CS314: Lab Assignment 9

B Siddharth Prabhu
200010003@iitdh.ac.in

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1 Problem Statement

In this lab, we must trace the working on the mfs file system, only for the file system mounted at `/home` . Statements are to be printed as follows, accompanied by roll number.

- Whenever a file is created, print `file created: <inode_number>`.
- Whenever a file is read, print `file read: <inode_number>; nbytes = <nbytes>; offset <offset>`.
- Whenever a file is written, print `file write: <inode_number>; nbytes = <nbytes>; offset = <offset>`.
- Whenever a file is deleted, print `file deleted: <inode_number>`

2 File Creation

To find the location where the file is created, and to give the corresponding output, we modify `open.c` . This is located in the directory with absolute path `/usr/src/minix/servers/vfs`. In the part of the code where the error code is 'OK', we The following code is added into the function `common_open()` :

```
printf("Minix (R.No.:03) file created: %llu\n", vp->v_inode_nr);
```

Note that screenshot of this file creation message is included in the 'Screenshots' section of this report.

3 File Reading

To print the required message for file read, we must add the following code in `read_write()` function of `read.c` , which is in the directory with absolute path `/usr/src/minix/servers/vfs`:

```
printf("Minix (R.No.:03) file read: %llu; nbytes = %zu; offset = %llu\n",
                    vp->v_inode_nr, size, f->filp_pos);
```

Here, we make sure that the flag `rw_flag` is set to 'READING'. Note that screenshot of this file read message is included in the 'Screenshots' section of this report.

4 File Writing

To print the required message for file read, we must add the following code in `read_write()` function of `read.c` , which is in the directory with absolute path `/usr/src/minix/servers/vfs`:

```
printf("Minix (R.No.:03) file write:  %llu; nbytes = %zu; offset = %llu\n",
                    vp->v_inode_nr, size, f->filp_pos);
```

Here, we make sure that the flag `rw_flag` is set to 'WRITING'. Note that screenshot of this file write message is included in the 'Screenshots' section of this report.

5 File Deletion

First we must lookup inode of the file to be deleted, set locks related to the vnode to READ, to prevent other processes from accessing it, advance the directory pointer, and then print the deletion message using the code below. All of this occurs in `do_unlink` function of `link.c`, which is in the directory with absolute path `/usr/src/minix/servers/vfs`.

```
printf("Minix (R.No.:03) file deleted:  %llu\n", vp->v_inode_nr);
```

Finally, the corresponding vnode lock is unlocked, followed by freeing of the vnode object, i.e., the record of the file on the file system. Note that screenshot of this file deletion message is included in the 'Screenshots' section of this report.

6 Screenshots

Everything happens to fit in one screenshot!

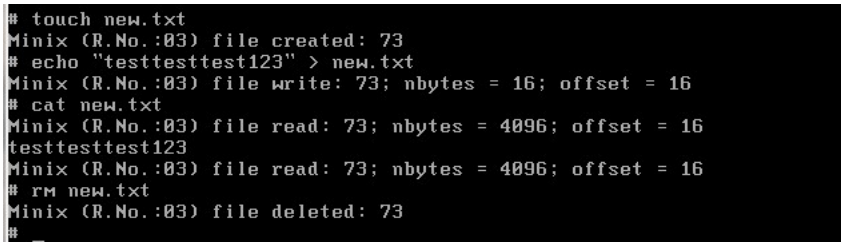

Figure 1: Output