

Exercise 4 - File System Consistency

Started: Oct 14 at 4:06am

Quiz Instructions

Question 1

1 pts

Consider the following representation of a file system on a disk. Assume both Inodes and Data blocks are indexed starting at 0.

Inode Bitmap (inode_bm[i])				Data Bitmap (data_bm[i])				Inodes (I[i])			
0	1	0	0	0	0	0	0	I[1]			
0	0	0	0	1	0	0	0				

Suppose we create a new empty file in the first block of the directory that Inode I[1] represents. Check all the potential changes to the above picture that result in a correct final state after this operation.

- ☐ New inode used at I[2]
- ☐ inode_bm[2] set to 1
- ☐ data_bm[4] set to 0
- ☐ Inode I[1] modified
- ☐ DB[4] modified
- ☐ inode_bm[1] set to 0
- ☐ New data block at DB[0]
- ☐ data_bm[0] set to 1

Question 2**1 pts**

Consider the following representation of a file system on a disk. Note that [v1] means version 1 of the block or Inode. Assume both Inodes and Data blocks are indexed starting at 0.

Inode Bitmap				Data Bitmap				Inodes			Data	
0	0	0	1	0	0	0	0				I[3]	
0	0	0	0	1	0	0	0					

Suppose the inode I[3] represents a file of size 4096 bytes (exactly one block). Suppose we write 20 bytes to the end of the file. Check all the potential changes to the above picture that result in a correct final state after this operation.

- ☐ New inode used at I[2]
- ☐ inode_bm[2] set to 1
- ☐ data_bm[4] set to 0
- ☐ Inode I[3] modified
- ☐ D[4] modified
- ☐ inode_bm[3] set to 0
- ☐ New data block at DB[3]
- ☐ data_bm[3] set to 1

Question 3**1 pts**

For the remaining questions, assume we are performing the operation as in question 2. Check the boxes that most closely explains what happens if a crash occurs after only the specified block or blocks are written to disk.

Note that a potential problem may occur only after a number of other file systems have taken place.

Only the data block is written to disk

- ☐ No inconsistency (it simply appears that the operation was not performed)
- ☐ Data leak (data block is lost for any future use)
- ☐ Inode leak (Inode is lost for any future use)
- ☐ Multiple file paths may point to same inode
- ☐ Something points to garbage
- ☐ Multiple inodes may point to same data block
- ☐ Multiple of the problems listed above

Question 4

1 pts

Only the inode is written to disk

- ☐ No inconsistency (it simply appears that the operation was not performed)
- ☐ Data leak (data block is lost for any future use)
- ☐ Inode leak (Inode is lost for any future use)
- ☐ Multiple file paths may point to same inode
- ☐ Something points to garbage
- ☐ Multiple inodes may point to same data block

Question 5**1 pts**

Only the data block bitmap is written to disk.

- ☐ No inconsistency (it simply appears that the operation was not performed)
- ☐ Data leak (data block is lost for any future use)
- ☐ Inode leak (Inode is lost for any future use)
- ☐ Multiple file paths may point to same inode
- ☐ Something points to garbage (or may eventually point to garbage)
- ☐ Multiple inodes may eventually point to same data block

Question 6**1 pts**

Only the inode and the data block bitmap are written to disk

- ☐ No inconsistency (it simply appears that the operation was not performed)
- ☐ Data leak (data block is lost for any future use)
- ☐ Inode leak (Inode is lost for any future use)
- ☐ Multiple file paths may point to same inode
- ☐ Something points to garbage (or may eventually point to garbage)
- ☐ Multiple inodes may point to same data block

Question 7**1 pts**

Only the inode and the data block are written

- ☐ No inconsistency (it simply appears that the operation was not performed)
- ☐ Data leak (data block is lost for any future use)
- ☐ Inode leak (Inode is lost for any future use)
- ☐ Multiple file paths may point to same inode
- ☐ Something points to garbage (or may eventually point to garbage)
- ☐ Multiple inodes may point to same data block

Question 8

1 pts

Only the data block bitmap and the data block are written.

- ☐ No inconsistency (it simply appears that the operation was not performed)
- ☐ Data leak (data block is lost for any future use)
- ☐ Inode leak (Inode is lost for any future use)
- ☐ Multiple file paths may point to same inode
- ☐ Something points to garbage
- ☐ Multiple inodes may point to same data block

Quiz saved at 5:07pm

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