

Name: \_\_\_\_\_ (First name first)

Score: \_\_\_\_\_

COSC 6360

QUIZ #3

AUGUST 1, 2011

**Closed book.** You can have with you one single-sided 8½ by 11 sheet of notes.

1. What is the major advantage of RAID level 5 disk arrays over RAID level 3 arrays? (10 points)

They allow parallel read and write accesses to the disks while RAID level 3 arrays do not. \_\_\_\_\_

What is the major advantage of RAID level 6 disk arrays over RAID level 5 arrays? (10 points)

Unlike RAID level 5 arrays, RAID level 6 arrays tolerate double disk failures without data loss. \_\_\_\_\_

2. Sprite LFS validates segments by placing segment summary blocks at the end of each segment. What is wrong with this approach? (10 points)

It assumes that the last blocks of a segment will always be written last to disk. This is not true because \_\_\_\_\_

disk controllers are known to reorder disk writes. \_\_\_\_\_

3. Give a rough estimate of the **write cost** of a log-structured file system whose disk utilization is 75 percent? (10 points)

Using the formula  $2/(1-u)$ , we get  $2/(1-0.75) = 2/0.25 = 8$ . \_\_\_\_\_

4. Which system parameter has the most impact on the performance of an asynchronous journaling file system? (10 points)

Number of updates batched together. \_\_\_\_\_

5. What does *close-to-open consistency* guarantee? (10 points)

Close-to-open guarantees that a client opening a file will always see the changes that were made by the process that closed that file last.

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6. What is the major disadvantage of AFS and Coda *callbacks*? (10 points)

They can be lost.

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How do AFS and Coda address that issue? (10 points)

Clients contact the server every few minutes

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7. What is the purpose of *ghost hints* in the Blue file system? (20 points)

When BlueFS accesses a file that is on the server and on the local disk and that disk is powered down, Blue FS accesses the file copy that is on the server to avoid powering up the local disk. In addition, it uses *ghost hints* to measure the penalty for not using that disk. When sum of ghost hints exceeds the cost of powering up the disk, the disk is powered up.

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