Motivation

Kubernetes is a widely used orchestration framework for containerized applications. A very basic feature of Kubernetes is the ease of scaling. But evaluating scalability of new ideas in Kubernetes can harm the production environment’s efficiency. There are multiple Kubernetes cluster simulators, mainly developed by companies for their internal purposes, which are not available for the academic research community.

Task

The aims of this master thesis are twofold. First, to survey the available Kubernetes simulators and compare their strengths and weaknesses. Then to develop a simulator that gives the flexibility and capability for being used in academia. Actually there are a few open-source projects for simulating Kubernetes that preferably should be used if possible. For the sake of this purpose, the simulator should be developed as an open-source project. It must be able to mimic the components and behavior of Kubernetes and also simulate large scale Kubernetes clusters and complex scenarios on a reasonable amount of hardware resources. The main focus of the new simulator is the ability of evaluating new scheduling mechanisms in Kubernetes clusters.

Requirements

- Background knowledge in parallel and distributed systems
- Linux command-line skills
- Programming experience with Go is a plus

Contact

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