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Change History

<table>
<thead>
<tr>
<th>Release</th>
<th>Change Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF (July, 2011)</td>
<td>First release of this guide for <em>Additional Features (AF) July 2011: Enrollment Web Services (EWS)</em>.</td>
</tr>
</tbody>
</table>

This updated guide is available on My Oracle Support as part of the documentation delivered for the releases indicated in the table.
IMPLEMENTATION SUMMARY

This document is aimed for a technical audience responsible for installing and configuring Enrollment Web Services (EWS). EWS interacts with the following Campus Solutions components:

- Records and Enrollment

This document lists the Peoplecode application packages and classes for these components.

EWS adheres to open web service standards currently supported in the latest release of Enterprise PeopleTools 8.50+. The EWS User's Guide describes the various service operations. We recommend that you read the EWS User's Guide before performing the configuration steps listed in this document.

To use EWS, complete the following steps:

1. Bundle Installation (Mandatory)
   
   EWS is delivered with Campus Solutions Additional Features Pack July 2011 (update ID 812869). This update was posted to My Oracle Support in July 2011.

2. Configuration (Mandatory)
   
   Perform the configuration steps to make EWS accessible to the user interface.

3. Implement Extensions (Optional)
   
   Design and create the country or institution specific extensions that EWS can use.

The following diagram shows an overview of the EWS architecture:
Service Oriented Architecture User Interface

Due to EWS's open standards Service Oriented Architecture (SOA), you can use any technology to develop your user interface, as long as the technology supports web services and SOAP.

The SOA user interface (SOA UI) would likely be a Student Enrollment application that interacts with Campus Solutions through EWS. Before developing your enrollment application user interface, we recommend that you use a SOAP service tester to become familiar with how the web services process the enrollment data and user information. One way to use a service tester could be by first passing the input parameters to a service operation and then viewing the service operation output.

Web Services

The Enrollment Web Service suite contains the following web service operations:

- SSR_ENROLLMENT – Study List Web Service
  - SSR_GET_ENROLLMENT: Retrieve Student StudyList
  - SSR_STUDYLIST_DEADLINES: Get Class Deadlines
- SSR_COURSE – Course Catalog Web Service
SSR_GET_COURSES: Browse Course Catalog
SSR_GET_COURSE_OFFERING: Retrieve Class Offering Detail
SSR_CLASS – Class Search Web Service
SSR_GET_CLASSES: Search for Classes
SSR_GET_CLASSSECTION: Retrieve Class Section Detail

Enrollments API

The Get Enrollment and StudyList Deadlines service operations interact with Enrollments API. The Enrollments API comprises of Programming Interfaces that are used to retrieve studylist and deadlines details.

Classes StudyList, Enrollment Details & ClassSections are tied to Get StudyList operation while class Deadlines is tied to StudyList Deadlines operation.

When the user interface submits a request for get studylist or deadlines data, the handler class StudyList invokes the appropriate class depending upon the service operation.

The following diagram shows the StudyList application package and classes in it:

![Figure 2: StudyList API](image)

Curriculum Search API

The Course Catalogue and Class Search web service operations interact with the Curriculum Search API. The Curriculum Search API is a set of programming interfaces including the Course Manager and Class Manager used to retrieve curriculum related information.

When the user interface submits a request for Curriculum data to EWS, the Manager interprets and actions this request using the appropriate API.

Course Manager is composed of a number of application classes and PeopleTools components which support the search and retrieval of Course data.

The following diagrams show the application packages and classes in the Course Manager component:
Class Manager is composed of a number of application classes and PeopleTools components which support the search and retrieval of Class data.

When the user interface submits a request for Class Search data to EWS, the Manager interprets and actions this request using the appropriate API.

The following diagrams show the application packages and classes in the Class Manager component:
Figure 3: Class Search API
POST INSTALLATION SETUPS

This chapter describes the setups that you must perform after installing AF July 2011 (Bundle update number 812869). The chapter includes some setup steps that are listed only for verification purposes and may require little or no setup.

Verifying Web Service Security Settings

The SSR_ENROLLMENT, SSR_COURSE and SSR_CLASS service operations are delivered with FULL ACCESS to the HCPSERVICE permission list.

To verify whether HCPSERVICE permission list is assigned to a service operation with FULL ACCESS:

2. Click the **Service Operation Security** link. The Web Service Access page appears as shown in this example:

**Web Service Access**

**Operation:**  
SSR_GET_ENROLLMENT

**Figure 5: Example of the General page**

**Figure 6: Example of a Web Service Access page**
**Student Access**

Access to the EWS Browse Course Catalog and Class Search services will likely be anonymous according to the institution’s individual requirements. Access to the EWS Class Studylist service (SSR_GET_ENROLLMENT) is via a valid authenticated PeopleTools User Profile only. Attempting to access this service from a non-authenticated User Profile will result in a PeopleTools Integration Broker Error response. Please see the Setting Up Integration Broker section for further detail on security prerequisites.

**Performing a Security Analysis**

Before migrating EWS to a *production* environment, we recommend that you complete a thorough analysis of your institution's security requirements.

**Publishing Web Services**

Use the Provide Web Service page to publish the following web services (*PeopleTools, Integration Broker, Web services, Provide Web Service*):

- SSR_ENROLLMENT
- SSR_COURSE
- SSR_CLASS

**Setting Up Integration Broker**

*Note:* We assume that you have performed and validated all the basic Integration Broker setups. Refer to the Integration Broker PeopleBooks for information on Integration Broker gateway setup and service configuration.

In PeopleTools 8.50+, any anonymous inbound request originates from the ANONYMOUS node. The PeopleSoft system, by default, associates all anonymous requests with the SCC_GUEST user profile. For information on setting up the SCC_GUEST user profile, refer to the Appendix section.

Perform the following steps to update the ANONYMOUS Integration Broker node:

1. Access the Node Definitions page (*PeopleTools, Integration Broker, Integration Setup, Nodes*).
2. Ensure that Node Type is set to *External*, the Default User ID is set to SCC_GUEST, and the Active Node and Segment Aware options are selected:
3. Enable WS-Security for this node by selecting an authentication token type:

Figure 7: Node Definitions page
Verifying Campus Solutions SOA Framework Setup Entries

During installation, the system automatically inserts configuration data into the Campus Solutions SOA Framework setup tables.

To verify whether the setup entries exist:

1. Access the Request Handlers component (Set Up SACR, System Administration, Integrations, Request Handlers).
2. For all the SSR_ENROLLMENT web service operations, ensure that the fields on the Request Handlers page contain the following values:

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package Name</td>
<td>SSR_STUDYLIST</td>
</tr>
<tr>
<td>Path</td>
<td>Handler</td>
</tr>
<tr>
<td>Application Class ID</td>
<td>StudyList</td>
</tr>
</tbody>
</table>
3. For all the SSR_COURSE web service operations, ensure that the fields on the Request Handlers page contain the following values:

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package Name</td>
<td>SSR_COURSE</td>
</tr>
<tr>
<td>Path</td>
<td>Handler</td>
</tr>
<tr>
<td>Application Class ID</td>
<td>Course</td>
</tr>
</tbody>
</table>

4. For all the SSR_CLASS web service operations, ensure that the fields on the Request Handlers page contain the following values:

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package Name</td>
<td>SSR_CLASS</td>
</tr>
<tr>
<td>Path</td>
<td>Handler</td>
</tr>
<tr>
<td>Application Class ID</td>
<td>ClassHandler</td>
</tr>
</tbody>
</table>

This example shows the Request Handlers page for a service operation with the correct setup entries:

**Figure 9: Example of a Request Handlers page**
Setting up Logging

This is an optional setup.

Use the Logging page to enable and configure the logging feature (Set Up SACR, System Administration, Integrations, Logging).

Logging

![Logging Parameters](image)

*Logging Type:* File

*Log Threshold:* All

Logging Filename: c:\temp\integration.log

Last Log ID Assigned: 49

Figure 10: Logging page

**Note:** You should not enable logging in a production environment. SOA framework logging is only appropriate for a testing, demo or development environment or when performing critical troubleshooting activities.

Setting Up List of Values

List of Values configuration is optional but recommended. The degree of configuration required is entirely dependent on the requirements of your institution. The List of Values Web Service will perform out-of-the-box with no configuration for simple scenarios. To navigate to the setup page, select Set Up SACR, System Administration, Utilities, List Of Values.
Refer to the "List of Values Web Service Operations" and "Configuration Hints and Tips" sections in the EWS User’s Guide for more information about this page. You can also refer to PeopleSoft Enterprise Campus Community Fundamentals 9.0 PeopleBook, Setting Up List of Values chapter for further details on List of Values – this chapter is posted to My Oracle Support in the Campus Community documentation for Bundle 22. The ID for the My Oracle Support Campus Solutions 9.0 Documentation Home Page is 751540.1.
It is beyond the scope of this guide to cover the best practices for user interface design and an effective Self Service user experience. However, this chapter presents some key considerations for designing and creating a user interface that interacts with EWS.

In addition to user interfaces interacting with EWS, a third party application can also interact with EWS by passing in requests for enrollment details, course or class search to EWS for processing.

We recommend that academic institutions use the Oracle Application Development Framework (Oracle ADF) to develop a Self Service Enrollment user interface. However, academic institutions can use any technology or tool that complies with the minimal technical prerequisites specified in the EWS User's Guide. Any third party application technology deployed in your institution can be used to communicate with EWS as long as it complies with the specified prerequisites.

The Web Service operations delivered by EWS Additional Features July 2011 are primarily query-only services meaning that they retrieve data from the Campus database for third party presentation. These services will most likely be utilized by a next generation mobile device to deliver timely information to students on Campus in order to support their core enrollment activities. This suite of services is the initial step in a comprehensive service roadmap that will support the entire student enrollment process.

In this chapter, we will examine a typical interface flow for an enrollment application user interface that uses EWS. This will reveal several recommendations on how a user interface should communicate with EWS. The following figure depicts a typical flow for an enrollment application user interface:
Discussion of the User Interface Flow

Homepage

This is the starting point for an Enrollment user interface.

Essentially all student users start in this state. All students are assumed to already have a username and password which they would use to access protected functions such as their current Class Schedule.

The PeopleSoft system considers any student at this point of time as anonymous. Therefore, these anonymous users will receive access only to the Course and Class search service functions until they log into the system after which they can access their Class Schedule.

At this beginning state a UI may request EWS for a bulk list of values data that the user interface can subsequently display to the user. This data will be helpful in supporting the Browse Course Catalog pages. Performing this activity up front may result in a general performance improvement and improved user experience.

A typical self service Enrollment UI might perform the following actions:

- Present a “Search” hyperlink on a homepage where a user can opt to browse the course catalog.
- Present a “Login” hyperlink that the user can click to initiate the user authentication process.
- Optionally, formulate a bulk List-Of-Values request message.
- Submit the request message to the SCC_GET_LOV service operation.
- Store the List-Of-Value results in a temporary storage area for use throughout the enrollment page flow.

LOGON (Authentication)

Logon is the process in which the institution's Identity Management or User Profile Management system authenticates the username and password. This authentication is not a one-time event. Re-authentication must occur on every request that the enrollment user interface sends to EWS. This is a security requirement for the web service architecture and is enforced by PeopleSoft Integration Broker as a standard behavior.

Academic institutions can use the SCC_USERREG_AUTHENTICATE service operation to validate a user's credentials before the user can access the parts of Enrollment Self Service (Please see the Admissions Application Web Services User Guide (refer to the documentation for Feature Pack 3) on My Oracle Support. The ID for the My Oracle Support Campus Solutions 9.0 Documentation Home Page is 751540.1.). Typically you want to ensure that a user has the key to the door before allowing them to proceed. This is the purpose of the SCC_USERREG_AUTHENTICATE service operation.

Once the system has authenticated the user, it is also an appropriate time for the user interface to perform any initialization or setup to prepare the user for entry into the Class Schedule functionality.

A typical self service Enrollment UI might perform the following actions:

- Present a “Login” hyperlink that the user can click to initiate the user authentication process.
- Present a Login page where the user can enter a username and password.
• Validate that the required information has been entered.
• Formulate a request message from the login information.
• Submit the request message to the SCC_USERREG_AUTHENTICATE service operation.
• Present the user with any error response messages from EWS and allow the user to correct the submitted data.
• Once a successful login response is received, the user interface should maintain the credentials within the program state and supply these credentials on every subsequent request to EWS as part of the WS-Security headers (thereby enabling ongoing authentication).
• The academic institution's Identity Management or User Account Management system will have its own configured rules surrounding login retries.

**BROWSE Course Catalog**

Students are likely entitled to browse the institution course catalog without being forced to logon. The User interface must collect a number of search criteria from the student and transmit the criteria to the Course Catalog web service. Upon receiving a response the course result list should be presented to the student.

A typical self service Enrollment UI might perform the following actions:

• Present a *Search Criteria* collection page to collect Search requirements from the student.
• Formulate a request message based on the Search criteria.
• Submit the request message to the SSR_GET_COURSES service operation.
• Receive the Course Search results response message from EWS.
• Present results to the student in a grid style format for subsequent actions.
• For each result in the grid present a “Course Detail” hyperlink which the student can click in order to retrieve more information on the course.

**GET Course Detail**

Once presented with a list of courses the student can select a particular course from a search results listing for more information. The detailed information could then be presented to the user on a new page or a modal sub-page.

A typical self service Enrollment UI might perform the following actions:

• Identify the requested Course based on the “Course Detail” hyperlink selected.
• Formulate a request message.
• Submit the request message to the SSR_GET_COURSE_OFFERING service operation.
• Receive the response from EWS.
• Present the Course Detail to the user within a new page or a modal sub-page.

**GET Classes**

From the Course Detail view a student can opt to see details of classes available for the selected course.

A typical self service Enrollment UI might perform the following actions:

• Present a “View Class Sections” hyperlink on the Course Detail page.
• Formulate a request message.
• Submit the request message to the SSR_GET_CLASSES service operation.
• Receive the class search results from EWS.
• Present the class list to the user through one or more user interface pages.
• For each class shown present a “Class Detail” hyperlink which the student can click to obtain more information on the class.

GET Class Section Detail

From the Class listing view a student can opt to see more detail on a particular class.

A typical self service Enrollment UI might perform the following actions:

- Identify the requested Class based on the “Class Section” hyperlink selected.
- Formulate a request message.
- Submit the request message to the SSR_GET_CLASS_SECTION service operation.
- Receive the response from EWS.
- Present the Class Detail to the user within a new page or a modal sub-page.

GET StudyList Details

Once a student has enrolled via PeopleSoft Self Service then the student studylist can be retrieved and presented to the student for viewing. Note that this is a secure service operation and the student must be logged on to the user interface in order to retrieve this detail.

A typical self service Enrollment UI might perform the following actions:

- Present a “Study List” hyperlink that the student can click in order to view their enrollment.
- Ensure that the student is logged on to the system, e.g. Have they provided a username and password. If not, then redirect the student to the LOGON page.
- Formulate a request message and include the username and password into the WS-Security SOAP header.
- Submit the request message to the SSR_GET_ENROLLMENT service operation.
- Receive the response from EWS.
- Present the StudyList Detail to the user within a new page or a modal sub-page.
- Each class presented should include a “Class Detail” hyperlink where the student can click to view more detail on the class.
- Each class presented should include an “Academic Calendar Deadlines” hyperlink where the student can click to view more detail on the deadlines associated with the class.

GET Class Deadlines

From the Class listing (StudyList) view a student can opt to see more detail on deadlines.

A typical self service Enrollment UI might perform the following actions:

- Identify the requested Class based on the “Academic Calendar Deadlines” hyperlink selected.
- Formulate a request message.
- Submit the request message to the SSR_GET_DEADLINES service operation.
- Receive the response from EWS.
- Present the Deadline Detail to the user within a new page or a modal sub-page.
Add To Cart & Enroll

As part of the Enrollment Web Services initiative, we anticipate delivering enrollment web services through the continuous delivery model which will facilitate easy adoption by customers. In addition to delivering the three services we have discussed in this document, we plan to deliver the following transaction based services in upcoming bundles:

- Shopping Cart Web Service Operations

  The existing enrollment Shopping Cart self service functionality for student is planned to be exposed through a web service which will have the following service operations:

  - Add a class item to the enrollment shopping cart
  - Clear classes that have been added to the enrollment shopping cart
  - Retrieve and view the classes in the enrollment shopping cart
  - Retrieve a particular class section from the enrollment shopping cart
  - Checkout a class from the enrollment shopping cart
  - Remove a class from the enrollment shopping cart added earlier
  - Save multiple classes to the enrollment shopping cart
  - Perform Pre Enrollment validation.

- Enrollment Request Web Service Operations

  In order to allow students to manage enrollment, the Enrollment Request service is targeted to include:

  - Add Enrollment: This service operation will allow a user to add a Class to a shopping cart and enroll
  - Drop Enrollment: This will allow an already enrolled class to be dropped.
  - Swap Enrollment: This service operation will allow student to swap an already enrolled class with a new class.
  - Maintain Enrollment: This will allow a student to edit enrollment details.
ERROR HANDLING

When the system validates the data during any EWS request, if validation errors occur, the error handling feature returns a list of textual descriptions of those errors along with error IDs and the field names related to the errors. As much information as possible is returned to the user interface to present the errors to the user, and allow correction of the errors.

The user interface must perform the following steps to use the error handling feature:

- The UI must populate a unique ID into the tag called SCC_ENTITY_INST_ID in the request xml for each entity. In the event of error during data validation, error handling returns to the UI the unique ID (that is obtained from the request message) and the field name related to the error along with the error message text.
- The UI can use this unique error ID, the field name, and the error message to know what fields on what pages are in error. This allows the UI to highlight the fields with errors and allows the user to correct the data.

The unique ID is optional in the request schema. Therefore, institutions should populate the unique ID only if they want to uptake the error handling feature.

Institutions can populate the SCC_ENTITY_INST_ID in any format, but it is recommended that they use the official UUID format, 36 character ISO standard found at http://en.wikipedia.org/wiki/Universally_unique_identifier

LOGOFF

An option to leave the Enrollment user interface could potentially be provided from any page in the Self Service application. Clicking the Logout hyperlink is a signal from the users that they intend to leave the system and that any sensitive information managed by the user interface should now be cleared.

A typical self service Enrollment UI might perform the following actions:

- Present a "Logout" hyperlink that the user can click to log out of Enrollment Self Service.
- Clear the username and password combination from the local UI temporary storage area.
- Present the user with a logged off confirmation page.
APPENDIX:

Setting up SCC_GUEST Account

Steps below provide the details for setting up SCC_GUEST account

1. **PeopleTools > Security > User Profiles**
   - Add SCC_GUEST

2. Go to General <tab>
   - Fill out the values as follows:
3. Go to ID <tab>
   - Fill out the values as follows:

4. Go to Roles <tab>
   - Fill out the values as follows:
Save your changes.