Kubernetes Deployment

##
Kubernetes Deployment - kubeadm
##

Launch 3 nodes (1 master and 2 Worker)

-----*** Initialise Hostnames ***-----

$ sudo hostnamectl set-hostname k8s-master

$ sudo hostnamectl set-hostname k8s-worker1

$ sudo hostnamectl set-hostname k8s-worker2

$ sudo nano /etc/hosts
172.31.39.255 m1
172.31.33.196 w1
172.31.37.69 w2

>>> Exit node and connect again

-----*** Set up Docker Engine and containerd ***-----

>>> Load and enable kernel modules

$ cat <<EOF | sudo tee /etc/modules-load.d/k8s.conf
overlay
br_netfilter
EOF

$ sudo modprobe overlay

$ sudo modprobe br_netfilter

>>> Iptable configs

```
$ cat <<EOF | sudo tee /etc/sysctl.d/k8s.conf
net.bridge.bridge-nf-call-iptables  = 1
net.bridge.bridge-nf-call-ip6tables = 1
net.ipv4.ip_forward                 = 1
EOF

$ sudo sysctl --system

$ sudo apt-get update && sudo apt-get install -y ca-certificates curl gnupg lsb-release apt-transport-https

$ sudo mkdir -m 0755 -p /etc/apt/keyrings

$ curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o /etc/apt/keyrings/docker.gpg

$ echo \
  "deb [arch=$(dpkg --print-architecture) signed-by=/etc/apt/keyrings/docker.gpg] https://download.docker.com/linux/ubuntu \
  $(lsb_release -cs) stable" | sudo tee /etc/apt/sources.list.d/docker.list > /dev/null

$ sudo apt-get update

$ VERSION_STRING=5:23.0.1-1~ubuntu.20.04~focal

$ sudo apt-get install -y docker-ce=$VERSION_STRING docker-ce-cli=$VERSION_STRING containerd.io docker-buildx-plugin docker-compose-plugin

$ sudo usermod -aG docker $USER

>>> Make sure that 'disabled_plugins' is commented out in your config.toml file

$ sudo sed -i 's/disabled_plugins/#disabled_plugins/' /etc/containerd/config.toml

$ sudo systemctl restart containerd

>>> Disable swap

$ sudo swapoff -a
```

-----*** Install kubadm, kubectl and kubelet ***-----

$ curl -fsSL https://pkgs.k8s.io/core:/stable:/v1.27/deb/Release.key | sudo gpg --dearmor -o /etc/apt/keyrings/kubernetes-apt-keyring.gpg

$ echo 'deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg] https://pkgs.k8s.io/core:/stable:/v1.27/deb/ /' | sudo tee /etc/apt/sources.list.d/kubernetes.list

$ sudo apt-get update

$ sudo apt-get install -y kubelet kubeadm kubectl

$ sudo apt-mark hold kubelet kubeadm kubectl

>>> On the Control pane (master) - Initialise the kubernetes cluster

$ sudo kubeadm init --pod-network-cidr 192.168.0.0/16

>>> Make kubectl work with non root user
$ mkdir -p $HOME/.kube

$ sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config

$ sudo chown $(id -u):$(id -g) $HOME/.kube/config

>>> Verify if clutser is running
$ kubectl get nodes

>>> Install the Calico network add-on
$ kubectl apply -f https://raw.githubusercontent.com/projectcalico/calico/v3.25.0/manifests/calico.yaml

>>> Get join command for workers
$ kubeadm token create --print-join-command

(Paste on all workers)

>>> Check the cluster
$ kubectl get nodes