OS Quiz 2018113012

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Q1) How RAID level 3 and RAID level 4 improve reliability...

Sol> RAID level 3 is the bit-interleaved parity organisation. In it the disk controllers can detect whether a sector has been read correctly. The bits of a failed sector can be recovered by computing the parity of the remaining bits, thus increasing reliability. RAID level 3 is also less expensive as compared to level 2. RAID level 3 needs just one parity disk, and hence reduces the storage overhead problem while keeping/maintaing the same transfer rate.

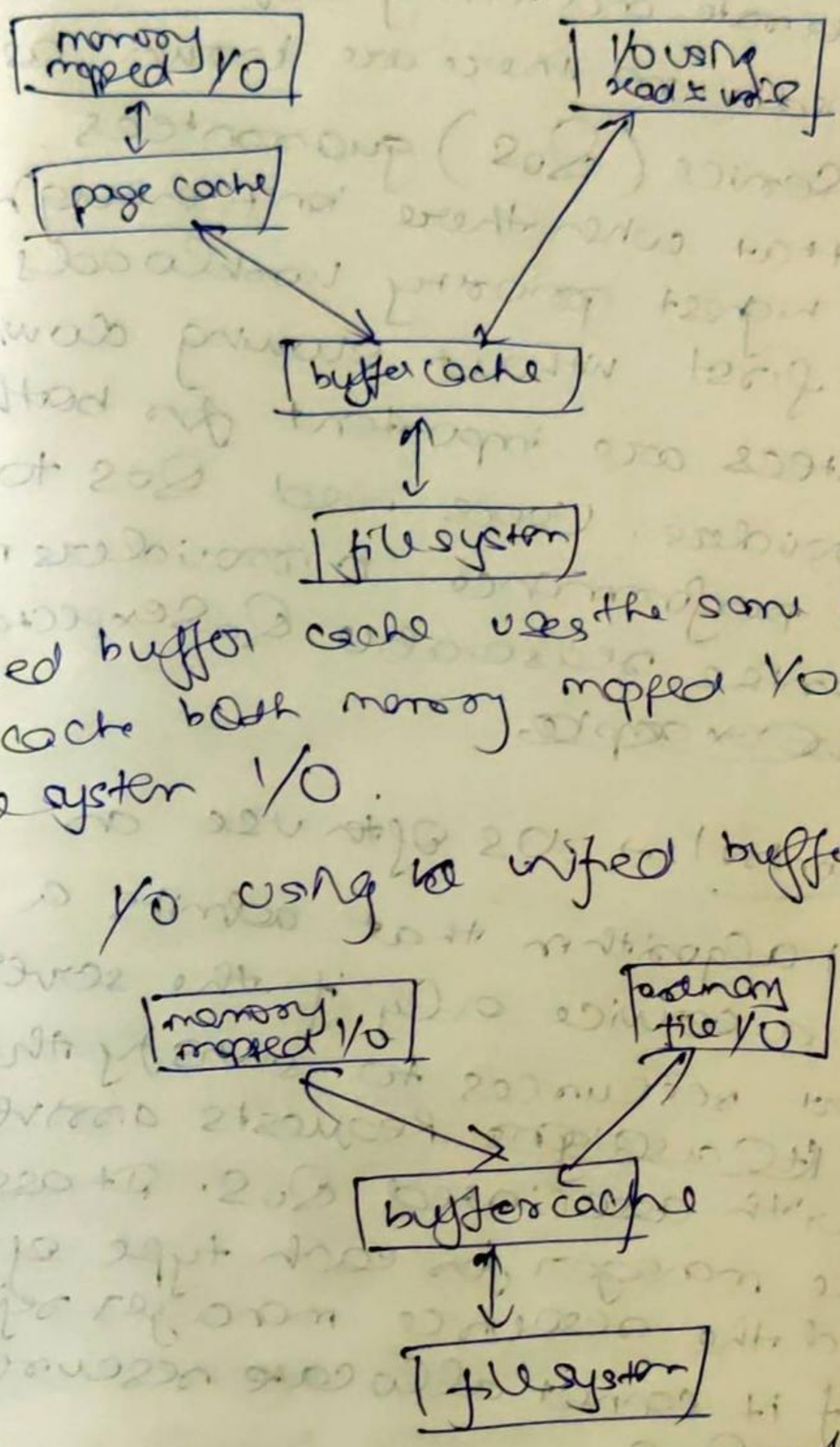
RAID level 4 is the block interleaved parity organisation. It uses block level stripping instead of bit level stripping. Similar to RAID 3, if one ~~block~~ disk fails then the parity block (which is kept on a separate disk) and other blocks can be used to recover the failed disk.

It writes the results in two writes: one for block and one for corresponding parity.

It allows multiple read requests to be carried out in parallel. Also like RAID 3 it provides lesser storage overhead which lowers further as more disks are added.

Q2) why do we want the files & devices to have a unified interface?

Q1) I/O without unified buffer cache



A unified buffer cache uses the same page cache to cache both memory mapped I/O & ordinary file system I/O.

I/O using a unified buffer cache

Also if we have a unified interface then read/write from I/O devices can be effected in the file system synchronously with no inconsistency in the values stored in memory & disk. Hence a unified interface allows files devices to be modelled as files hence reducing complexity

Q3) Briefly explain the importance of QoS and admission control?

Sol) QoS → The operating system must guarantee the specific data rate and timing requirements of continuous media. and these are known as Quality-of-Service (QoS) guarantees. QoS ensures that when there isn't enough capacity, the highest priority workloads get through first without slowing down. QoS guarantees are important for both users & providers. Users need QoS to ensure good performance & providers need to just promise reasonable QoS expectations ~~(If allowed for example~~

Admission control → OS after use an admission control algorithm that admits a request for a service only if the server has sufficient resources to satisfy the request. It ~~assigns~~ Requests arrive ~~If allows~~ with associated QoS. It assigns a resource manager for each type of resource and the resource manager rejects a service if it cannot allocate resources to meet the QoS

Q4) In UNIX, system administrator (root) can know the password of user? True/False

False.

Root can view /etc/shadow but these passwords are stored in an encrypted format and hence he cannot know it can never decrypt them. Guessing the password from the hash value (MD5) is not possible without a decrypting software. Root can change the password though

(8) Briefly explain the following consistency semantics with positive & negative.

i) UNIX semantics → Unix file system or write to an open file visible immediately to other users of the same open file. Sharing of the file pointer takes place to allow multiple users to read/write concurrently. → Adv
But as the file which is shared is associated with a single physical image that is accessed as an exclusive resource. This single image causes delays in user processes → DisAdv

ii) session semantics → Andrew file system (AFS) implements session semantics using complex remote file sharing. The writes to an open file by a user are not visible immediately to other users that have the same file open. These writes are only visible to sessions starting after the file is closed. A file is associated with multiple images hence there is no delay and multiple users can access concurrently on these images