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Assignment-10
CS-314:Operating Systems Laboratory

The task in this lab is to implement immediate files in the Minix File System, for files of size up to 32 bytes. This implementation is only for the file system mounted at /home.

An immediate file is a file whose data is not stored in a data block, but directly inside the inode itself. An inode in Minix is 64 bytes long, and 40 bytes are used to hold pointers to data blocks. For immediate files, you can clearly use those 40 bytes to store the file contents instead of pointers.

Tasks:

1. **File Creation**: The start has to be done by creating the file as an immediate one. When a file grows beyond 32B, then it has to be made into a regular file.
2. **File Read**: If it is an immediate file, it has to be responded with the inode structure contents. If not, it has to follow the default behavior of looking up zones.
3. **File Write**: 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.
4. **File Delete**: The deleting of immediate files does not require any handling of zones.

Images & Proof

File Creation:

```
Minix: PID 375 exited
# touch test1.txt
Minix: PID 376 created
(200010039, 200010041)Minix: PID 126 swapped in
200010039, 200010041: file created: 2
```

Writing to file:

```
Minix: PID 377 exited
# echo "Hello" > test1.txt (200010039, 200010041)Minix: PID 27 swapped in

200010039, 200010041: MINIX3 is writing to the immediate file
200010039, 200010041: file written: 2; nbytes = 6; offset = 6
```

Upto 32 bytes

```
Minix: PID 387 exited
# echo "Hello" >> test1.txt (200010039, 200010041)Minix: PID 27 swapped in

200010039, 200010041: MINIX3 is writing to the immediate file
200010039, 200010041: file written: 2; nbytes = 6; offset = 12
```

Concatenation to file – upto 32 bytes

```
# echo "This is e(200010039, 200010041)Minix: PID 27 swapped in
OF (200010039, 200010041)Minix: PID 27 swapped in
immediate(200010039, 200010041)Minix: PID 27 swapped in
file(200010039, 200010041)Minix: PID 25 swapped in
s" (200010039, 200010041)Minix: PID 28 swapped in
(200010039, 200010041)Minix: PID 25 swapped in
(200010039, 200010041)Minix: PID 27 swapped in
(200010039, 200010041)Minix: PID 28 swapped in
>>test1.txt
200010039, 200010041: file written: 2; nbytes = 27; offset = 39
```

Concatenation to file – beyond 32 bytes

Reading File:

```
# cat test1.txt
Minix: PID 399 created
(200010039, 200010041)Minix: PID 153 swapped in
200010039, 200010041: MINIX3 is reading from the immediate file
200010039, 200010041: MINIX3's Immediate File contents are:
Testing File
200010039, 200010041: MINIX3 has reached EOF Immediate File
200010039, 200010041: file read: 2; nbytes = 4096; offset = 0
Minix: PID 399 exited
```

File Delete:

```
# rm test1.txt
Minix: PID 395 created
(200010039, 200010041)Minix: PID 147 swapped in
Minix: PID 395 exited
```