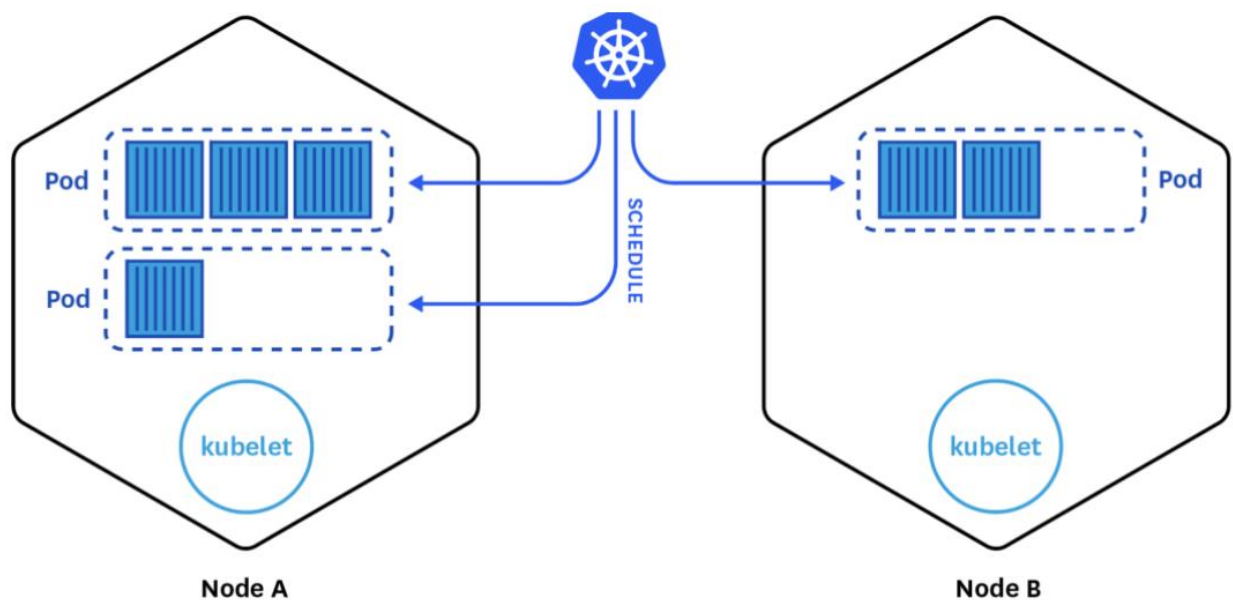# Kubernetes Scheduler Research

Abstract:

Kubernetes (commonly stylized as **K8s**),is young and fast-evolving Open source project, originally created by Google. It is a popular coin tanker orchestration system for automating deployment, scaling and management of containers. An important component of Kubernetes is its scheduler that selects on which node an unscheduled pod (the basic entity managed by the scheduler) will runs on, based on resource availability. Scheduler tracks resource use on each node to ensure that workload scheduling consumes optimally the available resources. For this purpose, the scheduler must know the resource requirements, resource availability, and other user-provided constraints and policy directives such as quality-of-service. In essence, the scheduler's role is to match resource "supply" to workload "demand".

Goals:

1. Study Kubernetes - https://kubernetes.io/
2. Raise Kubernetes Environment and execute its basic tutorials
   https://kubernetes.io/docs/tutorials/kubernetes-basics/
3. Learn about Kubernetes scheduler mechanism
   - https://kubernetes.io/docs/reference/command-line-tools-reference/kube-scheduler/
   - https://jvns.ca/blog/2017/07/27/how-does-the-kubernetes-scheduler-work/

4. Simulate the **Kubernetes algorithm.**
5. Develop new algorithm based on Power-of-choice concept. Refer to:
   https://www.eecs.harvard.edu/~michaelm/postscripts/tpds2001.pdf .
6. Compare efficiency utilization between both algorithms.

Requirements:

Introduction to Networking (Must), Internet Networking (Optional)

Programming Language:
Python

Guided by:
Dr. Jose Yallouz (Intel)