Integration with Test Modeller

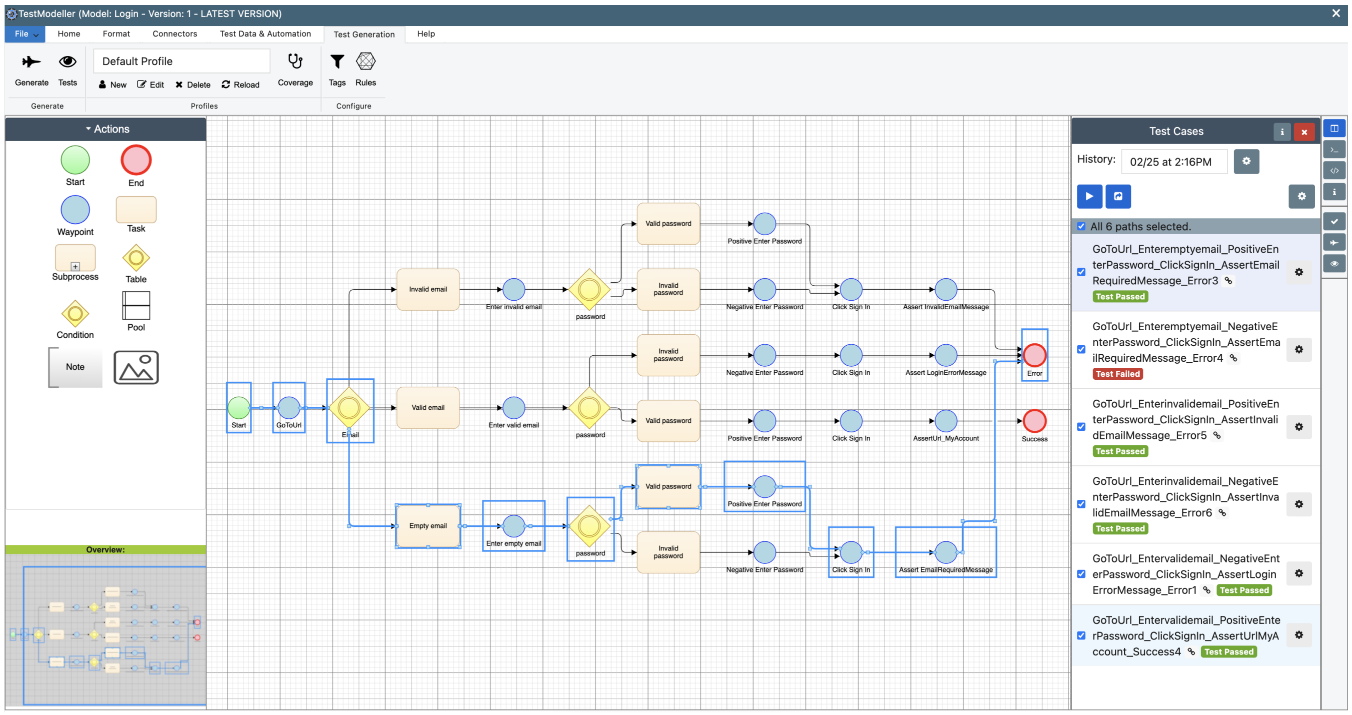
Overview

Test Modeller (TM) is a modelling tool that can be used to model parts of the system behaviour and easily implement test automation for it.

By using visual models, team members can visualize and collaborate more effectively to implement testing with greater coverage and in less time.

Models can be built by hand or using a web scanner (i.e. a Chrome extension), in case you're targetting web-based systems. The later will create objects that will contain the necessary identifiers (e.g. XPath, CSS), so they can be later on run by an automation framework.

More details about Test Modeller here.



GoToUrl_Enteremptyemail_PositiveEnterPassword_ClickSignIn_AssertEmailRequiredMessage_Error3 Test Passed

GoToUrl_Enteremptyemail_NegativeEnterPassword_ClickSignIn_AssertEmailRequiredMessage_Error4 Test Failed

GoToUrl_Enterinvalidemail_PositiveEnterPassword_ClickSignIn_AssertInvalidEmailMessage_Error5 Test Passed

GoToUrl_Enterinvalidemail_NegativeEnterPassword_ClickSignIn_AssertInvalidEmailMessage_Error6 Test Passed

GoToUrl_Entervalidemail_NegativeEnterPassword_ClickSignIn_AssertLoginErrorMessage_Error1 Test Passed

GoToUrl_Entervalidemail_PositiveEnterPassword_ClickSignIn_AssertUrlMyAccount_Success4 Test Passed

Main features

This integration provides:

- integration with Xray cloud
- automatic provisioning of Tests in Xray, corresponding to each generated path
- ability to link tests/paths to an existing "requirement" in Jira/Xray
- ability to track automation results in Xray from testing performed using Test Modeller and underlying automation frameworks

Test Modeller quick overview and core concepts

In Test Modeller, all happens in the context of a working project.

A project is tied to an automation framework, defined upon the moment of creation, which can be one from a set of supported ones including custom frameworks.

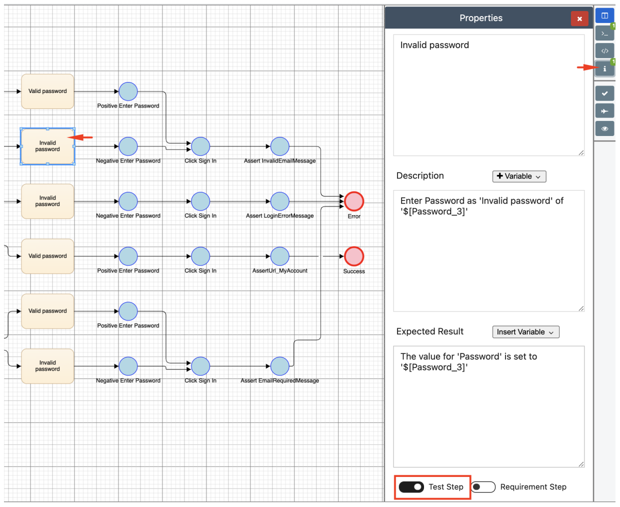
Inside a project, we can have:

- one or more **models**, each one abstracting a certain behaviour of the SUT
- **page objects/collections**, each one abstracting a certain web page; each page object contains one or more inner objects corresponding to the web/UI elements we can interact with
- **module objects/collections**, which provide an implementation layer for the page object (e.g. in Java, or other)

A model has a starting node and one or more ending nodes. The model is used as a source to generate test automation code, containing automated tests based on **test cases** (i.e. user journeys) generated by Test Modeller.

TM provides a configurable algorithm to fine-tune coverage (i.e. the test cases that will be created based on all possible paths derived from the model).

Mapping of concepts

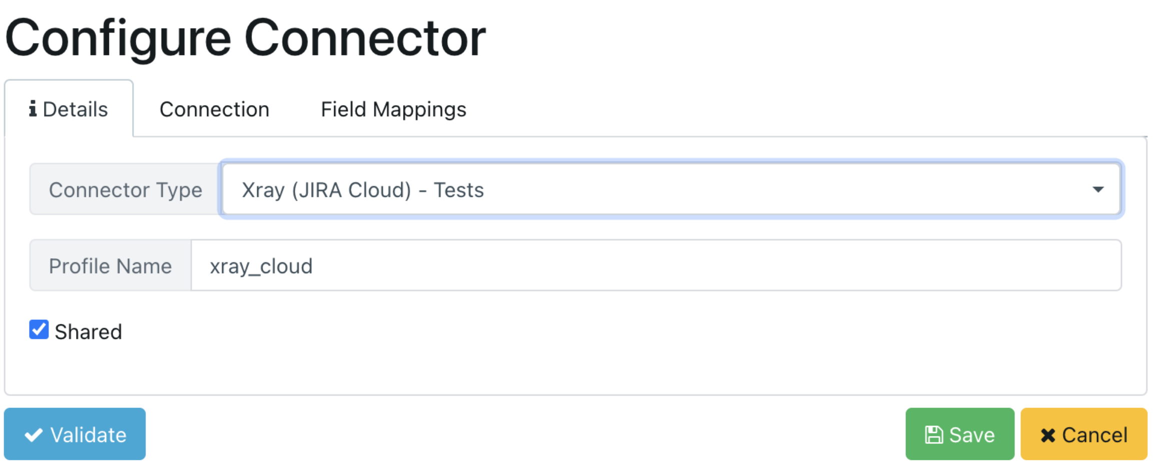
Test Modeller	**Xray**	**Examples**
Test/Test case /Test path	Test (manual/structured) • Test' Summary field is based on Test Path's name on TM. Please see the Setup section ahead, namelly the configuration of "Field Mappings" • It may be linked to one requirement, during the export operation Note: Tests are auto-provisioned whenever doing an explicit exporting of the test suite using the Xray connector profile	
Action (e.g. Task, Waypoint)	Test step Note: only Actions having the property Test Step enabled will be mapped to a test step in Xray.	 Valid password Positive Enter Password Invalid password Negative Enter Password Click Sign In Assert InvalidEmailMessage Assert LoginErrorMessage Error AssertUrl_MyAccount Success Assert EmailRequiredMessage Properties + Variable Insert Variable Invalid password Description: Enter Password as 'Invalid password' of '$[Password_3]' Expected Result: The value for 'Password' is set to '$[Password_3]' Test Step [✓] Requirement Step
results, of a given Test Case	Test Run	

Setup

In order to setup the integration, we need to configure and add a Xray connector profile to your project in Test Modeller.

You'll need to provide the URL of your Jira Cloud instance, Jira's username, create a Jira API token, specify the target Jira project, and also Xray API credentials (client id+client secret).

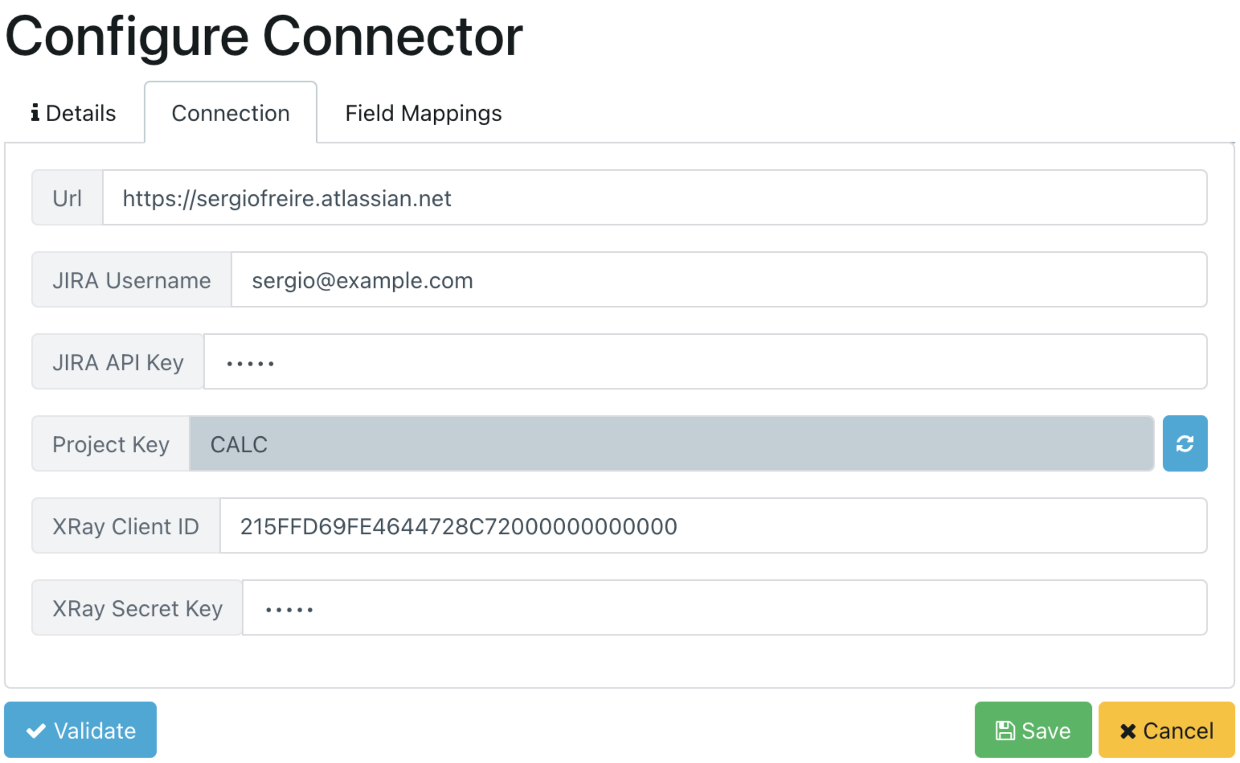
It's also important to configure the "Field Mappings", as these are used to identify how information will be mapped into the Test issue and to the step fields.



Configure Connector

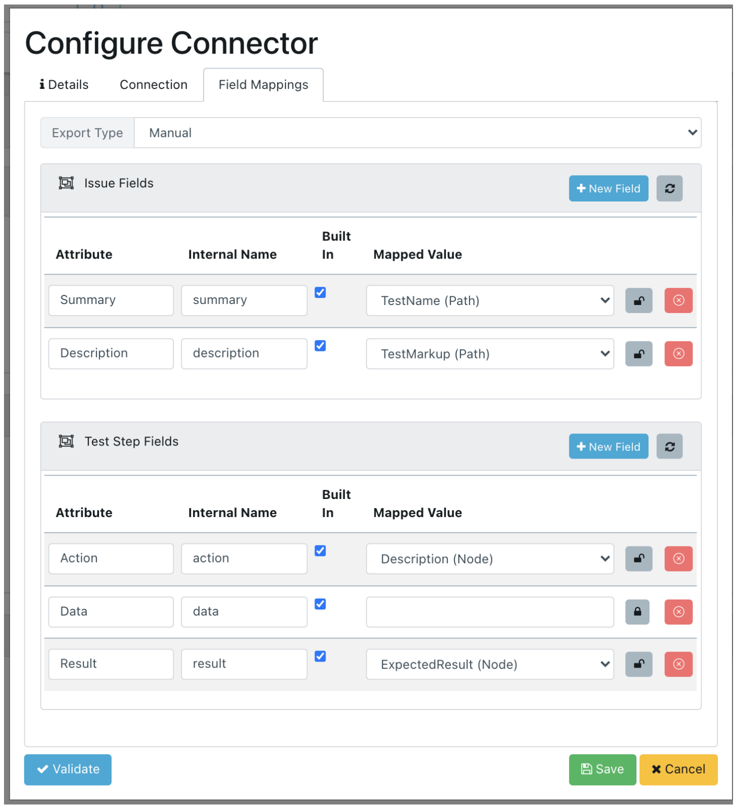
Connector Type	Xray (JIRA Cloud) - Tests
Profile Name	xray_cloud

☑ Shared



Configure Connector

Url	https://sergiofreire.atlassian.net
JIRA Username	sergio@example.com
JIRA API Key	•••••
Project Key	CALC
XRay Client ID	215FFD69FE4644728C72000000000000
XRay Secret Key	•••••


Configure Connector

Details | Connection | Field Mappings

Export Type: Manual

Issue Fields

Attribute	Internal Name	Built In	Mapped Value
Summary	summary	✓	TestName (Path)
Description	description	✓	TestMarkup (Path)

Test Step Fields

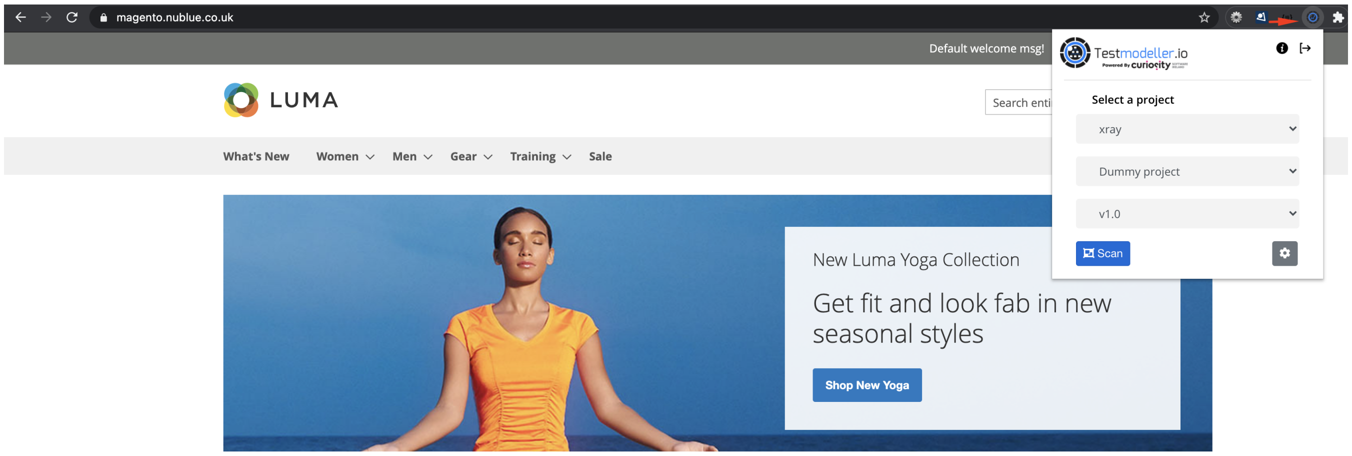
Attribute	Internal Name	Built In	Mapped Value
Action	action	✓	Description (Node)
Data	data	✓	
Result	result	✓	ExpectedResult (Node)

The following video shows how you can see how to setup the integration between Test Modeller and Xray.

Your browser does not support the HTML5 video element

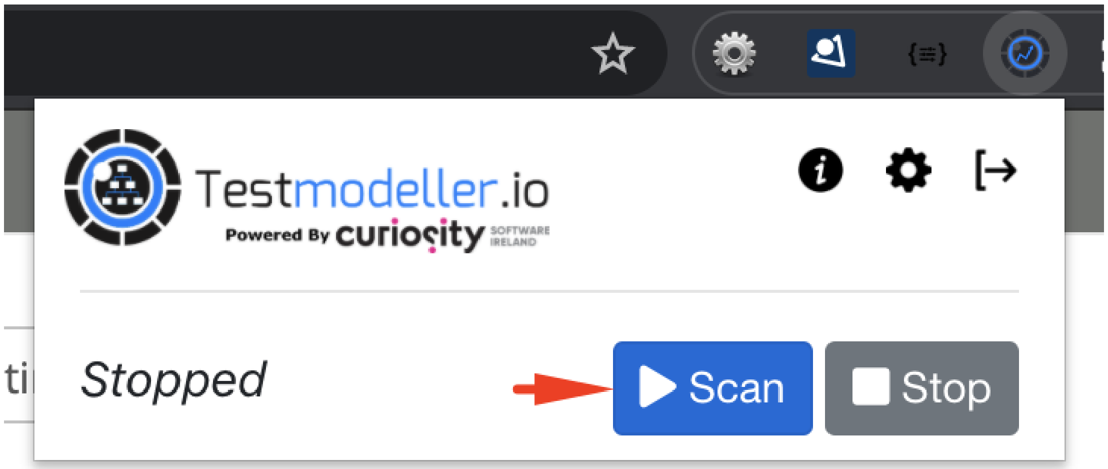
Login example

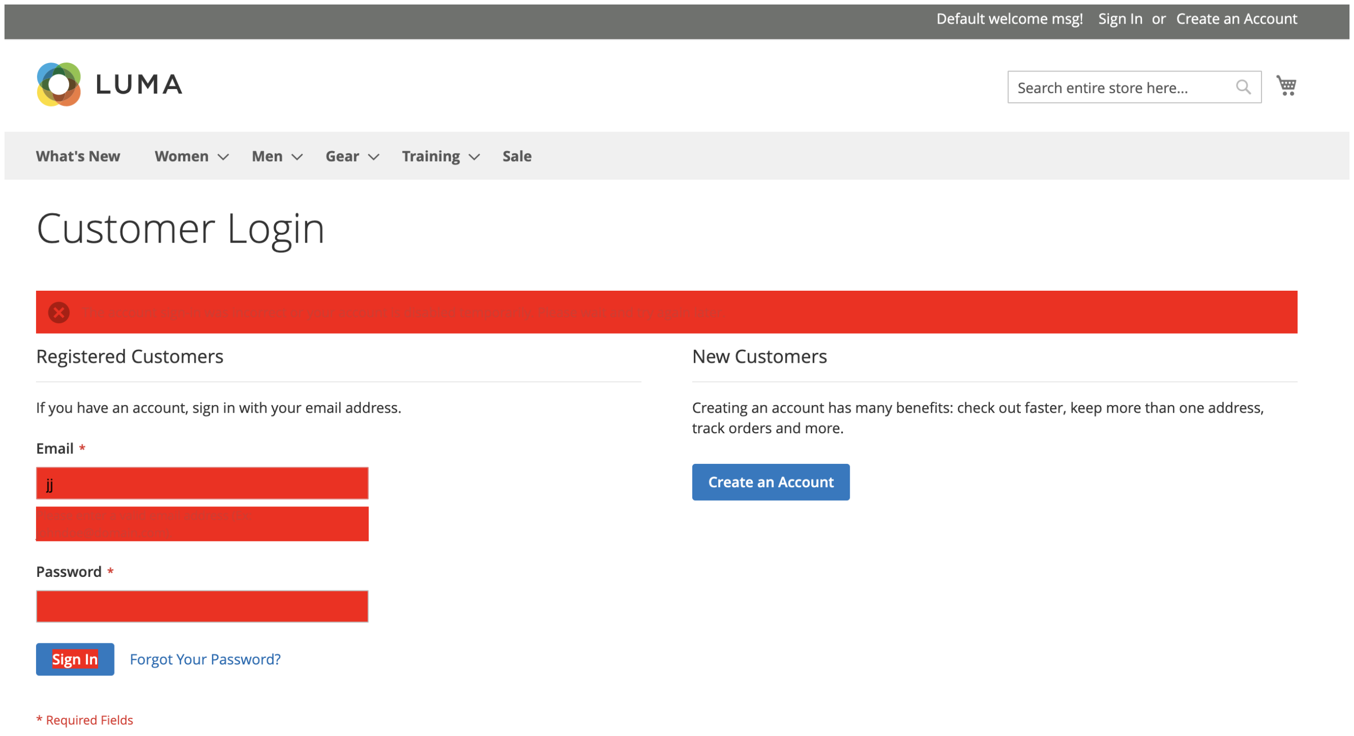
For the purpose of detailing possible use cases, we will use a simple example: test the login process of a website.



We start by using Test Modeller Explorer, a Chrome extension, to help us scan web elements and upload them to TM.

It's important to scan all elements that we need to interact with or assert (e.g. error messages.




Default welcome msg! Sign In or Create an Account

LUMA

Search entire store here...

What's New | Women | Men | Gear | Training | Sale

Customer Login

The account sign-in was incorrect or your account is disabled temporarily. Please wait and try again later.

Registered Customers

If you have an account, sign in with your email address.

Email *

jj

Please enter a valid email address (Ex: johndoe@domain.com).

Password *

Sign In | Forgot Your Password?

* Required Fields

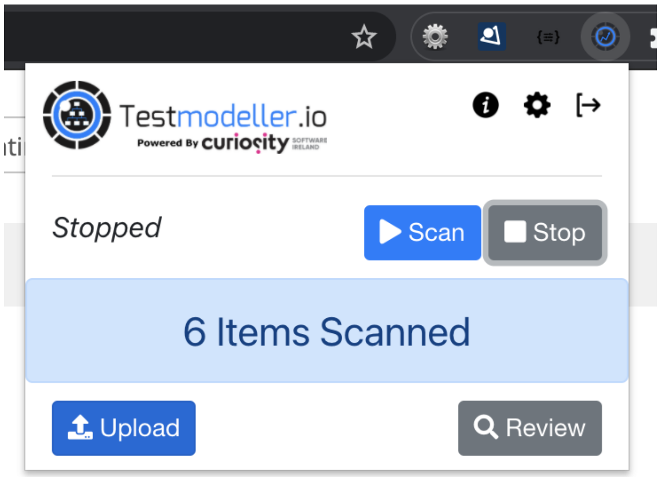
New Customers

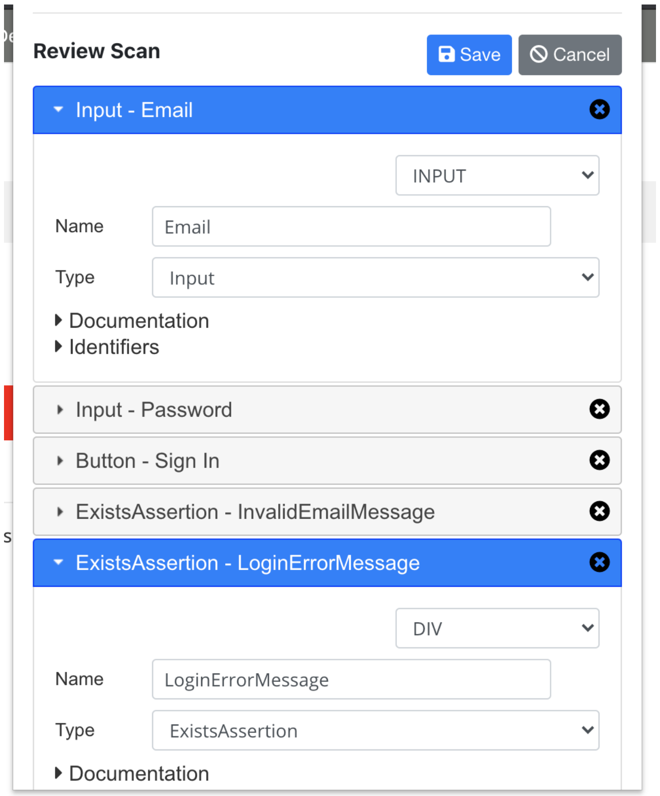
Creating an account has many benefits: check out faster, keep more than one address, track orders and more.

Create an Account

When we finish scanning, we may need to review the items to adjust the identifiers (i.e. the CSS and XPath locators) and also the type; if you're looking at some message that you want to assert, then you should use the type "ExistsAssertion".

It's also a good momentt o name the items properly, if needed.

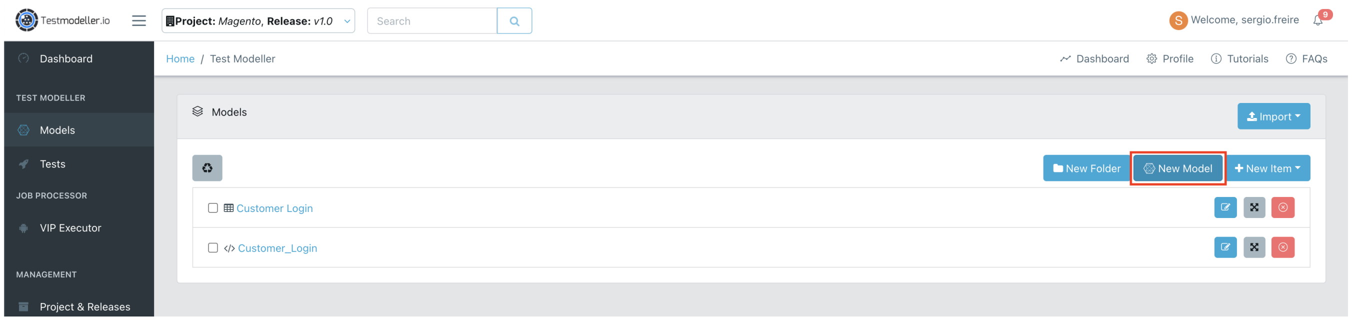




	INPUT
Name	Email
Type	Input

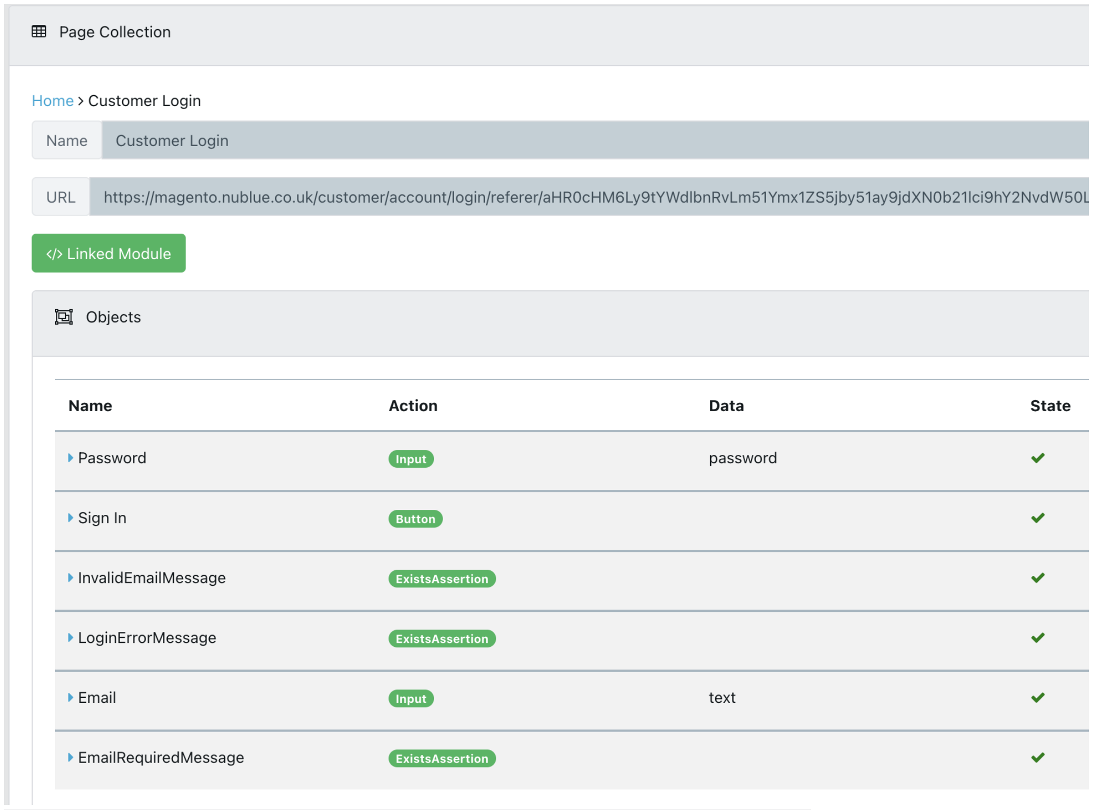
	DIV
Name	LoginErrorMessage
Type	ExistsAssertion

The page object can then be uploaded along with the web elements that will be provisioned as objects inside it. This can repeated for other pages and can also be done at any moment in time.



The "Page Collection" (i.e. the page object) contains inner objects that correspond to the web elements that we can interact with. It is linked to an implementation layer, also known as a Module/Module Collection.

The Module contains functions that allow us to interact with the page object, including navigating to the page, filling out some fields, clicking sign-in button, look for the presence of certain error messages.



Page Collection

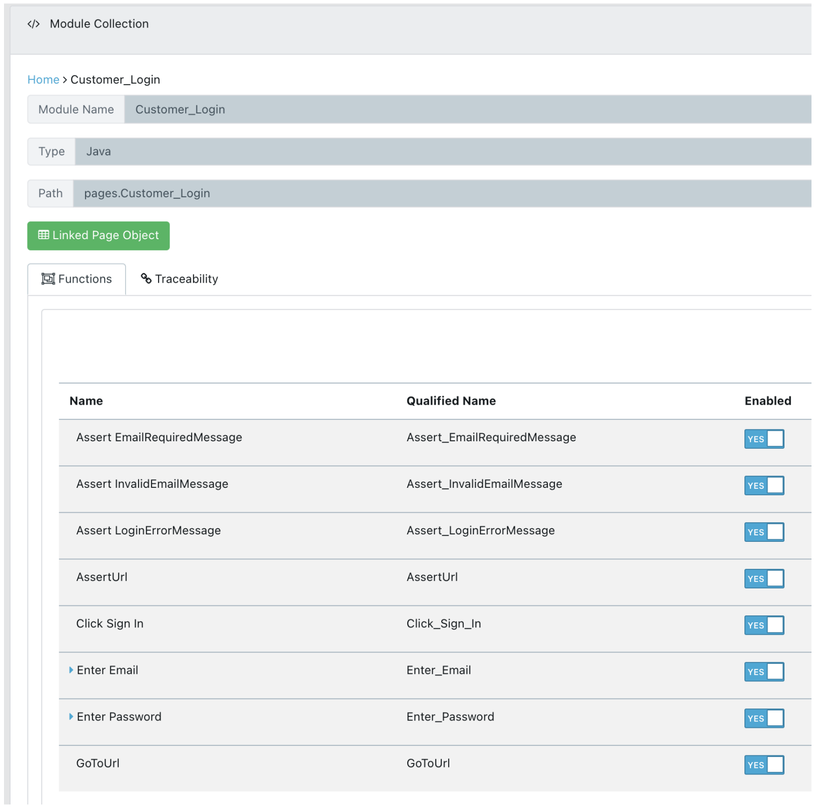
Home > Customer Login

Name	Customer Login
URL	https://magento.nublue.co.uk/customer/account/login/referer/aHR0cHM6Ly9tYWdlbnRvLm51Ymx1ZS5jby51ay9jdXN0b21lci9hY2NvdW50L

Linked Module

Objects

Name	Action	Data	State
Password	Input	password	✓
Sign In	Button		✓
InvalidEmailMessage	ExistsAssertion		✓
LoginErrorMessage	ExistsAssertion		✓
Email	Input	text	✓
EmailRequiredMessage	ExistsAssertion		✓



Module Collection

Home > Customer_Login

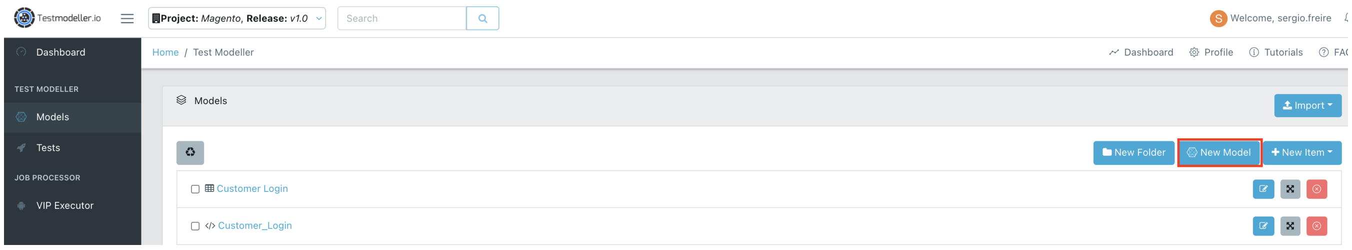
Module Name	Customer_Login
Type	Java
Path	pages.Customer_Login

Linked Page Object

Functions | Traceability

Name	Qualified Name	Enabled
Assert EmailRequiredMessage	Assert_EmailRequiredMessage	YES
Assert InvalidEmailMessage	Assert_InvalidEmailMessage	YES
Assert LoginErrorMessage	Assert_LoginErrorMessage	YES
AssertUrl	AssertUrl	YES
Click Sign In	Click_Sign_In	YES
Enter Email	Enter_Email	YES
Enter Password	Enter_Password	YES
GoToUrl	GoToUrl	YES

After importing or creating all the page objects, we can build a model.



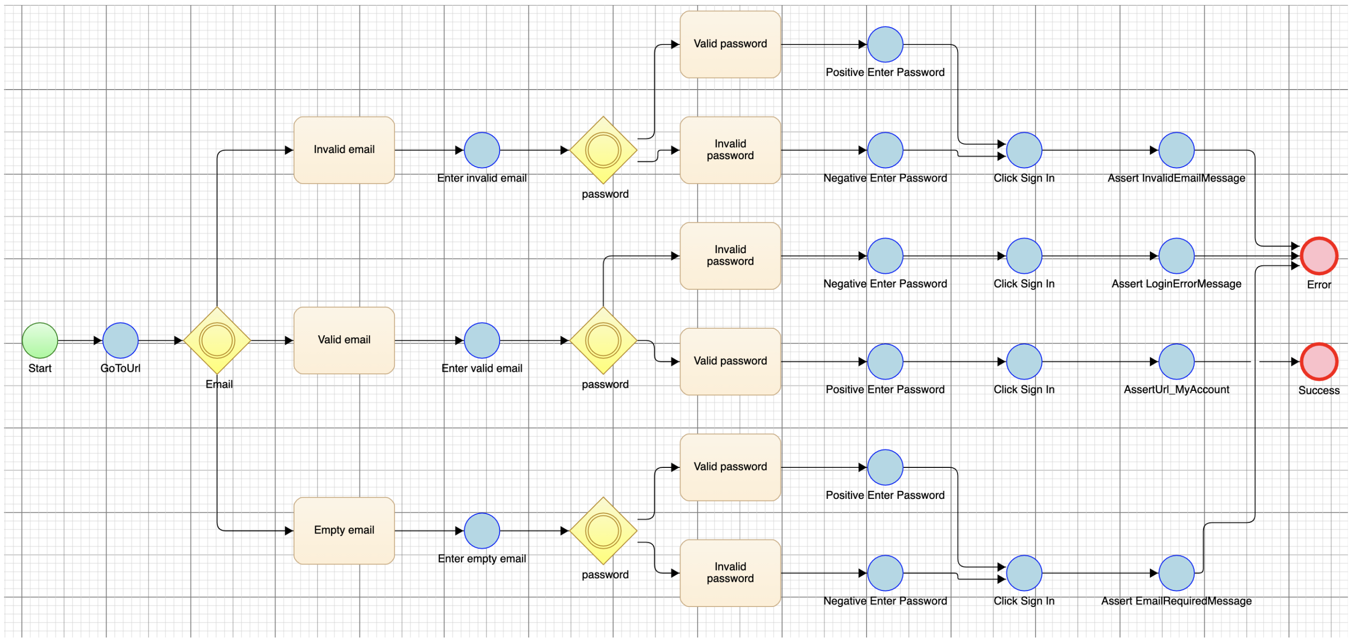
The following diagram shows a possible implemention for checking the login feature.

There is a start node and two ending nodes: one for successful login and another to encapsulate all failed login attempts.

Please note

Models can be implemented in different ways. What you decide to represent, the risks you want to assess, that and other will shape the design process of your model.

There is no right/wrong in a model but modelling is an art that requires practice.

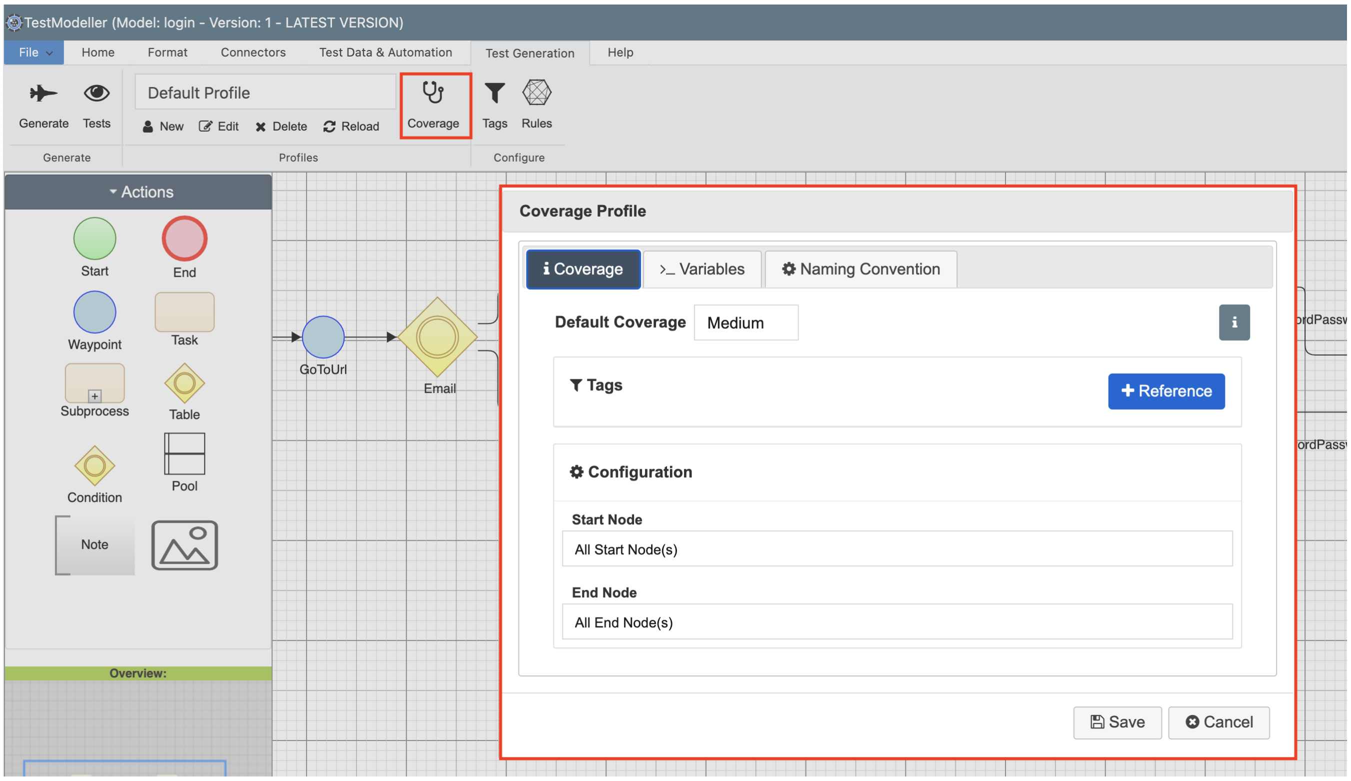


Use cases

Test Modeller to create manual Test cases in Xray

In this use case, Test Modeller is used to design models and generate multiple paths/test cases (i.e. tests).

But first, the coverage profile must be defined in order to fine tune the algorithm for the generation of the test cases.



Coverage Profile

Coverage

Default Coverage: Medium

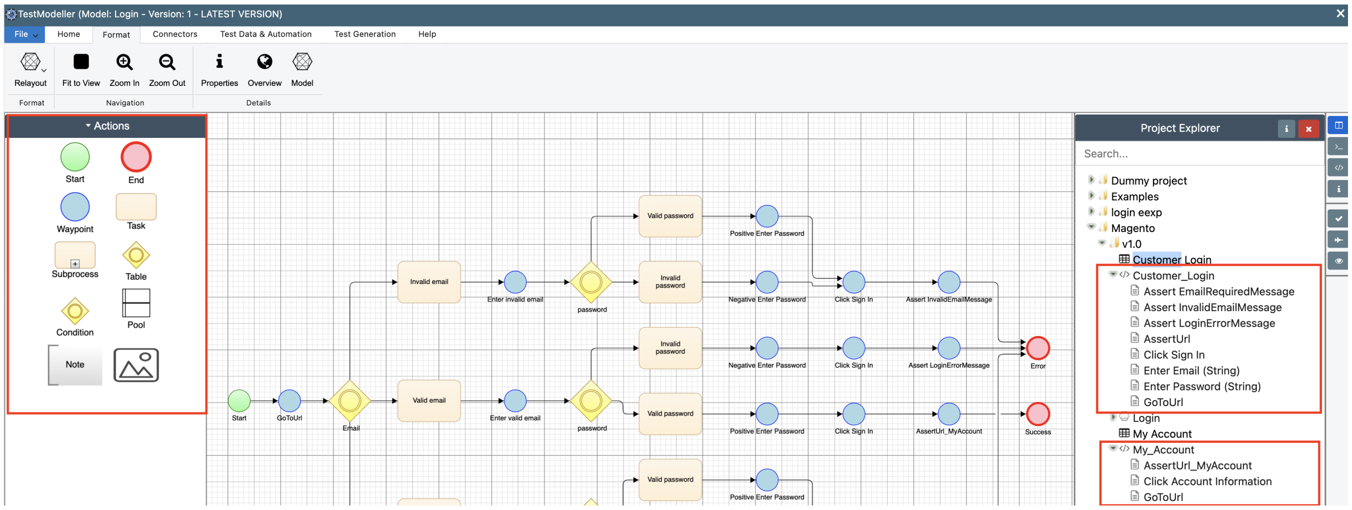
Tags

Configuration

Start Node: All Start Node(s)

End Node: All End Node(s)

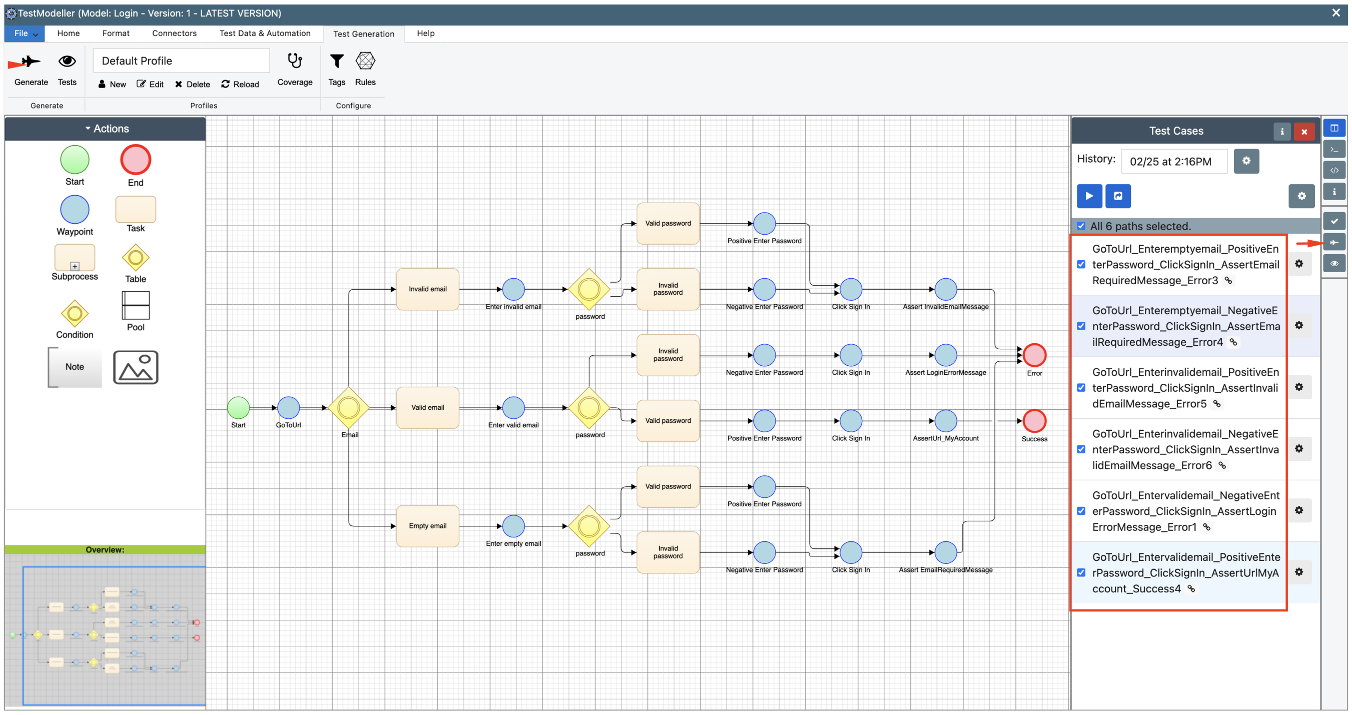
Then we can build the model using Actions or functions from the Modules we have in our project. Note that these functions are associated with operation done in the objects of the corresponding page object.



In the model different paths come to live, as a test case that represents a journey.

These test cases/paths will be provisioned in Xray as Test issues, by doing an export operation to Xray using the connector profile created earlier.

This can be done from within the Test Generation menu or the right-side bar. Paths will be created and will be visible on the Tests/Test Cases panel.



GoToUrl_Enteremptyemail_PositiveEnterPassword_ClickSignIn_AssertEmailRequiredMessage_Error3

GoToUrl_Enteremptyemail_NegativeEnterPassword_ClickSignIn_AssertEmailRequiredMessage_Error4

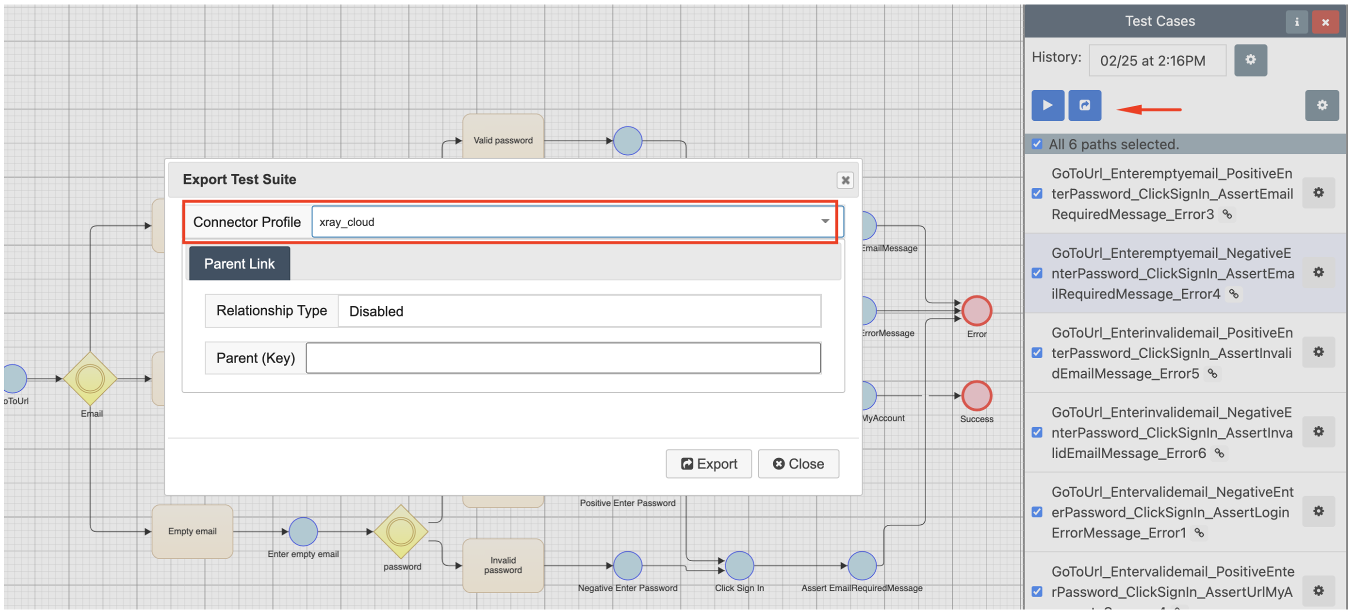
GoToUrl_Enterinvalidemail_PositiveEnterPassword_ClickSignIn_AssertInvalidEmailMessage_Error5

GoToUrl_Enterinvalidemail_NegativeEnterPassword_ClickSignIn_AssertInvalidEmailMessage_Error6

GoToUrl_Entervalidemail_NegativeEnterPassword_ClickSignIn_AssertLoginErrorMessage_Error1

GoToUrl_Entervalidemail_PositiveEnterPassword_ClickSignIn_AssertUrlMyAccount_Success4

To export these Test Cases to Xray, an export operation can be triggered using the Connector Profile having the Xray settings.

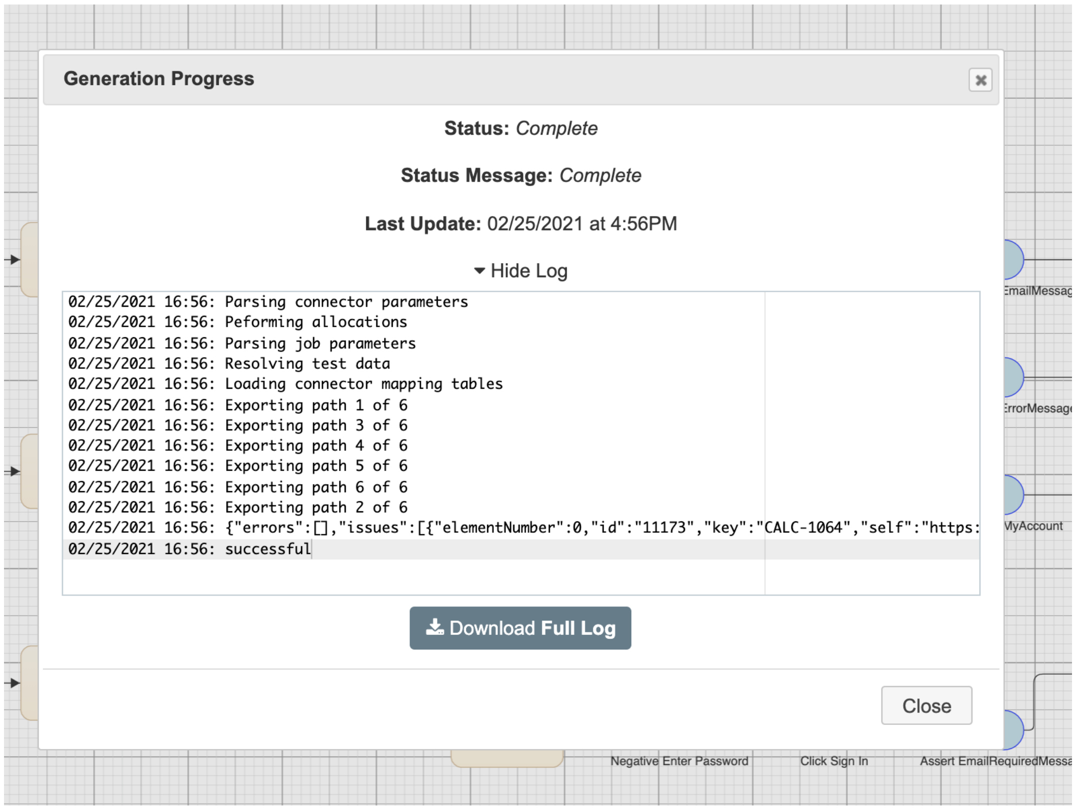


Test Cases
History: 02/25 at 2:16PM
All 6 paths selected.
GoToUrl_Enteremptyemail_PositiveEnterPassword_ClickSignIn_AssertEmailRequiredMessage_Error3
GoToUrl_Enteremptyemail_NegativeEnterPassword_ClickSignIn_AssertEmailRequiredMessage_Error4
GoToUrl_Enterinvalidemail_PositiveEnterPassword_ClickSignIn_AssertInvalidEmailMessage_Error5
GoToUrl_Enterinvalidemail_NegativeEnterPassword_ClickSignIn_AssertInvalidEmailMessage_Error6
GoToUrl_Entervalidemail_NegativeEnterPassword_ClickSignIn_AssertLoginErrorMessage_Error1
GoToUrl_Entervalidemail_PositiveEnterPassword_ClickSignIn_AssertUrlMyA
Export Test Suite
Parent Link
Export
Close

Connector Profile: xray_cloud

Relationship Type: Disabled

Parent (Key):



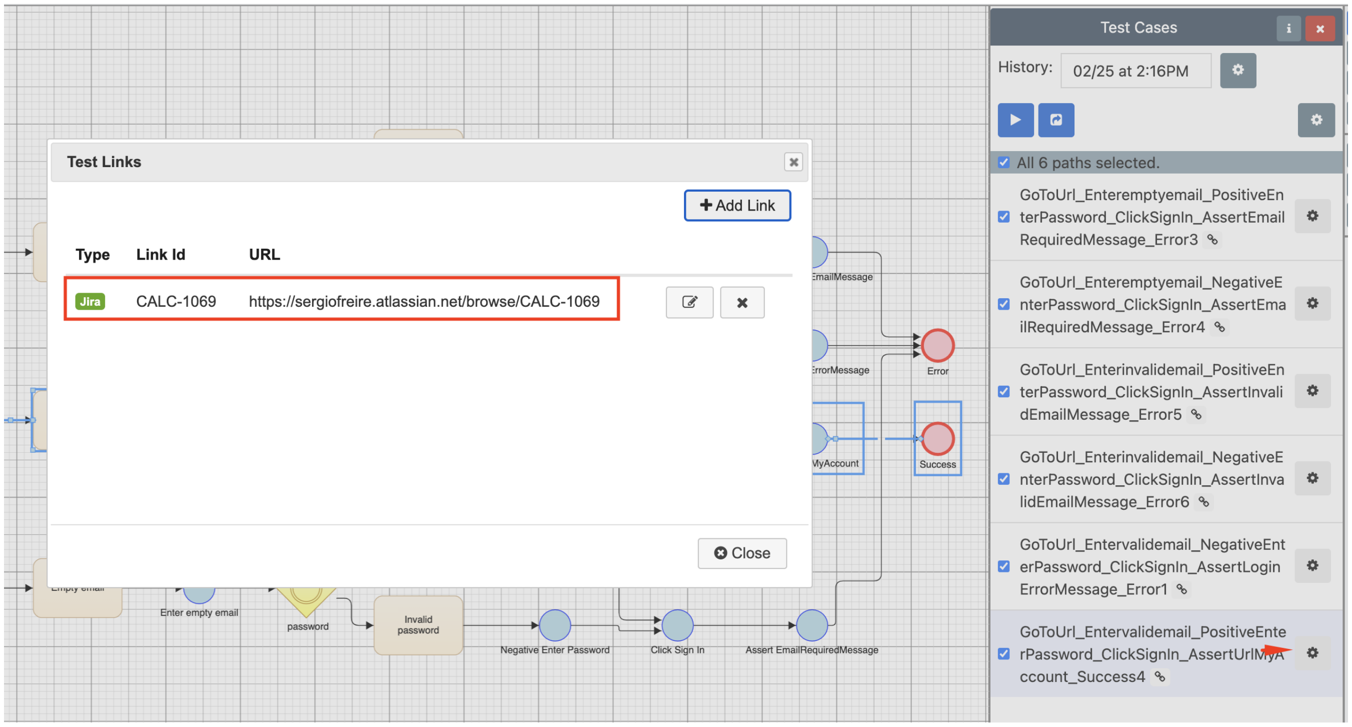
Status: *Complete*

Status Message: *Complete*

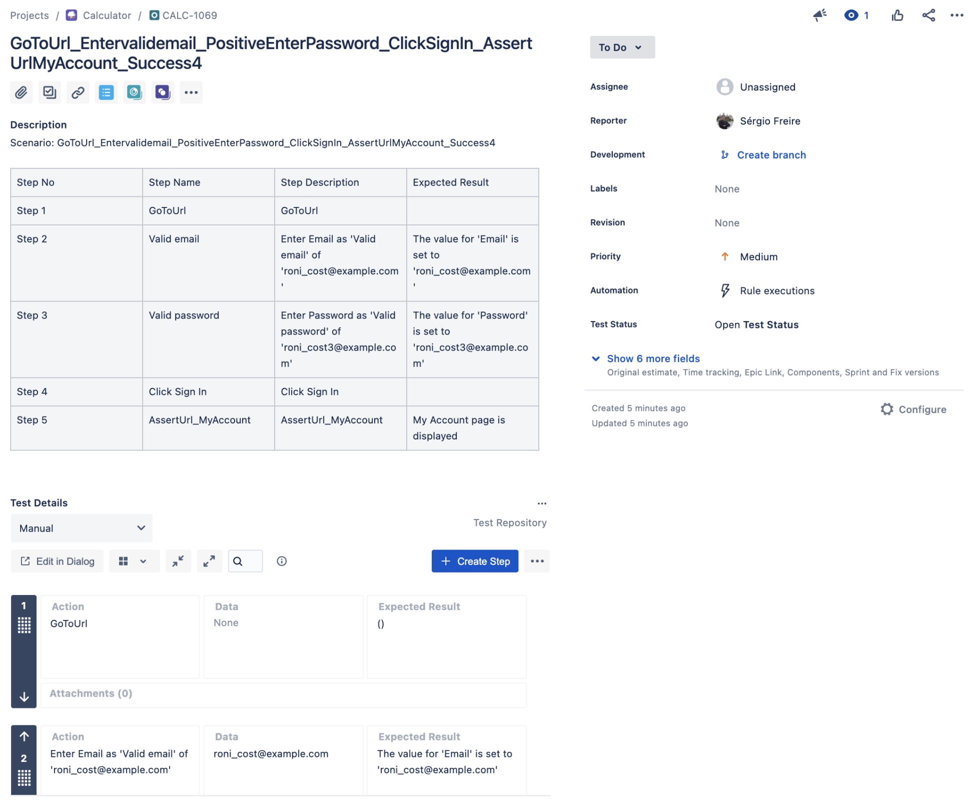
Last Update: 02/25/2021 at 4:56PM

```
02/25/2021 16:56: Parsing connector parameters
02/25/2021 16:56: Peforming allocations
02/25/2021 16:56: Parsing job parameters
02/25/2021 16:56: Resolving test data
02/25/2021 16:56: Loading connector mapping tables
02/25/2021 16:56: Exporting path 1 of 6
02/25/2021 16:56: Exporting path 3 of 6
02/25/2021 16:56: Exporting path 4 of 6
02/25/2021 16:56: Exporting path 5 of 6
02/25/2021 16:56: Exporting path 6 of 6
02/25/2021 16:56: Exporting path 2 of 6
02/25/2021 16:56: {"errors":[],"issues":[{"elementNumber":0,"id":"11173","key":"CALC-1064","self":"https:
02/25/2021 16:56: successful
```

In Xray, Test issues are created; each Test Modeller's test case/path has a corresponding Test issue in Xray. A link sign is shown in each path/test case in TM; the link to the Test issue in Jira can be obtained through the context options available in each path.


Test Cases
History: 02/25 at 2:16PM
All 6 paths selected.
GoToUrl_Enteremptyemail_PositiveEnterPassword_ClickSignIn_AssertEmailRequiredMessage_Error3
GoToUrl_Enteremptyemail_NegativeEnterPassword_ClickSignIn_AssertEmailRequiredMessage_Error4
GoToUrl_Enterinvalidemail_PositiveEnterPassword_ClickSignIn_AssertInvalidEmailMessage_Error5
GoToUrl_Enterinvalidemail_NegativeEnterPassword_ClickSignIn_AssertInvalidEmailMessage_Error6
GoToUrl_Entervalidemail_NegativeEnterPassword_ClickSignIn_AssertLoginErrorMessage_Error1
GoToUrl_Entervalidemail_PositiveEnterPassword_ClickSignIn_AssertUrlMyAccount_Success4
Test Links
Add Link
Close
Error
Success
Invalid password
Negative Enter Password
Click Sign In
Assert EmailRequiredMessage
Enter empty email
password

Type	Link Id	URL
Jira	CALC-1069	https://sergiofreire.atlassian.net/browse/CALC-1069


Projects / Calculator / CALC-1069
To Do
Show 6 more fields
Original estimate, Time tracking, Epic Link, Components, Sprint and Fix versions
Configure
Test Repository
Edit in Dialog
Create Step
Attachments (0)

GoToUrl_Entervalidemail_PositiveEnterPassword_ClickSignIn_AssertUrlMyAccount_Success4

Description
Scenario: GoToUrl_Entervalidemail_PositiveEnterPassword_ClickSignIn_AssertUrlMyAccount_Success4

Step No	Step Name	Step Description	Expected Result
Step 1	GoToUrl	GoToUrl	
Step 2	Valid email	Enter Email as 'Valid email' of 'roni_cost@example.com'	The value for 'Email' is set to 'roni_cost@example.com'
Step 3	Valid password	Enter Password as 'Valid password' of 'roni_cost3@example.com'	The value for 'Password' is set to 'roni_cost3@example.com'
Step 4	Click Sign In	Click Sign In	
Step 5	AssertUrl_MyAccount	AssertUrl_MyAccount	My Account page is displayed

Assignee	Unassigned
Reporter	Sérgio Freire
Development	Create branch
Labels	None
Revision	None
Priority	Medium
Automation	Rule executions
Test Status	Open Test Status

Created 5 minutes ago
Updated 5 minutes ago

Test Details
Manual

#	Action	Data	Expected Result
1	GoToUrl	None	()
2	Enter Email as 'Valid email' of 'roni_cost@example.com'	roni_cost@example.com	The value for 'Email' is set to 'roni_cost@example.com'

Test Modeller as a modeling and automation tool and Xray as single-source of truth

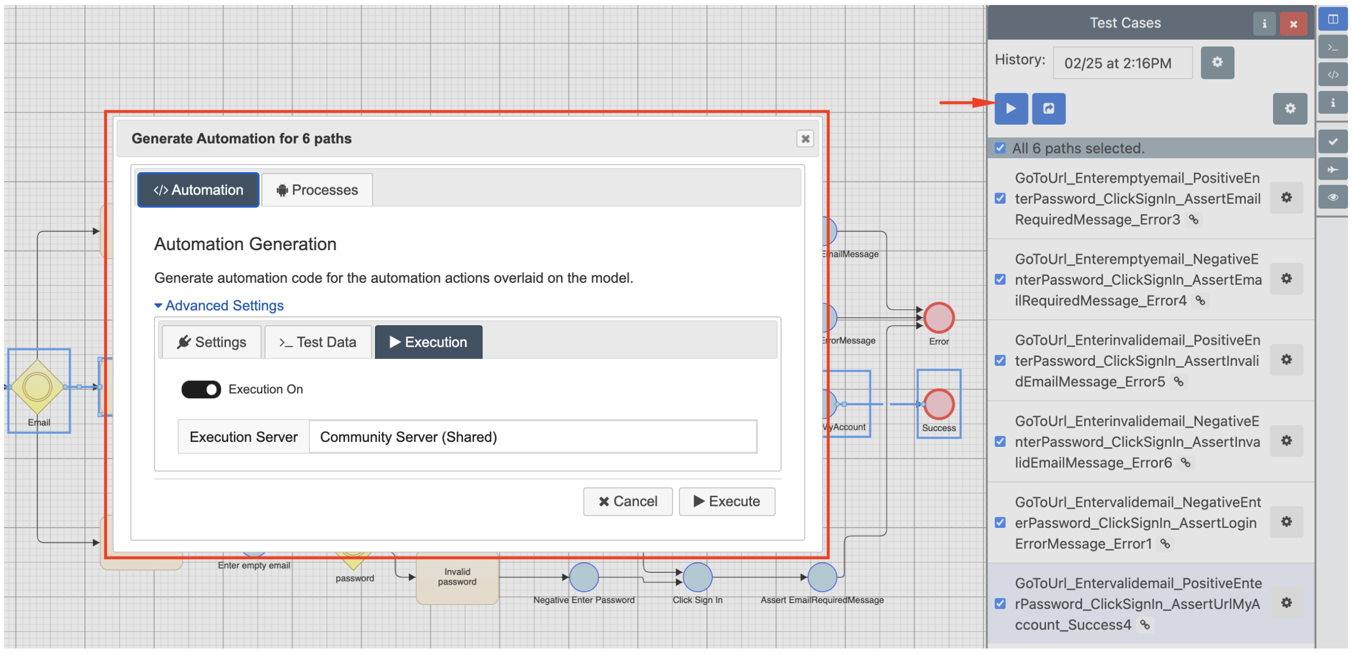
In this use case, Test Modeller is used once again to design models and generate multiple paths (i.e. tests). These paths will be provisioned in Xray as Test issues.

Test automation code will be also generated in one of different automation frameworks supported. This code will be executed by Test Modeller, or during CI, and results will be reported to Xray, to the Tests provisioned earlier.

The initial steps used by this use case are essentialy the same steps described earlier for the other use case.

However, we don't want to run the tests manually; we aim to run them through the low-code automation facilities provided by TM.

For that, we need to generate automation code for the selected paths/test cases, eventually commit it to Git, and run them.



Automation Generation

Generate automation code for the automation actions overlaid on the model.

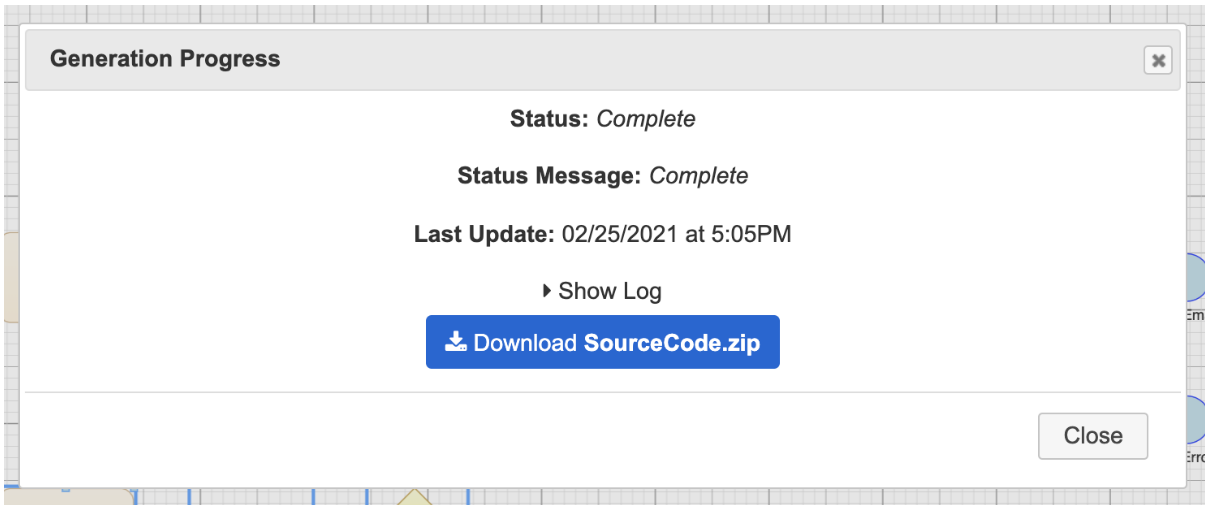
Execution On

Execution Server	Community Server (Shared)

History: 02/25 at 2:16PM

- GoToUrl_Enteremptyemail_PositiveEnterPassword_ClickSignIn_AssertEmailRequiredMessage_Error3
- GoToUrl_Enteremptyemail_NegativeEnterPassword_ClickSignIn_AssertEmailRequiredMessage_Error4
- GoToUrl_Enterinvalidemail_PositiveEnterPassword_ClickSignIn_AssertInvalidEmailMessage_Error5
- GoToUrl_Enterinvalidemail_NegativeEnterPassword_ClickSignIn_AssertInvalidEmailMessage_Error6
- GoToUrl_Entervalidemail_NegativeEnterPassword_ClickSignIn_AssertLoginErrorMessage_Error1
- GoToUrl_Entervalidemail_PositiveEnterPassword_ClickSignIn_AssertUrlMyAccount_Success4

Using the automation framework assigned to the project, tests will be executed. It's also possible to download the generated source code (we can also just generate the code without executing it).

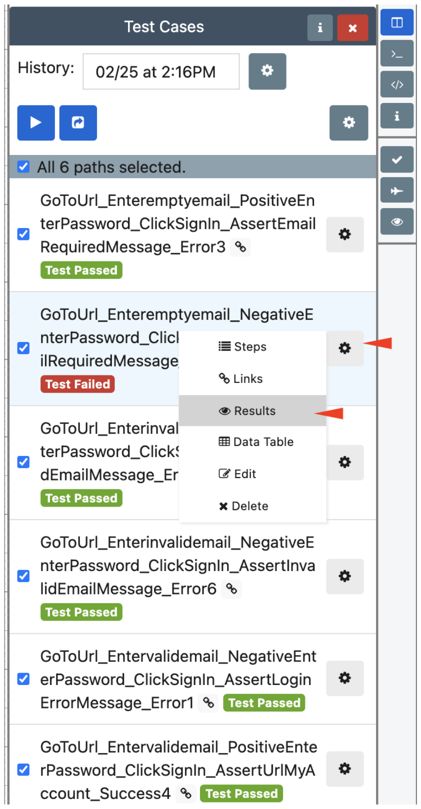


Status: *Complete*

Status Message: *Complete*

Last Update: 02/25/2021 at 5:05PM

Basic result information will be shown on the Test Cases panel. It is also possible to deep-dive to see historical results or to look at the current results in more detail (e.g. step results, screenshots).



Test Cases

History: 02/25 at 2:16PM

All 6 paths selected.

GoToUrl_Enteremptyemail_PositiveEnterPassword_ClickSignIn_AssertEmailRequiredMessage_Error3 Test Passed

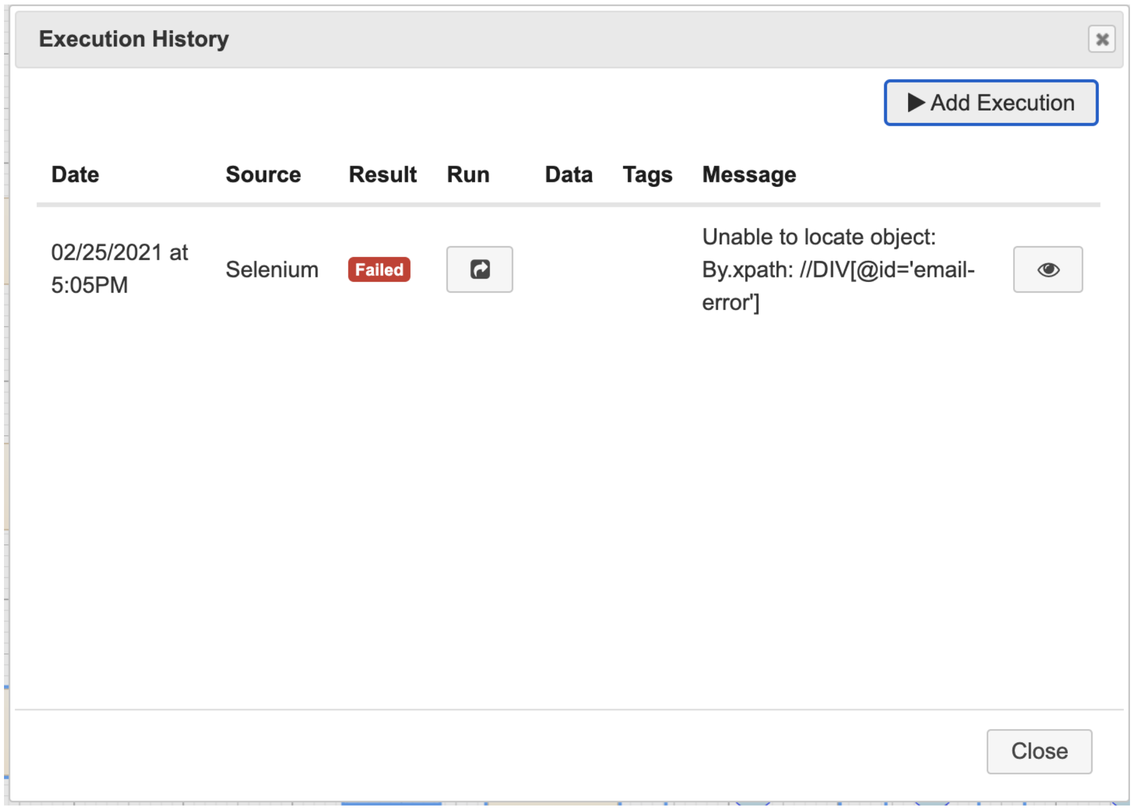
GoToUrl_Enteremptyemail_NegativeEnterPassword_Click… ilRequiredMessage… Test Failed

GoToUrl_Enterinval… terPassword_Click… dEmailMessage_Er… Test Passed

GoToUrl_Enterinvalidemail_NegativeEnterPassword_ClickSignIn_AssertInvalidEmailMessage_Error6 Test Passed

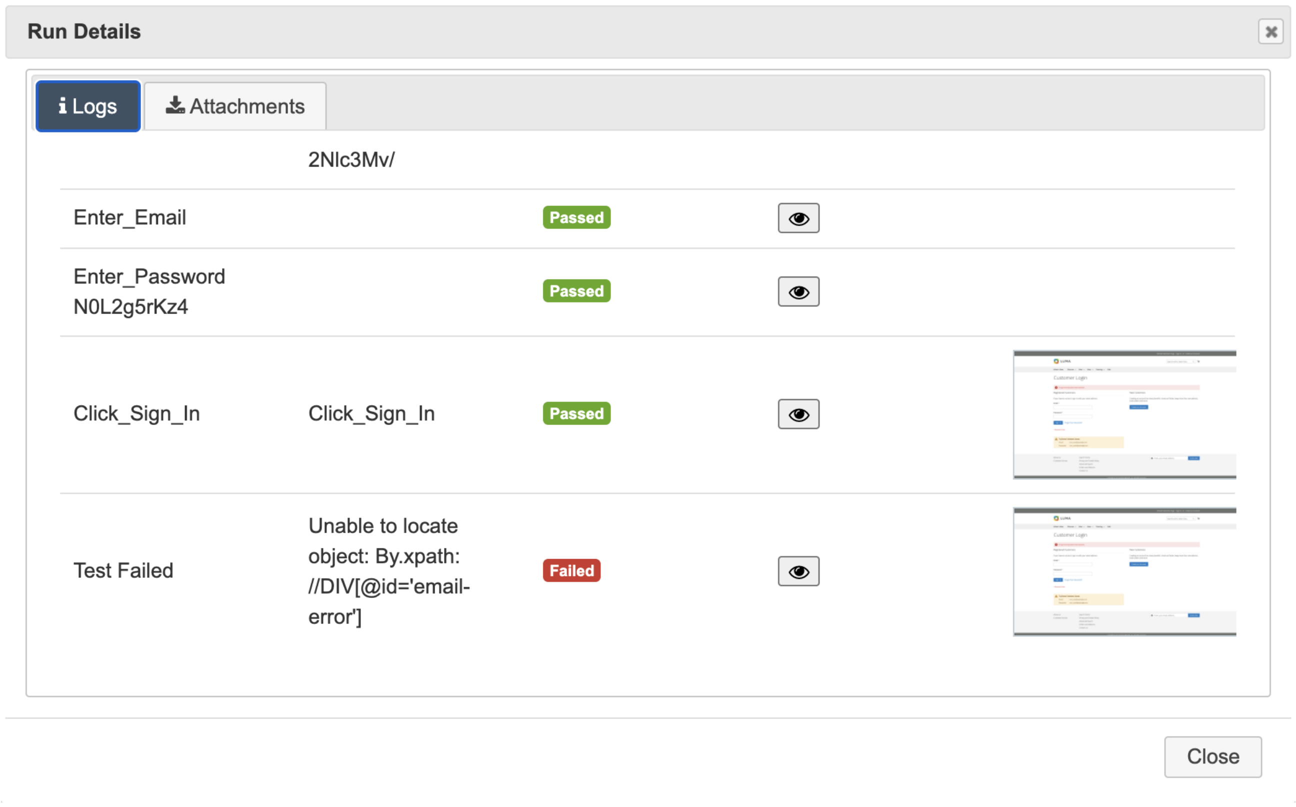
GoToUrl_Entervalidemail_NegativeEnterPassword_ClickSignIn_AssertLoginErrorMessage_Error1 Test Passed

GoToUrl_Entervalidemail_PositiveEnterPassword_ClickSignIn_AssertUrlMyAccount_Success4 Test Passed



Execution History

Date	Source	Result	Run	Data	Tags	Message
02/25/2021 at 5:05PM	Selenium	Failed				Unable to locate object: By.xpath: //DIV[@id='email-error']

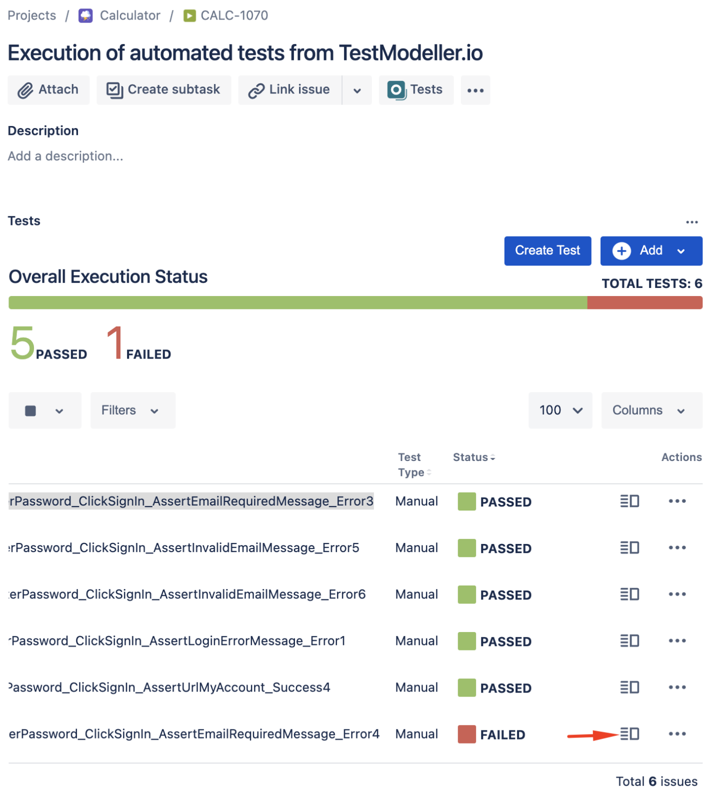

Run Details

Logs | Attachments

	2NIc3Mv/		
Enter_Email		Passed	
Enter_Password N0L2g5rKz4		Passed	
Click_Sign_In	Click_Sign_In	Passed	
Test Failed	Unable to locate object: By.xpath: //DIV[@id='email-error']	Failed	

Close

When running the automated test, and since the test cases in TM are already linked to Test issues in Xray due to a previous Export operation, a Test Execution will be created in Xray containing the results for the executed test cases/paths.


Projects / Calculator / CALC-1070

Execution of automated tests from TestModeller.io

Attach | Create subtask | Link issue | Tests

Description

Add a description...

Tests

Create Test | Add

Overall Execution Status

TOTAL TESTS: 6

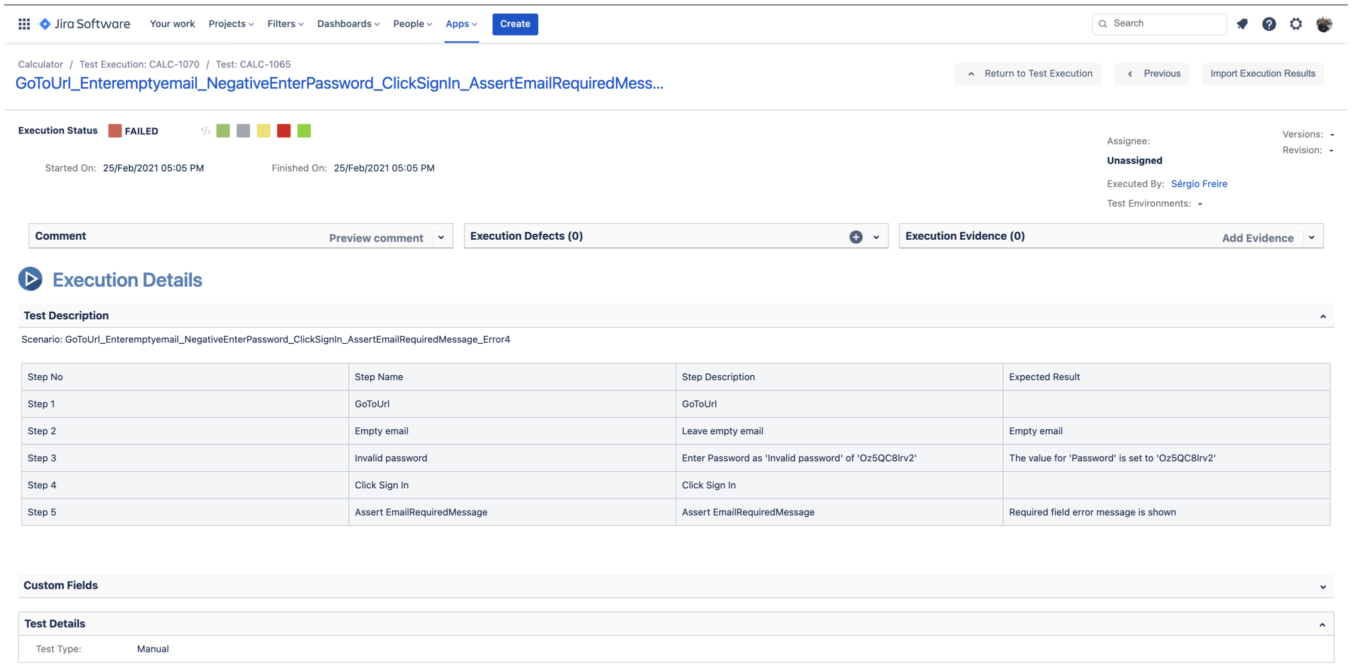
5 PASSED 1 FAILED

Filters | 100 | Columns

	Test Type	Status	Actions
rPassword_ClickSignIn_AssertEmailRequiredMessage_Error3	Manual	PASSED	
ırPassword_ClickSignIn_AssertInvalidEmailMessage_Error5	Manual	PASSED	
erPassword_ClickSignIn_AssertInvalidEmailMessage_Error6	Manual	PASSED	
·Password_ClickSignIn_AssertLoginErrorMessage_Error1	Manual	PASSED	
ɔassword_ClickSignIn_AssertUrlMyAccount_Success4	Manual	PASSED	
erPassword_ClickSignIn_AssertEmailRequiredMessage_Error4	Manual	FAILED	

Total 6 issues

We can access the execution details for a specific Test (i.e. it's Test Run), where results per step are available, including screenshots.



Calculator / Test Execution: CALC-1070 / Test: CALC-1065

GoToUrl_Enteremptyemail_NegativeEnterPassword_ClickSignIn_AssertEmailRequiredMess...

Return to Test Execution | Previous | Import Execution Results

Execution Status 🟥 FAILED

Started On: 25/Feb/2021 05:05 PM   Finished On: 25/Feb/2021 05:05 PM

Assignee: **Unassigned**

Versions: -
Revision: -

Executed By: Sérgio Freire
Test Environments: -

Comment Preview comment | **Execution Defects (0)** | **Execution Evidence (0)** Add Evidence

Execution Details

Test Description

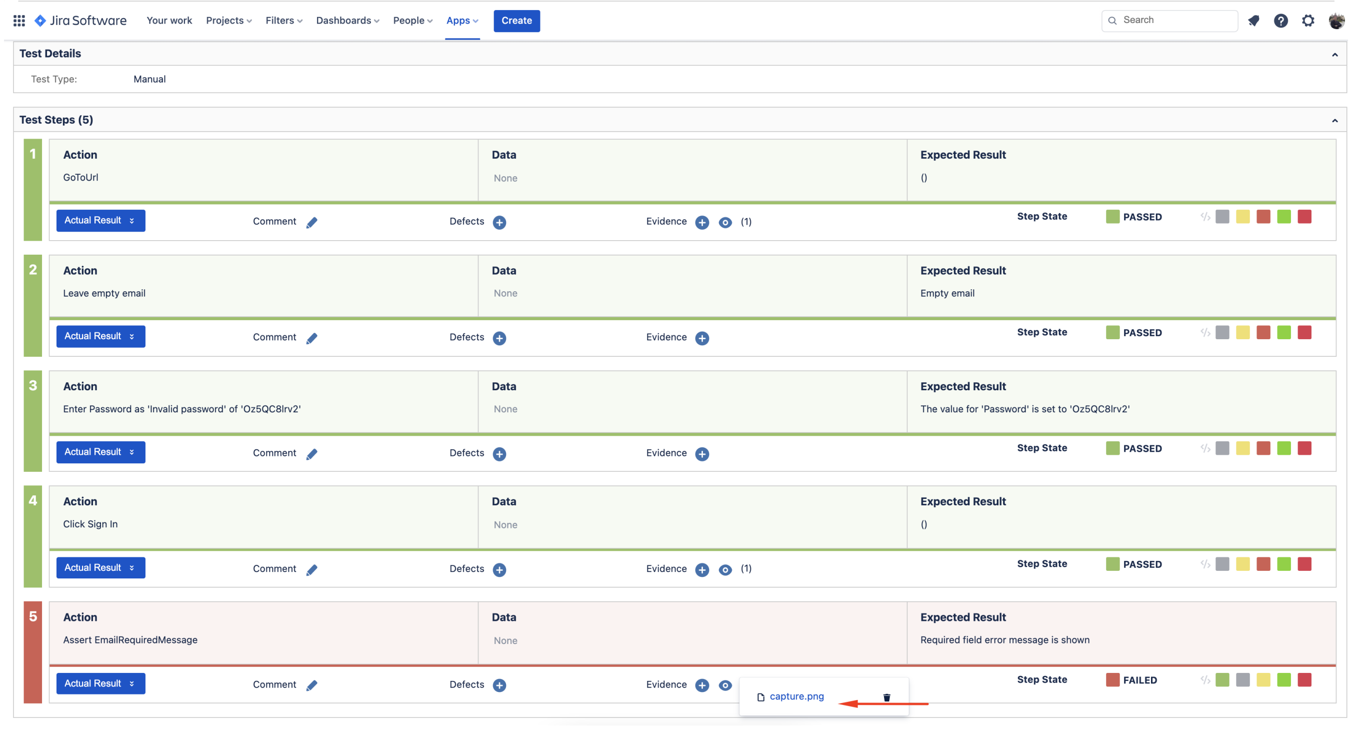
Scenario: GoToUrl_Enteremptyemail_NegativeEnterPassword_ClickSignIn_AssertEmailRequiredMessage_Error4

Step No	Step Name	Step Description	Expected Result
Step 1	GoToUrl	GoToUrl	
Step 2	Empty email	Leave empty email	Empty email
Step 3	Invalid password	Enter Password as 'Invalid password' of 'Oz5QC8lrv2'	The value for 'Password' is set to 'Oz5QC8lrv2'
Step 4	Click Sign In	Click Sign In	
Step 5	Assert EmailRequiredMessage	Assert EmailRequiredMessage	Required field error message is shown

Custom Fields

Test Details

Test Type: Manual



Test Details

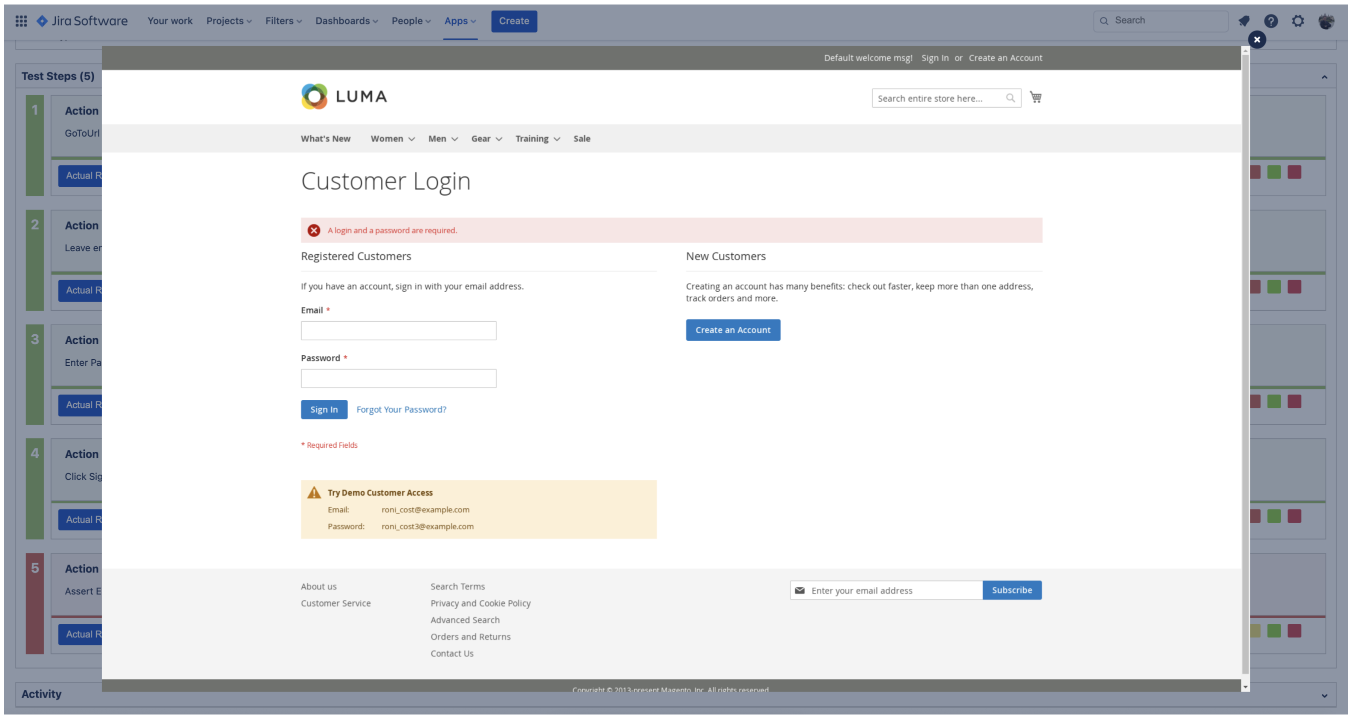
Test Type: Manual

Test Steps (5)

	Action	Data	Expected Result
1	GoToUrl	None	()
2	Leave empty email	None	Empty email
3	Enter Password as 'Invalid password' of 'Oz5QC8lrv2'	None	The value for 'Password' is set to 'Oz5QC8lrv2'
4	Click Sign In	None	()
5	Assert EmailRequiredMessage	None	Required field error message is shown

	Actual Result	Comment	Defects	Evidence	Step State
1	Actual Result	Comment	Defects	Evidence (1)	🟩 PASSED
2	Actual Result	Comment	Defects	Evidence	🟩 PASSED
3	Actual Result	Comment	Defects	Evidence	🟩 PASSED
4	Actual Result	Comment	Defects	Evidence (1)	🟩 PASSED
5	Actual Result	Comment	Defects	Evidence	🟥 FAILED

capture.png



Customer Login

A login and a password are required.

Registered Customers

If you have an account, sign in with your email address.

Email *

Password *

Sign In Forgot Your Password?

* Required Fields

Try Demo Customer Access

Email: roni_cost@example.com

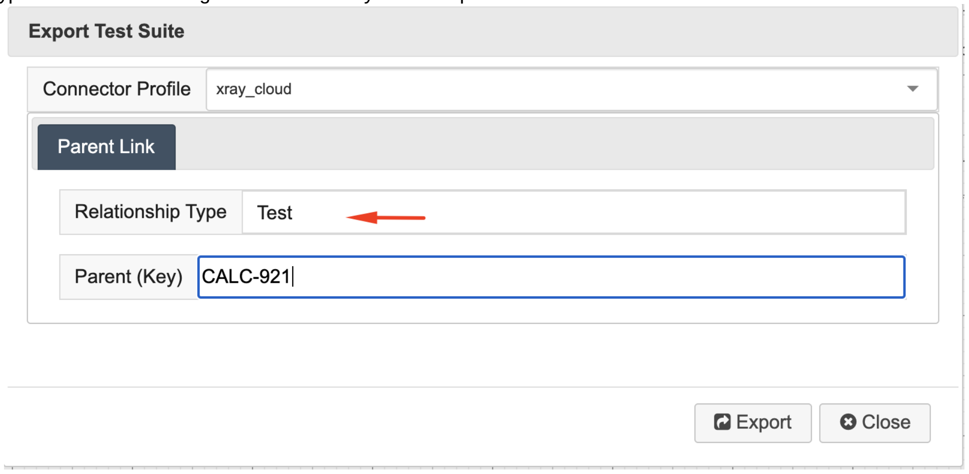
Password: roni_cost3@example.com

New Customers

Creating an account has many benefits: check out faster, keep more than one address, track orders and more.

Create an Account

Tips

- Whenever exporting test cases to Xray, it's possible to link them to an existing requirement and thus cover it. This can be achieved by specifying the link type named "Test" along with the issue key of the requirement.
  - 

    Export Test Suite

    Connector Profile: xray_cloud

    Parent Link

    Relationship Type: Test

    Parent (Key): CALC-921

- After uploading the test automation results, in Xray you can manually assign them to a specific version and also identify the Test Environment used (e.g. browser); this can be done on the respective Test Execution issues.

Learn more

- Test Modeller homepage
- Test Modeller tutorials
- Test Modeller Explorer (web scanner extension for Chrome)