

**Cloud Provider:AWS**  
**Server:Ubuntu 18.04 x6**  
**Server List: 2 Controller(Master), 2(Worker), 1 Nginx(Reverse Proxy), 1 Ubuntu 18.04(local)**

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What is etcd?

- etcd is a distributed key value store that provides a reliable way to store data across a cluster of machines.
- etcd provides a way to store data across a distributed cluster of machines and makes sure the data is synchronized across all machines.

How is etcd used in Kubernetes?

- Kubernetes uses etcd to store all of its internal data about cluster state.
- This data needs to be stored, but also needs to be reliably synchronized across all controller nodes in the cluster.etcd fulfills that purpose
- Must install etcd on each of our Kubernetes controller nodes and create an etcd cluster that includes all of those controller nodes

**//Here are the commands used in the demo (note that these have to be run on both controller servers, with a few differences between them):**

```
$ wget -q --show-progress --https-only --timestamping \
"https://github.com/coreos/etcd/releases/download/v3.3.5/etcd-v3.3.5-linux-amd64.tar.gz"
$ tar -xvf etcd-v3.3.5-linux-amd64.tar.gz
$ sudo mv etcd-v3.3.5-linux-amd64/etcd* /usr/local/bin/
$ sudo mkdir -p /etc/etcd /var/lib/etcd
$ sudo cp ca.pem kubernetes-key.pem kubernetes.pem /etc/etcd/
```

**//Set up the following environment variables. Be sure you replace all of the <placeholder values> with their corresponding real values:**

```
$ ETCD_NAME=<cloud server hostname>
$ INTERNAL_IP=$(curl http://169.254.169.254/latest/meta-data/local-ipv4)
$ INITIAL_CLUSTER=<controller 1 hostname>=https://<controller 1 private ip>:2380,<controller 2 hostname>=https://<controller 2 private ip>:2380
```

**//Create the systemd unit file for etcd using this command. Note that this command uses the environment variables that were set earlier:**

```
$ cat << EOF | sudo tee /etc/systemd/system/etcd.service
[Unit]
Description=etcd
Documentation=https://github.com/coreos

[Service]
ExecStart=/usr/local/bin/etcd \
--name ${ETCD_NAME} \
--cert-file=/etc/etcd/kubernetes.pem \
--key-file=/etc/etcd/kubernetes-key.pem \
```

```

--peer-cert-file=/etc/etcd/kubernetes.pem \
--peer-key-file=/etc/etcd/kubernetes-key.pem \
--trusted-ca-file=/etc/etcd/ca.pem \
--peer-trusted-ca-file=/etc/etcd/ca.pem \
--peer-client-cert-auth \
--client-cert-auth \
--initial-advertise-peer-urls https://${INTERNAL_IP}:2380 \
--listen-peer-urls https://${INTERNAL_IP}:2380 \
--listen-client-urls https://${INTERNAL_IP}:2379,https://127.0.0.1:2379 \
--advertise-client-urls https://${INTERNAL_IP}:2379 \
--initial-cluster-token etcd-cluster-0 \
--initial-cluster ${INITIAL_CLUSTER} \
--initial-cluster-state new \
--data-dir=/var/lib/etcd
Restart=on-failure
RestartSec=5

[Install]
WantedBy=multi-user.target
EOF

```

**//Start and enable the etcd service:**

```

$ sudo systemctl daemon-reload
$ sudo systemctl enable etcd
$ sudo systemctl start etcd

```

**//You can verify that the etcd service started up successfully like so:**

```

$ sudo systemctl status etcd

```

**//Use this command to verify that etcd is working correctly. The output should list your two etcd nodes:**

```

$ sudo ETCDCTL_API=3 etcdctl member list \
--endpoints=https://127.0.0.1:2379 \
--cacert=/etc/etcd/ca.pem \
--cert=/etc/etcd/kubernetes.pem \
--key=/etc/etcd/kubernetes-key.pem

```

```

Loaded: loaded (/etc/systemd/system/etcd.service; enabled; vendor preset: enabled)
Active: active (running) since Wed 2022-07-20 10:50:54 UTC; 4min 32s ago
Docs: https://github.com/coreos
Main PID: 15829 (etcd)
Tasks: 7 (limit: 1134)
CGroup: /system.slice/etcd.service
└─15829 /usr/local/bin/etcd --name ec2-3-38-253-243.ap-northeast-2.compute.amazonaws.com --cert-file=/et
Jul 20 10:51:01 kubernetesMasterA etcd[15829]: lost the TCP streaming connection with peer 10dff644fd7b6f88 (stream
Jul 20 10:51:01 kubernetesMasterA etcd[15829]: failed to dial 10dff644fd7b6f88 on stream Message (EOF)
Jul 20 10:51:01 kubernetesMasterA etcd[15829]: peer 10dff644fd7b6f88 became inactive
Jul 20 10:51:01 kubernetesMasterA etcd[15829]: lost the TCP streaming connection with peer 10dff644fd7b6f88 (stream
Jul 20 10:51:02 kubernetesMasterA etcd[15829]: peer 10dff644fd7b6f88 became active
Jul 20 10:51:02 kubernetesMasterA etcd[15829]: closed an existing TCP streaming connection with peer 10dff644fd7b6f
Jul 20 10:51:02 kubernetesMasterA etcd[15829]: established a TCP streaming connection with peer 10dff644fd7b6f88 (s
Jul 20 10:51:02 kubernetesMasterA etcd[15829]: established a TCP streaming connection with peer 10dff644fd7b6f88 (s
Jul 20 10:51:02 kubernetesMasterA etcd[15829]: established a TCP streaming connection with peer 10dff644fd7b6f88 (s
Jul 20 10:51:02 kubernetesMasterA etcd[15829]: established a TCP streaming connection with peer 10dff644fd7b6f88 (s
Jul 20 10:51:02 kubernetesMasterA etcd[15829]: established a TCP streaming connection with peer 10dff644fd7b6f88 (s
ubuntu@kubernetesMasterA:~$ sudo ETCDCTL_API=3 etcdctl member list --endpoints=https://127.0.0.1:2379 --cacert=
/etc/etcd/ca.pem --cert=/etc/etcd/kubernetes.pem --key=/etc/etcd/kubernetes-key.pem
10dff644fd7b6f88, started, ec2-15-164-129-151.ap-northeast-2.compute.amazonaws.com, https://10.100.20.150:2380, ht
ps://10.100.20.150:2379
b8297c4071d8aa01, started, ec2-3-38-253-243.ap-northeast-2.compute.amazonaws.com, https://10.100.0.223:2380, https:

```

