

OS -MP7

Design Document

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In this Machine Problem, we implement a Filesystem. We have a System Disk size of 10MB and a block size of 512 bytes.

In this implementation, the files are maintained by a linked list of blocks. Every file we create has a unique id - `_file_id` and a size parameter `file_size`. We determine where to start reading and writing in a file through `cur_blk` and `cur_pos`.

Format is one of the most important functions as it wipes any file system from disk and installs an empty file system by linking each block (but initializes the master block). Mount points to the mounted disk, puts file inode in buffer and adds a new file.

If a file needs to be accessed, we first check whether the file exists or not (LookupFile with a given `_file_id`) . If it doesn't, we create a new file (CreateFile) with a new `file_id`, `file_size` and `inode_block_no`, allocate blocks for writing data and record the index block no to know where to read from (load the inode block in buffer and write to disk). Then we add a file through the `add_file` function (creates a new `_file_array` with size increased by 1).

The required amount of characters can be read or written to/from the file starting from `cur_pos` till the EoF (end of file). Reset and rewrite functions were the easiest. We just have to set the `cur_blk` and `cur_pos` to 0 or erase file content by deallocating blocks i.e. returning them to the free linked list.

Although I wrote code for all the functions asked to be implemented I'm facing a problem in the read function. I haven't been able to work on it more due to the approaching finals. I have attached a screenshot of the same. However, the code compiles and all the other functions such as Mount, Format, CreateFile, DeleteFile, LookupFile, reset, EoF and Rewrite work without any errors. I'm just uncertain on why Read is giving me errors.

I have not designed or implemented any bonus opportunities.

