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Exercises „Operating Systems and Distributed Systems 2“
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Technology
Arts Sciences
TH Köln

Local File Systems

Exercise 1: FAT-Based Approach

- Given: A (very small) hard disk with blocks 0 - 11.
  - File A.TXT is stored in disk blocks 3, 1, 7 (in this order).
  - File B.DOC is stored in disk blocks 2, 11, 0, 10 (in this order).
  - Disk block 5 is damaged.
  - The remaining blocks are free.
  - Block length: 1 KByte (= 1024 Byte).
- Do the following:
  - Draw a directory that contains A.TXT and B.DOC.
    - Show for each file only the file name, the number of the first physical disk block, and a possible length in bytes.
  - Draw the corresponding FAT.
  - Assume that byte no. 3525 of file B.DOC shall be accessed:
    - How does the search for this byte proceed?
    - Which disk block and offset (= byte number within the block) result from the search?
  - What happens
    - when A.TXT is shortened by one block?
    - when B.DOC is extended by one block?
    - when B.DOC is deleted?

p.t.o.

Exercise 2: Inode-Based Approach

- Given: Two files A.TXT and B.DOC
  - File A.TXT is stored in disk blocks 3, 1, 7 (in this order).
  - File B.DOC is stored in disk blocks 2, 4, 5, 0 (in this order).
  - Block length: 1 KByte (= 1024 Byte).
- Do the following (using the traditional UNIX implementation):
  - Draw a directory containing A.TXT and B.DOC.
  - Draw the corresponding inodes.
    - Draw only those portions that specify
      a possible length in bytes and all the numbers of the physical disk blocks
    - Let *m* (the number of direct block addresses in the inode) be 10
  - Assume that byte no. 2100 of file A.TXT shall be accessed:
    - How does the search for this byte proceed?
    - Which disk block and offset (= byte number within the block) result from the search?
  - What happens
    - when A.TXT is shortened by one block?
    - when B.DOC is extended by
      - one block?
      - and eight more blocks?
      - (and how would this be done with the modern implementation based on "extents"?)
    - when B.DOC is deleted?