

Why so slow on hard disk drive?

Problem 1: in the original Unix File System, blocks were too small (512 bytes)

- File index too large
- Require more indirect blocks
- Transfer rate low (get one block at time)

Problem 2: unorganized freelist

- Consecutive file blocks not close together - pay seek cost for even sequential access
- Aging - becomes fragmented over time

Problem 3: poor locality

- inodes far from data blocks
- inodes for directory not close together - poor enumeration performance
e.g., "ls", "grep foo *.c"

FFS - Fast File System

- ➡ Design FS structures and allocation policies to be "disk aware"
Designed by a Berkeley research group for the BSD UNIX