Kubernetes (K8s) install

B411001 강도연

Master

```
ubuntu@ip-172-31-27-45:~$ sudo apt-get update
```

```
ubuntu@ip-172-31-27-45:~$ sudo apt-get install -y docker.io
```

```
ubuntu@ip-172-31-27-45:~$ sudo docker -v
Docker version 19.03.6, build 369ce74a3c
ubuntu@ip-172-31-27-45:~$ systemctl status docker
● docker.service - Docker Application Container Engine
   Loaded: loaded (/lib/systemd/system/docker.service; disabled; vendor preset:
   Active: active (running) since Thu 2020-05-07 11:21:13 UTC; 34s ago
     Docs: https://docs.docker.com
 Main PID: 3719 (dockerd)
```

```
ubuntu@ip-172-31-27-45:~$ sudo apt-get update && sudo apt-get install -y apt-tra
nsport-https curl
```

```
ubuntu@ip-172-31-27-45:~$ curl -s https://packages.cloud.google.com/apt/doc/apt-
key.gpg | sudo apt-key add -
OK
ubuntu@ip-172-31-27-45:~$ cat <<EOF | sudo tee /etc/apt/sources.list.d/kubernete
s.list
> deb https://apt.kubernetes.io/ kubernetes-xenial main
> EOF
deb https://apt.kubernetes.io/ kubernetes-xenial main
ubuntu@ip-172-31-27-45:~$ sudo apt-get update
```

```
ubuntu@ip-172-31-27-45:~$ sudo apt-get install -y kubelet kubeadm kubectl
```

```
ubuntu@ip-172-31-27-45:~$ sudo apt-mark hold kubelet kubeadm kubectl
kubelet set on hold.
kubeadm set on hold.
kubectl set on hold.
ubuntu@ip-172-31-27-45:~$ sudo apt-get update
Hit:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:3 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu bionic-security InRelease
Hit:5 https://packages.cloud.google.com/apt kubernetes-xenial InRelease
Reading package lists... Done
ubuntu@ip-172-31-27-45:~$ sudo apt-get upgrade
```

unhold하기 전에는 쉽게 없애거나 다시 깔지못하도록 함!

Worker

```
ubuntu@ip-172-31-22-156:~$ sudo apt-get update
```

```
ubuntu@ip-172-31-22-156:~$ sudo apt-get install -y docker.io
```

```
ubuntu@ip-172-31-22-156:~$ sudo docker -v
Docker version 19.03.6, build 369ce74a3c
ubuntu@ip-172-31-22-156:~$ systemctl status docker
● docker.service - Docker Application Container Engine
   Loaded: loaded (/lib/systemd/system/docker.service; disabled; vendor preset:
   Active: active (running) since Thu 2020-05-07 11:22:12 UTC; 30s ago
     Docs: https://docs.docker.com
 Main PID: 3886 (dockerd)
```

```
ubuntu@ip-172-31-22-156:~$ sudo apt-get update && sudo apt-get install -y apt-tr
ansport-https curl
```

```
ubuntu@ip-172-31-22-156:~$ curl -s https://packages.cloud.google.com/apt/doc/apt
-key.gpg | sudo apt-key add -
OK
ubuntu@ip-172-31-22-156:~$ cat <<EOF | sudo tee /etc/apt/sources.list.d/kubernet
es.list
> deb https://apt.kubernetes.io/ kubernetes-xenial main
> EOF
deb https://apt.kubernetes.io/ kubernetes-xenial main
ubuntu@ip-172-31-22-156:~$ sudo apt-get update
```

```
ubuntu@ip-172-31-22-156:~$ sudo apt-get install -y kubelet kubeadm kubectl
```

```
buntu@ip-172-31-22-156:~$ sudo apt-mark hold kubelet kubeadm kubectl
ubelet set on hold.
ubeadm set on hold.
ubectl set on hold.
buntu@ip-172-31-22-156:~$ sudo apt-get update
it:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic InRelease
it:2 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease
it:3 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease
it:5 http://security.ubuntu.com/ubuntu bionic-security InRelease
it:4 https://packages.cloud.google.com/apt kubernetes-xenial InRelease
eading package lists... Done
buntu@ip-172-31-22-156:~$ sudo apt-get upgrade
```

Kubernetes (K8s) Initialization


```
root@ip-172-31-27-45:~# kubeadm init --pod-network-cidr=192.168.0.0/16 --apiserv
er-advertise-address=172.31.27.45 --ignore-preflight-errors=NumCPU
```

pod-network-cidr (classless inter domain router):
내부에서 사용가능한 network module 은 calico로 지정.

CPU 개수는 무시

```
root@ip-172-31-27-45:~# exit
logout
ubuntu@ip-172-31-27-45:~$ mkdir -p $HOME/.kube
ubuntu@ip-172-31-27-45:~$ sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/conf
ig
ubuntu@ip-172-31-27-45:~$ sudo chown $(id -u):$(id -g) $HOME/.kube/config
ubuntu@ip-172-31-27-45:~$ sudo kubectl get nodes
NAME               STATUS     ROLES    AGE     VERSION
ip-172-31-22-156   NotReady   <none>   2m47s   v1.18.2
ip-172-31-27-45    NotReady   master   30m     v1.18.2
ubuntu@ip-172-31-27-45:~$ sudo kubectl apply -f https://docs.projectcalico.org/v
3.11/manifests/calico.yaml
```

Yaml파일을 이용하여 Calico 동작

```
root@ip-172-31-22-156:~# kubeadm join 172.31.27.45:6443 --token 6ekc05.h9ga0k0iv
uinew5g \
```

Worker쪽 machine을 join시킨다.

```
ubuntu@ip-172-31-27-45:~$ sudo kubectl get nodes
NAME               STATUS   ROLES    AGE     VERSION
ip-172-31-22-156   Ready    <none>   6m48s   v1.18.2
ip-172-31-27-45    Ready    master   34m     v1.18.2
```

Master와 Worker 둘다 준비 완료

```
ubuntu@ip-172-31-27-45:~$ sudo kubectl get pods --all-namespaces
NAMESPACE     NAME                                       READY   STATUS    RESTA
RTS   AGE
kube-system   calico-kube-controllers-75d56dfc47-4tkhw   1/1     Running   0
      3m42s
kube-system   calico-node-286dq                          1/1     Running   0
      3m42s
```

현재 pod 현황

Kubernetes (K8s) Application


```
ubuntu@ip-172-31-27-45:~$ kubectl apply -f https://k8s.io/examples/service/acces
s/hello-application.yaml
deployment.apps/hello-world created
ubuntu@ip-172-31-27-45:~$ kubectl get deployments hello-world
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
hello-world   2/2     2            2           51s
ubuntu@ip-172-31-27-45:~$ kubectl describe deployments hello-world
Name:                   hello-world
Namespace:              default
CreationTimestamp:      Thu, 07 May 2020 12:59:43 +0000
```

Apply hello world

```
root@ip-172-31-22-156:~# docker ps
CONTAINER ID        IMAGE                                  COMMAND
CREATED             STATUS              PORTS               NAMES
44f13b550c14        gcr.io/google-samples/node-hello   "/bin/sh -c 'node se…"
3 minutes ago       Up 3 minutes                            k8s_hello-world_hell
o-world-86d6c6f84d-6skrd_default_2636a745-64f9-438e-8ac2-f600a6aa2beb_0
f883c08fea33        gcr.io/google-samples/node-hello   "/bin/sh -c 'node se…"
3 minutes ago       Up 3 minutes                            k8s_hello-world_hell
```

Worker node쪽에서 돌아가고 있는 두개의 hello-world container

```
ubuntu@ip-172-31-27-45:~$ kubectl expose deployment hello-world --type=NodePort
--name=example-service
service/example-service exposed
ubuntu@ip-172-31-27-45:~$ kubectl describe services example-service
Name:                     example-service
Namespace:                default
Labels:                   <none>
```

Deploy 된것을 외부에서 사용할수 있도록 드러내 보임.

```
ubuntu@ip-172-31-27-45:~$ kubectl get pods --selector="run=load-balancer-example
" --output=wide
NAME                           READY   STATUS    RESTARTS   AGE   IP
    NODE                  NOMINATED NODE   READINESS GATES
hello-world-86d6c6f84d-6skrd   1/1     Running   0          13m   192.168.200.13
2   ip-172-31-22-156   <none>           <none>
hello-world-86d6c6f84d-jq8fb   1/1     Running   0          13m   192.168.200.13
3   ip-172-31-22-156   <none>           <none>
```

```
ubuntu@ip-172-31-27-45:~$ curl http://3.21.52.149:32095
Hello Kubernetes!ubuntu@ip-172-31-27-45:~$
```

Node port를 통해 worker container에 접근하여 결과 가져옴

Kubernetes (K8s) Apply on other machines

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```
*** System restart required ***
Last login: Thu Apr 30 17:14:34 2020 from 180.71.162.76
ubuntu@ip-172-31-46-150:~$ curl http://3.21.52.149:32095
Hello Kubernetes!ubuntu@ip-172-31-46-150:~$
```

Master나 worker가 아닌, 다른 하나의 EC2 instance에서, node port를 이용하여 접근한 결과, 잘 동작함을 확인하였다.