

Deploying Microservices on Kubernetes Clusters and Improving Scalability Using a Custom Scheduler

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Abstract:

The software engineering industry is rapidly embracing containers to deploy microservice based cloud-native services. When an application has massive workload, Kubernetes can automatically scale the microservices using the default Kubernetes Horizontal Pod Autoscaler. The default Kubernetes approach results in inefficient resource allocation, which affects cloud-native application performance and increases maintenance expenses. This project uses a custom controller algorithm and estimates the appropriate number of instances for containers. The suggested approach maintains cloud-native applications' Quality of Service (QoS) while cutting down on maintenance expenses. This project found that on comparison the default Kubernetes Horizontal Pod Autoscaler is more expensive and scales up and down very inefficiently and is more expensive than the custom controller. Project deals with deploying microservices on cloud and reduce the resource consumption like CPUs, memory, and bring down the cost of creation of pods.

The project is aimed to improve and optimize resource utilization, improve security feature and be able to monitor the performance and visualize the metrics to study the behavior of the microservices to increased load.