Running automated tests with EA add-ins

London EA User Group 2017

ENTERPRISE
ARCHITECT
USER GROUP

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VISEO

Content

- **Background**

- **Objectives**

- **Automated tests with eaUtils**

- **Extending to other add-ins and scripts**

- **Pros and cons**

- **Next steps**

- **Q/A**

Background

- **eaUtils free utilities add-in launched in 2015**

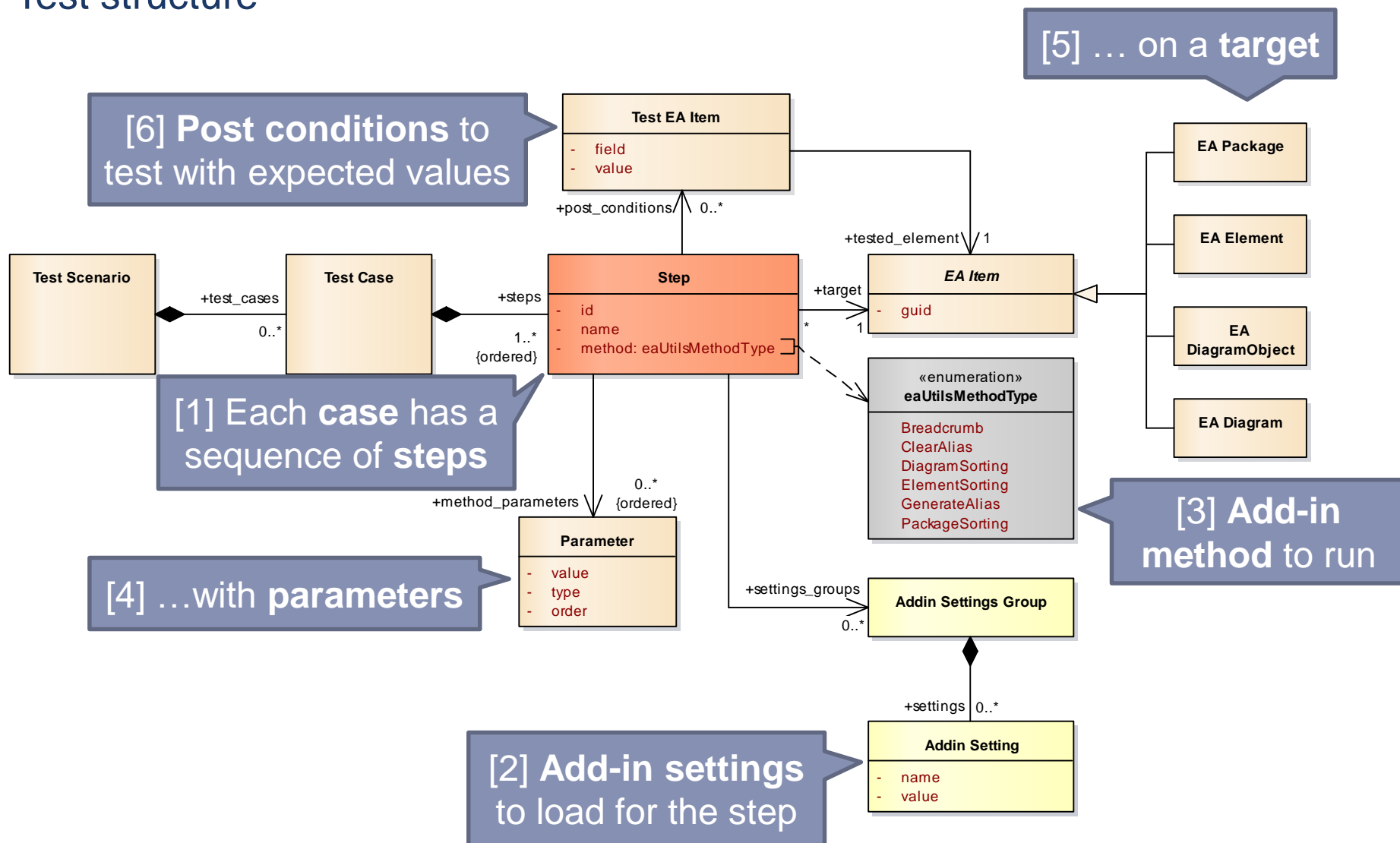- **Increased complexity over time**

- **Time consuming tests**

Objectives
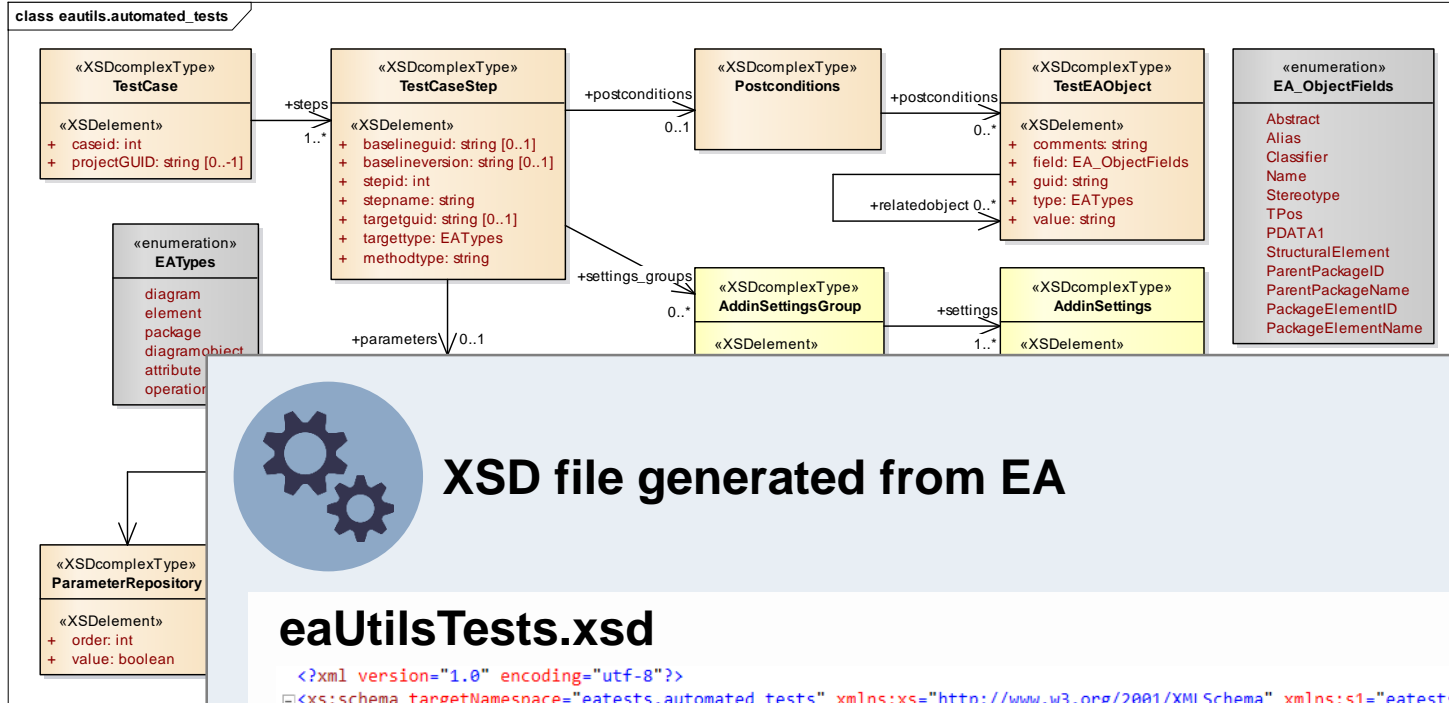
Automated tests with eaUtils

eaUtils automated tests

Test structure

[5] … on a target

[6] Post conditions to test with expected values

Test EA Item
- field
- value

+post_conditions 0..*

+tested_element 1

EA Item
- guid

EA Package

EA Element

EA DiagramObject

EA Diagram

Test Scenario

Test Case

Step
- id
- name
- method: eaUtilsMethodType

+test_cases 0..*

+steps 1..* {ordered}

+target 1

[1] Each case has a sequence of **steps**

«enumeration»
eaUtilsMethodType

Breadcrumb
ClearAlias
DiagramSorting
ElementSorting
GenerateAlias
PackageSorting

[3] Add-in method to run

+method_parameters 0..* {ordered}

Parameter
- value
- type
- order

[4] …with parameters

+settings_groups 0..*

Addin Settings Group

[2] Add-in settings to load for the step

+settings 0..*

Addin Setting
- name
- value

eaUtils automated tests

XML Schema to define the test file structure

class eautils.automated_tests

«XSDcomplexType» **TestCase**
«XSDelement»
+ caseid: int
+ projectGUID: string [0..-1]

+steps 1..*

«XSDcomplexType» **TestCaseStep**
«XSDelement»
+ baselineguid: string [0..1]
+ baselineversion: string [0..1]
+ stepid: int
+ stepname: string
+ targetguid: string [0..1]
+ targettype: EATypes
+ methodtype: string

+postconditions 0..1

«XSDcomplexType» **Postconditions**

+postconditions 0..*

«XSDcomplexType» **TestEAObject**
«XSDelement»
+ comments: string
+ field: EA_ObjectFields
+ guid: string
+ type: EATypes
+ value: string

«enumeration» **EA_ObjectFields**
Abstract
Alias
Classifier
Name
Stereotype
TPos
PDATA1
StructuralElement
ParentPackageID
ParentPackageName
PackageElementID
PackageElementName

+relatedobject 0..*

«enumeration» **EATypes**
diagram
element
package
diagramobject
attribute
operation

+settings_groups 0..*

«XSDcomplexType» **AddinSettingsGroup**
«XSDelement»

+settings 1..*

«XSDcomplexType» **AddinSettings**
«XSDelement»

+parameters 0..1

«XSDcomplexType» **ParameterRepository**
«XSDelement»
+ order: int
+ value: boolean

XSD file generated from EA

eaUtilsTests.xsd

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema targetNamespace="eatests.automated_tests" xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:s1="eatests.automated_tests">
  <xs:element name="TestCase" type="s1:TestCase"/>
  <xs:complexType name="TestCase">
    <xs:sequence>
      <xs:element name="caseid" type="xs:int" minOccurs="1" maxOccurs="1"/>
      <xs:element name="projectGUID" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element name="steps" type="s1:TestCaseStep" minOccurs="1" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexType>
  <xs:element name="TestCaseStep" type="s1:TestCaseStep"/>
  <xs:complexType name="TestCaseStep">
    <xs:sequence>...</xs:sequence>
  </xs:complexType>
  <xs:simpleType name="EATypes">
```
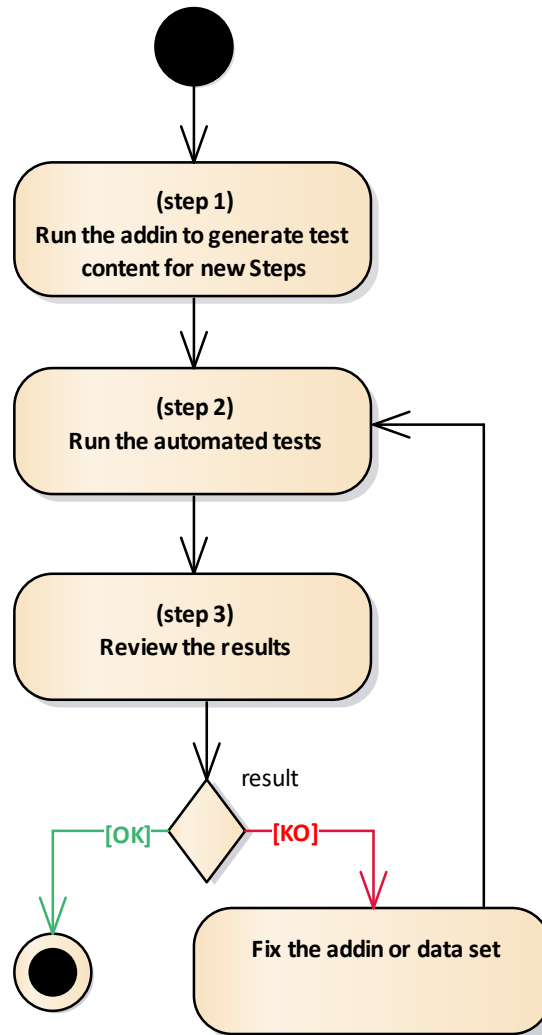
eaUtils automated tests

Adding the XML content to the test file

```
XMLExample1.xml*   ⇌  ✕  automatedTests.xml
⊟<TestCase xmlns="eatests.automated_tests">
     <caseid xmlns=""></caseid>
     <projectGUID xmlns="">{B8BC34E8-AAE7-4afa-B469-F7E0D089F899}</projectGUID>

   </TestCase>
```
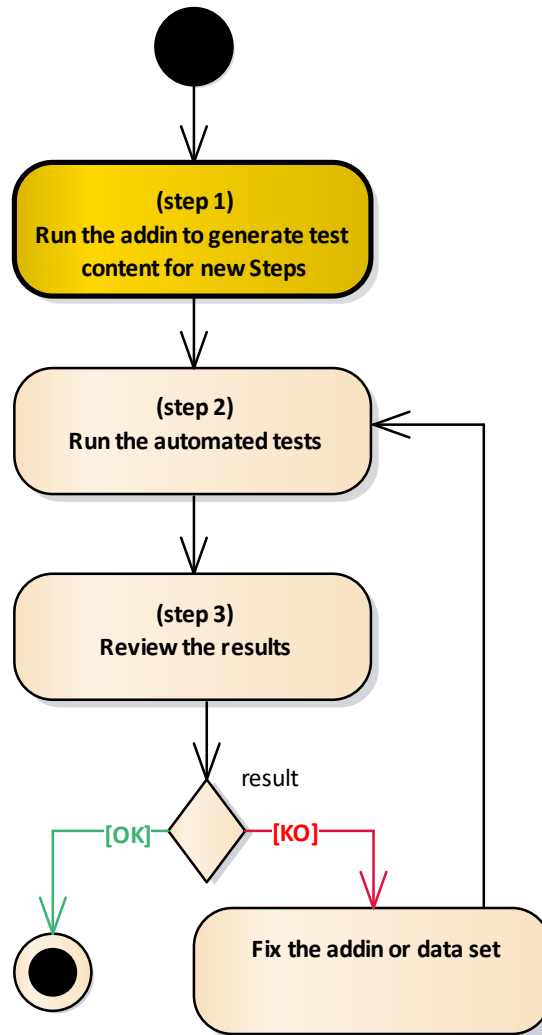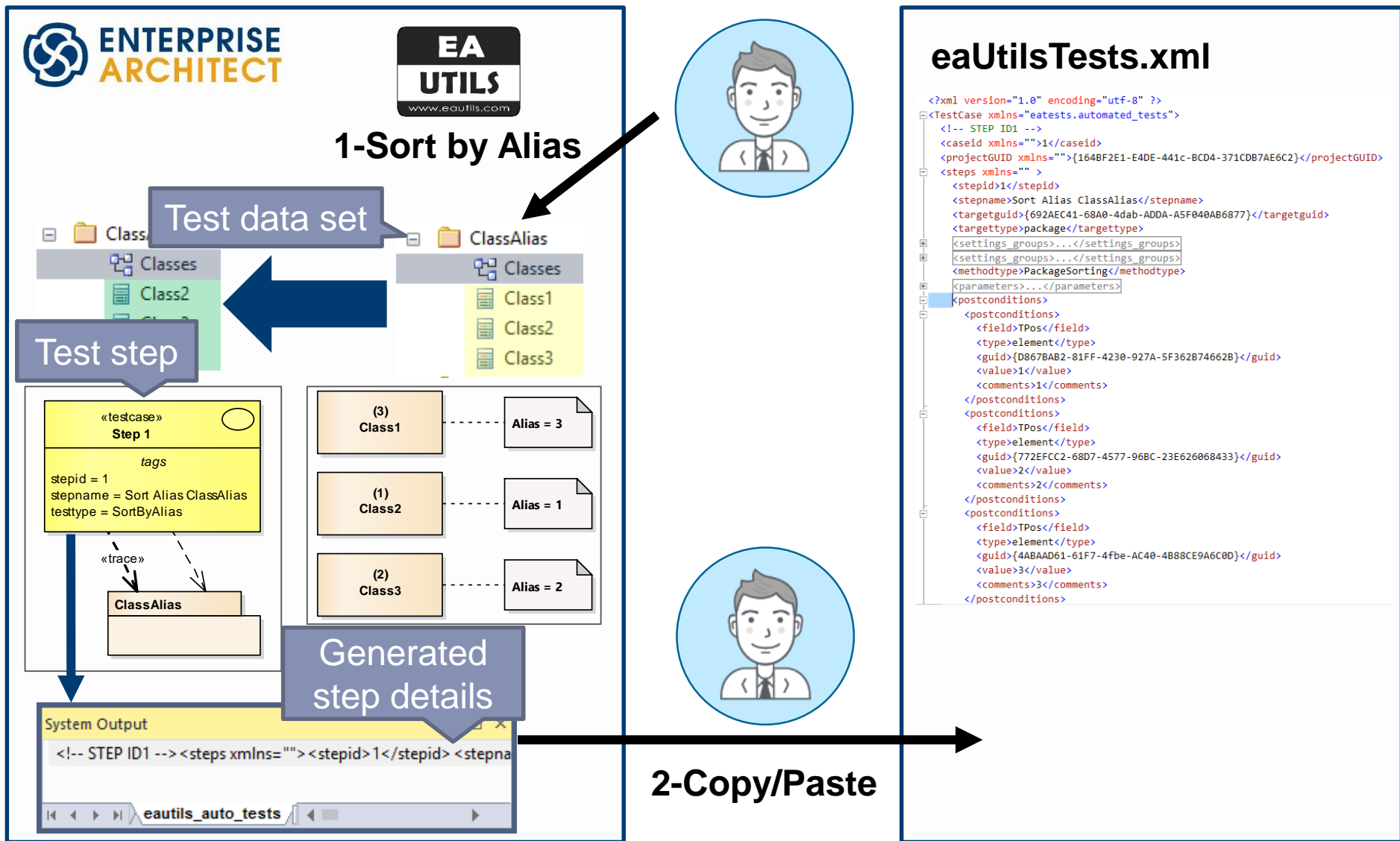
VIDEO

eaUtils automated tests

Process overview

eaUtils automated tests

Step 1: run the add-in to generate test content for new steps

eaUtils automated tests

Step 1: run the add-in to generate test content for new steps

eaUtils automated tests

Step 1: run the add-in to generate test content for new steps

```xml
<!-- STEP ID1 -->
<steps xmlns="">
<stepid>1</stepid>
<stepname>Sort Alias ClassAlias</stepname>
<targetguid>{F449EE82-3869-4a3b-BD98-37B1EF6B3F42}</targetguid>
<targettype>package</targettype>
<settings groups>
<settings groups>
<methodtype>PackageSorting</methodtype><parameters>
    <menus>
        <order>1</order>
        <value>SORT_ALIAS</value>
    </menus>
    <repo>
</parameters>
<postconditions>
    <postconditions>
        <field>TPos</field>
        <type>element</type>
        <guid>{87D95ACC-1087-44ed-82B0-8C6790867D9A}</guid>
        <value>2</value>
        <comments>Class3 alias = 2</comments>
    </postconditions>
    <postconditions>
        <field>TPos</field>
        <type>element</type>
        <guid>{A9AD4BE8-EFB2-4112-BB17-77B096209CEF}</guid>
        <value>3</value>
        <comments>Class1 alias = 3</comments>
    </postconditions>
    <postconditions>
        <field>TPos</field>
        <type>element</type>
        <guid>{234B40F6-C8F8-412d-BF26-953E642FE877}</guid>
        <value>1</value>
        <comments>Class2 alias = 1</comments>
    </postconditions>
```
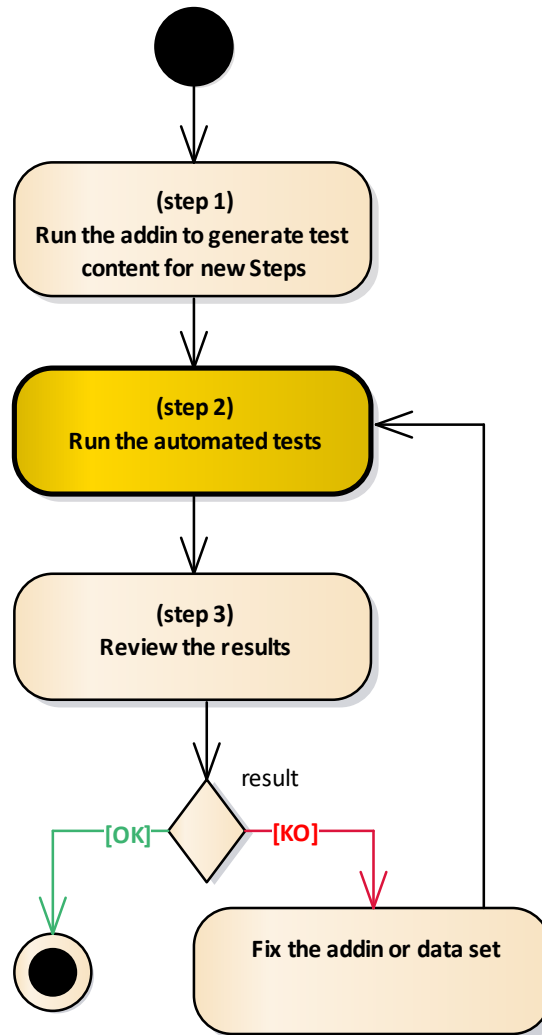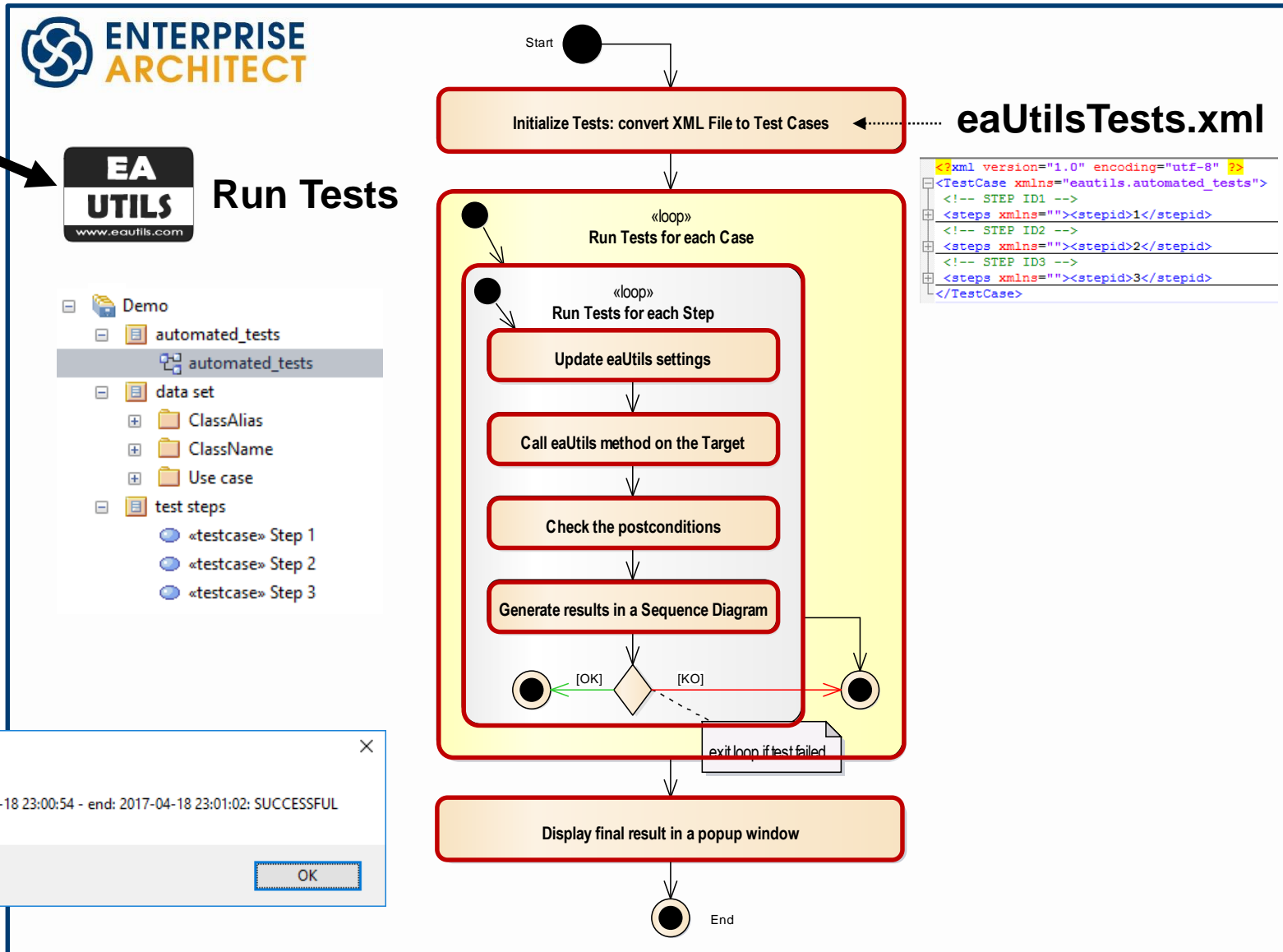
eaUtils automated tests

Resulting data sets and associated steps

eaUtils automated tests

Step 2: run automated tests

eaUtils automated tests

Step 2: run automated tests

eaUtils automated tests

Step 3: review the results

eaUtils automated tests

Step 3: review the results on sequence diagrams

eaUtils automated tests

DEMO

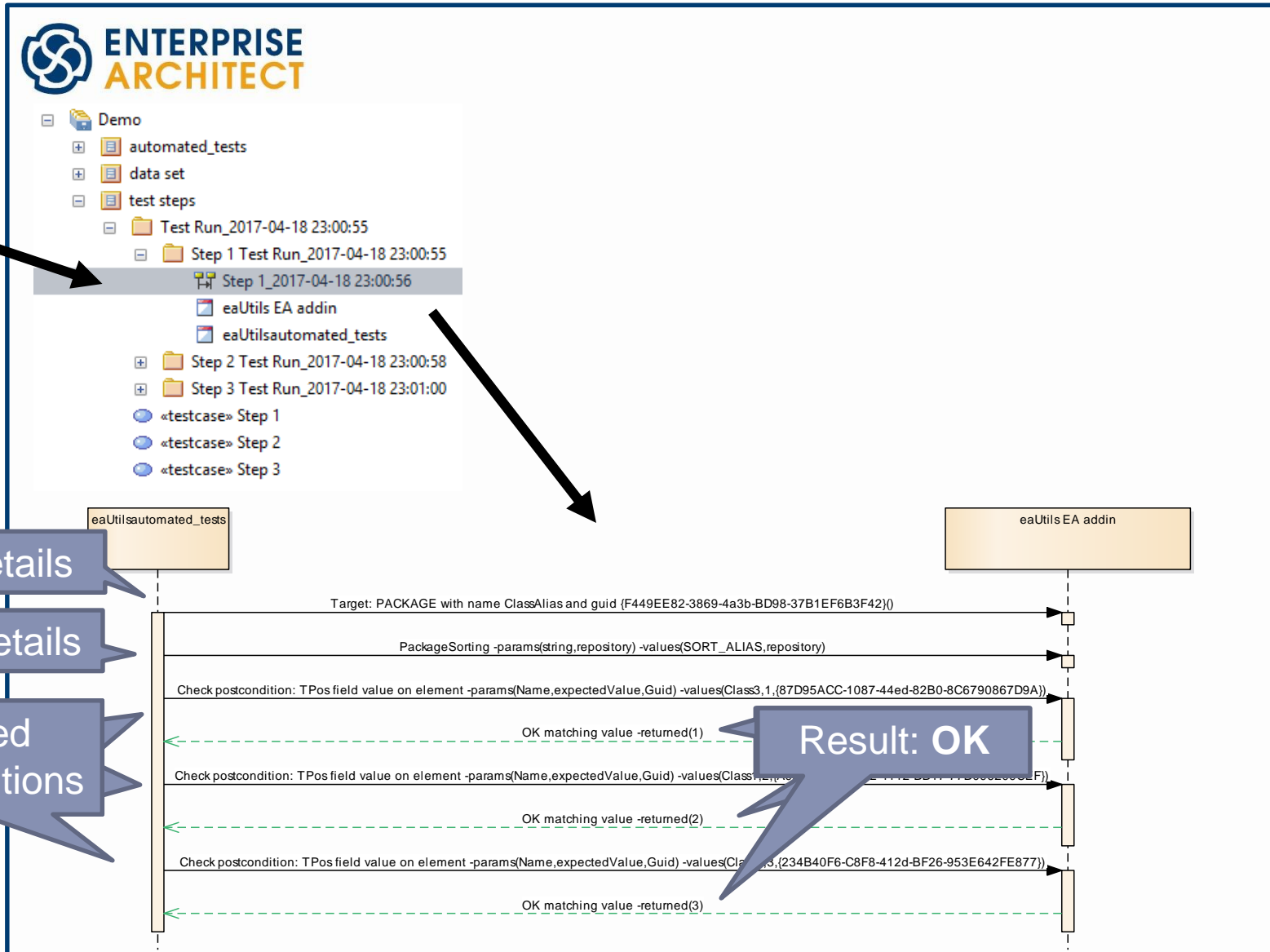# Extending automated tests
to other add-ins and scripts

EA add-ins

EA Scripts

VISEO
www.viseo.com

Extending automated tests

Target audience

- **Numerous add-ins and scripts exist**
  - **Specific for a client or project**
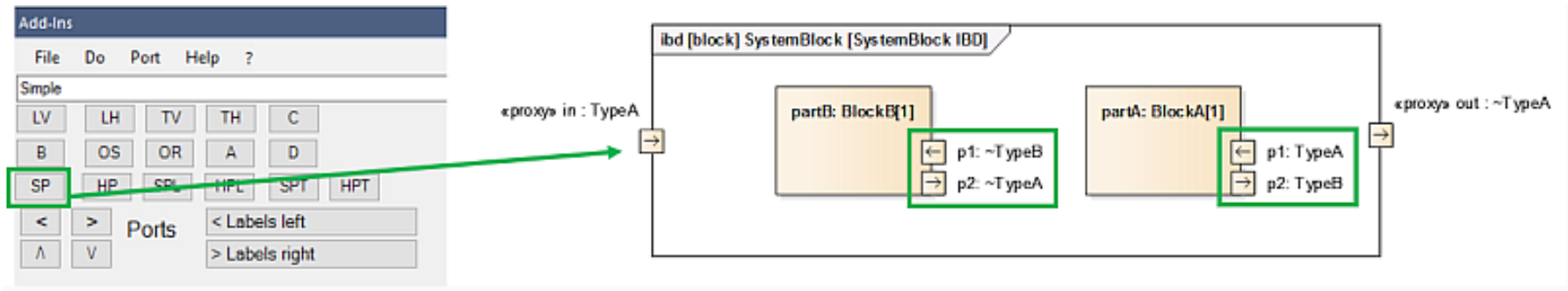 - **Shared as free or commercial EA extensions**

Third Party Extensions for Enterprise Architect

Many of our partners have developed extension technologies for Enterprise Architect, created with Enterprise Architect's powerful customization frameworks. These Third Party Extensions provide specialist tools to the wider Enterprise Architect Community.

Extending automated tests

- **Identified candidates from Open Source solutions**
  - **hoTools from Helmut Ortmann**
  - **Scripting library from Geert Bellekens**

- **Selected a feature to test**
  - **hoTools: create ports in parts from a SysML IBD diagram**

  - **Geert's Scripting library: DivideInPackages scripts**
    - **Moves each BusinessProcess or SubProcess/Activity in a new package**
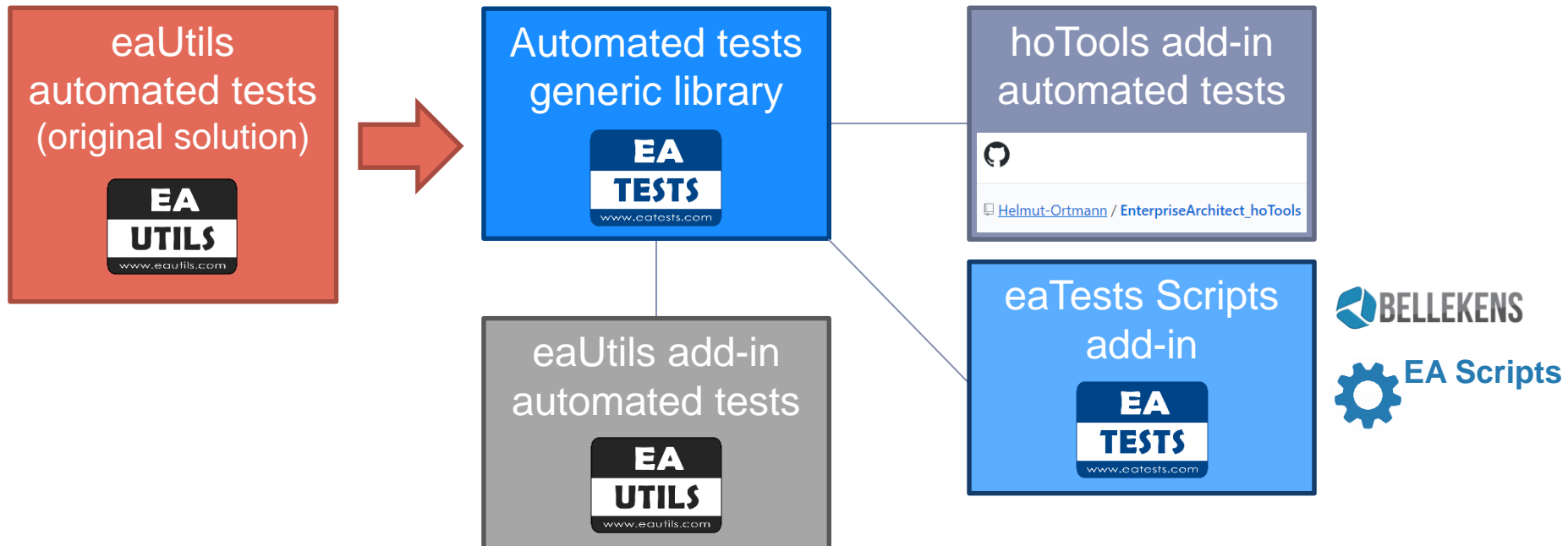 - **Own scripts: Teiid virtual DB schemas DDL import, Lock packages**

Extending automated tests

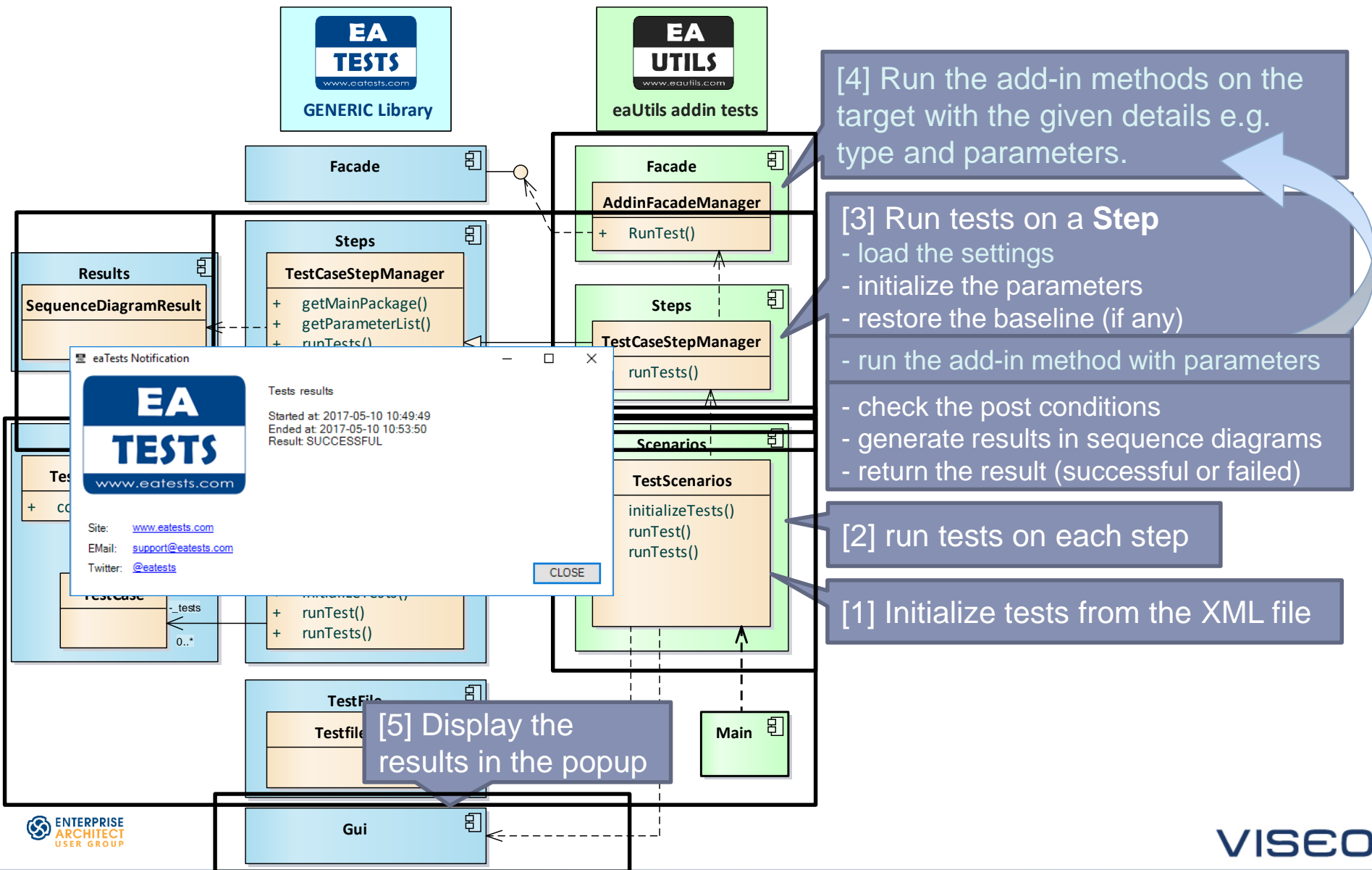| Extract a generic library and update eaUtils	hoTools add-in integration	Scripts tests add-in

- **Extracted a generic library from eaUtils: eaTests**
- **Implemented specific code in each add-in**
- **Created a dedicated add-in to test Scripts**

Extending automated tests

Using eaTests library

GENERIC Library

eaUtils addin tests

Facade

Facade

AddinFacadeManager

+   RunTest()

Steps

Steps

TestCaseStepManager

TestCaseStepManager

+   getMainPackage()
+   getParameterList()
+   runTests()

runTests()

Results

SequenceDiagramResult

Scenarios

TestScenarios

initializeTests()
runTest()
runTests()

+   runTest()
+   runTests()

TestCase

-_tests

0..*

TestFile

Testfile

Main

Gui

[4] Run the add-in methods on the target with the given details e.g. type and parameters.

[3] Run tests on a **Step**
- load the settings
- initialize the parameters
- restore the baseline (if any)

- run the add-in method with parameters

- check the post conditions
- generate results in sequence diagrams
- return the result (successful or failed)

[2] run tests on each step

[1] Initialize tests from the XML file

[5] Display the results in the popup

eaTests Notification

EA TESTS
www.eatests.com

Tests results

Started at: 2017-05-10 10:49:49
Ended at: 2017-05-10 10:53:50
Result: SUCCESSFUL

Site: www.eatests.com
EMail: support@eatests.com
Twitter: @eatests

CLOSE

VISEO

Extending automated tests

hoTools add-in

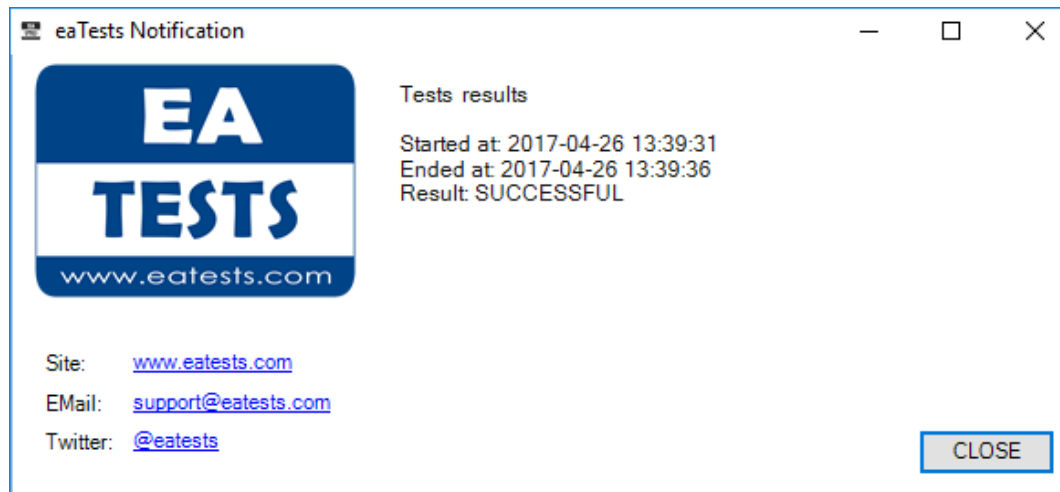- **Successful integration on the selected feature**

- **Resulting enhancements on eaTests**
  - **New post-condition field: related object to test elements' ports**
  - **EA Tab with debug messages from the automated tests library**
  - **Restore a package baseline before running the test**
  - **Bind tests with EA projects**

Extending automated tests

eaTests Scripts add-in

- **eaTests Scripts add-in launched**
  - **Tested with 3 scripts so far**

- **Resulting enhancements on eaTests**
  - **New post-condition field: ParentPackageName**
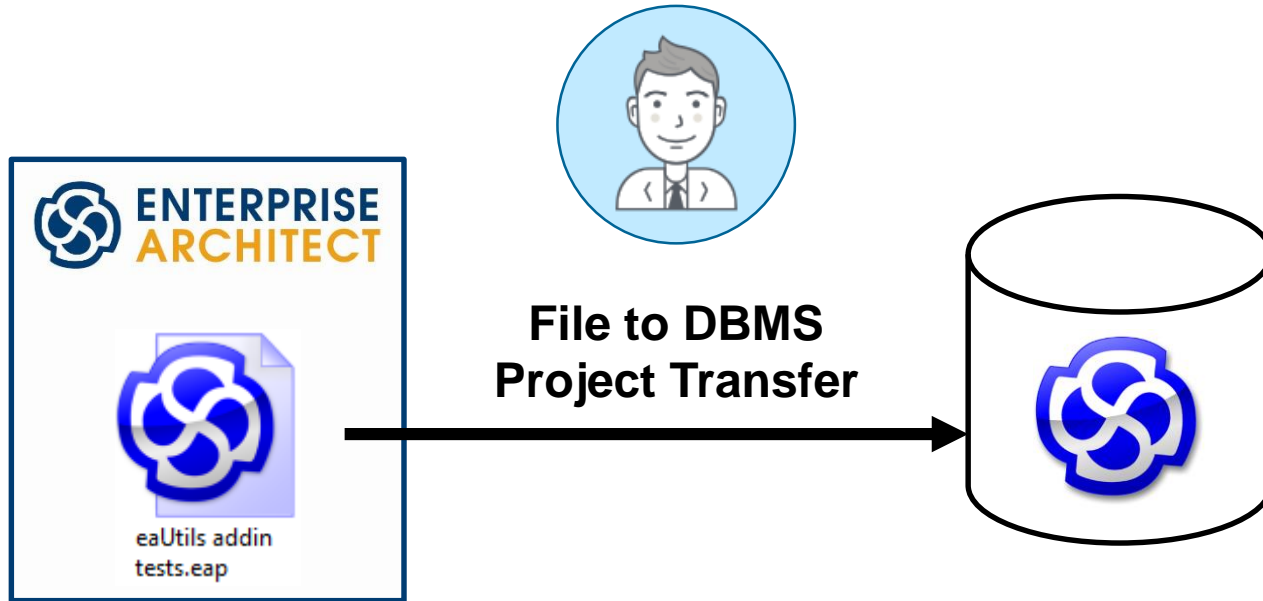 - **New pop-up window to display results**

eaTests

DEMO

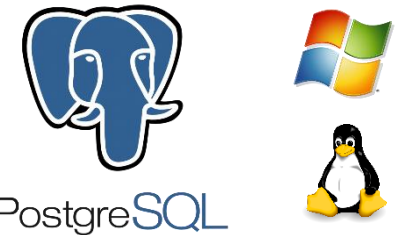# Testing environments

Duplicate the EA project to other repositories

File to DBMS Project Transfer

MySQL

Microsoft SQL Server

PostgreSQL

ORACLE DATABASE

❖ **Run tests**
- **on MySQL, SQL Server, Postgres…**
- **with EA 13, EA 12.1…**

Pros & Cons

Advantages +

ENTERPRISE ARCHITECT

EA TESTS
www.eatests.com

EA Scripts

EA add-ins

MySQL PostgreSQL Microsoft SQL Server ORACLE DATABASE

Maintain **data sets** in EA projects

Use EA to store **test runs**

Clone EA projects to **target DBs**

Find **regression bugs**

Supports **scripts** & **add-ins**

Use eaTests features

Pros & Cons

Disadvantages, limitations —

- **Additional code to write and maintain**
  - **Minimum level required**

- **This code must be tested**

- **Add-in user interface or external tools not currently covered**

Next steps

- **Initially achieved for personal use and interest**

- **Current backlog**
  - **Post-conditions: test attributes, tagged values.**
  - **Test scenario selection (multiple XML files support)**
  - **Option to automatically run tests when the EA project opens**

- **eaTests**
  - **Terms of use and publishing currently being looked at**
  - **Future updates available on www.umlchannel.com & www.eatests.com**

- **Contact me if you're interested for your add-in or scripts!**

Questions & answers

Guillaume FINANCE

Blog: www.umlchannel.com
EA Add-in: www.eautils.com
Twitter: @umlchannel