



IBM Software Group

WebSphere Process Server V6.0
WebSphere Integration Developer V6.0
WebSphere Adapters

IBM *WebSphere Adapter V6.0 for PeopleSoft*



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This presentation will cover the IBM WebSphere Adapter for PeopleSoft. Other presentations provide an overview of all the WebSphere Adapters, including installation and deployment of WebSphere Adapters and details of common function.

Agenda

- Overview and Architecture of WebSphere Adapters for PeopleSoft
- Tool and Enterprise Metadata Support
- Outbound Operations
- Inbound Operations and Event Manager
- Transaction and, Security
- Problem Determination
- Summary



The agenda for this presentation is shown here. The installation and deployment of PeopleSoft Adapter is covered in a separate presentation common for all WebSphere Adapters.

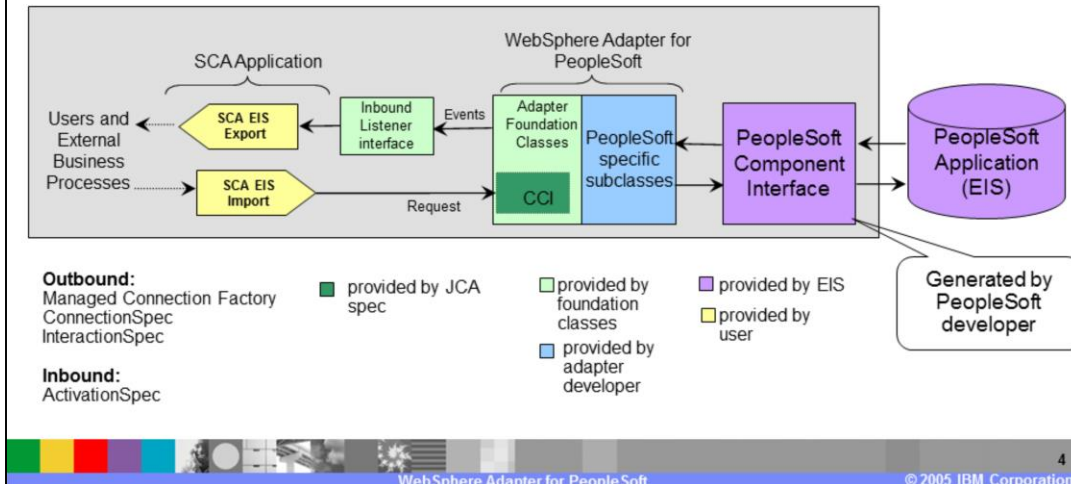
Overview and Architecture of IBM WebSphere Adapter for PeopleSoft



This section will provide an overview of the WebSphere Adapter for PeopleSoft.

Adapter Architecture

- IBM WebSphere Adapter for PeopleSoft implements the JCA version 1.5 specification, enabling bi-directional connectivity to PeopleSoft Enterprise application



This diagram shows the high-level architecture of components that play a role in the end to end invocation of the outbound or the inbound request. Using the Enterprise Service Discovery tool in the WebSphere Integration Developer (WID), the SCA EIS components are where the associated Business Objects are created. For the outbound request, the SCA EIS Export component is created, and for the inbound request, the SCA EIS Import component is created.

The SCA Clients interact with the SCA EIS Export and Import components to drive a outbound request or receive an inbound request, as shown in the diagram. The Adapter contains the implementation of JCA specifications and has extensions provided by the Adapter foundation classes. The SCA Export component passes a Business Object wrapped in a J2C CCI Record object. The Adapter extracts the Business Object from the Record object and determines the PeopleSoft function to call along with its arguments. The Adapter uses the PeopleSoft Component Interface JAR file to communicate with the PeopleSoft application.

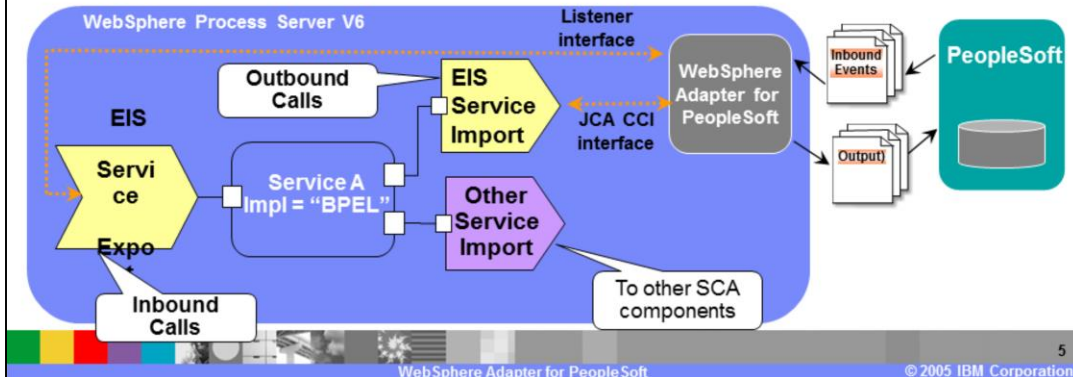
The two main interfaces to a JCA adapter are the Service Provider Interface (SPI) and the Common Client Interface (CCI). The SPI is the application server view of the adapter and contains the contracts necessary to work well with an application server, including

Connection creation and matching, security, and work management.

The CCI is designed to provide a common view of data and interaction with the adapter and defines the data model and provides a common mechanism to interact with the adapter.

EIS Import and Export Services

- EIS Import (for outbound) and EIS Export (for inbound) SCA components provide a uniform view of the EIS services external to the module
- Business Objects are generated by EMD, and are used by SCA components and the adapter
- This allows components to communicate with the variety of external EIS systems using consistent SCA programming model
- Interacting with the adapters through the use of SCA components and BOs fit the goals and the vision of SOA solutions



The Enterprise Service Discovery tool in WID creates an EIS Import SCA component for an outbound request, and creates EIS Export SCA component for an inbound event request. The Business Objects for the outbound or inbound requests are also created. Using the SCA components for the adapter, they can be wired with other SCA components to create a business application.

In the diagram, the SCA component representing "Service A" is wired with the Adapter EIS Export and EIS Import component. Also shown is the wiring from Service A to other SCA components through the Import. The implementation of Service A could be BPEL or any other support implementation such as POJO or Human task.

For SCA clients, the adapter functionality is exposed through the EIS Import and EIS Export SCA components.

Accessing PeopleSoft APIs

- There are two layers of the People Tools API classes to access a designated component interface and the underlying business
 1. The primary layer is the one through which a session instance is created and a connection is made
 2. The component interface is the secondary layer and is accessible to the resource adapter only from the session instance created in the primary layer. Within a component interface, the resource adapter has access to the following:
 - ▶ All the exposed PeopleSoft objects in the component interface definition
 - ▶ People Code methods associated with the underlying components
 - ▶ Records with the exception of Search Dialog and Menu specific processing such as Active X
- The EIS-specific portion of the PeopleSoft resource adapter will rely on these two layers to communicate with the EIS



PeopleSoft API classes expose two layers of classes to the Adapter. The first one is used to create a connection and a session instance to the PeopleSoft application. The second one is the component interface through which the adapter interacts with the exposed PeopleSoft objects and their methods.

Enterprise Metadata Discovery



This section covers the high level flow in the tool when using the Enterprise Service Discovery wizard.

Enterprise Metadata Service Discovery - Steps

- Import the PeopleSoft Adapter
 - ▶ Add PeopleSoft component interface jar file to the Adapter project
- Select “Enterprise Service Discovery” function and select the PeopleSoft Adapter
- Setup Connection Configuration
- Run Query to find objects in PeopleSoft EIS and select the object
- Specify Outbound or Inbound service type and their service functions
- Specify Connection Properties

Connection Configuration

Miscellaneous

Prefix:

Component Interface Jar:

Configure Additional BO Properties

User Credentials

Username:

Password:

Machine Credentials

Hostname:

Port Number:

Query:

Objects discovered by query:

- IBM_EVENT_CI
- PO_COMP_INTERFACE
- WBI_CUSTOMER_CI



Shown here are the high level steps of the Enterprise Service Discovery performed to create the Adapter SCA components for the outbound or inbound request.

1. Import the PeopleSoft Adapter and add the PeopleSoft component interface jar file to the adapter project.
2. Select the Enterprise Service Discovery tool and the PeopleSoft adapter in the wizard
3. Setup the connection configuration, including host name, port, user id, and password, necessary for the tool to connect to the PeopleSoft application.
4. Run the Query function in the Enterprise Service Discovery wizard. The PeopleSoft application will be introspected and a list of PeopleSoft objects will be returned on which the outbound or inbound request can be performed.
5. Select the type of interaction, whether outbound or inbound
6. Specify the managed connection properties for outbound request or ActivationSpec properties for inbound request.

These simple steps create the SCA EIS Export or Import component and the Business Objects for the interaction.

Outbound Operations

This section covers the outbound operations.

PeopleSoft Component Interface

- PeopleSoft provides a component interface architecture that includes three elements: Components, Component interfaces and Component Interface API
- Component interface enables third-party applications to access a PeopleSoft component
 - ▶ Component Interface API maps one-to-one with its corresponding PeopleSoft component
 - ▶ PeopleSoft provides tools to generate the Component Interface Java API
- Resource adapter uses the Component Interface Java API to communicate with the PeopleSoft components



PeopleSoft provides a component interface with an architecture that enables third-party applications to access a PeopleSoft component. The Component Interface API maps one-to-one with its corresponding PeopleSoft component. PeopleSoft also provides tools to generate the Component Interface Java API.

The PeopleSoft adapter uses the Component Interface Java API to communicate with the PeopleSoft components

Outbound Operations

- Adapter models PeopleSoft function calls as Business Objects (BOs)
- SCA client passes the BO to the adapter via the JCA CCI Record object
 - ▶ BO is wrapped in the JCA CCI Record
- Adapter extracts the BO as well as the meta-data information necessary to access the appropriate component interface and make the requested changes in the EIS
- Using the component interface name associated with the specific BO, the adapter gets the component interface and sets the appropriate keys from the values specified in the business objects
- When the key values are set, the adapter can instantiate an existing component interface to retrieve, update, or create a component interface
- Adapter then populates it with the data from the hierarchy of business objects within the business graph



The high level flow of the outbound operations is shown on this page.

The adapter models the PeopleSoft function call as Business Objects (BO). The SCA client wraps the BO inside the JCA CCI Record object, since the J2C specification does not support passing a BO as a parameter.

The adapter extracts the BO from the Record, determines the PeopleSoft function to call and extracts the parameters represented as metadata within the BO. The adapter will process the attributes in the order defined in the BO

The adapter then executes the function on the PeopleSoft backend.

Supported Outbound Operations

- Create - Adapter sets the CreateKey values, represented by the PrimaryKey ASI in BO
- Update - adapter support both a snapshot (afterimage) as well as delta representation
 - Also, another special kind of Update operation supported, 'UpdateWithDelete'
- Delete - adapter supports soft deletes against the component interface, i.e. Update only those attributes that have the ASI, SoftDeleteValue
- Retrieve – uses the GetKey (represented by the PrimaryKey ASI in the BO)
- RetrieveAll – uses the FindKey (FindKey ASI in the BO)
 - Number of records that the adapter can return cannot exceed the MaxRecords property – Exception occurs if exceeded
- Exists – same as Retrieve, except that it will not populate the retrieved data onto the BO - Exception is thrown if the object does not exist
- ApplyChanges - If the operation is 'ApplyChanges' then it enables users to send any CUD (Create/Update/Delete) BO to the adapter and have it be processed accordingly

Service Type:	Outbound
Namespace:	http://www.ibm.com/xmlns/prod/websphere/j2ca/peoplesoft
Service Functions*:	<ul style="list-style-type: none"> Create Update Delete Retrieve RetrieveAll ApplyChanges Exists

12

WebSphere Adapter for PeopleSoft

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Following are the supported outbound operations and some of their details:

Create: The adapter sets the CreateKey values, represented by the PrimaryKey ASI in the business object

Snapshot Update: If the operation in the interaction spec is Update, the adapter will check for the existence of the verb in the business graph. If the verb exists, it will perform the snapshot Update processing. The adapter will retrieve and compare the input business object with the retrieved object.

Delta Update: If the operation in the interaction spec is Update and the verb does not exist in the business graph, it will perform the delta Update processing. The adapter will inspect the ChangeSummary to identify the operation for each BO in the input hierarchy and perform the same.

UpdateWithDelete: This is a special form of the Update operation that intended to provide better performance. The verb will be set to 'UpdateWithDelete' at the top-level. It always requires a ChangeSummary and the ChangeSummary is expected to include BO-level creates and deletes. The ChangeSummary indicates what needs to be done. If ChangeSummary is empty, the adapter will not take any action on the request.

Inbound Operations and Event Manager



This section discusses the inbound operations and event manager.

PeopleSoft Configuration for Inbound Events

- Create a custom event project (People Tools Application Designer project) for the events with the fields and records needed for the IBM events
 - ▶ The detailed steps are described in the installation guide
- To generate events within PeopleSoft, insert the event generation calls (like in SavePostChange function) in the component of interest
 - ▶ Sample code provides two functions, IBMPublishFutureDatedEvent and IBMPublishEvent
 - IBMPublishFutureDatedEvent is used for publishing future dated events that need to be polled when the date arrived
 - IBMPublishEvent is used for publishing the regular events (not in the future)
 - ▶ This will allow the events to be published after the component save is done. The event information published will be stored in the event table



To support the inbound operations, a custom event project must be created in PeopleSoft for its event store. The schema for the event store is provided by IBM and should not be changed, since the adapter will expect the custom event store with that schema.

Event triggers will need to be inserted in the PeopleSoft components of interest. Future Dated events are supported by the adapter. The future events are polled and brought in by the adapter when that time arrives.

Samples are provided with the PeopleSoft adapter for the custom event project and the special custom event script.

Inbound Operations – Overall High level Flow

- Events are used to monitor changes to component operations within PeopleSoft
- People code should be added to the component for publishing events
- Events are stored in People Soft tables
 - ▶ Component keys are stored in event for the adapter to later retrieve the component information
- Adapter polls for events and if found, retrieves the event
- Adapter retrieves the component information (based on the operation on the component)
- Available inbound operations are for Create, Update, Delete operations

Service Type:	Inbound
Namespace:	http://www.ibm.com/xmlns/prod/websphere/j2ca/peoplesoft
Service Functions*:	<ul style="list-style-type: none"> Create Update Delete

15

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Inbound operations are based on events being triggered when a PeopleSoft component is created, modified or deleted. The PeopleSoft developer must create a custom PeopleSoft component to store the events that are being triggered as a result of the updates to the PeopleSoft component. The schema for the custom PeopleSoft component for event store cannot be changed. A sample custom PeopleSoft component, called, “IBM Events” is provided with the adapter.

Triggers must be inserted in the PeopleSoft component that need to be watched for events. Sample triggers are also provided.

The adapter polls for the events looking in the custom PeopleSoft component event store and uses its own event staging table and the custom PeopleSoft component event store to support “once and only once” event delivery. The details of the “Once and only once” event delivery are covered in the common adapter details presentation.

When a new event is detected by the adapter, based on the event status, the adapter retrieves it and stores it in its event staging table. The adapter retrieves the integration object represented by the event, wraps it in a Business object and calls the registered endpoint for that event, passing the business object to the endpoint.

The available inbound operations where events can be generated are Create, Update and Delete.

What happens when component is changed ?

1. The function, `IBMPublishEvent(&BOName, &KeyNames)` or `IBMPublishFutureDatedEvent` is called
 - ▶ `&KeyNames` will contain the values to allow the adapter to later instantiate the component interface with the necessary key values
2. A new entry will be added to the `IBM_EVENT_TBL` record (or whatever name was used to create the Event table project) where the information will be stored until the adapter retrieves it as an event
 - ▶ Event status will be set to 0 or 99 (99 is set for events with future dates)
 - ▶ Event date will be set to the system date (for `IBMPublishDate`) or future date (for `IBMPublishFutureDatedEvent`)
3. Adapter polls for the events in the event project and extracts events with status = 0 (indicating event has not been processed)
4. Adapter will retrieve information for the component interface and populate the BO before calling the message listener
5. Any errors that occur during the event function will not affect the commit or functionality of the People Code operation



Shown here are the details of what happens when a component, which has event trigger, is changed. Based on the trigger function, `IBMPublishEvent` or `IBMPublishFutureDatedEvent`, when the component is changed, a new entry is added to event store with the status of 0 for new event or 99 for new event for a future date. The adapter periodically polls for the new event, based on the polling period. New events (status = 0) are extracted and processed within the adapter.

For each new event, the adapter retrieves the component information related to the event and then populates a business object before sending it to the endpoint.

Transaction and Security

This section covers the transaction and security support.

Transaction and Security

- Transaction
 - ▶ PeopleSoft application does not support local or XA transaction
 - ▶ Hence this feature is not supported by the adapter
- Security
 - ▶ For outbound, use the WebSphere Process Server J2C Authentication Alias to specify the user id and password to connect to the PeopleSoft application
 - ▶ Inbound does not use J2C Authentication Alias – instead uses user id and password on the ActivationSpec



The PeopleSoft application does not support transactions, so there is no end to end transaction available from the adapter to and from the PeopleSoft application.

In terms of security, for the outbound request, the J2C Authentication Alias within the WebSphere Process Server is used. The authentication alias name can be specified in WID. The administrator must have that J2C Authentication Alias defined within the Process Server with its user id and password to authenticate the PeopleSoft application. The pre-defined J2C Authentication Alias “**SCA_Auth_Alias**” can be used for authentication.

For the inbound request, the user id and password properties specified on the inbound ActivationSpec are used. J2C Authentication Alias is not used for inbound operations.

Properties for RAR Deployment Descriptor, Managed Connection and Activation Spec

Common properties were covered In the WebSphere Adapter common details presentation. This section covers the PeopleSoft specific attributes.

Deployment Descriptor Custom Properties

Property	Description
EventKeyDelimiter	The delimiter for the Object key name-value pair in the event table
PollFutureEvents	This will enable events with the event date set to a future date, to be polled only on or after the corresponding date.
PingCompInterface	Will be used to check if the session is corrupt or not. An existing component interface name should be given and the adapter checks for its existence. The adapter will throw an exception back if the operation errors out or if the component interface does not exist.



Some of the specific PeopleSoft Adapter custom properties are shown here. The descriptions is self explanatory.

The event triggers within the PeopleSoft components can insert events for future processing. The adapter needs to know that future events will be used within PeopleSoft. The PollFutureEvents property lets the adapter know if future dated events should be expected.

Managed Connection Factory Properties (for Outbound)

Property	Description
User Name	User name to login to the EIS
Password	Password for the corresponding user name
Host Name	Name or IP Address of the machine hosting the EIS
Port	Jolt port number
Language	Language to be used

The Managed Factory outbound events used to connect to the PeopleSoft backend are shown here and are self explanatory.

Activation Specification Properties (for Inbound)

Property	Description
User Name	User name to login to the PeopleSoft EIS
Password	Password for the corresponding user name
Host Name	Name or IP Address of the machine hosting the PeopleSoft EIS
Port	port number
Language	Language to be used
EventCIName	The name of the component interface that the adapter will interact with during inbound operations. Default Value: IBM_EVENT_CI

22

The properties for the inbound ActivationSpec are shown in the table. They are same as the outbound except a new one called the EventCIName, which specifies the name of the custom event component in PeopleSoft that has been created to store the events from the PeopleSoft components.

Problem Determination



This section is a recap of Problem Determination. Problem Determination methodology, log and trace files are similar in all the WebSphere Adapters, and are covered in the common details section.

Problem Determination

- Covered in the Common Adapter details presentation –
Recap:
 - ▶ WebSphere Process Server log files (SystemOut.log and SystemErr.log)
 - ▶ Adapter Log and Trace files configured in WIDEMD and using the RAR custom properties in the Administrative console of the Process Server
 - ▶ Different logging level and tracing levels can be set
- Enabling trace for PeopleSoft Adapter in WPS :
 - ▶ Set the tracing level string as "com.ibm.j2ca.peoplesoft.*=finest"
- Before interacting with the Adapter, test the components in PeopleSoft, where possible



Listed here are the log files for WebSphere Process Server. Note the trace string used to turn on tracing of the PeopleSoft adapter, along with the levels.

Best practice is, where possible, to try to test the PeopleSoft components like the custom event component, generation of event triggers within the PeopleSoft backend before trying the end to end scenario with the adapter.

Summary and References

This section provides a summary and references.

Summary and References

- Summary
 - ▶ Discussed PeopleSoft Adapter in details covering the architecture, operations, Problem Determination

- References
 - ▶ Information Center
 - ▶ User guide



In summary, this presentation covered the details of WebSphere Adapter for PeopleSoft.

More information can be found in the user guide and the Information Center for the Adapter.

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