NEWS LETTER

CLOUD STARS

Towards Intelligent Cloud Orchestration

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Kubernetes has become the workhorse for scalable workloads, ranging from edge devices to large data centers. But the Kubernetes application model is aimed at running and sizing each workload in one cluster, and leaves tedious scaling configuration to users. There is a need for an intelligent supervisor that manages multiple clusters, keeps track of performance and decides on the right placement and scaling option. NearbyOne, the flagship product of Nearby Computing, is one

of the leading orchestration platforms currently available. In the context of a CLOUDSTARS secondment in Barcelona, Ranjan Ojha investigated better prediction of influencing effects on autoscaling behaviour in order to make the orchestration even more intelligent.

In the work entitled «A Dynamic Kubernetes Load Generation Solution Mimicking Human Traffic Patterns», the first outcome was a highly reproducible testbed for Kubernetes load testing experiments, with emphasis on low-latency edge workloads. The second outcome was the modelling of user behaviour, based on previously published data center numbers, in conjunction with application behaviour prediction.

The workloads generated for modeling application behaviour was produced using a tool known as `stress-ng`. It is a widely known tool with multiple test scenarios for CPU, memory, disk, network, IO, and many more. Similarly, the modeling of user behaviour was done using another popular tool known as k6. It is a load testing tool, that allows for programming the artificially generated load.

Future work will focus on incorporating latency simulation capabilities and investigating strategies to address the observed Kubernetes backoff behavior and cascading crashes. Zurich University of Applied Sciences and Nearby Computing are looking forward to three more secondments.

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