Kubernetes Installation:

Docker must have been installed

Redhat 7 :

Step 1: Disable SELinux & setup firewall rules

Login to your kubernetes master node and set the hostname and disable selinux using following commands

```
~]# hostnamectl set-hostname 'k8s-master'

~]# exec bash

~]# setenforce 0

~]# sed -i --follow-symlinks 's/SELINUX=enforcing/SELINUX=disabled/g'
/etc/sysconfig/selinux
```

Set the following firewall rules.

yum install firewalld

service start firewalld

```
[root@k8s-master ~]# firewall-cmd --permanent --add-port=6443/tcp

[root@k8s-master ~]# firewall-cmd --permanent --add-port=2379-2380/tcp

[root@k8s-master ~]# firewall-cmd --permanent --add-port=10250/tcp

[root@k8s-master ~]# firewall-cmd --permanent --add-port=10251/tcp

[root@k8s-master ~]# firewall-cmd --permanent --add-port=10252/tcp

[root@k8s-master ~]# firewall-cmd --permanent --add-port=10255/tcp

[root@k8s-master ~]# firewall-cmd --reload

[root@k8s-master ~]# modprobe br_netfilter

[root@k8s-master ~]# echo '1' > /proc/sys/net/bridge/bridge-nf-call-iptables
```

Note: In case you don't have your own dns server then update /etc/hosts file on master and worker nodes

```
192.168.1.30 k8s-master

192.168.1.40 worker-node1

192.168.1.50 worker-node2
```

Step 2: Configure Kubernetes Repository

Kubernetes packages are not available in the default CentOS 7 & RHEL 7 repositories, Use below command to configure its package repositories.

```
[root@k8s-master ~]# cat <<EOF > /etc/yum.repos.d/kubernetes.repo

[kubernetes]

name=Kubernetes

baseurl=https://packages.cloud.google.com/yum/repos/kubernetes-el7-x86_64

enabled=1

gpgcheck=1

repo_gpgcheck=1

gpgkey=https://packages.cloud.google.com/yum/doc/yum-key.gpg

       https://packages.cloud.google.com/yum/doc/rpm-package-key.gpg

EOF

[root@k8s-master ~]#
```

Step 3: Install Kubeadm and Docker

Once the package repositories are configured, run the beneath command to install kubeadm and docker packages.

```
[root@k8s-master ~]# yum install kubeadm docker -y
```

Start and enable kubectl and docker service

```
[root@k8s-master ~]# systemctl restart docker && systemctl enable docker

[root@k8s-master ~]# systemctl  restart kubelet && systemctl enable kubelet
```

Step 4: Initialize Kubernetes Master with 'kubeadm init'

Run the beneath command to initialize and setup kubernetes master.

```
[root@k8s-master ~]# kubeadm init
```

Output of above command would be something like below

As we can see in the output that kubernetes master has been initialized successfully. Execute the beneath commands to use the cluster as root user.

```
[root@k8s-master ~]# mkdir -p $HOME/.kube

[root@k8s-master ~]# cp -i /etc/kubernetes/admin.conf $HOME/.kube/config

[root@k8s-master ~]# chown $(id -u):$(id -g) $HOME/.kube/config
```

Step 5: Deploy pod network to the cluster

Try to run below commands to get status of cluster and pods.

```
[root@k8s-master ~]# kubectl get nodes
NAME         STATUS     AGE       VERSION
k8s-master   NotReady   45m       v1.7.5
[root@k8s-master ~]# kubectl  get pods  --all-namespaces
NAMESPACE     NAME                                 READY     STATUS    RESTARTS   AGE
kube-system   etcd-k8s-master                      1/1       Running   0          42m
kube-system   kube-apiserver-k8s-master            1/1       Running   0          42m
kube-system   kube-controller-manager-k8s-master   1/1       Running   0          42m
kube-system   kube-dns-2425271678-044ww            0/3       Pending   0          47m
kube-system   kube-proxy-9h259                     1/1       Running   0          47m
kube-system   kube-scheduler-k8s-master            1/1       Running   0          42m
[root@k8s-master ~]#
```

To make the cluster status ready and kube-dns status running, deploy the pod network so that containers of different host communicated each other. POD network is the overlay network between the worker nodes.

Run the beneath command to deploy network.

```
[root@k8s-master ~]# export kubever=$(kubectl version | base64 | tr -d '\n')

[root@k8s-master ~]# kubectl apply -f "https://cloud.weave.works/k8s/net?k8s-
version=$kubever"
```

```
serviceaccount "weave-net" created

clusterrole "weave-net" created

clusterrolebinding "weave-net" created

daemonset "weave-net" created

[root@k8s-master ~]#
```

Now run the following commands to verify the status

```
[root@k8s-master ~]# kubectl get nodes

NAME         STATUS    AGE       VERSION

k8s-master   Ready     1h        v1.7.5

[root@k8s-master ~]# kubectl  get pods  --all-namespaces

NAMESPACE     NAME                                  READY     STATUS    RESTARTS   A
GE

kube-system   etcd-k8s-
master                       1/1       Running   0          57m

kube-system   kube-apiserver-k8s-
master            1/1       Running   0          57m

kube-system   kube-controller-manager-k8s-
master   1/1       Running   0          57m

kube-system   kube-dns-2425271678-
044ww            3/3       Running   0          1h

kube-system   kube-proxy-
9h259                     1/1       Running   0          1h

kube-system   kube-scheduler-k8s-
master            1/1       Running   0          57m

kube-system   weave-net-
hdjzd                       2/2       Running   0          7m

[root@k8s-master ~]#
```

Now let's add worker nodes to the Kubernetes master nodes.

Perform the following steps on each worker node

Step 1: Disable SELinux & configure firewall rules on both the nodes

Before disabling SELinux set the hostname on the both nodes as ‘worker-node1’ and ‘worker-node2’ respectively

```
~]# setenforce 0

~]# sed -i --follow-symlinks 's/SELINUX=enforcing/SELINUX=disabled/g'
/etc/sysconfig/selinux

~]# firewall-cmd --permanent --add-port=10250/tcp

~]# firewall-cmd --permanent --add-port=10255/tcp

~]# firewall-cmd --permanent --add-port=30000-32767/tcp

~]# firewall-cmd --permanent --add-port=6783/tcp

~]# firewall-cmd  --reload

~]# echo '1' > /proc/sys/net/bridge/bridge-nf-call-iptables
```

Step 2: Configure Kubernetes Repositories on both worker nodes

```
~]# cat <<EOF > /etc/yum.repos.d/kubernetes.repo

> [kubernetes]

> name=Kubernetes

> baseurl=https://packages.cloud.google.com/yum/repos/kubernetes-el7-x86_64

> enabled=1

> gpgcheck=1

> repo_gpgcheck=1

> gpgkey=https://packages.cloud.google.com/yum/doc/yum-key.gpg

>         https://packages.cloud.google.com/yum/doc/rpm-package-key.gpg

> EOF
```

Step 3: Install kubeadm and docker package on both nodes

```
[root@worker-node1 ~]# yum  install kubeadm docker -y

[root@worker-node2 ~]# yum  install kubeadm docker -y
```

Start and enable docker service

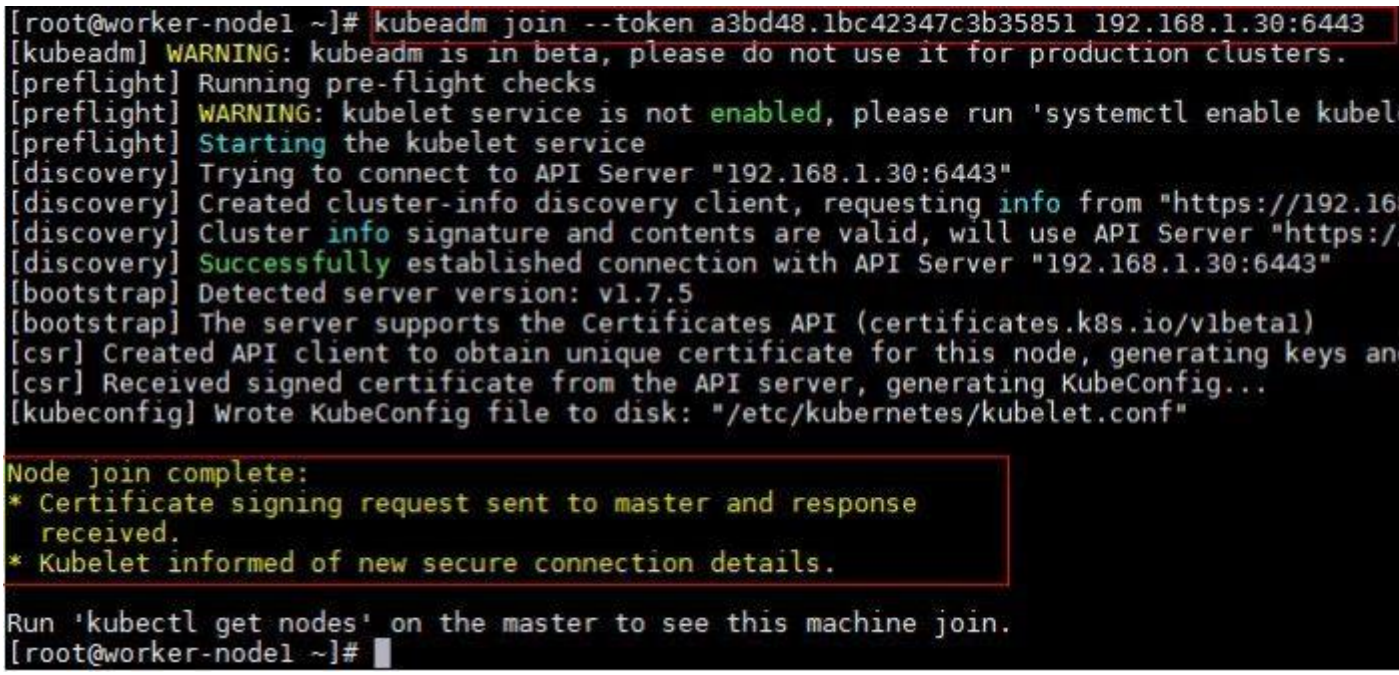
```
[root@worker-node1 ~]# systemctl restart docker && systemctl enable docker

[root@worker-node2 ~]# systemctl restart docker && systemctl enable docker
```

Step 4: Now Join worker nodes to master node

To join worker nodes to Master node, a token is required. Whenever kubernetes master initialized , then in the output we get command and token. Copy that command and run on both nodes.

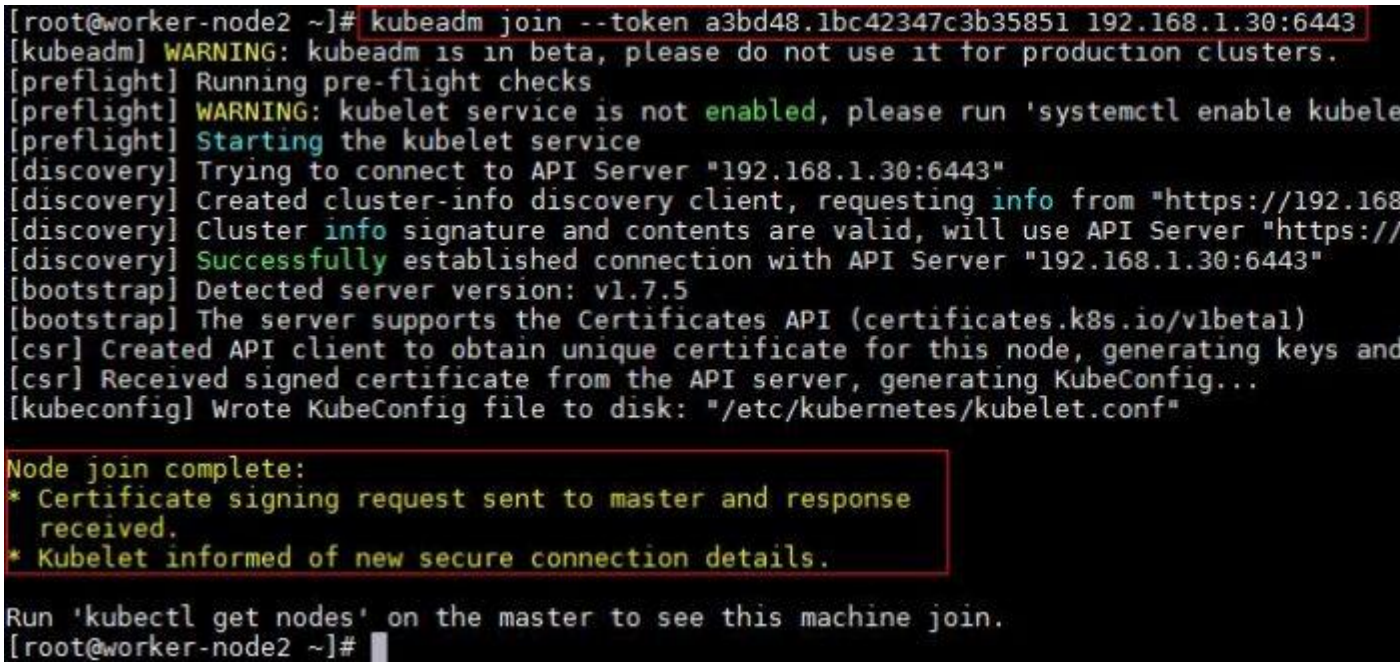
```
[root@worker-node1 ~]# kubeadm join --token a3bd48.1bc42347c3b35851
192.168.1.30:6443
```

Output of above command would be something like below



```
[root@worker-node2 ~]# kubeadm join --token a3bd48.1bc42347c3b35851
192.168.1.30:6443
```

Output would be something like below



Now verify Nodes status from master node using kubectl command

```
[root@k8s-master ~]# kubectl get nodes

NAME           STATUS    AGE       VERSION

k8s-master     Ready     2h        v1.7.5

worker-node1   Ready     20m       v1.7.5

worker-node2   Ready     18m       v1.7.5

[root@k8s-master ~]#
```