

# Effectiveness of Microservice and Token based Security access control method.

Emanuel Alby - [X00193250@myTuDublin.ie](mailto:X00193250@myTuDublin.ie)

School of Enterprise computing and Digital transformation, TU Dublin, Ireland

Supervisor: Dr. John Burns

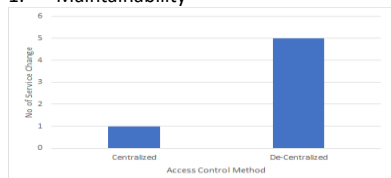
## Introduction

Microservices architecture is an architectural style that divides an application into small, independent services that are loosely coupled and deployed independently. Each service is typically organised around a specific business capability. Though there are significant advantages using microservices architecture, it increases the security risk complexities. Due to the distributed nature of the application, to manage the access control is an additional exercise and to maintained for each distributed service. There are two types of access control approaches namely Centralized and de-centralized access control architecture patterns.

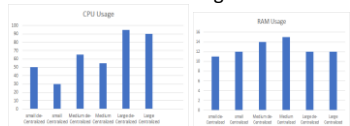
- RQ1 - Whether Centralised Access control pattern is preferable over De-Centralised Access control pattern.
- RQ2 - Will external access controls increase the efficiency of the application.
- RQ3 - Whether microservices pattern more advantages over the legacy architecture pattern.

## Centralized and De-Centralised

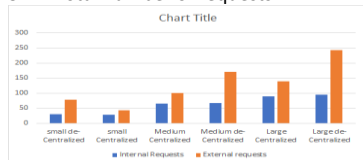
### 1. Maintainability



### 2. CPU and RAM Usage

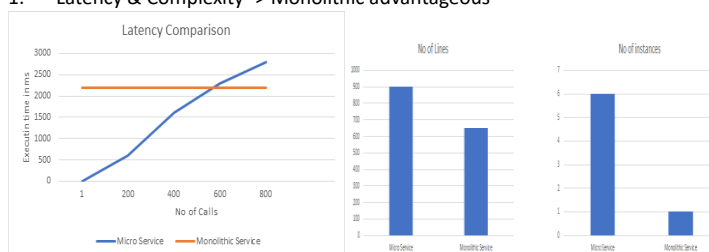


### 3. Total number of requests

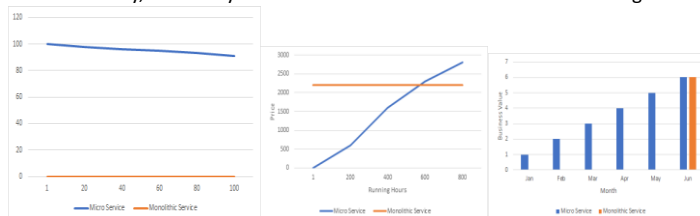


## Advantages of Microservices over monolithic architect pattern

### 1. Latency & Complexity -> Monolithic advantageous



### 2. Reliability, Scalability and Time to Market -> Microservices advantageous



## Topic overview

RQ1 -> Whether Centralised Access control pattern is preferable over De-Centralised Access control pattern.

- Experimental results denote security of the application is increased using De-Centralised access control patter due the distributed nature. Single point of failure can be avoided using de-centralised access control pattern.
- Applications with Central access control can be easily maintained using centralised access control pattern.
- Complexity of the application reduces using centralised access control pattern.

RQ2 -> Will external access controls increase the efficiency of the application.

- Externalizing the access control increase the application security as the resource details will not be exposed to outside world.

RQ3 -> Whether microservices pattern more advantages over the legacy architecture pattern.

- Latency and complexity denote monolithic pattern is advantageous.
- Reliability, Scalability and Time to Market parameters denote microservices is advantageous

## Conclusions and Future work

### Conclusion:

- De-Centralised access control is preferred over Centralized access control as this increase the security scalability, granularity of the security implementation.
- Access control using external token increase the system security.
- Microservices is preferred over Monolithic.

### Future work

- The load test that is used can be extended to include more complex load test scenarios.
- We have a used a set of microservices for this experiment using spring boot and can use other technologies.

## QR code for recording

