File Systems and Process Control

CSL301 - Operating System
Quiz

November 19, 2025

Fill in the Blanks

Q1: When a process calls `fork()`, the parent and child share the same open file table entry, which means they also share the same _____.

Q2: The `unlink()` system call removes a name from a directory; the file's data is only deleted when the inode's _____ reaches zero.

Q3: When mounting a file system, the OS first reads the _____ to get metadata about the entire file system, like its size and type.

Q4: A symbolic link points to a pathname, and can become a _____ if the target file is deleted.

Q5: The `lseek()` system call allows for random access within a file, but it does not perform a physical _____.

Short Descriptive Questions

Q1: What is the difference between what an inode bitmap tracks and what a data bitmap tracks?

Q2: What happens if you have two hard links to a file (file1 and link1) and you delete file1? Can you still access the content via link1? Why?

Q3: Explain the combined effect of using the O_CREAT and O_TRUNC flags together in an open() system call.

Q4: The slides mention that a potential issue with I/O interrupts is "livelock." Briefly describe what this means.

Coding-Related Questions

Q1: Given the following commands, what would you expect the inode number for file1 and link1 to be after the ln command is run?

```
echo "some data" > file1
ln file1 link1
ls -i file1 link1
```

Q2: A slide shows the following pseudo-code for device interaction:

```
While (STATUS == BUSY)
    ; // wait
Write data to DATA register
Write command to COMMAND register
```

What is this I/O technique called, and what is its main disadvantage?

Coding-Related Questions

Q3: After running the commands below, what will be the output of the final cat symlink1 command, and why?

```
echo "source content" > source1.txt
ln -s source1.txt symlink1
rm source1.txt
cat symlink1
```

Submission Checklist

Good Luck!