# (SOP) for Installing a Multi-master Kubernetes Setup with HA-Proxy

# Prerequisites

* HAProxy Server (Load Balancer): One server dedicated to HAProxy.
* Kubernetes Master Nodes: At least two master nodes.
* Kubernetes Worker Nodes: Any number of worker nodes.
* Network Configuration: Ensure the network settings and firewalls are configured to allow traffic between all nodes on required ports.
* add nameserver 8.8.8.8 in /etc/resolv.conf so the repository URL are resolved.

# Steps

## Set Up HAProxy on the Load Balancer Server

* Copy the `ha-proxy-k8s-install.sh` Script to the Load Balancer Server.
* Edit `ha-proxy-k8s-install.sh` with the Following Changes:

# Load Balancer IP

LB\_IP=<LB-ip>

# Master server 1 details

NEW\_master1=<control-master1-hostname>

NEW\_IP1=<control-master1-ip>

# Master server 2 details

NEW\_master2=<control-master2-hostname>

NEW\_IP2=<control-master2-ip>

* Run the Script:

sudo sh ha-proxy-k8s-install.sh

## 2. Install Kubernetes on Each Node

* Copy the `install-k8s.sh` Script to All Nodes (Masters and Workers).
* Run the Script on Each Node:

sudo sh install-k8s.sh

## 3. Initialize the Kubernetes Cluster on One Master Node

* Run the `kubeadm init` Command on One of the Master Nodes:

kubeadm init --control-plane-endpoint "<LB-IP>:6443" --upload-certs

* Follow the Instructions Provided by the `kubeadm init` Command:
  + Note the `kubeadm join` command with the certificate key. You will use this to join other master nodes and worker nodes to the cluster.

## 4. Join Additional Master Nodes to the Cluster

* Run the `kubeadm join` Command on Each Additional Master Node:

kubeadm join 10.48.209.75:6443 --token <token> --discovery-token-ca-cert-hash sha256:<hash> --control-plane --certificate-key <key>

## 5. Join Worker Nodes to the Cluster

* Run the `kubeadm join` Command on Each Worker Node:

kubeadm join 10.48.209.75:6443 --token <token> --discovery-token-ca-cert-hash sha256:<hash>

## Verification and post-installation

1. Verify the Nodes:

kubectl get nodes

1. Install a Network Add-On (e.g., Calico, Flannel):

kubectl apply -f <https://raw.githubusercontent.com/projectcalico/calico/v3.25.0/manifests/calico.yaml>

3. Verify the Setup:

* Ensure all nodes are in the `Ready` state.
* Check the HAProxy load balancer configuration to ensure it is correctly distributing traffic to the master nodes.
* 4. run test nginx pod

kubectl run –name=test –image=nginx

This SOP outlines the steps required to set up a multimaster Kubernetes cluster with HAProxy for load balancing. Ensure to replace the placeholder values with actual ones specific to your environment.