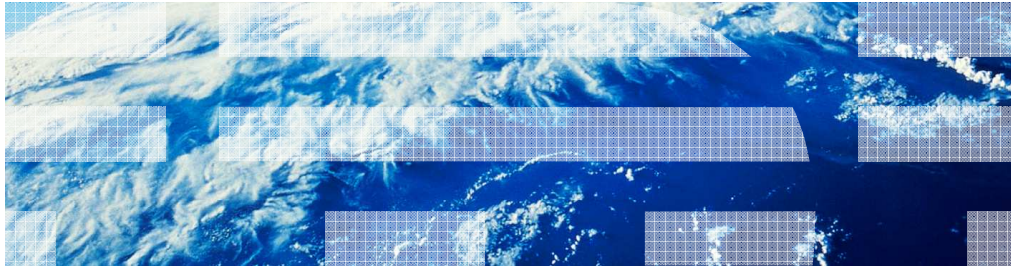


# IBM Business Process Manager V7.5

## IBM WebSphere adapter for Oracle E-Business suite V7.5



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This presentation covers WebSphere Adapter for Oracle E-Business Suite V7.5 enhancements.

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- Summary

This presentation provides details on the enhancements in WebSphere adapter for Oracle E-Business Suite (also referred to as Oracle EBS) V7.5. There were two key enhancements made to V7.5 . The first key feature is now WebSphere adapter for Oracle EBS can integrate with Oracle XML Gateway through JMS . The other key feature you see in this presentation is how WebSphere adapter for Oracle EBS V7.5 integrates with Oracle Advanced Queue through PL/SQL. There will also be a summary at the end of this presentation.

## ***Oracle XML gateway integration through JMS***

In this section you will have a detailed look at the Oracle XML Gateway Integration feature supported over JMS

## Oracle E-Business Suite Adapter – XML Gateway integration through JMS

- In adapter version before V7.5, which is V7.0.2, following integration means were available
  - PL/SQL (JDBC™ driver)
  - XML Gateway (web service based)
  - Integration Repository (web service based metadata discovery)
- In V7.5 new integration means added are
  - XML Gateway (JMS based using Oracle AQ API)
  - Advanced Queue (JDBC™ driver)

In WebSphere adapter for Oracle EBS V7.0.2, Oracle XML Gateway integration was supported using web services. Oracle Integration repository or IREP was used for metadata discovery. Apart from this V7.0.2, the adapter also supports integration through PL/SQL using JDBC driver.

With V7.5, WebSphere adapter for Oracle EBS now supports Oracle XML Gateway integration through JMS using Oracle AQ API. For metadata discovery, however, you use the same Oracle IREP feature. V7.5 of WebSphere Adapter for Oracle EBS will also support Oracle Advanced Queue integration through PL/SQL using JDBC driver.

## XML Gateway integration through JMS (1 of 6)

Oracle E-Business Suite facility and interfaces for integration	Integration requirement description
XML Gateway	Supports Oracle XML Gateway through web services and now through JMS, supports both Oracle seeded XML Gateway interfaces (like Order Entry, Invoice Entry) and custom XML Gateway interfaces.
IREP (Integration Repository) metadata discovery	<ul style="list-style-type: none"> <li>▪ IREP is shipped as part of Oracle E-Business Suite</li> <li>▪ IREP provides a complete catalog of Oracle E-Business Suite business service interfaces</li> <li>▪ Exposed as a web service, which can be invoked to retrieve the structure and metadata of different business service interfaces (including XML Gateway, Open Interfaces, Concurrent Programs, PL/SQL APIs etc)</li> </ul>

Here is the integration requirement description for XML Gateway and Integration Repository metadata discovery . Oracle XML Gateway is a set of services that allows easy integration with Oracle Applications to support XML messaging . XML Gateway supports Oracle seeded XML Gateway interfaces such as Order Entry, Invoice Entry and so on. It also supports XML Gateway custom interfaces. Integration to Oracle XML Gateway can be achieved through web services as supported in V7.0.2 or through JMS, which discusses in detail in this section. For the metadata discovery, WebSphere adapter for Oracle EBS makes use of the Oracle Integration Repository or IREP. IREP provides a complete catalog of Oracle EBS business service interfaces. IREP is a compilation of information about the different service endpoints exposed by the Oracle E-business Suite of applications. IREP can also be accessed directly using the hosted URL.

## XML Gateway integration through JMS (2 of 6)

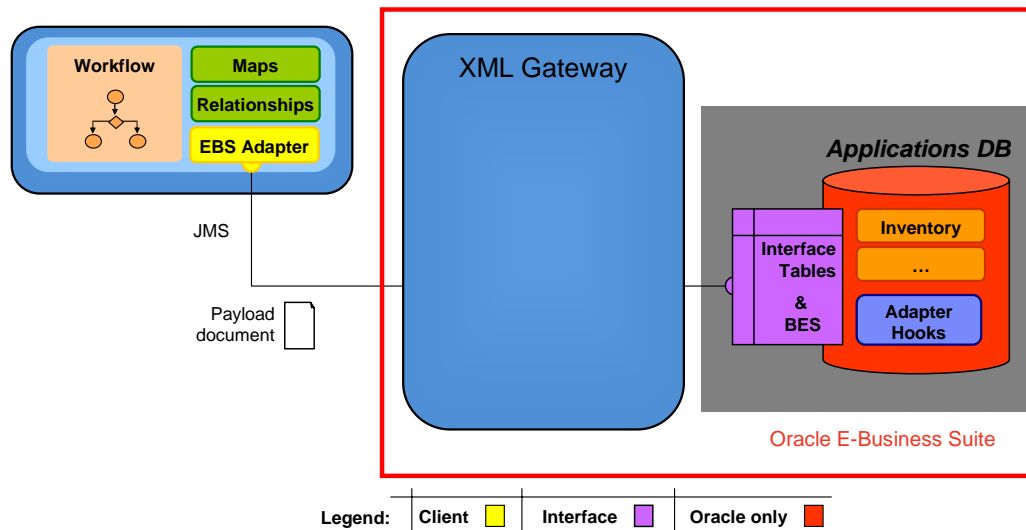
- What is XML Gateway integration?
  - XML Gateway is an interface type in Oracle E-Business Suite
  - Adapter allows Outbound integration with Oracle E-Business Suite using XML Gateway
  - Business data is XML document which is defined by a DTD
  - DTD's are converted to XSDs in the adapter, which are formalized and then business objects are generated
- Why XML Gateway integration?
  - Oracle EBS adapter provides the capability to interact with Oracle applications through Oracle XML Gateway
  - XML Gateway is one of the most popular Oracle E-Business Suite interface type, it supports 150+ business functions of Oracle E-Business Suite.
  - It is the most recommended integration point.
  - XML Gateway integration through JMS using the AQ API does not require much of database experience

Oracle XML Gateway emerges as a key component of Oracle's application integration framework. XML Gateway is a set of services that allows for easy integration with the Oracle e-Business Suite to create and consume XML messages triggered by business events. Oracle XML Gateway provides a set of services that allows easy integration with Oracle Applications . For the WebSphere adapter for Oracle EBS, the XML Gateway is an interface or integration point to establish connectivity to the Oracle E-Business Suite applications. Currently, WebSphere adapter for Oracle EBS only supports outbound integration with Oracle XML Gateway. Business data exchanged is an XML document that conforms to a DTD. Business objects are generated after converting the DTD to schema documents and formalizing these schema documents.

As mentioned earlier, XML Gateway being the key component of Oracle's application integration framework. Integrating with this allows seamless integration with various Oracle applications in the Oracle E-business Suite. XML Gateway supports more than 150 business functions or services. It is the recommended and popular mechanism to integrate to Oracle E-Business Suite. Integrating with XML Gateway through JMS using the AQ API does not require the integration developer to have any database experience.

## XML Gateway integration through JMS (3 of 6)

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This figure demonstrates how XML gateway integrates through JMS. Here you see the XML Gateway as a component of the Oracle E-Business Suite. XML Gateway exposes advanced queue called WF\_JMS\_IN where the message is enqueued to, by the WebSphere adapter for oracle EBS, using the AQ API. The payload is an XML document, that also carries a header section that will identify the message. WF\_JMS\_IN is the queue that is exposed by Oracle E-Business Suite for its inbound operations. In the WebSphere adapter for Oracle EBS, this queue name remains constant and cannot be changed, which you see in later slides. The AQ API provides the required implementation to connect to the AQ (WF\_JMS\_IN) using JMS.

## XML Gateway integration through JMS (4 of 6)

Supporting Terms	Description
Payload	An XML document that contains the business information required for the business process in XML Gateway business integration
WSDL	A document in XML format . It contains the specifications of the web service such as the location of the service and the operations or methods that the service uses.  Though the integration with XML Gateway is through JMS yet the metadata discovery will still be done through web service call to the IREP. IREP WSDL can be viewed by typing the IREP URL in the browser, this also indicates that the IREP service is up.
DTD	Defines the XML Gateway business data type for payload that contains a list of elements, attributes, entities and notations. Oracle EBS adapter provides translation from DTD to schema files.  User handles the gaps between the DTD and XSD.  The payload XML document, which is created based on generated schema files (XSD) is used to take the business data to the business process defined by the XML Gateway interface
Queue Name	The Oracle seeded XML Gateway AQ which will receive Oracle XML Gateway integration data using JMS.

Here are few supporting terms that are used in this feature. Payload is an XML document that contains the business information required for the business process in XML Gateway business integration.

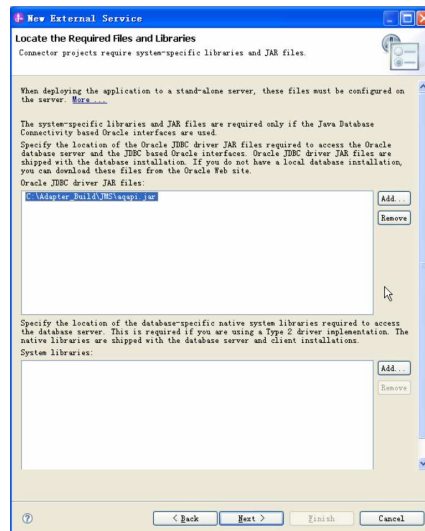
WSDL is discussed here with respect to the IREP web service. WSDL is a document in XML format that provides information on the service that is exposed, in this case, it is the IREP service. DTD defines the XML Gateway business data type for payload that contains a list of elements, attributes, entities and notations. The WebSphere adapter for Oracle EBS provides common translation from DTDs to schema files.

Queue Name is the queue that is configured to receive the payload XML from the application running on IBM integrated runtimes, when connected to Oracle EBS through the WebSphere adapter for Oracle EBS. This is an Oracle seeded XML Gateway Advanced Queue (AQ) which will act as a repository for the messages that needs to be received inbound to Oracle EBS system. The queue name exposed for XML Gateway integration using JMS for transaction inbound to Oracle E-Business Suite application is WF\_JMS\_IN. This presentation is mainly focusing in this inbound queue as WebSphere adapter for Oracle EBS currently only supports outbound integration to Oracle E-Business Suite, outbound from applications on IBM integration runtimes which is inbound to Oracle E-Business Suite.



## XML Gateway integration through JMS (5 of 6)

- For the adapter to act as a JMS client
  - User to provide the *aqapi.jar* as necessary implementation to connect to the inbound queue on Oracle E-Business Suite
- JMS message header should carry these properties to enable Oracle XML Gateway to process the inbound message:
  - *ECX\_MESSAGE\_TYPE*
  - *ECX\_MESSAGE\_STANDARD*
  - *ECX\_TRANSACTION\_TYPE*
  - *ECX\_TRANSACTION\_SUBTYPE*
  - *ECX\_PARTY\_SITE\_ID*
  - *BES\_EVENT\_NAME=oracle.apps.ecx.jms.receive;*
  - *BES\_EVENT\_KEY*

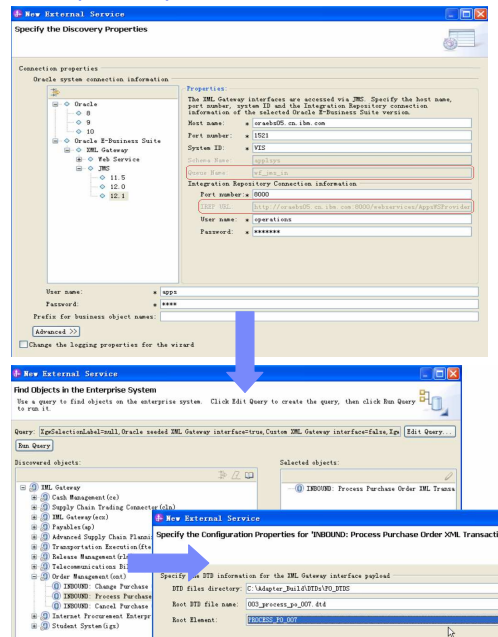


Since XML Gateway integration is through JMS, the adapter needs to act as a JMS client to connect to the exposed Advanced queue in Oracle EBS system. WebSphere adapter for Oracle EBS makes use of the Oracle *aqapi.jar* to obtain the necessary implementation to connect to the inbound queue *WF\_JMS\_IN* on the Oracle E-Business Suite.

The message that is sent to *WF\_JMS\_IN* carries a JMS message header that has the mentioned properties set, so that the Oracle XML Gateway is able to process the message appropriately after dequeuing it from *WF\_JMS\_IN*.

## XML Gateway integration through JMS (6 of 6)

- How to discover metadata ?
  - In the Enterprise Metadata Discovery wizard
    - Select the Oracle E-Business Suite XML Gateway interface type, JMS transport and specific version of Oracle E-Business Suite
    - Notice the Queue Name is *WF\_JMS\_IN*, which cannot be changed
    - IREP URL is the same as in case of XML Gateway integration using web services
      - Use for metadata discovery of business services.
    - Input the metadata information of the target business function (for example, Order Entry). The metadata includes original payload DTD info.



To configure the module for an XML Gateway interface, you can use the external service wizard in IBM Integration Designer. You can configure this interface for outbound integration only. You can select the number of interfaces you want to use. For each interface selected, you can configure the required elements based on your business requirement. This slide shows some key enterprise metadata discovery screens. First you start by selecting the Oracle E-Business Suite version. As seen in the top most screen here, the metadata discovery is using IREP URL highlighted here. Also the queue name is *wf\_jms\_in* which is the AQ for inbound integration to Oracle E-Business Suite. Next is the Enterprise metadata discovery (EMD) screen where the discovered services are displayed. Selecting any of the discovered services prompts you to provide the necessary information such as message DTD, root element, and so on.

## Oracle E-Business Suite – IREP metadata discovery

- What is IREP metadata discovery?
  - Oracle E-Business Suite exposes IREP as web service with a specific WSDL.
  - Invoke IREP web service to retrieve XML Gateway interface metadata
- Why IREP ?
  - Support for metadata discovery for the supported interfaces
  - IREP is the key feature of Oracle EBS, making seamless integration between Oracle EBS adapter and IBM integration runtimes.
  - Provides capability to seamlessly integrate with Oracle applications through XML Gateway.
- How ?
  - Configure the external service wizard
    - Select the Oracle E-Business Suite XML Gateway interface type, JMS transport and specific Oracle EBS version
    - Select to work with Oracle seeded XML Gateway interface or Custom Gateway interface or both
    - Adapter displays IREP structured metadata tree for XML Gateway interface type
    - Select specific XML Gateway interface and get specific IREP metadata for this interface.

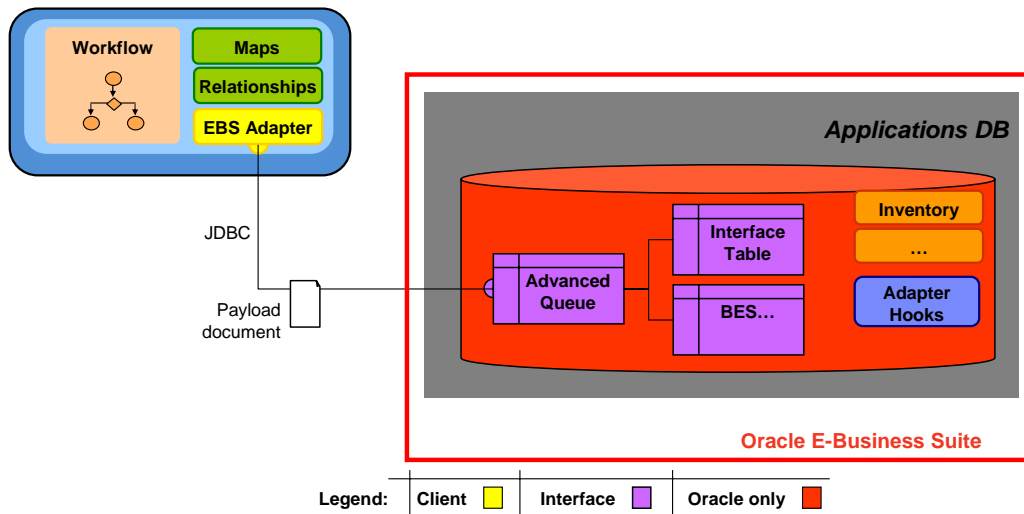
Integration Repository in Oracle E-Business Suite can be thought of as a repository of all integration points for the e-business suite. Oracle E-Business Suite exposes Integration Repository (IREP) as a web service with a specific WSDL. IREP provides you a complete catalog of Oracle E-Business Suite's business service interfaces. This is a powerful component that helps users to discover the appropriate business interface for integration. IREP is a key feature that is used to seamlessly integrate applications running on IBM integration runtimes with Oracle E-Business Suite using the WebSphere Adapter for Oracle EBS. Discovering and configuring with services discovered by using IREP does not require you to have a database experience. In the external service wizard, once you connect to the IREP URL , the EMD displays an IREP structured metadata tree for the XML Gateway interface type. From there, you can select a specific XML Gateway interface and get IREP metadata that is specific to this interface.

## ***Oracle Advanced Queue Integration through PL/SQL***

In this section you have a detailed look at the Oracle Advanced Queue Integration feature through PL/SQL.

## Advanced Queue integration through PL/SQL

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This figure demonstrates how Oracle Advanced Queue integrates through PL/SQL. Here you see Advanced Queue as a feature of the Oracle E-Business Suite. Oracle introduced powerful queuing mechanisms where messages can be exchanged between different programs. It is called **Advanced Queuing or AQ**. AQ is the database integrated messaging system. AQ was developed to support asynchronous messaging model. Applications communicate putting messages in queues (ENQUEUE) and by getting messages from queues (DEQUEUE). AQ provides for SQL based access to its queues. Messages can be placed or retrieved from the AQ using PL/SQL.

## Advanced Queuing in Oracle E-Business Suite

- Provide database-integrated message queuing functionality
  - Use the functions of the Oracle database so messages can be stored persistently and propagated between queues.
- Provide the message management functionality and asynchronous communication needed for application integration.
- Advanced Queuing sends and receives messages in these ways
  - Point-to-Point (P2P)
  - Publish-Subscribe (PubSub)
- Advanced Queuing functionality can be accessed through various interfaces of which the Oracle EBS adapter supports
  - PL/SQL

Advanced Queuing provides database-integrated message queuing functionality. Advanced Queuing uses the functions of the Oracle database so that messages can be stored persistently and propagated between queues. AQ was developed to support asynchronous messaging model. Advanced Queuing sends and receives messages in a couple of ways, one is Point to Point or P2P and the other being Publish-Subscribe or PubSub. Oracle AQ can be accessed using different interfaces one of which is through PL/SQL.

## Terminologies in Advanced Queuing

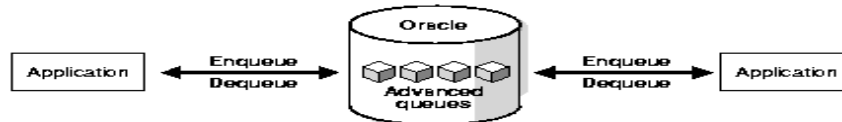
<b>Message</b>	A message is smallest unit of information that is inserted into or retrieved from a queue. Message consists of : Control information (metadata) Payload (data)
<b>Queue</b>	A queue is a repository for messages.
<b>Queue Table</b>	Queues are stored in Queue tables. Each queue table is a database table and contains one or more queues.
<b>Enqueue</b>	Putting a message in the queue defined is called enqueueing, performed by the message sender.
<b>Dequeue</b>	Reading the message out of the designated queue is called dequeueing, performed by the message recipient.

Some of the common terminologies in Advanced Queuing are shown here. A message is the information unit that is put into or retrieved out of the queue. Message consists of metadata information called control information and the payload or the business information. Queue is a repository for messages. Queue table is a database table that stores one or more queues. A queue table also contains a default exception queue. Putting a message into a queue is called enqueueing of the message typically performed by the message sender. Last, reading the message out of a designated queue is called dequeueing, which is normally done by the message recipient.

## Advanced Queue integration through PL/SQL (1 of 3)

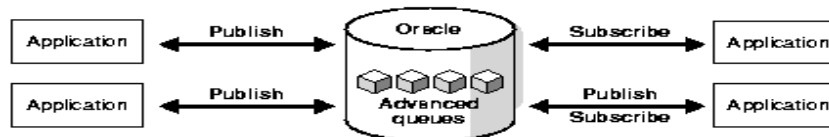
### ▪ Point to Point (P2P)

- A P2P messaging is aimed at a specific target. There is one sender and one receiver for the message.
- Sender and Receivers decide on common queue to exchange messages.
- Each message is consumed by only one receiver.
- Each application in Oracle EBS will have its own message queue, known as a single-consumer queue



### ▪ Publish-Subscribe (PubSub)

- A Publish-Subscribe message can be consumed by multiple receivers
- Publish-subscribe messaging has a wide dissemination mode--broadcast--and a more narrowly aimed mode--multicast, also called point-to-multipoint



Point to Point (P2P) and Publish-Subscribe (Pubsub) are two ways in which messages can be exchanged between a message producer and message consumer.

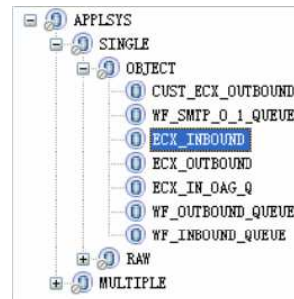
In P2P as the name indicates, it is the transfer of a message from one producer to one consumer. In this mode each message is consumed by only one receiver. Each application in Oracle EBS will have its own message queue, known as the single consumer queue.

In PubSub mode the message exchanged can be consumed by multiple receivers. There are two kinds in PubSub; one is broadcast type, where the message is consumed by multiple consumers who subscribe to the designated queue. The other type in PubSub is multicast mode also called as point to multipoint messaging,



## Advanced Queue integration through PL/SQL (2 of 3)

- Metadata discovery
  - JDBC™ is used to query the metadata of the advanced queue as shown in the figure.
  - For each selected advanced queue, the queue table payload type is shown.
- Runtime
  - The adapter will create a dynamic SQL script using PL/SQL, this will enqueue the message to the selected advanced queue.
  - Queue table payload is the Oracle PL/SQL type that contains the business information required by the business process in advanced queue integration.



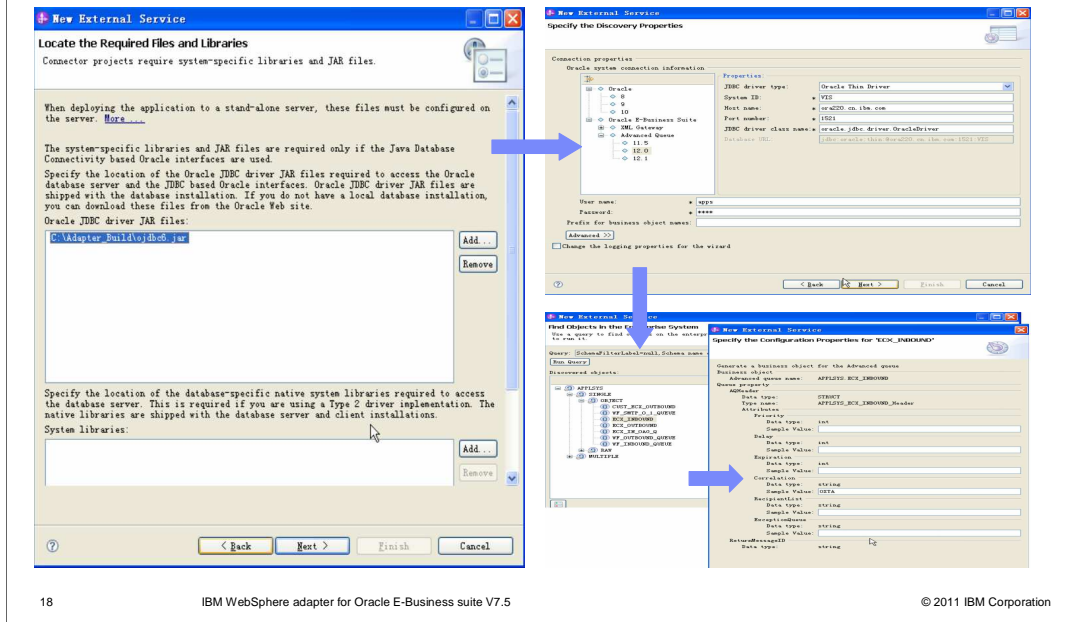
Advanced Queue integration in WebSphere adapter for Oracle EBS is achieved using PL/SQL, hence there is a need to provide the path to the database driver during the enterprise metadata discovery. JDBC is used to query the metadata of the advanced queue as shown in the figure, the discovered queues are shown in the EMD screen as a tree structure.

Selecting any of the discovered queues will prompt for configuring other meta information.

During runtime the adapter creates a dynamic SQL script with PL/SQL. This script is to run to enqueue the message to the selected advanced queue.

Queue table payload is the oracle PL/SQL type that contains the business information required by the business process in advanced queue integration.

## Advanced Queue integration through PL/SQL (3 of 3)



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Here are some screen captures showing the enterprise metadata discovery. Since AQ integration is using PL/SQL, the JDBC driver .jar for Oracle database needs to be provided as shown in the first screen. Followed by discovery screen, the version of Oracle EBS, database SystemID, host and other information needs to be provided. In the subsequent screens, the connection is established and the queue objects are discovered as shown. Selecting one of them prompts for information required to configure sending messages to the selected queue.

## ***Summary***

This section provides a summary of this presentation and some references on Oracle EBS adapter V7.5

## Summary

- Summary
  - Learned about the two new enhancements to WebSphere Adapter for Oracle E-Business Suite V7.5
    - XML Gateway integration
      - *Through JMS*
    - Advanced Queue integration
      - *Through PL/SQL*
- References
  - IBM WebSphere adapters V7.5 information center
    - [http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?topic=/com.ibm.wsadapters.jca.doc/welcome\\_wsa.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?topic=/com.ibm.wsadapters.jca.doc/welcome_wsa.html)
  - WebSphere Adapters Support
    - [http://www.947.ibm.com/support/entry/portal/Overview/Software/WebSphere/WebSphere\\_Adapters\\_Family](http://www.947.ibm.com/support/entry/portal/Overview/Software/WebSphere/WebSphere_Adapters_Family)

This presentation introduced two new features of WebSphere adapter for Oracle E-Business Suite. They include Oracle XML Gateway integration using JMS and Oracle Advanced Queuing integration using PL/SQL. Throughout the presentation, you had a closer look at the XML Gateway and Advanced Queue features in Oracle EBS and their importance in integration.

Finally, here are also some references to learn more about WebSphere adapters V7.5.

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