## 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

1. Extract the downloaded archive.

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

1. 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

1. 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

1. 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

1. Save and close config file

### Step 5: Start and Enable etcd Service

$ sudo systemctl start