Linux, Privacy Tools, Encryption and Self-Hosting Server Report

Course Title: Open Source Course

Code: 24CS02EF

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1. About the Linux Distribution Used

Linux distributions are open-source operating systems based on the Linux kernel. For this project, I used **Ubuntu 22.04 LTS**, a stable, user-friendly and widely supported Linux distribution.

Key Features

- Long-Term Support (5 years security updates)
- GNOME desktop environment
- APT package management
- Strong community and documentation
- Stable for server and desktop usage

Why I Chose Ubuntu

- Easy installation
- Best beginner-friendly environment

- Excellent support for privacy and encryption tools
- Compatible with development workflows

2. Encryption and GPG

GPG (GNU Privacy Guard) is an open-source implementation of OpenPGP used to encrypt files, sign data and manage keys.

2.1 Generating GPG Keys

Commands used: gpg --full-

generate-key Process:

1. Select key type (RSA recommended)
2. Choose key size (4096 bits)
3. Enter validity period
4. Provide identity (Name + Email)

2.2 Exporting Public Key

gpg --export -a "Your Name" > public_key.asc

2.3 Encrypting a File

gpg -e -r "Recipient Name" file.txt

2.4 Decrypting a File

gpg -d file.txt.gpg

3. Sending Encrypted Email

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

4. Five Privacy Tools (prism-break.org)

4.1 1. Signal Messenger

- End-to-end encrypted messaging
- Zero metadata policy

4.2 2. Tor Browser

- Anonymizes IP address
- Protects from tracking and fingerprinting

4.3 3. KeePassXC

- Secure password manager
- Local encrypted password database

4.4 4. ProtonMail

- End-to-end encrypted email
- Based in Switzerland (strict privacy laws)

4.5 5. VLC Media Player

- Open-source, telemetry-free multimedia player

5. Open Source (Course Code: 24CS02EF)

For this project, I used the **MIT License**, a widely-used permissive open-source license.

MIT License Key Features

- Allows free usage, modification and distribution
- Minimal restrictions
- Requires attribution to original authors

Reasons for Using MIT License

- Simple and permissive
- Ideal for educational and open-source contributions
- Encourages community adoption

6. Self-Hosted Server: Installation, Translation and Poster

For this project, I self-hosted **Gladys Assistant** (an open-source smart home assistant).

6.1 About Gladys

Gladys is a privacy-friendly home automation assistant that runs entirely on your local network.

6.2 Installation Steps

1. Install Docker and Docker Compose
2. Run Gladys container:

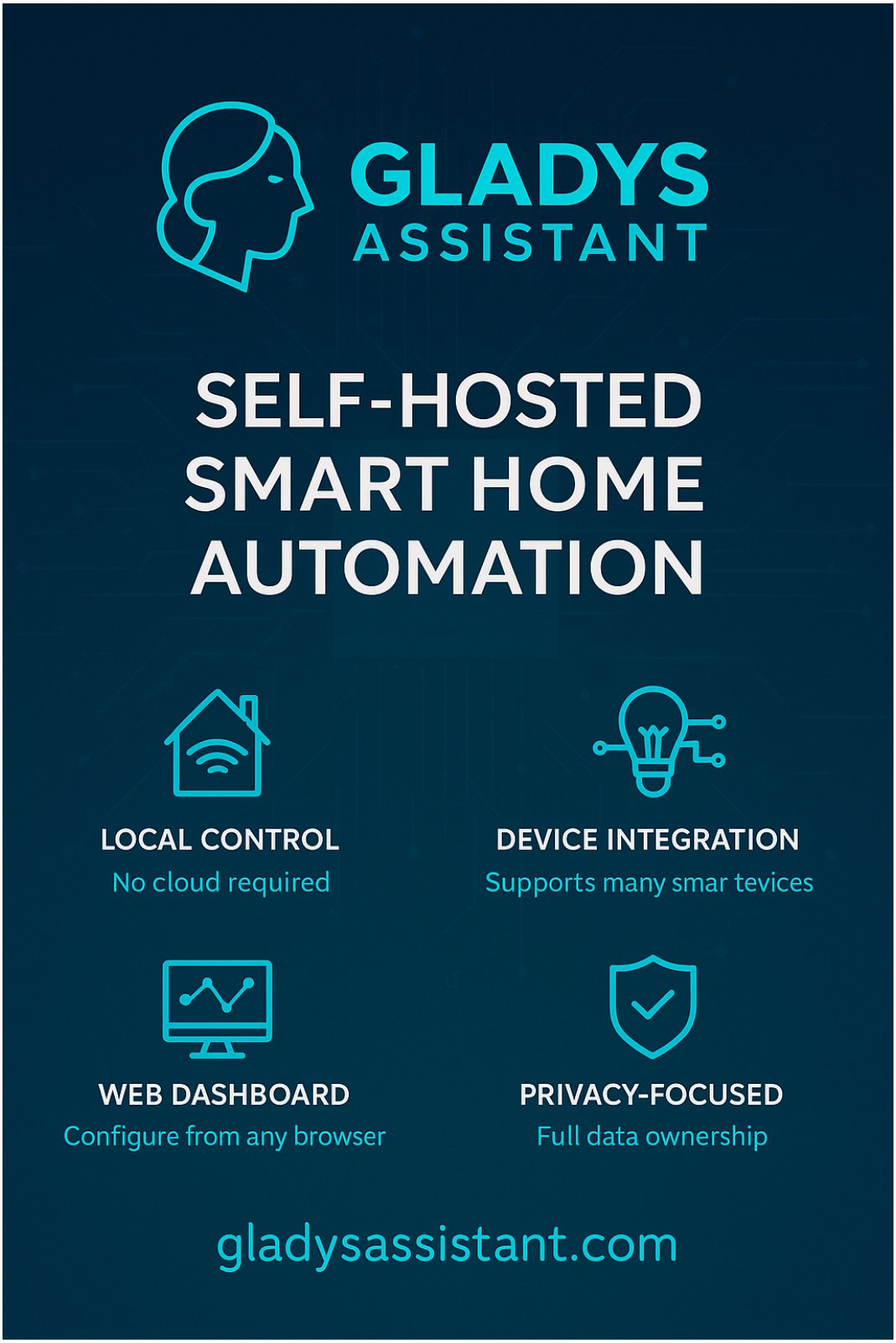
```
docker run -d \
--restart=always \
--network=host \
-v /var/lib/gladysassistant:/var/lib/gladysassistant \ gladysassistant/gladys
```

3. Access via browser at http://localhost:1443

6.3 Localized (Translated) Documentation

(Add your translated (Telugu/Hindi) paragraph here)

6.4 Poster


GLADYS
ASSISTANT
SELF-HOSTED
SMART HOME
AUTOMATION
LOCAL CONTROL
No cloud required
DEVICE INTEGRATION
Supports many smar tevices
WEB DASHBOARD
Configure from any browser
PRIVACY-FOCUSED
Full data ownership
gladysassistant.com

7. Open Source Contributions (PRs) and Status

This section documents my GitHub contributions with PR links, issues, and screenshots.

PR 1: Issuedocs: add community API & web demo link

- https://github.com/Ebazhanov/linkedin-skill-assessments-quizzes

- Issue Solved: I have added new quiz{'s}

I have added new reference link{'s}

I have made small correction/improvements

- PR Link: https://github.com/Ebazhanov/linkedin-skill-assessments-quizzes/pull/7238
- Status: Merged

PR 2: IssueAdd solution for 'Minimum operations to make array zero'

- Repository: https://github.com/noodles-sed/Simple-DSA

- Issue Solved: Added comments explaining the logic
- PR Link: https://github.com/noodles-sed/Simple-DSA/pull/437
- Status: Merged

PR 3: Title of Issue

- Repository: https://github.com/firstcontributions/first-contributions
- Issue Solved: Before submitting this pull request, check the changes to see it's only the changes you made intentionally
  If there are changes to other lines you didn't make deliberately, it's possible that your IDE made the changes with a utility like prettier.

- PR Link: https://github.com/firstcontributions/first-contributions/pull/106720

- Status: Merged

PR 4: Adding about self hosting server in local language

- Repository: https://github.com/KLGLUG/Y24OpenSourceEngineering
- Issue Solved: done documentation about my self hosting server in local language
- PR Link: https://github.com/KLGLUG/Y24OpenSourceEngineering/pull/108
- Status: Merged

PR 5: feat: add jaw-dropping JS interview questions

- Repository: https://github.com/sudheerj/javascript-interview-questions
- Issue Solved: 6 advanced JavaScript interview questions
  Short, clear explanations for each
  Topics like type coercion, event loop, microtasks, TDZ, array behavior, etc.
- PR Link: https://github.com/sudheerj/javascript-interview-questions/pull/333
- Status: Not Merged

PR 6: Replace Google reCAPTCHA with hCaptcha for User VerificationYour commit message

- Repository: https://github.com/wger-project/wger

Issue Solved: Replaced the reCAPTCHA widget and API with hCaptcha.

Updated front-end and back-end configurations to integrate hCaptcha.

- PR Link: https://github.com/wger-project/wger/pull/2106
- Status: Not Merged

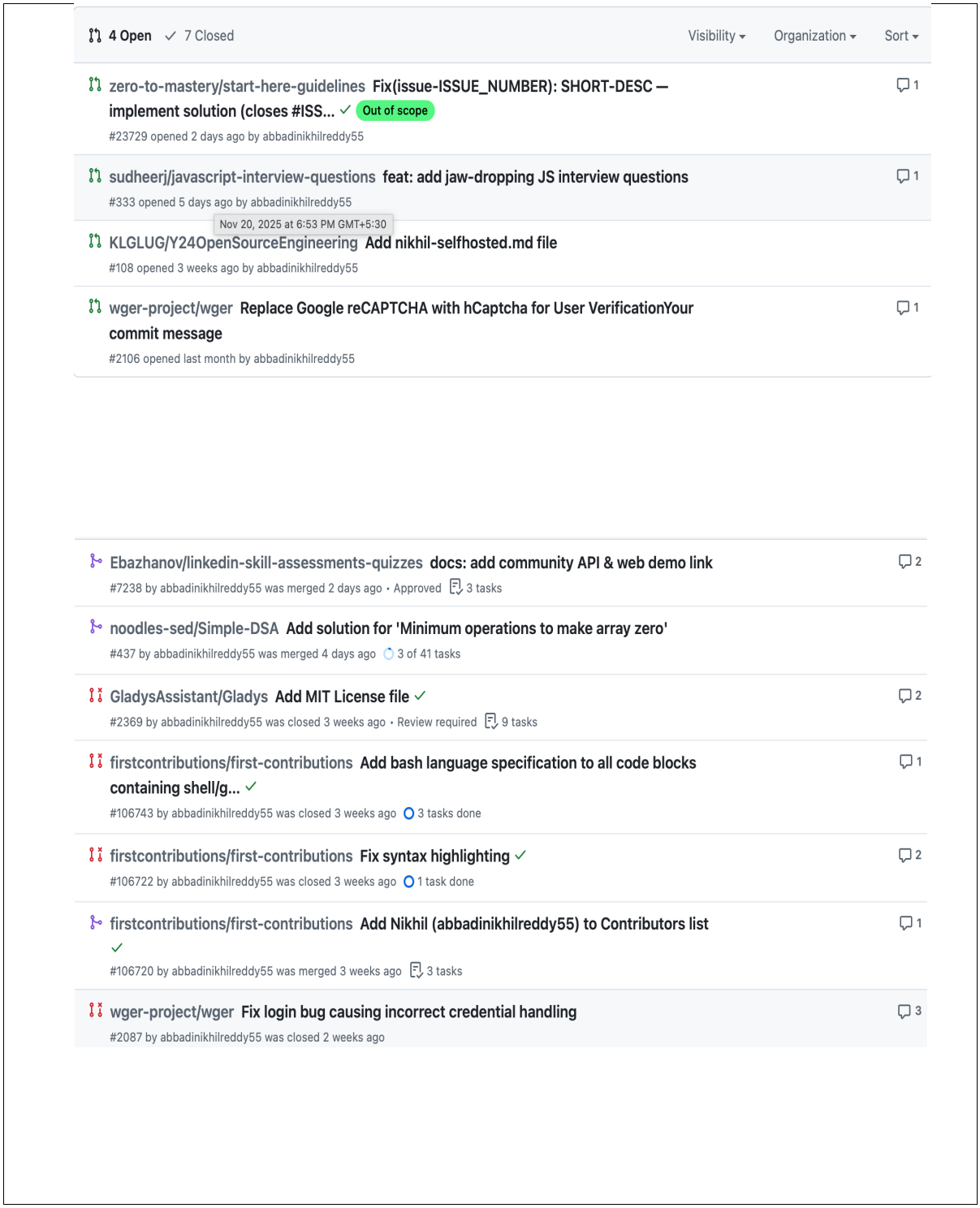


Figure 7.1: Screenshot of Issue and PR

8. LinkedIn Posts

1. Post on Self-Hosting Gladys Assistant

https://www.linkedin.com/posts/abbadi-nikhil-reddy-2a6907330_my-gladys-assistant-self-hosting-server-activity-7399043037391130624-CF9z?utm_source=share&utm_medium=member_desktop&rcm=ACoAAFNtnN4BHZv2-BLl3i4BkP6YOHoOheF8gdw

2. Post on PR Merge

https://www.linkedin.com/posts/abbadi-nikhil-reddy-2a6907330_github-firstcontributionsfirst-contributions-activity-7399042180557737984-H_JA?utm_source=share&utm_medium=member_desktop&rcm=ACoAAFNtnN4BHZv2-BLl3i4BkP6YOHoOheF8gdw

3. Post on Blog Publication

https://www.linkedin.com/pulse/my-journey-linux-self-hosting-open-source-abbadi-nikhil-reddy-hkqpf

Conclusion

In this report, I explored Linux, privacy tools, encryption, GPG, open-source licensing and self-hosted servers. Completing this project strengthened my understanding of secure digital practices, open-source contribution workflows and self-hosting technologies.