

Oracle® Application Express

Installation Guide

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Oracle Application Express Installation Guide, Release 3.2

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Preface

This guide explains how to install and configure Oracle Application Express.

This Preface contains these topics:

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

Audience

Oracle Application Express Installation Guide is intended for anyone responsible for installing Oracle Application Express.

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

Our goal is to make Oracle products, services, and supporting documentation accessible to all users, including users that are disabled. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Accessibility standards will continue to evolve over time, and Oracle is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For more information, visit the Oracle Accessibility Program Web site at <http://www.oracle.com/accessibility/>.

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Screen readers may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, some screen readers may not always read a line of text that consists solely of a bracket or brace.

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To reach Oracle Support Services, use a telecommunications relay service (TRS) to call Oracle Support at 1.800.223.1711. An Oracle Support Services engineer will handle technical issues and provide customer support according to the Oracle service request process. Information about TRS is available at

<http://www.fcc.gov/cgb/consumerfacts/trs.html>, and a list of phone numbers is available at <http://www.fcc.gov/cgb/dro/trsphonebk.html>.

Related Documents

For more information, see these Oracle resources:

- *Oracle Application Express Release Notes*
- *Oracle Database 2 Day + Oracle Application Express Developer's Guide*
- *Oracle Application Express Application Builder User's Guide*
- *Oracle Application Express Administration Guide*
- *Oracle Application Express SQL Workshop and Utilities Guide*
- *Oracle Application Express API Reference*
- *Oracle Application Migration Guide*
- *Oracle Application Express Advanced Tutorials*
- *Oracle Database Concepts*
- *Oracle HTTP Server Administrator's Guide*
- *Oracle9i Application Server Administrator's Guide*
- *Oracle Database Advanced Application Developer's Guide*
- *Oracle Database Administrator's Guide*
- *Oracle Database SQL Language Reference*
- *SQL*Plus User's Guide and Reference*

For information about Oracle error messages, see *Oracle Database Error Messages*. Oracle error message documentation is available only in HTML. If you have access to the Oracle Database Documentation Library, you can browse the error messages by range. Once you find the specific range, use your browser's "find in page" feature to locate the specific message. When connected to the Internet, you can search for a specific error message using the error message search feature of the Oracle online documentation.

Many books in the documentation set use the sample schemas of the seed database, which is installed by default when you install Oracle. Refer to *Oracle Database Sample Schemas* for information on how these schemas were created and how you can use them yourself.

For additional application examples, please visit the Oracle by Examples (OBES) Application Express page, located on Oracle's Technology Network. The OBES provide

step-by-step examples with screenshots on how to perform various tasks within Application Express.

http://www.oracle.com/technology/products/database/application_express/html/obes.html

Printed documentation is available for sale in the Oracle Store at

<http://oraclestore.oracle.com/>

To download free release notes, installation documentation, white papers, or other collateral, please visit the Oracle Technology Network (OTN). You must register online before using OTN; registration is free and can be done at

<http://www.oracle.com/technology/membership/>

If you already have a user name and password for OTN, then you can go directly to the documentation section of the OTN Web site at

<http://www.oracle.com/technology/documentation/>

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	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 Application Express contains third-party code. Oracle is required to provide the following notices. 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.

AnyChart

Flash chart support in Oracle Application Express is based on the Anychart Flash Chart Component. Anychart is a flexible Macromedia Flash-based solution that enables developers to create animated, compact, interactive flash charts. Flash charts are rendered by a browser and require Flash player 8 or later. Flash charts used in interactive reports require Flash Player 9 or later. For more information about Anychart, go to

<http://www.anychart.com>

Any attempt to unbundle the AnyChart Flash Chart Component from an Oracle product, or to use the AnyChart Flash Chart Component outside of the Oracle product will be in violation of this license and will result in the immediate termination of this license.

AnyChart AnyGantt Flash Gantt and AnyChart AnyMap

This release of Oracle Application Express includes the AnyChart AnyGantt Flash Gantt Component and the AnyChart AnyMap extension. These products are not exposed through the Oracle Application Express user interface, but can be used programatically in any Oracle Application Express application. To learn more, see:

- AnyChart AnyGantt Flash Gantt Component:
<http://www.anychart.com/products/anygantt/overview/>
- AnyChart AnyMap extension:
<http://www.anychart.com/products/anymap/overview/>

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FCKeditor

Oracle Application Express uses FCKeditor version 2.3.2 for the following item types; HTML Editor Minimal and HTML Editor Standard. This software is licensed under the Apache License, Version 2.0 (the "License"). To view a copy of the Apache License, see [Appendix C, "Third-Party License"](#) on page C-1.

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

For more information about FCKeditor, go to:

<http://www.fckeditor.net/>

Apache FOP

Oracle Application Express includes the Apache FOP Version 0.20.5 libraries and a custom XSL-FO processing JSP. This software is licensed under the Apache License, Version 2.0 (the "License"). To view a copy of the Apache License, see [Appendix C, "Third-Party License"](#) on page C-1.

If you wish to use Apache FOP as your report server for PDF region printing, this is now a supported report server configuration. Installation and configuration instructions can be found on Oracle Technology Network. See *Installing and Configuring Apache FOP* at:

http://www.oracle.com/technology/products/database/application_express/html/configure_printing.html#05

Oracle Application Express Installation Overview

This chapter provides an overview of installing Oracle Application Express and describes issues to consider before installing.

This chapter contains these topics:

- [Overview of the Installation Process](#)
- [Upgrading from a Previous Version of Oracle Application Express](#)
- [About the Oracle Application Express Runtime Environment](#)
- [About Choosing an HTTP Server](#)
- [Available Installation Scenarios](#)

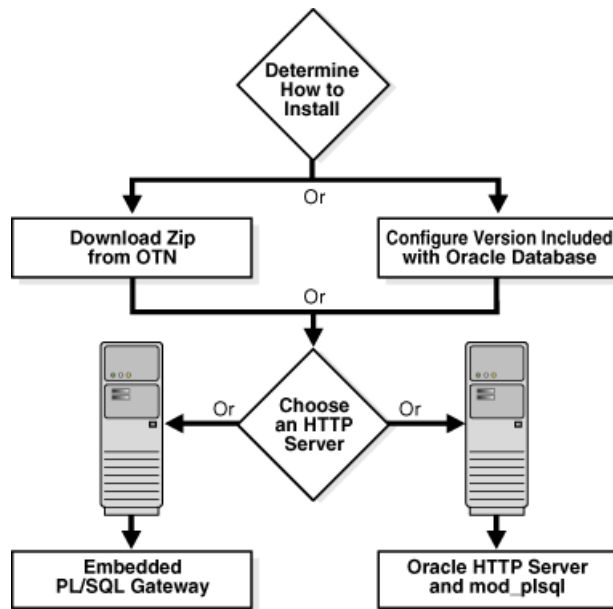
Overview of the Installation Process

The installation process consists of four parts:

1. **Plan your installation:** This chapter offers an overview of the steps required to install Oracle Application Express. During the planning phase, you should also determine whether to install a full development environment or runtime environment.

A **full development** environment provides complete access to the Application Builder environment to develop applications. A **runtime environment** is an appropriate choice for production implementations in which you want to run applications that cannot be modified. To learn more, see "[About the Oracle Application Express Runtime Environment](#)" on page 1-2.
2. **Verify installation requirements:** "[Oracle Application Express Installation Requirements](#)" describes the minimum requirements that your system must meet before you install the software.
3. **Install the software:** As described in [Figure 1–1](#), the required installation steps depend upon:
 - **How you install the Oracle Application Express.** Available options include downloading a ZIP file from Oracle Technology Network (OTN), or using the version of Oracle Application Express that installs with Oracle Database 11g or later.
 - **Which HTTP server you decide to use.** Available options include the embedded PL/SQL gateway or Oracle HTTP Server and `mod_plsql`.
To learn more, see "[About Choosing an HTTP Server](#)" on page 1-3.

Figure 1–1 Key Decision Points in the Installation Process



Upgrading from a Previous Version of Oracle Application Express

If you have version 1.5.0.00.33, 1.5.1.00.12, 1.6.0.00.87, 1.6.1.00.03, 2.0.0.00.49, 2.2.1.00.04, 3.0.0.00.20, 3.0.1.00.07, 3.0.1.00.08, 3.0.1.00.12, 3.1.0.00.32, 3.1.1.00.09 or 3.1.2.00.02 of Oracle Application Express, following any of the installation scenarios in this guide upgrades your Oracle Application Express instance to version 3.2 and creates Oracle Application Express 3.2 database objects in a new schema and migrates the application metadata to the new version.

About the Oracle Application Express Runtime Environment

For testing and production instances, Oracle Application Express supports the ability to install just a runtime version of Oracle Application Express. This runtime environment minimizes the installed footprint and privileges and improves application security since in a runtime instance developers cannot advertently update a production application.

An Oracle Application Express 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 Application Express runtime environment using SQL*Plus or SQL Developer and the `APEX_INSTANCE_ADMIN` API. To learn more see, "Managing a Runtime Environment" in *Oracle Application Express Application Builder User's Guide*.

Scripts are provided to remove or add the developer interface from an existing instance. To learn more, see "About the Oracle Application Express Runtime Environment" in "Downloading from Oracle Technology Network" on page 3-1 and "Configuration Tasks When Installing from the Database" on page 4-1.

About Choosing an HTTP Server

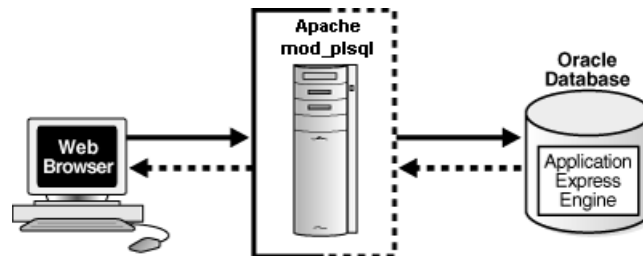
In order to run, Oracle Application Express must have access to either Oracle HTTP Server and `mod_plsql` or the embedded PL/SQL gateway.

Topics in this section include:

- [About Oracle HTTP Server and `mod_plsql`](#)
- [About the Embedded PL/SQL Gateway](#)
- [Selecting an HTTP Server in an Oracle RAC Environment](#)

About Oracle HTTP Server and `mod_plsql`

Oracle HTTP Server uses the `mod_plsql` plug-in to communicate with the Oracle Application Express engine within the Oracle database. It functions as communication broker between the Web server and the Oracle Application Express objects in the Oracle database. More specifically, it maps browser requests into database stored procedure calls over a `SQL*Net` connection. The following graphic illustrates the Oracle Application Express architecture using Oracle HTTP Server and `mod_plsql`.



See Also: ["HTTP Server Requirements"](#) on page 2-2

Note that this three tier architecture consists of the following components: a Web browser, Oracle HTTP Server (Apache) with `mod_plsql`, and an Oracle database containing Oracle Application Express.

Advantages of Oracle HTTP Server (Apache) with `mod_plsql`:

- Separation of mid-tier for the database tier
- Appropriate for Oracle Real Application Clusters (Oracle RAC) environments

Where Images Are Stored When Using Oracle HTTP Server

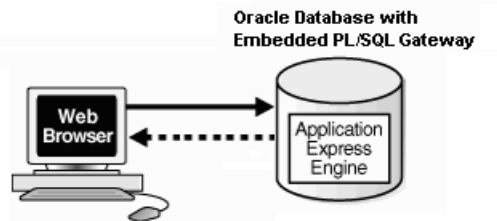
In an Oracle HTTP Server or Oracle Application Server configuration, images are stored on the file system in the location referenced by the alias `/i/`. If you are upgrading Oracle Application Express from a prior release, you can locate the images directory on the file system, by reviewing the following files and searching for the text alias `/i/`:

- Oracle9i HTTP Server Release 2—see the `httpd.conf` file.
- Oracle HTTP Server distributed with Oracle Database 11g—see the `dads.conf` file.
- Oracle Application Server 10g—see the `marvel.conf` file.

Specific examples for locating the text alias `/i/` can be found in ["Downloading from Oracle Technology Network"](#) on page 3-1 and ["Configuration Tasks When Installing from the Database"](#) on page 4-1.

About the Embedded PL/SQL Gateway

The embedded PL/SQL gateway installs with Oracle Database 11g. It provides the Oracle database with a Web server and also the necessary infrastructure to create dynamic applications. The embedded PL/SQL gateway runs in the Oracle XML DB HTTP server in the Oracle database and includes the core features of `mod_plsql`. The following graphic illustrates the Oracle Application Express architecture using the embedded PL/SQL gateway.



As shown in the previous graphic, the embedded PL/SQL gateway is a simple two tier architecture and consists of these components: a Web browser and an Oracle database, containing the embedded PL/SQL and Oracle Application Express.

Advantages of the embedded PL/SQL gateway:

- Ease of configuration
- Included in the database
- No separate server installation

Security Considerations When Using the Embedded PL/SQL Gateway

The embedded PL/SQL gateway runs in the database as part of the XML DB HTTP Protocol Listener. The XML DB HTTP Protocol Listener and embedded PL/SQL gateway provides the equivalent core features of Oracle HTTP Server and `mod_plsql`. Because the HTTP Listener runs in the same database where Oracle Application Express is installed, it is not possible to separate the HTTP listener from the database. For this reason, it is not recommended to use the embedded PL/SQL gateway for applications that run on the Internet. Additionally, the embedded PL/SQL gateway does not provide the same flexibility of configuration and detailed logging as Oracle HTTP Server with `mod_plsql`.

Where Images Are Stored When Using the Embedded PL/SQL Gateway

When running Oracle Application Express with the embedded PL/SQL gateway, images are stored directly in the database within the Oracle XML DB repository. You can access images by using the WebDAV feature of Oracle XML DB or by using FTP. To learn more, see "Using Protocols to Access the Repository" in *Oracle XML DB Developer's Guide*.

Selecting an HTTP Server in an Oracle RAC Environment

When running Oracle Application Express in an Oracle Real Application Clusters (Oracle RAC) environment, Oracle recommends that you use Oracle HTTP Server with `mod_plsql`. Oracle HTTP Server with `mod_plsql` permits you to specify a connection in the service name format, so that one HTTP Server can access all nodes.

Oracle recommends that you do not select the embedded PL/SQL gateway option for Oracle RAC installations. The embedded PL/SQL gateway uses an HTTP Server built

into the database instance, and because of this, it does not take advantage of the Oracle RAC shared architecture.

Available Installation Scenarios

How you install Oracle Application Express depends upon where you install the software from and which HTTP server you decide to use. This section provides an overview of each installation scenario.

See Also: ["About Choosing an HTTP Server"](#) on page 1-3 and ["About the Oracle Application Express Runtime Environment"](#) on page 1-2

Topics in this section include:

- [Scenario 1: Downloading from OTN and Configuring the Embedded PL/SQL Gateway](#)
- [Scenario 2: Downloading from OTN and Configuring Oracle HTTP Server](#)
- [Scenario 3: Installing from the Database and Configure the Embedded PL/SQL Gateway](#)
- [Scenario 4: Installing from the Database and Configure Oracle HTTP Server](#)

Scenario 1: [Downloading from OTN and Configuring the Embedded PL/SQL Gateway](#)

Follow the steps in this scenario if you are downloading Oracle Application Express from Oracle Technology Network (OTN) and configuring the embedded PL/SQL gateway. Required installation steps in this scenario include:

- [Step 1: Install the Oracle Database and Complete Pre-installation Tasks](#)
- [Step 2: Download and Install Oracle Application Express](#)
- [Step 3: Change the Password for the ADMIN Account](#)
- [Step 4: Restart Processes](#)
- [Step 5: Configure the Embedded PL/SQL Gateway](#)
- [Step 6: Enable Network Services in Oracle Database 11g](#)
- [Step 7: Security Considerations](#)
- [Step 8: About Running Oracle Application Express in Other Languages](#)
- [Step 9: About Managing JOB_QUEUE_PROCESSES](#)
- [Step 10: Configuring the SHARED_SERVERS Parameter](#)
- [Step 11: Create a Workspace and Add Oracle Application Express Users](#)

Scenario 2: [Downloading from OTN and Configuring Oracle HTTP Server](#)

Follow the steps in this scenario if you are downloading Oracle Application Express from Oracle Technology Network (OTN) and configuring Oracle HTTP Server with `mod_plsql` distributed with Oracle Database 11g or Oracle Application Server 10g. Required steps in this scenario include:

- [Step 1: Install the Oracle Database and Complete Pre-installation Tasks](#)
- [Step 2: Download and Install Oracle Application Express](#)

- **Step 3:** Change the Password for the ADMIN Account
- **Step 4:** Restart Processes
- **Step 5:** Configure Oracle HTTP Server Distributed with Oracle Database 11g or Oracle Application Server 10g
- **Step 6:** Enable Network Services in Oracle Database 11g
- **Step 7:** Security Considerations
- **Step 8:** About Running Oracle Application Express in Other Languages
- **Step 9:** About Managing JOB_QUEUE_PROCESSES
- **Step 10:** About Obfuscating PlsqlDatabasePassword Parameter
- **Step 11:** Create a Workspace and Add Oracle Application Express Users

See Also: "Configuring Oracle HTTP Server Distributed with Oracle9i Release 2" on page B-1.

Scenario 3: Installing from the Database and Configure the Embedded PL/SQL Gateway

Follow the steps in this scenario if you are using a version of Oracle Application Express that installs with Oracle Database 11g or later and configuring the embedded PL/SQL gateway. Required steps in this scenario include:

- **Step 1:** Install the Oracle Database and Complete Pre-installation Tasks
- **Step 2:** Configure the Embedded PL/SQL Gateway
- **Step 3:** Enable Network Services in Oracle Database 11g
- **Step 4:** Security Considerations
- **Step 5:** About Running Oracle Application Express in Other Languages
- **Step 6:** About Managing JOB_QUEUE_PROCESSES
- **Step 7:** Configuring the SHARED_SERVERS Parameter
- **Step 8:** Create a Workspace and Add Oracle Application Express Users

Scenario 4: Installing from the Database and Configure Oracle HTTP Server

Follow the steps in this scenario if you are using a version of Oracle Application Express that installs with Oracle Database 11g or later and configuring Oracle HTTP Server with `mod_plsql` distributed with Oracle Database 11g or Oracle Application Server 10g. Required steps in this scenario include:

- **Step 1:** Install the Oracle Database and Complete Pre-installation Tasks
- **Step 2:** Configure Oracle HTTP Server Distributed with Oracle Database 11g or Oracle Application Server 10g
- **Step 3:** Enable Network Services in Oracle Database 11g
- **Step 4:** Security Considerations
- **Step 5:** About Running Oracle Application Express in Other Languages
- **Step 6:** About Managing JOB_QUEUE_PROCESSES
- **Step 7:** About Obfuscating PlsqlDatabasePassword Parameter
- **Step 8:** Create a Workspace and Add Oracle Application Express Users

See Also: ["Configuring Oracle HTTP Server Distributed with Oracle9i Release 2"](#) on page B-1.

Oracle Application Express Installation Requirements

This chapter describes the requirements for installing Oracle Application Express.

This chapter contains these topics:

- [Oracle Database Requirement](#)
- [Browser Requirement](#)
- [HTTP Server Requirements](#)
- [Disk Space Requirement](#)
- [Oracle XML DB Requirement](#)
- [Oracle Text Requirement](#)
- [PL/SQL Web Toolkit](#)

Oracle Database Requirement

Oracle Application Express version 3.2 requires an Oracle database that is release 9.2.0.3 or later.

Note: You can upgrade the version of Oracle Application Express in Oracle Database Express Edition 10g Release 2 (10.2), by installing Oracle Application Express version 3.2. For more information, see the Oracle Application Express page on Oracle Technology Network (OTN).

Oracle JVM Requirement

If you plan to run Oracle Application Express with an Oracle database earlier than Oracle Database 10g release 1 (10.1), you must install Oracle Java Virtual Machine (JVM). To learn more, see the *Oracle Database Installation Guide* for your operating environment.

Checking the shared_pool_size of the Target Database

Note: Ignore this requirement if your configuration uses non-null values for the database initialization parameters `SGA_TARGET` (in Oracle Database 10g and 11g) or `MEMORY_TARGET` (in Oracle Database 11g).

Oracle Application Express requires the `shared_pool_size` of the target database to be at least 100 MB.

To check the `shared_pool_size` of the target database:

1. Start the database:

```
SQL> STARTUP
```

2. If necessary, enter the following command to determine whether the system uses an initialization parameter file (`inittsid.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.

3. Determine the current values of the `shared_pool_size` parameter:

```
SQL> SHOW PARAMETER SHARED_POOL_SIZE
```

4. If the system is using a server parameter file, set the value of the `SHARED_POOL_SIZE` initialization parameter to at least 100 MB:

```
SQL> ALTER SYSTEM SET SHARED_POOL_SIZE='100M' SCOPE=spfile;
```

5. If the system uses an initialization parameter file, change the values of the `SHARED_POOL_SIZE` parameter to at least 100 MB in the initialization parameter file (`inittsid.ora`).

6. Shut down the database:

```
SQL> SHUTDOWN
```

7. Restart the database:

```
SQL> STARTUP
```

Browser Requirement

To view or develop Oracle Application Express applications, Web browsers must support Java Script and the HTML 4.0 and CSS 1.0 standards. The following browsers meet these requirements:

- Microsoft Internet Explorer 6.0 or later version
- Firefox 1.0 or later

HTTP Server Requirements

In order to run, Oracle Application Express must have access to one of the following:

- Embedded PL/SQL gateway
- Oracle HTTP Server and `mod_plsql`

Oracle XML DB HTTP Server with the embedded PL/SQL gateway installs with Oracle Database 11g. It provides the database with a Web server and the necessary infrastructure to create dynamic applications.

Oracle HTTP Server uses the `mod_plsql` plug-in to communicate with the Oracle Application Express engine within the Oracle database. The following products include appropriate versions of HTTP Server and `mod_plsql`:

- Oracle9i release 2 (9.2) or later
- Oracle9i Application Server release 1 (1.0.2.2) or later
- Oracle Database 10g Companion CD release 1 or 2
- Oracle Database 11g release 1

See Also: ["About Choosing an HTTP Server"](#) on page 1-3

Disk Space Requirement

Oracle Application Express disk space requirements are as follows:

- Free space for Oracle Application Express software files on the file system: 450 MB
- Free space in Oracle Application Express tablespace: 125 MB
- Free space in `SYSTEM` tablespace: 85 MB
- Free space in Oracle Application Express tablespace for each additional language (other than English) installed: 34 MB

Oracle XML DB Requirement

Oracle XML DB must be installed in the Oracle database that you want to use. 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.

See Also: *Oracle XML DB Developer's Guide* for more information about manually adding Oracle XML DB to an existing database

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

Oracle Text Requirement

Oracle Text must be installed in order to use the searchable online Help in Oracle Application Express. By default, Oracle Text is installed as part of Oracle Database.

In addition, ensure that the default language preferences for Oracle Text have been installed. To install the Oracle Text default language, log in to the Oracle database where you plan to install Oracle Application Express and run the appropriate `drdeflang.sql` script, which by default is located in `ORACLE_BASE\ORACLE_HOME\ctx\admin\defaults`. For example, to run the language preferences script for US English, `drdefus.sql`:

```
jstraub: c:\> sqlplus /nolog
SQL> connect ctxsys
Enter password: password
SQL> @c:\oracle\product\10.2.0\db_1\ctx\admin\defaults\drdefus.sql
```

See Also: *Oracle Text Application Developer's Guide* for more information on Oracle Text and "Enabling Network Services in Oracle Database 11g" for your configuration scenario.

Tip: The installer does a prerequisite check for Oracle Text and will exit if it is not installed.

PL/SQL Web Toolkit

Oracle Application Express requires the PL/SQL Web Toolkit version 10.1.2.0.6 or later. For instructions on determining the current version of the PL/SQL Web Toolkit, and for instructions on installing version 10.1.2.0.6, please review the `README.txt` file contained in the directory `apex/owa`.

Downloading from Oracle Technology Network

This chapter describes how to install Oracle Application Express by downloading a ZIP file from Oracle Technology Network (OTN) and completing the appropriate postinstallation tasks.

The instructions in this chapter apply to both new and upgrade installations. To learn more, see ["Upgrading from a Previous Version of Oracle Application Express"](#) on page 1-2.

This chapter contains these topics:

- [Recommended Pre-installation Tasks](#)
- [Choosing an HTTP Server](#)
- [Downloading from OTN and Configuring the Embedded PL/SQL Gateway](#)
- [Downloading from OTN and Configuring Oracle HTTP Server](#)
- [Post Installation Tasks for Upgrade Installations](#)
- [About the Oracle Application Express Runtime Environment](#)

Note: Within the context of this document, the Apache Oracle home directory (ORACLE_HTTPSERVER_HOME) is the location where Oracle HTTP Server is installed.

Recommended Pre-installation Tasks

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

1. Review and satisfy all Oracle Application Express installation requirements. See ["Oracle Application Express Installation Requirements"](#) on page 2-1.
2. Shut down any existing Oracle Database instances with normal or immediate priority, except for the database where you plan to install the Oracle Application Express schemas. On Oracle Real Application Clusters (Oracle RAC) systems, shut down all instances on each node.

If Automatic Storage Management (ASM) is running, shut down all databases that use ASM except for the database where you will install Oracle Application Express, and then shut down the ASM instance.

You can use the Windows **Services** utility, located either in the Windows Control Panel or from the **Administrative Tools** menu (under **Start** and then **Programs**), to

shut down Oracle Database and ASM instances. Names of Oracle databases are preceded with `OracleService`. The Oracle ASM service is named `OracleASMService+ASM`. In addition, shut down the `OracleCSService` service, which ASM uses. Right-click the name of the service and from the menu, choose **Stop**.

3. Back up the Oracle Database installation.

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

See Also: *Oracle Database Backup and Recovery User's Guide*

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 the listener or Oracle HTTP Server. However, if you are performing a remote installation, make sure the database listener for the remote database has started.

Note: If you are connecting to a remote database, then start the listener.

Choosing an HTTP Server

In order to run, Oracle Application Express must have access to either the embedded PL/SQL gateway or Oracle HTTP Server and `mod_plsql`. To learn more, see "[About Choosing an HTTP Server](#)" on page 1-3.

Downloading from OTN and Configuring the Embedded PL/SQL Gateway

This section describes how to install Oracle Application Express by downloading a ZIP file from OTN and then configuring the embedded PL/SQL gateway.

Topics in this section include:

- [Install the Oracle Database and Complete Pre-installation Tasks](#)
- [Download and Install Oracle Application Express](#)
- [Change the Password for the ADMIN Account](#)
- [Restart Processes](#)
- [Configure the Embedded PL/SQL Gateway](#)
- [Enable Network Services in Oracle Database 11g](#)
- [Enable Indexing of Online Help in Oracle Database 11gR2 and Higher](#)
- [Security Considerations](#)
- [About Running Oracle Application Express in Other Languages](#)
- [About Managing JOB_QUEUE_PROCESSES](#)
- [Configuring the SHARED_SERVERS Parameter](#)
- [Create a Workspace and Add Oracle Application Express Users](#)

See Also: ["About the Oracle Application Express Runtime Environment"](#) on page 1-2

Install the Oracle Database and Complete Pre-installation Tasks

Oracle Application Express requires an Oracle database that is release 9.2.0.3 or later. To learn more, see the *Oracle Database Installation Guide* for your operating environment and ["Recommended Pre-installation Tasks"](#) on page 3-1.

Download and Install Oracle Application Express

To install Oracle Application Express:

1. Download the file `apex_3.2.zip` from the Oracle Application Express download page. See:

http://www.oracle.com/technology/products/database/application_express/download.html

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

2. Unzip `apex_3.2.zip` as follows, preserving directory names:
 - UNIX and Linux: Unzip `apex_3.2.zip`
 - Windows: Double click the file `apex_3.2.zip` in Windows Explorer
3. Change your working directory to `apex`.
4. Start SQL*Plus and connect to the database where Oracle Application Express 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. See ["Configuring Password Protection"](#) in *Oracle Database Security Guide*.
6. Select the appropriate installation option.

Full development environment provides complete access to the Application Builder environment to develop applications. A **Runtime environment** enables users to run applications that cannot be modified. To learn more, see ["About the Oracle Application Express Runtime Environment"](#) on page 1-2.

Available installation options include:

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

```
@apexins tablespace_apex tablespace_files tablespace_temp images
```

Where:

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

Example:

```
@apexins SYSAUX SYSAUX TEMP /i/
```

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

```
@apxrtins tablespace_apex tablespace_files tablespace_temp images
```

Where:

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

Example:

```
@apxrtins SYSAUX SYSAUX TEMP /i/
```

See Also: *Oracle Database PL/SQL Language Reference* for more information about SQL*Plus

When Oracle Application Express installs it creates three new database accounts:

- `APEX_030200` - The account that owns the Oracle Application Express schema and metadata.
- `FLows_FILES` - The account that owns the Oracle Application Express uploaded files.
- `APEX_PUBLIC_USER` - The minimally privileged account used for Oracle Application Express configuration with Oracle HTTP Server and `mod_plsql`.

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

Tip: Oracle Application Express must be installed from a writable directory on the file system. See "[Reviewing a Log of an Installation Session](#)" on page A-1.

Change the Password for the ADMIN Account

In a new installation of Oracle Application Express, or if you are converting a runtime environment to a development environment, you must change the password of the internal ADMIN account. In an upgrade scenario, the password will be preserved and carried over from the prior release.

To change the password for the ADMIN 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 Application Express 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
```

When prompted enter a password for the ADMIN account.

See Also: *Oracle Database PL/SQL Language Reference* for more information about SQL*Plus

Restart Processes

After you install Oracle Application Express, you must restart the processes that you stopped before you began the installation, such as listener and other processes.

Configure the Embedded PL/SQL Gateway

The embedded PL/SQL gateway installs with the Oracle Database 11g. However, you must configure it before you can use it with Oracle Application Express. To accomplish this, you run a configuration file and unlock the ANONYMOUS account.

Note: The Oracle XML DB HTTP Server with the embedded PL/SQL gateway is not supported before Oracle Database 11g.

Topics in this section include:

- [Running the apex_epg_config.sql Configuration Script](#)
- [Updating the Images Directory When Upgrading from a Previous Release](#)
- [Verifying the Oracle XML DB HTTP Server Port](#)
- [Enabling Oracle XML DB HTTP Server](#)
- [Disabling Oracle XML DB HTTP Server](#)

See Also: ["About Choosing an HTTP Server"](#) on page 1-3 and ["About the Embedded PL/SQL Gateway"](#) on page 1-4

Running the apex_epg_config.sql Configuration Script

In a new installation, you configure the embedded PL/SQL gateway by running the configuration script `apex_epg_config.sql`. Then, you unlock the `ANONYMOUS` account.

Note: If you are upgrading and have previously configured the embedded PL/SQL gateway, skip this section and go to ["Updating the Images Directory When Upgrading from a Previous Release"](#) on page 3-6.

To run the `apex_epg_config.sql` configuration script:

1. Change your working directory to the `apex` directory where you unzipped the Oracle Application Express software.
2. Start SQL*Plus and connect to the database where Oracle Application Express 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_epg_config.sql` passing the file system path to the base directory where the Oracle Application Express software was unzipped as shown in the following example:

- On Windows:

```
@apex_epg_config SYSTEM_DRIVE:\TEMP
```

- On UNIX and Linux:

```
@apex_epg_config /tmp
```

4. Enter the following statement to unlock the `ANONYMOUS` account:

```
ALTER USER ANONYMOUS ACCOUNT UNLOCK;
```

Updating the Images Directory When Upgrading from a Previous Release

If you are upgrading Oracle Application Express from a previous release, you must run the `apxldimg.sql` script to update the images directory.

Tip: If you are not upgrading from a prior release of Oracle Application Express, this step is unnecessary. The images will be loaded by running `apex_epg_config.sql` as described in the prior section.

To run the `apxldimg.sql` script:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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 `apxldimg.sql` passing the file system path to the base directory where the Oracle Application Express software was unzipped as shown in the following example:

- On Windows:

```
@apxldimg.sql SYSTEM_DRIVE:\TEMP
```

- On UNIX and Linux:

```
@apxldimg.sql /tmp
```

Tip: The above examples assume that you unzipped Oracle Application Express in a directory called `TEMP` on Windows and `tmp` on UNIX or Linux.

Verifying the Oracle XML DB HTTP Server Port

The embedded PL/SQL gateway runs in the Oracle XML DB HTTP server in the Oracle database. You can determine if the Oracle XML DB HTTP server is enabled by verifying the associated port number.

To verify the port number where the Oracle XML DB HTTP Server is running:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. Enter the following statement to verify the port number:

```
SELECT DBMS_XDB.GETHTTPPORT FROM DUAL;
```

If the port number returns 0, the Oracle XML DB HTTP Server is disabled.

3. To enable it, follow the instructions in ["Enabling Oracle XML DB HTTP Server"](#) on page 3-8.

Enabling Oracle XML DB HTTP Server

The embedded PL/SQL gateway runs in the Oracle XML DB HTTP server in the Oracle database.

To enable Oracle XML DB HTTP server:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. Enter a statement similar to the following:

```
EXEC DBMS_XDB.SETHTTPPORT(port);
```

For example:

```
EXEC DBMS_XDB.SETHTTPPORT(8080);
```

Note: Port numbers less than 1024 are reserved for use by privileged processes on many operating systems. To enable the XML DB HTTP listener on a port less than 1024, such as 80, review the following documentation:

- "Using Protocols to Access the Repository" in *Oracle XML DB Developer's Guide*.
- "Protocol Address Configuration" and "Port Number Limitations" in *Oracle Database Net Services Reference*.

Disabling Oracle XML DB HTTP Server

The embedded PL/SQL gateway runs in the Oracle XML DB HTTP server in the Oracle database.

To disable Oracle XML DB HTTP server:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. Run the following command:


```
EXEC DBMS_XDB.SETHTTPPORT(0);
```

Enable Network Services in Oracle Database 11g

By default, the ability to interact with network services is disabled in Oracle Database 11g release 1 (11.1). Therefore, if you are running Oracle Application Express with Oracle Database 11g release 1 (11.1), you must use the new `DBMS_NETWORK_ACL_ADMIN` package to grant connect privileges to any host for the `APEX_030200` database user. Failing to grant these privileges results in issues with:

- Sending outbound mail in Oracle Application Express.
Users can call methods from the `APEX_MAIL` package, but issues arise when sending outbound email.
- Using Web services in Oracle Application Express.
- PDF/report printing.
- Searching for content in online Help (that is, using the Find link).

Topics in this section include:

- [Granting Connect Privileges](#)
- [Troubleshooting an Invalid ACL Error](#)

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 database will already have the parameter set properly, but a database upgraded to 11g from a prior version may not. See "Creating and Configuring an Oracle Database" in *Oracle Database Administrator's Guide* for information about changing database initialization parameters.

Granting Connect Privileges

The following example demonstrates how to grant connect privileges to any host for the `APEX_030200` database user.

```
DECLARE
  ACL_PATH VARCHAR2(4000);
  ACL_ID   RAW(16);
BEGIN
  -- Look for the ACL currently assigned to '*' and give APEX_030200
  -- the "connect" privilege if APEX_030200 does not have the privilege yet.

  SELECT ACL INTO ACL_PATH FROM DBA_NETWORK_ACLS
  WHERE HOST = '*' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

  -- Before checking the privilege, ensure that the ACL is valid
  -- (for example, does not contain stale references to dropped users).
  -- If it does, the following exception will be raised:
  --
  -- ORA-44416: Invalid ACL: Unresolved principal 'APEX_030200'
  -- ORA-06512: at "XDB.DBMS_XDBZ", line ...
  --
  SELECT SYS_OP_R20(extractValue(P.RES, '/Resource/XMLRef')) INTO ACL_ID
  FROM XDB.XDB$ACL A, PATH_VIEW P
  WHERE extractValue(P.RES, '/Resource/XMLRef') = REF(A) AND
        EQUALS_PATH(P.RES, ACL_PATH) = 1;
```

```

DBMS_XDBZ.ValidateACL(ACL_ID);
IF DBMS_NETWORK_ACL_ADMIN.CHECK_PRIVILEGE(ACL_PATH, 'APEX_030200',
'connect') IS NULL THEN
    DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(ACL_PATH,
'APEX_030200', TRUE, 'connect');
END IF;

EXCEPTION
-- When no ACL has been assigned to '*'.
WHEN NO_DATA_FOUND THEN
DBMS_NETWORK_ACL_ADMIN.CREATE_ACL('power_users.xml',
'ACL that lets power users to connect to everywhere',
'APEX_030200', TRUE, 'connect');
DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL('power_users.xml', '*');
END;
/
COMMIT;

```

The following example demonstrates how to provide less privileged access to local network resources. This example would enable indexing the Oracle Application Express Online Help and could possibly enable email and PDF printing if those servers were also on the local host.

```

DECLARE
    ACL_PATH VARCHAR2(4000);
    ACL_ID RAW(16);
BEGIN
    -- Look for the ACL currently assigned to 'localhost' and give APEX_030200
    -- the "connect" privilege if APEX_030200 does not have the privilege yet.
    SELECT ACL INTO ACL_PATH FROM DBA_NETWORK_ACLS
    WHERE HOST = 'localhost' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

    -- Before checking the privilege, ensure that the ACL is valid
    -- (for example, does not contain stale references to dropped users).
    -- If it does, the following exception will be raised:
    --
    -- ORA-44416: Invalid ACL: Unresolved principal 'APEX_030200'
    -- ORA-06512: at "XDB.DBMS_XDBZ", line ...
    --

    SELECT SYS_OP_R20(extractValue(P.RES, '/Resource/XMLRef')) INTO ACL_ID
    FROM XDB.XDB$ACL A, PATH_VIEW P
    WHERE extractValue(P.RES, '/Resource/XMLRef') = REF(A) AND
    EQUALS_PATH(P.RES, ACL_PATH) = 1;

    DBMS_XDBZ.ValidateACL(ACL_ID);
    IF DBMS_NETWORK_ACL_ADMIN.CHECK_PRIVILEGE(ACL_PATH, 'APEX_030200',
'connect') IS NULL THEN
        DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(ACL_PATH,
'APEX_030200', TRUE, 'connect');
    END IF;

EXCEPTION
-- When no ACL has been assigned to 'localhost'.
WHEN NO_DATA_FOUND THEN
DBMS_NETWORK_ACL_ADMIN.CREATE_ACL('local-access-users.xml',
'ACL that lets power users to connect to everywhere',
'APEX_030200', TRUE, 'connect');
DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL('local-access-users.xml', 'localhost');

```

```
END;
/
COMMIT;
```

Troubleshooting an Invalid ACL Error

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 =
          DELETXML(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_030200` user. See ["Granting Connect Privileges"](#) on page 3-9.

Enable Indexing of Online Help in Oracle Database 11gR2 and Higher

The ability to search Oracle Application Express online Help is accomplished through Oracle Text and a URL datastore. There is a change in the default behavior and permissions to use an Oracle Text URL datastore in database 11gR2 and higher.

If users attempt to search Oracle Application Express online Help in Oracle database 11gR2 and encounter the following error, then the permission to use an Oracle Text URL datastore has not been granted to database user APEX_030200.

```
ORA-29855: error occurred in the execution of ODCIINDEXCREATE routine
ORA-20000: Oracle Text error:
DRG-10758: index owner does not have the privilege to use file or URL datastore
```

To enable the indexing of online Help in Oracle Application Express, the permission to use an Oracle Text URL datastore must be granted to the APEX_030200 database user. This is accomplished by assigning this specific privilege to a database role and then granting this role to the APEX_030200 database user.

To determine if the ability to use an Oracle Text URL datastore is already granted to a database role:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. Run the following command:

```
SELECT par_value FROM ctxsys.ctx_parameters WHERE par_name = 'FILE_ACCESS_
ROLE';
```

This returns either NULL or the database role which is granted the ability to use an Oracle Text URL datastore.

3. If no value is returned by step 2, then create a new database role as shown in the following example:

```
CREATE ROLE APEX_URL_DATASTORE_ROLE;
```

4. Grant this role to the database user APEX_030200 with the following statement:

```
GRANT APEX_URL_DATASTORE_ROLE to APEX_030200;
```

If step 2 returned a value, use this database role name instead of the example APEX_URL_DATASTORE_ROLE.

5. Lastly, if step 2 did not return a value, then use the Oracle Text API to grant permission to the newly created database role with the following statement:

```
EXEC ctxsys.ctx_adm.set_parameter('file_access_role', 'APEX_URL_DATASTORE_
ROLE');
```

Security Considerations

Oracle highly recommends you configure and use 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.

About Running Oracle Application Express in Other Languages

The Oracle Application Express interface is translated into German, Spanish, French, Italian, Japanese, Korean, Brazilian Portuguese, Simplified Chinese, and Traditional Chinese. A single instance of Oracle Application Express can be installed with one or more of these translated versions. At runtime, each user's Web browser language settings determine the specific language version.

The translated version of Oracle Application Express 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 Application Express into a database that does not support the character encoding of the language, the installation may fail or the translated Oracle Application Express instance may appear corrupt when run. The database character set AL32UTF8 supports all the translated versions of Oracle Application Express.

You can manually install translated versions of Oracle Application Express 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 Application Express, 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 Application Express translations:

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

Installing a Translated Version of Oracle Application Express

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 Application Express.

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 of directory, there is a language loading script identified by the language code (for example, `load_de.sql` or `load_ja.sql`).

To install a translated version of Oracle Application Express:

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. Start SQL*Plus and connect to the database where Oracle Application Express 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 following statement:


```
ALTER SESSION SET CURRENT_SCHEMA = APEX_030200;
```
 4. 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).

About Managing JOB_QUEUE_PROCESSES

JOB_QUEUE_PROCESSES determine the maximum number of concurrently running jobs. In Oracle Application Express release 3.2, transactional support and SQL scripts require jobs. If JOB_QUEUE_PROCESSES is not enabled and working properly, you cannot successfully execute a script.

Topics in this section include:

- [Viewing the Number of JOB_QUEUE_PROCESSES](#)
- [Changing the Number of JOB_QUEUE_PROCESSES](#)

Viewing the Number of JOB_QUEUE_PROCESSES

There are currently three ways to view the number of JOB_QUEUE_PROCESSES:

- In the installation log file
- On the About Application Express page in Oracle Application Express
- From SQL*Plus

Viewing JOB_QUEUE_PROCESSES in the Installation Log File After installing or upgrading Oracle Application Express to release 3.2, you can view the number of JOB_QUEUE_

PROCESSES in the installation log files. See ["Reviewing a Log of an Installation Session"](#) on page A-1.

Viewing JOB_QUEUE_PROCESSES in Oracle Application Express You can also view the number of JOB_QUEUE_PROCESSES on the About Application Express page.

To view the About Application Express page:

1. Log in to Oracle Application Express. See ["Logging in to Your Workspace"](#) on page 3-18.
2. On the Administration list, click **About Application Express**.

The current number JOB_QUEUE_PROCESSES displays at the bottom of the page.

Viewing JOB_QUEUE_PROCESSES from SQL*Plus You can also view the number of JOB_QUEUE_PROCESSES from SQL*Plus by running the following SQL statement:

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

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 Application Express 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.

Configuring the SHARED_SERVERS Parameter

The embedded PL/SQL gateway uses the shared server architecture of the Oracle Database. To achieve acceptable performance when using the embedded PL/SQL gateway, ensure the SHARED_SERVERS database initialization parameter is set to a reasonable value (that is, not 0 or 1). For a small group of concurrent users, Oracle recommends a value of 5 for SHARED_SERVERS.

Consider the following example:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. Run the following statement:

```
ALTER SYSTEM SET SHARED_SERVERS = 5 SCOPE=BOTH;
```

Create a Workspace and Add Oracle Application Express Users

You access the Oracle Application Express home page by logging in to workspace using a Web browser. Your Web browser must support JavaScript and the HTML 4.0 and CSS 1.0 standards. See "[Browser Requirement](#)" on page 2-2.

A **workspace** is a virtual private database allowing multiple users to work within the same Oracle Application Express installation while keeping their objects, data and applications private. Each workspace has a unique ID and name.

An Oracle Application Express administrator can create a workspace manually within Oracle Application Express Administration Services or have users submit requests. Oracle Application Express Administration Services is a separate application for managing an entire Oracle Application Express instance. See "Creating Workspaces" and "Managing Workspace Requests" in *Oracle Application Express Administration Guide*.

See Also: *Oracle Database 2 Day + Oracle Application Express Developer's Guide* if you are new to Oracle Application Express

Topics in this section include:

- [Creating a Workspace Manually](#)
- [Creating Oracle Application Express Users](#)
- [Logging in to Your Workspace](#)

Creating a Workspace Manually

To create an Oracle Application Express workspace manually:

1. **Log in to Oracle Application Express Administration Services.** Oracle Application Express Administration Services is a separate application for managing an entire Oracle Application Express instance. You log in using the ADMIN account and password created or reset during the installation process.
 - a. In a Web browser, navigate to the Oracle Application Express Administration Services application.

If your setup uses the embedded PL/SQL gateway, go to:

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

Where:

hostname is the name of the system where Oracle XML DB HTTP server is installed.

port is the port number assigned to Oracle XML DB HTTP server. In a default installation, this number is 8080.

apex is the database access descriptor (DAD) defined in the configuration file.

b. On the Login page:

- In Username, enter `admin`.
- In Password, enter the Oracle Application Express administrator account password you specified when you installed Oracle Application Express.
- Click **Login**.

See Also: See "Logging in to Oracle Application Express Administration Services" in *Oracle Application Express Administration Guide*.

Next, create a workspace.

2. Click **Manage Workspaces**.

3. Under Manage Workspaces, click **Create Workspace**.

The Create Workspace Wizard appears.

4. For Identify Workspace, enter a workspace name and description and click **Next**.

5. For Identify Schema, select the Oracle Forms application schema.

- a.** For Re-use existing schema, select **Yes**.
- b.** Select a schema from the list.
- c.** Click **Next**.

6. For Identify Administrator, enter the Workspace administrator information and click **Next**.

7. Confirm your selections and click **Create**.

Creating Oracle Application Express Users

To create an Oracle Application Express user account:

1. Log in to Oracle Application Express Administration Services as described in the previous section. See "Logging in to Oracle Application Express Administration Services" in *Oracle Application Express Administration Guide*.

2. Click **Manage Workspaces**.

3. Under Manage Workspaces, click **Manage Developers and Users**.

The Manage Developers and Users page appears.

4. Click **Create**.

The Create/Edit User page appears.

5. Under User Attributes, enter the appropriate information. Fields marked with an asterisk are required.

Tip: To learn more about a specific attribute, click the item label. When Help is available, the item label changes to red when you pass your cursor over it and the cursor changes to an arrow and question mark.

6. Under Password, type a case-sensitive password for this account.
If your organization has set up a password policy, be sure the password meets the requirements.
7. Under Developer Privileges, select the appropriate privileges:
 - **User is a developer** - To add this user as a developer or Workspace administrator, select **Yes**. For end users, select **No**.
Developers can create and modify applications and database objects as well as view developer activity, session state, workspace activity, application, and schema reports.
 - **User is a workspace administrator** - To add this user as a Workspace administrator, select **Yes**. For developers or end users, select **No**.
In addition to having developer privileges, workspace administrators can create and edit user accounts, manage groups, alter passwords of users within the same workspace, and manage development services.
8. Under Account Control, specify the following:
 - **Account Availability** - Select **Unlocked** to enable a user to log in to this account.
 - **Require Change of Password on First Use** - Select **Yes** to require the user to change the password immediately after logging in with the current, temporary password. Otherwise, select **No**.
9. Click **Create User** or **Create and Create Another**.

Logging in to Your Workspace

Once you create a workspace, you must log in to it using your login credentials (that is, the workspace name, user name, and password).

See Also: See "Creating Workspaces" and "Managing Workspace Requests" in *Oracle Application Express Administration Guide*

To log in to your workspace:

1. In a Web browser, navigate to the Oracle Application Express Login page.

If your setup uses the embedded PL/SQL gateway, go to:

`http://hostname:port/apex`

Where:

- `hostname` is the name of the system where Oracle XML DB HTTP server is installed.
- `port` is the port number assigned to Oracle XML DB HTTP server. In a default installation, this number is 8080.
- `apex` is the database access descriptor (DAD) defined in the configuration file.

For users who have upgraded from earlier releases, or who have a custom configuration, this value may be `htmldb` or something else. Verify your DAD with your Oracle Application Express administrator.

The Login page appears.

2. Under Login, enter the following:

- Workspace field - Enter the name of your workspace.
- Username field - Enter your user name.
- Password field - Enter your case-sensitive password.

3. Click Login.

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

Downloading from OTN and Configuring Oracle HTTP Server

This section describes how to install Oracle Application Express by downloading a ZIP file from OTN and then configuring Oracle HTTP Server with `mod_plsql` distributed with Oracle Database 11g or Oracle Application Server 10g.

Topics in this section include:

- [Install the Oracle Database and Complete Pre-installation Tasks](#)
- [Download and Install Oracle Application Express](#)
- [Change the Password for the ADMIN Account](#)
- [Restart Processes](#)
- [Configure Oracle HTTP Server Distributed with Oracle Database 11g or Oracle Application Server 10g](#)
- [Enable Network Services in Oracle Database 11g](#)
- [Enable Indexing of Online Help in Oracle Database 11gR2 and Higher](#)
- [Security Considerations](#)
- [About Running Oracle Application Express in Other Languages](#)
- [About Managing JOB_QUEUE_PROCESSES](#)
- [About Obfuscating PlsqlDatabasePassword Parameter](#)
- [Create a Workspace and Add Oracle Application Express Users](#)

See Also: ["About the Oracle Application Express Runtime Environment"](#) on page 1-2 and ["Configuring Oracle HTTP Server Distributed with Oracle9i Release 2"](#) on page B-1

Install the Oracle Database and Complete Pre-installation Tasks

Oracle Application Express requires an Oracle database that is release 9.2.0.3 or later. To learn more, see the *Oracle Database Installation Guide* for your operating environment and ["Recommended Pre-installation Tasks"](#) on page 3-1.

Download and Install Oracle Application Express

To install Oracle Application Express:

1. Download the file `apex_3.2.zip` from the Oracle Application Express download page. See:

http://www.oracle.com/technology/products/database/application_express/download.html

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

2. Unzip `apex_3.2.zip` as follows, preserving directory names:
 - UNIX and Linux: Unzip `apex_3.2.zip`
 - Windows: Double click the file `apex_3.2.zip` in Windows Explorer
3. Change your working directory to `apex`.
4. Start SQL*Plus and connect to the database where Oracle Application Express 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. See "Configuring Password Protection" in *Oracle Database Security Guide*.
6. Select the appropriate installation option.

Full development environment provides complete access to the Application Builder environment to develop applications. A **Runtime environment** enables users to run applications that cannot be modified. To learn more, see "[About the Oracle Application Express Runtime Environment](#)" on page 1-2.

Available installation options include:

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

```
@apexins tablespace_apex tablespace_files tablespace_temp images
```

Where:

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

Example:

```
@apexins SYSAUX SYSAUX TEMP /i/
```

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

```
@apxrtins tablespace_apex tablespace_files tablespace_temp images
```

Where:

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

Example:

```
@apxrtins SYSAUX SYSAUX TEMP /i/
```

See Also: *Oracle Database PL/SQL Language Reference* for more information about SQL*Plus

When Oracle Application Express installs it creates three new database accounts:

- *APEX_030200* - The account that owns the Oracle Application Express schema and metadata.
- *FLows_FILES* - The account that owns the Oracle Application Express uploaded files.
- *APEX_PUBLIC_USER* - The minimally privileged account used for Oracle Application Express configuration with Oracle HTTP Server and *mod_plsql*.

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

Tip: Oracle Application Express must be installed from a writable directory on the file system. See "[Reviewing a Log of an Installation Session](#)" on page A-1.

Change the Password for the ADMIN Account

In a new installation of Oracle Application Express, or if you are converting a runtime environment to a development environment, you must change the password of the internal ADMIN account. In an upgrade scenario, the password will be preserved and carried over from the prior release.

To change the password for the ADMIN 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 Application Express 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
```

When prompted enter a password for the ADMIN account.

See Also: *Oracle Database PL/SQL Language Reference* for more information about SQL*Plus

Restart Processes

After you install Oracle Application Express, you must restart the processes that you stopped before you began the installation, such as listener and other processes. In addition, restart Oracle HTTP Server.

Configure Oracle HTTP Server Distributed with Oracle Database 11g or Oracle Application Server 10g

This section describes how to configure Oracle HTTP Server with `mod_plsql` distributed with Oracle Database 11g or Oracle Application Server 10g.

Topics in this section include:

- [Unlocking the APEX_PUBLIC_USER Account](#)
- [Changing the Password for the APEX_PUBLIC_USER Account](#)
- [Copy the Images Directory](#)
- [Configuring Oracle HTTP Server 11g or Oracle Application Server 10g](#)

See Also: ["Configuring Oracle HTTP Server Distributed with Oracle9i Release 2"](#) on page B-1

Unlocking the APEX_PUBLIC_USER Account

The `APEX_PUBLIC_USER` account is locked at the end of a new installation of Oracle Application Express. You must unlock this account before configuring the database access descriptor (DAD) in a new installation.

Tip: If you are upgrading from a prior release of Oracle Application Express, this step is unnecessary.

To unlock the `APEX_PUBLIC_USER` account:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. Run the following statement:

```
ALTER USER APEX_PUBLIC_USER ACCOUNT UNLOCK
```

Changing the Password for the APEX_PUBLIC_USER Account

The APEX_PUBLIC_USER account is created with a random password in a new installation of Oracle Application Express. You will must change the password for this account before configuring the database access descriptor (DAD) in a new installation.

Tip: If you are upgrading from a prior release of Oracle Application Express, 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 Application Express 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. 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.

About Password Expiration in Oracle Database 11g In the default profile in Oracle Database 11g, the parameter `PASSWORD_LIFE_TIME` is set to 180. If you are using Oracle Database 11g with Oracle Application Express, this causes the password for APEX_PUBLIC_USER to expire in 180 days. As a result, your Oracle Application Express instance will become unusable until you change the password.

To prevent this behavior, create another profile in which the `PASSWORD_LIFE_TIME` parameter is set to unlimited and alter the APEX_PUBLIC_USER account and assign it the new profile.

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

Copy 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 to the location on the file system containing the Oracle home for Oracle HTTP Server.

Topics in this section include:

- [Copying the Images Directory After an Upgrade](#)

- [Copying the Images Directory in a New Installation](#)

Copying the Images Directory After an Upgrade During an upgrade, you must 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 Application Express, indicating the release number of the images (for example, `images_3_1`).

To locate the images directory on the file system, review the following files for the text alias `/i/`:

- Oracle HTTP Server distributed Oracle9i Release 2—see the `httpd.conf` file.
- Oracle Application Server 10g—see the `marvel.conf` or `dads.conf` files.
- Oracle HTTP Server distributed with Oracle Database 11g—see the `marvel.conf` or `dads.conf` files.

When you locate the images directory path, copy the existing images directory to a backup location. Doing so enables you to revert to the previous release, if that becomes necessary.

After you copy the existing images directory, use the following command syntax to copy the `apex\images` directory from the Oracle Database home to the existing images directory path, overwriting the existing images:

- Oracle Application Server 10g:
 - On Windows:


```
xcopy /E /I APEX_HOME\apex\images ORACLE_HTTPSERVER_HOME\Apache\images
```
 - On UNIX and Linux:


```
cp -rf APEX_HOME/apex/images ORACLE_HTTPSERVER_HOME/Apache
```
- Oracle HTTP Server distributed with Oracle Database 11g:
 - On Windows:


```
xcopy /E /I APEX_HOME\apex\images ORACLE_HTTPSERVER_HOME\ohs\images
```
 - On UNIX and Linux:


```
cp -rf APEX_HOME/apex/images ORACLE_HTTPSERVER_HOME/ohs
```

In the preceding syntax examples:

- `APEX_HOME` is the directory where the Oracle Application Express software was unzipped
- `ORACLE_HTTPSERVER_HOME` is the existing Oracle Application Server or Oracle HTTP Server Oracle home

Copying the Images Directory in a New Installation After installation, copy the directory `apex/images`.

- Oracle Application Server 10g:
 - On Windows:


```
xcopy /E /I ORACLE_HOME\apex\images ORACLE_HTTPSERVER_HOME\Apache\images
```
 - On UNIX and Linux:


```
cp -rf $ORACLE_HOME/apex/images ORACLE_HTTPSERVER_HOME/Apache
```


- Oracle HTTP Server distributed with Oracle Database 11g:
 - On Windows:


```
xcopy /E /I ORACLE_HOME\apex\images ORACLE_HTTPSERVER_HOME\ohs\images
```
 - On UNIX and Linux:


```
cp -rf $ORACLE_HOME/apex/images ORACLE_HTTPSERVER_HOME/ohs
```

In the preceding syntax examples:

- ORACLE_HOME is the Oracle Database Oracle home
- ORACLE_HTTPSERVER_HOME is the existing Oracle Application Server or Oracle HTTP Server Oracle home

Configuring Oracle HTTP Server 11g or Oracle Application Server 10g

Perform the following postinstallation steps if:

- This is a new installation of Oracle Application Express (that is, you are not upgrading from a previous release).
- You are running Oracle HTTP Server distributed with Oracle Database 11g or Oracle Application Server 10g.
- Oracle HTTP Server is installed in an Oracle home.

Topics in this section include:

- [Editing the dads.conf File](#)
- [Stopping and Restarting Oracle HTTP Server](#)

Note that these instructions do not apply if you are running Oracle HTTP Server release 9.0.3. To learn more, see "[Configuring Oracle HTTP Server Distributed with Oracle9i Release 2](#)" on page B-1.

Note: Within the context of this document, ORACLE_HTTPSERVER_HOME is the location where Oracle HTTP Server is installed.

Editing the dads.conf File If this is a new installation of Oracle Application Express, you must edit the `dads.conf` file. The `dads.conf` file contains the information about the DAD to access Oracle Application Express.

To edit the `dads.conf` file:

1. Use a text editor and open the `dads.conf`.
 - Oracle Application Server 10g:
 - On Windows see:


```
ORACLE_HTTPSERVER_HOME\Apache\modplsql\conf\dads.conf
```
 - On UNIX and Linux see:


```
ORACLE_HTTPSERVER_HOME/Apache/modplsql/conf/dads.conf
```
 - Oracle HTTP Server distributed with Oracle Database 11g:
 - On Windows see:

```
ORACLE_HTTPSERVER_HOME\ohs\modplsql\conf\dads.conf
```

- On UNIX and Linux see:

```
ORACLE_HTTPSERVER_HOME/ohs/modplsql/conf/dads.conf
```

2. In the `dads.conf` file, replace `ORACLE_HTTPSERVER_HOME`, `host`, `port`, `service_name`, and `apex_public_user_password` with values appropriate for your environment. Note that the `apex_public_user_password` is the password you changed in ["Changing the Password for the APEX_PUBLIC_USER Account"](#) on page 3-23.

Note that the path listed is only an example. The path in the `dads.conf` file should reference the file system path described in ["Copy the Images Directory"](#) on page 3-23.

```
Alias /i/ "ORACLE_HTTPSERVER_HOME/Apache/images/"
```

```
AddType text/xml      xbl
```

```
AddType text/x-component  htc
```

```
<Location /pls/apex>
```

```
Order deny,allow
```

```
PlsqlDocumentPath docs
```

```
AllowOverride None
```

```
PlsqlDocumentProcedure      wvw_flow_file_mgr.process_download
```

```
PlsqlDatabaseConnectString  host:port:service_name ServiceNameFormat
```

```
PlsqlNLSLanguage            AMERICAN_AMERICA.AL32UTF8
```

```
PlsqlAuthenticationMode     Basic
```

```
SetHandler                  pls_handler
```

```
PlsqlDocumentTablename      wvw_flow_file_objects$
```

```
PlsqlDatabaseUsername        APEX_PUBLIC_USER
```

```
PlsqlDefaultPage            apex
```

```
PlsqlDatabasePassword        apex_public_user_password
```

```
PlsqlRequestValidationFunction wvw_flow_epg_include_modules.authorize
```

```
Allow from all
```

```
</Location>
```

3. Locate the line containing `PlsqlNLSLanguage`.

The `PlsqlNLSLanguage` setting determines the language setting of the DAD. The character set portion of the `PlsqlNLSLanguage` value must be set to `AL32UTF8`, regardless of whether or not the database character set is `AL32UTF8`. For example:

```
...
```

```
PlsqlNLSLanguage            AMERICAN_AMERICA.AL32UTF8
```

```
...
```

4. Save and exit the `dads.conf` file.

Stopping and Restarting Oracle HTTP Server To stop and restart Oracle HTTP Server:

- For UNIX and Linux, execute the following:

```
ORACLE_HTTPSERVER_HOME/opmn/bin/opmnctl stopproc ias-component=HTTP_Server
```

```
ORACLE_HTTPSERVER_HOME/opmn/bin/opmnctl startproc ias-component=HTTP_Server
```

- For Windows, execute the following:

```
ORACLE_HTTPSERVER_HOME\opmn\bin\opmnctl stopproc ias-component=HTTP_Server
```

```
ORACLE_HTTPSERVER_HOME\opmn\bin\opmnctl startproc ias-component=HTTP_Server
```

Enable Network Services in Oracle Database 11g

By default, the ability to interact with network services is disabled in Oracle Database 11g release 1 (11.1). Therefore, if you are running Oracle Application Express with Oracle Database 11g release 1 (11.1), you must use the new `DBMS_NETWORK_ACL_ADMIN` package to grant connect privileges to any host for the `APEX_030200` database user. Failing to grant these privileges results in issues with:

- Sending outbound mail in Oracle Application Express.
Users can call methods from the `APEX_MAIL` package, but issues arise when sending outbound email.
- Using Web services in Oracle Application Express.
- PDF/report printing.
- Searching for content in online Help (that is, using the Find link).

Topics in this section include:

- [Granting Connect Privileges](#)
- [Troubleshooting an Invalid ACL Error](#)

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 database will already have the parameter set properly, but a database upgraded to 11g from a prior version may not. See "Creating and Configuring an Oracle Database" in *Oracle Database Administrator's Guide* for information about changing database initialization parameters.

Granting Connect Privileges

The following example demonstrates how to grant connect privileges to any host for the `APEX_030200` database user.

```
DECLARE
  ACL_PATH VARCHAR2(4000);
  ACL_ID   RAW(16);
BEGIN
  -- Look for the ACL currently assigned to '*' and give APEX_030200
  -- the "connect" privilege if APEX_030200 does not have the privilege yet.

  SELECT ACL INTO ACL_PATH FROM DBA_NETWORK_ACLS
  WHERE HOST = '*' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

  -- Before checking the privilege, ensure that the ACL is valid
  -- (for example, does not contain stale references to dropped users).
  -- If it does, the following exception will be raised:
  --
  -- ORA-44416: Invalid ACL: Unresolved principal 'APEX_030200'
  -- ORA-06512: at "XDB.DBMS_XDBZ", line ...
  --
  SELECT SYS_OP_R20(extractValue(P.RES, '/Resource/XMLRef')) INTO ACL_ID
  FROM XDB.XDB$ACL A, PATH_VIEW P
  WHERE extractValue(P.RES, '/Resource/XMLRef') = REF(A) AND
        EQUALS_PATH(P.RES, ACL_PATH) = 1;
```

```

DBMS_XDBZ.ValidateACL(ACL_ID);
IF DBMS_NETWORK_ACL_ADMIN.CHECK_PRIVILEGE(ACL_PATH, 'APEX_030200',
'connect') IS NULL THEN
    DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(ACL_PATH,
'APEX_030200', TRUE, 'connect');
END IF;

EXCEPTION
-- When no ACL has been assigned to '*'.
WHEN NO_DATA_FOUND THEN
DBMS_NETWORK_ACL_ADMIN.CREATE_ACL('power_users.xml',
'ACL that lets power users to connect to everywhere',
'APEX_030200', TRUE, 'connect');
DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL('power_users.xml', '*');
END;
/
COMMIT;

```

The following example demonstrates how to provide less privileged access to local network resources. This example would enable indexing the Oracle Application Express Online Help and could possibly enable email and PDF printing if those servers were also on the local host.

```

DECLARE
    ACL_PATH  VARCHAR2(4000);
    ACL_ID    RAW(16);
BEGIN
    -- Look for the ACL currently assigned to 'localhost' and give APEX_030200
    -- the "connect" privilege if APEX_030200 does not have the privilege yet.
    SELECT ACL INTO ACL_PATH FROM DBA_NETWORK_ACLS
    WHERE HOST = 'localhost' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

    -- Before checking the privilege, ensure that the ACL is valid
    -- (for example, does not contain stale references to dropped users).
    -- If it does, the following exception will be raised:
    --
    -- ORA-44416: Invalid ACL: Unresolved principal 'APEX_030200'
    -- ORA-06512: at "XDB.DBMS_XDBZ", line ...
    --

    SELECT SYS_OP_R20(extractValue(P.RES, '/Resource/XMLRef')) INTO ACL_ID
    FROM XDB.XDB$ACL A, PATH_VIEW P
    WHERE extractValue(P.RES, '/Resource/XMLRef') = REF(A) AND
    EQUALS_PATH(P.RES, ACL_PATH) = 1;

    DBMS_XDBZ.ValidateACL(ACL_ID);
    IF DBMS_NETWORK_ACL_ADMIN.CHECK_PRIVILEGE(ACL_PATH, 'APEX_030200',
'connect') IS NULL THEN
        DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(ACL_PATH,
'APEX_030200', TRUE, 'connect');
    END IF;

EXCEPTION
-- When no ACL has been assigned to 'localhost'.
WHEN NO_DATA_FOUND THEN
DBMS_NETWORK_ACL_ADMIN.CREATE_ACL('local-access-users.xml',
'ACL that lets power users to connect to everywhere',
'APEX_030200', TRUE, 'connect');
DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL('local-access-users.xml', 'localhost');
END;

```

```
/
COMMIT;
```

Troubleshooting an Invalid ACL Error

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 NAACL, XDS_ACE ACE
       WHERE HOST = '*' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL AND
             NAACL.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 =
                 DELETETEXML(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_030200` user. See ["Granting Connect Privileges"](#) on page 3-27.

Enable Indexing of Online Help in Oracle Database 11gR2 and Higher

The ability to search Oracle Application Express online Help is accomplished through Oracle Text and a URL datastore. There is a change in the default behavior and permissions to use an Oracle Text URL datastore in database 11gR2 and higher.

If users attempt to search Oracle Application Express online Help in Oracle database 11gR2 and encounter the following error, then the permission to use an Oracle Text URL datastore has not been granted to database user APEX_030200.

```
ORA-29855: error occurred in the execution of ODCIINDEXCREATE routine
ORA-20000: Oracle Text error:
DRG-10758: index owner does not have the privilege to use file or URL datastore
```

To enable the indexing of online Help in Oracle Application Express, the permission to use an Oracle Text URL datastore must be granted to the APEX_030200 database user. This is accomplished by assigning this specific privilege to a database role and then granting this role to the APEX_030200 database user.

To determine if the ability to use an Oracle Text URL datastore is already granted to a database role:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. Run the following command:

```
SELECT par_value FROM ctxsys.ctx_parameters WHERE par_name = 'FILE_ACCESS_
ROLE';
```

This returns either NULL or the database role which is granted the ability to use an Oracle Text URL datastore.

3. If no value is returned by step 2, then create a new database role as shown in the following example:

```
CREATE ROLE APEX_URL_DATASTORE_ROLE;
```

4. Grant this role to the database user APEX_030200 with the following statement:

```
GRANT APEX_URL_DATASTORE_ROLE to APEX_030200;
```

If step 2 returned a value, use this database role name instead of the example APEX_URL_DATASTORE_ROLE.

5. Lastly, if step 2 did not return a value, then use the Oracle Text API to grant permission to the newly created database role with the following statement:

```
EXEC ctxsys.ctx_adm.set_parameter('file_access_role', 'APEX_URL_DATASTORE_
ROLE');
```

Security Considerations

Oracle highly recommends you configure and use 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.

About Running Oracle Application Express in Other Languages

The Oracle Application Express interface is translated into German, Spanish, French, Italian, Japanese, Korean, Brazilian Portuguese, Simplified Chinese, and Traditional Chinese. A single instance of Oracle Application Express can be installed with one or more of these translated versions. At runtime, each user's Web browser language settings determine the specific language version.

The translated version of Oracle Application Express 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 Application Express into a database that does not support the character encoding of the language, the installation may fail or the translated Oracle Application Express instance may appear corrupt when run. The database character set AL32UTF8 supports all the translated versions of Oracle Application Express.

You can manually install translated versions of Oracle Application Express 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 Application Express, 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 Application Express translations:

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

Installing a Translated Version of Oracle Application Express

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 Application Express.

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 of directory, there is a language loading script identified by the language code (for example, `load_de.sql` or `load_ja.sql`).

To install a translated version of Oracle Application Express:

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. Start SQL*Plus and connect to the database where Oracle Application Express 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 following statement:


```
ALTER SESSION SET CURRENT_SCHEMA = APEX_030200;
```
 4. 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).

About Managing JOB_QUEUE_PROCESSES

JOB_QUEUE_PROCESSES determine the maximum number of concurrently running jobs. In Oracle Application Express release 3.2, transactional support and SQL scripts require jobs. If JOB_QUEUE_PROCESSES is not enabled and working properly, you cannot successfully execute a script.

Topics in this section include:

- [Viewing the Number of JOB_QUEUE_PROCESSES](#)
- [Changing the Number of JOB_QUEUE_PROCESSES](#)

Viewing the Number of JOB_QUEUE_PROCESSES

There are currently three ways to view the number of JOB_QUEUE_PROCESSES:

- In the installation log file
- On the About Application Express page in Oracle Application Express
- From SQL*Plus

Viewing JOB_QUEUE_PROCESSES in the Installation Log File After installing or upgrading Oracle Application Express to release 3.2, you can view the number of JOB_QUEUE_

PROCESSES in the installation log files. See ["Reviewing a Log of an Installation Session"](#) on page A-1.

Viewing JOB_QUEUE_PROCESSES in Oracle Application Express You can also view the number of JOB_QUEUE_PROCESSES on the About Application Express page.

To view the About Application Express page:

1. Log in to Oracle Application Express. See ["Logging in to Your Workspace"](#) on page 3-36.
2. On the Administration list, click **About Application Express**.

The current number JOB_QUEUE_PROCESSES displays at the bottom of the page.

Viewing JOB_QUEUE_PROCESSES from SQL*Plus You can also view the number of JOB_QUEUE_PROCESSES from SQL*Plus by running the following SQL statement:

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

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 Application Express 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.

About Obfuscating PlsqlDatabasePassword Parameter

The PlsqlDatabasePassword parameter specifies the password for logging in to the database. You can use the dadTool.pl utility to obfuscate passwords in the dads.conf file.

You can find the dadTool.pl utility in the following directory:

- For UNIX and Linux based systems:

```
ORACLE_BASE/ORACLE_HTTPSERVER_HOME/Apache/modplsql/conf
```

- For Windows based systems:

`ORACLE_BASE\ORACLE_HTTPSERVER_HOME\Apache\modplsql\conf`

Obfuscating Passwords

To obfuscate passwords, run `dadTool.pl` by following the instructions in the `dadTool.README` file.

Create a Workspace and Add Oracle Application Express Users

You access the Oracle Application Express home page by logging in to workspace using a Web browser. Your Web browser must support JavaScript and the HTML 4.0 and CSS 1.0 standards. See "[Browser Requirement](#)" on page 2-2.

A **workspace** is a virtual private database allowing multiple users to work within the same Oracle Application Express installation while keeping their objects, data and applications private. Each workspace has a unique ID and name.

An Oracle Application Express administrator can create a workspace manually within Oracle Application Express Administration Services or have users submit requests. Oracle Application Express Administration Services is a separate application for managing an entire Oracle Application Express instance. See "Creating Workspaces" and "Managing Workspace Requests" in *Oracle Application Express Administration Guide*.

See Also: *Oracle Database 2 Day + Oracle Application Express Developer's Guide* if you are new to Oracle Application Express

Topics in this section include:

- [Creating a Workspace Manually](#)
- [Creating Oracle Application Express Users](#)
- [Logging in to Your Workspace](#)

Creating a Workspace Manually

To create an Oracle Application Express workspace manually:

1. **Log in to Oracle Application Express Administration Services.** Oracle Application Express Administration Services is a separate application for managing an entire Oracle Application Express instance. You log in using the ADMIN account and password created or reset during the installation process.
 - a. In a Web browser, navigate to the Oracle Application Express Administration Services application.

If your setup uses Apache and `mod_plsql`, go to:

```
http://hostname:port/pls/apex/apex_admin
```

Where:

`hostname` is the name of the system where Oracle HTTP Server is installed.

`port` is the port number assigned to Oracle HTTP Server. In a default installation, this number is 7777.

`pls` is the indicator to use the `mod_plsql` cartridge.

`apex` is the database access descriptor (DAD) defined in the `mod_plsql` configuration file.

- b. On the Login page:
 - In Username, enter admin.
 - In Password, enter the Oracle Application Express administrator account password you specified when you installed Oracle Application Express.
 - Click **Login**.

See Also: See "Logging in to Oracle Application Express Administration Services" in *Oracle Application Express Administration Guide*.

Next, create a workspace.

2. Click **Manage Workspaces**.
3. Under Manage Workspaces, click **Create Workspace**.
The Create Workspace Wizard appears.
4. For Identify Workspace, enter a workspace name and description and click **Next**.
5. For Identify Schema, select the Oracle Forms application schema.
 - a. For Re-use existing schema, select **Yes**.
 - b. Select a schema from the list.
 - c. Click **Next**.
6. For Identify Administrator, enter the Workspace administrator information and click **Next**.
7. Confirm your selections and click **Create**.

Creating Oracle Application Express Users

To create an Oracle Application Express user account:

1. Log in to Oracle Application Express Administration Services as described in the previous section. See "Logging in to Oracle Application Express Administration Services" in *Oracle Application Express Administration Guide*.
2. Click **Manage Workspaces**.
3. Under Manage Workspaces, click **Manage Developers and Users**.
The Manage Developers and Users page appears.
4. Click **Create**.
The Create/Edit User page appears.
5. Under User Attributes, enter the appropriate information. Fields marked with an asterisk are required.

Tip: To learn more about a specific attribute, click the item label. When Help is available, the item label changes to red when you pass your cursor over it and the cursor changes to an arrow and question mark.

6. Under Password, type a case-sensitive password for this account.
If your organization has set up a password policy, be sure the password meets the requirements.

7. Under Developer Privileges, select the appropriate privileges:
 - **User is a developer** - To add this user as a developer or Workspace administrator, select **Yes**. For end users, select **No**.
 Developers can create and modify applications and database objects as well as view developer activity, session state, workspace activity, application, and schema reports.
 - **User is a workspace administrator** - To add this user as a Workspace administrator, select **Yes**. For developers or end users, select **No**.
 In addition to having developer privileges, workspace administrators can create and edit user accounts, manage groups, alter passwords of users within the same workspace, and manage development services.
8. Under Account Control, specify the following:
 - **Account Availability** - Select **Unlocked** to enable a user to log in to this account.
 - **Require Change of Password on First Use** - Select **Yes** to require the user to change the password immediately after logging in with the current, temporary password. Otherwise, select **No**.
9. Click **Create User** or **Create and Create Another**.

Logging in to Your Workspace

Once you create a workspace, you must log in to it using your login credentials (that is, the workspace name, user name, and password).

See Also: See "Creating Workspaces" and "Managing Workspace Requests" in *Oracle Application Express Administration Guide*

To log in to your workspace:

1. In a Web browser, navigate to the Oracle Application Express Login page.

If your setup uses the embedded PL/SQL gateway, go to:

`http://hostname:port/apex`

Where:

- `hostname` is the name of the system where Oracle XML DB HTTP server is installed.
- `port` is the port number assigned to Oracle XML DB HTTP server. In a default installation, this number is 8080.
- `apex` is the database access descriptor (DAD) defined in the configuration file.

For users who have upgraded from earlier releases, or who have a custom configuration, this value may be `html:db` or something else. Verify your DAD with your Oracle Application Express administrator.

The Login page appears.

2. Under Login, enter the following:
 - Workspace field - Enter the name of your workspace.
 - Username field - Enter your user name.
 - Password field - Enter your case-sensitive password.

3. Click Login.

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

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 Application Express installations.

Topics in this section include:

- [Remove Prior Oracle Application Express Installations](#)
- [Fix Invalid ACL in Oracle Database 11g](#)

Remove Prior Oracle Application Express Installations

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.

Verify if a Prior Installation Exists

To verify if a prior installation exists:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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_%' OR USERNAME LIKE 'APEX_%')
AND USERNAME NOT IN (
    SELECT 'FLOWS_FILES'
    FROM DUAL
    UNION
    SELECT 'APEX_PUBLIC_USER' FROM DUAL
    UNION
    SELECT SCHEMA s
    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.

Remove Schemas from Prior Installations

To remove schemas from prior installations:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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 a statement similar to the following example:

```
DROP USER FLOWS_030000 CASCADE;
```

Fix Invalid ACL in Oracle Database 11g

After following the instructions in ["Remove Prior Oracle Application Express Installations"](#) on page 3-37, you may need to fix an invalid ACL if you are running Oracle Database 11g and you enabled network services for the prior Oracle Application Express 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 Application Express 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 following:

```
EXEC DBMS_NETWORK_ACL_ADMIN.DELETE_PRIVILEGE('power_users.xml', 'FLOWS_030000');
```

About the Oracle Application Express Runtime Environment

The Oracle Application Express runtime environment enables users to run a production application without supporting the ability to change or edit the application. It 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 the Oracle Application Express runtime environment using SQL*Plus or SQL Developer and the APEX_INSTANCE_ADMIN API. To learn more see, "Managing a Runtime Environment" and in *Oracle Application Express Application Builder User's Guide*.

Topics in this section include:

- [Converting a Runtime Environment to a Full Development Environment](#)
- [Converting a Full Development Environment to a Runtime Environment](#)

Converting a Runtime Environment to a Full Development Environment

To convert an Oracle Application Express 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 Application Express 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
```

4. Follow the instructions in "[Change the Password for the ADMIN Account](#)" on page 3-21.

See Also: *Oracle Database PL/SQL Language Reference* for more information about SQL*Plus

Converting a Full Development Environment to a Runtime Environment

To convert an Oracle Application Express 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 Application Express 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
```

See Also: *Oracle Database PL/SQL Language Reference* for more information about SQL*Plus

Configuration Tasks When Installing from the Database

Oracle Application Express is installed by default with Oracle Database 11g. This chapter describes required postinstallation configuration tasks for Oracle Application Express when installed with Oracle Database 11g or later.

The instructions in this chapter apply to both new and upgrade installations. To learn more, see "[Upgrading from a Previous Version of Oracle Application Express](#)" on page 1-2.

This chapter contains these topics:

- [About Patching Oracle Application Express](#)
- [Recommended Pre-installation Tasks](#)
- [Choosing an HTTP Server](#)
- [Installing from the Database and Configure the Embedded PL/SQL Gateway](#)
- [Installing from the Database and Configure Oracle HTTP Server](#)
- [Post Installation Tasks for Upgrade Installations](#)
- [About the Oracle Application Express Runtime Environment](#)

About Patching Oracle Application Express

If you are already running Oracle Application Express, then check the Oracle Application Express page on the Oracle Technology Network (OTN) at the following URL for information about patch set releases or later versions of Oracle Application Express:

http://www.oracle.com/technology/products/database/application_express/index.html

Upgrading to Oracle Database 11g will not patch Oracle Application Express. To learn more about downloading and installing Oracle Application Express from Oracle Technology Network (OTN) see "[Downloading from Oracle Technology Network](#)" on page 3-1.

Recommended Pre-installation Tasks

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

1. Review and satisfy all Oracle Application Express installation requirements. See "[Oracle Application Express Installation Requirements](#)" on page 2-1.
2. Shut down any existing Oracle Database instances as well as Oracle-related processes.

Shut down any existing Oracle Database instances with normal or immediate priority, except for the database where you plan to install the Oracle Application Express schemas. On Oracle Real Application Clusters (Oracle RAC) systems, shut down all instances on each node.

If Automatic Storage Management (ASM) is running, shut down all databases that use ASM except for the database where you will install Oracle Application Express, and then shut down the ASM instance.

You can use the Windows **Services** utility, located either in the Windows Control Panel or from the **Administrative Tools** menu (under **Start** and then **Programs**), to shut down Oracle Database and ASM instances. Names of Oracle databases are preceded with `OracleService`. The Oracle ASM service is named `OracleASMService+ASM`. In addition, shut down the `OracleCSService` service, which ASM uses. Right-click the name of the service and from the menu, choose **Stop**.

3. Back up the Oracle Database installation.

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

See Also: *Oracle Database Backup and Recovery User's Guide*

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 the listener or Oracle HTTP Server. However, if you are performing a remote installation, make sure the database listener for the remote database has started.

Note: If you are connecting to a remote database, then start the listener.

Choosing an HTTP Server

In order to run, Oracle Application Express must have access to either the embedded PL/SQL gateway or Oracle HTTP Server and `mod_plsql`. To learn more, see "[About Choosing an HTTP Server](#)" on page 1-3.

Installing from the Database and Configure the Embedded PL/SQL Gateway

This section describes required postinstallation configuration tasks when running Oracle Application Express with the embedded PL/SQL gateway.

Topics in this section include:

- [Install the Oracle Database and Complete Pre-installation Tasks](#)

- [Configure the Embedded PL/SQL Gateway](#)
- [Enable Network Services in Oracle Database 11g](#)
- [Enable Indexing of Online Help in Oracle Database 11gR2 and Higher](#)
- [Security Considerations](#)
- [About Running Oracle Application Express in Other Languages](#)
- [About Managing JOB_QUEUE_PROCESSES](#)
- [Configuring the SHARED_SERVERS Parameter](#)
- [Create a Workspace and Add Oracle Application Express Users](#)

See Also: ["About the Oracle Application Express Runtime Environment"](#) on page 4-33

Install the Oracle Database and Complete Pre-installation Tasks

Oracle Application Express automatically installs with Oracle Database 11g or later. To learn more about install the Oracle Database, see the *Oracle Database Installation Guide* for your operating environment and ["Recommended Pre-installation Tasks"](#) on page 4-1.

Configure the Embedded PL/SQL Gateway

Although the embedded PL/SQL gateway installs with the Oracle Database 11g, you must configure it before you can use it with Oracle Application Express. To accomplish, you run a configuration file and unlock the ANONYMOUS account.

Note: The Oracle XML DB HTTP Server with the embedded PL/SQL gateway is not supported before Oracle Database 11g.

Topics in this section include:

- [Running the apxconf.sql Configuration Script](#)
- [Verifying the Oracle XML DB HTTP Server Port](#)
- [Enabling Oracle XML DB HTTP Server](#)
- [Disabling Oracle XML DB HTTP Server](#)

Running the apxconf.sql Configuration Script

In a new installation, you configure the embedded PL/SQL gateway by running the configuration script `apxconf.sql`. Then, you unlock the ANONYMOUS account.

Note: If you are upgrading and have previously configured the embedded PL/SQL gateway, skip this section and go to ["Enable Network Services in Oracle Database 11g"](#) on page 4-6.

To run the `apxconf.sql` configuration script:

1. Change your working directory to `ORACLE_BASE\ORACLE_HOME\apex` or whatever convention used to indicate the Oracle home.
2. Start SQL*Plus and connect to the database where Oracle Application Express 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
```

3. Run `apxconf.sql` as shown in the following example:

```
@apxconf
```

4. When prompted, enter a password for the Application Express Admin account.

Be sure to make a note of the password you enter. You will use this password to log in to Oracle Application Express Administration Services.

5. When prompted, enter the port for the Oracle XML DB HTTP server. The default port number is 8080.

6. Enter the following statement to unlock the ANONYMOUS account:

```
ALTER USER ANONYMOUS ACCOUNT UNLOCK;
```

Verifying the Oracle XML DB HTTP Server Port

The embedded PL/SQL gateway runs in the Oracle XML DB HTTP server in the Oracle database. You can determine if the Oracle XML DB HTTP server is enabled by verifying the associated port number.

To verify the port number where the Oracle XML DB HTTP Server is running:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. Enter the following statement to verify the port number:

```
SELECT DBMS_XDB.GETHTTPPORT FROM DUAL;
```

If the port number returns 0, the Oracle XML DB HTTP Server is disabled.

3. To enable it, follow the instructions in ["Enabling Oracle XML DB HTTP Server"](#) on page 4-4.

Enabling Oracle XML DB HTTP Server

The embedded PL/SQL gateway runs in the Oracle XML DB HTTP server in the Oracle database.

To enable Oracle XML DB HTTP server:

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

- Windows:

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

- UNIX and Linux:

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

2. Run the following statements:

```
EXEC DBMS_XDB.SETHTTPPORT(port);
COMMIT;
```

For example:

```
EXEC DBMS_XDB.SETHTTPPORT(8080);
COMMIT;
```

Note: Port numbers less than 1024 are reserved for use by privileged processes on many operating systems. To enable the XML DB HTTP listener on a port less than 1024, such as 80, review the following documentation:

- "Using Protocols to Access the Repository" and "Using HTTP(S) on Nonstandard Ports" in *Oracle XML DB Developer's Guide*.
 - "Protocol Address Configuration" and "Port Number Limitations" in *Oracle Database Net Services Reference*.
-
-

Disabling Oracle XML DB HTTP Server

The embedded PL/SQL gateway runs in the Oracle XML DB HTTP server in the Oracle database. To disable Oracle XML DB HTTP server:

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

- Windows:

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

- UNIX and Linux:

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

2. Run the following statements:

```
EXEC DBMS_XDB.SETHTTPPORT(0);
COMMIT;
```

Enable Network Services in Oracle Database 11g

By default, the ability to interact with network services is disabled in Oracle Database 11g release 1 (11.1). Therefore, if you are running Oracle Application Express with Oracle Database 11g release 1 (11.1), you must use the new `DBMS_NETWORK_ACL_ADMIN` package to grant connect privileges to any host for the `APEX_030200` database user. Failing to grant these privileges results in issues with:

- Sending outbound mail in Oracle Application Express.
Users can call methods from the `APEX_MAIL` package, but issues arise when sending outbound email.
- Using Web services in Oracle Application Express.
- PDF/report printing.
- Searching for content in online Help (that is, using the Find link).

Topics in this section include:

- [Granting Connect Privileges](#)
- [Troubleshooting an Invalid ACL Error](#)

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 database will already have the parameter set properly, but a database upgraded to 11g from a prior version may not. See "Creating and Configuring an Oracle Database" in *Oracle Database Administrator's Guide* for information about changing database initialization parameters.

Granting Connect Privileges

The following example demonstrates how to grant connect privileges to any host for the `APEX_030200` database user.

```
DECLARE
  ACL_PATH  VARCHAR2(4000);
  ACL_ID    RAW(16);
BEGIN
  -- Look for the ACL currently assigned to '*' and give APEX_030200
  -- the "connect" privilege if APEX_030200 does not have the privilege yet.

  SELECT ACL INTO ACL_PATH FROM DBA_NETWORK_ACLS
  WHERE HOST = '*' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

  -- Before checking the privilege, ensure that the ACL is valid
  -- (for example, does not contain stale references to dropped users).
  -- If it does, the following exception will be raised:
  --
  -- ORA-44416: Invalid ACL: Unresolved principal 'APEX_030200'
  -- ORA-06512: at "XDB.DBMS_XDBZ", line ...
  --
  SELECT SYS_OP_R20(extractValue(P.RES, '/Resource/XMLRef')) INTO ACL_ID
  FROM XDB.XDB$ACL A, PATH_VIEW P
  WHERE extractValue(P.RES, '/Resource/XMLRef') = REF(A) AND
        EQUALS_PATH(P.RES, ACL_PATH) = 1;

  DBMS_XDBZ.ValidateACL(ACL_ID);
  IF DBMS_NETWORK_ACL_ADMIN.CHECK_PRIVILEGE(ACL_PATH, 'APEX_030200',
    'connect') IS NULL THEN
```

```

        DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(ACL_PATH,
        'APEX_030200', TRUE, 'connect');
    END IF;

EXCEPTION
    -- When no ACL has been assigned to '*'.
    WHEN NO_DATA_FOUND THEN
        DBMS_NETWORK_ACL_ADMIN.CREATE_ACL('power_users.xml',
        'ACL that lets power users to connect to everywhere',
        'APEX_030200', TRUE, 'connect');
        DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL('power_users.xml', '*');
    END;
    /
COMMIT;

```

The following example demonstrates how to provide less privileged access to local network resources. This example would enable indexing the Oracle Application Express Online Help and could possibly enable email and PDF printing if those servers were also on the local host.

```

DECLARE
    ACL_PATH VARCHAR2(4000);
    ACL_ID RAW(16);
BEGIN
    -- Look for the ACL currently assigned to 'localhost' and give APEX_030200
    -- the "connect" privilege if APEX_030200 does not have the privilege yet.
    SELECT ACL INTO ACL_PATH FROM DBA_NETWORK_ACLS
    WHERE HOST = 'localhost' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

    -- Before checking the privilege, ensure that the ACL is valid
    -- (for example, does not contain stale references to dropped users).
    -- If it does, the following exception will be raised:
    --
    -- ORA-44416: Invalid ACL: Unresolved principal 'APEX_030200'
    -- ORA-06512: at "XDB.DBMS_XDBZ", line ...
    --

    SELECT SYS_OP_R20(extractValue(P.RES, '/Resource/XMLRef')) INTO ACL_ID
    FROM XDB.XDB$ACL A, PATH_VIEW P
    WHERE extractValue(P.RES, '/Resource/XMLRef') = REF(A) AND
    EQUALS_PATH(P.RES, ACL_PATH) = 1;

    DBMS_XDBZ.ValidateACL(ACL_ID);
    IF DBMS_NETWORK_ACL_ADMIN.CHECK_PRIVILEGE(ACL_PATH, 'APEX_030200',
    'connect') IS NULL THEN
        DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(ACL_PATH,
        'APEX_030200', TRUE, 'connect');
    END IF;

EXCEPTION
    -- When no ACL has been assigned to 'localhost'.
    WHEN NO_DATA_FOUND THEN
        DBMS_NETWORK_ACL_ADMIN.CREATE_ACL('local-access-users.xml',
        'ACL that lets power users to connect to everywhere',
        'APEX_030200', TRUE, 'connect');
        DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL('local-access-users.xml', 'localhost');
    END;
    /
COMMIT;

```

Troubleshooting an Invalid ACL Error

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 NAACL, XDS_ACE ACE
       WHERE HOST = '*' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL AND
             NAACL.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 =
                 DELETEXML(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_030200` user. See ["Granting Connect Privileges"](#) on page 4-6.

Enable Indexing of Online Help in Oracle Database 11gR2 and Higher

The ability to search Oracle Application Express online Help is accomplished through Oracle Text and a URL datastore. There is a change in the default behavior and permissions to use an Oracle Text URL datastore in database 11gR2 and higher.

If users attempt to search Oracle Application Express online Help in Oracle database 11gR2 and encounter the following error, then the permission to use an Oracle Text URL datastore has not been granted to database user APEX_030200.

```
ORA-29855: error occurred in the execution of ODCIINDEXCREATE routine
ORA-20000: Oracle Text error:
DRG-10758: index owner does not have the privilege to use file or URL datastore
```

To enable the indexing of online Help in Oracle Application Express, the permission to use an Oracle Text URL datastore must be granted to the APEX_030200 database user. This is accomplished by assigning this specific privilege to a database role and then granting this role to the APEX_030200 database user.

To determine if the ability to use an Oracle Text URL datastore is already granted to a database role:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. Run the following command:

```
SELECT par_value FROM ctxsys.ctx_parameters WHERE par_name = 'FILE_ACCESS_
ROLE';
```

This returns either NULL or the database role which is granted the ability to use an Oracle Text URL datastore.

3. If no value is returned by step 2, then create a new database role as shown in the following example:

```
CREATE ROLE APEX_URL_DATASTORE_ROLE;
```

4. Grant this role to the database user APEX_030200 with the following statement:

```
GRANT APEX_URL_DATASTORE_ROLE to APEX_030200;
```

If step 2 returned a value, use this database role name instead of the example APEX_URL_DATASTORE_ROLE.

5. Lastly, if step 2 did not return a value, then use the Oracle Text API to grant permission to the newly created database role with the following statement:

```
EXEC ctxsys.ctx_adm.set_parameter('file_access_role', 'APEX_URL_DATASTORE_
ROLE');
```

Security Considerations

Oracle highly recommends you configure and use a 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.

About Running Oracle Application Express in Other Languages

The Oracle Application Express interface is translated into German, Spanish, French, Italian, Japanese, Korean, Brazilian Portuguese, Simplified Chinese, and Traditional Chinese. A single instance of Oracle Application Express can be installed with one or more of these translated versions. At runtime, each user's Web browser language settings determine the specific language version.

The translated version of Oracle Application Express 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 Application Express into a database that does not support the character encoding of the language, the installation may fail or the translated Oracle Application Express instance may appear corrupt when run. The database character set `AL32UTF8` supports all the translated versions of Oracle Application Express.

You can manually install translated versions of Oracle Application Express 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 Application Express, 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 Application Express translations:

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

Installing a Translated Version of Oracle Application Express

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 Application Express.

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 of directory, there is a language loading script identified by the language code (for example, `load_de.sql` or `load_ja.sql`).

To install a translated version of Oracle Application Express:

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. Start SQL*Plus and connect to the database where Oracle Application Express 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 following statement:


```
ALTER SESSION SET CURRENT_SCHEMA = APEX_030200;
```
 4. 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).

About Managing JOB_QUEUE_PROCESSES

JOB_QUEUE_PROCESSES determine the maximum number of concurrently running jobs. In Oracle Application Express release 3.2, transactional support and SQL scripts require jobs. If JOB_QUEUE_PROCESSES is not enabled and working properly, you cannot successfully execute a script.

Topics in this section include:

- [Viewing the Number of JOB_QUEUE_PROCESSES](#)
- [Changing the Number of JOB_QUEUE_PROCESSES](#)

Viewing the Number of JOB_QUEUE_PROCESSES

There are currently three ways to view the number of JOB_QUEUE_PROCESSES:

- In the installation log file
- On the About Application Express page in Oracle Application Express
- From SQL*Plus

Viewing JOB_QUEUE_PROCESSES in the Installation Log File After installing or upgrading Oracle Application Express to release 3.2, you can view the number of JOB_QUEUE_

PROCESSES in the installation log files. See ["Reviewing a Log of an Installation Session"](#) on page A-1.

Viewing JOB_QUEUE_PROCESSES in Oracle Application Express You can also view the number of JOB_QUEUE_PROCESSES on the About Application Express page.

To view the About Application Express page:

1. Log in to Oracle Application Express. See ["Logging in to Your Oracle Application Express Workspace"](#) on page 4-15.
2. On the Administration list, click **About Application Express**.

The current number JOB_QUEUE_PROCESSES displays at the bottom of the page.

Viewing JOB_QUEUE_PROCESSES from SQL*Plus You can also view the number of JOB_QUEUE_PROCESSES from SQL*Plus by running the following SQL statement:

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

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 Application Express 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.

Configuring the SHARED_SERVERS Parameter

The embedded PL/SQL gateway uses the shared server architecture of the Oracle Database. To achieve acceptable performance when using the embedded PL/SQL gateway, ensure the SHARED_SERVERS database initialization parameter is set to a reasonable value (that is, not 0 or 1). For a small group of concurrent users, Oracle recommends a value of 5 for SHARED_SERVERS.

Consider the following example:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. Run the following statement:

```
ALTER SYSTEM SET SHARED_SERVERS = 5 SCOPE=BOTH;
```

Create a Workspace and Add Oracle Application Express Users

You access the Oracle Application Express home page by logging in to workspace using a Web browser. Your Web browser must support JavaScript and the HTML 4.0 and CSS 1.0 standards. See "[Browser Requirement](#)" on page 2-2.

A **workspace** is a virtual private database allowing multiple users to work within the same Oracle Application Express installation while keeping their objects, data and applications private. Each workspace has a unique ID and name.

An Oracle Application Express administrator can create a workspace manually within Oracle Application Express Administration Services or have users submit requests. Oracle Application Express Administration Services is a separate application for managing an entire Oracle Application Express instance. See "Creating Workspaces" and "Managing Workspace Requests" in *Oracle Application Express Administration Guide*.

See Also: *Oracle Database 2 Day + Oracle Application Express Developer's Guide* if you are new to Oracle Application Express

This section includes these topics:

- [Creating a Workspace Manually](#)
- [Creating Oracle Application Express Users](#)
- [Logging in to Your Oracle Application Express Workspace](#)

Creating a Workspace Manually

To create an Oracle Application Express workspace manually:

1. **Log in to Oracle Application Express Administration Services.** Oracle Application Express Administration Services is a separate application for managing an entire Oracle Application Express instance. You log in using the ADMIN account and password created or reset during the installation process.
 - a. In a Web browser, navigate to the Oracle Application Express Administration Services application.

If your setup uses the embedded PL/SQL gateway, go to:

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

Where:

hostname is the name of the system where Oracle XML DB HTTP server is installed.

`port` is the port number assigned to Oracle XML DB HTTP server. In a default installation, this number is 8080.

`apex` is the database access descriptor (DAD) defined in the configuration file.

- b. On the Login page:
 - In Username, enter `admin`.
 - In Password, enter the Oracle Application Express administrator account password you specified when you installed Oracle Application Express.
 - Click **Login**.

See Also: See "Logging in to Oracle Application Express Administration Services" in *Oracle Application Express Administration Guide*.

Next, create a workspace.

2. Click **Manage Workspaces**.
3. Under Manage Workspaces, click **Create Workspace**.
The Create Workspace Wizard appears.
4. For Identify Workspace, enter a workspace name and description and click **Next**.
5. For Identify Schema, select the Oracle Forms application schema.
 - a. For Re-use existing schema, select **Yes**.
 - b. Select a schema from the list.
 - c. Click **Next**.
6. For Identify Administrator, enter the Workspace administrator information and click **Next**.
7. Confirm your selections and click **Create**.

Creating Oracle Application Express Users

To create an Oracle Application Express user account:

1. Log in to Oracle Application Express Administration Services as described in the previous section. See "Logging in to Oracle Application Express Administration Services" in *Oracle Application Express Administration Guide*.
2. Click **Manage Workspaces**.
3. Under Manage Workspaces, click **Manage Developers and Users**.
The Manage Developers and Users page appears.
4. Click **Create**.
The Create/Edit User page appears.
5. Under User Attributes, enter the appropriate information. Fields marked with an asterisk are required.

Tip: To learn more about a specific attribute, click the item label. When Help is available, the item label changes to red when you pass your cursor over it and the cursor changes to an arrow and question mark.

6. Under Password, type a case-sensitive password for this account.
If your organization has set up a password policy, be sure the password meets the requirements.
7. Under Developer Privileges, select the appropriate privileges:
 - **User is a developer** - To add this user as a developer or Workspace administrator, select **Yes**. For end users, select **No**.
Developers can create and modify applications and database objects as well as view developer activity, session state, workspace activity, application, and schema reports.
 - **User is a workspace administrator** - To add this user as a Workspace administrator, select **Yes**. For developers or end users, select **No**.
In addition to having developer privileges, workspace administrators can create and edit user accounts, manage groups, alter passwords of users within the same workspace, and manage development services.
8. Under Account Control, specify the following:
 - **Account Availability** - Select **Unlocked** to enable a user to log in to this account.
 - **Require Change of Password on First Use** - Select **Yes** to require the user to change the password immediately after logging in with the current, temporary password. Otherwise, select **No**.
9. Click **Create User** or **Create and Create Another**.

Logging in to Your Oracle Application Express Workspace

Once you create a workspace, you must log in to it using your login credentials (that is, the workspace name, user name, and password).

See Also: See "Creating Workspaces" and "Managing Workspace Requests" in *Oracle Application Express Administration Guide*

To log in to a workspace:

1. In a Web browser, navigate to the Oracle Application Express Login page.

If your setup uses the embedded PL/SQL gateway, go to:

`http://hostname:port/apex`

Where:

- `hostname` is the name of the system where Oracle XML DB HTTP server is installed.
- `port` is the port number assigned to Oracle XML DB HTTP server. In a default installation, this number is 8080.
- `apex` is the database access descriptor (DAD) defined in the configuration file.

For users who have upgraded from earlier releases, or who have a custom configuration, this value may be `html.db` or something else. Verify your DAD with your Oracle Application Express administrator.

The Login page appears.

2. Under Login, enter the following:

- Workspace field - Enter the name of your workspace.
 - Username field - Enter your user name.
 - Password field - Enter your case-sensitive password.
3. Click **Login**.

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

Installing from the Database and Configure Oracle HTTP Server

This section describes how to configure Oracle HTTP Server with `mod_plsql` distributed with Oracle Database 11g or Oracle Application Server 10g.

Topics in this section include:

- [Install the Oracle Database and Complete Pre-installation Tasks](#)
- [Configure Oracle HTTP Server Distributed with Oracle Database 11g or Oracle Application Server 10g](#)
- [Enable Network Services in Oracle Database 11g](#)
- [Enable Indexing of Online Help in Oracle Database 11gR2 and Higher](#)
- [Security Considerations](#)
- [About Running Oracle Application Express in Other Languages](#)
- [About Managing JOB_QUEUE_PROCESSES](#)
- [About Obfuscating PlsqlDatabasePassword Parameter](#)
- [Create a Workspace and Add Oracle Application Express Users](#)

Note that these instructions do not apply if you are running Oracle HTTP Server release 9.0.3. To learn more, see "[Configuring Oracle HTTP Server Distributed with Oracle9i Release 2](#)" on page B-1.

Note: Within the context of this section, the Oracle home directory (`ORACLE_HTTPSERVER_HOME`) is the location where Oracle HTTP Server is installed.

Install the Oracle Database and Complete Pre-installation Tasks

Oracle Application Express automatically installs with Oracle Database 11g or later. To learn more about install the Oracle Database, see the *Oracle Database Installation Guide* for your operating environment and "[Recommended Pre-installation Tasks](#)" on page 4-1.

Configure Oracle HTTP Server Distributed with Oracle Database 11g or Oracle Application Server 10g

Perform the following postinstallation steps if:

- You are using a version of Oracle Application Express that installs with Oracle Database 11g or later.
- You are not upgrading from a previous release. This is a new installation of Oracle Application Express.

- You are running Oracle HTTP Server distributed with Oracle Database 11g or Oracle Application Server 10g.
- Oracle HTTP Server is installed in an Oracle home.

Topics in this section include:

- [Change the Password for the ADMIN Account](#)
- [Unlock the APEX_PUBLIC_USER Database User](#)
- [Change the Password for the APEX_PUBLIC_USER Database User](#)
- [Copy the Images Directory](#)

Note that these instructions do not apply if you are running Oracle HTTP Server release 9.0.3. To learn more, see "[Configuring Oracle HTTP Server Distributed with Oracle9i Release 2](#)" on page B-1.

Note: Within the context of this section, the Oracle home directory (ORACLE_HTTPSERVER_HOME) is the location where Oracle HTTP Server is installed.

Change the Password for the ADMIN Account

First, change the password for the Oracle Application Express ADMIN account.

Tip: If you are upgrading from a prior release of Oracle Application Express, this step is unnecessary.

To change the password for the ADMIN account:

1. Change your working directory to `ORACLE_BASE\ORACLE_HOME\apex` or whatever convention used to indicate the Oracle home.
2. Start SQL*Plus and connect to the database where Oracle Application Express 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
```

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

```
@apxchpwd.sql
```

When prompted enter a password for the ADMIN account.

Unlock the APEX_PUBLIC_USER Database User

When configuring Oracle HTTP Server for Oracle Application Express in a new installation, the database user `APEX_PUBLIC_USER` must be an unlocked account. To unlock the account for database user `APEX_PUBLIC_USER`, execute the following steps:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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 statement:

```
ALTER USER APEX_PUBLIC_USER ACCOUNT UNLOCK
```

Change the Password for the APEX_PUBLIC_USER Database User

In order to specify the password in the DAD file, you have to change the password for the database user *APEX_PUBLIC_USER*. Please use the following steps to change the password for the *APEX_PUBLIC_USER* database user:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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 statement:

```
SQL> PASSWORD APEX_PUBLIC_USER
Changing password for APEX_PUBLIC_USER
New password: password
Retype new password: password
```

About Password Expiration in Oracle Database 11g In the default profile in Oracle Database 11g, the parameter *PASSWORD_LIFE_TIME* is set to 180. If you are using Oracle Database 11g with Oracle Application Express, this causes the password for *APEX_PUBLIC_USER* to expire in 180 days. As a result, your Oracle Application Express instance will become unusable until you change the password.

To prevent this behavior, create another profile in which the *PASSWORD_LIFE_TIME* parameter is set to unlimited and alter the *APEX_PUBLIC_USER* account and assign it the new profile.

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

Copy 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 to the location on the file system containing the Oracle home for Oracle HTTP Server.

Topics in this section include:

- [Copying the Images Directory After an Upgrade](#)
- [Copying the Images Directory in a New Installation](#)

Copying the Images Directory After an Upgrade During an upgrade, you must 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 Application Express, indicating the release number of the `images` (for example, `images_3_1`).

To locate the `images` directory on the file system, review the following files for the text alias `/i/`:

- Oracle HTTP Server distributed Oracle9i Release 2—see the `httpd.conf` file.
- Oracle Application Server 10g—see the `marvel.conf` or `dads.conf` files.
- Oracle HTTP Server distributed with Oracle Database 11g—see the `marvel.conf` or `dads.conf` files.

When you locate the `images` directory path, copy the existing `images` directory to a backup location. Doing so enables you to revert to the previous release, if that becomes necessary.

After you copy the existing `images` directory, use the following command syntax to copy the `apex\images` directory from the Oracle Database home to the existing `images` directory path, overwriting the existing `images`:

- Oracle Application Server 10g:
 - On Windows:


```
xcopy /E /I ORACLE_HOME\apex\images ORACLE_HTTPSERVER_HOME\Apache\images
```
 - On UNIX and Linux:


```
cp -rf $ORACLE_HOME/apex/images ORACLE_HTTPSERVER_HOME/Apache
```
- Oracle HTTP Server distributed with Oracle Database 11g:
 - On Windows:


```
xcopy /E /I ORACLE_HOME\apex\images ORACLE_HTTPSERVER_HOME\ohs\images
```
 - On UNIX and Linux:


```
cp -rf $ORACLE_HOME/apex/images ORACLE_HTTPSERVER_HOME/ohs
```

In the preceding syntax examples:

- `ORACLE_HOME` is the Oracle Database Oracle home
- `ORACLE_HTTPSERVER_HOME` is the existing Oracle Application Server or Oracle HTTP Server Oracle home

Copying the Images Directory in a New Installation After installation, copy the directory `apex/images`.

You can copy the `images` directory using Windows Explorer, or running a command from a command prompt similar to the following:

```
DRIVE_LETTER:\> xcopy /E /I ORACLE_HOME\apex\images ORACLE_HTTPSERVER_HOME\ohs\images
```

In the preceding syntax example:

- `ORACLE_HOME` is the Oracle Database 11g Oracle home
- `ORACLE_HTTPSERVER_HOME` is the existing Oracle Application Server or Oracle HTTP Server Oracle home

Configure Oracle HTTP Server 11g or Oracle Application Server 10g

Perform the following postinstallation steps if:

- You are running Oracle HTTP Server distributed with Oracle Database 11g or Oracle Application Server 10g.
- Oracle HTTP Server is installed in an Oracle home.

Note that these instructions do not apply if you are running Oracle HTTP Server release 9.0.3. To learn more, see "[Configuring Oracle HTTP Server Distributed with Oracle9i Release 2](#)" on page B-1.

Note: Within the context of this document, `ORACLE_HTTPSERVER_HOME` is the location where Oracle HTTP Server is installed.

Topics in this section include:

- [Editing the `dads.conf` File](#)
- [Stopping and Restarting Oracle HTTP Server](#)

Editing the `dads.conf` File If this is a new installation of Oracle Application Express, you must edit the `dads.conf` file. The `dads.conf` file contains the information about the DAD to access Oracle Application Express.

To edit the `dads.conf` file:

1. Use a text editor and open the `dads.conf`.
 - Oracle Application Server 10g:
 - On Windows see:


```
ORACLE_HTTPSERVER_HOME\Apache\modplsql\conf\dads.conf
```
 - On UNIX and Linux see:


```
ORACLE_HTTPSERVER_HOME/Apache/modplsql/conf/dads.conf
```
 - Oracle HTTP Server distributed with Oracle Database 11g:
 - On Windows see:


```
ORACLE_HTTPSERVER_HOME\ohs\modplsql\conf\dads.conf
```
 - On UNIX and Linux see:


```
ORACLE_HTTPSERVER_HOME/ohs/modplsql/conf/dads.conf
```

2. In the `dads.conf` file, replace `ORACLE_HTTPSERVER_HOME`, `host`, `port`, `service_name`, and `apex_public_user_password` with values appropriate for your environment. Note that the `apex_public_user_password` is the password you changed in ["Change the Password for the APEX_PUBLIC_USER Database User"](#) on page 4-18.

Note that the path listed is only an example. The path in the `dads.conf` file should reference the file system path described in ["Copy the Images Directory"](#) on page 4-19.

```
Alias /i/ "ORACLE_HTTPSERVER_HOME/Apache/images/"
AddType text/xml      xbl
AddType text/x-component      htc

<Location /pls/apex>
  Order deny,allow
  PlsqlDocumentPath docs
  AllowOverride None
  PlsqlDocumentProcedure      wwv_flow_file_mgr.process_download
  PlsqlDatabaseConnectString  host:port:service_name ServiceNameFormat
  PlsqlNLSLanguage            AMERICAN_AMERICA.AL32UTF8
  PlsqlAuthenticationMode     Basic
  SetHandler                  pls_handler
  PlsqlDocumentTablename      wwv_flow_file_objects$
  PlsqlDatabaseUsername       APEX_PUBLIC_USER
  PlsqlDefaultPage            apex
  PlsqlDatabasePassword       apex_public_user_password
  PlsqlRequestValidationFunction wwv_flow_epg_include_modules.authorize
  Allow from all
</Location>
```

3. Locate the line containing `PlsqlNLSLanguage`.

The `PlsqlNLSLanguage` setting determines the language setting of the DAD. The character set portion of the `PlsqlNLSLanguage` value must be set to `AL32UTF8`, regardless of whether or not the database character set is `AL32UTF8`. For example:

```
...
PlsqlNLSLanguage      AMERICAN_AMERICA.AL32UTF8
...
```

4. Save and exit the `dads.conf` file.

Stopping and Restarting Oracle HTTP Server To stop and restart the Oracle HTTP Server, enter commands using the following syntax, where `ORACLE_BASE` is the path to the Oracle base directory:

```
ORACLE_BASE\ORACLE_HTTPSERVER_HOME\opmn\bin\opmnctl stopproc ias-component=HTTP_S
Server
ORACLE_BASE\ORACLE_HTTPSERVER_HOME\opmn\bin\opmnctl startproc ias-component=HTTP_
Server
```

Enable Network Services in Oracle Database 11g

By default, the ability to interact with network services is disabled in Oracle Database 11g release 1 (11.1). Therefore, if you are running Oracle Application Express with Oracle Database 11g release 1 (11.1), you must use the new `DEMS_NETWORK_ACL_`

ADMIN package to grant connect privileges to any host for the APEX_030200 database user. Failing to grant these privileges results in issues with:

- Sending outbound mail in Oracle Application Express.
Users can call methods from the APEX_MAIL package, but issues arise when sending outbound email.
- Using Web services in Oracle Application Express.
- PDF/report printing.
- Searching for content in online Help (that is, using the Find link).

Topics in this section include:

- [Granting Connect Privileges](#)
- [Troubleshooting an Invalid ACL Error](#)

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 database will already have the parameter set properly, but a database upgraded to 11g from a prior version may not. See "Creating and Configuring an Oracle Database" in *Oracle Database Administrator's Guide* for information about changing database initialization parameters.

Granting Connect Privileges

The following example demonstrates how to grant connect privileges to any host for the APEX_030200 database user.

```

DECLARE
  ACL_PATH  VARCHAR2(4000);
  ACL_ID    RAW(16);
BEGIN
  -- Look for the ACL currently assigned to '*' and give APEX_030200
  -- the "connect" privilege if APEX_030200 does not have the privilege yet.

  SELECT ACL INTO ACL_PATH FROM DBA_NETWORK_ACLS
  WHERE HOST = '*' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

  -- Before checking the privilege, ensure that the ACL is valid
  -- (for example, does not contain stale references to dropped users).
  -- If it does, the following exception will be raised:
  --
  -- ORA-44416: Invalid ACL: Unresolved principal 'APEX_030200'
  -- ORA-06512: at "XDB.DBMS_XDBZ", line ...
  --
  SELECT SYS_OP_R20(extractValue(P.RES, '/Resource/XMLRef')) INTO ACL_ID
  FROM XDB.XDB$ACL A, PATH_VIEW P
  WHERE extractValue(P.RES, '/Resource/XMLRef') = REF(A) AND
        EQUALS_PATH(P.RES, ACL_PATH) = 1;

  DBMS_XDBZ.ValidateACL(ACL_ID);
  IF DBMS_NETWORK_ACL_ADMIN.CHECK_PRIVILEGE(ACL_PATH, 'APEX_030200',
    'connect') IS NULL THEN
    DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(ACL_PATH,
    'APEX_030200', TRUE, 'connect');
  END IF;

EXCEPTION

```

```

-- When no ACL has been assigned to '*'.
WHEN NO_DATA_FOUND THEN
DBMS_NETWORK_ACL_ADMIN.CREATE_ACL('power_users.xml',
  'ACL that lets power users to connect to everywhere',
  'APEX_030200', TRUE, 'connect');
DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL('power_users.xml', '*');
END;
/
COMMIT;

```

The following example demonstrates how to provide less privileged access to local network resources. This example would enable indexing the Oracle Application Express Online Help and could possibly enable email and PDF printing if those servers were also on the local host.

```

DECLARE
  ACL_PATH VARCHAR2(4000);
  ACL_ID RAW(16);
BEGIN
  -- Look for the ACL currently assigned to 'localhost' and give APEX_030200
  -- the "connect" privilege if APEX_030200 does not have the privilege yet.
  SELECT ACL INTO ACL_PATH FROM DBA_NETWORK_ACLS
    WHERE HOST = 'localhost' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

  -- Before checking the privilege, ensure that the ACL is valid
  -- (for example, does not contain stale references to dropped users).
  -- If it does, the following exception will be raised:
  --
  -- ORA-44416: Invalid ACL: Unresolved principal 'APEX_030200'
  -- ORA-06512: at "XDB.DBMS_XDBZ", line ...
  --

  SELECT SYS_OP_R20(extractValue(P.RES, '/Resource/XMLRef')) INTO ACL_ID
    FROM XDB.XDB$ACL A, PATH_VIEW P
    WHERE extractValue(P.RES, '/Resource/XMLRef') = REF(A) AND
          EQUALS_PATH(P.RES, ACL_PATH) = 1;

  DBMS_XDBZ.ValidateACL(ACL_ID);
  IF DBMS_NETWORK_ACL_ADMIN.CHECK_PRIVILEGE(ACL_PATH, 'APEX_030200',
    'connect') IS NULL THEN
    DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(ACL_PATH,
    'APEX_030200', TRUE, 'connect');
  END IF;

EXCEPTION
  -- When no ACL has been assigned to 'localhost'.
  WHEN NO_DATA_FOUND THEN
  DBMS_NETWORK_ACL_ADMIN.CREATE_ACL('local-access-users.xml',
    'ACL that lets power users to connect to everywhere',
    'APEX_030200', TRUE, 'connect');
  DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL('local-access-users.xml', 'localhost');
END;
/
COMMIT;

```

Troubleshooting an Invalid ACL Error

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 =
DELETXML(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_030200 user. See "[Granting Connect Privileges](#)" on page 4-22.

Enable Indexing of Online Help in Oracle Database 11gR2 and Higher

The ability to search Oracle Application Express online Help is accomplished through Oracle Text and a URL datastore. There is a change in the default behavior and permissions to use an Oracle Text URL datastore in database 11gR2 and higher.

If users attempt to search Oracle Application Express online Help in Oracle database 11gR2 and encounter the following error, then the permission to use an Oracle Text URL datastore has not been granted to database user APEX_030200.

```
ORA-29855: error occurred in the execution of ODCIINDEXCREATE routine
ORA-20000: Oracle Text error:
DRG-10758: index owner does not have the privilege to use file or URL datastore
```

To enable the indexing of online Help in Oracle Application Express, the permission to use an Oracle Text URL datastore must be granted to the APEX_030200 database user. This is accomplished by assigning this specific privilege to a database role and then granting this role to the APEX_030200 database user.

To determine if the ability to use an Oracle Text URL datastore is already granted to a database role:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. Run the following command:

```
SELECT par_value FROM ctxsys.ctx_parameters WHERE par_name = 'FILE_ACCESS_
ROLE';
```

This returns either NULL or the database role which is granted the ability to use an Oracle Text URL datastore.

3. If no value is returned by step 2, then create a new database role as shown in the following example:

```
CREATE ROLE APEX_URL_DATASTORE_ROLE;
```

4. Grant this role to the database user APEX_030200 with the following statement:

```
GRANT APEX_URL_DATASTORE_ROLE to APEX_030200;
```

If step 2 returned a value, use this database role name instead of the example APEX_URL_DATASTORE_ROLE.

5. Lastly, if step 2 did not return a value, then use the Oracle Text API to grant permission to the newly created database role with the following statement:

```
EXEC ctxsys.ctx_adm.set_parameter('file_access_role', 'APEX_URL_DATASTORE_
ROLE');
```

Security Considerations

Oracle highly recommends you configure and use 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.

About Running Oracle Application Express in Other Languages

The Oracle Application Express interface is translated into German, Spanish, French, Italian, Japanese, Korean, Brazilian Portuguese, Simplified Chinese, and Traditional Chinese. A single instance of Oracle Application Express can be installed with one or more of these translated versions. At runtime, each user's Web browser language settings determine the specific language version.

The translated version of Oracle Application Express 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 Application Express into a database that does not support the character encoding of the language, the installation may fail or the translated Oracle Application Express instance may appear corrupt when run. The database character set `AL32UTF8` supports all the translated versions of Oracle Application Express.

You can manually install translated versions of Oracle Application Express 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 Application Express, 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 Application Express translations:

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

Installing a Translated Version of Oracle Application Express

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 Application Express.

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 of directory, there is a language loading script identified by the language code (for example, `load_de.sql` or `load_ja.sql`).

To install a translated version of Oracle Application Express:

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. Start SQL*Plus and connect to the database where Oracle Application Express 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 following statement:


```
ALTER SESSION SET CURRENT_SCHEMA = APEX_030200;
```
 4. 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).

About Managing JOB_QUEUE_PROCESSES

JOB_QUEUE_PROCESSES determine the maximum number of concurrently running jobs. In Oracle Application Express release 3.2, transactional support and SQL scripts require jobs. If JOB_QUEUE_PROCESSES is not enabled and working properly, you cannot successfully execute a script.

Topics in this section include:

- [Viewing the Number of JOB_QUEUE_PROCESSES](#)
- [Changing the Number of JOB_QUEUE_PROCESSES](#)

Viewing the Number of JOB_QUEUE_PROCESSES

There are currently three ways to view the number of JOB_QUEUE_PROCESSES:

- In the installation log file
- On the About Application Express page in Oracle Application Express
- From SQL*Plus

Viewing JOB_QUEUE_PROCESSES in the Installation Log File After installing or upgrading Oracle Application Express to release 3.2, you can view the number of JOB_QUEUE_PROCESSES in the installation log files. See "[Reviewing a Log of an Installation Session](#)" on page A-1.

Viewing JOB_QUEUE_PROCESSES in Oracle Application Express You can also view the number of JOB_QUEUE_PROCESSES on the About Application Express page.

To view the About Application Express page:

1. Log in to Oracle Application Express. See "[Logging in to Your Oracle Application Express Workspace](#)" on page 4-31.
2. On the Administration list, click **About Application Express**.

The current number JOB_QUEUE_PROCESSES displays at the bottom of the page.

Viewing JOB_QUEUE_PROCESSES from SQL*Plus You can also view the number of JOB_QUEUE_PROCESSES from SQL*Plus by running the following SQL statement:

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

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 Application Express 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.

About Obfuscating PlsqlDatabasePassword Parameter

The PlsqlDatabasePassword parameter specifies the password for logging in to the database. You can use the dadTool.pl utility to obfuscate passwords in the dads.conf file.

You can find the dadTool.pl utility in the following directory:

- For UNIX and Linux based systems:

```
ORACLE_BASE/ORACLE_HTTPSERVER_HOME/Apache/modplsql/conf
```

- For Windows based systems:

```
ORACLE_BASE\ORACLE_HTTPSERVER_HOME\Apache\modplsql\conf
```

Obfuscating Passwords

To obfuscate passwords, run `dadTool.pl` by following the instructions in the `dadTool.README` file.

Create a Workspace and Add Oracle Application Express Users

You access the Oracle Application Express home page by logging in to workspace using a Web browser. Your Web browser must support JavaScript and the HTML 4.0 and CSS 1.0 standards. See "[Browser Requirement](#)" on page 2-2.

A **workspace** is a virtual private database allowing multiple users to work within the same Oracle Application Express installation while keeping their objects, data and applications private. Each workspace has a unique ID and name.

An Oracle Application Express administrator can create a workspace manually within Oracle Application Express Administration Services or have users submit requests. Oracle Application Express Administration Services is a separate application for managing an entire Oracle Application Express instance. See "Creating Workspaces" and "Managing Workspace Requests" in *Oracle Application Express Administration Guide*.

See Also: *Oracle Database 2 Day + Oracle Application Express Developer's Guide* if you are new to Oracle Application Express

This section includes these topics:

- [Creating a Workspace Manually](#)
- [Creating Oracle Application Express Users](#)
- [Logging in to Your Oracle Application Express Workspace](#)

Creating a Workspace Manually

To create an Oracle Application Express workspace manually:

1. **Log in to Oracle Application Express Administration Services.** Oracle Application Express Administration Services is a separate application for managing an entire Oracle Application Express instance. You log in using the ADMIN account and password created or reset during the installation process.

If your setup uses Apache and `mod_plsql`, go to:

```
http://hostname:port/pls/apex/apex_admin
```

Where:

`hostname` is the name of the system where Oracle HTTP Server is installed.

`port` is the port number assigned to Oracle HTTP Server. In a default installation, this number is 7777.

`pls` is the indicator to use the `mod_plsql` cartridge.

`apex` is the database access descriptor (DAD) defined in the `mod_plsql` configuration file.

See Also: See "Logging in to Oracle Application Express Administration Services" in *Oracle Application Express Administration Guide*.

Next, create a workspace.

2. Click **Manage Workspaces**.
3. Under Manage Workspaces, click **Create Workspace**.
The Create Workspace Wizard appears.
4. For Identify Workspace, enter a workspace name and description and click **Next**.
5. For Identify Schema, select the Oracle Forms application schema.
 - a. For Re-use existing schema, select **Yes**.
 - b. Select a schema from the list.
 - c. Click **Next**.
6. For Identify Administrator, enter the Workspace administrator information and click **Next**.
7. Confirm your selections and click **Create**.

Creating Oracle Application Express Users

To create an Oracle Application Express user account:

1. Log in to Oracle Application Express Administration Services as described in the previous section. See "Logging in to Oracle Application Express Administration Services" in *Oracle Application Express Administration Guide*.
2. Click **Manage Workspaces**.
3. Under Manage Workspaces, click **Manage Developers and Users**.
The Manage Developers and Users page appears.
4. Click **Create**.
The Create/Edit User page appears.
5. Under User Attributes, enter the appropriate information. Fields marked with an asterisk are required.

Tip: To learn more about a specific attribute, click the item label. When Help is available, the item label changes to red when you pass your cursor over it and the cursor changes to an arrow and question mark.
6. Under Password, type a case-sensitive password for this account.
If your organization has set up a password policy, be sure the password meets the requirements.
7. Under Developer Privileges, select the appropriate privileges:
 - **User is a developer** - To add this user as a developer or Workspace administrator, select **Yes**. For end users, select **No**.
Developers can create and modify applications and database objects as well as view developer activity, session state, workspace activity, application, and schema reports.
 - **User is a workspace administrator** - To add this user as a Workspace administrator, select **Yes**. For developers or end users, select **No**.
In addition to having developer privileges, workspace administrators can create and edit user accounts, manage groups, alter passwords of users within the same workspace, and manage development services.

8. Under Account Control, specify the following:
 - **Account Availability** - Select **Unlocked** to enable a user to log in to this account.
 - **Require Change of Password on First Use** - Select **Yes** to require the user to change the password immediately after logging in with the current, temporary password. Otherwise, select **No**.
9. Click **Create User** or **Create and Create Another**.

Logging in to Your Oracle Application Express Workspace

Once you create a workspace, you must log in to it using your login credentials (that is, the workspace name, user name, and password).

See Also: See "Creating Workspaces" and "Managing Workspace Requests" in *Oracle Application Express Administration Guide*

To log in to a workspace:

1. In a Web browser, navigate to the Oracle Application Express Login page. By default, Oracle Application Express installs to the following location:

If your setup uses Oracle HTTP Server (Apache) and `mod_plsql`, go to:

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

Where:

- `hostname` is the name of the system where Oracle HTTP Server is installed.
- `port` is the port number assigned to Oracle HTTP Server. In a default installation, this number is 7777. You can find information about your Oracle HTTP Server installation's port number from either of the following files:

```
ORACLE_BASE\ORACLE_HOME\install\portlist.ini
ORACLE_BASE\ORACLE_HTTPSERVER_HOME\Apache\Apache\conf\httpd.conf
```

Be aware that if you change a port number, it is not updated in the `portlist.ini` file. You can only rely on this file immediately after installation.

- `pls` is the indicator to use the `mod_plsql` cartridge.
- `apex` is the database access descriptor (DAD) defined in the `mod_plsql` configuration file.

For users who have upgraded from earlier releases, or who have a custom configuration, this value may be `htmldb` or something else. Verify your DAD with your Oracle Application Express administrator.

The Login page appears.

2. Under Login, enter the following:
 - **Workspace field** - Enter the name of your workspace.
 - **Username field** - Enter your user name.
 - **Password field** - Enter your case-sensitive password.
3. Click **Login**.

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

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 Application Express installations.

Topics in this section include:

- [Remove Prior Oracle Application Express Installations](#)
- [Fix Invalid ACL in Oracle Database 11g](#)

Remove Prior Oracle Application Express Installations

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.

Verify if Prior Installation Exist

To verify if prior installations exist:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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_%' OR USERNAME LIKE 'APEX_%')
AND USERNAME NOT IN (
    SELECT 'FLOWS_FILES'
    FROM DUAL
    UNION
    SELECT 'APEX_PUBLIC_USER' FROM DUAL
    UNION
    SELECT SCHEMA s
    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.

Remove Schemas from Prior Installations

To remove schemas from prior installations:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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 a statement connected similar to the following example:

```
DROP USER FLOWS_030000 CASCADE;
```

Fix Invalid ACL in Oracle Database 11g

After following the instructions in "[Remove Prior Oracle Application Express Installations](#)" on page 4-32, you may need to fix an invalid ACL if you are running Oracle Database 11g and you enabled network services for the prior Oracle Application Express schema.

To fix an invalid ACL:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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 a statement similar to following:

```
EXEC DBMS_NETWORK_ACL_ADMIN.DELETE_PRIVILEGE('power_users.xml', 'FLOWS_030000');
```

About the Oracle Application Express Runtime Environment

The Oracle Application Express runtime environment enables you to run production applications. It 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 the Oracle Application Express runtime environment using SQL*Plus or SQL Developer and the APEX_INSTANCE_ADMIN API. To learn more see, "Managing a Runtime Environment" and in *Oracle Application Express Application Builder User's Guide*.

Topics in this section include:

- [Convert a Runtime Environment to a Full Development Environment](#)
- [Convert a Full Development Environment to a Runtime Environment](#)

Convert a Runtime Environment to a Full Development Environment

To convert an Oracle Application Express 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 Application Express 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
```

See Also: *Oracle Database PL/SQL Language Reference* for more information about SQL*Plus

Convert a Full Development Environment to a Runtime Environment

To convert an Oracle Application Express 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 Application Express 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
```

4. Follow the instructions in "[Change the Password for the ADMIN Account](#)" on page 4-17.

See Also: *Oracle Database PL/SQL Language Reference* for more information about SQL*Plus

Oracle Application Express Troubleshooting

This appendix contains information on troubleshooting.

This chapter contains these topics:

- [Reviewing a Log of an Installation Session](#)
- [Verifying the Validity of an Oracle Application Express Installation](#)
- [Cleaning Up After a Failed Installation](#)
- [Images Displaying Incorrectly in Oracle Application Express](#)
- [Online Help Not Working](#)

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 Application Express.  
Oracle Application Express is installed in the APEX_030200 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.

Verifying the Validity of an Oracle Application Express Installation

You can verify the validity of an Oracle Application Express 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.

Cleaning Up After a Failed Installation

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

```
Thank you for installing Oracle Application Express.  
Oracle Application Express is installed in the APEX_030200 schema.
```

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

Topics in this section include:

- [Reverting to a Previous Release After a Failed Upgrade Installation](#)
- [Removing Oracle Application Express from the Database](#)

Reverting to a Previous Release After a Failed Upgrade Installation

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

Topics in this section include:

- [Verifying If You Have a Previous Version of Oracle Application Express](#)
- [Reverting to a Previous Release](#)
- [Removing the Oracle Application Express Release 3.2 Schema](#)

Verifying If You Have a Previous Version of Oracle Application Express

To verify whether you have a previous version of Application Express:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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 username LIKE 'FLOWS_%';
```

If the query above returns any rows, the database contains a previous version of Oracle Application Express.

Reverting to a Previous Release

To revert to a previous Oracle Application Express release:

1. If you altered your images directory, you must point the text alias /i/ back to images directory for the release you wish to revert to. See "[Copying the Images Directory After an Upgrade](#)" on page 3-24 or "[Copying the Images Directory After an Upgrade](#)" on page 4-19.
2. Start SQL*Plus and connect to the database where Oracle Application Express 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. Depending upon the release you are reverting to, execute the appropriate command in SQL*Plus:

a. To revert to Oracle Application Express release 1.5, execute the following:

```
ALTER SESSION SET CURRENT_SCHEMA = FLOWS_010500;
exec flows_010500.wv_flow_upgrade.switch_schemas
('APEX_030200', 'FLOWS_010500');
```

b. To revert to Oracle Application Express release 1.6, execute the following:

```
ALTER SESSION SET CURRENT_SCHEMA = FLOWS_010600;
exec flows_010600.wv_flow_upgrade.switch_schemas
('APEX_030200', 'FLOWS_010600');
```

c. To revert to Oracle Application Express release 2.0, execute the following:

```
ALTER SESSION SET CURRENT_SCHEMA = FLOWS_020000;
exec flows_020000.wv_flow_upgrade.switch_schemas
('APEX_030200', 'FLOWS_020000');
```

d. To revert to Oracle Application Express release 2.2, execute the following:

```
ALTER SESSION SET CURRENT_SCHEMA = FLOWS_020200;
exec flows_020200.wv_flow_upgrade.switch_schemas
('APEX_030200', 'FLOWS_020200');
```

e. To revert to Oracle Application Express release 3.0, execute the following:

```
ALTER SESSION SET CURRENT_SCHEMA = FLOWS_030000;
exec flows_030000.wv_flow_upgrade.switch_schemas
('APEX_030200', 'FLOWS_030000');
```

f. To revert to Oracle Application Express release 3.1:

– Execute the following:

```
ALTER SESSION SET CURRENT_SCHEMA = FLOWS_030100;
flows_030100.wv_flow_upgrade.switch_schemas
('APEX_030200', 'FLOWS_030100');
```

– Change your working directory to apex/core in the 3.1 source.

– Execute the following:

```
@apexvalidate x x FLOWS_030100
```

– Start SQL*Plus and connect to the database where Oracle Application Express 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
```

- Execute the following commands:

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

4. See the next section, "[Removing the Oracle Application Express Release 3.2 Schema](#)" on page A-4.

Removing the Oracle Application Express Release 3.2 Schema

After you have reverted back to the prior release you can remove the Oracle Application Express 3.2 schema.

To remove the release 3.2 schema:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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_030200 CASCADE;
```

Once you have removed the Oracle Application Express 3.2 schema, you can now attempt the upgrade again.

Removing Oracle Application Express from the Database

This section describes how to remove the Oracle Application Express schema, synonyms, and users from the database without deleting the database. If you are going to delete the database, then you must complete these steps.

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 Application Express. For information about reverting to a prior release, see "[Reverting to a Previous Release](#)" on page A-2. If you are not sure whether you have completed a new installation or an upgrade installation, follow the steps in "[Cleaning Up After a Failed Installation](#)" on page A-1 to verify if a previous version of Application Express exists in the database

To remove Oracle Application Express from the database:

1. Change your working directory to the apex directory where you unzipped the Oracle Application Express software.
2. Start SQL*Plus and connect to the database where Oracle Application Express 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
```

Images Displaying Incorrectly in Oracle Application Express

If images in Oracle Application Express 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 `ORACLE_HOME\apex\images` directory to the directory defined by the first `/i/` alias.

Online Help Not Working

This section describes issues with Oracle Application Express online Help.

Topics in this section include:

- [Online Help Not Working When Using a Virtual Host](#)
- [Problems Searching Online Help](#)

See Also: "Enable Network Services in Oracle Database 11g" for your installation scenario.

Online Help Not Working When Using a Virtual Host

If users are accessing Oracle Application Express through a Virtual Host, online Help will not work. Consider the following example:

- The hostname of the Oracle HTTP Server where the Oracle Application Express database access descriptor (DAD) resides is `internal.server.com` and the port is 7777.
- Users access Oracle Application Express through a Virtual Host. In their Web browsers, users see `external.server.com` and port 80.

In this example, Oracle Application Express online Help will not work if the users cannot access `internal.server.com`. To resolve this issue, add the following lines to the Oracle Application Express database access descriptor (DAD) to override the CGI environment variables `SERVER_NAME` and `SERVER_PORT`:

```
PlsqlCGIEnvironmentList SERVER_NAME=external.server.com
PlsqlCGIEnvironmentList SERVER_PORT=80
```

See Also: *Oracle HTTP Server mod_plsql User's Guide* for information on overriding the CGI environment variables and "[Oracle Text Requirement](#)" on page 2-3

Problems Searching Online Help

The underlying index that enables search capability in Oracle Application Express online Help is created upon first use. Note that this index must be created over a non-SSL link. If your connection is an SSL link, `https` displays in the URL. To index online help, access Oracle Application Express over a non-SSL link. Once the online Help index is created, you can revert to normal `https` access.

See Also: "Enable Indexing of Online Help in Oracle Database 11gR2 and Higher" for your installation scenario

Configuring Oracle HTTP Server Distributed with Oracle9i Release 2

In Oracle HTTP Server distributed with Oracle9i Release 2 (9.2), the `wdbsvr.app` file contains information about the DAD to access Oracle Application Express. A DAD is a set of values that specify how the Oracle HTTP Server component `modplsql` connects to the database server to fulfill an HTTP request.

Topics in this appendix include:

- [Recommended Pre-installation Tasks](#)
- [Downloading from OTN and Configuring Oracle HTTP Server](#)
- [Install the Database and Configure Oracle HTTP Server](#)

Recommended Pre-installation Tasks

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

1. Review and satisfy all Oracle Application Express installation requirements. See ["Oracle Application Express Installation Requirements"](#) on page 2-1.
2. Shut down any existing Oracle Database instances as well as Oracle-related processes.

Shut down any existing Oracle Database instances with normal or immediate priority, except for the database where you plan to install the Oracle Application Express schemas. On Oracle Real Application Clusters (Oracle RAC) systems, shut down all instances on each node.

If Automatic Storage Management (ASM) is running, shut down all databases that use ASM except for the database where you will install Oracle Application Express, and then shut down the ASM instance.

You can use the Windows **Services** utility, located either in the Windows Control Panel or from the **Administrative Tools** menu (under **Start** and then **Programs**), to shut down Oracle Database and ASM instances. Names of Oracle databases are preceded with `OracleService`. The Oracle ASM service is named `OracleASMService+ASM`. In addition, shut down the `OracleCSService` service, which ASM uses. Right-click the name of the service and from the menu, choose **Stop**.

3. Back up the Oracle Database installation.

Oracle recommends that you create a backup of the current installation of Oracle Database installation before you install Oracle Application Express. You can use

Oracle Database Recovery Manager, which is included the Oracle Database installation, to perform the backup.

See Also: *Oracle Database Backup and Recovery User's Guide*

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 the listener or Oracle HTTP Server. However, if you are performing a remote installation, make sure the database listener for the remote database has started.

Note: If you are connecting to a remote database, then start the listener.

Downloading from OTN and Configuring Oracle HTTP Server

This section describes how to install Oracle Application Express by downloading a ZIP file from OTN and then configuring Oracle HTTP Server distributed with Oracle9i Release 2.

Topics in this section include:

- [Install the Oracle Database and Complete Pre-installation Tasks](#)
- [Download and Install the Software](#)
- [Change the Password for the ADMIN Account](#)
- [Restart Processes](#)
- [Configure Oracle HTTP Server](#)
- [About Enabling Network Services in Oracle Database 11g](#)
- [Security Considerations](#)
- [About Running Oracle Application Express in Other Languages](#)
- [About Managing JOB_QUEUE_PROCESSES](#)
- [About Obfuscating PlsqlDatabasePassword Parameter](#)
- [Create a Workspace and Add Oracle Application Express Users](#)

See Also: ["About the Oracle Application Express Runtime Environment"](#) on page 1-2 and ["Configuring Oracle HTTP Server Distributed with Oracle9i Release 2"](#) on page B-1

Install the Oracle Database and Complete Pre-installation Tasks

Oracle Application Express requires an Oracle database that is release 9.2.0.3 or later. To learn more, see the *Oracle Database Installation Guide* for your operating environment and ["Recommended Pre-installation Tasks"](#) on page B-1.

Download and Install the Software

To install Oracle Application Express:

1. Download the file `apex_3.2.zip` from the Oracle Application Express download page. See:

http://www.oracle.com/technology/products/database/application_express/download.html

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

2. Unzip apex_3.2.zip as follows, preserving directory names:
 - UNIX and Linux: Unzip apex_3.2.zip
 - Windows: Double click the file apex_3.2.zip in Windows Explorer
3. Change your working directory to apex.
4. Start SQL*Plus and connect to the database where Oracle Application Express 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. See "Configuring Password Protection" in *Oracle Database Security Guide*.
6. Select the appropriate installation option.

Full development environment provides complete access to the Application Builder environment to develop applications. A **Runtime environment** enables users to run applications that cannot be modified. To learn more, see "[About the Oracle Application Express Runtime Environment](#)" on page 1-2.

Available installation options include:

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

```
@apexins tablespace_apex tablespace_files tablespace_temp images
```

Where:

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

Example:

```
@apexins SYSAUX SYSAUX TEMP /i/
```

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

```
@apxrtins tablespace_apex tablespace_files tablespace_temp images
```

Where:

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

Example:

```
@apxrtins SYSAUX SYSAUX TEMP /i/
```

See Also: *Oracle Database PL/SQL Language Reference* for more information about SQL*Plus

When Oracle Application Express installs it creates three new database accounts:

- *APEX_030200* - The account that owns the Oracle Application Express schema and metadata.
- *FLows_FILES* - The account that owns the Oracle Application Express uploaded files.
- *APEX_PUBLIC_USER* - The minimally privileged account used for Oracle Application Express configuration with Oracle HTTP Server and *mod_plsql*.

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

Tip: Oracle Application Express must be installed from a writable directory on the file system. See "[Reviewing a Log of an Installation Session](#)" on page A-1.

Change the Password for the ADMIN Account

In a new installation of Oracle Application Express, or if you are converting a runtime environment to a development environment, you must change the password of the internal ADMIN account. In an upgrade scenario, the password will be preserved and carried over from the prior release.

To change the password for the ADMIN 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 Application Express 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
```

When prompted enter a password for the ADMIN account.

See Also: *Oracle Database PL/SQL Language Reference* for more information about SQL*Plus

Restart Processes

After you install Oracle Application Express, you must restart the processes that you stopped before you began the installation, such as listener and other processes. In addition, restart Oracle HTTP Server.

Configure Oracle HTTP Server

This section describes how to configure Oracle HTTP Server with `mod_plsql` distributed with Oracle9i Release 2.

Topics in this section include:

- [Unlock the APEX_PUBLIC_USER Account](#)
- [Change the Password for the APEX_PUBLIC_USER Account](#)
- [Copy the Images Directory](#)
- [Modifying the wdbsvr.app File](#)
- [Modify the Oracle9i httpd.conf](#)

Unlock the APEX_PUBLIC_USER Account

The `APEX_PUBLIC_USER` account is locked at the end of a new installation of Oracle Application Express. You must unlock this account before configuring the database access descriptor (DAD) in a new installation.

To unlock the `APEX_PUBLIC_USER` account:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. Run the following statement:

```
ALTER USER APEX_PUBLIC_USER ACCOUNT UNLOCK
```

Change the Password for the APEX_PUBLIC_USER Account

The APEX_PUBLIC_USER account is created with a random password in a new installation of Oracle Application Express. You will must change the password for this account before configuring the database access descriptor (DAD) in a new installation.

To change the password for the APEX_PUBLIC_USER account:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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. 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.

About Password Expiration in Oracle Database 11g In the default profile in Oracle Database 11g, the parameter `PASSWORD_LIFE_TIME` is set to 180. If you are using Oracle Database 11g with Oracle Application Express, this causes the password for APEX_PUBLIC_USER to expire in 180 days. As a result, your Oracle Application Express instance will become unusable until you change the password.

To prevent this behavior, create another profile in which the `PASSWORD_LIFE_TIME` parameter is set to unlimited and alter the APEX_PUBLIC_USER account and assign it the new profile.

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

Copy 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 to the location on the file system containing the Oracle home for Oracle HTTP Server.

Topics in this section include:

- [Copying the Images Directory After an Upgrade](#)
- [Copying the Images Directory in a New Installation](#)

Copying the Images Directory After an Upgrade During an upgrade, you must 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 Application Express, indicating the release number of the images (for example, `images_3_1`).

To locate the `images` directory on the file system, review the `httpd.conf` file for the text alias `/i/`.

When you locate the `images` directory path, copy the existing `images` directory to a backup location. Doing so enables you to revert to the previous release, if that becomes necessary.

After you copy the existing `images` directory, use the following command syntax to copy the `apex\images` directory from the Oracle Database home to the existing `images` directory path, overwriting the existing `images`:

- On Windows:

```
xcopy /E /I APEX_HOME\apex\images ORACLE_HTTPSERVER_HOME\Apache\images
```

- On UNIX and Linux:

```
cp -rf APEX_HOME/apex/images ORACLE_HTTPSERVER_HOME/Apache
```

In the preceding syntax examples:

- `ORACLE_HOME` is the Oracle Database Oracle home
- `ORACLE_HTTPSERVER_HOME` is the existing Oracle HTTP Server Oracle home

Copying the Images Directory in a New Installation After installation, copy the directory `apex/images`.

- On Windows:

```
xcopy /E /I ORACLE_HOME\apex\images ORACLE_HTTPSERVER_HOME\Apache\images
```

- On UNIX and Linux:

```
cp -rf $ORACLE_HOME/apex/images ORACLE_HTTPSERVER_HOME/Apache
```

In the preceding syntax examples:

- `ORACLE_HOME` is the Oracle Database Oracle home
- `ORACLE_HTTPSERVER_HOME` is the existing Oracle HTTP Server Oracle home

Modifying the `wdbsvr.app` File

To create the DAD, you modify the `wdbsvr.app` file and add an entry for Oracle Application Express.

To modify the `wdbsvr.app` file:

1. Use a text editor and open the `wdbsvr.app` file:

- On Windows, see:

```
ORACLE_HTTPSERVER_HOME\Apache\modplsql\cfg\wdbsvr.app
```

- On UNIX and Linux, see:

```
ORACLE_HTTPSERVER_HOME/Apache/modplsql/cfg/wdbsvr.app
```

2. Add an entry for Oracle Application Express using the following syntax. Only change the settings indicated in *italics*.

```
[DAD_apex]
connect_string = localhost:1521:orcl
password = apex
username = apex_public_user
```

```

default_page = apex
document_table = wwv_flow_file_objects$
document_path = docs
document_proc = wwv_flow_file_mgr.process_download
reuse = Yes
enablesso = No
stateful = STATELESS_RESET
nls_lang = American_America.AL32UTF8

```

Where:

- `connect_string` refers to the host ID, port number, and Oracle9i database where Oracle Application Express was installed. Use the format `host:port:sid`.

If the Oracle9i version of Oracle HTTP Server you want to use is installed in the same Oracle home as the database you specified for use with Oracle Application Express, leave this parameter blank.

- `password` is the password you changed for the APEX_PUBLIC_USER. See ["Change the Password for the APEX_PUBLIC_USER Account"](#) on page B-6.
- `nls_lang` determines the language setting of the DAD. The character set portion of the `nls_lang` value must always be set to AL32UTF8, regardless of whether or not the database character set is AL32UTF8.

If either the territory portion or the language portion of the NLS settings contains a space, you must wrap the value in double quotes as shown in the following example:

```
nls_lang = "ENGLISH_UNITED KINGDOM.AL32UTF8"
```

You can find information about your database's NLS settings by querying the view NLS_DATABASE_PARAMETERS as shown in the following example:

```

SELECT parameter,value
FROM nls_database_parameters
WHERE PARAMETER IN ('NLS_CHARACTERSET','NLS_LANGUAGE','NLS_TERRITORY');

```

3. Leave the remaining settings, including the user name setting, as they appear in the previous example.
4. Save and exit the `wdbsvr.app` file.

Modify the Oracle9i httpd.conf

You must modify the `httpd.conf` file to include an alias that points to the file system path where you copied the images directory. You may also need to modify the `httpd.conf` file to add two new MIME types to support SQL Workshop.

See Also: ["Copy the Images Directory"](#) on page B-6

To modify `httpd.conf` file:

1. Use a text editor and open the `httpd.conf` file:

- On Windows:

```
ORACLE_HTTPSERVER_HOME\Apache\Apache\conf\httpd.conf
```

- On UNIX and Linux:

```
ORACLE_HTTPSERVER_HOME/Apache/Apache/conf/httpd.conf
```


2. Add an alias entry that points to the file system path where you copied the images directory.

- Windows example:

```
Alias /i/ "C:\oracle\ora92\Apache\Apache\images/"
```

- UNIX and Linux example:

```
Alias /i/ "/home/oracle/OraHome1/Apache/Apache/images/"
```

Note that the previous examples assume you specified the image directory alias as `/i/` when you ran the `apexins.sql` script.

Note you must include the forward slash (`/`) at the end of the path.

3. Next, add the following two lines to support SQL Workshop if they do not currently exist:

```
AddType text/xml          xbl
AddType text/x-component   htc
```

If you are upgrading from Oracle HTML DB 2.0 or later, these MIME types should already exist.

4. Save and exit the `httpd.conf` file.
5. Stop and restart Oracle HTTP Server.
 - On Windows, Stop and restart Oracle HTTP Server:
 - Stop Oracle HTTP Server - From the **Start** menu, select **Programs, Oracle - OraHome, Oracle HTTP Server, and Stop HTTP Server**.
 - Restart Oracle HTTP Server - From the **Start** menu, select **Programs, Oracle - OraHome, Oracle HTTP Server, and Start HTTP Server**.
 - On UNIX and Linux, execute the following commands:

```
ORACLE_HTTPSERVER_HOME/Apache/Apache/bin/apachectl stop
ORACLE_HTTPSERVER_HOME/Apache/Apache/bin/apachectl start
```

Note that if the Oracle HTTP Server is listening on a port less than 1024, then these commands must be executed as a privileged user (such as `root`).

See Also: *Oracle HTTP Server Administrator's Guide*

About Enabling Network Services in Oracle Database 11g

By default, the ability to interact with network services is disabled in Oracle Database 11g release 1 (11.1). Therefore, if you are running Oracle Application Express with Oracle Database 11g release 1 (11.1), you must use the new `DBMS_NETWORK_ACL_ADMIN` package to grant connect privileges to any host for the `APEX_030200` database user. Failing to grant these privileges results in issues with:

- Sending outbound mail in Oracle Application Express.
 - Users can call methods from the `APEX_MAIL` package, but issues arise when sending outbound email.
- Using Web services in Oracle Application Express.
- PDF/report printing.
- Searching for content in online Help (that is, using the Find link).

Topics in this section include:

- [Granting Connect Privileges](#)
- [Troubleshooting an Invalid ACL Error](#)

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 database will already have the parameter set properly, but a database upgraded to 11g from a prior version may not. See "Creating and Configuring an Oracle Database" in *Oracle Database Administrator's Guide* for information about changing database initialization parameters.

Granting Connect Privileges

The following example demonstrates how to grant connect privileges to any host for the APEX_030200 database user.

```

DECLARE
  ACL_PATH  VARCHAR2(4000);
  ACL_ID    RAW(16);
BEGIN
  -- Look for the ACL currently assigned to '*' and give APEX_030200
  -- the "connect" privilege if APEX_030200 does not have the privilege yet.

  SELECT ACL INTO ACL_PATH FROM DBA_NETWORK_ACLS
  WHERE HOST = '*' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

  -- Before checking the privilege, ensure that the ACL is valid
  -- (for example, does not contain stale references to dropped users).
  -- If it does, the following exception will be raised:
  --
  -- ORA-44416: Invalid ACL: Unresolved principal 'APEX_030200'
  -- ORA-06512: at "XDB.DBMS_XDBZ", line ...
  --
  SELECT SYS_OP_R20(extractValue(P.RES, '/Resource/XMLRef')) INTO ACL_ID
  FROM XDB.XDB$ACL A, PATH_VIEW P
  WHERE extractValue(P.RES, '/Resource/XMLRef') = REF(A) AND
        EQUALS_PATH(P.RES, ACL_PATH) = 1;

  DBMS_XDBZ.ValidateACL(ACL_ID);
  IF DBMS_NETWORK_ACL_ADMIN.CHECK_PRIVILEGE(ACL_PATH, 'APEX_030200',
    'connect') IS NULL THEN
    DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(ACL_PATH,
    'APEX_030200', TRUE, 'connect');
  END IF;

EXCEPTION
  -- When no ACL has been assigned to '*'.
  WHEN NO_DATA_FOUND THEN
    DBMS_NETWORK_ACL_ADMIN.CREATE_ACL('power_users.xml',
    'ACL that lets power users to connect to everywhere',
    'APEX_030200', TRUE, 'connect');
    DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL('power_users.xml', '*');
END;
/
COMMIT;

```

The following example demonstrates how to provide less privileged access to local network resources. This example would enable indexing the Oracle Application

Express Online Help and could possibly enable email and PDF printing if those servers were also on the local host.

```

DECLARE
  ACL_PATH  VARCHAR2(4000);
  ACL_ID    RAW(16);
BEGIN
  -- Look for the ACL currently assigned to 'localhost' and give APEX_030200
  -- the "connect" privilege if APEX_030200 does not have the privilege yet.
  SELECT ACL INTO ACL_PATH FROM DBA_NETWORK_ACLS
  WHERE HOST = 'localhost' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

  -- Before checking the privilege, ensure that the ACL is valid
  -- (for example, does not contain stale references to dropped users).
  -- If it does, the following exception will be raised:
  --
  -- ORA-44416: Invalid ACL: Unresolved principal 'APEX_030200'
  -- ORA-06512: at "XDB.DBMS_XDBZ", line ...
  --

  SELECT SYS_OP_R20(extractValue(P.RES, '/Resource/XMLRef')) INTO ACL_ID
  FROM XDB.XDB$ACL A, PATH_VIEW P
  WHERE extractValue(P.RES, '/Resource/XMLRef') = REF(A) AND
        EQUALS_PATH(P.RES, ACL_PATH) = 1;

  DBMS_XDBZ.ValidateACL(ACL_ID);
  IF DBMS_NETWORK_ACL_ADMIN.CHECK_PRIVILEGE(ACL_PATH, 'APEX_030200',
    'connect') IS NULL THEN
    DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(ACL_PATH,
    'APEX_030200', TRUE, 'connect');
  END IF;

EXCEPTION
  -- When no ACL has been assigned to 'localhost'.
  WHEN NO_DATA_FOUND THEN
    DBMS_NETWORK_ACL_ADMIN.CREATE_ACL('local-access-users.xml',
    'ACL that lets power users to connect to everywhere',
    'APEX_030200', TRUE, 'connect');
    DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL('local-access-users.xml','localhost');
END;
/
COMMIT;

```

Troubleshooting an Invalid ACL Error

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 =
             DELETEXML(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_030200 user. See "[Granting Connect Privileges](#)" on page B-10.

Security Considerations

Oracle highly recommends you configure and use a 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.

About Running Oracle Application Express in Other Languages

The Oracle Application Express interface is translated into German, Spanish, French, Italian, Japanese, Korean, Brazilian Portuguese, Simplified Chinese, and Traditional Chinese. A single instance of Oracle Application Express can be installed with one or more of these translated versions. At runtime, each user's Web browser language settings determine the specific language version.

The translated version of Oracle Application Express 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 Application Express into a database that does not support the character encoding of the language, the installation may fail or the translated Oracle Application Express instance may appear corrupt when run. The database character set AL32UTF8 supports all the translated versions of Oracle Application Express.

You can manually install translated versions of Oracle Application Express 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 Application Express, 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 Application Express translations:

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

Installing a Translated Version of Oracle Application Express

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 Application Express.

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 of directory, there is a language loading script identified by the language code (for example, `load_de.sql` or `load_ja.sql`).

To install a translated version of Oracle Application Express:

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. Start SQL*Plus and connect to the database where Oracle Application Express 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 following statement:

```
ALTER SESSION SET CURRENT_SCHEMA = APEX_030200;
```

4. 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).

About Managing JOB_QUEUE_PROCESSES

JOB_QUEUE_PROCESSES determine the maximum number of concurrently running jobs. In Oracle Application Express release 3.2, transactional support and SQL scripts require jobs. If JOB_QUEUE_PROCESSES is not enabled and working properly, you cannot successfully execute a script.

Topics in this section include:

- [Viewing the Number of JOB_QUEUE_PROCESSES](#)
- [Changing the Number of JOB_QUEUE_PROCESSES](#)

Viewing the Number of JOB_QUEUE_PROCESSES

There are currently three ways to view the number of JOB_QUEUE_PROCESSES:

- In the installation log file
- On the About Application Express page in Oracle Application Express
- From SQL*Plus

Viewing JOB_QUEUE_PROCESSES in the Installation Log File After installing or upgrading Oracle Application Express to release 3.2, you can view the number of JOB_QUEUE_PROCESSES in the installation log files. See "[Reviewing a Log of an Installation Session](#)" on page A-1.

Viewing JOB_QUEUE_PROCESSES in Oracle Application Express You can also view the number of JOB_QUEUE_PROCESSES on the About Application Express page.

To view the About Application Express page:

1. Log in to Oracle Application Express. See "[Logging in to Your Oracle Application Express Workspace](#)" on page B-18.
2. On the Administration list, click **About Application Express**.

The current number JOB_QUEUE_PROCESSES displays at the bottom of the page.

Viewing JOB_QUEUE_PROCESSES from SQL*Plus You can also view the number of JOB_QUEUE_PROCESSES from SQL*Plus by running the following SQL statement:

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

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 Application Express 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.

About Obfuscating PlsqlDatabasePassword Parameter

The `PlsqlDatabasePassword` parameter specifies the password for logging in to the database. You can use the `dadTool.pl` utility to obfuscate passwords in the `dads.conf` file.

You can find the `dadTool.pl` utility in the following directory:

- For UNIX and Linux based systems:

```
ORACLE_BASE/ORACLE_HTTPSERVER_HOME/Apache/modplsql/conf
```

- For Windows based systems:

```
ORACLE_BASE\ORACLE_HTTPSERVER_HOME\Apache\modplsql\conf
```

Obfuscating Passwords

To obfuscate passwords, run `dadTool.pl` by following the instructions in the `dadTool.README` file.

Create a Workspace and Add Oracle Application Express Users

You access the Oracle Application Express home page by logging in to workspace using a Web browser. Your Web browser must support JavaScript and the HTML 4.0 and CSS 1.0 standards. See "[Browser Requirement](#)" on page 2-2.

A **workspace** is a virtual private database allowing multiple users to work within the same Oracle Application Express installation while keeping their objects, data and applications private. Each workspace has a unique ID and name.

An Oracle Application Express administrator can create a workspace manually within Oracle Application Express Administration Services or have users submit requests. Oracle Application Express Administration Services is a separate application for

managing an entire Oracle Application Express instance. See "Creating Workspaces" and "Managing Workspace Requests" in *Oracle Application Express Administration Guide*.

See Also: *Oracle Database 2 Day + Oracle Application Express Developer's Guide* if you are new to Oracle Application Express

Topics in this section include:

- [Creating a Workspace Manually](#)
- [Creating Oracle Application Express Users](#)
- [Logging in to Your Oracle Application Express Workspace](#)

Creating a Workspace Manually

To create an Oracle Application Express workspace manually:

1. **Log in to Oracle Application Express Administration Services.** Oracle Application Express Administration Services is a separate application for managing an entire Oracle Application Express instance. You log in using the ADMIN account and password created or reset during the installation process.
 - a. In a Web browser, navigate to the Oracle Application Express Administration Services application.

If your setup uses Apache and mod_plssql, go to:

```
http://hostname:port/pls/apex/apex_admin
```

Where:

hostname is the name of the system where Oracle HTTP Server is installed.

port is the port number assigned to Oracle HTTP Server. In a default installation, this number is 7777.

pls is the indicator to use the mod_plssql cartridge.

apex is the database access descriptor (DAD) defined in the mod_plssql configuration file.

- b. On the Login page:
 - In Username, enter admin.
 - In Password, enter the Oracle Application Express administrator account password you specified when you installed Oracle Application Express.
 - Click **Login**.

See Also: See "Logging in to Oracle Application Express Administration Services" in *Oracle Application Express Administration Guide*.

Next, create a workspace.

2. Click **Manage Workspaces**.
3. Under Manage Workspaces, click **Create Workspace**.

The Create Workspace Wizard appears.

4. For Identify Workspace, enter a workspace name and description and click **Next**.

5. For Identify Schema, select the Oracle Forms application schema.
 - a. For Re-use existing schema, select **Yes**.
 - b. Select a schema from the list.
 - c. Click **Next**.
6. For Identify Administrator, enter the Workspace administrator information and click **Next**.
7. Confirm your selections and click **Create**.

Creating Oracle Application Express Users

To create an Oracle Application Express user account:

1. Log in to Oracle Application Express Administration Services as described in the previous section. See "Logging in to Oracle Application Express Administration Services" in *Oracle Application Express Administration Guide*.
2. Click **Manage Workspaces**.
3. Under Manage Workspaces, click **Manage Developers and Users**.
The Manage Developers and Users page appears.
4. Click **Create**.
The Create/Edit User page appears.
5. Under User Attributes, enter the appropriate information. Fields marked with an asterisk are required.

Tip: To learn more about a specific attribute, click the item label. When Help is available, the item label changes to red when you pass your cursor over it and the cursor changes to an arrow and question mark.

6. Under Password, type a case-sensitive password for this account.
If your organization has set up a password policy, be sure the password meets the requirements.
7. Under Developer Privileges, select the appropriate privileges:
 - **User is a developer** - To add this user as a developer or Workspace administrator, select **Yes**. For end users, select **No**.
Developers can create and modify applications and database objects as well as view developer activity, session state, workspace activity, application, and schema reports.
 - **User is a workspace administrator** - To add this user as a Workspace administrator, select **Yes**. For developers or end users, select **No**.
In addition to having developer privileges, workspace administrators can create and edit user accounts, manage groups, alter passwords of users within the same workspace, and manage development services.
8. Under Account Control, specify the following:
 - **Account Availability** - Select **Unlocked** to enable a user to log in to this account.

- **Require Change of Password on First Use** - Select **Yes** to require the user to change the password immediately after logging in with the current, temporary password. Otherwise, select **No**.

9. Click **Create User** or **Create and Create Another**.

Logging in to Your Oracle Application Express Workspace

Once you create a workspace, you must log in to it using your login credentials (that is, the workspace name, user name, and password).

See Also: See "Creating Workspaces" and "Managing Workspace Requests" in *Oracle Application Express Administration Guide*

To log in to a workspace:

1. In a Web browser, navigate to the Oracle Application Express Login page.

If your setup uses Oracle HTTP Server (Apache) and `mod_plsql`, go to:

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

Where:

- `hostname` is the name of the system where Oracle HTTP Server is installed.
- `port` is the port number assigned to Oracle HTTP Server. In a default installation, this number is 7777. You can find information about your Oracle HTTP Server installation's port number from either of the following files:

`ORACLE_BASE\ORACLE_HOME\install\portlist.ini`
`ORACLE_BASE\ORACLE_HTTPSERVER_HOME\Apache\Apache\conf\httpd.conf`

Be aware that if you change a port number, it is not updated in the `portlist.ini` file. You can only rely on this file immediately after installation.

- `pls` is the indicator to use the `mod_plsql` cartridge.
- `apex` is the database access descriptor (DAD) defined in the `mod_plsql` configuration file.

For users who have upgraded from earlier releases, or who have a custom configuration, this value may be `htmldb` or something else. Verify your DAD with your Oracle Application Express administrator.

The Login page appears.

2. Under Login, enter the following:

- Workspace field - Enter the name of your workspace.
- Username field - Enter your user name.
- Password field - Enter your case-sensitive password.

3. Click **Login**.

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

Install the Database and Configure Oracle HTTP Server

This section describes how to configure Oracle HTTP Server with `mod_plsql` in a new installation.

Topics in this section include:

- [Install the Oracle Database and Complete Pre-installation Tasks](#)
- [Configure Oracle HTTP Server Distributed with Oracle Database Release 9.0.3](#)
- [About Enabling Network Services in Oracle Database 11g](#)
- [Security Considerations](#)
- [About Running Oracle Application Express in Other Languages](#)
- [About Managing JOB_QUEUE_PROCESSES](#)
- [About Obfuscating PlsqlDatabasePassword Parameter](#)
- [Create a Workspace and Add Oracle Application Express Users](#)

Note that instructions do not apply if you are running Oracle HTTP Server distributed with Oracle9i Release 2. To learn more, see "[Configuring Oracle HTTP Server Distributed with Oracle9i Release 2](#)" on page B-1.

Note: Within the context of this section, the Oracle home directory (`ORACLE_HTTPSERVER_HOME`) is the location where Oracle HTTP Server is installed.

Install the Oracle Database and Complete Pre-installation Tasks

Oracle Application Express requires an Oracle database that is release 9.2.0.3 or later. To learn more, see the *Oracle Database Installation Guide* for your operating environment and "[Recommended Pre-installation Tasks](#)" on page B-1.

Configure Oracle HTTP Server Distributed with Oracle Database Release 9.0.3

Perform the following postinstallation steps if:

- This is a new installation of Oracle Application Express (that is, you are not upgrading from a previous release)
- You are running Oracle HTTP Server distributed with Oracle Database Release 9.0.3.
- Oracle HTTP Server is installed in an Oracle home.

Topics in this section include:

- [Change the Password for the ADMIN Account](#)
- [Unlock the APEX_PUBLIC_USER Database User](#)
- [Change the Password for the APEX_PUBLIC_USER Database User](#)
- [Modifying the wdbsvr.app File](#)
- [Modify the Oracle9i httpd.conf](#)
- [Stop and Restart Oracle HTTP Server](#)
- [Copy the Images Directory](#)

Note: Within the context of this section, the Oracle home directory (`ORACLE_HTTPSERVER_HOME`) is the location where Oracle HTTP Server is installed.

Change the Password for the ADMIN Account

First, change the password for the Oracle Application Express ADMIN account.

To change the password for the ADMIN account:

1. Change your working directory to `ORACLE_BASE\ORACLE_HOME\apex` or whatever convention used to indicate the Oracle home.
2. Start SQL*Plus and connect to the database where Oracle Application Express 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
```

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

```
@apxchpwd.sql
```

When prompted enter a password for the ADMIN account.

Unlock the APEX_PUBLIC_USER Database User

When configuring Oracle HTTP Server for Oracle Application Express in a new installation, the database user `APEX_PUBLIC_USER` must be an unlocked account. To unlock the account for database user `APEX_PUBLIC_USER`, execute the following steps:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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 statement:

```
ALTER USER APEX_PUBLIC_USER ACCOUNT UNLOCK
```

Change the Password for the APEX_PUBLIC_USER Database User

In order to specify the password in the DAD file, you have to change the password for the database user APEX_PUBLIC_USER. Please use the following steps to change the password for the APEX_PUBLIC_USER database user:

1. Start SQL*Plus and connect to the database where Oracle Application Express 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 statement:

```
SQL> PASSWORD APEX_PUBLIC_USER
Changing password for APEX_PUBLIC_USER
New password: password
Retype new password: password
```

About Password Expiration in Oracle Database 11g In the default profile in Oracle Database 11g, the parameter PASSWORD_LIFE_TIME is set to 180. If you are using Oracle Database 11g with Oracle Application Express, this causes the password for APEX_PUBLIC_USER to expire in 180 days. As a result, your Oracle Application Express instance will become unusable until you change the password.

To prevent this behavior, create another profile in which the PASSWORD_LIFE_TIME parameter is set to unlimited and alter the APEX_PUBLIC_USER account and assign it the new profile.

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

Modifying the wdbsvr.app File

To create the DAD, you modify the wdbsvr . app file and add an entry for Oracle Application Express.

To modify the wdbsvr . app file:

1. Use a text editor and open the wdbsvr . app file:

- On Windows, see:

```
ORACLE_HTTPSERVER_HOME\Apache\modplsql\cfg\wdbsvr . app
```

- On UNIX and Linux, see:

```
ORACLE_HTTPSERVER_HOME/Apache/modplsql/cfg/wdbsvr . app
```

2. Add an entry for Oracle Application Express using the following syntax. Only change the settings indicated in italics.

```
[DAD_apex]
connect_string = localhost:1521:orcl
```

```
password = apex
username = apex_public_user
default_page = apex
document_table = wwv_flow_file_objects$
document_path = docs
document_proc = wwv_flow_file_mgr.process_download
reuse = Yes
enablenesso = No
stateful = STATELESS_RESET
nls_lang = American_America.AL32UTF8
```

Where:

- `connect_string` refers to the host ID, port number, and Oracle9i database where Oracle Application Express was installed. Use the format `host:port:sid`.

If the Oracle9i version of Oracle HTTP Server you want to use is installed in the same Oracle home as the database you specified for use with Oracle Application Express, leave this parameter blank.

- `password` is the password you changed for the APEX_PUBLIC_USER. See ["Change the Password for the APEX_PUBLIC_USER Database User"](#) on page B-21.
- `nls_lang` determines the language setting of the DAD. The character set portion of the `nls_lang` value must always be set to AL32UTF8, regardless of whether or not the database character set is AL32UTF8.

If either the territory portion or the language portion of the NLS settings contains a space, you must wrap the value in double quotes as shown in the following example:

```
nls_lang = "ENGLISH_UNITED KINGDOM.AL32UTF8"
```

You can find information about your database's NLS settings by querying the view `NLS_DATABASE_PARAMETERS` as shown in the following example:

```
SELECT parameter,value
FROM nls_database_parameters
WHERE PARAMETER IN ('NLS_CHARACTERSET','NLS_LANGUAGE','NLS_TERRITORY');
```

3. Leave the remaining settings, including the user name setting, as they appear in the previous example.
4. Save and exit the `wdbsvr.app` file.

Modify the Oracle9i `httpd.conf`

You must modify the `httpd.conf` file to include an alias that points to the file system path where you copied the images directory. You may also need to modify the `httpd.conf` file to add two new MIME types to support SQL Workshop.

See Also: ["Copy the Images Directory"](#) on page B-23

To modify `httpd.conf` file:

1. Use a text editor and open the `httpd.conf` file:

- On Windows:

```
ORACLE_HTTPSERVER_HOME\Apache\Apache\conf\httpd.conf
```

- On UNIX and Linux:

```
ORACLE_HTTPSERVER_HOME/Apache/Apache/conf/httpd.conf
```

2. Add an alias entry that points to the file system path where you copied the images directory.

- Windows example:

```
Alias /i/ "C:\oracle\ora92\Apache\Apache\images/"
```

- UNIX and Linux example:

```
Alias /i/ "/home/oracle/OraHome1/Apache/Apache/images/"
```

Note that the previous examples assume you specified the image directory alias as `/i/` when you ran the `apexins.sql` script.

Note you must include the forward slash (`/`) at the end of the path.

3. Next, add the following two lines to support SQL Workshop if they do not currently exist:

```
AddType text/xml          xbl
AddType text/x-component   htc
```

If you are upgrading from Oracle HTML DB 2.0 or later, these MIME types should already exist.

4. Save and exit the `httpd.conf` file.

See Also: *Oracle HTTP Server Administrator's Guide*

Stop and Restart Oracle HTTP Server

To stop and restart Oracle HTTP Server:

- On Windows, Stop and restart Oracle HTTP Server:
 - Stop Oracle HTTP Server - From the **Start** menu, select **Programs, Oracle - OraHome, Oracle HTTP Server, and Stop HTTP Server**.
 - Restart Oracle HTTP Server - From the **Start** menu, select **Programs, Oracle - OraHome, Oracle HTTP Server, and Start HTTP Server**.
- On UNIX and Linux, execute the following commands:

```
ORACLE_HTTPSERVER_HOME/Apache/Apache/bin/apachectl stop
ORACLE_HTTPSERVER_HOME/Apache/Apache/bin/apachectl start
```

Note that if the Oracle HTTP Server is listening on a port less than 1024, then these commands must be executed as a privileged user (such as `root`).

See Also: *Oracle HTTP Server Administrator's Guide*

Copy 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 `ORACLE_BASE\ORACLE_HOME\apex` directory to the location on the file system containing the Oracle home for Oracle HTTP Server.

Note: This section is relevant only if your plan to run Oracle Application Express with Oracle HTTP Server with mod_plsql.

Topics in this section include:

- [Copying the Images Directory After an Upgrade](#)
- [Copying the Images Directory in a New Installation](#)

Copying the Images Directory After an Upgrade During an upgrade, you must 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 Application Express, indicating the release number of the images (for example, `images_3_1`).

To locate the `images` directory on the file system, review the `httpd.conf` file for the text alias `/i/`:

When you locate the `images` directory path, Oracle recommends that you copy the existing `images` directory to a backup location. Doing this allows you to revert to the previous release, if that becomes necessary.

After you copy the existing `images` directory, use the following command syntax to copy the `apex\images` directory from the Oracle database home to the existing `images` directory path, overwriting the existing images:

- On Windows:

```
xcopy /E /I ORACLE_HOME\apex\images ORACLE_HTTPSERVER_HOME\Apache\images
```

- On UNIX and Linux:

```
cp -rf $ORACLE_HOME/apex/images ORACLE_HTTPSERVER_HOME/Apache
```

In the preceding syntax examples:

- `ORACLE_HOME` is the Oracle Database Oracle home
- `ORACLE_HTTPSERVER_HOME` is the existing Oracle Application Server or Oracle HTTP Server Oracle home

Copying the Images Directory in a New Installation After installation, copy the directory `apex/images`.

You can copy the `images` directory using Windows Explorer, or running a command from a command prompt similar to the following:

- On Windows:

```
xcopy /E /I ORACLE_HOME\apex\images ORACLE_HTTPSERVER_HOME\Apache\images
```

- On UNIX and Linux:

```
cp -rf $ORACLE_HOME/apex/images ORACLE_HTTPSERVER_HOME/Apache
```

In the preceding syntax example:

- `ORACLE_HOME` is the Oracle Database Oracle home
- `ORACLE_HTTPSERVER_HOME` is the existing Oracle HTTP Server Oracle home

About Enabling Network Services in Oracle Database 11g

By default, the ability to interact with network services is disabled in Oracle Database 11g release 1 (11.1). Therefore, if you are running Oracle Application Express with Oracle Database 11g release 1 (11.1), you must use the new `DBMS_NETWORK_ACL_ADMIN` package to grant connect privileges to any host for the `APEX_030200` database user. Failing to grant these privileges results in issues with:

- Sending outbound mail in Oracle Application Express.
Users can call methods from the `APEX_MAIL` package, but issues arise when sending outbound email.
- Using Web services in Oracle Application Express.
- PDF/report printing.
- Searching for content in online Help (that is, using the Find link).

Topics in this section include:

- [Granting Connect Privileges](#)
- [Troubleshooting an Invalid ACL Error](#)

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 database will already have the parameter set properly, but a database upgraded to 11g from a prior version may not. See "Creating and Configuring an Oracle Database" in *Oracle Database Administrator's Guide* for information about changing database initialization parameters.

Granting Connect Privileges

The following example demonstrates how to grant connect privileges to any host for the `APEX_030200` database user.

```
DECLARE
  ACL_PATH VARCHAR2(4000);
  ACL_ID   RAW(16);
BEGIN
  -- Look for the ACL currently assigned to '*' and give APEX_030200
  -- the "connect" privilege if APEX_030200 does not have the privilege yet.

  SELECT ACL INTO ACL_PATH FROM DBA_NETWORK_ACLS
    WHERE HOST = '*' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

  -- Before checking the privilege, ensure that the ACL is valid
  -- (for example, does not contain stale references to dropped users).
  -- If it does, the following exception will be raised:
  --
  -- ORA-44416: Invalid ACL: Unresolved principal 'APEX_030200'
  -- ORA-06512: at "XDB.DBMS_XDBZ", line ...
  --
  SELECT SYS_OP_R20(extractValue(P.RES, '/Resource/XMLRef')) INTO ACL_ID
    FROM XDB.XDB$ACL A, PATH_VIEW P
   WHERE extractValue(P.RES, '/Resource/XMLRef') = REF(A) AND
         EQUALS_PATH(P.RES, ACL_PATH) = 1;

  DBMS_XDBZ.ValidateACL(ACL_ID);
  IF DBMS_NETWORK_ACL_ADMIN.CHECK_PRIVILEGE(ACL_PATH, 'APEX_030200',
    'connect') IS NULL THEN
```

```

        DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(ACL_PATH,
        'APEX_030200', TRUE, 'connect');
    END IF;

EXCEPTION
    -- When no ACL has been assigned to '*'.
    WHEN NO_DATA_FOUND THEN
        DBMS_NETWORK_ACL_ADMIN.CREATE_ACL('power_users.xml',
        'ACL that lets power users to connect to everywhere',
        'APEX_030200', TRUE, 'connect');
        DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL('power_users.xml', '*');
    END;
    /
COMMIT;

```

The following example demonstrates how to provide less privileged access to local network resources. This example would enable indexing the Oracle Application Express Online Help and could possibly enable email and PDF printing if those servers were also on the local host.

```

DECLARE
    ACL_PATH  VARCHAR2(4000);
    ACL_ID    RAW(16);
BEGIN
    -- Look for the ACL currently assigned to 'localhost' and give APEX_030200
    -- the "connect" privilege if APEX_030200 does not have the privilege yet.
    SELECT ACL INTO ACL_PATH FROM DBA_NETWORK_ACLS
    WHERE HOST = 'localhost' AND LOWER_PORT IS NULL AND UPPER_PORT IS NULL;

    -- Before checking the privilege, ensure that the ACL is valid
    -- (for example, does not contain stale references to dropped users).
    -- If it does, the following exception will be raised:
    --
    -- ORA-44416: Invalid ACL: Unresolved principal 'APEX_030200'
    -- ORA-06512: at "XDB.DBMS_XDBZ", line ...
    --

    SELECT SYS_OP_R20(extractValue(P.RES, '/Resource/XMLRef')) INTO ACL_ID
    FROM XDB.XDB$ACL A, PATH_VIEW P
    WHERE extractValue(P.RES, '/Resource/XMLRef') = REF(A) AND
    EQUALS_PATH(P.RES, ACL_PATH) = 1;

    DBMS_XDBZ.ValidateACL(ACL_ID);
    IF DBMS_NETWORK_ACL_ADMIN.CHECK_PRIVILEGE(ACL_PATH, 'APEX_030200',
    'connect') IS NULL THEN
        DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(ACL_PATH,
        'APEX_030200', TRUE, 'connect');
    END IF;

EXCEPTION
    -- When no ACL has been assigned to 'localhost'.
    WHEN NO_DATA_FOUND THEN
        DBMS_NETWORK_ACL_ADMIN.CREATE_ACL('local-access-users.xml',
        'ACL that lets power users to connect to everywhere',
        'APEX_030200', TRUE, 'connect');
        DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL('local-access-users.xml', 'localhost');
    END;
    /
COMMIT;

```

Troubleshooting an Invalid ACL Error

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 =
                 DELETETEXTML(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_030200 user. See ["Granting Connect Privileges"](#) on page B-10.

Security Considerations

Oracle highly recommends you configure and use a 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.

About Running Oracle Application Express in Other Languages

The Oracle Application Express interface is translated into German, Spanish, French, Italian, Japanese, Korean, Brazilian Portuguese, Simplified Chinese, and Traditional Chinese. A single instance of Oracle Application Express can be installed with one or more of these translated versions. At runtime, each user's Web browser language settings determine the specific language version.

The translated version of Oracle Application Express 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 Application Express into a database that does not support the character encoding of the language, the installation may fail or the translated Oracle Application Express instance may appear corrupt when run. The database character set `AL32UTF8` supports all the translated versions of Oracle Application Express.

You can manually install translated versions of Oracle Application Express 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 Application Express, 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 Application Express translations:

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

Installing a Translated Version of Oracle Application Express

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 Application Express.

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 of directory, there is a language loading script identified by the language code (for example, `load_de.sql` or `load_ja.sql`).

To install a translated version of Oracle Application Express:

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. Start SQL*Plus and connect to the database where Oracle Application Express 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 following statement:
- ```
ALTER SESSION SET CURRENT_SCHEMA = APEX_030200;
```
4. 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).

About Managing JOB_QUEUE_PROCESSES

JOB_QUEUE_PROCESSES determine the maximum number of concurrently running jobs. In Oracle Application Express release 3.2, transactional support and SQL scripts require jobs. If JOB_QUEUE_PROCESSES is not enabled and working properly, you cannot successfully execute a script.

Topics in this section include:

- [Viewing the Number of JOB_QUEUE_PROCESSES](#)
- [Changing the Number of JOB_QUEUE_PROCESSES](#)

Viewing the Number of JOB_QUEUE_PROCESSES

There are currently three ways to view the number of JOB_QUEUE_PROCESSES:

- In the installation log file
- On the About Application Express page in Oracle Application Express
- From SQL*Plus

Viewing JOB_QUEUE_PROCESSES in the Installation Log File After installing or upgrading Oracle Application Express to release 3.2, you can view the number of JOB_QUEUE_PROCESSES in the installation log files. See "[Reviewing a Log of an Installation Session](#)" on page A-1.

Viewing JOB_QUEUE_PROCESSES in Oracle Application Express You can also view the number of JOB_QUEUE_PROCESSES on the About Application Express page.

To view the About Application Express page:

1. Log in to Oracle Application Express. See "[Logging in to Your Oracle Application Express Workspace](#)" on page B-33.
2. On the Administration list, click **About Application Express**.

The current number JOB_QUEUE_PROCESSES displays at the bottom of the page.

Viewing JOB_QUEUE_PROCESSES from SQL*Plus You can also view the number of JOB_QUEUE_PROCESSES from SQL*Plus by running the following SQL statement:

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

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 Application Express 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.

About Obfuscating PlsqlDatabasePassword Parameter

The PlsqlDatabasePassword parameter specifies the password for logging in to the database. You can use the dadTool.pl utility to obfuscate passwords in the dads.conf file.

You can find the dadTool.pl utility in the following directory:

- For UNIX and Linux based systems:

```
ORACLE_BASE/ORACLE_HTTPSERVER_HOME/Apache/modplsql/conf
```

- For Windows based systems:

```
ORACLE_BASE\ORACLE_HTTPSERVER_HOME\Apache\modplsql\conf
```

Obfuscating Passwords

To obfuscate passwords, run `dadTool.pl` by following the instructions in the `dadTool.README` file.

Create a Workspace and Add Oracle Application Express Users

You access the Oracle Application Express home page by logging in to workspace using a Web browser. Your Web browser must support JavaScript and the HTML 4.0 and CSS 1.0 standards. See "[Browser Requirement](#)" on page 2-2.

A **workspace** is a virtual private database allowing multiple users to work within the same Oracle Application Express installation while keeping their objects, data and applications private. Each workspace has a unique ID and name.

An Oracle Application Express administrator can create a workspace manually within Oracle Application Express Administration Services or have users submit requests. Oracle Application Express Administration Services is a separate application for managing an entire Oracle Application Express instance. See "Creating Workspaces" and "Managing Workspace Requests" in *Oracle Application Express Administration Guide*.

See Also: *Oracle Database 2 Day + Oracle Application Express Developer's Guide* if you are new to Oracle Application Express

Topics in this section include:

- [Creating a Workspace Manually](#)
- [Creating Oracle Application Express Users](#)
- [Logging in to Your Oracle Application Express Workspace](#)

Creating a Workspace Manually

To create an Oracle Application Express workspace manually:

1. **Log in to Oracle Application Express Administration Services.** Oracle Application Express Administration Services is a separate application for managing an entire Oracle Application Express instance. You log in using the ADMIN account and password created or reset during the installation process.
 - a. In a Web browser, navigate to the Oracle Application Express Administration Services application.

If your setup uses Oracle HTTP Server (Apache) and `mod_plsql`, go to:

```
http://hostname:port/pls/apex/apex_admin
```

Where:

`hostname` is the name of the system where Oracle HTTP Server is installed.

`port` is the port number assigned to Oracle HTTP Server. In a default installation, this number is 7777.

`pls` is the indicator to use the `mod_plsql` cartridge.

`apex` is the database access descriptor (DAD) defined in the `mod_plsql` configuration file.

- b. On the Login page:
 - In Username, enter `admin`.

- In Password, enter the Oracle Application Express administrator account password you specified when you installed Oracle Application Express.
- Click **Login**.

See Also: See "Logging in to Oracle Application Express Administration Services" in *Oracle Application Express Administration Guide*.

Next, create a workspace.

2. Click **Manage Workspaces**.
3. Under Manage Workspaces, click **Create Workspace**.
The Create Workspace Wizard appears.
4. For Identify Workspace, enter a workspace name and description and click **Next**.
5. For Identify Schema, select the Oracle Forms application schema.
 - a. For Re-use existing schema, select **Yes**.
 - b. Select a schema from the list.
 - c. Click **Next**.
6. For Identify Administrator, enter the Workspace administrator information and click **Next**.
7. Confirm your selections and click **Create**.

Creating Oracle Application Express Users

To create an Oracle Application Express user account:

1. Log in to Oracle Application Express Administration Services as described in the previous section. See "Logging in to Oracle Application Express Administration Services" in *Oracle Application Express Administration Guide*.
2. Click **Manage Workspaces**.
3. Under Manage Workspaces, click **Manage Developers and Users**.
The Manage Developers and Users page appears.
4. Click **Create**.
The Create/Edit User page appears.
5. Under User Attributes, enter the appropriate information. Fields marked with an asterisk are required.

Tip: To learn more about a specific attribute, click the item label. When Help is available, the item label changes to red when you pass your cursor over it and the cursor changes to an arrow and question mark.
6. Under Password, type a case-sensitive password for this account.
If your organization has set up a password policy, be sure the password meets the requirements.
7. Under Developer Privileges, select the appropriate privileges:

- **User is a developer** - To add this user as a developer or Workspace administrator, select **Yes**. For end users, select **No**.

Developers can create and modify applications and database objects as well as view developer activity, session state, workspace activity, application, and schema reports.

- **User is a workspace administrator** - To add this user as a Workspace administrator, select **Yes**. For developers or end users, select **No**.

In addition to having developer privileges, workspace administrators can create and edit user accounts, manage groups, alter passwords of users within the same workspace, and manage development services.

8. Under Account Control, specify the following:

- **Account Availability** - Select **Unlocked** to enable a user to log in to this account.
- **Require Change of Password on First Use** - Select **Yes** to require the user to change the password immediately after logging in with the current, temporary password. Otherwise, select **No**.

9. Click **Create User** or **Create and Create Another**.

Logging in to Your Oracle Application Express Workspace

Once you create a workspace, you must log in to it using your login credentials (that is, the workspace name, user name, and password).

See Also: See "Creating Workspaces" and "Managing Workspace Requests" in *Oracle Application Express Administration Guide*

To log in to a workspace:

1. In a Web browser, navigate to the Oracle Application Express Login page.

If your setup uses Oracle HTTP Server (Apache) and `mod_plsql`, go to:

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

Where:

- `hostname` is the name of the system where Oracle HTTP Server is installed.
- `port` is the port number assigned to Oracle HTTP Server. In a default installation, this number is 7777. You can find information about your Oracle HTTP Server installation's port number from either of the following files:

```
ORACLE_BASE\ORACLE_HOME\install\portlist.ini
ORACLE_BASE\ORACLE_HTTPSERVER_HOME\Apache\Apache\conf\httpd.conf
```

Be aware that if you change a port number, it is not updated in the `portlist.ini` file. You can only rely on this file immediately after installation.

- `pls` is the indicator to use the `mod_plsql` cartridge.
- `apex` is the database access descriptor (DAD) defined in the `mod_plsql` configuration file.

For users who have upgraded from earlier releases, or who have a custom configuration, this value may be `htmldb` or something else. Verify your DAD with your Oracle Application Express administrator.

The Login page appears.

2. Under Login, enter the following:
 - Workspace field - Enter the name of your workspace.
 - Username field - Enter your user name.
 - Password field - Enter your case-sensitive password.
3. Click **Login**.

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

Third-Party License

This appendix contains the third party license for Apache.

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Accessibility in Oracle Application Express

This section attempts to provide information for users who are accessing Oracle Application Express utilizing only a keyboard or Freedom Scientific's screen reader JAWS.

This section contains the following topics:

- [General Violations](#)
- [Tips for Accessing Form Pages in Oracle Application Express](#)
- [Issues with Interactive Report Regions](#)
- [Accessing Interactive Report Regions Using a Keyboard](#)

For additional information about the accessibility of Oracle products, see:

<http://www.oracle.com/accessibility>

Note: JAWS release 10.0.1139 with all default settings was used in writing this section.

General Violations

The following is a list of general accessibility violations in Oracle Application Express, followed by known workarounds where possible:

- Some tables containing data are poorly marked up with appropriate summary information. This issue does not currently have a workaround.

In some situations, JAWS may interpret the contents of a layout table as a data table and when this happens, the table will be available in the JAWS buffer and navigable using the JAWS navigation quick key T. However due to the missing summary text, these are difficult to identify.
- Some form items do not have a `label` tag describing the form item.
This issue does not currently have a workaround.
- Some decorative images are missing an empty `alt` text.
This issue does not currently have a workaround.
- Some non-decorative images are not accompanied by `alt` text.
This issue does not currently have a workaround.
- Some region types contain layout tables (that is, tables with an empty `summary` attribute) that contain `th` tags.
This issue does not currently have a workaround.

- If functionality is provided by XMLHTTP (AJAX) and DHTML scripting languages, screen readers may not properly interpret screen updates. In most, but not all cases, JAWS interprets the updates presented utilizing XMLHTTP. In the cases where updates are picked up, there is still a problem since JAWS does not notify the user of the update.

This issue does not currently have a workaround.

- Some event handlers are not device independent.

For example, JAWS does have a mechanism to fire `onmouseover` events that can help with these types of event handlers.

To activate an `onmouseover` event handler in JAWS:

- a. Move to the element that contains the `onmouseover` event. Note that you know if the element has this event handler if JAWS announces “on mouse over” on arrival.
 - b. Press **CTRL+INSERT+ENTER** to launch the `mouseover` event.
- Some pages contain contextual Help within Show/Hide regions, which are hidden by default. This information is currently not accessible using keyboard navigation.
This issue does not currently have a workaround.
 - Tab orders do not always follow a logical order.
This issue does not currently have a workaround.
 - Some layout tables have no `summary` attribute.
This issue does not currently have a workaround.
 - Some tables containing data have an empty `summary` attribute.
This issue does not currently have a workaround.

Tips for Accessing Form Pages in Oracle Application Express

Many of the pages in Oracle Application Express are form pages designed for maintaining application metadata. This section describes how you can gain an understanding of the structure of these pages and interact with them using a screen reader such as JAWS.

Topics in this section include:

- [Understanding the Structure of a Page](#)
- [Using the Tasks Links on a Page](#)
- [Accessing Help Text](#)
- [Dealing with Raised Validations](#)

Understanding the Structure of a Page

Many form pages are logically broken up into different regions. For example, the Edit Page Item page has the following regions containing form fields for maintaining information about the page item:

- Name
- Displayed
- Label

- Element
- Source
- Default
- LOV
- Security
- Conditions
- Read Only
- Help
- Configuration
- Comments

Unfortunately these page sections are not marked up with `HEADERS (Hn)` tags, therefore another approach is required to gain an understanding of this structure. At the top of the page, there are links that take the user directly to the region they wish to locate. There are contained within a division element. Additionally, there is Show All link as the first link in the set.

By understanding that links to each section exist in a `division` element, you can understand of the overall structure of the page using JAWS:

1. Press **CTRL+HOME** to go to the top of the page.
JAWS announces the page name, Edit Page Item.
2. Press **CTRL+INSERT+ Z** to load the Select a Division dialog box.
3. Press **S** repeatedly to go to the division that begins with Show All.
JAWS reads the contents of the division and in doing so gives you a list of all the regions on the page.
4. Press **ENTER** to navigate to the division.
5. Press **DOWN ARROW** to access each link for each region on the page.
6. To navigate to a particular region, press **ENTER** on the appropriate link.

Using the Tasks Links on a Page

Many pages in Oracle Application Express contain a Tasks region on the right-hand side of the page. For example, the Edit Page Item page has a Tasks region on the right side containing a list of links relevant to the current item type. There is no `HEADER` defined on this region currently.

To navigate to the Tasks region using JAWS:

1. Press **CTRL+HOME** to go to the top of the page.
JAWS announces the page name.
2. Press **CTRL+F** to launch the Find dialog box.
3. Type `tasks` and press **ENTER**.
4. Since Tasks links are implemented in a list, press the JAWS navigation quick key **L** once to navigate to the list.
5. Press the JAWS navigation quick key **I** to navigate through the list items and **ENTER** if you wish to activate a link.

Accessing Help Text

This section describes how to use JAWS to access Page Help and Item-level help in Oracle Application Express.

Topics in this section include:

- [Accessing Page Help](#)
- [Accessing Item Help](#)

Accessing Page Help

Many pages in Oracle Application Express have regions on the right side of the page containing Help text. This Help text describes basic concepts or decision points relevant to the current page. For example, the Edit Page Item page has a region on the top right of the page that reads as follows:

Page Items - Page items are HTML elements with associated session state. Page items can be rendered in many ways such as a text field, a check box, or a select list.

This text is contained within a table with empty summary text and has no `HEADER`. Navigation to this text is difficult. However, you can navigate to regions like this by searching for text which is similar to the page title. For example, if you were on the Edit Page Item page, you might search for the text *Page Items*.

To search for the text *Page Items* using JAWS:

1. Press the **PLUS** sign (+) on the numeric keypad to go back into Virtual PC Cursor mode.

Note: This step is not required if using JAWS 10 with Auto Forms Mode enabled.

2. Press **CTRL+HOME** to go to the top of the page.
JAWS announces the page name.
3. Press **CTRL+F** to launch the JAWS Find dialog box.
4. Type `page items` and press **ENTER**.

Once the text has been located, press **DOWN ARROW** to read the text.

Accessing Item Help

Most items within the user interface have field-level Help available by activating or clicking on the field label. If Help text is available, the adjacent label will be implemented as a link, where the link text will match that of the current form item's label text. Activating this link will load a separate window containing the help text.

To access this field-level Help for an item using JAWS:

1. Press **CTRL+HOME** to go to the top of the page.
JAWS announces the page name.
2. Press **INSERT+F7** to load the Links List dialog box.
3. Press the first letter of the link text you wish to locate, repeatedly.

If there is no link text matching the label of the form item you wish to get help for, then there is no help available for that item

4. If the appropriate link is found, press **ENTER** to activate the link.

A separate window containing the Help text appears

5. Press the JAWS navigation quick key **N** to go to the help text.
6. Once you are finished reading the help text, press **ALT+F4** to close the Help window and return to page.

Dealing with Raised Validations

If a validation fails when submitting a form, you are redirected back to the same page and an error message displays in a list at the top of the page. Additionally, error text displays inline next to the page item associated with the validation.

The following procedure explains how to identify when a validation fails, review error messages, and rectify the necessary values in order to pass the validation, all within the context of the Edit Page Item form page.

Topics in this section include:

- [Identifying when a Validation Fails](#)
- [Reviewing Error Messages](#)
- [Fixing a Validation Error](#)

Identifying when a Validation Fails

When a validation fails, the same page loads with details of the failure. In this situation JAWS does not read the page as it would normally when loading a new page. You can quickly check if a validation error has occurred by searching for any images with an `alt` text of `Error`.

To check for images having an `alt` text of `Error`:

1. Press **CTRL+HOME** to go to the top of the page.
JAWS announces the page name.
2. Press **CTRL+INSERT+G** to launch the Select a Graphic dialog box.
3. Press **E** repeatedly to try and locate the error image. If there is an error image, then this means a validation has failed.

Reviewing Error Messages

If a validation error occurs, a list appears at the top of the page and contains list items with the error text for the failed validations.

To navigate to the list containing error text:

1. Press **CTRL+HOME** to go to the top of the page.
JAWS announces the page name.
2. Press the JAWS navigation quick key **L** to go to the first list on the page.
JAWS will announce "list of *x* items" where *x* is the number of errors that has occurred.
3. Press the JAWS navigation quick key **I** to read through each error message.

Fixing a Validation Error

There is no simple way to navigate from the summary list of error messages to the page item associated with the failed validation. One approach is to navigate to the error image that displays next to the associated page item and then use JAWS reading commands to understand which error you are dealing with.

To navigate to the error image:

1. Press **CTRL+HOME** to go to the top of the page.
JAWS announces the page name.
2. Press **CTRL+INSERT+G** to load the Select a Graphic dialog box.
3. Press **E** repeatedly to locate the error image.
4. Press **ENTER** to navigate to the error image.
5. Press **DOWN ARROW** once to go to the Help text link for the associated field.
This tells you which field has a validation error since the link text is the same as the form field label.
6. Press the **DOWN ARROW** again to go to the error message.
7. Press the JAWS navigation quick key **F** to go to the page item.
8. Press **ENTER** to enable Forms Mode and provide a new value.
Once you provide a new value and fix the error, you need to locate subsequent error images on the page.
9. To locate subsequent error messages on the page:
 - a. Press the **PLUS** sign (+) on the numeric keypad to go back into Virtual PC Cursor mode.
 - b. Press the JAWS navigation quick key **G** repeatedly until you locate the next error image.
JAWS announces "graphic error."
 - c. Once you have located the next error image, repeat steps 5 to 8 until all errors have been addressed.
 - d. Once all errors have been addressed, you need to click the **Apply Changes** button:
 - Press the JAWS navigation quick key **B** until you hear JAWS announce "Apply Changes Button."
 - Press **ENTER** to apply your changes.
If your changes fixed all the validation errors, you will be taken back to the 'Page Definition' page.

Issues with Interactive Report Regions

Oracle Application Express, release 3.1 included a new report region called interactive report. Interactive report regions enable users to alter the layout of report data by choosing columns and applying filters.

In Oracle Application Express release 3.2, interactive report regions are only utilized within the Oracle Application Express Application Migration module. Interactive report regions have a number of violations that strongly prohibits their usability with screen readers and keyboard-only users.

The following list explains these violations and includes known workarounds where possible:

- The Actions menu is not accessible by a screen reader or by keyboard navigation.
This issue does not currently have a workaround.

- The Search icon menu to the left of the Search region is not accessible by screen reader or by keyboard navigation.

This issue does not currently have a workaround.

- The column headings used to sort, filter, group, exclude data, or display Help about data are not accessible by a screen reader or by keyboard navigation.

This issue does not currently have a workaround.

- Interactive report regions produce a table with rows that do not contain a `HEADER` attribute linking to the `id` of the `th` tag for that column. Although the number of violations on interactive reports strongly prohibits their use with screen readers such as JAWS, this particular violation is not a major issue. This is because the data tables are fairly simple (nearly always where each cell is associated with only 1 `HEADER` and row) and do use the appropriate table markup (`th` and `td` elements). Thus, screen readers such as JAWS are able to announce the context of a particular cell.

The one exception is when a `Control Break` is defined on the data in the interactive report to group it. In this situation, an additional `th` element is generated for the column that the `Control Break` has been enabled. Because of the missing markup, it is therefore difficult to get the full context when navigating the cells of the table in this situation.

- Flash charts do not provide alternative descriptive text.

This issue does not currently have a workaround.

- An animated GIF is sometimes used to indicate processing is underway (for example, when filtering a report or loading a chart). This information is not available in a non-animated presentation mode.

This issue does not currently have a workaround.

- Some Form items in AJAX-based dialog boxes do not have associated `label` tags.

This issue does not currently have a workaround.

- The layout table used for the Search tab has no `summary` attribute. Although the number of violations on interactive reports strongly prohibits their use with screen readers such as JAWS, this particular violation is not a major issue. Screen readers such as JAWS do not pick this up as a data table.

- The table containing data has an empty `summary` attribute. This issue does not currently have a workaround.

Due to the contents of the table, screen readers such as JAWS do pick this up as a data table. It is therefore available in the screen reader's buffer and navigable using the JAWS navigation quick key T. However due to the empty `summary` text, it is difficult to identify.

- Because interactive reports requires functionality provided by the `XMLHTTP` (AJAX) and `DHTML` scripting languages, screen readers may not properly interpret screen updates. For example, in some cases screen readers such as JAWS pick up the updates presented using `XMLHTTP`. Even if updates are picked up, JAWS does not announce the update.

This issue does not currently have a workaround.

Accessing Interactive Report Regions Using a Keyboard

As described in "Issues with Interactive Report Regions" on page D-6, some features in Interactive Reports are not available to keyboard-only users. This section describes some basic features that are available by tabbing through the focusable elements on the page.

Topics in this section include:

- [Searching an Interactive Report](#)
- [Specifying Rows to Display](#)
- [Managing Bulk Updates](#)
- [Utilizing Drill Down Links](#)
- [Editing Existing Filters](#)

Searching an Interactive Report

All interactive reports feature a Search field at the top of the page. This Search field is a standard text item.

To execute a search using a keyboard:

1. Press **TAB** repeatedly to navigate to the Search field.
2. Type keywords in the Search field.
3. Press **ENTER** to invoke the search. Alternatively, you can also press **TAB** to navigate to the **Go** button and then press **ENTER**.

Specifying Rows to Display

The Rows select list displays to the right of the Search field at the top of the page and controls the number of rows that display in the report. This is a standard select list.

To use the Rows list using a keyboard:

1. Press **TAB** to navigate to the Rows list.
2. Press **Down Arrow** or **Up Arrow** to make a selection.
3. Press **TAB** to navigate to the **Go** button and then press **ENTER**.

Managing Bulk Updates

Some interactive reports in Oracle Application Express Application Migration Workshop contain form items for applying bulk updates to components (for example, the Blocks page). All form items within the report and buttons to apply the changes are keyboard accessible. Also some pages feature a check box in the first row to perform bulk processing and corresponding **Select All** and **Deselect All** links below the report. All of these items are keyboard accessible.

Utilizing Drill Down Links

All the interactive reports Oracle Application Express Application Migration Workshop contain at least one link to edit or view a specific sub-components. These are all standard links and are therefore keyboard accessible.

Editing Existing Filters

When an existing search filter is applied to an interactive report, a search filter displays below the Search bar.

You can access the search filter using the keyboard to:

- Edit the search filter.

Press **TAB** to navigate to the search filter and then press **ENTER** to open the Filter dialog box. Since the focus does not move automatically to the dialog box, press **SHIFT+TAB** until you reach the appropriate controls.

- Disable or enable the search filter.

Press **TAB** to navigate to the check box to the right of the filter and **SPACEBAR** to disable or enable the filter.

- Delete the search filter.

Press **TAB** to navigate to the search filter and then **ENTER** to open the Filter dialog box. Press **TAB** or **SHIFT+TAB** to navigate to the **Delete** button and then press **ENTER**.

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