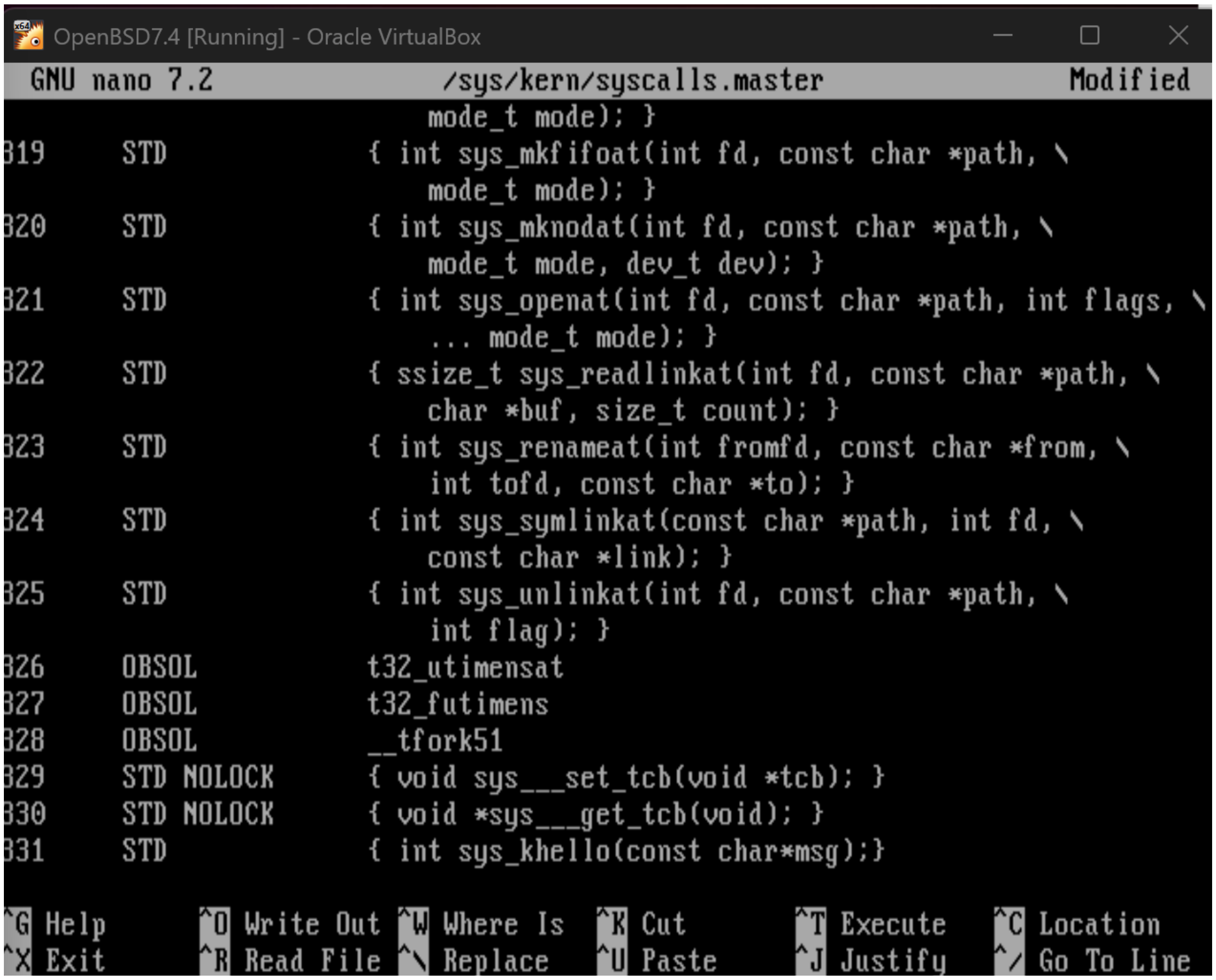
Andrei Cristea
Grupa 234

TEMA 2

CERINTA 2



```
  GNU nano 7.2              /sys/kern/syscalls.master                Modified
                            mode_t mode); }
319     STD             { int sys_mkfifoat(int fd, const char *path, \
                            mode_t mode); }
320     STD             { int sys_mknodat(int fd, const char *path, \
                            mode_t mode, dev_t dev); }
321     STD             { int sys_openat(int fd, const char *path, int flags, \
                            ... mode_t mode); }
322     STD             { ssize_t sys_readlinkat(int fd, const char *path, \
                            char *buf, size_t count); }
323     STD             { int sys_renameat(int fromfd, const char *from, \
                            int tofd, const char *to); }
324     STD             { int sys_symlinkat(const char *path, int fd, \
                            const char *link); }
325     STD             { int sys_unlinkat(int fd, const char *path, \
                            int flag); }
326     OBSOL           t32_utimensat
327     OBSOL           t32_futimens
328     OBSOL           __tfork51
329     STD NOLOCK      { void sys___set_tcb(void *tcb); }
330     STD NOLOCK      { void *sys___get_tcb(void); }
331     STD             { int sys_khello(const char*msg);}

^G Help       ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location
^X Exit       ^R Read File  ^\ Replace    ^U Paste      ^J Justify    ^/ Go To Line
```

- ⇨ Adaug semnatura primei functii la primul id liber din /sys/kern/syscalls.master, 331
- ⇨ Iau ca argument un ptr la un string

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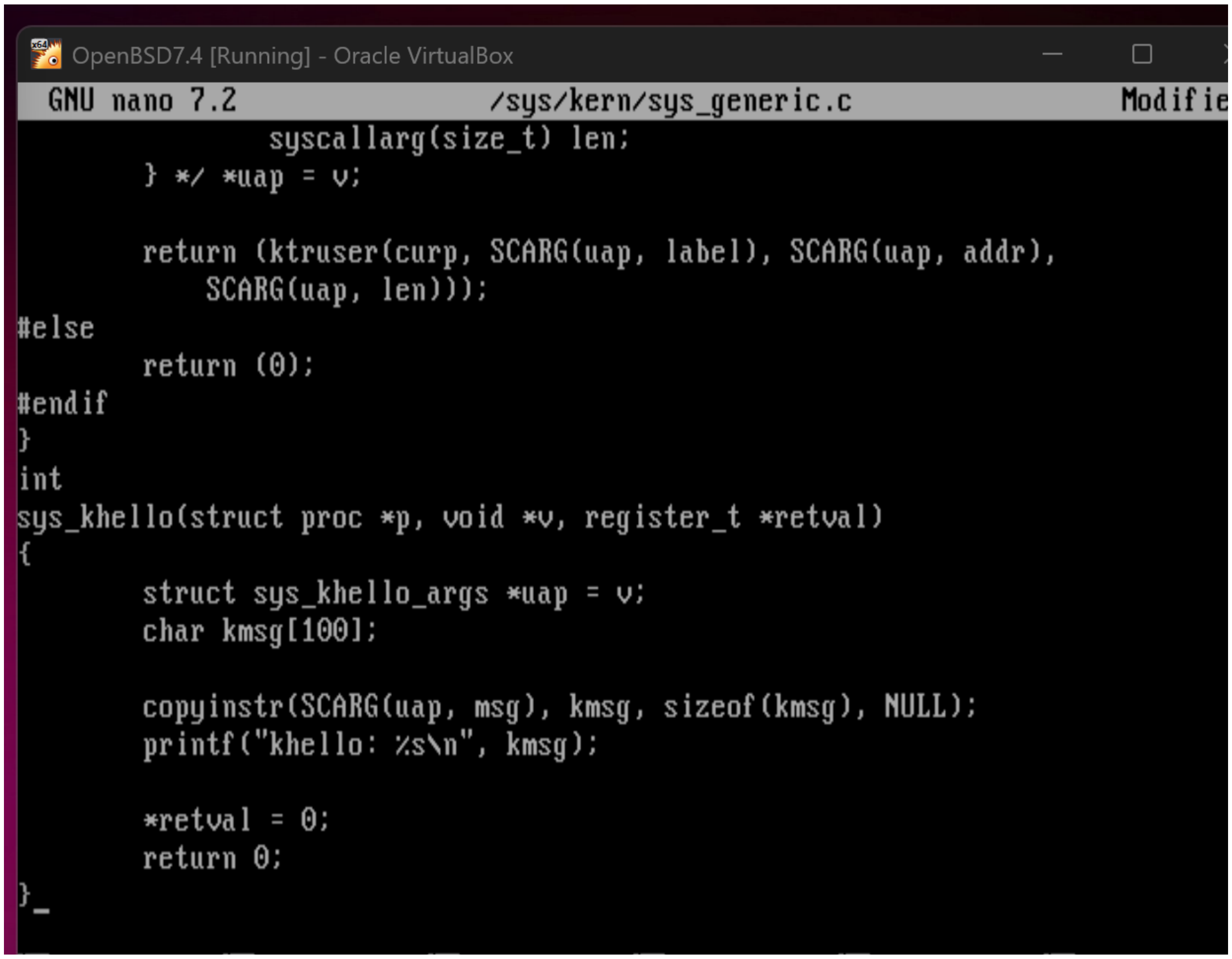

OpenBSD7.4 [Running] - Oracle VirtualBox

```
 GNU nano 7.2                    /sys/kern/sys_generic.c                 Modifie
                syscallarg(size_t) len;
        } */ *uap = v;

        return (ktruser(curp, SCARG(uap, label), SCARG(uap, addr),
            SCARG(uap, len)));
#else
        return (0);
#endif
}
int
sys_khello(struct proc *p, void *v, register_t *retval)
{
        struct sys_khello_args *uap = v;
        char kmsg[100];

        copyinstr(SCARG(uap, msg), kmsg, sizeof(kmsg), NULL);
        printf("khello: %s\n", kmsg);

        *retval = 0;
        return 0;
}
```

- ⇨ Adaug codul in c in sys/kern/sys_generic.c
- ⇨ Ma folosesc de SCARG ca sa extrag ptr ul de la msg
- ⇨ Il afisez cu un printf
- ⇨ Recompilez kernel ul si dau reboot
- ⇨

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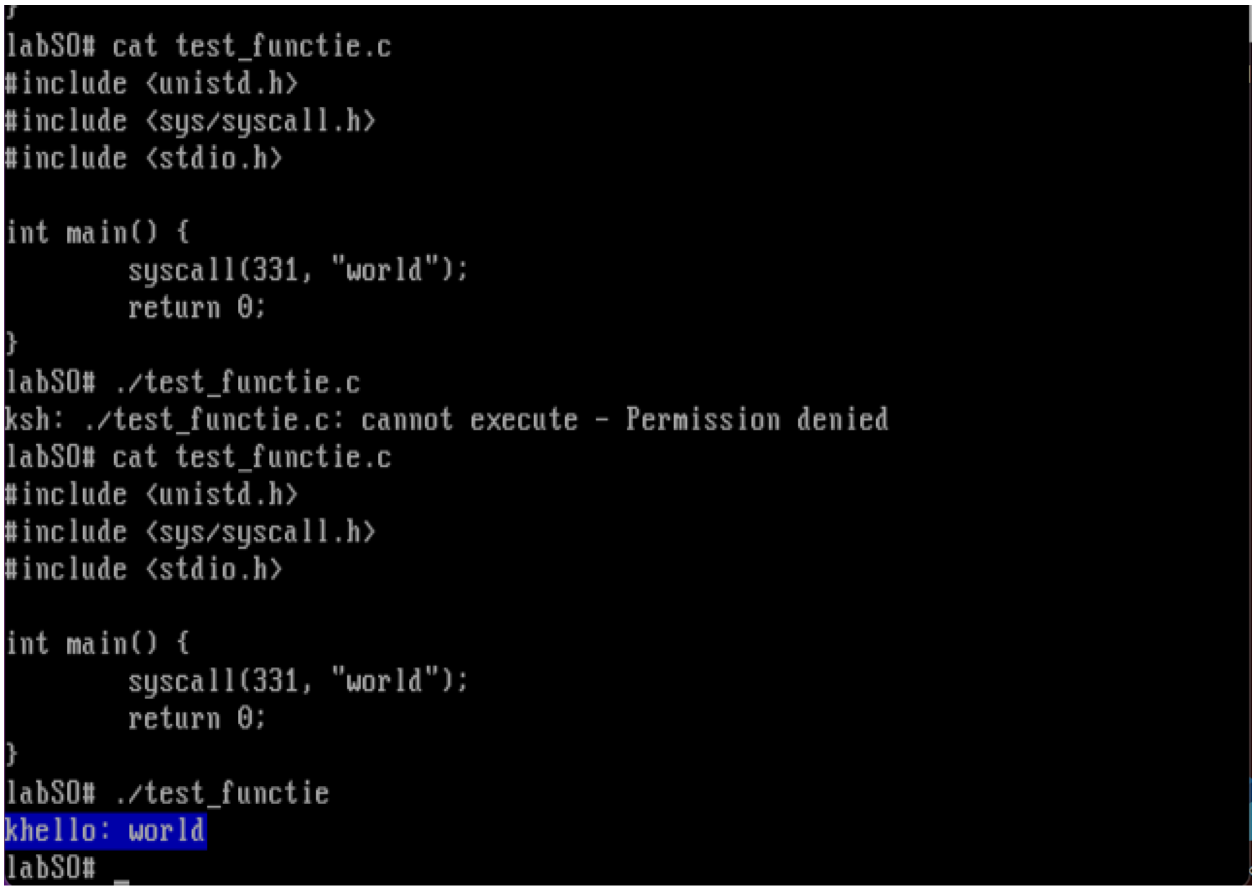
```
labSO# cat test_functie.c
#include <unistd.h>
#include <sys/syscall.h>
#include <stdio.h>

int main() {
        syscall(331, "world");
        return 0;
}
labSO# ./test_functie.c
ksh: ./test_functie.c: cannot execute - Permission denied
labSO# cat test_functie.c
#include <unistd.h>
#include <sys/syscall.h>
#include <stdio.h>

int main() {
        syscall(331, "world");
        return 0;
}
labSO# ./test_functie
khello: world
labSO# _
```

⇨ Testez codul cu un c file in care fac syscall 331 si ii dau string ul world si el imi va afisa “khello: world” folosindu se de functia din kernel

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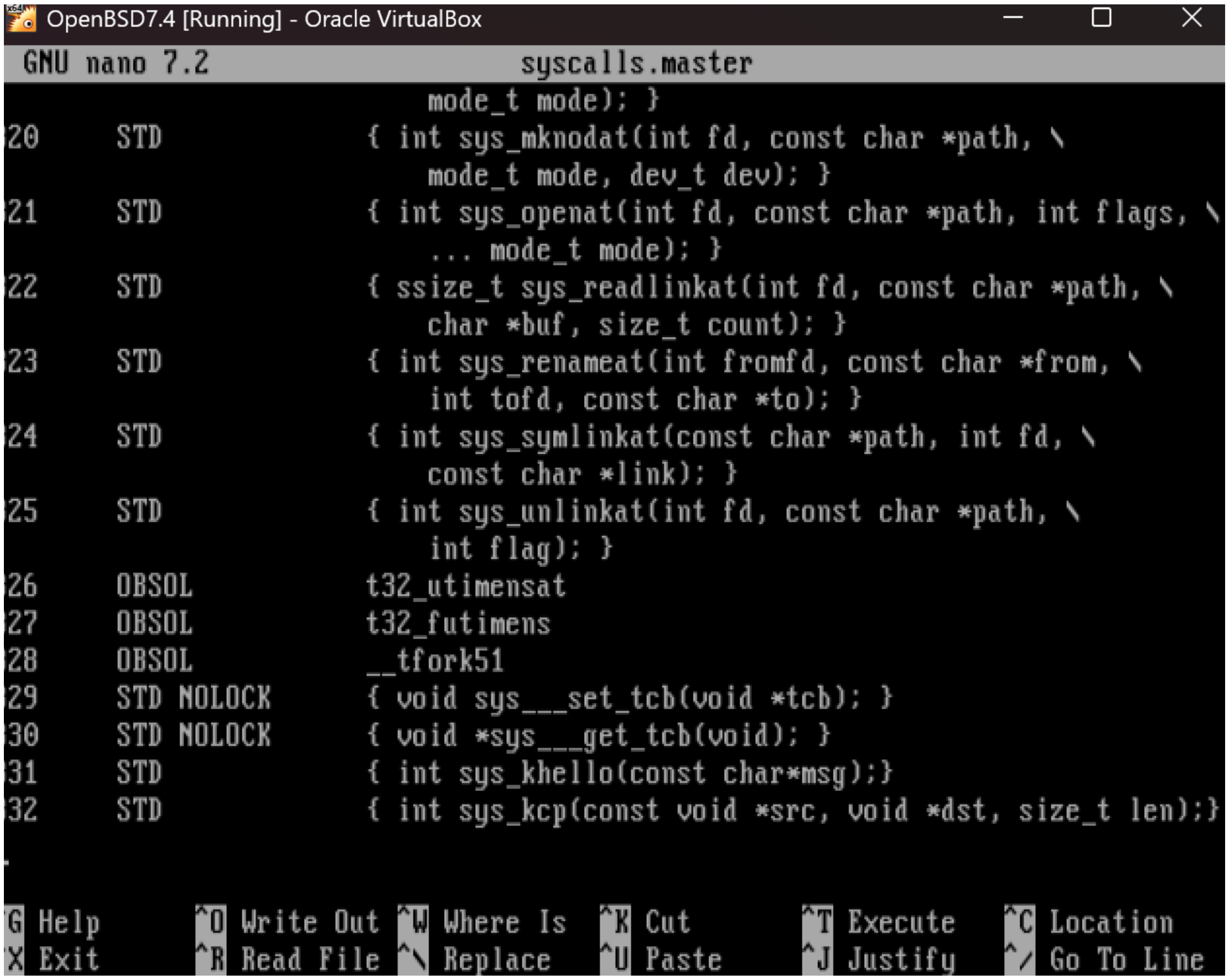
CERINTA 3



```
                            mode_t mode); }
20      STD             { int sys_mknodat(int fd, const char *path, \
                            mode_t mode, dev_t dev); }
21      STD             { int sys_openat(int fd, const char *path, int flags, \
                            ... mode_t mode); }
22      STD             { ssize_t sys_readlinkat(int fd, const char *path, \
                            char *buf, size_t count); }
23      STD             { int sys_renameat(int fromfd, const char *from, \
                            int tofd, const char *to); }
24      STD             { int sys_symlinkat(const char *path, int fd, \
                            const char *link); }
25      STD             { int sys_unlinkat(int fd, const char *path, \
                            int flag); }
26      OBSOL           t32_utimensat
27      OBSOL           t32_futimens
28      OBSOL           __tfork51
29      STD NOLOCK      { void sys___set_tcb(void *tcb); }
30      STD NOLOCK      { void *sys___get_tcb(void); }
31      STD             { int sys_khello(const char*msg);}
32      STD             { int sys_kcp(const void *src, void *dst, size_t len);}
```

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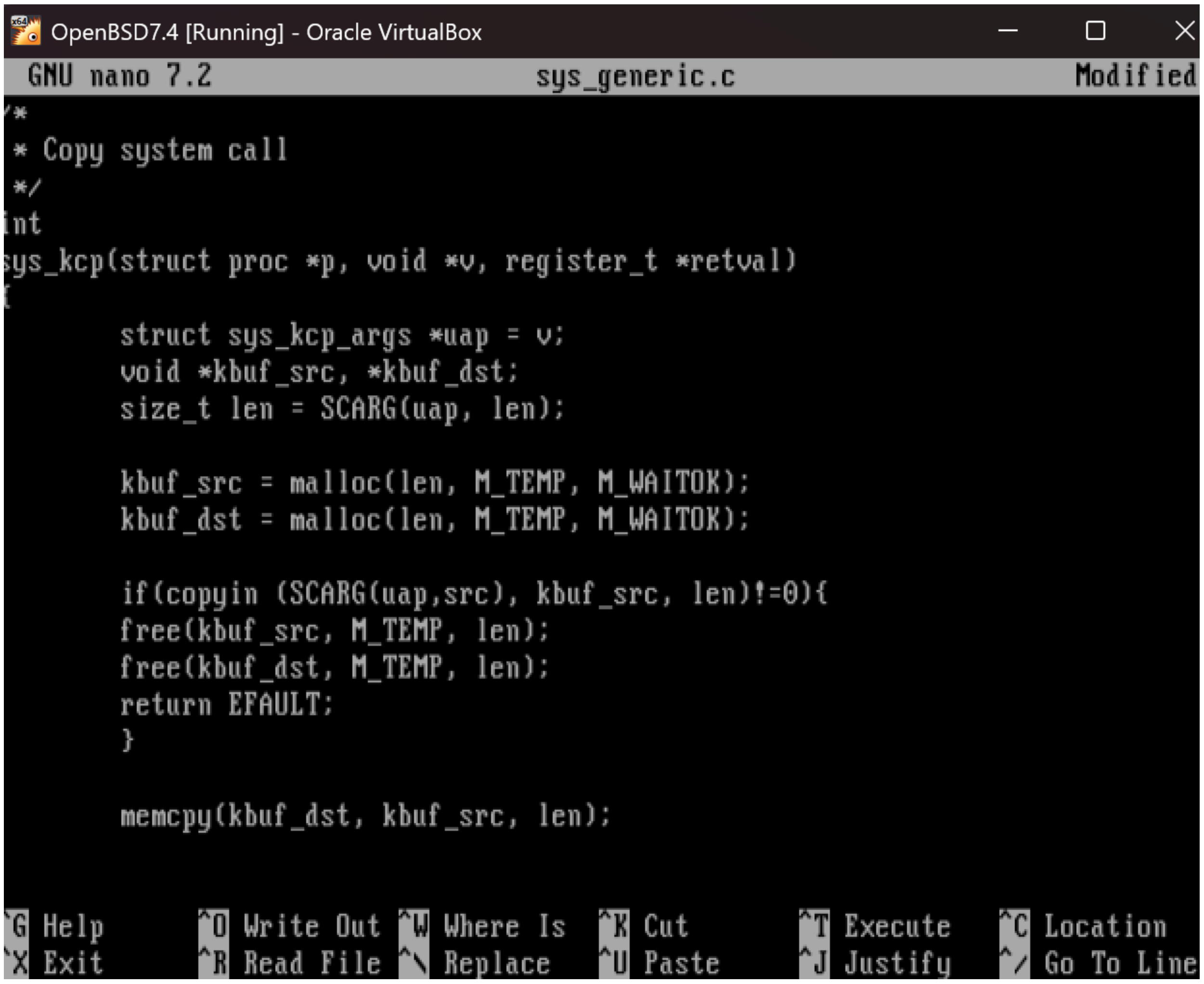
OpenBSD7.4 [Running] - Oracle VirtualBox

```
 GNU nano 7.2                    sys_generic.c                    Modified
/*
 * Copy system call
 */
int
sys_kcp(struct proc *p, void *v, register_t *retval)
{
        struct sys_kcp_args *uap = v;
        void *kbuf_src, *kbuf_dst;
        size_t len = SCARG(uap, len);

        kbuf_src = malloc(len, M_TEMP, M_WAITOK);
        kbuf_dst = malloc(len, M_TEMP, M_WAITOK);

        if(copyin (SCARG(uap,src), kbuf_src, len)!=0){
        free(kbuf_src, M_TEMP, len);
        free(kbuf_dst, M_TEMP, len);
        return EFAULT;
        }

        memcpy(kbuf_dst, kbuf_src, len);
```

- ⇨ Procedez la fel, pun semnatura functiei insyscalls.masters si codul functiei in sys_generic.c
- ⇨ Ma folosesc de malloc si free ca sa ocup loc in memorie pentru buffer ul copiat
- ⇨ Ma folosesc de copyin si copyout pentru a copia date din buffer in kernel si daca copierea returneaza un cod diferit de 0 arunc eroare => invalid memory address
- ⇨ Recompilez kernel ul si dau reboot

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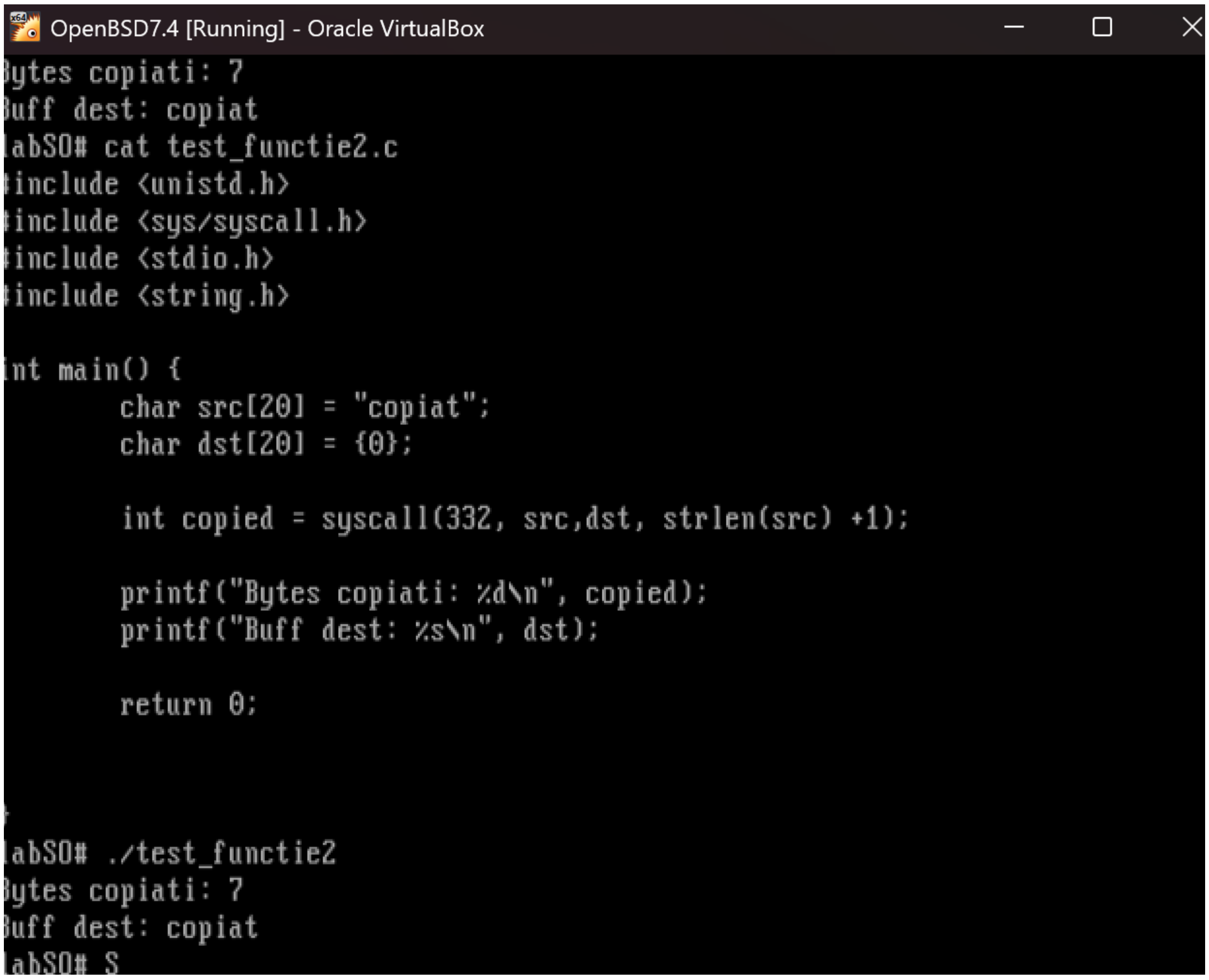
⇨ 

OpenBSD7.4 [Running] - Oracle VirtualBox

```
Bytes copiati: 7
Buff dest: copiat
labSO# cat test_functie2.c
#include <unistd.h>
#include <sys/syscall.h>
#include <stdio.h>
#include <string.h>

int main() {
        char src[20] = "copiat";
        char dst[20] = {0};

        int copied = syscall(332, src,dst, strlen(src) +1);

        printf("Bytes copiati: %d\n", copied);
        printf("Buff dest: %s\n", dst);

        return 0;


}
labSO# ./test_functie2
Bytes copiati: 7
Buff dest: copiat
labSO# S
```

⇨ Apelez syscall ul din kernel cu un program in c si observ ca la adrea vectorului de chars dest initializat cu 0 uri au fost mutate bitii din string ul src