Enterprise Architect

User Guide Series

BPMN Models

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BPMN Models

If you need to model the activity of a business, capturing the behavior and the information flows within the organization or system, you can do so using the Business Process Modeling Notation (BPMN). BPMN is specifically targeted at the business modeling community and has a direct mapping to UML through BPMN Profiles integrated with the Enterprise Architect installer. Through use of these profiles, you can develop BPMN diagrams quickly and simply, and:

- Maintain existing diagrams created in BPMN 1.0 format, and create new diagrams in BPMN 1.0
- Create and maintain diagrams in the BPMN 1.1 and BPEL formats
- Create and maintain diagrams in the BPMN 2.0 and BPEL formats
- Migrate a BPMN 1.0 model (or part of a model) to BPMN 1.1, and a BPMN 1.1 model (or part of a model) to BPMN 2.0

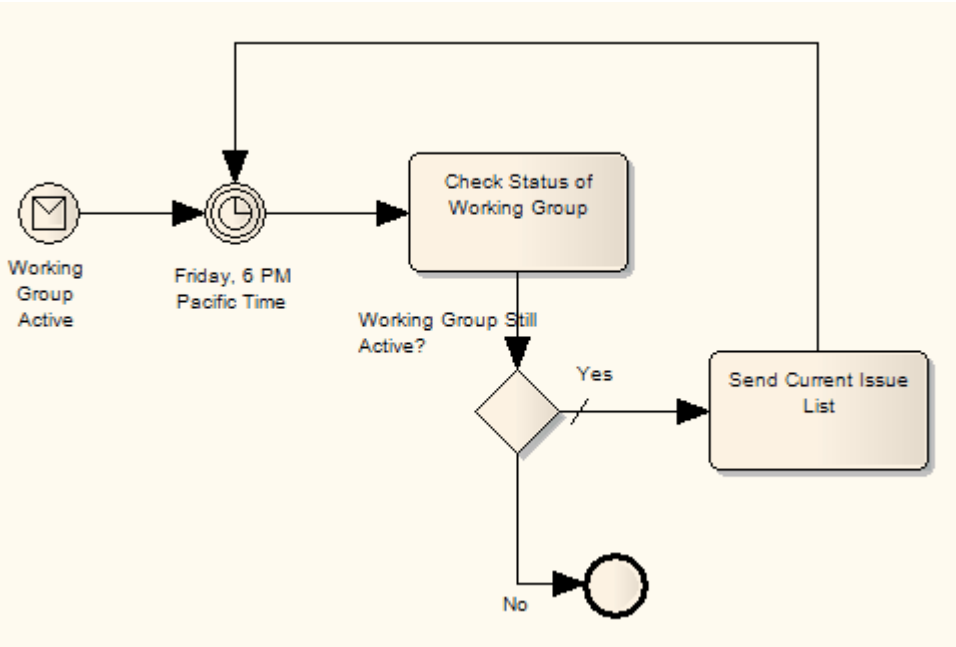
The Enterprise Architect installer for releases later than 8.0 provides you with separate versions of the MDG Technology for BPMN that support BPMN versions 1.0, 1.1 and 2.0, and BPEL.

Access

BPMN facilities are provided in the form of:

- A BPMN diagram type, accessed through the 'New Diagram' dialog
- BPMN pages in the Toolbox
- BPMN element and relationship entries in the 'Toolbox Shortcut' menu and Quick Linker.

Specifications of BPMN elements and relationships are defined by **Tagged Values**; for example, to define the Message, Timer and Default Path (/) symbols in this diagram:



BPMN Toolbox Pages

You can access the BPMN Toolbox pages through the 'Diagram | Toolbox : More tools...' option; select the 'BPMN 1.0', 'BPMN 1.1' or 'BPMN 2.0' option as appropriate.

You can also set BPMN as the active default technology to access the Toolbox pages directly.

Disable BPMN

If you prefer not to use BPMN in Enterprise Architect, you can disable it (and subsequently re-enable it) using the 'MDG Technologies' dialog ('Extensions | MDG Technologies').

Learning Center topics

- **Alt+F1** | Enterprise Architect | Modeling Languages | Business | BPMN | Introduction
- Alt+F1 | Enterprise Architect | Business Modeling | BPMN | Getting Started

Modeling with BPMN 2.0

Within Enterprise Architect, modeling with BPMN 2.0 is well supported, quick and simple. Use these notes to guide you as you create your business models.

Model Structure

A Business Process can be re-used by encapsulating the Pool (see *Notes* at the end of this topic). Once the Pool is encapsulated, a Business Process is created that is referenced by the Pool's **Tagged Value** processRef. At this point, elements that appeared in the Pool on the diagram will be nested in the referenced Business Process.

In Enterprise Architect, a BPMN Participant is represented by the Pool element. When you export your BPMN model to another tool, in order to comply with the BPMN 2.0 specification the Pool is interpreted as a Participant in the XML. On import to Enterprise Architect, a Participant is interpreted as a Pool.

You can also use a Call Activity to reference another Business Process. As an illustration:

1. Drop an Activity element onto a diagram.
2. Open the element's 'Properties' dialog.
3. On the 'BPMN2.0' tab, click on the drop-down arrow in the **Type field** and select 'callProcessActivity'.
4. In the Activity Tagged Value list, click on the button at the right of the calledActivityRef Tagged Value, and browse for the appropriate Business Process.
5. Click on the browser **OK button** and on the 'Properties' dialog OK button.

Now, whenever you move an element onto this Call Activity, it will be nested in the referencing Business Process.

BPMN 2.0 Diagram Orientation

On a BPMN 2.0 diagram, you can set the flow orientation to horizontal or vertical, or none (the default).

To set or clear the orientation, right-click on the diagram background and click on 'Set Diagram Flow Direction'. Then click on either:

- None (the default, no specific orientation set)
- Horizontal (diagram flows across the page, Pool and Lane elements occupy the full width of the diagram), or
- Vertical (diagram flows down the page, Pool and Lane elements occupy the full height of the diagram)

BPMN 2.0 Sequence Flow and Message Flow Rules

Rules concerning the use of Sequence Flows and Message Flows, as defined in the BPMN 2.0 Specification and described here, are implemented by the MDG Technology for BPMN 2.0.

These rules apply to Sequence Flows in relation to Events (Start, Intermediate and End), Activities (Task and Sub-Process, for Processes), Choreography Activities (Choreography Task and Sub-Choreography, for Choreographies) and Gateways:

- A Sequence Flow cannot cross a Pool boundary
- An End Event cannot be the source element for a Sequence Flow
- A Start Event cannot be the target element for a Sequence Flow
- An Intermediate Event, if edge mounted on an Activity element, cannot be the source element for a Sequence Flow; it cannot have incoming Sequence Flows
- An Intermediate Event - if edge mounted on an Activity element and having the **Tagged Value**

eventDefinition=Compensation, cannot be either the source or target element for a Sequence Flow

- Objects within a Sub-Process cannot have a Sequence Flow relationship with objects outside the Sub-Process
- A Sequence Flow cannot connect directly to a Pool

These rules apply to Message Flows in relation to Events (Start, Intermediate and End), Activities (Task and Sub-Process, for Processes), Choreography Activities (Choreography Task and Sub-Choreography, for Choreographies) and Pools:

- Message Flows can be created from objects in one Pool to objects in another Pool; Message Flows can connect directly to another Pool
- A Message Flow can connect to Events (Start, Intermediate and End) only if they have the Tagged Value eventDefinition=Message or eventDefinition=Multiple
- A Start Event cannot be the source element for a Message Flow
- An End Event cannot be the target element for a Message Flow

Notes

- If a Pool element has the partnerEntity and partnerRole **Tagged Values** assigned, and an empty 'Name' field, the element will display the Tagged Values
- If a Lane element has the partitionElementRef **Tagged Value** assigned, and an empty 'Name' field, the element will display the Tagged Value
- When you create Lanes in a Pool, the first Lane will fill half the Pool and subsequent Lanes will fill the remaining space
- In the **Project Browser**, you can right-click on the diagram, Pool or Collaboration model and select 'Encapsulate Process', which will move all the object's nested elements to a Business Process; elements placed inside the encapsulated element (during diagramming) will be moved to the Business Process
- Encapsulating the diagram and the Collaboration/Choreography model give the same result; the action:
  - Creates a 'main Pool' that the Collaboration Model will reference via the mainPool Tagged Value
  - Creates a Business Process that the 'main Pool' will reference via the processRef Tagged Value
  - Moves everything nested in or added to the Collaboration (minus pools and diagrams) to the new Business Process
- When you create a BPMN 2.0 diagram, the system prompts you to select whether or not to create an encapsulating element for the diagram; that is, a:
  - Business Process for a Business Process diagram
  - Choreography Model for a Choreography diagram
  - Collaboration Model for a Collaboration or BPEL diagram
  - Conversation Model for a Conversation diagram
- When a Pool is dropped onto a BPMN diagram that is directly under a Package (and only in this circumstance), the system prompts you to select whether or not to create a Collaboration Model for the Pool (rather than always creating the Collaboration Model)
- The two prompts above each have the checkbox 'Do not show this message again' that, if checked, blocks the prompt from displaying and retains the current setting as the automatic action; you can reset the checkbox to unselected using the **Reset BPMN Prompts button** on the 'Diagram | Behavior' page of the 'Options' dialog
- Encapsulating supports the re-use of processes, in that you can create links to Pools in other Collaboration models for diagramming, and elements moved into them will be placed in the same Business Process (since the Pool represents a Process)

BPMN 2.0 Toolbox Pages

You can create BPMN elements and relationships on diagrams in BPMN 2.0 and BPEL formats using the BPMN 2.0 pages of the **Diagram Toolbox**.

Access

Use any of the methods outlined below to display the **Diagram Toolbox**.

On the Diagram Toolbox, click on the More tools button and select 'BPMN 2.0'.

Ribbon	Design > Diagram > Toolbox
Menu	Diagram | Toolbox
Keyboard Shortcuts	**Alt** + 5
Other	Click the icon on the Diagram caption bar to display the **Diagram Toolbox**

Diagram Type Toolboxes

Enterprise Architect provides a set of pages for each of these BPMN 2.0 diagram types:

Diagram Type
Business Process - contains the constructs needed to build Business Process models.
Choreography - contains the constructs needed to build Choreography models.
Collaboration - contains the constructs required to build Collaboration models.
Conversation - contains the constructs needed to build Conversation models.
Types - contains the constructs common to all BPMN 2.0 diagrams.

BPMN 2.0 Business Process Toolbox Pages

To create BPMN elements and relationships on business process diagrams in either BPMN 2.0 or BPEL formats, you can use the 'BPMN 2.0 Business Process' pages of the **Diagram Toolbox**.

Access

Use any of the methods outlined below to display the **Diagram Toolbox**.

On the Diagram Toolbox, click on the More tools button then select 'BPMN 2.0 | BPMN 2.0 Business Process'.

Ribbon	Design > Diagram > Toolbox : More Tools > BPMN 2.0 > BPMN 2.0 Business Process
Menu	Diagram | Toolbox : More Tools | BPMN 2.0 | BPMN 2.0 Business Process
Keyboard Shortcuts	**Alt** + 5 : More Tools | BPMN 2.0 | BPMN 2.0 Business Process
Other	Click the icon on the Diagram caption bar to display the **Diagram Toolbox**, then More Tools | BPMN 2.0 | BPMN 2.0 Business Process

BPMN 2.0 Business Process Elements

Item	Use to
Business Process	Extend a composite Activity that defines a business process.
BPEL	Define the behavior of an executable or abstract business process.
Activity	Represent work that is performed within a Business Process. An Activity can be modeled as a: • Sub-Process - a compound Activity that is defined as a flow of other BPMN 2.0 elements or • Task - an atomic Activity that cannot be broken down into a smaller unit As a sub-process, the Activity can be made a composite element that links to a child diagram containing the flow of other BPMN elements. A BPMN Activity is initially created on a diagram with the name centered at the top. If you drag elements onto the Activity the name can be obscured, so the system automatically moves the name into the top-left corner out of the way. You can also control this movement manually, by right-clicking on the element and selecting the 'Is Expanded' option to toggle the setting.
Global Task	Define a task or activity performed in the top-level process, at a higher level of execution.
Data Object	Provide or store the information for an Activity.

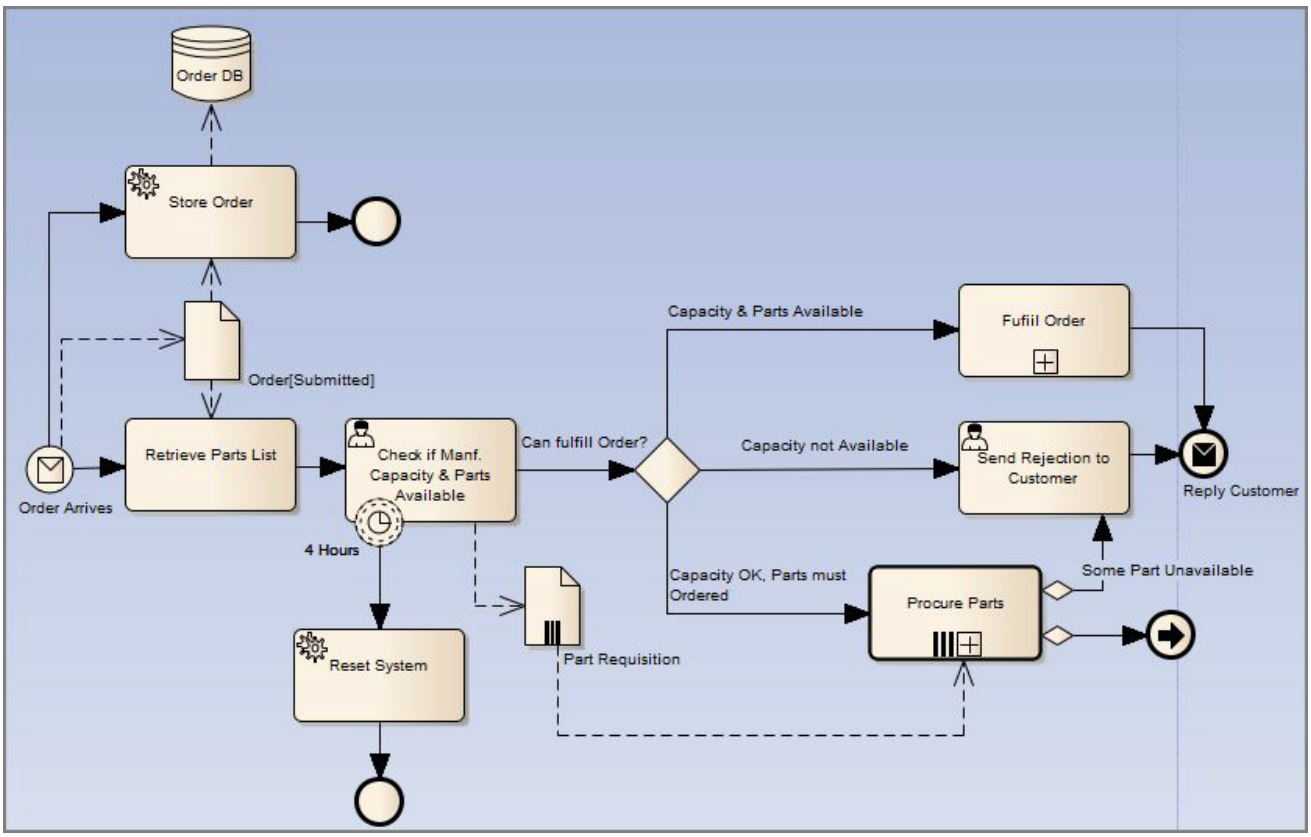
Data Store	Represent a mechanism for an Activity to retrieve or update stored information.
Start Event	Define the initiating event in a process. Elements of this type cannot be edge-mounted on other elements.
Intermediate Event	Define an intermediate event in a process. Elements of this type can only be edge-mounted on Activity elements.
End Event	Define the terminating event in a process. Elements of this type cannot be edge-mounted on other elements.
Gateway	Define a decision point in a business process. If a condition is true then processing continues one way; if false, then another.
Pool	Extend a Partition element to logically organize an Activity.
Lane	Extend a Partition element to subdivide a Pool.
Message	Represent the contents of a communication between two elements.
Group	Extend a Boundary element to group other elements.
Text Annotation	Create a comment.
BPMN 2.0 Business Process Connectors	Sequence Flow Use to: Extend a Control Flow relationship to define the flow of activity.
Association	Link the information and Artifacts with BPMN graphic elements.
Message Flow	Extend a Control Flow relationship to define the flow of communications in the process.
Data Association	Move data between Data Objects, Data Store, Properties and Activities, Processes.
Conversation Link	Connect a Conversation Node with a Pool, in either direction.

BPMN 2.0 Business Process Connectors

Item	Use to
Sequence Flow	Sequence Flow Use to: Extend a Control Flow relationship to define the flow of activity.
Association	Link the information and Artifacts with BPMN graphic elements.
Message Flow	Extend a Control Flow relationship to define the flow of communications in the process.

Data Association	Move data between Data Objects, Data Store, Properties and Activities, Processes.
Conversation Link	Connect a Conversation Node with a Pool, in either direction.

Example BPMN 2.0 Business Process Diagram



Notes

- The appearance and specification of many elements and connectors are defined by **Tagged Values**

Learning Center topics

- **Alt+F1** | Enterprise Architect | Modeling Languages | Business | BPMN | Business Process Toolbox
- Alt+F1 | Enterprise Architect | Business Modeling | BPMN | Process Modeling

BPMN 2.0 Choreography Toolbox Pages

To create BPMN elements and relationships on Choreography diagrams in either BPMN 2.0 or BPEL formats, you can use the BPMN 2.0 Choreography pages of the **Diagram Toolbox**.

Access

Use any of the methods outlined below to display the **Diagram Toolbox**.

On the Diagram Toolbox, click on the More tools button then select 'BPMN 2.0 | BPMN 2.0 Choreography'.

Ribbon	Design > Diagram > Toolbox : More tools | BPMN 2.0 | BPMN 2.0 Choreography
Menu	Diagram | Toolbox : More tools | BPMN 2.0 | BPMN 2.0 Choreography
Keyboard Shortcuts	**Alt** + 5 : More tools | BPMN 2.0 | BPMN 2.0 Choreography
Other	Click the icon on the Diagram caption bar to display the **Diagram Toolbox**, then More tools | BPMN 2.0 | BPMN 2.0 Choreography

BPMN 2.0 Chorography Elements

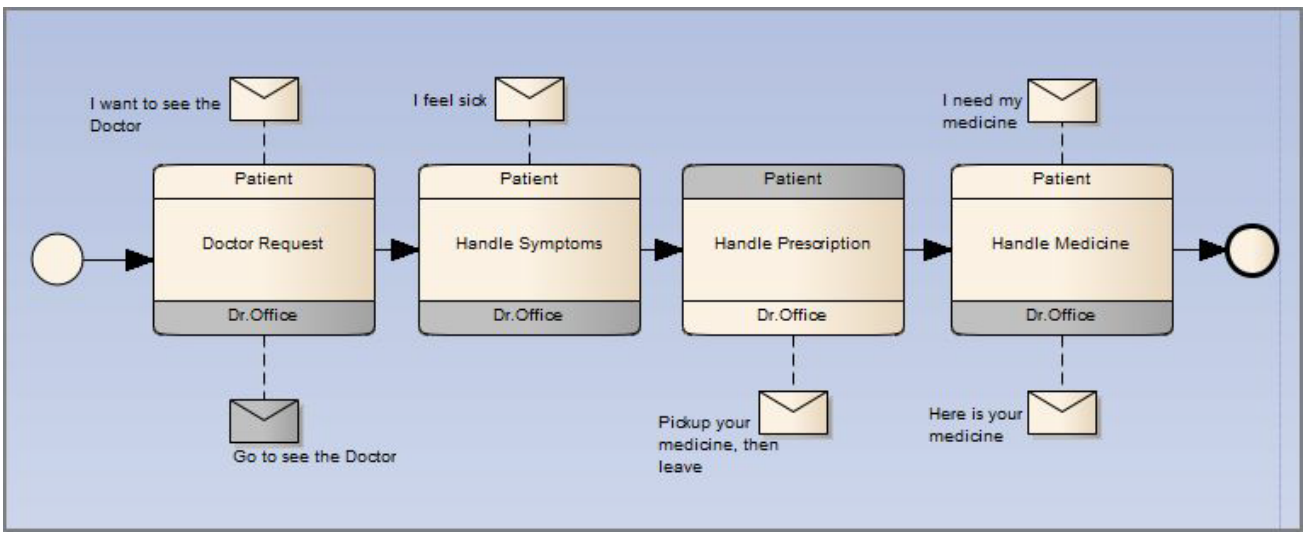
Item	Use to
Choreography Model	Extend a composite Activity that defines a Choreography process.
Choreography	Extend an Activity element to represent a process unit of information exchange between elements.
Start Event	Define the initiating event in a process. Elements of this type cannot be edge-mounted on other elements.
Intermediate Event	Define an intermediate event in a process. Elements of this type can only be edge-mounted on Activity elements.
End Event	Define the terminating event in a process. Elements of this type cannot be edge-mounted on other elements.
Gateway	Define a decision point in a business process. If a condition is true then processing continues one way; if false, then another.
Message	Represent the contents of a communication between two elements.
Pool	Extend a Partition element to logically organize an Activity.

Text Annotation	Create a comment.

BPMN 2.0 Chorography Connectors

Item	Use to
Sequence Flow	Define the order of activity in a Choreography.
Association	Link the information and Artifacts with BPMN graphic elements.
Message Flow	Extend a Control Flow relationship to define the flow of communications in the process.

Example BPMN 2.0 Choreography Diagram



Notes

- The appearance and specification of some elements and connectors are defined by **Tagged Values**

Learning Center topics

- **Alt+F1** | Enterprise Architect | Modeling Languages | Business | BPMN | Choreography
- Alt+F1 | Enterprise Architect | Business Modeling | BPMN | Choreography Modeling

BPMN 2.0 Collaboration Toolbox Page

To create BPMN elements and relationships on Collaboration diagrams in either BPMN 2.0 or BPEL formats, you can use the BPMN 2.0 Collaboration pages of the **Diagram Toolbox**.

Access

Use any of the methods outlined below to display the **Diagram Toolbox**.

On the Diagram Toolbox, click on the More tools button then select 'BPMN 2.0 | BPMN 2.0 Collaboration'.

Ribbon	Design > Diagram > Toolbox : More tools > BPMN 2.0 > BPMN 2.0 Collaboration
Menu	Diagram | Toolbox : More tools | BPMN 2.0 | BPMN 2.0 Collaboration
Keyboard Shortcuts	**Alt** + 5 : More tools | BPMN 2.0 | BPMN 2.0 Collaboration
Other	Click the icon on the Diagram caption bar to display the **Diagram Toolbox**, then More tools | BPMN 2.0 | BPMN 2.0 Collaboration

BPMN 2.0 Collaboration Elements

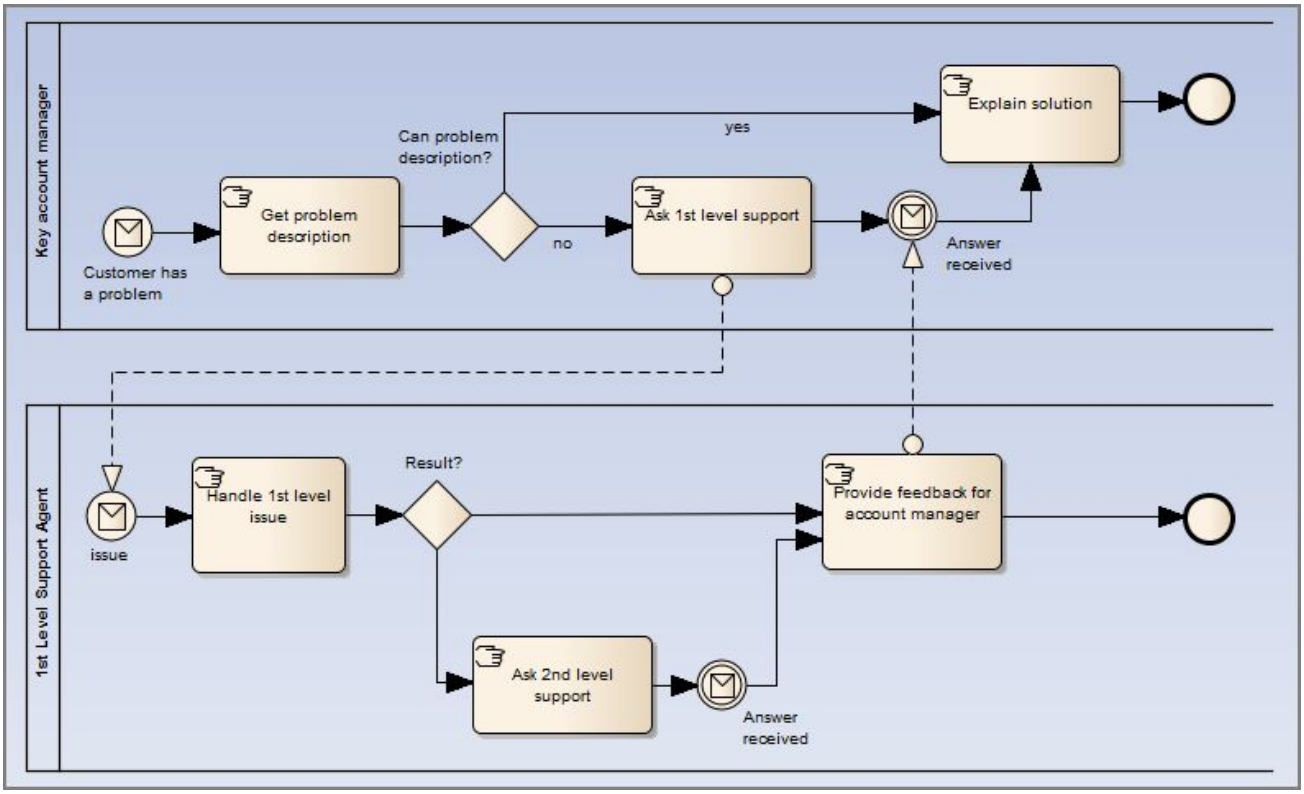
Item	Use to
Collaboration Model	Extend a composite Activity that defines a Collaboration process.
Pool	Extend a Partition element to logically organize an Activity.
Lane	Extend a Partition element to subdivide a Pool.
Conversation	Extend a Class element to group a set of Message Flows based on a certain concept.
Start Event	Define the initiating event in a process. Elements of this type cannot be edge-mounted on other elements.
Intermediate Event	Define an intermediate event in a process. Elements of this type can only be edge-mounted on Activity elements.
End Event	Define the terminating event in a process. Elements of this type cannot be edge-mounted on other elements.
Gateway	Define a decision point in a business process. If a condition is true then processing continues one way; if false, then another.
Activity	Represents work that is performed within a Business Process. An Activity can be

	modeled as a: • Sub-Process - a compound Activity that is defined as a flow of other BPMN 2.0 elements or • Task - an atomic Activity that cannot be broken down into a smaller unit As a sub-process, the Activity can be made a composite element that links to a child diagram containing the flow of other BPMN elements.
Data Object	Provide or store the information for an Activity.
Data Store	Represent a mechanism for an Activity to retrieve or update stored information.
Choreography	Extend an Activity element to represent a process unit of information exchange between elements.
Group	Extend a Boundary element to group other elements.
Text Annotation	Create a comment.

BPMN 2.0 Collaboration Connectors

Item	Use to
Message Flow	Extend a Control Flow relationship to define the flow of communications in the process.
Conversation Link	Connect a Conversation Node to or from an element.
Sequence Flow	Extend a Control Flow relationship to define the flow of activity.
Association	Link the information and artifacts with BPMN graphic elements.

Example BPMN 2.0 Collaboration Diagram



Notes

- The appearance and specification of some elements and connectors are defined by **Tagged Values**

Learning Center topics

- **Alt+F1** | Enterprise Architect | Modeling Languages | Business | BPMN | Collaboration
- Alt+F1 | Enterprise Architect | Business Modeling | BPMN | Collaboration Modeling

BPMN 2.0 Conversation Toolbox Pages

To create BPMN elements and relationships on Conversation diagrams in either BPMN 2.0 or BPEL formats, you can use the BPMN 2.0 Conversation pages of the **Diagram Toolbox**.

Access

Use any of the methods outlined below to display the **Diagram Toolbox**.

On the Diagram Toolbox, click on the More tools button then select 'BPMN 2.0 | BPMN 2.0 Business Process'.

Ribbon	Design > Diagram > Toolbox : More tools > BPMN 2.0 > BPMN 2.0 Conversation
Menu	Diagram | Toolbox : More tools | BPMN 2.0 | BPMN 2.0 Conversation
Keyboard Shortcuts	**Alt** + 5 : More tools | BPMN 2.0 | BPMN 2.0 Conversation
Other	Click the icon on the Diagram caption bar to display the **Diagram Toolbox**, then More tools | BPMN 2.0 | BPMN 2.0 Conversation

BPMN 2.0 Conversation Elements

Item	Use to
Conversation Model	Extend a composite Activity that defines the logical relationship of Message exchanges between two or more business entities.
Conversation	Extend a Class element to group a set of Message Flows together based on a certain concept.
Pool	Extend a Partition element to logically organize an Activity.
Activity	Represents work that is performed within a Business Process. An Activity can be modeled as a: • Sub-Process - a compound Activity that is defined as a flow of other BPMN 2.0 elements or • Task - an atomic Activity that cannot be broken down into a smaller unit As a sub-process, the Activity can be made a composite element that links to a child diagram containing the flow of other BPMN elements.
Start Event	Define the initiating event in a process. Elements of this type cannot be edge-mounted on other elements.
Intermediate Event	Define an intermediate event in a process. Elements of this type can only be edge-mounted on Activity elements.

End Event	Define the terminating event in a process. Elements of this type cannot be edge-mounted on other elements.
Gateway	Define a decision point in a business process. If a condition is true then processing continues one way; if false, then another.
Text Annotation	Create a comment.

BPMN 2.0 Conversation Connectors

Item	Use to
Conversation Link	Connect a Conversation Node to a Pool element, in either direction. Either the source or target element for a Conversation Link must be a Conversation Node element.
Message Flow	Extend a Control Flow relationship to define the flow of communications in the process.
Sequence Flow	Extend a Control Flow relationship to define the flow of activity.
Association	Link the information and artifacts with BPMN graphic elements.

Notes

- The appearance and specification of some elements and connectors are defined by **Tagged Values**

Learning Center topics

- **Alt+F1** | Enterprise Architect | Modeling Languages | Business | BPMN | Conversation
- Alt+F1 | Enterprise Architect | Business Modeling | BPMN | Conversation Modeling

BPMN 2.0 Type Toolbox Page

When you are working on a BPMN 2.0 diagram, you can also create a range of elements and connectors that are common to all of the BPMN 2.0 diagram types, by dragging them from the BPMN 2.0 Types page of the **Diagram Toolbox**. The 'BPMN 2.0 Types' toolbox page is common to all of the BPMN 2.0 toolboxes.

Access

Use any of the methods outlined below to display the **Diagram Toolbox**.

On the Diagram Toolbox, click on the More tools button then select 'BPMN 2.0 | BPMN 2.0 <any diagram type>'.

Ribbon	Design > Diagram > Toolbox : More Tools > BPMN 2.0 > BPMN 2.0 <any diagram type>
Menu	Diagram | Toolbox : More Tools | BPMN 2.0 | BPMN 2.0 <any diagram type>
Keyboard Shortcuts	**Alt** + 5 : More Tools | BPMN 2.0 | BPMN 2.0 <any diagram type>
Other	Click the icon on the Diagram caption bar to display the **Diagram Toolbox**, then More Tools | BPMN 2.0 | BPMN 2.0 <any diagram type>

BPMN 2.0 Types

These items define the non-graphic elements or properties (**Tagged Values**) of the Core BPMN 2.0 graphic elements.

- Assignment
- CorrelationKey
- CorrelationProperty
- CorrelationPropertyBinding
- CorrelationPropertyRetrievalExpression
- CorrelationSubscription
- Category
- CategoryValue
- ComplexBehaviorDefinition
- ItemDefinition
- Error
- Escalation
- Signal
- IOSpecification
- InputSet
- OutputSet
- InputOutputBinding
- Interface

- Endpoint
- Operation
- Participant (use Pool element)
- Resource
- ResourceRole
- ResourceParameter
- Property
- ConversationAssociation
- PartnerEntity
- PartnerRole

BPMN 2.0 XML

It is possible to serialize BPMN 2.0 Models in BPMN 2.0 XML. The serialized XML file contains both the model semantics as well as the diagram-interchange information. You can also import a BPMN 2.0 XML file into your project.

Access

For Serialization:

Select a package in the **Project Browser**, then use one of the methods outlined below, to open the '**Publish Model** Package' dialog.

Ribbon	Publish > Model Exchange > Export XMI > Export XMI > Publish
Menu	Package | Import/Export | Export Package to XMI | Publish
Context Menu	Right-click on Package | Import/Export | Export Package to XMI file | Publish
Keyboard Shortcuts	**Ctrl** + **Alt** + E | Publish

Serialize a Model

Step	Action
1	Open the '**Publish Model** Package' dialog.
2	In the 'XML Type' field, select 'BPMN 2.0 XML'.
3	Click on the **Export button** to initiate the BPMN 2.0 XML serialization.

Access

For Import:

Select a package in the **Project Browser**, into which to import the XML file. Then use one of the methods outlined below, to open the 'Import Package from BPMN 2.0' dialog.

Ribbon	Publish > Model Exchange > Import XMI > Import Model XMI : Other XML Formats > BPMN 2.0
Menu	Extensions | Import | BPMN 2.0
Context Menu	Right-click on Package | Import/Export | Import package from XMI file : Other XML Formats > BPMN 2.0
Keyboard Shortcuts	**Ctrl** + **Alt** + I : Other XML Formats > BPMN 2.0

Import BPMN 2.0 XML

Step	Action
1	In the 'Import Package from BPMN 2.0' dialog, specify the file path name, or click on the file browser icon and choose a file.
2	Click on the **Import button** to import the file into the Package.

Notes

- The Package being serialized is assumed to be self-contained
- Only the contents of the selected Package are considered for serialization - child Packages (and their contents) are ignored
- Serialization of these items in the BPMN 2.0 Types section of the Toolbox is not supported:
  - InputOutputBinding
  - Conversation Association
- Exporting to and importing from BPMN 2.0 XML is supported in the Enterprise Architect Professional edition and above

BPMN 1.0 and 1.1 Toolbox Pages

You can create graphical (Core) and non-graphical (Types) BPMN elements and relationships on business process diagrams in BPMN 1.0, BPMN 1.1 and BPEL formats, using the BPMN 1.0 and BPMN 1.1 pages of the **Diagram Toolbox**.

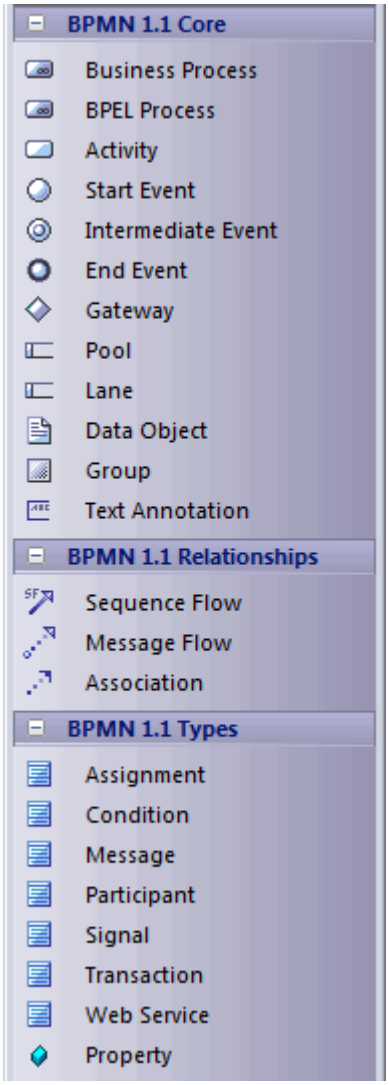
Access

Use any of the methods outlined below to display the **Diagram Toolbox**.

On the Diagram Toolbox, click on the More tools button and select either 'BPMN 1.0' or 'BPMN 1.1'.

Ribbon	Design > Diagram > Toolbox : More Tools > BPMN 1.1
Menu	Diagram | Toolbox : More Tools > BPMN 1.1
Keyboard Shortcuts	**Alt** + 5 : More Tools > BPMN 1.1
Other	Click the icon on the Diagram caption bar to display the **Diagram Toolbox**, then More Tools > BPMN 1.1

Toolbox



BPMN 1.1 Core Toolbox Page

Item	Action
Business Process	Extend a composite Activity that defines a business process.
BPEL Process	Define the behavior of an executable or abstract business process.
Activity	Represents work that is performed within a Business Process. An Activity can be modeled as a: • Sub-Process - a compound Activity that is defined as a flow of other BPMN 1.1 elements or • Task - an atomic Activity that cannot be broken down into a smaller unit As a sub-process, the Activity can be made a composite element that links to a child diagram containing the flow of other BPMN elements.
Start Event	Define the initiating event in a process.

Intermediate Event	Define an intermediate event in a process.
End Event	Define the terminating event in a process.
Gateway	Define a decision point in a business process. If a condition is true, then processing continues one way; if not, then another.
Pool	Extend a Partition element to logically organize an Activity.
Lane	Extend a Partition element to subdivide a Pool.
Data Object	Extend an Artifact element to define a physical piece of information used or produced by a system.
Group	Extend a Boundary element to group other elements.
Text Annotation	Create a comment.

BPMN 1.1 Relationship Toolbox Page

Item	Action
Sequence Flow	Extend a Control Flow relationship to define the flow of activity.
Message Flow	Extend a Control Flow relationship to define the flow of communications in the process.
Association	Associate information and artifacts with flow objects.

BPMN 1.1 Types Toolbox Page

Item	Action
Assignment	Define the properties (**Tagged Values**) of the Core BPMN 1.1 elements such as Activities, Events and Gates.
Condition	Define the properties (**Tagged Values**) of the Core BPMN 1.1 elements such as Activities, Events and Gates.
Message	Define the properties (**Tagged Values**) of the Core BPMN 1.1 elements such as Activities, Events and Gates.
Participant	Define the properties (**Tagged Values**) of the Core BPMN 1.1 elements such as Activities, Events and Gates.

Signal	Define the properties (**Tagged Values**) of the Core BPMN 1.1 elements such as Activities, Events and Gates.
Rule	Define the properties (**Tagged Values**) of the Core BPMN 1.1 elements such as Activities, Events and Gates.
Transaction	Define the properties (**Tagged Values**) of the Core BPMN 1.1 elements such as Activities, Events and Gates.
Web Service	Define the properties (**Tagged Values**) of the Core BPMN 1.1 elements such as Activities, Events and Gates.
Property	Define the properties (**Tagged Values**) of the Core BPMN 1.1 elements such as Activities, Events and Gates.

Migrate BPMN 1.0 Model to BPMN 1.1

It is possible to migrate a BPMN 1.0 model (or part of a model) to BPMN 1.1 or BPMN1.1::BPEL, using the **Automation Interface**. There are two functions you can use:

- MigrateToBPMN11()
  - proj.MigrateToBPMN11 sGUID, "BPMN"
  - proj.MigrateToBPMN11 sGUID, "BPEL"
- Migrate()
  - proj.Migrate sGUID, "BPMN", "BPMN1.1"
  - proj.Migrate sGUID, "BPMN", "BPMN1.1::BPEL"

These functions update the **Tagged Values** and, if required, stereotypes to BPMN 1.1 for all elements, attributes, connectors and diagrams under the selected Package or element.

Example

This VB script calls the MigrateToBPMN11() function to migrate the **Tagged Values** to *BPMN 1.1:*

```
Sub MigrateElement (sGUID, lngPackageID)
    Dim proj as EA.Project
    set proj = Repository.GetProjectInterface
    proj.MigrateToBPMN11 sGUID, "BPMN"

    'refresh the model
    If lngPackageID<>0 Then
        Repository.RefreshModelView (lngPackageID)
    End If
End Sub

Sub MigrateSelectedItem
    Dim selType
    Dim selElement as EA.Element
    Dim selPackage as EA.Package

    selType = GetTreeSelectedItemType

    If selType = 4 Then 'means Element
        set selElement = GetTreeSelectedObject
        MigrateElement selElement.ElementGUID, selElement.PackageID
        MsgBox "Complete",0,"BPMN 1.1 Migration"
    ElseIf selType = 5 Then 'means Package
        set selPackage = GetTreeSelectedObject
        MigrateElement selPackage.PackageGUID, selPackage.PackageID
        MsgBox "Complete",0,"BPMN 1.1 Migration"
```

```
    Else
        MsgBox "Select a Package or Element in the Project Browser to initiate migration",0,"BPMN 1.1 Migration"
    End If
End Sub

Sub Main
    MigrateSelectedItem
End Sub

Main
```

Notes

- In BPMN 1.0, various tags have free-text direct-entry value fields, and you can provide additional information on these tags in the '**Tagged Value** Note' dialog, for display at the bottom of the **Tagged Values** window

  In BPMN 1.1, some of these tags (such as the Categories tag on a BusinessProcess stereotyped element) have been changed to Memo type, and you use the 'Tagged Value Note' dialog to enter the value; therefore, you cannot have additional notes for these tags, all information must be within the tag's value
- For such tags, when migrating from BPMN 1.0 to BPMN 1.1, the BPMN 1.0 tag value is moved into the BPMN 1.1 tag 'Notes' field and the BPMN 1.0 tag notes are discarded; if you want to preserve the tag notes text, take a copy of the BPMN 1.0 model before migration to enable you to copy the tag notes text into the tag value after migration

Migrate BPMN 1.1 Model to BPMN 2.0

It is possible to migrate a BPMN 1.1 model (or part of a model) to BPMN 2.0, using the **Automation Interface** function Migrate(). This function updates the **Tagged Values** and, if required, stereotypes to BPMN 2.0 for all elements, attributes, connectors and diagrams under the selected Package or element.

Example

This VB script calls the Migrate() function to migrate the Package or element to BPMN 2.0:

```
Sub MigrateElement (sGUID, lngPackageID)
    Dim proj as EA.Project
    set proj = Repository.GetProjectInterface
    proj.Migrate sGUID, "BPMN1.1", "BPMN2.0"
    'refresh the model
    If lngPackageID<>0 Then
        Repository.RefreshModelView (lngPackageID)
    End If
End Sub
Sub MigrateSelectedItem
    Dim selType
    Dim selElement as EA.Element
    Dim selPackage as EA.Package
    selType = GetTreeSelectedItemType
    If selType = 4 Then 'means Element
        set selElement = GetTreeSelectedObject
        MigrateElement selElement.ElementGUID, selElement.PackageID
        MsgBox "Element Migration Completed",0,"BPMN 2.0 Migration"
    ElseIf selType = 5 Then 'means Package
        set selPackage = GetTreeSelectedObject
        MigrateElement selPackage.PackageGUID, selPackage.PackageID
        MsgBox "Package Migration Completed",0,"BPMN 2.0 Migration"
    Else
        MsgBox "Select a Package or Element in the Project Browser to initiate migration",0,"BPMN 2.0 Migration"
    End If
End Sub
Sub Main
    MigrateSelectedItem
End Sub
Main
```

Notes

- Please backup your project before you run the BPMN 2.0 Migrator
- Normalization occurs on these tags:
  - BPMN1.1::Activity::InMessageRef
  - BPMN1.1::Activity::OutMessageRef
  - BPMN1.1::Activity::IORules
  - BPMN1.1::Activity::InputSets
  - BPMN1.1::Activity::OutputSets
  - BPMN1.1::Activity::ComplexMI_FlowCondition
  - BPMN1.1::Activity::Performers
  - BPMN1.1::BusinessProcess::InputSets
  - BPMN1.1::BusinessProcess::OutputSets
  - BPMN1.1::BusinessProcess::Performers
  - BPMN1.1::EndEvent::ErrorCode
  - BPMN1.1::IntermediateEvent::ErrorCode

  Taking BPMN1.1::Activity::InMessageRef as an example, these steps take place:

  (1) Create a new element BPMN2.0::Operation (this is the bridging element)
  (2) Insert the reference tag 'BPMN2.0::Activity::operationRef'
  (3) Migrate BPMN1.1::Activity::InMessageRef to BPMN2.0::Operation::InMessageRef
- Denormalization occurs on these tags:
  - A BPMN1.1::Transaction referenced by a BPMN1.1::Activity::TransactionRef
    > BPMN1.1::Transaction::TransactionMethod
    > BPMN1.1::Transaction::TransactionProtocol
  - A BPMN1.1::WebService referenced by a BPMN1.1::Activity::WebServiceRef, BPMN1.1::StartEvent::WebServiceRef, BPMN1.1::IntermediateEvent::WebServiceRef, BPMN1.1::EndEvent::WebServiceRef
    > BPMN1.1::WebService::Operation
    > BPMN1.1::WebService::Interface
    > BPMN1.1::WebService::ParticipantRef
  - A BPMN1.1::Condition referenced by a BPMN1.1::StartEvent::ConditionRef, BPMN1.1::IntermediateEvent::ConditionRef
    > BPMN1.1::Condition::ConditionExpression

  Taking BPMN1.1::Activity::TransactionRef as an example, these steps take place:

  (1) Find element BPMN1.1::Transaction by BPMN1.1::Activity::TransactionRef
  (2) Migrate this referenced BPMN1.1::Transaction::TransactionMethod's value to BPMN2.0::Activity::transactionMethod
  (3) Migrate this referenced BPMN1.1::Transaction::TransactionProtocol's value to BPMN2.0::Activity::transactionProtocol
- If a BPMN1.1 stereo tag is discarded in BPMN2.0, it is preserved if the tag has a value

Change BPMN Element Appearance

A number of **Tagged Values** directly affect the appearance of the BPMN element or connector they apply to. Therefore, you can change the appearance of the object by changing the value of the tags.

You can also set the 'reference' **Tagged Value** for a BPMN element that refers to another BPMN element, simply by dragging the referred-to element from the **Project Browser** onto the referring element in a diagram. See the *Set Reference Tagged Value* table in this topic.

Access

Select a BPMN 1.1 element, then display the 'Properties' dialog, using any of the methods outlined in the table.

Ribbon	Design > Element > Manage > Properties
Menu	Element | Properties
Context Menu	Right-click on Element | Properties
Keyboard Shortcuts	**Alt** + Enter
Other	Double-click on a BPMN element

Define the appearance of BPMN elements and connectors

Step	Action
1	The system opens the element 'Properties' dialog at the 'General' tab and displays the child tab 'BPMN1.1'. The 'BPMN1.1' tab lists the BPMN specific **Tagged Values** for the stereotype. Where the element is a BPMN subtype, the 'Type' field shows the parent type. Click on the drop-down arrow to show the subtypes and, if necessary, select a different subtype. The list updates to show the Tagged Values for the new subtype.
2	For each 'appearance' **Tagged Value**, the default value is shown (where relevant). If you want to add or change values, click on the 'Value' field and either: • Type in the appropriate value (for a <memo> type, click on the ... button and type the text in the 'Tagged Value Note' dialog) • Click on the ... button and locate the defining object, or • Click on the drop-down arrow and select the appropriate value Suggested values are described in the *Values for Tags* table.

Tags for Activity Elements

Tag	Value Description
activityType	Set to: • **Task** for no decoration • **Sub-Process** to display the plus-in-box decoration on the bottom edge of the shape
adHoc	Set to true to display the tilde decoration on the bottom edge of the shape, indicating that this is an ad-hoc Activity.
isACallActivity	Set to true to show the boundary of the Activity element as a thick line, indicating that this is a Call Activity.
isATransaction	Set to true to give the Activity element a double-lined border, indicating that this is a Transaction.
isForCompensation	Set to true to display the rewind icon on the bottom edge of the shape, indicating that this is a Compensation Activity.
isSequential	Set to true to display three horizontal bars on the bottom edge of the shape. The loopCharacteristics tag must first be set to MultiInstance.
loopCharacteristics	Set to: • Standard to display three vertical bars at the bottom edge of the shape • MultiInstance to display a loop icon at the bottom edge of the shape
taskType	When set to different value, the associated decoration is displayed at the top-left corner of the shape.
triggeredByEvent	Set to true to show the boundary of the Activity element as a dotted line.

Tags for Choregraphy

Tag	Value Description
choreographyType	Set to: • **Task** for no decoration • **Sub-Process** to display the *plus-in-box* decoration on the bottom edge of the shape.
isACallChoreography	Set to true show the boundary of the Choreography element as a thick line.
loopType	Set to: • Standard to display three vertical bars at the bottom edge of the shape • MultiInstance to display a loop icon at the bottom edge of the shape Each element has its own MultiInstance setting.

Tags for Conversation

Tag	Value Description
isACallConversation	Set to true to show the boundary of the Conversation element as a thick line.
isComposite	Set to true to display a plus-in-box decoration on the bottom edge of the shape, indicating that the Conversation is a composite element.

Tags for Data Object

Tag	Value Description
dataInOut	Set to: • **Input** to add a light-colored arrow at the top-left corner of the Data Object, indicating that it represents a Data Input element • **Output** to add a dark-colored arrow at the top-left corner of the Data Object, indicating that it represents a Data Output element
isCollection	Set to true to add three vertical lines at the bottom edge of the shape, indicating that the object is a collection.

Tags for Event

Tag	Value Description
cancelActivity	For Intermediate Event only. Set to **false** to show the Intermediate Event border as a dashed line.
catchOrThrow	For Intermediate Event only. Set to: • Catch or • Throw
eventDefinition	Use to change the decoration of a Start Event, Intermediate Event or End Event.
isInterrupting	For Start Event only. Set to false to show the border of the Start Event as a dashed line, indicating that the Start Event is not an interrupting event.

Tags for Gateway

Tag	Value Description
eventGatewayType	Use to define two types of Event-based Gateway: • Exclusive and • Parallel
gatewayType	Set to: • Exclusive to render the Gateway as a diamond shape without any marker in the middle; if you also set the markerVisible tag to **True**, the Gateway is rendered as a diamond shape with an X inside • Complex to render the Gateway as a diamond shape with an asterisk (*) inside • Inclusive to render the Gateway as a diamond shape with a circle (o) inside • Parallel to render the Gateway as a diamond shape with a plus (+) inside • Event to define the Gateway as Event-based
instantiate	Use only to define the Exclusive and Parallel Event-based Gateway.

Tags for Message

Tag	Value Description
IsInitiate	Set to true to make the envelope color gray, indicating that this is an initiating Message.

Tags for Message Flow

Tag	Value Description
messageVisible	Set to: • **Unspecified** to make the Message Flow connector without decoration • **Initiating** to add a white envelope to the Message Flow connector • **Non-Initiating** to add a gray envelope to the Message Flow connector

Tags for Pool

Tag	Value Description

blackBoxPool	Set to **true** to render the Pool element as a rectangle, which is used in a Main Pool diagram.

Tags for Sequence Flow

Tag	Value Description
conditionType	Set to: • **Expression** to show an unfilled diamond marker at the source end of the connector • **Default** to show a slash marker at the source end of the connector

Set Reference Tagged Value

A number of types of BPMN element make reference to elements of other types, for context. For example, BPMN Activities can refer to ResourceRole elements, which in turn can refer to Resource elements. Each of the referring elements has a specific tag that identifies the referenced element. You can quickly add or update the value of the tag, in this way:

Step	Action
1	Both referenced and referring elements must already exist in the model and at least the referring element must exist in a diagram.
2	Display the **Tagged Values** window (**Ctrl+Shift+6**).
3	Drag the referenced element from the **Project Browser** onto the referring element in a diagram. A short menu displays, the options on which depend on the combination of referring and referenced element types.
4	Select the appropriate option to set, overwrite or append the referenced element name to the **Tagged Value** in the referring element (if the referring element's multiplicity is greater than 1, it can reference more than one element). The referenced element is NOT overlaid on the referring element in the diagram.
5	Expand the section of the **Tagged Values** window listing Tagged Values for the generic element type and note the referenced element name(s) in the appropriate 'Value' field.

Notes

- Some BPMN elements changed in appearance between BPMN version 1.0 and BPMN version 1.1
- In Enterprise Architect releases later than 7.1, if you work on a BPMN 1.0 model created in an earlier release, existing elements default to their version 1.0 appearance; new elements assume the BPMN version 1.1 appearance and automatically have a **Tagged Value** BPMNVersion set to 1.1
- If you want a new element to revert to the BPMN version 1.0 appearance, set the BPMNVersion Tagged Value to 1.0

- Conversely, if you want an older element to assume the BPMN version 1.1 appearance, assign the BPMNVersion Tagged Value to it, with the value 1.1

BPEL Models

This text is derived from the BPEL entry in the online Wikipedia:

'Business Process Execution Language (BPEL), short for Web Services Business Process Execution Language (WS-BPEL), is an executable language for specifying interactions with Web Services. Processes in Business Process Execution Language export and import information by using Web Service interfaces exclusively.'

Web service interactions can be described in two ways:

1. Executable business processes, which model the actual behavior of a participant in a business interaction.
2. Abstract business processes, which are partially specified processes that are not intended to be executed. An Abstract Process may hide some of the required concrete operational details.

BPEL is an Orchestration language, serialized in XML, which specifies an executable process that involves message exchanges with other systems. This messaging facility depends on the use of the Web Services Description Language (WSDL) 1.1 to describe outgoing and incoming messages.

BPEL in Enterprise Architect:

Enterprise Architect supports generating BPEL from executable processes in the Business and Software Engineering and the Ultimate editions. Although there is no standard graphical notation for WS-BPEL, Enterprise Architect uses BPMN profile as a graphical front-end to capture BPEL Process descriptions. With the help of the BPMN Profile, Enterprise Architect enables you to develop BPEL diagrams quickly and simply. While BPMN provides a graphical notation for visualizing business process, BPEL provides a way for visualizing this graphical business process in XML.

Enterprise Architect supports generating:

- BPEL 1.1 Model from models created using constructs in BPMN 1.1 Profile
- BPEL 2.0 Model from models created using constructs in BPMN 2.0 Profile

Notes

- BPEL is supported in the Business and Software Engineering and the Ultimate editions of Enterprise Architect
- Enable BPMN 1.1 Technology for BPEL 1.1 modeling, and BPMN 2.0 Technology for BPEL 2.0 modeling, in the 'MDG Technologies' dialog ('Extensions | MDG Technologies')

Learning Center topics

- **Alt+F1** | Enterprise Architect | Modeling Languages | Business | BPMN | BPEL
- Alt+F1 | Enterprise Architect | Business Modeling | BPEL | Getting Started

BPEL 1.1 Model

Enterprise Architect uses BPMN 1.1 as a graphical front-end to capture BPEL 1.1 Process description (as BPEL 1.1 does not have a standard graphical notation). Enterprise Architect uses the partial mapping specified in the OMG BPMN 1.1 Specification to map BPMN 1.1 constructs to BPEL 1.1.

Create a BPEL 1.1 Model

Step	Action
1	Create a BPEL 1.1 Package Structure. Alternatively: • Create a Package in the **Project Browser** • Click on the 'New Diagram' icon in the Project Browser • Select 'BPMN 1.1' in the 'Select From' field and 'BPEL' in the 'Diagram Types' field • Click on the 'BPEL Process' icon from the BPMN 1.1 Core toolbox and drag it into the created BPEL diagram
2	Open the BPEL diagram under the BPELProcess stereotyped element.
3	Model the BPEL Process using the constructs in the BPMN 1.1 Core page of the Diagram Toolbox; use these constructs in each Toolbox page to model BPEL 1.1: BPMN 1.1 - Core page: • BPEL Process • Activity • Start Event • Intermediate Event • End Event • Gateway • Pool BPMN 1.1 - Relationships page: • Sequence Flow • Message Flow • Association BPMN 1.1 Types page: • Assignment • Condition • Message • Participant • Web Service
4	Create Web Service for the BPEL Process and other related Pools, if required.
5	Generate BPEL 1.1 code from the BPEL Process.

Notes

- Generating BPEL 1.1 from a BPMN 1.1 model is supported in the Business and Software Engineering and the Ultimate editions of Enterprise Architect
- Ensure that BPMN 1.1 Technology is enabled in the 'MDG Technologies' dialog ('Extensions | MDG Technologies')

BPEL 1.1 Example

- The Enterprise Architect Example file (EAExample.EAP) has a sample BPMN 1.1 model from which BPEL 1.1 can be generated
- If you have installed Enterprise Architect at the default location, open this file: C:\Program Files\Sparx Systems\EA\EAExample.EAP
- The BPMN 1.1 model Package is in: Project Models | Analysis and Business Modeling | BPEL Example | BPEL 1.1 Model

Modeling Restrictions

- Every BPEL Process and Sub-Process should start with a Start Event and end with an End Event
- A Start Event or an End Event should not be attached to the boundary of a Sub-Process
- Sequence Flow Looping is not supported - only Activity looping is supported; all Sequence Flows should flow downstream and not upstream
- Mapping of an Intermediate Event with multiple triggers to BPEL 1.1 is not supported
- Mapping of Multi-Instance Parallel While loops to BPEL 1.1 is not supported
- Mapping of Independent Sub-Process to BPEL 1.1 is not supported
- Pools are treated as black box (i.e. they do not expose any details) and hence they cannot contain any child elements or have any incoming/outgoing Sequence Flow connectors

Create BPEL 1.1 Model Structure

A BPEL 1.1 model consists of a BPEL Process (containing a BPEL diagram and mappable BPMN 1.1 constructs) and other supporting elements (like BPMN 1.1 Assignment, BPMN 1.1 Web Service) required for generating BPEL 1.1 code. A sample BPEL 1.1 Package structure can be created in the **Project Browser**, using the 'Select Model(s) (**Model Wizard**)' dialog. You can use this Package structure as a template for developing your BPEL Process.

Access

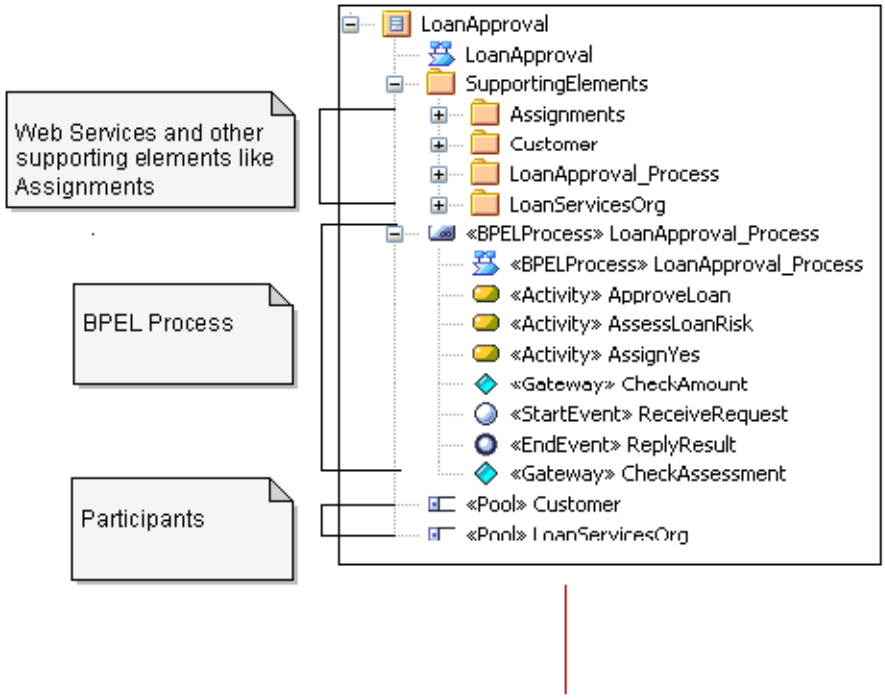
Ribbon	Design > Package > **Model Wizard**
Context Menu	**Project Browser** | Right-click on Package | Add a Model using Wizard
Keyboard Shortcuts	**Ctrl** + **Shift** + M
Other	**Project Browser** caption bar menu : New Model from Pattern

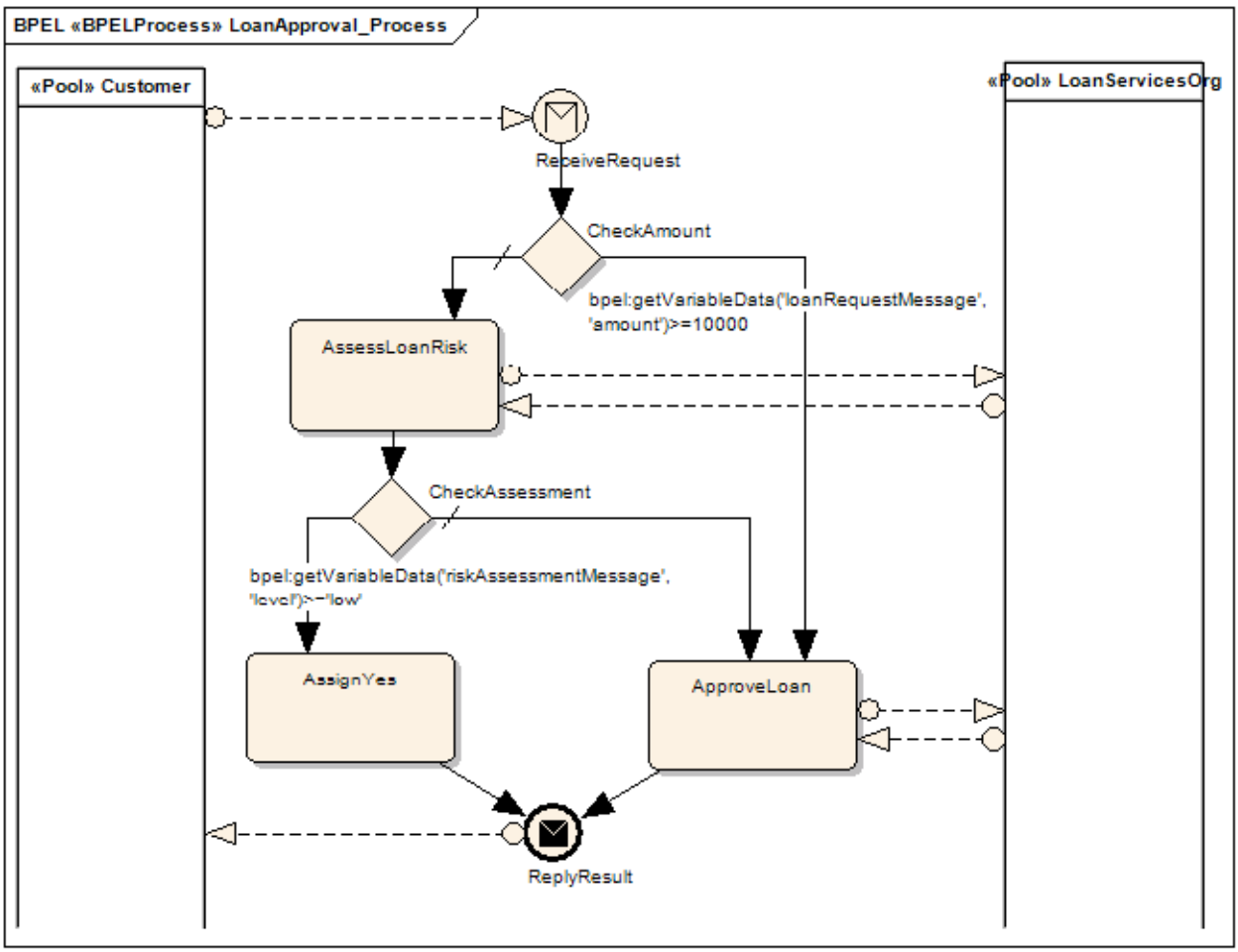
Create a new BPEL 1.1 Package structure as a starting point for developing a BPEL Process

Step	Action
1	Select the root node or a Package in the **Project Browser**.
2	Click on the New Model from Pattern icon in the toolbar.
3	Select the value BPMN 1.1 i n the Technology section.
4	Check the option 'BPEL 1.1 Model' in the 'Name' section.
5	Click on the **OK button** to create the sample BPEL 1.1 Package structure.

Example BPEL 1.1 Package Structure:

The BPEL Process LoanApproval_Process acts as container for the BPEL diagram and elements. The SupportingElements Package contains supporting components like Assignments and Web Services.


Web Services and other supporting elements like Assignments
BPEL Process
Participants
LoanApproval
LoanApproval
SupportingElements
Assignments
Customer
LoanApproval_Process
LoanServicesOrg
«BPELProcess» LoanApproval_Process
«BPELProcess» LoanApproval_Process
«Activity» ApproveLoan
«Activity» AssessLoanRisk
«Activity» AssignYes
«Gateway» CheckAmount
«StartEvent» ReceiveRequest
«EndEvent» ReplyResult
«Gateway» CheckAssessment
«Pool» Customer
«Pool» LoanServicesOrg


BPEL «BPELProcess» LoanApproval_Process
«Pool» Customer
«Pool» LoanServicesOrg
ReceiveRequest
CheckAmount
bpel:getVariableData('loanRequestMessage', 'amount')>=10000
AssessLoanRisk
CheckAssessment
bpel:getVariableData('riskAssessmentMessage', 'level')>='low'
AssignYes
ApproveLoan
ReplyResult

Model a BPEL 1.1 Process

The BPEL Process in Enterprise Architect represents the top-level container for the BPMN 1.1 elements, from which BPEL 1.1 can be generated. Conceptually it maps to the BPEL process element.

BPEL Properties:

- Double-click on the BPEL Process in the BPEL diagram
- Right-click on the BPEL Process | BPEL | BPEL Properties

Reference

Field/Button	Action
Name	Specify the name for the BPEL Process.
Query Language	Specify the value of the language used in the BPEL Process for the selection of nodes in Assignments. Defaults to XPath 1.0.
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Start Event

A BPMN 1.1 Start Event indicates where a particular Process begins. Every Process in Enterprise Architect must begin with a Start Event.

BPEL Properties:

- Double-click on the Start Event in the BPEL diagram (or)
- Right-click on the Start Event | BPEL | BPEL Properties

Reference

Field/Option/Button	Action
Name	Specify the name for the Start Event.
Trigger Type	Select a trigger for the Start Event, namely: • Conditional • Link • Message • Multiple • None • Signal • Timer
Details Tab	Depending on the selected Trigger Type, the 'Details' tab changes as shown: Conditional Trigger Type • Condition - Select a BPMN 1.1 Condition from the list of Condition(s) created in the Supporting Elements Package Message Trigger Type • Web Service - Select a BPMN 1.1 Web Servicefrom the Package (in the Supporting Elements Package) that represents one of the involved Participants • Message - Select a BPMN 1.1 Message from the list of Message(s) in the selected Web Service Multiple Trigger Type • Events - Select additional BPMN 1.1 Start Events from the list of events in this Process that might trigger the Process, by clicking the ... button Timer Trigger Type • Time Cycle - Specify the value for the time **duration** • Time Date - Specify the value for the time date
Assignments	Select one or more Assignment elements created in the SupportingElements Package in this tab (Optional).
OK	Save the values entered in the dialog.

Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- Set either 'Time Cycle' or 'Time Date for Timer Trigger Type' but not both as they are mutually exclusive fields
- Link, None and Signal Event types cannot be mapped to BPEL 1.1

Intermediate Event

A BPMN 1.1 Intermediate Event indicates where an event occurs somewhere between the start and end of a Process.

BPEL Properties:

- Double-click on the Intermediate Event in the BPEL diagram
- Right-click on the Intermediate Event | BPEL | BPEL Properties

Reference

Field/Button	Action
Name	Specify the name for the Intermediate Event.
Trigger Type	Select the type for the Intermediate Event, namely: • Cancel • Compensation • Conditional • Error • Link • Message • Multiple • None • Signal • Timer
Details Tab	Depending on the selected Trigger Type, the 'Details' tab changes as shown: Compensation Trigger Type • Activity - Select a BPMN 1.1 Task from the list of all Activities in the Process Conditional Trigger Type • Condition - Select a BPMN 1.1 Condition from the list of Condition(s) created in the SupportingElements Package Error Trigger Type • Error Code - Specify the required error code Link Trigger Type • Link Event - Select a Link Event element (to act as a target for this Link Event) from the list under the current Process/Sub-Process Message Trigger Type • Web Service - Select a BPMN 1.1 Web Service from the Package (in the SupportingElements Package) that represents one of the involved Participants • Message - Select a BPMN 1.1 Message from the list of Message(s) in the selected Web Service Multiple Trigger Type

	• Events - Select additional BPMN 1.1 Intermediate Events from the list of events in this Process, by clicking the ... button Timer Trigger Type • Time Cycle - Specify the value for the time **duration** • Time Date - Specify the value for the time date
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- Cancel, None and Signal Event types cannot be mapped to BPEL 1.1
- Set either 'Time Cycle' or 'Time Date for Timer Trigger Type' but not both as they are mutually exclusive fields
- For a Compensation Intermediate Event edge-mounted on an Activity, create a BPMN 1.1 Association from this event to the Compensation Activity; ensure that the IsCompensation tag for the Activity is set to true
- Link Intermediate Event can be used either as a GOTO or an off-page connector; therefore, this event can have either incoming or outgoing Sequence Flows - but not both

Activity

A BPMN 1.1 Activity represents work that is performed within a Process. An Activity can be modeled as a:

- Sub-Process - a compound Activity that is defined as a flow of other BPMN 1.1 elements or
- Task - an atomic Activity that cannot be broken down into a smaller unit

Activities - both Tasks and Sub-Processes - can also, optionally, act as Looping constructs. The OMG BPMN 1.1 Specification defines two types of Looping construct:

- Standard Loop (while or until)
- Multi-Instance Loop (for each)

BPEL Properties:

- Double-click on the Activity in the BPEL diagram
- Right-click on the Activity | BPEL | BPEL 1.1 Properties

Reference

Field/Button	Action
Name	Specify the name for the Activity.
Type	Specify whether the Activity is a: • Task, or • Sub-Process
Task Type / SubProcess Type	Depending on the value selected in the 'Type' field, the 'Task Type / SubProcess Type' field has these values: Task Type: • Manual • None • Receive • Reference • Script • Send • Service • User SubProcess Type: • Embedded • References • Reusable
Details Tab	Depending on the selected Task Type, the 'Details' tab changes as shown. Receive Task Type: • Web Service - Select a BPMN 1.1 Web Service from the Package (in the

	SupportingElements Package) that represents one of the involved Participants • Message - Select a BPMN 1.1 Message from the list of Message(s) in the selected Web Service • Instantiate - Select True if this is the first Activity after the Start Event, otherwise select **False** Reference Task Type • Activity - Select a BPMN 1.1 Task from the list of all Activities in the Process Send Task Type • Web Service - Select a BPMN 1.1 Web Service from the Package (in the SupportingElements Package) that represents one of the involved Participants • Message - Select a BPMN 1.1 Message from the list of Message(s) in the selected Web Service Service / User Task Type • Web Service - Select a BPMN 1.1 Web Service from the Package (in the SupportingElements Package) that represents one of the involved Participants • Input Message - Select a BPMN 1.1 Message from the list of Message(s) in the selected Web Service that represents the input element • Output Message - Select a BPMN 1.1 Message from the list of Message(s) in the selected Web Service that represents the output element Depending on the selected SubProcess Type, the Details tab changes as shown: References SubProcess Type • SubProcess - Select a BPMN 1.1 Sub-Process from the list of all Activities in the Process
Assignments	Select one or more Assignment elements created in the SupportingElements Package in this tab (Optional).
Loop Details	Activities can be repeated sequentially, behaving like a loop. Specify the Activity looping details in this tab (Optional). • Type - Select 'Standard' for creating a 'while or until' loop, or 'MultiInstance' for creating a 'for each' loop • Condition - Enter a boolean condition for Standard loop or a numeric condition for MultiInstance loop • Min Value - Specify the minimum value for the loop evaluation for a Standard loop (Optional) • Max Value - Specify the maximum value for the loop evaluation for a Standard loop (Optional) • Test Time - Select 'After' to define a 'while' Standard loop or 'Before' to define an 'until' Standard loop
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- Manual and Script types cannot be mapped to BPEL 1.1
- Reusable Sub - Process types cannot be mapped to BPEL 1.1

Gateway

A BPMN 1.1 Gateway control the way in which Sequence Flows converge and diverge within a Process. They provide a gating mechanism that either allows or blocks a Sequence Flow.

BPEL Properties:

- Double-click on the Gateway in the BPEL diagram
- Right-click on the Gateway | BPEL | BPEL Properties

Reference

Field/Button	Action
Name	Specify the name for the Gateway.
Gateway	Select the type for the Gateway, namely: • Complex • Exclusive • Inclusive • Parallel
Details Tab	Depending on the selected Gateway, the 'Details' tab changes as shown: Exclusive Gateway • Exclusive Type: - Data - allows alternate paths to be taken based on the evaluation of conditions - Event - allows alternate paths to be taken based on the occurrence of events
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- The target of the outgoing Sequence Flows of this Event Exclusive Gateway must be either a:
- Receive Task or a
- Message or Timer Intermediate Event
- If a Message Task is one of the targets of the outgoing Sequence Flow of an Event Exclusive Gateway, then a Message Intermediate Event cannot be the target of the other outgoing Sequence Flows of this Event Exclusive

Gateway

End Event

A BPMN 1.1 End Event indicates where a particular Process ends. Every Process in Enterprise Architect must end with an End Event.

BPEL Properties:

- Double-click on the End Event in the BPEL diagram
- Right-click on the End Event | BPEL | BPEL Properties

Reference

Field/Button	Action
Name	Specify the name for the End Event.
Result Type	Select the type for the End Event, namely: • Cancel • Compensation • Error • Link • Message • Multiple • None • Signal • Terminate
Details Tab	Depending on the selected Result Type, the 'Details' tab changes as shown: Compensation Result Type • Activity - Select a BPMN 1.1 Task from the list of all Activities in the Process Error Trigger Type • Error Code - Specify the required error code Message Result Type • Web Service - Select a BPMN 1.1 Web Service from the Package (in the SupportingElements Package) that represents one of the involved Participants • Message - Select a BPMN 1.1 Message from the list of Message(s) in the selected Web Service Multiple Result Type • Events - Select additional BPMN 1.1 Start Events from the list of events in this Process that might trigger the Process, by clicking on the ... button
Assignments	Select one or more Assignment elements created in the SupportingElements Package in this tab (Optional).
OK	Save the values entered in the dialog.

Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- Cancel, Link, None and Signal Event types cannot be mapped to BPEL 1.1

Sequence Flow

A BPMN 1.1 Sequence Flow connector shows the order in which the activities (Tasks and Events) are performed in a BPEL Process.

BPEL Properties:

- Double-click on the Sequence Flow in the BPEL diagram
- Right-click on the Sequence Flow | BPEL | BPELProperties

Reference

Field/Button	Action
Condition Type	Specify the type of the condition on the Sequence Flow, namely: • None • Default • Expression
Expression	This field gets enabled when the Condition Type is set to Expression. Specify a boolean expression to act as a gating condition.
Ordering	This field gets enabled when the 'Condition Type' is set to 'Expression'. Specify a numerical value that determines the order in which the condition set in the 'Expression' field is to be evaluated.
Assignments	Select one or more Assignment elements created in the SupportingElements Package in this tab (Optional).
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Pool

A BPMN 1.1 Pool represents a Participant in a Process and does not map to any specific BPEL 1.1 element. Enterprise Architect uses Pools to represent external Participants, with which the BPEL Process communicates. These are 'black box' pools; that is, they are abstract and do not expose any details (they do not contain any BPMN 1.1 elements inside them).

BPEL Properties:

- Double-click on the Pool in the BPEL diagram
- Right-click on the Pool | BPEL | BPEL Properties

Reference

Field/Button	Action
Name	Specify the name for the Pool.
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- A BPEL Process should not contain a Pool as its child element
- A BPEL diagram under a BPEL Process contains an implicit Pool - so it is invalid to add a Pool in this BPEL diagram to represent the BPEL Process
- Pool cannot have any incoming or outgoing Sequence Flow connectors - it can have only incoming or outgoing Message Flow connectors

Assignment

A BPMN 1.1 Assignment element enables data to be copied between messages and new data to be inserted, using expressions within a BPEL Process. A BPMN 1.1 Assignment element maps to a BPEL 1.1 assign activity and copies the specified value from the source to the target.

In Enterprise Architect, Assignment elements should be created in the Assignments Package in Create BPEL 2.0 Model Structure. If they are created elsewhere, they cannot be enacted correctly.

Access

Ribbon	Design > Diagram > Toolbox : More tools > BPMN 1.1 > BPMN 1.1 Types
Menu	Diagram > Toolbox : More tools | BPMN 1.1 | BPMN 1.1 Types
Keyboard Shortcuts	**Alt** + 5 : More tools | BPMN 1.1 | BPMN 1.1 Types
Other	You can display or hide the **Diagram Toolbox** by clicking on the or icons at the left-hand end of the Caption Bar at the top of the **Diagram View**.

BPEL Properties:

- Double-click on the Assignment in the BPEL diagram
- Right-click on the Assignment | BPEL | BPEL Properties

Controls on BPEL Properties

Field/Button	Usage
Name	Specify the name for the Assignment.
Assign Time	Select either Start or End to determine whether the assignment occurs at the start or end of an Activity / Event.
Copy From Type	Depending on the value selected in this field, further details are required.
Copy From Literal	Specify a literal value.
Copy From Expression / Message	Select a BPMN 1.1 Message in the Package representing the BPEL Process / Pool under the SupportingElements Package.
Copy From Part	Select a BPMN 1.1 Property belonging to the selected Message (Optional).
Copy To Message	Select a BPMN 1.1 Message in the Package representing the BPEL Process / Pool under the SupportingElements Package.

Copy To Part	Select a BPMN 1.1 Property belonging to the selected Message (Optional).
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- Messages are created when you create Web Services
- If you select Expression, Enterprise Architect uses the getVariableData XPATH 1.0 function to create the expression from the selected Message and Part

Create BPEL 1.1 Web Service

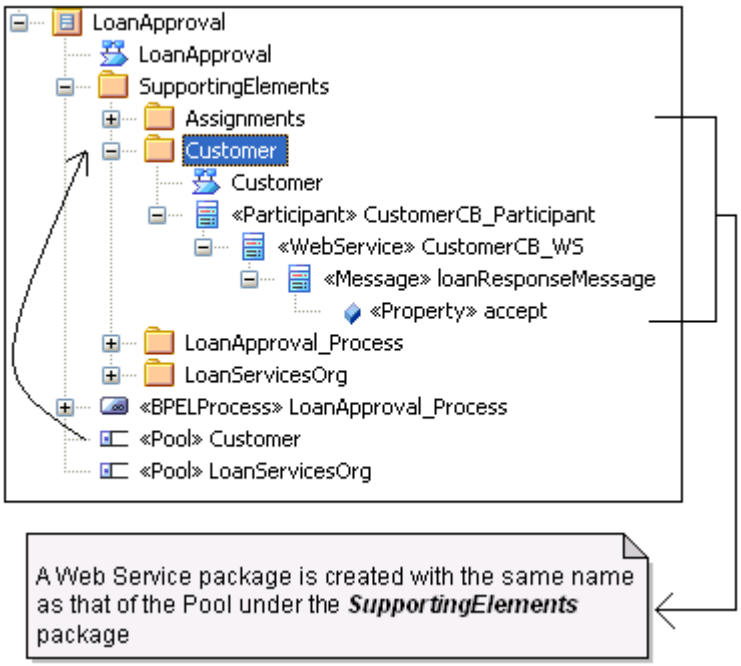
BPEL is an Orchestration language, which orchestrates services that are exposed using WSDL 1.1. It coordinates the execution of the various operations of these involved services. BPEL 1.1 supports WSDL 1.1 one-way and request-response operations only (and not solicit-response and notification operations). Enterprise Architect enables you to create, for BPEL Process and Pool elements, Web Service Operations that support either synchronous (request-response) or asynchronous (one-way) interactions.

Access

Context Menu	In the **Project Browser** or on a diagram: Right-click on a BPEL Process or Pool | BPEL | Create WebService

Options

Field/Button	Action
Operation	Specify whether to create a new Web Service or create one from an existing WSDL created / imported into Enterprise Architect (using the 'Import WSDL' dialog) by selecting either: • Create New (or) • Create from existing WSDL
Type	Specify whether to create a one-way or request-response Operation by selecting either: • Asynchronous (or) • Synchronous
Partnership Details	The interaction between the Web Service and the BPEL Process is modeled as a BPEL partnerLink. For this interaction, provide a: • Name - Name of the BPEL partnerLink • Role - Name of either: - myRole (if this operation belongs to the BPEL Process Web Service) or - partnerRole (if this operation belongs to the Web Service of a Pool) of the BPEL partnerLink
Web Service	• When 'Create New' is selected in the 'Operation' field: - Web Service Name - Name of the WSDL 1.1 Web Service - PortType - Name of the WSDL 1.1 PortType (Interface) - Operation - Name of the WSDL 1.1 PortType Operation • When 'Create from existing WSDL PortType Operation' is selected in the 'Operation' field: - WSDL Package - Select an existing WSDL Package created / imported into Enterprise Architect - Web Service Name - Name of the WSDL 1.1 Web Service; the default is the name of the selected WSDL Package - PortType - Select a WSDL 1.1 PortType from the selected WSDL Package

	- Operation - Select a WSDL 1.1 PortType Operation in the selected PortType
Input	When 'Create New' is selected in the 'Operation' field: • Message Name - Name of the WSDL 1.1 Message • Properties - Click on the ... button to enter the WSDL 1.1 Message Part Name and **XSD** Type When 'Create from existing WSDL PortType Operation' is selected in the 'Operation' field: • The fields in this tab are pre-filled with the details of the input WSDL 1.1 Message (of the WSDL 1.1 Port Type Operation selected in the 'Operation' field in the 'Web Service' tab)
Output	When 'Create New' is selected in the 'Operation' field: • Message Name - The name of the WSDL 1.1 Message • Properties - Click on the ... button to enter the WSDL 1.1 Message Part Name and **XSD** Type When 'Create from existing WSDL Port Type Operation' is selected in the 'Operation' field: • The fields in this tab are pre-filled with the details of the output WSDL 1.1 Message (of the WSDL 1.1 Port Type Operation selected in the 'Operation' field in the 'Web Service' tab)
OK	Create a Web Service Operation based on the values entered in the dialog. The Operation is created in a Package, whose name is the same as that of the BPEL Process / Pool from which this dialog is invoked, under the SupportingElements Package. 
Cancel	Discard the values entered in the dialog and abort creating the Web Service Operation.

Help	Display this Help topic.

Notes

- The 'Output' tab is not applicable for an Asynchronous operation

Generate BPEL 1.1

BPEL 1.1 code can be generated from a BPEL Process. Enterprise Architect validates the BPEL Process before generating the BPEL 1.1 code. In addition to generating the BPEL 1.1 code, WSDL 1.1 files are generated for the BPEL Process and all of the involved Pools (provided that Web Services are defined for them).

Access

Context Menu	In the **Project Browser** or on a diagram: Right-click on a BPEL Process | BPEL | Generate BPEL

Reference

Field/Button	Action
File Name	Specify the path where the BPEL 1.1 file is to be generated.
Namespace Details	Double-click on an entry (if any) in this field to open the 'Namespace Details' dialog and add / edit the namespace details. The entry DefaultPool represents the current BPEL Process.
Generate BPEL	**Validate** the model and generate BPEL 1.1.
Close	Click on this button to close this dialog.
Help	Display this Help topic.
View BPEL	View the generated BPEL 1.1 file.

BPEL 2.0 Model

Enterprise Architect uses BPMN 2.0 as a graphical front-end to capture BPEL 2.0 Process description (as BPEL 2.0 does not have a standard graphical notation). Enterprise Architect uses the partial mapping specified in the BPMN 2.0 specification to map BPMN 2.0 constructs to BPEL 2.0.

Map Constructs

Step	Action
1	Create a BPEL 2.0 Package Structure. Alternatively: • Create a Package in the Project Browse • Click on the 'New Diagram' icon in the **Project Browser** toolbar • Select 'BPMN 2.0' in the 'Select From' field and 'BPEL' in the 'Diagram Types' field • Click on the 'BPEL' icon from the BPMN 2.0 - Business Process Toolbox and drag it into the created BPEL diagram
2	Open the BPEL diagram under the <<BPELProcess>> stereotyped element.
3	Model the BPEL Process using the constructs in the BPMN 2.0 - Business Process Toolbox. Use these constructs in this toolbox to model BPEL 2.0. BPMN 2.0 - Business Process page: • BPEL • Activity • Data Object • Start Event • Intermediate Event • Event • Gateway • Pool BPMN 2.0 - Business Process Connectors page: • Sequence Flow • Association • Message Flow BPMN 2.0 Types page: • Assignment • Error • Interface • Operation • Property
4	Create Web Service Operations for the BPEL Process and other related Pools, if required.
5	Generate BPEL 2.0 code from the BPEL Process.

Notes

- Generating BPEL 2.0 from a BPMN 2.0 model is supported in the Business and Software Engineering and the Ultimate editions of Enterprise Architect
- Enable the BPMN 2.0 Technology in the 'MDG Technologies' dialog ('Extensions | MDG Technologies')

BPEL 2.0 Example

- The Enterprise Architect Example file (EAExample.EAP) has a sample BPMN 2.0 model from which BPEL 2.0 can be generated
- If you have installed Enterprise Architect at the default location, open this file: C:\Program Files\Sparx Systems\EA\EAExample.EAP
- The BPMN 2.0 model Package is in: Project Models | Analysis and Business Modeling | BPEL Example | BPEL 2.0 Model

Modeling Restrictions

- Every BPEL Process and Sub-Process should start with a Start Event and end with an End Event
- Boundary Start and End Events are not supported
- Sequence Flow Looping is not supported in both Normal and Exception Paths
- All Sequence Flows should flow downstream and not upstream
- Sub-Process cannot be a Loop node and have boundary Intermediate Events
- Event Sub-Process cannot act as a Loop Node
- Assignments are not supported on:
  - Start Events on Event Sub-Processes
  - End Events
  - Sub-Processes
  - Boundary Intermediate Events
  - Gateways
  - Tasks and Intermediate Events that immediately follow an XOR Event Gateway
- Exception Path has to merge back into the Normal Path
- An exception to this rule is boundary Compensation Intermediate Event, which should have a BPMN 2.0 Association to a Compensation Activity (that has no incoming or outgoing Sequence Flows)
- Multiple Exception Paths from an Activity must join at the same location in the Normal Path
- An Exception Path should not cross another Exception Path
- Activities in an Exception Path cannot have boundary Intermediate Events
- Pools are treated as black boxes (that is, they do not expose any details) and hence they cannot contain any child elements or have any incoming/outgoing Sequence Flow connectors

Learning Center topics

- **Alt+F1** | Enterprise Architect | Business Modeling | BPEL | Getting Started

Create BPEL 2.0 Model Structure

A BPEL 2.0 model consists of a BPEL Process (containing a BPEL diagram and mappable BPMN 2.0 constructs) and other supporting elements (like BPMN 2.0 Assignment, BPMN 2.0 Operation) required for generating a BPEL 2.0 code.

A sample BPEL 2.0 Package structure can be created in the **Project Browser**, using the 'Select Model(s) (**Model Wizard**)' dialog. You can use this Package structure as a template for developing your BPEL Process.

Access

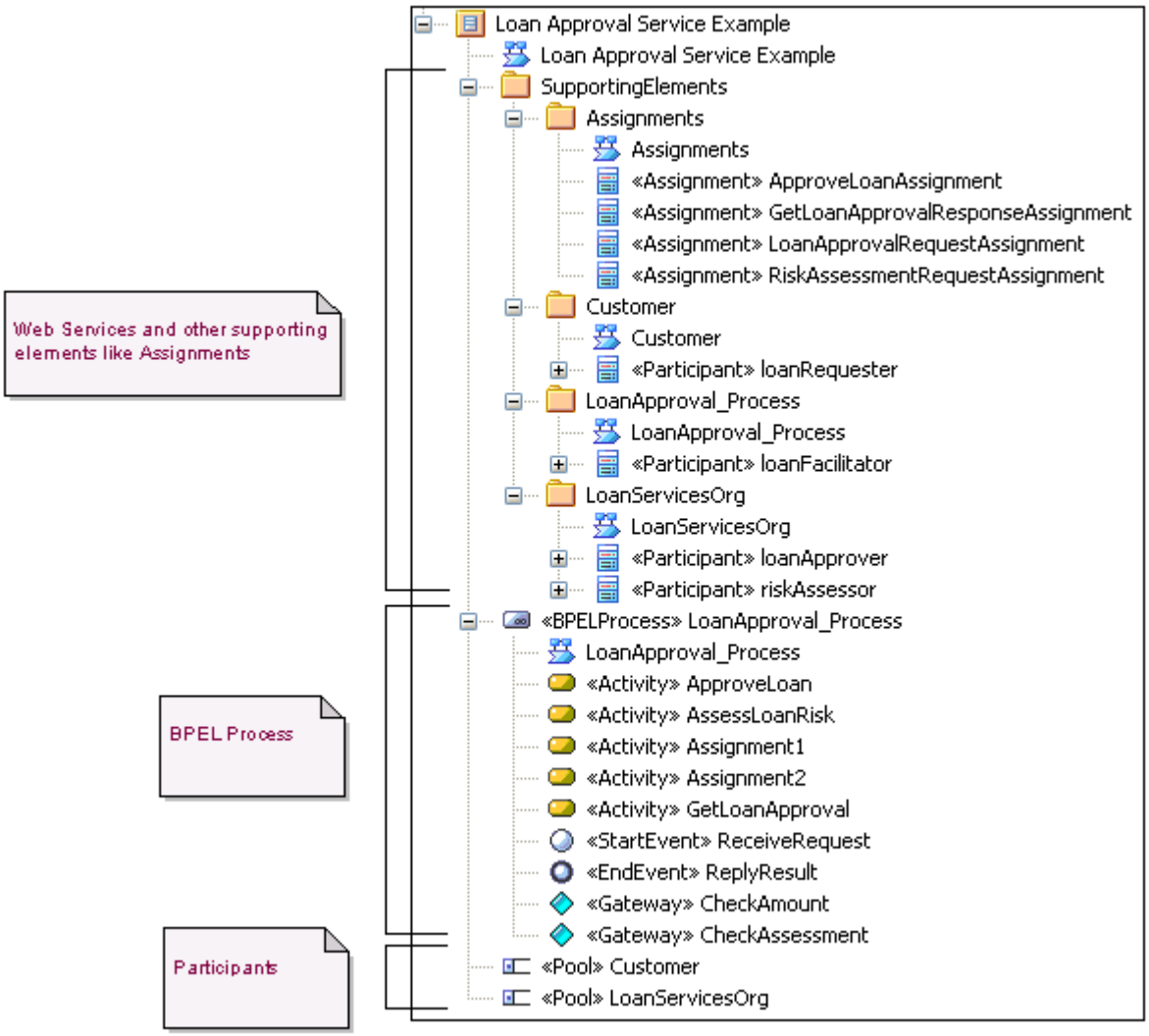
Ribbon	Design > Package > **Model Wizard**
Menu	Package | New
Context Menu	**Project Browser** | Right-click on Package | Add a Model using Wizard
Keyboard Shortcuts	**Ctrl** + **Shift** + M
Other	**Project Browser** caption bar menu | New Model from Pattern

Create a BPEL 2.0 Package structure as a starting point for developing a BPEL Process

Step	Action
1	Select the root node or a Package in the **Project Browser**.
2	Click on the New Model from Pattern icon in the **Project Browser** toolbar.
3	Select the value BPMN 2.0 in the Technology section.
4	Check the option 'BPEL 2.0 Model' in the 'Name' section.
5	Click on the **OK button** to create the sample BPEL 2.0 Package structure.

Example BPEL 2.0 Package Structure

The BPEL Process LoanApproval_Process acts as container for the BPEL diagram and elements. The SupportingElements Package contains supporting components like Assignments and Web Service Operations.


Loan Approval Service Example
Loan Approval Service Example
SupportingElements
Assignments
Assignments
«Assignment» ApproveLoanAssignment
«Assignment» GetLoanApprovalResponseAssignment
«Assignment» LoanApprovalRequestAssignment
«Assignment» RiskAssessmentRequestAssignment
Customer
Customer
«Participant» loanRequester
LoanApproval_Process
LoanApproval_Process
«Participant» loanFacilitator
LoanServicesOrg
LoanServicesOrg
«Participant» loanApprover
«Participant» riskAssessor
«BPELProcess» LoanApproval_Process
LoanApproval_Process
«Activity» ApproveLoan
«Activity» AssessLoanRisk
«Activity» Assignment1
«Activity» Assignment2
«Activity» GetLoanApproval
«StartEvent» ReceiveRequest
«EndEvent» ReplyResult
«Gateway» CheckAmount
«Gateway» CheckAssessment
«Pool» Customer
«Pool» LoanServicesOrg
Web Services and other supporting elements like Assignments
BPEL Process
Participants

Model a BPEL 2.0 Process

The BPEL Process in Enterprise Architect represents the top-level container for the BPMN 2.0 elements, from which BPEL 2.0 can be generated. Conceptually it maps to the BPEL process element.

BPEL Properties

- Double-click on the BPEL Process in the BPEL diagram, or
- Right-click on the BPEL Process in the BPEL diagram (or the **Project Browser**) and select BPEL | BPEL 2.0 Properties

Options

Field/Button	Action
Name	Specify the name for the BPEL Process.
Query Language	Specify the language used in the BPEL Process for the selection of nodes in Assignments. Defaults to 'XPath 1.0'.
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Learning Center topics

- **Alt+F1** | Enterprise Architect | Business Modeling | BPEL | Process Modeling

Start Event

A BPMN 2.0 Start Event indicates where a particular Process begins. Every Process in Enterprise Architect must begin with a Start Event.

BPEL Properties

- Double-click on the Start Event in the BPEL diagram, or
- Right-click on the Start Event | BPEL | BPEL 2.0 Properties

Options

Field/Button	Action
Name	Type the name for the Start Event.
Event Type	Select a trigger for the Start Event, namely: • Compensation • Conditional • Error • Escalation • Message • Multiple • None • Parallel Multiple • Signal • Timer
Details Tab	Depending on the selected Event Type, the 'Details' tab changes as shown: • Message Event Type - Pool Package - Select the Package that represents one of the involved Participants - Operation - Select an Operation from the list of operation(s) in the selected Pool Package • Timer Event Type - Time Cycle - Specify the value for the time **duration** - Time Date - Specify the value for the time date • Error Event Type - Error - Select an Error element
Assignments	(Optional) Select one or more Assignment elements created in the SupportingElements Package in this tab.
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.

Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- Either set 'Time Cycle' or 'Time Date for Timer Event Type' but not both, as they are mutually exclusive fields
- The 'Assignments' tab is not available on Start Events that are used to start an Event Sub-Process
- Compensation, Error and Timer event types are valid only on an Event Sub-Process
- Conditional, Escalation, Multiple, Parallel Multiple and Signal event types cannot be mapped to BPEL 2.0

Intermediate Event

A BPMN 2.0 Intermediate Event indicates where an event occurs somewhere between the start and end of a Process.

BPEL Properties

- Double-click on the Intermediate Event in the BPEL diagram
- Right-click on the Intermediate Event | BPEL | BPEL 2.0 Properties

Options

Field/Button	Action
Name	Specify the name for the Intermediate Event.
Event Type	Select the type for the Intermediate Event, namely: • Cancel • Compensation • Conditional • Error • Escalation • Link • Message • Multiple • None • Parallel Multiple • Signal • Timer
Details Tab	Depending on the selected Event Type, the 'Details' tab changes: • Message Event Type - Pool Package - Select the Package that represents one of the involved Participants - Operation - Select an Operation from the list of operation(s) in the selected Pool Package • Link Event Type - Link Event - Select a Link Event element (to act as a target for this Link Event) from the list of Link Event elements under the current Process / Sub-Process • Timer Event Type - Time Cycle - Specify the value for the time **duration** - Time Date - Specify the value for the time date • Compensation Event Type - Activity - Select an Activity from the list of Activity elements under the current Process / Sub-Process • Error Event Type

	- Error - Select an Error element
Assignments	(Optional) Select one or more Assignment elements created in the SupportingElements Package in this tab.
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- Cancel, Conditional, Escalation, Multiple, None, Parallel Multiple and Signal event type cannot be mapped to BPEL 2.0
- The 'Assignments' tab is not available on Intermediate Events that are attached to the boundary of an Activity
- Either set 'Time Cycle' or 'Time Date for Timer Trigger Type' but not both as they are mutually exclusive fields
- The Error event type is valid only on an Intermediate Event attached to the boundary of an Activity
- The Compensation event type is valid only on an Event Sub-Process or when attached to the boundary of an Activity
- The Link Intermediate Event can be used either as a GOTO or an off-page connector; therefore, this event can have either incoming or outgoing Sequence Flows - but not both

Activity

A BPMN 2.0 Activity represents work that is performed within a Process. An Activity can be modeled as a:

- Sub-Process - a compound Activity that is defined as a flow of other BPMN 2.0 elements or
- Task - an atomic Activity that cannot be broken down into a smaller unit

Activities - both Tasks and Sub-Processes - can also, optionally, act as Looping constructs. The OMG BPMN 2.0 Specification defines two types of Looping construct:

- Standard Loop (while or until)
- Multi-Instance Loop (for each)

BPEL Properties

- Double-click on the Activity in the BPEL diagram
- Right-click on the Activity | BPEL | BPEL 2.0 Properties

Options

Field/Option/Button	Action
Name	Type a name for the Activity.
Type	Specify whether the Activity is a: • Task or • Sub-Process
Task Type / SubProcess Type	Depending on the value selected in the 'Type' field, the 'Task Type / SubProcess Type' field has these values: • Task Type: - Abstract - Business Rule - Manual - Receive - Script - Send - Service - User • SubProcess Type: - Ad-Hoc - Call Activity - Compensation - Embedded - Event - Transaction
Details Tab	Depending on the selected Task Type, the 'Details' tab changes: Receive / Send / Service Task Type • Pool Package - Select the Package that represents one of the involved Participants

	• Operation - Select an Operation from the list of operation(s) in the selected Pool Package
Assignments	(Optional) Select one or more Assignment elements created in the SupportingElements Package in this tab.
Loop Details	(Optional) Activities can be repeated sequentially, behaving like a Loop. Specify the Activity looping details in this tab. • Loop Type - Select 'Standard' for creating a 'while' or 'until' loop, or 'MultiInstance' for creating a 'for each' loop • Evaluate condition at the beginning of loop - Check this option to create a 'while' Standard loop; defaults to unselected for an 'until' loop • Loop Condition - Enter a boolean condition for a Standard loop or a numeric condition for a MultiInstance loop • Loop Maximum - (Optional) Specify the maximum value for the loop evaluation for a Standard loop • Loop Ordering - For a MultiInstanceLoop Type select 'Parallel' for generating instances in parallel, or 'Sequential for generating instances in sequence
OK	Click on this button to save the values entered in the dialog.
Cancel	Click on this button to discard the values entered in the dialog.
Help	Click on this button to display this Help topic.
General	Click on this button to open the 'UML Properties' dialog.

Notes

- The 'Assignments' tab is not applicable for Sub-Process
- The 'Loop Details' tab is not applicable for Event Sub-Process
- Business Rule, Manual, Script and User Task types cannot be mapped to BPEL 2.0
- Ad-Hoc, Call Activity and Transaction Sub-Process types cannot be mapped to BPEL 2.0

Gateway

A BPMN 2.0 Gateway controls the way in which Sequence Flows converge and diverge within a Process. They provide a gating mechanism that either allows or blocks a Sequence Flow.

BPEL Properties

- Double-click on the Gateway in the BPEL diagram
- Right-click on the Gateway | BPEL | BPEL 2.0 Properties

Options

Field/Button	Action
Name	Specify the name for the Gateway.
Gateway	Select the type for the Gateway, namely: • Complex • Event • Exclusive • Inclusive • Parallel
Details Tab	Depending on the selected Gateway, the 'Details' tab changes as shown: • Event Type - Set to 'Exclusive' to represent an Exclusive Event Based Gateway
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- The target of the outgoing Sequence Flows of this Event Exclusive Gateway must be either a:
  - Receive Task or a
  - Message or Timer Intermediate Event
- If a Message Task is one of the targets of the outgoing Sequence Flow of an Event Exclusive Gateway, then a Message Intermediate Event cannot be the target of the other outgoing Sequence Flows of this Event Exclusive Gateway

End Event

A BPMN 2.0 End Event indicates where a particular Process ends. Every Process in Enterprise Architect must end with an End Event.

BPEL Properties

- Double-click on the End Event in the BPEL diagram
- Right-click on the End Event | BPEL | BPEL 2.0 Properties

Options

Field/Button	Action
Name	Specify the name for the End Event.
Event Type	Select the type for the End Event, namely: • Cancel • Compensation • Error • Escalation • Message • Multiple • None • Signal • Terminate
Details Tab	Depending on the selected Event Type, the 'Details' tab changes: • Message Event Type: - Pool Package - Select the Package that represents one of the involved Participants - Operation - Select an Operation from the list of operation(s) in the selected Pool Package • Compensation Event Type: - Activity - Select an Activity from the list of Activity elements under the current Process/Sub-Process • Error Event Type - Error - Select an Error element
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- The Compensation Event type is valid only on an Event Sub-Process
- Cancel, Escalation, Multiple and Signal Event types cannot be mapped to BPEL 2.0

Data Object

A BPMN 2.0 Data Object is mapped to a BPEL 2.0 Variable and occurs in the context of a Process or Sub-Process, just like a Property. A Data Object cannot have any incoming or outgoing Sequence Flow or Message Flow.

BPEL Properties

- Double-click on the Data Object in the BPEL diagram
- Right-click on the Data Object | BPEL | BPEL 2.0 Properties

Options

Field/Button	Action
Name	Specify the name for the Data Object.
Type	Either: • Select an XML Schema basic type from the drop-down list, or • Use the button to select XML Schema ComplexType, SimpleType, Union or Enumeration
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Property

A BPMN 2.0 Property is mapped to a BPEL 2.0 Variable and occurs in the context of a Process or Sub-Process, just like a Data Object.

However, unlike a Data Object, Property is not displayed on a BPEL diagram. Enterprise Architect supports Property on BPMN 2.0 BPEL and BPMN 2.0 Activity elements.

Access

Ribbon	Design > Diagram > Toolbox : More tools > BPMN 2.0 > BPMN 2.0 Business Process > BPMN 2.0 Types
Menu	Diagram > Toolbox : More tools | BPMN 2.0 | BPMN 2.0 Business Process | BPMN 2.0 Types
Keyboard Shortcuts	**Alt** + 5 : More tools | BPMN 2.0 | BPMN 2.0 Business Process | BPMN 2.0 Types
Other	You can display or hide the **Diagram Toolbox** by clicking on the or icons at the left-hand end of the Caption Bar at the top of the **Diagram View**.

BPEL Properties

- Right-click on the Property | BPEL | BPEL 2.0 Properties

Options

Field/Button	Action
Name	Specify the name for the Property.
Type	Either: • Select an XML Schema basic type from the drop-down list or • Use the button to select XML Schema ComplexType, SimpleType, Union or Enumeration
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the attribute properties.

Sequence Flow

A BPMN 2.0 Sequence Flow connector shows the order in which the activities (Tasks and Events) are performed in a BPEL Process.

Access BPEL Properties

- Double-click on the Sequence Flow in the BPEL diagram
- Right-click on the Sequence Flow | BPEL | BPEL 2.0 Properties

Define the Sequence Flow

Field/Button	Action
Condition Type	Click on the drop-down arrow and select the type of the condition on the Sequence Flow, namely: • None • Default • Expression
Expression	This field is enabled when the 'Condition Type' is set to 'Expression'. Type in a boolean expression to act as a gating condition.
Ordering	This field is enabled when the 'Condition Type' is set to 'Expression'. Type in a numerical value that determines the order in which the condition set in the 'Expression' field is to be evaluated.
OK	Click on this button to save the values entered in the dialog.
Cancel	Click on this button to discard the values entered in the dialog.
Help	Click on this button to display this Help topic.
General	Click on this button to open the 'UML Properties' dialog.

Pool

A BPMN 2.0 Pool represents a Participant in a Process and does not map to any specific BPEL 2.0 element. Enterprise Architect uses Pools to represent external Participants, with which the BPEL Process communicates. These are 'black box' pools; that is, they are abstract and do not expose any details (they do not contain any BPMN 2.0 elements inside them).

BPEL Properties

- Double-click on the Pool in the BPEL diagram
- Right -click on the Pool | BPEL | BPEL 2.0 Properties

Options

Field/Button	Action
Name	Specify the name for the Pool.
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- A BPEL Process should not contain a Pool as its child element
- A BPEL diagram under a BPEL Process contains an implicit Pool, so it is invalid to add a Pool in this BPEL diagram to represent the BPEL Process
- Pool cannot have any incoming or outgoing Sequence Flow connectors - it can have only incoming or outgoing Message Flow connectors

Assignment

A BPMN 2.0 Assignment element enables data to be copied between messages and variables within a BPEL Process. An Assignment element maps to a BPEL 2.0 assign activity and copies the specified value from the source to the target.

In Enterprise Architect, Assignment elements should be created in the Assignments Package in SupportingElements. If they are created elsewhere, they cannot be enacted correctly.

Access

Ribbon	Design > Diagram > Toolbox : More tools > BPMN 2.0 > BPMN 2.0 Business Process > BPMN 2.0 Types
Menu	Diagram > Toolbox : More tools | BPMN 2.0 | BPMN 2.0 Business Process | BPMN 2.0 Types
Keyboard Shortcuts	**Alt** + 5 : More tools | BPMN 2.0 | BPMN 2.0 Business Process | BPMN 2.0 Types
Other	You can display or hide the **Diagram Toolbox** by clicking on the or icons at the left-hand end of the Caption Bar at the top of the **Diagram View**.

BPEL Properties

- Double-click on the Assignment in the BPEL diagram
- Right-click on the Assignment \| BPEL \| BPEL 2.0 Properties

Options

Field/Button	Action
Name	Specify the name for the Assignment.
Copy From	Complete the fields in this panel, as directed.
Type	Depending on the value selected in this field, further details are required.
Literal	Specify a literal value.
Expression	Specify an expression.
Message	Select a BPMN 2.0 Message in the Package representing the BPEL Process / Pool under the SupportingElements Package.
Part	Select a BPMN 2.0 Property belonging to the selected Message.

Variable	Select a BPMN 2.0 Data Object or BPMN 2.0 Property created under the BPEL Process.
Copy To	Complete the fields in this panel, as directed.
Message	Select a BPMN 2.0 Message in the Package representing the BPEL Process / Pool under the SupportingElements Package.
Part	Select a BPMN 2.0 Property belonging to the selected Message.
Variable	Select a BPMN 2.0 Data Object or BPMN 2.0 Property created under the BPEL Process.
OK	Save the values entered in the dialog.
Cancel	Discard the values entered in the dialog.
Help	Display this Help topic.
General	Open the 'UML Properties' dialog.

Notes

- Messages are created when you create a Web Service Operation

Create BPEL 2.0 Web Service Operation

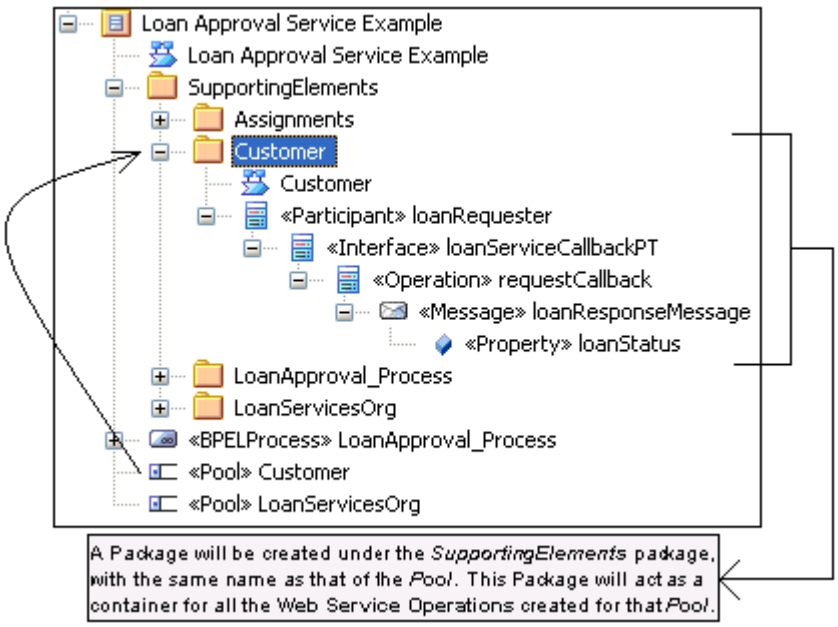
BPEL is an Orchestration language, which orchestrates services that are exposed using WSDL 1.1. It coordinates the execution of the various operations of these involved services. BPEL 2.0 supports WSDL 1.1 one-way and request-response operations only (and not solicit-response and notification operations). Enterprise Architect enables you to create, for BPEL Process and Pool elements, Web Service Operations that support either synchronous (request-response) or asynchronous (one-way) interactions.

Access

Context Menu	In the **Project Browser** or on a diagram: Right-click on a BPEL Process or Pool element | BPEL | Create WebService

Options

Field/Button	Action
Operation	Specify whether to create a new Web Service Operation or create one from an existing WSDL created / imported into Enterprise Architect (using the 'Import WSDL' dialog) by selecting either: • Create New, or • Create from existing WSDL PortType Operation
Type	Specify whether to create a one-way or request-response Operation by selecting either: • Asynchronous or • Synchronous
Partnership Details	The interaction between the Web Service and the BPEL Process is modeled as a BPEL partnerLink. For this interaction, provide: • Name - Name of the BPEL partnerLink • Role - Name of either: - myRole (if this operation belongs to the BPEL Process Web Service) or - partnerRole (if this operation belongs to the Web Service of a Pool) of the BPEL partnerLink.
Web Service	• When 'Create New' is selected in the 'Operation' field: - PortType - Name of the WSDL 1.1 PortType (Interface) - Operation - Name of the WSDL 1.1 PortType Operation • When 'Create from existing WSDL PortType Operation' is selected in the 'Operation' field: - WSDL Package - Select an existing WSDL Package created / imported into Enterprise Architect - PortType - Select a WSDL 1.1 PortType from the selected WSDL Package - Operation - Select a WSDL 1.1 PortType Operation in the selected PortType

Input	When 'Create New' is selected in the 'Operation' field: • Message Name - Name of the WSDL 1.1 Message. • Properties - Click on the ... button to enter the WSDL 1.1 Message Part Name and XSDType When 'Create from existing WSDL Port Type Operation' is selected in the 'Operation' field: • The fields in this tab are pre-filled with the details of the input WSDL 1.1 Message (of the WSDL 1.1 PortType Operation selected in the 'Operation' field in the 'Web Service' tab)
Output	When 'Create New' is selected in the 'Operation' field: • Message Name - Name of the WSDL 1.1 Message • Properties - Click on the ... button to enter the WSDL 1.1 Message Part Name and **XSD** Type When 'Create from existing WSDL Port Type Operation' is selected in the 'Operation' field: • The fields in this tab are pre-filled with the details of the output WSDL 1.1 Message (of the WSDL 1.1 PortType Operation selected in the 'Operation' field in the 'Web Service' tab)
OK	Create a Web Service Operation based on the values entered in the dialog. The operation is created in a Package that has the same name as the BPEL Process / Pool from which this dialog is invoked, under the SupportingElements Package. 
Cancel	Discard the values entered in the dialog and abort creating the Web Service Operation.
Help	Display this Help topic.

Notes

- The 'Output' tab is not applicable for an Asynchronous operation

Generate BPEL 2.0

BPEL 2.0 code can be generated from a BPEL Process. The system validates the BPEL Process before generating the code. In addition to generating the code, WSDL 1.1 files are generated for the BPEL Process and all the involved Pools (provided Web Service Operations are defined for them).

Access

Context Menu	In the **Project Browser** or on a diagram: Right-click on a BPEL Process element | BPEL | Generate BPEL 2.0

Options

Field/Button	Action
File Name	Specify the path where the BPEL 2.0 file is to be generated.
Namespace Details	Double-click on an entry (if any) in this field to open the 'Namespace Details' dialog and add / edit the namespace details. The entry DefaultPool represents the current BPEL Process.
Generate BPEL	**Validate** the model and generate BPEL 2.0.
Close	Click on this button to close this dialog.
Help	Display this Help topic.
View BPEL	View the generated BPEL 2.0 file.

Learning Center topics

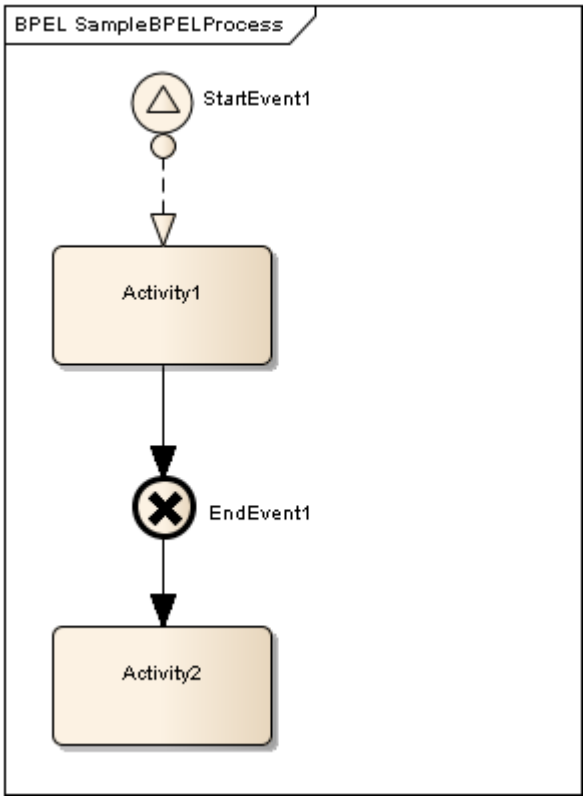
- **Alt+F1** | Enterprise Architect | Business Modeling | BPEL | Generate BPEL

BPEL Model Validation

The BPEL model is validated for both syntax and semantic errors before generating the BPEL code. Upon successful validation, the BPEL file (and the associated WSDL 1.1 files, if any) are generated. The results of the validation, as well as the progress of the BPEL generation, are displayed in the 'BPEL Progress' tab of the **System Output** window.

Example BPEL Model Violation

This model shows several basic BPEL violations:



- StartEvent1 is of type Signal, which cannot be mapped to BPEL
- The Message Flow connector between StartEvent1 and Activity1 is invalid, as Message Flow cannot be used to connect Activities or Events within a Process
- EndEvent1 is of type Cancel, which cannot be mapped to BPEL
- EndEvent1 cannot have any outgoing Sequence Flow connector, as it represents the end of a Process
- Activity2 is not valid, as only an End Event represents the end of a Process

Notes

- Double-click on a validation error entry in the 'BPEL Progress' tab of the **System Output** window to go to the source of the error in the **Project Browser**

Learning Center topics

- **Alt+F1** | Enterprise Architect | Business Modeling | Business Rules | Validate Business Rules