



Enterprise Architect

User Guide Series

# Maintenance

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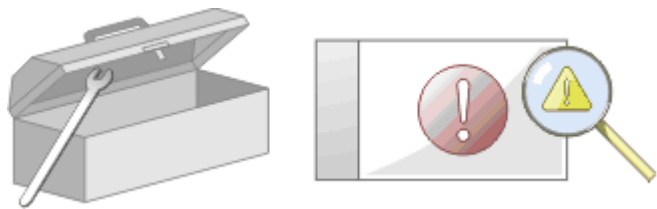
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# Maintenance



In the course of your team's work on a model, changes and issues can arise at a number of levels, for problems that apply system-wide through areas of the model and down to within a specific element. A Change, very broadly, defines an addition or alteration to a requirement, whilst an Issue identifies either a failure to meet a requirement, or a risk in meeting the requirement.

There are two mechanisms that can be used to identify a change or issue, and the work required to resolve it:

- Change and Issue (or Defect) elements - structured comments that identify a problem at system-level, although they can also be attached to a specific element from which a problem arises; both types of element can be linked by relationships such as Association, Dependency and Realize to one or more other elements that have to be reviewed, and for complex problems can form hierarchies or groups
- Maintenance items - properties raised against a specific element and recorded for that element in the Maintenance window; these provide a distinction between Defects (a failure to meet a requirement) and Issues (a risk factor that might affect satisfying the requirement) and also include Tasks, which record work items associated with the element

Maintenance items are very specific, but if an item begins to have a wider impact on other elements or the system in general, you can translate that item into a Change, Issue, or any other type of element that best identifies the problem and its solution

Maintenance items are defects, changes, issues, tasks, events and decisions that apply at the model element level. They are properties of individual model elements that can be used to record and capture problems, changes, issues, tasks, events and decisions as they arise, and document the solution and associated details.

## Maintenance Tasks

Task Area	Detail
Maintenance Items - Element-level	<p>You create maintenance items in the Construct window. Typically you create:</p> <ul style="list-style-type: none"> <li>• A defect to record a failure to meet a requirement for the current model element</li> <li>• A change to record a change in requirement for the current model element</li> <li>• An issue to record a risk factor that might affect the project being recorded for the current model element</li> <li>• A task to record work in progress and work outstanding for the current model element</li> <li>• An event to record the action taken for the current model element</li> <li>• A decision to record the choice taken for the current model element</li> </ul>
Creating and Editing Maintenance Items	<p>Tasks that you might perform when working with maintenance items include:</p> <ul style="list-style-type: none"> <li>• Moving or copying maintenance items between maintenance types</li> <li>• Generating new items of one type from an item of a different type</li> <li>• Creating elements from maintenance Items</li> <li>• Showing maintenance items on elements in a diagram</li> </ul>

	<ul style="list-style-type: none"><li>• Adding a maintenance item directly to an element via in-place editing</li><li>• Generating a report on the status of maintenance items of specific types or all types</li></ul>
Maintenance - System-level	<p>To represent changes, defects and issues that apply to the model you can create Change and Issue elements with - if necessary - subordinate structures.</p> <p>To represent issues and tasks that apply to the progress of the project as a whole and that are not related to model structures, you create Project Status records in Project Management.</p>

## Working on Maintenance Items



Creating, viewing and modifying the Maintenance items - changes, issues, defects, tasks, events and decisions - associated with a particular model element is quick and convenient, using the Construct window and the Maintenance windows. If a Maintenance window is open, when you select an element in a diagram or in the Project Browser, the appropriate maintenance items for that element are immediately listed in the window, and you can select them there to modify in the Construct window. The Maintenance windows provide several facilities for managing the maintenance items.


You can include the maintenance items in the document and web reports generated on your model. The 'Document Setup' dialog has checkboxes to show or hide element maintenance items.

### Access

Ribbon	Start > Explore > Properties > Construct Construct > Change Management > Changes > Show Changes Window Construct > Change Management > Defects > Show Defects Window Construct > Change Management > Issues > Show Issues Window Construct > Change Management > Tasks > Show Tasks Window Construct > Change Management > Events > Show Events Window Construct > Change Management > Decisions > Show Decisions Window
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### Facilities

Facility	Detail
Maintenance Item Types	<p>The six types of Maintenance Item you can create records for are each listed on a separate Maintenance window:</p> <ul style="list-style-type: none"> <li>Defects - each recording a failure to meet a requirement for the current model element</li> <li>Changes - each recording a change in requirement for the current model element</li> <li>Issues - each recording a risk factor that might affect the project, associated with the current model element</li> <li>Tasks - each recording work in progress and work outstanding for the current model element</li> <li>Events - each recording the action taken on a requirement of the current model element</li> <li>Decisions - each recording the choice made on a requirement of the model element</li> </ul> <p>Similarly, the Construct window reflects the type of item you have selected, and you can click on the  icon in the Construct window toolbar to select the type of maintenance item to create ('Maintenance &gt; &lt;item type&gt;').</p>
Adding New Items	<p>To add new items, click on the  icon in the window toolbar on either the</p>

	Maintenance window or the Construct window. In either case, the appropriate fields for the item type are displayed on the Construct window, where you create the item. The fields you complete for each type of maintenance item are very similar.
Applying Automatic Naming/Numbering	<p>On the Construct window you can apply an automatic naming/numbering convention that you have previously defined, to each new item record. To do this, simply click on the  icon next to the 'Name' field.</p> <p>If you already have some text in the 'Name' field, it is over-written by the auto-counter text.</p>
Element Browser	You can also use the Element Browser window to select and display specific items on the Construct window; select the 'Start > Explore > Browse > Element Browser > Maintenance > <maintenance type>' ribbon option and double-click on the required item.


## Notes



- Columns in the item list can be reorganized, added, removed, grouped, filtered and sorted using the options provided in the List Header facilities

## Create Maintenance Items

When you need to create a new maintenance record for an element, you can do so by selecting the 'New' option from the toolbar of the Maintenance window or the Construct window.


### Access

Use one of the ribbon paths outlined here to display the Maintenance window for the type of maintenance item to create, then click on  (the 'New' icon) to display the Construct window for that item type.

Alternatively, display the Construct window directly ('Start > Explore > Properties > Construct >  > Maintenance > <maintenance item type> : )


Ribbon	Construct > Change Management > Changes > Show Changes Window Construct > Change Management > Defects > Show Defects Window Construct > Change Management > Issues > Show Issues Window Construct > Change Management > Tasks > Show Tasks Window Construct > Change Management > Events > Show Events Window Construct > Change Management > Decisions > Show Decisions Window
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### Create maintenance items

Option	Action
Name / Event / Decision	Type the name or a short description of the defect, change, task, issue, event or decision.
Auto	As an alternative to typing in the name, click on the  button to insert predefined auto-counter text. If you already have some text in the 'Name' field, it is over-written by the auto-counter text.
Reported by / Requested by / Raised by	Click on the drop-down arrow and select the user name of the person who initiated the maintenance item.
Date	Defaults to today's date as the date on which the maintenance item was raised; if necessary, change this by clicking on the drop-down arrow and selecting a different date.
Status	Click on the drop-down arrow and select the appropriate status of the maintenance item, such as 'New' or 'Complete'.
Resolved by / Implemented by / Completed by	Click on the drop-down arrow and select the user name of the person who completed and closed the maintenance item.

Date Resolved / Date implemented / Date Completed	Defaults to today's date as the date on which the maintenance item was completed; click on the checkbox to select today's date or, if necessary, change the field by clicking on the drop-down arrow and selecting a different date.
Priority	Click on the drop-down arrow and select the priority for completing the maintenance item.
Version / ID	Type the version number associated with this defect, change, task, event, decision or issue.
Description	Type a longer description of the maintenance item; you can format the text using the Notes toolbar at the top of the field.
History	Enter any notes or references to previous occurrences of this maintenance item; you can format the text using the Notes toolbar at the top of the field.
Save	Click on this button to save the record data.

## Notes

- To edit an item, click on it on the Maintenance window; the item details display in the Construct window for editing
- To delete an item, click on it on either the Maintenance window or the Construct window and click on the  icon in the window toolbar; in response to the confirmation prompt, click on the Yes button
- A further possibility for editing and deleting items is to right-click on items in the Element Browser window and select menu options there; select the 'Start > Explore > Browse > Element Browser > Maintenance > <maintenance type>' ribbon option
- To change the element for which to create or edit maintenance items, click on the new element in the Project Browser



## Move or Copy Maintenance Items

After you define a maintenance item of one type (Defect, Change, Issue, Event, Decision or Task), you might decide that the item either is better suited to another type or forms a good template for items of other types. If so, you can either move or copy the item to the other types.

### Access

Display the appropriate Maintenance window using one of the methods outlined here.

In the Maintenance window:

- Right-click on a maintenance item | Move to | <item type> or
- Right-click on a maintenance item | Copy to | <item type>

Ribbon	Construct > Change Management > Changes > Show Changes Window Construct > Change Management > Defects > Show Defects Window Construct > Change Management > Issues > Show Issues Window Construct > Change Management > Tasks > Show Tasks Window Construct > Change Management > Events > Show Events Window Construct > Change Management > Decisions > Show Decisions Window
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### Move or copy a maintenance item

Step	Action
1	Click on the appropriate option - 'Move to' or 'Copy to'. A list of maintenance item types displays.
2	Click on the item type to which to move or copy the item. A confirmatory prompt displays.
3	Click on the Yes button to confirm the move or copy.
4	Switch to the appropriate type version of the Maintenance window to ensure that the item has been added, double-click on the item to open it in the Construct window and make any necessary changes.
5	If you are copying the item to more than one other item type, repeat steps 1 to 4 for the next item type to copy to.

## Create Elements From Maintenance Item

A maintenance item identifies a defect, change, issue, event, decision or task concerning an element. The maintenance item could itself be represented by an element if it has wider implications for the project or identifies - for example - an actor, activity or action that requires further definition.

You can create one or more elements from any maintenance item, using the Maintenance window. The new element is connected to the maintenance item's parent element by a Dependency connector. The original maintenance item remains unchanged as a characteristic of its parent element.

### Access

Use one of the methods outlined here to display the Maintenance window appropriate to the maintenance item from which to create a model element.

In the Maintenance window: Right-click on the maintenance item > Create as New Element

Ribbon	Construct > Change Management > Changes > Show Changes Window Construct > Change Management > Defects > Show Defects Window Construct > Change Management > Issues > Show Issues Window Construct > Change Management > Tasks > Show Tasks Window Construct > Change Management > Events > Show Events Window Construct > Change Management > Decisions > Show Decisions Window
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### Create an element from a maintenance item

Step	Action
1	<p>On the 'New Element' dialog, complete the fields.</p> <p>In the 'Type' field, select the required element type; you might create:</p> <ul style="list-style-type: none"> <li>• An Issue element for a Defect or Issue maintenance item</li> <li>• A Change element for a Change item, or</li> <li>• An Action for a Task item</li> </ul> <p>You can, however, create a wide range of other element types should any of these be more appropriate.</p> <p>When you click on the Save button, the new element is added to the Project Browser. You can drag and drop it onto a diagram from there.</p>

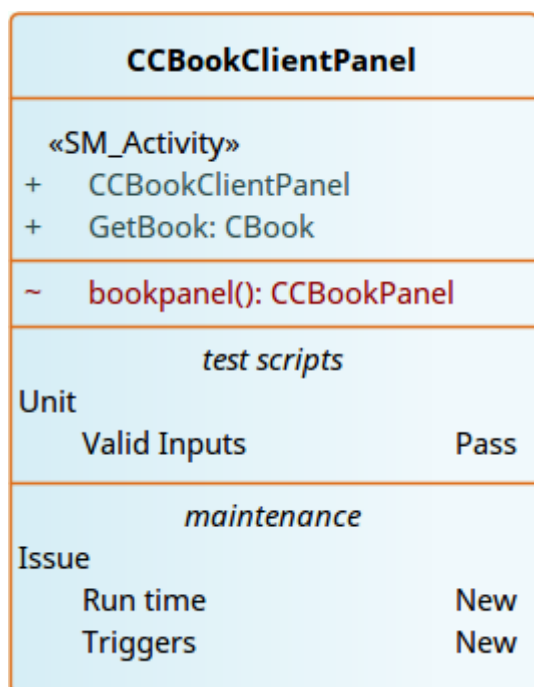
## Show Maintenance Items in Diagram

When you have created a maintenance item, it is useful to make the record visible on its parent element. You can do this by displaying the record within a maintenance compartment on the element as it displays in a diagram. Any element that is capable of displaying a compartment, and that has maintenance items assigned to it, can show the items in a diagram.

### Show maintenance items in a diagram

Step	Action
1	Open a diagram containing the element with the attached maintenance items.
2	Double-click on the diagram background to display the diagram 'Properties' dialog. Click on the 'Elements' tab.
3	In the 'Show Compartments' panel, select the 'Maintenance' checkbox.
4	Click on the OK button to save the setting.  Each maintenance item now appears in the maintenance compartment of the diagram element. Items of each type are grouped together so that, for example, all Issues on the element are grouped under the heading 'Issue', and all Tasks on the element are grouped under the heading 'Task'.  If you click on a maintenance item and the Construct window is open, the item details are immediately displayed in the window. If the Construct window is not open, click twice on the item.

### Maintenance Compartment - Example





## Changes, Defects and Issues

If your work in managing a project identifies issues, defects or required changes in the model rather than internal to a single element, you can represent these using Change, Issue or Defect elements as structured comments with which you can track and manage the problems.

- A Change element corresponds to a change in requirements for the current system
- An Issue element corresponds to a failure to match the requirements for the current system due to newly arisen organizational or legal factors such as staffing problems, changes in laws or guidelines, or business unit restructuring
- A Defect element corresponds to a failure to match the requirements for the current system due to a flaw in the model, system or process, such as a missing element or module, or no inclusion of a necessary actor

You can also define any specific work to be done in researching or resolving the problem using Task elements, and assign resources to these or directly to the Change, Issue or Defect elements internally, in Resource Allocation, or externally as Actors.

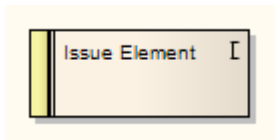
The use of maintenance elements provides a broad scope for managing changes, defects and issues, providing the facility to fully define the problem and its resolution with linked documents, both internal and external Notes, and Composite Structure diagrams including Interaction and Activity diagrams.

You can create Change, Defect and Issue elements in various UML diagrams (especially Maintenance diagrams) and connect them using Realization, Dependency, Aggregation and other relationships to show what model elements each problem affects and how each is resolved. Within the element 'Properties' dialog for Changes, Defects and Issues you can identify the problem as the element name and record relevant management details, such as owner and dates.

A useful tool in managing problems and changes is the Relationship Matrix, in which you might - for example - link staff (Actors) through Realization connectors to Issues. Each highlighted square in the Matrix indicates the responsibility of a staff member to work on or correct a named Issue.

## Issues

In your modeling, issues concerning the development of the system or model might arise; more formally, you encounter a failure to meet defined requirements for the current system. You can represent this failure using an Issue element, which is a structured comment containing information about the issue and the measures taken to manage it. The element is rendered as shown.



You can link Issues to model elements that are responsible for the issue, using Realize connectors. You can also create a hierarchy of related Issues using Aggregation connectors. Each Issue element has a status band at the left end, which is color coded to visually represent the value of the 'Status' field in the element properties. The element has an identifying 'I' in the top right corner, which you can hide if you prefer not to show it.

You can create Issue elements on most types of diagram, although the Maintenance diagram is specifically designed for displaying and managing them. You can also create your own issue-management diagram as a Custom diagram. You can add the Issue (and other) elements to the diagram from the Diagram Toolbox, or directly to a Package in the Project Browser.

### Add an Issue to the model using the Toolbox

Step	Action
1	Open the Maintenance or Custom (or other) diagram to define the problem.
2	From the 'Custom' pages or 'Common' page of the Diagram Toolbox, drag the Issue icon onto the diagram.
3	If the Properties window is not already displayed, press Alt+I on the element. Record the name and details of the Issue, in the Properties window.

### Add an Issue to the model using the 'New Element' dialog

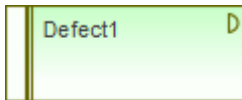
Step	Action
1	Identify the Package in which to record the Issue, in the Project Browser. Right-click on this Package and select the 'Add Element' option.
2	Complete the fields on the 'New Element' dialog - in the 'Type' field, click on the drop-down arrow and select 'Issue'.
3	When you have created the element, record the name and details of the Issue, in the Properties window.

## Notes

- To toggle display of the letter 'I' in the top right corner of the element, select or deselect the 'Show stereotype icon for requirements' checkbox on the 'Preferences' dialog, 'Objects' page

## Defects

In your modeling, problems in the development of the system or model might arise; more formally, you encounter an obstacle to meeting defined requirements for the current system, through a defect of the model, system or process. You can represent this failure using a Defect element, which is a structured comment containing information about the defect and the measures taken to manage it. The element is rendered as shown.



You can link Defects to model elements that are responsible for the problem, using Realize connectors. You can also create a hierarchy of related Defects using Aggregation connectors. Each Defect element has a status band at the left end, which is color coded to visually represent the value of the 'Status' field in the element properties. The element has an identifying 'D' in the top right corner, which you can hide if you prefer not to show it.

You can create Defect elements on most types of diagram, although the Maintenance diagram is specifically designed for displaying and managing them. You can also create your own defect-management diagram as a Custom diagram. You can add the Defect (and other) elements to the diagram from the Diagram Toolbox, or directly to a Package in the Project Browser.

### Add a Defect to the model using the Toolbox

Step	Action
1	Open the Maintenance or Custom (or other) diagram to define the problem.
2	From the 'Custom' pages of the Diagram Toolbox, drag the Defect icon onto the diagram.
3	If the Properties window is not already displayed, press Alt+1. Record the name and details of the Defect, in the Properties window.

### Add a Defect to the model using the 'New Element' dialog

Step	Action
1	Identify the Package in which to record the Defect, in the Project Browser. Right-click on this Package and select the 'Add Element' option.
2	Complete the fields on the 'New Element' dialog - in the 'Type' field, click on the drop-down arrow and select 'Defect'.
3	When you have created the element, record the name and details of the Defect, in the Properties window.

## Notes

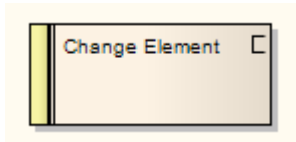
- To toggle display of the letter 'D' in the top right corner of the element, select or deselect the 'Show stereotype icon



for requirements' checkbox on the 'Preferences' dialog, 'Objects' page

## Changes

In your modeling it might become necessary to change an aspect of the system or model; more formally, you need to request and manage a change in the defined requirements for the current system. You can represent this change request using a Change element, which is a structured comment containing information about the change and the measures taken to manage it. The element is rendered as shown.



You can link Changes to model elements that are impacted by the change, using Realize connectors. You can also create a hierarchy of related Changes using Aggregation connectors. Each Change element has a status band at the left end, which is color coded to visually represent the value of the Status field in the element properties. The element has an identifying C in the top right corner, which you can hide if you prefer not to show it.

You can create Change elements on most types of diagram, although the Maintenance diagram is specifically designed for displaying and managing them. You can also create your own change-management diagram as a Custom diagram. You can add the Change (and other) elements to the diagram from the Diagram Toolbox, or directly to a Package in the Project Browser.

### Add a Change to the model using the Toolbox

Step	Action
1	Open the Maintenance or Custom (or other) diagram in which to define the problem.
2	From the 'Custom' or 'Common' pages of the Diagram Toolbox, drag the Change icon onto the diagram.
3	If the Properties window is not already displayed, press Alt+1. Record the name and details of the Change, in the Properties window.

### Add a Change to the model using the 'New Element' dialog

Step	Action
1	Identify the Package in which to record the change, in the Project Browser. Right-click on this Package and select the 'Add Element' option.
2	Complete the fields on the 'New Element' dialog - in the 'Type' field, click on the drop-down arrow and select 'Change'.
3	When you have created the element, record the name and details of the Change, in the Properties window.

## Notes

- To toggle display of the letter 'C' in the top right corner of the element, select or deselect the 'Show stereotype icon for requirements' checkbox on the 'Preferences' dialog, 'Objects' page

# Maintenance Diagram

A Maintenance diagram is a type of Custom diagram, an extension to the UML model. It is a change management tool, used to record:

- Requests for change to the model structure or project process, as Change elements
- Issues that impact the development and progress of the project, as Issue elements, and
- Groups of tests that can be applied to many elements rather than specific elements, as Test Cases

Each Change, Issue or Test Case element can link to other model elements in the project, to illustrate how they contribute to or are impacted by the item, and how they must be modified, removed, applied or extended to provide a solution. This includes identifying areas of work, represented by Task elements, to which resources can be allocated as either external (Actor) elements or internal properties (resource allocation).









You generate Maintenance diagram elements and connectors from the 'Maintenance' pages of the Diagram Toolbox, although you might also make frequent use of connectors from other pages.

## Example Diagram


[Example Maintenance Diagram](#)

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## Maintenance Diagram Element Toolbox Icons

Icon	Description
 Package	A Package is a namespace as well as an element that can be contained in other Package's namespaces.
 Issue	Issue elements represent a failure to meet defined requirements for the current system.
 Change	This element represents a change in the defined requirements for the current system and can be used to request and manage the change process.
 Task	A Task element represents a task that must be performed in relation to an element.
 Test Case	A Test Case is a stereotyped Use Case element. You might use it to extend the facilities of the Testing window, by applying element properties and capabilities to the tests of a feature represented by another element or - more appropriately - set of elements.
 Entity	An Entity is a stereotyped Object that models a store or persistence mechanism that captures the information or knowledge in a system.
 Test	A Test element represents a step in the Basic, Alternate and Exception Paths of a Scenario created in a Use Case or other element.
 Defect	The defect element represents an obstacle to meeting defined requirements for the current system.

## Maintenance Diagram Connector Toolbox Icons

Icon	Description
 <b>Aggregate</b>	An Aggregation connector is a type of association that shows that an element contains or is composed of other elements.

## Example Maintenance Diagram

Very simply, this example diagram depicts a request for a change (C) to a process represented by an Activity element (Transfer WH Receipts to Active Stock). The change currently involves the Task (T) of reviewing the interface between two recording systems, one of which could be affected by an Issue (I) concerning an external stocktaking system.

