Koneru Lakshmaiah University

Open Source Engineering Report

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Course: Open Source Engineering

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Contents

Chapter 1

About the Linux Distribution Used

The Linux distribution chosen for this project is **Ubuntu 22.04 LTS**.

- **Base: Debian-based**
  Ubuntu is developed on top of the Debian operating system.
  It inherits Debian's stability and strong security features.
  This provides a reliable and robust foundation for daily use.
- **Default Desktop Environment: GNOME 42**
  GNOME 42 offers a clean and modern user interface.
  It provides smooth performance and better system resource handling.
  The design improves usability and accessibility for all users.
- **Package Manager: APT/Snap**
  APT is used for managing core system packages efficiently.
  Snap allows easy installation of containerized applications.
  Together, they provide flexibility and better software management.
- **Kernel Version: 5.15 LTS**
  The 5.15 LTS kernel is optimized for long-term support.
  It includes security patches and performance improvements regularly.
  It also supports modern hardware and device drivers.

Reason for choosing: It is beginner-friendly, stable, and widely supported with extensive community resources. It offers long-term support updates which ensure reliability and security over time. It also provides excellent documentation and troubleshooting support through its global user community.

Chapter 2

Encryption and GPG

GPG (GNU Privacy Guard) is an open-source tool used for secure encryption and decryption of data. It follows the OpenPGP standard to ensure compatibility with other encryption tools. GPG uses a public and private key system to protect sensitive information. It helps maintain confidentiality, integrity, and authenticity of digital communication. It is widely used for secure email, file encryption, and digital signing.

Key Concepts

- **Public Key** — Shared with others to allow message encryption.
  Used by senders to encrypt data before transmitting it securely.
  It does not reveal any private information about the owner.
- **Private Key** — Secret key used to decrypt received messages.
  It must be kept confidential and never shared with anyone.
  Only the owner can use it to access encrypted data.

Commands Used

```
gpg --full-generate-key
gpg --list-keys
gpg --export --armor "jeswanthkotini@gmail.com"
```

Description of Commands

- **gpg –full-generate-key**
  This command is used to generate a new GPG key pair (public and private keys).
  It allows users to choose the key type, key size, and expiration period.
- **gpg –list-keys**
  This command displays all the public keys present in the local keyring.
  It is useful for verifying already generated or imported keys.
- **gpg –export –armor ”jeswanthkotini@gmail.com”**
  This command exports your public key in a readable ASCII format.
  The exported key can be shared with others so they can encrypt messages for you.

Chapter 3

Sending Encrypted Email

The encrypted email process ensures privacy and data security by protecting sensitive information from attackers.It also prevents unauthorized users from accessing the messages.

Procedure

1. Import Receiver Public Key

   ```
   gpg --import receiver_public.asc
   ```

2. Encrypt the message

   ```
   gpg --encrypt --armor -r receiver@email.com message.txt > encrypted.asc
   ```

3. Send encrypted file via Thunderbird Email Client

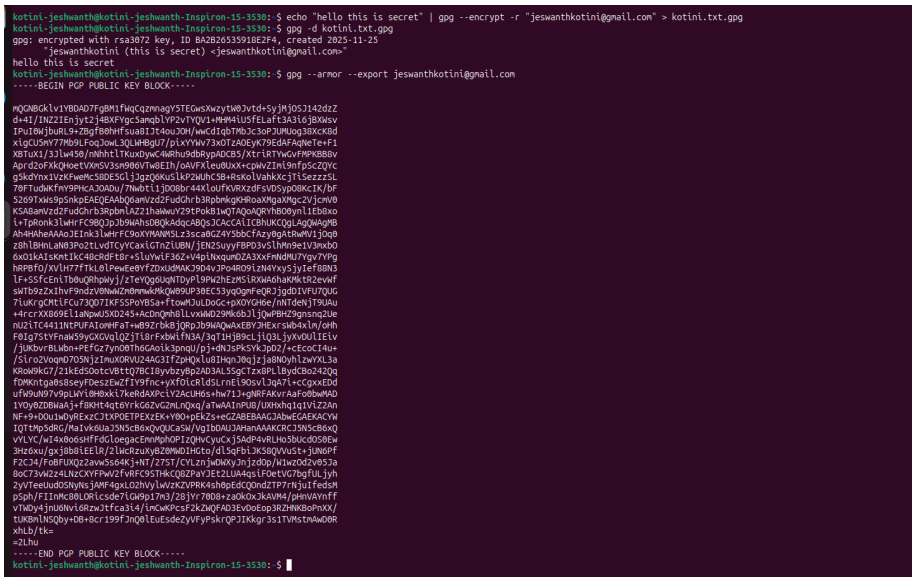

Figure 3.1: Encrypted Email Sent Using Thunderbird + GPG

Chapter 4

Privacy Tools from Prism-Break.org

1. **Signal** — End-to-end encrypted messaging
   Signal provides highly secure communication using end-to-end encryption. It collects minimal user data and does not store messages on its servers. It supports secure voice calls, video calls, and disappearing messages.

2. **Tor Browser** — Privacy-focused browser for anonymous internet access
   Tor Browser routes your traffic through multiple encrypted layers for anonymity. It prevents tracking, fingerprinting, and blocks third-party trackers by default. It is widely used for privacy protection and censorship circumvention.

3. **KeePassXC** — Secure open-source password manager
   KeePassXC stores passwords in an encrypted local database under user control. It supports strong password generation and auto-lock features for safety. It works completely offline, improving privacy and reducing attack risks.

4. **ProtonMail** — Encrypted email service with privacy protection
   ProtonMail provides end-to-end encrypted email with zero-access architecture. Even Proton cannot read user emails due to strong encryption mechanisms. It is based in Switzerland and follows strict privacy laws.

5. **DuckDuckGo** — Private alternative search engine
   DuckDuckGo does not track users or store personal search history. It blocks trackers and provides private search by default. It also offers a privacy browser and tools to block online tracking.

Chapter 5

Open Source License Used

The selected license for contributions is the **MIT License**.

- Allows free use of the software for any purpose.
  Users can modify the source code as needed.
  Redistribution is permitted without major restrictions.
- Contains very few limitations on software usage.
  It is suitable for both personal and business applications.
  It does not restrict commercial distribution.
- It encourages open collaboration and code sharing.
  Many developers and companies prefer it for flexibility.
  It is widely used in open-source and commercial projects.
- Requires only copyright and license notice to be included.
  No additional legal obligations are imposed on users.
  This makes it simple and easy to comply with.
- Does not provide any warranty or liability protection.
  The software is provided "as is" by the author.
  Users must take responsibility for their own usage.
- Supports wide adoption across different industries.
  It is used in software, web projects, and research work.
  Its simplicity increases its popularity across communities.
- Helps developers release their projects quickly.
  There is no need for complicated legal procedures.
  This saves time and encourages innovation.

```
MIT License
Copyright (c) 2025 K Jeswanth
```

Chapter 6

Self-Hosted Server Setup — Solidtime

SolidTime self-hosting server allows users to host and manage their own time-tracking data securely on their own system. It gives full control over data, ensuring privacy, customization, and offline accessibility. Users can track working hours, projects, and productivity without relying on third-party cloud services. Since it runs on a local or private server, it reduces the risk of data leaks and unauthorized access. It is highly suitable for individuals and organizations that prioritize data security and full ownership.

- It is completely open-source and supported by the community.
  Developers can modify and improve it freely.
- It allows users to set up their own server at home.
  This removes dependency on external service providers.
- Access media and data privately without third-party servers.
  It ensures better privacy and data ownership.
- It provides enhanced security through local hosting.
  Sensitive information stays within the user's network.
- It supports Docker-based deployment for easy installation.
  This makes the setup process simple and efficient.

Installation Commands (Ubuntu)

```
git clone https://github.com/solidtime-io/self-hosting-examples.git
cd self-hosting-examples/1-docker-with-database
cp .env.example .env
cp laravel.env.example laravel.env
docker compose run scheduler php artisan self-host:generate-keys
docker compose up -d
docker compose exec scheduler php artisan migrate --force
```

Server Access: `http://172.27.234.166:8000`

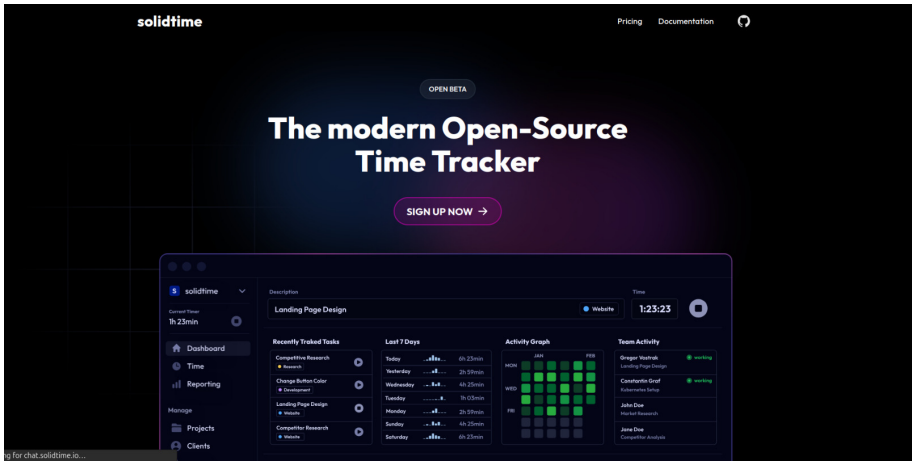

Figure 6.1: SolidTime Self-Hosted Time Tracking Server Running on Local Network

Figure 6.2: SolidTime is a self-hosted time tracking server that helps users manage time securely and privately.

Chapter 7

Open Source Contributions (GitHub Pull Requests)

Total PRs Raised: 8

- **3** PRs Merged
- **2** PRs Under Review
- **6** PRs Closed (Requested Changes)
- **2** Newly Created

Pull Request Summary

- **matterhorn-chat/matterhorn**
  This pull request corrected a typo in the README file where "CentOS Steam 8" was incorrectly written.
  It improved documentation accuracy and helped maintain clarity for users installing on CentOS systems.
  PR #857 — Merged
  `https://github.com/matterhorn-chat/matterhorn/pull/857`

- **zero-to-mastery/start-here-guidelines**
  This pull request added my name to the CONTRIBUTORS.md file according to the contribution guidelines.
  It helped me understand the contribution process and community guidelines of large open-source projects.
  PR #23697 — Merged
  `https://github.com/zero-to-mastery/start-here-guidelines/pull/23697`

- **firstcontributions/first-contributions**
  This pull request provided feedback and followed the contribution checklist in the documentation.
  It helped improve the tutorial experience for new contributors joining the project.
  PR #106141 — Merged
  `https://github.com/firstcontributions/first-contributions/pull/106141`

- **PrismJS/prism**
  This pull request proposed adding missing Installation and Usage sections in the README file.
  It aims to help new users understand how to install and use PrismJS more easily.
  PR #4037 — Not Merged, Review Required
  `https://github.com/PrismJS/prism/pull/4037`

- **zulip/zulip-terminal**
  This pull request updated the documentation to clearly state the supported Python versions (3.8–3.11).
  It helps remove confusion for new users installing Zulip Terminal on modern Python environments.
  PR #1594 — Not Merged, Review Required
  `https://github.com/zulip/zulip-terminal/pull/1594`

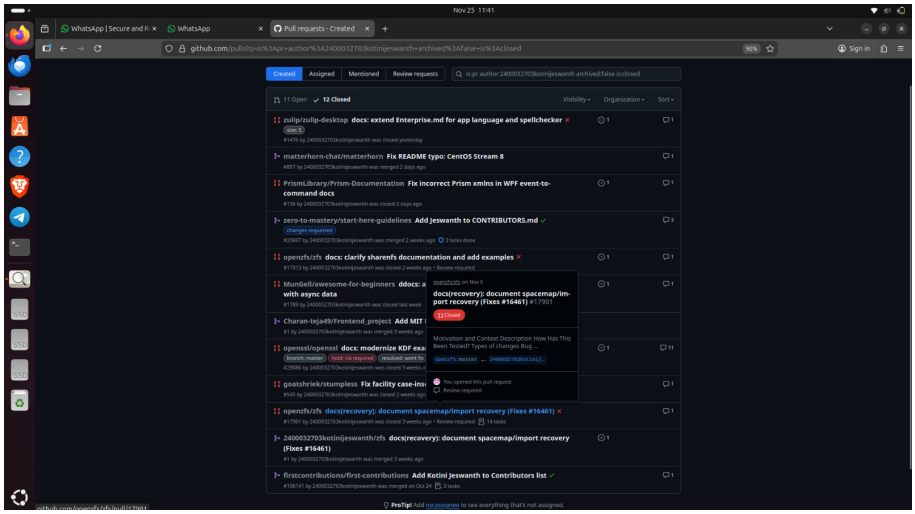

Figure 7.1: Pull Request Activity Screenshot of closed/merged

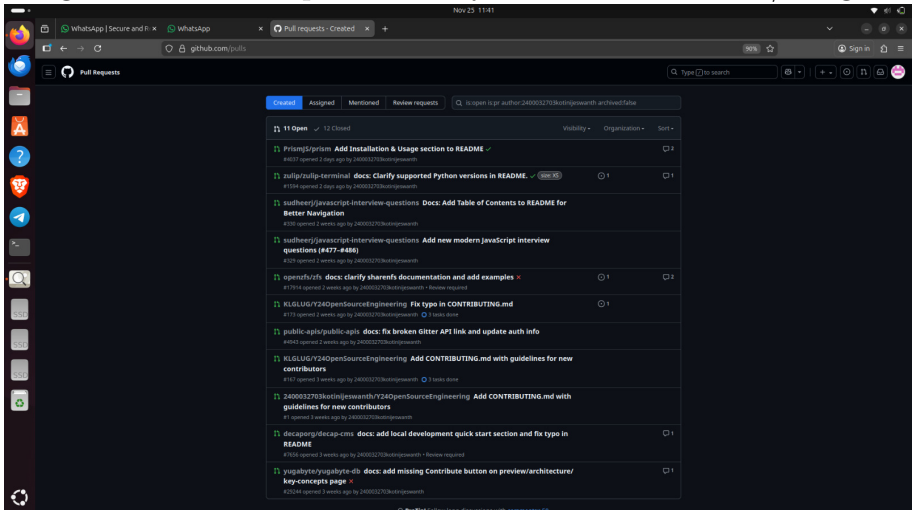

Figure 7.2: Pull Request Activity Screenshot of open/review required

Chapter 8

LinkedIn Posts

- Self-Hosting Server
  https://www.linkedin.com/feed/update/urn:li:activity:7399111336988868608/
- Pull Request Merge Update
  https://www.linkedin.com/feed/update/urn:li:activity:7399087877839659008/
- Open Source Contribution Blog
  https://www.linkedin.com/pulse/building-learning-sharing-my-open-source-journey-?trackingId=i%2BxWg3U5gVM2hSRQySMQUQ%3D%3D