



Securing Linux Storage with ACLs: An Open-Source Web Management Interface for Enhanced Data Protection

Midterm Presentation for GSoC 2025 Project

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Backend ✓

ACL API Daemon ✓

ACL Core Daemon ✓

Docs ✓ (Till backend and daemons)

Frontend



Major Change

Architecture of Daemons

The daemon component was split into ACL API and ACL Core for security purposes.

ACL API Daemon remains exposed to the network, being at least privilege.

ACL Core Daemon is at a privilege where it can modify ACLs on behalf of other users.



Major Change

Archival Database

The archival database allows us to keep track of past sessions and associated transactions.

In the event of a backend shutdown while transactions are being processed, they are marked as pending and stored in the archive.

In future, we will be able to restore the pending transactions and process them once backend is healthy.



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Major Change

Admin Panel

For IT teams and administrators, building an Admin Panel was proposed.

It tracks the health of components, lists all active and archived sessions, and transactions.

Users will be able to monitor system activities, resolve issues, and detect malicious behaviors, among other tasks.

Currently, it's a low priority and is being done when time persists. It will be continued to work upon after GSoC if it's not completed.



Development Phase Setbacks

Premature Optimizations

During the initial days, I was very engaged in solving minor performance issues, which led to overworking and slowing the development process.

I realised it after some time and got the process back on track by working more on weekends.

I am happy to say I am on track now.



Some tweaks to the Backend

Parts of Backend to Work Upon

Moving forward, the part of the backend that's still in development is the one that will pair with the frontend (streaming data).

Working on it too much at this point doesn't make much sense.

Most of the optimizations and changes will occur during frontend pairing so that it can be taken up while working with it.

*still, I have setup 2 handlers for testing and PoC.



Testing

Testing the Current Work

The development process has been done on Apple Silicon, which is not the intended target system for the project.

Most of the testing has been conducted in a Docker environment, which is a virtual and limited resource.

Daemons were run on remote Linux instances since I am not at my usual workplace and don't have my Linux system.

This part will be done in a few weeks when I am back to my place



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Next Phase

Futher Work

In the next phase, I will work on the frontend component and connect it to the backend.

At the end of the next phase, I aim to complete the project and ship a working Linux ACL Management System.