CS 342 – Operating Systems

Project 4

Report

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Section 03

May 16, 2021

1. Introduction

This report consists of experiments performed on file system implemented as a library (libsimplefs.a) that store files in a virtual disk. An application can create and use files that are linked with the library. The experiment performed measures measure how long it takes to create, read and write various files with different sizes.

2. Experiment Results

The following table shows the time in millisecond of creating a file:

Filename	**Time (ms)**
File1	1003406
File2	560295
File3	420349
File4	524530
File5	324345

Table 1: Time of creating files using function sfs_create.

The following shows the time in milliseconds of reading a file:

Filename	**Filesize (approx.)**	**Time (ms)**
File1	2000	5034048
File2	4000	15023470
File3	6000	20234450
File4	8000	25052550
File5	10000	40789642

Table 2: Time of reading files using sfs_read.

The time taken to conduct the experiments was measured using gettimeofday function.

3. Conclusions

As noted in table 1, time taken for file1 is the largest. This is because it takes into account the time for formatting the disk and then creates a file. For creating the rest of the files, the time is generally constant and is done in less time because the disk has already been formatted and does not require time for that anymore. The variations in time for file 2 to 6 is due to the CPU and processor's state, this leads to a fluctuation in time for each file. Thus, it leads to the conclusion that the first file requires the largest time to be created as it takes time to format the disk as well, while the rest of the files (file 2 to 6) take less time as compared to file 1. The time taken for the creation of file 2 to 6 is also generally similar, with respect to a few variations that occur due to the CPU itself.

Similarly, table 2 reports the time taken for reading files of various sizes. As expected, larger files account to a higher time taken for the read function. This is because a larger set of data needs to be read and iterated. It is also worth noting that the time will remain constant regardless of the number of bits being read at a time due to the system and CPU state.

4. References

[1] Operating System Concepts, 9th edition, Silberschatz et al. Wiley

[2] http://www.mathcs.emory.edu/~cheung/Courses/255/Syllabus/1-C-intro/bit-array.html