Introduction

etcd is a distributed key-value store designed for high-availability and fault-tolerance, widely used as a data store for distributed systems. It uses the Raft consensus algorithm to manage a highly-available replicated log, which allows distributed systems to maintain strong consistency. In this tutorial, we will cover how to install and configure etcd.

Prerequisites

- A Linux-based system (we will use Ubuntu 20.04 in this tutorial)
- Basic knowledge of Linux command line and networking concepts

Step 1: Update and Install Dependencies

Before we install etcd, let's update the package list and install the necessary dependencies.

```
$ sudo apt-get update
$ sudo apt-get install -y curl wget tar
```

Step 2: Download and Install etcd

1. First, visit the etcd GitHub releases page (https://github.com/etcd-io/etcd/releases) to find the latest release.
2. Download the release binary using wget or curl. In this example, we will download version 3.5.1.

```
$ wget https://github.com/etcd-io/etcd/releases/download/v3.5.1/etcd-v3.5.1-linux-amd64.tar.gz
```

3. Extract the downloaded archive.

$ tar xvf etcd-v3.5.1-linux-amd64.tar.gz

4. Move the extracted etcd and etcdctl binaries to /usr/local/bin/ for system-wide access.

$ sudo mv etcd-v3.5.1-linux-amd64/etcd* /usr/local/bin/

Step 3: Create etcd User and Directories

1. Create a new user for etcd to ensure it runs with restricted privileges.

$ sudo useradd -r -M -d /var/lib/etcd -s /sbin/nologin etcd

2. Create necessary directories and set appropriate ownership.

$ sudo mkdir -p /etc/etcd /var/lib/etcd
$ sudo chown -R etcd:etcd /etc/etcd /var/lib/etcd

Step 4: Configure etcd

1. Create a new configuration file for etcd at /etc/etcd/etcd.conf.yml.

$ sudo nano /etc/etcd/etcd.conf.yml

2. Add the following configuration to the file, adjusting the values as needed for your environment.
Example (etcd.conf.yml):

```
name: 'etcd-node-1'
data-dir: '/var/lib/etcd'
wal-dir: ''
snapshot-count: 10000
heartbeat-interval: 100
election-timeout: 1000
listen-peer-urls: 'http://localhost:2380'
```

listen-client-urls: 'http://localhost:2379'
max-snapshots: 5
max-wals: 5
cors: ''
initial-advertise-peer-urls: 'http://localhost:2380'
advertise-client-urls: 'http://localhost:2379'
discovery: ''
discovery-fallback: 'proxy'
discovery-proxy: ''
discovery-srv: ''
strict-reconfig-check: false
auto-compaction-retention: 0
quota-backend-bytes: 0
enable-v2: false

3. Save and close config file

Step 5: Start and Enable etcd Service

$ sudo systemctl start