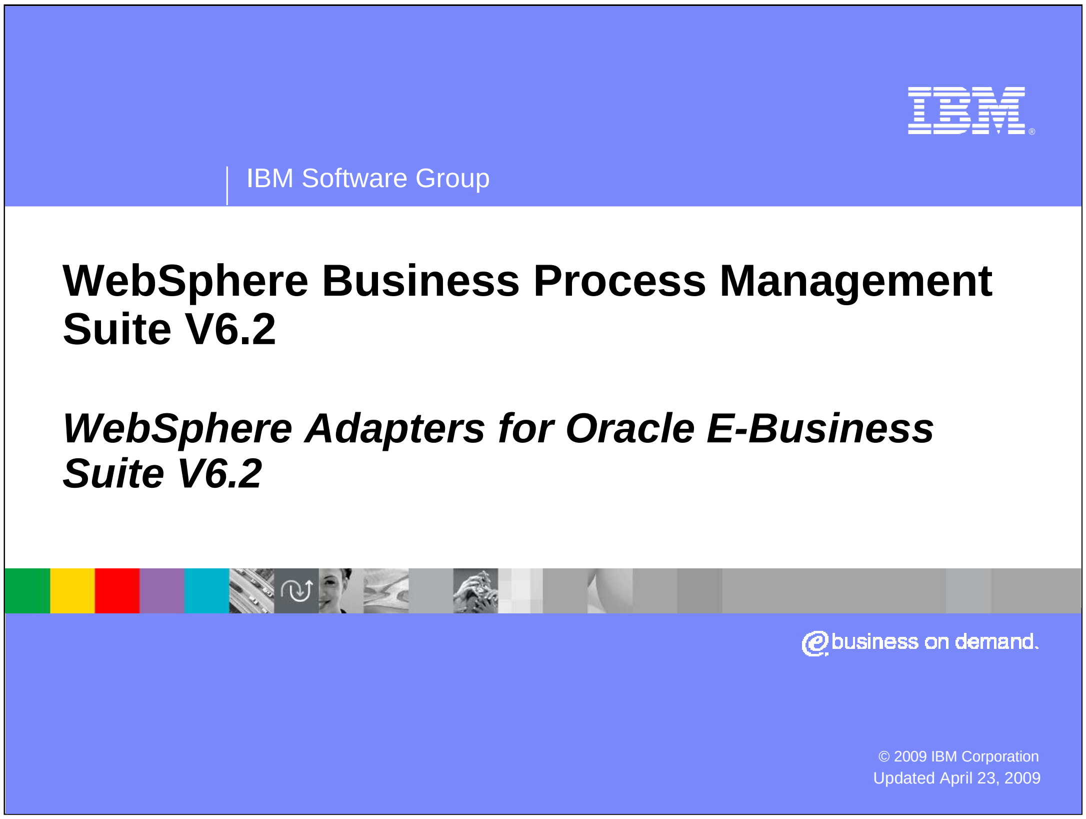

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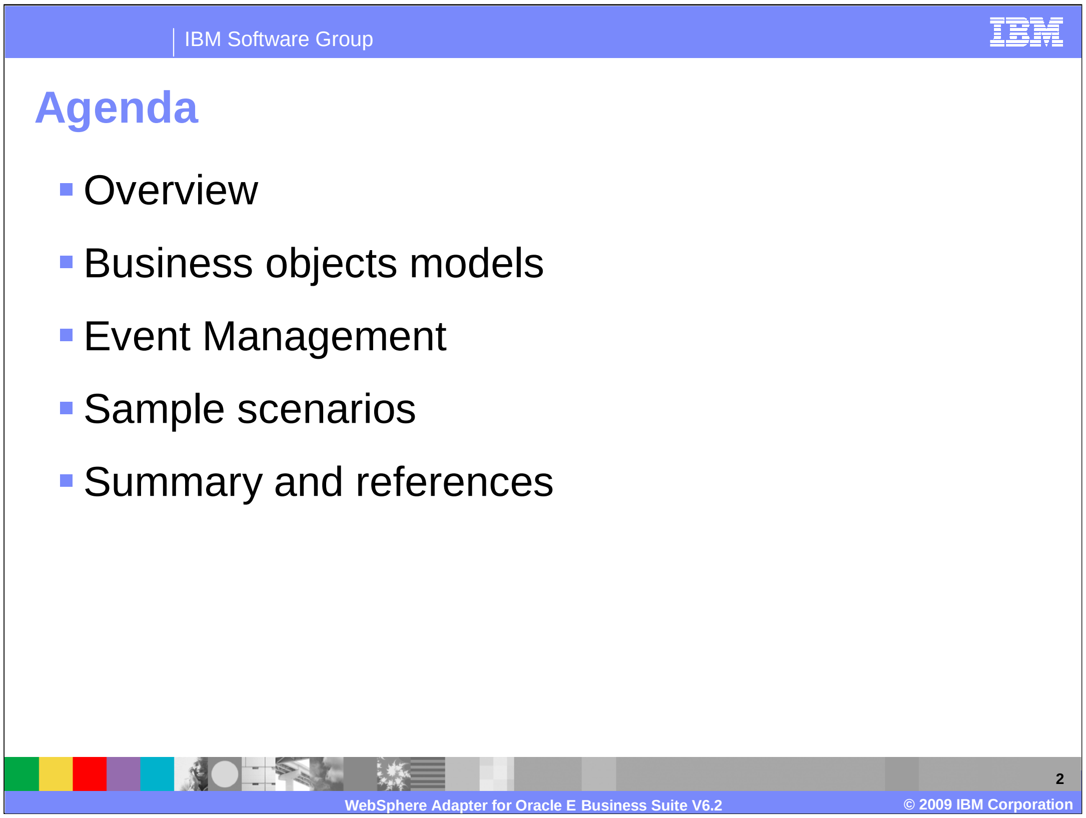
WebSphere Business Process Management Suite V6.2

WebSphere Adapters for Oracle E-Business Suite V6.2

business on demand.

Updated April 23, 2009

This presentation covers WebSphere® Adapter for Oracle E-Business Suite V6.2.



Agenda

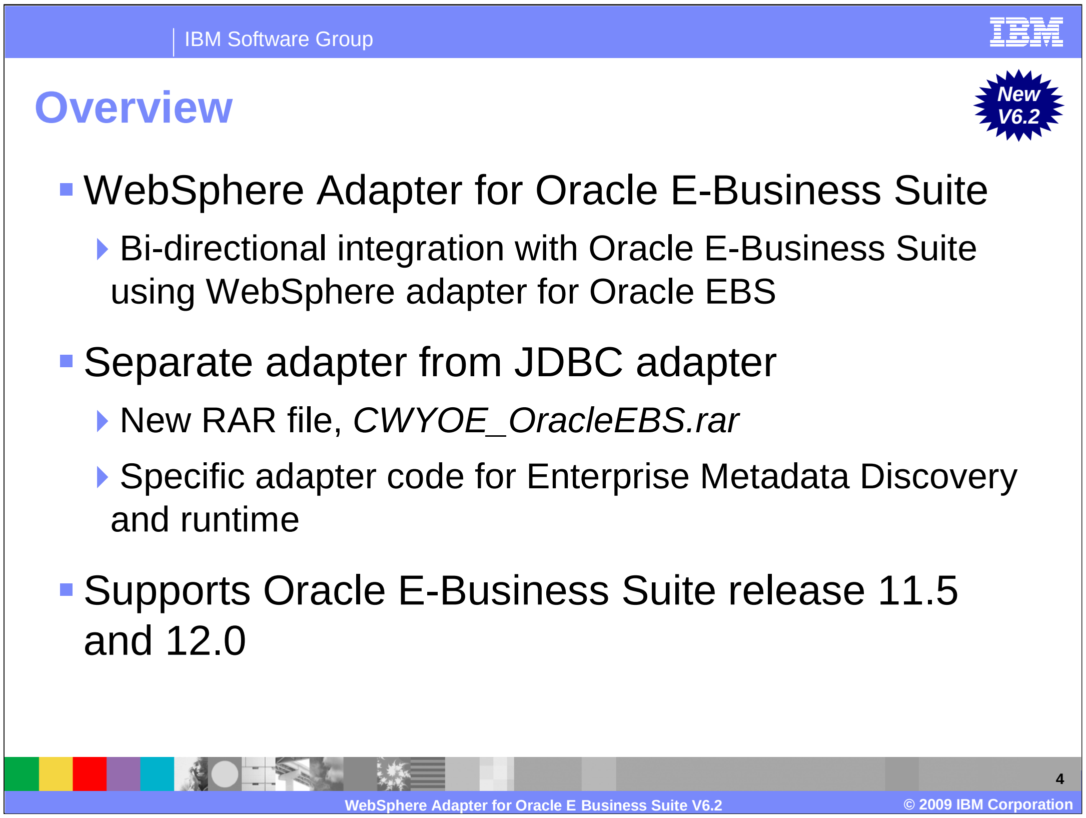
- Overview
- Business objects models
- Event Management
- Sample scenarios
- Summary and references

This presentation covers in detail the IBM WebSphere Adapter for Oracle E-Business Suite (EBS). It starts with the overview of Oracle adapter with preparation steps in installation. It also captures different business object models with inbound and outbound operations. The next section provides information about event management in inbound processing. Last, Oracle EBS adapter provides different sample scenarios in V6.2.

Section

Overview

This section provides an overview and new enhancements in installations of the WebSphere Adapter for Oracle E-Business Suite V6.2



Overview

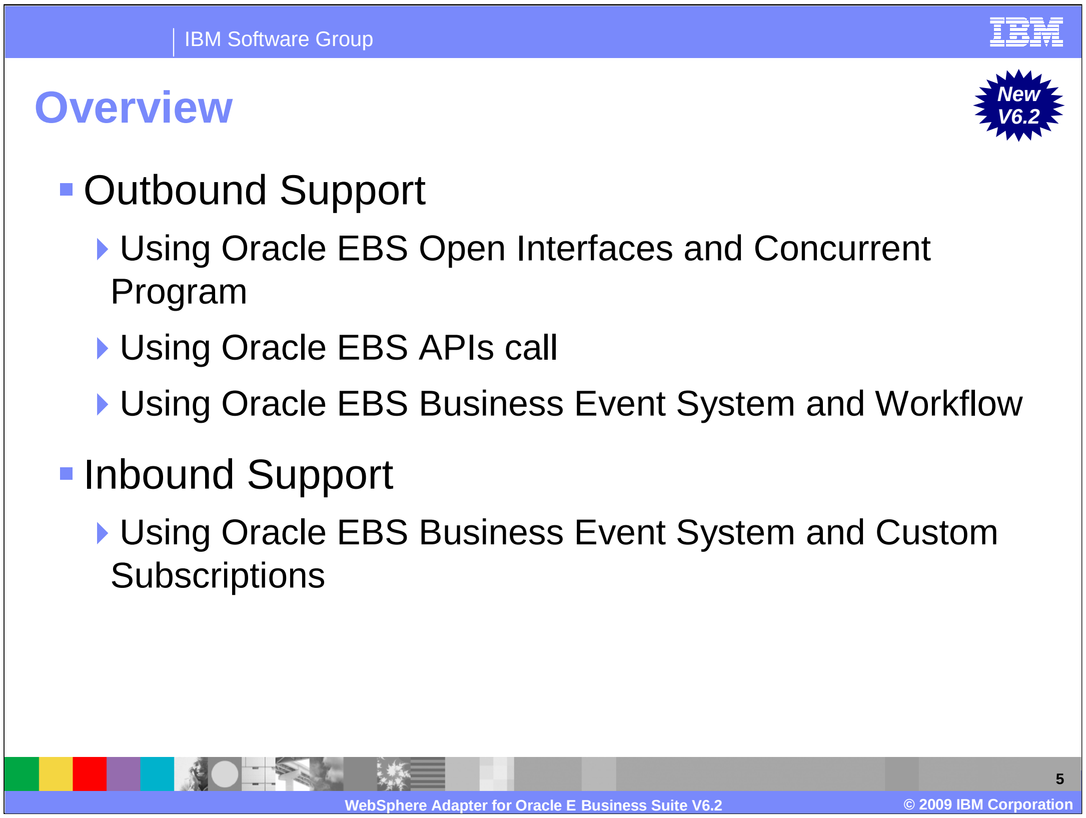
New V6.2

- WebSphere Adapter for Oracle E-Business Suite
  - Bi-directional integration with Oracle E-Business Suite using WebSphere adapter for Oracle EBS
- Separate adapter from JDBC adapter
  - New RAR file, *CWYOE_OracleEBS.rar*
  - Specific adapter code for Enterprise Metadata Discovery and runtime
- Supports Oracle E-Business Suite release 11.5 and 12.0

WebSphere adapter for Oracle EBS is a solution that uses existing WebSphere components to enable bidirectional communication between Oracle EBS and the WebSphere Business Integration system. This solution uses WebSphere Adapter for Oracle EBS to interact with the database components in Oracle EBS to process data to and from external sources.

Previously, WebSphere Adapter for JDBC™ was used to interact with the database components in Oracle EBS to process data. With V6.2, Oracle adapter is now a separate adapter with its own RAR file. The discovery process using the external service wizard is customized for connecting to Oracle E-Business system.

WebSphere Adapter for Oracle E-Business Suite V6.2 supports Oracle E-Business Suite Release 11.5 and 12.0

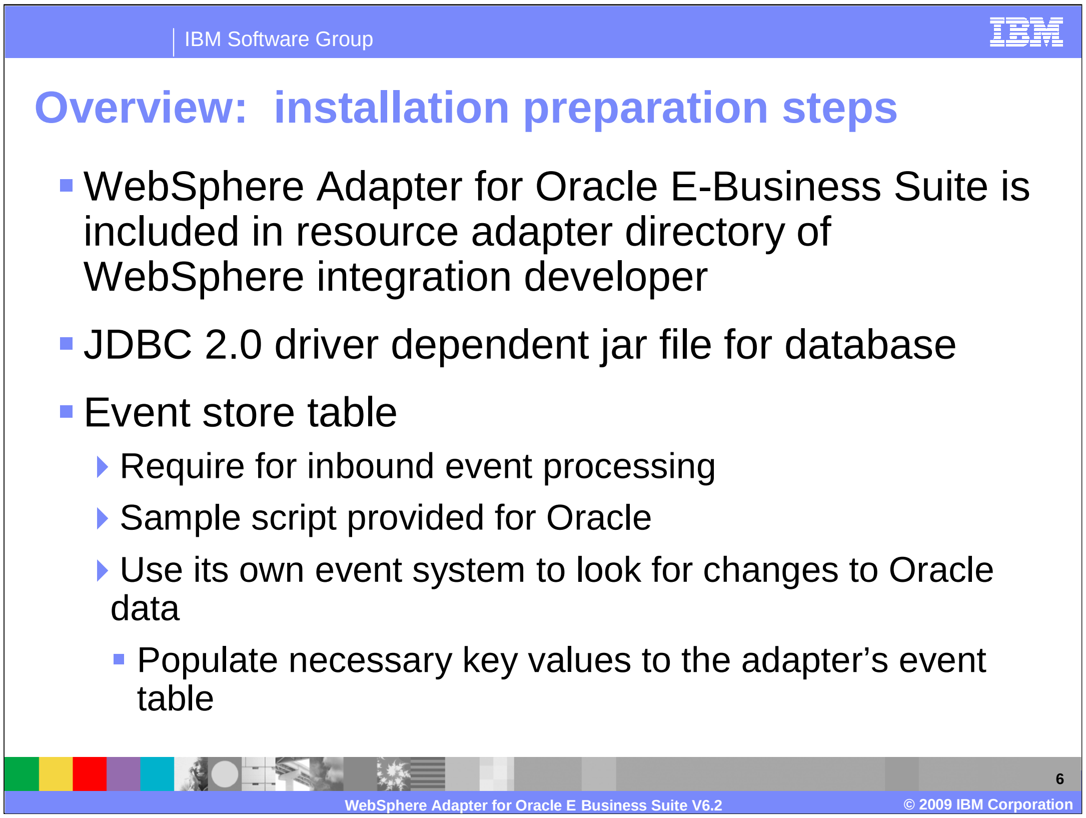


Overview

New V6.2

- Outbound Support
  - Using Oracle EBS Open Interfaces and Concurrent Program
  - Using Oracle EBS APIs call
  - Using Oracle EBS Business Event System and Workflow
- Inbound Support
  - Using Oracle EBS Business Event System and Custom Subscriptions

Oracle EBS adapter supports both inbound and outbound communication with Oracle EBS applications. This is different from integrating with the Oracle database; the adapter for Oracle EBS can use several ways to integrate with EBS applications. For outbound, the current Oracle EBS adapter supports three approaches: using the Oracle EBS Interface Table and Stored Procedure, using the Oracle EBS API call, and using the Oracle EBS Business Event System and Workflow. For Inbound, the current Oracle EBS adapter supports one approach, which is using Oracle EBS Business Event System and Custom Subscriptions.



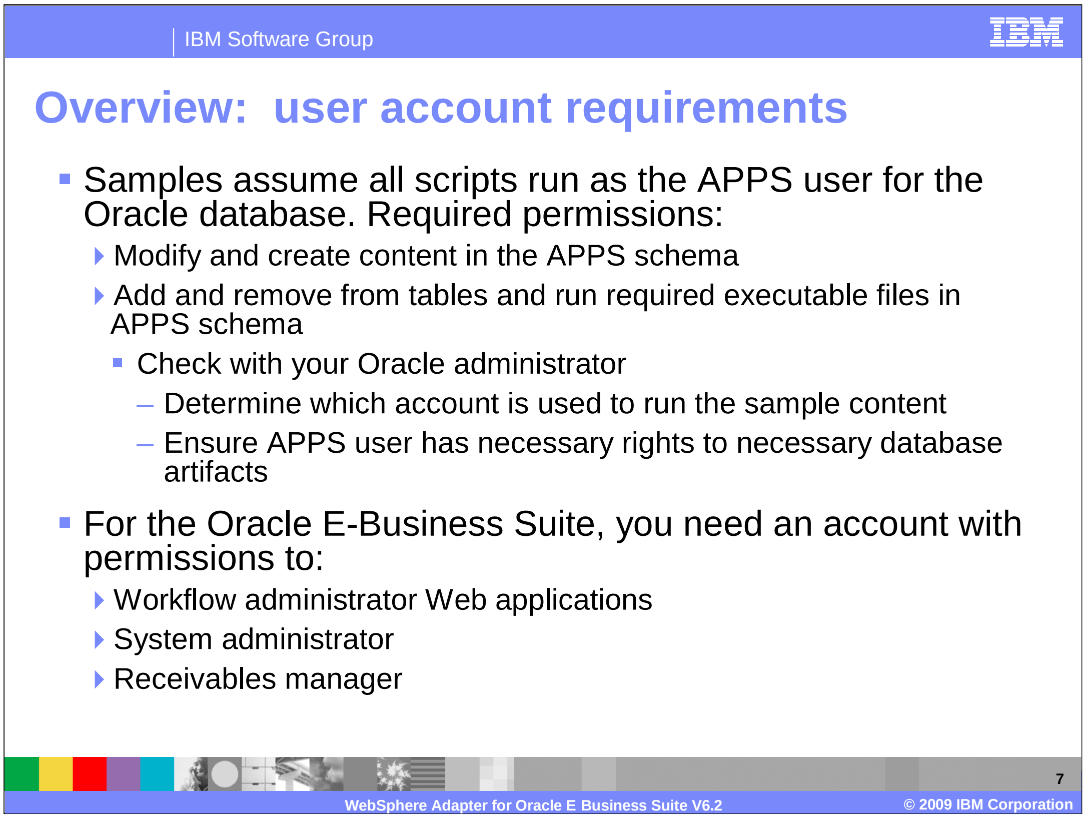
Overview: installation preparation steps

- WebSphere Adapter for Oracle E-Business Suite is included in resource adapter directory of WebSphere integration developer
- JDBC 2.0 driver dependent jar file for database
- Event store table
  - Require for inbound event processing
  - Sample script provided for Oracle
  - Use its own event system to look for changes to Oracle data
    - Populate necessary key values to the adapter’s event table

The JCA adapters are packaged as resource adapter archive (RAR) files. The adapter for Oracle EBS is packaged in WebSphere Integration Developer. The RAR files are located in resource adapter directory.

Any JDBC 2.0 driver specific to the database that you are integrating with must be added to the class path. Other information necessary in preparation for use of the adapter are the databases and tables used by the adapter.

The sample script is provided for the Oracle event table for inbound processing. The WebSphere Adapter for Oracle EBS uses its own event system to look for change to Oracle data by populating necessary key values to the adapter’s event table.



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Overview: user account requirements

- Samples assume all scripts run as the APPS user for the Oracle database. Required permissions:
  - Modify and create content in the APPS schema
  - Add and remove from tables and run required executable files in APPS schema
    - Check with your Oracle administrator
      - Determine which account is used to run the sample content
      - Ensure APPS user has necessary rights to necessary database artifacts
- For the Oracle E-Business Suite, you need an account with permissions to:
  - Workflow administrator Web applications
  - System administrator
  - Receivables manager

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WebSphere Adapter for Oracle E Business Suite V6.2

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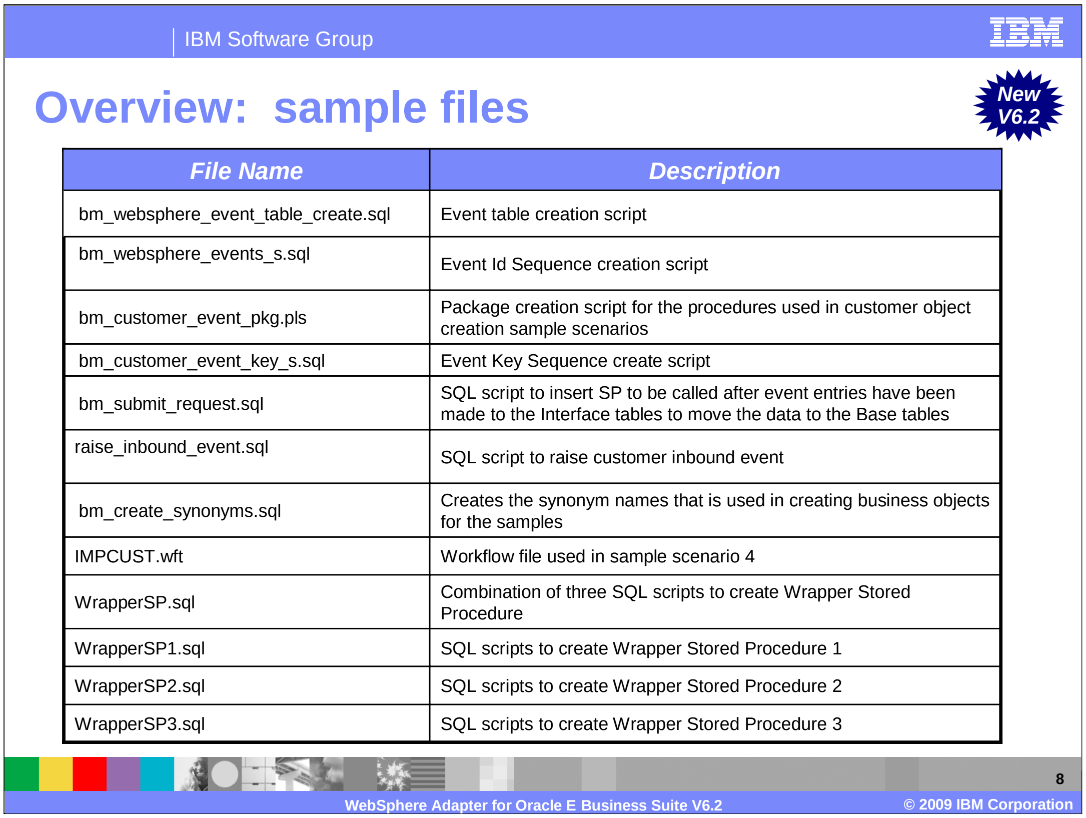
For those samples that are shipped with the adapters, these security requirements must be met in order to run through these samples and scripts. You need permission to modify and create content, to add and remove tables, and to run required executable files in the APPS schema. You might need to check with your Oracle administrator to determine which account to use to run the sample and to ensure that you have the necessary permission to access database artifacts. For the Oracle EBS, you need an account with workflow administrator Web applications, system administrator, and receivables manager permissions.



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Overview: sample files

New V6.2

File Name	Description
bm_websphere_event_table_create.sql	Event table creation script
bm_websphere_events_s.sql	Event Id Sequence creation script
bm_customer_event_pkg.pls	Package creation script for the procedures used in customer object creation sample scenarios
bm_customer_event_key_s.sql	Event Key Sequence create script
bm_submit_request.sql	SQL script to insert SP to be called after event entries have been made to the Interface tables to move the data to the Base tables
raise_inbound_event.sql	SQL script to raise customer inbound event
bm_create_synonyms.sql	Creates the synonym names that is used in creating business objects for the samples
IMPCUST.wft	Workflow file used in sample scenario 4
WrapperSP.sql	Combination of three SQL scripts to create Wrapper Stored Procedure
WrapperSP1.sql	SQL scripts to create Wrapper Stored Procedure 1
WrapperSP2.sql	SQL scripts to create Wrapper Stored Procedure 2
WrapperSP3.sql	SQL scripts to create Wrapper Stored Procedure 3

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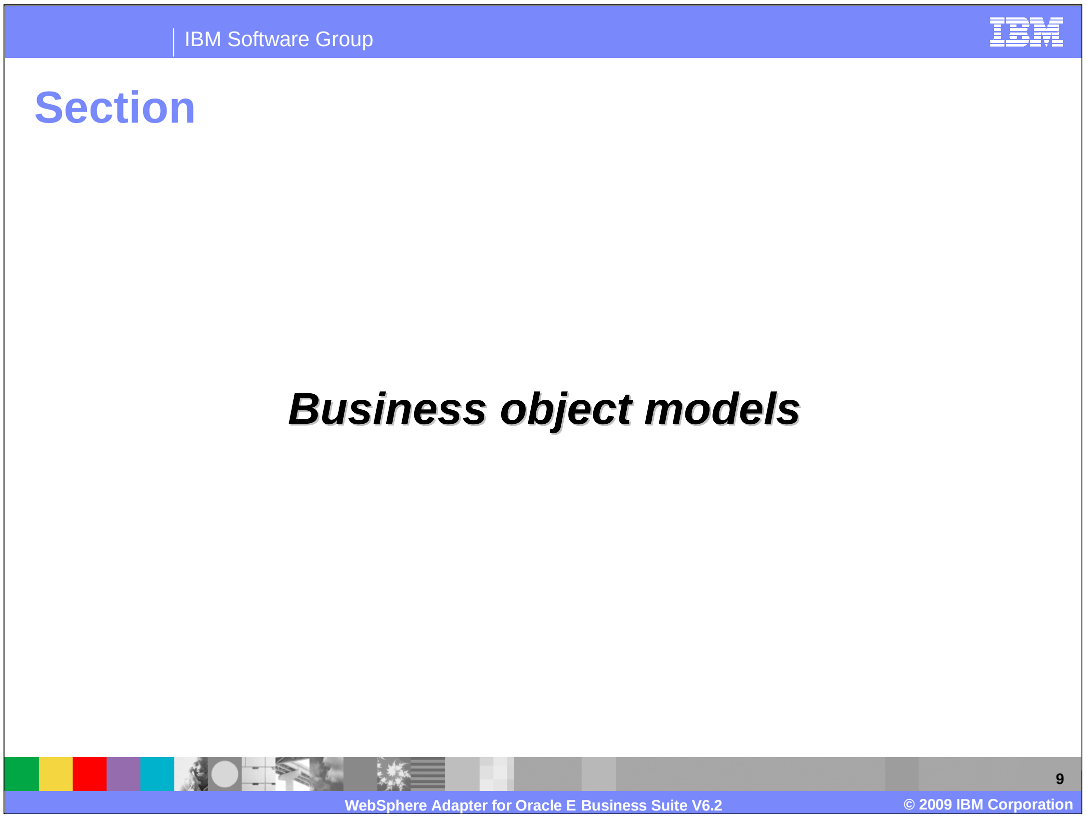
The adapter is now included in the resource adapters directory of WebSphere Integration Developer. Inside the Oracle directory, there is a Script directory with lists of sample file names. Shown here is a list of scripts and packages that will help you to create the necessary tables and stored procedures. These scripts are needed in order to go through six scenarios that are provided.



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Section

Business object models

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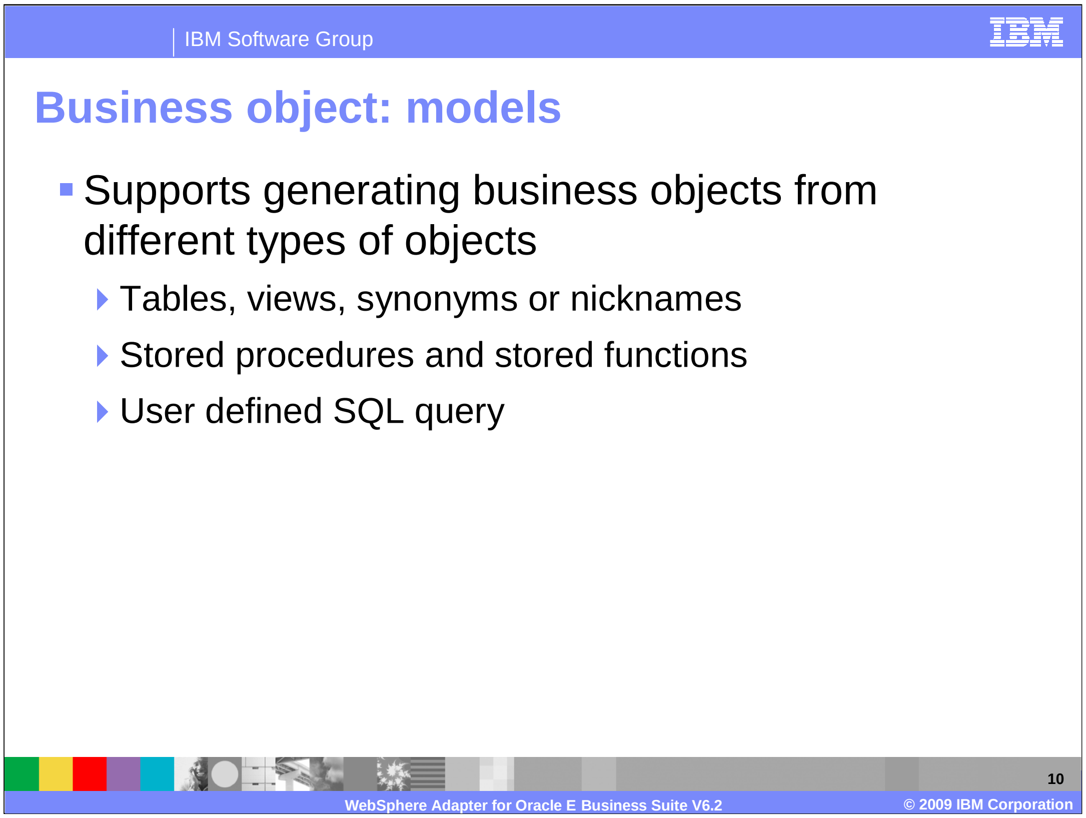
This section provides an overview of the business object models.



Business object: models

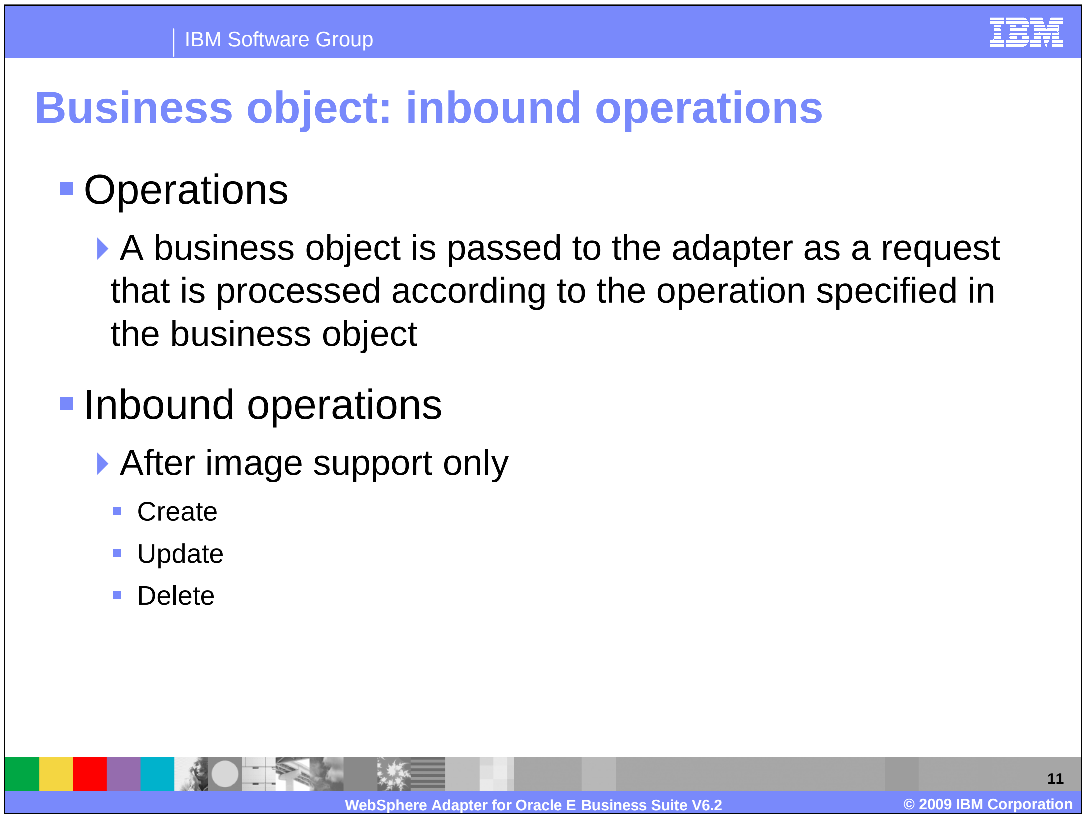
- Supports generating business objects from different types of objects
  - Tables, views, synonyms or nicknames
  - Stored procedures and stored functions
  - User defined SQL query

A business object is a structure that consists of data, the action to be performed on the data, and additional instructions, if any, for processing the data. WebSphere adapter for Oracle EBS uses business objects to represent tables and views in the database and the results of database queries, stored procedures, and stored functions. Business objects can also create a hierarchy of objects from your database and group unrelated tables. Your component communicates with the adapter using business objects.

The adapter uses business objects to represent these following types of objects in a database. For table or view business objects, each column in the table or view is represented by a simple attribute of the table or view business object. A *simple attribute* is an attribute that represents a single value, such as a String, Integer, or Date. Other attributes represent a child business object or an array of child business objects.

For a stored procedure or stored function, all of the input and output parameters for the stored procedure or stored function have corresponding attributes in the business object. If any of the input or output parameters is of a complex type, such as an array or structure, then the corresponding business object attribute is a child business object type with the child business object containing the attributes of the array or structure. If the stored procedure returns a result set, a child business object is created that contains the attributes of the returned result set.

Last, a business object for a database query defines the SQL statement that performs the query and the parameters that the query requires. Query business objects run a user-defined SELECT statement against the database and return the matching records in business objects.



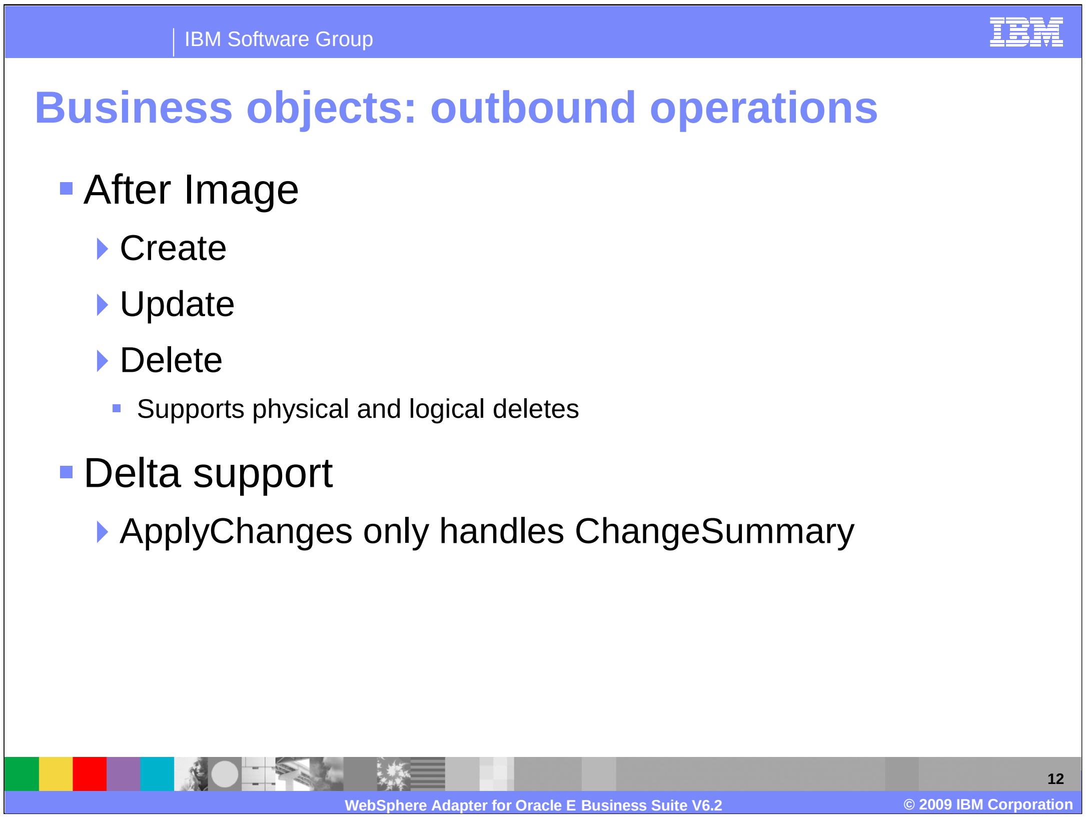
Business object: inbound operations

- Operations
  - A business object is passed to the adapter as a request that is processed according to the operation specified in the business object
- Inbound operations
  - After image support only
    - Create
    - Update
    - Delete

A business object's content is related to the amount and purpose of the information conveyed by the business object. There are two categories of business object content, "After image" and "Delta". After image content represents the state of the business object after all changes have been made. This type of content is indicated by the presence of a top-level verb in the business graph of the business object.

Delta content represents the changes that have happened to the business object content. This type of content is indicated by the absence of a top-level verb.

The operations specified in the business object indicate what type of processing is being requested. Business objects are passed to the adapter and processed according to the operations they specify. In the case of inbound operations, only after-image support is available for the operations, which include Create, Update, and Delete.



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Business objects: outbound operations

- After Image
  - Create
  - Update
  - Delete
    - Supports physical and logical deletes
- Delta support
  - ApplyChanges only handles ChangeSummary

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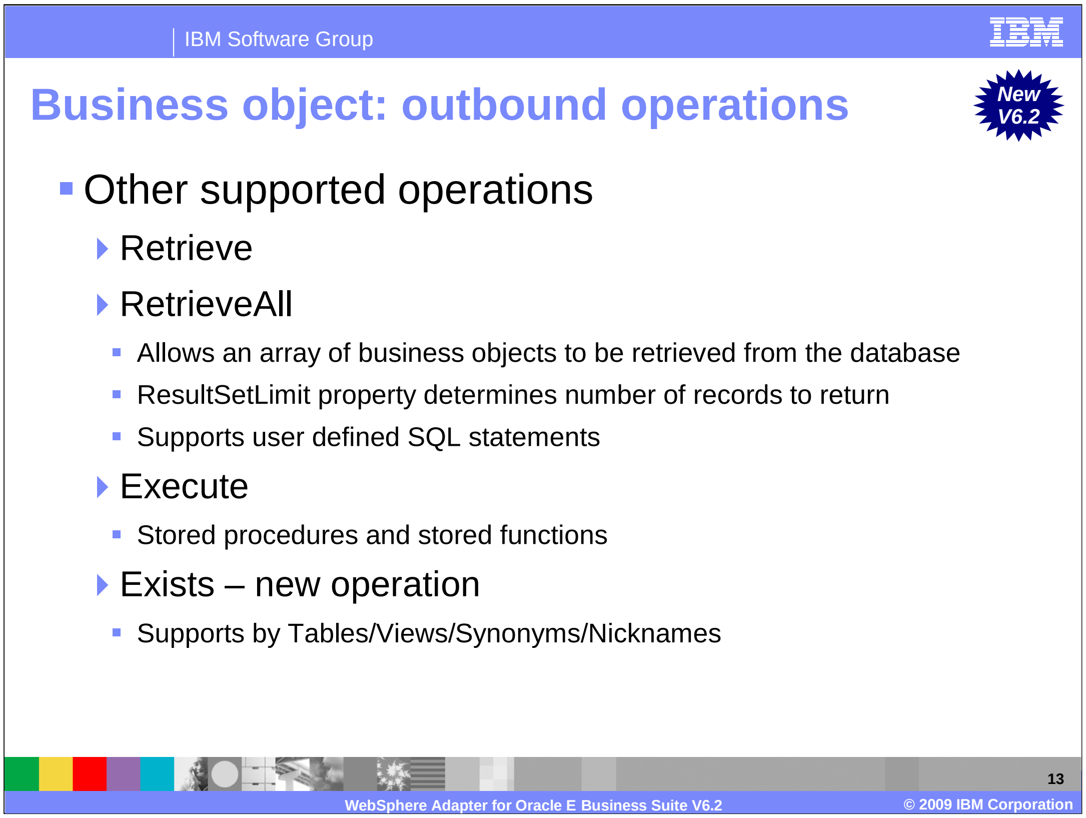
WebSphere Adapter for Oracle E Business Suite V6.2

In the case of outbound operations, after-image support is available for the Create, Update, and Delete operations. Delete operations can include both physical and logical deletes. For Delta support, outbound operations also include the ApplyChanges operation.



Business object: outbound operations

New V6.2

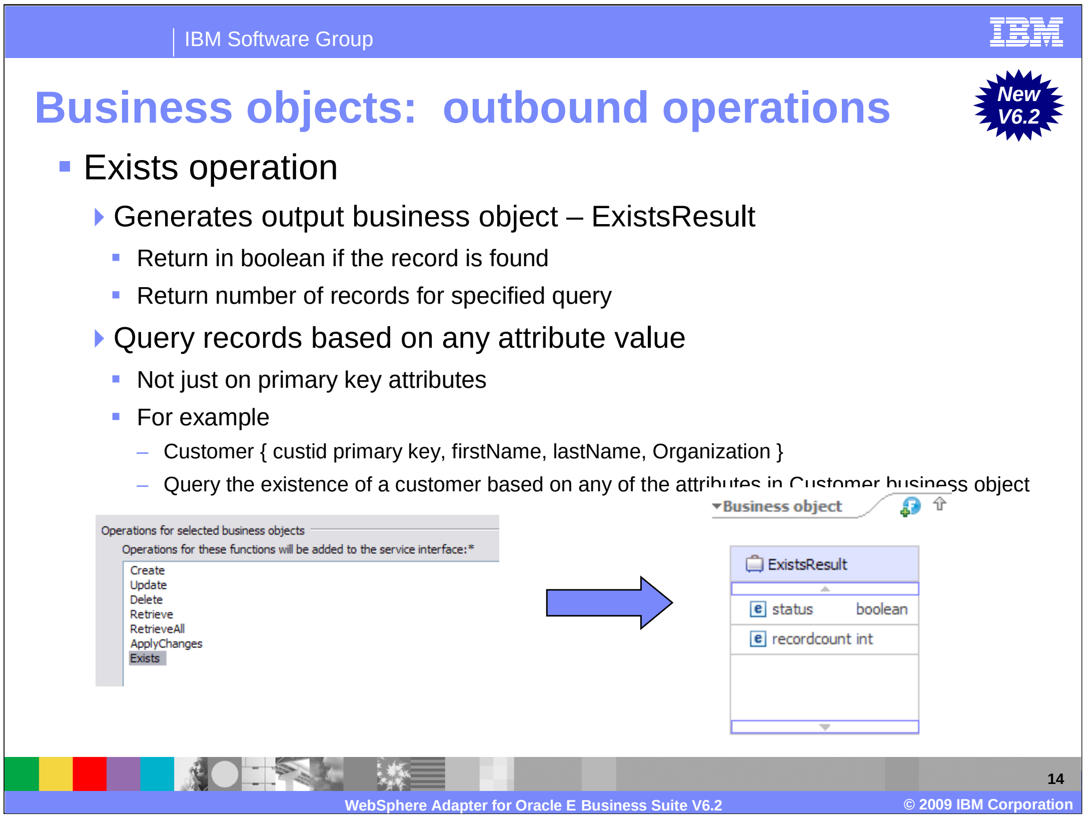
- Other supported operations
  - Retrieve
  - RetrieveAll
    - Allows an array of business objects to be retrieved from the database
    - ResultSetLimit property determines number of records to return
    - Supports user defined SQL statements
  - Execute
    - Stored procedures and stored functions
  - Exists – new operation
    - Supports by Tables/Views/Synonyms/Nicknames

Outbound supports three other operations as well, retrieve, retrieveAll and execute. The retrieve operation, when passed a hierarchical business object, starts processing by first making a copy of the top level business object without any of its children. It then recursively retrieves the child business objects starting with the parent of the incoming business object.

RetrieveAll is an operation that will direct the Oracle EBS adapter to retrieve an array of business objects from the database. The value of the ResultSetLimit property determines the number of records to return. This value can be set during the EMD processing or by specifying the value for MaxRecords on the Configure Objects panel for the outbound ServiceType.

The Execute operation is used to run stored procedures and stored functions. The external service wizard generates the required stored procedure business object that corresponds to the stored procedure or stored function definition in the database. The adapter uses the Execute operation to process the stored procedure business object.

Different from WebSphere adapter of JDBC, the Execute operation is not available for Oracle EBS adapter since it does not support user defined SQL statements. However, a new operation Exists is introduced to the list of supported operations. The Exists operation determines whether the database table contains records that match the attributes set in a business object. The Exists operation is supported by the table business object, the views business object, the synonyms, and nicknames business object. More detail is covered in the next few slides.



Business objects: outbound operations

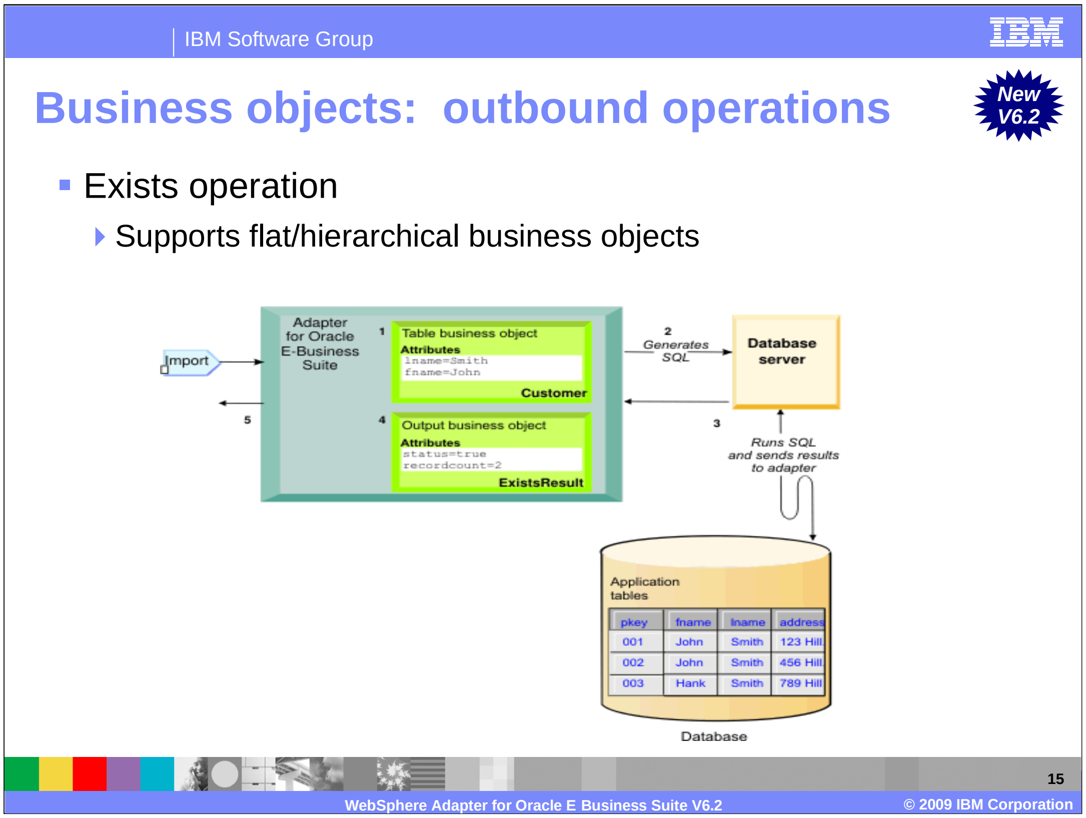
New V6.2

- Exists operation
  - Generates output business object – ExistsResult
    - Return in boolean if the record is found
    - Return number of records for specified query
  - Query records based on any attribute value
    - Not just on primary key attributes
    - For example
      - Customer { custid primary key, firstName, lastName, Organization }
      - Query the existence of a customer based on any of the attributes in Customer business object

Operations for selected business objects
Operations for these functions will be added to the service interface:*
Create
Update
Delete
Retrieve
RetrieveAll
ApplyChanges
Exists
Business object
ExistsResult
status boolean
recordcount int

Continued from the previous slide, the results of the Exist operation is returned in a different business object then the input business object. It actually generates a new business object called ExistsResults, which is used in the output result based on query criteria set on the attributes of input business object. The business object ExistsResult has two attributes. Status attribute returns with a Boolean value if the record is found in the database and the recordcount attribute returns the number of records found in the databases for the specified query. The default value for the recordcount attribute is 0. The screen capture illustrates the structure of the ExistsResult business object returned from an Exists operation.

The Exists operation also supports both key and non-key attributes in the selection criteria. It sends that object as an input to query records in the database. For example, if you have generated a business object for a customer table that has a primary key and non-primary keys attributes, then you can query the existence of a customer based on any of the attributes in customer business object, and not just query based on primary key attributes only.



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Business objects: outbound operations

New V6.2

- Exists operation
  - Supports flat/hierarchical business objects

pkey	fname	lname	address
001	John	Smith	123 Hill
002	John	Smith	456 Hill
003	Hank	Smith	789 Hill

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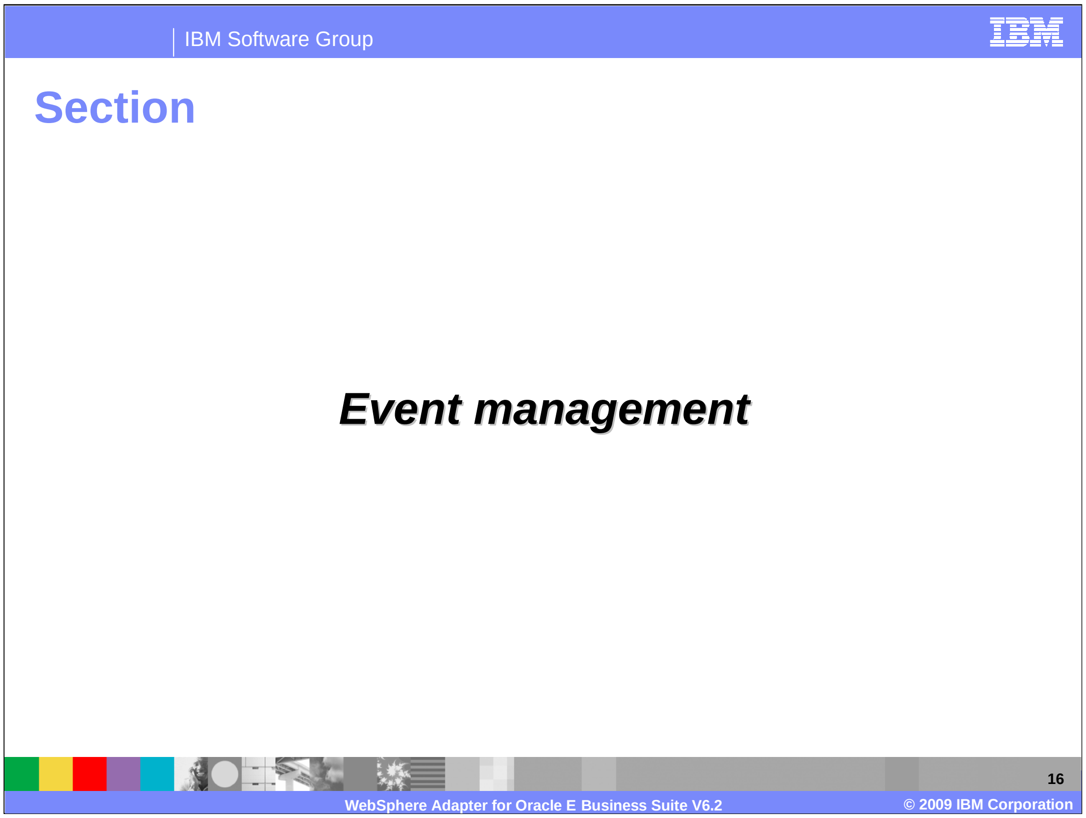
WebSphere Adapter for Oracle E Business Suite V6.2

The above illustration shows how the adapter processes a table business object with an Exists operation. In this scenario, the adapter receives a Customer table business object from the import. This input business object can be flat (simple with no child business objects) or hierarchical (complex, containing one or more child business objects). If the business object is hierarchical, it is only for the top-level business object (the individual business object at the top of a hierarchical business object) for which the adapter builds the query.

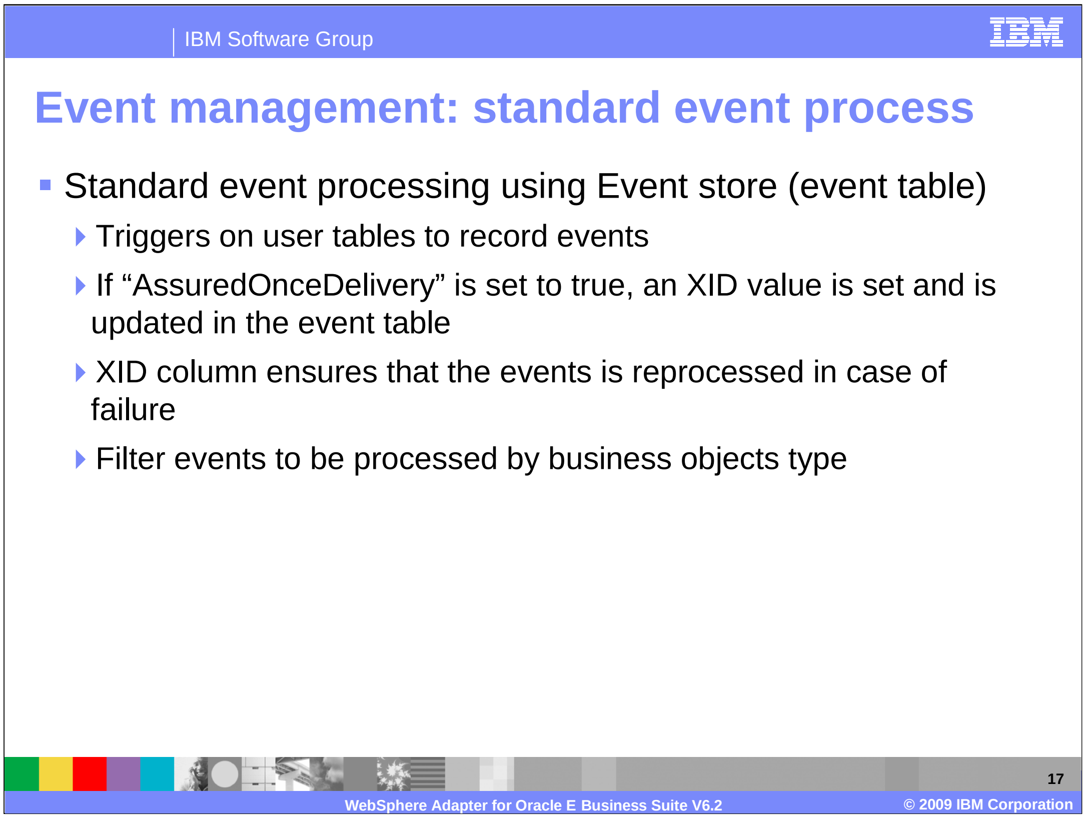
It then uses this input table business object to generate an SQL SELECT statement and sends to the database server. In this case, the SQL statement specifies *non-primary key* attributes fname with the assigned values of John and lname with the assigned values of Smith. The adapter includes the attribute information from the table business object in the *where* clause of the SQL query. The database server runs the SQL query and sends the results back to the adapter. Then it obtains the results of the SQL query from the database server and sets the recordcount and status attributes on the ExistsResults business object. Finally, the adapter returns the ExistsResult business object to the caller.



Section

Event management

This section provides an overview of the event management of the WebSphere Adapter for Oracle EBS V6.2.



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Event management: standard event process

- Standard event processing using Event store (event table)
  - Triggers on user tables to record events
  - If “AssuredOnceDelivery” is set to true, an XID value is set and is updated in the event table
  - XID column ensures that the events is reprocessed in case of failure
  - Filter events to be processed by business objects type

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In standard event processing, the adapter provides the SQL queries that poll for events and ensure that the event is delivered exactly one time. Database triggers or tools such as Oracle Change Data Capture run when records are created, updated, or deleted in tables in the database. You can define the triggers or set up other tools to report changes to the database tables about which you want to receive events. A trigger or other tool writes an event record into the *event store.* It is implemented as a table in the same database as user tables, which are the tables that contain the database objects accessed by the adapter.

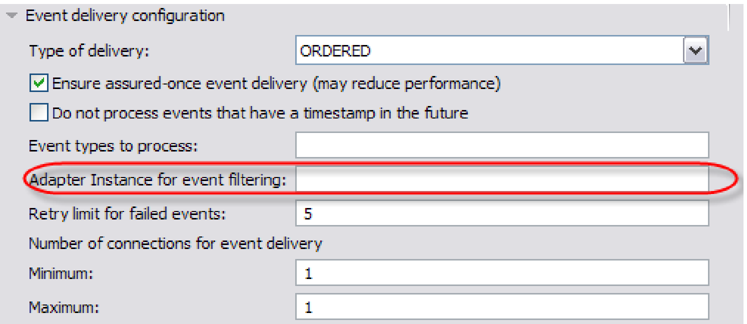
The adapter offers assured once delivery, which guarantees that each event is delivered once and only once to the export. If you enable assured once delivery for the module, a transaction ID (XID) is set for each event in the event store. After an event is obtained for processing, the XID value for that event is updated in the event store. The event is then delivered to its corresponding export, and subsequently deleted from the event store. If the database connection is broken or the application is stopped before the event can be delivered, the event cannot be processed completely. In this case, the XID column indicates that the event must be reprocessed and sent to the export again. After the database connection is reestablished or the adapter starts again, the adapter checks for events in the event store that have a value in the XID column. The adapter processes these events first, and then polls the other events during the poll cycles.

The adapter can also filter the events to be processed by business object type, or timestamp. The filter is set in the EventFilterType property specified in the adapter foundation classes. This property has a comma-delimited list of business object types and only the types specified in this property is picked for processing. If no value is specified for the property, no filter is applied and all the events are picked up for processing. If the FilterFutureEvents property in the adapter foundation classes is set to true, the adapter will filter events based on their timestamp. The adapter will retrieve the system-time in each poll cycle and compare it to the timestamp on each event. If the event is set to occur in the future, it is not picked up for processing until that future time.

Event management: event filtering

New V6.2

- Adapter Instance
  - Configure in Activation Specification
  - String value for event filtering
  - Ignore if adapter instance for event filtering is not configured



Event delivery configuration

Type of delivery: ORDERED

☑ Ensure assured-once event delivery (may reduce performance)

□ Do not process events that have a timestamp in the future

Event types to process:

Adapter Instance for event filtering:

Retry limit for failed events: 5

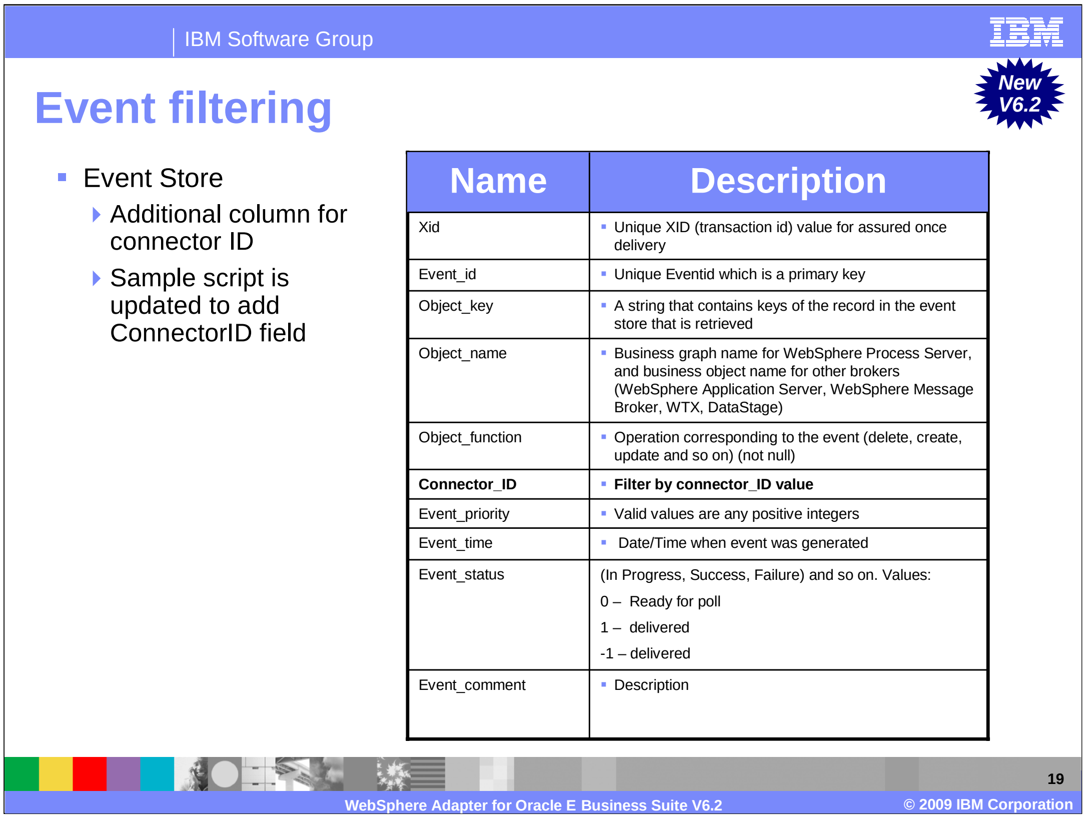
Number of connections for event delivery

Minimum: 1

Maximum: 1

With V6.2, the Oracle EBS adapter can also filter the events to be processed by connector ID. The benefit of this new feature is for users to load balance when they have large number of events of the same type.

The Oracle EBS adapter supports this filter through Activation Specification property and provides the filtering mechanism when a connector ID is configured. The adapter only retrieves events with that particular connector ID. It also ensures compatibility with earlier versions when connector ID field is not specified. That allows the event table structure without the connector ID field to be supported.



Event filtering

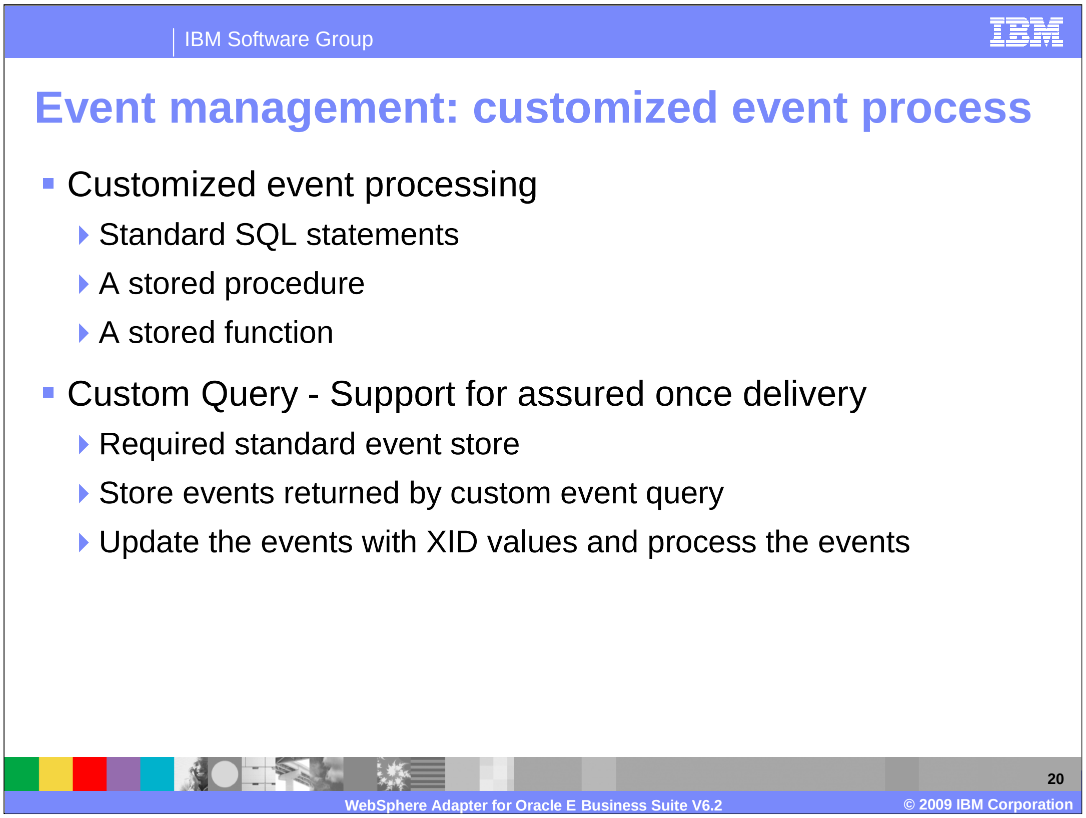
New V6.2

- Event Store
  - Additional column for connector ID
  - Sample script is updated to add ConnectorID field

Name	Description
Xid	Unique XID (transaction id) value for assured once delivery
Event_id	Unique Eventid which is a primary key
Object_key	A string that contains keys of the record in the event store that is retrieved
Object_name	Business graph name for WebSphere Process Server, and business object name for other brokers (WebSphere Application Server, WebSphere Message Broker, WTX, DataStage)
Object_function	Operation corresponding to the event (delete, create, update and so on) (not null)
Connector_ID	**Filter by connector_ID value**
Event_priority	Valid values are any positive integers
Event_time	Date/Time when event was generated
Event_status	(In Progress, Success, Failure) and so on. Values: 0 – Ready for poll 1 – delivered -1 – delivered
Event_comment	Description

The event store is a persistent cache where event records are saved until the polling adapter can process them. The adapter uses the event store to keep track of inbound requests as they make their way through the system. Each time a database record is created, updated, or deleted, the adapter updates the status of the event in the event store. The status of each event is continually updated by the adapter for recovery purposes until the events are delivered to a configured export on the server.

With this new event filtering feature, it is configured in Activation Specification with any string values and required changes to the event store to add another column for connector ID. The adapter then adds the corresponding column to the event query. The adapter samples and scripts are also updated to add the connectorID field to the event table structure.



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Event management: customized event process

- Customized event processing
  - Standard SQL statements
  - A stored procedure
  - A stored function
- Custom Query - Support for assured once delivery
  - Required standard event store
  - Store events returned by custom event query
  - Update the events with XID values and process the events

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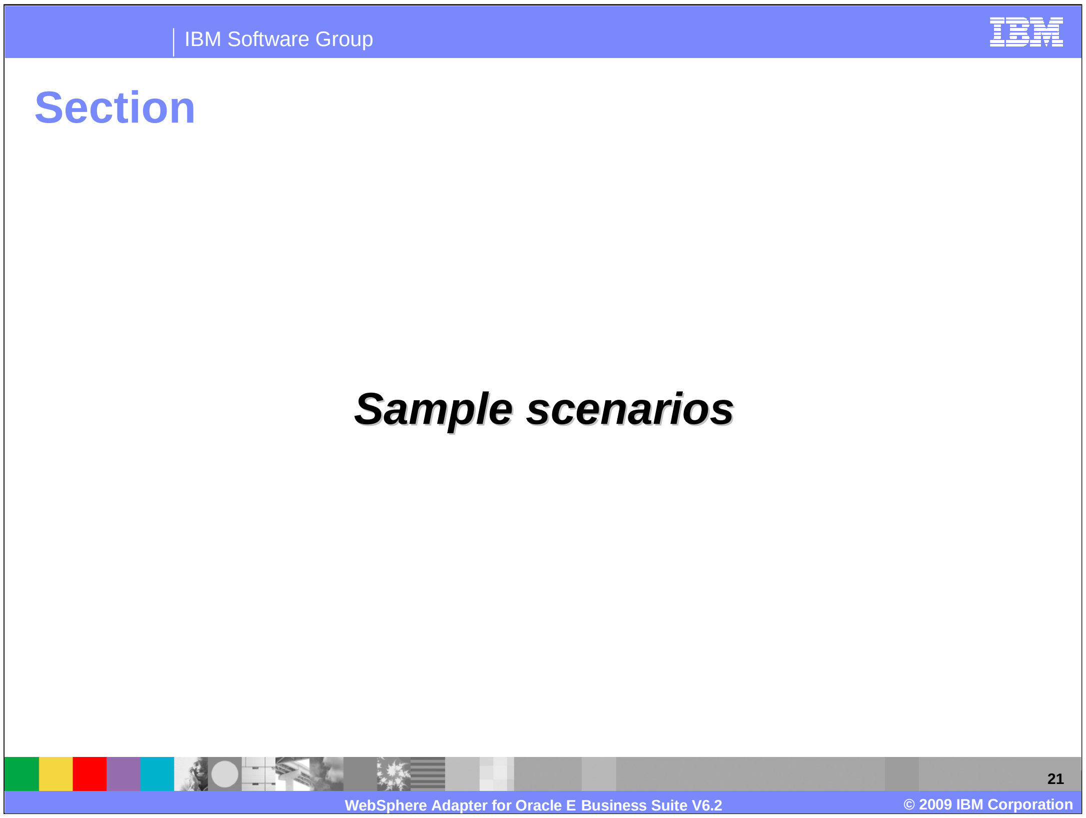
In custom event processing, you provide the SQL queries or stored procedures that poll for events. With custom event processing, you control which events are delivered to the export by providing a database *custom event query* for the adapter to run in place of the SQL query it uses to poll the event store in standard event processing. They can be either a standard SQL statement, a stored procedure, or a stored function. The custom event query must perform any necessary filtering. You specify that you want custom event processing by selecting an option in the wizard or by setting the EventQueryType activation specification property in the administrative console.

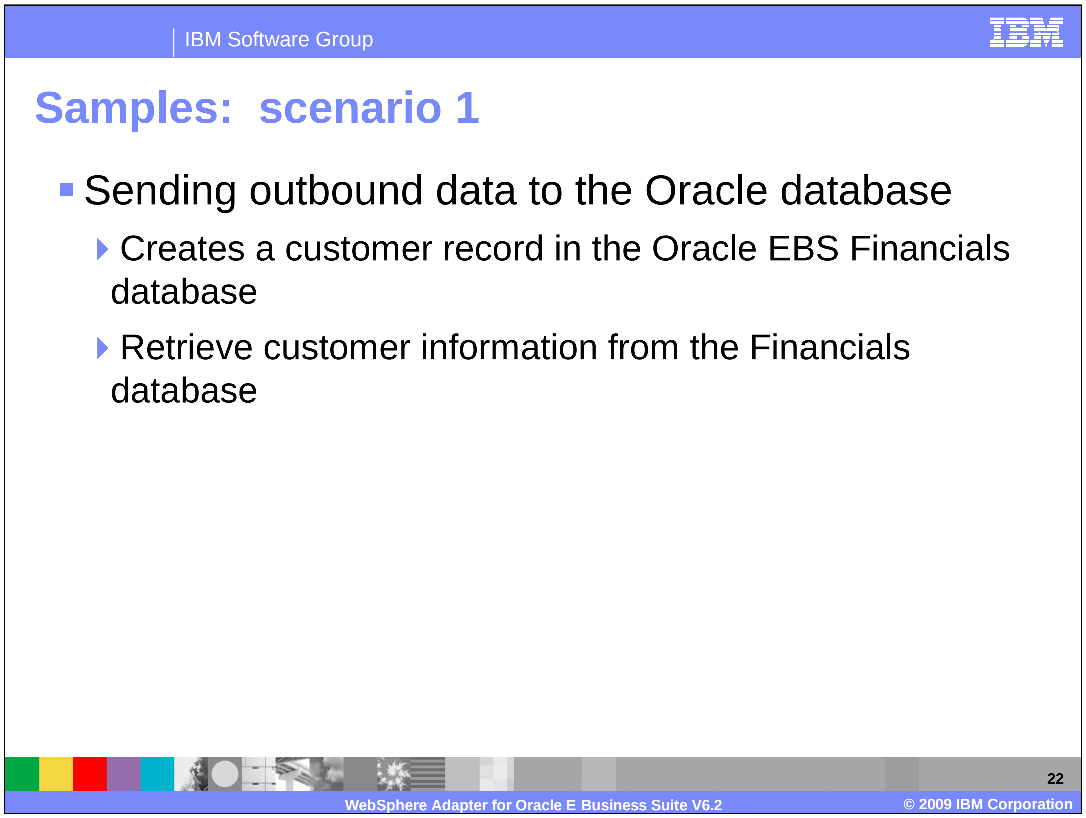
Custom event processing supports assured once delivery if you create the standard event store for storing XID values. The adapter stores the events returned by the custom event query in the event store and it updates the events with XID values. The adapter processes the events in the same way as for standard event processing. Do not create a custom query that queries the standard event store, because that table temporarily holds the events when the adapter is configured for assured once delivery. In addition, in this situation the event store must not have an automatic generation of event ID values, because the adapter populates the event ID value it retrieves from the custom query in the event store.



Section

Sample scenarios

This section provides description for samples in WebSphere Adapter for Oracle EBS V6.2.

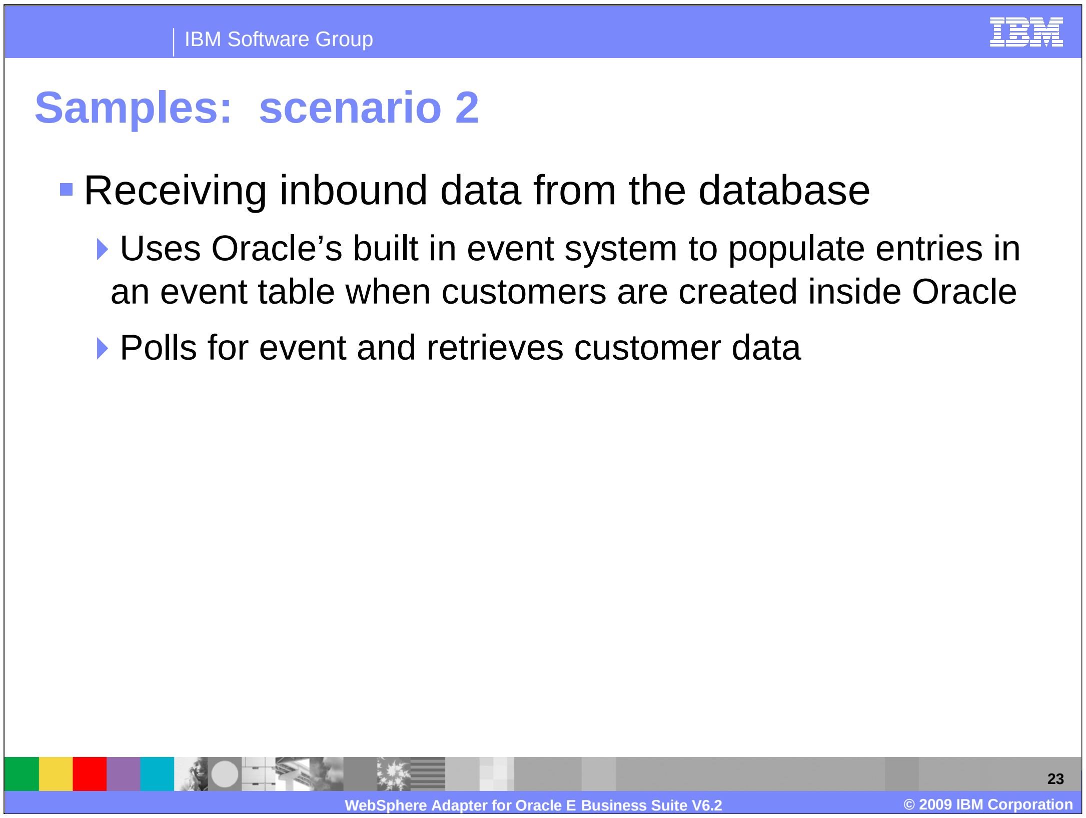


Samples: scenario 1

- Sending outbound data to the Oracle database
  - Creates a customer record in the Oracle EBS Financials database
  - Retrieve customer information from the Financials database

Here is the description of the first scenario provided in the samples. With WebSphere Adapter for Oracle EBS, you can create data in an Oracle application and retrieve data from the application. In this scenario, you use the WebSphere Adapter for Oracle EBS as the integration method to create a customer record in the Oracle E-Business Suite Financials database and to retrieve that customer information from the Financials database. This sample shows you how to set up information flows between Oracle EBS and WebSphere Process Server or WebSphere Enterprise Service Bus for outbound requests, regardless of the Oracle EBS module you use. For example, you can use Payables or General Ledger rather than Receivables.

Refer to the summary and reference section at the end of this presentation for a link to the quick start tutorials documentation.

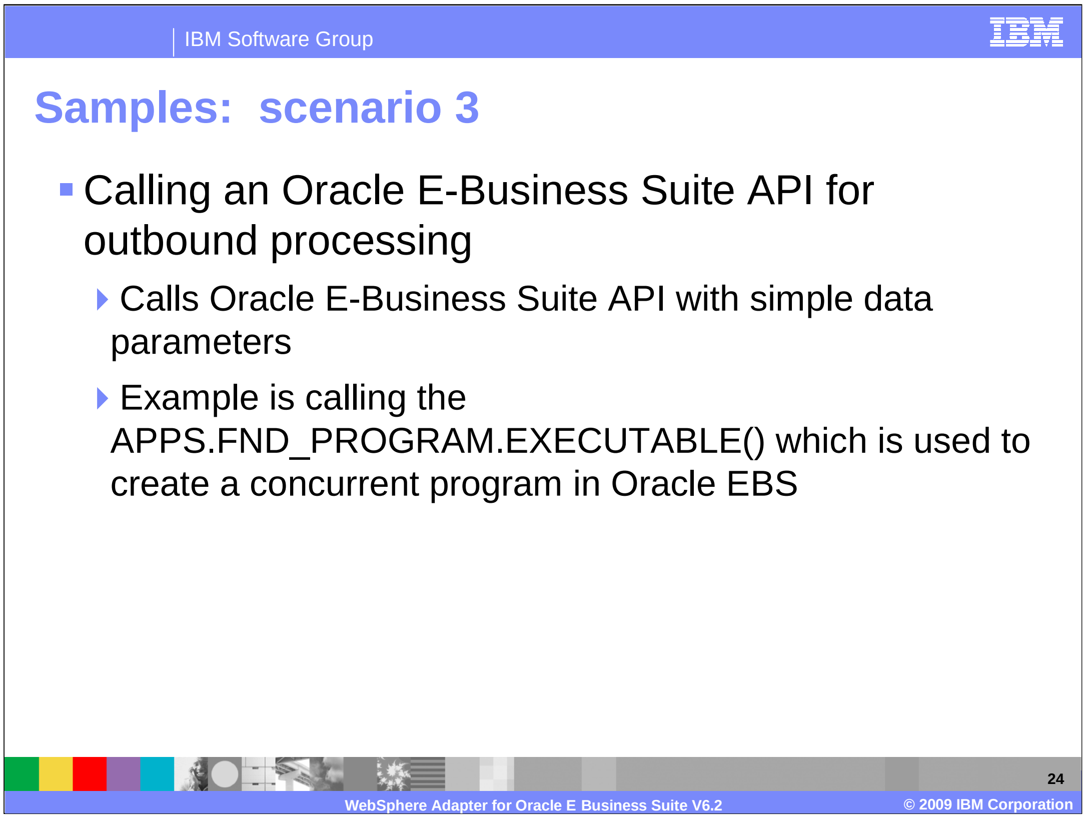


Samples: scenario 2

- Receiving inbound data from the database
  - Uses Oracle’s built in event system to populate entries in an event table when customers are created inside Oracle
  - Polls for event and retrieves customer data

In this second sample, you use the event system within Oracle EBS to populate an event table with customer events. You also use the WebSphere Adapter for Oracle EBS to poll for events and retrieve customer data. By performing this scenario, you can see how to set up information flows between Oracle EBS and WebSphere Process Server or WebSphere Enterprise Service Bus for inbound events.

Refer to the summary and reference section at the end of this presentation for a link to the quick start tutorials documentation.

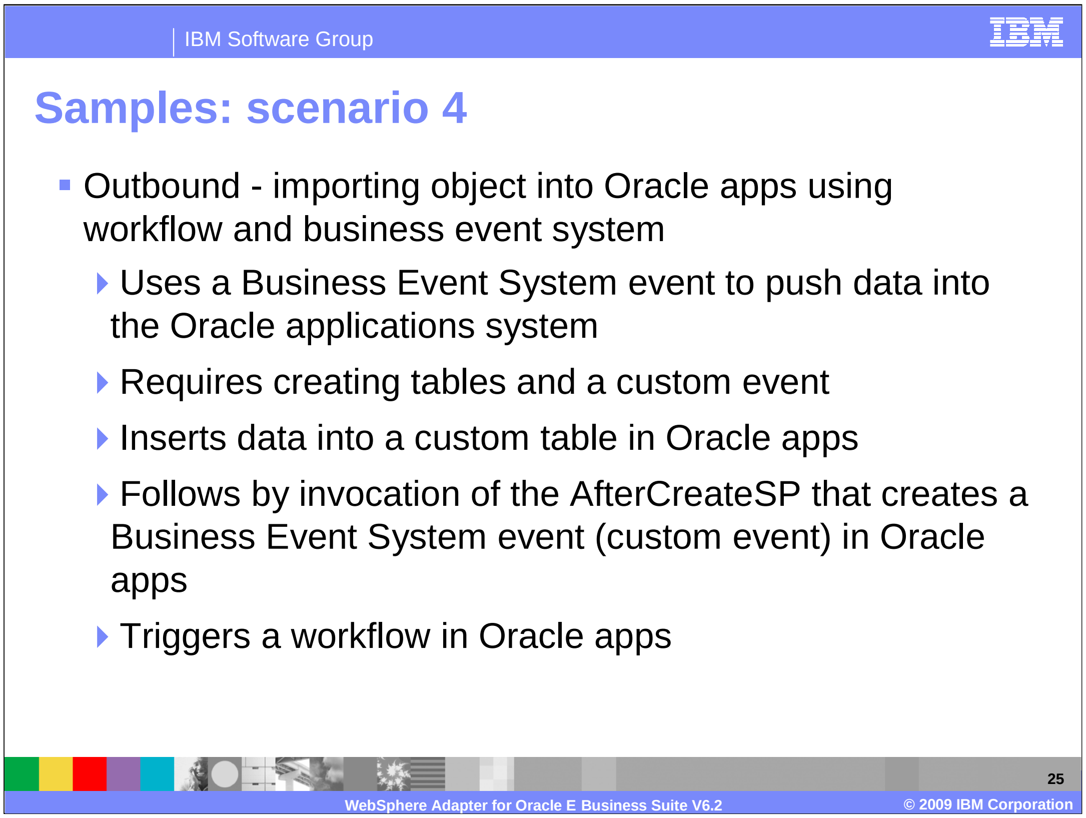


Samples: scenario 3

- Calling an Oracle E-Business Suite API for outbound processing
  - Calls Oracle E-Business Suite API with simple data parameters
  - Example is calling the APPS.FND_PROGRAM.EXECUTABLE() which is used to create a concurrent program in Oracle EBS

In this third scenario, the adapter can call directly any Oracle E-Business Suite API that uses simple data parameters. This sample provide steps to call an API that creates a concurrent program executable file for outbound processing. By performing this sample, you can see how to structure simple data API calls between the adapter and an Oracle E-Business Suite database.

Refer to the summary and reference section at the end of this presentation for a link to the quick start tutorials documentation.



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Samples: scenario 4

- Outbound - importing object into Oracle apps using workflow and business event system
  - Uses a Business Event System event to push data into the Oracle applications system
  - Requires creating tables and a custom event
  - Inserts data into a custom table in Oracle apps
  - Follows by invocation of the AfterCreateSP that creates a Business Event System event (custom event) in Oracle apps
  - Triggers a workflow in Oracle apps

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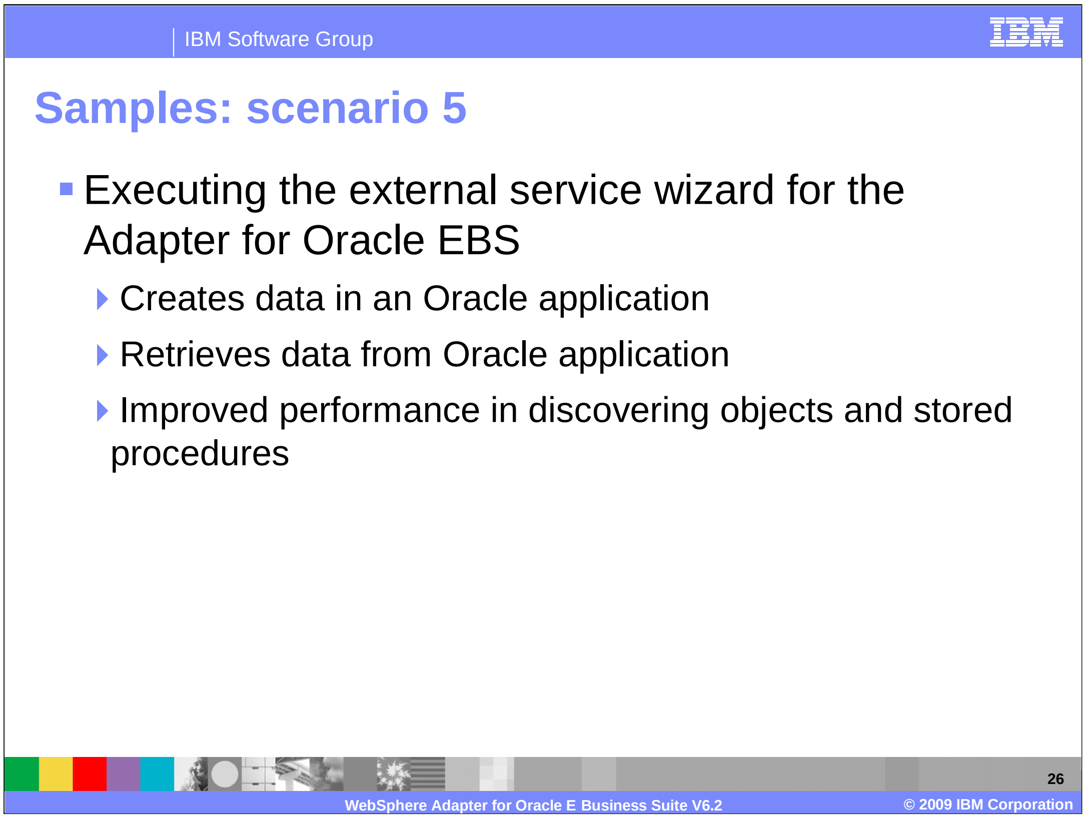
WebSphere Adapter for Oracle E Business Suite V6.2

This fourth scenario demonstrates using a Business Event System (BES) event to push data into the Oracle applications system. By doing this, it requires creating tables and a custom event (custom event is an event created by business event system). The JDBC adapter is used as an outbound adapter. It is used to insert data into a custom table in Oracle apps, followed by invocation of the AfterCreateSP that creates a BES event (custom event) in Oracle apps. This event triggers a workflow in Oracle apps.

During outbound processing, the Adapter for Oracle EBS uses a create operation to insert customer data into the custom event table. A stored procedure is invoked, that creates a custom event in the Business Event System. The Business Event System has a built-in subscription to this event. Once BES receives this event it triggers a workflow that creates this customer in Oracle EBS. The workflow is also built as part of this scenario and handles errors during customer creation as well.

Refer to the summary and reference section at the end of this presentation for a link to the quick start tutorials documentation.

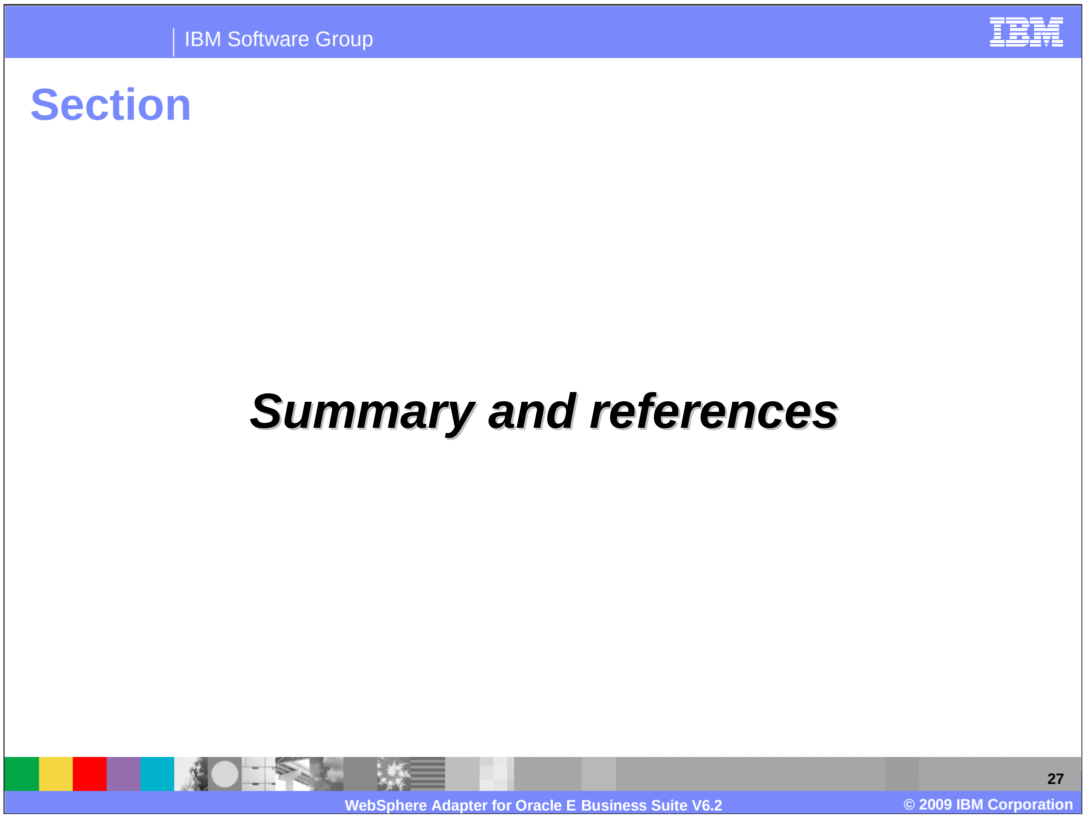


Samples: scenario 5

- Executing the external service wizard for the Adapter for Oracle EBS
  - Creates data in an Oracle application
  - Retrieves data from Oracle application
  - Improved performance in discovering objects and stored procedures

Here is the description for the fifth scenario. With the WebSphere Adapter for Oracle E-Business Suite, you can create data in an Oracle application and retrieve data from the application. In this scenario, you use the WebSphere Adapter for Oracle E-Business Suite with improved performance to discover tables and stored procedures in the Receivables module.

Refer to the summary and reference section at the end of this presentation for a link to the quick start tutorials documentation.



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Section

Summary and references

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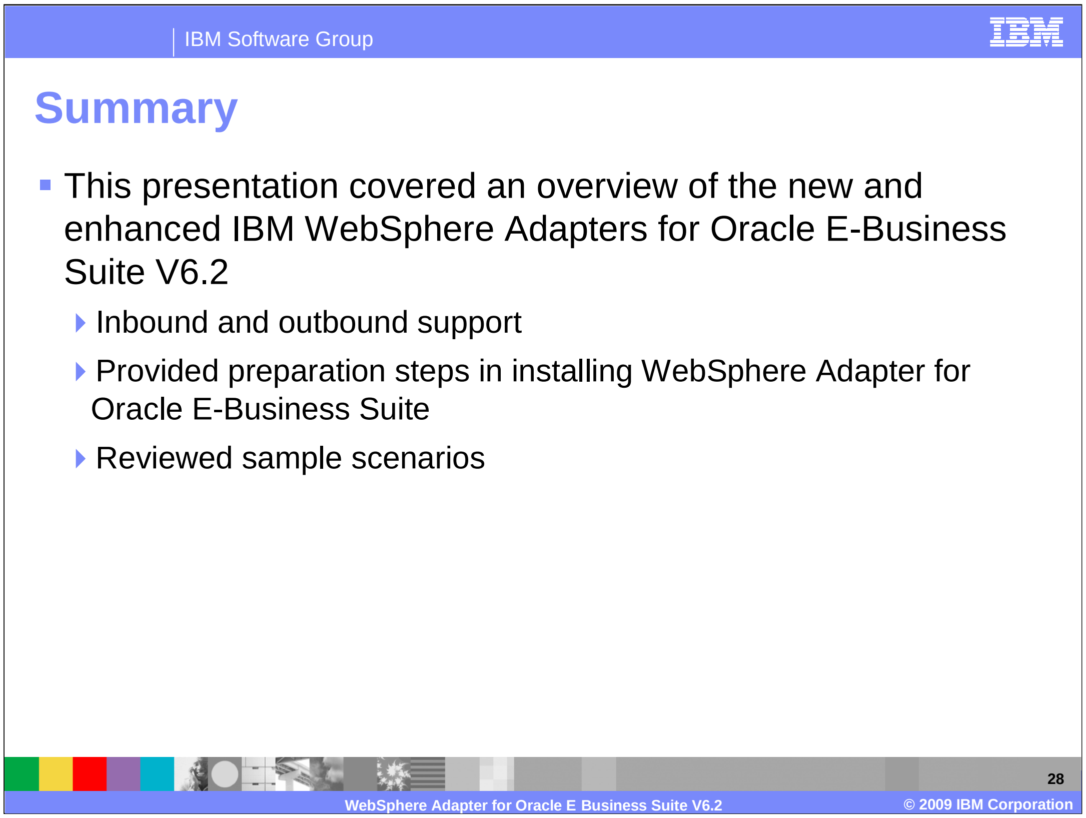
WebSphere Adapter for Oracle E Business Suite V6.2

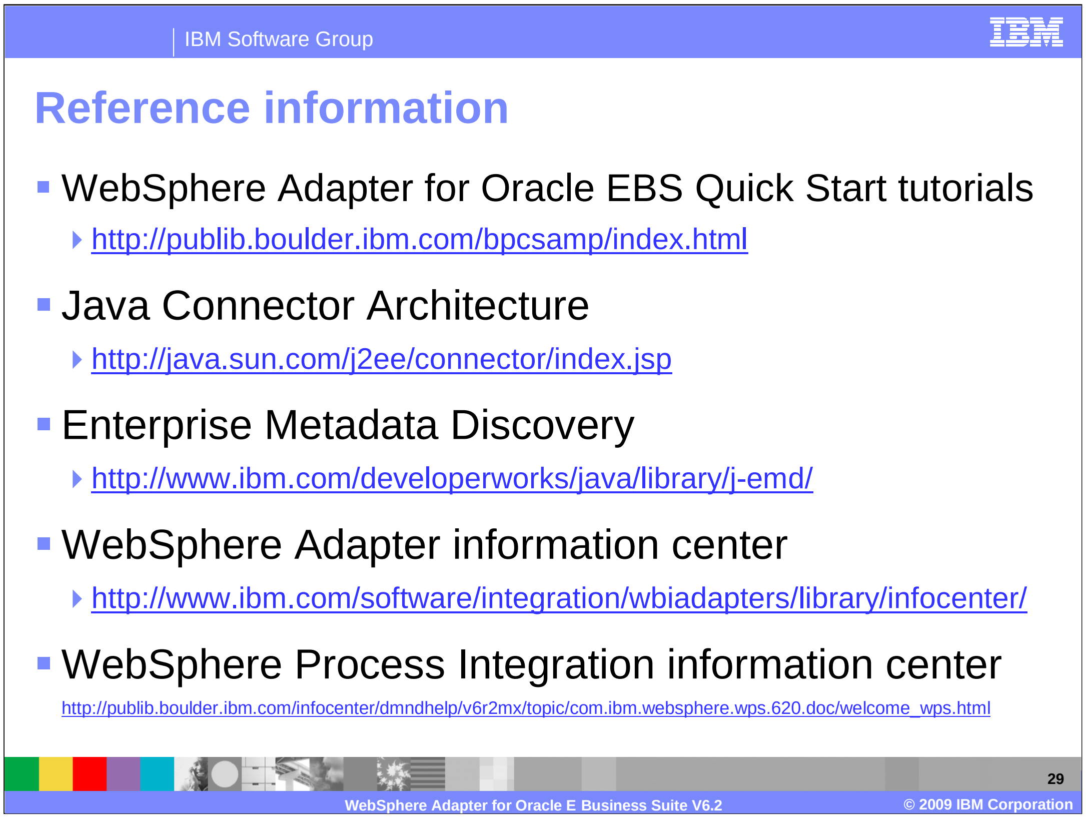
This section provides a summary of the WebSphere Adapter for Oracle E-Business Suite version 6.2.



Summary

- This presentation covered an overview of the new and enhanced IBM WebSphere Adapters for Oracle E-Business Suite V6.2
  - Inbound and outbound support
  - Provided preparation steps in installing WebSphere Adapter for Oracle E-Business Suite
  - Reviewed sample scenarios

To summarize this presentation, WebSphere Adapter for Oracle E-Business Suite allows bi-directional connectivity, both inbound and outbound, with Oracle E-Business Suite applications using a JDBC adapter. The adapter supports both inbound and outbound interaction and installation preparation steps in installing WebSphere Adapter for Oracle E-Business Suite. Also, the Oracle adapter included three additional integration scenarios for V6.2.

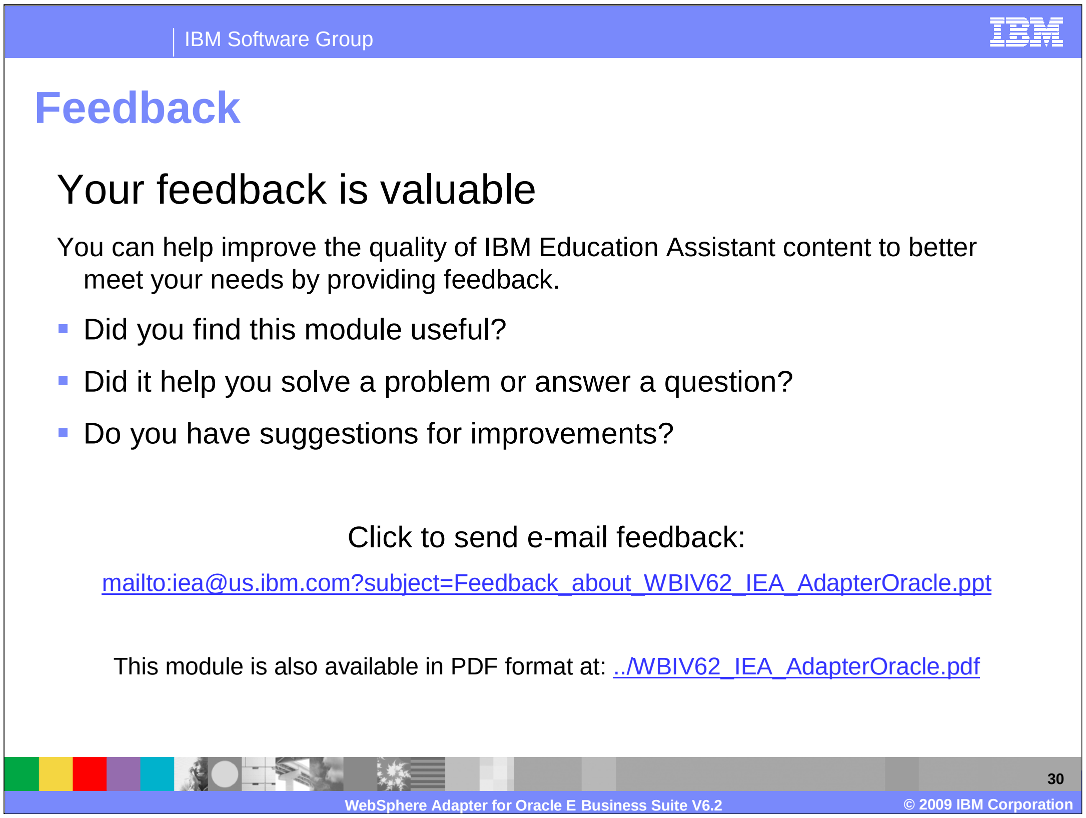


Reference information

- WebSphere Adapter for Oracle EBS Quick Start tutorials
  - http://publib.boulder.ibm.com/bpcsamp/index.html
- Java Connector Architecture
  - http://java.sun.com/j2ee/connector/index.jsp
- Enterprise Metadata Discovery
  - http://www.ibm.com/developerworks/java/library/j-emd/
- WebSphere Adapter information center
  - http://www.ibm.com/software/integration/wbiadapters/library/infocenter/
- WebSphere Process Integration information center

  http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.websphere.wps.620.doc/welcome_wps.html

Additional reference information can be found at these addresses.



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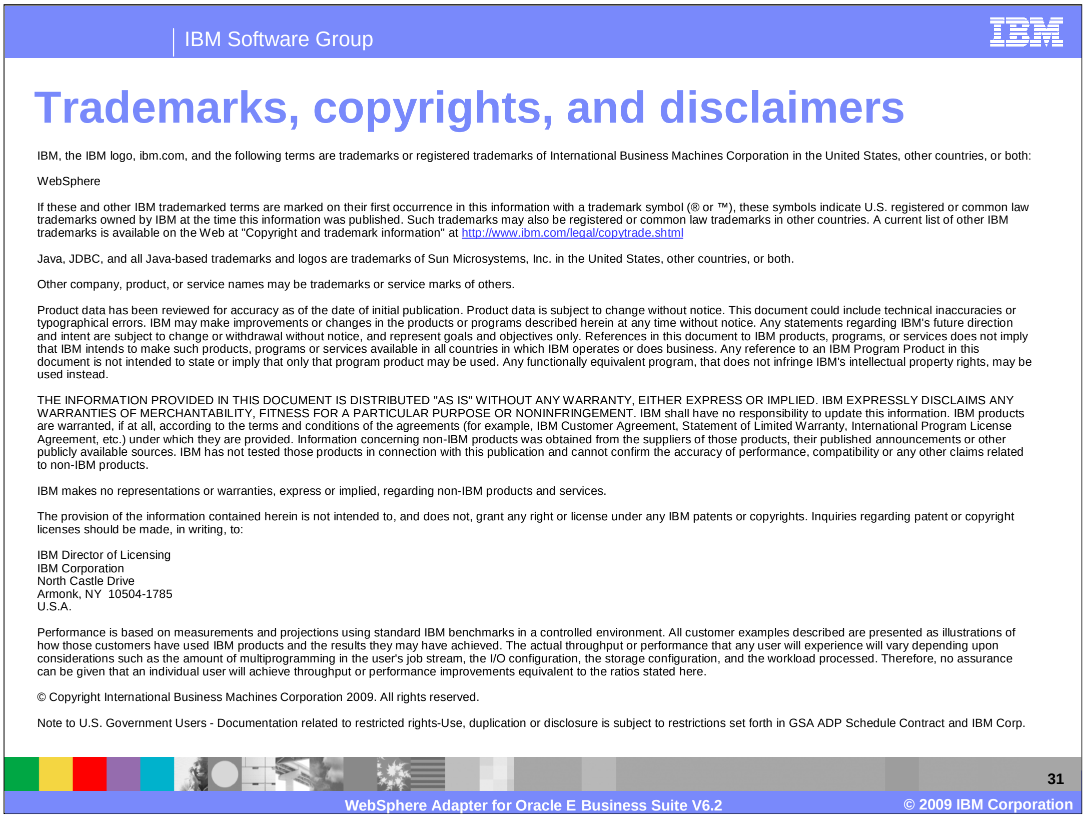

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