Московский Авиационный Институт
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Факультет информационных технологий и прикладной математики
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**Лабораторная работа №1 по курсу
«Операционные системы»**

Диагностика программного обеспечения

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Приобретение практических навыков диагностики работы программного обеспечения.
Strace – показывает все системные вызовы программы, которые та отправляет к системе во время выполнения, а также их параметры и результат выполнения.

Общий метод и алгоритм решения

Проводится диагностика всех ранее созданных программ(ЛР 2-8).

Демонстрация работы программы

ЛР 2

sergey@sergey-RedmiBook-14:**~/labs/OS/lab2**$ strace ./a.out

```
execve("./a.out", ["./a.out"], 0x7ffd2617a760 /* 54 vars
*/) = 0
brk(NULL)                               = 0x558900f6a000
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=139596, ...}) = 0

mmap(NULL, 139596, PROT_READ, MAP_PRIVATE, 3, 0) =
0x7f8b42ccd000
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\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, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7f8b42ccb000
mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7f8b426d8000
```

```
mprotect(0x7f8b428bf000, 2097152, PROT_NONE) = 0
mmap(0x7f8b42abf000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) =
0x7f8b42abf000
mmap(0x7f8b42ac5000, 15072, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7f8b42ac5000
close(3)                                    = 0
arch_prctl(ARCH_SET_FS, 0x7f8b42ccc4c0) = 0
mprotect(0x7f8b42abf000, 16384, PROT_READ) = 0
mprotect(0x5588ff243000, 4096, PROT_READ) = 0
mprotect(0x7f8b42cf0000, 4096, PROT_READ) = 0
munmap(0x7f8b42ccd000, 139596)         = 0
brk(NULL)                              = 0x558900f6a000
brk(0x558900f8b000)                    = 0x558900f8b000
clone(child_stack=NULL, flags=CLONE_CHILD_CLEARTID|
CLONE_CHILD_SETTID|SIGCHLD, child_tidptr=0x7f8b42ccc790)
= 8656
fstat(0, {st_mode=S_IFCHR|0600, st_rdev=makedev(136,
1), ...}) = 0
read(0, wc file)
0x558900f6aaa0, 1024)            = ? ERESTARTSYS (To be
restarted if SA_RESTART is set)
--- SIGCHLD {si_signo=SIGCHLD, si_code=CLD_DUMPED,
si_pid=8656, si_uid=1000, si_status=SIGSEGV, si_utime=0,
si_stime=0} ---
read(0, wc file
"wc file\n", 1024)              = 8
openat(AT_FDCWD, "file", O_RDONLY)      = 3
dup3(3, 0, 0)                          = 0
close(3)                               = 0
fstat(1, {st_mode=S_IFCHR|0600, st_rdev=makedev(136,
1), ...}) = 0
write(1, "~~~~~~~~ 0  0.\n", 15~~~~~~~~ 0  0.
)          = 15
execve("/usr/local/sbin/wc", ["wc"], 0x7ffd5c725db8 /* 54
vars */) = -1 ENOENT (No such file or directory)
execve("/usr/local/bin/wc", ["wc"], 0x7ffd5c725db8 /* 54
vars */) = -1 ENOENT (No such file or directory)
execve("/usr/sbin/wc", ["wc"], 0x7ffd5c725db8 /* 54 vars
*/) = -1 ENOENT (No such file or directory)
execve("/usr/bin/wc", ["wc"], 0x7ffd5c725db8 /* 54 vars
*/) = 0
brk(NULL)                              = 0x55fcc48bc000
```

```
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=139596, ...}) = 0

mmap(NULL, 139596, PROT_READ, MAP_PRIVATE, 3, 0) =
0x7efed288a000
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\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, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7efed2888000
mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7efed2295000
mprotect(0x7efed247c000, 2097152, PROT_NONE) = 0
mmap(0x7efed267c000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) =
0x7efed267c000
mmap(0x7efed2682000, 15072, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7efed2682000
close(3)                                = 0
arch_prctl(ARCH_SET_FS, 0x7efed2889540) = 0
mprotect(0x7efed267c000, 16384, PROT_READ) = 0
mprotect(0x55fcc407f000, 4096, PROT_READ) = 0
mprotect(0x7efed28ad000, 4096, PROT_READ) = 0
munmap(0x7efed288a000, 139596)          = 0
brk(NULL)                               = 0x55fcc48bc000
brk(0x55fcc48dd000)                     = 0x55fcc48dd000
openat(AT_FDCWD, "/usr/lib/locale/locale-archive",
O_RDONLY|O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=4257552, ...}) =
0
mmap(NULL, 4257552, PROT_READ, MAP_PRIVATE, 3, 0) =
0x7efed1e85000
```

```
close(3)                                   = 0
fstat(0, {st_mode=S_IFREG|0664, st_size=10, ...}) = 0
openat(AT_FDCWD, "/usr/share/locale/locale.alias",
O_RDONLY|O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=2995, ...}) = 0
read(3, "# Locale name alias data base.\n#"..., 4096) =
2995
read(3, "", 4096)                          = 0
close(3)                                   = 0
openat(AT_FDCWD,
"/usr/share/locale/ru_RU.UTF-8/LC_MESSAGES/coreutils.mo",
O_RDONLY) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/usr/share/locale/ru_RU.utf8/LC_MESSAGES/coreutils.mo",
O_RDONLY) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/usr/share/locale/ru_RU/LC_MESSAGES/coreutils.mo",
O_RDONLY) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/usr/share/locale/ru.UTF-8/LC_MESSAGES/
coreutils.mo", O_RDONLY) = -1 ENOENT (No such file or
directory)
openat(AT_FDCWD,
"/usr/share/locale/ru.utf8/LC_MESSAGES/coreutils.mo",
O_RDONLY) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/usr/share/locale/ru/LC_MESSAGES/coreutils.mo",
O_RDONLY) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/usr/share/locale-langpack/ru_RU.UTF-8/
LC_MESSAGES/coreutils.mo", O_RDONLY) = -1 ENOENT (No such
file or directory)
openat(AT_FDCWD,
"/usr/share/locale-langpack/ru_RU.utf8/LC_MESSAGES/coreut
ils.mo", O_RDONLY) = -1 ENOENT (No such file or
directory)
openat(AT_FDCWD,
"/usr/share/locale-langpack/ru_RU/LC_MESSAGES/coreutils.m
o", O_RDONLY) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/usr/share/locale-langpack/ru.UTF-8/LC_MESSAGES/coreutil
s.mo", O_RDONLY) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/usr/share/locale-langpack/ru.utf8/LC_MESSAGES/coreutils
.mo", O_RDONLY) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
```

```
"/usr/share/locale-langpack/ru/LC_MESSAGES/coreutils.mo",
O_RDONLY) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=455804, ...}) = 0

mmap(NULL, 455804, PROT_READ, MAP_PRIVATE, 3, 0) =
0x7efed2818000
close(3)                                        = 0
openat(AT_FDCWD, "/usr/lib/x86_64-linux-gnu/gconv/gconv-
modules.cache", O_RDONLY) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=26376, ...}) = 0
mmap(NULL, 26376, PROT_READ, MAP_SHARED, 3, 0) =
0x7efed28a6000
close(3)                                        = 0
fadvise64(0, 0, 0, POSIX_FADV_SEQUENTIAL) = 0
read(0, "abc\nasdas\n", 16384)          = 10
read(0, "", 16384)                      = 0
fstat(1, {st_mode=S_IFCHR|0600, st_rdev=makedev(136,
1), ...}) = 0
write(1, " 2  2 10\n", 9 2  2 10
)               = 9
close(0)                                        = 0
close(1)                                        = 0
close(2)                                        = 0
exit_group(0)                                   = ?
+++ exited with 0 +++
```

ЛР 3

```
sergey@sergey-RedmiBook-14:~/labs/OS/lab3$ strace ./a.out

execve("./a.out", ["./a.out"], 0x7ffe50a001e0 /* 54 vars
*/) = 0
brk(NULL)                               = 0x55de418fd000
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=139596, ...}) = 0
```

```
mmap(NULL, 139596, PROT_READ, MAP_PRIVATE, 3, 0) =
0x7f5852609000
close(3)                                = 0
access("/etc/ld.so.nohwcap", F_OK)      = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD, "/usr/lib/x86_64-linux-gnu/libstdc+
+.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\
0\1\0\0\0\220\304\10\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=1594864, ...}) =
0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7f5852607000
mmap(NULL, 3702848, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7f585207c000
mprotect(0x7f58521f5000, 2097152, PROT_NONE) = 0
mmap(0x7f58523f5000, 49152, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x179000) =
0x7f58523f5000
mmap(0x7f5852401000, 12352, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7f5852401000
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/libgcc_s.so.1",
O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\0\3\0>\
0\1\0\0\0\300*\0\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=96616, ...}) = 0
mmap(NULL, 2192432, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7f5851e64000
mprotect(0x7f5851e7b000, 2093056, PROT_NONE) = 0
mmap(0x7f585207a000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x16000) =
0x7f585207a000
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\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, 2221184, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7f5851c45000
mprotect(0x7f5851c5f000, 2093056, PROT_NONE) = 0
mmap(0x7f5851e5e000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19000) =
0x7f5851e5e000
mmap(0x7f5851e60000, 13440, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7f5851e60000
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\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) = 0x7f5851854000
mprotect(0x7f5851a3b000, 2097152, PROT_NONE) = 0
mmap(0x7f5851c3b000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) =
0x7f5851c3b000
mmap(0x7f5851c41000, 15072, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7f5851c41000
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/libm.so.6",
O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\
0\1\0\0\0\200\272\0\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=1700792, ...}) =
0
mmap(NULL, 3789144, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7f58514b6000
mprotect(0x7f5851653000, 2093056, PROT_NONE) = 0
mmap(0x7f5851852000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19c000) =
0x7f5851852000
close(3)                                  = 0
```

```
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7f5852605000
mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7f5852602000
arch_prctl(ARCH_SET_FS, 0x7f5852602740) = 0
mprotect(0x7f5851c3b000, 16384, PROT_READ) = 0
mprotect(0x7f5851852000, 4096, PROT_READ) = 0
mprotect(0x7f5851e5e000, 4096, PROT_READ) = 0
mprotect(0x7f585207a000, 4096, PROT_READ) = 0
mprotect(0x7f58523f5000, 40960, PROT_READ) = 0
mprotect(0x55de4080f000, 4096, PROT_READ) = 0
mprotect(0x7f585262c000, 4096, PROT_READ) = 0
munmap(0x7f5852609000, 139596)           = 0
set_tid_address(0x7f5852602a10)          = 8675
set_robust_list(0x7f5852602a20, 24)      = 0
rt_sigaction(SIGRTMIN, {sa_handler=0x7f5851c4acb0,
sa_mask=[], sa_flags=SA_RESTORER|SA_SIGINFO,
sa_restorer=0x7f5851c578a0}, NULL, 8) = 0
rt_sigaction(SIGRT_1, {sa_handler=0x7f5851c4ad50,
sa_mask=[], sa_flags=SA_RESTORER|SA_RESTART|SA_SIGINFO,
sa_restorer=0x7f5851c578a0}, 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)                                = 0x55de418fd000
brk(0x55de4191e000)                      = 0x55de4191e000
futex(0x7f585240209c, FUTEX_WAKE_PRIVATE, 2147483647) = 0

futex(0x7f58524020a8, FUTEX_WAKE_PRIVATE, 2147483647) = 0

fstat(0, {st_mode=S_IFCHR|0600, st_rdev=makedev(136,
1), ...}) = 0
read(0, 3
"3\n", 1024)                             = 2
read(0, 1 1
"1 1\n", 1024)                           = 4
read(0, 2 2
"2 2\n", 1024)                           = 4
mmap(NULL, 8392704, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS|
MAP_STACK, -1, 0) = 0x7f5850cb5000
mprotect(0x7f5850cb6000, 8388608, PROT_READ|PROT_WRITE) =
0
clone(child_stack=0x7f58514b4fb0, flags=CLONE_VM|
CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|
```

```
CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|
CLONE_CHILD_CLEARTID, parent_tidptr=0x7f58514b59d0,
tls=0x7f58514b
5700, child_tidptr=0x7f58514b59d0) = 8676
mmap(NULL, 8392704, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS|
MAP_STACK, -1, 0) = 0x7f58504b4000
mprotect(0x7f58504b5000, 8388608, PROT_READ|PROT_WRITE) =
0
clone(child_stack=0x7f5850cb3fb0, flags=CLONE_VM|
CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|
CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|
CLONE_CHILD_CLEARTID, parent_tidptr=0x7f5850cb49d0,
tls=0x7f5850cb
4700, child_tidptr=0x7f5850cb49d0) = 8677
mmap(NULL, 8392704, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS|
MAP_STACK, -1, 0) = 0x7f584b7ff000
mprotect(0x7f584b800000, 8388608, PROT_READ|PROT_WRITE) =
0
clone(child_stack=0x7f584bffefb0, flags=CLONE_VM|
CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|
CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|
CLONE_CHILD_CLEARTID, parent_tidptr=0x7f584bfff9d0,
tls=0x7f584bff
f700, child_tidptr=0x7f584bfff9d0) = 8678
read(0, 3 3
"3 3\n", 1024)                        = 4
clone(child_stack=0x7f584bffefb0, flags=CLONE_VM|
CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|
CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|
CLONE_CHILD_CLEARTID, parent_tidptr=0x7f584bfff9d0,
tls=0x7f584bff
f700, child_tidptr=0x7f584bfff9d0) = 8681
clone(child_stack=0x7f5850cb3fb0, flags=CLONE_VM|
CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|
CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|
CLONE_CHILD_CLEARTID, parent_tidptr=0x7f5850cb49d0,
tls=0x7f5850cb
4700, child_tidptr=0x7f5850cb49d0) = 8682
clone(child_stack=0x7f58514b4fb0, flags=CLONE_VM|
CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|
CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|
CLONE_CHILD_CLEARTID, parent_tidptr=0x7f58514b59d0,
tls=0x7f58514b
5700, child_tidptr=0x7f58514b59d0) = 8683
```

```
mmap(NULL, 8392704, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS|
MAP_STACK, -1, 0) = 0x7f584affe000
mprotect(0x7f584afff000, 8388608, PROT_READ|PROT_WRITE) =
0
clone(child_stack=0x7f584b7fdfb0, flags=CLONE_VM|
CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|
CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|
CLONE_CHILD_CLEARTID, parent_tidptr=0x7f584b7fe9d0,
tls=0x7f584b7f
e700, child_tidptr=0x7f584b7fe9d0) = 8684
fstat(1, {st_mode=S_IFCHR|0600, st_rdev=makedev(136,
1), ...}) = 0
write(1, " \n", 2
)                          = 2
write(1, "1 1 \n", 51 1
)                       = 5
write(1, "2 2 \n", 52 2
)                       = 5
write(1, "3 3 \n", 53 3
)                       = 5
write(1, "\n", 1
)                          = 1
write(1, "6 18 18 6 \n", 116 18 18 6
)            = 11
exit_group(0)                         = ?
+++ exited with 0 +++
```

ЛР 4

```
sergey@sergey-RedmiBook-14:~/labs/OS/lab4/l4$ strace
./a.out
execve("./a.out", ["./a.out"], 0x7fff2d19b0c0 /* 54 vars
*/) = 0
brk(NULL)                         = 0x558bcfc8e000
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=139596, ...}) = 0
```

```
mmap(NULL, 139596, PROT_READ, MAP_PRIVATE, 3, 0) =
0x7fe0896a5000
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/librt.so.1",
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\0\0\"\0\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=31680, ...}) = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7fe0896a3000
mmap(NULL, 2128864, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fe089299000
mprotect(0x7fe0892a0000, 2093056, PROT_NONE) = 0
mmap(0x7fe08949f000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x6000) =
0x7fe08949f000
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, 2221184, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fe08907a000
mprotect(0x7fe089094000, 2093056, PROT_NONE) = 0
mmap(0x7fe089293000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19000) =
0x7fe089293000
mmap(0x7fe089295000, 13440, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7fe089295000
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\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) = 0x7fe088c89000
mprotect(0x7fe088e70000, 2097152, PROT_NONE) = 0
mmap(0x7fe089070000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) =
0x7fe089070000
mmap(0x7fe089076000, 15072, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7fe089076000
close(3)                                       = 0
mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7fe0896a0000
arch_prctl(ARCH_SET_FS, 0x7fe0896a0740) = 0
mprotect(0x7fe089070000, 16384, PROT_READ) = 0
mprotect(0x7fe089293000, 4096, PROT_READ) = 0
mprotect(0x7fe08949f000, 4096, PROT_READ) = 0
mprotect(0x558bceb2d000, 4096, PROT_READ) = 0
mprotect(0x7fe0896c8000, 4096, PROT_READ) = 0
munmap(0x7fe0896a5000, 139596)        = 0
set_tid_address(0x7fe0896a0a10)       = 8721
set_robust_list(0x7fe0896a0a20, 24)   = 0
rt_sigaction(SIGRTMIN, {sa_handler=0x7fe08907fcb0,
sa_mask=[], sa_flags=SA_RESTORER|SA_SIGINFO,
sa_restorer=0x7fe08908c8a0}, NULL, 8) = 0
rt_sigaction(SIGRT_1, {sa_handler=0x7fe08907fd50,
sa_mask=[], sa_flags=SA_RESTORER|SA_RESTART|SA_SIGINFO,
sa_restorer=0x7fe08908c8a0}, 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
statfs("/dev/shm/", {f_type=TMPFS_MAGIC, f_bsize=4096,
f_blocks=999468, f_bfree=927953, f_bavail=927953,
f_files=999468, f_ffree=999286, f_fsid={val=[0, 0]},
f_namelen=255, f_frsize=4096, f_flags=ST_VALID|ST_NO
SUID|ST_NODEV}) = 0
futex(0x7fe089298370, FUTEX_WAKE_PRIVATE, 2147483647) = 0

openat(AT_FDCWD, "/dev/shm/shared_file", O_RDWR|O_CREAT|
O_TRUNC|O_NOFOLLOW|O_CLOEXEC, 0600) = 3
ftruncate(3, 4194306)                         = 0
mmap(NULL, 4194306, PROT_READ|PROT_WRITE, MAP_SHARED, 3,
0) = 0x7fe088888000
```

```
close(3)                                        = 0
clone(child_stack=NULL, flags=CLONE_CHILD_CLEARTID|
CLONE_CHILD_SETTID|SIGCHLD, child_tidptr=0x7fe0896a0a10)
= 8722
fstat(0, {st_mode=S_IFCHR|0600, st_rdev=makedev(136,
1), ...}) = 0
brk(NULL)                                       = 0x558bcfc8e000
brk(0x558bcfcaf000)                             = 0x558bcfcaf000
read(0, wc file
"wc file\n", 1024)                  = 8
wait4(8722,  1  4 15
[{WIFEXITED(s) && WEXITSTATUS(s) == 0}], 0, NULL) = 8722
--- SIGCHLD {si_signo=SIGCHLD, si_code=CLD_EXITED,
si_pid=8722, si_uid=1000, si_status=0, si_utime=0,
si_stime=0} ---
lseek(0, -1, SEEK_CUR)                          = -1 ESPIPE
(Illegal seek)
exit_group(0)                                   = ?
+++ exited with 0 +++
```

ЛР 5

```
sergey@sergey-RedmiBook-14:~/labs/OS/lab5$ strace ./dyn
execve("./dyn", ["./dyn"], 0x7ffdeac09e70 /* 54 vars */)
= 0
brk(NULL)                                       = 0x55af3e459000
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, "./tls/haswell/x86_64/libdl.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
openat(AT_FDCWD, "./tls/haswell/libdl.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./tls/x86_64/libdl.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./tls/libdl.so.2", O_RDONLY|O_CLOEXEC)
= -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./haswell/x86_64/libdl.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
```

```
openat(AT_FDCWD, "./haswell/libdl.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./x86_64/libdl.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./libdl.so.2", O_RDONLY|O_CLOEXEC) = -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=139596, ...}) = 0

mmap(NULL, 139596, PROT_READ, MAP_PRIVATE, 3, 0) =
0x7f7df1c22000
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\0\3\0>\0\1\0\0\0P\
16\0\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) = 0x7f7df1c20000
mmap(NULL, 2109712, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7f7df181a000
mprotect(0x7f7df181d000, 2093056, PROT_NONE) = 0
mmap(0x7f7df1a1c000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) =
0x7f7df1a1c000
close(3)                                    = 0
openat(AT_FDCWD, "./tls/haswell/x86_64/libc.so.6",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
openat(AT_FDCWD, "./tls/haswell/libc.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./tls/x86_64/libc.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./tls/libc.so.6", O_RDONLY|O_CLOEXEC) =
-1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./haswell/x86_64/libc.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./haswell/libc.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./x86_64/libc.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
```

```
openat(AT_FDCWD, "./libc.so.6", O_RDONLY|O_CLOEXEC) = -1
ENOENT (No such file or directory)
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\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) = 0x7f7df1429000
mprotect(0x7f7df1610000, 2097152, PROT_NONE) = 0
mmap(0x7f7df1810000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) =
0x7f7df1810000
mmap(0x7f7df1816000, 15072, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7f7df1816000
close(3)                                    = 0
mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7f7df1c1d000
arch_prctl(ARCH_SET_FS, 0x7f7df1c1d740) = 0
mprotect(0x7f7df1810000, 16384, PROT_READ) = 0
mprotect(0x7f7df1a1c000, 4096, PROT_READ) = 0
mprotect(0x55af3cbf4000, 4096, PROT_READ) = 0
mprotect(0x7f7df1c45000, 4096, PROT_READ) = 0
munmap(0x7f7df1c22000, 139596)          = 0
openat(AT_FDCWD, "./tls/haswell/x86_64/libtree.so",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
openat(AT_FDCWD, "./tls/haswell/libtree.so", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./tls/x86_64/libtree.so", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./tls/libtree.so", O_RDONLY|O_CLOEXEC)
= -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./haswell/x86_64/libtree.so", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./haswell/libtree.so", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./x86_64/libtree.so", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./libtree.so", 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\0\360\n\0\0\0\0\0\0"..., 832) = 832
brk(NULL)                            = 0x55af3e459000
brk(0x55af3e47a000)                  = 0x55af3e47a000
fstat(3, {st_mode=S_IFREG|0775, st_size=12920, ...}) = 0
getcwd("/home/sergey/labs/OS/lab5", 128) = 26
mmap(NULL, 2105528, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7f7df1226000
mprotect(0x7f7df1228000, 2093056, PROT_NONE) = 0
mmap(0x7f7df1427000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1000) =
0x7f7df1427000
close(3)                             = 0
mprotect(0x7f7df1427000, 4096, PROT_READ) = 0
fstat(1, {st_mode=S_IFCHR|0600, st_rdev=makedev(136,
1), ...}) = 0
write(1, "Commands\n", 9Commands
)                = 9
write(1, "\n", 1
)                        = 1
write(1, "1 - Insert\n", 111 - Insert
)            = 11
write(1, "2 - Search\n", 112 - Search
)            = 11
write(1, "3 - Delete\n", 113 - Delete
)            = 11
write(1, "4 - Print tree\n", 154 - Print tree
)         = 15
write(1, "0 - Quit\n", 90 - Quit
)                = 9
write(1, "\n", 1
)                        = 1
write(1, "Command: \n", 10Command:
)                = 10
fstat(0, {st_mode=S_IFCHR|0600, st_rdev=makedev(136,
1), ...}) = 0
read(0, 1
"1\n", 1024)                         = 2
write(1, "value to insert: \n", 18value to insert:
)      = 18
read(0, 5
"5\n", 1024)                         = 2
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands
```

```
1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                        = 1
write(1, "Command: \n", 10Command:
)                = 10
read(0, 1
"1\n", 1024)                      = 2
write(1, "value to insert: \n", 18value to insert:
)        = 18
read(0, 4
"4\n", 1024)                      = 2
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                        = 1
write(1, "Command: \n", 10Command:
)                = 10
read(0, 1
"1\n", 1024)                      = 2
write(1, "value to insert: \n", 18value to insert:
)        = 18
read(0, 9
"9\n", 1024)                      = 2
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
```

```
) = 67
write(1, "\n", 1
)                              = 1
write(1, "Command: \n", 10Command:
)                 = 10
read(0, 1
"1\n", 1024)                          = 2
write(1, "value to insert: \n", 18value to insert:
)        = 18
read(0, 6
"6\n", 1024)                          = 2
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                              = 1
write(1, "Command: \n", 10Command:
)                 = 10
read(0, 2
"2\n", 1024)                          = 2
write(1, "value to find: \n", 16value to find:
)         = 16
read(0, 6
"6\n", 1024)                          = 2
write(1, "6 is found in tree!\n", 206 is found in tree!
)     = 20
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                              = 1
write(1, "Command: \n", 10Command:
```

```
)                    = 10
read(0, 4
"4\n", 1024)                        = 2
write(1, "tree:\n", 6tree:
)                    = 6
write(1, "\t9\n", 3        9
)                      = 3
write(1, "\t\t6\n", 4              6
)                    = 4
write(1, "5\n", 25
)                        = 2
write(1, "\t4\n", 3        4
)                        = 3
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                            = 1
write(1, "Command: \n", 10Command:
)                = 10
read(0, 3
"3\n", 1024)                          = 2
write(1, "value to delete: \n", 18value to delete:
)      = 18
read(0, 6
"6\n", 1024)                          = 2
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                            = 1
write(1, "Command: \n", 10Command:
```

```
)                       = 10
read(0, 4
"4\n", 1024)                            = 2
write(1, "tree:\n", 6tree:
)                       = 6
write(1, "\t9\n", 3        9
)                       = 3
write(1, "5\n", 25
)                       = 2
write(1, "\t4\n", 3        4
)                       = 3
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                       = 1
write(1, "Command: \n", 10Command:
)                       = 10
read(0, 0
"0\n", 1024)                            = 2
exit_group(0)                           = ?
+++ exited with 0 +++
```

sergey@sergey-RedmiBook-14:**~/labs/OS/lab5**$ strace ./stat

```
execve("./stat", ["./stat"], 0x7fffa32b3cf0 /* 54 vars
*/) = 0
brk(NULL)                       = 0x558655ca3000
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, "./tls/haswell/x86_64/libtree.so",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
openat(AT_FDCWD, "./tls/haswell/libtree.so", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
```

```
openat(AT_FDCWD, "./tls/x86_64/libtree.so", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./tls/libtree.so", O_RDONLY|O_CLOEXEC)
= -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./haswell/x86_64/libtree.so", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./haswell/libtree.so", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./x86_64/libtree.so", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./libtree.so", 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\0\360\n\0\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0775, st_size=12920, ...}) = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7fce826c9000
getcwd("/home/sergey/labs/OS/lab5", 128) = 26
mmap(NULL, 2105528, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fce822a1000
mprotect(0x7fce822a3000, 2093056, PROT_NONE) = 0
mmap(0x7fce824a2000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1000) =
0x7fce824a2000
close(3)                                        = 0
openat(AT_FDCWD, "./tls/haswell/x86_64/libc.so.6",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
openat(AT_FDCWD, "./tls/haswell/libc.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./tls/x86_64/libc.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./tls/libc.so.6", O_RDONLY|O_CLOEXEC) =
-1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./haswell/x86_64/libc.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./haswell/libc.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./x86_64/libc.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "./libc.so.6", O_RDONLY|O_CLOEXEC) = -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=139596, ...}) = 0
```

```
mmap(NULL, 139596, PROT_READ, MAP_PRIVATE, 3, 0) =
0x7fce826a6000
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\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) = 0x7fce81eb0000
mprotect(0x7fce82097000, 2097152, PROT_NONE) = 0
mmap(0x7fce82297000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) =
0x7fce82297000
mmap(0x7fce8229d000, 15072, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7fce8229d000
close(3)                                = 0
mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7fce826a3000
arch_prctl(ARCH_SET_FS, 0x7fce826a3740) = 0
mprotect(0x7fce82297000, 16384, PROT_READ) = 0
mprotect(0x7fce824a2000, 4096, PROT_READ) = 0
mprotect(0x558655673000, 4096, PROT_READ) = 0
mprotect(0x7fce826cb000, 4096, PROT_READ) = 0
munmap(0x7fce826a6000, 139596)          = 0
fstat(1, {st_mode=S_IFCHR|0600, st_rdev=makedev(136,
1), ...}) = 0
brk(NULL)                               = 0x558655ca3000
brk(0x558655cc4000)                     = 0x558655cc4000
write(1, "Commands\n", 9Commands
)                   = 9
write(1, "\n", 1
)                         = 1
write(1, "1 - Insert\n", 111 - Insert
)             = 11
write(1, "2 - Search\n", 112 - Search
)             = 11
write(1, "3 - Delete\n", 113 - Delete
)             = 11
```

```
write(1, "4 - Print tree\n", 154 - Print tree
)            = 15
write(1, "0 - Quit\n", 90 - Quit
)               = 9
write(1, "\n", 1
)                        = 1
write(1, "Command: \n", 10Command:
)                = 10
fstat(0, {st_mode=S_IFCHR|0600, st_rdev=makedev(136,
1), ...}) = 0
read(0, 1
"1\n", 1024)                         = 2
write(1, "value to insert: \n", 18value to insert:
)       = 18
read(0, 5
"5\n", 1024)                         = 2
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                        = 1
write(1, "Command: \n", 10Command:
)                = 10
read(0, 1
"1\n", 1024)                         = 2
write(1, "value to insert: \n", 18value to insert:
)       = 18
read(0, 6
"6\n", 1024)                         = 2
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
```

```
write(1, "\n", 1
)                             = 1
write(1, "Command: \n", 10Command:
)                  = 10
read(0, 1
"1\n", 1024)                          = 2
write(1, "value to insert: \n", 18value to insert:
)       = 18
read(0, 7
"7\n", 1024)                          = 2
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                             = 1
write(1, "Command: \n", 10Command:
)                  = 10
read(0, 2
"2\n", 1024)                          = 2
write(1, "value to find: \n", 16value to find:
)          = 16
read(0, 7
"7\n", 1024)                          = 2
write(1, "7 is found in tree!\n", 207 is found in tree!
)    = 20
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                             = 1
write(1, "Command: \n", 10Command:
)                  = 10
```

```
read(0, 3
"3\n", 1024)                          = 2
write(1, "value to delete: \n", 18value to delete:
)       = 18
read(0, 4
"4\n", 1024)                          = 2
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                      = 1
write(1, "Command: \n", 10Command:
)           = 10
read(0, 3
"3\n", 1024)                          = 2
write(1, "value to delete: \n", 18value to delete:
)       = 18
read(0, 7
"7\n", 1024)                          = 2
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                      = 1
write(1, "Command: \n", 10Command:
)           = 10
read(0, 4
"4\n", 1024)                          = 2
write(1, "tree:\n", 6tree:
)                  = 6
write(1, "\t6\n", 3     6
)                  = 3
```

```
write(1, "5\n", 25
)                             = 2
write(1, "Commands\n\n1 - Insert\n2 - Search\n"...,
67Commands

1 - Insert
2 - Search
3 - Delete
4 - Print tree
0 - Quit
) = 67
write(1, "\n", 1
)                             = 1
write(1, "Command: \n", 10Command:
)               = 10
read(0, 0
"0\n", 1024)                          = 2
exit_group(0)                              = ?
+++ exited with 0 +++
```

ЛР 6-8

```
strace ./main
execve("./main", ["./main"], 0x7fff6b244880 /* 54 vars
*/) = 0
brk(NULL)                         = 0x56150328d000
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=139596, ...}) = 0

mmap(NULL, 139596, PROT_READ, MAP_PRIVATE, 3, 0) =
0x7fc4afbd0000
close(3)                          = 0
access("/etc/ld.so.nohwcap", F_OK)     = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD, "/usr/lib/x86_64-linux-gnu/libzmq.so.5",
```

```
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\0P?\1\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=630464, ...}) = 0

mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7fc4afbce000
mmap(NULL, 2725560, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fc4af732000
mprotect(0x7fc4af7c5000, 2097152, PROT_NONE) = 0
mmap(0x7fc4af9c5000, 28672, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x93000) =
0x7fc4af9c5000
close(3)                                   = 0
access("/etc/ld.so.nohwcap", F_OK)      = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD, "/usr/lib/x86_64-linux-gnu/libstdc+
+.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\
0\1\0\0\0\220\304\10\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=1594864, ...}) =
0
mmap(NULL, 3702848, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fc4af3a9000
mprotect(0x7fc4af522000, 2097152, PROT_NONE) = 0
mmap(0x7fc4af722000, 49152, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x179000) =
0x7fc4af722000
mmap(0x7fc4af72e000, 12352, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7fc4af72e000
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/libgcc_s.so.1",
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\0\300*\0\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=96616, ...}) = 0
mmap(NULL, 2192432, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fc4af191000
mprotect(0x7fc4af1a8000, 2093056, PROT_NONE) = 0
mmap(0x7fc4af3a7000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x16000) =
```

```
0x7fc4af3a7000
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\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) = 0x7fc4aeda0000
mprotect(0x7fc4aef87000, 2097152, PROT_NONE) = 0
mmap(0x7fc4af187000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) =
0x7fc4af187000
mmap(0x7fc4af18d000, 15072, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7fc4af18d000
close(3)                                = 0
access("/etc/ld.so.nohwcap", F_OK)      = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD,
"/usr/lib/x86_64-linux-gnu/libsodium.so.23", 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\0\340\251\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=330440, ...}) = 0

mmap(NULL, 2425864, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fc4aeb4f000
mprotect(0x7fc4aeb9f000, 2093056, PROT_NONE) = 0
mmap(0x7fc4aed9e000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x4f000) =
0x7fc4aed9e000
close(3)                                = 0
access("/etc/ld.so.nohwcap", F_OK)      = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD, "/usr/lib/x86_64-linux-gnu/libpgm-
5.2.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\0000;\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=293784, ...}) = 0
```

```
mmap(NULL, 2406448, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fc4ae903000
mprotect(0x7fc4ae94a000, 2093056, PROT_NONE) = 0
mmap(0x7fc4aeb49000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x46000) =
0x7fc4aeb49000
mmap(0x7fc4aeb4b000, 14384, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7fc4aeb4b000
close(3)                                = 0
access("/etc/ld.so.nohwcap", F_OK)      = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD,
"/usr/lib/x86_64-linux-gnu/libnorm.so.1", 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\0000\374\1\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=522248, ...}) = 0

mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7fc4afbcc000
mmap(NULL, 3340624, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fc4ae5d3000
mprotect(0x7fc4ae650000, 2097152, PROT_NONE) = 0
mmap(0x7fc4ae850000, 12288, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x7d000) =
0x7fc4ae850000
mmap(0x7fc4ae853000, 719184, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7fc4ae853000
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/librt.so.1",
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\0\0\"\0\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=31680, ...}) = 0
mmap(NULL, 2128864, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fc4ae3cb000
mprotect(0x7fc4ae3d2000, 2093056, PROT_NONE) = 0
mmap(0x7fc4ae5d1000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x6000) =
0x7fc4ae5d1000
```

```
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, 2221184, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fc4ae1ac000
mprotect(0x7fc4ae1c6000, 2093056, PROT_NONE) = 0
mmap(0x7fc4ae3c5000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19000) =
0x7fc4ae3c5000
mmap(0x7fc4ae3c7000, 13440, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7fc4ae3c7000
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/libm.so.6",
O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\
0\1\0\0\0\200\272\0\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=1700792, ...}) =
0
mmap(NULL, 3789144, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fc4ade0e000
mprotect(0x7fc4adfab000, 2093056, PROT_NONE) = 0
mmap(0x7fc4ae1aa000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19c000) =
0x7fc4ae1aa000
close(3)                                      = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7fc4afbca000
mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7fc4afbc7000
arch_prctl(ARCH_SET_FS, 0x7fc4afbc7b80) = 0
mprotect(0x7fc4af187000, 16384, PROT_READ) = 0
mprotect(0x7fc4ae1aa000, 4096, PROT_READ) = 0
mprotect(0x7fc4ae3c5000, 4096, PROT_READ) = 0
mprotect(0x7fc4ae5d1000, 4096, PROT_READ) = 0
mprotect(0x7fc4af3a7000, 4096, PROT_READ) = 0
```

```
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|
MAP_ANONYMOUS, -1, 0) = 0x7fc4afbc5000
mprotect(0x7fc4af722000, 40960, PROT_READ) = 0
mprotect(0x7fc4ae850000, 8192, PROT_READ) = 0
mprotect(0x7fc4aeb49000, 4096, PROT_READ) = 0
mprotect(0x7fc4aed9e000, 4096, PROT_READ) = 0
mprotect(0x7fc4af9c5000, 24576, PROT_READ) = 0
mprotect(0x561502261000, 4096, PROT_READ) = 0
mprotect(0x7fc4afbf3000, 4096, PROT_READ) = 0
munmap(0x7fc4afbd0000, 139596)          = 0
set_tid_address(0x7fc4afbc7e50)         = 8781
set_robust_list(0x7fc4afbc7e60, 24)     = 0
rt_sigaction(SIGRTMIN, {sa_handler=0x7fc4ae1b1cb0,
sa_mask=[], sa_flags=SA_RESTORER|SA_SIGINFO,
sa_restorer=0x7fc4ae1be8a0}, NULL, 8) = 0
rt_sigaction(SIGRT_1, {sa_handler=0x7fc4ae1b1d50,
sa_mask=[], sa_flags=SA_RESTORER|SA_RESTART|SA_SIGINFO,
sa_restorer=0x7fc4ae1be8a0}, 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)                               = 0x56150328d000
brk(0x5615032ae000)                     = 0x5615032ae000
futex(0x7fc4af72f09c, FUTEX_WAKE_PRIVATE, 2147483647) = 0

futex(0x7fc4af72f0a8, FUTEX_WAKE_PRIVATE, 2147483647) = 0

openat(AT_FDCWD, "/sys/devices/system/cpu/online",
O_RDONLY|O_CLOEXEC) = 3
read(3, "0-7\n", 8192)                  = 4
close(3)                                = 0
openat(AT_FDCWD, "/sys/devices/system/cpu", O_RDONLY|
O_NONBLOCK|O_CLOEXEC|O_DIRECTORY) = 3
fstat(3, {st_mode=S_IFDIR|0755, st_size=0, ...}) = 0
getdents(3, /* 26 entries */, 32768)    = 752
getdents(3, /* 0 entries */, 32768)     = 0
close(3)                                = 0
getpid()                                = 8781
sched_getaffinity(8781, 128, [0, 1, 2, 3, 4, 5, 6, 7]) =
8
openat(AT_FDCWD, "/etc/nsswitch.conf", O_RDONLY|
O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=556, ...}) = 0
read(3, "# /etc/nsswitch.conf\n#\n# Example"..., 4096) =
```

```
556
read(3, "", 4096)                               = 0
close(3)                                        = 0
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC)
= 3
fstat(3, {st_mode=S_IFREG|0644, st_size=139596, ...}) = 0

mmap(NULL, 139596, PROT_READ, MAP_PRIVATE, 3, 0) =
0x7fc4afbd0000
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/tls/haswell/x86_64/libnss_db.so.2"
, O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/lib/x86_64-linux-gnu/tls/haswell/x86_64",
0x7ffdd4916940) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/lib/x86_64-linux-gnu/tls/haswell/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/lib/x86_64-linux-gnu/tls/haswell", 0x7ffdd4916940)
= -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/lib/x86_64-linux-gnu/tls/x86_64/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/lib/x86_64-linux-gnu/tls/x86_64", 0x7ffdd4916940)
= -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/lib/x86_64-linux-gnu/tls/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/lib/x86_64-linux-gnu/tls", 0x7ffdd4916940) = -1
ENOENT (No such file or directory)
openat(AT_FDCWD,
"/lib/x86_64-linux-gnu/haswell/x86_64/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/lib/x86_64-linux-gnu/haswell/x86_64",
0x7ffdd4916940) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/lib/x86_64-linux-gnu/haswell/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
```

```
stat("/lib/x86_64-linux-gnu/haswell", 0x7ffdd4916940) = -
1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/lib/x86_64-linux-gnu/x86_64/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/lib/x86_64-linux-gnu/x86_64", 0x7ffdd4916940) = -1
ENOENT (No such file or directory)
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/lib/x86_64-linux-gnu", {st_mode=S_IFDIR|0755,
st_size=12288, ...}) = 0
openat(AT_FDCWD,
"/usr/lib/x86_64-linux-gnu/tls/haswell/x86_64/libnss_db.s
o.2", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/usr/lib/x86_64-linux-gnu/tls/haswell/x86_64",
0x7ffdd4916940) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/usr/lib/x86_64-linux-gnu/tls/haswell/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/usr/lib/x86_64-linux-gnu/tls/haswell",
0x7ffdd4916940) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/usr/lib/x86_64-linux-gnu/tls/x86_64/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/usr/lib/x86_64-linux-gnu/tls/x86_64",
0x7ffdd4916940) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/usr/lib/x86_64-linux-gnu/tls/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/lib/x86_64-linux-gnu/tls", 0x7ffdd4916940) = -
1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/usr/lib/x86_64-linux-gnu/haswell/x86_64/libnss_db.so.2"
, O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/usr/lib/x86_64-linux-gnu/haswell/x86_64",
0x7ffdd4916940) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/usr/lib/x86_64-linux-gnu/haswell/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
```

```
directory)
stat("/usr/lib/x86_64-linux-gnu/haswell", 0x7ffdd4916940)
= -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/usr/lib/x86_64-linux-gnu/x86_64/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/usr/lib/x86_64-linux-gnu/x86_64", 0x7ffdd4916940)
= -1 ENOENT (No such file or directory)
openat(AT_FDCWD,
"/usr/lib/x86_64-linux-gnu/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/lib/x86_64-linux-gnu", {st_mode=S_IFDIR|0755,
st_size=131072, ...}) = 0
openat(AT_FDCWD,
"/lib/tls/haswell/x86_64/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/lib/tls/haswell/x86_64", 0x7ffdd4916940) = -1
ENOENT (No such file or directory)
openat(AT_FDCWD, "/lib/tls/haswell/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/lib/tls/haswell", 0x7ffdd4916940) = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD, "/lib/tls/x86_64/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/lib/tls/x86_64", 0x7ffdd4916940) = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD, "/lib/tls/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/lib/tls", 0x7ffdd4916940)        = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD, "/lib/haswell/x86_64/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/lib/haswell/x86_64", 0x7ffdd4916940) = -1 ENOENT
(No such file or directory)
openat(AT_FDCWD, "/lib/haswell/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/lib/haswell", 0x7ffdd4916940)     = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD, "/lib/x86_64/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
```

```
stat("/lib/x86_64", 0x7ffdd4916940)      = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD, "/lib/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/lib", {st_mode=S_IFDIR|0755, st_size=4096, ...}) =
0
openat(AT_FDCWD,
"/usr/lib/tls/haswell/x86_64/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/lib/tls/haswell/x86_64", 0x7ffdd4916940) = -1
ENOENT (No such file or directory)
openat(AT_FDCWD, "/usr/lib/tls/haswell/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/usr/lib/tls/haswell", 0x7ffdd4916940) = -1 ENOENT
(No such file or directory)
openat(AT_FDCWD, "/usr/lib/tls/x86_64/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/usr/lib/tls/x86_64", 0x7ffdd4916940) = -1 ENOENT
(No such file or directory)
openat(AT_FDCWD, "/usr/lib/tls/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/lib/tls", 0x7ffdd4916940)     = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD,
"/usr/lib/haswell/x86_64/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/lib/haswell/x86_64", 0x7ffdd4916940) = -1
ENOENT (No such file or directory)
openat(AT_FDCWD, "/usr/lib/haswell/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/usr/lib/haswell", 0x7ffdd4916940) = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD, "/usr/lib/x86_64/libnss_db.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or
directory)
stat("/usr/lib/x86_64", 0x7ffdd4916940) = -1 ENOENT (No
such file or directory)
openat(AT_FDCWD, "/usr/lib/libnss_db.so.2", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/lib", {st_mode=S_IFDIR|0755,
st_size=12288, ...}) = 0
```

```
munmap(0x7fc4afbd0000, 139596)          = 0
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC)
= 3
fstat(3, {st_mode=S_IFREG|0644, st_size=139596, ...}) = 0

mmap(NULL, 139596, PROT_READ, MAP_PRIVATE, 3, 0) =
0x7fc4afbd0000
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/libnss_files.so.2", 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\0P#\0\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=47568, ...}) = 0
mmap(NULL, 2168632, PROT_READ|PROT_EXEC, MAP_PRIVATE|
MAP_DENYWRITE, 3, 0) = 0x7fc4adbfc000
mprotect(0x7fc4adc07000, 2093056, PROT_NONE) = 0
mmap(0x7fc4ade06000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0xa000) =
0x7fc4ade06000
mmap(0x7fc4ade08000, 22328, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) =
0x7fc4ade08000
close(3)                                = 0
mprotect(0x7fc4ade06000, 4096, PROT_READ) = 0
munmap(0x7fc4afbd0000, 139596)          = 0
openat(AT_FDCWD, "/etc/protocols", O_RDONLY|O_CLOEXEC) =
3
fstat(3, {st_mode=S_IFREG|0644, st_size=2932, ...}) = 0
read(3, "# Internet (IP) protocols\n#\n# Up"..., 4096) =
2932
read(3, "", 4096)                       = 0
close(3)                                = 0
eventfd2(0, EFD_CLOEXEC)                = 3
fcntl(3, F_GETFL)                       = 0x2 (flags
O_RDWR)
fcntl(3, F_SETFL, O_RDWR|O_NONBLOCK)    = 0
fcntl(3, F_GETFL)                       = 0x802 (flags
O_RDWR|O_NONBLOCK)
fcntl(3, F_SETFL, O_RDWR|O_NONBLOCK)    = 0
getrandom("\xbf\xcb\x19\xed\x4a\x1e\x28\x5c\x93\x27\x47\
xd8\x9c\xc6\xc4\xf5", 16, 0) = 16
```

```
getrandom("\x40\x38\x37\x78\xe8\x87\x80\xd2\x86\x08\xd3\
x47\x58\xb8\xb6\x8f", 16, 0) = 16
eventfd2(0, EFD_CLOEXEC)                 = 4
fcntl(4, F_GETFL)                        = 0x2 (flags
O_RDWR)
fcntl(4, F_SETFL, O_RDWR|O_NONBLOCK)     = 0
fcntl(4, F_GETFL)                        = 0x802 (flags
O_RDWR|O_NONBLOCK)
fcntl(4, F_SETFL, O_RDWR|O_NONBLOCK)     = 0
epoll_create1(EPOLL_CLOEXEC)             = 5
epoll_ctl(5, EPOLL_CTL_ADD, 4, {0, {u32=53082144,
u64=94648247384096}}) = 0
epoll_ctl(5, EPOLL_CTL_MOD, 4, {EPOLLIN, {u32=53082144,
u64=94648247384096}}) = 0
mmap(NULL, 8392704, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS|
MAP_STACK, -1, 0) = 0x7fc4ad3fb000
mprotect(0x7fc4ad3fc000, 8388608, PROT_READ|PROT_WRITE) =
0
clone(child_stack=0x7fc4adbfab70, flags=CLONE_VM|
CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|
CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|
CLONE_CHILD_CLEARTID, parent_tidptr=0x7fc4adbfb9d0,
tls=0x7fc4adbf
b700, child_tidptr=0x7fc4adbfb9d0) = 8782
openat(AT_FDCWD, "/proc/self/task/8782/comm", O_RDWR) = 6

write(6, "ZMQbg/0", 7)                   = 7
close(6)                                 = 0
eventfd2(0, EFD_CLOEXEC)                 = 6
fcntl(6, F_GETFL)                        = 0x2 (flags
O_RDWR)
fcntl(6, F_SETFL, O_RDWR|O_NONBLOCK)     = 0
fcntl(6, F_GETFL)                        = 0x802 (flags
O_RDWR|O_NONBLOCK)
fcntl(6, F_SETFL, O_RDWR|O_NONBLOCK)     = 0
epoll_create1(EPOLL_CLOEXEC)             = 7
epoll_ctl(7, EPOLL_CTL_ADD, 6, {0, {u32=53097584,
u64=94648247399536}}) = 0
epoll_ctl(7, EPOLL_CTL_MOD, 6, {EPOLLIN, {u32=53097584,
u64=94648247399536}}) = 0
mmap(NULL, 8392704, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS|
MAP_STACK, -1, 0) = 0x7fc4acbfa000
mprotect(0x7fc4acbfb000, 8388608, PROT_READ|PROT_WRITE) =
0
```

```
clone(child_stack=0x7fc4ad3f9b70, flags=CLONE_VM|
CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|
CLONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|
CLONE_CHILD_CLEARTID, parent_tidptr=0x7fc4ad3fa9d0,
tls=0x7fc4ad3f
a700, child_tidptr=0x7fc4ad3fa9d0) = 8783
openat(AT_FDCWD, "/proc/self/task/8783/comm", O_RDWR) = 8

write(8, "ZMQbg/1", 7)                    = 7
close(8)                                  = 0
eventfd2(0, EFD_CLOEXEC)                  = 8
fcntl(8, F_GETFL)                         = 0x2 (flags
O_RDWR)
fcntl(8, F_SETFL, O_RDWR|O_NONBLOCK)      = 0
fcntl(8, F_GETFL)                         = 0x802 (flags
O_RDWR|O_NONBLOCK)
fcntl(8, F_SETFL, O_RDWR|O_NONBLOCK)      = 0
poll([{fd=8, events=POLLIN}], 1, 0)       = 0 (Timeout)
socket(AF_NETLINK, SOCK_RAW|SOCK_CLOEXEC, NETLINK_ROUTE)
= 9
bind(9, {sa_family=AF_NETLINK, nl_pid=0,
nl_groups=00000000}, 12) = 0
getsockname(9, {sa_family=AF_NETLINK, nl_pid=8781,
nl_groups=00000000}, [12]) = 0
sendto(9, {{len=20, type=RTM_GETLINK,
flags=NLM_F_REQUEST|NLM_F_DUMP, seq=1603290030, pid=0},
{ifi_family=AF_UNSPEC, ...}}, 20, 0,
{sa_family=AF_NETLINK, nl_pid=0, nl_groups=00000000}, 12)
= 20
recvmsg(9, {msg_name={sa_family=AF_NETLINK, nl_pid=0,
nl_groups=00000000}, msg_namelen=12,
msg_iov=[{iov_base=[{{len=1316, type=RTM_NEWLINK,
flags=NLM_F_MULTI, seq=1603290030, pid=8781},
{ifi_family=AF_UNSPEC,
ifi_type=ARPHRD_LOOPBACK, ifi_index=if_nametoindex("lo"),
ifi_flags=IFF_UP|IFF_LOOPBACK|IFF_RUNNING|0x10000,
ifi_change=0}, [{{nla_len=7, nla_type=IFLA_IFNAME},
"lo"}, {{nla_len=8, nla_type=IFLA_TXQLEN}, 1000},
{{nla_len=5, nla_type=IFLA_OPERSTATE}, 0}, {{nla_len=5,
nla_type=IFLA_LINKMODE}, 0}, {{nla_len=8,
nla_type=IFLA_MTU}, 65536}, {{nla_len=8, nla_type=0x32 /*
IFLA_??? */}, "\x00\x00\x00\x00"}, {{nla_len=8, nla_t
ype=0x33 /* IFLA_??? */}, "\x00\x00\x00\x00"},
{{nla_len=8, nla_type=IFLA_GROUP}, 0}, {{nla_len=8,
```

nla_type=IFLA_PROMISCUITY}, 0}, {{nla_len=8,
nla_type=IFLA_NUM_TX_QUEUES}, 1}, {{nla_len=8,
nla_type=IFLA_GSO_M
AX_SEGS}, 65535}, {{nla_len=8,
nla_type=IFLA_GSO_MAX_SIZE}, 65536}, {{nla_len=8,
nla_type=IFLA_NUM_RX_QUEUES}, 1}, {{nla_len=5,
nla_type=IFLA_CARRIER}, 1}, {{nla_len=12,
nla_type=IFLA_QDISC}, "noqueue"}, {{nla_
len=8, nla_type=IFLA_CARRIER_CHANGES}, 0}, {{nla_len=5,
nla_type=IFLA_PROTO_DOWN}, 0}, {{nla_len=8, nla_type=0x2f
/* IFLA_??? */}, "\x00\x00\x00\x00"}, {{nla_len=8,
nla_type=0x30 /* IFLA_??? */}, "\x00\x00\x00\
x00"}, {{nla_len=36, nla_type=IFLA_MAP}, {mem_start=0,
mem_end=0, base_addr=0, irq=0, dma=0, port=0}},
{{nla_len=10, nla_type=IFLA_ADDRESS}, "\x00\x00\x00\x00\
x00\x00"}, {{nla_len=10, nla_type=IFLA_BROADCAST},
"\x00\x00\x00\x00\x00\x00"}, {{nla_len=196,
nla_type=IFLA_STATS64}, {rx_packets=69331,
tx_packets=69331, rx_bytes=7016347, tx_bytes=7016347,
rx_errors=0, tx_errors=0, rx_dropped=0, tx_dropped=0,
multicast=0, co
llisions=0, rx_length_errors=0, rx_over_errors=0,
rx_crc_errors=0, rx_frame_errors=0, rx_fifo_errors=0,
rx_missed_errors=0, tx_aborted_errors=0,
tx_carrier_errors=0, tx_fifo_errors=0,
tx_heartbeat_errors=0, tx_
window_errors=0, rx_compressed=0, tx_compressed=0,
rx_nohandler=0}}, {{nla_len=100, nla_type=IFLA_STATS},
{rx_packets=69331, tx_packets=69331, rx_bytes=7016347,
tx_bytes=7016347, rx_errors=0, tx_errors=0, rx_dr
opped=0, tx_dropped=0, multicast=0, collisions=0,
rx_length_errors=0, rx_over_errors=0, rx_crc_errors=0,
rx_frame_errors=0, rx_fifo_errors=0, rx_missed_errors=0,
tx_aborted_errors=0, tx_carrier_errors=0, tx_fif
o_errors=0, tx_heartbeat_errors=0, tx_window_errors=0,
rx_compressed=0, tx_compressed=0, rx_nohandler=0}},
{{nla_len=12, nla_type=IFLA_XDP}, {{nla_len=5,
nla_type=IFLA_XDP_ATTACHED}, 0}}, {{nla_len=760, nla_typ
e=IFLA_AF_SPEC}, "\x88\x00\x02\x00\x84\x00\x01\x00\x00\
x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x01\x00\x00\
x00\x01\x00\x00\x00\x01\x00\x00\x00"...}]], {{len=1324,
type=RTM_NEWLINK, flags=NLM_F_MULTI, seq=16
03290030, pid=8781}, {ifi_family=AF_UNSPEC,
ifi_type=ARPHRD_ETHER,

ifi_index=if_nametoindex("wlp0s20f3"), ifi_flags=IFF_UP|
IFF_BROADCAST|IFF_RUNNING|IFF_MULTICAST|0x10000,
ifi_change=0}, [{{nla_len=14, nla_type
=IFLA_IFNAME}, "wlp0s20f3"}, {{nla_len=8,
nla_type=IFLA_TXQLEN}, 1000}, {{nla_len=5,
nla_type=IFLA_OPERSTATE}, 6}, {{nla_len=5,
nla_type=IFLA_LINKMODE}, 1}, {{nla_len=8,
nla_type=IFLA_MTU}, 1500}, {{nla_len=8,
nla_type=0x32 /* IFLA_??? */}, "\x00\x01\x00\x00"},
{{nla_len=8, nla_type=0x33 /* IFLA_??? */}, "\x00\x09\
x00\x00"}, {{nla_len=8, nla_type=IFLA_GROUP}, 0},
{{nla_len=8, nla_type=IFLA_PROMISCUITY}, 0}, {{nla_len
=8, nla_type=IFLA_NUM_TX_QUEUES}, 1}, {{nla_len=8,
nla_type=IFLA_GSO_MAX_SEGS}, 65535}, {{nla_len=8,
nla_type=IFLA_GSO_MAX_SIZE}, 65536}, {{nla_len=8,
nla_type=IFLA_NUM_RX_QUEUES}, 1}, {{nla_len=5,
nla_type=IFL
A_CARRIER}, 1}, {{nla_len=12, nla_type=IFLA_QDISC},
"noqueue"}, {{nla_len=8, nla_type=IFLA_CARRIER_CHANGES},
46}, {{nla_len=5, nla_type=IFLA_PROTO_DOWN}, 0},
{{nla_len=8, nla_type=0x2f /* IFLA_??? */}, "\x17\x0
0\x00\x00"}, {{nla_len=8, nla_type=0x30 /* IFLA_??? */},
"\x17\x00\x00\x00"}, {{nla_len=36, nla_type=IFLA_MAP},
{mem_start=0, mem_end=0, base_addr=0, irq=0, dma=0,
port=0}}, {{nla_len=10, nla_type=IFLA_ADDRESS}
, "\x3c\xf0\x11\x86\x47\x5a"}, {{nla_len=10,
nla_type=IFLA_BROADCAST}, "\xff\xff\xff\xff\xff\xff"},
{{nla_len=196, nla_type=IFLA_STATS64},
{rx_packets=901335, tx_packets=501919,
rx_bytes=1050626965, tx_bytes=76
352231, rx_errors=0, tx_errors=0, rx_dropped=0,
tx_dropped=0, multicast=0, collisions=0,
rx_length_errors=0, rx_over_errors=0, rx_crc_errors=0,
rx_frame_errors=0, rx_fifo_errors=0, rx_missed_errors=0,
tx_aborte
d_errors=0, tx_carrier_errors=0, tx_fifo_errors=0,
tx_heartbeat_errors=0, tx_window_errors=0,
rx_compressed=0, tx_compressed=0, rx_nohandler=0}},
{{nla_len=100, nla_type=IFLA_STATS}, {rx_packets=901335,
tx_pack
ets=501919, rx_bytes=1050626965, tx_bytes=76352231,
rx_errors=0, tx_errors=0, rx_dropped=0, tx_dropped=0,
multicast=0, collisions=0, rx_length_errors=0,
rx_over_errors=0, rx_crc_errors=0, rx_frame_errors=0, rx_

fifo_errors=0, rx_missed_errors=0, tx_aborted_errors=0,
tx_carrier_errors=0, tx_fifo_errors=0,
tx_heartbeat_errors=0, tx_window_errors=0,
rx_compressed=0, tx_compressed=0, rx_nohandler=0}},
{{nla_len=12, nla_ty
pe=IFLA_XDP}, {{nla_len=5, nla_type=IFLA_XDP_ATTACHED},
0}}, {{nla_len=760, nla_type=IFLA_AF_SPEC}, "\x88\x00\
x02\x00\x84\x00\x01\x00\x00\x00\x00\x00\x00\x00\x00\x00\
x00\x00\x00\x00\x01\x00\x00\x00\x01\x00\x00\
x00\x01\x00\x00\x00"...}]}], iov_len=4096}],
msg_iovlen=1, msg_controllen=0, msg_flags=0}, 0) = 2640
recvmsg(9, {msg_name={sa_family=AF_NETLINK, nl_pid=0,
nl_groups=00000000}, msg_namelen=12,
msg_iov=[{iov_base={{len=20, type=NLMSG_DONE,
flags=NLM_F_MULTI, seq=1603290030, pid=8781}, 0},
iov_len=4096}], msg_iov
len=1, msg_controllen=0, msg_flags=0}, 0) = 20
sendto(9, {{len=20, type=RTM_GETADDR,
flags=NLM_F_REQUEST|NLM_F_DUMP, seq=1603290031, pid=0},
{ifa_family=AF_UNSPEC, ...}}, 20, 0,
{sa_family=AF_NETLINK, nl_pid=0, nl_groups=00000000}, 12)
= 20
recvmsg(9, {msg_name={sa_family=AF_NETLINK, nl_pid=0,
nl_groups=00000000}, msg_namelen=12,
msg_iov=[{iov_base=[{{len=76, type=RTM_NEWADDR,
flags=NLM_F_MULTI, seq=1603290031, pid=8781},
{ifa_family=AF_INET, ifa_
prefixlen=8, ifa_flags=IFA_F_PERMANENT,
ifa_scope=RT_SCOPE_HOST, ifa_index=if_nametoindex("lo")},
[{{nla_len=8, nla_type=IFA_ADDRESS}, 127.0.0.1},
{{nla_len=8, nla_type=IFA_LOCAL}, 127.0.0.1},
{{nla_len=7, nla_
type=IFA_LABEL}, "lo"}, {{nla_len=8, nla_type=IFA_FLAGS},
IFA_F_PERMANENT}, {{nla_len=20, nla_type=IFA_CACHEINFO},
{ifa_prefered=4294967295, ifa_valid=4294967295,
cstamp=476, tstamp=476}}]}, {{len=92, type=RTM_
NEWADDR, flags=NLM_F_MULTI, seq=1603290031, pid=8781},
{ifa_family=AF_INET, ifa_prefixlen=16, ifa_flags=0,
ifa_scope=RT_SCOPE_UNIVERSE,
ifa_index=if_nametoindex("wlp0s20f3")}, [{{nla_len=8,
nla_type=IFA_ADDRESS
}, 172.31.101.217}, {{nla_len=8, nla_type=IFA_LOCAL},
172.31.101.217}, {{nla_len=8, nla_type=IFA_BROADCAST},
172.31.255.255}, {{nla_len=14, nla_type=IFA_LABEL},

```
"wlp0s20f3"}, {{nla_len=8, nla_type=IFA_FLAGS}, I
FA_F_NOPREFIXROUTE}, {{nla_len=20,
nla_type=IFA_CACHEINFO}, {ifa_prefered=14049,
ifa_valid=14049, cstamp=7736, tstamp=1282450}}]}],
iov_len=4096}], msg_iovlen=1, msg_controllen=0,
msg_flags=0}, 0) = 168
recvmsg(9, {msg_name={sa_family=AF_NETLINK, nl_pid=0,
nl_groups=00000000}, msg_namelen=12,
msg_iov=[{iov_base=[{{len=72, type=RTM_NEWADDR,
flags=NLM_F_MULTI, seq=1603290031, pid=8781},
{ifa_family=AF_INET6, ifa
_prefixlen=128, ifa_flags=IFA_F_PERMANENT,
ifa_scope=RT_SCOPE_HOST, ifa_index=if_nametoindex("lo")},
[{{nla_len=20, nla_type=IFA_ADDRESS}, ::1}, {{nla_len=20,
nla_type=IFA_CACHEINFO}, {ifa_prefered=4294967295,
ifa_valid=4294967295, cstamp=476, tstamp=476}},
{{nla_len=8, nla_type=IFA_FLAGS}, IFA_F_PERMANENT}]},
{{len=72, type=RTM_NEWADDR, flags=NLM_F_MULTI,
seq=1603290031, pid=8781}, {ifa_family=AF_INET6,
ifa_prefixle
n=64, ifa_flags=IFA_F_PERMANENT, ifa_scope=RT_SCOPE_LINK,
ifa_index=if_nametoindex("wlp0s20f3")}, [{{nla_len=20,
nla_type=IFA_ADDRESS}, fe80::16c8:1398:c79b:b183},
{{nla_len=20, nla_type=IFA_CACHEINFO}, {ifa_pr
efered=4294967295, ifa_valid=4294967295, cstamp=7630,
tstamp=7747}}, {{nla_len=8, nla_type=IFA_FLAGS},
IFA_F_PERMANENT|IFA_F_NOPREFIXROUTE}]}], iov_len=4096}],
msg_iovlen=1, msg_controllen=0, msg_flags=0}, 0) =
144
recvmsg(9, {msg_name={sa_family=AF_NETLINK, nl_pid=0,
nl_groups=00000000}, msg_namelen=12,
msg_iov=[{iov_base={{len=20, type=NLMSG_DONE,
flags=NLM_F_MULTI, seq=1603290031, pid=8781}, 0},
iov_len=4096}], msg_iov
len=1, msg_controllen=0, msg_flags=0}, 0) = 20
close(9)                                   = 0
socket(AF_INET, SOCK_STREAM|SOCK_CLOEXEC, IPPROTO_TCP) =
9
setsockopt(9, SOL_SOCKET, SO_REUSEADDR, [1], 4) = 0
bind(9, {sa_family=AF_INET, sin_port=htons(30000),
sin_addr=inet_addr("127.0.0.1")}, 16) = 0
listen(9, 100)                             = 0
getsockname(9, {sa_family=AF_INET, sin_port=htons(30000),
sin_addr=inet_addr("127.0.0.1")}, [128->16]) = 0
```

```
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
write(8, "\1\0\0\0\0\0\0\0", 8)          = 8
fstat(1, {st_mode=S_IFCHR|0600, st_rdev=makedev(136,
1), ...}) = 0
write(1, "30000\n", 630000
)                        = 6
fstat(0, {st_mode=S_IFCHR|0600, st_rdev=makedev(136,
1), ...}) = 0
read(0, create 2 3
"create 2 3\n", 1024)               = 11
clone(child_stack=NULL, flags=CLONE_CHILD_CLEARTID|
CLONE_CHILD_SETTID|SIGCHLD, child_tidptr=0x7fc4afbc7e50)
= 8802
poll([{fd=8, events=POLLIN}], 1, 0)      = 1 ([{fd=8,
revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
poll([{fd=8, events=POLLIN}], 1, 5000)   = 1 ([{fd=8,
revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
poll([{fd=8, events=POLLIN}], 1, 5000)   = 1 ([{fd=8,
revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
poll([{fd=8, events=POLLIN}], 1, 5000)   = 1 ([{fd=8,
revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
write(1, "Ok: 8802\n", 9Ok: 8802
)                 = 9
read(0, create 3 2
"create 3 2\n", 1024)               = 11
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
poll([{fd=8, events=POLLIN}], 1, 500030001
)   = 1 ([{fd=8, revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(1, "Ok: 8805\n", 9Ok: 8805
)                 = 9
```

```
read(0, create 4 2
"create 4 2\n", 1024)               = 11
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
poll([{fd=8, events=POLLIN}], 1, 500030002
)  = 1 ([{fd=8, revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(1, "Ok: 8808\n", 90k: 8808
)               = 9
read(0, create 5 3
"create 5 3\n", 1024)               = 11
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
poll([{fd=8, events=POLLIN}], 1, 500030003
)  = 1 ([{fd=8, revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(1, "Ok: 8813\n", 90k: 8813
)               = 9
read(0, ping 5
"ping 5\n", 1024)                   = 7
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
poll([{fd=8, events=POLLIN}], 1, 5000)  = 1 ([{fd=8,
revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(1, "Ok: 1\n", 60k: 1
)                  = 6
read(0, ping 6
"ping 6\n", 1024)                   = 7
write(1, "Error: Not found\n", 17Error: Not found
)       = 17
read(0, ping 2
"ping 2\n", 1024)                   = 7
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
poll([{fd=8, events=POLLIN}], 1, 5000)  = 1 ([{fd=8,
revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(1, "Ok: 1\n", 60k: 1
)                  = 6
```

```
read(0, exec 4 time
"exec 4 time\n", 1024)              = 12
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
poll([{fd=8, events=POLLIN}], 1, 5000)  = 1 ([{fd=8,
revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(1, "Ok: 4: 0\n", 90k: 4: 0
)                   = 9
read(0, exec 4 start
"exec 4 start\n", 1024)            = 13
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
poll([{fd=8, events=POLLIN}], 1, 5000)  = 1 ([{fd=8,
revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(1, "Ok:4\n", 50k:4
)                     = 5
read(0, exec 4 stop
"exec 4 stop\n", 1024)            = 12
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
poll([{fd=8, events=POLLIN}], 1, 5000)  = 1 ([{fd=8,
revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(1, "Ok:4\n", 50k:4
)                     = 5
read(0, exec 4 time
"exec 4 time\n", 1024)            = 12
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
poll([{fd=8, events=POLLIN}], 1, 5000)  = 1 ([{fd=8,
revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)           = 8
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(1, "Ok: 4: 6050\n", 120k: 4: 6050
)             = 12
read(0, exit
"exit\n", 1024)                  = 5
poll([{fd=8, events=POLLIN}], 1, 0)      = 0 (Timeout)
write(6, "\1\0\0\0\0\0\0\0", 8)          = 8
```

```
poll([{fd=8, events=POLLIN}], 1, 5000)  = 1 ([{fd=8,
revents=POLLIN}])
read(8, "\1\0\0\0\0\0\0\0", 8)          = 8
poll([{fd=8, events=POLLIN}], 1, 0)     = 0 (Timeout)
kill(8802, SIGTERM)                      = 0
kill(8802, SIGKILL)                      = 0
write(4, "\1\0\0\0\0\0\0\0", 8)         = 8
write(8, "\1\0\0\0\0\0\0\0", 8)         = 8
poll([{fd=3, events=POLLIN}], 1, -1)    = 1 ([{fd=3,
revents=POLLIN}])
--- SIGCHLD {si_signo=SIGCHLD, si_code=CLD_KILLED,
si_pid=8802, si_uid=1000, si_status=SIGTERM, si_utime=1,
si_stime=1} ---
read(3, "\1\0\0\0\0\0\0\0", 8)          = 8
write(6, "\1\0\0\0\0\0\0\0", 8)         = 8
futex(0x7fc4ad3fa9d0, FUTEX_WAIT, 8783, NULL) = -1 EAGAIN
(Resource temporarily unavailable)
close(7)                                = 0
close(6)                                = 0
close(5)                                = 0
close(4)                                = 0
close(3)                                = 0
lseek(0, -1, SEEK_CUR)                  = -1 ESPIPE
(Illegal seek)
exit_group(0)                           = ?
+++ exited with 0 +++
```

Вывод

В результате данной лабораторной работы я увидел, с помощью утилиты strace работу системных вызвав в ходе работы программы.