COSC 6360   FINAL EXAMINATION   AUGUST 11, 2006

This exam is **closed book**. You can have **two pages** of notes. UH expels cheaters.

1. Which of the following statements are *true* or *false* (2 points) and *why*? (3 points)

    a)   Coda servers are *stateless*.

       False, they keep track of *callbacks*

    b)   NFS puts *performance* ahead of *reliability*.

       False, they are stateless to ease recovery from server crashes even though statelessness harms performance.

    c)   Journaling file systems do not need an *i-node map*.

       True, they keep their i-nodes at fixed addresses.

    d)   The NFS file system uses *soft update*s to reduce the overhead of metadata updates.

       False, NFS servers immediately write all updates on disk.

    e)   Sprite LFS stores the addresses of its *i-node map* blocks in its *checkpoint area*.

       True, this is how they are retrieved at boot time..

2. What steps does BSD-LFS take to check the consistency of the file system at boot time? (2×5 points)

3. What is the major motivation for AFS callbacks? (5 points) What is their major disadvantage (5 points) and how does AFS solve that problem? (5 points)

AFS introduced callbacks in order to _____

    _____

    _____

The main disadvantage of callbacks is that _____

    _____

The solve that problem, _____

    _____

    _____

4. Why are RAID levels 2 and 4 *never used?* (2×5 points)

RAID level 2 is never used because _____

_____

_____

RAID level 4 is never used because _____

_____

_____

5. What is the main difference between a *lease* and a *callback*? (5 points))

Unlike callbacks, leases _____

_____

6. A RAID Level 5 system consists of five disk drives, namely, d_0, d_1, d_2, d_3 and d_4. Assuming that we want to update a block b_3 on drive d_3, How many read and writes are needed to update a block b_3 on drive d_3 **assuming that we already have in memory the old value of block b_3?** (2×5 points)

We would need _____ reads and ____ writes

Use the space below to detail your reasoning for possible partial credit:

7. What are the respective advantages of journaling file systems using (a) synchronous writes and (b) buffered writes? (2×5 points)

Journaling file systems using synchronous writes _____

_____

_____

Journaling file systems using buffered writes _____

_____

_____

8. Define the write policy of the *Blue file system* (5 points) and shows what it does to (a) minimize data transfers (5 points) and (b) allow disk drives to spin down as much as possible. (5 points)