

Fruit Cocktail - Optimised Microservice Deployment in the Cloud

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1 Status report

1.1 Proposal

1.1.1 Motivation

Using microservices is currently the prevalent architecture, this structures an application as a collection of services that are highly maintainable, testable, loosely coupled which allows to be independently deployable. These features present new challenges of their own, hence this project investigates optimization different ways in which a application curated with microservices could be deployed to the cloud.

1.1.2 Aims

This project develops a deployment workflow using Terraform, this allow for automation of managing various virtual machines on Azure Cloud. The workflow takes in source code and provide a performance measurement once a load generator has run for a substantial time.

The goal is to have 9 different scripts, each workflow contains scripts with different type of deployment method and application. These scripts which ideally return machine metrics, and can be used to compare the different deployment methods across each application which are created using a different number of micro-services.

1.2 Progress

1. Researched different microservice patterns, decided on 3 Patterns.
2. Researched different sample applications based on the microservice architectures.
3. Researched Terraform, an infrastructure as code (IaC) tool.
4. Tested different sample applications to check if they work as inteded.
5. Researched different cloud platforms, stuck to Azure.
6. Tested Azure Cloud, to experiment with different features
7. Tested Terraform with Azure Cloud.
8. Set-up 1(Robot Shop) sample application to run with Terraform, with pattern 1.

9. Set-up Load Gen for above mentioned application with Terraform.
10. Set-up 2(Social Network) sample application to run with Terraform with pattern 1.

1.3 Problems and risks

1.3.1 Problems

1. Different sample applications are built differently, testing each application and how they run varies, this was remedied by short listing applications based on a few characteristics, such as deployment being available through a docker-container.
2. Cloud computing can be expensive to test on, this was remedied by collaborating with Dr Faiza Samreen from Sheffield Hallam University, thanks to my supervisor Dr Yehai Elkhatab.
3. Metric collection through terraform is an issue, as it's not natively supported, this was remedied by using Azure CLI, which is an additional

1.3.2 Risks

1. Pattern 3, would possibly be an issue in the future, this would require time to mitigate.

1.4 Plan

December- March	Start and Finish dissertation.
December	Complete entire automation scripts for Pattern 1 for all 3 applications.
January 1 - 15	Complete entire automation scripts for Pattern 2 for all 3 applications.
January 1 - 15	Complete entire automation scripts for Pattern 3 for all 3 applications.
February	Data Analysis