Bachelor/Master Thesis – Evaluation of Capacity Characteristics in Orchestrated Execution Environments

Background
Traditionally the Ericsson RAN (Radio Access Network) applications have been hosted on Ericsson proprietary hardware. The current trend is to deploy the RAN applications in orchestrated executing environment, which typically is virtualized, and/or container based and running on commercial-off-the-shelf (COTS) HW. The same hardware is potentially shared between several non-related applications (“Workload generators”), and in the virtual machine case multiple OS instances.

The purpose of this thesis is to get an understanding of how the RAN applications behave and preforms in a variety of execution environments. Based on this understanding a model should be constructed that can be used to predict the behavior of the RAN application in different execution environment configurations.

Thesis Description
- Analyze the overhead for running in VM and containers in terms of reduced CPU capacity, memory etc.
- Investigate latency and jitter of inter and intra vm/container process communication
- Determine suitable overbooking ratio per physical CPU
- Investigate impact the ratio of virtual CPU:s per physical CPU.
- Investigate how cache performance is affected by containers and virtualization.
- Built a model based on execution environment properties that can be used to predict the RAN application characteristics in different execution environment configurations.
- Present findings, and model, to the characteristics team.

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

Extent
1-2 students, 15-30hp each

Location
Ericsson AB Mjärdevi, Linköping

Preferred Starting Date
Spring 2019

Keywords
Cloud, virtualization, dockers, orchestration

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