



Enterprise Architect

User Guide Series

Testing

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Testing

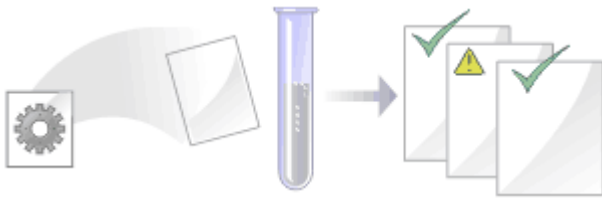


It is important in any project to perform quality control of both the process and the output of the project; Enterprise Architect provides several facilities for testing and validating your model structure and content, including Integration with the unit testing tools JUnit and NUnit.

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 |
|---------------------|---|
| <p>Create Tests</p> | <p>You initially create tests in the Construct window.</p> <p>Typically, you create:</p> <ul style="list-style-type: none"> • 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 <p>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.</p> |
| <p>Using Tests</p> | <p>Tasks that you might perform via the Testing window when working with tests include:</p> <ul style="list-style-type: none"> • Import a scenario as a test • Move or copy tests between test classes • Import a test from other elements • Import an internal requirement or constraint as a test • Create a maintenance item from a test • Generate a Test Details report • Show test script compartments |

- | | |
|--|---|
| | <ul style="list-style-type: none">• 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 the Construct window.

Whichever type of test you are recording, you complete effectively the same fields.

Access



| | |
|--------------------|--|
| Ribbon | <p>Start > Explore > Properties > Construct :  Tests <test class> : </p> <p>Start > Explore > Browse > Element Browser > Testing > Add New <test class> (complete Construct window fields)</p> <p>Construct > Testing > Tests > <test class> :  (complete Construct window fields)</p> |
| Keyboard Shortcuts | <p>Alt+3 : <test class>  (complete Construct window fields)</p> |

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 | <p>As an alternative to typing in the name, click on  to insert predefined auto-counter text; if you do not have auto-counter text configured, an information message displays.</p> <p>If you already have some text in the 'Test' field, it is over-written by the auto-counter text.</p> |
| Type | Click on the drop-down arrow and select the value indicating the type of test (Load, Regression or Standard). |
| Run Date | Click on the drop-down arrow and select the date on which the test is to be run (or when it was last run). |
| Result | Click on the drop-down arrow and select the value indicating the current status of the test (Not Run, Pass, Fail, Deferred or Canceled). |
| Run By | Click on the drop-down arrow and select the name of the person who is to run, or has run, the test. (Possible values are derived from the Project Author definitions in the 'People' dialog - select the 'Configure > Reference Data > Project Types > People > Project Authors' ribbon option.) |
| | Click on the drop-down arrow and select the name of the person who is to check, or |

| | |
|---------------------|--|
| Check By | has checked, the test run. |
| Description | Type a description of the test; you can format the text using the Notes toolbar at the top of the field. |
| 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. |
| Acceptance Criteria | Type the acceptance or test success conditions; you can format the text using the Notes toolbar at the top of the field. |
| Results | Type the results of the last test; you can format the text using the Notes toolbar at the top of the field. |
| Save | Click on this icon to save the data you have entered and to add the entry to the Testing window and the Project Browser |

Notes

- On the Construct window you can quickly add a series of tests of one type or several types, using the  icon or the  icon
- To access an existing item for editing, display the Testing window for the element and click on the item; the details display in the Construct window where you can edit them
- To delete an item, click on it on the Testing window or Construct 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 generating and editing Test items is to right-click on the *Testing* folder in the Element Browser - or the required item within the folder - and select menu options to perform the required operation in the Construct window
- To change the element for which to create or edit test items, click on the element in a diagram or the Project Browser
- In the Corporate, Unified and Ultimate editions of Enterprise Architect, if security is enabled you must have 'Manage Tests' permission to add, update and delete test records

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 item now appears in the test scripts compartment of the diagram element. Items of each type are grouped together so that, for example, all Unit Tests on the element are grouped under the heading 'Unit', and all Integration Tests on the element are grouped under the heading 'Integration'. If you click on a test item and the Construct window is open, the test details are immediately displayed in the window. If the Construct window is not open, click twice on the item. |

Example

| CCBookClientPanel | | |
|-----------------------------------|--|---------|
| «SM_Activity» | | |
| + CCBookClientPanel | | |
| + GetBook: CBook | | |
| ~ bookpanel(): CCBookPanel | | |
| <i>test scripts</i> | | |
| Unit | | |
| Valid Inputs | | Pass |
| Integration | | |
| Pass on output | | Not Run |
| <i>maintenance</i> | | |
| Issue | | |
| Run time | | New |
| Triggers | | New |

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 class lists.

Access

Click on the element containing the test records.

| | |
|--------------------|--|
| Ribbon | Construct > Testing > Tests > <test class> > Right-click on test to move/copy Start > Explore > Browse > Element Browser > Testing > <test class> > Right-click on test |
| 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 | In the 'Test Class' field in the Testing window toolbar, click on the drop-down arrow and select the test class you moved/copied the test into, to check that the test has been added. Open the Construct window (the 'Start > Explore > Properties > Construct' ribbon option) and make any necessary changes to the test record. |
| 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

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 the element containing the failed test, then use one of the methods outlined here to display the Testing window or Element Browser

| | |
|--------------------|--|
| Ribbon | <p>Construct > Testing > Tests > <test class> > Right-click on test > Create a Maintenance Defect from this test</p> <p>Start > Explore > Browse > Element Browser > Testing > <test class> > Right-click on test > Create a Maintenance Defect from this test</p> <p>Design > Element > Properties > Element Browser > Testing > <test class> > Right-click on test > Create a Maintenance Defect from this test</p> |
| Keyboard Shortcuts | <p>Alt+3 : <test class> Right-click on test Create a Maintenance Defect from this test</p> <p>Alt+9 : Testing > <test class> > Right-click on test > Create a Maintenance Defect from this test</p> |

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 Defects window (the 'Construct > Change Management > Defects > Show Defects Window' ribbon option). The window shows a Defect item having the same name as the test. |
| 3 | Double-click on the Defect item to open it in the Construct window, and edit the 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 Construct 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

Click on the element containing the test records.

| | |
|--------------------|---|
| Ribbon | <p>Construct > Testing > Tests > <test class> > right-click on test > Import element scenario(s) or</p> <p>Construct > Testing > Tests > <test class> > right-click on test > Import Package Scenarios or</p> <p>Start > Explore > Browse > Element Browser > Testing > <test class> > Right-click on test > Import element scenario(s)</p> <p>Start > Explore > Browse > Element Browser > Testing > <test class> > Right-click on test > Import Package Scenarios</p> |
| Keyboard Shortcuts | <p>Alt+3 : right-click on test Import element scenario(s) or</p> <p>Alt+3 : right-click on test Import Package Scenarios</p> |

Import a scenario from a single element

The 'Import Scenario' dialog displays.

| Field/Button | Action |
|--|--|
| Select element | <p>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.</p> <p>Otherwise, leave this field blank.</p> |
| 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 drop-down. |
| Select items to import | <p>Lists the scenarios defined in the source element. Select the scenario(s) to import.</p> <p>If you do not use the 'Select element' field, any scenarios listed are from the current element to which this test record belongs.</p> |

| | |
|-----------|--|
| | If you have selected a different element, the scenarios come from that element. |
| Import As | Defaults to the test class of the test you selected to populate from the scenario. If you need to change this, click on the drop-down arrow and select a different test class from the list. |
| 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 the 'Limit Selection...' field value, to refresh the list of available elements in the 'Select items to import' 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. |
| Import As | Defaults to the test class of the test you selected to populate from the scenario. If you need to change this, click on the drop-down arrow and select a different test class from the list. |
| 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, Unified 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 or Element Browser, 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 > Tests > <test class> Right-click on tests Import tests from other element Start > Explore > Browse > Element Browser > Testing > <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

The 'Import Element Tests' dialog displays.

| 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. |
| Import As | Defaults to the test class of the test you selected to populate from the other element. If you need to change this, click on the drop-down arrow and select a different test class from the list. |
| 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, Unified and Ultimate editions of Enterprise Architect, if security is enabled you must have 'Manage Tests' permission to add, update and delete test records

Import Requirement or Constraint as Test

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

The test record is generated into the Construct 'test-type' window that you currently have open, and the requirement 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 or Element Browser.

| | |
|--------------------|--|
| Ribbon | <p>Construct > Testing > Tests > <test class> > Right-click on test list > Import element constraint(s) or Import element requirement(s)</p> <p>Start > Explore > Browse > Element Browser > Testing > <test class> > Right-click on test > Import element constraint(s) or Import element requirement(s)</p> <p>Design > Element > Properties > Element Browser > Testing > <test class> > Right-click on test > Import element constraint(s) or Import element requirement(s)</p> |
| Keyboard Shortcuts | <p>Alt+3 : <test class> Right-click on test list Import element constraint(s) or Import element requirement(s)</p> <p>Alt+9 : Testing > <test class> > Right-click on test > Import element constraint(s) or Import element requirement(s)</p> |

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. The 'Import As' field defaults to the test class of the test into which you are importing the requirement or constraint details. If you need to change this, click on the drop-down arrow and select a different test class. |
| 3 | Click on the OK button. Each item is added to the list of tests in the Testing window, under the appropriate <test-type>, as a standard, 'Not Run' test. Double-click on one item to open the Construct window to edit the test details; thereafter, just click once on the next test item to edit that in the Construct window. |

Notes

- In the Corporate, Unified 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 select the types of test to include or exclude in the report and whether to include child Packages, and enter the file location to which to generate the report.

Click on the Generate button to produce the report.

You can also run a number of searches to show the results - where generated - of tests:

- Not Run
- Not Checked
- Recently run
- Recently Passed
- Recently Failed
- Recently Deferred
- Run on recently modified elements
- Run in the last week
- Run in the last 30 days

Access

Select a Package, then use the ribbon options:

| | |
|--------|--|
| Ribbon | Construct > Testing > Report (to display the 'Generate Test Documentation' dialog) Construct > Testing > Not Run Construct > Testing > Not Checked Construct > Testing > Test Results > <report type> |
|--------|--|

