**Kubernetes HA on bare-metal – Installation Steps**

1. Create HAPROXY Load-Balancer to distribute incoming traffic between the three masters
   1. The HAPROXY VM will serve as the entry point to the incoming traffic from outside the cluster and will load balance the requests on the three masters in round-robin fashion.
2. Create three Master VM’s
   1. open the below ports as described below
      1. 6443\* for Kubernetes API server
      2. 2379-2380 for etcd server client API
      3. 10250 for Kubelet API
      4. 10251 for kube-scheduler
      5. 10252 for kube-controller-manager
   2. Install Docker, Kubectl, kubeadm and kubelet on all the three master nodes
3. Create the kubeadm-config.yaml on master-1 VM and update the apiserver and controlPlaneEndpoint as the HAPROXY internal IP in the kubeadm-config.yaml
4. Initiate Stacked control plane from the master-1.
5. Once the Cluster is initiated and the certificates are created in /etc/kubernetes/pki/ folder of master-1, save the join token output.
6. Install the CNI (weave) on the cluster.
7. Copy the certificates from master-1 to master-2 and master-3 VM.
8. Move the certificates on master-2 and master-3 VM from /home/ubuntu/ to /etc/kubernetes/pki folder.
9. Run the kubeadm join token command with **--experimental-control-plane** on master-2 and then on master-3
   1. Note: If the master-2 and master-3 are not able to communicate with the stacked etcd cluster, they will join the cluster as a worker instead of master.
10. Create two worker VM’s and open the below ports once the VM’s are provisioned.
    1. 10250 for Kubelet API
    2. 30000-32767 for NodePort Services\*\*
11. Install kubeadm and kubelet on the worker VM’s
12. Run the kubeadm join command on the worker nodes to join the cluster.
13. Copy the kubeconfig from master-1 to the HAProxy VM.
14. Install kubectl on the HAProxy VM to work as a workstation.
15. Deploy the Dashboard and expose it over NodePort to access it from the Internet from the HAProxy VM.

\* Port numbers are overrideable

\*\* Default port range for NodePort services