CS334 Project Proposal
Group 7: GAS File System

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1. Topic selection

This project corresponds to COMP2023 Project209-Linux custom file system.

The project repository is open source on github at GAS Filesystem.

GAS File System is a custom Linux file system designed and implemented as a kernel module.

2. Basic idea

Design a custom Linux file system in C and implement file and directory read/write operations.

2.1. Linux kernel module

Design and implement a Linux kernel module, which accomplishes the following functions:

- Interface the newly created file system with Virtual File System(VFS).

- Implement the read/write operations of superblock, dentry, and inode of GAS File System.

- Implement the permission attributes, with different operation attributes for different users.

- Implement the interface with the user state program

2.2. Block device format app

Design and implement a user-state application that can format a block device (which can be emulated by a file) into the format of GAS File System.

2.3. Usability and performance test

Design a user-state test case application to test and verify the usual file system operations such as open/read/write/ls/cd using GAS File System.

3. Completion plan

The lecture about File System is in week 12, to design this file system, we will learn file system design in advance.

The following is the tentatively decided plan:

Week 9
1. Topic selection
2. Plan and proposal
3. Project initialization

Week 10-12
1. Learn file system with tutorial: Linux Filesystems in 21 days
2. Implement the linux kernel module
3. Update documents

Week 12-15
1. Design user application and test cases
2. Organize the project and documents

Further
1. Normalization and optimization