

Assignment 9

Operating Systems Lab

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Abstract

In this assignment we have to implement immediate files in the Minix File System, for files of size up to 32 bytes mounted at `/home`.

Functionalities Implemented

- **File Creation:** Create new file as an immediate one. When a file grows beyond 32B, then it can become a regular file.
- **File Reading:** If the file is an immediate file, respond with the inode structure contents. If not, it follows the default behavior of looking up zones.
- **File Writing:** The task is similar to read. The care has to be taken to ensure that if inode structure has to be written, then the new file size is still within 32B. When a regular file shrinks to less than 32 bytes, there is no need to come back to immediate mode.
- **File Deletion:** The deleting of immediate files does not require any handling of zones.

Screenshots

```
Minix: PID 358 exited
# pwd
/home
# touch new.txt
Minix: PID 359 created
Minix: Allotted Quantum: 200 ms
Minix: Used Quantum: 200 ms
Minix: PID 109 swapped in
Minix: File Created: 75
Minix: PID 359 exited
#
```

Figure 1: File Creation

```
Minix: PID 360 exited
# pwd
/home
# echo "Line One\n" > new.txt
Minix: Writing to Immediate File
Minix: File Write: 75; nbytes = 11; offset = 11
# -
```

Figure 2: File Writing

```
Minix: PID 360 exited
# pwd
/home
# echo "Line One\n" > new.txt
Minix: Writing to Immediate File
Minix: File Write: 75; nbytes = 11; offset = 11
#
# echo "Second Line\n" >> new.txt
Minix: Writing to Immediate File
Minix: File Write: 75; nbytes = 14; offset = 25
#
```

Figure 3: File Writing for file size less than 32 Bytes

```
Minix: PID 360 exited
# pwd
/home
# echo "Line One\n" > new.txt
Minix: Writing to Immediate File
Minix: File Write: 75; nbytes = 11; offset = 11
#
# echo "Second Line\n" >> new.txt
Minix: Writing to Immediate File
Minix: File Write: 75; nbytes = 14; offset = 25
#
# echo "Some big line of text, to make file above 32 bytes" >> new.txt
Minix: File Write: 75; nbytes = 51; offset = 76
# -
```

Figure 4: File Writing for file size greater than 32 Bytes

```
Minix: PID 367 exited
# pwd
/home
# cat new.txt
Minix: PID 368 created
Minix: Allotted Quantum: 200 ms
Minix: Used Quantum: 200 ms
Minix: PID 118 swapped in
Minix: Reading from Immediate File
Minix: Contents of Immediate File:
Line One
Minix: End of Immediate File
Minix: File Read: 75; nbytes = 4096; offset = 0
Minix: PID 368 exited
#
```

Figure 5: File Reading

```
Minix: PID 359 exited
# pwd
/home
# rm new.txt
Minix: PID 360 created
Minix: Allotted Quantum: 200 ms
Minix: Used Quantum: 200 ms
Minix: PID 110 swapped in
Minix: PID 360 exited
# -
```

Figure 6: File Deletion