Oracle9*i*AS Single Sign-On

Application Developer’s Guide

Release 3.0.9

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Preface

*Oracle9i*AS Single Sign-On *Application Developer's Guide* provides the information you need to understand and use the Oracle9*i*AS Single Sign-On product and its related applications

This preface contains these topics:

- Audience
- Organization
- Related Documentation
- Conventions
- Documentation Accessibility

Audience

Application Developer's Guide is intended primarily for application developers responsible for integrating Oracle9*i*AS Single Sign-On with partner applications.

Application Developer's Guide is also provided for anyone who wants to understand how Oracle9*i*AS Single Sign-On works.

Organization

This document contains:

Chapter 1, "Introduction" explains how Oracle9*i*AS Single Sign-On solves the problems associated with using and administering user names and passwords for multiple applications in an enterprise.

Chapter 2, "Concepts and Architecture" discusses the significance of Single Sign-On to users and administrators in an enterprise. It describes the components of Single Sign-On, the application types, and the authentication methods Single Sign-On uses. It also explains the process and architecture through which Single Sign-On authenticates users to applications.

Chapter 3, "PL/SQL Single Sign-On Application Programming Interface" explains how to use the PL/SQL Single Sign-On Application Programming Interface (API).

Chapter 4, "Java Oracle9iAS Single Sign-On Application Programming Interface" explains how to use the Java Single Sign-On Application Programming Interface.

Chapter 5, "Examples in PL/SQL and Java" explains how to install Application Programming Interfaces for PL/SQL and Java and gives examples of installation code.

Related Documentation

For more information, see these Oracle resources:

For more information about development related issues, refer to the Readme file included in the Software Development Kit (SDK).

For additional information, see the online help and related documentation for Oracle9*i*AS Portal.In North America, printed documentation is available for sale in the Oracle Store at

`http://oraclestore.oracle.com/`

Customers in Europe, the Middle East, and Africa (EMEA) can purchase documentation from

`http://www.oraclebookshop.com/`

Other customers can contact their Oracle representative to purchase printed documentation.

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://technet.oracle.com/membership/index.htm`

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

`http://technet.oracle.com/docs/index.htm`

Conventions

This section describes the conventions used in the text and code examples of this documentation set. It describes:

- Conventions in Text
- Conventions in Code Examples

Conventions in Text

We use various conventions in text to help you more quickly identify special terms. The following table describes those conventions and provides examples of their use.

Convention	Meaning	Example
Bold	Bold typeface indicates terms that are defined in the text or terms that appear in a glossary, or both.	When you specify this clause, you create an **index-organized table**.
Italics	Italic typeface indicates book titles or emphasis.	*Oracle9i Database Concepts* Ensure that the recovery catalog and target database do *not* reside on the same disk.

Convention	Meaning	Example
`UPPERCASE monospace (fixed-width font)`	Uppercase monospace typeface indicates elements supplied by the system. Such elements include parameters, privileges, datatypes, RMAN keywords, SQL keywords, SQL*Plus or utility commands, packages and methods, as well as system-supplied column names, database objects and structures, usernames, and roles.	You can specify this clause only for a `NUMBER` column. You can back up the database by using the `BACKUP` command. Query the `TABLE_NAME` column in the `USER_TABLES` data dictionary view. Use the `DBMS_STATS.GENERATE_STATS` procedure.
`lowercase monospace (fixed-width font)`	Lowercase monospace typeface indicates executables, filenames, directory names, and sample user-supplied elements. Such elements include computer and database names, net service names, and connect identifiers, as well as user-supplied database objects and structures, column names, packages and classes, usernames and roles, program units, and parameter values. **Note:** Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.	Enter `sqlplus` to open SQL*Plus. The password is specified in the `orapwd` file. Back up the datafiles and control files in the `/disk1/oracle/dbs` directory. The `department_id`, `department_name`, and `location_id` columns are in the `hr.departments` table. Set the `QUERY_REWRITE_ENABLED` initialization parameter to `true`. Connect as `oe` user. The `JRepUtil` class implements these methods.
`lowercase monospace (fixed-width font) italic`	Lowercase monospace italic font represents placeholders or variables.	You can specify the *`parallel_clause`*. Run `U`*`old_release`*`.SQL` where *`old_release`* refers to the release you installed prior to upgrading.

Conventions in Code Examples

Code examples illustrate SQL, PL/SQL, SQL*Plus, or other command-line statements. They are displayed in a monospace (fixed-width) font and separated from normal text as shown in this example:

```
SELECT username FROM dba_users WHERE username = 'MIGRATE';
```

The following table describes typographic conventions used in code examples and provides examples of their use.

Convention	Meaning	Example
[ ]	Brackets enclose one or more optional items. Do not enter the brackets.	`DECIMAL (`*`digits`*` [ , `*`precision`*` ])`
{ }	Braces enclose two or more items, one of which is required. Do not enter the braces.	`{ENABLE | DISABLE}`

|	A vertical bar represents a choice of two or more options within brackets or braces. Enter one of the options. Do not enter the vertical bar.	`{ENABLE | DISABLE}`
		`[COMPRESS | NOCOMPRESS]`

...	Horizontal ellipsis points indicate either:
	■ That we have omitted parts of the code that are not directly related to the example
	■ That you can repeat a portion of the code
		`CREATE TABLE ... AS `*`subquery`*`;`
		`SELECT `*`col1`*`, `*`col2`*`, ... , `*`coln`*` FROM employees;`

. . .	Vertical ellipsis points indicate that we have omitted several lines of code not directly related to the example.	

Other notation	You must enter symbols other than brackets, braces, vertical bars, and ellipsis points as shown.	`acctbal NUMBER(11,2);`
		`acct    CONSTANT NUMBER(4) := 3;`

`Italics`	Italicized text indicates placeholders or variables for which you must supply particular values.	`CONNECT SYSTEM/`*`system_password`*
		`DB_NAME = `*`database_name`*

`UPPERCASE`	Uppercase typeface indicates elements supplied by the system. We show these terms in uppercase in order to distinguish them from terms you define. Unless terms appear in brackets, enter them in the order and with the spelling shown. However, because these terms are not case sensitive, you can enter them in lowercase.	`SELECT last_name, employee_id FROM employees;`
		`SELECT * FROM USER_TABLES;`
		`DROP TABLE hr.employees;`

`lowercase`	Lowercase typeface indicates programmatic elements that you supply. For example, lowercase indicates names of tables, columns, or files.
	Note: Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.
		`SELECT last_name, employee_id FROM employees;`
		`sqlplus hr/hr`
		`CREATE USER mjones IDENTIFIED BY ty3MU9;`

Documentation Accessibility

1 Introduction

This chapter explains how Oracle9*i*AS Single Sign-On solves the problems associated with using and administering user names and passwords for multiple applications in an enterprise.

This chapter contains these topics:

- What Is Oracle9iAS Single Sign-On?
- The Problem of Too Many Passwords
- The Oracle9iAS Single Sign-On Solution

What Is Oracle9*i*AS Single Sign-On?

Oracle9*i*AS Single Sign-On is a service of the Oracle9*i* Application Server that enables:

- Authentication to all appropriate applications in an enterprise by entering a user name and password only once
- Centralized administration of user name and password combinations for all users in an enterprise

This section contains these topics:

- The Problem of Too Many Passwords
- The Oracle9iAS Single Sign-On Solution

The Problem of Too Many Passwords

Within any given enterprise, a typical user accesses several applications: one, for example, to create expense reports, another to use email, and still another to schedule appointments. Each application requires the user to enter a valid user name and password, which presents three major difficulties:

- Inconvenience

  A user must enter a user name and password to access each and every application. Moreover, it can be difficult to remember the user name and password combinations for multiple applications.

- Poor security

  To remember so many user name and password combinations, users often use one of two strategies:

  - They use the same combination for all applications. This makes it possible for a thief who steals that combination to access all of the user's applications.
  - They use multiple combinations, writing them on pieces of paper that can be lost, stolen, or observed. The more user name and password combinations, the greater the risk that one or more of them may be lost or stolen.

- Difficulty of administration

It can be costly and difficult to administer password stores for multiple applications. To create or delete a user, or change a password, an administrator must tediously make changes in each application.

The Oracle9*i*AS Single Sign-On Solution

With Oracle9*i*AS Single Sign-On, users typically sign on to a centrally administered Login Server through a central Web portal. Once it authenticates a particular user, the Login Server displays links to all the applications for that user.

Using a central Web portal with a centrally administered Login Server has these advantages:

- Convenience

  The user enters the user name and password only once, at a central corporate Web portal, to access all the needed applications. From the user's perspective, authentication to each application happens transparently.

- Increased security

  Fewer user name and password combinations lowers the risk of a thief stealing them and gaining access to a user's restricted information.

- Ease of administration

  Oracle9*i*AS Single Sign-On provides centralized provisioning of user accounts, so that administrators can easily create new user accounts.

  Centralizing the authentication process also makes it possible to support additional authentication mechanisms in a localized manner. For example, you can implement an LDAP-based authentication, or digital certificate-based authentication, and the change would be localized to the Login Server.

2
Concepts and Architecture

This chapter describes the components of Oracle9*i*AS Single Sign-On, the kinds of applications to which it can provide access, and the authentication methods it uses. It explains the process and architecture through which Oracle9*i*AS Single Sign-On authenticates users to applications.

This chapter contains these topics:

- Components of Single Sign-On
- Single Sign-On Application Types
- Single Sign-On Authentication Methods
- How Single Sign-On Works

Components of Single Sign-On

Oracle9*i*AS Single Sign-On has two components:

- Login Server
- Single Sign-On Application Programming Interface (API)

Login Server

The first time that a user seeks access to an application, the Login Server:

- Authenticates the user by means of user name and password
- Passes the user's identity to the various applications
- Marks the user being authenticated with an encrypted login cookie

In subsequent user logins, the login cookie provides the Login Server with the user's identity, and indicates that authentication has already been performed. If there is no login cookie, the Login Server presents the user with a login challenge.

To guard against sniffing, the Login Server can send the login cookie to the client browser over an encrypted SSL channel.

The login cookie expires with the session, either at the end of a time interval specified by the administrator, or when the user exits the browser. It is never written to disk.

A partner application can expire its session through its own explicit logout.

Note: To logout of a partner application and log in as another user, you must also log out of the Login Server session. Otherwise, the authentication request returns the partner application to the logged in state of the previous user.

Single Sign-On Application Programming Interface (API)

The Oracle9*i*AS Single Sign-On API enables:

- Applications to communicate with the Login Server and to accept a user's identity as validated by the Login Server
- Administrators to manage the application's association to the Login Server

Single Sign-On Application Types

There are two kinds of applications to which Oracle9*i*AS Single Sign-On provides access:

- Partner Applications
- External Applications

Partner Applications

Partner applications are integrated with the Login Server. They contain a Oracle9*i*AS Single Sign-On API that enables them to accept a user's identity as validated by the Login Server.

External Applications

External applications are web-based applications that retain their authentication logic. They do not delegate authentication to the Login Server and, as such, require a user name and password to provide access. Currently, these applications are limited to those which employ an HTML form for accepting the user name and password. The user name may be different from the SSO user name, and the Login Server provides the necessary mapping.

Single Sign-On Authentication Methods

Oracle9*i*AS Single Sign-On can use one of these authentication methods:

Table 2-1 Single Sign-On Authentication Methods

Local user authentication	Uses a lookup table within the Login Server schema. This table contains user name, password, Login Server privilege level, and other auditing fields for the user. The incoming password is one-way hashed and compared to the entry in the table.
External repository authentication	Typically relies on an LDAP-compliant directory. In this case, the Login Server binds to the LDAP-compliant directory, then looks up the user credentials stored there. External Authentication includes LDAP and Database Authentication and any others that may be custom-developed.

How Single Sign-On Works

Whenever a user accesses either a partner application or an external application, the Login Server first authenticates that user.

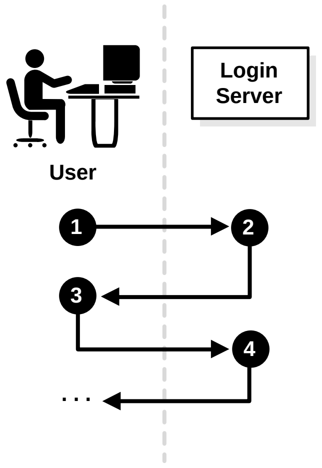
This section contains these topics:

- Authenticating to the Login Server
- Accessing a Partner Application
- Accessing an External Application

Authenticating to the Login Server

The Login Server authenticates a user as follows:

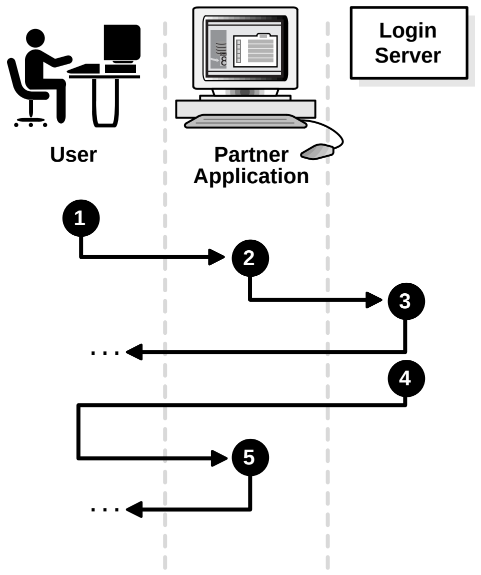
1. The Login Server checks for a login cookie. If one is present, the Login Server identifies the user from the encrypted information in the login cookie.
2. If a login cookie is not present, the Login Server prompts the user for the user's credentials.
3. The user provides the user name and password.
4. The Login Server authenticates the user by passing the provided name and password to the configured authentication routine—either the local routine or one provided by an external authentication module for an external repository. If the authentication is successful, the Login Server establishes a login cookie on the client browser to facilitate Single Sign-On for future authentication requests.



See Also: "Login Server" for information on the login cookie

Accessing a Partner Application

When a user seeks access to a partner application, the following:



1. The user seeks access to the partner application directly.

2. If this is the first time during a session that the user is accessing the partner application, the partner application transparently directs the user to the Login Server to obtain authentication credentials.

3. The Login Server authenticates the user as described in "Authenticating to the Login Server."

4. The Login Server transparently directs the user to the partner application. It does this by using a URL with an encrypted parameter containing the user’s identity.

5. The partner application:

—Decrypts the parameter

—Identifies the user

—Establishes its own session management

Note: In Step 2 of this process, the partner application directs the user to the Login Server only if the application requires it based on the URL requested. Some URLs may be public and no redirection to the Login Server is necessary. When it is necessary, the partner application must protect itself from unauthenticated access by using its own session management.

If, during the same session, the user again seeks access to the same or to a different partner application, the Login Server does not prompt the user for user name and password. Instead, the Login Server obtains that information from the login cookie on the client browser.

Partner Application Development Requirement

- To implement an authentication check:

  1. Protected URLs need to check for an application session cookie for authorization.

2. If no application session cookie exists, then the browser redirects the user to the Single Sign-On server.
3. If the URL is publicly accessible, then no authorization check is implemented.

- To implement a sign-on URL:
  1. This URL must establish an application session cookie using the identity information sent by the Single Sign-On server.
  2. The browser then redirects the user to the requested URL

Accessing an External Application

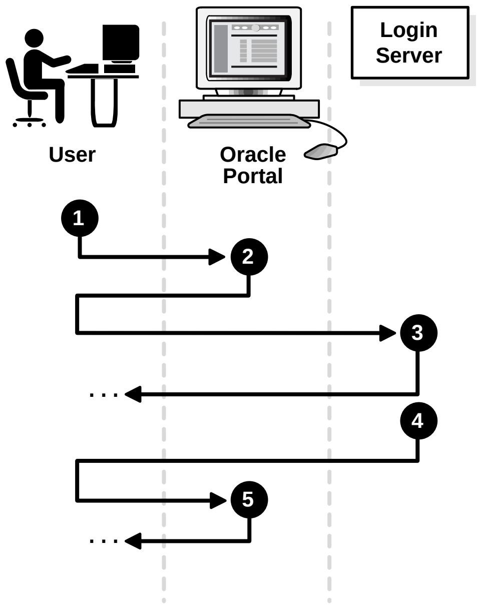
You can accessing an external application through Oracle9*i*AS Portal. In this scenario, Oracle9*i*AS Portal functions as a partner application.

This section contains these topics:

- Authenticating to Oracle9iAS Portal
- Authenticating to an External Application for the First Time
- Authenticating to an External Application After the First Time

Authenticating to Oracle9*i*AS Portal

When a user seeks access to an external application by way of Oracle9*i*AS Portal, Oracle9*i*AS Single Sign-On authenticates the user to Oracle9*i*AS Portal through this process:



1. The user seeks access to the Oracle9iAS Portal site.

2. If this is the first time during a session that the user is accessing Oracle9iAS Portal, then Oracle9iAS Portal transparently directs the user to the Login Server to obtain authentication credentials.

3. The Login Server authenticates the user as described in "Authenticating to the Login Server."

4. The Login Server transparently directs the user to Oracle9iAS Portal. It does this by using a URL with an encrypted parameter containing the user’s identity.

5. Oracle9iAS Portal:

—Decrypts the parameter

—Identifies the user

—Establishes its own session management

—Presents the user with links to the external applications

If, during the same session, the user again seeks access to Oracle9*i*AS Portal, the Login Server does not prompt the user for user name and password. Instead, it obtains that information from the login cookie on the client browser.

Authenticating to an External Application for the First Time

Oracle9*i*AS Single Sign-On uses the process described in the next figure under these conditions:

- The user has authenticated to the Oracle9*i*AS Portal
- The user is accessing an external application for the first time through Oracle9*i*AS Portal

1. Oracle9iAS Portal presents to the user links to external applications. These links invoke a routine on the Login Server.

2. A user clicks one of the links.

3. The user's clicking a link invokes on the Login Server the external application login procedure. This procedure checks the Login Server password store for the user's credentials for the requested external application. If it finds that the user has no such credentials, then the Login Server prompts the user for them.

4. The user enters the user name and password. The user can also indicate whether to save these credentials in the Login Server password store.

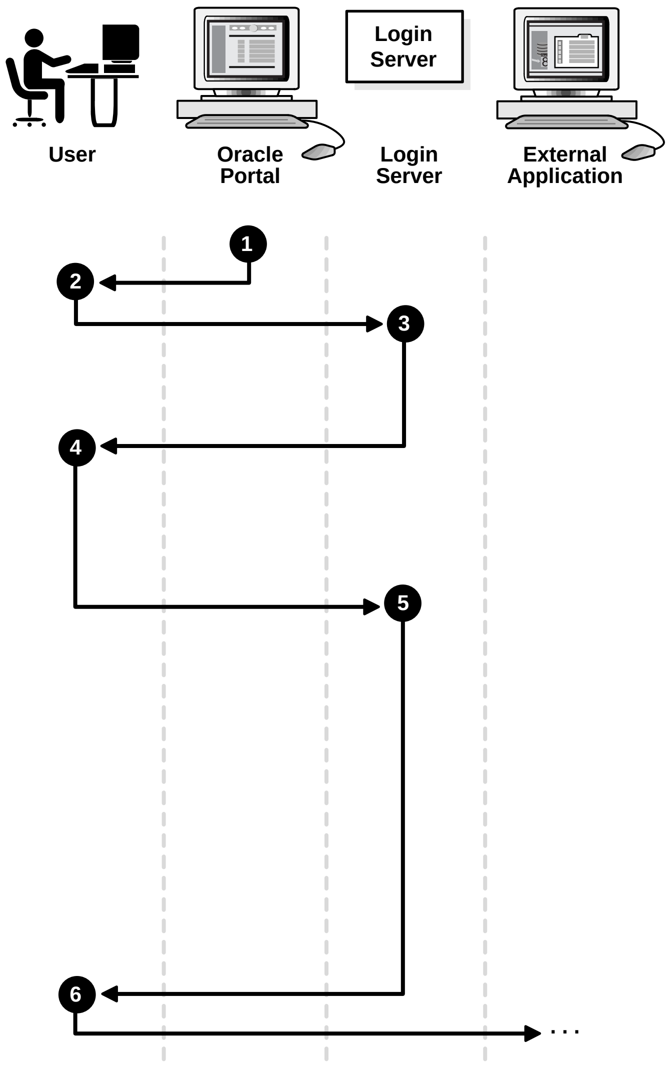
5. If the user chooses to save the credentials in the Login Server password store, then the Login Server saves them. The Login Server performs the following tasks:

—Constructs a login page using the user's credentials

—Formulates the form to post to the external application login processing routine. This routine has been preconfigured by the Login Server administrator and associated with the requested application.

—Sends the form to the client browser, with a directive to post it immediately to the external application

6. The client posts the form to the external application and logs in.



Authenticating to an External Application After the First Time

Oracle9*i*AS Single Sign-On uses the process described in the next figure if the user:

- Has authenticated to the Oracle9*i*AS Portal
- Has a user name and password in the Login Server password store
- Is accessing an external application after the first time

1. Oracle9iAS Portal presents to the user links to external applications. These links invoke a routine on the Login Server.

2. A user clicks one of the links.

3.The user's clicking a link invokes on the Login Server the external application login procedure. This procedure checks the password store for any credentials the user has for the requested external application.

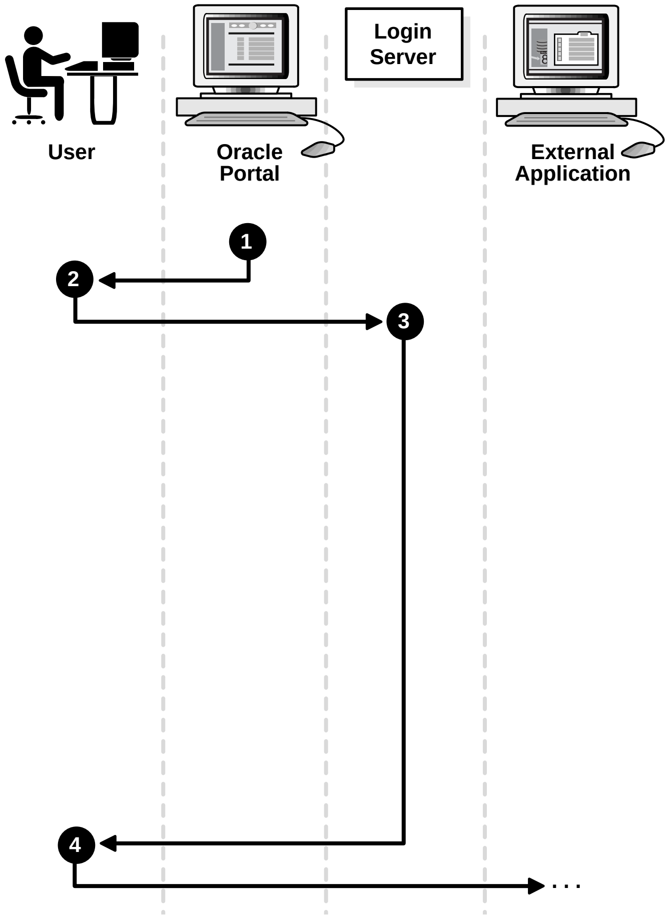
The Login Server then:

—Constructs a login page using the user's credentials

—Formulates the form to post to the external application's login processing routine. This routine has been preconfigured by the Login Server administrator and associated with the requested application.

—Sends the form to the client browser, with a directive to post it immediately to the external application

4. The client posts the form to the external application and logs in.



If the user has not stored a user name and password in the Login Server password store, then Oracle9*i*AS Single Sign-On follows the process described in "Authenticating to an External Application for the First Time".

3

PL/SQL Single Sign-On Application Programming Interface

This chapter explains how to use the PL/SQL Single Sign-On Application Programming Interface.

This chapter contains these topics:

- Developing Partner Applications
- Exceptions
- Datatype and Table Definitions

Developing Partner Applications

The information in this section allows you to enable applications to participate in Oracle9*i*AS Single Sign-On by becoming partner applications. It discusses the application restructuring required. It also describes the basic architecture and explains where the API calls in this package are to be used.

This section contains these topics:

- How a Partner Application Works
- Functions and Procedures

How a Partner Application Works

Partner applications delegate user authentication to the Login Server. When the application determines that this delegation is needed, it uses `WWSEC_SSO_ENABLER_PRIVATE.GENERATE_REDIRECT` to obtain the URL to which it performs the redirect.

As a result of this redirect, the Login Server:

- Authenticates the user.
- Calls a procedure that it is configured to call in the partner application. It makes this call by redirecting the browser to the specified procedure.

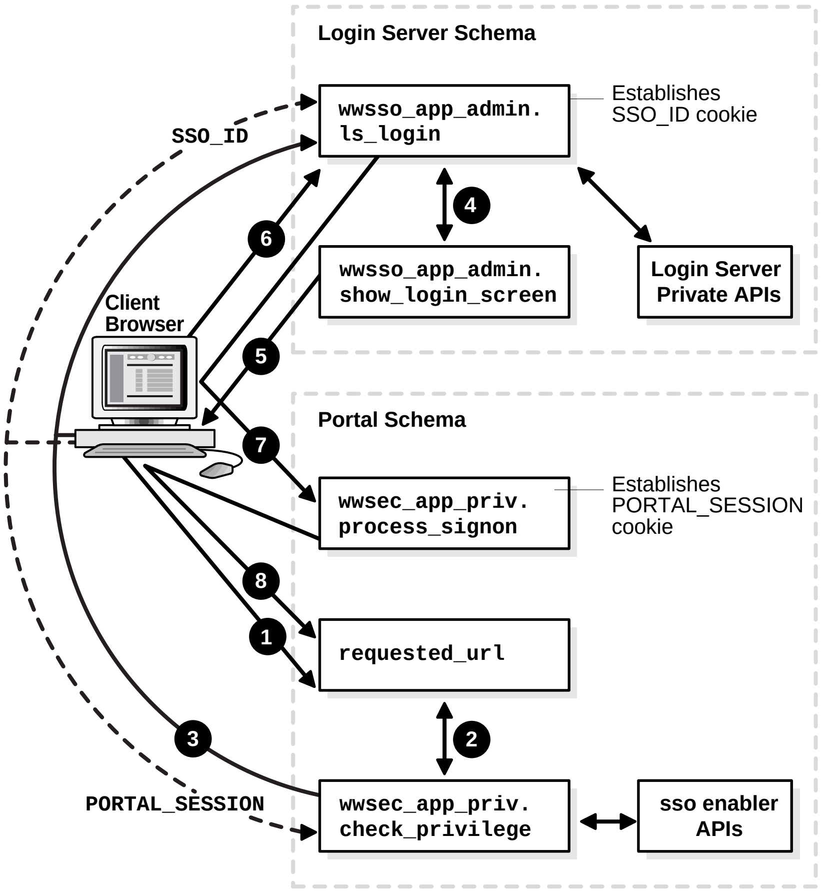
The procedure that the Login Server calls has a single `VARCHAR2` parameter that has the default name `URLC` (an abbreviation for URL Cookie). This procedure should parse the encrypted value that is passed in this parameter by using the `WWSEC_SSO_ENABLER_PRIVATE.PARSE_URL_COOKIE` procedure. This parsing enables the partner application to obtain the `ssousername` and the `urlrequested` from the parameter.

The partner application should then establish an application session for the `ssousername` obtained from the parameter. Typically, this means that the application establishes a cookie for its own use, and may set up some session information internally. The application can then redirect to the `urlrequested` that is typically the protected URL that the user seeks to access.

Each application must develop its own convention for protecting pages that need authentication. Ideally, a well-defined procedure or function is established that all components of the application can use for access control. When it is determined that the user needs to be authenticated, then the application can perform the redirect to the Login Server from the single centralized place.

The Oracle9*i*AS Single Sign-On Process for a Partner Application

The figure that follows illustrates the Login Server authentication sequence used by Oracle9*i*AS Portal as a partner application.



1. The browser requests a URL. This URL could be a PL/SQL procedure in Oracle9*i*AS Portal. It also could be indirectly a PL/SQL procedure of the `WWDOC_PROCESS.PROCESS_DOWNLOAD` procedure that is invoked when requesting a document resident in Oracle9*i*AS Portal.

   If the procedure has no security, then it simply returns HTML, resulting in the display of the page.

2. If the procedure applies access restrictions, it calls internal Oracle9*i*AS Portal security APIs to check whether the current user has privileges on the current procedure. Typically, this is accomplished by calling an Oracle9*i*AS Portal security function, `WWSEC_APP_PRIV.CHECK_PRIVILEGE`. This function in turn checks whether the user is logged on by inspecting the current session information obtained from the `portal_session` cookie. If the user is not logged in, and, as a public user, has insufficient privileges to execute the procedure, then `WWSEC_APP_PRIV.CHECK_PRIVILEGE` must invoke the login sequence. Note that there will always be a `portal_session` cookie, because the Oracle9*i*AS Portal gateway establishes a public session if it cannot find an existing cookie. The cookie name is specified in the Database Access Descriptor (DAD), and if not specified, defaults to the DAD name.

3. To initiate the login sequence, Oracle9*i*AS Portal generates a redirect request to the Login Server, using enabler APIs provided by the Login Server to generate the token that is passed as a URL parameter. The token contains the name of the partner application, the URL that was requested in the partner application, and, optionally, another URL to return to if authentication is canceled by the user. The Login Server `LS_LOGIN` procedure checks for an SSO_ID cookie, referred to as the login cookie. It checks whether this specific browser has already performed a Login Server authentication within this session. If it has, then the Login Server uses the information in the login cookie and does not provide the user with another authentication challenge.

4. If the login cookie is not present, then the Login Server calls the `SHOW_LOGIN_SCREEN` procedure.

5. The Login Server presents a login page to the user, prompting the user for a user name and password.

6. The user enters a user name and password and submits the form.

   The Login Server then authenticates the user's user name and password, using the configured authentication mechanism.

   If the authentication fails, then the login page is displayed again with an error message.

If the user clicks Cancel on the login page, then the Login Server redirects the page to the cancel URL provided in the initial request (in Step 3).

If the authentication is successful, then the Login Server establishes a login cookie. The default name for this cookie is `SSO_ID`. It keeps track of the user name of the user that logged in, and the session expiry time.

7. The Login Server constructs a URL with an encrypted parameter containing the user's identity for processing by the partner application. The Login Server sends this URL to the partner application with the purpose of:

   - Informing the partner application that the user has successfully authenticated
   - Providing the user name with which the user authenticated
   - Returning the URL that is being requested by the user

   The URL to which this parameter is passed is stored in the Login Server configuration table. The Partner Application entry specifies:

   - The URL that will process this parameter
   - The name of the parameter itself

   In Oracle9*i*AS Portal, the name of the procedure that processes this is `WWSEC_APP_PRIV.PROCESS_SIGNON`. The parameter name is `URLC`. This procedure uses the `WWSEC_SSO_ENABLER_PRIVATE.PARSE_URL_COOKIE` API to get the SSO user name and the requested URL. When this procedure is invoked, Oracle9*i*AS Portal converts the `portal_session` cookie to an authenticated cookie, updating the user name with the logged in user's name, and, if necessary, updating the associated `db_user`. Also, the `WWCTX_SSO_SESSION$` table is updated with the updated session information. The session is then flagged as logged on.

8. The `PROCESS_SIGNON` procedure redirects the browser to the URL initially requested by the user. The `CHECK_PRIVILEGE` function is invoked. Because the user is logged in, it is possible to check whether the user has sufficient privilege, by using the APIs that query the Oracle9*i*AS Portal `WWSEC_SYS_PRIV$` table, to invoke the procedure.

   If the user has sufficient privileges, the procedure executes. If the user does not hve sufficient privileges, an error page indicating insufficient privileges is displayed.

When a user later seeks access to secured pages, the `CHECK_PRIVILEGE` procedure sees the authenticated `portal_session` cookie, and does not need to interact with the Login Server. Instead, it uses the privilege APIs to determine whether the user has sufficient access privileges.

Functions and Procedures

The functions and procedures in this section are part of the `WWSEC_SSO_ENABLER_PRIVATE` package. This package is used to enable a PL/SQL application to become a partner application.

This section contains these topics:

- PAPP_SHOW_CONFIG Procedure
- GENERATE_REDIRECT Function (URL Cookie Version V1.0)
- PARSE_URL_COOKIE Function (URL Cookie Version V1.0)
- GET_ENABLER_CONFIG Function
- CREATE_ENABLER_CONFIG Procedure
- UPDATE_ENABLER_CONFIG Procedure
- DELETE_ENABLER_CONFIG Procedure

PAPP_SHOW_CONFIG Procedure

This procedure returns enabler configuration information for a partner application.

Syntax

```
PROCEDURE PAPP_SHOW_CONFIG
(
    P_LSNR_TOKEN IN VARCHAR2
ENABLER_CONFIG IN OUT sec_enabler_config_type
);
```

Table 3–1   PAPP_SHOW_CONFIG Procedure Parameters

Parameter	Description
`P_LSNR_TOKEN`	Listener token to get the necessary partner application registration configuration
`ENABLER_CONFIG`	Enabler configuration type

Example

```
wwsec_sso_enabler_private.papp_show_config
(
   p_lsnr_token =>  listener token
   enabler_config => enabler configuration type
);
```

GENERATE_REDIRECT Function (URL Cookie Version V1.0)

This function generates a redirect URL along with SITE2PSTORETOKEN that the Login Server parses.

Syntax

```
FUNCTION GENERATE_REDIRECT
(
   P_LSNR_TOKEN IN VARCHAR2,
   URLREQUESTED IN VARCHAR2,
   URLONCANCEL IN VARCHAR2
) RETURN VARCHAR2;
```

Table 3–2   GENERATE_REDIRECT Function Parameters

Parameter	Description
P_LSNR_TOKEN	Listener token to get the necessary partner application registration configuration. The listener token is the host name and port used on the URL for the current request. This is used to select the appropriate configuration entry in the WWSEC_ ENABLER_CONFIG_INFO$ table.
URLREQUESTED	URL requested by the client for which authentication is needed
URLONCANCEL	URL to go to if client clicks cancel on the login page

Table 3–3 GENERATE_REDIRECT Function Return Values

Return Value	Description
REDIRECTURL	URL to which the partner application must direct the browser to delegate authentication to the Login Server. This URL contains the request for authentication.

Example

```
WWSEC_SSO_ENABLER_PRIVATE.GENERATE_REDIRECT
(
    p_lsnr_token => listener token
   ,urlrequested => URL requested by the client for which authentication is
                  needed
   ,urloncancel => URL to go to if client clicks cancel on the login page
);
```

Depending on the architecture of the system, it may be necessary for an application to be accessible through multiple web addresses. The partner application establishes an application session cookie to keep track of authenticated sessions. Since cookies have scoping properties, the session cookie needs to be scoped to the appropriate web address.

When a partner application requests authentication, the GENERATE_REDIRECT function creates the site2pstoretoken parameter, containing the ID of the partner application (site_id, site_token). This is used to look up the appropriate partner configuration on the Login Server. Also in the Login Server's partner configuration data is the URL that should be called on a successful authentication to establish the partner application's session. The URL for this 'Success URL' must have the same cookie scope (since it will be generating the cookie from this URL) as the requested URL. For this reason, each entry in the partner's configuration table must have a corresponding entry in the Login Server partner configuration file. The `p_lsnr_token` is what is used by the partner application to look up the appropriate configuration entry based on the current request. To establish the correct cookie scope, it needs to use a `p_lsnr_token`, which will retrieve the appropriate enabler entry. Typically, the `p_lsnr_token` should be the `hostname.domain:port` of the current request if the cookie path is scoped to the root "/." (without quotes) Otherwise, if the cookie is scoped down to a path, then the `p_lsnr_token` should include a path as well.

PARSE_URL_COOKIE Function (URL Cookie Version V1.0)

This function parses the URL cookie that is generated by the `GENERATE_REDIRECT` function on the Login Server side.

Syntax

```
PROCEDURE parse_url_cookie
(
   P_LSNR_TOKEN        IN VARCHAR2,
   ENCRYPTED_URLCOOKIE IN VARCHAR2,
   SSOUSERNAME      IN OUT VARCHAR2,
   IPADD            IN OUT VARCHAR2,
   SSOTIMEREMAINING IN OUT NUMBER,
   SITETIMESTAMP    IN OUT DATE,
   URLREQUESTED     IN OUT VARCHAR2,
   SUBSCRIBER_ID    IN OUT NUMBER
   NEWSITEKEY       IN OUT VARCHAR2
);
```

Table 3–4 PARSE_URL_COOKIE Function Parameters

Parameter	Description
`P_LSNR_TOKEN`	Listener token to get the necessary partner application registration configuration
`ENCRYPTED_URLCOOKIE`	URL cookie
`SSOUSERNAME`	SSO user name
`IPADD`	IP Address of user
`SSOTIMEREMAINING`	Time remaining on SSO session
`SITETIMESTAMP`	Timestamp at cookie generation
`URLREQUESTED`	URL that the client is attempting to access
`NEWSITEKEY`	Reserved for future use

Example

```
WWSEC_SSO_ENABLER_PRIVATE.PARSE_URL_COOKIE
(
    p_LSNR_TOKEN     => listener token
   ,ENCRYPTED_URLCOOKIE => URL cookie
   ,SSOUSERNAME      => ssousername
   ,IPADD            => IP Address of user
   ,SSOTIMEREMAINING => time remaining on SSO session
   ,SITETIMESTAMP    => timestamp at cookie generation
   ,URLREQUESTED     => URL that the client is authenticated to access
   ,SUBSCRIBER_ID    => Resend for future use
   ,NEWSITEKEY       => reserved for future use
);
```

GET_ENABLER_CONFIG Function

This function returns the partner application registration information specified by the listener token.

Syntax

```
PROCEDURE get_enabler_config
(
    P_LSNR_TOKEN IN VARCHAR2
) RETURN sec_enabler_config_type;
```

Table 3–5 GET_ENABLER_CONFIG Function Parameters

Parameter	Description
P_LSNR_TOKEN	Listener token to get the necessary partner application registration configuration

Example

```
WWSEC_SSO_ENABLER_PRIVATE.GET_ENABLER_CONFIG
(
   p_lsnr_token => listener token
)
```

CREATE_ENABLER_CONFIG Procedure

This procedure stores the partner application registration information specified by the listener token into the enabler configuration table.

Syntax

```
PROCEDURE create_enabler_config
(
    P_CONFIG IN sec_enabler_config_type
);
```

Table 3–6 CREATE_ENABLER_CONFIG Procedure Parameters

Parameter	Description
P_CONFIG	sec_enabler_config_type object which contains partner application registration information

Example

```
WWSEC_SSO_ENABLER_PRIVATE.CREATE_ENABLER_CONFIG
(
   p_config => sec_enabler_config_type object
)
```

UPDATE_ENABLER_CONFIG Procedure

This procedure updates the partner application registration information specified by the listener token.

Syntax

```
PROCEDURE update_enabler_config
(
    P_LSNR_TOKEN IN VARCHAR2,
    P_CONFIG     IN sec_enabler_config_type
);
```

Table 3–7 UPDATE_ENABLER_CONFIG Procedure Parameters

Parameter	Description
P_LSNR_TOKEN	Listener token to get the necessary partner application registration configuration
P_CONFIG	`sec_enabler_config_type` object which contains partner application registration information

Example

```
WWSEC_SSO_ENABLER_PRIVATE.UPDATE_ENABLER_CONFIG
(
   p_lsnr_token   => listener token
   ,p_config      => sec_enabler_config_type object
)
```

DELETE_ENABLER_CONFIG Procedure

This procedure deletes the partner application registration information specified by the listener token.

Syntax

```
PROCEDURE delete_enabler_config
(
    P_LSNR_TOKEN  IN VARCHAR2
);
```

Table 3–8 DELETE_ENABLER_CONFIG Procedure Parameters

Parameter	Description
P_LSNR_TOKEN	Listener token to get the necessary partner application registration configuration

Example

```
WWSEC_SSO_ENABLER_PRIVATE.DELETE_ENABLER_CONFIG
(
   p_lsnr_token =>  listener token
)
```

Exceptions

This section lists and describes the exceptions raised by the procedures and functions in this chapter.

Table 3–9 Exceptions

Exception	Description
COOKIE_DECRYPTION_FAILED	Decryption of URL parameter failed.
COOKIE_ENCRYPTION_FAILED	Creation of site2pstore token failed.
DUP_ENABLER_EXCEPTION	Site with the same name already exists.
ENABLER_CONFIG_NOT_FOUND	Could not find configuration information for partner site.
MANDATORY_ATTRIBUTE_IS_NULL	Login Server registration information is not correct.
INVALID_IP_ADDRESS	IP address contained in the URLC does not match the client's IP address.
UNSUPPORTED_COOKIE_VERSION	Cookie version is not supported.
URL_COOKIE_EXPIRED	URL cookie is timed out. The URLC parameter will time out if the user takes more than about 5 minutes to log in.

Datatype and Table Definitions

SEC_ENABLER_CONFIG_TYPE

This is the object type for partner application configuration.

```
CREATE OR replace TYPE sec_enabler_config_type AS object
  (
  lsnr_token              VARCHAR2(255)
  , site_token            VARCHAR2(255)
  , site_id               VARCHAR2(255)
  , ls_login_url          VARCHAR2(1000)
  , urlcookie_version     VARCHAR2(80)
  , encryption_key        VARCHAR2(1000)
  , encryption_mask_pre   VARCHAR2(1000)
  , encryption_mask_post  VARCHAR2(1000)
  , url_cookie_ip_check   VARCHAR2(1)
  );
```

WWSEC_ENABLER_CONFIG_INFO$

This table stores partner application configuration information.

```
create table wwsec_enabler_config_info$ OF sec_enabler_config_type
  (
  lsnr_token              constraint wwsec_seci_pk primary key
  , site_token            constraint wwsec_seci_uk1 UNIQUE
  , site_id               constraint wwsec_seci_uk2 UNIQUE
  , ls_login_url         NOT NULL
  , urlcookie_version     NOT NULL
  , encryption_key        NOT NULL
  , encryption_mask_pre   NOT NULL
  , encryption_mask_post  NOT NULL
  , CHECK (url_cookie_ip_check IN ('Y','N'))
  );
```

WWSEC_SSO_LOG

This table stores debug information when debug is enabled.

```
CREATE TABLE wwsec_sso_log$
(
  , SUBSCRIBER_ID  NUMBER  NOT NULL
  , id  NUMBER
  , msg  VARCHAR2(1000)
  , log_date DATE
 );
```

4 Java Oracle9*i*AS Single Sign-On Application Programming Interface

The Java package, `oracle.security.sso.enabler,` contains information about how application developers can use Java classes and methods to enable web users to access partner applications by means of Oracle9iAS Single Sign-On. This chapter should be used as a reference and assumes that the reader is familiar with PL/SQL functions and procedures for using Oracle9iAS Single Sign-On.

This chapter contains these topics:

- Package
  - SSOConfigException
  - SSOEnabler
  - SSOEnablerConfig
  - SSOEnablerConfigMgr
  - SSOEnablerException
  - SSOEnablerUtil
  - SSOIpCheckException
  - SSOTokenExpiredException
  - SSOUserInfo
  - SSOVersionException

See Also: Chapter 3, "PL/SQL Single Sign-On Application Programming Interface"

Package

oracle.security.sso.enabler

Description

Class Summary

Classes	
`SSOEnabler`	This class implements the enabler stack of the Oracle9*i*AS Single Sign-On service for partner application development.
`SSOEnablerConfig`	This class is used with SSOEnabler class for configutation parameters setup
`SSOEnablerConfigMgr`	This class implements the enabler stack of Oracle9*i*AS Single Sign-On service for partner application development.
`SSOEnablerUtil`	
`SSOUserInfo`	This class is used for returning user information after parsing redirect url from SSOEnabler class
Exceptions	
`SSOConfigException`	This exception is raised when SSO enabler configuration is missing or have wrong parameter
`SSOEnablerException`	Generic exception class for Login Server SSO SDK This class is subclass of java.lang.Exception
`SSOIpCheckException`	This exception is raised if the IP address of the original requested URL do not match.
`SSOTokenExpiredException`	This exception is raised if user takes too long time to enter username and password to the Login Server login page
`SSOVersionException`	This exception is raised if the SDK version does not match with Login Server version or the enabler version information is not correct

oracle.security.sso.enabler

SSOConfigException

Syntax:

public class `SSOConfigException` extends `SSOEnablerException`

```
java.lang.Object
  |
  +--java.lang.Throwable
        |
        +--java.lang.Exception
              |
              +--SSOEnablerException
                    |
                    +--oracle.security.sso.enabler.SSOConfigException
```

All Implemented Interfaces:

java.io.Serializable

Description:

This exception is raised when SSO enabler configuration is missing or have wrong parameter.

This class is subclass of `SSOEnablerException`.

Member Summary

Constructors	
`SSOConfigException()`	Constructs a `SSOConfigException` object with out error message.
`SSOConfigException(String)`	Constructs a `SSOConfigException` object with a error message.

Inherited Member Summary

Methods inherited from class java.lang.Throwable

fillInStackTrace, getLocalizedMessage, getMessage, printStackTrace, printStackTrace, printStackTrace, toString

Inherited Member Summary

Methods inherited from class java.lang.Object
equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

Constructors

SSOConfigException()

Syntax:
```
public  SSOConfigException()
```

Description:

Constructs a `SSOConfigException` object with out error message.

SSOConfigException(String)

Syntax:

```
public  SSOConfigException(java.lang.String p_str)
```

Description:

Constructs a `SSOConfigException` object with a error message.

oracle.security.sso.enabler

SSOEnabler

Syntax:

```
public class SSOEnabler extends java.lang.Object

java.lang.Object
  |
  +--oracle.security.sso.enabler.SSOEnabler
```

Description:

This class implements the enabler stack of the Oracle9*i*AS Single Sign-On service for partner application development.

Since:

1.0

Member Summary

Constructors	
`SSOEnabler()`	Creates an Oracle9*i*AS Single Sign-On enabler object, with no database connection
`SSOEnabler(Connection)`	Creates an Oracle9*i*AS Single Sign-On enabler object, with database connection
Methods	
`generateRedirect(String, String, String)`	It generates a redirect URL from requested URL and cancel URL.
`getSSOUserInfo(String, String, InetAddress)`	It parses a redirect URL from Oracle9*i*AS Single Sign-On server which contains user information.
`setDbConnection(Connection )`	Initializes Oracle9*i*AS Single Sign-On enabler object, with a database connection

Inherited Member Summary

Methods inherited from class java.lang.Object

Inherited Member Summary

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SSOEnabler()

Syntax:
```
public  SSOEnabler()
```

Description:

Creates an Oracle9*i*AS Single Sign-On enabler object, with no database connection

SSOEnabler(Connection)

Syntax:
```
public  SSOEnabler(java.sql.Connection p_db_conn)
```

Description:

Creates an Oracle9*i*AS Single Sign-On enabler object, with database connection

Methods

generateRedirect(String, String, String)

Syntax:

```
public java.lang.String generateRedirect(java.lang.String p_listenerToken,
java.lang.String p_requestedUrl, java.lang.String p_onCancelUrl)
```

Description:

It generates a redirect URL from requested URL and cancel URL. When a partner application wants to authenticate a user, it redirects the user(browser) to the Oracle9*i*AS Single Sign-On server with this URL. The requested URL string is the URL which user want to access and the cancel URL string is the URL where Oracle9*i*AS Single Sign-On server will redirect the user, if user dosen't want to authenticate at that moment.

Returns:

Redirect URL

Throws:

`SSOEnablerException` - if there is an error in constructing redirect URL

getSSOUserInfo(String, String, InetAddress)

Syntax:

```
public SSOUserInfo getSSOUserInfo(java.lang.String p_listenerToken,
java.lang.String p_cookieStr, java.net.InetAddress p_clientIp)
```

Description:

It parses a redirect URL from Oracle9*i*AS Single Sign-On server which contains user information.

Returns:

`SSOUserInfo` object which will contain user information

Throws:

`SSOEnablerException` - if there is an error in parsing

setDbConnection(Connection)

Syntax:

```
public void setDbConnection(java.sql.Connection p_db_conn)
```

Description:

Initializes Oracle9*i*AS Single Sign-On enabler object, with a database connection

Throws:

`SSOEnablerException` - if the database connection lost

oracle.security.sso.enabler

SSOEnablerConfig

Syntax:

```
public class SSOEnablerConfig extends java.lang.Object

java.lang.Object
  |
  +--oracle.security.sso.enabler.SSOEnablerConfig
```

Description:

This class is used with `SSOEnabler` class for configutation parameters setup

Since:

1.0

Member Summary

Constructors	
`SSOEnablerConfig()`	Constructor that sets none of the properties.
`SSOEnablerConfig(String, String, String, String, String, String, String, String, String)`	Constructor that sets all of the propeties
Methods	
`getEncryptionKey()`	Returns the encryption key.
`getEncryptionMaskPost()`	Returns the post encryption mask
`getEncryptionMaskPre()`	Returns the pre encryption mask
`getListnerToken()`	Returns the listner token.
`getLoginUrl()`	Returns the login URL.
`getSiteID()`	Returns the site ID.
`getSiteToken()`	Returns the site token.
`getUrlCookieIPCheck()`	Returns the url cookie IP check.
`getUrlCookieVersion()`	Returns the URL cookie version.

Member Summary	
`setEncryptionKey(String)`	Sets the encryption key.
`setEncryptionMaskPost(String)`	Sets the post encryption mask
`setEncryptionMaskPre(String)`	Sets the pre encryption mask
`setListnerToken(String)`	Sets the listner token.
`setLoginUrl(String)`	Sets the login URL.
`setSiteID(String)`	Sets the site ID.
`setSiteToken(String)`	Sets the site token.
`setUrlCookieIPCheck(String)`	Sets the url cookie IP check.
`setUrlCookieVersion(String)`	Sets the URL cookie version.

Inherited Member Summary
Methods inherited from class java.lang.Object
equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SSOEnablerConfig()

Syntax:

```
public  SSOEnablerConfig()
```

Description:

Constructor that sets none of the properties.

SSOEnablerConfig(String, String, String, String, String, String, String, String, String)

Syntax:

```
public  SSOEnablerConfig(java.lang.String p_listenerToken, java.lang.String p_
siteToken, java.lang.String p_siteID, java.lang.String p_loginURL,
java.lang.String p_urlCookieVersion, java.lang.String p_encryptionKey,
java.lang.String p_encryptionMaskPre, java.lang.String p_encryptionMaskPost,
java.lang.String p_urlCookieIPCheck)
```

Description:

Constructor that sets all of the propeties

Methods

getEncryptionKey()

Syntax:

```
public java.lang.String getEncryptionKey()
```

Description:

Returns the encryption key.

Returns:

The encryption key.

getEncryptionMaskPost()

Syntax:

```
public java.lang.String getEncryptionMaskPost()
```

Description:

Returns the post encryption mask

Returns:

The post encryption mask

getEncryptionMaskPre()

Syntax:

```
public java.lang.String getEncryptionMaskPre()
```

Description:

Returns the pre encryption mask

Returns:

The encryption mask pre.

getListnerToken()

Syntax:
```
public java.lang.String getListnerToken()
```

Description:

Returns the listner token.

Returns:

The listner token.

getLoginUrl()

Syntax:
```
public java.lang.String getLoginUrl()
```

Description:

Returns the login URL.

Returns:

The login URL.

getSiteID()

Syntax:
```
public java.lang.String getSiteID()
```

Description:

Returns the site ID.

Returns: The site ID.

getSiteToken()

Syntax:

```
public java.lang.String getSiteToken()
```

Description:

Returns the site token.

Returns:

The site token.

getUrlCookieIPCheck()

Syntax:

```
public java.lang.String getUrlCookieIPCheck()
```

Description:

Returns the url cookie IP check.

Returns:

The url cookie IP check.

getUrlCookieVersion()

Syntax:

```
public java.lang.String getUrlCookieVersion()
```

Description:

Returns the URL cookie version.

Returns:

The URL cookie version.

setEncryptionKey(String)

Syntax:
`public void setEncryptionKey(java.lang.String p_encryptionKey)`

Description:

Sets the encryption key.

Parameters:

`encryptionKey` - The encryption key.

setEncryptionMaskPost(String)

Syntax:
`public void setEncryptionMaskPost(java.lang.String p_encryptionMaskPost)`

Description:

Sets the post encryption mask

Parameters:

`encryptionMaskPost` - The post encryption mask

setEncryptionMaskPre(String)

Syntax:
`public void setEncryptionMaskPre(java.lang.String p_encryptionMaskPre)`

Description:

Sets the pre encryption mask

Parameters:

`encryptionMaskPre` - The encryption mask pre.

setListnerToken(String)

Syntax:

```
public void setListnerToken(java.lang.String p_listnerToken)
```

Description:

Sets the listner token.

Parameters:

`listnerToken` - The listner token.

setLoginUrl(String)

Syntax:

```
public void setLoginUrl(java.lang.String p_loginURL)
```

Description:

Sets the login URL.

Parameters:

`loginURL` - The login URL.

setSiteID(String)

Syntax:

```
public void setSiteID(java.lang.String p_siteID)
```

Description:

Sets the site ID.

Parameters:

`siteID` - The site ID.

setSiteToken(String)

Syntax:

```
public void setSiteToken(java.lang.String p_siteToken)
```

Description:

Sets the site token.

Parameters:

`siteToken` - The site token.

setUrlCookieIPCheck(String)

Syntax:
```
public void setUrlCookieIPCheck(java.lang.String p_urlCookieIPCheck)
```

Description:

Sets the url cookie IP check.

Parameters:

`urlCookieIPCheck` - The url cookie IP check.

setUrlCookieVersion(String)

Syntax:
```
public void setUrlCookieVersion(java.lang.String p_urlCookieVersion)
```

Description:

Sets the URL cookie version.

Parameters:

`urlCookieVersion` - The URL cookie version.

oracle.security.sso.enabler

SSOEnablerConfigMgr

Syntax:
```
public class SSOEnablerConfigMgr extends java.lang.Object

java.lang.Object
```

```
 |
 +--oracle.security.sso.enabler.SSOEnablerConfigMgr
```

Description:

This class implements the enabler stack of Oracle9*i*AS Single Sign-On service for partner application development.

Since:

1.0

Member Summary

Constructors	
`SSOEnablerConfigMgr()`	Creates an Oracle9*i*AS Single Sign-On enabler object, with no database connection
`SSOEnablerConfigMgr(Connection)`	Creates an Oracle9*i*AS Single Sign-On enabler object, with database connection
Methods	
`createEnablerConfig(SSOEnablerConfig)`	Creates configuration parameters of the SSO enabler specified by the listner token.
`deleteEnablerConfig(String)`	Deletes the configuration parameters of the SSO enabler specified by the listner token.
`getEnablerConfig(String)`	Returns the configuration parameters of the SSO enabler specified by the listner token.
`setDbConnection(Connection)`	Initializes Oracle9*i*AS Single Sign-On enabler object, with a database connection
`setEnablerConfig(String, SSOEnablerConfig)`	Updates the configuration parameters of the SSO enabler specified by the listner token.

Inherited Member Summary

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SSOEnablerConfigMgr()

Syntax:
`public  SSOEnablerConfigMgr()`

Description:

Creates an Oracle9*i*AS Single Sign-On enabler object, with no database connection

SSOEnablerConfigMgr(Connection)

Syntax:
`public  SSOEnablerConfigMgr(java.sql.Connection p_db_conn)`

Description:

Creates an Oracle9*i*AS Single Sign-On enabler object, with database connection

Methods

createEnablerConfig(SSOEnablerConfig)

Syntax:
`public void createEnablerConfig(SSOEnablerConfig p_configuration)`

Description:

Creates configuration parameters of the SSO enabler specified by the listner token.

Parameters:

`p_configuration` - The configuration for the SSO enabler to be added. All the members of this class must be filled in except for encryptionMaskPre and encryptionMaskPost which must be empty strings ("").

Throws:

`SSOEnablerException`- Raised if database connection is lost, the database is not configured properly, or invalid data is passed into this procedure.

deleteEnablerConfig(String)

Syntax:

```
public void deleteEnablerConfig(java.lang.String p_listenerToken)
```

Description:

Deletes the configuration parameters of the SSO enabler specified by the listner token.

Parameters:

`p_listenerToken` - The listner token of the SSO enabler p_configuration that is to be deleted.

Throws:

`SSOEnablerException` - Raised if database connection is lost, the database is not configured properly, or invalid data is passed into this procedure.

getEnablerConfig(String)

Syntax:

```
public SSOEnablerConfig getEnablerConfig(java.lang.String p_listenerToken)
```

Description:

Returns the configuration parameters of the SSO enabler specified by the listner token.

Parameters:

`p_listenerToken` - The listner token of the SSO enabler p_configuration that is to be selected.

Returns:

An instance of `SSOEnablerConfig` containing the p_configuration of the SSO enabler specified by the listner token.

Throws:

`SSOEnablerException` - Raised if database connection is lost, the database is not configured properly, or the listner token is invalid.

setDbConnection(Connection)

Syntax:

```
public void setDbConnection(java.sql.Connection p_db_conn)
```

Description:

Initializes Oracle9*i*AS Single Sign-On enabler object, with a database connection

Throws:

`SSOEnablerException` - if the database connection lost

setEnablerConfig(String, SSOEnablerConfig)

Syntax:

```
public void setEnablerConfig(java.lang.String p_listenerToken,SSOEnablerConfig
(p_configuration)
```

Description:

Updates the configuration parameters of the SSO enabler specified by the listner token.

Parameters:

`p_listenerToken` - The listner token of the SSO enabler p_configuration that is to be updated.

`p_configuration` - The configuration for the SSO enabler to be updated. All the members of this class must be filled in.

Throws:

`SSOEnablerException` - Raised if database connection is lost, the database is not configured properly, or invalid data is passed into this procedure.

oracle.security.sso.enabler

SSOEnablerException

Syntax:

```
public class SSOEnablerException extends java.lang.Exception

java.lang.Object
  |
  +--java.lang.Throwable
        |
        +--java.lang.Exception
              |
              +--oracle.security.sso.enabler.SSOEnablerException
```

Direct Known Subclasses:

`SSOConfigException`, `SSOIpCheckException`, `SSOTokenExpiredException`, `SSOVersionException`

All Implemented Interfaces:

`java.io.Serializable`

Description:

Generic exception class for Login Server SSO SDK This class is subclass of java.lang.Exception

Member Summary

Constructors	
`SSOEnablerException()`	Constructs a `SSOEnablerException` object with out error message.
`SSOEnablerException(String)`	Constructs a `SSOEnablerException` object with a error message.

Inherited Member Summary

Methods inherited from class java.lang.Throwable

Inherited Member Summary

fillInStackTrace, getLocalizedMessage, getMessage, printStackTrace, printStackTrace, printStackTrace, toString

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

Constructors

SSOEnablerException()

Syntax:

```
public  SSOEnablerException()
```

Description:

Constructs a `SSOEnablerException` object with out error message.

SSOEnablerException(String)

Syntax:

```
public  SSOEnablerException(java.lang.String p_str)
```

Description:

Constructs a `SSOEnablerException` object with a error message.

oracle.security.sso.enabler

SSOEnablerUtil

Syntax:

```
public class SSOEnablerUtil extends java.lang.Object

java.lang.Object
  |
  +--oracle.security.sso.enabler.SSOEnablerUtil
```

Description:

Member Summary

Constructors	
`SSOEnablerUtil()`	Creates a utility object for application cookie baking / unbaking, with no database connection
`SSOEnablerUtil(Connection)`	Creates a utility object for application cookie baking / unbaking, with database connection
Methods	
`bakeAppCookie(String, String)`	This method will bake the input application cookie for encryption and hashing The return string will be encrypted along with hashed application cookie
`genHtmlPostForm(String)`	This method will generate a html post form to the login server url from generate redirect url
`genRedirect(String)`	This method will generate a html redirect to the specified url
`setDbConnection(Connection)`	Initializes utility object for application cookie baking / unbaking, with a database connection
`unbakeAppCookie(String, String)`	This method will unbake the input baked application cookie The return string will be decrypted application cookie

Inherited Member Summary

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SSOEnablerUtil()

Syntax:

```
public  SSOEnablerUtil()
```

Description:

Creates a utility object for application cookie baking / unbaking, with no database connection

SSOEnablerUtil(Connection)

Syntax:
```
public  SSOEnablerUtil(java.sql.Connection p_db_conn)
```

Description:

Creates a utility object for application cookie baking / unbaking, with database connection

Methods

bakeAppCookie(String, String)

Syntax:
```
public java.lang.String bakeAppCookie(java.lang.String p_listenerToken,
java.lang.String p_appCookie)
```

Description:

This method will bake the input application cookie for encryption and hashing The return string will be encrypted along with hashed application cookie

Parameters:

`p_listenerToken` - Listener token for the specific login server

`p_appCookie` - Application cookie

Returns:

Baked application cookie

Throws:

`SSOEnablerException` - if the database connection lost or any other error occurs

genHtmlPostForm(String)

Syntax:
```
public static java.lang.String genHtmlPostForm(java.lang.String p_
genRedirectUrl)
```

Description:

This method will generate a html post form to the login server url from generate redirect url

Parameters: `p_genRedirectUrl` - generate redirect url

Returns: html redirect url

Throws: `IllegalArgumentException` - if the input url is incorrect

genRedirect(String)

Syntax:
`public static java.lang.String genRedirect(java.lang.String p_redirectUrl)`

Description:

This method will generate a html redirect to the specified url

Parameters:

`p_redirectUrl` - generate redirect url

Returns:

html post form for login server

Throws:

`IllegalArgumentException` - if the input url is incorrect

setDbConnection(Connection)

Syntax:
`public void setDbConnection(java.sql.Connection p_db_conn)`

Description:

Initializes utility object for application cookie baking / unbaking, with a database connection

Throws:

`SSOEnablerException` - if the database connection lost

unbakeAppCookie(String, String)

Syntax:

```
public java.lang.String unbakeAppCookie(java.lang.String p_listenerToken,
java.lang.String p_bakedAppCookie)
```

Description:

This method will unbake the input baked application cookie The return string will be decrypted application cookie

Parameters:

`p_listenerToken` - Listener token for the specific login server

`p_bakedAppCookie` - Unbaked application cookie

Returns:

Unbaked application cookie

Throws:

`SSOEnablerException` - if the database connection is lost or any other error occurs

oracle.security.sso.enabler

SSOIpCheckException

Syntax:

```
public class SSOIpCheckException extends SSOEnablerException
```

```
java.lang.Object
  |
  +--java.lang.Throwable
        |
        +--java.lang.Exception
              |
              +-- SSOEnablerException
```

```
|
+--oracle.security.sso.enabler.SSOIpCheckException
```

All Implemented Interfaces:

`java.io.Serializable`

Description

This exception is raised if the IP address of the original requested URL do not match. If the request came through a proxy server which may not have fixed IP then this exception will be raised. This exception can be disabled by disabling IP check while entering registration information to the enabler configuration table.

This class is subclass of `SSOEnablerException`

Member Summary

Constructors	
`SSOIpCheckException()`	Constructs a `SSOIpCheckException` object with out error message.
`SSOIpCheckException(String)`	Constructs a `SSOIpCheckException` object with a error message.

Inherited Member Summary

Methods inherited from class java.lang.Throwable

fillInStackTrace, getLocalizedMessage, getMessage, printStackTrace, printStackTrace, printStackTrace, toString

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

Constructors

SSOIpCheckException()

Syntax:

```
public  SSOIpCheckException()
```

Description:

Constructs a `SSOIpCheckException` object with out error message.

SSOIpCheckException(String)

Syntax:

```
public  SSOIpCheckException(java.lang.String p_str)
```

Description:

Constructs a `SSOIpCheckException` object with a error message.

oracle.security.sso.enabler

SSOTokenExpiredException

Syntax:

```
public class SSOTokenExpiredException extends SSOEnablerException

java.lang.Object
  |
  +--java.lang.Throwable
        |
        +--java.lang.Exception
              |
              +-- SSOEnablerException
                    |
                    +--oracle.security.sso.enabler.SSOTokenExpiredExcept
ion
```

All Implemented Interfaces:

`java.io.Serializable`

Description:

This exception is raised if user takes too long time to enter username and password to the Login Server login page

This class is subclass of `SSOEnablerException`

Member Summary

Constructors	
`SSOTokenExpiredException()`	Constructs a `SSOTokenExpiredException` object with out error message.
`SSOTokenExpiredException(String)`	Constructs a `SSOTokenExpiredException` object with a error message.

Inherited Member Summary

Methods inherited from class java.lang.Throwable

fillInStackTrace, getLocalizedMessage, getMessage, printStackTrace, printStackTrace, printStackTrace, toString

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

Constructors

SSOTokenExpiredException()

Syntax:

```
public  SSOTokenExpiredException()
```

Description:

Constructs a `SSOTokenExpiredException` object with out error message.

SSOTokenExpiredException(String)

Syntax:

```
public  SSOTokenExpiredException(java.lang.String p_str)
```

Description:

Constructs a `SSOTokenExpiredException` object with a error message.

oracle.security.sso.enabler

SSOUserInfo

Syntax:

```
public class SSOUserInfo extends java.lang.Object

java.lang.Object
  |
  +--oracle.security.sso.enabler.SSOUserInfo
```

Description:

This class is used for returning user information after parsing redirect url from `SSOEnabler` class

Since:

1.0

Member Summary

Methods	
`getIPAddress()`	Returns IP Address
`getSiteTimeStamp()`	Returns the site time stamp
`getSSOTimeRemaining()`	Returns remaining Single Sign-On time in hours
`getSSOUserName()`	Returns Single Sign-On user name
`getUrlRequested()`	Returns requested url

Inherited Member Summary

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Methods

getIPAddress()

Syntax:

```
public java.lang.String getIPAddress()
```

Description:

Returns IP Address

getSiteTimeStamp()

Syntax:

```
public java.sql.Date getSiteTimeStamp()
```

Description:

Returns the site time stamp

getSSOTimeRemaining()

Syntax:

```
public int getSSOTimeRemaining()
```

Description:

Returns remaining Single Sign-On time in hours

getSSOUserName()

Syntax:

```
public java.lang.String getSSOUserName()
```

Description:

Returns Single Sign-On user name

getUrlRequested()

Syntax:

```
public java.lang.String getUrlRequested()
```

Description:

Returns requested url

oracle.security.sso.enabler

SSOVersionException

Syntax:

```
public class SSOVersionException extends SSOEnablerException

java.lang.Object
  |
  +--java.lang.Throwable
        |
        +--java.lang.Exception
              |
              +--SSOEnablerException
                    |
                    +--oracle.security.sso.enabler.SSOVersionException
```

All Implemented Interfaces:

java.io.Serializable

Description

This exception is raised if the SDK version does not match with Login Server version or the enabler version information is not correct

This class is subclass of SSOEnablerException

Member Summary

Constructors

Member Summary	
`SSOVersionException()`	Constructs a `SSOVersionException` object with out a error message.
`SSOVersionException(String)`	Constructs a `SSOVersionException` object with a error message.

Inherited Member Summary

Methods inherited from class java.lang.Throwable

fillInStackTrace, getLocalizedMessage, getMessage, printStackTrace, printStackTrace, printStackTrace, toString

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

Constructors

SSOVersionException()

Syntax:

```
public  SSOVersionException()
```

Description:

Constructs a `SSOVersionException` object with out a error message.

SSOVersionException(String)

Syntax:

```
public  SSOVersionException(java.lang.String p_str)
```

Description:

Constructs a `SSOVersionException` object with a error message.

5

Examples in PL/SQL and Java

This chapter provides some sample programs and examples of code to illustrate for developers how to implement partner applications.

This chapter contains the following topics:

- Writing Partner Application using PL/SQL SSO APIs
- Writing Partner Application Using Java SSO APIs

Note: For additional information about development related issues, refer to the Readme file included in the Software Development Kit (SDK).

Writing Partner Application using PL/SQL SSO APIs

Writing a partner application using PL/SQL requires Oracle Web Agent packages for web related functionality and requires that two procedures be implemented. In the following code example, these two public procedures perform all redirection and parsing functionality. The public procedures are as follows:

- SAMPLE_SSO_PAPP.SSOAPP
- SAMPLE_SSO_PAPP.SIGN_ON

SAMPLE_SSO_PAPP.SSOAPP

This procedure constructs the application URL and it requires authentication to access it. This procedure checks to see if the application cookie exists and user information can be retrieved. Otherwise it redirects the user to the SSO server by generating redirect url.

SAMPLE_SSO_PAPP.SIGN_ON

This procedure gets the URLC token from the SSO server, decrypts it, and retrieves user information and the requested url. It sets the application cookie and redirects the browser to the partner application URL (i.e. SSOAPP URL).

```
// papp.pks

CREATE OR REPLACE PACKAGE sample_sso_papp
IS
    /* Single Sign-On enabled web procedure */
    PROCEDURE ssoapp;

    /* Web procedure for success url of this
     Partner application
    */
    PROCEDURE sign_on(urlc IN VARCHAR2);
END sample_sso_papp;
/
show errors package sample_sso_papp;

//papp.pkb

set define on;
set verify off;

CREATE OR REPLACE PACKAGE BODY sample_sso_papp
IS
```

```
    g_listener_token VARCHAR2(1000);
    g_requested_url  VARCHAR2(1000);
    g_cancel_url     VARCHAR2(1000);
    g_cookie_domain  VARCHAR2(1000);
    p_html_str       VARCHAR2(32000);

    g_cookie_name    VARCHAR2(1000) := '&session_cookie_name';
    g_cookie_path    VARCHAR2(1000) := '/';
    g_dad_name       VARCHAR2(100)  := '&partner_app_dad_name';
    g_schema_name    VARCHAR2(100)  := user;

PROCEDURE init_params
AS
   l_host_name        VARCHAR2(256);
   l_server_port      VARCHAR2(256);
   l_protocol         VARCHAR2(256);
BEGIN
   begin
     htp.init;
   exception
     when others then null;
   end;

   l_host_name := owa_util.get_cgi_env('SERVER_NAME');
   l_server_port := owa_util.get_cgi_env('SERVER_PORT');
   -- the mod_plsql gateway will pass in the protocol in
   -- a new environment variable REQUEST_PROTOCOL.
   -- The SERVER_PROTOCOL, which the Apache Listener sets,
   -- and currently always sets to HTTP/1.0, will not be
   -- modified by the gateway.
   l_protocol := owa_util.get_cgi_env('REQUEST_PROTOCOL');

   g_listener_token := l_host_name || ':' || l_server_port;
   if(l_protocol is null) or (length(l_protocol) = 0) then
     l_protocol := 'http';
   end if;
   l_protocol := lower(l_protocol);
   g_requested_url := l_protocol || '://' || g_listener_token
     || '/pls/' || g_dad_name || '/' ||g_schema_name ||'.sample_sso_
papp.ssoapp';
   g_cancel_url := l_protocol || '://' || g_listener_token;
   g_cookie_domain := l_host_name;
EXCEPTION
  when others then
    htp.p(SQLERRM);htp.nl;
```

```
END init_params;


/* Get user information */
FUNCTION get_user_info
    RETURN VARCHAR2
IS
    l_user_info  VARCHAR2(1000);
    l_app_cookie owa_cookie.cookie;
BEGIN

    l_app_cookie := owa_cookie.get(g_cookie_name);
    if (l_app_cookie.num_vals > 0)
    then
      l_user_info  := l_app_cookie.vals(1);
    else
      l_user_info  := NULL;
    end if;
    return l_user_info;
EXCEPTION
    WHEN OTHERS THEN
      htp.p('get_user_info: '||SQLERRM);htp.nl;
END get_user_info;

function gen_html_post_str
(
    l_gen_url IN VARCHAR2
)
   RETURN VARCHAR2
IS
   l_htmlstr  varchar2(1000);
   l_ls_url   varchar2(1000);
   l_tname    varchar2(100);
   l_tvalue   varchar2(1000);
   l_len      number;
   l_qindex   number;
   l_eq_index number;
BEGIN
   l_len      := length(l_gen_url);
   l_qindex   := instr(l_gen_url, '?');
   l_eq_index := instr(l_gen_url, '=');

   l_ls_url := substr(l_gen_url, 0,  l_qindex-1);
   l_tname  := substr(l_gen_url, l_qindex+1, l_eq_index-l_qindex-1);
   l_tvalue := substr(l_gen_url, l_eq_index+1);
   l_htmlstr :=
      '<HTML><BODY onLoad="document.LoginForm.submit();">'
   || '<FORM ACTION="' || l_ls_url || '" METHOD="POST" NAME="LoginForm">'
   || '<INPUT TYPE="HIDDEN" NAME="' || l_tname
         || '" VALUE="' || l_tvalue  || '">'
   || '</FORM></BODY></HTML>';
   return l_htmlstr;
EXCEPTION
  WHEN OTHERS THEN
    htp.p(sqlerrm);
END gen_html_post_str;

PROCEDURE ssoapp
IS
    l_user_info        VARCHAR2(1000);
    l_gen_redirect_url VARCHAR2(32000);
    l_html_str         VARCHAR2(32000);
BEGIN
    init_params;
    l_user_info := get_user_info;
    IF l_user_info is  NULL THEN

        l_gen_redirect_url :=
        wwsec_sso_enabler_private.generate_redirect
        (
            p_lsnr_token => g_listener_token,
            urlrequested => g_requested_url,
            urloncancel  => g_cancel_url
        );
       htp.p('Redirecting to the Login Server for authentication...');
       --
       -- The l_gen_redirect_url is usually large url which might
       -- get truncated by the browser.
       -- Instead of using owa_util.redirect_url, we will use
       -- HTTP POST for sending redirect.
       -- For moblie application etc. it may not be possible to use HTTP
       -- POST since it may not support html hidden form parameter.
       -- owa_util.redirect_url(l_gen_redirect_url);
       --
       l_html_str := gen_html_post_str(l_gen_redirect_url);
       htp.p(l_html_str);
    ELSE
        htp.htmlOpen;
        htp.headOpen;
        htp.title('PL/SQL based SSO Partner Application');
        htp.headCLose;
        htp.bodyOpen;
        htp.p('Congratulations! It is working!<br>');
        htp.p('User Information:' || l_user_info || '<br>');
        htp.bodyClose;
        htp.htmlClose;
    END IF;
EXCEPTION
    WHEN  no_data_found OR
        wwsec_sso_enabler_private.enabler_config_not_found THEN
       htp.p('Error in application: missing application registration
information');
       htp.p('<br>');
       htp.p('Please register this application as described in installation
guide');
       htp.nl;
   WHEN others THEN
       htp.p('Error in application:' || sqlerrm);
       htp.nl;
END ssoapp;

PROCEDURE sign_on
(
    urlc IN VARCHAR2
)
IS
    l_urlc                VARCHAR2(32000);
    l_sso_user_name       VARCHAR2(1000);
    l_ip_address          VARCHAR2(1000);
    l_sso_time_remaining  VARCHAR2(1000);
    l_site_time_stamp     VARCHAR2(1000);
    l_url_requested       VARCHAR2(1000);
    l_unused_param        VARCHAR2(1000);
BEGIN
    init_params;
    -- Process URLC token
    wwsec_sso_enabler_private.parse_url_cookie
    (
        p_lsnr_token => g_listener_token,
        encrypted_urlcookie => urlc,
        ssousername => l_sso_user_name,
        ipadd => l_ip_address,
        ssotimeremaining => l_sso_time_remaining,
        sitetimestamp => l_site_time_stamp,
        urlrequested => l_url_requested,
        newsitekey => l_unused_param
    );
    -- Set application cookie
    owa_util.mime_header('text/html', FALSE);
    owa_cookie.send
    (
        name => g_cookie_name,
        value => l_sso_user_name,
        expires => null,
        path => g_cookie_path,
        domain => g_cookie_domain
    );
owa_util.redirect_url(l_url_requested);
owa_util.http_header_close;
    -- Redirect user to the requested application url
    htp.htmlOpen;
    htp.headOpen;
    htp.p('');
    htp.headClose;
    htp.htmlClose;
EXCEPTION
  WHEN OTHERS THEN
    htp.p(sqlerrm);
END sign_on;

END sample_sso_papp;
/
show errors package body sample_sso_papp
```

Writing Partner Application Using Java SSO APIs

Initially, the partner application redirects the user to the Login Server for authentication and, after successful authentication, sets its own application session cookie. Any future request first attempts to validate the application session cookie. If the application session cookie is not found, then the partner application redirects the user to the Login Server. To avoid contacting Login Server for authentication verification of every user request, all partner applications should maintain their own application session.

This section contains the following topics

- Implementing the Partner Application in Java
- Servlet Based Partner Application

- JSP based partner application

Implementing the Partner Application in Java

To implement the partner application in Java, we will implement a generic bean which will be used in Servlet as well as JSP based applications.

```
// SSOEnablerBean.java
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.Cookie;

import java.net.URL;
import java.net.InetAddress;

import java.sql.DriverManager;
import java.sql.Connection;

import oracle.jdbc.pool.OracleConnectionCacheImpl;

import oracle.security.sso.enabler.SSOEnabler;
import oracle.security.sso.enabler.SSOUserInfo;
import oracle.security.sso.enabler.SSOEnablerUtil;
import oracle.security.sso.enabler.SSOEnablerException;

public class SSOEnablerBean
{
    private  String m_listenerToken    = null;
    private  String m_requestedUrl     = null;
    private  String m_onCancelUrl      = null;

    private  String m_pappCookieName   = null;
    private  String m_pappCookieDomain = null;
    private  String m_pappCookieScope  = null;

    private OracleConnectionCacheImpl  m_connCache = null;

   /**
    *  Default constructor
    */
    public SSOEnablerBean()
    {
    }

   /**
```

```
 *  Set listener token
 */
 public void setListenerToken(String p_listenerToken)
 {
     m_listenerToken = p_listenerToken;
 }

/**
 *  Set requested and cancel url
 */
 public void setUrls(String p_requestedUrl, String p_cancelUrl)
 {
     m_requestedUrl = p_requestedUrl;
     m_onCancelUrl  = p_cancelUrl;
 }

 /**
  * Set application cookie information
  */
 public void setAppCookieInfo(String p_name, String p_domain, String p_path)
 {
     m_pappCookieName        = p_name;
     m_pappCookieDomain      = p_domain;
     m_pappCookieScope       = p_path;
 }

 public void setDbConnectionInfo(String p_schema , String p_password,
     String p_hostname, int p_port, String p_sid, int p_dbPoolSize)
 {
    try
     {
        m_connCache = new OracleConnectionCacheImpl();
        // m_connCache.setURL("jdbc:oracle:oci8:@");

        Class.forName("oracle.jdbc.driver.OracleDriver");
        m_connCache.setURL("jdbc:oracle:thin:@"
              + p_hostname + ":" + p_port + ":" + p_sid );

        m_connCache.setUser(p_schema);
        m_connCache.setPassword(p_password);

        m_connCache.setMaxLimit(p_dbPoolSize);
     }
     catch(Exception e)
     {
            m_connCache = null;
         }
     }

    /**
     *  This method will return SSO user information. If the user is not
authenticated against
     *  SSO server then it will redirect user to the SSO Server for
authentication
     */
     public String getSSOUserInfo(HttpServletRequest p_request,
HttpServletResponse p_response)
         throws SSOEnablerException
     {
        String l_userName = null;

        if(p_response == null || p_response == null)
        {
             throw new SSOEnablerException("Http objects are null");
        }

        if(m_listenerToken == null)
        {
             throw new SSOEnablerException("Listener token is null");
        }

        if(m_requestedUrl == null || m_onCancelUrl == null)
        {
             throw new SSOEnablerException("Requested url and cancel url must be
set");
        }

        try
        {
             // Get database connection
             Connection l_db_con = m_connCache.getConnection();

             // Try to get user information from application cookie
             l_userName = getUserInfo(p_request);

             if(l_userName == null)
             {
                 // Create SSOEnabler object
                 SSOEnabler l_ssoEnabler = new SSOEnabler(l_db_con);
                 // Create redirect url to the SSO server for user authentication
```

```
                String l_redirectUrl =
                    l_ssoEnabler.generateRedirect(m_listenerToken, m_
requestedUrl, m_onCancelUrl);
                // close database connection
                l_db_con.close();

                // p_response.sendRedirect(l_redirectUrl);

                // Since the redirect url is usually large so send the redirect
url input
               // parameters using HTTP post method instead of usual GET method
of
                // HttpServletResponse.sendRedirect
                String htmlPostForm = SSOEnablerUtil.genHtmlPostForm(l_
redirectUrl);
                p_response.getWriter().println(htmlPostForm);

                return null;
            }
            else
            {
                // We got this user information from application cookie
                SSOEnablerUtil l_ssoAppUtil = new SSOEnablerUtil(l_db_con);
                return l_ssoAppUtil.unbakeAppCookie(m_listenerToken, l_
userName);
            }
        }
        catch(Exception e)
        {
           throw new SSOEnablerException(e.toString());
        }
    }

   /**
    *  Get  user information from application cookie
    */
    private String getUserInfo(HttpServletRequest p_request)
        throws SSOEnablerException
    {
        boolean l_gotPappCookie = false;
        String  l_userInfo      = null;

        if(m_pappCookieName == null)
            throw new SSOEnablerException("Cookie name is null");
        try
        {
            Cookie[] l_cookies = p_request.getCookies();
            for(int i=0; i < l_cookies.length; i++)
            {
                Cookie l_pappCookie = l_cookies[i];
                if (l_pappCookie.getName().equals(m_pappCookieName))
                {
                    l_gotPappCookie = true;
                    l_userInfo      = l_pappCookie.getValue();
                    break;
                }
            }
        }
        catch(Exception e)
        {
           return null;
        }

        if( (l_userInfo != null) && (l_userInfo.length() > 0) )
        {
            return l_userInfo;
        }
        else
        {
            return null;
        }
    }

   /**
    *  This method will set application cookie from SSO server token and then
redirect
    *  user to the application
    */
    public void setPartnerAppCookie(HttpServletRequest p_request,
HttpServletResponse p_response)
        throws SSOEnablerException
    {
       if(p_response == null || p_response == null)
       {
            throw new SSOEnablerException("Http objects are null");
       }

       if(m_listenerToken == null)
       {
            throw new SSOEnablerException("Listener token is null");
       }

       if( m_pappCookieName  == null
            || m_pappCookieDomain == null
            || m_pappCookieScope  == null)
       {
           throw new SSOEnablerException("Application cookie information is not
available");
       }

       SSOUserInfo l_ssoUserInfo = null;
       try
       {
          String l_urlParam = p_request.getParameterValues("urlc")[0];
          if(l_urlParam != null)
          {
              // Get database connection
             Connection l_db_con = m_connCache.getConnection();

             // Create SSOEnabler object
             SSOEnabler l_ssoEnabler  = new SSOEnabler(l_db_con);

             // Get IP address of the client
             InetAddress l_clientIp = InetAddress.getByName(p_
request.getRemoteAddr());
             l_ssoUserInfo = l_ssoEnabler.getSSOUserInfo(m_listenerToken, l_
urlParam, l_clientIp);

             // Set application cookie
             SSOEnablerUtil l_ssoAppUtil = new SSOEnablerUtil(l_db_con);
             String l_bakedAppCookie =
                 l_ssoAppUtil.bakeAppCookie(m_listenerToken, l_
ssoUserInfo.getSSOUserName());
             // Close database connection
             l_db_con.close();

             // Create application cookie and set it
             // ** IMPORTANT **
             // Time stamp **must** be added in this cookie and should implement
             // application cookie time out based on user in-activity etc.
             Cookie l_AppCookie = new Cookie(m_pappCookieName,
                 l_bakedAppCookie);
             l_AppCookie.setDomain(m_pappCookieDomain);
             // In-memory cookie for better security
             l_AppCookie.setMaxAge(-1);
```

```
                l_AppCookie.setPath(m_pappCookieScope);
                p_response.addCookie(l_AppCookie);

                String reqRedirHtmlStr = SSOEnablerUtil.genRedirect(l_
ssoUserInfo.getUrlRequested());

                p_response.getWriter().println(reqRedirHtmlStr);
            }
            else
            {
                 throw new SSOEnablerException("SSO server returned null user
information");
            }
        }
        catch(Exception e)
        {
            throw new SSOEnablerException(e.toString());
        }
    }

   /**
    * Remove application cookie to end user application session
    */
    public void removeAppCookie(HttpServletResponse p_response)
        throws SSOEnablerException
    {
        if(p_response == null)
        {
            throw new SSOEnablerException("HttpServletResponse is null");
        }

        if( m_pappCookieName  == null
            || m_pappCookieDomain == null
            || m_pappCookieScope  == null)
        {
           throw new SSOEnablerException("Application cookie information is not
available");
        }

        Cookie l_AppCookie = new Cookie(m_pappCookieName, "End application
sesion");
        l_AppCookie.setDomain(m_pappCookieDomain);
        l_AppCookie.setMaxAge(0);
        l_AppCookie.setPath(m_pappCookieScope);
        p_response.addCookie(l_AppCookie);
    }

    public void close()
    {
        try
        {
           m_connCache.close();
        }
        catch(Exception e)
        {
        }
    }

}
```

Servlet Based Partner Application

A sample servlet based partner application could be implemented using one bean and three servlets.

1. The user goes to the `SSOPartnerServlet` application URL. This servlet will get the user information with the help of `SSOEnablerServletBean`. If the user information can be found, then it is used inside the application. Otherwise, the browser redirects the user to the Single Sign-On server.
2. After authentication, the Single Sign-On server does the following:
    a. It redirects the user to the `SSOSignOnServlet` URL.
    b. It sets the application cookie.
    c. It redirects the user to the requested application URL using `SSOEnablerServletBean`.

SSOEnablerServletBean

This bean is derived from the `SSOEnablerBean` and implements the necessary methods for servlet based application.

SSOPartnerServlet

This servlet is the main partner application servlet. To access this servlet, the user must authenticate to the SSO server. This servlet redirects the unauthenticated user to the SSO server.

SSOSignOnServlet

This servlet parses the URLC token received from SSO server, sets the application cookie, and redirects the user to the requested web application URL (i.e. `SSOPartnerServlet`)

SSOPartnerLogoutServlet

This servlet removes the application session of the partner application

SSOEnablerServletBean.java

```
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

import oracle.security.sso.enabler.SSOEnablerException;

public class SSOEnablerServletBean.Java
{
   /** Start configuration parameters
    *  For production quality application, you should read these
    *  parameters from database instead of harcoding them here.
    */

    // Listener token for this partner application name
    private static String m_listenerToken  = "www.papp.com:80";

    // Partner application  session cookie name
    private static String m_cookieName     = "SSO_PAPP_JSP_ID";
    // Partner application  session domain
    private static String m_cookieDomain   = "www.papp.com";
    // Partner application  session path scope
    private static String m_cookiePath     = "/";

    // Host name of the database
    private static String m_dbHostName     = "www.papp.com";
    // Port for database
    private static int    m_dbPort         = 1521;
    // Sehema name
    private static String m_dbSchemaName   = "papp";
    // Schema password
    private static String m_dbSchemaPasswd = "papp";
    // Database SID name
    private static String m_dbSID          = "orcl";
    // Database connection pool size
    private static int    m_dbPoolSize     = 3;

    // Requested URL (User requested page)
    private static String m_requestUrl     =
"http://www.papp.com/servlet/SSOPartnerServlet";
    // Cancel URL(Home page for this application which don't require
authentication)
    private static String m_cancelUrl      = "http://www.papp.com";

    /* End of configuration parameters */

    // Enabler object (Don't change)
    private SSOEnablerBean  m_enablerBean = null;

   /**
    *  Default constructor
    */
    public SSOEnablerServletBean()
    {
        m_enablerBean = new SSOEnablerBean();
        m_enablerBean.setListenerToken(m_listenerToken);
        m_enablerBean.setUrls(m_requestUrl, m_cancelUrl);
        m_enablerBean.setAppCookieInfo(m_cookieName, m_cookieDomain, m_
cookiePath);
        m_enablerBean.setDbConnectionInfo(m_dbSchemaName, m_dbSchemaPasswd,
            m_dbHostName , m_dbPort , m_dbSID, m_dbPoolSize);
    }

    public String getSSOUserInfo(HttpServletRequest p_request,
HttpServletResponse p_response)
        throws SSOEnablerException
    {
        return m_enablerBean.getSSOUserInfo(p_request, p_response);
    }

    public void setPartnerAppCookie(HttpServletRequest p_request,
HttpServletResponse p_response)
        throws SSOEnablerException
    {
        m_enablerBean.setPartnerAppCookie(p_request, p_response);
    }

    public void removeServletAppCookie(HttpServletResponse p_response)
        throws SSOEnablerException
    {
        m_enablerBean.removeAppCookie(p_response);
    }
}
```

SSOPartnerServlet.java

```
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpServlet;
import javax.servlet.ServletException;

import java.io.PrintWriter;

public class SSOPartnerServlet extends HttpServlet
{
   /**
    * The HTTP GET request will show the application content of the user if
he/she is already
    * authenticated, otherwise he/she will be redirected to the Single Sign-On
server
    */
   public void doGet(HttpServletRequest p_request, HttpServletResponse p_
response)
        throws ServletException
   {
       p_response.setContentType("text/html");

       if(p_request == null || p_response == null)
       {
            throw new ServletException("Http objects are null");
       }

       try
       {
           PrintWriter l_out   = p_response.getWriter();
           SSOEnablerServletBean l_ssobean = new SSOEnablerServletBean();
           String l_userInfo   = l_ssobean.getSSOUserInfo(p_request, p_
response);

           if(l_userInfo != null)
           {
               // Display some application content for the SSO user
               l_out.println("<HTML><HEAD><TITLE>Servlet based SSO Partner
Application</TITLE></HEAD><BODY>");
               l_out.println("<H3><center>Servlet based SSO Partner
Application</center></H3>");
               l_out.println("<P><center>User Information: " + l_userInfo +
"<center><BR>");
               l_out.println("<P><center><A
HREF=\"/servlet/SSOPartnerLogoutServlet\">Logout</A><center></P>");
               l_out.println("</BODY></HTML>");
           }
           else
           {
               // Display redirection to SSO server message
               l_out.println("<HTML><HEAD><TITLE>Servlet based SSO Partner
Application</TITLE></HEAD><BODY>");
               l_out.println("<center>Please wait while redirecting to the Login
Server...</center>");
               l_out.println("</BODY></HTML>");
           }
       }
       catch(Exception e)
       {
            try
            {
                p_response.getWriter().println("Error " + e.toString());
            }
            catch(Exception e1)
            {
                throw new ServletException(e1.toString());
            }
       }
   }
}
```

SSOSignOnServlet.java

```
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpServlet;
import javax.servlet.ServletException;
import java.io.PrintWriter;

public class SSOSignOnServlet extends HttpServlet
{
   /**
```

```
    * The HTTP Post will set application cookie from SSO server token and then
redirect
    *  user to the Servlet based partner application
    */
   public void doPost(HttpServletRequest p_request, HttpServletResponse p_
response)
        throws ServletException
   {
       p_response.setContentType("text/html");

       if(p_request == null || p_response == null)
       {
            throw new ServletException("Http objects are null");
       }
       try
       {
           SSOEnablerServletBean l_ssobean = new SSOEnablerServletBean();
           l_ssobean.setPartnerAppCookie(p_request, p_response);
       }
       catch(Exception e)
       {
            try
            {
                p_response.getWriter().println("Error " + e.toString());
            }
            catch(Exception e1)
            {
                throw new ServletException(e1.toString());
            }
       }
    }
}

SSOPartnerLogoutServlet.java

import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpServlet;
import javax.servlet.ServletException;

import java.io.PrintWriter;

public class SSOPartnerLogoutServlet extends HttpServlet
{
   public void doGet(HttpServletRequest p_request,
                               HttpServletResponse p_response)
                               throws ServletException
   {
       p_response.setContentType("text/html");

       if(p_request == null || p_response == null)
       {
            throw new ServletException("Http objects are null");
       }

       try
       {
           SSOEnablerServletBean l_ssobean = new SSOEnablerServletBean();
           l_ssobean.removeServletAppCookie(p_response);

           PrintWriter l_out = p_response.getWriter();
           l_out.println("<HTML><HEAD><TITLE>"
                + "Servlet based SSO Partner Application</TITLE></HEAD><BODY>");
           l_out.println("<center><H3>Servlet based SSO Partner"
                + " Application</H3><center>");
           l_out.println("<P><center>You are logged off from application"
                + " session<center><BR>");
           l_out.println("<P><center>"
                +"<A HREF='/servlet/SSOPartnerServlet'>Login</A><center></P>");
           l_out.println("</BODY></HTML>");
       }
       catch(Exception e)
       {
            try
            {
                p_response.getWriter().println("Error " + e.toString());
            }
            catch(Exception e1)
            {
                throw new ServletException(e1.toString());
            }
       }
   }
}
```

JSP based partner application

The JSP based partner application can be implemented using a Java bean for generating a redirection URL and processing the redirected URL parameter from the SSO server. A JSP page should embed this bean, which can be included in all JSP based applications that require SSO functionality.

1. The user goes to the `papp.jsp` page.
2. This page gets the user information with the help of the `ssoinclude.jsp` page. If the user information can be found, then it is used by the application. Otherwise, the browser redirects the user to the Single Sign-On server using `SSOEnablerJspBean`.
3. After authentication, the Single Sign-On server redirects the user to the `ssosignon.jsp` page. This page sets the application cookie and redirects the user to the requested application URL using `SSOEnablerJspBean`.

A sample JSP based application can be implemented by implementing the following bean and JSP pages:

SSOEnablerJspBean.java

This bean has the `getSSOUserInfo` method which returns the user information when the application cookie is already set. Otherwise, it redirects the user to the SSO server for authentication.

ssoinclude.jsp

This page embeds the `SSOEnablerJsp` bean and should be included all application JSP pages where SSO functionality is necessary.

ssosignon.jsp

This page embeds the `SSOEnablerJspBean` for generating redirection URL and processing the redirected URL parameter received from the SSO server.

papp.jsp

This page is the main application page and requires SSO functionality. This page must include the `ssoinclude.jsp` page to get the user information.

papplogoff.jsp

This JSP page removes the application session

SSOEnablerJspBean.java

```
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import oracle.security.sso.enabler.SSOEnablerException;

public class SSOEnablerJspBean
{
   /** Start configuration parameters
    *  For production quality application, you should read these
    *  parameters from database instead of harcoding them here.
    */

    // Listener token for this partner application name
    private static String m_listenerToken  = "www.papp.com:80";

    // Partner application  session cookie name
    private static String m_cookieName     = "SSO_PAPP_JSP_ID";
    // Partner application  session domain
    private static String m_cookieDomain   = "www.papp.com";
    // Partner application  session path scope
    private static String m_cookiePath     = "/";

    // Host name of the database
    private static String m_dbHostName     = "www.papp.com";
    // Port for database
    private static int    m_dbPort         = 1521;
    // Sehema name
    private static String m_dbSchemaName   = "papp";
    // Schema password
    private static String m_dbSchemaPasswd = "papp";
    // Database SID name
    private static String m_dbSID          = "orcl";
    // Database connection pool size
    private static int    m_dbPoolSize     =  5;

    // Requested URL (User requested page)
    private static String m_requestUrl     =
"http://www.papp.com/papp/plsql/jsp/papp.jsp";
    // Cancel URL(Home page for this application which don't require
authentication)
    private static String m_cancelUrl      = "http://www.papp.com";

    /* End of configuration parameters */

    // Enabler object (Don't change)
    private SSOEnablerBean  m_enablerBean = null;
    /**
     *  Default constructor
     */
    public SSOEnablerJspBean()
    {
        m_enablerBean = new SSOEnablerBean();
        m_enablerBean.setListenerToken(m_listenerToken);
        m_enablerBean.setUrls(m_requestUrl, m_cancelUrl);
        m_enablerBean.setAppCookieInfo(m_cookieName, m_cookieDomain, m_
cookiePath);
        m_enablerBean.setDbConnectionInfo(m_dbSchemaName, m_dbSchemaPasswd,
            m_dbHostName , m_dbPort , m_dbSID, m_dbPoolSize);

    }

    public String getSSOUserInfo(HttpServletRequest p_request,
HttpServletResponse p_response)
        throws SSOEnablerException
    {
        return m_enablerBean.getSSOUserInfo(p_request, p_response);
    }

    public void setPartnerAppCookie(HttpServletRequest p_request,
HttpServletResponse p_response)
        throws SSOEnablerException
    {
        m_enablerBean.setPartnerAppCookie(p_request, p_response);
    }

    public void removeJspAppCookie(HttpServletResponse p_response)
        throws SSOEnablerException
    {
        m_enablerBean.removeAppCookie(p_response);
    }
}
```

ssoinclude.jsp

```
<%@ page language="java" import="oracle.security.sso.enabler.*" %>
<jsp:useBean id="ssoObj" scope="application" class="SSOEnablerJspBean" />
<%
    String usrInfo = ssoObj.getSSOUserInfo(request, response);
    if(usrInfo == null)
    {
%>
```

```
    <center>Please wait while redirecting to the SSO Server...</center>
<%
    }
%>
```

ssosignon.jsp

```
<%@ page language="java" import="oracle.security.sso.enabler.*" %>
<jsp:useBean id="ssoObj" scope="application" class="SSOEnablerJspBean" />
<%
    ssoObj.setPartnerAppCookie(request, response);
%>
```

papp.jsp

```
<%@ page buffer="5" autoFlush="true" %>

<%@ include file="ssoinclude.jsp" %>
<%
    if(usrInfo != null)
    {
        response.getWriter().println("<center><h2>Sample JSP Partner
Application</FONT></h2></center>");
        response.getWriter().println("<center>User information :" + usrInfo
+"</center>");
        response.getWriter().println("<center><a
href=\"papplogoff.jsp\">Logoff</a></center>");
    }
    else
    {
       response.getWriter().println("<center>User information not
found</center>");
    }
%>
```

papplogoff.jsp

```
<%@ page language="java" import="oracle.security.sso.enabler.*" %>
<jsp:useBean id="ssoObj" scope="application" class="SSOEnablerJspBean" />
<%
         try
         {
             ssoObj.removeJspAppCookie(response);
         }
         catch(Exception e)
         {
%>
            <center>
              Error in ending JSP application session.
              Please quit your all browser windows.
            </center>
<%
            return;
         }
%>
          <center>
            You are logged off from JSP application session
            <br>
            <a href="papp.jsp">Login</a>
          </center>
```

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