installation of docker

1. yum install docker -y
2. systemctl enable docker --now
3. docker info

```
[root@ip-172-31-49-3 ~]# yum install docker -y
Loaded plugins: extras_suggestions, langpacks, priorities, update-
               : motd
```

```
[root@ip-172-31-49-3 ~]# systemctl enable docker --now
Created symlink from /etc/systemd/system/multi-user.target.wants/docker.service to /usr/lib/systemd/system/docker.service.
[root@ip-172-31-49-3 ~]# docker info
Client:
 Debug Mode: false

Server:
 Containers: 0
  Running: 0
  Paused: 0
  Stopped: 0
 Images: 0
 Server Version: 19.03.13-ce
 Storage Driver: overlay2
  Backing Filesystem: xfs
  Supports d_type: true
  Native Overlay Diff: true
 Logging Driver: json-file
 Cgroup Driver: cgroupfs
```

installation of kubeadm

1. yum install kubeadm - fails
2. vi /etc/yum.repos.d/kubernetes.repo - need to setup the repo
3. yum repolist
4. yum install -y kubelet kubeadm kubectl --disableexcludes=kubernetes
5. systemctl status kubelet
6. systemctl enable kubelet –now

```
[root@ip-172-31-49-3 ~]# vi /etc/yum.repos.d/kubernetes.repo
[root@ip-172-31-49-3 ~]# cat  /etc/yum.repos.d/kubernetes.repo
[kubernetes]
name=Kubernetes
baseurl=https://packages.cloud.google.com/yum/repos/kubernetes-el7-\$basearch
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
exclude=kubelet kubeadm kubectl
[root@ip-172-31-49-3 ~]# yum install -y kubelet kubeadm kubectl --disableexcludes=kubernetes
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core                                                                                  | 3.7 kB  00:00:00
kubernetes/x86_64/signature                                                                 |  844 B  00:00:00
Retrieving key from https://packages.cloud.google.com/yum/doc/yum-key.gpg
Importing GPG key 0xA7317B0F:
```

```
[root@ip-172-31-49-3 ~]# systemctl enable kubelet --now
Created symlink from /etc/systemd/system/multi-user.target.wants/kubelet.service to /usr/lib/systemd/system/kubelet.service.
[root@ip-172-31-49-3 ~]# systemctl status kubelet
● kubelet.service - kubelet: The Kubernetes Node Agent
   Loaded: loaded (/usr/lib/systemd/system/kubelet.service; enabled; vendor preset: disabled)
  Drop-In: /usr/lib/systemd/system/kubelet.service.d
           └─10-kubeadm.conf
   Active: activating (auto-restart) (Result: exit-code) since Wed 2021-02-03 14:20:22 UTC; 7s ago
     Docs: https://kubernetes.io/docs/
  Process: 1889 ExecStart=/usr/bin/kubelet $KUBELET_KUBECONFIG_ARGS $KUBELET_CONFIG_ARGS $KUBELET_KUBEADM_ARGS $KUBELET_EXTRA_ARGS (code=exited, status=255)
 Main PID: 1889 (code=exited, status=255)

Feb 03 14:20:22 ip-172-31-49-3.ec2.internal kubelet[1889]: created by k8s.io/kubernetes/vendor/go.opencensus.io/stats/view.init.0
Feb 03 14:20:22 ip-172-31-49-3.ec2.internal systemd[1]: kubelet.service: main process exited, code=exited, status=255/n/a
Feb 03 14:20:22 ip-172-31-49-3.ec2.internal kubelet[1889]: /workspace/src/k8s.io/kubernetes/_output/dockerized/go/src/k8s.io/ku  +0x57
```

joining…. -- fails

```
[root@ip-172-31-58-206 ~]# kubeadm join
discovery: Invalid value: "": bootstrapToken or file must be set
To see the stack trace of this error execute with --v=5 or higher
[root@ip-172-31-58-206 ~]#
```

- a token is required to allow worker node to get connected to master

➔ go to master create a new token..

a. kubeadm token list

```
[root@ip-172-31-52-186 ~]# kubeadm token list
TOKEN                     TTL         EXPIRES                USAGES
             DESCRIPTION                                                E
XTRA GROUPS
y3934u.hvqcghz22oucu6rs   22h         2021-02-04T12:16:14Z   authenticati
on,signing   The default bootstrap token generated by 'kubeadm init'.   s
ystem:bootstrappers:kubeadm:default-node-token
[root@ip-172-31-52-186 ~]#
```

it is the pre-created token, it was also the last time of kubeadm init command.

See its same, I have copied this form master previous ss.

```
kubeadm join 172.31.52.186:6443 --token y3934u.hvqcghz22oucu6rs \
    --discovery-token-ca-cert-hash sha256:c140d470d1bd13e48adf450bae48aae0d88a94f42472a5aa06842302d95f295e
```

b. master's IP : ifconfig

```
[root@ip-172-31-52-186 ~]# ifconfig eth0
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 9001
        inet 172.31.52.186  netmask 255.255.240.0  broadcast 172.31.63.255
        inet6 fe80::4c5:9dff:fe79:af95  prefixlen 64  scopeid 0x20<link>
        ether 06:c5:9d:79:af:95  txqueuelen 1000  (Ethernet)
        RX packets 301944  bytes 422451131 (402.8 MiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 43071  bytes 4042135 (3.8 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

c. kubeadm token create --print-join-command

```
To see the stack trace of this error execute with --v=5 or higher
[root@ip-172-31-52-186 ~]# kubeadm token  create --print-join-command
kubeadm join 172.31.52.186:6443 --token 6m5ot5.kihdgb1stsd1zjup     --dis
covery-token-ca-cert-hash sha256:c140d470d1bd13e48adf450bae48aae0d88a94f4
2472a5aa06842302d95f295e
[root@ip-172-31-52-186 ~]#
```

kubeadm join 172.31.52.186:6443 --token 6m5ot5.kihdgb1stsd1zjup --discovery-token-ca-cert-hash sha256:c140d470d1bd13e48adf450bae48aae0d88a94f42472a5aa06842302d95f295e

go to Worker(172-21-49-3)

➔ same setup we have to kubeadm all trouble shoot all the errors.

```
[root@ip-172-31-49-3 ~]# kubeadm join 172.31.52.186:6443 --token 6m5ot5.kihdgb1stsd1zjup     --discovery-token-ca-cert-hash sha256:c140
d470d1bd13e48adf450bae48aae0d88a94f42472a5aa06842302d95f295e
[preflight] Running pre-flight checks
        [WARNING IsDockerSystemdCheck]: detected "cgroupfs" as the Docker cgroup driver. The recommended driver is "systemd". Please fo
llow the guide at https://kubernetes.io/docs/setup/cri/
        [WARNING FileExisting-tc]: tc not found in system path
error execution phase preflight: [preflight] Some fatal errors occurred:
        [ERROR FileContent--proc-sys-net-bridge-bridge-nf-call-iptables]: /proc/sys/net/bridge/bridge-nf-call-iptables contents are not
 set to 1
[preflight] If you know what you are doing, you can make a check non-fatal with `--ignore-preflight-errors=...`
To see the stack trace of this error execute with --v=5 or higher
[root@ip-172-31-49-3 ~]#
```

1st error: [WARNING IsDockerSystemdCheck]: we have to use system instead of cgroups.

vi /etc/docker/daemon.json

```
{
  "exec-opts": ["native.cgroupdriver=systemd"]
}
```

cat /etc/docker/daemon.json

systemctl restart docker

docker info | grep Driver

```
[root@ip-172-31-49-3 ~]# vi /etc/docker/daemon.json
[root@ip-172-31-49-3 ~]# cat /etc/docker/daemon.json
{
  "exec-opts": ["native.cgroupdriver=systemd"]
}
[root@ip-172-31-49-3 ~]# systemctl restart docker
[root@ip-172-31-49-3 ~]# docker info | grep Driver
WARNING: bridge-nf-call-iptables is disabled
WARNING: bridge-nf-call-ip6tables is disabled
 Storage Driver: overlay2
 Logging Driver: json-file
 Cgroup Driver: systemd
```

```
[root@ip-172-31-49-3 ~]# kubeadm join 172.31.52.186:6443 --token 6m5ot5.kihdgb1stsd1zjup     --discovery-token-ca-cert-hash sha256:c140
d470d1bd13e48adf450bae48aae0d88a94f42472a5aa06842302d95f295e
[preflight] Running pre-flight checks
        [WARNING FileExisting-tc]: tc not found in system path
error execution phase preflight: [preflight] Some fatal errors occurred:
        [ERROR FileContent--proc-sys-net-bridge-bridge-nf-call-iptables]: /proc/sys/net/bridge/bridge-nf-call-iptables contents are not
 set to 1
[preflight] If you know what you are doing, you can make a check non-fatal with `--ignore-preflight-errors=...`
To see the stack trace of this error execute with --v=5 or higher
```

2nd error: [WARNING FileExisting-tc]: tc not found in system path

yum install -y iproute-tc

```
[root@ip-172-31-49-3 ~]# yum install -y iproute-tc
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core                                                                                                    | 3.7 kB  00:00:00
```

```
[root@ip-172-31-49-3 ~]# kubeadm join 172.31.52.186:6443 --token 6m5ot5.kihdgb1stsd1zjup     --discovery-token-ca-cert-hash sha256:c140
d470d1bd13e48adf450bae48aae0d88a94f42472a5aa06842302d95f295e
[preflight] Running pre-flight checks
error execution phase preflight: [preflight] Some fatal errors occurred:
        [ERROR FileContent--proc-sys-net-bridge-bridge-nf-call-iptables]: /proc/sys/net/bridge/bridge-nf-call-iptables contents are not
 set to 1
[preflight] If you know what you are doing, you can make a check non-fatal with `--ignore-preflight-errors=...`
To see the stack trace of this error execute with --v=5 or higher
```

3rd error: FileContent—proc-sys-net-bridge-bridge-nf-call-iptables

vim /etc/sysctl.d/k8s.conf

net.bridge.bridge-nf-call-ip6tables = 1

net.bridge.bridge-nf-call-iptables = 1

cat /etc/sysctl.d/k8s.conf

sysctl –system

sysctl -a | grep bridge-bridge-nf-call

```
[root@ip-172-31-49-3 ~]# vim /etc/sysctl.d/k8s.conf
[root@ip-172-31-49-3 ~]# cat /etc/sysctl.d/k8s.conf
net.bridge.bridge-nf-call-ip6tables = 1
net.bridge.bridge-nf-call-iptables = 1
[root@ip-172-31-49-3 ~]# sysctl -system
sysctl: cannot stat /proc/sys/-system: No such file or directory
[root@ip-172-31-49-3 ~]# sysctl --system
* Applying /etc/sysctl.d/00-defaults.conf ...
kernel.printk = 8 4 1 7
kernel.panic = 30
net.ipv4.neigh.default.gc_thresh1 = 0

[root@ip-172-31-49-3 ~]# sysctl -a | grep bridge-bridge-nf-call
sysctl: reading key "net.ipv6.conf.all.stable_secret"
sysctl: reading key "net.ipv6.conf.default.stable_secret"
sysctl: reading key "net.ipv6.conf.docker0.stable_secret"
sysctl: reading key "net.ipv6.conf.eth0.stable_secret"
sysctl: reading key "net.ipv6.conf.lo.stable_secret"
```

DONE..

```
[root@ip-172-31-49-3 ~]# kubeadm join 172.31.52.186:6443 --token 6m5ot5.kihdgb1stsd1zjup     --discovery-token-ca-cert-hash sha256:c140
d470d1bd13e48adf450bae48aae0d88a94f42472a5aa06842302d95f295e
[preflight] Running pre-flight checks
[preflight] Reading configuration from the cluster...
[preflight] FYI: You can look at this config file with 'kubectl -n kube-system get cm kubeadm-config -o yaml'
[kubelet-start] Writing kubelet configuration to file "/var/lib/kubelet/config.yaml"
[kubelet-start] Writing kubelet environment file with flags to file "/var/lib/kubelet/kubeadm-flags.env"
[kubelet-start] Starting the kubelet
[kubelet-start] Waiting for the kubelet to perform the TLS Bootstrap...

This node has joined the cluster:
* Certificate signing request was sent to apiserver and a response was received.
* The Kubelet was informed of the new secure connection details.

Run 'kubectl get nodes' on the control-plane to see this node join the cluster.

[root@ip-172-31-49-3 ~]#
```

Go to master

- kubectl get nodes

```
[root@ip-172-31-52-186 ~]# kubectl get node
NAME                            STATUS     ROLES                  AGE     VERSION
ip-172-31-49-3.ec2.internal     NotReady   <none>                 8m11s   v1.20.2
ip-172-31-52-186.ec2.internal   NotReady   control-plane,master   150m    v1.20.2
[root@ip-172-31-52-186 ~]#
```

- kubectl create deploy myd --image=httpd

```
[root@ip-172-31-52-186 ~]# kubectl create deploy myd --image=httpd
deployment.apps/myd created
[root@ip-172-31-52-186 ~]# kubectl get deploy
NAME   READY   UP-TO-DATE   AVAILABLE   AGE
myd    0/1     1            0           40s
[root@ip-172-31-52-186 ~]#
[root@ip-172-31-52-186 ~]# kubectl get pods
NAME                    READY   STATUS    RESTARTS   AGE
myd-7cf9bb6c54-ppssg    0/1     Pending   0          53s
[root@ip-172-31-52-186 ~]#
```

```
[root@ip-172-31-52-186 ~]# kubectl describe pods myd
Name:             myd-7cf9bb6c54-ppssg
Namespace:        default
```

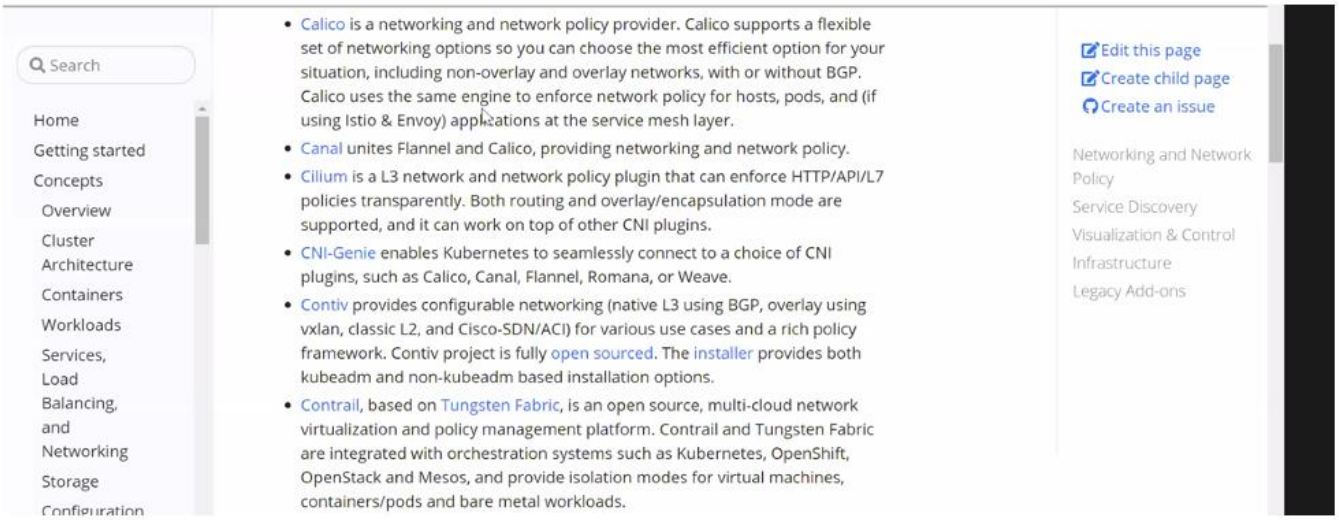
```
                 node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  Type     Reason            Age                  From               Message
  ----     ------            ----                 ----               -------
  Warning  FailedScheduling  84s (x3 over 2m37s)  default-scheduler  0/2 nodes are available: 1 node(s) had taint {node-role.kubernetes
.io/master: }, that the pod didn't tolerate, 1 node(s) had taint {node.kubernetes.io/not-ready: }, that the pod didn't tolerate.

[root@ip-172-31-52-186 ~]#
```

failing scheduling.

master scheduler looking for pod and they cant find it.

➔ how to make it ready?

lots of CNI need to develop



here flannel is req:

kubectl apply -f https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml

```
[root@ip-172-31-52-186 ~]# kubectl apply -f https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml
podsecuritypolicy.policy/psp.flannel.unprivileged created
clusterrole.rbac.authorization.k8s.io/flannel created
clusterrolebinding.rbac.authorization.k8s.io/flannel created
serviceaccount/flannel created
configmap/kube-flannel-cfg created
daemonset.apps/kube-flannel-ds created
[root@ip-172-31-52-186 ~]#
```

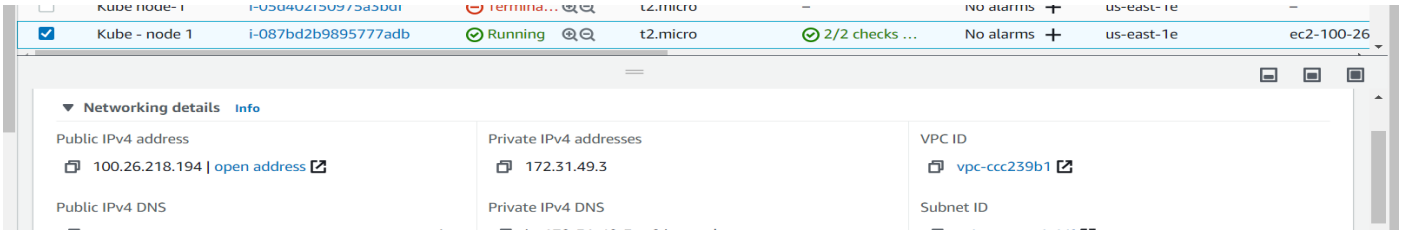
➢ again checking now.

```
[root@ip-172-31-52-186 ~]# kubectl get pods
NAME                    READY   STATUS    RESTARTS   AGE
myd-7cf9bb6c54-ppssg    1/1     Running   0          7m26s
[root@ip-172-31-52-186 ~]#
```

➢ -o wide will tell in which ip the pod is running.
kubectl get pods -o wide

```
[root@ip-172-31-52-186 ~]# kubectl get pods -o wide
NAME                    READY   STATUS    RESTARTS   AGE    IP          NODE                          NOMINATED NODE   READINESS GATES
myd-7cf9bb6c54-ppssg    1/1     Running   0          8m5s   10.240.1.4  ip-172-31-49-3.ec2.internal   <none>           <none>
[root@ip-172-31-52-186 ~]#
```

none => worker node, also verify the ip.



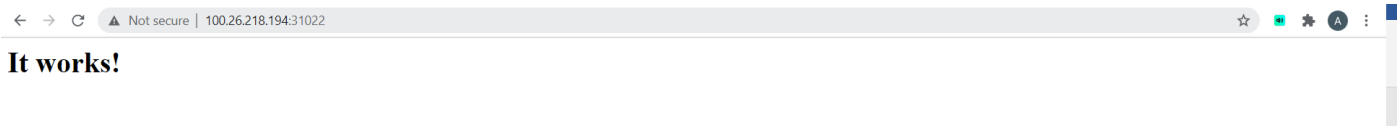
➢ the ip range is also as we mentioned in kubeadm init
➢ lets expose the port now
kubectl expose deploy myd --port=80 --type=NodePort

```
[root@ip-172-31-52-186 ~]# kubectl expose deploy myd --port=80 --type=NodePort
service/myd exposed
```

```
[root@ip-172-31-52-186 ~]# kubectl get svc
NAME          TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)        AGE
kubernetes    ClusterIP   10.96.0.1       <none>        443/TCP        3h8m
myd           NodePort    10.110.49.182   <none>        80:31022/TCP   58s
[root@ip-172-31-52-186 ~]#
```

port exposed is : 31022

worker node public IP is mentioned above as : 100.26.218.194



working fine.....