Integrate E2E Test Results into Grafana for Real-time Monitoring

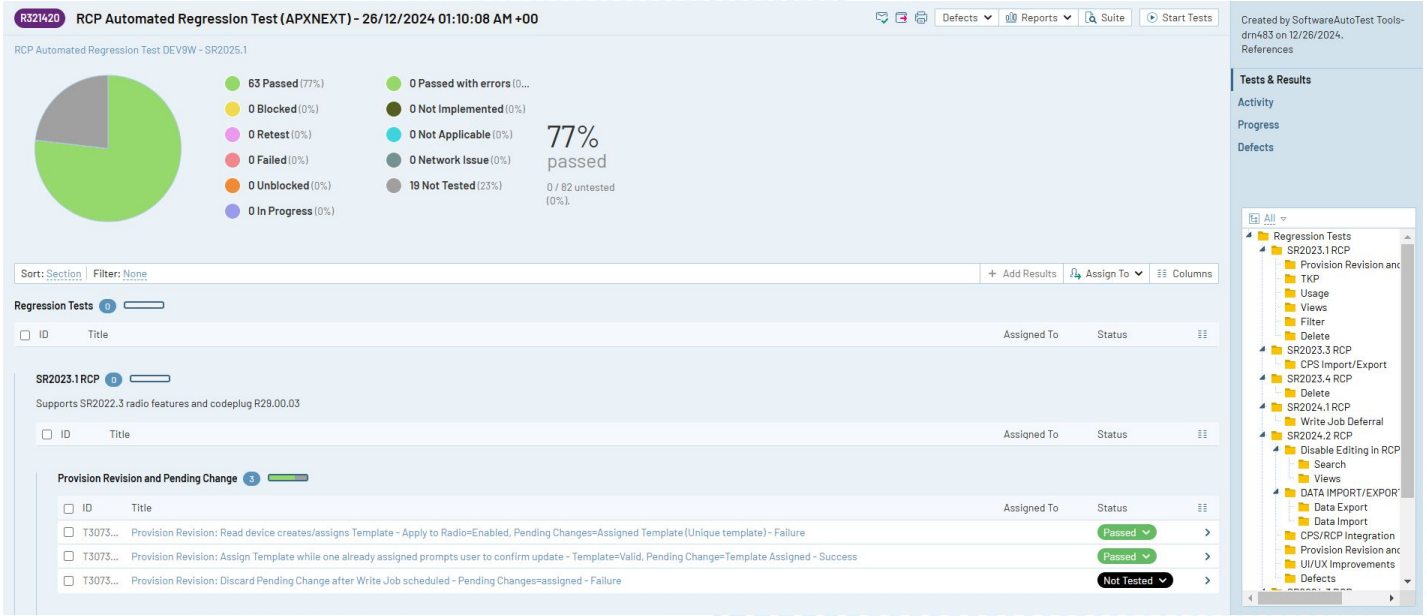
Ayesha Imelda binti Rohaizan - SWBB Student Program

05/02/25

MOTOROLA SOLUTIONS

PROBLEM STATEMENT

The current process for monitoring and visualizing E2E test results is manual and time-consuming. It is difficult to get a real-time understanding of the test execution status, pass/fail rates, and error details. This lack of visibility makes it challenging to identify issues quickly and proactively address them.



OBJECTIVES

Three main objectives of this project include

1. Integrating E2E test results into Grafana for real-time monitoring and visualization.

2. Creating dashboards to display key metrics like test pass/fail rates, execution time, and top 5 failed test cases.

3. Improving the efficiency of the test result analysis process by automating the data retrieval and visualization processes.

Prometheus

1. Prometheus is an open-source systems monitoring and alerting toolkit.

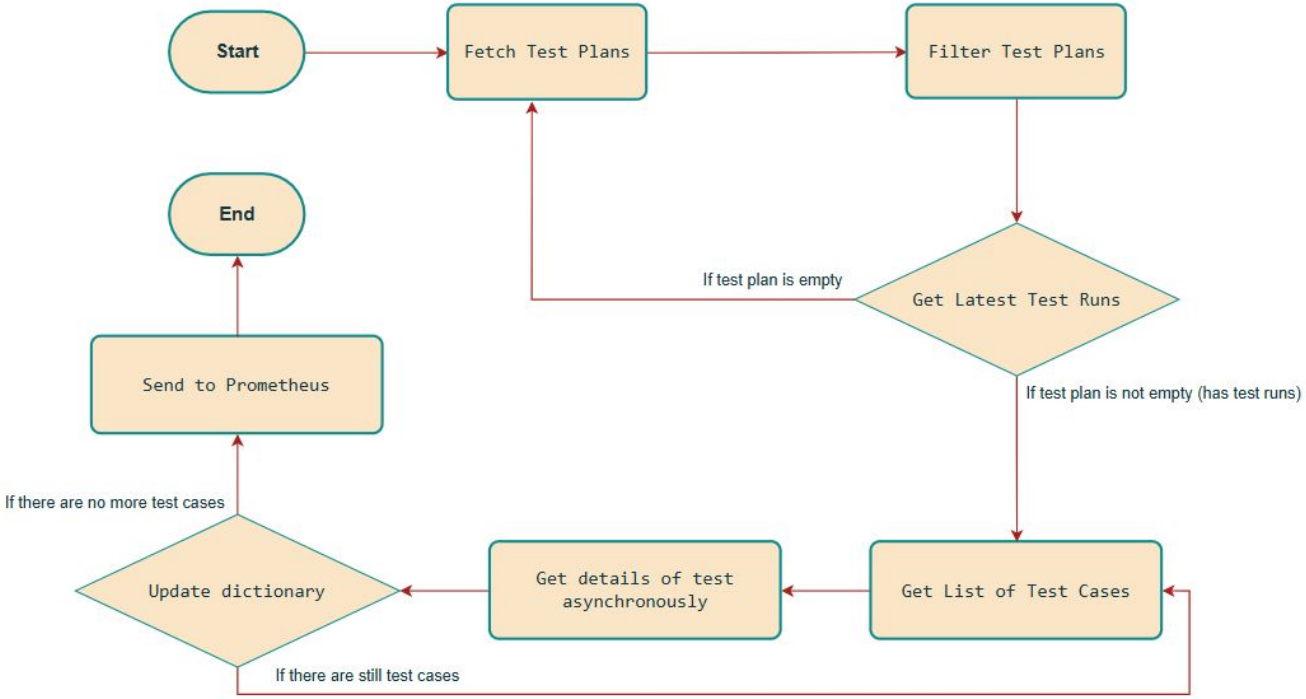
2. It collects and stores its metrics as time series data, i.e. metrics information is stored with the timestamp at which it was recorded, alongside optional key-value pairs called labels.

Grafana

1. Grafana is an open-source observability and monitoring platform. It allows users to query, visualize, alert on and understand metrics no matter where they come from.

2. It uses a query language called PromQL (Prometheus Query Language) to retrieve specific metrics data from Prometheus.

HIGH-LEVEL FLOWCHART



BENEFITS

BENEFITS	DESCRIPTION
Improved data analysis capabilities	The solution provides a more comprehensive and flexible way to analyze the test data, allowing for more insightful and actionable insights. Apart from that, it enable teams to make more informed decisions regarding test planning, resource allocation, and quality improvement strategies. - Force/Risk Failure: Allows teams to proactively identify and address potential issues, such as those related to specific test cases or environments, before they become major problems, thus improving overall test quality and preventing potential failures. - Dashboards: Provides a centralized platform for visualizing key metrics, enabling teams to quickly identify trends, anomalies, and areas requiring attention. This empowers them to make data-driven decisions regarding test execution, resource allocation, and quality improvement efforts.

CHALLENGES

CHALLENGES	DESCRIPTION	SOLUTION
Limited functionalities	Initially used Grafana Infinity Plugin and JSON Exporter to push the metrics to Grafana. However, when implementing both of the methods; - results cannot be manipulated or transformed in a manner to integrate more than one API endpoint into one panel - limited transformation capabilities on Grafana itself resulting to panels not be returning the expected results	Implement Prometheus Client Python as it is perfect for - straightforward metric collection and minimal data manipulation - easier to identify and resolve issues related to metric collection and exposure
Time consuming	Upon completion of the first few versions of the script, it was observed that it took at least 30-40 minutes for the script to finish scraping metrics. This is because the script iterates through the test plans synchronously, where the test runs under the test plans contains a large number of test cases.	- Implement asynchronous HTTP client/server framework (AIOHHTP) - Filter test plans to only return RCP Automated by using regex '**RCP Automated.*SR\d{4}\.\d**' - By having a dictionary that stores the metrics that are requested by the API endpoints, it is easier to access the specific data needed and is helpful when it is needed to retrieve and process information efficiently.

LEARNINGS

LEARNINGS	DESCRIPTION
Technical Skills	- Proficiency in Python programming (specifically asynchronous programming with aiohttp). - Experience with Prometheus and Grafana for metrics collection and visualization. - Understanding and application of RESTful APIs. - Experience with Docker containerization for deploying and managing applications. - Working with a version control system (Git/GitHub).
Soft Skills	- Improved teamwork and collaboration skills through working with team members. - Enhanced communication skills (written and verbal) via interaction with lecturers and colleagues. - Enhanced problem-solving skills through tackling complex challenges in the project. - Improved time management and organizational skills through project planning and execution. - Increased ability to adapt to changing requirements and new technologies.

EXPERIENCE

Participation in company events such as Team Building and CSR;

1. Team Building - Keyboard Workshop
    a. Build our own custom mechanical keyboard from scratch at Click&Brew cafe.
    b. Got to bring back home the mechanical keyboard.

2. Team Building - Buffet at E&O Hotel

3. CSR at Taman Jajar Sungai Ara
    a. Includes park and trail cleaning around the neighborhood.

4. CSR at Taman Rimba Teluk Bahang
    a. Includes painting and cleaning.

5. Annual Dinner at Setia Spice Arena


Typing...


Calvin Klein Jeans
Gryffindor


TAMAN RIMBA TELUK BAHANG
TELUK BAHANG FOREST ECO PARK
PULAU PINANG
MOTOCARE

WHAT'S NEXT

Future implementations will include

1. Add more metrics (JIRA defect lists, etc.) on the dashboard according to suitability.
2. Hosts Prometheus and Grafana in VM. (Cloud/On-Prem)

GRAFANA DASHBOARD