

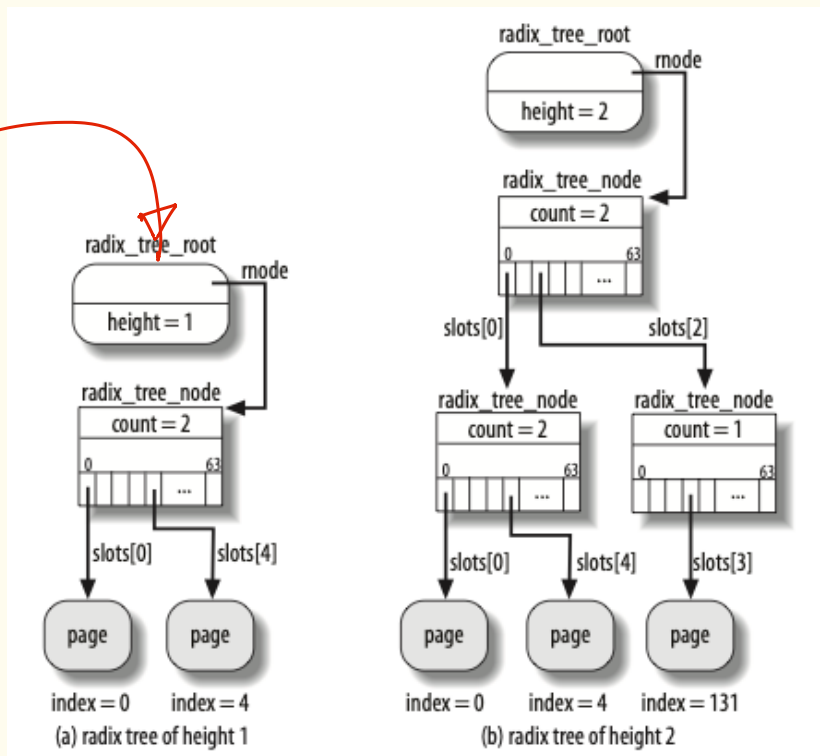
CS 219

Lecture 37

① Linux has sophisticated data structures to manage OS objects.

- arrays
- lists
- merkle trees
- hash tables

page
cache
ptr.
stored
in the
inode.



query as offset for access.

① Lab 12

peek into the world of device drivers.

① Lab 11

~ FS < 1
2

③ 22nd - Endsem

23rd - LQ5

24th - !OS

(2) multiple types of devices for OS to support!



linux/unix-like systems —

major & minor number for every device.

device type

↓
device driver

unique device type

instance

two
disks
devices

/dev/sda1

8, 1

/dev/sda2

8, 2

— may have
different
FS
for storage
& mgmt.

\$ ls -l /dev

\$ mount /dev/sda2 /home/untrusteddata/ -f ext2

└─ attach the root node of disk

to a directory in current directory
hierarchy

& integrate/expand the directory
structure.

vfs : virtual file system

every FS

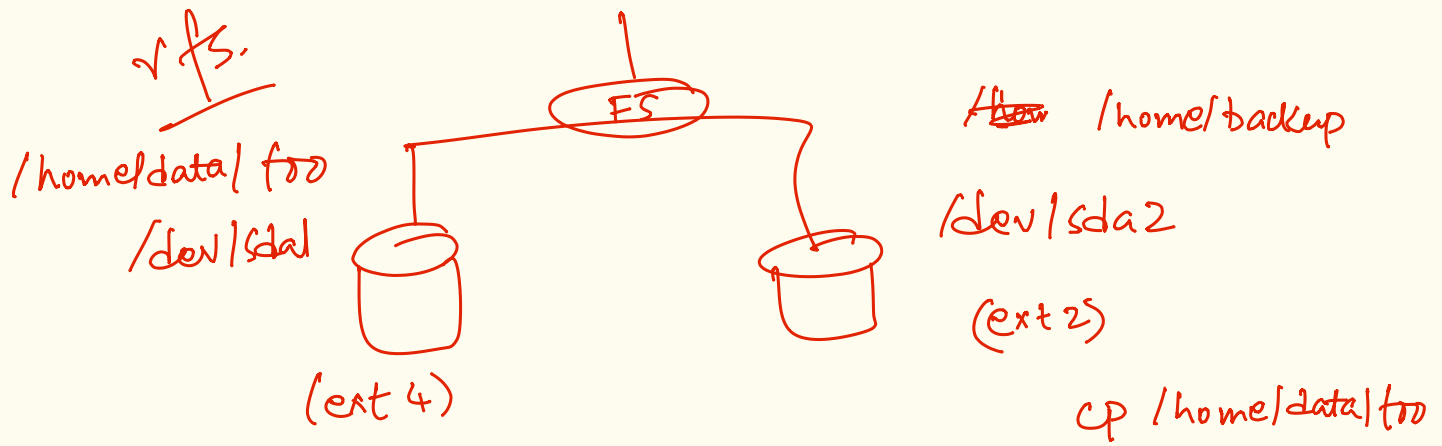
~ inode

dentry

sb

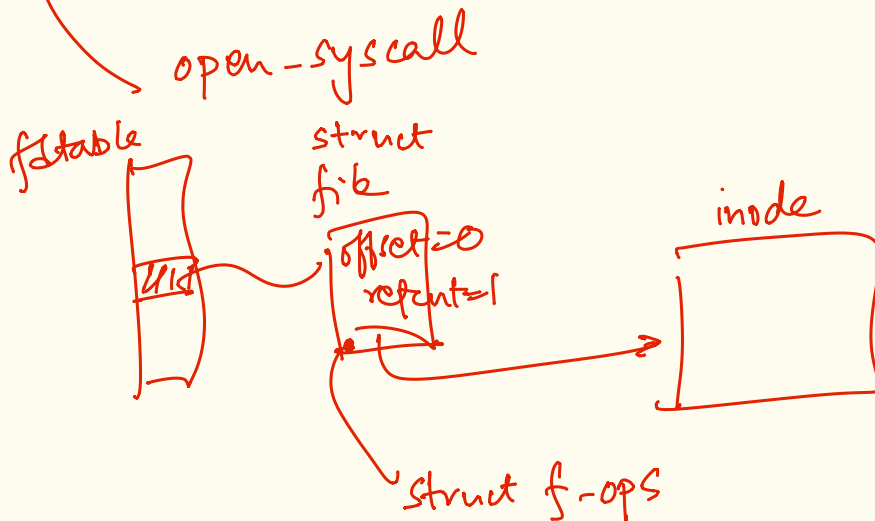
fops (exportable)

(3)



fd1 = open
read(fd1, buf, ...)
close(fd1)

fd2 = open
write(fd2, buf)
close(fd2);



read
write
open
close

} FS specific functions.

fd → f → f-ops

④ "everything is a file!" — in UNIX / linux

files directories devices pipe sockets
network
end points

