KL UNIVERSITY

DEPARTMENT OF HTE

Open Source Engineering Report

Linux Distribution Used: Ubuntu

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Contents

1 About the Linux Distribution Used: Ubuntu

Ubuntu is one of the most widely used open-source Linux distributions and is known for its stability, strong community support, and extensive software ecosystem.

1. **Common Ubuntu Commands**

   ```
   sudo apt update
   sudo apt install <package>
   nano, echo, cat <filename>, cd, pwd, ls, df -h
   git init, git add <filename>, git commit, git pull,
   git push -u origin main
   ls -la, ls -a
   ```

2. **Distro**

   It has been a long journey working with the Linux kernel, during which we have explored many concepts, tools, and the various advantages that Linux provides. Compared to using a Windows operating system, working in Linux felt like having greater freedom to install and remove tools as we wished. We have also learned about the four essential freedoms of Open Source:

   - Share
   - Study
   - Modify
   - Use

   We learned to control the OS by using linux basic commands (like cd, pwd, ls, whoami, etc..) in terminal which is far more different from using tools in windows. We have worked on open-source Git contributions by forking repositories, cloning them, making updates in the local copies, and then pushing those changes back to the remote repositories. We also reported two issues in one of the repositories. In addition, we installed the "Oh My Git" software and completed the modules and games on the "Learn Git Branching" online platform.

2 Encryption and GPG

GNU Privacy Guard (GPG) implements OpenPGP for secure communication and data encryption. Encryption is the process of converting readable data (plaintext) into unreadable data (ciphertext) so that only authorized people can read it.

1. **Why do we use encryption?**
   - To protect data from hackers and unauthorized access
   - To ensure privacy
   - To safely send sensitive information over the internet

2. **Types of Encryption**
   - **Symmetric Encryption:** Uses a single shared key.
   - **Asymmetric Encryption:** Uses public and private keys.

3. **GPG**

   GPG is a free, open-source encryption tool that uses the OpenPGP standard. You can use GPG to:
   - Generate public/private keypairs
   - Encrypt files
   - Decrypt files
   - Sign messages

3 Sending Encrypted Email

"Sending encrypted email" means sending an email in such a way that only the intended recipient can read it.

`When you encrypt an email:`

- You use the recipient's public key to encrypt the message.
- Only the recipient's private key can decrypt it.
- Even if someone hacks the email server, they cannot read the message.

`To send an encrypted email:`

1. Generate your GPG keypair.
2. Share your public key with the receiver.
3. Import the receiver's public key.

1. **Encrypt an Email**

   ```
   gpg --encrypt --sign --armor -r receiver@email.com message.txt
   ```

2. **Email Clients Supporting GPG**

   - Mozilla Thunderbird + Enigmail
   - Evolution Mail

4 Five Privacy Tools from PRISM-BREAK

Tools

1. **Tor Browser :**
   - Used mainly in cybersecurity, penetration testing, and anonymity research.
   - Hides your IP address, location, and browsing identity.
2. **Signal :**
   - One of the most secure end-to-end encrypted messaging apps in the world.
   - Uses Signal Protocol, adopted by WhatsApp, Messenger, and Google RCS.
3. **DuckDuckGo :**
   - Privacy-focused search engine that does not track your searches.
   - Does not create profiles, store IP addresses, or use behavioral ads.
4. **Brave Browser :**
   - Privacy-first browser which is fast + secure.
   - Blocks ads, trackers, cookies, fingerprinting, and malware by default.
5. **ProtonMail :**
   - End-to-end encrypted email service based in Switzerland.
   - Protected by strict Swiss privacy laws.

5 Open Source License Used: AGPL

For our open source Server we hosted "NextCloud" and used the **Affero General Public License (AGPL)** is a strong copyleft license developed by the Free Software Foundation.

1. **About AGPL?**

   AGPL ensures that:

   - Source code must be provided to users interacting over a network.
   - Modified versions must also remain open source.
   - Under GPL, you must share source code only if you distribute the software

2. **Usage of AGPL in NextCloud**

   The AGPL protects Nextcloud by making sure the software always stays open and community-driven. If someone changes the Nextcloud code and offers it over the internet, they must share those changes.

   - Nextcloud stays truly open-source
   - Improvements made by anyone must be shared
   - Users can trust the code running on their server
   - Big companies can't exploit the project without giving back

6 Self-Hosted Server: Nextcloud

1. **About Nextcloud**
   Nextcloud is an open-source self-hosted cloud platform for:
   - File Storage
   - Calendar, Contacts Sync
   - Video/Audio calls
   - Document collaboration
2. **Install ation on Ubuntu Install the required software(Apache)**

```
sudo apt install apache2 -y
sudo systemctl enable apache2
sudo systemctl start apache2
```

3. **Install MySQL Server**

```
sudo apt install mysql-server -y
```

4. **Create a Database for NextCloud**

```
sudo mysql
Run this command:
 CREATE DATABASE nextclouddb;
 CREATE USER 'nextclouduser'@'localhost' IDENTIFIED BY 'password';
 GRANT ALL PRIVILEGES ON nextclouddb.* TO 'nextclouduser'@'localhost';
 FLUSH PRIVILEGES;
 EXIT;
```

5. **Install PHP**

```
sudo apt install php php-mysql php-xml php-gd php-curl
php-zip php-mbstring php-intlphp-bcmath php-gm
php-imagick php-fpm -y
Restart Apache:
sudo systemctl restart apache2
```

6. **Download NextCloud**

```
Move to web dir:
   cd /var/www/
Download latest version:
sudo wget https://download.nextcloud.com/server/releases/latest.zip
Extract:
  sudo apt install unzip -y
  sudo unzip latest.zip
Give permissions:
   sudo chown -R www-data:www-data /var/www/nextcloud/
   sudo chmod -R 755 /var/www/nextcloud/
```

7. **Create a virtual host**

```
sudo nano /etc/apache2/sites-available/nextcloud.conf
Add this:
  <VirtualHost *:80>
    DocumentRoot /var/www/nextcloud/
    ServerName yourdomain.com

    <Directory /var/www/nextcloud/>
      Require all granted
      AllowOverride All
    </Directory>
 </VirtualHost>
```

8. **Final setup brower**

```
http://your-server-ip
OR
http://localhost/nextcloud
Fill the login details to continue.
Then your done with hosting the server.
```

9. **Localized (English) Documentation**

- Open browser → http://localhost
- Create admin user
- Configure storage & database

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OPEN SOURCE ENGINEERING

NEXT CLOUD

Nextcloud Server is an open-source platform that provides secure file storage, sharing, and collaboration. It allows users to host their own cloud server, ensuring complete data privacy and control. Ideal for organizations seeking self-hosted alternatives to services like Google Drive or Dropbox.

🔒 LICENCE OF THE SOFTWARE:

GNU Affero General Public License (AGPL) version 3.

🎯 HIGHLIGHTS/FEATURES:

1.Secure file storage
2.File sharing
3.Access anywhere
4.Collaboration tools
5.Customizable

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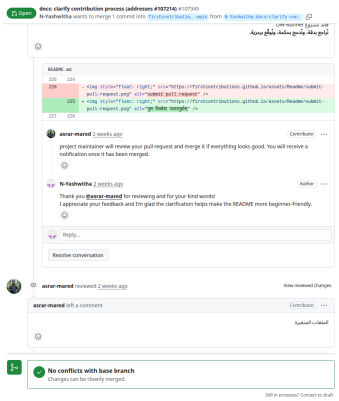
7 Open Source Contributions (PRs)

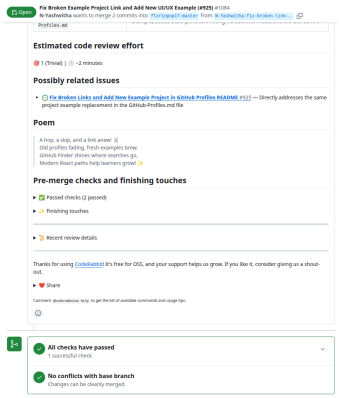
PR Status: All Open

All pull requests mentioned below are currently in **OPEN** state.

1. First Contributions Description: Improves README clarity by removing the misleading line ("Soon I'll be merging your changes...") and explaining that project maintainers review and merge pull requests. This makes the contribution process clearer and more beginner-friendly.

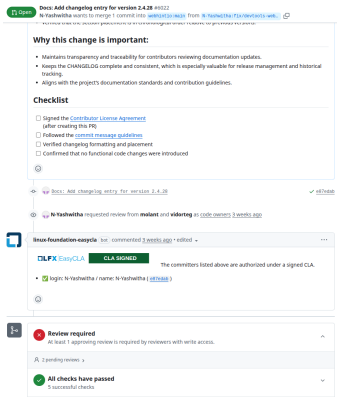


2. florinpop17 Description: Problem: The "Example projects" section in Projects/2-Intermediate/GitHub-Profiles.md contained a broken link: github-profile-search → returned Site Not Found. Fix Implemented: Replaced the broken github-profile-search link with a working example: New Example: GitHub Finder Repo: GitHub Finder Repository



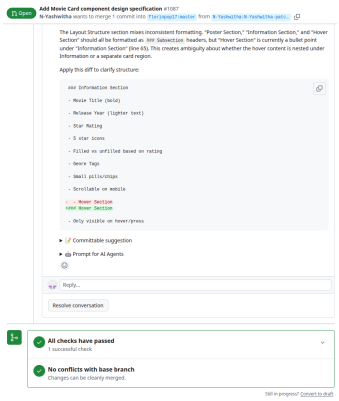
3. webhintio

Description: This PR adds a missing changelog entry for version 2.4.28 in the packages/hint-webpack-config/CHANGELOG.md file. During the recent maintenance update, a documentation improvement was made but not reflected in the changelog. This update ensures that the changelog remains accurate, consistent, and aligned with Webhint's version history.



4.florinpop17

Description: This Pull Request adds the complete Movie Card Component – Design & Specification document for Issue 1053. The file provides a clear, structured blueprint for contributors to implement the Movie Card UI component without ambiguity.



5.PolicyEngine Description: This PR fixes a KeyError in gcp/social-card-tags.py that occurred when a post did not have a filename key. Previously, the script crashed if at least one post was missing this field. The change ensures that posts without filename are safely skipped, preventing the social card tagging process from failing. This resolves issue #2727

8 LinkedIn Posts

1. **Self-Hosting Post:**

   https://www.linkedin.com/posts/nettem-yashwitha-416504348$_{o}pensource-kluniversity-foss-activity-7382314685020270593-kJFY?utm_{s}ource=shareutm_{m}edium=member_{d}esktoprcm=ACoAAFbtmVIB_{5}x$

xnBsovjSnnBk1blolMYZKz4

2. **PR Merge/Contribution Post:**

   https://www.linkedin.com/posts/nettem-yashwitha-416504348$_{o}pensource-github-kluniversity-activity-7399148312760750081-fmvl?utm_{s}ource=shareutm_{m}edium=member_{d}esktoprcm=ACoAAFbtmVIB_{5}x_{x}nBsovjSnnBk1blolMYZKz4$

3. **Blog/Open Source Post:**

   https://www.linkedin.com/pulse/using-ubuntu-starting-my-open-source-journey-nettem-yashwitha-behtf