Open Source Engineering Report

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Chapter 1

Student Details

Information

Name: Kari Chiru Naga Hasan

Roll Number: 2400040466

Course:

Open Source Engineering

Course code: 24CS02EF

Lecturer: Dr. Arunekumar Bala, PhD

This report documents my journey in Open Source Engineering, covering Linux usage, self-hosting, encryption, privacy tools, licensing, and contributions to open source projects.

Chapter 2

Linux Distribution Used

About the Distro

I used Ubuntu as my primary Linux distribution. Initially, I struggled with dual boot installation alongside Windows, facing issues with partitioning and bootloader configuration. Over time, I learned how to manage packages, use the terminal effectively, and execute commands for system navigation and configuration. These experiences taught me resilience and gave me confidence in handling Linux environments.

Chapter 3

Encryption and GPG

Technical Details

GNU Privacy Guard (GPG) is a tool for secure communication and data encryption. I explored how to generate key pairs using the command:

gpg --gen-key

The public key can be shared with others, while the private key remains secure. This ensures confidentiality and authenticity in communication. I practiced encrypting and decrypting files to understand how encryption protects sensitive data.

Chapter 4

Sending Encrypted Email

Process

Sending an encrypted email ensures privacy and prevents unauthorized access.

Procedure

1. Install **Thunderbird Mail** on Ubuntu.
2. Install the **OpenPGP built-in encryption tool**.
3. Import your GPG private key.
4. Import recipient's public key.
5. Compose email ⟶ Click *Encrypt* button.

Advantages

- Prevents MITM attacks
- Maintains confidentiality
- Secure communications for sensitive data

Chapter 5

Privacy Tools (Prism-Break.org)

Five Tools

I explored five privacy tools recommended by prism-break.org:

- **Signal** – Secure messaging application with end-to-end encryption.
- **ProtonMail** – Encrypted email service based in Switzerland.
- **KeePassXC** – Password manager for securely storing credentials.
- **Tor Browser** – Browser for anonymous web browsing.
- **Nextcloud** – Self-hosted cloud storage solution.

These tools highlight the importance of privacy and security in everyday digital activities.

Chapter 6

Open Source License Used

Details

For my contributions, I used the MIT License. This license allows reuse, modification, and distribution of code with minimal restrictions, while requiring attribution to the original author. It balances openness with recognition, making it suitable for collaborative projects.

Chapter 7

Self-Hosted Server

OnionShare: About and Installation

I self-hosted the advantages and disadvantages of OnionShare. OnionShare is an open-source tool that allows users to securely and anonymously share files, host websites, and chat using the Tor network.

Installation

On Ubuntu, OnionShare can be installed using:

```
sudo apt update
sudo apt install onionshare
```

After installation, OnionShare can be launched from the terminal with:

```
onionshare
```

It generates a unique .onion address that can be shared with recipients, ensuring privacy and anonymity.

Advantages

- Provides anonymous file sharing via Tor.
- No need for third-party servers.
- Supports hosting simple websites securely.
- Easy to use with a graphical interface.

Disadvantages

- Requires Tor network, which may be slow.
- Limited scalability for large deployments.
- Onion links can be difficult to manage.

Localized Document (Telugu)

OnionShare ఒక ఓపెన్ సోర్స్ టూల్. ఇది Tor నెట్‌వర్క్ ద్వారా ఫైళ్ళను సురక్షితంగా మరియు గోప్యంగా పంచుకోవడానికి ఉపయోగపడుతుంది. ప్రయోజనాలు: గోప్యత, మూడవ పార్టీ సర్వర్ అవసరం లేదు, సులభంగా ఉపయోగించవచ్చు. ప్రతికూలతలు: Tor నెట్‌వర్క్ నెమ్మదిగా ఉంటుంది, పెద్ద స్థాయి వినియోగానికి అనుకూలం కాదు, Onion లింక్‌లు నిర్వహించడం కష్టం

POSTER

Figure 7.1: Poster: Benefits and Limitations of OnionShare

Chapter 8

Open Source Contributions

Pull Requests and Issues

As part of Hacktoberfest and the Open Source Engineering course, I contributed to open source repositories on GitHub. Each contribution involved identifying issues, solving them, and raising pull requests (PRs). This process helped me understand collaborative development, version control, and the importance of clear documentation.

For each PR, I documented the following:

1. Issue description
2. My solution
3. Screenshot of the issue
4. Screenshot of the PR
5. Screenshot of merged changes

PR 1: Add Hasan-8326 to Contributors list

- **Repository:** firstcontributions/first-contributions
- **Issue Solved:** Added myself to the Contributors list following project guidelines. Ensured only intentional changes were committed.
- **PR Link:** #106719
- **Status:** ☑ Merged

PR 2: docs: Add new sample dataset (Fixes #40)

- **Repository:** Udayraj123/OMRChecker
- **Issue Solved:** Added a new sample dataset to improve documentation and usability. Linked to issue #40.
- **PR Link:** #255

- **Status:** 🕓 Review Required

PR 3: docs: Clarify where to obtain .pem files for --cert

- **Repository:** pypa/pip
- **Issue Solved:** Improved documentation by clarifying how to obtain .pem files for the --cert option.
- **PR Link:** #13663
- **Status:** ✅ Merged

PR 4: chore: Add linguist override for Coconut syntax highlighting

- **Repository:** evhub/coconut
- **Issue Solved:** Added linguist override to improve syntax highlighting for Coconut files on GitHub.
- **PR Link:** #876
- **Status:** ✅ Merged

PR 5: Selfhosted onionshare doc

- **Repository:** KLGLUG/Y24OpenSourceEngineering
- **Issue Solved:** Documented my self-hosted OnionShare setup, including a localized version in Telugu.
- **PR Link:** #150
- **Status:** ✅ Merged

PR 6: [SOLUTION] Q200 - LRU Cache in C++

- **Repository:** noodles-sed/Simple-DSA
- **Issue Solved:** Implemented a solution for Q200 using LRU Cache in C++. Added comments explaining the logic.
- **PR Link:** #442
- **Status:** 🕓 Open

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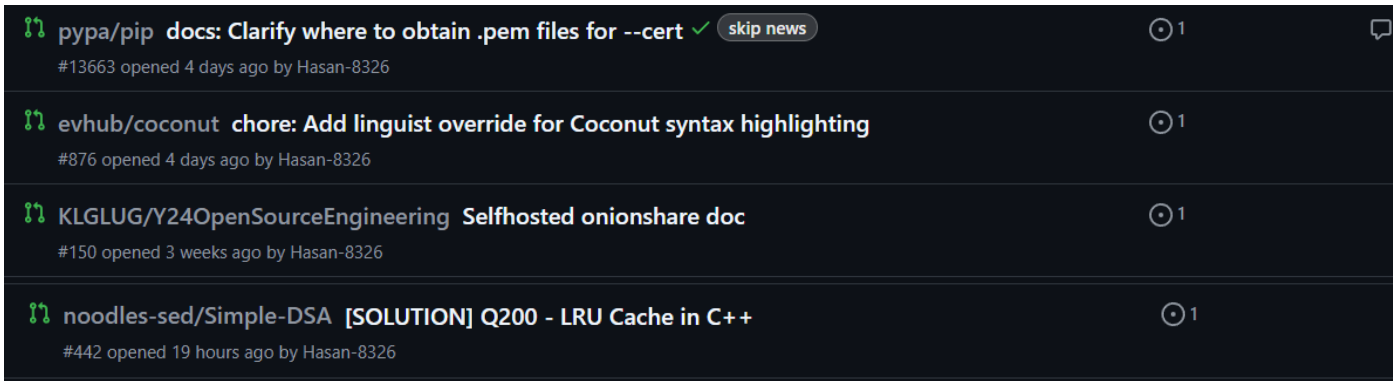

These contributions helped me gain confidence in working with public repositories, understanding licensing, and communicating with maintainers. I also learned how to reference issues, write commit messages, and follow best practices in pull request formatting.

Chapter 9

LinkedIn Posts

Links

I shared my journey and milestones on LinkedIn:

- Blog: https://www.linkedin.com/posts/kari-chiru-naga-hasan-87aaa5228_activity-7399058852303929344-utm_source=share&utm_medium=member_desktop&rcm=ACoAADkdSJ4BWREvLHpk-dI-F2T_13J-oeYfoK8
- Self Hosting: https://www.linkedin.com/posts/kari-chiru-naga-hasan-87aaa5228_opensource-kluniversity utm_source=share&utm_medium=member_desktop&rcm=ACoAADkdSJ4BWREvLHpk-dI-F2T_13J-oeYfoK8

Chapter 10

Acknowledgements

I would like to give special thanks to Dr. Arunekumar Bala, PhD, for his guidance and support throughout my journey. I also thank my classmates and the open source community for their encouragement.