DevOps Tasks

Guidelines

Task Assignment

Take the last 4 digits of your enrollment number, perform a mod 6 operation and the result + 1 is the question you are assigned from the below.

> **Example:**
> Assume the enrollment number `20BIT0383` and take `0383` and perform the mod operation with 6 and add it with 1:
> `0383 mod 6 + 1 = 6`
> Hence the applicant with the above enrollment number is assigned **task 6**.

Task Completion

- **Queries:** To resolve queries we have created a **Discord server.** Join the discord server by **clicking here (https://discord.gg/kadmtZnM).**
- **Plagiarism:** Honesty is a core value at Luganodes. Applicants whose response is found to be plagiarised from the internet or fellow applicants will face immediate elimination from the hiring process and will be reported to the placement cell.
- **Github Repositories:** All applicants must maintain their repositories as **private**.

Task Submission

- After completion of the task, you must add the following account: **luganodes-devops (https://github.com/luganodes-devops)** as a collaborator to the repository for assessment.
- Submit your task and repository details on this **form (https://docs.google.com/forms/d/e/1FAIpQLSex1eA79ZNtQq7A4syhKtbnFWAQ747IM0nHex863NMk4-**

XXDg/viewform) before 10:00AM (IST) 2nd August, 2023.

Tasks

Task 1: Build Toolchain for Cardano using Containerization

Features:

- Write a **Containerfile** that can be used as a build toolchain for `cardano-node` and `cardano-cli` (including `libsodium`).

Resources:

- **Cardano Introduction** (https://docs.cardano.org/new-to-cardano/introduction/)
- **Github link to cardano-node** (https://github.com/input-output-hk/cardano-node)

Deliverables:

- **Documentation:** Must include thorough documentation of each step while writing the Containerfile.
- **Containerfile** (Github link)
- **Video Demonstration:** Demonstrate the build process of the binaries via containerization tools. (Video Link)

Task 2: Node Exporter via Ansible with Monitoring

Features:

- Write an **ansible playbook** that can be used to deploy `node-exporter` on multiple hosts.
- Set up **Grafana & Prometheus** on your laptop where the node exporter metrics are pushed.
- **(Bonus)** Setup Alerting and Demonstrate the alerting via Telegram.

Resources:

- **Ansible Documentation** (https://docs.ansible.com/)
- **Getting started with Grafana & Prometheus** (https://grafana.com/docs/grafana/latest/getting-started/get-started-grafana-prometheus/)

Deliverables:

- **Documentation:** Must include thorough documentation of each step while creating the playbook and deploying Prometheus and Grafana.
- **Ansible Playbook** (Github link)
- **Prometheus and Grafana config files** (Github link)
- **Video Demonstration:** Demonstrate the Grafana Dashboard for node exporter metrics. Demonstrate the front-ends of both Prometheus (Show all targets) and Grafana (Show alerts if bonus task is done). (Video Link)

Task 3: Monitoring Tool for Cardano Validator

Features:

- Write a **monitoring tool** to monitor the block production of Luganodes using the Cardano Explorer.
- Trigger **alerts** if blocks have not been produced in 6 hours.
- Also, compare the blocks produced with a leadership schedule file provided to you at every epoch (5 days) and alert if a scheduled block is missed.
- Alerts should be sent to **telegram** (Use any telegram-api library you like).
- Logging System that integrates with systemd.
- Deploy the tool as a **systemd service** with proper logging.

Resources:

- **Cardano Introduction** (https://docs.cardano.org/new-to-cardano/introduction/)
- **Leadership Schedule File** (https://hackmd.io/@ArjunSomvanshi/ryVcBD4j3)
- **Cardano Explorer Link to Luganodes Validator** (https://cexplorer.io/pool/pool1qvudfuw9ar47up5fugs53s2g84q3c4v86z4es6uwsfzzs89rwha/blocks#data)

Deliverables:

- **Documentation:** Must include thorough documentation of the tool, its features, and how to deploy it.
- **Github Repository of the Tool** (Github link)

- Systemd Service File
- Source Code

Task 4: Firewall Setup and Configuration

Features:

- Install and set up **firewalld** using nftables on a linux virtual machine.
- Use trusted-zone, internal-zone, and public-zone.

Resources:

- **Manpage to firewalld** (https://firewalld.org/documentation/man-pages/firewall-cmd.html)

Deliverables:

- **Documentation:** Must include thorough documentation of each step. (Github Link)
- **Video Demonstration:** Demonstrate the working of firewalld, its configuration process and an explanation of each step. (Video Link)

Task 5: Cosmos Node Setup

Features:

- Set up a Cosmos node on their public testnet.
- You can use your system, a virtual machine, or a cloud instance.
- (Bonus) Run an explorer within the same. (Setting up the explorer is a bonus task)

Resources:

- **Cosmos Network** (https://cosmos.network/)
- **Docs** (https://docs.cosmos.network/main)

Deliverables

- **Documentation:** Must include thorough documentation of each step while deploying the node. (Github Link)
- If using containerization provide the **Containerfile** (Github link)

- **Video Demonstration:** Demonstrate the node running with logs and metrics. Also, explain the deployment process. (Video Link)

Task 6: Build Toolchain for Geth using Containerization

Features:

- Write a **Containerfile** that can be used as a build toolchain for **geth.**

Resources:

- **Github link to geth** (https://github.com/ethereum/go-ethereum)

Deliverables:

- **Documentation:** Must include thorough documentation of each step while writing the Containerfile.
- **Containerfile** (Github link)
- **Video Demonstration:** Demonstrate the build process of the binary via containerization tools. (Video Link)