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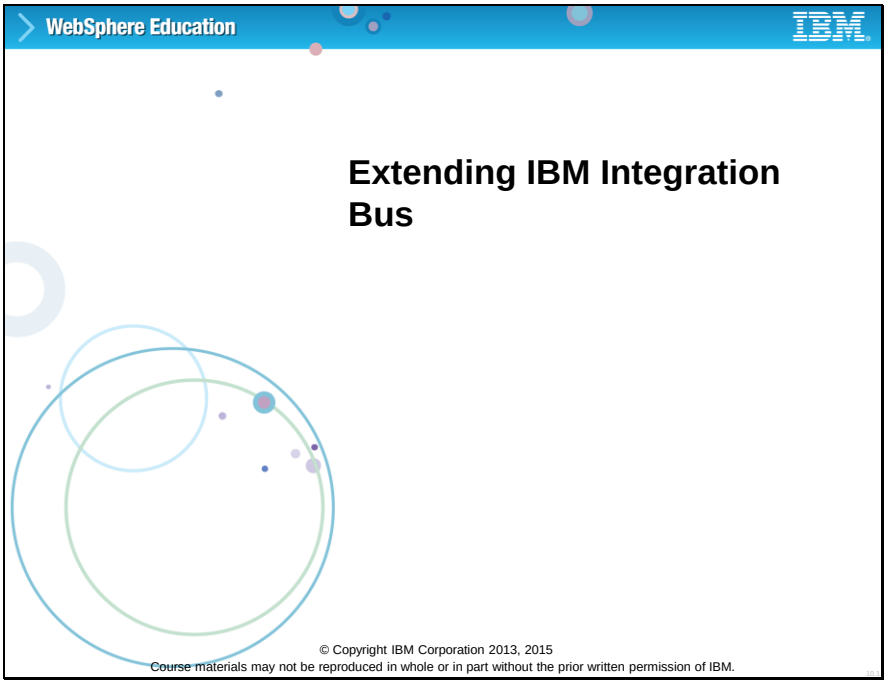
WebSphere Education
IBM
Extending IBM Integration Bus
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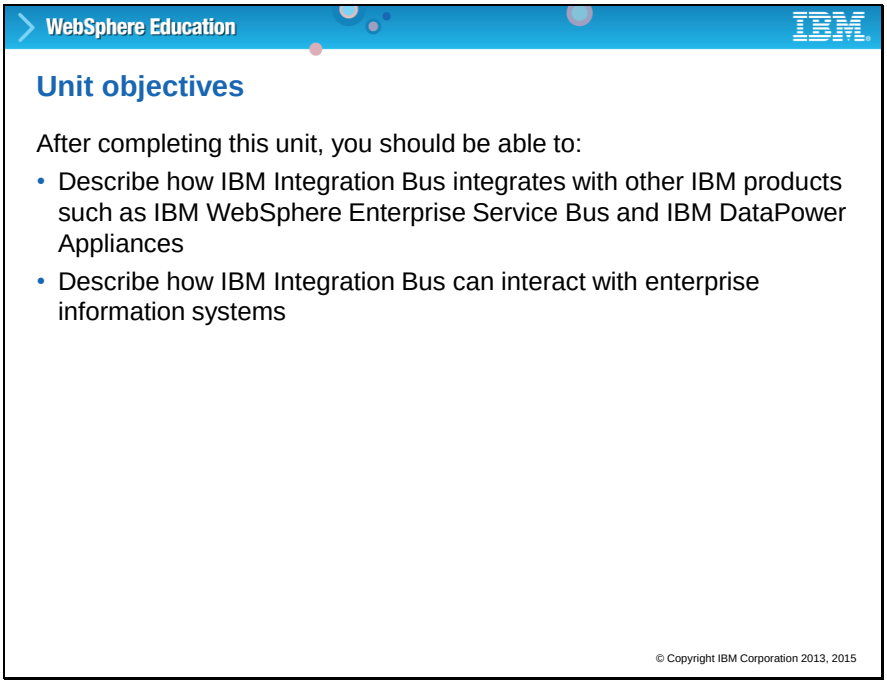
Slide 2



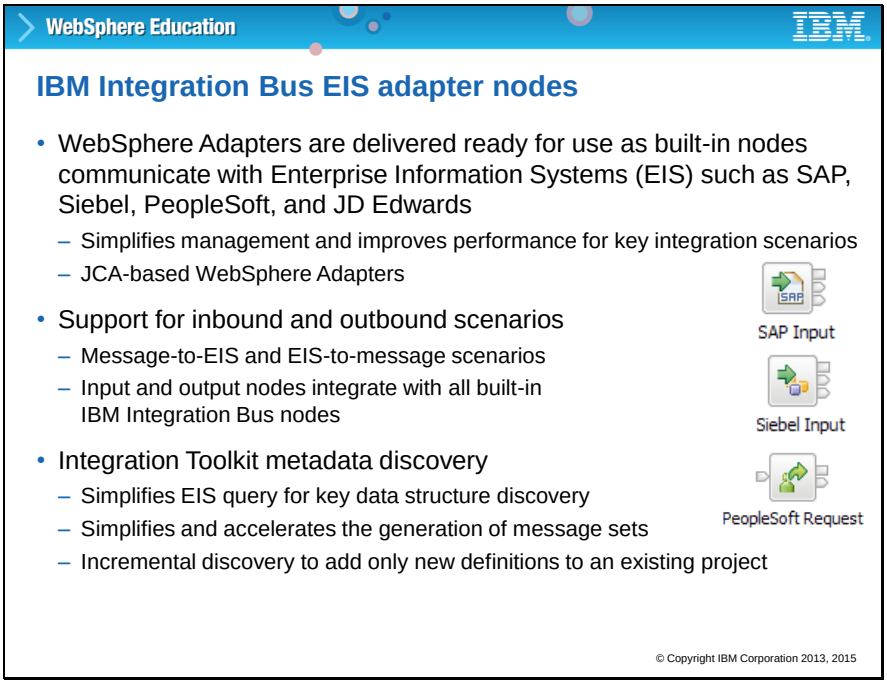
Unit objectives

In this unit, you learn how IBM Integration Bus functions can be extended with other IBM products, Industry Content Packs, and enterprise information systems.

After completing this unit, you should be able to:

- Describe how IBM Integration Bus integrates with other IBM products such as IBM WebSphere Enterprise Service Bus and IBM DataPower Appliances
- Describe how IBM Integration Bus can interact with enterprise information systems

Slide 3



IBM Integration Bus EIS adapter nodes

Enterprise information systems, such as SAP, Siebel, PeopleSoft, and JD Edwards, provide a technology platform that enables organizations to integrate and coordinate their business processes on a robust foundation.

In Integration Bus, you use Adapter nodes to communicate with enterprise information systems. Using nodes in Integration Bus simplifies the management of adapters and improves performance for key integration scenarios because no outside components must be started or stopped.

Support is provided for the major EIS systems.

The Integration Toolkit installation also includes a sample adapter that is named Twineball. The TwineBallInput and TwineBallRequest nodes are sample nodes with their own sample EIS. You can use the TwineBall nodes to see how adapter nodes work without having to connect to an external EIS.

The EIS Adapters support two modes of communication: Inbound and Outbound.

- Inbound is where an event is generated on the EIS and a message is propagated from the EIS adapter input node.
- Outbound an EIS adapter request node sends a request to the EIS.

In the Integration Toolkit, you use the **Adapter Connection** wizard to examine an EIS. The definitions are then stored as XML schema by default. You can use the wizard to quickly build components that can access the EIS.

Each adapter requires a separate license entitlement to deploy message flows to an integration node for any purpose other than unit testing on the developer's workstation.

Next are some common scenarios for using EIS adapter nodes.

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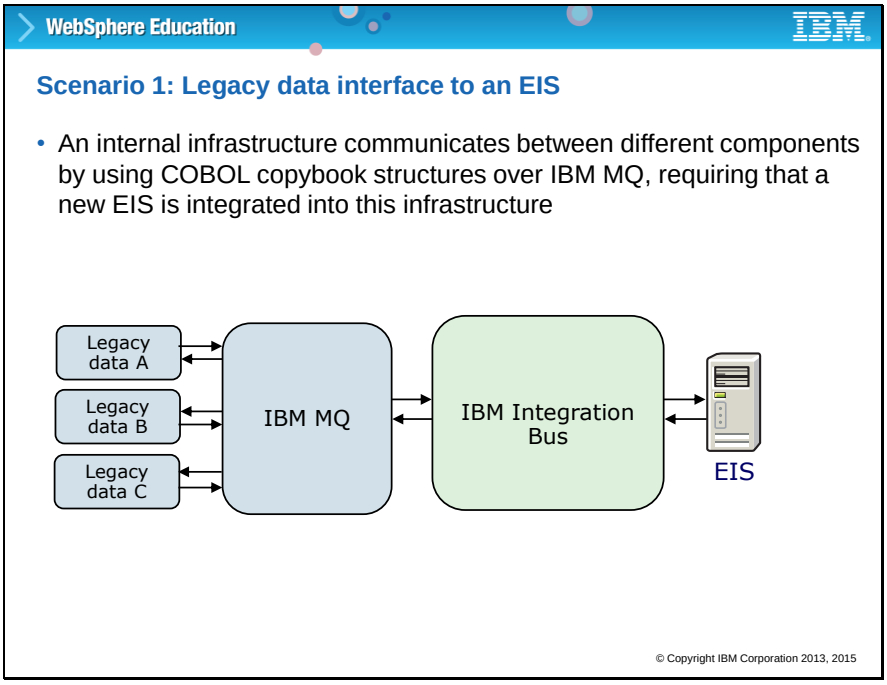
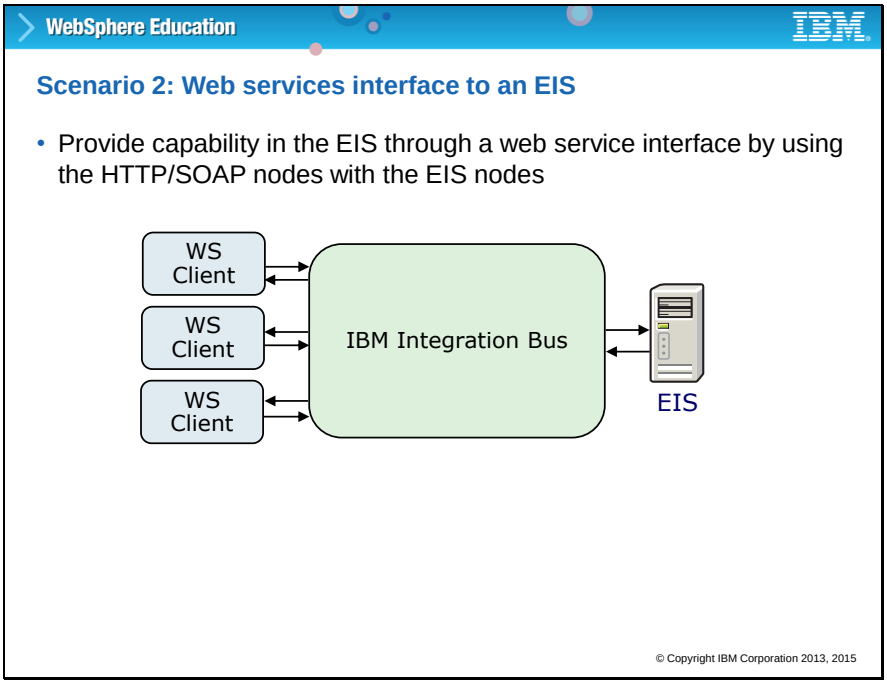


Scenario 1: Legacy data interface to an EIS

In this first scenario, Integration Bus provides the interface between legacy applications and an EIS. In this scenario, the in-flight state of the messages is maintained in IBM MQ. If you do not require the nodes in the flow to be transactional, you can set the **Transaction mode** property to **No**, and access to MQ is not required.

Slide 5

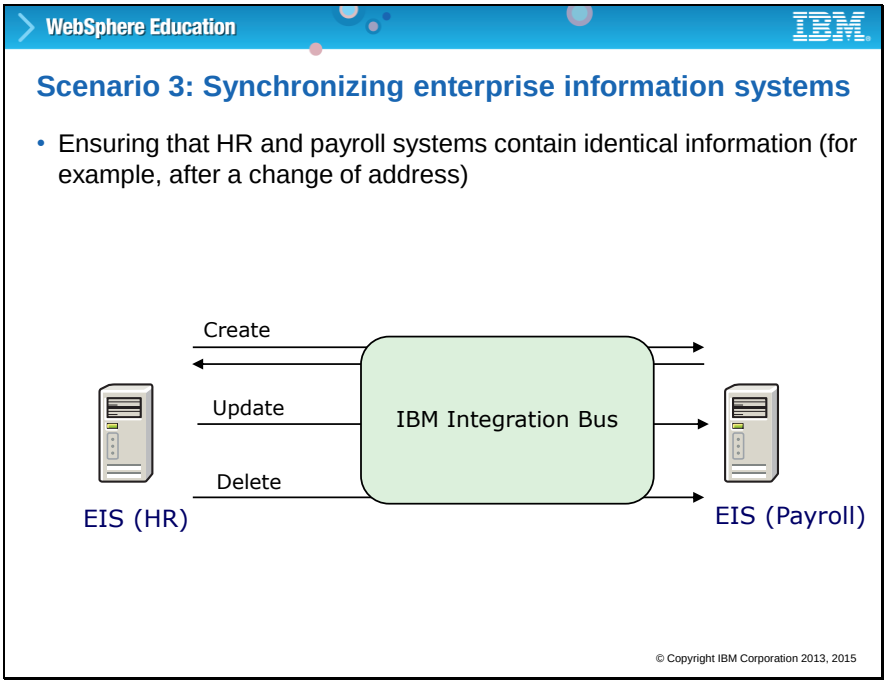


Scenario 2: Web services interface to an EIS

In this scenario, Integration Bus can be used to make the EIS accessible through web services by using HTTP and SOAP nodes.

In this example, Integration Bus provides the communication link between web services clients and the EIS.

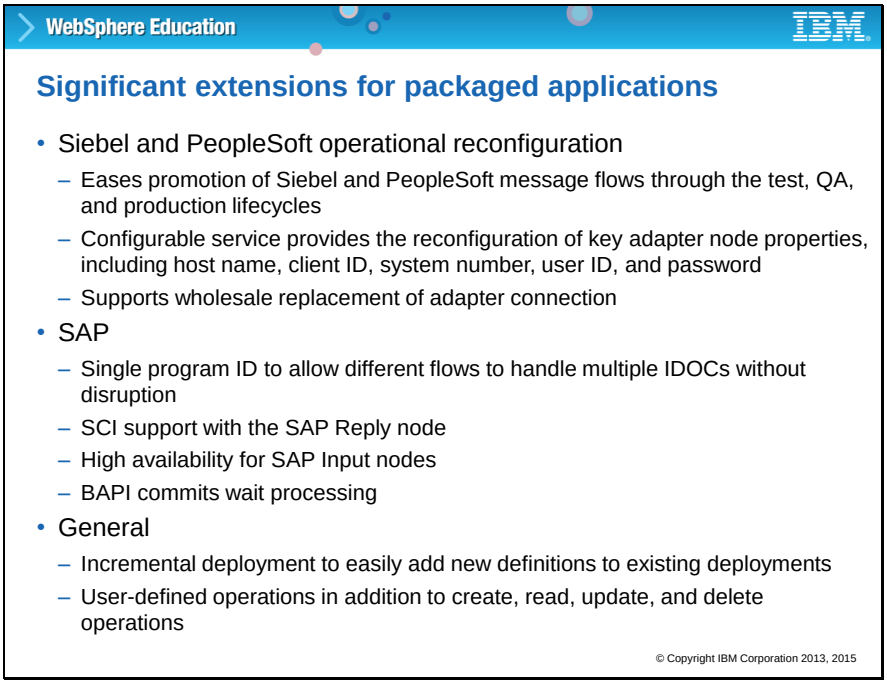
Slide 6



Scenario 3: Synchronizing enterprise information systems

In this scenario, Integration Bus can be used to synchronize two different Enterprise Information Systems.

Slide 7



Significant extensions for packaged applications

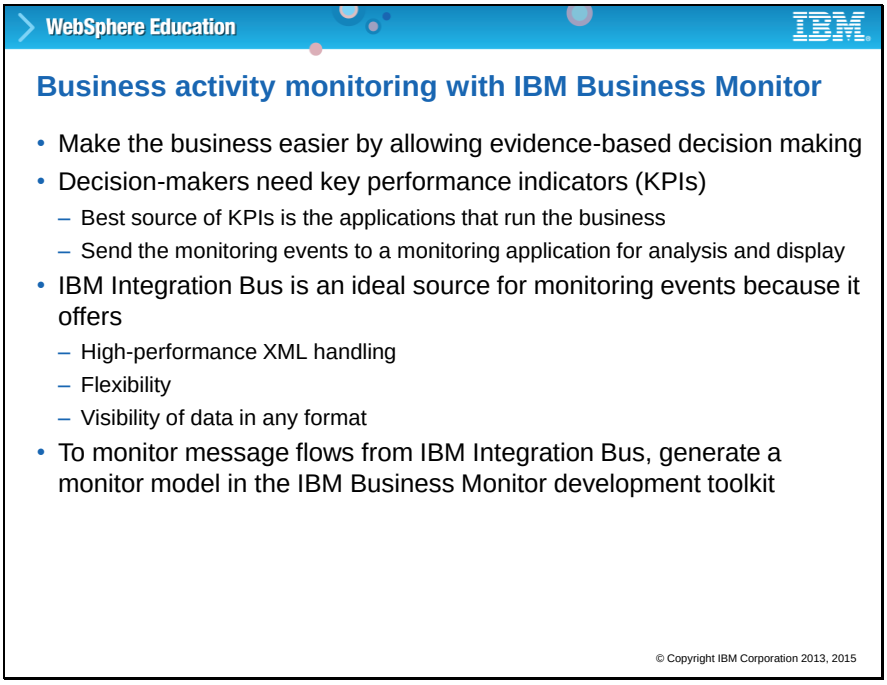
Integration Bus includes significant extensions for SAP, Siebel, and PeopleSoft. It includes fully configurable services for user IDs, passwords, servers, and all properties for connectivity to the engineering resource planning (ERP) system. The configurable services can be modified in the Integration web user interface and with a command.

Integration Bus can communicate with a single SAP program ID and provide synchronous RFC support for the SAP reply node. Integration Bus can also support high availability for the SAP node. For example, you could have an SAP input node in a message flow and another SAP node that is running in another integration node. The state is stored in the multi-instance queue manager, which allows one instance to take over if the other fails.

Other functions include incremental discovery and incremental deployment. If you have an adapter project with 50 adapter definitions, you can go back and add more definitions without reprocessing the original 50. Incremental discovery and deployment also allow multiple adapters to use the same connection configuration.

Integration Bus also supports user-defined operations that allow for more expressive operations to be declared, in addition to the standard operations provided in Integration Bus.

Slide 8



Business activity monitoring with IBM Business Monitor

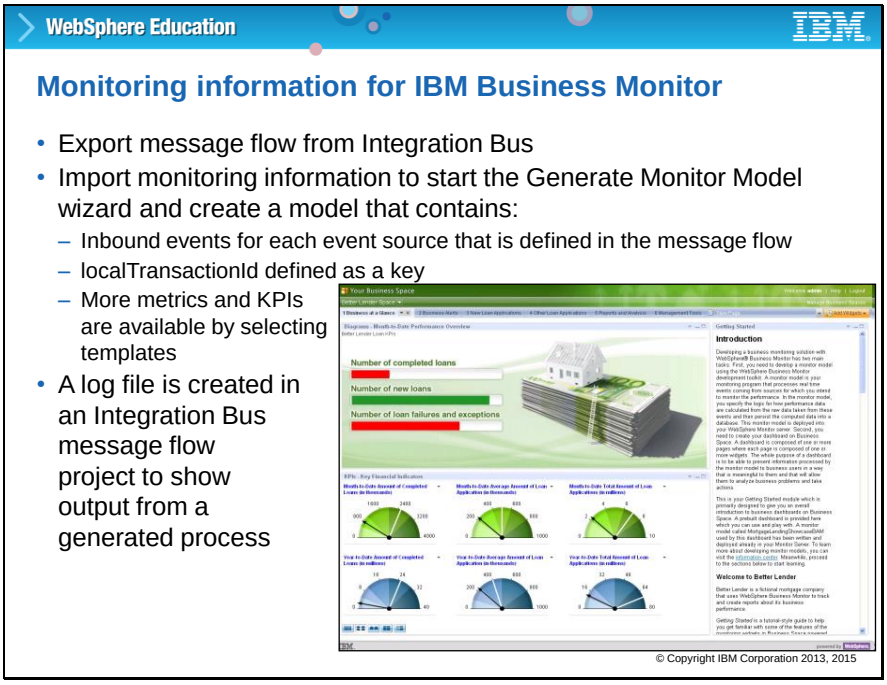
Another opportunity for integration with Integration Bus is business activity monitoring.

Business activity monitoring is the aggregation, analysis, and presentation of real-time information about activities. You can extract data about the flow, in real time, and to decide based on the data.

With Integration Bus, you can identify events and audit the data.

Integration Bus can easily integration with IBM Business Monitor. In Integration Bus V10.0.0.4 and later, you can also use the Integration web user interface for business monitoring.

Slide 9



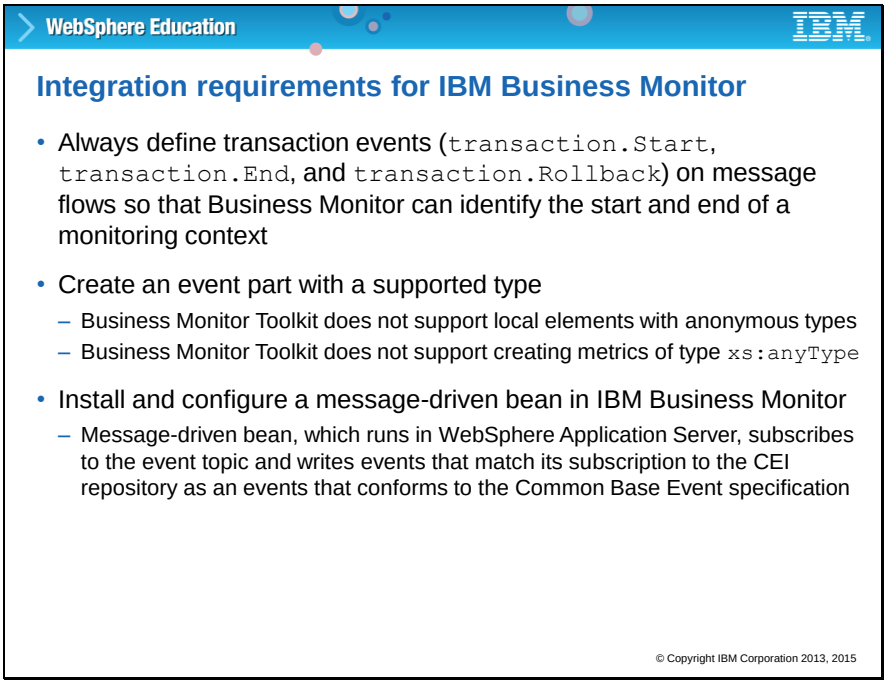
Monitoring information for IBM Business Monitor

In Integration Bus, a monitor model is created by using a wizard. The monitor model can then be exported from the Integration Toolkit and imported into the Business Monitor.

The imported model contains:

- Inbound event names that are taken from the event source address name.
- Inbound events for Integration Bus transaction event sources that are created at the flow level in the model.
- Event groups for each of the nodes where the Integration Bus terminal event sources are defined.
- Inbound events for subflow event sources.

Slide 10



Integration requirements for IBM Business Monitor

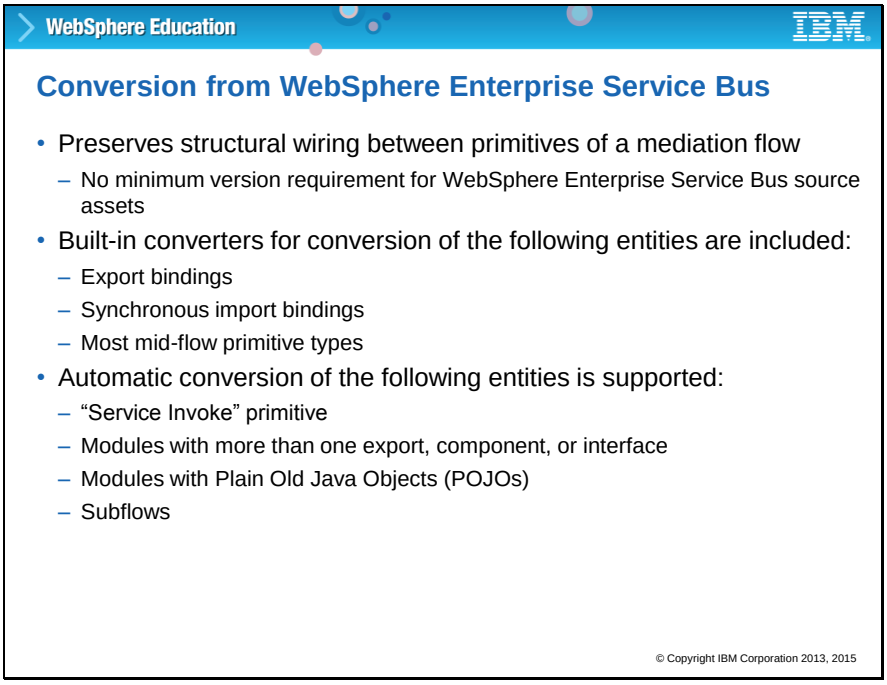
Business Monitor must be able to identify the start and end of a monitoring context. Always define transaction start, end, and rollback events on message flows you want Business Monitor to monitor.

The Business Monitor toolkit does not support local elements with anonymous types. The export monitoring information option does not generate an event part for event payload XPath queries that resolve to an element of this type. You see a warning message in the report log *flowProjectName*_batchgen_report.txt.

The Business Monitor toolkit does not support creating metrics of type xs:anyType. If an XPath expression in your event payload resolves to an element of type xs:anyType, the export monitoring information option creates an event part of this type, but you cannot create a metric of this type in the Business Monitor toolkit. Create an event part with a supported type.

For Business Monitor to monitor events, they must be submitted to the CEI repository by using a message-driven bean. You must install and configure a message-driven bean in Business Monitor. The message-driven bean, which runs in WebSphere Application Server, subscribes to the event topic and writes events that match its subscription to the CEI repository as Common Base Event events.

Slide 11



Conversion from WebSphere Enterprise Service Bus

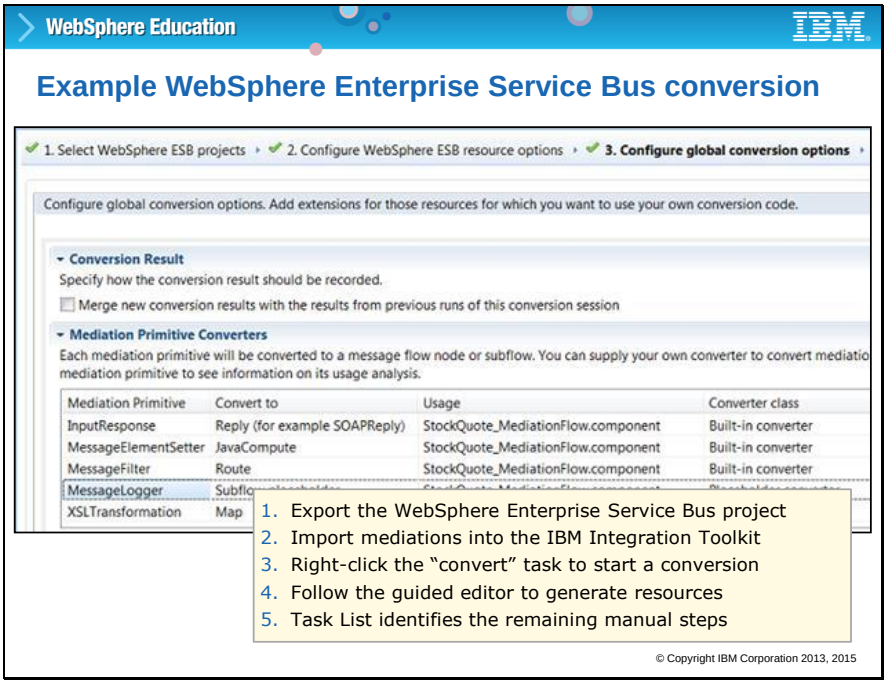
Integration Bus represents IBM's strategic ESB offering and is the successor product for existing clients of both WebSphere Message Broker and WebSphere Enterprise Service Bus.

Integration Bus provides tools that facilitate the conversion of existing WebSphere Enterprise Service Bus assets so that they can run on IBM Integration Bus.

- WebSphere Enterprise Service Bus Project Interchange files can be imported and viewed.
- Common flow primitives are converted automatically while maintaining the flow structure.
- A task list describes the remaining manual tasks that must be completed.
- Flows are created and can be modified and deployed.

The conversion tool is built upon an extensible framework, enabling further enhancements that reduce the number of manual tasks required.

Slide 12

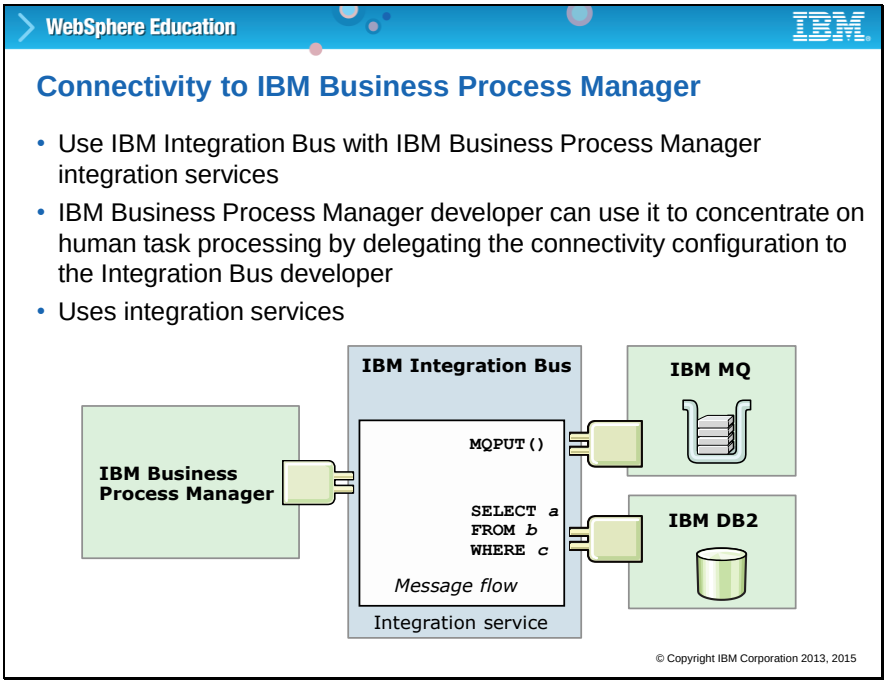


Example WebSphere Enterprise Service Bus conversion

The steps for converting a WebSphere Enterprise Service Bus project to an Integration Bus project are:

1. Export the WebSphere Enterprise Service Bus project.
2. Import mediations into the Integration Toolkit.
3. Right-click “convert” to start conversion.
4. Follow guided editing to generate resources.
5. Complete the tasks in the Task List.

Slide 13

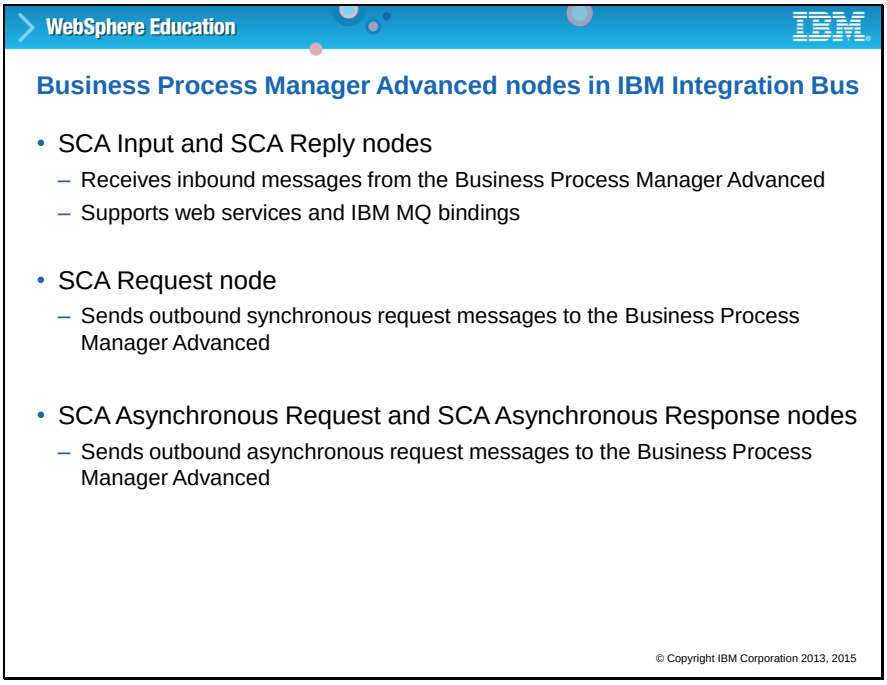


Connectivity to IBM Business Process Manager

You can use IBM Process Designer to design IBM Business Process Manager integration services, including input and output business objects, and use these definitions to generate services and operations in Integration Bus.

From Business Process Manager, a process designer can specify the input data that is sent to a system task and the response that is expected from the task. This information is passed to the Integration Toolkit. In the Integration Toolkit, the developer can then implement an integration service that accepts the defined request and delivers the expected response.

Slide 14



Business Process Manager Advanced nodes in IBM Integration Bus

You can connect to an integration node by using IBM Business Process Manager Advanced.

IBM Business Process Manager Advanced includes three layers:

- The SOA of Business Process Manager Advanced provides both uniform invocation and data representation programming models, and monitoring and management capabilities for applications that run on Business Process Manager Advanced.
- Supporting services in Business Process Manager address a number of transformation challenges for connecting components and external artifacts.
- All integration artifacts that run on Business Process Manager are represented as services components with well-defined interfaces.

In Integration Bus, an SCA Input node allows a Business Process Manager Advanced SCA Import component to use Integration Bus as an SCA endpoint.

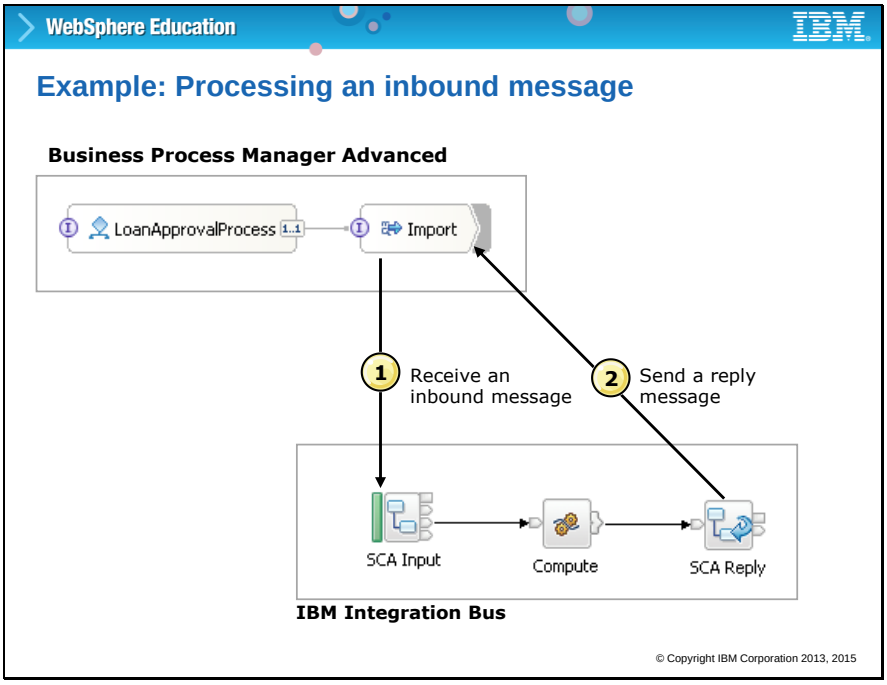
The SCA Reply node sends a response message from the integration node back to the originating Business Process Manager Advanced SCA client in response to a message received by an SCA Input node.

The SCA Request node sends synchronous requests from the integration node, allowing the integration node to participate in synchronous message exchange patterns with a Business Process Manager Advanced SCA Export component.

The SCA Async Request node sends asynchronous requests from the integration node, allowing the integration node to participate in asynchronous message exchange patterns with a Business Process Manager Advanced SCA Export component. SCA Async Response node allows the integration node to receive the response to a previous asynchronous request made from an SCA Async Request node.

For each node, the message the integration node receives can be a SOAP/HTTP or an MQ message, depending on the binding that the node used. An example is next.

Slide 15



Example: Processing an inbound message

The flow in the example uses an SCA Input node to receive a request from SCA components that are running on Business Process Manager Advanced.

The SCA Import component in Business Process Manager Advanced sends the inbound requests to the Integration Bus SCAInput node, which uses dynamic terminals to process the message body. The operations that are defined in the WSDL interface file determine these terminals. An incoming message is routed to the appropriate terminal as determined by the target operation.

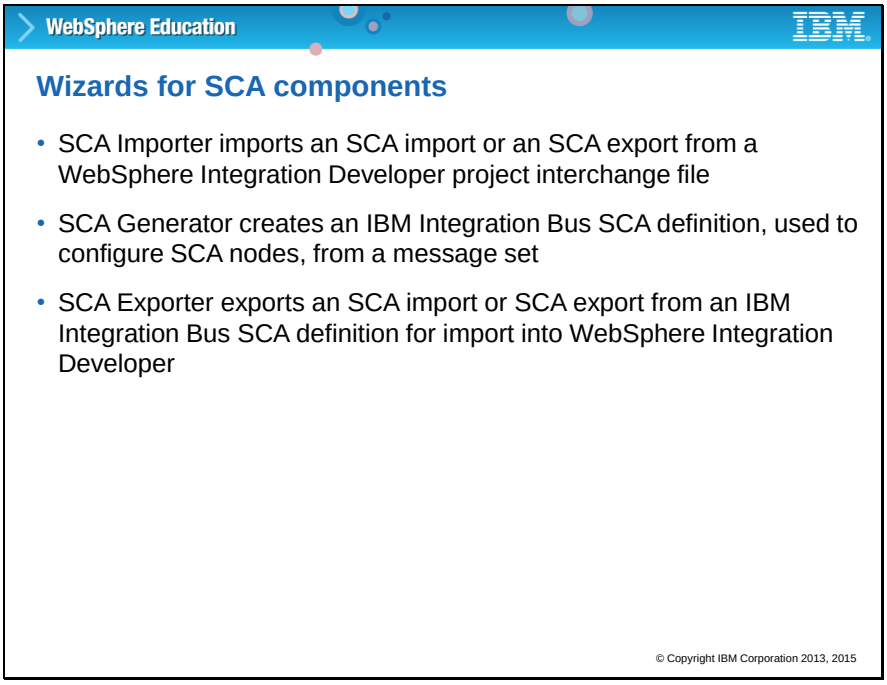
A ReplyIdentifier on the SCA Input node is set in the message context and the local environment. The value must be preserved throughout the flow, especially if the SCA Input and SCA Reply nodes are in different flows so that the reply can get back to the originating Business Process Manager Advanced client.

An SCA Reply node sends a reply to the Business Process Manager Advanced business process.

If the user does not have an integration node SCA definition with which to configure the node, the SCA Input and SCA Reply nodes cannot be used.

The SCA Input node can route the message as determined by the operation that was specified in the service request. The SCA Input node can be configured only from an Integration Bus SCA definition.

Slide 16

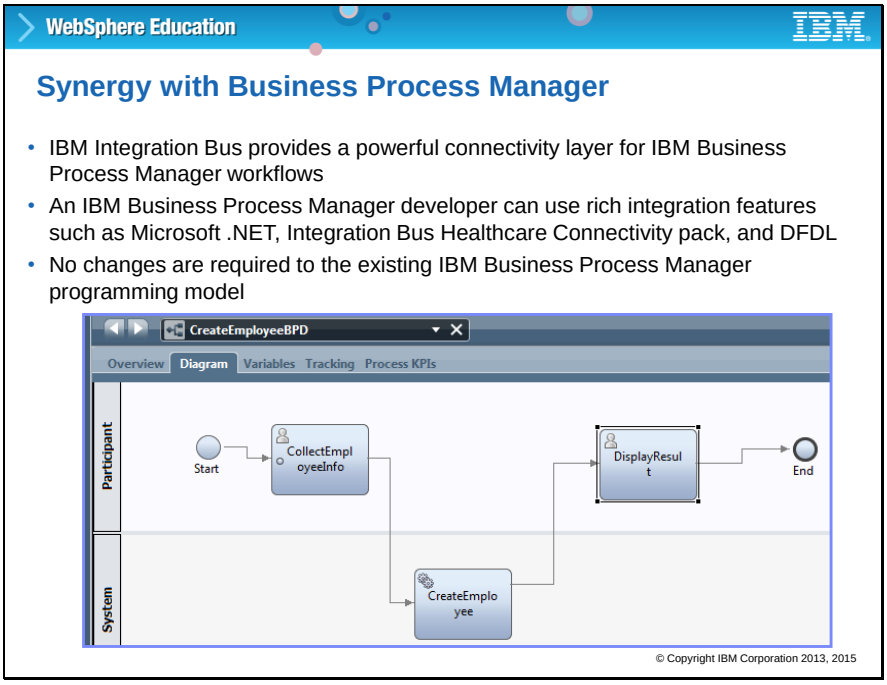


Wizards for SCA components

The Integration Toolkit includes wizards to help you integrate an Integration Bus message flow with Business Process Manager Advanced.

- The SCA Importer imports an SCA import or an SCA export from an Integration Developer project interchange file.
- The SCA Generator creates an Integration Bus SCA definition that is used to configure SCA nodes from a message set.
- The SCA Exporter exports an SCA import or SCA export from an Integration Bus SCA definition for import into Integration Developer.

Slide 17



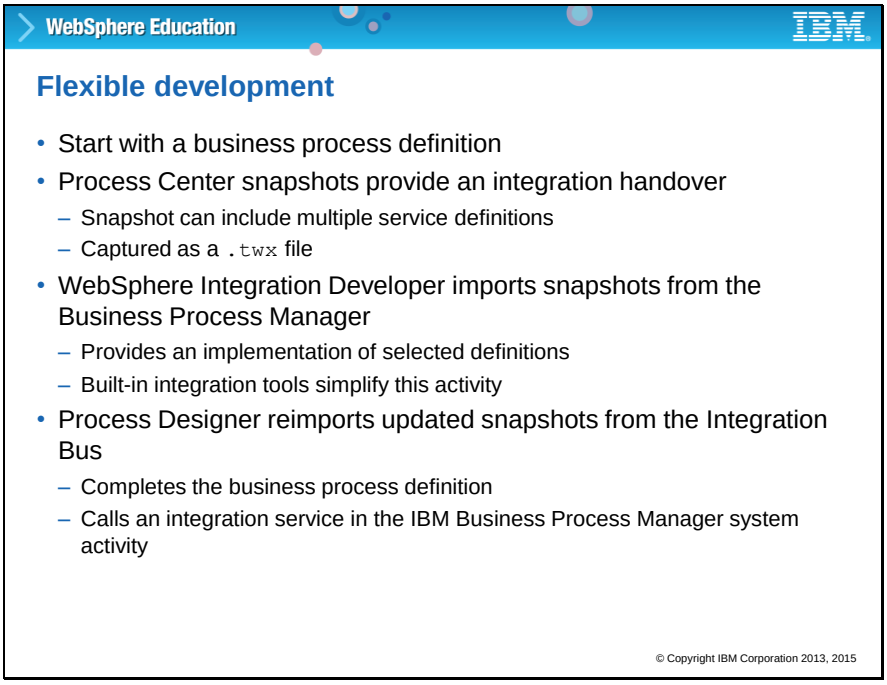
Synergy with Business Process Manager

You can incorporate IBM Integration Bus integration services with IBM Business Process Manager (BPM) integration services.

BPM provides enterprise-level business process design and modeling and Integration Bus provides enterprise-strength connectivity and integration.

This connectivity allows an IBM Business Process Manager developer to use rich integration features such as Microsoft .NET, Integration Bus Healthcare Connectivity pack, and DFDL data models.

Slide 18



Flexible development

Integration Bus supports bottom-up and top-down development approaches when integrating with Business Process Manager.

For example, you might start the development by creating the Business Process Manager integration service definition in the Business Process Manager toolkit, adding the integration service definition, and then export the toolkit from BPM as an export .twx file. You would then import the .twx file into the Integration Bus Toolkit to create an Integration Bus integration service.

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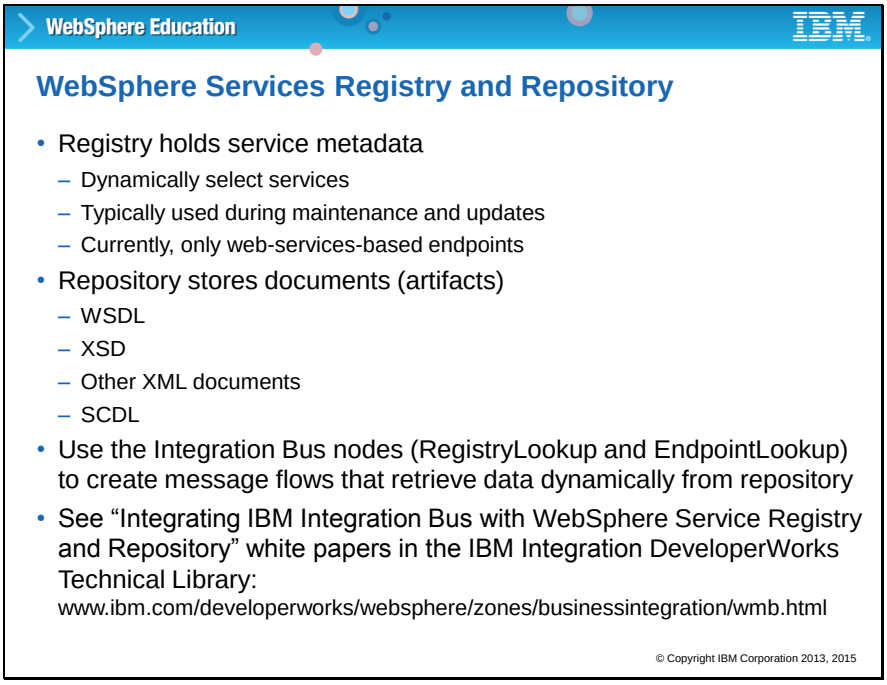


WebSphere Service Registry and Repository

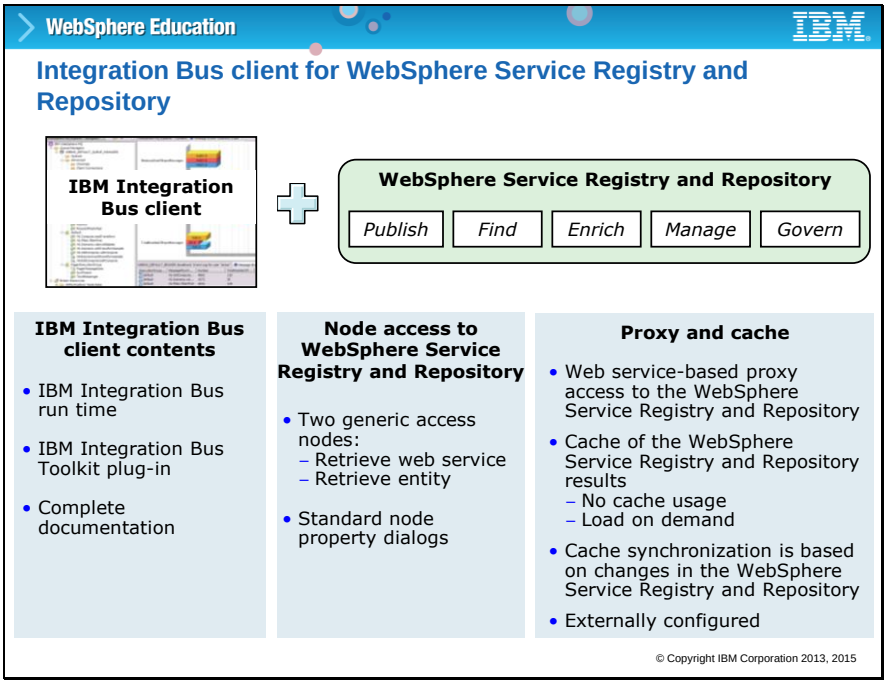
WebSphere Service Registry and Repository is a central repository of documents that describe services, service interfaces (for example, SOAP over HTTP), and associated policies that control access mechanisms.

The repository can store generic XML documents, WSDL, SCDL, and other XML documents.

The integration between Integration Bus and WebSphere Service Registry and Repository has both development and runtime aspects that can be used together to achieve true governance.

The Integration Toolkit contains two message processing nodes for connecting to WebSphere Service Registry and Repository: RegistryLookup and EndpointLookup.

Slide 20



Integration Bus client for WebSphere Service Registry and Repository

The WebSphere Service Registry and Repository message processing nodes are part of Integration Bus. However, WebSphere Service Registry and Repository is a separate product.

The runtime environment includes two nodes that can be used to access service metadata that is in WebSphere Service Registry and Repository. These nodes are included in message processing flows that mediate between service consumers and service providers in an SOA installation. These nodes are for generic WebSphere Service Registry and Repository access and allow for the two most popular processing scenarios: Query (return all) or Select (return one).

In the development environment, the WebSphere Service Registry and Repository plug-in can be used to search the registry for a particular entity. This discovered entity can then be used to start the creation of the message set and message flow. You can then use the WSDL drag-and-drop capability in the Toolkit to use the discovered service definition in your flow.

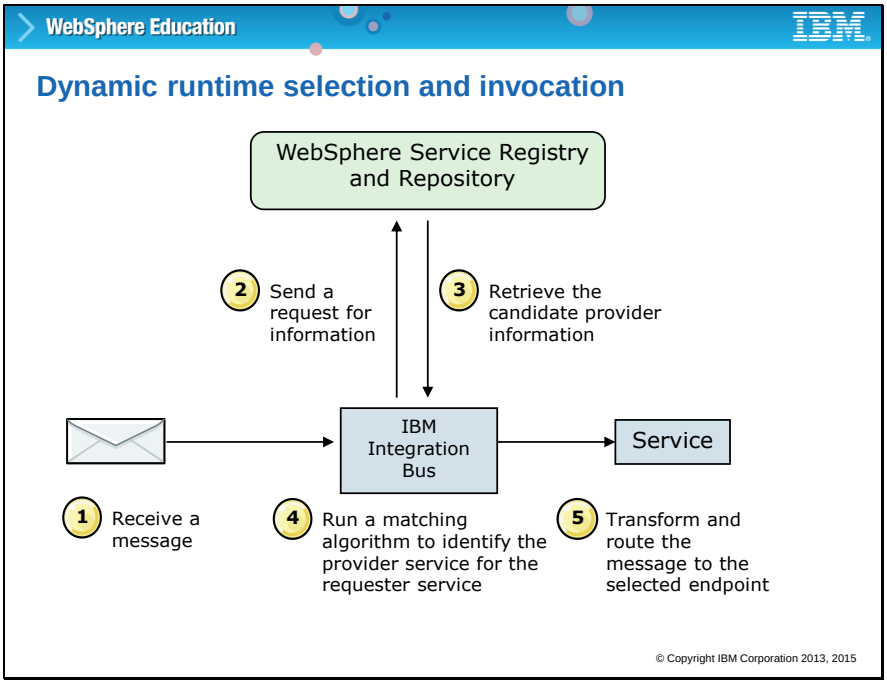
You set the configuration parameters for the WebSphere Service Registry and Repository nodes to specify how Integration Bus interfaces with your WSRR server.

- Use the **needCache** parameter to enable the Integration Bus WebSphere Service Registry and Repository cache. The cache is used to store results from queries that Integration Bus nodes send.

- If the Integration Bus WebSphere Service Registry and Repository cache is enabled, a cache timeout controls how long results from queries that are stored in the cache are used before the query is reissued.

Next, are some examples of how these nodes can be used.

Slide 21



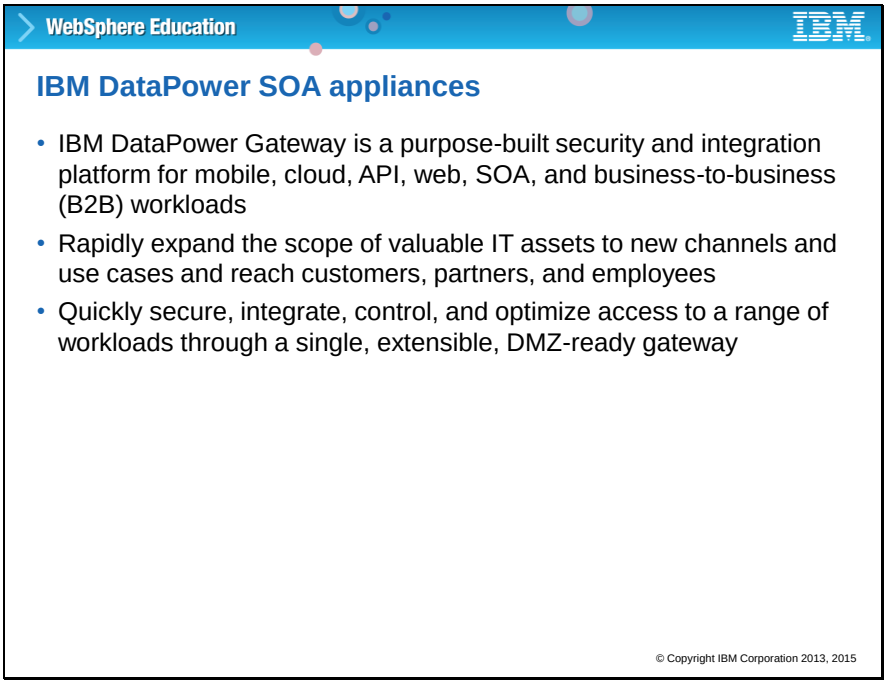
Dynamic runtime selection and invocation

Integration Bus and WebSphere Service Registry have several basic usage patterns.

- Dynamic XSLT transformation uses the RegistryLookup node to retrieve XSL stylesheet. A transformation node copies the returned stylesheet into the input message.
- Selecting between multiple services, for example, choosing between premium service and standard service. Use the EndpointLookup node to retrieve a set of endpoints. A transformation node then selects the required service and copies the endpoint information into the correct place for the SOAP node.
- Having an alternative service provider where the Failure terminal is used to denote a problem of accessing services with the SOAP Request node. A transformation node marks the endpoint as failed, returns to back up the flow, and selects the new service.

The slide shows an example of dynamic endpoint selection. In this example, a message flow queries WebSphere Service Registry and Repository for information about the requester and candidate provider. The message flow matches the requester with best candidate provider and routes the message.

Slide 22



IBM DataPower SOA appliances

Another product that complements IBM Integration Bus for web services applications is the DataPower appliance.

IBM DataPower embeds message processing directly into network hardware. This speed allows complex heavy-use problems to be broken down and approached differently. The devices run as a proxy, providing integration features without core processor impact or application modification. Hardened security is embedded in the devices.

DataPower appliances enable high-volume XML traffic to be processed more effectively, while addressing XML security and integration requirements.

Here are some specific areas where DataPower products effectively made a difference in SOA deployments:

- Electronic insurance: connecting with outside reinsurers for faster and more precise processes
- Creating connectivity to integrate divisions of a large bank, improving opportunity for cross-selling, real-time account settlement, and single customer view.
- Winning an important customer and growing revenue by offering direct access to life insurance and other benefits to millions of employees by using their own HR portal

- Setting up electronic tax filings to speed up revenue collection, and reduce errors and costs.
- Enabling information-driven, net-centric logistics by using XML messages to securely and instantly transmit intelligence information between different agencies and commands.

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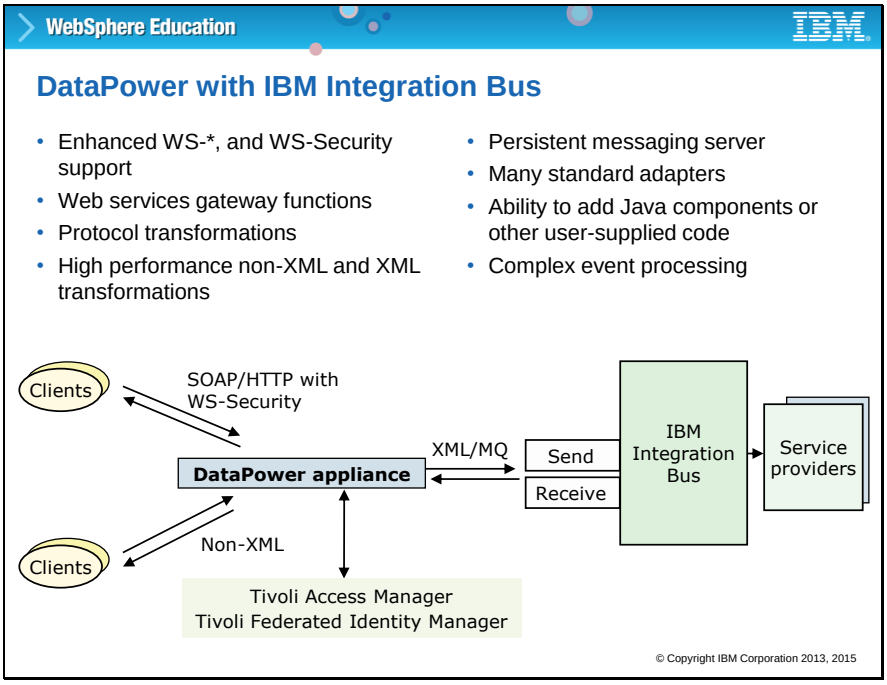


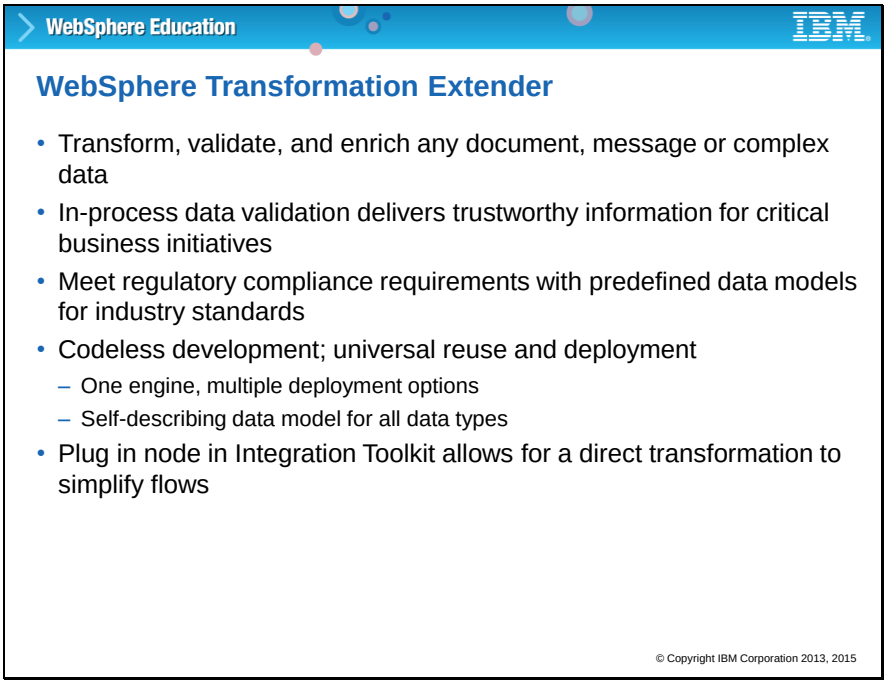
DataPower with IBM Integration Bus

This scenario shows DataPower working with Integration Bus to provide a high performance web services security gateway.

Clients connect to the DataPower appliance by using SOAP over HTTP. The DataPower appliance connects to Integration Bus by using MQ.

In this scenario, the DataPower device offers significant performance benefits, and allows security processing to be offloaded from the primary application processing within the Integration Bus environment.

Slide 24



WebSphere Transformation Extender

Another complement for Integration Bus is IBM Transformation Extender.

Transformation Extender is a transformation engine for application data. It has a similar function to the Compute node in IBM Integration Bus, with the advantage of providing a codeless approach to transforming data. Transformation Extender is a data mapping and transformation engine. It is unique because it can easily define and map all data types, including complex, deeply nested data types such as EDI, HIPAA, and SWIFT.

Furthermore, Transformation Extender can handle transformations in a code-free environment, which can significantly help reduce the time that is required to develop transformations. The Transformation Extender embeddable engine can work in various run times, one of which is IBM Integration Bus.

Using the Transformation Extender design tools, a business analyst or designer can build integration objects across the applications, databases, and systems that are being integrated.

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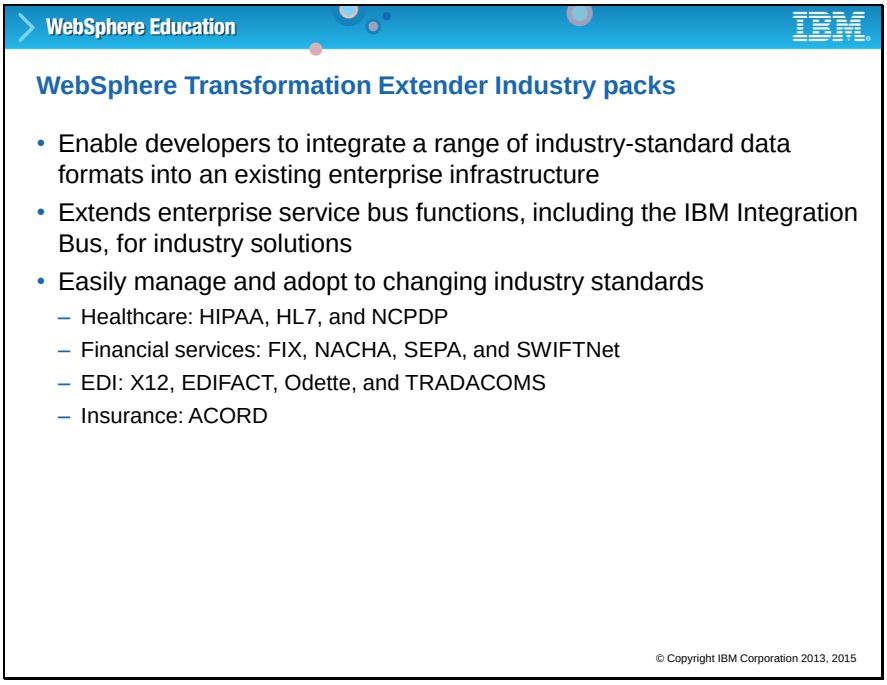
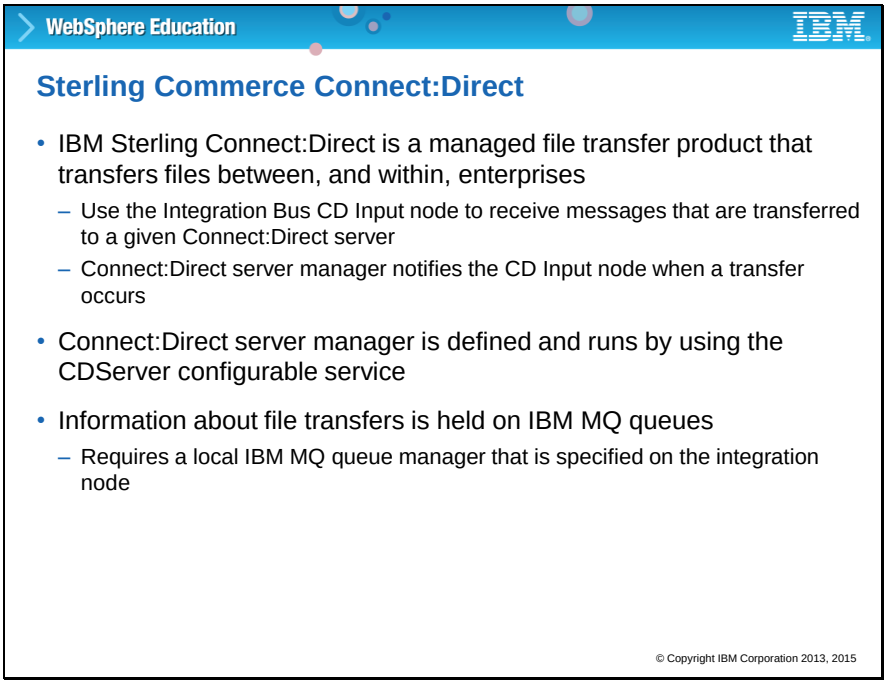


WebSphere Transformation Extender Industry packs

The Transformation Extender industry packs are an add-on option of predefined data definitions and examples. They are designed for handling complex transformation that is based on industry standards. You can concentrate on the data application, not changes to a standard.

Slide 26



Sterling Commerce Connect:Direct

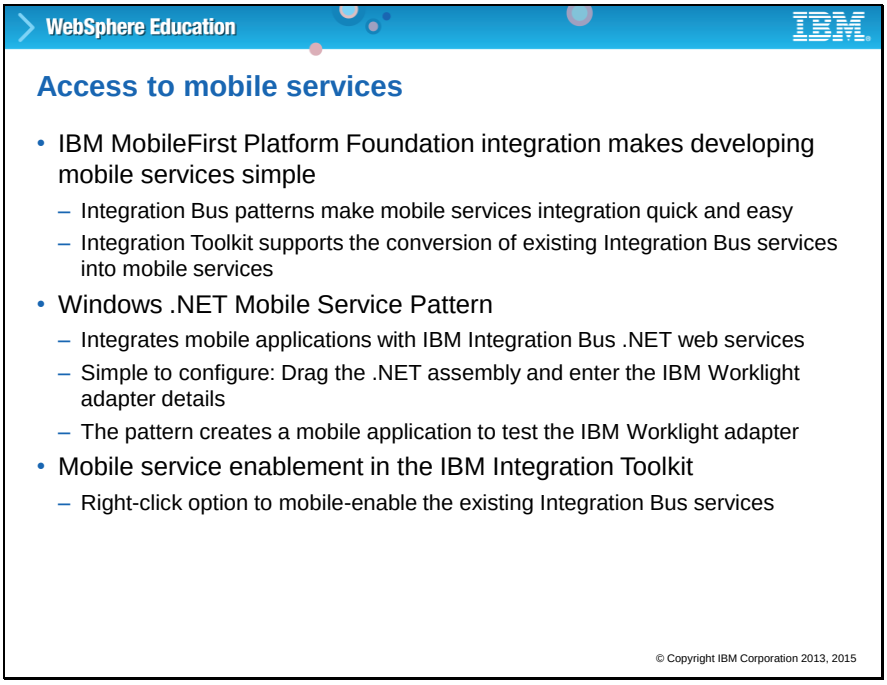
IBM Sterling Connect:Direct is a managed file transfer product that transfers files between, and within, enterprises.

In an Integration Bus message flow, the CDInput node receives messages that were transferred to a given Connect:Direct server. The node receives both the contents of the file and metadata provided by IBM Sterling Connect:Direct on the transfer. One or more CDInput nodes can be used to receive transfers, either in the same flow, different flows, or different integration servers; for any given transfer only one CDInput node receives a message.

You can also specify which transfer a CDInput node can receive, by using filters based on directory and file name of the transfer. After the transfer is processed, you have a set of options of what to do with the transferred file.

The CDInput and CDOutput nodes go through the Connect:Direct server manager to both send and receive transfers from a server, the name of which is set on the node. The Connect:Direct server manager properties are defined by using a CDServer configurable service.

Slide 27



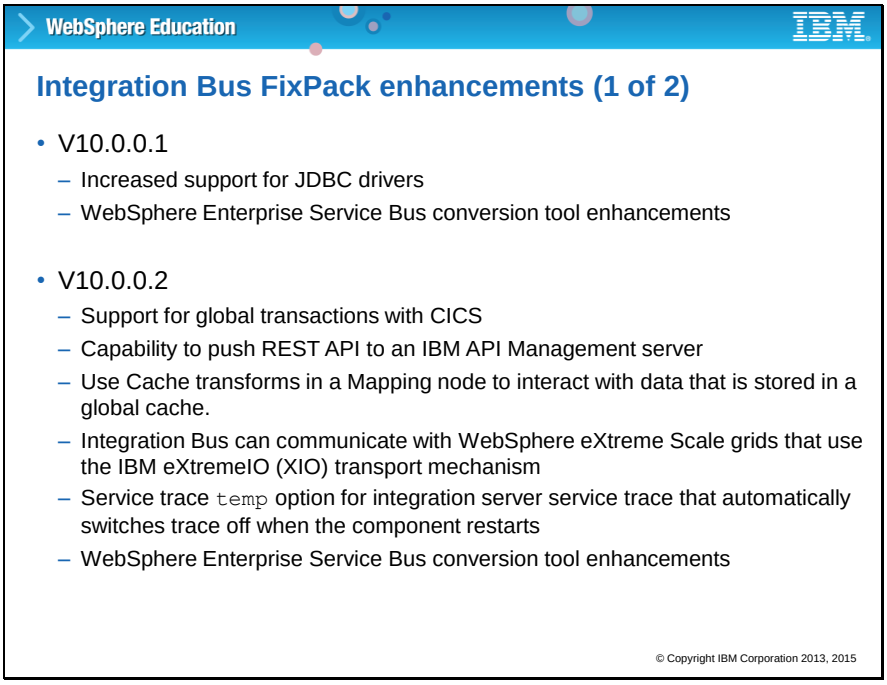
Access to mobile services

Integration Bus includes patterns for integrating with mobile services.

Worklight, an IBM company, provides an advanced mobile application platform and tools software for smartphones and tablets.

You can use the Worklight mobile service pattern in the Integration Toolkit to integrate a mobile application that is written for the Worklight platform with a service that is running in Integration Bus. You can use the pattern to make an Integration Bus service available through REST APIs used by mobile applications that run on all types of devices.

Slide 28



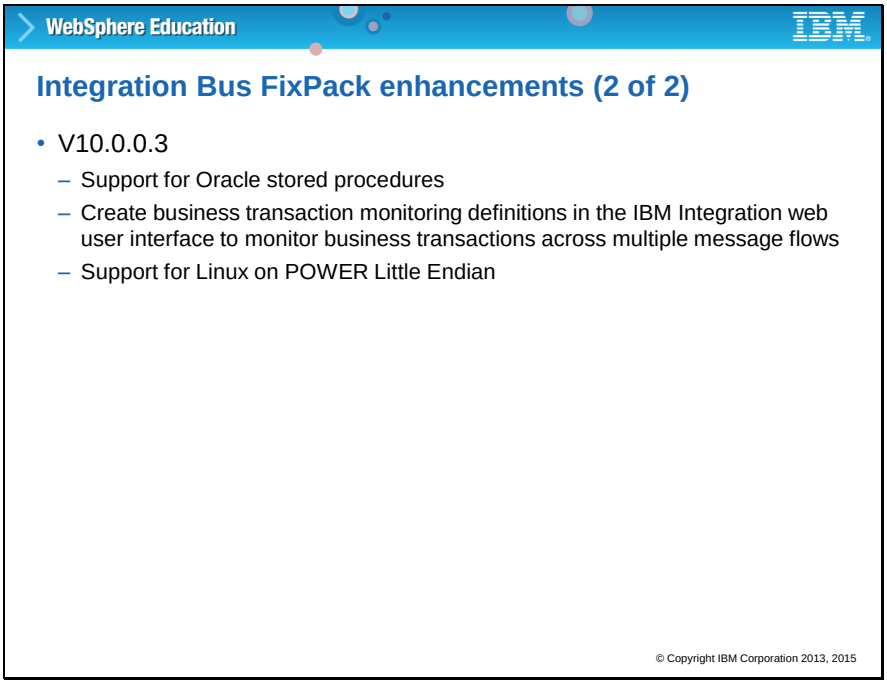
Integration Bus FixPack enchancements (1 of 2)

Service updates and other fixes are delivered occasionally in the form of fix packs. You can find information about the fix packs available on the IBM Integration Bus support web page and in the IBM Knowledge Center for Integration Bus.

After you install a fix pack, you can enable new features by changing the function level of your integration nodes. Before you change the function level, review the function that is new in the fix pack that you installed and in any previous fix packs to understand the behavior changes that might occur when you change the function level.

This slide summarizes the enhancements that are provided in IBM Integration Bus fix packs for 10.0.0.1 and 10.0.0.2.

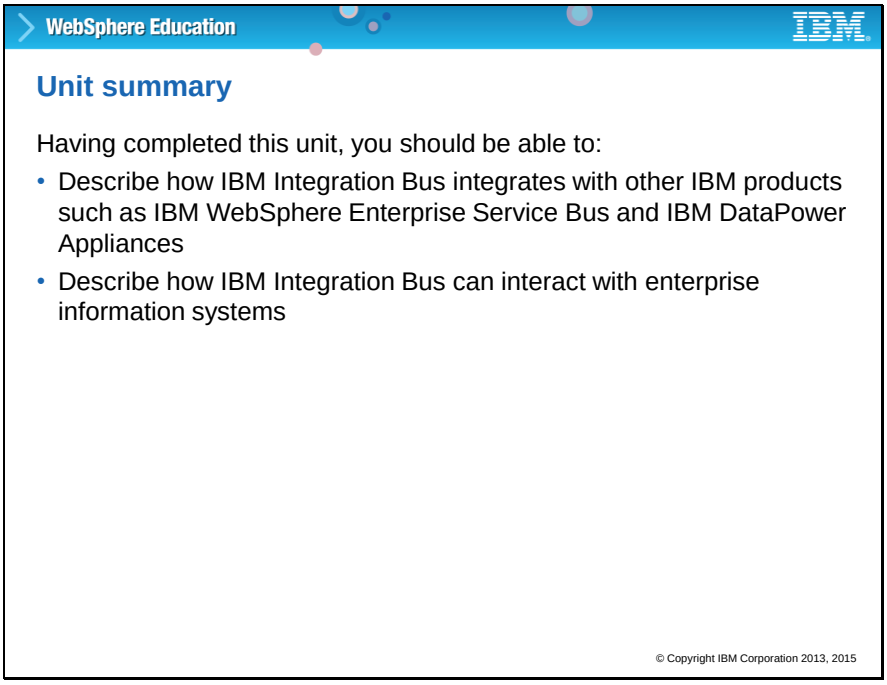
Slide 29



Integration Bus FixPack enchancements (2 of 2)

This slide summarizes the enhancements that are provided in IBM Integration Bus fix packs for 10.0.0.3.

Slide 30



Unit summary

In this unit, you learned how IBM Integration Bus functions can be extended with other IBM products, Industry Content Packs, and enterprise information systems.

Having completed this unit, you should be able to:

- Describe how IBM Integration Bus integrates with other IBM products such as IBM WebSphere Enterprise Service Bus and IBM DataPower Appliances
- Describe how IBM Integration Bus can interact with enterprise information systems