

Московский Авиационный Институт
(Национальный Исследовательский Университет)

Факультет информационных технологий и прикладной математики
Кафедра вычислительной математики и программирования

**Лабораторная работа
по курсу «Операционные системы»
III Семестр**

Задание 1

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Оценка:	
Дата:	

1. Описание задания

При выполнении последующих лабораторных работ необходимо продемонстрировать ключевые системные вызовы, которые в них используются и то, что их использование соответствует варианту ЛР.

Для наглядности я выделю жирным шрифтом строки в каждом трейсе.

2. Strace

2.1 lab2

```
walien@PC-name:~/2kurs/OS/lab2$ strace ./OS_lab2
execve("./OS_lab2", ["/OS_lab2"], 0x7ffd445c8400 /* 63 vars */) = 0
brk(NULL)                               = 0x55fdbf0ed000
access("/etc/ld.so.nohwcap", F_OK)      = -1 ENOENT (No such file or directory)
access("/etc/ld.so.preload", R_OK)      = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=83072, ...}) = 0
mmap(NULL, 83072, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7f5485cb7000
close(3)                                = 0
access("/etc/ld.so.nohwcap", F_OK)      = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libpthread.so.0", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0000b\0\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=144976, ...}) = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0)
= 0x7f5485cb5000
mmap(NULL, 2221184, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7f5485886000
mprotect(0x7f54858a0000, 2093056, PROT_NONE) = 0
mmap(0x7f5485a9f000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19000) = 0x7f5485a9f000
mmap(0x7f5485aa1000, 13440, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f5485aa1000
close(3)                                = 0
access("/etc/ld.so.nohwcap", F_OK)      = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\3\0>\0\1\0\0\0260\34\2\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=2030544, ...}) = 0
mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7f5485495000
mprotect(0x7f548567c000, 2097152, PROT_NONE) = 0
mmap(0x7f548587c000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) = 0x7f548587c000
mmap(0x7f5485882000, 15072, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f5485882000
close(3)                                = 0
mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1,
0) = 0x7f5485cb2000
arch_prctl(ARCH_SET_FS, 0x7f5485cb2740) = 0
mprotect(0x7f548587c000, 16384, PROT_READ) = 0
mprotect(0x7f5485a9f000, 4096, PROT_READ) = 0
mprotect(0x55fdbd39b000, 4096, PROT_READ) = 0
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mprotect(0x7f5485ccc000, 4096, PROT_READ) = 0
munmap(0x7f5485cb7000, 83072) = 0
set_tid_address(0x7f5485cb2a10) = 3459
set_robust_list(0x7f5485cb2a20, 24) = 0
rt_sigaction(SIGRTMIN, {sa_handler=0x7f548588bcb0, sa_mask=[],
sa_flags=SA_RESTORER|SA_SIGINFO, sa_restorer=0x7f5485898890}, NULL, 8) = 0
rt_sigaction(SIGRT_1, {sa_handler=0x7f548588bd50, sa_mask=[],
sa_flags=SA_RESTORER|SA_RESTART|SA_SIGINFO, sa_restorer=0x7f5485898890}, NULL,
8) = 0
rt_sigprocmask(SIG_UNBLOCK, [RTMIN RT_1], NULL, 8) = 0
prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) =
0
pipe([3, 4]) = 0
pipe([5, 6]) = 0
clone(child_stack=NULL,
flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLD,
child_tidptr=0x7f5485cb2a10) = 3460
close(3) = 0
close(6) = 0
fstat(0, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0
brk(NULL) = 0x55fdbf0ed000
brk(0x55fdbf10e000) = 0x55fdbf10e000
read(0, 5+5
"5+5\n", 1024) = 4
write(4, "\5\0\0\0\1\0\0\0\5\0\0\0\375U\0\0", 16) = 16
read(5, "\5\0\0\0\1\0\0\0\5\0\0\0\n\0\0\0", 16) = 16
fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0
write(1, "5 + 5 = 10\n", 115 + 5 = 10
) = 11
read(0, 7-7
"7-7\n", 1024) = 4
write(4, "\7\0\0\0\377\377\377\377\7\0\0\0\n\0\0\0", 16) = 16
read(5, "\7\0\0\0\377\377\377\377\7\0\0\0\0\0\0", 16) = 16
write(1, "7 - 7 = 0\n", 107 - 7 = 0
) = 10
read(0, "", 1024) = 0
close(4) = 0
close(5) = 0
exit_group(0) = ?
+++ exited with 0 +++

```

2.2 lab3

```

execve("./OS_lab3", ["/OS_lab3", "2"], 0x7ffd8547fd68 /* 66 vars */) = 0
brk(NULL) = 0x55ffb3abd000
access("/etc/ld.so.nohwcap", F_OK) = -1 ENOENT (No such file or directory)
access("/etc/ld.so.preload", R_OK) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=83936, ...}) = 0
mmap(NULL, 83936, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7fc092773000
close(3) = 0

```

```

access("/etc/ld.so.nohwcap", F_OK)    = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libpthread.so.0", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0000b\0\0\0\0\0"... , 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=144976, ...}) = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0)
= 0x7fc092771000
mmap(NULL, 2221184, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7fc092342000
mprotect(0x7fc09235c000, 2093056, PROT_NONE) = 0
mmap(0x7fc09255b000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19000) = 0x7fc09255b000
mmap(0x7fc09255d000, 13440, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fc09255d000
close(3)                                = 0
access("/etc/ld.so.nohwcap", F_OK)    = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\3\0>\0\1\0\0\0260\34\2\0\0\0\0"... , 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=2030544, ...}) = 0
mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7fc091f51000
mprotect(0x7fc092138000, 2097152, PROT_NONE) = 0
mmap(0x7fc092338000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) = 0x7fc092338000
mmap(0x7fc09233e000, 15072, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fc09233e000
close(3)                                = 0
mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1,
0) = 0x7fc09276e000
arch_prctl(ARCH_SET_FS, 0x7fc09276e740) = 0
mprotect(0x7fc092338000, 16384, PROT_READ) = 0
mprotect(0x7fc09255b000, 4096, PROT_READ) = 0
mprotect(0x55ffb2500000, 4096, PROT_READ) = 0
mprotect(0x7fc092788000, 4096, PROT_READ) = 0
munmap(0x7fc092773000, 83936)           = 0
set_tid_address(0x7fc09276ea10)        = 13430
set_robust_list(0x7fc09276ea20, 24)    = 0
rt_sigaction(SIGRTMIN, {sa_handler=0x7fc092347cb0, sa_mask=[],
sa_flags=SA_RESTORER|SA_SIGINFO, sa_restorer=0x7fc0923548a0}, NULL, 8) = 0
rt_sigaction(SIGRT_1, {sa_handler=0x7fc092347d50, sa_mask=[],
sa_flags=SA_RESTORER|SA_RESTART|SA_SIGINFO, sa_restorer=0x7fc0923548a0}, NULL, 8)
= 0
rt_sigprocmask(SIG_UNBLOCK, [RTMIN RT_1], NULL, 8) = 0
prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) =
0
fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0
brk(NULL)                               = 0x55ffb3abd000
brk(0x55ffb3ade000)                     = 0x55ffb3ade000
write(1, "Input array size\n", 17Input array size
)    = 17
fstat(0, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0
read(0, 3
"3\n", 1024)                           = 2

```

```

read(0, ver
"ver\n", 1024)          = 4
read(0, orf
"orf\n", 1024)          = 4
read(0, abc
"abc\n", 1024)          = 4
mmap(NULL, 8392704, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS|MAP_STACK, -1,
0) = 0x7fc091750000
mprotect(0x7fc091751000, 8388608, PROT_READ|PROT_WRITE) = 0
clone(child_stack=0x7fc091f4ffb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CL
ONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEAR
ID, parent_tidptr=0x7fc091f509d0, tls=0x7fc091f50700, child_tidptr=0x7fc091f509d0) = 13431
futex(0x7fc091f509d0, FUTEX_WAIT, 13431, NULL) = 0
write(1, "\n", 1
)          = 1
write(1, "Result:\n", 8Result:
)          = 8
write(1, "abc\n", 4abc
)          = 4
write(1, "orf\n", 4orf
)          = 4
write(1, "ver\n", 4ver
)          = 4
write(1, "Number of threads: 2\n", 21Number of threads: 2
) = 21
lseek(0, -1, SEEK_CUR)          = -1 ESPIPE (Illegal seek)
exit_group(0)          = ?
+++ exited with 0 +++

```

2.3 lab4

```

walien@PC-name:~/2kurs/OS/lab4$ strace ./os_lab4
execve("./os_lab4", ["/os_lab4"], 0x7ffdd379b0b0 /* 63 vars */) = 0
brk(NULL)          = 0x55631fb7f000
access("/etc/ld.so.nohwcap", F_OK)    = -1 ENOENT (No such file or directory)
access("/etc/ld.so.preload", R_OK)    = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=83168, ...}) = 0
mmap(NULL, 83168, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7fecd37bf000
close(3)          = 0
access("/etc/ld.so.nohwcap", F_OK)    = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libpthread.so.0", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0000b\0\0\0\0\0\0"... , 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=144976, ...}) = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -
1, 0) = 0x7fecd37bd000
mmap(NULL, 2221184, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE,
3, 0) = 0x7fecd338e000
mprotect(0x7fecd33a8000, 2093056, PROT_NONE) = 0
mmap(0x7fecd35a7000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19000) = 0x7fecd35a7000

```

```

mmap(0x7fecd35a9000, 13440, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fecd35a9000
close(3) = 0
access("/etc/ld.so.nohwcap", F_OK) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\260\34\2\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=2030544, ...}) = 0
mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7fecd2f9d000
mprotect(0x7fecd3184000, 2097152, PROT_NONE) = 0
mmap(0x7fecd3384000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) = 0x7fecd3384000
mmap(0x7fecd338a000, 15072, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fecd338a000
close(3) = 0
mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS,
-1, 0) = 0x7fecd37ba000
arch_prctl(ARCH_SET_FS, 0x7fecd37ba740) = 0
mprotect(0x7fecd3384000, 16384, PROT_READ) = 0
mprotect(0x7fecd35a7000, 4096, PROT_READ) = 0
mprotect(0x55631f13c000, 4096, PROT_READ) = 0
mprotect(0x7fecd37d4000, 4096, PROT_READ) = 0
munmap(0x7fecd37bf000, 83168) = 0
set_tid_address(0x7fecd37baa10) = 6516
set_robust_list(0x7fecd37baa20, 24) = 0
rt_sigaction(SIGRTMIN, {sa_handler=0x7fecd3393cb0, sa_mask=[],
sa_flags=SA_RESTORER|SA_SIGINFO, sa_restorer=0x7fecd33a0890}, NULL, 8) = 0
rt_sigaction(SIGRT_1, {sa_handler=0x7fecd3393d50, sa_mask=[],
sa_flags=SA_RESTORER|SA_RESTART|SA_SIGINFO, sa_restorer=0x7fecd33a0890}, NULL, 8)
= 0
rt_sigprocmask(SIG_UNBLOCK, [RTMIN RT_1], NULL, 8) = 0
prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) =
0
brk(NULL) = 0x55631fb7f000
brk(0x55631fba0000) = 0x55631fba0000
openat(AT_FDCWD, "file", O_RDWR|O_CREAT|O_TRUNC, 0666) = 3
write(3, "\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0", 20) = 20
mmap(NULL, 5, PROT_READ|PROT_WRITE, MAP_SHARED, 3, 0) = 0x7fecd37d3000
statfs("/dev/shm/", {f_type=TMPFS_MAGIC, f_bsize=4096, f_blocks=255097, f_bfree=255071,
f_bavail=255071, f_files=255097, f_ffree=255070, f_fsid={val=[0, 0]}, f_namelen=255,
f_frsize=4096, f_flags=ST_VALID|ST_NOSUID|ST_NODEV}) = 0
futext(0x7fecd35ac370, FUTEX_WAKE_PRIVATE, 2147483647) = 0
openat(AT_FDCWD, "/dev/shm/sem.calc", O_RDWR|O_NOFOLLOW) = -1 ENOENT (No such
file or directory)
getpid() = 6516
lstat("/dev/shm/YCwPur", 0x7ff36337b20) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/dev/shm/YCwPur", O_RDWR|O_CREAT|O_EXCL, 01411) = 4
write(4, "\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0", 32) = 32
mmap(NULL, 32, PROT_READ|PROT_WRITE, MAP_SHARED, 4, 0) = 0x7fecd37d2000
link("/dev/shm/YCwPur", "/dev/shm/sem.calc") = 0
fstat(4, {st_mode=S_IFREG|S_ISVTX|0411, st_size=32, ...}) = 0
unlink("/dev/shm/YCwPur") = 0

```

[illegible]

```

walien@PC-name:~/2kurs/OS/lab5$ strace ./mainR
execve("./mainR", ["/mainR"], 0x7ffceba9e870 /* 63 vars */) = 0
brk(NULL) = 0x555be9870000
access("/etc/ld.so.nohwcap", F_OK) = -1 ENOENT (No such file or directory)
access("/etc/ld.so.preload", R_OK) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=83168, ...}) = 0
mmap(NULL, 83168, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7fe53e55a000
close(3) = 0
access("/etc/ld.so.nohwcap", F_OK) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libdl.so.2", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0P\16\0\0\0\0\0"... , 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=14560, ...}) = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0)
= 0x7fe53e558000
mmap(NULL, 2109712, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7fe53e144000
mprotect(0x7fe53e147000, 2093056, PROT_NONE) = 0
mmap(0x7fe53e346000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7fe53e346000
close(3) = 0
access("/etc/ld.so.nohwcap", F_OK) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\3\0>\0\1\0\0\0260\34\2\0\0\0\0"... , 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=2030544, ...}) = 0
mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7fe53dd53000
mprotect(0x7fe53df3a000, 2097152, PROT_NONE) = 0
mmap(0x7fe53e13a000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) = 0x7fe53e13a000
mmap(0x7fe53e140000, 15072, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fe53e140000
close(3) = 0
mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1,
0) = 0x7fe53e555000
arch_prctl(ARCH_SET_FS, 0x7fe53e555740) = 0
mprotect(0x7fe53e13a000, 16384, PROT_READ) = 0
mprotect(0x7fe53e346000, 4096, PROT_READ) = 0
mprotect(0x555be7ea5000, 4096, PROT_READ) = 0
mprotect(0x7fe53e56f000, 4096, PROT_READ) = 0
munmap(0x7fe53e55a000, 83168) = 0
brk(NULL) = 0x555be9870000
brk(0x555be9891000) = 0x555be9891000
openat(AT_FDCWD, "./str_deque.so", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0200\7\0\0\0\0\0"... , 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=12392, ...}) = 0
getcwd("/home/walien/2kurs/OS/lab5", 128) = 27
mmap(NULL, 2105432, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7fe53db50000
mprotect(0x7fe53db51000, 2097152, PROT_NONE) = 0
mmap(0x7fe53dd51000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1000) = 0x7fe53dd51000

```



```

close(3) = 0
mprotect(0x7fe53dd51000, 4096, PROT_READ) = 0
fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0
write(1, "Error. Deque is empty.\n", 23Error. Deque is empty.
) = 23
write(1, "Error. Deque is empty.\n", 23Error. Deque is empty.
) = 23
write(1, "-----\n", 11-----
) = 11
write(1, "\321\201\321\202\321\200\320\276\320\272\320\260 1\n", 15строка 1
) = 15
write(1, "+++++++\n", 11+++++++
) = 11
write(1, "-----\n", 11-----
) = 11
write(1, "\321\201\321\202\321\200\320\276\320\272\320\260 3\n", 15строка 3
) = 15
write(1, "\321\201\321\202\321\200\320\276\320\272\320\260 1\n", 15строка 1
) = 15
write(1, "\321\201\321\202\321\200\320\276\320\272\320\260 2\n", 15строка 2
) = 15
write(1, "+++++++\n", 11+++++++
) = 11
write(1, "-----\n", 11-----
) = 11
write(1, "\321\201\321\202\321\200\320\276\320\272\320\260 1\n", 15строка 1
) = 15
write(1, "+++++++\n", 11+++++++
) = 11
write(1, "Error. Deque is empty.\n", 23Error. Deque is empty.
) = 23
munmap(0x7fe53db50000, 2105432) = 0
exit_group(0) = ?
+++ exited with 0 +++

```

2.2 lab6

Использован ключ `-f`, чтобы отображать информацию только о новых процессах.

```

walien@PC-name:~/2kurs/OS/lab6/tmp$ strace -f -e trace=clone ./terminal
clone(child_stack=0x7ff5e473bfb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7ff5e473c9d0, tls=0x7ff5e473c700, child_tidptr=0x7ff5e473c9d0) = 13506
strace: Process 13506 attached
[pid 13505] clone(child_stack=0x7ff5e3f3afb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7ff5e3f3b9d0, tls=0x7ff5e3f3b700, child_tidptr=0x7ff5e3f3b9d0) = 13507
strace: Process 13507 attached
create 3

```

```
[pid 13505] clone(child_stack=NULL,
flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLD,
child_tidptr=0x7ff5e5d35a10) = 13508
strace: Process 13508 attached
[pid 13508] clone(strace: Process 13509 attached
child_stack=0x7f0939a3cfb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTID|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7f0939a3d9d0, tls=0x7f0939a3d700, child_tidptr=0x7f0939a3d9d0) = 13509
[pid 13508] clone(strace: Process 13510 attached
child_stack=0x7f093923bfb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTID|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7f093923c9d0, tls=0x7f093923c700, child_tidptr=0x7f093923c9d0) = 13510
[pid 13508] clone(strace: Process 13511 attached
child_stack=0x7f0938a3afb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTID|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7f0938a3b9d0, tls=0x7f0938a3b700, child_tidptr=0x7f0938a3b9d0) = 13511
[pid 13508] clone(strace: Process 13512 attached
child_stack=0x7f0938239fb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTID|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7f093823a9d0, tls=0x7f093823a700, child_tidptr=0x7f093823a9d0) = 13512
Ok:13508
create 1
[pid 13508] clone(child_stack=NULL,
flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLD,
child_tidptr=0x7f093b036a10) = 13513
strace: Process 13513 attached
[pid 13513] clone(strace: Process 13514 attached
child_stack=0x7f5692e2dfb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTID|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7f5692e2e9d0, tls=0x7f5692e2e700, child_tidptr=0x7f5692e2e9d0) = 13514
[pid 13513] clone(strace: Process 13515 attached
child_stack=0x7f569262cfb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTID|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7f569262d9d0, tls=0x7f569262d700, child_tidptr=0x7f569262d9d0) = 13515
[pid 13513] clone(strace: Process 13516 attached
child_stack=0x7f5691e2bfb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTID|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7f5691e2c9d0, tls=0x7f5691e2c700, child_tidptr=0x7f5691e2c9d0) = 13516
[pid 13513] clone(strace: Process 13517 attached
child_stack=0x7f569162afb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTID|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7f569162b9d0, tls=0x7f569162b700, child_tidptr=0x7f569162b9d0) = 13517
Ok:13513
create 5
```

```

[pid 13508] clone(child_stack=NULL,
flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLD,
child_tidptr=0x7f093b036a10) = 13518
strace: Process 13518 attached
[pid 13518] clone(strace: Process 13519 attached
child_stack=0x7fb1f8078fb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7fb1f80799d0, tls=0x7fb1f8079700, child_tidptr=0x7fb1f80799d0) = 13519
[pid 13518] clone(strace: Process 13520 attached
child_stack=0x7fb1f7877fb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7fb1f78789d0, tls=0x7fb1f7878700, child_tidptr=0x7fb1f78789d0) = 13520
[pid 13518] clone(strace: Process 13521 attached
child_stack=0x7fb1f7076fb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7fb1f70779d0, tls=0x7fb1f7077700, child_tidptr=0x7fb1f70779d0) = 13521
[pid 13518] clone(strace: Process 13522 attached
child_stack=0x7fb1f6875fb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE
_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7fb1f68769d0, tls=0x7fb1f6876700, child_tidptr=0x7fb1f68769d0) = 13522
Ok:13518
exec 1 2 1 3
Ok:1:4
pingall
Ok: 1 3 5
remove 3
[pid 13508] --- SIGTERM {si_signo=SIGTERM, si_code=SI_USER, si_pid=13505, si_uid=1000}
---
[pid 13511] +++ killed by SIGKILL +++
Ok
[pid 13512] +++ killed by SIGKILL +++
[pid 13510] +++ killed by SIGKILL +++
[pid 13509] +++ killed by SIGKILL +++
[pid 13508] +++ killed by SIGKILL +++
[pid 13505] --- SIGCHLD {si_signo=SIGCHLD, si_code=CLD_KILLED, si_pid=13508,
si_uid=1000, si_status=SIGKILL, si_utime=0, si_stime=0} ---
pingall
Ok: -1
exit
[pid 13506] +++ exited with 0 +++
[pid 13507] +++ exited with 0 +++
[pid 13505] +++ exited with 0 +++

```

Вывод

Выполняя лабораторные работы по данному курсу я познакомился с утилитой strace, которая является важным инструментом в разработке и отладке программ.