Open Source Software

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1 Linux Distribution

1.1 Distribution Used: Ubuntu 22.04 LTS

For this project, I have used Ubuntu 22.04 LTS as my primary operating system.

1.2 Why Ubuntu?

Ubuntu is one of the most popular Linux distributions for several reasons:

- User-Friendly: Simple interface suitable for beginners
- Long Term Support: LTS versions receive 5 years of security updates
- Large Community: Extensive documentation and support
- Software Availability: Wide range of packages via APT
- Stability: Reliable for both development and production

1.3 Key Features of Ubuntu 22.04 LTS

1. Desktop Environment: GNOME 42

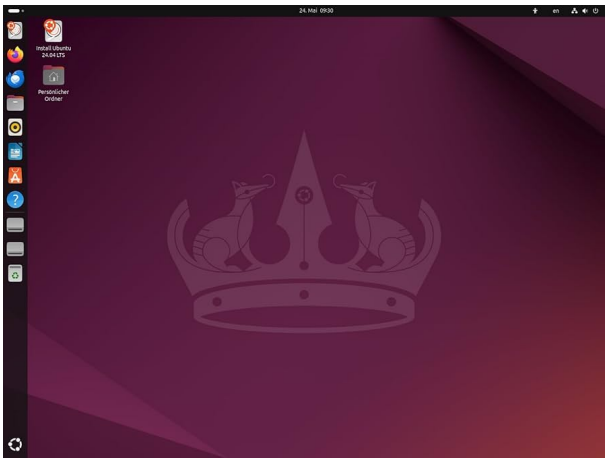

Figure 1.1: Enter Caption

2. Kernel Version: Linux 5.15 LTS
3. Package Manager: APT
4. Default Apps: Firefox, LibreOffice, GNOME utilities
5. Snap Support: Built-in snap store

1.4 System Specifications

- Operating System: Ubuntu 22.04 LTS
- Architecture: x86_64
- Desktop Environment: GNOME
- Shell: Bash 5.1

1.5 Installation Process

1. Downloaded Ubuntu ISO
2. Created bootable USB (Rufus/Etcher)
3. Configured dual boot
4. Installed essential developer tools
5. Configured environment for open source work

2 Encryption and GPG

2.1 What is Encryption?

Encryption converts plaintext into ciphertext to protect data confidentiality.

2.2 Types of Encryption

2.2.1 Symmetric Encryption

Uses same key for encryption and decryption (AES, DES).

2.2.2 Asymmetric Encryption

Uses public-private key pair (RSA, ECC).

2.3 GNU Privacy Guard (GPG)

GPG is a free implementation of OpenPGP used for encryption and signing.

2.4 Installing GPG

```
sudo apt update
sudo apt install gnupg
```

2.5 Generating GPG Keys

Steps:

1. Selected RSA and RSA
2. Key size: 4096 bits
3. Validity: 1 year

4. Entered name, email
5. Set strong passphrase

2.6 Listing Keys

```
gpg --list-keys
```

2.7 Exporting Public Key

```
gpg --export -a "Your Name" > publickey.asc
```

2.8 Encrypting Files

```
gpg --encrypt --recipient "name" file.txt
```

2.9 Decrypting Files

```
gpg --decrypt file.txt.gpg
```

3 Sending Encrypted Email

3.1 Email Encryption Overview

Email encryption protects data during transmission.

3.2 Tools Used

- Thunderbird (OpenPGP support)
- GPG Keys
- ProtonMail (alternative)

3.3 Setting up Thunderbird

3.3.1 Installation

```
sudo apt install thunderbird
```

3.3.2 Configuring OpenPGP

Steps:

1. Open Thunderbird
2. Go to Account Settings
3. Select End-to-End Encryption
4. Add GPG key
5. Import recipient's public key

3.4 Sending Encrypted Email

1. Compose email
2. Click Security
3. Enable “Require Encryption”
4. Send email

3.5 Receiving Encrypted Email

1. Thunderbird detects encryption
2. Enter passphrase
3. Content decrypted automatically

3.6 Best Practices

- Never share private key
- Use strong passphrases
- Backup keys safely
- Verify fingerprints

4 Privacy Tools from prism-break.org

4.1 What is PRISM-Break?

A website recommending privacy-focused open-source alternatives.

4.2 Signal (Encrypted Messaging)

Features:

- End-to-end encrypted
- Independently audited
- No ads

4.3 Firefox (Web Browser)

Privacy Features:

- Enhanced Tracking Protection
- DNS over HTTPS
- No telemetry

4.4 ProtonMail (Encrypted Email)

- Zero-access encryption
- Swiss privacy laws

4.5 Tor Browser (Anonymous Browsing)

Provides:

- Multi-layered routing
- IP masking
- Anti-tracking

4.6 VeraCrypt (Disk Encryption)

- Full disk encryption
- Hidden volumes
- Supports AES, Serpent, Twofish

5 Open Source License

5.1 License Used: MIT License

MIT License is permissive and widely used.

5.2 MIT License Text

```
Permission is hereby granted...
(Copy full text here)
```

5.3 Why Choose MIT License?

- Simple
- Permissive
- Business-friendly
- Compatible

5.4 Other Open Source Licenses

5.4.1 GPL

Copyleft, requires derivatives to be open source.

5.4.2 Apache 2.0

Includes patent protection.

5.4.3 BSD License

Very permissive, similar to MIT.

6 Self-Hosted Server: AFFINE

6.1 What is AFFINE?

AFFINE is a free, open-source workspace platform that supports note-taking, document creation, knowledge management, and collaboration. It is especially useful for students because it allows them to generate study notes, upload educational documents, search across shared content, and contribute to a global student knowledge base.

6.2 Why Self-Host?

- Full privacy and complete control over all notes and documents
- No ads or third-party tracking
- Customizable for academic workflows
- Supports collaboration for group projects and assignments
- Useful as a multi-purpose student knowledge hub

6.3 Installation Guide

6.3.1 System Requirements

- Ubuntu 22.04 LTS

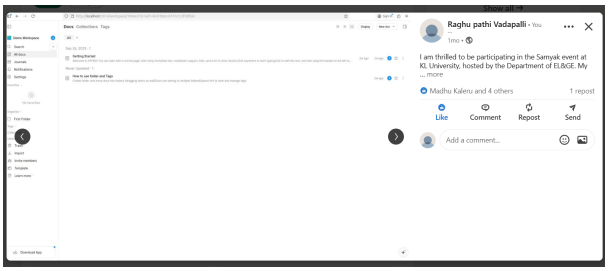

Figure 6.1: Affine interface

- Minimum 2GB RAM
- 5–10 GB free disk space
- Docker and Docker Compose installed

6.3.2 Installation Steps

```
sudo apt update
sudo apt upgrade -y
sudo apt install docker.io docker-compose git -y

cd /opt
sudo git clone https://github.com/toeverything/AFFiNE.git
cd AFFiNE

sudo docker-compose up -d
```

6.4 Configuration

AFFINE can be configured by editing the `docker-compose.yml` file:

```
- PORT=3010
- NODE_ENV=production
- AFFINE_SECRET_KEY=your_secret_key
- DATABASE_URL=postgres://affine:password@localhost:5432/affine
```

Restart after configuration:

```
sudo docker-compose down
sudo docker-compose up -d
```

6.5 Student-Oriented Features

- AI-powered note generation
- Upload and organize PDFs, study material, and documents
- Real-time collaboration for group work
- Powerful search engine for all notes and data
- Markdown + rich text editor for flexible note creation
- Cloud/offline access depending on deployment

6.6 Contribution Features

1. Students can upload subject-wise notes
2. Create templates for assignments and study guides
3. Collaborate by editing shared documents
4. Tagging and metadata for improved search results
5. Contribute translations using AFFINE's i18n support

6.7 Benefits

- Complete privacy with self-hosted control
- No rate limits or paid restrictions
- Centralized student knowledge repository
- Useful for academic institutions and student groups
- Unlimited customization opportunities

7 Open Source Contributions

7.1 PR 1: modifying CONTRIBUTORS.md

Repository: zero-to-mastery/start-here-guidelines PR: 23714 (Merged)

7.2 PR 2:Adding shr's dino

Repository:dinosaurs PR: 1357 (Merged)

7.3 PR 3: First contributions

Repository: firstcontributions/first-contributions PR: 106062 (Merged)

7.4 PR 4: added-a-new-file of server translation documentation

Repository: KLGLUG/Y24OpenSourceEngineering PR: 144(approved)

7.5 PR 5: docs: remove height attributes and improve README formatting

Repository: TheAlgorithms/Python PR: 13843(approved)

7.6 PR 6: Improve README.md Documentation for Clarity and Contributor

Repository: public-apis/public-apis PR: 4918(approved)

7.7 OTHER PRs

Improvements in:

- Documentation
- Bug fixes
- implementation of algorithms

8 LinkedIn Posts

8.1 LinkedIn Posts

8.1.1 Post 1: Zero to Mastery Open Source Contribution

Link: https://www.linkedin.com/posts/raghu-pathi-vadapalli-8b9600315_opensource-github
utm_source=share&utm_medium=member_desktop&rcm=ACoAAFAAXQ0BlHtcUOkYMm6UMu_
cscPLdz7kCag

Summary: Shared my experience contributing to the Zero-to-Mastery *start-here-guidelines* repository, where my Pull Request was successfully merged. Highlighted the process of contributing, following guidelines, and engaging with maintainers.

Key Points:

- First merged Pull Request to a major open-source community
- Learned complete workflow: fork, clone, commit, PR, review, merge
- Understood contribution guidelines and best practices
- Boosted confidence to explore more open-source projects

8.1.2 Post 2: Affine Server Contribution

Link: https://www.linkedin.com/posts/raghu-pathi-vadapalli-8b9600315_opensource-selfho
i92?utm_source=share&utm_medium=member_desktop&rcm=ACoAAFAAXQ0BlHtcUOkYMm6UMu_
cscPLdz7kCag

Summary: (Highly student-friendly platform designed to help learners organize and manage their study materials easily.)

Highlights:

- (Allows creation of files, notes, and documents directly inside the workspace, improving productivity.)
- (Enables seamless sharing of notes and documents with peers, making collaboration simple and efficient.)

- (Completely free to use, making it accessible for students and beginners without any financial barriers.)

8.1.3 Post 3:blog to my open source journey

Link: https://www.linkedin.com/posts/raghu-pathi-vadapalli-8b9600315_my-open-source-jo
utm_source=share&utm_medium=member_desktop&rcm=ACoAAFAAXQ0BlHtcUOkYMm6UMu_
cscPLdz7kCag

9 Conclusion

This report documents my complete open source journey including:

- Linux setup
- Encryption
- Privacy tools
- Self-hosting
- Open source contributions

Open source has helped me gain:

1. Technical skills
2. Collaboration experience
3. Understanding of Git and reviews
4. Appreciation of open-source ethics