Name(s)	Project Number
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Project Title

Comparison of File Systems for the Megalithic Kernel

Abstract

Objectives/Goals
The goal of this project is to implement two RAM disk file systems and test their performance under Dreckig OS. This operating system uses the experimental megalithic kernel where all software is within the kernel for efficiency and security. This architecture makes traditional file systems impractical, so I have designed these file systems for speed and efficiency with this architecture. The two file systems, as well as Dreckig OS, were designed and written by me.

Methods/Materials
Two file systems, bFS and bFAT, were implemented in x86 assembly language inside of the Dreckig OS v0.005.8 kernel. bFS stores needed information about a file in the file itself, and bFAT stores file information in a small file allocation table at the start of the RAM disk. To be able to test how fast each file system could write and read files I wrote a timer that makes use of the 8253 PIT. I then put each file system through a series of tests. I had each system make a 10, 20 and 30 byte file; this tested each file systems writing speed. Both file systems then searched for each file to test for read speed. These tests were repeated multiple times for validity. I controlled the computer system, code base, and operating system so that all tests could be performed in the same environment.

Results
The bFS file system was implemented in 89 lines of code, while the bFAT system was implemented in 98. It took bFS, on average, 55.3 ticks to write a file, and 4633.3 ticks to read a file. It took bFAT, on average, 72.6 ticks to write file, and 4644.2 to read a file. bFS was able to write a file 17.3 ticks faster than bFAT and read a file 10.9 ticks faster, while being implemented in 9 less lines of code.

Conclusions/Discussion
The bFS file system was able to operate faster than bFAT, while using less code. Currently the bFS file system is being further implemented and tested under Dreckig OS. A computer running Dreckig OS will be displayed at the fair.

Summary Statement

Designed,implemented and tested performance of two file systems for use with the megalithic kernel architecture.

Help Received