Towards Network-Aware Resource Provisioning in Kubernetes for Fog Computing applications

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Abstract -

1 Introduction

- Starting with the IoT devices
- Management of IoT devices, transitioning from Cloud to Fog Computing
- some use-cases of IoT using fog computing
- Fog computing Infrastructure
- VMs vs Container-based solutions (VM Cloud infra vs Kubernetes)
- Kubernetes brief overview
- Kubernetes in-terms of Fog Computing (network consideration and issues)
- last paragraph about proposed solution for network related issues, and strucutre of seminar paper

2 Backgroud

- Kubernetes Internal Archietecture and Main Components
- Kubernetes works as an Orchestrator
- Kubernetes resource provisioning
- Concluding the section with pitfals of default scheduler of Kubernetes

2.1 Kubernetes Main Components

- Write about the Archietecture of Kubernetes with diagram
- Write about the building blocks of Kubernetes and their working

2.2 Kubernetes as Orchestrator

- Orchestrator main functions
- Workflow of Kubernetes as an Orchestrator (steps)

2.3 Kubernetes resource provisioning

- write about the default Kubernetes scheduler
- its main Components
- workflow of default scheduler

3 Kubernetes network-based resource provisioning

- write about why we need network-based resource provisioning
- main factors consideration (e.g bandwidth and latency)
- workflow of network-based scheduler

4 Performance Evaluation

- Write about the considered use-case of Fog Computing for Evaluation

4.1 Expermentation Setup

- setup of Kubernetes base on the mentioned use-case of Fog Computing with diagram

4.2 Analysis of Kubernetes default and network-based resource provisioning

- write about the Performance difference between default Kubernetes scheduler and network based scheduler with supporting result tables and graphs

5 Comparison of Network-based resource provisioning solutions

- Compare different solutions based on the following criteria:

5.1 Infrastructure

- write about the differences between Kubernetes and other available cloud solutions such as Fogernetes[1]

6 Conclusion

References

[1] C. Wöbker, A. Seitz, H. Mueller, and B. Bruegge. "Fogernetes: Deployment and management of fog computing applications". In: `https://ieeexplore.ieee.org/document/8406321`. IEEE/IFIP Network Operations and Management Symposium: Cognitive Management in a Cyber World, NOMS 2018, 2018.