Master Thesis –
Load Balancing in a Kubernetes Cluster

Background
In mobile networks like for example 5G, data rates can be very high. For a system to be able to process data at a high rate, there is a need to distribute data among computers in a cluster to reduce the risk of bottlenecks. To support such distribution, the technique of automatic load balancing can be used.

Thesis Description
This master thesis is about analyzing techniques for how high throughput traffic can be load balanced among application instances in a cluster of containers by using Kubernetes. A prototype shall be implemented for a proposal of load balancing.

The term load balancing means here how different application instances processing received traffic are used so that the load of the application instances is approximately even. The term load means here to what degree CPUs are used. Kubernetes is an open-source system for automating deployment, scaling, and management of containerized applications.

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

• Investigate and compare techniques for load balancing among containers in a Kubernetes cluster.
• Give a proposal for how load balancing can be implemented.
• Analyze the proposal for load balancing by implementing a prototype.

The thesis will be concluded with a result presentation for Ericsson.

Qualifications
This project aims at students in electrical engineering, computer science, computer engineering or similar. Some knowledge about Docker or Kubernetes is preferred.

Extent
1-2 students, 30hp each

Location
Ericsson AB Mjärdevi, Linköping

Preferred Starting Date
Spring 2023

Keywords
Kubernetes, Docker, Load balancing

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