Oracle Application Express Listener

Version 1.0

June 2010

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Oracle Application Express Listener

This document is divided into two parts:

1. Installation
2. Configuration

Installation

The Oracle Application Express Listener is available on Oracle Technology Network (OTN).

Requirements:
Java 6 Update 20 JDK or higher
Java Servlet Specification 2.3 or higher

The Oracle Application Express Listener supports the following Java Enterprise Edition application servers:

Application Server	Version
Oracle WebLogic Server	11g Release 1 (10.3.3)
Sun GlassFish Enterprise Server	3 +
Oracle Containers for J2EE	10.1.3.4 or higher

Application Express Listener Web Archive (WAR) File

1. Download the Application Express Listener.
2. Unzip the downloaded Application Express Listener zip file into a temporary directory.
3. Follow the instructions to install Application Express Listener onto your application server.

This section contains instructions for installing and upgrading Application Express Listener onto your application server.

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Installing with Oracle WebLogic Server

You can install the Oracle Application Express Listener with the Oracle WebLogic Server.

The Oracle WebLogic Server is available for download from the Oracle Technology Network. Refer to the Oracle WebLogic Server Installation Guide to install the Oracle WebLogic Server.

If you are a first-time user of Oracle WebLogic Server, refer to the WebLogic Server *QuickStart* on Getting Started which is installed with your WebLogic Server.

Note: The following instructions provided assume that Oracle WebLogic Server is already installed and that you are familiar with Oracle WebLogic Server. If you are unfamiliar with Domains, Managed Servers, Deployment, Security, Users and Roles, refer to the Oracle WebLogic Server documentation.

Before You Begin

Create Web Archive for Oracle Application Express Images

You will need to create a web archive file (war) to contain the Oracle Application Express image files. Using the Java Archive (jar) command, enter the following command to create a web archive file named **i.war**:

```
jar –cvf0 <temp directory>\i.war –C <apex directory>\images .
```

where <***temp directory***> is the directory location of the unzipped Application Express Listener files and <***apex directory***> is the directory location of Oracle Application Express.

WebLogic Server

A WebLogic Server domain must be started before you start the Administration Server Console.

Administration Server Console

1. Start an Administration Server.
2. Launch the WebLogic Administration Console by typing the following URL in your browser:

   http://*host:port*/console

   where **host** is the DNS name or IP address of the Administration Server and **port** is the listen port on which the Administration Server is listening for requests (port 7001 by default).

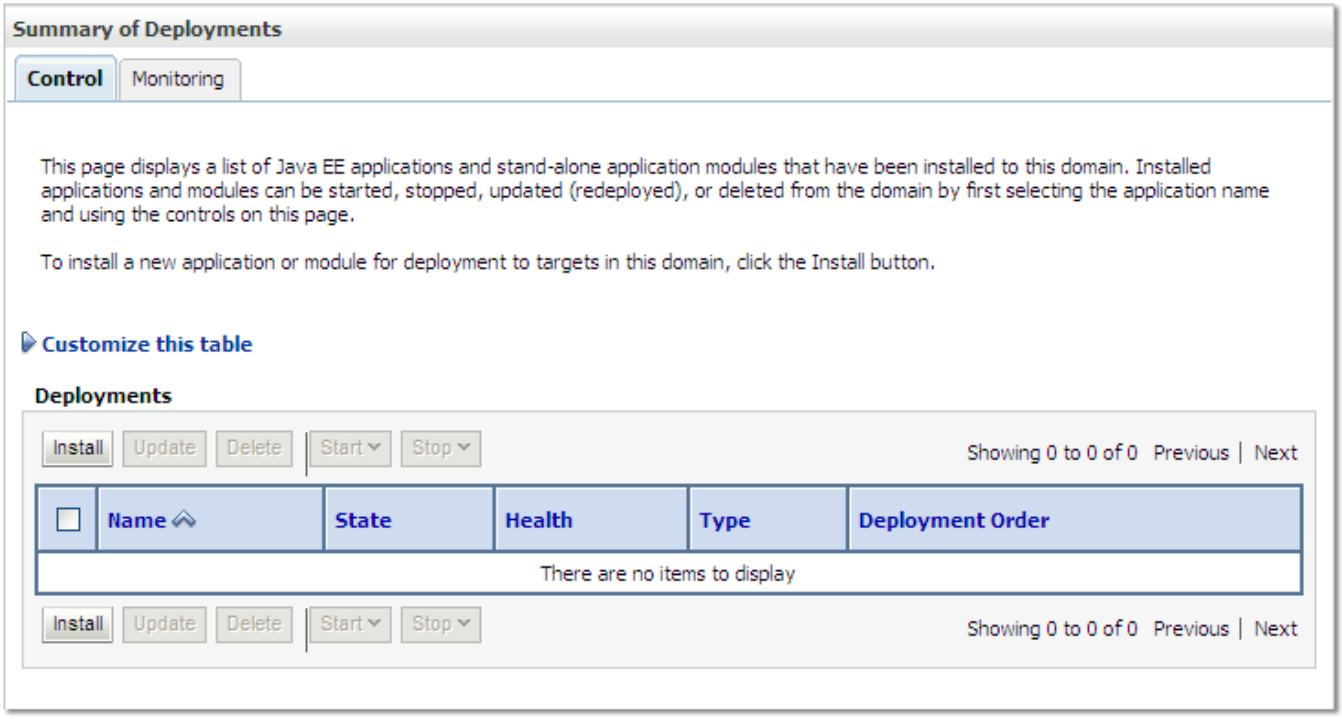
3. Enter the WebLogic Administrator username and password.
4. If your domain is in Production mode, click on the Lock & Edit button on the left-pane below the sub-menu Change Center. Otherwise, if your domain is in Development mode this button will not be displayed.

Deployment

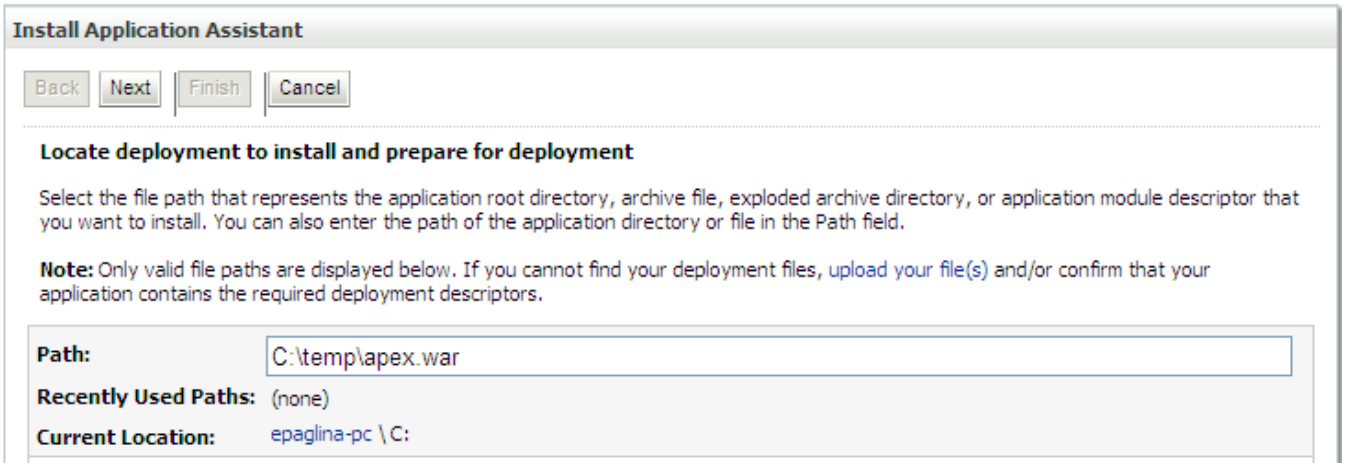
Before You Begin

The Application Express Listener files, **apex.war** and **i.war**, must be available before you start this task.

1. On the WebLogic Server Home Page below the Domain Configuration, select Deployments. The Summary of Deployments will be displayed. Click on the Install button.

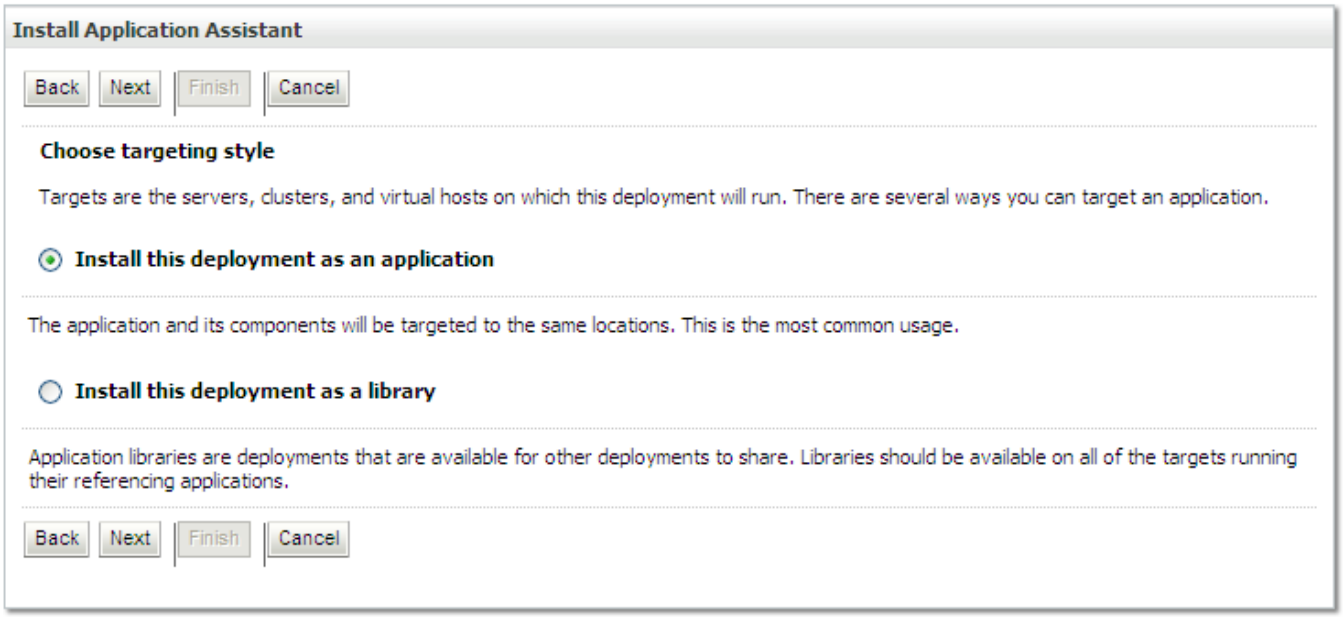


2. Specify the location of the apex.war file. The apex.war file is the location where you unzipped the APEX Listener zip file.



3. Click Next.

4. Select **Install this deployment as an application**.



5. Click Next.
6. Select the servers and/or clusters to which you want to deploy the application or module.

   Note: If you have not created additional Managed Servers or clusters, you will not see this assistant page.

7. Click Next.
8. In the optional settings, specify and select the following:

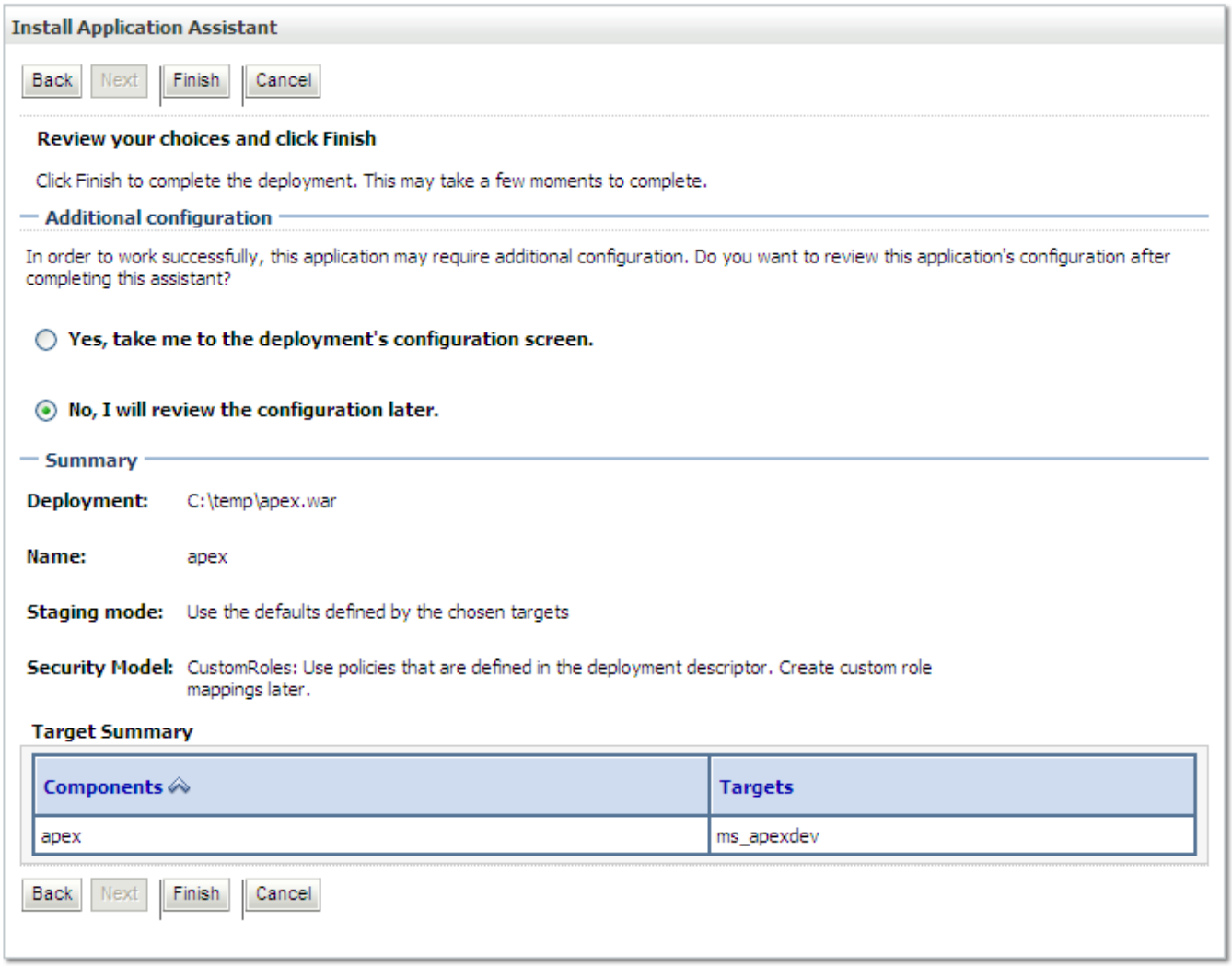
   a. What do you want to name this deployment?
      - **apex**

   b. What security model do you want to use with this application?
      - **Custom Roles: Use roles that are defined in the Administration Console; use policies that are defined in the deployment descriptor.**

   c. How should the source files be made accessible?
      - **Use the defaults defined by the deployment's targets**

9. Click Next.

10. Review the Summary of configuration settings that you have specified, and click **Finish** to complete the installation.

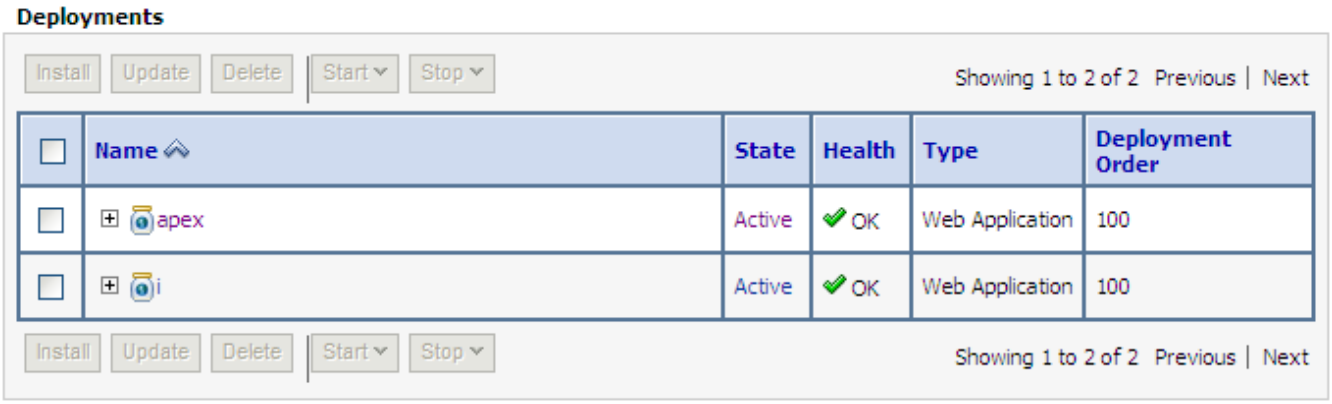


11. If you have selected from the sub-menu Additional Configuration, **No I will review the configuration later**, you are returned to the Summary of Deployments. Messages are displayed indicating the status of the deployment. Follow any additional instructions provided in the Messages. Otherwise, if you have selected, **Yes, take me to the deployment's configuration screen**, then the Configuration screen will be displayed to allow you to make any additional configuration changes.
12. Repeat the above steps to deploy the i.war file.
    In the optional settings, specify and select the following:
    a. What do you want to name this deployment?
        - **i**
    b. What security model do you want to use with this application?
        - **DD Only: Use only roles and policies that are defined in the deployment descriptors**
    c. How should the source files be made accessible?
        - **Use the defaults defined by the deployment's targets**

13. If your domain is in Production Mode, then on the Change Center click on Activate Changes.

Note: In the Summary of Deployments, select the Control tab and verify that both the **apex** and **i** State are **Active** and the Health is **OK**. If **apex** and/or **i** are not Active, then in the Deployments table, click on the checkbox next to **apex** and/or **i**. This will enable the Start button.

Click on the **Start** button and select **Servicing all requests** to make them Active.



Users and Roles

1. The APEX Listener requires users to be assigned roles to access the Application Express Listener Administration. The next steps describe creating users and roles. For additional information on Security Realms, Users and Roles, refer to the Oracle WebLogic Server documentation.
2. If your domain is in Production mode, click on the Lock & Edit button on the left-pane below the sub-menu Change Center. Otherwise, if your domain is in Development mode this button will not be displayed.
3. On the left pane below sub-menu Domain Structure, click on Security Realms.

4. The Summary of Security Realms is displayed.

Create Users

Create an administrator user to access the APEX Listener Administration page and a manager user to access the APEX Listener Status page.

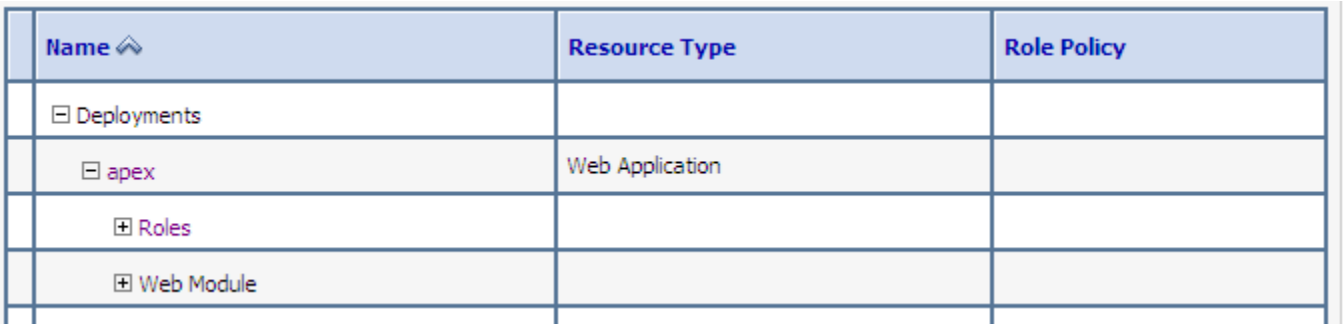
1. Select a security realm by clicking on the name of the security realm (for example, myrealm). The Settings for *Realm Name* is displayed. Click on Users and Groups tab. Then click on Users tab.
2. The User table displays the names of all users defined.
3. Click New.
4. In the Name field of the Create New User page enter the name of the user.
   Example: **adminlistener.**
5. User names are case sensitive and must be unique. Do not use commas, tabs or any other characters in the following comma-separated list: <>, #, |, &, ?, ( ), { }
6. (Optional) In the Description field, enter a description.
   Example: **APEX Listener administrator user**
7. In the Provider drop-down list, select the Authentication provider for the user.
8. In the Password field, enter a password for the user.
   The minimum password length for a user defined in the WebLogic Authentication provider is 8 characters.
9. Re-enter the password for the user in the Confirm Password field.
10. Click OK to save your changes.
11. The user name appears in the User table.
12. Create another user to access the APEX Listener Status page:
    Name: **managerlistener**
    Description: **APEX Listener manager user**

Create Roles

The APEX Listener requires roles to be assigned to the users to access the Application Express Listener Administration. The two types of roles are:

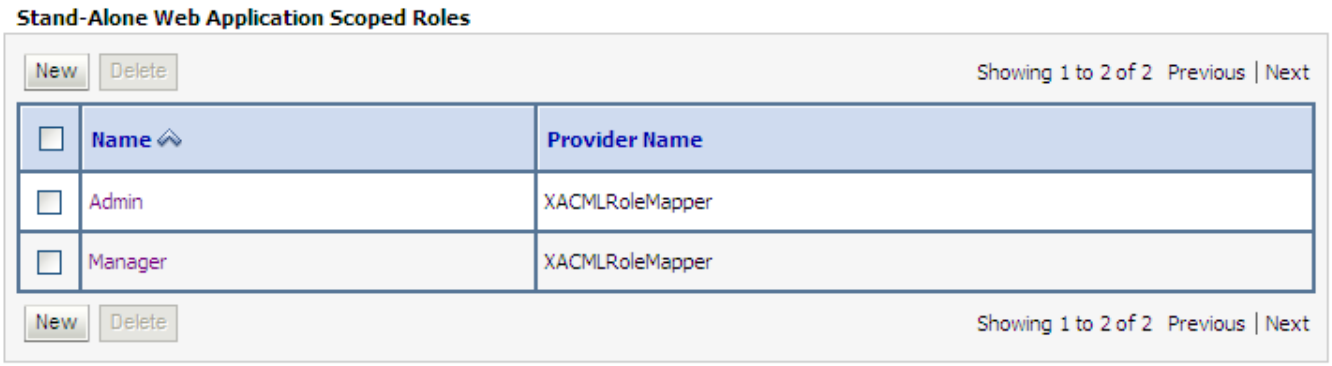
- **Admin**
  The user with an APEX Listener Admin role has permission to access the APEX Listener Administration Page.
- **Manager**
  The user with an APEX Listener Manager role has permission to access the APEX Listener Status Information Page.

1. In the left pane of the Administration Console, select Security Realms.
2. On the Summary of Security Realms page, select the name of the realm that you want to secure the resource (for example, *myrealm*).
3. On the Settings page, select the Roles and Policies tab. Then select the Realm Roles sub-tab.
4. The Roles page organizes all of the domain's resources and corresponding roles in a hierarchical tree control.
5. On the Roles page, in the Roles table, expand the node Deployment in the Names column until you find resource **apex**. Next, expand **apex** and click on Roles.



6. The Stand-Alone Web Application Scoped Roles table is displayed. Click on the New button.
7. The Create Stand-Alone Web Applications Scoped Roles is displayed.
   a. In the Name field, enter **Admin**.
   b. Select the Provider Name for the role mapper (for example, *XACMLRoleMapper*).
   c. Click OK.
8. You will be returned to the Stand-Alone Web Application Scoped Roles table with the **Admin** role displayed. Click on the **Admin** role.
9. The Edit Stand-Alone Web Application Scoped Roles page is displayed. Create a role condition, which specifies who is in the scoped role under which set of conditions:
   a. In the Role Conditions section, click Add Conditions.
   b. In the Predicate List, select **User** and click Next.
   c. In the User Argument List, add **adminlistener**. Click Add and click Finish.
   d. The User **adminlistener** will be displayed.
   e. Click Save. A status message will be displayed above.
10. Repeat the steps above starting at the Stand-Alone Web Application Scoped Roles table to create another role with the following information:
    a. Name: **Manager**

b. In the Role Conditions Predicate List for **Manager**, select **User** and add **managerlistener**.
c. Once you have completed creating the Manager role, click Save.



11. If your domain is in Production Mode, then in the left pane below the Change Center, click on Release Configuration .

APEX Listener Administration

1. On your browser, specify http://*host:port*/apex/listenerConfigure to display the Oracle Application Express Listener Administration. Refer to the Configuration section for detailed information.

Installing with Sun GlassFish Enterprise Server

You can install the Oracle Application Express Listener with the Sun GlassFish Enterprise Server.

The Sun GlassFish Enterprise Server is available for download from the Oracle Technology Network. Refer to the Sun GlassFish Enterprise Server Installation Guide to install the Sun GlassFish Enterprise Server.

If you are a first-time user of Sun GlassFish Enterprise Server, refer to the GlassFish Server *Quick Start Guide* which demonstrates key features of the GlassFish server and enables you to quickly learn the basics.

Note: The following instructions provided assume that the GlassFish Server is already installed and you are familiar with the GlassFish Server. If you are unfamiliar with Domains, Servers, Applications, Security and Users, refer to the Sun GlassFish Enterprise Server documentation.

Before You Begin

Copy Oracle Application Express Images

1. Create folder **i** in <*glassfish directory*>/domains/<*domainName*>/docroot .
2. Copy all files and its folders from Oracle Application Express images directory <*apex directory*>/images to <*glassfish directory*>/domains/<*domainName*>/docroot/i .

Note: If the images are not in this location, the Oracle Application Express login page will appear to be missing images and style sheets.

GlassFish Server

At least one GlassFish server domain must be started before you start the Administration Console.

Administration Console

1. To start the Administration Console, type the URL in your browser.
   The default URL for the Administration Console is:
   http://localhost:4848
2. If prompted, log in to the Administration Console.
   You will be prompted to log in if you chose to require an administration password at the time GlassFish server was installed.

Users and Roles

The APEX Listener requires users to be assigned roles to access the Application Express Listener Administration. For additional information on Security Realms, Users, Group List, Roles, refer to the Sun GlassFish Enterprise Server documentation.

Create Roles

The APEX Listener requires roles to be assigned to the users to access the Application Express Listener Administration. The two types of roles are:

- **Admin**
  The user with an APEX Listener Admin role has permission to access the APEX Listener Administration Page.
- **Manager**
  The user with an APEX Listener Manager role has permission to access the APEX Listener Status Information Page.

You can enable a default principal-to-role mapping on the Application Server using the Admin Console if the group list names is defined the same as the role names.

1. On the navigation tree, select Configuration, then Security. The Security page is displayed.
2. Click on the checkbox next to **Default Principal to Role Mapping** to enable this option.
3. Click on the Save button.

Note: Enabling the Default Principal to Role requires the Group List to be the same as the role name as described below when creating the user.

Create Users

You will need to create users to access the APEX Listener Administration page and Status page.

1. In the navigation tree, expand the Configuration node.
2. Expand the Security node.
3. Expand the Realms node.
4. Select the realm to add your user (e.g., **file**)
5. The Edit Realm page opens.
6. On the Edit Realm page, click the Manage Users button.
7. The File Users page opens.
8. On the File Users page, click New.
9. The New File Realm User page opens.
10. In the User ID field, type the name of the APEX Listener administrator: **adminlistener**
11. In the Group List field, type the role to which the user belongs: **Admin**
12. In the Password field, type a unique password.
13. In the Confirm New Password field, type the user password again.
14. Click OK.
15. Create another user for the APEX Listener manager:
    a. User ID: **managerlistener**

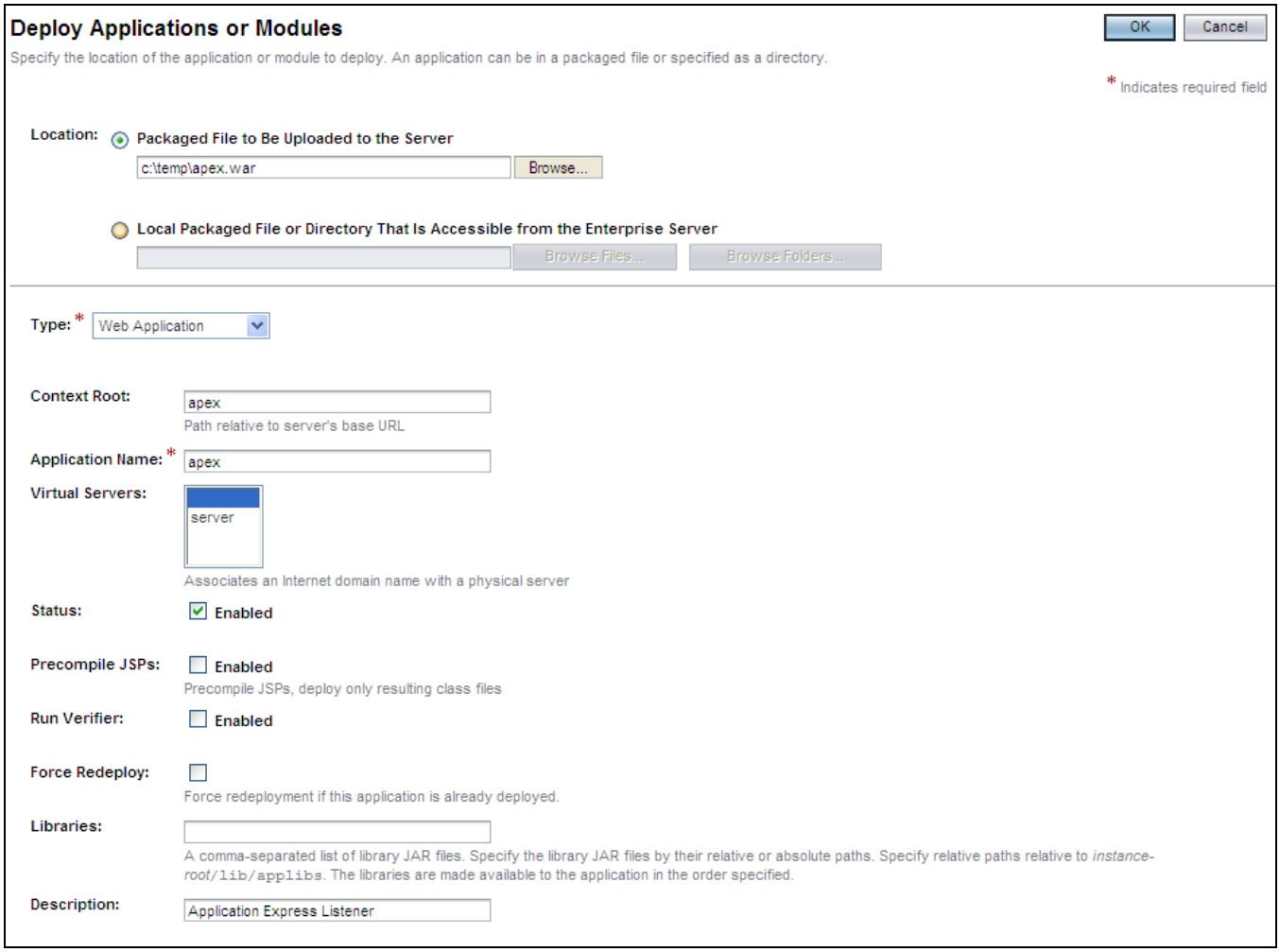
b. Group List: **Manager**
c. Click OK when you are done.

Deployment

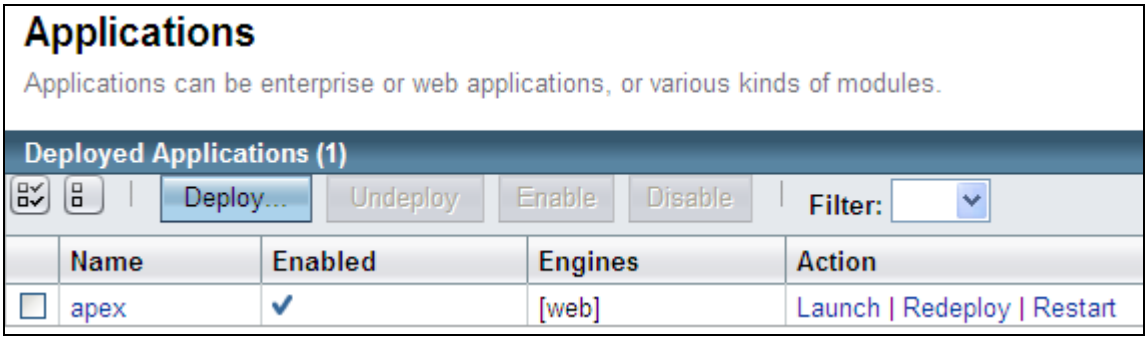
Before You Begin

The Application Express Listener file, **apex.war**, must be available before you start this task.

1. On the navigation tree, click on Application node. The Applications page is displayed.
2. Click the Deploy button. The Deploy Applications or Modules page is displayed.
3. Select Packaged File to be Uploaded to the Server, and click Browse.
4. Navigate to the location of the **apex.war** file, select the file, and click Open. You are returned to the Deploy Applications or Modules page.
5. Specify and select the following:
    a. Type: **Web Application**
    b. Context Root: **apex**
    c. Application Name: **apex**
    d. Status: Enabled
    e. Description: **Application Express Listener**
    f. Accept all other default settings, and click OK.



6. You are returned to the Applications page. If a check mark does not appear in the Enabled field for **apex**, then select the check box next to the **apex** application and click the Enable button.



APEX Listener Administration

1. On your browser, specify http://*host:port*/apex/listenerConfigure to display the Oracle Application Express Listener Administration. Refer to the Configuration section for detailed information.

Installing with Oracle Containers for J2EE (OC4J)

You can install the Oracle Application Express Listener with the Oracle Containers for J2EE (OC4J).

The Oracle Containers for J2EE is available for download from the Oracle Technology Network. Refer to the Oracle Containers for J2EE Installation Guide to install the OC4J.

Note: The following instructions provided assume that OC4J is already installed and you are familiar with OC4J. If you are unfamiliar with Servers, Deployment, Security, Users and Roles, refer to the Oracle Containers for J2EE documentation.

Before You Begin

Copy Oracle Application Express Images

1. Create folder **i** in *<oc4j install directory>*/j2ee/home/default-web-app .
2. Copy all files and its folders from Oracle Application Express images directory *<apex directory>*/images to *<oc4j install directory>*/j2ee/home/default-web-app/i.

   Note: If the images are not in this location, the Oracle Application Express login page will appear to be missing images and style sheets.

Start OC4J Server

The default port is 8888. If you need to change the port number, then edit file *<oc4j install directory>*/j2ee/home/config/default-web-site.xml.

The OC4J Server must be started before you start the Application Server Control Console. Refer to Oracle for Containers J2EE documentation for additional information.

Example:

```
cd <oc4j install directory>/j2ee/home
java -jar oc4j.jar
```

Note: If this is your first-time initializing the server, you will be prompted to enter a password for the OC4J administrator account. The username for this account defaults to oc4jadmin.

Application Server Control Console

1. To start the Application Server Control Console, type the URL in your browser.
   The default URL for the Application Server Control Console is:
   http://localhost:8888/em

2. You will be prompted to log in with the oc4jadmin account.

Users and Roles

The APEX Listener requires users to be assigned roles to access the Application Express Listener Administration. For additional information on Security Realms, Users and Roles refer to the Oracle for Containers J2EE documentation.

Create Roles

The APEX Listener requires roles to be assigned to the users to access the Application Express Listener Administration. The two types of roles are:

- **Admin**
  The user with an APEX Listener Admin role has permission to access the APEX Listener Administration Page.
- **Manager**
  The user with an APEX Listener Manager role has permission to access the APEX Listener Status Information Page.

1. On the OC4J Home page, click on the Administration tab.
2. Expand Security node.
3. Click on the Security Providers Go To Task**.**
4. Click on the Instance Level Security button. The Instance Security Level page is displayed.
5. Click on the Realms tab.
6. Use an existing realm or create a realm.
7. Click on the selected realm's Roles number. The Roles page is displayed.
8. Click on the Create button. On the Name field enter **Admin**. Click OK.
9. Click on the Create button. On the Name field enter **Manager**. Click OK.
10. On the top page, click on the Instance Security Level link.

Create Users

You will need to create users and assign roles to access the APEX Listener Administration page and Status page.

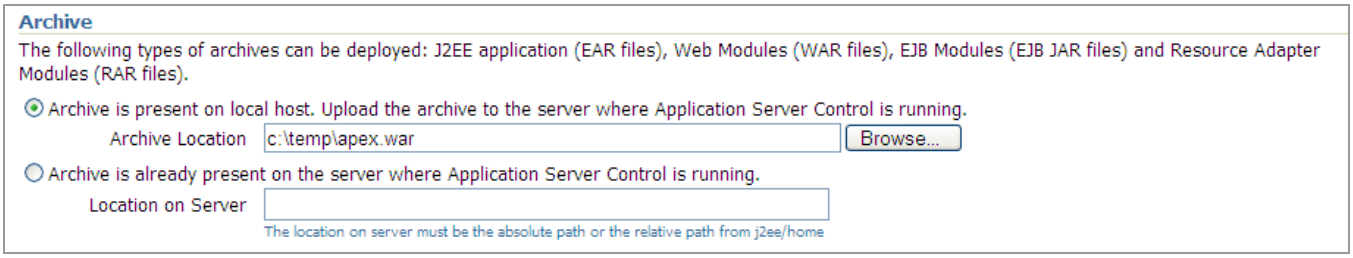
1. In the Instance Security Level page, click on the selected realm's Users number. The Users page is displayed.
2. Click on the Create button.
3. On the Name field enter **adminlistener** and specify its password.
4. Select Admin for the Selected Roles. Click OK.
5. Click on the Create button.
6. On the Name field enter **managerlistener** and specify its password.
7. Select Manager for the Selected Roles. Click OK.
8. On the top page, click on OC4J:home link.

Deployment

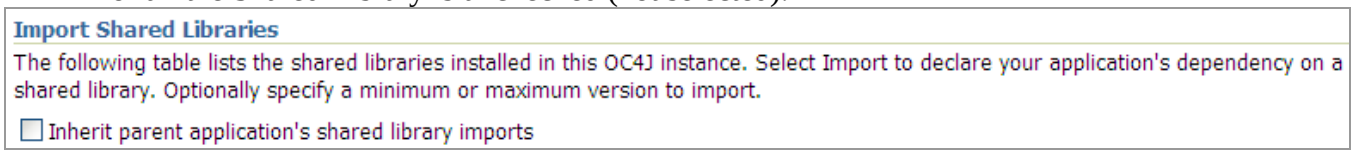
Before You Begin

The Application Express Listener file, **apex.war**, must be available before you start this task.

1. On the OC4J Home page, click on the Applications tab. The Applications page is displayed.
2. Click on the Deploy button. The Deploy: Select Archive page is displayed.
3. Select **Archive is present on local host. Upload the archive to the server where Application Server Control is running.**
4. Specify the file location of the apex.war file.



5. Click Next.
6. The Deploy: Application Attributes page is displayed. In the Application Name field, enter **apex**.
7. Click Next.
8. The Deploy: Deployment Settings is displayed. In the Deployment Tasks, click on Configure Class Loading's Go To Task.
9. The Deployment Settings: Configure Class Loading page is displayed.
    a. In the Import Shared Libraries, uncheck the box for **Inherit parent application's shared library imports**. The APEX Listener contains its own libraries in the apex.war file and does not use the OC4J Shared Libraries. Also, verify that the Import column checkboxes for all the Shared Library is unchecked (not selected).



    b. Click OK.

10. Click on the Deploy button.
11. The Confirmation page is displayed. A message should display a success message: **The Application "apex" has been successfully deployed.**
12. Click on the Return button which returns you to the Applications page.
13. Verify that the apex is listed on the Applications and the Status displays a green up-arrow indicating that it is Active (Up).

APEX Listener Administration

1. On your browser, specify http://*host:port*/apex/listenerConfigure to display the Oracle Application Express Listener Administration. Refer to the Configuration section for detailed information.

Upgrading Oracle Application Express Listener

Upgrading Oracle Application Express Listener requires you to redeploy the application.

Before You Begin

The Application Express Listener file, **apex.war**, must be available before you start this task.

Oracle WebLogic Server

1. Start an Administration Server domain and log in to your WebLogic Administration Console.
2. If your domain is in Production mode, click on the Lock & Edit button on the left-pane below the sub-menu Change Center. Otherwise, if your domain is in Development mode this button will not be displayed.

Redeploy

1. On the WebLogic Server Home Page below the Domain Configuration, select Deployments. The Summary of Deployments will be displayed.
2. Click on the checkbox next to **apex**. This will enable the Update button.
3. Click on the **Update** button.
4. The Update Application Assistant is displayed. Specify the location of your apex.war file.
5. Click Next.
6. Review your choices and click the **Finish** button.
7. You are returned to the Summary of Deployments. Messages are displayed indicating the status of apex deployment. Follow any additional instructions provided in the Messages.
8. If your domain is in Production Mode, then on the Change Center click on Activate Changes.

Sun GlassFish Enterprise Server

Start a GlassFish Server domain and log in to your GlassFish Administration Console.

Redeploy

1. On the navigation tree, click on Application node. The Applications is displayed. Click on the checkbox next to **apex**.
2. Click on the Disable button. An **X** will appear on the Enabled field next to apex.
3. Click on the Redeploy link for apex.
4. The Redeploy Applications or Modules page is displayed. Specify the location of your apex.war file.
5. Click OK.
6. You will be returned to the Applications page. Verify that a check mark is displayed on the Enabled field next to apex.

Oracle Containers for J2EE (OC4J)

Start the OC4J server and log in to your Application Server Control Console.

Redeploy

1. On the OC4J Home page, click on the Applications tab. The Applications page is displayed.
2. Click on the checkbox next to **apex** and select the **Redeploy** button.
3. The Redeploy: Select Archive and deployment plan page is displayed. Specify the location of your apex.war file.
4. Click Next. The Redeploy: Application Attributes page is displayed. Review the information.
5. Click Next. The Redeploy: Deployment Settings are displayed.
6. Click the Redeploy button.
7. You will be returned to the Applications tab. Verify that the apex Status displays a green up-arrow indicating that the Status is Up (Active).

Upgrading Oracle Application Express Images

Upgrading Oracle Application Express images requires you to copy or redeploy the images.

Oracle WebLogic Server

1. Follow the instructions in **Create Web Archive for Oracle Application Express Images** for Oracle WebLogic Server.
2. Start an Administration Server domain and log in to your WebLogic Administration Console.
3. If your domain is in Production mode, click on the Lock & Edit button on the left-pane below the Change Center. Otherwise, if your domain is in Development mode this button will not be displayed.

   Redeploy

   1. On the WebLogic Server Home Page below the Domain Configuration, select Deployments. The Summary of Deployments will be displayed.
   2. Click on the checkbox next to **i**. This will enable the Update button.
   3. Click on the **Update** button.
   4. The Update Application Assistant is displayed. Specify the location of your i.war file.
   5. Click Next.
   6. Review your choices and click the **Finish** button.
   7. You are returned to the Summary of Deployments. Messages are displayed indicating the status of i (images) deployment. Follow any additional instructions provided in the Messages.
   8. If your domain is in Production Mode, then on the Change Center click on Activate Changes.

Sun GlassFish Enterprise Server

1. Delete all the files and folders in folder **i** in

   <*glassfish directory*>/domains/<*domainName*>/docroot/i

2. Follow the instructions in **Copy Oracle Application Express Images** for Sun GlassFish Enterprise Server.

Oracle Containers for J2EE (OC4J)

1. Delete all the files and folders in folder **i** in

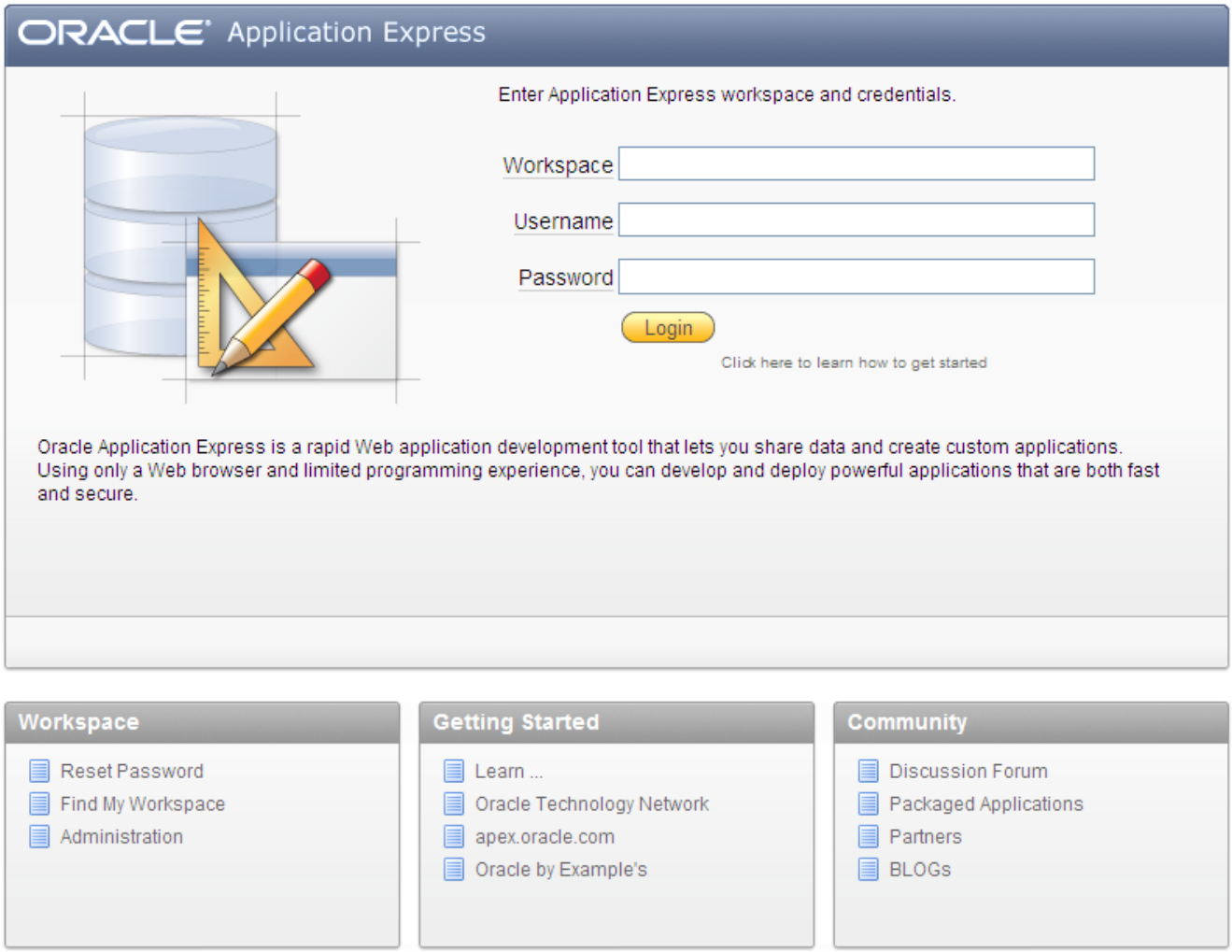
   <*oc4j install directory*>/j2ee/home/default-web-app/i

2. Follow the instructions in **Copy Oracle Application Express Images** for Oracle Containers for J2EE.

Troubleshooting

Issue: Application Express images are not being displayed.

Example of the Oracle Application Express Login Page for Version 4.0.



If your login page appears to be missing images or missing partial images, and links are being displayed instead, then your Oracle Application Express images have not been setup properly.

If you have not copied or deployed the Oracle Application Express images to your application server, then refer to the Application Express Listener Installation instructions about copying or deploying images to your application server.

Issue 1: You have copied or deployed the Oracle Application Express images to your application server as described in the Application Express Listener Installation instructions. However, the images are not being displayed:

Resolution:

a. Make sure the Oracle Application Express images that you copied or deployed to your application server is the same Oracle Application Express version that is installed onto your database.
b. If you upgraded Oracle Application Express, refer to Upgrading Oracle Application Express Images for details on copying or deploying images.

Issue 2: You have copied or deployed your Oracle Application Express images and used a different web application's context root other than the default context root (for example, **i**) . The images are not being displayed.

Resolution:

a. Execute reset_image_prefix.sql utility located in Oracle Application Express to change the default image prefix path (e.g., **/i/**) to your web application's context root for the images. You will need to execute this utility via SQLPlus and connect as SYS. Refer to Oracle Application Express documentation for additional information.

   Note: The default web application's context root for the Oracle Application images is **i**. Oracle recommends to use the default context root, **i**, for the Oracle Application images unless your business practice requires to change it.

   Example: If you copied or deployed the Application Express images using a different context root name (e.g., **apeximages**) instead of using the default context root name (e.g., **i**)**,** then you will need to specify the different context root in the prefix path, for example, **/apeximages/** .

   If the images are located in a folder of a context root, then you will need to specify the context root and the folder in the prefix path, for example, **/apeximages/myfolder/**.

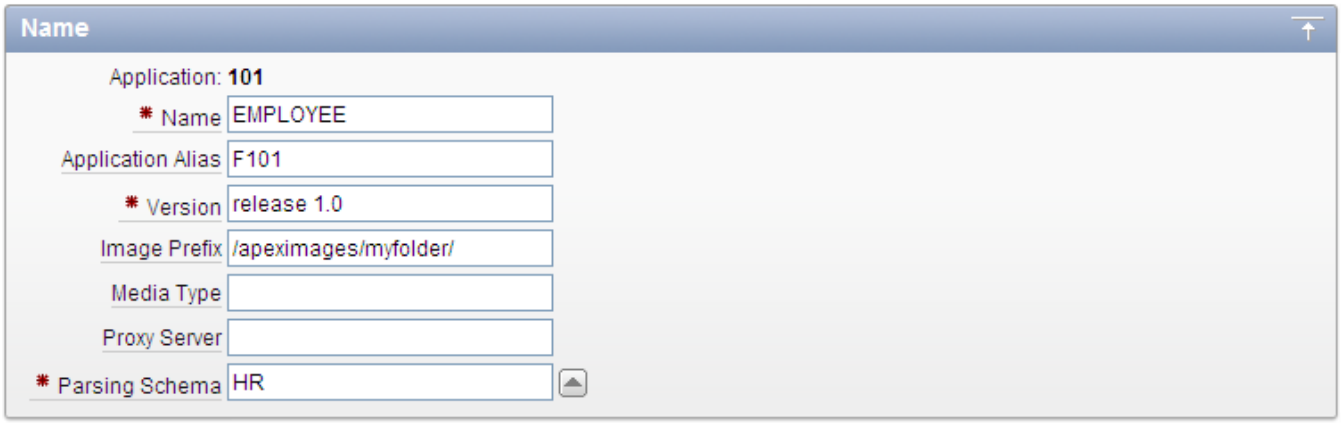
The prefix path is case-sensitive and must begin and end with a forward slash.

```
SQL> @<apex directory>\utilities\reset_image_prefix.sql

Enter the Application Express image prefix [/i/]  /apeximages/myfolder/

. . .

Image Prefix update complete
```

b. Next, you will need to update the image prefix for each application using Oracle Application Express Builder.

Setting the Image Prefix using Oracle Application Express Version 4.0

1. Logon to Oracle Application Express.
2. Click on Application Builder.
3. Select an application.
4. Click on Edit Application Properties button. The Edit Application Definition is displayed.
5. In the Name region, locate the Image Prefix field. By default, this prefix is defined as **/i/**. Change the Image Prefix to the prefix that you specified in the reset_image_prefix utility as described above.
   Example: **/apeximages/myfolder/**
6. Click on Apply Changes button.



Setting the Image Prefix using Oracle Application Express Version 3.x

1. Logon to Oracle Application Express.
2. Click on Application Builder.
3. Select an application.
4. On the Application page, click on the Shared Components down-arrow and select Application **->** Definition. The Edit Application Definition is displayed.
5. In the Name region, locate the Image Prefix field. By default, this prefix is defined as **/i/**. Changed it to the image prefix that you specified in the reset_image_prefix utility.
   Example: **/apeximages/myfolder/**
6. Click on Apply Changes button.

Issue: Cannot logon to Application Express Listener Administration.

Check if the user is assigned the role Admin and/or Manager and the roles are setup properly on your application server. The roles, Admin and Manager, are case-sensitive. Review the section on the Application Express Listener Installation for Users and Roles, and refer to your application server documentation for additional details for Users and Roles.

Configuration

This section contains instructions on configuring your Application Express Listener.
You can setup the database connection, security, file caching, pre/post-procedures and miscellaneous options by using the Application Express Listener Administration. In addition, you can view statistical information, error messages and logging information.

The topics include the following:

Accessing Application Express Listener
Administration
Status Information
Application Express Configuration File

Accessing Application Express Listener

Administration

To access the Application Express (APEX) Listener Administration, specify the URL on your browser:

http://*host:port*/apex/listenerConfigure

This URL does not require you to login to access APEX Listener Administration. However, once the APEX Listener is configured, you can only access the Administration with the URL specified below.

http://*host:port*/apex/listenerAdmin

This URL requires a user to have the Admin role to login.

Status Information

To access the Application Express Listener Status information, specify the URL on your browser:

http://*host:port*/apex/listenerStatus
This URL requires a user to have the Manager role to login.

Refer to the Installation section for Creating users and roles for additional information.

Administration

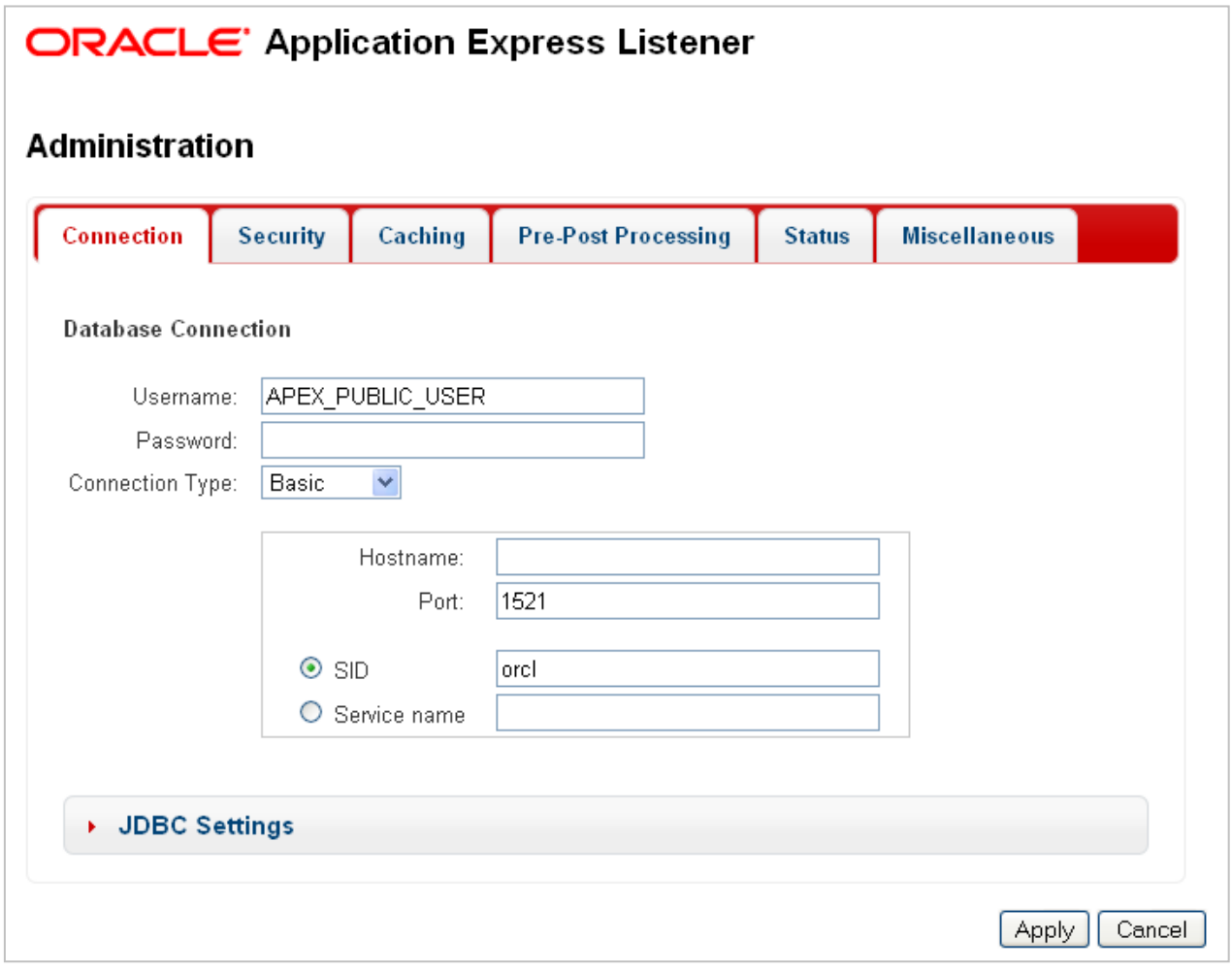
The APEX Listener Administration contains six categories which are separated by tabs:

- Connection
- Security
- Caching
- Pre-Post Processing
- Status
- Miscellaneous

Connection

The Database Connection allows you to enter the database credentials. This includes the database Username, Password and Connection information which are required fields. The Username, Connection Type, Port and SID contain default values.

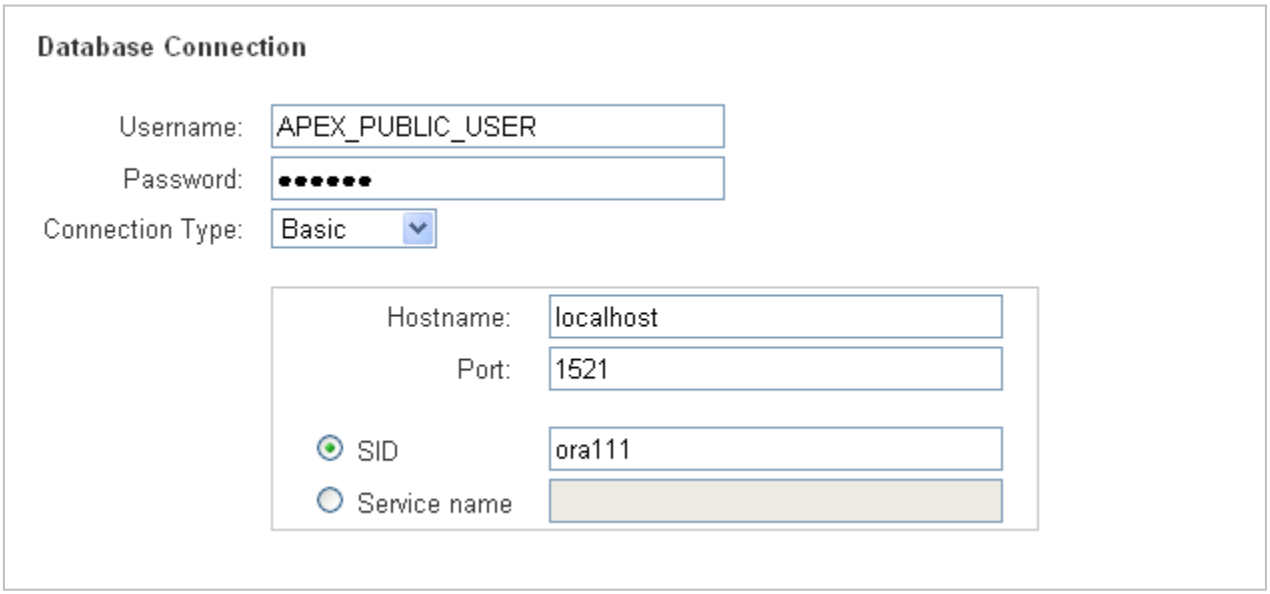
Option	Description
Username	The name of the database user for the connection.
Password	The password of the specified database user.
Connection Type	Select the option Basic, TNS or Advanced. The fields displayed below the Connection Type will change based on your selection.



Basic Connection Type

The Basic connection type contains the Host, Port, SID and Service Name. Click on the radio button to select either SID or Service Name.

Option	Description
Host	The host system for the Oracle database.
Port	The database listener port.
SID	The name of the database.
Service Name	Network service name of the database.

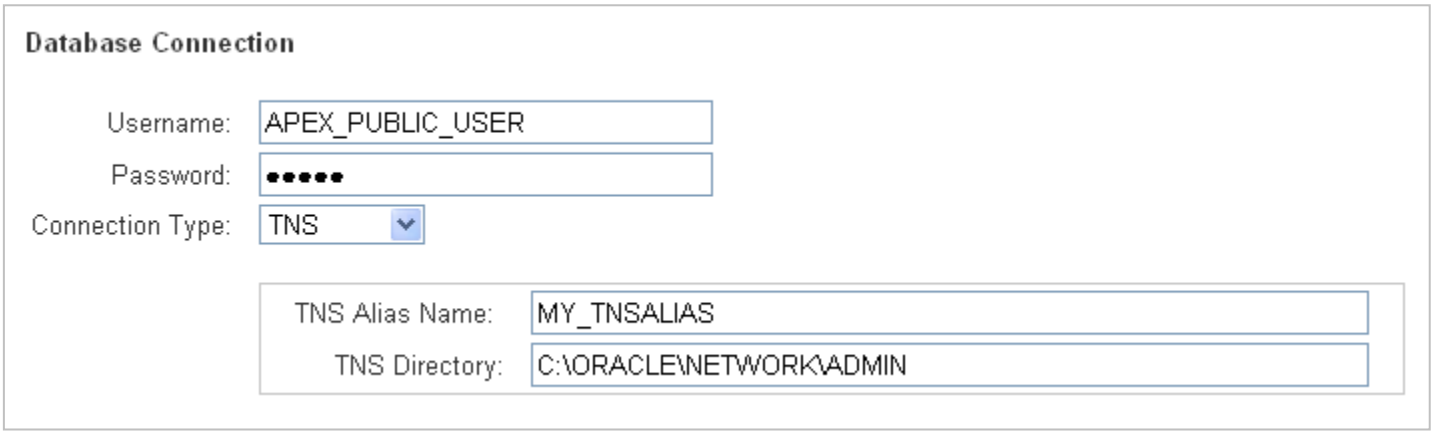


TNS Connection Type

The TNS connection type contains the TNS Alias Name and TNS directory.

If the environment variables TNS_ADMIN or ORACLE_HOME are defined, then the listener will check if the file, tnsnames.ora, exists in either the TNS_ADMIN directory or ORACLE_HOME/NETWORK/ADMIN directory. If the file exists, then the TNS Directory will contain the default directory location. Otherwise, the user is required to specify the TNS Directory.

Option	Description
TNS Alias Name	The TNS alias name must match the name in the tnsnames.ora file.
TNS Directory	The directory location of your tnsnames.ora file.



Advanced Connection Type

The Advanced connection type allows you to specify a Custom JDBC URL to connect to the database.

Option	Description
Custom JDBC URL	Specify the custom url to connect to the database.

You can specify different formats for the custom JDBC URL. Below are some examples:

SID example:

jdbc:oracle:thin:host:port:sid

jdbc:oracle:thin:myhost:1521:orcl
jdbc:oracle:oci8:myhost:1521:orcl

Service name example:

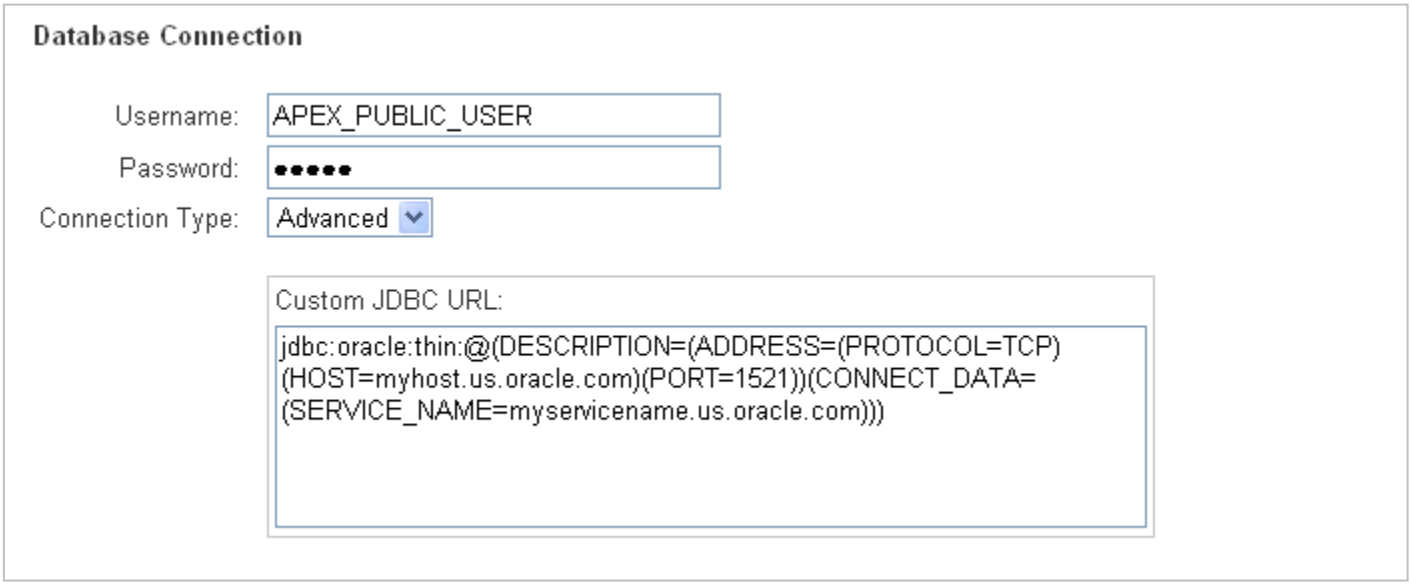
jdbc:oracle:thin:@//host:port/servicename

jdbc:oracle:thin:@//myhost:1521/orcl.us.oracle.com

Example of Oracle Net keyword-value pair:

jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=myhost)(PORT=1521))(CONNECT_DATA=(SERVICE_NAME=myservicename.com)))

See Also: *Oracle Database Net Services Administrator's Guide* for more information about connection formats.



JDBC Settings

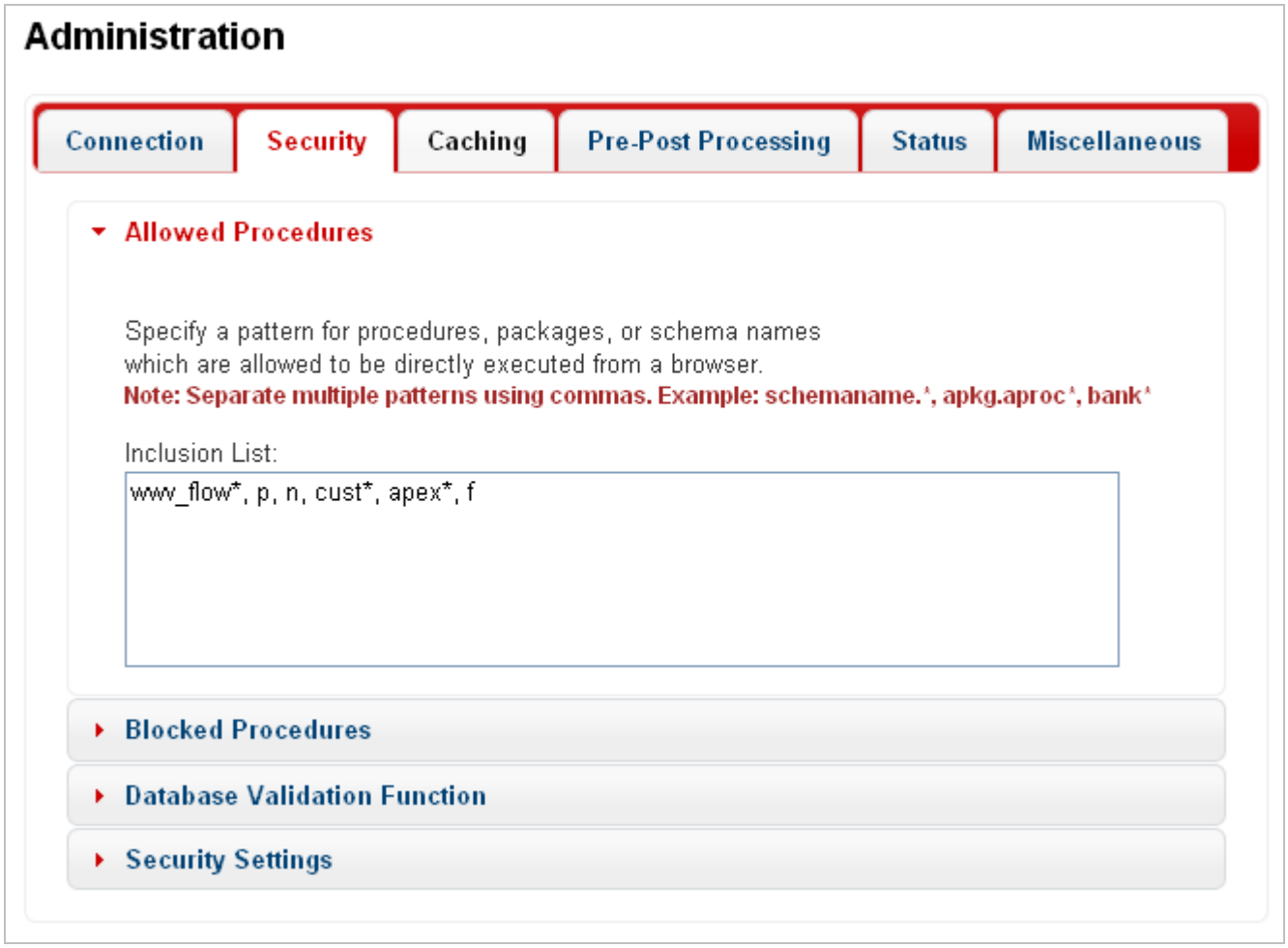
The JDBC Settings contains the JDBC options. Click on the JDBC Settings header to expand or collapse the content below. The JDBC options can also be changed during runtime except for the JDBC Driver type.

Option	Description
JDBC Driver Type	Select either thin or oci8.
Initial Pool Size	Specify the initial pool size for the number of connections that will be created.
Minimum Connections	Specify the minimum number of connections.
Maximum Connections	Specify the maximum number of connections.
Maximum Statements	Specify the maximum number of statements to cache for each connection.
Inactivity Timeout	Specify how long an available connection can remain idle before it is closed. The inactivity connection timeout is in seconds.
Abandoned Connection Timeout	Specify how long a borrowed (in use) connection can remain unused before it is considered as abandoned and reclaimed. The abandoned connection timeout is in seconds.

Security

The Security features provide protection by validating the procedure requests and determining if the user is allowed to access the procedure. The Security features are

- Allowed Procedures
- Block Procedures
- Database Validation Function

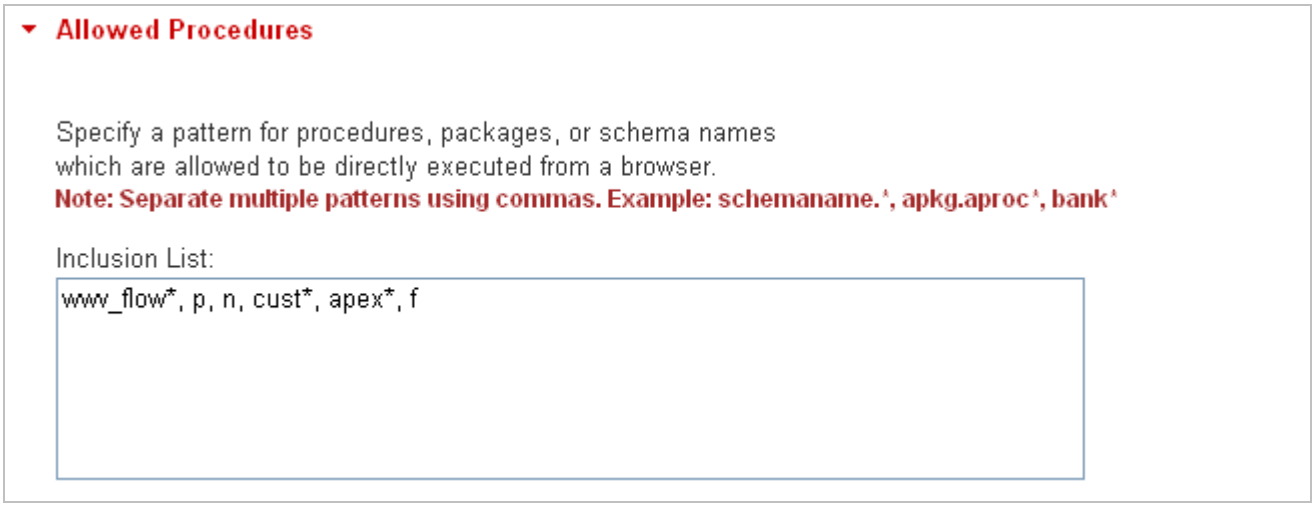


Allowed Procedures

You can specify the procedures that are allowed to be executed from the browser. Click on the Allowed Procedures header to expand or collapse the content. Specify the procedure names or procedure name patterns which are separated by commas.

- The wildcard characters asterisk "*" and question mark "?" can be used. The asterisk wildcard character substitutes for zero or more characters, whereas the question mark substitutes for any one character.

If this field is left blank, then the APEX Listener does not validate the procedure names to determine if the procedure is allowed for processing.

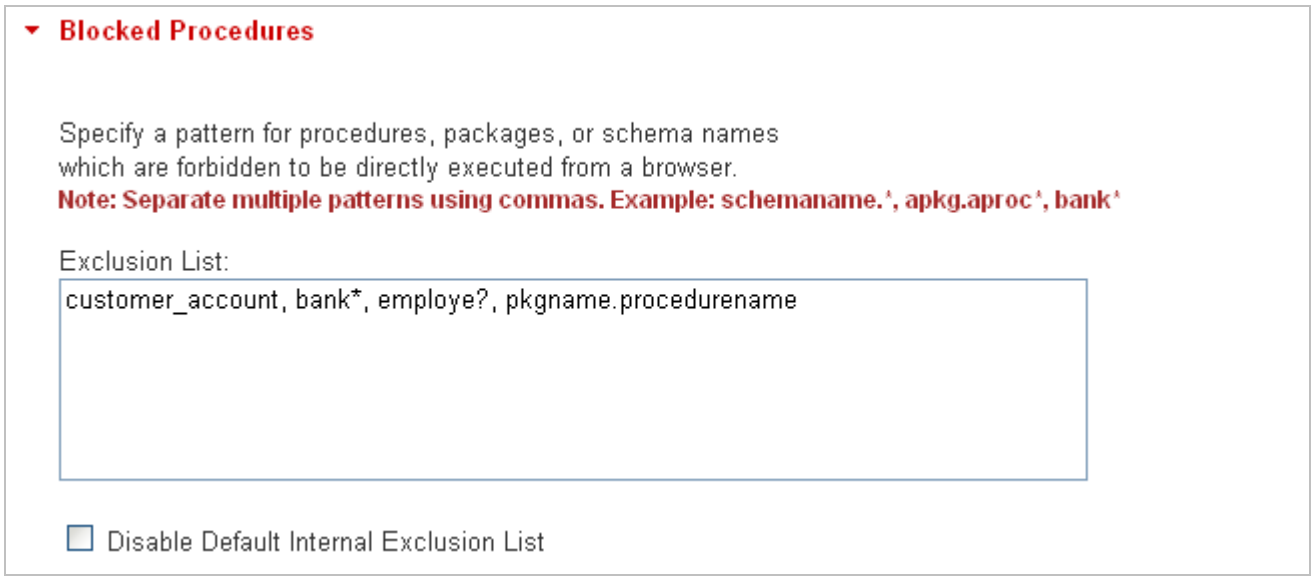


Blocked Procedures

You can specify the procedures that are not allowed to be executed from the browser. Click on the Blocked Procedures header to expand or collapse the content. Specify the procedure names or procedure name patterns which are separated by commas.

- The wildcard characters asterisk "*" and question mark "?" can be used. The asterisk wildcard character substitutes for zero or more characters, whereas the question mark substitutes for any one character.

If this field is left blank, then the APEX Listener does not validate the procedure names to determine if the procedure should be disallowed for processing.



Internal Exclusion List

The APEX Listener contains an internal exclusion list which will block users from accessing the following:

sys.*, dbms_*, utl_*, owa_*, owa.*, htp.*, htf.*, wpg_docload.*

The option is available to disable the default internal exclusion list, but is not recommended. If this is disabled, it should only be used for debugging purposes.

Database Validation Function

You can specify the Database Validation Function which determines if the requested procedure in the URL should be allowed for processing. The APEX Listener will execute the Validation Function for each requested procedure or check the security cache to determine if a procedure is valid or invalid. Refer to Security Cache for additional information.

Click on the Database Validation Function header to expand or collapse the content. Specify the name of the Database Validation Function. The Database Validation Function is a stored function that resides in the database. If the Database Validation Function does not exist, then an error message will be displayed.

The Database Validation Function should return true if the procedure is allowed for processing; otherwise, returns false.

If this field is left blank, then the APEX Listener does not validate the procedure name to determine if the procedure should be allowed for processing.

Database Validation Function Format

The validation function must return a boolean and have one argument for the procedure name.

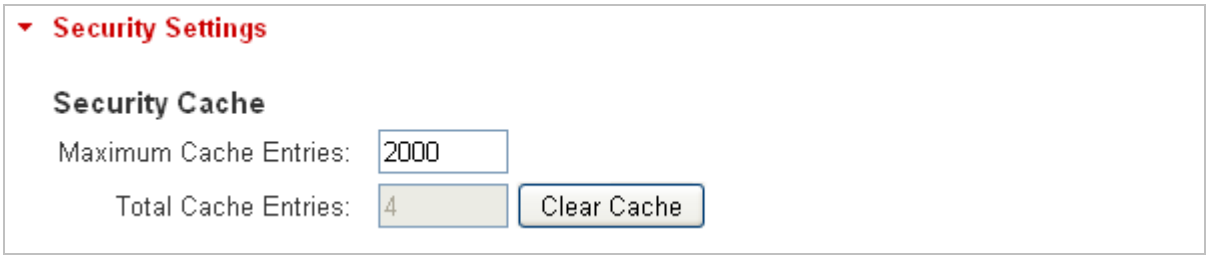
```
Example:

CREATE OR REPLACE
FUNCTION CHECK_VALID_PROCEDURE (Procedure_Name IN VARCHAR2) RETURN BOOLEAN AS
BEGIN
    IF (UPPER(Procedure_Name) LIKE ('CUST%')) THEN
      RETURN true;
    ELSE
      RETURN false;
    END IF;
END CHECK_VALID_PROCEDURE;
```

Security Settings

The APEX Listener uses the Security Cache when a Database Validation Function is specified. The APEX Listener will cache the procedure names to determine if they are valid or invalid. By using the caching mechanism, this will reduce the number of database roundtrips to execute the Database Validation Function by first checking the Security Cache.

Option	Description
Maximum Cache Entries	Specify the maximum cache size. Note: When the maximum entries have been reached, the older or stale procedure name that was least recently used will be removed from the cache when a new procedure name is added to the cache.
Total Cache Entries	Displays the total number of procedure names that are valid or invalid in the Security Cache.
Clear Cache	If the total cache entries is greater than 0, then the Clear Cache button will be enabled to allow you to delete the cache entries. You should clear the cache whenever the Database Validation Function is updated.

Click on the Database Validation Function header to expand or collapse the content.



Security Feature Considerations

The advantage of using Allowed Procedures is that the procedure names and procedure patterns are stored in the APEX Listener, whereas invoking the Database Validation Function requires a database roundtrip.

Security Processing

If the user entered data for Allowed Procedures, Database Validation Function and/or Blocked Procedures, the APEX Listener determines if the entered procedure name is valid by checking the security information in the following order:

1. Database Validation Function
   - Checks if the procedure name is valid.
2. Allowed Procedures
   - Checks if the procedure name is in the inclusion list.
3. Blocked Procedures
   - Checks if the procedure is NOT in the exclusion list.

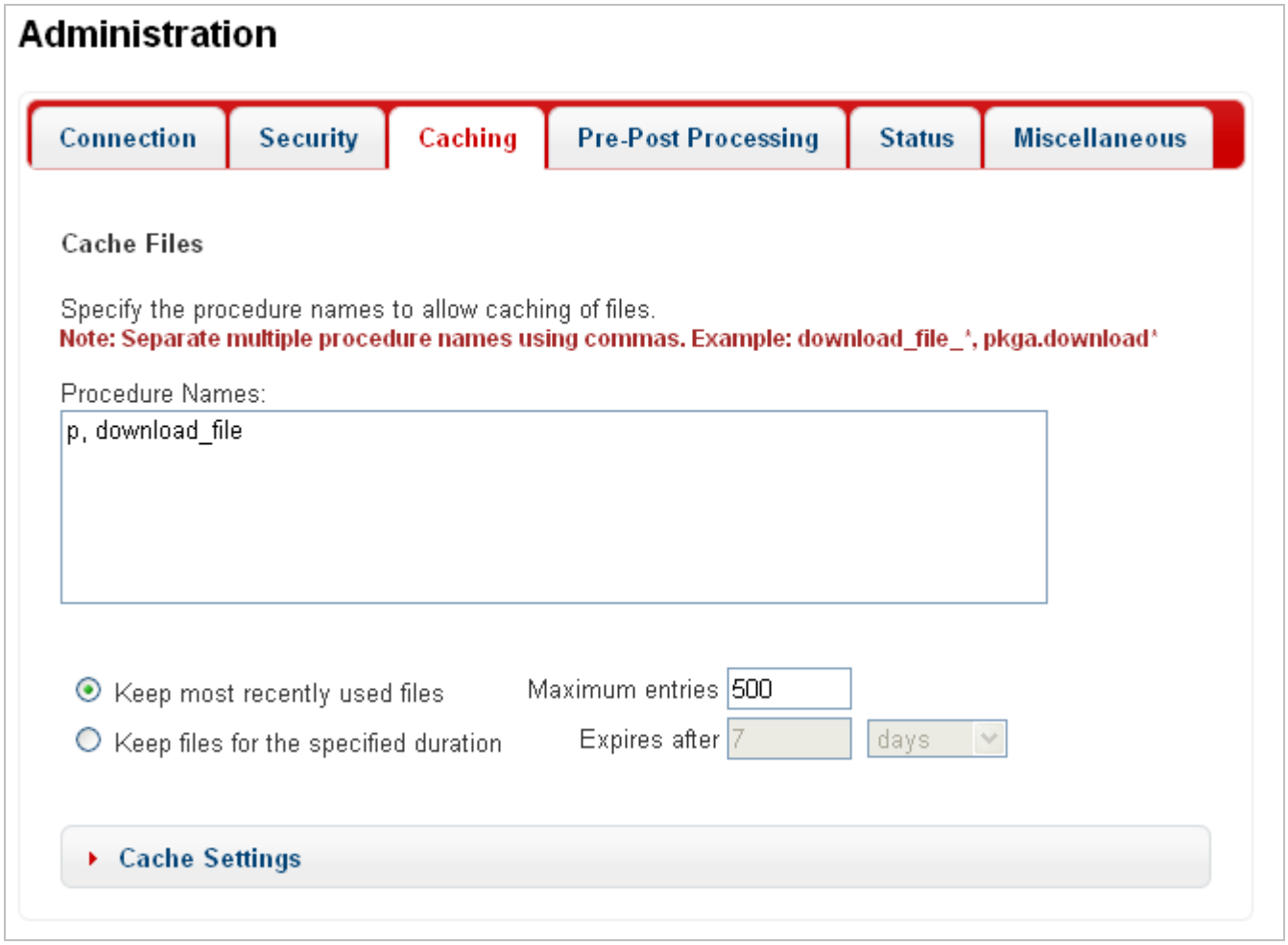
If the above validation passes, then the procedure is valid for processing.

Caching

Caching Files

The APEX Listener allows you to cache file-based content for quick access. Caching will only be enabled if the procedure names are specified in the Procedure Names field.

Option	Description
Procedure Names	Specify the procedure names to allow for caching of their files. The procedure names can contain the wildcard character asterisk "*", or the question mark "?". The asterisk wildcard character substitutes for zero or more characters, whereas the question mark substitutes for any one character. Each procedure name must be separated by a comma. Example: p, wwv_flow_file*, download_my_file Note: The following radio button options will be enabled once the procedure name is added: • Keep files for the specified duration • Keep most recently used files
Keep most recently used files	Files that are most recently used will remain in the cache.
Maximum entries	Specify the maximum number of files to cache. When the maximum entries have been reached, the older or stale files will be removed from the cache when a new file is added.
Keep files for the specified duration	Files that are cached will expire after the specified length of time.
Expires after	Specify the length of time. Must be a numeric value greater than 0.
duration	Select the amount of time from the list: days, hours or minutes.

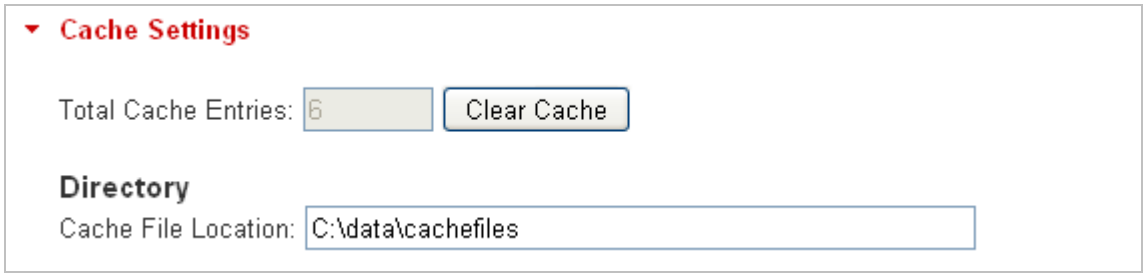


Cache Settings

The APEX Listener will cache the file-based content if Caching File is requested. The Total Cache Entries displays the total number of files that are cached. You can specify the directory location for the cached files.

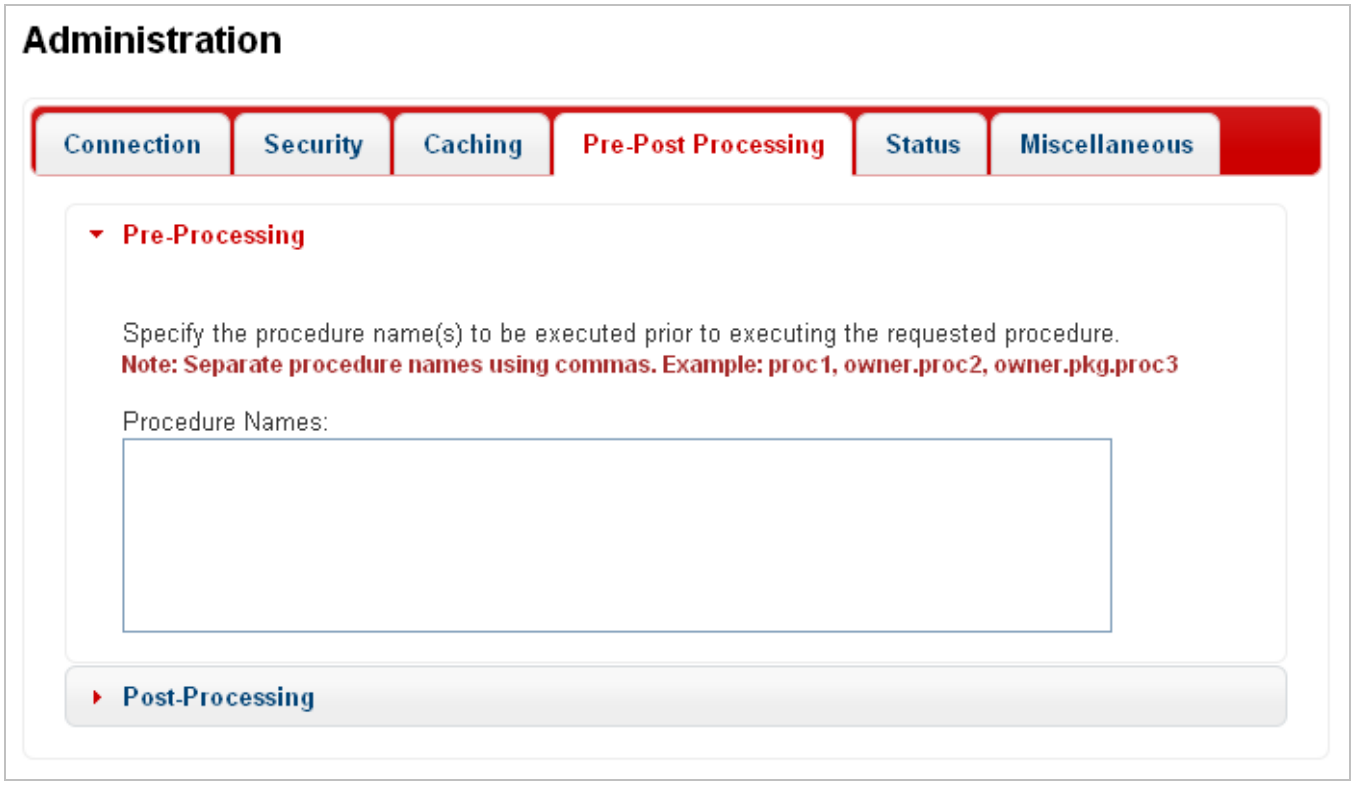
Option	Description
Total Cache Entries	Displays the total number of files that are cached.
Clear Cache	Allows the you to clear the file cache entries. The files that are cached will be removed.
Directory	The directory location for the cache files.

Click on the Cache Settings header to expand or collapse the content.



Pre and Post Processing Procedures

The Pre and Post Procedures allows you to specify the database procedures to invoke before or after executing the procedure specified on the URL.

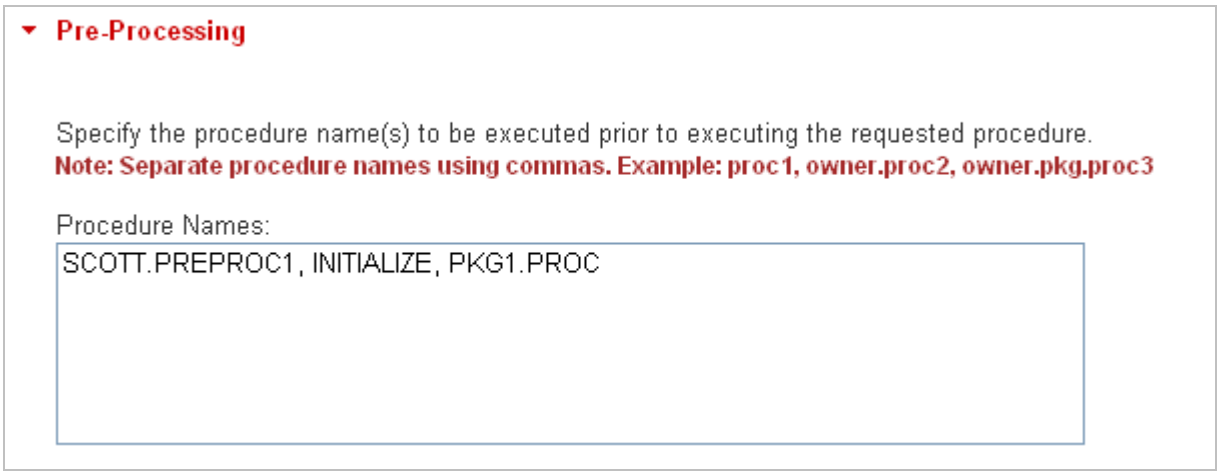


Pre-Processing Procedure

Specify the procedure name(s) to execute prior to executing the procedure specified on the URL. Multiple procedure names must be separated by commas.

The APEX Listener will execute the procedures in the order specified in the Procedure Names. For example, proc1, proc2, … , procN.

Click on the Pre-Processing header to expand or collapse the content.

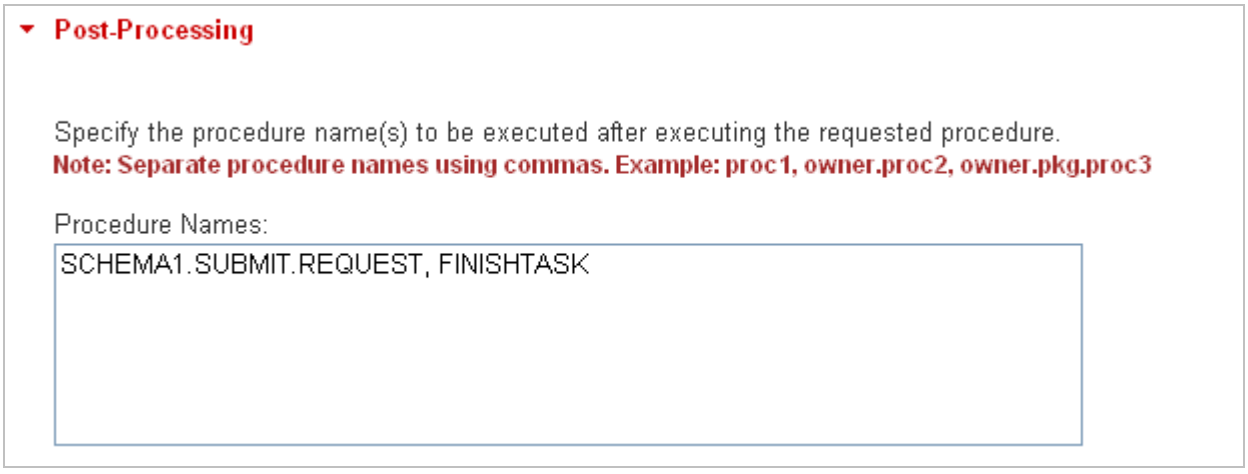


Post-Processing Procedure

Specify the procedure name(s) to execute after executing the procedure specified on the URL. Multiple procedure names must be separated by commas.

The APEX Listener will execute the procedures in the order specified in the Procedure Names. For example, proc1, proc2, … , procN.

Click on Pre-Processing header to expand or collapse the content.



Status

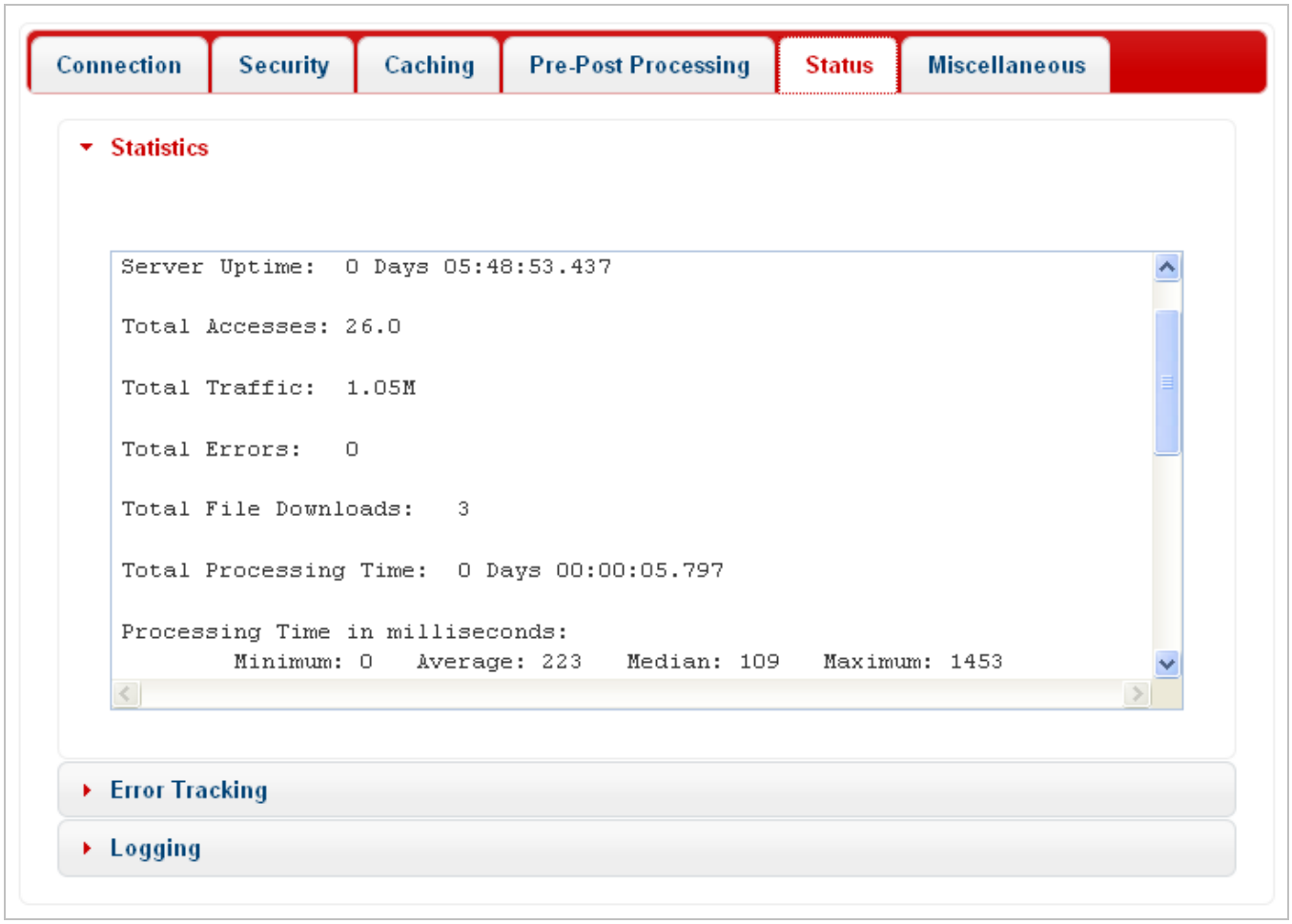
The Status Information provides statistics, error tracking and logging information.

Statistics

The Statistics displays the APEX Listener information which includes:

- Server uptime
- Total accesses, total traffic, total errors, total file downloads, total processing time
- Processing time in milliseconds for minimum, average, median and maximum
- Database time in milliseconds for minimum, average, median and maximum
- Active requests
- Active and available connections in the pool
- Security enabled or disabled, and its cache entries and maximum entries
- Cache file enabled or disabled, and its cache entries and maximum entries

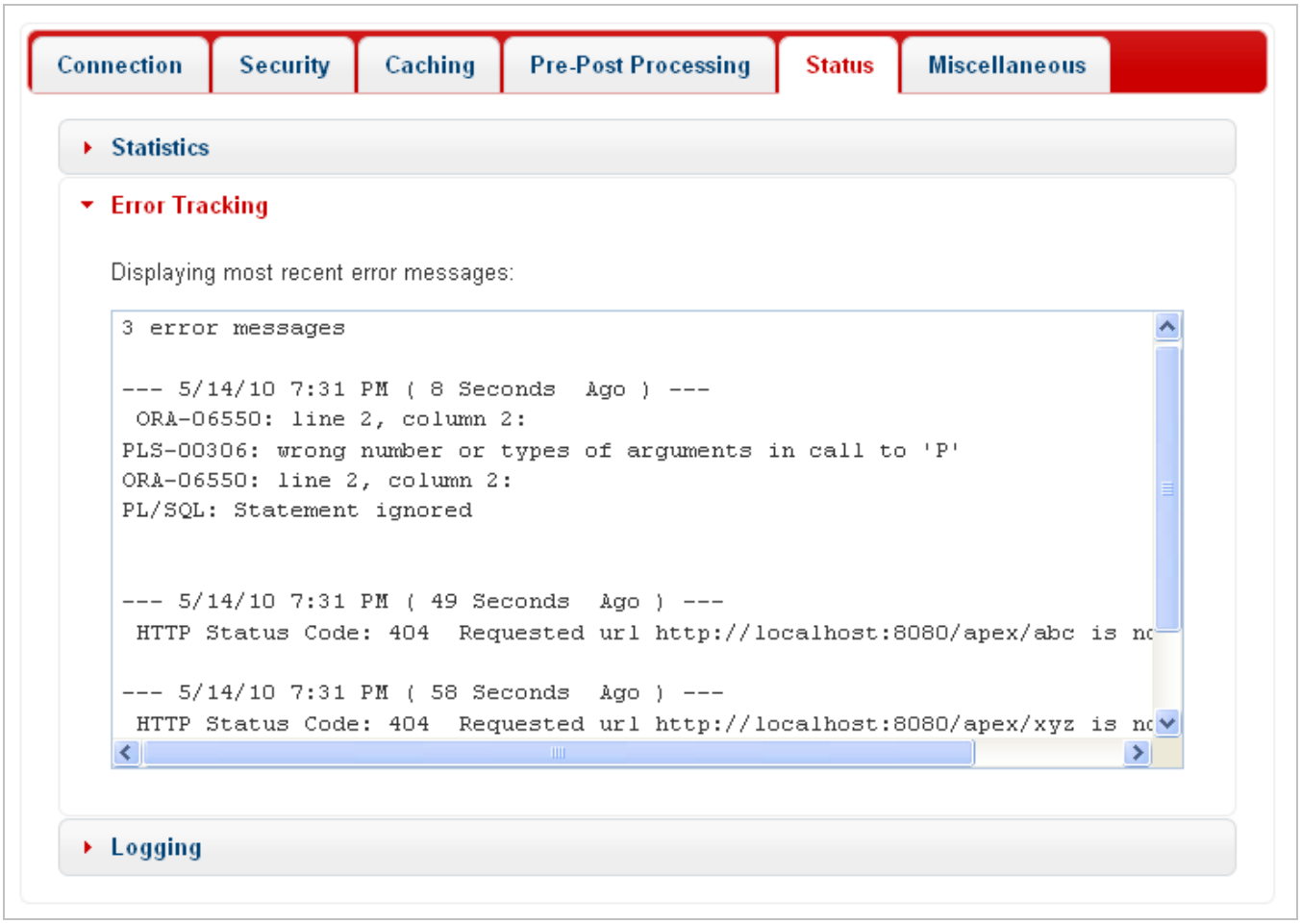
Click on Statistics header to expand or collapse the content.



Error Tracking

The Error Tracking displays the most recent error messages in descending order. It provides the total number of errors, and the date, time, elapsed time for each error message.

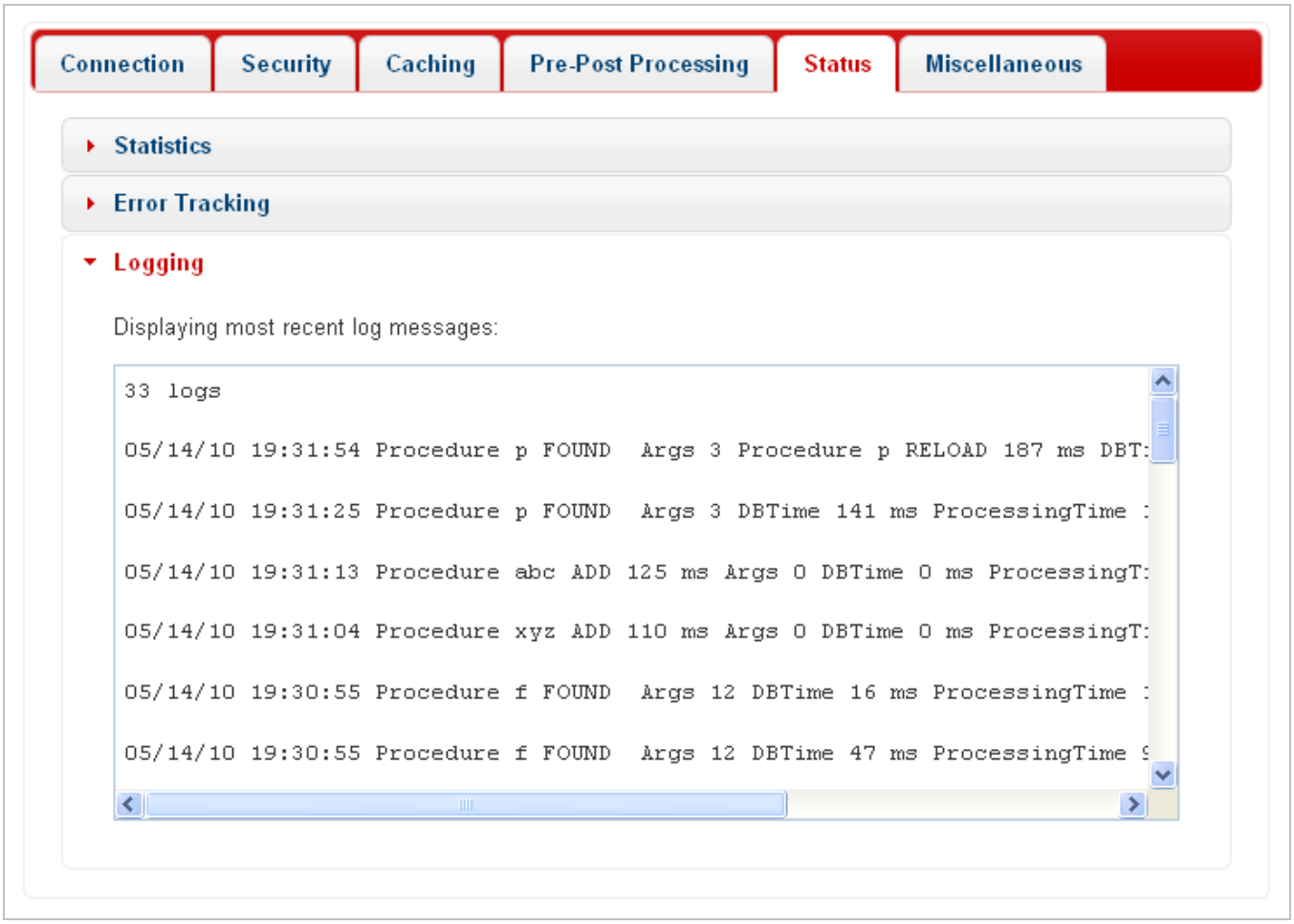
Click on the Error Tracking header to expand or collapse the content.



Logging

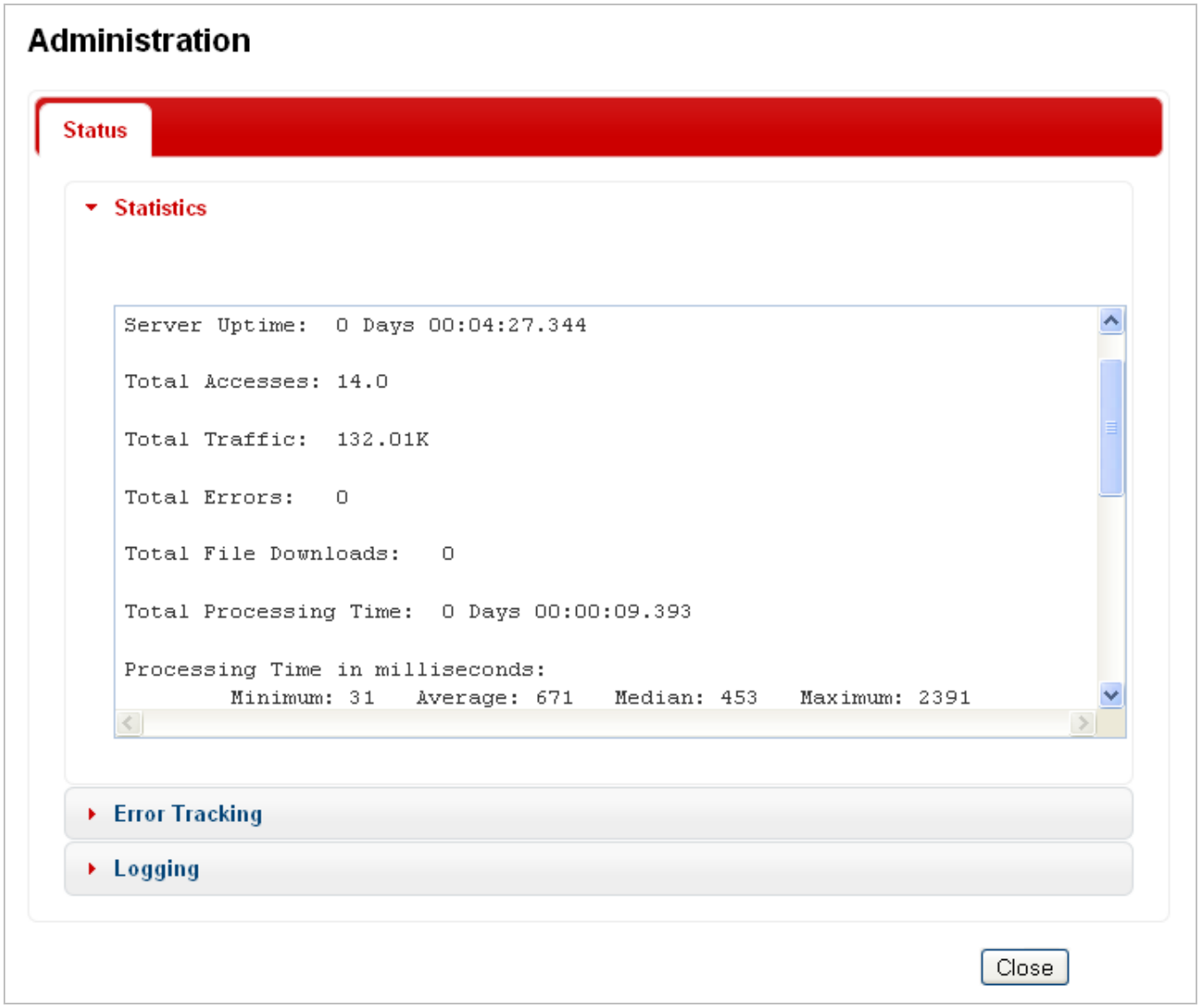
The Logging displays the different type of activities occurring in the APEX Listener such as adding a procedure to the cache, finding a procedure in the cache or reloading a procedure. It displays the database time and processing time in milliseconds for that procedure.

Click on the Logging header to expand or collapse the content.



Status Information for Users with Manager Role

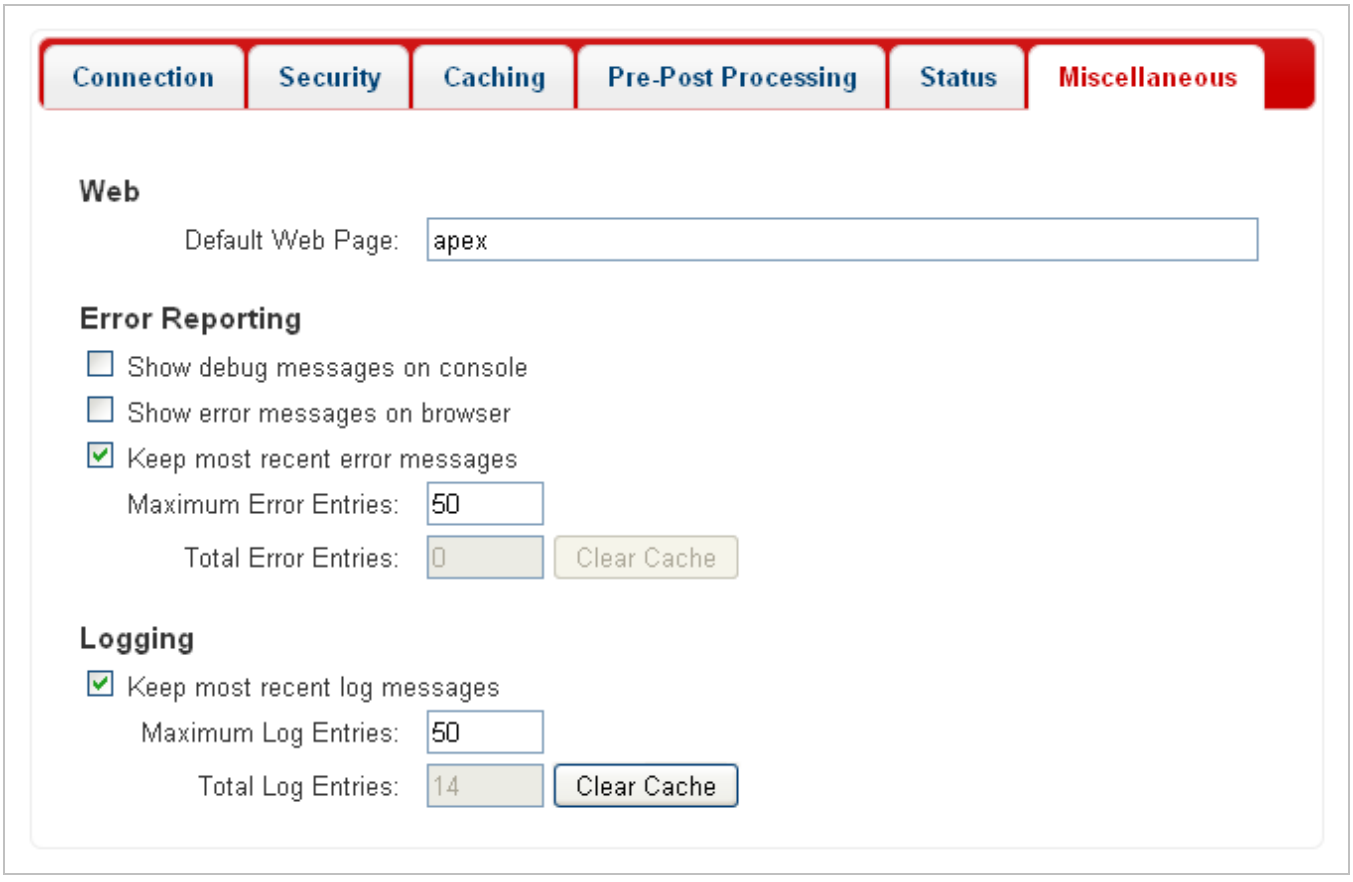
The Status information will only be displayed for users with the Manager role. The user can view the Statistics, Error Tracking and Logging. Refer to Status Information for additional information.



Miscellaneous

The Miscellaneous tab provides various options. The user can specify the default web page, enable the different types of error reporting and logging.

Option	Description
Default Web Page	Specify the default page to display. The Oracle Application Express home page, apex, is commonly used.
Show debug messages on console	Indicate whether to display debugging messages on the application server console.
Show error messages on browser	Indicate whether to display error messages on the browser.
Keep most recent error messages	Indicate whether to retain the error messages.
Maximum Error Entries	Specify the total number of error messages to retain.
Total Error Entries	Displays the total error entries in the cache.
Clear Cache (Error)	If the total error entries is greater than 0, then the Clear Cache button will be enabled to allow you to delete the error entries.
Keep most recent log messages	Indicate whether to retain the log messages.
Maximum Log Entries	Specify the total number of error messages to retain.
Total Log Entries	Displays the total log entries in the cache.
Clear Cache (Logging)	If the total log entries is greater than 0, then the Clear Cache button will be enabled to allow you to delete the log entries.

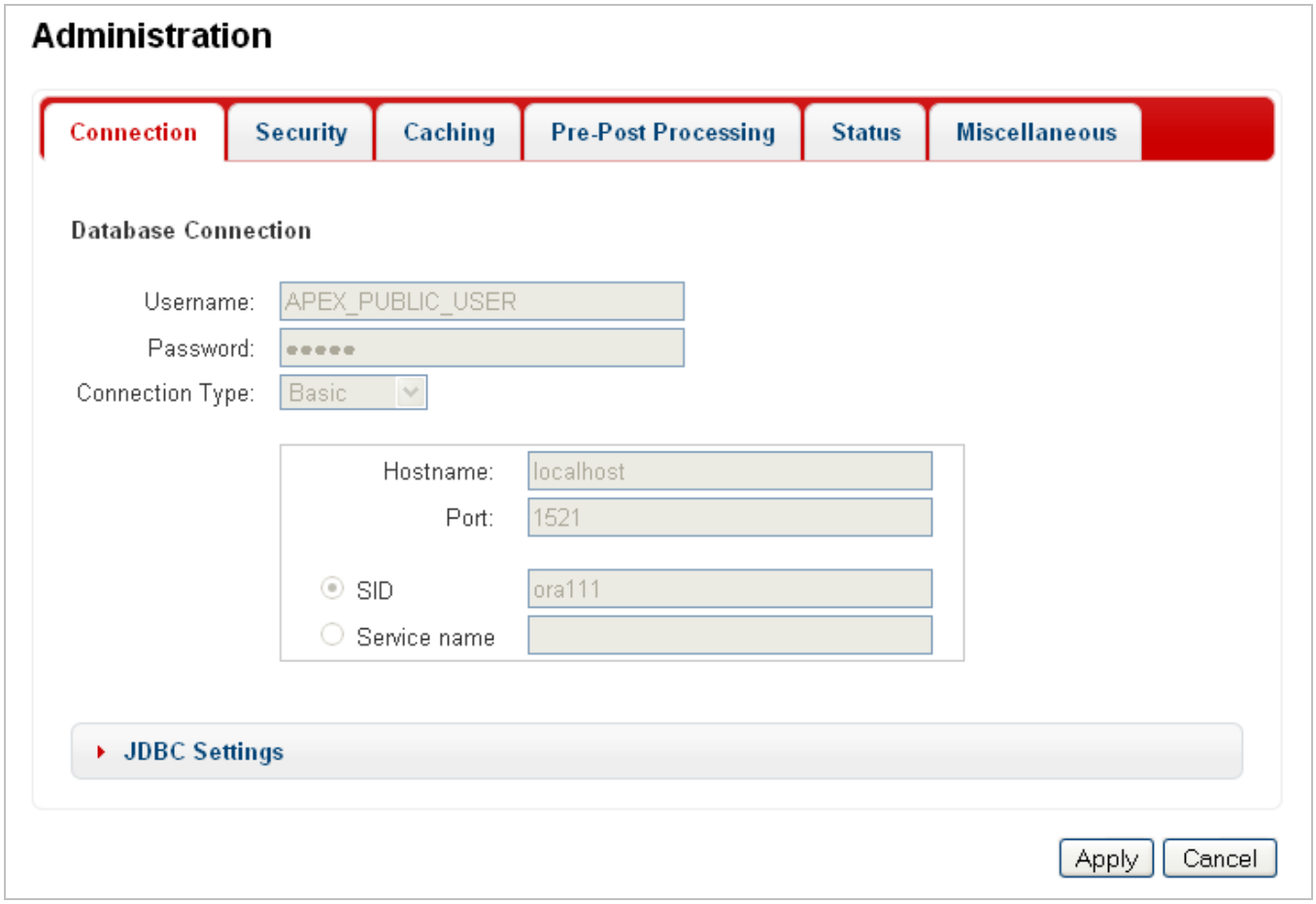


Saving and Applying the Configuration Information

Click on the Apply button when you completed entering your information. The APEX Listener will validate the information entered. If the APEX Listener detects missing data or incorrect information, then an error message is displayed. The user would need to correct the errors. Upon successful completion, the information is written to the APEX Listener configuration file, and the user is redirected to the default web page.

Updating the Configuration Information

You can update the APEX Listener configuration except for the Database Connection: Username, Password, Connection information and JDBC Driver Type. These values cannot be changed.
Click on the Apply button when you have completed your updates.



Configuration File

The APEX Listener configuration file is created or updated by the APEX Listener Administration.

The APEX Listener configuration file is an XML file document which conforms to the Java Properties policy. The user can create or edit the file manually. The file name of the configuration file is apex-config.xml.

The directory location may be specified in the /<application server directory>/apex/WEB-INF/web.xml file.
The web.xml initialization parameter, config.dir, specifies the location of the configuration file.

The APEX Listener searches for the configuration file at the following locations in this sequence. The Mount Point refers to the name of the deployment on the webserver.

1) $HOME/<Mount Point>/apex-config.xml
2) ${config.dir}/<Mount Point>/apex-config.xml (from web.xml)
3) ${java.io.tmpdir}/<Mount Point>/apex-config.xml (default for new installs)
4) $HOME/apex-config.xml
5) ${config.dir}/apex-config.xml (from web.xml)
6) ${java.io.tmpdir}/APEX/apex-config.xml (default for new installs)

In the configuration file, each entry contains a key and its corresponding value.

Example of an XML file document containing the declaration, entry key and value format:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE properties SYSTEM "http://java.sun.com/dtd/properties.dtd">
<properties>
  <entry key="key.name">value</entry>
   . . .
  <entry key="key.name">value</entry>
</properties>
```

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE properties SYSTEM "http://java.sun.com/dtd/properties.dtd">
<properties>
<comment> Created: Tue Apr 27 03:00:39 PDT 2010  Version: 0.10.111.13.51 </comment>

<entry key="apex.db.username">APEX_PUBLIC_USER</entry>
<entry key="apex.db.password">@05D783103A9583BF206ABCA52F7D2E850B</entry>
<entry key="apex.db.connectionType">basic</entry>
<entry key="apex.db.hostname">localhost</entry>
<entry key="apex.db.port">1521</entry>
<entry key="apex.db.sid">ora111</entry>
<entry key="apex.db.servicename"></entry>
<entry key="apex.db.tnsAliasName">MY_TNSALIAS</entry>
<entry key="apex.db.tnsDirectory">C:\ORACLE\NETWORK\ADMIN</entry>
<entry key="apex.db.customURL"> jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=myhost)(PORT=1521))(CONNECT_DATA=(SERVICE_NAME=ora111.us.oracle.com)))</entry>
<entry key="apex.jdbc.DriverType">thin</entry>
<entry key="apex.jdbc.InitialLimit">3</entry>
<entry key="apex.jdbc.MinLimit">1</entry>
<entry key="apex.jdbc.MaxLimit">10</entry>
<entry key="apex.jdbc.MaxStatementsLimit">10</entry>
<entry key="apex.jdbc.InactivityTimeout">1800</entry>
<entry key="apex.jdbc.AbandonedConnectionTimeout">900</entry>
<entry key="apex.security.inclusionList">apex, p, v, f, wwv_*, apple, y*, c*</entry>
<entry key="apex.security.exclusionList">customer_account,bank*, employe?</entry>
<entry key="apex.security.disableDefaultExclusionList">false</entry>
<entry key="apex.security.requestValidationFunction">CHECK_VALID_PROCEDURE</entry>
<entry key="apex.security.maxEntries">2000</entry>
<entry key="apex.cache.caching">true</entry>
<entry key="apex.cache.procedureNameList">p,download_file</entry>
<entry key="apex.cache.type">lru</entry>
<entry key="apex.cache.maxEntries">500</entry>
<entry key="apex.cache.expiration">7</entry>
<entry key="apex.cache.duration">days</entry>
<entry key="apex.cache.monitorInterval">60</entry>
<entry key="apex.cache.directory">C:\data\cachefiles</entry>
<entry key="apex.procedure.preProcess">SCOTT.PREPROC1, INITIALIZE, PKG1.PROC</entry>
<entry key="apex.procedure.postProcess">SCHEMA1.SUBMIT.REQUEST,FINISHTASK</entry>
<entry key="apex.misc.defaultPage">apex</entry>
<entry key="apex.debug.debugger">false</entry>
<entry key="apex.debug.printDebugToScreen">false</entry>
<entry key="apex.error.keepErrorMessages">true</entry>
<entry key="apex.error.maxEntries">50</entry>
<entry key="apex.log.logging">true</entry>
<entry key="apex.log.maxEntries">50</entry>
</properties>
```

Configuration File Parameters

A list of editable parameters for the APEX Listener configuration file.

Key	Value	Example
apex.db.username	string The name of the database user for the connection.	APEX_PUBLIC_USER
apex.db.password	string The password of the specified database user. Include an exclamation at the beginning of the password so that it can be stored encrypted.	!password4user
apex.db.connectionType	string Allowable values: • basic • tns • advanced The type of connection.	basic
apex.db.hostname	string The host system for the Oracle database.	myhostname
apex.db.port	numeric The database listener port.	1521
apex.db.sid	string The name of the database.	ora111
apex.db.servicename	string The network service name of the database.	ora111.acme.com
apex.db.tnsAliasName	string The TNS alias name that matches the name in the tnsnames.ora file.	MY_TNSALIAS
apex.db.tnsDirectory	string The directory location of your tnsnames.ora file.	C:\ORACLE\NETWORK\ADMIN
apex.db.customURL	string The jdbc url connection to connect to the database.	jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=myhost)(PORT=1521))(CONNECT_DATA=(SERVICE_NAME=ora111.us.oracle.com)))
apex.jdbc.DriverType	string Allowable values: • thin • oci8 The jdbc driver type.	thin

apex.jdbc.InitialLimit	numeric Specify the initial size for the number of connections that will be created. Defaults to 3	3
apex.jdbc.MinLimit	numeric Specify the minimum number of connections. Defaults to 1.	1
apex.jdbc.MaxLimit	numeric Specify the maximum number of connections. Defaults to 10	10
apex.jdbc.MaxStatementsLimit	numeric Specify the maximum number of statements to cache for each connection. Defaults to 10.	10
apex.jdbc.InactivityTimeout	numeric Specify how long an available connection can remain idle before it is closed. The inactivity connection timeout is in seconds. Defaults to 1800.	1800
apex.jdbc.AbandonedConnectionTimeout	numeric Specify how long a borrowed (in use) connection can remain unused before it is considered as abandoned and reclaimed. The abandoned connection timeout is in seconds. Defaults to 900.	900
apex.security.inclusionList	string Specify a pattern for procedures, packages, or schema names which are allowed to be directly executed from a browser. The procedure names can contain the asterisk wildcard character "*", or the question mark "?". The asterisk wildcard character substitutes for zero or more characters, whereas the question mark character substitutes for any one character. Note: separate multiple patterns using commas.	apex, p, v, f, wwv_*, y*, c*
apex.security.exclusionList	string Specify a pattern for procedures, packages, or schema names which are forbidden to be directly executed from a browser. The procedure names can contain the asterisk wildcard character "*", or the question mark "?". The asterisk wildcard character substitutes for zero or more characters, whereas the question mark character	customer_account,bank*, employe?

	substitutes for any one character. Note: separate multiple patterns using commas.	
apex.security.disableDefaultExclusionList	boolean Allowable values: • true • false Defaults to false.	false
apex.security.requestValidationFunction	string Specify a validation function to determine if the requested procedure in the URL should be allowed or disallowed for processing. The function should return true if the procedure is allowed; otherwise, return false.	CHECK_VALID_PROCEDURE
apex.security.maxEntries	numeric Specify the maximum cache size. Defaults to 2000.	2000
apex.cache.caching	boolean Allowable values: • true • false For caching to be enabled, this must be set to true and the procedureNameList must have a procedure. Defaults to false.	true
apex.cache.procedureNameList	string Specify the procedure names to allow for caching of their files. The procedure names can contain the asterisk wildcard character "*", or the question mark "?". The asterisk wildcard character substitutes for zero or more characters, whereas the question mark substitutes for any one character. Each procedure name must be separated by a comma.	p, download_file
apex.cache.type	string Allowable values: • expire • lru Defaults to lru.	lru
apex.cache.maxEntries	numeric Required for lru cache type. Defaults to 500.	500
apex.cache.expiration	numeric	7

	Required for expire cache type. Defaults to 7.	
apex.cache.duration	string Allowable values: • days • minutes • hours Required for expire cache type. Defaults to days.	days
apex.cache.monitorInterval	numeric Interval time is specified in minutes. If the cache type is expire, APEX listener will check the cache every NN minutes for files that have expired. For example, if the monitorInterval is 60, then it will check the cache every 60 minutes. Defaults to 60.	60
apex.cache.directory	string The directory location for the cache files.	C:\data\cachefiles
apex.procedure.preProcess	string Specify the procedure name(s) to execute prior to executing the procedure specified on the URL. Multiple procedure names must be separated by commas.	SCOTT.PREPROC1, INITIALIZE, PKG1.PROC
apex.procedure.postProcess	string Specify the procedure name(s) to execute after executing the procedure specified on the URL. Multiple procedure names must be separated by commas.	SCHEMA1.SUBMIT.REQUEST, FINISHTASK
apex.misc.defaultPage	string The default page to display. The Oracle Application Express home page, apex, is commonly used.	apex
apex.debug.debugger	boolean Indicate whether to display debugging messages on the application server console. Defaults to false.	false
apex.debug.printDebugToScreen	boolean Indicate whether to display error messages on the browser. Defaults to false.	false

apex.error.keepErrorMessages	boolean Indicate whether to retain the error messages. Defaults to false.	true
apex.error.maxEntries	numeric Specify the total number of error messages to retain. Defaults to 50.	50
apex.log.logging	boolean Indicate whether to retain the log messages. Defaults to false.	true
apex.log.maxEntries	numeric Specify the total number of log messages to retain. Defaults to 50.	50