

NAME: \_\_\_\_\_ (FIRST NAME FIRST) SCORE: \_\_\_\_\_

**COSC 6360**

**FINAL EXAMINATION**

**MAY 6, 2008**

THIS EXAM IS **CLOSED BOOK**. YOU CAN HAVE ONE SHEET (I.E., TWO PAGES) OF NOTES.

1. What is the difference between a *lease* and a *callback*? (5 points) What is happening when the server cannot contact the client holding a lease for a file that another process wants to access? (5 points)
2. How does LBFS determine chunk boundaries? (10 points)
3. What is the difference between a *Byzantine failure* and a conventional failure? (5 points)
4. What is a *Sybil attack*? (5 points) Why is FARSITE specially vulnerable to these attacks? (5 points) Which steps does FARSITE take to protect itself against them? (5 points)
5. What are the two techniques used by FARSITE to *protect file contents* against malicious attempts to access them without authorization, to corrupt them and delete them? (2×5 points)
6. How does BlueFS select the device from which to read a given file? (5 points) How does it ensure that the selected device actually contains the file? (5 points) When does it make sense to obtain the file data from two different sources? (5 points for a good example)
7. What is the purpose of the *CRUSH function* in the Ceph distributed file system ? (5 points) Why is it publicly available? (5 points) How does it simplify the design of the Ceph metadata server cluster? (5 points)
8. Which steps does Ceph take to ensure the *safety* of data updates? (2×5 points)
9. What is the special role assigned by Zyzzyva to its *clients*? (2×5 points)