

Advanced Distributed Systems- Exercise 4

Optimization-Based Custom Scheduler for Minikube Deployment

This assignment focuses on enhancing the scheduling of application services on Minikube to minimize response time using genetic, particle swarm optimization, or other metaheuristic algorithms. The goal is to develop a custom scheduler for Kubernetes within the Minikube environment.

Assignment Tasks:

1. Algorithm Selection and Implementation:
 - Choose either genetic, particle swarm optimization, or another suitable metaheuristic algorithm to optimize the scheduling of application services.
 - Implement the chosen algorithm to minimize response time of the application.
2. Develop a custom scheduler for Kubernetes within the Minikube environment:
 - Apply the scheduler from previous step to minikube and provide your customized scheduler for scheduling your application in the minikube.
3. Minikube Configuration:
 - Customize Minikube to operate with multiple worker nodes to provide the scheduler with a broader range of options for service assignment.
4. Response Time Measurement or Resource Utilization Monitoring:
 - Optionally measure the response time of each service or monitor the runtime resource utilization of each node.
 - Assign services to nodes with lower response time or lower utilization rates, aiming for reduced response times.
 - Note measuring the response time of each service or monitoring the runtime resource utilization of each node is optional, and constant response time assumptions for each node can be made if preferred.

Documentation and Deliverables:

- Prepare a detailed PDF document providing step-by-step configuration instructions, the model for the scheduling problem, outlining constraints, and the objective function.
- Include all necessary configuration files.
- Deliver the source code of the developed scheduler.

This is a useful link for configuring more nodes for the minikube:

<https://medium.com/@kiranms.unixadm/how-to-minikube-with-multi-node-setup-1159006fc80e>

