

Integration with GitLab

GitLab is a well-known CI/CD tool available on-premises and as SaaS.

Xray does not provide yet a plugin for GitLab. However, it is easy to setup GitLab in order to integrate it with Xray Cloud.

Since Xray provides a full REST API, you may interact with Xray, for submitting results for example.

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Integration scenarios

JUnit example

In this scenario, we want to get visibility of the automated test results from some tests implemented in Java, using the JUnit framework.

This recipe could also be applied for other frameworks such as NUnit or Robot (if supported).

We need to setup a Git repository containing the code along with the configuration for GitLab build process.

The tests are implemented in a JUnit class as follows.

CalcTest.java

```
package com.xpand.java;

import org.junit.After;
import org.junit.Before;
import org.junit.Test;

import static org.hamcrest.CoreMatchers.is;
import static org.junit.Assert.assertThat;

public class CalcTest {

    @Before
    public void setUp() throws Exception {

    }

    @After
    public void tearDown() throws Exception {

    }

    @Test
    public void CanAddNumbers()
    {
        assertThat(Calculator.Add(1, 1), is(2));
        assertThat(Calculator.Add(-1, 1), is(0));
    }

    @Test
    public void CanSubtract()
    {
        assertThat(Calculator.Subtract(1, 1), is(0));
        assertThat(Calculator.Subtract(-1, -1), is(0));
        assertThat(Calculator.Subtract(100, 5), is(95));
    }

    @Test
    public void CanMultiply()
    {
        assertThat(Calculator.Multiply(1, 1), is(1));
        assertThat(Calculator.Multiply(-1, -1), is(1));
        assertThat(Calculator.Multiply(100, 5), is(500));
    }

    public void CanDivide()
    {
        assertThat(Calculator.Divide(1, 1), is(1));
        assertThat(Calculator.Divide(-1, -1), is(1));
        assertThat(Calculator.Divide(100, 5), is(20));
    }

    @Test
    public void CanDoStuff()
    {
        assertThat(true, is(true));
    }

}
```

The GitLab configuration file `.gitlab-ci.yml` contains the definition of the build steps, including running the automated tests and submitting the results.

`.gitlab-ci.yml`

```
# Use Maven 3.5 and JDK8
image: maven:3.5-jdk-8

variables:
  # This will suppress any download for dependencies and plugins or upload messages which would clutter the
  # console log.
  # `showDateTime` will show the passed time in milliseconds. You need to specify `--batch-mode` to make this
  # work.
  MAVEN_OPTS: "-Dmaven.repo.local=.m2/repository -Dorg.slf4j.simpleLogger.log.org.apache.maven.cli.transfer.Slf4jMavenTransferListener=WARN -Dorg.slf4j.simpleLogger.showDateTime=true -Djava.awt.headless=true"
  # As of Maven 3.3.0 instead of this you may define these options in `.mvn/maven.config` so the same config is
  # used
  # when running from the command line.
  # `installAtEnd` and `deployAtEnd` are only effective with recent version of the corresponding plugins.
  MAVEN_CLI_OPTS: "--batch-mode --errors --fail-at-end --show-version -DinstallAtEnd=true -DdeployAtEnd=true"

# Cache downloaded dependencies and plugins between builds.
# To keep cache across branches add 'key: "$CI_JOB_REF_NAME"'
cache:
  paths:
    - .m2/repository

maven_build:
  script:
    - |
      echo "building my amazing repo..."
      mvn test
      export token=$(curl -H "Content-Type: application/json" -X POST --data "{ \"client_id\": \"${client_id}\",
      \"client_secret\": \"${client_secret}\" }" https://xray.cloud.getxray.app/api/v2/authenticate | tr -d '{}')
      echo $token
      curl -H "Content-Type: text/xml" -H "Authorization: Bearer $token" --data @target/surefire-reports/TEST-com.xpand.java.CalcTest.xml "https://xray.cloud.getxray.app/api/v2/import/execution/junit?projectKey=CALC"
      echo "done"
```

In order to submit those results, we'll just need to invoke the REST API (as detailed in [Import Execution Results - REST](#)).

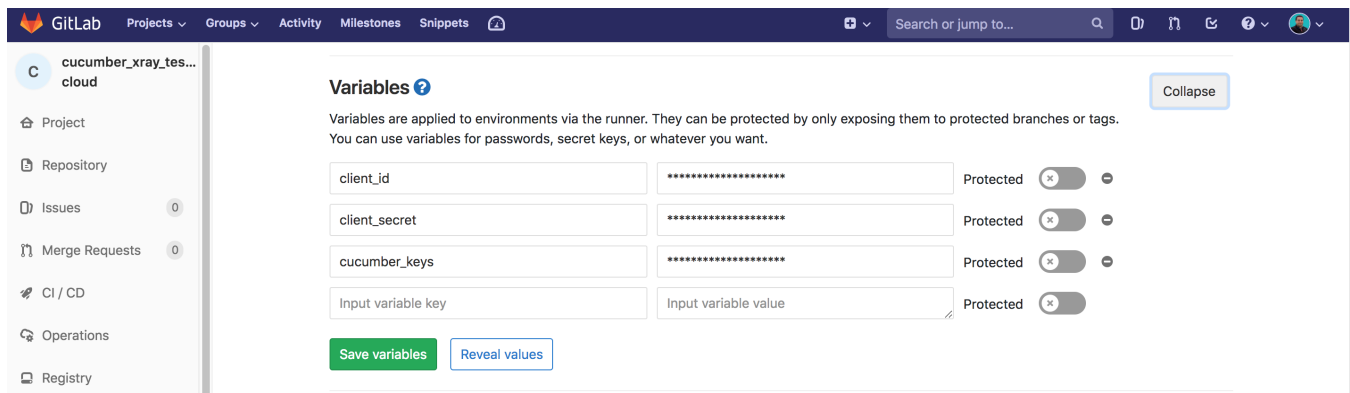
However, we do not want to have the Xray API credentials hardcoded in GitLab's configuration file. Therefore, we'll use some environment variables defined in project settings, including:

- **client_id**: the `client_id` associated with the API key created in the Xray cloud instance
- **client_secret**: the `client_secret` associated with the API key created in the Xray cloud instance



Please note

The user associated with Xray's API key must have permission to Create Test and Test Execution Issues.

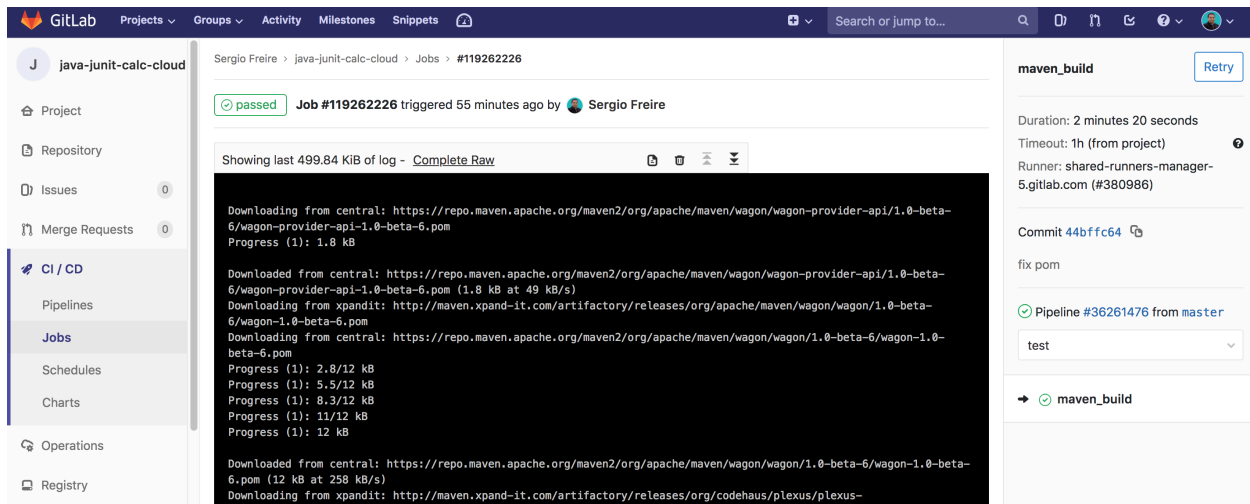


In `.gitlab-ci.yml` a "step" must be included that will use "curl" in order to first obtain a token and then finally submit the results to the REST API, using that token.

```
export token=$(curl -H "Content-Type: application/json" -X POST --data "{ \"client_id\": \"${client_id}\", \"client_secret\": \"${client_secret}\" }" https://xray.cloud.getxray.app/api/v2/authenticate | tr -d '\n')

curl -H "Content-Type: text/xml" -H "Authorization: Bearer $token" --data @target/surefire-reports/TEST-com.xpand.java.CalcTest.xml "https://xray.cloud.getxray.app/api/v2/import/execution/junit?projectKey=SP"
```

We're using "curl" utility that comes in Unix based OS'es but you can easily use another tool to make the HTTP request; however, "curl" is provided in the container used by GitLab.



Triggering automation from Xray

If you aim to trigger automation from Xray/Jira side, please have a look at [Taking advantage of Jira Cloud built-in automation capabilities](#) page where you can see an example of triggering a GitLab pipeline from a Test Plan and reporting results back to it.

Robot Framework example

In this scenario, we want to get visibility of the automated test results from some UI tests implemented in Robot Framework (Python) together with Selenium (using the "robotframework-seleniumlibrary"), and using Chrome for testing.

We need to set up a Git repository containing the code along with the configuration for GitLab build process.

The tests are implemented in Robot Framework .robot files as follows.

valid_login.robot

```
*** Settings ***
Documentation      A test suite with a single test for valid login.
...
...               This test has a workflow that is created using keywords in
...               the imported resource file.
Resource          resource.robot

*** Test Cases ***
Valid Login
    [Tags]        UI
    Open Browser To Login Page
    Input Username    demo
    Input Password    mode
    Submit Credentials
    Welcome Page Should Be Open
    [Teardown]      Close Browser
```

The GitLab configuration file `.gitlab-ci.yml` contains the definition of the build steps, including running the automated tests and submitting the results, as two different stages.

.gitlab-ci.yml

```
# Official language image. Look for the different tagged releases at:
# https://hub.docker.com/r/library/python/tags/
image: python:3.12.2

# Change pip's cache directory to be inside the project directory since we can
# only cache local items.
variables:
  PIP_CACHE_DIR: "${CI_PROJECT_DIR}/.cache/pip"

# https://pip.pypa.io/en/stable/topics/caching/
cache:
  paths:
    - .cache/pip

stages:
  - execute_automated_tests
  - upload_test_results

before_script:
  - python --version ; pip --version # For debugging
  - pip install virtualenv
  - virtualenv venv
  - source venv/bin/activate
  - pip install -r requirements.txt
  - apt-get update

test:
  stage: execute_automated_tests
  before_script: |
    set -e
    apt-get install -yqq unzip curl
    # Install Chrome & chromedriver
    curl -sS -o - https://dl.google.com/linux/linux_signing_key.pub | apt-key add -
    echo "deb https://dl.google.com/linux/chrome/deb/ stable main" >> /etc/apt/sources.list.d/google.list
    apt update && apt install google-chrome-stable -y
    wget -O /tmp/chromedriver.zip https://storage.googleapis.com/chrome-for-testing-public/121.0.6167.85/linux64
/chromedriver-linux64.zip
    ls -la /tmp/chromedriver.zip
    unzip -j /tmp/chromedriver.zip chromedriver-linux64/chromedriver -d /usr/local/bin/
    nohup python demoapp/server.py &
  script: |
    chromedriver -v && \
    pip install -r requirements.txt && \
    robot -x junit.xml -o output.xml login_tests || true
  allow_failure: true
  artifacts:
    paths:
      - output.xml
    when: always

upload_results_to_xray:
  stage: upload_test_results
  script:
    - |
      echo "uploading results to Xray..."
      export token=$(curl -H "Content-Type: application/json" -X POST --data "{ \"client_id\": \"${client_id}\", \"
client_secret\": \"${client_secret}\" }" https://xray.cloud.getxray.app/api/v2/authenticate| tr -d '"')
      curl -H "Content-Type: text/xml" -H "Authorization: Bearer $token" --data @"output.xml" "https://xray.
cloud.getxray.app/api/v2/import/execution/robot?projectKey=${project_key}"
  dependencies:
    - test
```

In order to submit those results, we'll just need to invoke the REST API (as detailed in [Import Execution Results - REST](#)).

However, we do not want to have the Xray API credentials hardcoded in the GitLab's configuration file. Therefore, we'll use environment variables defined in the project settings, including:

- **client_id**: the client_id associated with the API key created in the Xray cloud instance
- **client_secret**: the client_secret associated with the API key created in the Xray cloud instance
- **project_key**: the Jira project key

 **Please note**
The user associated with the Xray's API key must have permissions to Create Test and Test Execution Issues.

Variables

Variables store information that you can use in job scripts. Each project can define a maximum of 8000 variables. [Learn more](#).

Variables can be accidentally exposed in a job log, or maliciously sent to a third party server. The masked variable feature can help reduce the risk of accidentally exposing variable values, but is not a guaranteed method to prevent malicious users from accessing variables. [How can I make my variables more secure?](#)

Variables can have several attributes. [Learn more](#).

- **Protected**: Only exposed to protected branches or protected tags.
- **Masked**: Hidden in job logs. Must match masking requirements.
- **Expanded**: Variables with \$ will be treated as the start of a reference to another variable.

CI/CD Variables </> 7		Reveal values	Add variable
Key ↓	Value	Environments	Actions
project_key 	***** 	All (default) 	 
client_secret 	***** 	All (default) 	 
client_id 	***** 	All (default) 	 

In `.gitlab-ci.yml` a "step" must be included that will use "curl" in order to first obtain a token and then finally submit the results to the REST API, using that token.

```
export token=$(curl -H "Content-Type: application/json" -X POST --data "{ \"client_id\": \"${client_id}\", \"client_secret\": \"${client_secret}\" }" https://xray.cloud.getxray.app/api/v2/authenticate| tr -d '"')
curl -H "Content-Type: text/xml" -H "Authorization: Bearer $token" --data @"output.xml" "https://xray.cloud.getxray.app/api/v2/import/execution/robot?projectKey=${project_key}"
```

We're using "curl" utility that comes in Unix based OS'es but you can easily use another tool to make the HTTP request; however, "curl" is provided in the container used by GitLab.



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📄

🔗

📧 1

🔍 Search or go to...

Project

W WebDemo

📌 Pinned

Issues 0

Merge requests 0

Repository

📁 Manage

📅 Plan

🔗 Code

🚀 Build

Pipelines

Jobs

Pipeline editor

Pipeline schedules

Artifacts

🛡️ Secure

🚚 Deploy

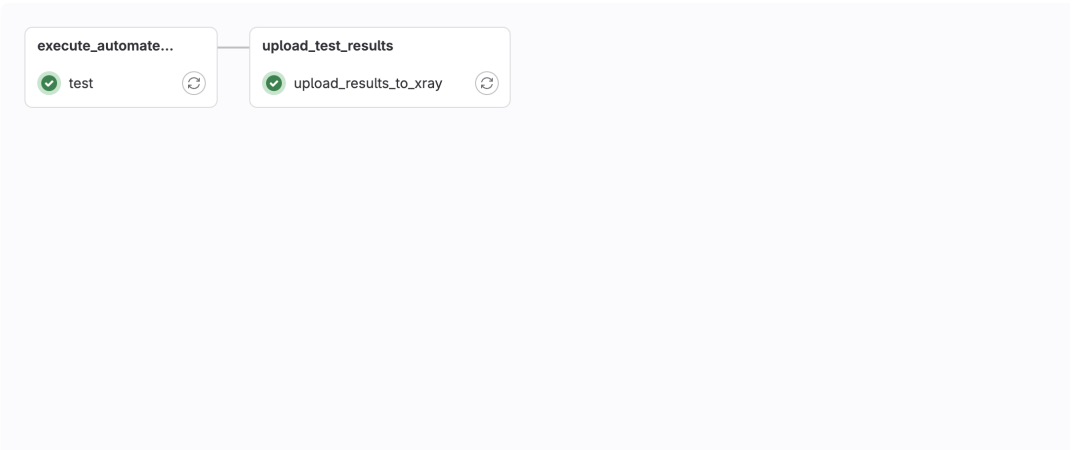
Update .gitlab-ci.yml file

✔️ **Passed** Sergio Freire created pipeline for commit `3846bd77` finished 1 minute ago

For `master`

`latest` 2 Jobs 2.51 2 minutes 30 seconds, queued for 0 seconds

Pipeline Needs Jobs 2 Tests 0



Project

WebDemo

Pinned

Issues0

Merge requests0

Repository

Manage

Plan

Code

Build

Pipelines

Jobs

Pipeline editor

Pipeline schedules

Artifacts

Secure

Deploy

Operate

Monitor

Analyze

Settings

Sergio Freire / WebDemo / Jobs / #6245186304

Search job log

135 Using cached wsproto-1.2.0-py3-none-any.whl (24 kB)

136 Using cached outcome-1.3.0.post0-py3-none-any.whl (10 kB)

137 Using cached h11-0.14.0-py3-none-any.whl (58 kB)

138 Installing collected packages: sortedcontainers, wrapt, urllib3, typing-extensions, sniffio, robotframework-pythonlibcore, robotframework, pysocks, pyjwt, pycparser, invoke, idna, h11, docutils, charset-normalizer, certifi, attrs, wsproto, requests, outcome, Deprecated, cffi, t rio, pynacl, cryptography, trio-websocket, selenium, PySithub, robotframework-seleniumlibrary, rellu

139 Successfully installed Deprecated-1.2.14 PySithub-2.2.0 attrs-23.2.0 certifi-2024.2.2 cffi-1.16.0 charset-normalizer-3.3.2 cryptography-42.0.4 docutils-0.20.1 h11-0.14.0 idna-3.6 invoke-2.2.0 outcome-1.3.0.post0 pycparser-2.21 pyjwt-2.8.0 pynacl-1.5.0 pysocks-1.7.1 rellu-0.7 requests-2.31.0 robotframework-6.0.2 robotframework-pythonlibcore-4.3.0 robotframework-seleniumlibrary-6.2.0 selenium-4.18.1 sniffio-1.3.0 sortedcontainers-2.4.0 trio-0.24.0 trio-websocket-0.11.1 typing-extensions-4.9.0 urllib3-2.2.1 wrapt-1.16.0 wsproto-1.2.0

140 \$ apt-get update

141 Get:1 http://deb.debian.org/debian bookworm InRelease [151 kB]

142 Get:2 http://deb.debian.org/debian bookworm-updates InRelease [55.4 kB]

143 Get:3 http://deb.debian.org/debian-security bookworm-security InRelease [48.0 kB]

144 Get:4 http://deb.debian.org/debian bookworm/main amd64 Packages [8786 kB]

145 Get:5 http://deb.debian.org/debian bookworm-updates/main amd64 Packages [12.7 kB]

146 Get:6 http://deb.debian.org/debian-security bookworm-security/main amd64 Packages [143 kB]

147 Fetched 9196 kB in 1s (9227 kB/s)

148 Reading package lists...

149 \$ echo "uploading results to Xray..." # collapsed multi-line command

150 uploading results to Xray...

151 % Total % Received % Xferd Average Speed Time Time Time Current

152 Dload Upload Total Spent Left Speed

153 100 578 100 443 100 135 325 99 0:00:01 0:00:01 --:--:-- 424

154 % Total % Received % Xferd Average Speed Time Time Time Current

155 Dload Upload Total Spent Left Speed

156 100 42350 100 99 100 42251 9 4131 0:00:11 0:00:10 0:00:01 24

157 {"id":"12585","key":"CALC-337","self":"https://xraytutorials.atlassian.net/rest/api/2/issue/12585"}

158 Saving cache for successful job

159 Creating cache default-protected...

160 .cache/pip: Found 659 matching artifact files and directories

161 Uploading cache.zip to https://storage.googleapis.com/gitlab-com-runners-cache/project/55088851/default-protected

162 Created cache

163 Cleaning up project directory and file based variables

164 Job succeeded

Duration: 58 seconds

Finished: just now

Queued: 0 seconds

Timeout: 1h (from project)

Runner: #12270831 (XxUkrIXT) 2-blue-saas-linux-small-amd64-runners-manager.gitlab.com/default

Commit 3846bd777

Update .gitlab-ci.yml file

Pipeline #1188548786 Passed for master

upload_test_results

Related jobs

upload_results_to_xray

Projects / Calculator / Add epic / CALC-337

Execution results [1708704422697]

Attach Create subtask Link issue Tests Scripted Fields Risk assessment

Description

Add a description...

Environment

None

Tests

Add Tests Trigger Build

View on board

Overall Execution Status

8 PASSED

TOTAL TESTS: 8

Rank	Key	Summary	Test Type	Dataset	#Defects	TestRun Assignee	Priority	Status	Actions
1	CALC-20	Valid Login	Generic		0	Sérgio Freire		PASSED	
2	CALC-21	Invalid Username	Generic		0	Sérgio Freire		PASSED	
3	CALC-22	Invalid Password	Generic		0	Sérgio Freire		PASSED	
4	CALC-338	Invalid Username And Password	Generic		0	Sérgio Freire		PASSED	
5	CALC-24	Empty Username	Generic		0	Sérgio Freire		PASSED	
6	CALC-25	Empty Password	Generic		0	Sérgio Freire		PASSED	
7	CALC-26	Empty Username And Password	Generic		0	Sérgio Freire		PASSED	
8	CALC-27	Valid Login	Generic		0	Sérgio Freire		PASSED	

Prev 1 Next

Total 8 issues

Triggering automation from Xray

If you aim to trigger automation from the Xray/Jira side, please have a look at [Taking advantage of Jira Cloud built-in automation capabilities](#) page where you can see an example of triggering a GitLab pipeline from a Test Plan and reporting results back to it.

Cucumber example

Standard workflow (Xray as master)

In this scenario, we are managing the specification of Cucumber Scenarios/Scenario Outline(s) based tests [in Jira, using Xray](#), as detailed in the "standard workflow" mentioned in [Testing in BDD with Gherkin based frameworks](#) (e.g. [Cucumber](#)).

Then we need to extract this specification from Jira (i.e. generate related Cucumber .feature files), and run it in GitLab against the code that actually implements each step that are part of those scenarios.

Finally, we can then submit the results back to JIRA and they'll be reflected on the related entities.

The GitLab configuration file `.gitlab-ci.yml` contains the definition of the build steps, including extracting the cucumber specification from Xray, running the automated tests and submitting back the results.

`.gitlab-ci.yml`

```
image: "ruby:2.6"

test:
  script:
    - |
      apt-get update -qq
      apt-get install unzip
      gem install cucumber
      gem install rspec-expectations
      export token=$(curl -H "Content-Type: application/json" -X POST --data "{ \"client_id\": \"$client_id\",
      \"client_secret\": \"$client_secret\" }" https://xray.cloud.getxray.app/api/v2/authenticate| tr -d '"')
      curl -H "Content-Type: application/json" --output features/features.zip -X GET -H "Authorization:
      Bearer ${token}" "https://xray.cloud.getxray.app/api/v2/export/cucumber?keys=$cucumber_keys"
      mkdir -p features
      rm -f features/*.feature
      unzip -o features/features.zip -d features/
      cucumber -x -f json -o data.json
      curl -H "Content-Type: application/json" -X POST -H "Authorization: Bearer ${token}" --data @data.json
      https://xray.cloud.getxray.app/api/v2/import/execution/cucumber
      echo "done"
```

In this example, we're using a variable **cucumber_keys** defined in the CI/CD project-level settings in GitLab. This variable contains one or more keys of the issues that will be used as source data for generating the Cucumber .feature files; it can be the key(s) of Test Plan(s), Test Execution(s), Test(s), requirement(s). For more info, please see: [Exporting Cucumber Tests - REST](#).

The screenshot displays the GitLab web interface. On the left, the 'CI / CD' section is expanded, showing 'Jobs'. The main panel shows a job titled 'cucumber_xray_tests-cloud' with a 'passed' status. The job details include the runner 'runner-fa6cab46-project-9353858-concurrent-0' and the commit 'abb780eb'. The job output shows the execution of the `.gitlab-ci.yml` script, including the installation of dependencies and the execution of the Cucumber tests. The right sidebar shows the 'test' job details, including the duration (39 seconds) and the runner information.

VCS workflow (Git as master)

In this scenario, we are managing (i.e. editing) the specification of Cucumber Scenarios/Scenario Outline(s) based tests [outside Jira](#), as detailed in the "VCS workflow" mentioned in [Testing in BDD with Gherkin based frameworks \(e.g. Cucumber\)](#).

The GitLab configuration file `.gitlab-ci.yml` contains the definition of the build steps, including synchronizing the Scenarios/Backgrounds to Xray, extracting the cucumber specification from Xray, running the automated tests and submitting back the results.

.gitlab-ci.yml

```
image: "ruby:2.6"

test:
  script:
    - |
      apt-get update -qq
      apt-get -y install zip unzip
      gem install cucumber
      gem install rspec-expectations
      export token=$(curl -H "Content-Type: application/json" -X POST --data "{ \"client_id\": \"${client_id}\",
      \"client_secret\": \"${client_secret}\" }" https://xray.cloud.getxray.app/api/v2/authenticate | tr -d '"')

      cd features; zip -R features.zip "*.feature"; cd ..; curl -H "Content-Type: multipart/form-data" -H
      "Authorization: Bearer ${token}" -F "file=@features/features.zip"
      "https://xray.cloud.getxray.app/api/v2/import/feature?projectKey=CALC"
      mkdir -p features

      rm -f features/*.feature

      curl -H "Content-Type: application/json" --output features/features.zip -X GET -H "Authorization:
      Bearer ${token}" "https://xray.cloud.getxray.app/api/v2/export/cucumber?filter=${filter_id}"
      unzip -o features/features.zip -d features/
      cucumber -x -f json -o data.json || true
      curl -H "Content-Type: application/json" -X POST -H "Authorization: Bearer ${token}" --data @data.json
      https://xray.cloud.getxray.app/api/v2/import/execution/cucumber
      echo "done"
```

In this example, we're using a variable **filter_id** defined in the CI/CD project level settings in GitLab. This variable contains the *id* of the Jira issues based filter that will be used as source data for generating the Cucumber `.feature` files; it can be the key(s) of Test Plan(s), Test Execution(s), Test(s), requirement(s). For more info, please see: [Exporting Cucumber Tests - REST](#).

Triggering automation from Xray side

Please have a look at [Integration with Automation for Jira](#) to see some examples of how automation can be triggered from Xray side.