Lecture 39

25 October 2018 11:39

# Storage and File systems

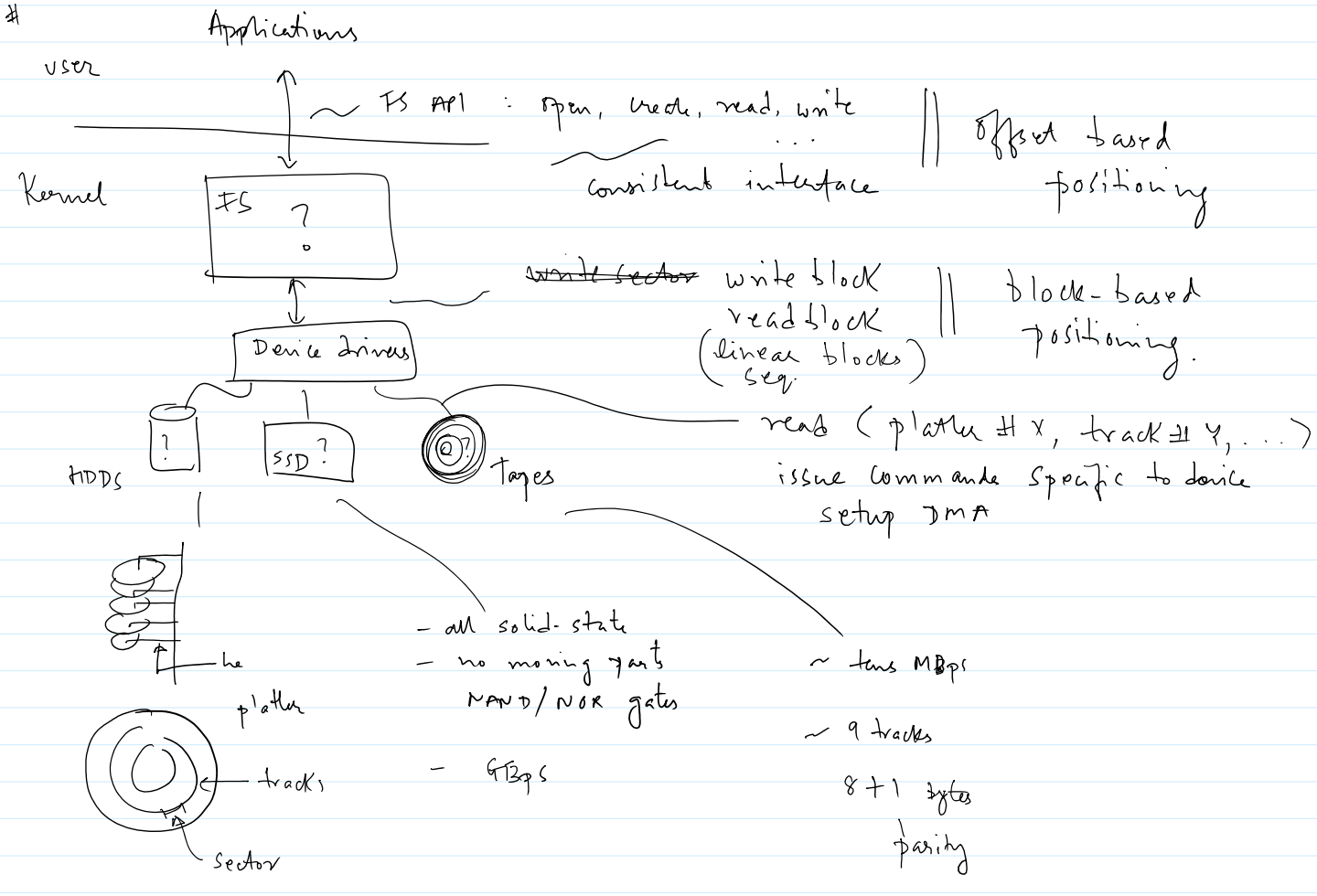
- the need for "persistence" — store & retrieve on power cycle.

programs, DBs, input/output data, ...

- primary OS mechanism for persistence is via the file abstraction.
- file system "manages" / provides / implements the file abstraction.

## What is a file?

- persistence, sequential object w/ an offset for indexing.
- name, size, permissions, timestamps, identifier
- operations/interface: open, close, read, write, seek.
  - delete (?)
    - delete contents of a file.



— \ sector

- each platter is magnetically coated.
  └ orientation encodes bits.

— ~ 100 MB/s

~ 5000 — 15000 rpm
— seek time: 2ms ~ 20ms

parity
— reliable.

# What does a FS do?

(i) provide a std. file abstraction across device types.

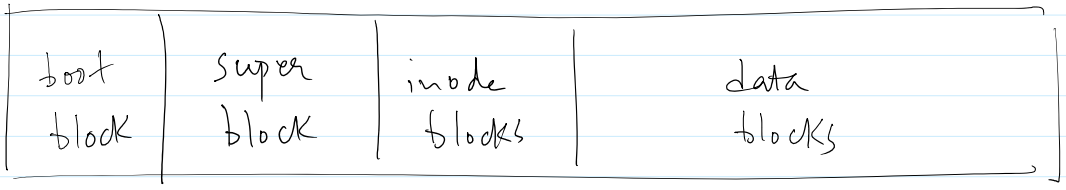
(ii) implement the file abstraction.

(iii) efficiently implement the abstraction. { caching; disk layout aware IO scheduling; read-ahead.

# What a typical file system looks like?

- metadata & data } both of which reside on disk.
- abstraction metadata: FCB (file control block) — inode (index node)

physical disk




meta data for the file system

meta-data for files

content of files