



Software Engineering  
Research Group

# Efficient test execution in End to End testing

Smart Resource-aware End to End Test Cases Orchestration

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## Scope and Research Question

E2E Testing is expensive in resource terms frequently the resources are containerized and deployed for each test case (causing underusage).

**Use Case:** Execution of suites with multiple E2E tests and resources  
→ avoid resource oversubscribing and reduce costs.

**RQ** – Can a smart characterization, aggrupation, and scheduling of the test cases achieve savings in resource usage?

## Resource

“Physical, logical and/or computational entities required by the execution of one or more test cases”

Resource **Attributes** for example:

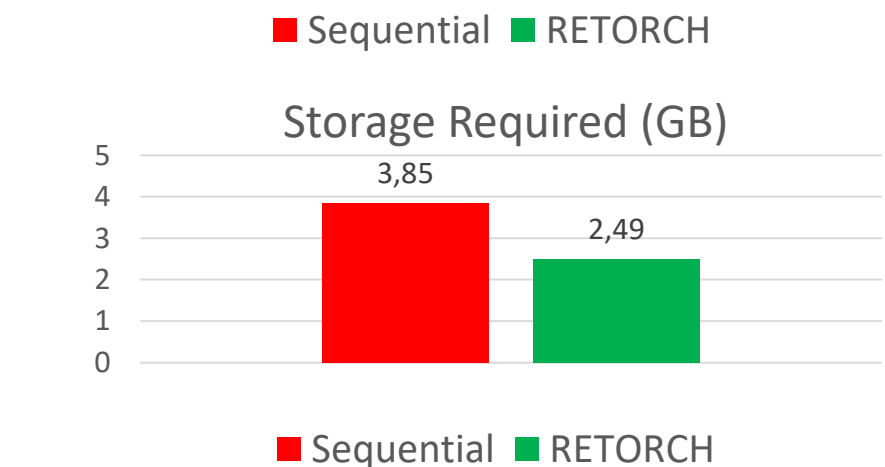
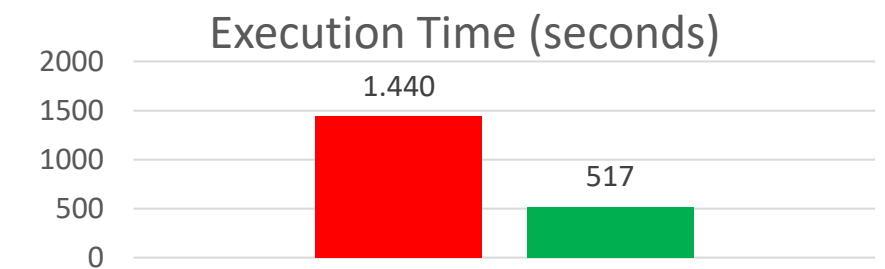
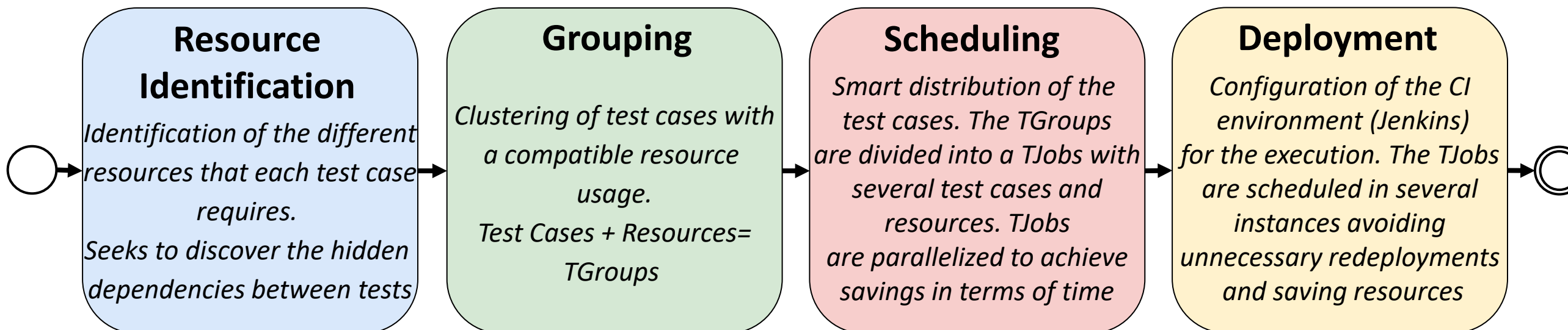
- Replaceable
- Elasticity
- Elasticity Cost
- Access Mode

## Results

ElasTest demonstrator: *FullTeaching*

- 19 E2E tests.
- 10 resources.
- Access modes → read, read-write, dynamic, no-access...

## Resource-aware End to end Test ORCHestration (RETORCH) : Processes



**RQ:** RETORCH achieves savings:

**Execution time** → 64% RETORCH savings deploying compatible parallel test cases

**Storage** → 35% → RETORCH savings (re)deploying fewer containers.

## Publications

C. Augusto, J. Morán, A. Bertolino, C. de la Riva, and J. Tuya, 'RETORCH: Resource-Aware End-to-End Test Orchestration', *QUATIC*, 2019

C. Augusto, J. Morán, A. Bertolino, C. de la Riva, and J. Tuya, 'RETORCH: An Approach for Resource-Aware Orchestration of End-to-End Test Cases', *Soft. Quality Journal*, 2020