Using Continuous Integration in the development and verification of a new central controller for JET

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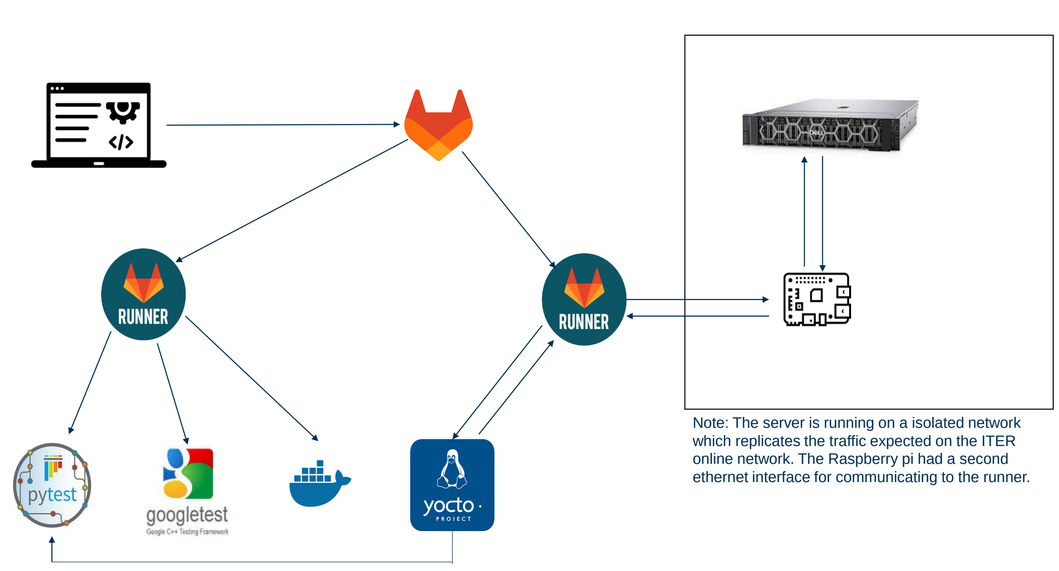
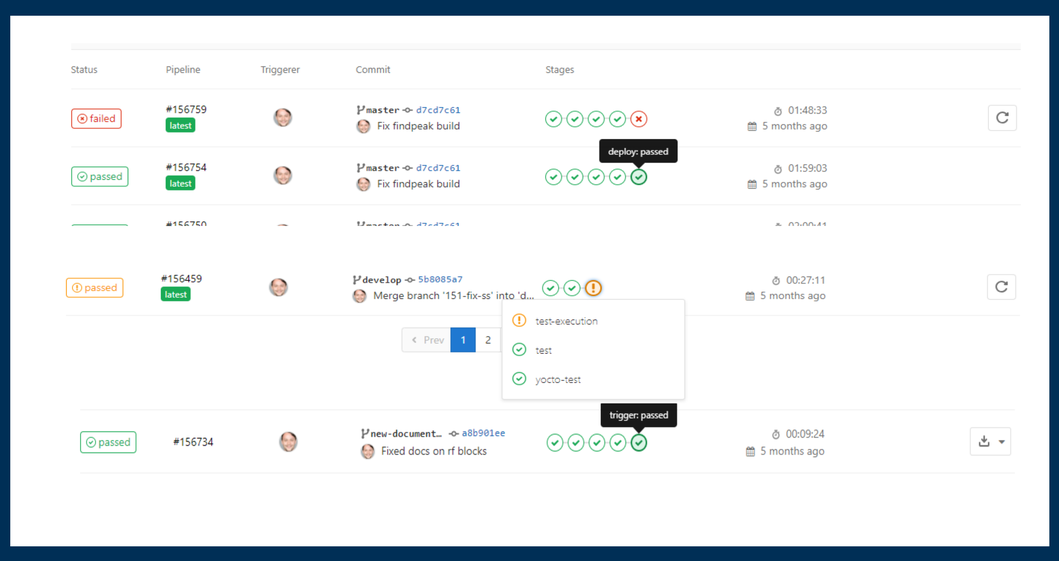
PROBLEM STATEMENT

JET being an experimental reactor uses a per pulse configurable control system. Due to a new experiment to identify and control the X-Point in real time, the existing control framework needed an upgrade. Given the nature of the system being replaced, it was necessary to successfully carry out thorough levels of testing to ensure that the replacement system behaved identically to the previous, whilst providing new functionality and improving our user experience.

SYSTEM OVERVIEW



Note: The server is running on a isolated network which replicates the traffic expected on the ITER online network. The Raspberry pi had a second ethernet interface for communicating to the runner.



SOLUTION

In order to achieve this, we used:
- Gitlab's continuous integration practices in pipelines.
- Using pytest we were able to define both unit and system level testing against playback.
- Used a dockerized yocto environment on remote hardware to perform performanceand regression testing.

OUTCOMES

- Ready before the deadline of the campaign
- Robust methodology of testing new code
- Confidence in the system by all parties
- User experience improved in developing JET control algorithms
- Ability to add new functionality with more ease.

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The experiment

Boot Setup

Yocto Test Setup

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