

NAME: _____ (FIRST NAME FIRST)

SCORE: _____

COSC 6360

QUIZ #5

MAY 12, 2010

This exam is closed book. You can have one page of notes. All questions are worth 20 points.

1. What are the proper replication levels for a FARSITE file system that is to tolerate two simultaneous Byzantine failures?

Each directory group should have at least seven members and each file should have at least three replicas.

2. How can we **adjust the average size of chunks** detected by the LBFS chunk detection algorithm?

By increasing or decreasing the number of least significant bits of the Rabin fingerprint used to detect chunk boundaries.

3. How does the Blue file system ensure that “[n] o data is lost when a portable device is lost, stolen, or damaged”?

By requiring all writes to be forwarded to the BFS server.

4. What is **disk scrubbing**? Which feature of Pergamum reduces the need for frequent full-disk scrubs?

Disk scrubbing periodically verifies that a given range of disk blocks can be retrieved and reconstitutes the contents of the blocks that it could no access due to an irrecoverable read error. Pergamum intra-volume parity reduces the need for frequent disk scrubs as it provides an additional way to reconstitute the contents of the blocks that caused irrecoverable read errors.

5. Why may a Zyzzyva replica sometimes store **two checkpoints**? How does it know when it is time to discard one of them?

Zyzzyva replicas have two checkpoints whenever their latest checkpoint contains non-committed history. (That checkpoint is then called a tentative checkpoint.) As a result, the replica must keep its previous checkpoint until the new checkpoint only contains committed history. At that time the replica discard the older checkpoint.