D — DEVOPS

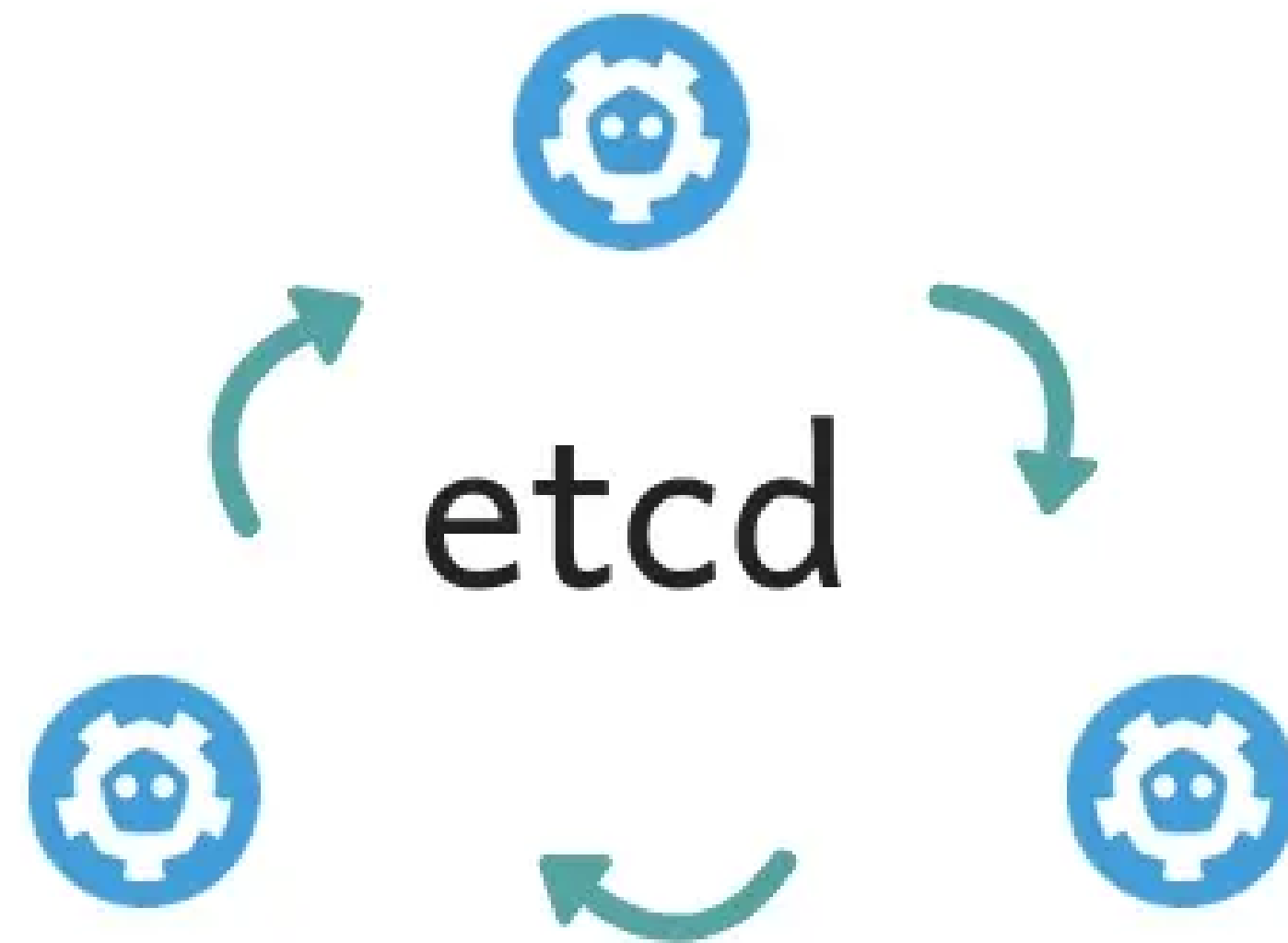# How To Setup a etcd Cluster On Linux – Beginners Guide

by **devopscube** · November 8, 2018

Introduction

etcd is an open source key-value store for storing and retrieving configurations. It is a core component in Kubernetes to store and retrieve objects state information. It works in a leader-member fashion by making the etcd clusters highly available to withstand node failures.

1. Its a distributed key-value store
2. It uses raft protocol
3. Clients can use REST/gRPC to retrieve the stored values.

Prerequisites

Before you begin, make sure you have the following setup.

1. Three Linux servers (Can be an odd quorum of 5, 7 etc based on the needs)

2. A valid hostname for all the servers

3. Firewall rules enabled all the servers on following ports for client requests and peer to peer communication.

```
2380
2379
```

Setup an etcd Cluster on Linux

etcd setup is fairly easy and this guide follows the static bootstrap method, which means you need to know the IPs of your nodes for bootstrapping. This guide covers all the necessary steps to set up a cluster on Linux servers. It is a multinode setup with systemd files to run etcd as a service.

Following are the etcd server hostname and IP details used in this guide. Change the IPs mentioned in the guide with your IPs where ever needed.

1. **etcd-1**: 10.128.0.2
2. **etcd-2**: 10.128.0.4
3. **etcd-3:** 10.128.0.3

Let's get started with the setup.

On All the 3 Nodes

Perform steps 1 to 6 on all the three nodes.

Step 1: CD into local src folder

```
cd /usr/local/src
```

Step 2: Download the latest etcd release from the etcd Github Releases. At the time of writing this article, the latest version is 3.3.10

Step 3: Untar the binary.

```
sudo tar -xvf etcd-v3.3.9-linux-amd64.tar.gz
```

Step 4: Move the extracted etcd executables (etcd & ectdctl) to local bin.

```
sudo mv etcd-v3.3.9-linux-amd64/etcd* /usr/local/bin/
```

Step 5: Create relevant etcd folders, user & group. We will be running the etcd service as an etcd user.

```
sudo mkdir -p /etc/etcd /var/lib/etcd
groupadd -f -g 1501 etcd
useradd -c "etcd user" -d /var/lib/etcd -s /bin/false -g etcd -u 1501 etcd
chown -R etcd:etcd /var/lib/etcd
```

Step 6: Perform the following as root user.

Set two environment variables. One to fetch the system IP and another to get the system hostname.

```
ETCD_HOST_IP=$(ip addr show eth0 | grep "inet\b" | awk '{print $2}' | cut -d/
-f1)
ETCD_NAME=$(hostname -s)
```

Create a systemd service file for etcd. Replace `--listen-client-urls` with your server IPs

Note: –name , –initial-advertise-peer-urls, –listen-peer-urls, –listen-client-urls will be different for each server. ETCD_NAME & ETCD_HOST_IP variables will automatically replace it.

```
cat << EOF > /lib/systemd/system/etcd.service
[Unit]
Description=etcd service
Documentation=https://github.com/coreos/etcd

[Service]
User=etcd
--name ${ETCD_NAME} \\
```

```
    --data-dir /var/lib/etcd \\
    --initial-advertise-peer-urls http://${ETCD_HOST_IP}:2380 \\
    --listen-peer-urls http://${ETCD_HOST_IP}:2380 \\
    --listen-client-urls http://${ETCD_HOST_IP}:2379,http://127.0.0.1:2379 \\
    --advertise-client-urls http://${ETCD_HOST_IP}:2379 \\
    --initial-cluster-token etcd-cluster-1 \\
    --initial-cluster etcd-1=http://10.142.0.2:2380,etcd-
2=http://10.142.0.4:2380,etcd-3=http://10.142.0.3:2380 \\
    --initial-cluster-state new \\
    --heartbeat-interval 1000 \\
    --election-timeout 5000
Restart=on-failure
RestartSec=5

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

Bootstrap The etcd Cluster

Once all the configurations are applied on the three servers, start and enable the
newly created etcd service on all the nodes. The first server will act as a bootstrap
node. One node will be automatically elected as a leader once the service is started in
all the three nodes.

```
systemctl daemon-reload
systemctl enable etcd
systemctl start etcd.service
systemctl status -l etcd.service
```

Verify etcd Cluster Status

`ectdctl` is the utility to interact with the etcd cluster. You can find this utility in
the folder `/usr/local/bin` of all the nodes.

You can use any one of the cluster nodes to perform the following checks.

Check the cluster health using the following command

```
etcdctl cluster-health
```

Verify cluster membership status using the following command. It will show the
leader status.

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etcdctl member list

By default, etcdctl uses etcd v2. So you need to explicitly use a variable `ETCDCTL_API=3` to access etcd v3 functionalities.

You can set it as an environment variable or pass it along with each etcdctl command as shown below.

Let's write few key-value pairs in the cluster and verify it.

```
ETCDCTL_API=3 etcdctl put name1 batman
ETCDCTL_API=3 etcdctl put name2 ironman
ETCDCTL_API=3 etcdctl put name3 superman
ETCDCTL_API=3 etcdctl put name4 spiderman
```

Now you can try getting the value of name3 using the following command.

```
ETCDCTL_API=3 etcdctl get name3
```

You can list all the keys using ranges and prefixes

```
ETCDCTL_API=3 etcdctl get name1 name4 # lists range name1 to name 4
ETCDCTL_API=3 etcdctl get --prefix name # lists all keys with name prefix
```

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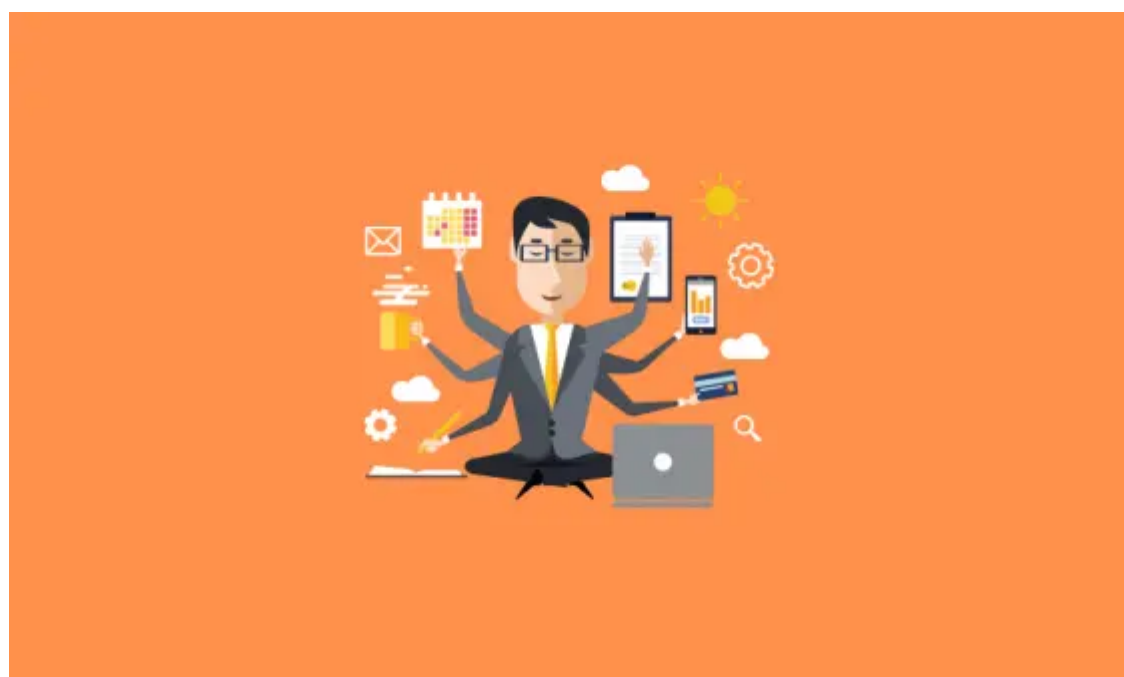Sonarqube is a great tool for source code quality management, code analysis etc. This is the most widely...

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