



IBM Software Group

## IBM WebSphere® Adapters V6.0.2

### *WebSphere Adapter for JD Edwards EnterpriseOne V6.0.2*



@business on demand.

© 2007 IBM Corporation  
Converted to video June 18, 2015

This presentation covers the IBM WebSphere Adapter for JD Edwards EnterpriseOne V6.0.2

## Agenda

- Overview and architecture
- Installation
- Enterprise service discovery
- Configuration properties
- Business objects
- Summary and references



The agenda for this presentation is shown here.

## Section

# ***Overview and architecture***

This section will provide an overview of the WebSphere Adapter for JD Edwards EnterpriseOne V6.0.2

## Overview

- The JD Edwards EnterpriseOne Resource Adapter enables outbound connectivity for integration to JD Edwards EnterpriseOne Applications.
- Information is exchanged with the EnterpriseOne application through:
  - ▶ Business Function calls
    - Business function calls are core to EnterpriseOne interoperability. Business functions encapsulate transaction logic to perform specific tasks.
  - ▶ XML List calls
    - XML List is XML-based interoperability that runs as an EnterpriseOne process. It provides List functionality that enables retrieval of a list of records from EnterpriseOne.

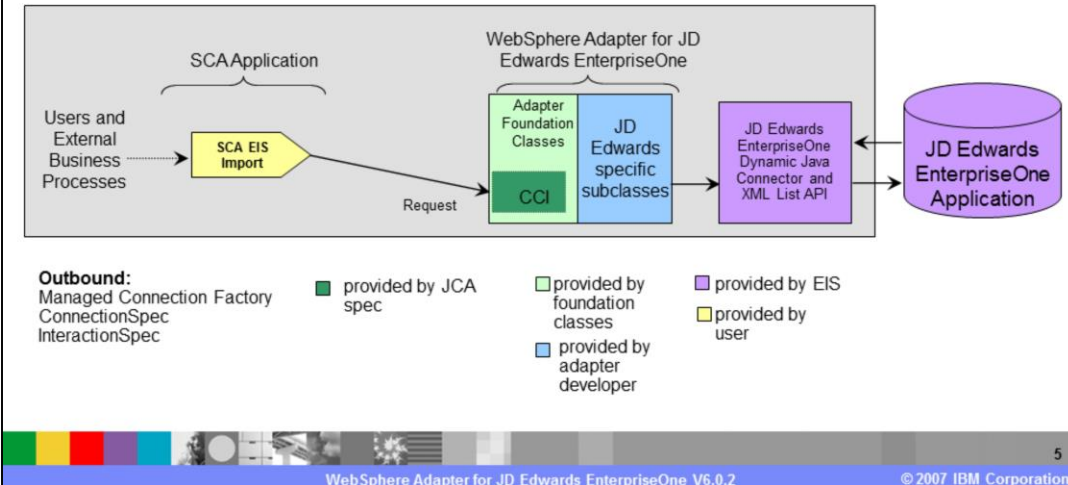


The JD Edwards EnterpriseOne Resource Adapter enables only outbound connection for integration to JD Edwards EnterpriseOne Applications. Information is exchanged with the EnterpriseOne application through either Business Function Call or XML List calls.

For Business Function calls, they are core to EnterpriseOne interoperability. These business functions encapsulate transaction logic to perform specific tasks. For XML List call, it is XML-based interoperability that runs as an EnterpriseOne process. It provides List functionality that enables retrieval of a list of records from EnterpriseOne applications.

## Adapter architecture

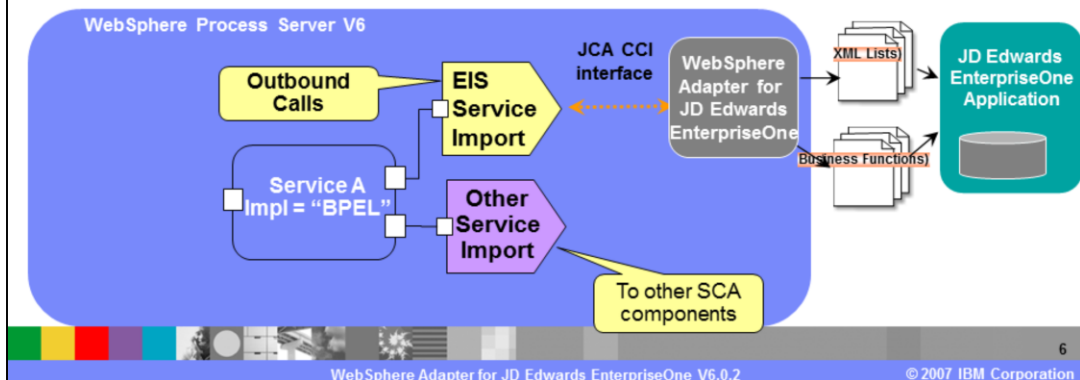
- IBM WebSphere Adapter for JD Edwards EnterpriseOne implements the JCA version 1.5 specification, enabling outbound connectivity to the Enterprise Information System



The architecture of WebSphere Adapter for JD Edwards EnterpriseOne is similar to any other adapters. With the similar chart here, you see an SCA EIS Import, which indicates that the adapter only supports outbound. There are adapter foundation classes and JD Edwards specific subclasses. The adapter then uses a JD Edwards EnterpriseOne Dynamic Java connector and XML List API to communicate with a JD Edwards EnterpriseOne Application.

## EIS import services

- EIS Import (for outbound) SCA components provide a uniform view of the EIS services external to the module
- Business Objects are generated by ESD, 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



This diagram is showing the SOA version of the architecture. Here you see a business integration application, Service A, implemented as a BPEL process, making its references or invokes to other services using the EIS Service Import and WebSphere Adapter for JD Edwards EnterpriseOne. Outbound is made through Service Import and used JCA CCI interface to pass business objects. It wraps the information over to the adapter and the adapter will invoke it using either XML List or Business Function available on JD Edwards Adapter.

## Section

# *Installation*



This section will provide the installation preparation steps for WebSphere Adapter for JD Edwards EnterpriseOne. Note that this section is also included in a separate presentation common for all WebSphere Adapters.

## Importing the adapter into Integration Developer

- Import JD Edwards Adapter Resource Archive into Integration Developer – this creates a Java™ 2 Enterprise Edition (J2EE) connector RAR project in the workspace
- Add EIS external dependencies to the RAR project and add them to the Java Build path of the project
  - ▶ Many files, depending on JD Edwards version
  - ▶ Right click the CWYED\_JDE connector module folder -> Import -> Import from File System, Browse to location, select all dependent files
  - ▶ Add libraries from CWYED\_JDE connector module to the connector project classpath
    - Right click CWYED\_JDE -> Properties -> Java Build Path, from the Libraries tab click Add JARS
    - Add all of the libraries in the connector module folder



The WebSphere Adapter for JDE RAR file is now included in Resource Adapter directory of WebSphere Integration Developer. Once you have located the adapter, you will proceed with WebSphere Integration Developer and import the JDE archive into WebSphere Integration Developer. This creates a J2EE connector project in your workspace. Add any EIS external dependencies to the RAR project. You also need to add libraries from the connector module to the connector project class path.



## Required client libraries

8.9 (SP1,SP2), 8.93	8.94	8.95	
kernel.jar	kernel.jar	Connector.jar	BizLogicContainerClient_JAR.jar
Connector.jar	Connector.jar	JDBjBase_JAR.jar	ApplicationAPIs_JAR.jar
database.jar	database.jar	JdbjInterfaces_JAR.jar	ApplicationLogic_JAR.jar
log4j.jar	log4j.jar	JdeNet_JAR.jar	jdeinterop.ini
xerces.jar	xerces.jar	Spec_JAR.jar	jde.ini
xalan.jar	xalan.jar	System_JAR.jar	jdelog.properties
jdeinterop.ini	jdeutil.jar	Base_JAR.jar	JDBC driver
jdeLog.properties	jdbj.ini	log4j.jar	
JDBC driver	jdeinterop.ini	xerces.jar	
	jdelog.properties	xalan.jar	
	JDBC driver	PMApi_JAR.jar	
		BizLogicContainer_JAR.jar	

- Copy files to a folder where adapter is installed
- See JD Edwards documentation – Connectors, and Interoperability
- jde.ini file needs to point to tnames.ora, and other props

Here is a list of required client libraries for the version of the JD Edwards software that you are using. Consult the JD Edwards documentation for connectors and interoperability properties. The jde.ini file needs to point to tnames.ora, along with other properties such as connection, user ID and password, and so on.

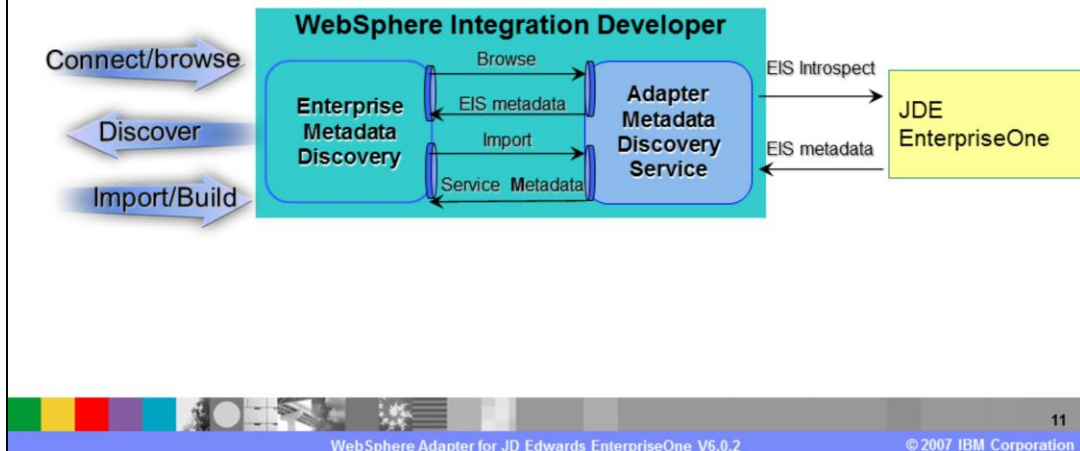
## Section

# ***Enterprise service discovery***

This section will provide an overview of the Enterprise Service Discovery

## Enterprise service discovery

- Allow for discovery of and generation of business objects and service constructs that enable the adapter to integrate into SOA applications as an SCA component.



The enterprise service discovery allows for discovery and generation of business objects and service constructs that enable the adapter to integrate into SOA applications as an SCA component.

## Enterprise service discovery

- Generates business objects corresponding to business functions and XML lists.
- Generates properties in the business objects corresponding to the properties in the business functions and XML lists.
- Sets application specific information on the business objects
- Provides outbound service descriptions used by integration developer to generate the import and WSDL files

Some of these Enterprise Service Discovery functionalities include:

- Generating Business Objects corresponding to Business Functions and XML Lists.
- Generating properties in the Business Objects corresponding to the properties in the Business Functions and XML List.
- Providing Outbound service descriptions used by WebSphere Integration Developer to generate the Import and WSDL files.

## Enterprise service discovery

- Edit Query button will display the Query Filter Properties window, allowing selection of Business Functions, XML Lists with Tables specified by user.
- JDE API does not have the capability of retrieving the tables for which XML Lists can be generated.
  - ▶ There is no way for the Service Discovery to retrieve a list of tables.
  - ▶ Required to manually enter the names of the tables from which to generate XML List business objects.
    - Table information can be retrieved with JD Edwards tools such as the Universal Table Browser.
    - If the table listed in the “Tables for XML Lists” property, there will be nothing listed in the tree under XML Lists node.

During the Enterprise Service Discovery, you can edit the query for types listed here. It allows selection of business functions or xml lists with tables. You need to specify the name of the table. For the XML lists with tables, the API does not have the capability of retrieving the tables; you must manually enter the names of the table from which to generate the XML List business objects. You can retrieve the table information using JD Edwards tools such as the Universal Table Browser.

## Business function container business object

- ▶ These properties will be empty by default. Valid values will be set to the list of all the business functions selected.
- ▶ You can add/remove business functions.
- ▶ The order specified will be retained in the Container Business Object Operation ASI.

Business Function Container Business Object

Container Business Object Name:

Business Functions for Create:

Business Functions for Retrieve:

Business Functions for Update:

Business Functions for Delete:

Business Functions for Execute:

For the business function container business object, you will see the panel of Enterprise Service Discovery, which allows you to select business functions and libraries from which to have your business object created. You will then need to provide the container business object name and then you can add any business functions for Create, Retrieve, Update, Delete, and Execute operations. You can also add or remove these business functions. The order specified will be retained in the Container Business Object Operation Application Specific Information.

## XML lists – Query capability during ESD

- Add query capability
  - ▶ Sorting
  - ▶ Conditions
  - ▶ Where clause
  - ▶ Operator comparisons

Business Object Name: F0116  
Table Type: OWTABLE  
Table Conversion Version:  
Operations: RetrieveAll

Queries

Query

Sorting:

Add Condition  
 Remove Query

Query Condition

Attribute: Addressnumber  
Clause: WHERE  
Operator: Equal To  
UseAttributeValue:  
Default: 33937

Remove Condition  
 Add Query

For XML Lists, query capabilities include sorting, add conditions, the Where clause, operator comparisons and other default values. You also have the option to add multiple queries.

## Outbound operations

- Business functions
  - ▶ Create
  - ▶ Retrieve
  - ▶ Update
  - ▶ Delete
  - ▶ Execute
- XML lists
  - ▶ RetrieveAll

For outbound operations, these are the operations that are available. For Business Functions, these include Create, Retrieve, Update, Delete, and Execute. For XML Lists, only RetrieveAll is available.



## Section

# ***Configuration properties***

This section will provide details on configuration properties

## Managed connection factory properties (for outbound)

Property	Description
User Name	User name to login to the JD Edwards Server
Password	Password for the corresponding user name
Environment	JD Edwards EnterpriseOne environment name for the corresponding user name. Multiple JD Edwards EnterpriseOne environments can be present on a single machine.
Role	Role name to use to connect

Managed connection factory configuration properties are used at run time to create an outbound connection instance with an enterprise information system. Username and password properties are required when logging into the JD Edwards EnterpriseOne Server. Environment is the JD Edwards EnterpriseOne name for the corresponding user name. There can be multiple environments present on a single machine.

## InteractionSpec configuration properties

Property	Description
maxRecords	Maximum number of records to return on a Retrieve operation
Timeout	Timeout value to be set on XML List call. If not specified, global adapter value will be used.

Here are highlights on properties for XML Lists call where you can specify the maxRecords and TimeOut. maxRecords property is used to provide the maximum number of records to return on a Retrieve operation.

## Resource adapter properties

- Configurable properties of the deployment descriptor

Property	Description
enableHASupport	When the enableHASupport property is set to true, only one of the replicated adapter instances actively polls for events while other instances are in standby mode. If the enableHASupport property is set to false, all of the adapter instances replicated on cluster members actively poll for events. This may result in event duplication. Do not change the value of enableHASupport to false for single server environments.
Timeout	Global timeout value to be set on XML List call. Default is 30 seconds

Resource adapter properties consist of logging and tracing and activities specific to the adapter. One of the properties available for high availability is enableHASupport property which supports multiple adapter instances in clustered environment. So, if enableHASupport is set to true, only one of the replicated adapter instances actively polls for events while other instances are in standby mode. And if it is set to false, all of the adapter instances replicated on cluster members actively poll for events. This capability would improve adapter performance and availability. The Timeout global value can be set on XML List call. You configure these properties using the enterprise service discovery wizard or the administrative console of the server.

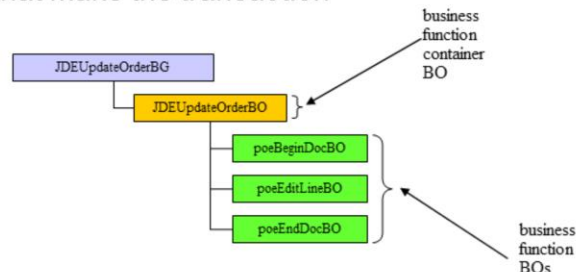
## Section

# ***Business objects***

This section will provide an overview of the business object model.

## Object model – Business functions

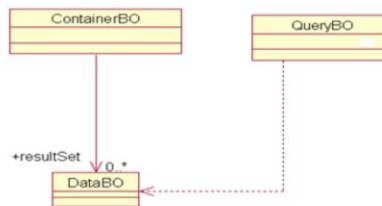
- The Business Function BOs as defined by the resource adapter are designed to support the execution of multiple EnterpriseOne business functions as a single transaction.
- The business function BO definitions map one-to-one to individual EnterpriseOne business functions. They contain attributes that map to the input and output parameters of the business function.
- Each business function container BO definition will contain references to the business function business objects that represent the business functions that make the transaction



Now look at the business object model for Business Functions and XML List. The Business Function Business Object, as defined by the Resource Adapter, are designed to support the execution of multiple EnterpriseOne business functions as a single transaction. So here you would see the individual business function and individual business object. They are mapping one-to-one to those individual EnterpriseOne business functions. They contain attributes that map to the input and output parameters of the business function. Each business function container Business Object definition in the yellow box shown here will contain references to the business function Business Object that represent the business function that make the total transaction.

## Object model – XML list

- The XML List BOs are designed to support the retrieval of multiple records from a specific JDE table or view based on parameterized SQL-like queries.
- For query support the following requirements have been taken into consideration:
  - Build time definition of query structure
  - Support for more than one query expression per table
  - Right-hand operand values in conditions to be specified at runtime
  - Default values for right-hand operands to be specified at build time, for cases where a static condition is preferred
  - Support for multiple occurrences of a column in a query expression
  - Support for >2 cardinality operators: IN, NI, BW (between) and so forth...
- As such, structural distinction had to be made between the query BOs and the data BOs to hold the query result.



23

WebSphere Adapter for JD Edwards EnterpriseOne V6.0.2

© 2007 IBM Corporation

Here is the business object model for XML List. The XML List Business Objects are designed to support the retrieval of multiple records from a specific JD Edwards table or view, based on parameterized SQL-like queries. These listed requirements need to be taken into consideration for query support. In business structure requirement, the structural distinction has to be made between the query Business Object and the actual data Business Object to hold the query result.

## Object model – XML list (cont.)

- The XML List Data BO definitions map one-to-one to EnterpriseOne tables. They are generated based on a table/table conversion structure and will be reused across multiple queries on the same table.
- Each XML List QueryBO is based on one JDE Table/Table Conversion and its attributes reference the associated table's data BO. There may be multiple QueryBOs that are based on the same table/table conversion.
- XML List Query BOs are created at build-time, through ESD based on the corresponding data BO definition and user definition of the query structure. They are semantically similar to SQL stored procedures.
- QueryBO ASI contains information about what XML List Data BO it is based on (in DataType element)
- The Container BO will hold the result set of a query. ESD will generate one container BO definition per Data BO.

Here is more information on the XML List data Business Object and Query Business Object, concerning how they map to JD Edwards tables.



## Section

# ***Summary and references***

The next section covers the summary and references.

## Summary and references

### ▪ Summary

- ▶ The JD Edwards EnterpriseOne Resource Adapter enables integration to JD Edwards EnterpriseOne Applications.
  - Outbound support only
- ▶ Support for Enterprise Metadata Discovery for discovering services

### ▪ References

- ▶ User Guide

To summarize this presentation, you have learned that the JD Edwards EnterpriseOne Resource Adapter enables only outbound connections for integration to JD Edwards EnterpriseOne Applications. Enterprise Service Discovery is used for discovery of services and creating the service description. It is also used to specify values for custom adapter properties and for the discovery of business objects. Additional reference information may be found in the WebSphere Adapter for JD Edward EnterpriseOne user guide.

# Trademarks, copyrights, and disclaimers

The following terms are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both:

IBM                      WebSphere

J2EE, Java, Java, and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Product data has been reviewed for accuracy as of the date of initial publication. Product data is subject to change without notice. This document could include technical inaccuracies or typographical errors. IBM may make improvements or changes in the products or programs described herein at any time without notice. Any statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business. Any reference to an IBM Program Product in this document is not intended to state or imply that only that program product may be used. Any functionally equivalent program, that does not infringe IBM's intellectual property rights, may be used instead.

Information is provided "AS IS" without warranty of any kind. THE INFORMATION PROVIDED IN THIS DOCUMENT IS DISTRIBUTED "AS IS" WITHOUT ANY WARRANTY, EITHER EXPRESS OR IMPLIED. IBM EXPRESSLY DISCLAIMS ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT. IBM shall have no responsibility to update this information. IBM products are warranted, if at all, according to the terms and conditions of the agreements (for example, IBM Customer Agreement, Statement of Limited Warranty, International Program License Agreement, etc.) under which they are provided. Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products in connection with this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products.

IBM makes no representations or warranties, express or implied, regarding non-IBM products and services.

The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents or copyrights. Inquiries regarding patent or copyright licenses should be made, in writing, to:

IBM Director of Licensing  
IBM Corporation  
North Castle Drive  
Armonk, NY 10504-1785  
U.S.A.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. All customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. The actual throughput or performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput or performance improvements equivalent to the ratios stated here.

© Copyright International Business Machines Corporation 2007. All rights reserved.

Note to U.S. Government Users - Documentation related to restricted rights-Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract and IBM Corp.