Name: _Key_____ (First name first) **Score:** _____

COSC 6360 **QUIZ #4** **NOVEMBER 15, 2010**

Closed book. You can have with you one single-sided 8½ by 11 sheet of notes. Each question is worth 20 points.

1. Consider a distributed file system implementing ***close-to-open consistency***. Assuming that

- Alice opens the file at 9:30 AM modifies it and closes it at 10:15 AM,
- Bob opens the file at 10:00 AM modifies it and closes it at 10:25 AM,
- Carol opens the file at 10:20 AM, modifies it and closes it at 10:45 AM,

Which of these three users would see his or her changes actually incorporated in the final version of the file?

Alice and Carol. (Bob's changes would have been overwritten by Carol's changes.) _____

2. Two replicas of the same CODA file are identified by the following metadata

$LSID_A$ = 544679 $CVV_A = \{v_A = 347, v_B = 346\}$
$LSID_A$ = 379228 $CVV_A = \{v_A = 346, v_B = 347\}$

What can you say about the state of that file?

The file is in an INCONSISTENT state. _____

3. What is the purpose of BitTorrent ***rarest first*** policy? When does it ***not*** apply?

BitTorrent rarest first policy requires peers to download first the pieces that the fewest of their own peers have. This policy ensures that peers have the pieces that most of their peers want.

It does not apply to new peers that have not yet downloaded an entire piece.

4. How does FARSITE store ***users' secret keys***? Why?

FARSITE encrypts the secret keys of its users with a symmetric key derived from user password and stores them in a globally-readable directory. It does it because these keys are typically too long to be memorized by the user.

5. Explain how the Blue file system saves energy by aggregating writes to local disks.

Aggregating writes to local disks saves energy by amortizing disk power state transitions across multiple writes.

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1. Consider a distributed file system implementing ***close-to-open consistency***. Assuming that

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Which of these three users would see his or her changes actually incorporated in the final version of the file?

Bob and Carol. (Alice's changes would have been overwritten by Bob's changes.)

2. Two replicas of the same CODA file are identified by the following metadata

Replica A: $LSID_A = 544679$ $CVV_A = \{v_A = 348, v_B = 346\}$
Replica B: $LSID_B = 379228$ $CVV_B = \{v_A = 346, v_B = 346\}$

What can you say about the state of the file?

The file is in a CONSISTENT state and replica A hold the MOST RECENT version of the file.

3. How does FARSITE store ***users' secret keys***?

FARSITE encrypts the secret keys of its users with a symmetric key derived from user password and stores them in a globally-readable directory. It does it because these keys are typically too long to be memorized by the user.

4. What is the purpose of BitTorrent ***random first piece*** policy? When does it apply?

BitTorrent random first policy requires new peers to select the first pieces to download at random until they have obtained a complete piece. This policy ensures that all new peers have the pieces that most of their peers want.

5. Explain how the Blue file system saves energy by integrating flash drives in its storage hierarchy.

The Blue FS attempts to save energy by powering down the local disk drive whenever they are not active. Redirecting read requests to a flash drive reduces the number of disk accesses and let these disks remain inactive for longer periods of time.