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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

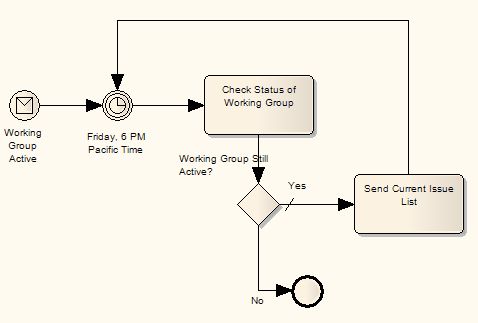
The Enterprise Architect installer for releases later than 8.0 provides you with separate versions of the MDG Technology for BPMN that support BPMN versions 1.0, 1.1 and 2.0, and BPEL.

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 'Design > Diagram > Toolbox : 'Hamburger'' 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 ('Configure > Technology > Manage').

## 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

Generate Call Activities

If you drag a BPMN 2.0 Global Task or Business Process element from the **Project Browser** onto a diagram, the system creates a Call Activity element containing **Tagged Values** appropriate to the type of element from which the Call Activity was generated.

BPMN Validation

It is possible to validate your BPMN Model, either directly or as part of a simulation using a BPSim Configuration.  
All errors and warnings will be reported in the **System Output** window.  
Either:

* Select a root Package containing a BPMN model, then select the 'Design > Package > Manage > Validation > **Validate** Current Package' option, or
* Within the BPSim Configuration, click on the **Validate button** to validate the model and configuration

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 'Preferences' 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 here to display the **Diagram Toolbox**.

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

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

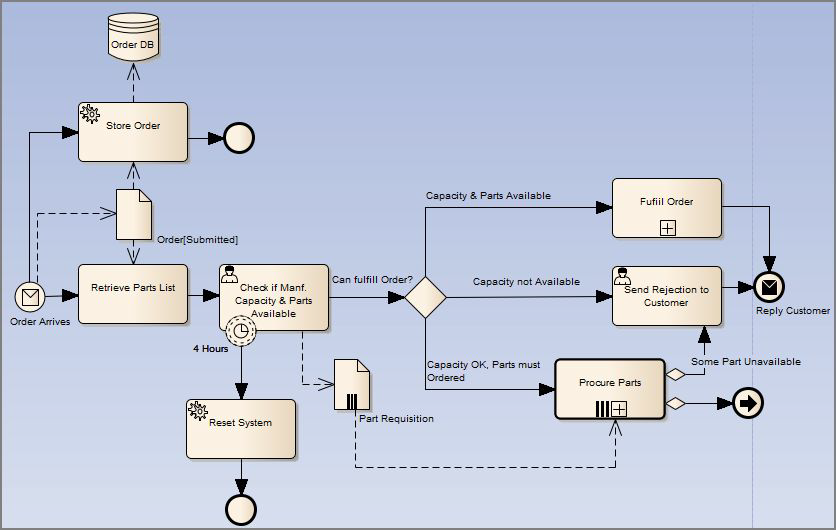
BPMN 2.0 Business Process Elements

|  |  |
| --- | --- |
| 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**

## 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 here 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 |
| 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 |

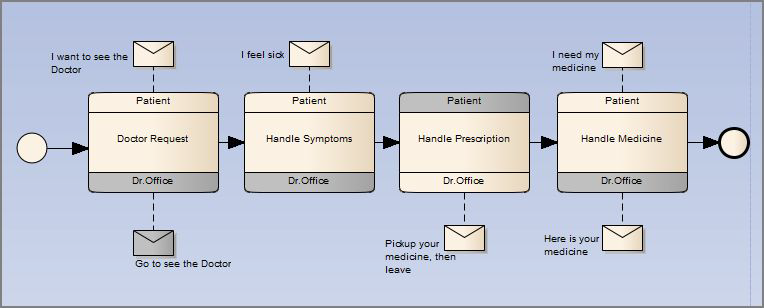
BPMN 2.0 Chorography Elements

|  |  |
| --- | --- |
| 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**

## 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 here 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 |
| 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 |

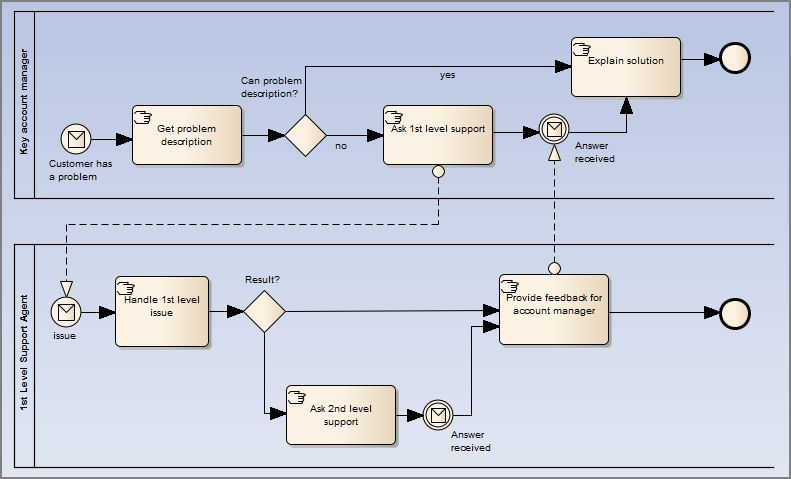
BPMN 2.0  Collaboration Elements

|  |  |
| --- | --- |
| 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**

## 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 here 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 |
| 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**

## 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 here 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> |
| Keyboard Shortcuts | **Alt+5** : 'Hamburger' icon | BPMN 2.0 | BPMN 2.0 <any diagram type> |
| Other | Click the  icon on the Diagram caption bar to display the **Diagram Toolbox**, then  > 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 here, to open the '**Publish Model** Package' dialog.

|  |  |
| --- | --- |
| Ribbon | Publish > Model Exchange > Export XMI > Export 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 here 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 |
| 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**.

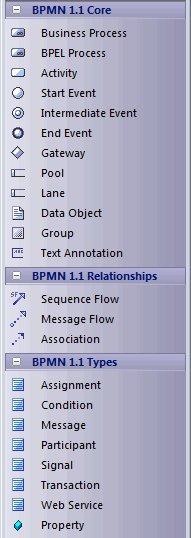
Access

Use any of the methods outlined here 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 |
| 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 |
| 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 might 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](http://www.sparxsystems.com/enterprise_architect_user_guide/13.5/model_domains/bpel11_model.html) from models created using constructs in BPMN 1.1 Profile
* [BPEL 2.0 Model](http://www.sparxsystems.com/enterprise_architect_user_guide/13.5/model_domains/bpel2_models.html) from models created using constructs in BPMN 2.0 Profile

Notes

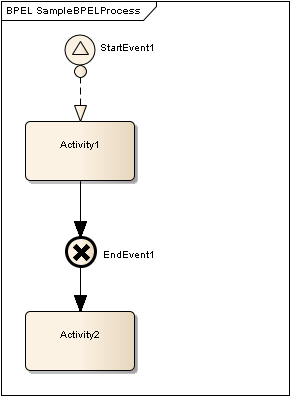
* BPEL is supported in the Business and Software Engineering and the Ultimate editions of Enterprise Architect
* Enable BPMN 1.1 Technology for BPEL 1.1 modeling, and BPMN 2.0 Technology for BPEL 2.0 modeling, in the 'MDG Technologies' dialog ('Configure > Technology > Manage')

## 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**