Getting Started with Kubernetes and MicroK8s - HTRC

# Introduction

This guide aims to help beginners get started with Kubernetes using MicroK8s, a lightweight, single-node Kubernetes distribution perfect for development and testing environments. We will cover the basics of Kubernetes, how to set up MicroK8s, and how to deploy a simple application using Kubernetes.

# What is Kubernetes?

Kubernetes is an open-source container orchestration platform that automates containerized applications' deployment, scaling, and management. It groups containers into logical units for easy management and discovery.

## Key Concepts

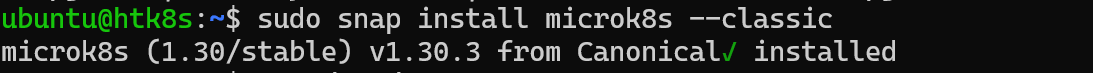
- Pod: The smallest and simplest Kubernetes object. A Pod represents a single instance of a running process in your cluster.  
- Node: A worker machine in Kubernetes, which can be a VM or a physical machine, depending on the cluster.  
- Cluster: A set of nodes grouped.  
- Service: An abstraction that defines a logical set of Pods and a policy by which to access them.  
- Deployment: A higher-level concept that manages a group of Pods and ensures that the specified number of Pods are running.

# Setting Up MicroK8s

MicroK8s is a lightweight Kubernetes distribution that can run on a single node, making it an excellent choice for development and testing.

## Installation

1. Install MicroK8s:  
sudo snap install microk8s --classic



2. Add your user to the MicroK8s group:  
sudo usermod -a -G microk8s $USER

mkdir -p ~/. kube

chmod 0700 ~/. Kube

newgrp microk8s

A screenshot of a computer

Description automatically generated

3. Verify MicroK8s installation:  
microk8s status --wait-ready

# Deploying a Sample Application

We will deploy a simple Apache Server application using Kubernetes. For this example, we will use a Docker image.

microk8s kubectl create deployment nginx --image=nginx

microk8s kubectl create deployment apache-server --image=httpd:latest

microk8s kubectl expose deployment apache-server --type=NodePort --port=80

A screen shot of a computer

Description automatically generated

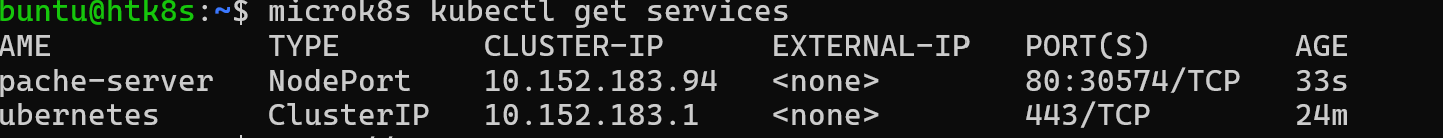
To check the deployed pods, nodes and services:

microk8s kubectl get nodes

microk8s kubectl get pods

microk8s kubectl get deployments

microk8s kubectl get services



**Adding a new node:**

Run

microk8s add-node f

rom the node to which a new node has to be added.  
And execute the next steps in the node that is to be added that is the result of

microk8s add-node

command as shown below

A computer screen with white text

Description automatically generated

# Reference

<https://www.youtube.com/watch?v=s_o8dwzRlu4>

<https://www.youtube.com/watch?v=TlHvYWVUZyc&t=1s>

<https://kubernetes.io/docs/home/>

<https://microk8s.io/docs>

<https://kubernetes.io/docs/tutorials/>