Navid Malek
navidmalekedu@gmail.com
navidmalek.blog.ir

Setting up an ETCD cluster

objective:

- setup an etcd cluster on 3 servers
- write appropriate service to be sure ETCD will be always running

- ETCD version ==> 3.3.9

- server OS ==> CentOS7

first set up an `ssh-keygen`:

```
ssh-keygen
ssh-copy-id server1
ssh-copy-id server2
ssh-copy-id server3
```

After that download and install ansible on your host machine, the next thing is to use ansible to automatically install and generate (some but not accurate) service file on each servers.

To get familiar with ansible:

https://www.dideo.ir/v/yt/icR-df2Olm8

https://www.tutorialspoint.com/ansible/index.htm

- for warming up i just wrote a simple playbook to download nano text editor on all three servers (defined in hosts.txt file)

```
---
- name: Install nano
  hosts: etcd
  become: true

  tasks:
  - name: task of install
    yum:
      name: nano
      state: present
```

Navid Malek
navidmalekedu@gmail.com
navidmalek.blog.ir

Change the ansible.cfg file if you have moved (or copied) ansible directory to other place.

Uncomment this line :

```
inventory      = hosts
```

(for more info watch here https://www.dideo.ir/v/yt/icR-df2Olm8)

the base ansible i use for work is from here:

https://github.com/Nosmoht/ansible-role-etcd#description

but there are some miss configurations with this ansible role, so i have to change it a little bit.

The correct ansible configs are here:

http://cdn.persiangig.com/dl/onzh7/w9E1lePfsL/mycontrolansible.zip

to run the playbook just type this command: (don't forget to –syntax-check first!)

```
ansible-playbook -K etcdinstallcluster.yml
```

After that ansible should be installed on each host, but yet it is not configured correctly.

In order to config etcd correctly read this:

https://coreos.com/etcd/docs/3.3.1/dev-guide/local_cluster.html

remember :

the member listens and advertises for clients on different port (2379)

initial advertise and listen peer URLs are on the default port (2380)

Navid Malek
navidmalekedu@gmail.com
navidmalek.blog.ir

COMMAND LINE

first we start the cluster via the **command line** (not systemd service):

in server 172.30.18.17 start an etcd server with this command:

```
etcd --name backend07 --initial-advertise-peer-urls http://172.30.18.17:2380 \
  --listen-peer-urls http://172.30.18.17:2380 \
  --listen-client-urls http://0.0.0.0:2379\
  --advertise-client-urls http://172.30.18.17:2379 \
  --initial-cluster
backend07=http://172.30.18.17:2380,backend08=http://172.30.18.18:2380,backend09=http://172.30.18.19:2380 \
  --initial-cluster-state new
```

for the other two servers:

```
etcd --name backend08 --initial-advertise-peer-urls http://172.30.18.18:2380 \
  --listen-peer-urls http://172.30.18.18:2380 \
  --listen-client-urls http://0.0.0.0:2379\
  --advertise-client-urls http://172.30.18.18:2379 \
  --initial-cluster
backend07=http://172.30.18.17:2380,backend08=http://172.30.18.18:2380,backend09=http://172.30.18.19:2380 \
  --initial-cluster-state new


----------------------------------------------other server----------------------------------------------


etcd --name backend09 --initial-advertise-peer-urls http://172.30.18.19:2380 \
  --listen-peer-urls http://172.30.18.19:2380 \
  --listen-client-urls http://0.0.0.0:2379 \
  --advertise-client-urls http://172.30.18.19:2379 \
  --initial-cluster
backend07=http://172.30.18.17:2380,backend08=http://172.30.18.18:2380,backend09=http://172.30.18.19:2380 \
  --initial-cluster-state new
```

Navid Malek
navidmalekedu@gmail.com
navidmalek.blog.ir

COMMON ERRORS

If there is an error indicating **no connection to remote host** or **no route....** (or something like these)

then the problem may be with ports (maybe they are not allowed in the firewall)

to know if port is the problem just telnet the ip and specific port that is not reachable.

To allow a port on host, read this :

https://www.digitalocean.com/community/tutorials/how-to-set-up-a-firewall-using-firewalld-on-centos-7

don't forget to allow :

- the port on public zone
- the http service
- permannent
- after that reload firewalld to see effects

after that the cluster should work fine, you can test it by putting some key value from one server and read it via **etcdctl** from another server (and many other various tests....)

dont forget to use : `export ETCDCTL_API=3`

if you get the following error : mismatch error....

then it's because the cluster does exists but you are trying to create it instead. There are two workarounds for this problem:

- delete all the cluster data (member data and cluster)
  - for example in server 172.30.18.17 delete the backend07.etcd in the root directory
- change the *--initial-cluster-state new* to *--initial-cluster-state existing*

Navid Malek
navidmalekedu@gmail.com
navidmalek.blog.ir

SYSTEMD SERVICE

Now we are ready to setup the service file, first delete all the existing cluster data that were created using the *etcdctl* (via command line).

After that change the *etcd.service* file with these values on each server:


```
[Unit]
Description=Etcd Service

[Service]
Type=notify
PermissionsStartOnly=true
Environment="ETCD_OPTS=--name backend07 \
  --listen-client-urls http://0.0.0.0:2379 \
  --advertise-client-urls http://172.30.18.17:2379 \
  --listen-peer-urls http://172.30.18.17:2380 \
  --initial-advertise-peer-urls http://172.30.18.17:2380 \
  --initial-cluster
backend07=http://172.30.18.17:2380,backend08=http://172.30.18.18:2380,backend09=http://172.3
0.18.19:2380 \
  --initial-cluster-state new"

ExecStart=/usr/local/bin/etcd $ETCD_OPTS


Restart=always
RestartSec=10s

[Install]
WantedBy=multi-user.target
```

Navid Malek
navidmalekedu@gmail.com
navidmalek.blog.ir


```
 [Unit]
Description=Etcd Service

[Service]
Type=notify
PermissionsStartOnly=true

Environment="ETCD_OPTS=--name backend08 \
  --listen-client-urls http://0.0.0.0:2379 \
  --advertise-client-urls http://172.30.18.18:2379 \
  --listen-peer-urls http://172.30.18.18:2380 \
  --initial-advertise-peer-urls http://172.30.18.18:2380 \
  --initial-cluster
backend07=http://172.30.18.17:2380,backend08=http://172.30.18.18:2380,backend09=http://172.30.18.19:2380 \
  --initial-cluster-state new"

ExecStart=/usr/local/bin/etcd $ETCD_OPTS

Restart=always
RestartSec=10s

[Install]
WantedBy=multi-user.target
```

Navid Malek
navidmalekedu@gmail.com
navidmalek.blog.ir

19

```
[Unit]
Description=Etcd Service

[Service]
Type=notify
PermissionsStartOnly=true

Environment="ETCD_OPTS=--name backend09 \
--listen-client-urls http://0.0.0.0:2379 \
--advertise-client-urls http://172.30.18.19:2379 \
--listen-peer-urls http://172.30.18.19:2380 \
--initial-advertise-peer-urls http://172.30.18.19:2380 \
--initial-cluster
backend07=http://172.30.18.17:2380,backend08=http://172.30.18.18:2380,backend09=http://172.3
0.18.19:2380 \
--initial-cluster-state new"

ExecStart=/usr/local/bin/etcd $ETCD_OPTS

Restart=always
RestartSec=10s

[Install]
WantedBy=multi-user.target
```

Navid Malek
navidmalekedu@gmail.com
navidmalek.blog.ir

After that each services should be up (if there is an error please check COMMON ERRORS section)

if everything works fine you should change the *--initial-cluster-state new* in each of services config file in order to avoid getting mismatch error in future (maybe on reboot or service restart).

Some note on ETCD enviroment variables

In writing the service file avoid using this syntax:

```
#Environment=ETCD_DATA_DIR=/var/lib/etcd
#Environment=ETCD_NAME=backend09
#Environment=ETCD_LISTEN_PEER_URLS=http://0.0.0.0:2380
#Environment=ETCD_INITIAL_ADVERTISE_PEER_URLS=http://172.30.18.19:2380
#Environment=ETCD_LISTEN_CLIENT_URLS=http://0.0.0.0:2379
#Environment=ETCD_ADVERTISE_CLIENT_URLS=http://172.30.18.19:2379
#Environment=ETCD_INITIAL_CLUSTER="backend07=http://172.30.18.17:2380,backend08=h
ttp://172.30.18.18:2380,backend09=http://172$
#Environment=ETCD_INITIAL_CLUSTER_STATE=new
```

It’s verryyyyy buggy!

You may get error like « no etcd local name defined...(or found or set)» but you will see in *journal -xe* that ETCD has set ETCD_NAME

Congrats everything is fine now and servers are ready to go!