API testing tool selection

for a generic and flexible pipeline

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This is a brief document with the purpose of explaining the process and choices made in selecting an API testing tool, which will be used in the project of the *Digital transformation integration & API management framework* internship.

Requirements

To understand the requirements of the chosen tool, we need a brief description of the project: a flexible and generic API testing tool, which can be used in many cases with as little modifications as possible.

With that in mind, we can define a few requirements:

* Flexibility (The tool must be able to test multiple types of APIs and multiple metrics).
* Integrability (The tool must have ease of integration with other common tools).
* Easy to install and use.
* Cost-free.

Our Options

With these requirements, we can find quite a few options in the market. Already excluding a few priced options (such as *LoadRunner*), here are the most popular options which were found to fit the requirements, with a quick description following:

* Postman: common API testing tool, easy to learn interface, supports JavaScript, REST and SOAP, has a paid version.
* SOAP UI: a standalone graphical API testing tool, supports Groovy and Java but is mainly drag-and-drop, works with REST but is mainly made for SOAP, has a paid version.
* REST Assured: Java library, cannot be used without coding, only supports REST.
* Karate: graphical API testing tool, load test focused, easy code integration for Java and Gherkin, supports REST and SOAP
* JMeter: heavy load API testing tool, works both through graphical UI or Java, supports REST and SOAP

With these options in mind, we can more easily choose the best fit for our needs, but it is important to reference that Postman will not be further-more considered as the main testing tool because the is already another similar project for it, and there is a privacy and data protection problem to be solved which puts sensitive data at risk when using the free version. However, it may still be used through Newman for automatically doing collections.

From the list we also eliminate REST Assured, as it is not flexible enough to work with non-REST APIs, and documented as a Unit Test focused tool, which is not our goal.

Final Choice

At last, we can compare the three tools that seem to fit our needs: JMeter, SOAP UI and Karate. There is, however, an obvious choice in JMeter. This is caused by the fact that JMeter has a much larger tool set, community support and flexibility. SOAP UI is also held back by the fact that the paid version detracts features from the free one, and although Karate is as powerful as JMeter, it does not have the same ease of integration and use.  
 Therefore, JMeter is the tool to be used because it is easy to integrate with almost anything, has a very powerful set of functions (such as heavy load testing), has a large supporting community, and is easy to install and use (only requires Java).