



## Open Source Engineering Report

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# 1 About Linux Distro Used: Ubuntu

Ubuntu is one of the most popular Linux distributions used by developers, students and beginners. It is based on Debian and is known for its stability, regular updates and a friendly graphical interface. Ubuntu is widely used in software development, cloud computing and open-source learning labs.

Ubuntu provides thousands of free and open-source packages through the `apt` package manager. Using simple commands, we can install compilers, editors, servers and security tools. This makes it a very good choice for students who are just starting with Linux.

A key advantage of Ubuntu is its Long-Term Support (LTS) releases. LTS versions receive security and bug fix updates for five years, so they are trusted by companies and universities. Most major cloud platforms like AWS, Azure and Google Cloud support Ubuntu images by default.

In this course, Ubuntu helped me learn:

- Basic terminal commands for navigation and file handling
- Installing and updating software using `apt`
- Managing users, permissions and executable files
- Using Git and GitHub directly from the terminal
- Running and testing self-hosted services such as Scribble

Overall, Ubuntu gave me a strong foundation in using Linux as a development environment for open source engineering.

# 2 Encryption and GPG

GNU Privacy Guard (GPG) is a free and open-source implementation of the OpenPGP standard. It is used for encrypting files, signing data and verifying signatures. The main idea is public-key cryptography: each user has a **public key** (can be shared) and a **private key** (kept secret).

When someone wants to send us a secret message, they encrypt it with our public key. Only our private key can decrypt that message. In the same way, if we sign a file with our private key, others can verify the signature with our public key and confirm that it really came from us and has not been modified.

## Common GPG Commands

- `gpg --full-generate-key` – Generate a new key pair
- `gpg --list-keys` – Show the public keys stored in our keyring
- `gpg --export --armor > publickey.asc` – Export our public key for sharing
- `gpg --encrypt --recipient <email> file.txt` – Encrypt a file
- `gpg --decrypt file.txt.gpg` – Decrypt an encrypted file

## **3 Sending Encrypted Email**

Normal email is like sending a postcard: anyone can read the content. To protect privacy, we combine email with GPG encryption using tools like Thunderbird and Mailvelope.

### **Steps for Encrypted Email**

- Generate GPG key pairs on both sides
- Exchange public keys
- Import and trust the recipient's public key
- Enable "Encrypt" while sending mail
- Receiver decrypts using their private key

## **4 Privacy Tools (PRISM-BREAK)**

PRISM-BREAK lists privacy-respecting alternatives to proprietary services.

Tools explored:

- Signal – Secure messaging
- Tor Browser – Anonymous browsing
- KeePassXC – Local password manager
- Jitsi Meet – Secure video conferencing
- LineageOS – Open-source Android system

## **5 Open Source License Used – MIT**

MIT License is a permissive license allowing free use, modification, distribution and commercial usage with attribution.

## **6 Self Hosted Server – Scribble**

Scribble is an open-source notes platform that can be self-hosted.

### **Features**

- Markdown support
- Tagging and search
- Private and local network access
- Portable and open source

## How I Self-Hosted Scribble

- Installed Docker & Docker Compose
- Cloned Scribble GitHub repo
- Configured ports and storage paths
- Used `docker-compose up -d` to deploy
- Accessed using `http://localhost:<port>`

## Localized Documentation (Telugu)

I also created a Telugu tutorial explaining how to self-host Scribble:

- Access Telugu Documentation –  
<https://drive.google.com/file/d/1kv83qxntC01wpxGBGHoX9xlg0yw0N9Qr/view?usp=sharing>

## Dashboard Screenshot



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## Scribble Game

Scribble.rs is an open-source online drawing and guessing game, inspired by Skribbl.io. It allows multiple players to join rooms, take turns drawing words, and guess what others are sketching in real time through a simple web interface. When self-hosted, it enables friends, classrooms, or teams to run their own private, secure instance of the game without relying on public servers.

License: MIT License

- Key Features of Scribble Self-Hosting Server
- Real-time multiplayer drawing & guessing: players draw and guess words together instantly in a shared game room.
- Self-hosted and private: run the server on your own machine or VPS, keeping games secure and under your control.
- Custom word lists: create your own word sets for themed games, learning activities, or inside jokes.

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# 7 Open Source Contributions

GitHub Username: **Nihhaar0002**

In this course, I contributed to two open-source repositories. One PR was successfully merged and the other is open for review.

## List of Pull Requests

- First PR in **first-contributions** repository – Successfully merged
- Telugu Documentation PR in **Y24OpenSourceEngineering** – Under review

## Screenshots of Contributions

This screenshot shows a GitHub pull request page for repository 'first-contributions'. The pull request is titled 'Translated tool names in Irish README' and has been merged. It includes a table comparing English and Irish tool names for various IDEs like GitLab, Clion, etc. The pull request has received one review and no comments. The developer, Nihhaar0002, has commented twice. The pull request is marked as 'Up to date'.

This screenshot shows a GitHub pull request page for repository 'Y24OpenSourceEngineering'. The pull request is titled 'Added Scribble self-hosted project documentation in Telugu' and is currently open. It includes a document detailing the purpose and contents of the documentation. The pull request has no reviews or comments. The developer, Nihhaar0002, has commented once. The pull request is marked as 'Up to date'.

## 8 LinkedIn Posts

Shared updates on my open-source journey:

- First merged PR –  
[https://www.linkedin.com/posts/sai-nihhaar-menta-ab7618353\\_opensource-github-firstcontribution-activity-7392115951330271232-v\\_ZS?utm\\_source=social\\_share\\_send&utm\\_medium=android\\_app&rcm=ACoAAFgwxSsBFbJmFYkjzoWop0z10jgaxeb8fq0&utm\\_campaign=copy\\_link](https://www.linkedin.com/posts/sai-nihhaar-menta-ab7618353_opensource-github-firstcontribution-activity-7392115951330271232-v_ZS?utm_source=social_share_send&utm_medium=android_app&rcm=ACoAAFgwxSsBFbJmFYkjzoWop0z10jgaxeb8fq0&utm_campaign=copy_link)
- Self-hosted Scribble –  
[https://www.linkedin.com/posts/bangaru-venkata-krishna-mahesh-88a441357\\_opensource-foss-selfhosted-ugcPost-7390934242433695744-H1vL?utm\\_source=social\\_share\\_send&utm\\_medium=android\\_app&rcm=ACoAAFgwxSsBFbJmFYkjzoWop0z10jgaxeb8fq0](https://www.linkedin.com/posts/bangaru-venkata-krishna-mahesh-88a441357_opensource-foss-selfhosted-ugcPost-7390934242433695744-H1vL?utm_source=social_share_send&utm_medium=android_app&rcm=ACoAAFgwxSsBFbJmFYkjzoWop0z10jgaxeb8fq0)
- Article about this course –  
[https://www.linkedin.com/posts/sai-nihhaar-menta-ab7618353\\_activity-7398420967447785472-spEp?utm\\_source=social\\_share\\_send&utm\\_medium=member\\_desktop\\_web&rcm=ACoAAFgwxSsBFbJmFYkjzoWop0z10jgaxeb8fq0](https://www.linkedin.com/posts/sai-nihhaar-menta-ab7618353_activity-7398420967447785472-spEp?utm_source=social_share_send&utm_medium=member_desktop_web&rcm=ACoAAFgwxSsBFbJmFYkjzoWop0z10jgaxeb8fq0)