Scalable Parallel Automated Test

Optimizing Software Testing Solution

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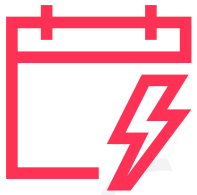
Agenda

Introduction



Problems

Solutions

Benefits

Introduction

The demand in test automation

A high regression test coverage obviously requires a large amount of test cases

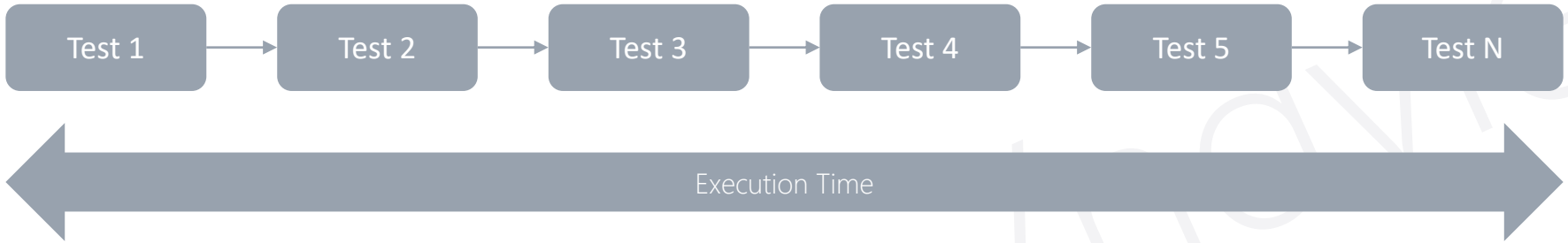
Test execution time begins to become an important factor in software development pipelines

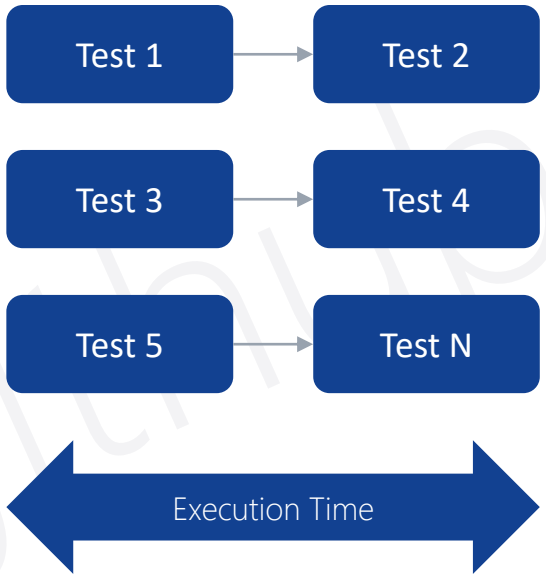
The “Shift Left” initiative has put more pressure on tests to deliver fast feedback

Distributed Cloud for Cross Browser Testing

Introduction

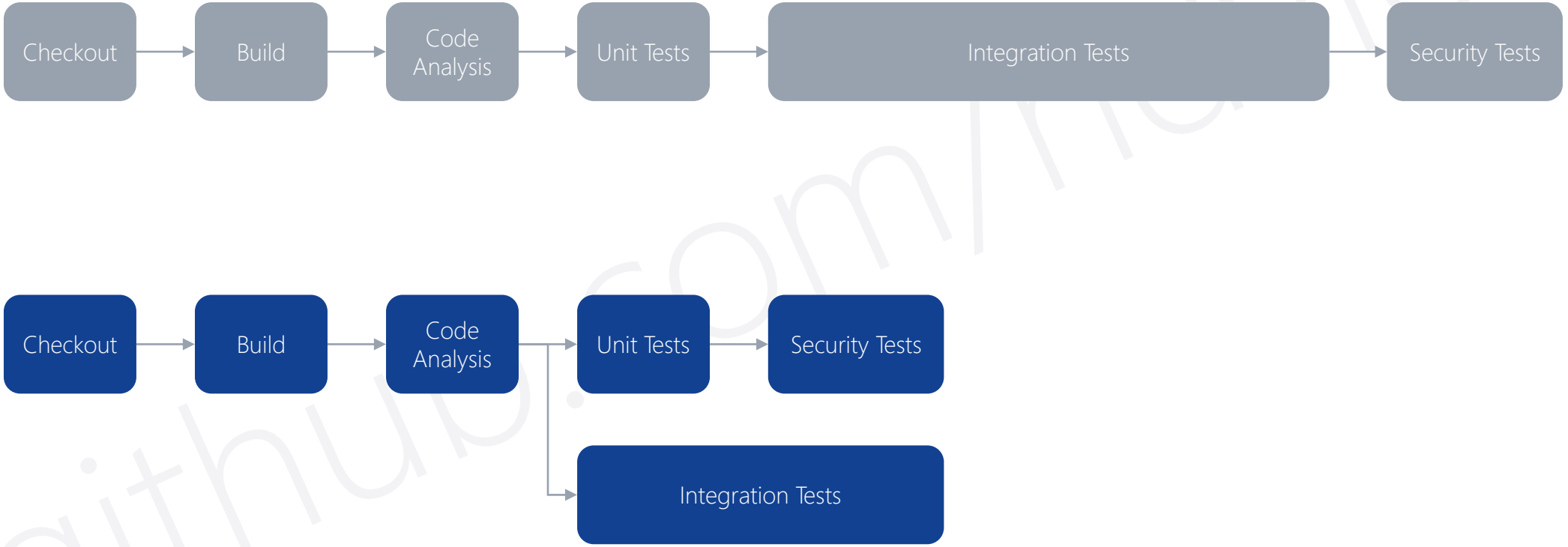
Parallel execution overview





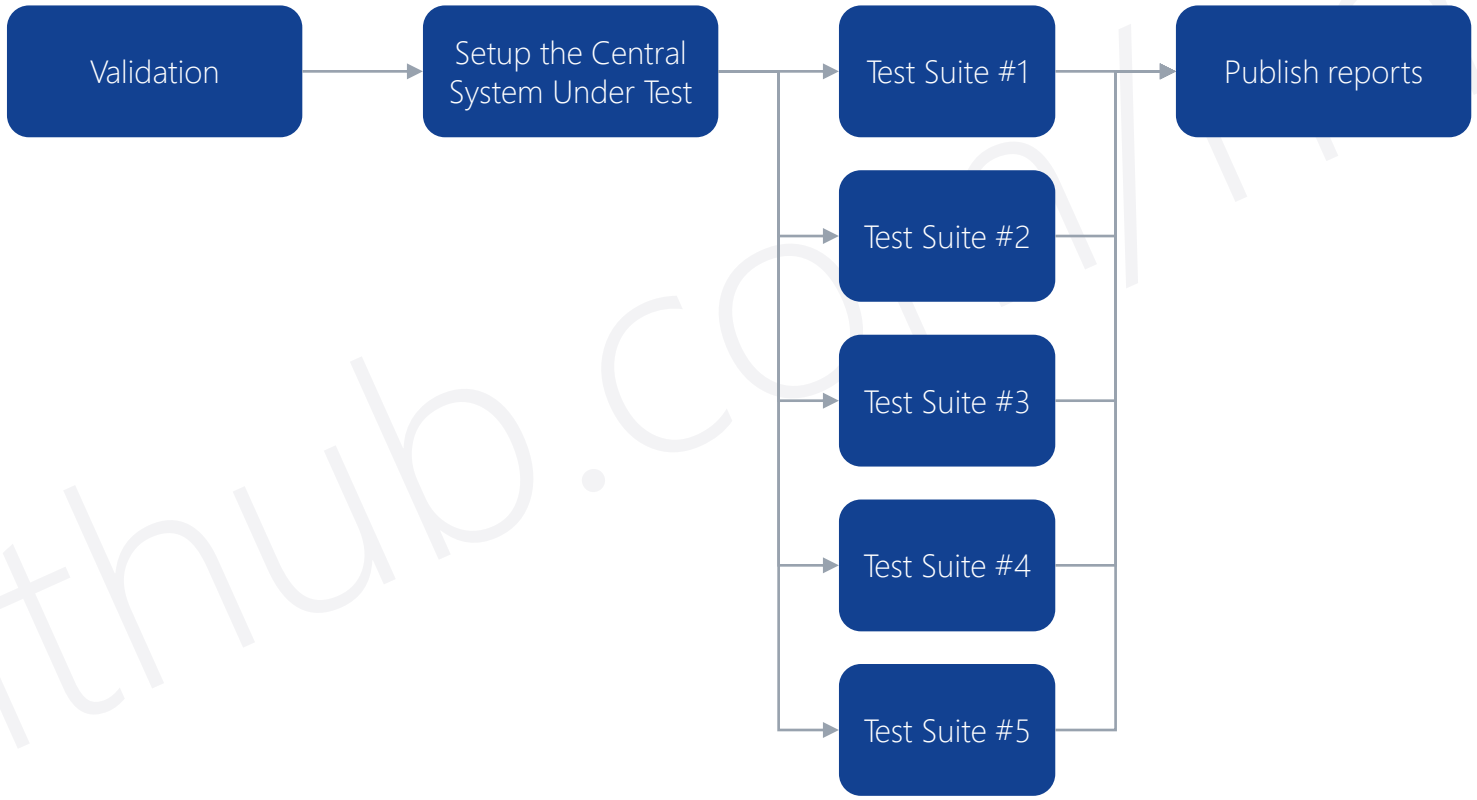
Introduction

Parallel execution stages of pipeline



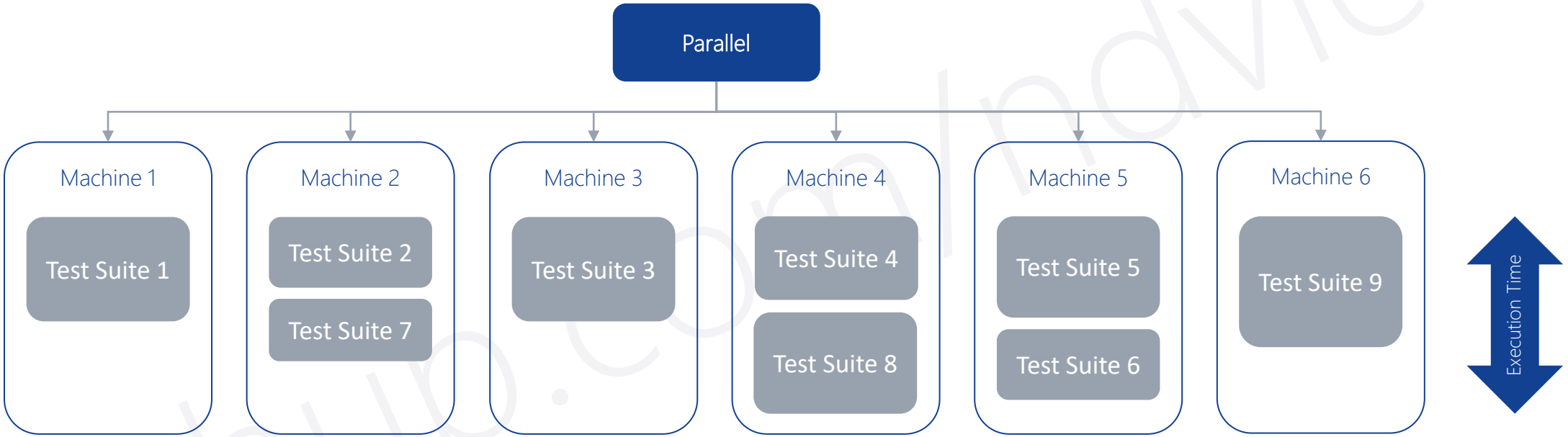
Introduction

Parallel execution tests in the CI/CD pipeline



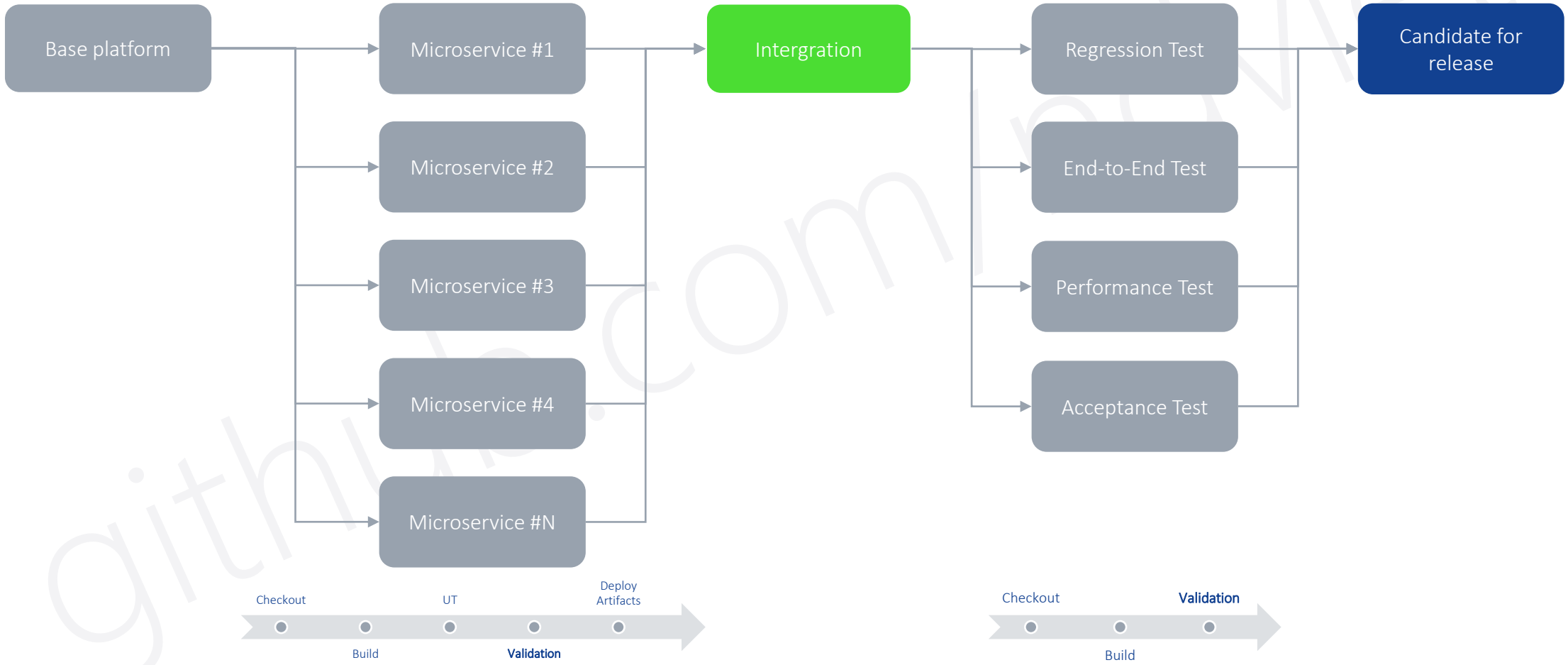
Introduction

Parallel execution tests in multiple machines



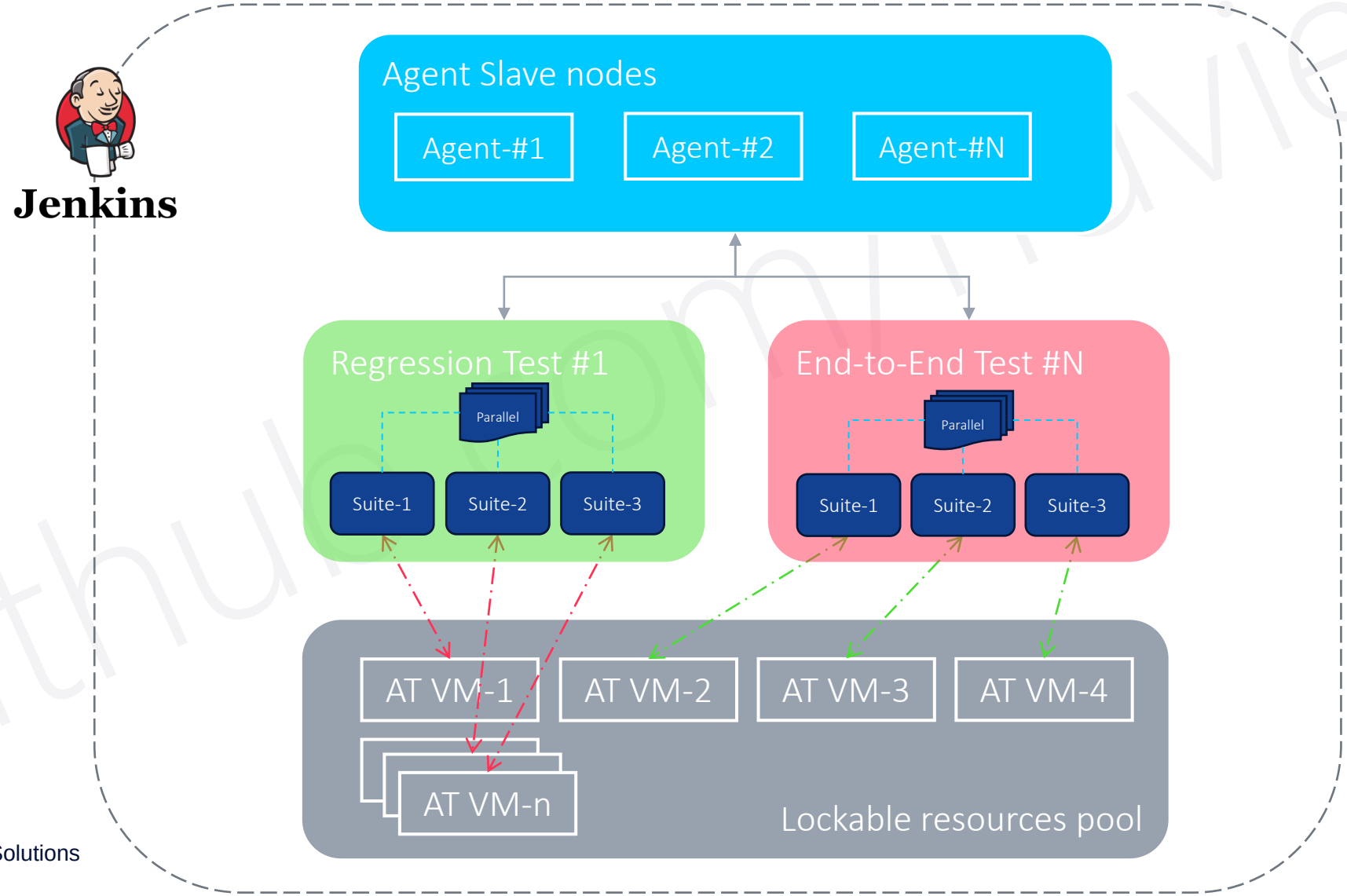
Introduction

Parallel execution multiple pipelines



Introduction

Parallel testing in multiple pipelines



Problems

Resource costs

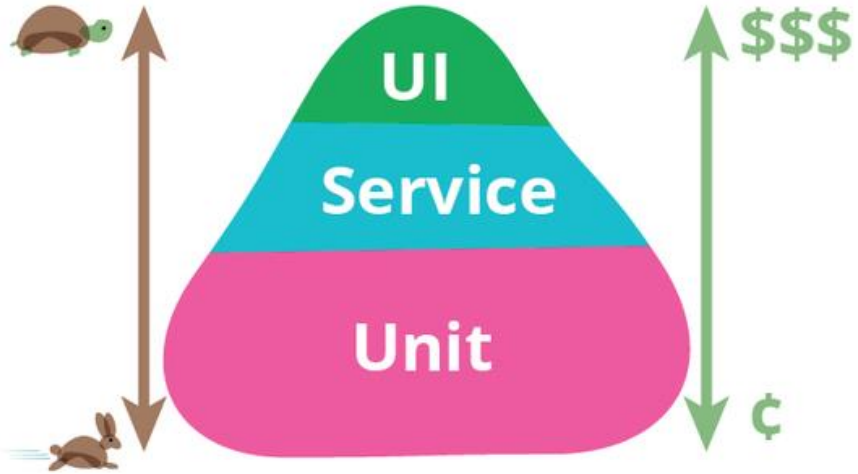
- Significant reduction comes at a high cost
- Resources are not continuously needed
- Resources should be allocated dynamically to avoid the costs of providing environments
- Resources should be provisioned automatically as fast
- Resources should be scaled down when they are in idle time

Problems

Test costs

Run tests against multiple browsers, multiple versions of browser, and browsers running on different operating system

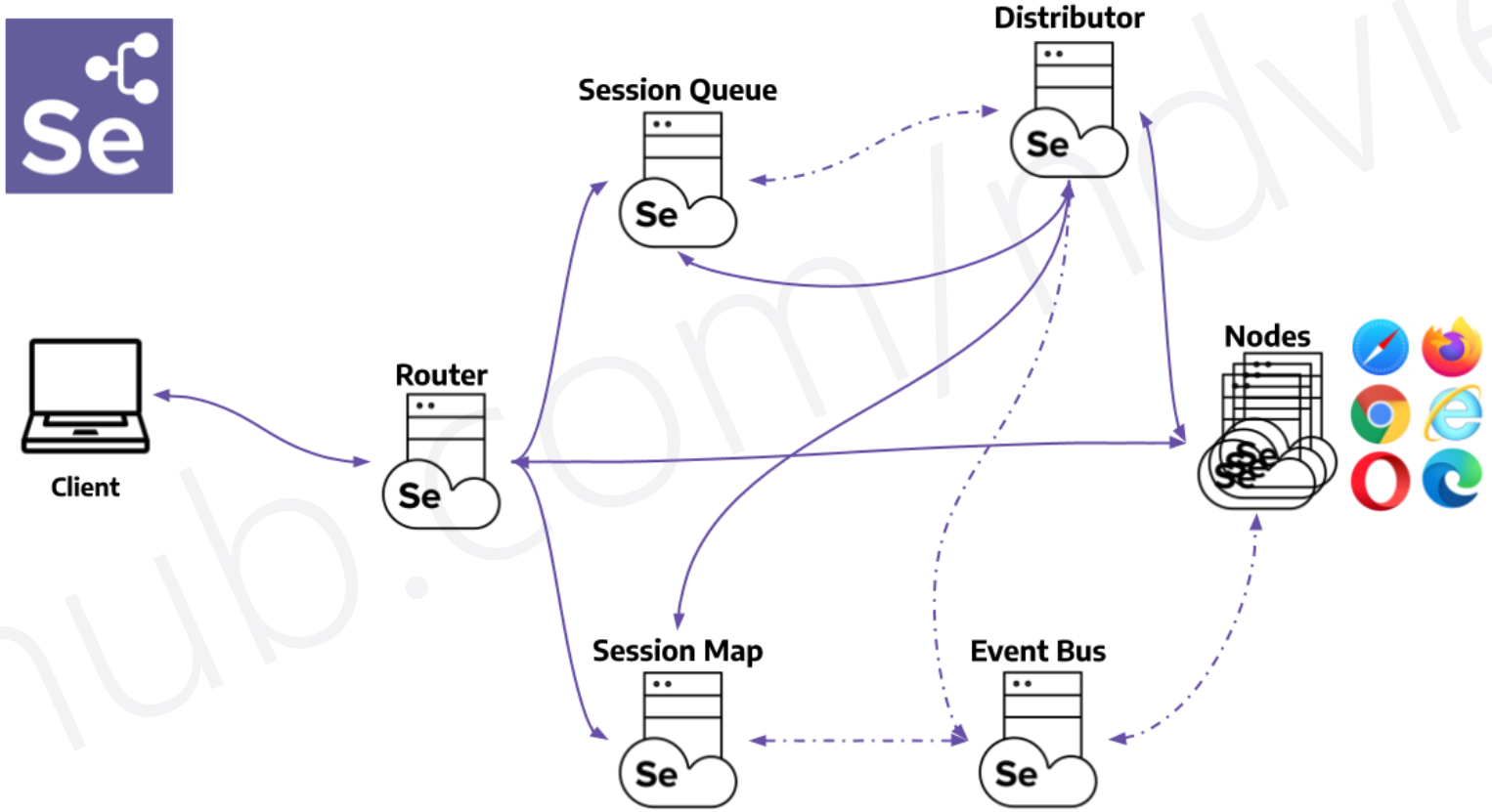
Run the tests parallelly in same browser with multiple instances to reduce the time it takes for the test suite to complete a test pass



Source: https://martinfowler.com/bliki/TestPyramid.html

Solutions

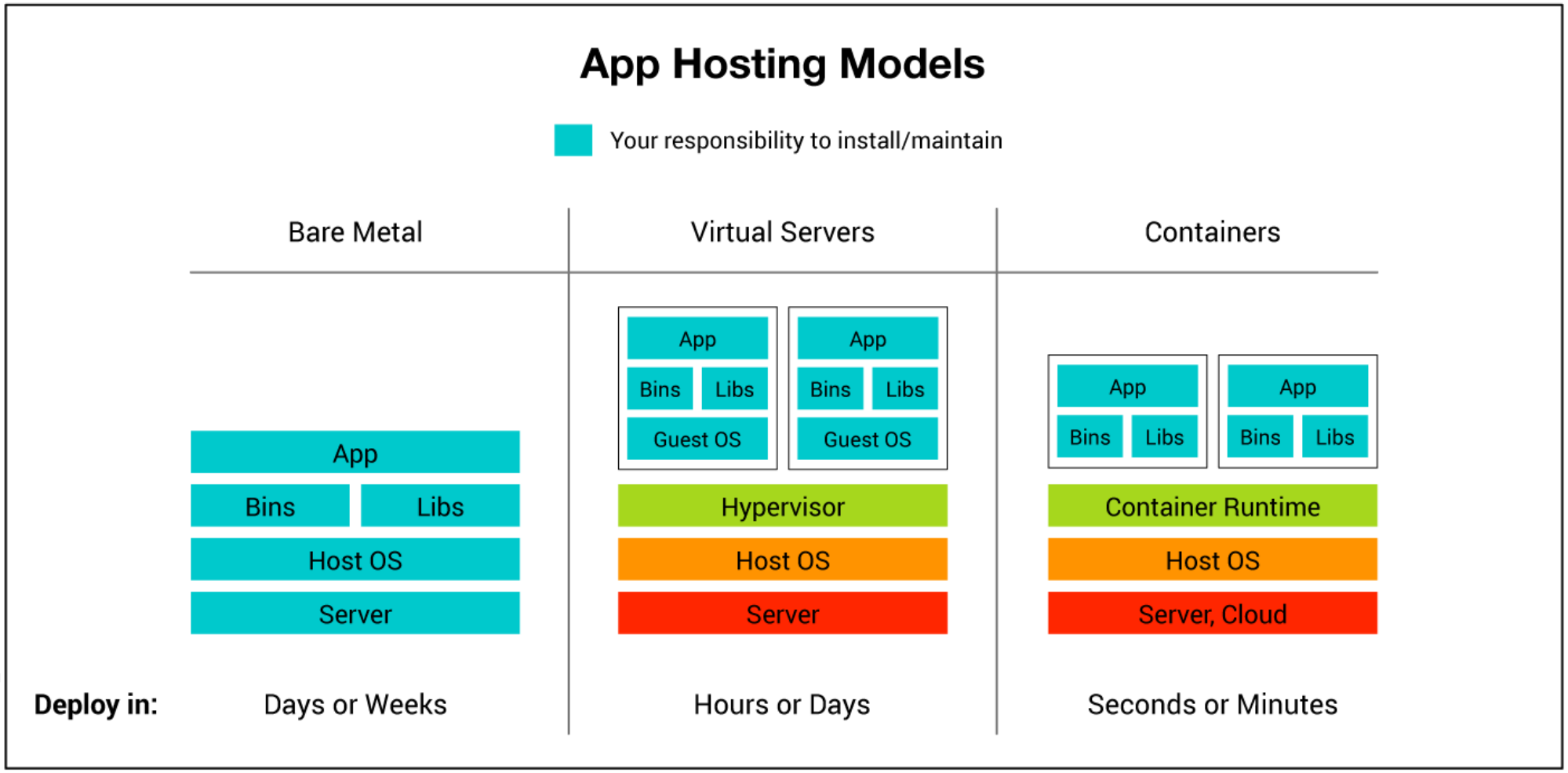
Selenium Grid v4.0 supports fully Distributed



Source: https://www.selenium.dev/documentation/grid/components/

Solutions

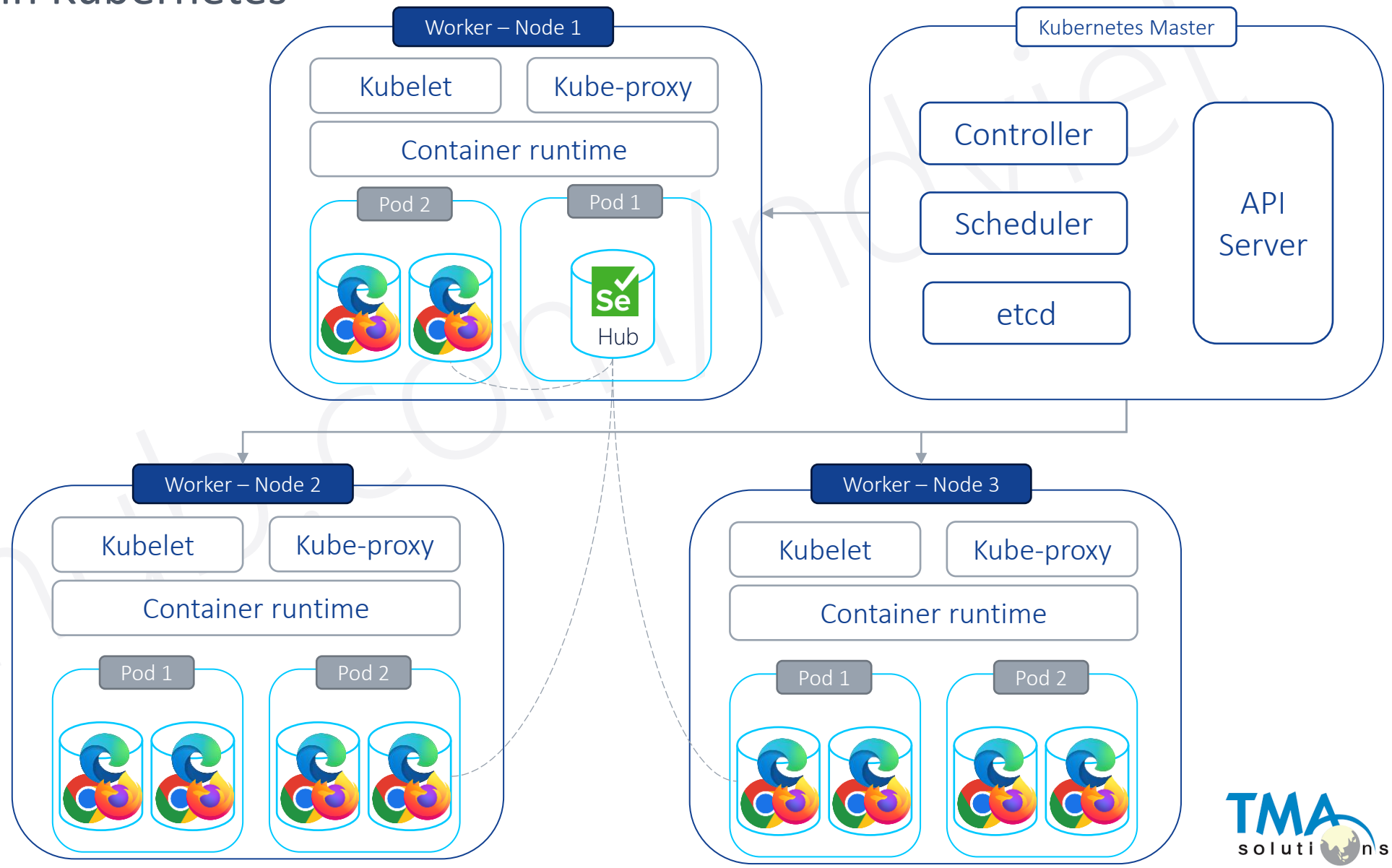
Containerization



Source: https://its.umich.edu/computing/virtualization-cloud/container-service/our-model

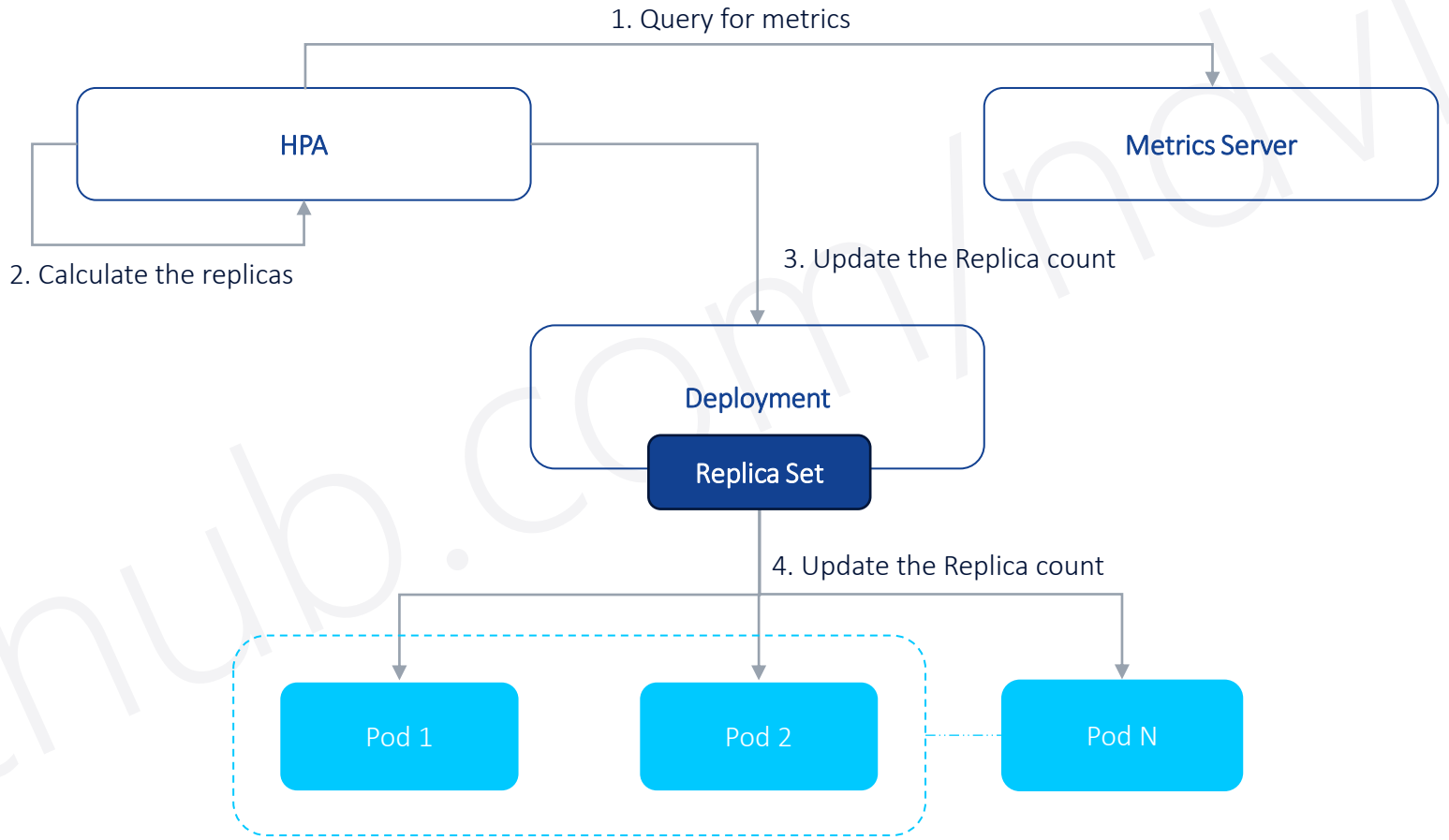
Solutions

Selenium Grid in Kubernetes



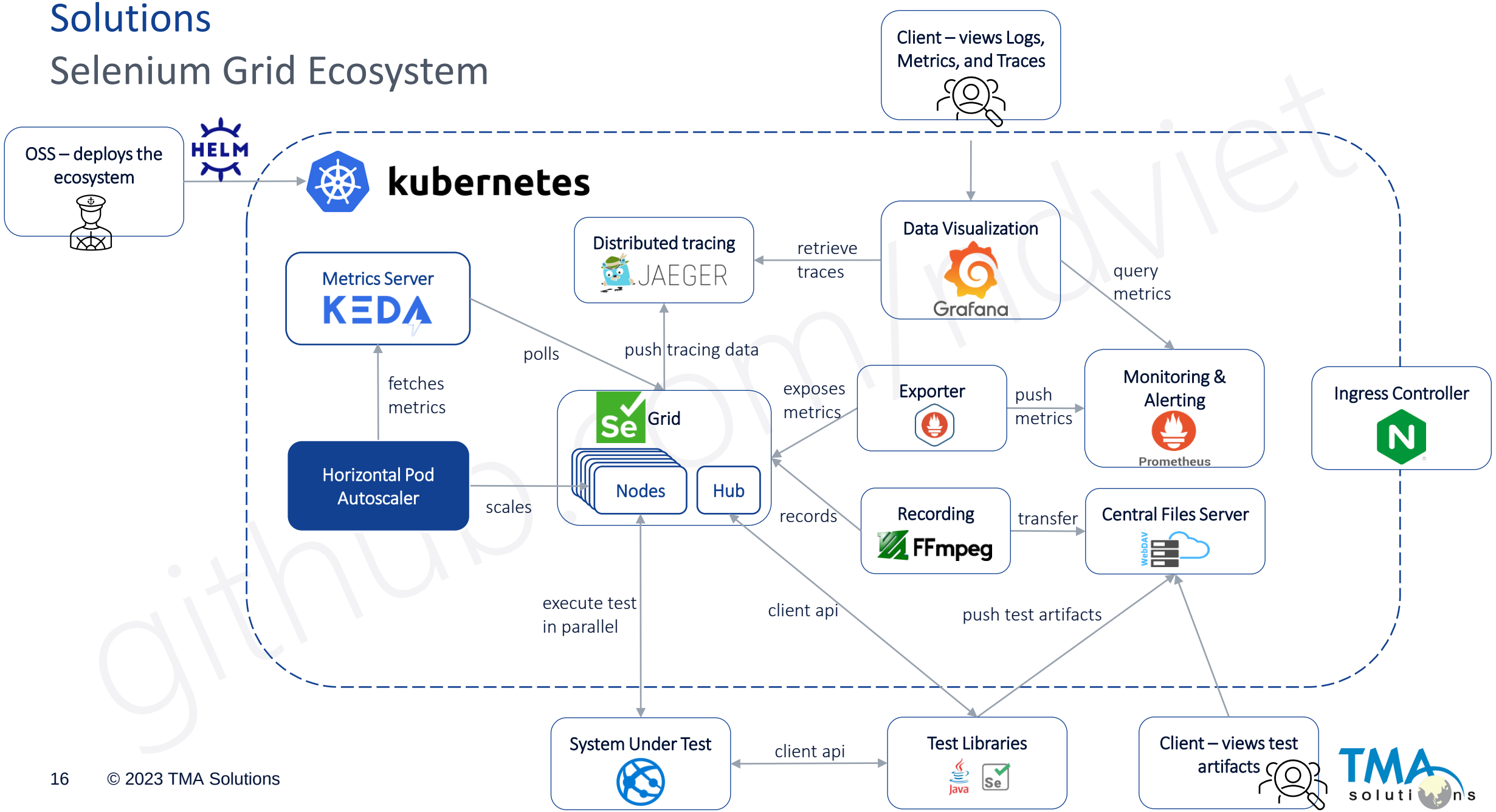
Solutions

Kubernetes Horizontal Pod Autoscaler (HPA)



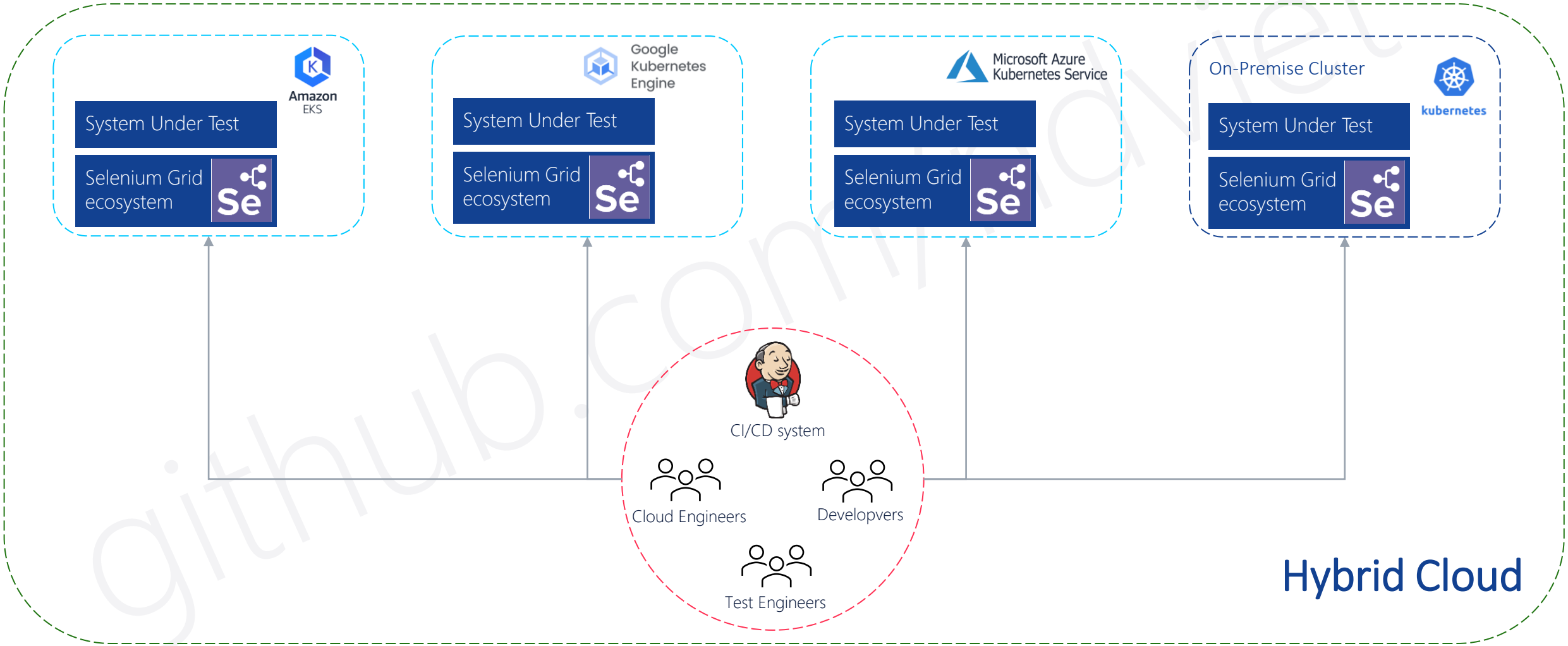
Solutions

Selenium Grid Ecosystem



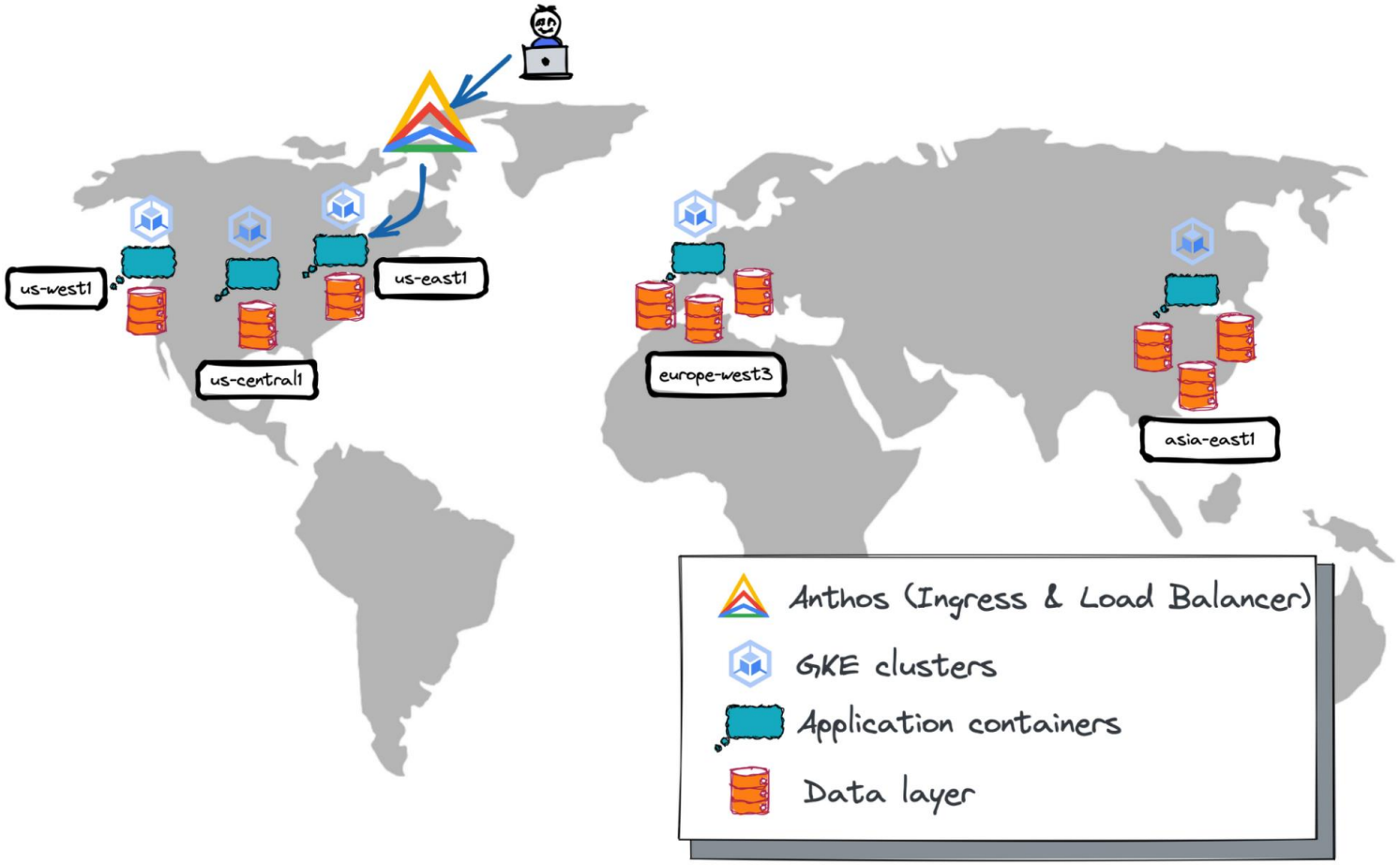
Solutions

Distributed cloud for testing



Solutions

Geo-distributed apps testing



Source: https://cloud.google.com/blog/products/containers-kubernetes/building-geo-distributed-applications-gke-yugabytedb

Benefits

Tech stack

Free (using stack of tools are open-sources)

Easy to deploy (powered by Helm charts package management, cloud service providers)

Support cloud-native infrastructure

Benefits

Testing works

Better utilization of resources

Faster feedback

Improved efficiency

What's next?

Umbrella charts to install the Scalable Central Grid
https://github.com/ndviet/test-scaling-grid

Test Automation Framework with adaptation for parallel executions
https://github.com/ndviet/test-automation-fwk

Q&A


TMA
solutions