Master Thesis –
SLA-Aware Microservice Orchestration

Background
Telecommunication systems are bound by requirements in form of Service Level Agreements (SLAs) that require extremely high uptime. At the same time there is currently a drive for microservice architectures where new versions of microservices are continuously delivered to customers without passing through time-consuming test machineries. This means that there needs to be a system level resilience towards faulty microservices that ensures that the system as a whole fulfills the SLAs even though newly introduced versions of individual microservices do not. To achieve this resilience there need to be mechanisms in place that detect faulty microservices, recover from failures, and adapt by orchestrating the system accordingly.

Thesis Description
The following steps are envisioned as part of the thesis work:

- Implement an algorithm for SLA-aware microservice orchestration that is tailored for telecommunication systems.
- Deploy a part of the virtualized radio access network (or a simplified system with similar characteristics) with the container framework Kubernetes and use the new algorithm to orchestrate it.
- Compare the SLA-aware deployment to a static deployment in terms of SLA violations and resource usage.

The thesis will be concluded with a presentation for the Ericsson development team.

Qualifications
This project aims at students in computer science, computer engineering or similar.

Extent
1-2 students, 30hp each

Location
Ericsson AB Mjärdevi, Linköping

Preferred Starting Date
Spring 2021

Keywords
Microservice architecture, Kubernetes, Mobile telecommunication

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