



Enterprise Architect

User Guide Series

Maintenance

In Sparx Systems Enterprise Architect, Maintenance items (such as defects, tasks and events) are managed as element properties. Change and Issue elements identify conditions affecting several elements. Status records define issues concerning a project.

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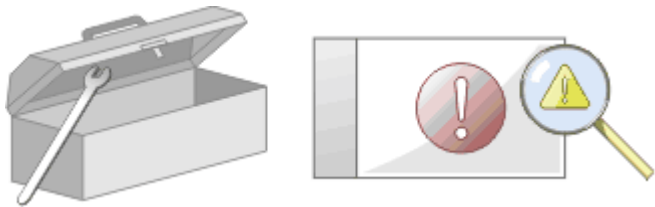
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Maintenance



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, features and documents 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 and tasks 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 Maintenance window. Typically you create:</p> <ul style="list-style-type: none"> • A defect to record a failure to meet a requirement for the current model element • A change to record a change in requirement for the current model element • An issue to record a risk factor that might affect the project being recorded for the current model element • A task to record work in progress and work outstanding for the current model element • A feature to record a feature in requirement for the current model element • A document to record supporting documentation such as Help, release notes and user comments
Creating and Editing Maintenance Items	<p>Tasks that you might perform when working with maintenance items include:</p> <ul style="list-style-type: none"> • Moving or copying maintenance items between maintenance types • Generating new items of one type from an item of a different type • Creating elements from maintenance items • Showing maintenance items on elements in a diagram

	<ul style="list-style-type: none">• Adding a maintenance item directly to an element via in-place editing• Generating a report on the status of maintenance items of specific types or all types
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 Issue and Project Task records in Project Management.</p>

Working on Maintenance Items

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

Click on an element in the Browser window or diagram and select the appropriate ribbon option.

Ribbon	Construct > Change Management > Features > Show Features Window Construct > Change Management > Changes > Show Changes Window Construct > Change Management > Documents > Show Documents Window Construct > Change Management > Issues > Show Issues Window Construct > Change Management > Tasks > Show Tasks Window Construct > Change Management > Defects > Show Defects Window
Keyboard	Ctrl+8 <Required tab> Select any of the above items on a diagram or Element tab of the browser then use Shift+Enter

Facilities

Facility	Detail
Maintenance Item Types	<p>The six types of Maintenance Item you can create records for are each listed on a separate tab of the Maintenance window:</p> <ul style="list-style-type: none"> Defects - each recording a failure to meet a requirement for the current model element Changes - each recording a change in requirement for the current model element Issues - each recording a risk factor that might affect the project, associated with the current model element Tasks - each recording work in progress and work outstanding for the current model element Features - each recording a feature in requirement for the current model element Documents - each recording the supporting documentation such as Help, release notes and user comments <p>There is also an 'Overview' tab that displays a read-only list of all the Maintenance items on the element, grouped by type. If you double-click on an item in this list, the appropriate tab displays with the item highlighted.</p>

Adding New Items	<p>To add new items, right-click on the main panel of the Maintenance window and select the 'Add New' option. The appropriate fields for the item type are displayed on the '<Maintenance Item Type> details for <element>' dialog, where you create the item.</p> <p>The fields you complete for each type of maintenance item are very similar.</p>
Applying Automatic Naming/Numbering	<p>On the '<Maintenance Item Type> details for <element>' dialog, 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 Auto button next to the 'Detail' field.</p> <p>If you already have some text in the 'Detail' field, it is over-written by the auto-counter text.</p>
Element tab	<p>You can also use the 'Element' tab of the Browser window to create, select and display specific items on the '<Maintenance Item Type> details for <element>' dialog. Select the 'Start > Desktop > Design > Browser' ribbon option to open the Browser window, select 'Element' tab and the 'Maintenance > <maintenance type>' list, and either:</p> <ul style="list-style-type: none">• Double-click on an existing item to show and - if necessary - change the details, or• Right-click on the appropriate '<maintenance type>' folder name and select the 'New <item type>' option to create a new 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 'Add New' context menu option in the Maintenance window.

Access

Use one of the access paths outlined here to display first the Maintenance window at the appropriate tab for the type of maintenance item to create, then the '<Maintenance Item Type> details for <element type>' dialog for that item type.

Ribbon	Construct > Change Management > Features > Show Features Window > right-click Add New Construct > Change Management > Changes > Show Changes Window > right-click Add New Construct > Change Management > Documents > Show Documents Window > right-click Add New Construct > Change Management > Issues > Show Issues Window > right-click Add New Construct > Change Management > Defects > Show Defects Window > right-click Add New Construct > Change Management > Tasks > Show Tasks Window > right-click Add New
Keyboard	Ctrl+8 > <required tab> Right-click Add New Select any of the Maintenance items on a diagram or on the 'Element' tab of the Browser window, then press Shift+Enter

Create Maintenance items on the Maintenance dialog

Option	Action
Detail	Type the name or a short description of the change, defect, task, issue or document.
Auto	As an alternative to typing in the name, click on this button to insert predefined auto-counter text. If you already have some text in the 'Detail' 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'.

Priority	Click on the drop-down arrow and select the priority for completing the maintenance item.
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	Select 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.
Version / ID	Displays the version number assigned to this defect, change, task, issue or document. If you want to refer to this maintenance item from another element or document, click on the Copy button to copy the ID to the clipboard, from where it can be pasted into the other text.
Description	Type a longer description of the maintenance item; you can format the text using the Notes toolbar at the top of the field. The text you enter here is also displayed and can be edited in the Notes window.
History	Over time, enter any notes on the actions concerning this maintenance item; you can format the text using the Notes toolbar at the top of the field. The text you enter here is also displayed and can be edited in the Notes window.
Apply	Click on this button to save the record data and keep the dialog open.
OK	Click on this button to save the record data and close the dialog.
Close	Click on this button to discard the unsaved record data and close the dialog.
New	Click on this button to clear the dialog fields ready to define a new maintenance item.
left chevron/right chevron	If there are existing items, click on these buttons to display the details of the previous item or next item in the sequence.

Create Maintenance Items on the Maintenance Window

An alternative method of creating simple Maintenance items is to display the Maintenance window as indicated in the *Access* section, but complete the fields on the window rather than go on to display the 'Maintenance' dialog. In this way you can quickly create a set of basic Maintenance items at once and then add more detail to individual items as necessary at a later time.

To create an item:

1. Display the appropriate tab for the type of item.
2. Double click on the *Add new <item type>* text and type in the name of the item.
3. Tab to the 'Status' field; the 'Status', 'Priority' and 'Date Reported' fields display default values. If these are acceptable to you, the Maintenance item is created and available for future editing.
4. If you want to change the field values, click once on the field and once on the drop-down arrow, and select the appropriate value.

Notes

- To edit an item, double-click on it on the Maintenance window; the item details display in the '<Maintenance Item Type> details for <element type>' dialog for editing
- To delete an item, right-click on it on the Maintenance window and select the 'Delete' option; 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' tab of the Browser window and select menu options there; select the 'Start > Desktop > Design > Browser > Element > Maintenance > <maintenance type>' ribbon option
- To change the element for which to create or edit maintenance items, click on the new element on a diagram or in the 'Project' tab of the Browser window

Properties Window for Maintenance Items


When the Properties window is open, it displays the properties of the selected object or assigned item, including a Maintenance record for an element. These items include Changes, Issues, Defects, Tasks, Features and Documents.

You might select the item in the appropriate tab of the Maintenance window, the *maintenance* compartment of an element on a diagram, or the 'Element' tab of the Browser window.

The Properties window identifies the type of item just under the toolbar, and shows the current values for the:

- Item name
- User who raised the item
- Date the item was raised
- Status
- User who implemented or resolved the item
- Date that action was completed
- Priority of the item
- Version of the item

You can change the value for each of these fields (except for the 'Name' and 'Version' fields), clicking on the drop-down arrow and selecting a new value.

For the 'Name' field, you can either overtype the item name or click on the  icon and apply any autonaming convention you have configured for maintenance items. If you click on the icon for the 'Version/ID' field, that value is copied to the clipboard to be pasted into a discussion or document.

The toolbar options operate on the parent element for the maintenance item. Any changes you make are automatically saved and displayed elsewhere when you click off the field.

Move or Copy Maintenance Items

After you define a maintenance item of one type (Defect, Change, Issue, Document, Feature 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 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 > Features > Show Features Window Construct > Change Management > Changes > Show Changes Window Construct > Change Management > Documents > Show Documents Window Construct > Change Management > Issues > Show Issues Window Construct > Change Management > Tasks > Show Tasks Window Construct > Change Management > Defects > Show Defects Window
Keyboard	Ctrl+8 > <required tab>

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 tab of the Maintenance window to ensure that the item has been added.
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, task, feature or document 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

The 'New Element' dialog displays.

Ribbon	Construct > Change Management > Features > Show Features Window Construct > Change Management > Changes > Show Changes Window Construct > Change Management > Documents > Show Documents Window Construct > Change Management > Issues > Show Issues Window Construct > Change Management > Tasks > Show Tasks Window Construct > Change Management > Defects > Show Defects Window
Keyboard	Ctrl+8 > <required tab for item type> Select any of the Maintenance items on a diagram or in the 'Element' tab of the Browser window, then press Shift+Enter

Create an element from a maintenance item

On the 'New Element' dialog, complete the fields.

Field/Option	Action
Toolset	The two 'Toolset' fields default to the last-set domain and Perspective. If these are not appropriate to this task, click on the drop-down arrows and select the correct domain and Perspective.
Name	The 'Name' field defaults to the name of the Maintenance item. If necessary you can overtype it with a different name, or click on the Auto button to apply a name from your auto naming and numbering system.
Type	Click on the drop-down arrow and select the required element type; you might create: <ul style="list-style-type: none"> • An Issue element for a Issue maintenance item • A Defect element for a Defect maintenance item • A Change element for a Change or Feature maintenance item, or • A Task for a Task maintenance item

	The types are filtered by the Toolset you have selected; if the element type you require is not listed, you can change the Toolset to provide that type. You can, therefore, create a wide range of other element types should any of these be more appropriate.
Stereotype	If you require the element type you have selected to be refined by a stereotype, click on the drop-down arrow and select the stereotype name. The stereotypes are listed in alphabetical order.
Add Element to Diagram	This option is enabled when you have a diagram open. If you want the new element to be added to a diagram, have that diagram open and select this checkbox.
Save	Click on this button to add the new element to the Browser window and, if appropriate, the diagram.

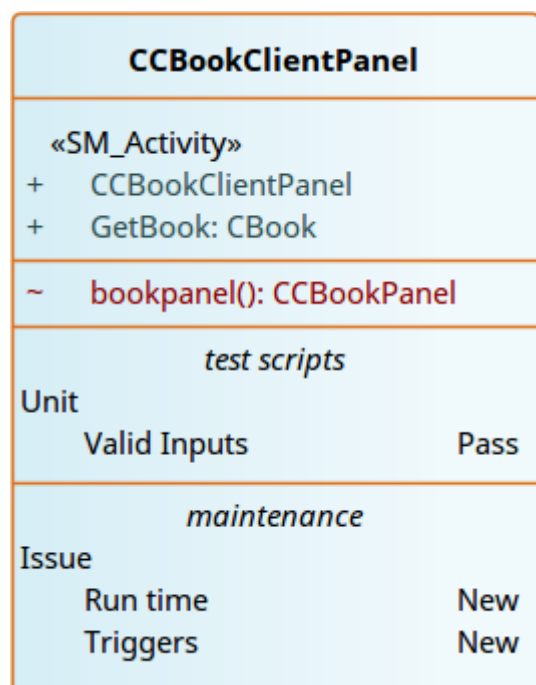
Show Maintenance Items in Diagram

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 <i>maintenance</i> 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 double-click on a maintenance item, the '<maintenance item type> for <element>' dialog displays and you can edit the details of 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.

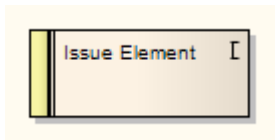
The use of maintenance elements provides a broad scope for managing changes, defects and issues, providing the facility to fully define the problem and its resolution with Linked Documents, both internal and external Notes, and Composite Structure diagrams including Interaction and Activity diagrams.

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 Browser window.

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 Ctrl+2 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

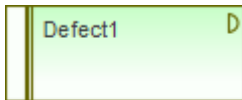
Step	Action
1	Identify the Package in which to record the Issue, in the Browser window. Right-click on this Package and select the 'Add Element' option.
2	Complete the fields on the 'New Element' dialog - in the 'Type' field, click on the drop-down arrow and select 'Issue'.
3	When you have created the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

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 Ctrl+2. 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 Browser window. 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.

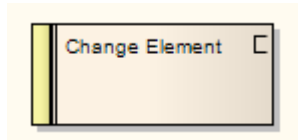
Notes

- 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 Browser window.

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 Ctrl+2. 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 Browser window. 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.
 Review	The Review element acts as a focus for performing a formal review of one or more

	model elements. It defines the parameters of the review.
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Maintenance Diagram Connector Toolbox Icons

Icon	Description
 Aggregate	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.

