

Kubernetes Project 1

Deploying a Flask Application on Kubernetes with Auto-Scaling & Load Testing

Overview

This guide walks through deploying a Flask application on Kubernetes, handling authentication issues, enabling auto-scaling (HPA), and performing load testing.

Prerequisites

Ensure you have the following installed:

- Docker (for building images)
- Kubernetes cluster (with master-vm, worker1-vm, worker2-vm)
- Metrics Server (for auto-scaling)

```
master@master-vm:~$ kubectl get hpa
NAME          REFERENCE          TARGETS  MINPODS  MAXPODS  REPLICAS  AGE
flask-app     Deployment/flask-app 49%/50%   3         10        8         135m
master@master-vm:~$ kubectl get hpa
NAME          REFERENCE          TARGETS  MINPODS  MAXPODS  REPLICAS  AGE
flask-app     Deployment/flask-app 50%/50%   3         10        8         135m
master@master-vm:~$ kubectl get hpa
NAME          REFERENCE          TARGETS  MINPODS  MAXPODS  REPLICAS  AGE
flask-app     Deployment/flask-app 50%/50%   3         10        8         135m
master@master-vm:~$ kubectl get hpa
NAME          REFERENCE          TARGETS  MINPODS  MAXPODS  REPLICAS  AGE
flask-app     Deployment/flask-app 43%/50%   3         10        8         136m
master@master-vm:~$ kubectl get hpa
NAME          REFERENCE          TARGETS  MINPODS  MAXPODS  REPLICAS  AGE
flask-app     Deployment/flask-app 43%/50%   3         10        8         136m
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flask-app     Deployment/flask-app 49%/50%   3         10        8         136m
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flask-app     Deployment/flask-app 49%/50%   3         10        8         136m
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NAME          REFERENCE          TARGETS  MINPODS  MAXPODS  REPLICAS  AGE
flask-app     Deployment/flask-app 15%/50%   3         10        8         136m
master@master-vm:~$ kubectl get hpa
NAME          REFERENCE          TARGETS  MINPODS  MAXPODS  REPLICAS  AGE
flask-app     Deployment/flask-app 15%/50%   3         10        8         136m
master@master-vm:~$
```

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The screenshot shows a Linux desktop with a dark purple theme. The top panel includes system status icons on the left and window titles for 'Activities', 'Workspace', and several browser windows. The left sidebar contains icons for Firefox, Telegram, a file manager, and other applications. The main window is a terminal titled 'master@master-vm: ~', which displays a continuous stream of messages from a Flask application running in Docker: '{ "message": "Hello, World! This is a Flask app running in Docker." }'. The terminal window has a dark background with light-colored text.