Thesis Proposal for Master or CivIng (30 ECTS)

Migrating a monolithic Telecom Application to Microservice Architecture on Google Kubernetes

SDN Controllers are the “brains” of a software controlled network. A SDN acts as strategic control point in the SDN network. It manages network states by installing flow rules to the switches/routers ‘below’ (via southbound APIs) and it interacts with the applications and business logic ‘above’ (via northbound APIs) to deploy intelligent networks. An SDN Controller platform typically contains a collection of “pluggable” modules that can perform different network tasks. Some of the basic tasks including inventorying what devices are within the network and the capabilities of each, gathering network statistics, etc. Typically, an SDN controller is a monolithic piece of software, which limits the scalability and the size of the network such controller can handle.

Recently, microservices have been proposed as a concept to make distributed application easily adaptable, reliable and scalable. Instead of providing an application with its set of functionality as monolithic block over the internet, this paradigm proposes to split the application up into small functional units, the microservice, that run on separate network nodes, e.g. in containers, and collaborate over the network.

The goal of this thesis is to migrate an existing monolithic SDN controller such as OpenDaylight into Microservice architecture and deploy it on a Kubernetes cluster. Kubernetes is an open-source system used by many companies and originally proposed by Google for automating deployment, scaling, and management of containerized applications. Several benchmarks need to be run and evaluated in order to compare the scalability of the approach with the monolithic application.

The student should be familiar with Docker and container based systems.

The thesis will be conducted together with Ericsson, a world leader in communication networks.

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