2013 操作系统 课程设计

Operating Systems, Module Practice, 2013

王昊翔

Requirements

1. Simulate a Unix file system on your Windows Platform
2. Understand the file system on Unix system, and the usage of i-nodes
3. Implement the function of sub-directory
4. The task needs to be completed using C++ or C
5.

Tasks/Functionalities

The following functions are required in your file system:

1. Allocate **16MB** space in memory as the storage for your file system. The space is divided as blocks with block size 1KB
   Assume **block address length is 32-bit;**
   Design the information contained in i-node
   The i-node should support **up to 10 direct block addresses**
   The i-node should support **at least one indirect block address**

2. The fist block is used for storing the i-node for the root directory(/). While your program is lunched, two directories (/dir1 and / dir1/dir2) should be created, and also two files need to be written as /dir1/file1 and /dir1/dir2/file2 **(5 marks)**
3. File 1 and 2 contain the message of "This is file 1." and "This is file2".

4. Following commands should be supported in your system：
   a) Create a file：**createFile fileName fileSize (10 marks)**
      i.e.：createFile /dir1/myFile 1024 (in bytes)
      if fileSiz > max file size, print out an error message.
      The file content is filled up with filename + repeated digits from 0 - 9
      i.e.: "myFile01234567890123456789012345678901234567890123…."
   b) Delete a file：**deleteFile** filename **(10 marks)**
      i.e.：deleteFile /dir1/myFile
   c) Create a directory：**createDir (5 marks)**
      i.e.：createDir /dir1/sub1

d) Delete a directory：**deleteDir (5 marks)**

i.e.: deleteDir /dir1/sub1 （The current working directory is not allowed to be deleted）

e) Change current working direcotry：**changeDir (5 marks)**

i.e.: changeDir /dir2

f) List all the files and sub-directories under current working directory：**dir (5 marks)**

You **also need to list at least two file attributes**. (i.e. file size, time created, etc.)

g) Copy a file : **cp (5 marks)**

i.e.: file1 file2

h) Display the usage of storage space：**sum (10 marks)**

Display the usage of the 16MB space. You need to list how many blocks are used and how many blocks are unused.

i) Print out the file contents: **cat (10 marks)**

Print out the contents of the file on the terminal

i.e: cat /dir1/file1

5. **quit**，exit the program and release all the memory occupied；**(5 marks)** **You do not need to save the contents in memory onto hard disk**

Submissions

This project is an individual task. NO COPY & PASTE

Submissions include:

Source code

A README file to explain how to execute your code and how to use your program.

A Report to explain your design of the project (**especially, the layout of your file system, the design of your i-node**) and what you have learned

Zip all the files as a single zip file: studentID+NAME.zip

All zip files should be burned on a CD ROM

Deadline:

The 1st day of the coming semester (arrive on my hand)

Marking Schema

Report:	**20**
Submission structure	**5**
Readme	**5**
Functionalities:	**70**
Total:	**100**

Try to provide more functions as specified in this document. You will earn more bonus marks.

Good Luck!

Happy New Year & Have a Nice Holiday!