

Linux-File-IO-Systems-locking

Ex07-Linux File-IO Systems-locking

AIM:

To Write a C program that illustrates files copying and locking

DESIGN STEPS:

Step 1:

Navigate to any Linux environment installed on the system or installed inside a virtual environment like virtual box/vmware or online linux JSLinux (<https://bellard.org/jslinux/vm.html?url=alpine-x86.cfg&mem=192>) or docker.

Step 2:

Write the C Program using Linux IO Systems locking

Step 3:

Execute the C Program for the desired output.

PROGRAM:

1.To Write a C program that illustrates files copying

```
#include <unistd.h>
#include <sys/stat.h>
#include <fcntl.h>
#include <stdlib.h>
int main()
{
char block[1024];
int in, out;
int nread;
in = open("filecopy.c", O_RDONLY);
out = open("file.out", O_WRONLY|O_CREAT, S_IRUSR|S_IWUSR);
while((nread = read(in,block,sizeof(block))) > 0)
write(out,block,nread);
exit(0);}
```



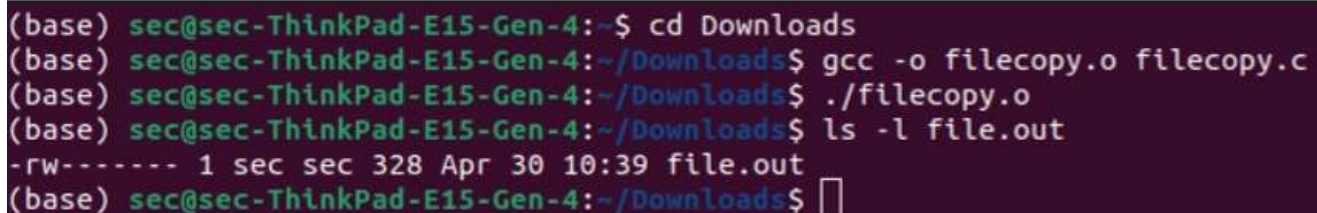
2.To Write a C program that illustrates files locking

```
//C program that illustrates files locking goes here
#include <fcntl.h>
#include <stdio.h>
#include <string.h>
#include <unistd.h>
#include <sys/file.h>
int main (int argc, char* argv[])
{ char* file = argv[1];
int fd;
struct flock lock;
printf ("opening %s\n", file);
/* Open a file descriptor to the file. */
fd = open (file, O_WRONLY);
```



```
// acquire shared lock
if (flock(fd, LOCK_SH) == -1) {
    printf("error");
}else
{printf("Acquiring shared lock using flock");
}
getchar();
// non-atomically upgrade to exclusive lock
// do it in non-blocking mode, i.e. fail if can't upgrade immediately
if (flock(fd, LOCK_EX | LOCK_NB) == -1) {
    printf("error");
}else
{printf("Acquiring exclusive lock using flock");}
getchar();
// release lock
// lock is also released automatically when close() is called or process exits
if (flock(fd, LOCK_UN) == -1) {
    printf("error");
}else{
printf("unlocking");
}
getchar();
close (fd);
return 0;
}
```

OUTPUT



```
(base) sec@sec-ThinkPad-E15-Gen-4:~$ cd Downloads
(base) sec@sec-ThinkPad-E15-Gen-4:~/Downloads$ gcc -o filecopy.o filecopy.c
(base) sec@sec-ThinkPad-E15-Gen-4:~/Downloads$ ./filecopy.o
(base) sec@sec-ThinkPad-E15-Gen-4:~/Downloads$ ls -l file.out
-rw----- 1 sec sec 328 Apr 30 10:39 file.out
(base) sec@sec-ThinkPad-E15-Gen-4:~/Downloads$
```

```
(base) sec@sec-ThinkPad-E15-Gen-4:~/Downloads$ gcc -o lock.o lock.c
(base) sec@sec-ThinkPad-E15-Gen-4:~/Downloads$ ./lock.o tricky.txt
opening tricky.txt
Acquiring shared lock using flock
Acquiring exclusive lock using flock
unlocking
(base) sec@sec-ThinkPad-E15-Gen-4:~/Downloads$ lslocks
```

COMMAND	PID	TYPE	SIZE	MODE	M	START	END	PATH
nvidia-persiste	1170	POSIX		WRITE	0	0	0	/run/snapd/
firefox	2697	POSIX		WRITE	0	1073741826	1073742335	
tracker-miner-f	1402	POSIX		READ	0	1073741826	1073742335	
tracker-miner-f	1402	POSIX		READ	0	128	128	
snapped	754	FLOCK		WRITE	0	0	0	
nautilus	5782	POSIX		READ	0	1073741826	1073742335	
nautilus	5782	POSIX		READ	0	128	128	
cron	735	FLOCK		WRITE	0	0	0	/run/snapd/
pipewire	1321	FLOCK		WRITE	0	0	0	/run/user/1
tracker-miner-f	1402	POSIX		READ	0	1073741826	1073742335	
tracker-miner-f	1402	POSIX		READ	0	128	128	
update-notifier	3506	FLOCK		WRITE	0	0	0	/run/user/1
firefox	2697	POSIX		WRITE	0	0	0	
firefox	2697	POSIX		WRITE	0	1073741826	1073742335	
tracker-miner-f	1402	POSIX		READ	0	1073741826	1073742335	
tracker-miner-f	1402	POSIX		READ	0	128	128	
tracker-miner-f	1402	POSIX		READ	0	1073741826	1073742335	
tracker-miner-f	1402	POSIX		READ	0	128	128	
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tracker-miner-f	1402	POSIX		READ	0	128	128	
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firefox	2697	POSIX		WRITE	0	1073741826	1073742335	
firefox	2697	POSIX		WRITE	0	1073741826	1073742335	

```
(base) sec@sec-ThinkPad-E15-Gen-4:~/Downloads$
```

RESULT:

The programs are executed successfully.