Enterprise Architect

User Guide Series

Testing

Author: Sparx Systems

Date: 30/06/2017

Version: 1.0

Table of Contents

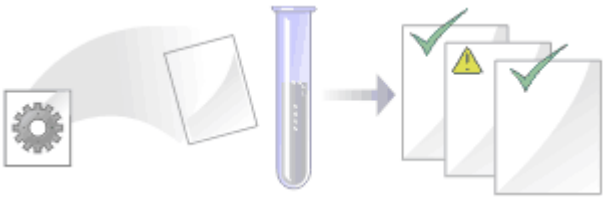
Testing

It is important in any project to perform quality control of both the process and the output of the project; Enterprise Architect provides several facilities for testing and validating your model structure and content, including Integration with the unit testing tools JUnit and NUnit.

Facilities

Facility	Description
Testing 	Create and manage test scripts for model elements. Explore the Testing UI supporting unit, integration, scenario, system, acceptance and inspection tests.
Model Validation 	Check UML elements, diagrams or Packages against known UML rules (identified in configuring validation) and constraints defined within the model, using the Object Constraint Language (OCL). Define your own checks against custom rules and constraints. See the Model Validation topic for more information on setting up model validation rules.
Testpoint Management 	Pass or fail application tasks, viewing test results in real time as the program executes and results are saved. See the section on Testpoints management for more information on setting up and running automated tests.

Test Management



Enterprise Architect is not only a UML Modeling environment, it is also a complete Test Management environment. Using Enterprise Architect you can create and manage test scripts for model elements, developing unit, integration, scenario, system, acceptance and inspection tests; these can include test cases generated from xUnit testing and Testpoint Management.

You can also import tests from other elements, generate them from scenarios, and generate test documentation and reports; you can indicate the presence of tests on an element by displaying test information on the element in a diagram.

It is simple to attach even complex tests to any model element. Keeping the model elements and the testing documentation in one integrated model significantly improves the communication between the test-team and the software developers and architects.

The system's detailed search facilities make it easy to find failing test cases, test cases not run and test cases that have been passed; using the testing and search capabilities, it is easy to navigate through the model and quickly locate problem spots, design flaws and other critical issues.

Test Tasks

Tasks	Detail
Create Tests	You create tests in the 'Testing Workspace', and using the 'Test Details' dialog. Typically, you create: • Unit tests for things that are being built, such as Classes and components • Integration tests to test how components work together • System tests to ensure the system meets business requirements • Acceptance tests to test user satisfaction • Scenario tests to test the end-to-end suitability and functionality of the application • Inspection tests for peer review of things that are being built using a well defined process These test categories are otherwise referred to as test Classes; the type of Class is internally identified by a value from 1 to 6 corresponding to the test types in the order listed above.
Using Tests	Tasks that you might perform when working with tests include: • Import a scenario as a test • Move or copy tests between test classes • Import a test from other elements • Import a responsibility or constraint as a test • Create a maintenance item from a test • Generate a Test Details report • Show test script compartments

	• Create test documentation

Notes

- Most of the tasks identified above relate to a tests for a single element
- You can make a set of tests available to a number of elements by performing the above tasks on a Test Case element and then associating that Test Case with each of the other elements; the Test Case element also helps to make tests more visible in diagrams, the Project Browser, windows and searches

Create Test Records

When you need to create or edit a test record on an element, for any of the six types of test, you can do so using either the Testing window in Item mode, or the 'Test details' dialog. The 'Test details' dialog displays when you select the 'New' option or double-click on a test entry on the Testing window in List mode.

Whichever type of test you are recording, and whichever dialog you use, you complete effectively the same fields.

Access

Ribbon	Construct > Testing > Test Windows > <test class> :  (toolbar 'New' icon)
Keyboard Shortcuts	Alt+3 :  (toolbar 'New' icon)

Create a test record

Field/Button	Action
Test	Type the name of the test. This can be any alphanumeric text string you want to use.
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 'Test' field, it is over-written by the auto-counter text.
Status	Click on the drop-down arrow and select the value indicating the current status of the test (Not Run, Pass, Fail, Deferred and Canceled).
Type	Click on the drop-down arrow and select the value indicating the type of test (Load, Regression or Standard).
Class Type (Class on the 'Test details' dialog)	This field defaults to the class (type) of test selected in the drop-down field at the left of the Testing window Toolbar - Unit, Acceptance, Scenario, Integration, Inspection or System. If you are creating a different class of test, click on the drop-down arrow and select that class.
Run By	Click on the drop-down arrow and select the name of the person who ran the test.
Checked By	Click on the drop-down arrow and select the name of the person who checked the test run.
Last Run (Run Date on the 'Test Details' dialog)	Click on the drop-down arrow and select the date on which the test was last run.

Result	('Test Details' dialog) Click on the drop-down arrow and select the value indicating the results of the test (Not Run, Pass, Fail, Deferred and Canceled).
Append to Test Result	('Test Details' dialog) Select this checkbox to reproduce the Test Run data in the 'Results' tab for the test.
Description	Type a description of the test; you can format the text using the Notes toolbar at the top of the field. This text is also reflected in the Notes window, but cannot be edited there.
Input	Type in the input data provided to the test; you can format the text using the Notes toolbar at the top of the field. This text is also reflected in the Notes window, but cannot be edited there.
Acceptance Criteria	Type the acceptance or test success conditions; you can format the text using the Notes toolbar at the top of the field. This text is also reflected in the Notes window, but cannot be edited there.
Results	Type the results of the last test; you can format the text using the Notes toolbar at the top of the field. This text is also reflected in the Notes window, but cannot be edited there.
Previous	('Test Details' dialog) If earlier test records exist, click on this button to reset the fields to the values of the previous test record.
Next	('Test Details' dialog) If you are looking at an earlier test record, click on this button to reset the fields to the values of the next most recent test record.
New	('Test Details' dialog) Click on this button to clear the fields so that you can enter the information for a new test record.
OK	('Test Details' dialog) Click on this button to save the new or changed data and close the dialog.
Close	('Test Details' dialog) Click on this button to close the dialog without saving the new or changed data.
Apply	('Test Details' dialog) Click on this button to save the new or changed data without closing the dialog.

Notes

- On the 'Test Details' dialog, you can add multiple test cases in one batch using the New button and Apply button
- On the 'Test Details' dialog, if you have several tests of one category (such as Unit or Integration), once you have saved a new test (click on the Apply button) or displayed an existing test, you can work backwards and forwards through any other existing tests of that category, by clicking on the Previous button and Next button
- To display an existing item for editing, click on the item in the left-hand panel in Item mode, or double-click on the item in List mode to display the 'Test Details' dialog
- To delete an item, right-click on it on the Testing window and click on the Delete 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 and select menu options there; to access an item through the Element Browser, click on the  icon in the Testing window toolbar and click on the required item in the *Testing* folder in the Element Browser window
- To change the element for which to create or edit test items, click on the element in the Project Browser
- In the Corporate, Business and Software Engineering, System Engineering and Ultimate editions of Enterprise Architect, if security is enabled you must have 'Manage Tests' permission to add, update and delete test records

Working On Test Records

Creating and working on element Test records is quick and convenient, using the Testing window or Workspace. If the Testing window is open, when you select an element in a diagram or in the Project Browser, the tests for that element are immediately listed in the window ready for modification or addition. The window provides several facilities for creating and managing the test records.

Access

Ribbon	Construct > Testing > Test Windows > <test class>
Keyboard Shortcuts	Alt+3

Facilities

Facility	Detail
Window Formats	The Testing window has two formats - Item mode and List mode. • Item mode provides a list on the left hand side from which you select a test record, the details of which then display in the fields in the rest of the window; you can edit these fields directly • List mode consists of a list of test records with summary data distributed across the columns; you cannot directly edit these fields To toggle between the modes, click on  (the Show/Hide Properties button) in the window toolbar.
Adding New Items	To add new items, click on the 'New' icon in the window toolbar. In: • Item mode, this clears the fields for new data • List mode, this displays the 'Test Details' dialog, which you complete in the same way as the Testing window in Item mode
Applying Automatic Naming/Numbering	On the Testing window in Item mode, or on the 'Test details' dialog, you can apply an automatic naming/numbering convention that you have previously defined, to each new test record. To do this, simply click on the Auto button next to the 'Test' field. If you already have some text in the 'Test' field, it is over-written by the auto-counter text.
Test Types	The six types of test you can create records for are: • Unit tests - to test Classes, Components and other elements as programmers build them • Integration tests - to test how the constructed components work together • System tests - to test that the system performs the right business functions correctly • Acceptance tests - to test the system against user requirements

	• Scenario tests - to test the application with real-world situations and scenarios; an end-to-end test of all functions • Inspection tests - to record peer reviews using a well defined process The fields you complete for each type of test are identical. You can filter the display to show tests of a specific type, or all types of test, using the drop-down arrow at the left hand end of the toolbar.
Element Browser	You can also use the Element Browser window to select and display specific items on the Testing window; click on the  icon in the Testing window toolbar to display the Element Browser, open the Testing folder and the appropriate test type group (one of the six listed in *Test Types*), and select the required test record.

Notes

- In the Corporate, Business and Software Engineering, System Engineering and Ultimate editions of Enterprise Architect, if security is enabled you must have Manage Tests permission to add, update and delete test records
- The Testing window can be docked to the application workspace
- Columns in the List mode can be reorganized, added, removed, grouped, filtered and sorted using the options provided in the List Header facilities

Move or Copy Tests Between Test Classes

After you define a test within one test class (Unit, Integration, System, Acceptance, Inspection or Scenario), you might decide that the test either is better suited to another test class, or forms a good template for tests in other classes. If so, you can either move or copy the test to the other classes.

Access

Ribbon	Construct > Testing > Test Windows > <test class> > right-click on test to move/copy
Keyboard Shortcuts	Alt+3 : right-click on test to move/copy

Move or copy a test

Step	Action
1	Click on the appropriate option - 'Move to' or 'Copy to'. A list of test classes displays.
2	Click on the test class to which to move or copy the test. A confirmatory prompt displays.
3	Click on the Yes button to confirm the move or copy.
4	Change the test class selected on of the Testing window to the target class, to check that the test has been added, and make any necessary changes.
5	If you are copying the test to more than one other test class, repeat steps 1 to 4 for the next class to copy to.

Notes

- If you move or copy a test into the Scenario class, some unassociated data could be lost

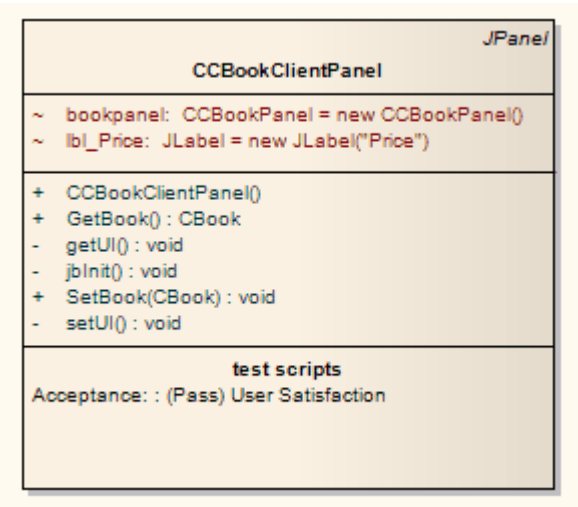
Show Test Script Compartments

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

Show the Test Scripts on an element in a diagram

Step	Action
1	Open a diagram containing the element with the attached test 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 'Testing' checkbox.
4	Click on the OK button to save the setting. Each test now appears as an item in the test scripts compartment of the diagram element.

Example



Create Maintenance Item From Test

If an element fails a test, one likely consequence is that a Defect (Issue) item has to be raised in model maintenance to correct the problem. You can generate this Defect item directly from the test that failed.

Access

Select an element, then use one of the methods outlined here to display the Testing window and show the required class of tests. Then, in the Testing window:

- Right-click on test | Create a Maintenance Defect from this test

Alternatively, select an element, then open the Element Browser window and within the *Testing* folder:

Right-click on test | Create a Maintenance Defect from this test

Ribbon	Construct > Testing > Test Windows > <test class> > Right-click on test > Create a Maintenance Defect from this test Start > Explore > Element Browser > Right-click on test > Create a Maintenance Defect from this test
Keyboard Shortcuts	Alt+3 : <test class> | Right-click on test | Create a Maintenance Defect from this test Alt+9 : Right-click on test | Create a Maintenance Defect from this test

Create a Maintenance item from a test

Step	Action
1	The system immediately creates the Defect item and displays a confirmation message box. Click on the OK button to clear the message.
2	Open the Maintenance window ('Construct > Change Management > Defects > Show Defects Window'). The tab shows a Defect item having the same name as the test. The Description, Input, Acceptance Criteria and Results texts from the test are all displayed in the Defect's 'Description' tab under separate headings.
3	Complete the Defect item as necessary - you might provide values for the 'Reported By', 'Status' and 'Priority' fields.

Notes

- You can create Maintenance Defect items from several Test items at once; press and hold Shift as you select the Test items, and then right-click and proceed as above - each selected Test item then generates a Defect item

Import Scenario as Test

If you are creating a test for a scenario from either a single element or many elements in a Package, you do not have to manually re-type the scenario details into the test record in the Testing window. You can generate the test into the 'Scenario' tab of one element from one or more scenarios in any element in the model.

Within the Scenario test record, the scenario description is copied to the 'Description' tab. If a scenario contains a Structured Specification, its Action steps are also copied to the 'Description' tab under the heading 'Structured Specification'.

Access

Ribbon	Construct > Testing > Test Windows > <test class> > right-click on test > Import element scenario(s) or Construct > Testing > Test Windows > <test class> > right-click on test > Import Package scenarios
Keyboard Shortcuts	Alt+3 : right-click on test | Import element scenario(s) or Alt+3 : right-click on test | Import Package scenarios

Import a scenario from a single element

Field/Button	Action
Select element	If you are copying scenarios from a different element to the target element, click on the drop-down arrow and select the source element. The list identifies elements that have scenarios that can be imported. Otherwise, leave this field blank.
Show related elements only	Select this checkbox to restrict the list of selectable elements to those that are related to the target element.
Limit selection to these Object Types only	If you want to restrict the list of selectable elements to only those of specific types, type in those element types in a comma-separated list.
Refresh	Click on this button after changing any of the above field values, to refresh the list of available elements in the 'Select element' field.
Select items to import	Lists the scenarios defined in the source element. Select the scenario(s) to import. If you do not use the 'Select element' field, any scenarios listed are from the current element to which this test record belongs. If you have selected a different element, the scenarios come from that element.
All	Click on this button to select all scenarios listed in the 'Select items to import' field.
None	Click on this button to clear the selection of scenarios listed in the 'Select items to import' field.

Import	Click on this button to import the selected scenario(s).

Import scenarios from the elements in a Package

Field/Button	Action
Limit selection to these Object Types only	If you want to restrict the selected elements to only those of specific types, type in those element types in a comma-separated list. This version of the 'Import Scenario' dialog lists all scenarios against all elements in the Package; it does not enable you to select a specific element, but does enable you to filter the list of scenarios to those from specific types of element.
Refresh	Click on this button after changing any of the above field values, to refresh the list of available elements in the 'Select element' field.
Select Items to import	Lists the scenarios defined in the selected elements in the Package. Select the scenario(s) to import.
All	Click on this button to select all scenarios listed in the 'Select items to import' field.
None	Click on this button to clear the selection of scenarios listed in the 'Select items to import' field.
Import	Click on this button to import the scenarios from each element as Scenario tests.

Notes

- In the Corporate, Business and Software Engineering, System Engineering and Ultimate editions of Enterprise Architect, if security is enabled you must have 'Manage Tests' permission to add, update and delete test records

Import Test From Other Elements

If you have created useful tests in one element, you can import those tests into any other element through the Testing window and so avoid having to duplicate the test information manually. You open the Testing window for the empty, target element and then select the source element that contains the tests to import.

Access

Select target element, then:

Ribbon	Construct > Testing > Test Windows > <test class> | Right-click on tests | Import tests from other element
Keyboard Shortcuts	Alt+3 : Right-click on tests | Import tests from other element or Alt+9 : Testing folder | Right-click on tests | Import tests from other element

Import a test

Field/Button	Action
Select element	Click on the drop-down arrow and locate and select the source element. This list identifies elements that have tests that can be imported.
Show related elements only	Select this checkbox to restrict the list of selectable elements to those that are related to the target element.
Limit selection to these Object Types only	If you want to restrict the list of selectable elements to only those of specific types, type in those element types in a comma-separated list.
Refresh	Click on this button after changing any of the above field values, to refresh the list of available elements in the 'Select element' field.
Select items to import	Lists the tests defined in the source element. Select the test(s) to import. If you have not used the 'Select element' field, any tests listed are from the current element to which this test record belongs. There is no purpose in importing these.
All	Click on this button to select all tests listed in the 'Select items to import' field.
None	Click on this button to clear the selection of tests listed in the 'Select items to import' field.
Import	Click on this button to import the selected test(s).

Notes

- In the Corporate, Business and Software Engineering, System Engineering and Ultimate editions of Enterprise Architect, if security is enabled you must have Manage Tests permission to add, update and delete test records

Import Responsibility or Constraint as Test

If you are creating a test against a responsibility (internal requirement) or internal constraint of an element, you do not have to manually re-type the details into the test record in the Testing window. You can generate a testing record on the element from the responsibility or constraint.

The test record is generated into the test-type tab that you currently have open, and the responsibility or constraint description is copied to the 'Description' tab for the test record.

Access

Select an element, then use one of the methods outlined here to display the Testing window and show the required class of tests. Then, in the Testing window:

- Right-click on test list | Import element constraint(s) or
- Right-click on test list | Import element requirement(s)

Alternatively, select an element, then open the Element Browser and, within the Testing folder:

- Right-click on test of required class | Import element constraint(s) or
- Right-click on test of required class | Import element requirement(s)

Ribbon	Construct > Testing > Test Windows > <test class> > Right-click on test list > Import element constraint/requirement Start > Explore > Element Browser > Right-click on test of required class > Import element constraint/requirement
Keyboard Shortcuts	Alt+3 : <test class> | Right-click on test list | Import element constraint/requirement Alt+9 : Right-click on test of required Class | Import element constraint/requirement

Import a requirement or constraint as a test

Step	Action
1	On the 'Import Constraint' or 'Import Requirements' dialog (the two dialogs are identical) review the list of internal requirements or constraints in the selected element.
2	Click on one of the items to import as a test, or press Ctrl+click on more than one to import several. Click on the OK button. Each item is added to the list of tests in the Testing window, on the selected <test-type> tab, as a standard, 'Not Run' test.
3	Edit the items to complete their definition as tests.

Notes

- In the Corporate, Business and Software Engineering, System Engineering and Ultimate editions of Enterprise Architect, if security is enabled you must have Manage Tests permission to add, update and delete test records

Test Documentation

After you have recorded a number of test scripts and results against elements in the model, you can output the information as a report in Rich Text Format, using the 'Generate Test Documentation' dialog. You can configure which tests to include or exclude in the report, whether to include child Packages, and the file location to which to generate the report.

Access

Select a Package, then display the 'Generate Test Documentation' dialog using one of the methods outlined here.

Ribbon	Construct > Testing > Test Report
Context Menu	Right-click on Package | Documentation | Testing Report