IBM WebSphere Adapters V6.2

WebSphere Adapter V6.2 for SAP Overview

This presentation will focus on the WebSphere® Adapter for SAP V6.2 overview.

Agenda

- SAP terminology
- Overview
- Dependencies
- Configuration properties
- Enterprise service discovery
- Transaction and security
- Migration
- Summary

The agenda for this presentation is shown here.

Section

SAP terminology

This section will cover SAP terminology.

SAP terminology

- **IDoc (SAP intermediate document)**
  - ▸ IDocs represent SAP business objects as flat structures
  - ▸ Proprietary format defined by SAP for business data transmission
  - ▸ IDocs are used for asynchronous batch data transmission
- **SAPJCo:**
  - ▸ The SAP Java™ Connector (SAPJCo) is a toolkit that allows a Java application to communicate with any SAP system
  - ▸ The package supports both, Java to SAP system and SAP system to Java calls

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Shown on this slide and the next two slides is some common SAP terminology that will help you to understand the SAP adapter.

SAP terminology (continued)

- **Business Application Program Interfaces (BAPI)**
  - ▶ BAPI's are programming interface to access SAP Database from within SAP or other development platforms external to R/3 that support the Remote Function Call (RFC) protocol
  - ▶ The main objective of BAPI is to achieve integration between the SAP System and external applications, legacy systems, and so on.
  - ▶ BAPIs are defined in the Business Object Repository (BOR) as methods of SAP Business Objects or SAP Interface Types and enable object-oriented access to Business Components (application components) in the SAP System

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BAPI's are programming interface to access SAP Database from within SAP or other development platforms external to R/3 that support the Remote Function Call protocol.

SAP terminology (continued)

ALE (Application Link Enabling)

- Application Link Enabling (ALE) is an integration interface in SAP's Business Framework Architecture. It is a component-based architecture enabling software components from SAP and from other software vendors to communicate and be integrated with each other

- ALE can integrate business processes between SAP Systems and external applications and between SAP Systems. Application systems are loosely coupled in an ALE integrated system and the Data is exchanged asynchronously

- ALE uses IDoc for data exchange

Application Link Enabling (ALE) is an integration interface in SAP's Business Framework Architecture, a component-based architecture enabling software components from SAP and from other software vendors to communicate and be integrated with each other.

ALE uses IDoc for data exchange.

Section

Overview

This section provides an overview of the WebSphere Adapter for SAP.

IBM

SAP adapter outbound support

- Outbound calls supported using these interfaces:

- For making BAPI calls
  - ▶ BAPI
    - Synchronous
    - Asynchronous using queue RFC(qRFC) or transactional RFC *New V6.2* -- support added in V6.2
  - ▶ BAPI work unit (Multiple BAPI calls in a single interaction)
  - ▶ BAPI result set

- Using IDocs - qRFC supported for the interfaces below
  - ▶ ALE interface
    - Single IDoc or IDoc packets (collection of IDocs)
  - ▶ ALE pass-through interface
    - Single IDoc or IDoc packets (collection of IDocs)

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Outbound calls are supported with the BAPI interface, BAPI work unit, BAPI result set, ALE interface, or Advanced Event Processing (AEP) interface using ABAP handlers and Query Interface for SAP Software (QISS).

With BAPI, outbound can be simple BAPI calls, or BAPI using remote function calls, or multiple BAPI calls in a single interaction, referred to as a BAPI work unit. BAPI outbound calls have request and response interaction style. In V6.1 result set functionality has been added. Using the BAPI result set interface, you can configure the adapter to return combination of output from two different BAPI calls. In V6.2 the adapter has added support for transactional and queued RFC support for BAPI calls. With the Advanced Event processing interface, the adapter makes use of the Advanced Business Application Programming (ABAP) handlers.

With the QISS interface, you can directly query the SAP application tables.

SAP adapter outbound support

- Outbound calls supported using these interfaces (continued)

- Using IDocs - qRFC supported for the interfaces below
  - ▶ ALE interface
    - Single IDoc or IDoc packets (collection of IDocs)
  - ▶ ALE pass-through interface
    - Single IDoc or IDoc packets (collection of IDocs)

- Advanced event processing (AEP) interface
  - ▶ Custom IDocs and ABAP handlers

- Query interface for SAP software (QISS) interface
  - ▶ Retrieve application table data

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The ALE interface supports passing single or multiple IDocs, which are one-way calls where the IDocs are passed to the SAP application.

With the Advanced Event processing interface, the adapter makes use of the Advanced Business Application Programming (ABAP) handlers.

With the QISS interface, you can directly query the SAP application tables and retrieve the data in the hierarchical form you define.
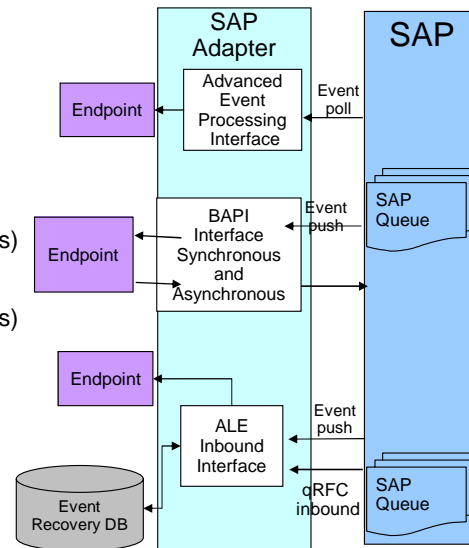
SAP adapter outbound support
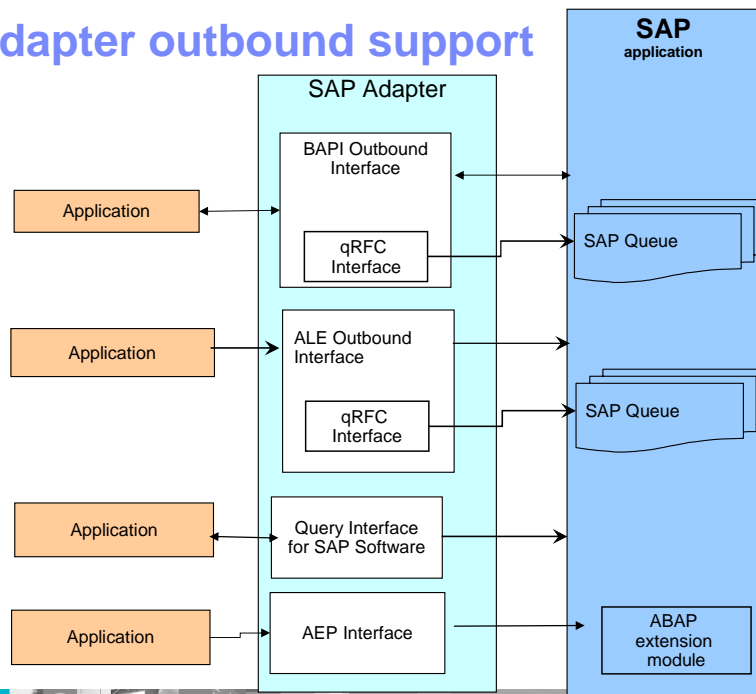
This diagram shows the high level flow and the components in outbound calls. The various interfaces that the adapter supports for outbound are shown in the diagram above. You can use the adapter to make BAPI calls, exchange data using IDocs over ALE interface, interact directly with application tables using query interface for SAP software interface or can call ABAP handlers when using the advanced event processing interface.

SAP adapter inbound support

- Inbound calls supported using these interfaces:
- Using IDocs - qRFC supported for the interfaces below
  - ▸ ALE interface
    - Single IDoc or IDoc packets (collection of IDocs)
  - ▸ ALE pass-through interface
    - Single IDoc or IDoc packets (collection of IDocs)
- BAPI interface
  - ▸ Synchronous
  - ▸ Asynchronous using tRFC
  - ▸ Asynchronous using qRFC
- Advanced event processing interface
  - ▸ For processing custom IDocs

SAP Adapter
- Endpoint
- Advanced Event Processing Interface — Event poll
- Endpoint
- BAPI Interface Synchronous and Asynchronous — Event push
- Endpoint
- ALE Inbound Interface — Event push
- Event Recovery DB
- qRFC inbound

SAP
- SAP Queue
- SAP Queue

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This diagram shows the high level flow and the components for the inbound events from SAP.

Inbound calls are supported by the ALE interface using asynchronous event notification. For the inbound call, the Adapter acts as an RFC server and listens for ALE events from the SAP Application and the adapter uses an event recovery table to manage the inbound events.

For ALE outbound and inbound operations, a qRFC support is enabled for the ALE interface in V6.0.2.1. Client applications can specify a queue to which IDocs are delivered, to ensure the order in which the IDocs are delivered and processed by an SAP application.

The Synchronous call back interface introduced in V6.0.2.1 is used to monitor any events related to the invocation on BAPI call on. In V6.2 synchronous call back interface has been renamed to BAPI interface. The adapter supports transactional RFC (tRFC) and queue RFC (qRFC). So adapter now supports both synchronous and asynchronous processing of events. More information on tRFC and qRFC support is covered in the inbound presentation

With the Advanced Event Processing interface, the adapter processes any events related to custom IDocs using the Advanced Business Application Programming (ABAP) handlers.

More details on outbound and inbound calls are discussed in a different presentation.

Section

Configuring dependent files

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This section will provide the steps in installation and deployment of the WebSphere Adapter for SAP. Note that this section is also covered in a separate presentation common for all WebSphere Adapters.

Specify dependencies

- Select the SAP Adapter entry in the External Service Wizard

- Add EIS external dependencies, "sapjco.jar
  - ▸ For WebSphere Process Server: *<WPS_INSTALL>*\lib directory
  - ▸ For WebSphere Integration Developer: You are prompted in External service wizard

- Add the external SAP native libraries required for the adapter
  - ▸ For WebSphere Process Server : *<WPS_INSTALL>*\bin directory
  - ▸ For WebSphere Integration Developer : You are prompted in External service wizard
  - ▸ Libraries are:
    - ▪ librfc2.dll (or .so)
    - ▪ Sapjcorfc.dll (or .so)

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The adapter requires the dependant files to communicate with the Enterprise Information System (EIS). At the design time, you can now browse and select the dependent files in the external service wizard. For runtime usage of these dependent files by adapter, you need to place the files in the locations shown in the slide.

Deployment in WebSphere Process Server

- Add the SAP dependent jar files and DLLs to the WebSphere Process Server class path
  - ▶ sapco.jar: *<WPS_INSTALL>*\lib directory
  - ▶ DLLs: *<WPS_INSTALL>*\bin directory
- Install EAR file in WebSphere Process Server using the administrative console or command line tool "wsadmin"
  - ▶ For most install steps, defaults are fine
- If needed, modify any RAR properties (from Your application -> Connector Modules -> CWYEP_SAPAdapter.rar)
  - ▶ Custom RAR properties
  - ▶ Managed Connection Factory for outbound connection to EIS
  - ▶ Activation Spec for inbound event from EIS
- Start the Enterprise application using Administrative console or wsadmin

This page outlines the high level flow of deploying the business process application built in WebSphere Integration Developer to a WebSphere Process Server. Adapter's external dependencies must be satisfied. The J2C authentication alias for the outbound request must be specified. The database that holds the event table must be created for adapters that require them. SAP Adapter requires it, whereas for the other adapter, the table is optional.

Add necessary SAP dependent jar files and DLLs to the WebSphere Process class path. Installation of the application containing the WebSphere Adapter for SAP to the WebSphere Process Server is similar to installing any other enterprise application. Either the administrative console or command line tool, wsadmin, can be used for application installation. Once installed, the administrator can modify the adapter properties. The last task is to start the application, either in the console or through wsadmin.
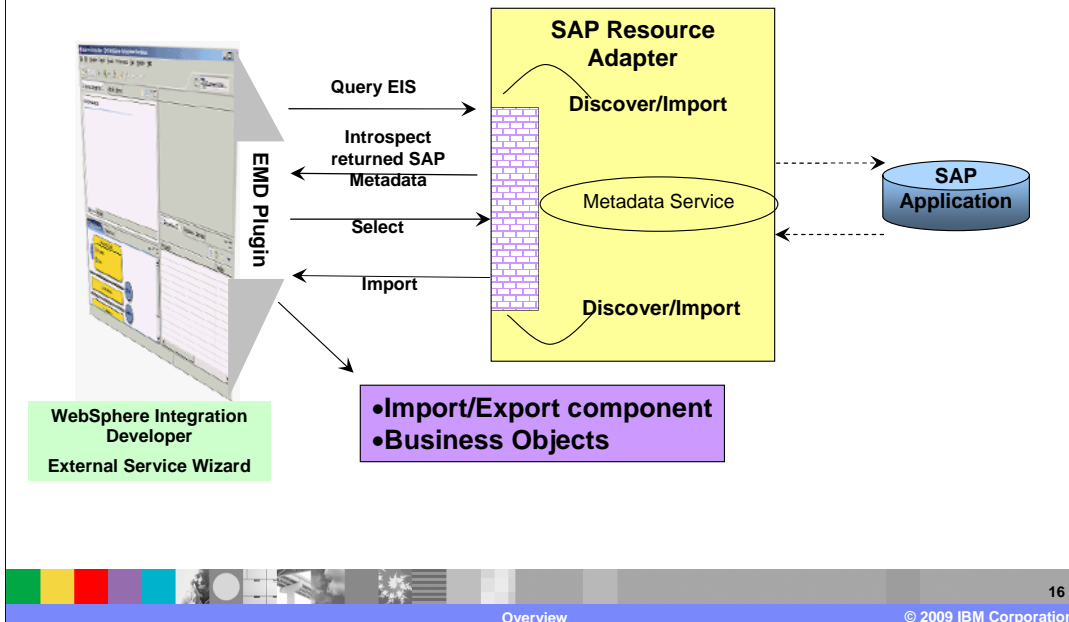
Section

Enterprise metadata discovery

Overview
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This section will cover Enterprise Service Discovery.

SAP adapter metadata discovery

This diagram shows the interaction between the External Service wizard in WebSphere Integration Developer and the Enterprise Metadata Discovery (EMD) support classes within the SAP adapter. It also shows the end to end flow of interaction from the tool to the adapter to the SAP application to create the artifacts for the outbound and inbound requests to and from SAP.

The wizard lets you discover and import SAP metadata definitions and other artifacts related to BAPI, ALE and other interfaces. Based on your selection of metadata, business objects containing properties that correspond to the method arguments are generated. Application specific information is set in the business objects. The import and export components along with other artifacts are also generated based on the interactions style you chose.

Section

Transaction and security

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The next section covers the transaction and security support.

Transaction and security

- Transaction
  - ▶ SAP application support transaction for BAPI calls only
  - ▶ Adapter provides local transaction support for the BAPI interface using these BAPI calls
    - BAPI_TRANSACTION_COMMIT
    - BAPI_TRANSACTION_ROLLBACK
  - ▶ Adapter provides local transaction support for the ALE interface when using the transactional .RAR file
    - JCA client needs to handle the persistence of Transaction ID
- Security
  - ▶ Adapter supports container managed sign-on and basic authentication. It does not support re-authentication
  - ▶ For outbound or inbound, use the WebSphere Process Server J2C Authentication Alias to specify user ID and password to connect to the EIS

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SAP application supports transaction for BAPI calls only through the use of BAPI_TRANSACTION_COMMIT and BAPI_TRANSACTION_ROLLBACK calls. In this version, the adapter also provides local transaction support for the ALE interface when using the transactional RAR file. The JCA client will need to determine how to store the SAP transaction ID and how to relate the SAP transaction ID with the data being sent to the adapter. If the JCA client does not send an SAP transaction ID with the business object, the adapter will return one after executing the transaction. If the JCA client has a SAP transaction ID, it needs to populate the SAP transaction ID property with that value before executing the transaction.

On the security front, for the outbound or inbound request, the J2C Authentication Alias within the WebSphere Process Server can be used. The authentication alias name can be specified in WebSphere Integration Developer. The administrator must have that J2C Authentication Alias defined within the Process Server with its user ID and the password to authenticate the SAP application. Pre-defined J2C Authentication Alias "**SCA_Auth_Alias**" can be used for authentication.

Section

Summary and references

The next section covers the summary and references.

Summary and references

- Summary
  - ▶ Discussed SAP adapter in details covering the architecture and enterprise service discovery
  - ▶ Looked at transaction and security

- References
  - ▶ Information center:
    http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.wbit.620.help.adapter.emd.ui.doc/topics/tcreatecmps.html
  - ▶ User guide
  - ▶ IBM Education Assistant

In summary, this presentation covered the overview of WebSphere Adapter for SAP including the architecture and enterprise service discovery. The presentation has also provided information on transaction and security. More information on WebSphere Adapter for SAP can be found in the user guide and the information center for the adapter. Details about inbound and outbound functionality are covered in separate presentations.

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