure the certificate chain is complete and that the private key matches the certificate. Use openssl s_client -connect your-domain.com:443 to diagnose SSL issues.

Advanced Topics

Once you’re comfortable with the basics, explore advanced features to extend your APEX environment.

1. Oracle REST Data Services (ORDS) Customization

- Configure ords.properties to enable OAuth2, JWT, or custom authentication schemes.
- Use the ords-admin utility to manage database connections, listener ports, and SSL settings.

2. High Availability & Load Balancing

Deploy multiple ORDS instances behind a load balancer (e.g., HAProxy or AWS ELB). Ensure session persistence or implement sticky sessions for stateful applications.

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