

fs features

- consistency — fsck, journaling

offline file system introspection
reactive

transactions
& logs.

low
probabilistically

reliability — make the unreliable disk

look reliable.

operate as

+ checksums & replication.

+ single disk

+ multiple copies of each block.

+ (slow based)

~ replicate meta-data primarily.

① RAID — redundant array of independent disks.
inexpensive

RAID 0

performance

stripping

disk0



B0
B2
B4
...

FS
actions

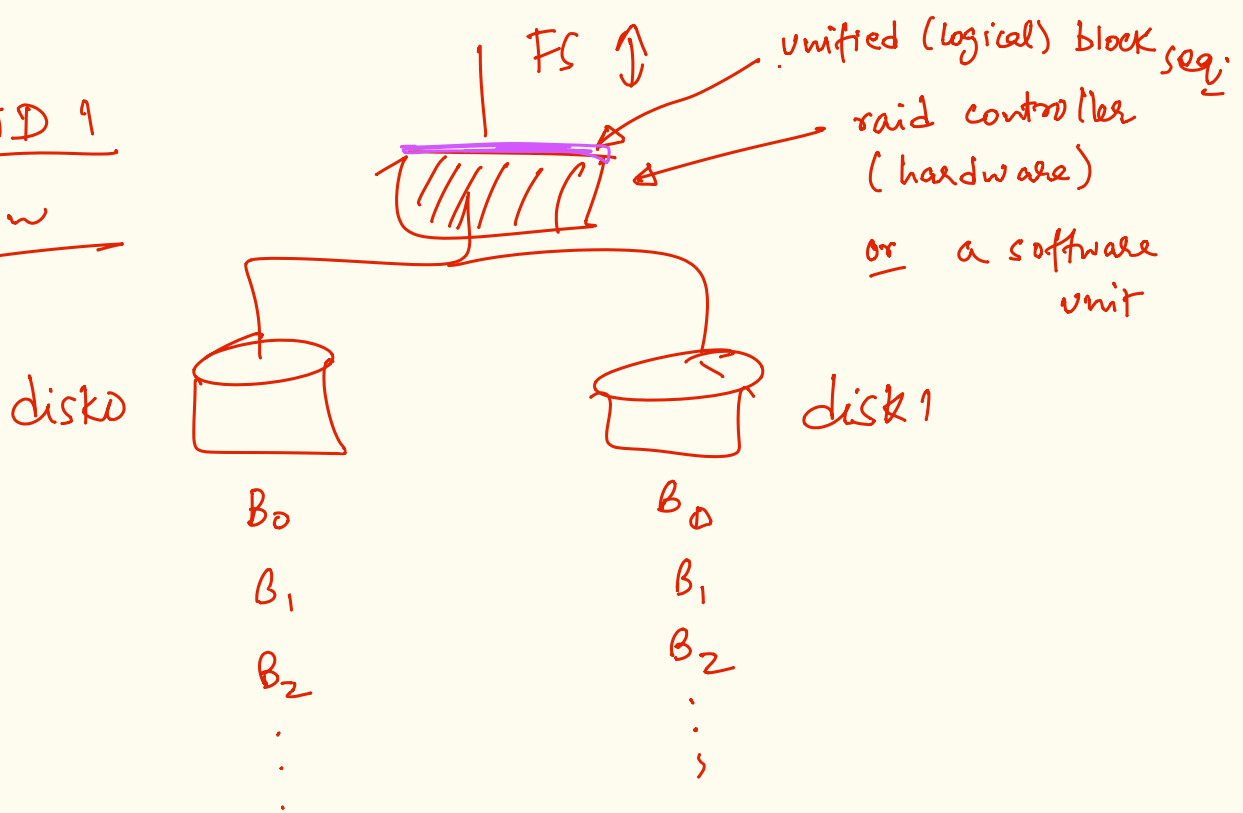


disk1

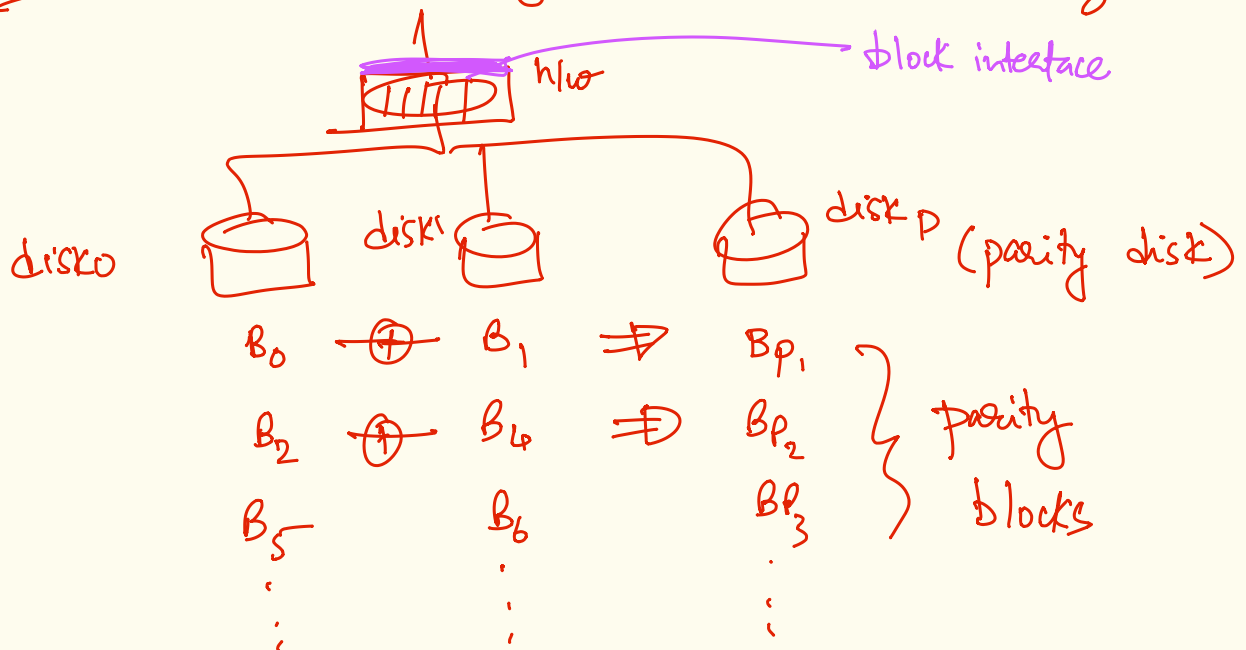
B1
B3
B5
...

RAID 1

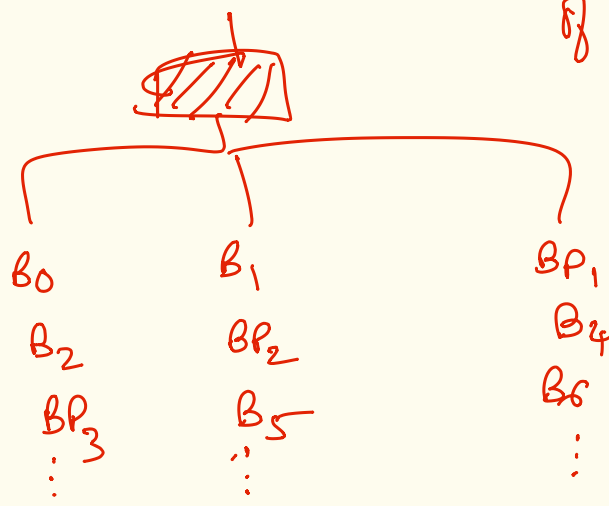
replication



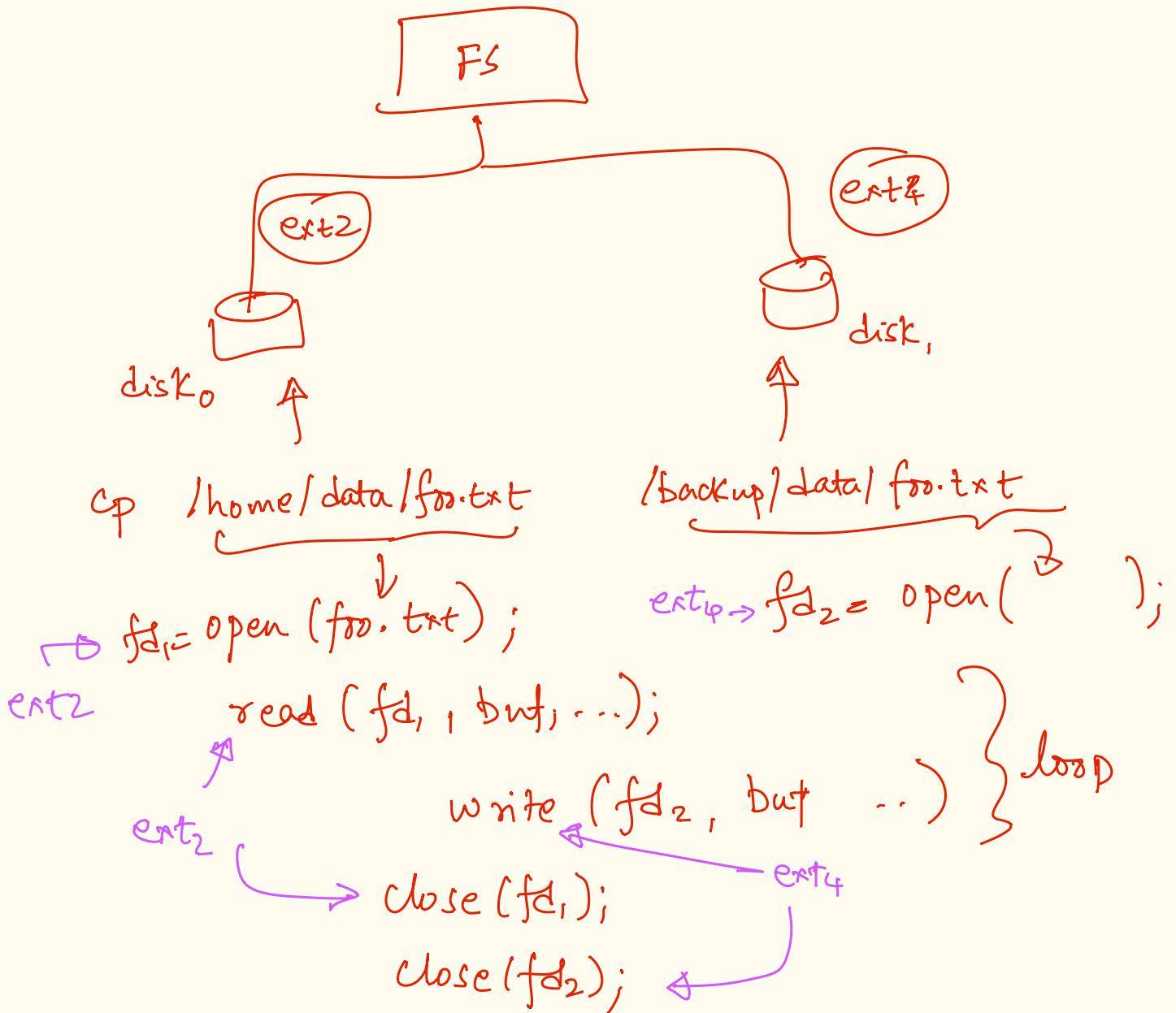
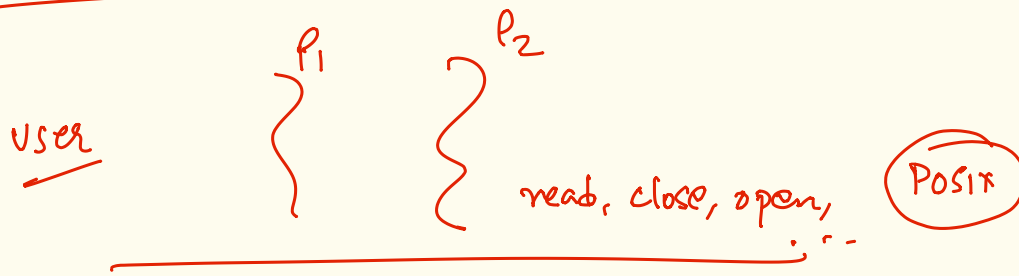
RAID 4 ~ striping + error detection/fixing



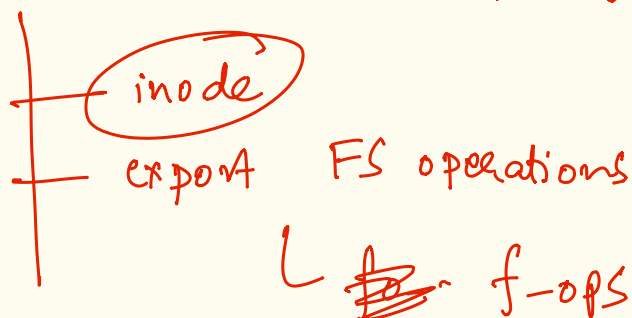
RAID 5 $\Rightarrow$ RAID 4 + load balancing / spread of the parity block



standardized interfaces



* Linux: VFS — virtual file system spec.



open file



struct file {

~~file~~ struct f_ops



← pointers
for
FS specific
operation

read(fd, ...)

↳ struct file

↳ read — invoked.