Московский Авиационный Институт

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Факультет информационных технологий и прикладной математики

Кафедра вычислительной математики и программирования

Лабораторная работа №1 по курсу

«Операционные системы»

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Оценка: _____

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Задание

Цель работы — приобретение практических навыков диагностики работы программного обеспечения.

Strace

Strace показывает все системные вызовы программы, которые она отправляет к системе во время выполнения, а также их параметры и результат выполнения. При необходимости можно подключиться к уже запущенному процессу.

Strace имеет следующие(и не только) ключи

- **-i** — выводить указатель на инструкцию во время выполнения системного вызова

- **-o** — выводить всю информацию о системных вызовах не в стандартный поток ошибок, а в файл

- **-r** — выводить временную метку для каждого системного вызова

- **-T** — выводить длительность выполнения каждого системного вызова

- **-b** — если указанный системный вызов обнаружен, трассировка прекращается

- **-l** — позволяет блокировать реакцию нажатия Ctrl+C и Ctrl+Z

- **-f** — отслеживать дочерние процессы и создаваемые потоки

Лабораторная работа №2

[pid 14844] – ID процесса

Execve – запуск исполняемого файла

pipe([3, 4]) = **0** создание пайпа

dup(1) = **7** копирование в переменную файлового дескриптора

clone – fork

strace: Process 14844 attached – процесс в таблице процессов

dup2(6, 1) = **1** смена дескриптора

+++ **exited with 0** +++ завершение процесса с кодом 0

execve("./parent.out", ["./parent.out"], 0x7fff476700b8 /* 59 vars */) = 0
brk(NULL) = 0x55ffd3a65000

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=79721, ...}) = 0

mmap(NULL, 79721, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7fe861d1b000

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) = 0x7fe861d19000

mmap(NULL, 3702848, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE,
3, 0) = 0x7fe86177d000

mprotect(0x7fe8618f6000, 2097152, PROT_NONE) = 0

mmap(0x7fe861af6000,   49152,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x179000) = 0x7fe861af6000

mmap(0x7fe861b02000,   12352,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fe861b02000

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) = 0x7fe861565000

mprotect(0x7fe86157c000, 2093056, PROT_NONE) = 0

mmap(0x7fe86177b000,   8192,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x16000) = 0x7fe86177b000

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\0\3\0>\0\1\0\0\0\20\35\2\0\0\0\0\0"..., 832) = 832

fstat(3, {st_mode=S_IFREG|0755, st_size=2030928, ...}) = 0

mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7fe861174000

mprotect(0x7fe86135b000, 2097152, PROT_NONE) = 0

mmap(0x7fe86155b000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) = 0x7fe86155b000

mmap(0x7fe861561000, 15072, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fe861561000

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\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) = 0x7fe860dd6000

mprotect(0x7fe860f73000, 2093056, PROT_NONE) = 0

mmap(0x7fe861172000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19c000) = 0x7fe861172000

close(3)   = 0

mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7fe861d17000

arch_prctl(ARCH_SET_FS, 0x7fe861d17d80) = 0

mprotect(0x7fe86155b000, 16384, PROT_READ) = 0

mprotect(0x7fe861172000, 4096, PROT_READ) = 0

mprotect(0x7fe86177b000, 4096, PROT_READ) = 0

mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7fe861d15000

mprotect(0x7fe861af6000, 40960, PROT_READ) = 0

mprotect(0x55ffd2130000, 4096, PROT_READ) = 0

mprotect(0x7fe861d2f000, 4096, PROT_READ) = 0

munmap(0x7fe861d1b000, 79721)   = 0

brk(NULL)   = 0x55ffd3a65000

brk(0x55ffd3a86000)   = 0x55ffd3a86000

fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0

write(1, "Enter the name of file for answe"..., 36Enter the name of file for answers:) = 36

fstat(0, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0

read(0, t.txt

"t.txt\n", 1024)   = 6

write(1, "Enter numerous:\n", 16Enter numerous:

)   = 16

write(1, "\n", 1

)   = 1

pipe([3, 4])   = 0

pipe([5, 6])   = 0

dup(1)   = 7

clone(child_stack=NULL,

flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLD,

child_tidptr=0x7fe861d18050) = 14844

strace: Process 14844 attached

[pid 14813] close(3)   = 0

[pid 14844] close(5 <unfinished ...>

[pid 14813] close(3 <unfinished ...>

[pid 14844] <... close resumed>)   = 0

[pid 14813] <... close resumed>)   = -1 EBADF (Bad file descriptor)

[pid 14844] close(4 <unfinished ...>

[pid 14813] close(6 <unfinished ...>

[pid 14844] <... close resumed>)   = 0

[pid 14813] <... close resumed>)   = 0

[pid 14844] dup2(3, 0 <unfinished ...>

[pid 14813] dup2(4, 1 <unfinished ...>

[pid 14844] <... dup2 resumed>)   = 0

[pid 14813] <... dup2 resumed>)   = 1

[pid 14844] dup2(6, 1)   = 1

[pid 14813] read(0, <unfinished ...>

[pid 14844] execve("child.out", ["child.out", "t.txt"], 0x7fffd8efa468 /* 59 vars */) = 0

[pid 14844] brk(NULL)   = 0x55a9c440d000

[pid 14844] access("/etc/ld.so.nohwcap", F_OK) = -1 ENOENT (No such file or directory)

[pid 14844] access("/etc/ld.so.preload", R_OK) = -1 ENOENT (No such file or directory)

[pid 14844] openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 4

[pid 14844] fstat(4, {st_mode=S_IFREG|0644, st_size=79721, ...}) = 0

[pid 14844] mmap(NULL, 79721, PROT_READ, MAP_PRIVATE, 4, 0) = 0x7f025ee1a000

[pid 14844] close(4)   = 0

[pid 14844] access("/etc/ld.so.nohwcap", F_OK) = -1 ENOENT (No such file or directory)

[pid   14844]   openat(AT_FDCWD,   "/usr/lib/x86_64-linux-gnu/libstdc++.so.6",
O_RDONLY|O_CLOEXEC) = 4

[pid 14844] read(4, "\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

[pid 14844] fstat(4, {st_mode=S_IFREG|0644, st_size=1594864, ...}) = 0

[pid   14844]   mmap(NULL,   8192,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f025ee18000

[pid   14844]   mmap(NULL,   3702848,   PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_DENYWRITE, 4, 0) = 0x7f025e87c000

[pid 14844] mprotect(0x7f025e9f5000, 2097152, PROT_NONE) = 0

[pid   14844]   mmap(0x7f025ebf5000,   49152,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 4, 0x179000) = 0x7f025ebf5000

[pid   14844]   mmap(0x7f025ec01000,   12352,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f025ec01000

[pid 14844] close(4)   = 0

[pid 14844] access("/etc/ld.so.nohwcap", F_OK) = -1 ENOENT (No such file or directory)

[pid   14844]   openat(AT_FDCWD,   "/lib/x86_64-linux-gnu/libc.so.6",
O_RDONLY|O_CLOEXEC) = 4

[pid 14844] read(4, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\20\35\2\0\0\0\0\0"..., 832) =
832

[pid 14844] fstat(4, {st_mode=S_IFREG|0755, st_size=2030928, ...}) = 0

[pid 14844] mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 4, 0) = 0x7f025e48b000

[pid 14844] mprotect(0x7f025e672000, 2097152, PROT_NONE) = 0

[pid 14844] mmap(0x7f025e872000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 4, 0x1e7000) = 0x7f025e872000

[pid 14844] mmap(0x7f025e878000, 15072, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f025e878000

[pid 14844] close(4) = 0

[pid 14844] access("/etc/ld.so.nohwcap", F_OK) = -1 ENOENT (No such file or directory)

[pid 14844] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libm.so.6", O_RDONLY|O_CLOEXEC) = 4

[pid 14844] read(4, "\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

[pid 14844] fstat(4, {st_mode=S_IFREG|0644, st_size=1700792, ...}) = 0

[pid 14844] mmap(NULL, 3789144, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 4, 0) = 0x7f025e0ed000

[pid 14844] mprotect(0x7f025e28a000, 2093056, PROT_NONE) = 0

[pid 14844] mmap(0x7f025e489000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 4, 0x19c000) = 0x7f025e489000

[pid 14844] close(4) = 0

[pid 14844] access("/etc/ld.so.nohwcap", F_OK) = -1 ENOENT (No such file or directory)

[pid 14844] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libgcc_s.so.1", O_RDONLY|O_CLOEXEC) = 4

[pid 14844] read(4, "\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

[pid 14844] fstat(4, {st_mode=S_IFREG|0644, st_size=96616, ...}) = 0

[pid 14844] mmap(NULL, 2192432, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 4, 0) = 0x7f025ded5000

[pid 14844] mprotect(0x7f025deec000, 2093056, PROT_NONE) = 0

[pid 14844] mmap(0x7f025e0eb000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 4, 0x16000) = 0x7f025e0eb000

[pid 14844] close(4) = 0

[pid 14844] mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f025ee16000

[pid 14844] arch_prctl(ARCH_SET_FS, 0x7f025ee16d80) = 0

[pid 14844] mprotect(0x7f025e872000, 16384, PROT_READ) = 0

[pid 14844] mprotect(0x7f025e0eb000, 4096, PROT_READ) = 0

[pid 14844] mprotect(0x7f025e489000, 4096, PROT_READ) = 0

[pid 14844] mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f025ee14000

[pid 14844] mprotect(0x7f025ebf5000, 40960, PROT_READ) = 0

[pid 14844] mprotect(0x55a9c2fd3000, 4096, PROT_READ) = 0

[pid 14844] mprotect(0x7f025ee2e000, 4096, PROT_READ) = 0

[pid 14844] munmap(0x7f025ee1a000, 79721) = 0

[pid 14844] brk(NULL)   = 0x55a9c440d000

[pid 14844] brk(0x55a9c442e000)   = 0x55a9c442e000

[pid 14844] openat(AT_FDCWD, "t.txt", O_WRONLY|O_CREAT, 0700) = 4

[pid 14844] fstat(0, {st_mode=S_IFIFO|0600, st_size=0, ...}) = 0

[pid 14844] read(0, 23 6543

 <unfinished ...>

[pid 14813] <... read resumed> "23 6543\n", 1024) = 8

[pid 14813] write(1, "2 23 6543 ", 10) = 10

[pid 14844] <... read resumed> "2 23 6543 ", 4096) = 10

[pid 14813] read(5, <unfinished ...>

[pid 14844] fstat(4, {st_mode=S_IFREG|0700, st_size=0, ...}) = 0

[pid 14844] lseek(4, 0, SEEK_CUR)   = 0

[pid 14844] write(4, "0.003515\n", 9)   = 9

[pid 14844] fstat(1, {st_mode=S_IFIFO|0600, st_size=0, ...}) = 0

[pid 14844] write(1, "1", 1)   = 1

[pid 14813] <... read resumed> "1", 4) = 1

[pid 14844] read(0, <unfinished ...>

[pid 14813] read(0, "", 1024)   = 0

[pid 14813] close(4)   = 0

[pid 14813] close(5)   = 0

[pid 14813] close(1)   = 0

[pid 14813] wait4(-1, <unfinished ...>

[pid 14844] <... read resumed> "", 4096) = 0

[pid 14844] close(4)   = 0

[pid 14844] exit_group(0)   = ?

[pid 14844] +++ exited with 0 +++

<... wait4 resumed> [{WIFEXITED(s) && WEXITSTATUS(s) == 0}], 0, NULL) = 14844

--- SIGCHLD {si_signo=SIGCHLD, si_code=CLD_EXITED, si_pid=14844, si_uid=1000, si_status=0, si_utime=0, si_stime=0} ---

exit_group(0)   = ?

+++ exited with 0 +++

Лабораторная работа №3

ann@ann:~/os/lab3$ strace ./a.out 4 <test.txt
execve("./a.out", ["./a.out", "4"], 0x7ffc5ed400d8 /* 63 vars */) = 0
brk(NULL)   = 0x558aa21db000
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=79721, ...}) = 0
mmap(NULL, 79721, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7fc166b0c000
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) = 0x7fc166b0a000
mmap(NULL, 3702848, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7fc16656e000
mprotect(0x7fc1666e7000, 2097152, PROT_NONE) = 0
mmap(0x7fc1668e7000, 49152, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x179000) = 0x7fc1668e7000
mmap(0x7fc1668f3000, 12352, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fc1668f3000

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) = 0x7fc166356000
mprotect(0x7fc16636d000, 2093056, PROT_NONE) = 0
mmap(0x7fc16656c000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x16000) = 0x7fc16656c000
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) = 0x7fc166137000
mprotect(0x7fc166151000, 2093056, PROT_NONE) = 0
mmap(0x7fc166350000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19000) = 0x7fc166350000
mmap(0x7fc166352000, 13440, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fc166352000
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\20\35\2\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=2030928, ...}) = 0
mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7fc165d46000
mprotect(0x7fc165f2d000, 2097152, PROT_NONE) = 0
mmap(0x7fc16612d000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) = 0x7fc16612d000
mmap(0x7fc166133000, 15072, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fc166133000
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) = 0x7fc1659a8000

mprotect(0x7fc165b45000, 2093056, PROT_NONE) = 0

mmap(0x7fc165d44000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19c000) = 0x7fc165d44000

close(3)   = 0

mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1,
0) = 0x7fc166b08000

mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1,
0) = 0x7fc166b05000

arch_prctl(ARCH_SET_FS, 0x7fc166b05740) = 0

mprotect(0x7fc16612d000, 16384, PROT_READ) = 0

mprotect(0x7fc165d44000, 4096, PROT_READ) = 0

mprotect(0x7fc166350000, 4096, PROT_READ) = 0

mprotect(0x7fc16656c000, 4096, PROT_READ) = 0

mprotect(0x7fc1668e7000, 40960, PROT_READ) = 0

mprotect(0x558aa1a97000, 4096, PROT_READ) = 0

mprotect(0x7fc166b20000, 4096, PROT_READ) = 0

munmap(0x7fc166b0c000, 79721)   = 0

set_tid_address(0x7fc166b05a10)   = 4040

set_robust_list(0x7fc166b05a20, 24)   = 0

rt_sigaction(SIGRTMIN, {sa_handler=0x7fc16613ccb0, sa_mask=[],
sa_flags=SA_RESTORER|SA_SIGINFO, sa_restorer=0x7fc166149980}, NULL, 8) = 0

rt_sigaction(SIGRT_1, {sa_handler=0x7fc16613cd50, sa_mask=[],
sa_flags=SA_RESTORER|SA_RESTART|SA_SIGINFO, sa_restorer=0x7fc166149980}, 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)   = 0x558aa21db000

brk(0x558aa21fc000)   = 0x558aa21fc000

futex(0x7fc1668f409c, FUTEX_WAKE_PRIVATE, 2147483647) = 0

futex(0x7fc1668f40a8, FUTEX_WAKE_PRIVATE, 2147483647) = 0

fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0

write(1, "Max threads number is 4\n", 24Max threads number is 4
) = 24

write(1, "Enter vector for sorting:\n", 26Enter vector for sorting:
) = 26

fstat(0, {st_mode=S_IFREG|0664, st_size=1944, ...}) = 0

read(0, "95 665 998 -56 867 713 682 771 9"..., 4096) = 1944

read(0, "", 4096)   = 0

write(1, "Size = 500\n", 11Size = 500
)   = 11

write(1, "MINRUN = 63\n", 12MINRUN = 63
)   = 12
mmap(NULL, 8392704, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS|MAP_STACK, -1, 0) = 0x7fc1651a7000
mprotect(0x7fc1651a8000, 8388608, PROT_READ|PROT_WRITE) = 0
clone(child_stack=0x7fc1659a6fb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc1659a79d0, tls=0x7fc1659a7700, child_tidptr=0x7fc1659a79d0) =
4041
mmap(NULL, 8392704, PROT_NONE,
MAP_PRIVATE|MAP_ANONYMOUS|MAP_STACK, -1, 0) = 0x7fc1649a6000
mprotect(0x7fc1649a7000, 8388608, PROT_READ|PROT_WRITE) = 0
clone(child_stack=0x7fc1651a5fb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc1651a69d0, tls=0x7fc1651a6700, child_tidptr=0x7fc1651a69d0) =
4042
mmap(NULL, 8392704, PROT_NONE,
MAP_PRIVATE|MAP_ANONYMOUS|MAP_STACK, -1, 0) = 0x7fc1641a5000
mprotect(0x7fc1641a6000, 8388608, PROT_READ|PROT_WRITE) = 0
clone(child_stack=0x7fc1649a4fb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc1649a59d0, tls=0x7fc1649a5700, child_tidptr=0x7fc1649a59d0) =
4043
mmap(NULL, 8392704, PROT_NONE,
MAP_PRIVATE|MAP_ANONYMOUS|MAP_STACK, -1, 0) = 0x7fc15f7ff000
mprotect(0x7fc15f800000, 8388608, PROT_READ|PROT_WRITE) = 0
clone(child_stack=0x7fc15fffefb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc15ffff9d0, tls=0x7fc15ffff700, child_tidptr=0x7fc15ffff9d0) = 4044
clone(child_stack=0x7fc15fffefb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc15ffff9d0, tls=0x7fc15ffff700, child_tidptr=0x7fc15ffff9d0) = 4045
clone(child_stack=0x7fc1649a4fb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc1649a59d0, tls=0x7fc1649a5700, child_tidptr=0x7fc1649a59d0) =

4046

clone(child_stack=0x7fc1651a5fb0,

flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc1651a69d0, tls=0x7fc1651a6700, child_tidptr=0x7fc1651a69d0) =
4047

clone(child_stack=0x7fc1659a6fb0,

flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc1659a79d0, tls=0x7fc1659a7700, child_tidptr=0x7fc1659a79d0) =
4048

clone(child_stack=0x7fc1659a6fb0,

flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc1659a79d0, tls=0x7fc1659a7700, child_tidptr=0x7fc1659a79d0) =
4049

clone(child_stack=0x7fc1651a5fb0,

flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc1651a69d0, tls=0x7fc1651a6700, child_tidptr=0x7fc1651a69d0) =
4050

clone(child_stack=0x7fc1649a4fb0,

flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc1649a59d0, tls=0x7fc1649a5700, child_tidptr=0x7fc1649a59d0) =
4051

clone(child_stack=0x7fc15fffefb0,

flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc15ffff9d0, tls=0x7fc15ffff700, child_tidptr=0x7fc15ffff9d0) = 4052
futex(0x7fc15ffff9d0, FUTEX_WAIT, 4052, NULL) = 0

clone(child_stack=0x7fc15fffefb0,

flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc15ffff9d0, tls=0x7fc15ffff700, child_tidptr=0x7fc15ffff9d0) = 4053

clone(child_stack=0x7fc1649a4fb0,

flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|C
LONE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEA
RTID, parent_tidptr=0x7fc1649a59d0, tls=0x7fc1649a5700, child_tidptr=0x7fc1649a59d0) =
4054

futex(0x7fc15ffff9d0, FUTEX_WAIT, 4053, NULL) = 0

clone(child_stack=0x7fc1649a4fb0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLON
E_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7fc1649a59d0, tls=0x7fc1649a5700, child_tidptr=0x7fc1649a59d0) = 4055
futex(0x7fc1649a59d0, FUTEX_WAIT, 4055, NULL) = 0
write(1, "Time: 5028 microseconds\n", 24Time: 5028 microseconds
) = 24
write(1, "Sorted vector:\n", 15Sorted vector:
)   = 15
write(1, "-100 -99 -95 -93 -93 -92 -92 -90"..., 1024-100 -99 -95 -93 -93 -92 -92 -90 -89 -83 -80 -80
-76 -71 -67 -66 -65 -62 -60 -59 -56 -53 -52 -52 -52 -50 -47 -41 -41 -41 -27 -24 -20 -19 -15 -15 -14
-14 -9 0 3 4 9 9 10 12 19 22 23 23 25 26 28 29 31 31 32 32 34 34 36 37 38 39 39 39 42 45 46 48
56 56 59 62 62 64 64 66 68 71 74 77 77 79 80 80 83 87 95 101 104 108 114 116 117 117 118 119
120 120 124 129 138 139 143 143 144 144 145 148 151 151 152 153 155 155 162 164 167 168
172 176 177 177 183 185 186 187 187 189 189 190 192 192 195 196 199 200 201 203 203 204
206 207 210 210 212 215 226 231 232 233 233 234 238 242 243 244 244 250 252 256 264 266
268 270 272 272 272 282 287 289 297 298 299 300 306 306 307 312 312 313 316 317 318 326
327 329 329 331 332 333 340 340 342 342 342 351 355 356 358 361 366 367 367 371 376 377
381 393 395 396 398 402 402 408 409 409 410 411 411 419 419 424 424 426 428 429 431 432
434 438 439 443 443 448 452 457 457 465 466 466 468 470 474 475 480 484 484 489 489 491
493 494 498 500 503 506 506 507 510 511 515 520 524 531 534 536 536 537) = 1024
write(1, " 539 542 544 544 545 547 548 551"..., 922 539 542 544 544 545 547 548 551 553 560
560 562 564 564 564 567 573 575 577 578 579 580 584 593 593 595 602 603 605 606 608 610
611 611 613 614 614 619 619 620 620 620 621 623 624 625 625 626 626 629 633 635 637 639
639 643 645 646 646 647 648 653 655 658 660 662 662 663 663 665 667 670 679 681 682 684
685 688 692 693 694 696 709 710 713 713 715 716 717 720 720 722 722 723 724 726 727 729
730 731 732 732 740 745 749 749 752 754 756 758 758 761 761 762 764 764 766 769 771 776
776 783 783 784 786 786 787 788 800 802 802 805 806 807 808 808 809 810 812 813 816 816
817 820 822 824 825 826 828 831 831 836 838 843 843 854 857 857 858 860 860 861 861 864
864 866 867 867 868 869 874 875 876 877 878 878 884 889 894 897 897 899 900 902 902 903
903 906 909 917 918 918 925 929 929 932 936 938 938 939 939 942 944 944 945 947 949 950
950 955 955 956 959 959 962 963 964 970 975 983 984 987 989 990 996 996 997 998 998 998
) = 922
exit_group(0)   = ?
+++ exited with 0 +++

Лабораторная работа №4

mmap – memory map – отражение в память, флаг MAP_SHARED показывает, что память

разделяемая

ann@ann:~/os/lab4$ strace ./main

execve("./main", ["./main"], 0x7ffd00177910 /* 63 vars */) = 0

brk(NULL)   = 0x55b70b0d0000

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=79721, ...}) = 0

mmap(NULL, 79721, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7f47f948a000

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) = 0x7f47f9488000

mmap(NULL, 2221184, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f47f9056000

mprotect(0x7f47f9070000, 2093056, PROT_NONE) = 0

mmap(0x7f47f926f000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19000) = 0x7f47f926f000

mmap(0x7f47f9271000, 13440, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f47f9271000

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) = 0x7f47f8e4e000

mprotect(0x7f47f8e55000, 2093056, PROT_NONE) = 0

mmap(0x7f47f9054000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x6000) = 0x7f47f9054000

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) = 0x7f47f8ac5000

mprotect(0x7f47f8c3e000, 2097152, PROT_NONE) = 0

15

mmap(0x7f47f8e3e000, 49152, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x179000) = 0x7f47f8e3e000
mmap(0x7f47f8e4a000, 12352, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f47f8e4a000
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\20\35\2\0\0\0\0\0"..., 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=2030928, ...}) = 0
mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f47f86d4000
mprotect(0x7f47f88bb000, 2097152, PROT_NONE) = 0
mmap(0x7f47f8abb000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) = 0x7f47f8abb000
mmap(0x7f47f8ac1000, 15072, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f47f8ac1000
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) = 0x7f47f8336000
mprotect(0x7f47f84d3000, 2093056, PROT_NONE) = 0
mmap(0x7f47f86d2000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19c000) = 0x7f47f86d2000
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) = 0x7f47f811e000
mprotect(0x7f47f8135000, 2093056, PROT_NONE) = 0
mmap(0x7f47f8334000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x16000) = 0x7f47f8334000
close(3)   = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f47f9486000
mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f47f9483000

arch_prctl(ARCH_SET_FS, 0x7f47f9483740) = 0
mprotect(0x7f47f8abb000, 16384, PROT_READ) = 0
mprotect(0x7f47f8334000, 4096, PROT_READ) = 0
mprotect(0x7f47f86d2000, 4096, PROT_READ) = 0
mprotect(0x7f47f8e3e000, 40960, PROT_READ) = 0
mprotect(0x7f47f926f000, 4096, PROT_READ) = 0
mprotect(0x7f47f9054000, 4096, PROT_READ) = 0
mprotect(0x55b70935b000, 4096, PROT_READ) = 0
mprotect(0x7f47f949e000, 4096, PROT_READ) = 0
munmap(0x7f47f948a000, 79721)   = 0
set_tid_address(0x7f47f9483a10)   = 26737
set_robust_list(0x7f47f9483a20, 24)   = 0
rt_sigaction(SIGRTMIN, {sa_handler=0x7f47f905bcb0, sa_mask=[],
sa_flags=SA_RESTORER|SA_SIGINFO, sa_restorer=0x7f47f9068980}, NULL, 8) = 0
rt_sigaction(SIGRT_1, {sa_handler=0x7f47f905bd50, sa_mask=[],
sa_flags=SA_RESTORER|SA_RESTART|SA_SIGINFO, sa_restorer=0x7f47f9068980}, 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)   = 0x55b70b0d0000
brk(0x55b70b0f1000)   = 0x55b70b0f1000
futex(0x7f47f8e4b09c, FUTEX_WAKE_PRIVATE, 2147483647) = 0
futex(0x7f47f8e4b0a8, FUTEX_WAKE_PRIVATE, 2147483647) = 0
fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0
fstat(0, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0
write(1, "Enter the name of file for answe"..., 36Enter the name of file for answers:) = 36
read(0, 1.txt
"1.txt\n", 1024)   = 6
write(1, "Enter numerous:\n", 16Enter numerous:
)   = 16
read(0, 67 5 6
"67 5 6\n", 1024)   = 7
read(0, 34 7 8
"34 7 8\n", 1024)   = 7
read(0, "", 1024)   = 0
statfs("/dev/shm/", {f_type=TMPFS_MAGIC, f_bsize=4096, f_blocks=494308, f_bfree=411429,
f_bavail=411429, f_files=494308, f_ffree=493960, f_fsid={val=[0, 0]}, f_namelen=255,
f_frsize=4096, f_flags=ST_VALID|ST_NOSUID|ST_NODEV}) = 0
futex(0x7f47f9274370, FUTEX_WAKE_PRIVATE, 2147483647) = 0
openat(AT_FDCWD, "/dev/shm/like_a_pipe",

O_RDWR|O_CREAT|O_NOFOLLOW|O_CLOEXEC, 0644) = 3
openat(AT_FDCWD, "/dev/shm/sem.my_semaphore", O_RDWR|O_NOFOLLOW) = -1
ENOENT (No such file or directory)
getpid()   = 26737
lstat("/dev/shm/RxIaDn", 0x7ffefdff24f0) = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/dev/shm/RxIaDn", O_RDWR|O_CREAT|O_EXCL, 0644) = 4
write(4, "\1\0\0\0\0\0\0\0\200\0\0\0e_a_\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) = 0x7f47f949d000
link("/dev/shm/RxIaDn", "/dev/shm/sem.my_semaphore") = 0
fstat(4, {st_mode=S_IFREG|0644, st_size=32, ...}) = 0
unlink("/dev/shm/RxIaDn")   = 0
close(4)   = 0
ftruncate(3, 15)   = 0
mmap(NULL, 15, PROT_READ|PROT_WRITE, MAP_SHARED, 3, 0) = 0x7f47f949c000
clone(child_stack=NULL,
flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLD,
child_tidptr=0x7f47f9483a10) = 26869
futex(0x7f47f949d000, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 0, NULL,
0xffffffff) = 0
--- SIGCHLD {si_signo=SIGCHLD, si_code=CLD_EXITED, si_pid=26869, si_uid=1000,
si_status=0, si_utime=0, si_stime=0} ---
exit_group(0)   = ?
+++ exited with 0 +++

Лабораторная работа №5

openat – открытие файла, в моём случае - библиотеки

ann@ann:~/os/lab5$ strace ./main1.out

execve("./main1.out", ["./main1.out"], 0x7ffdfb088fc0 /* 63 vars */) = 0

brk(NULL)   = 0x5589be797000

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/libd1.so", O_RDONLY|O_CLOEXEC) = -1

ENOENT (No such file or directory)

openat(AT_FDCWD, "./tls/haswell/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No

such file or directory)

openat(AT_FDCWD, "./tls/x86_64/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./tls/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./haswell/x86_64/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./haswell/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./x86_64/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./libd1.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`\5\0\0\0\0\0\0"..., 832) = 832

fstat(3, {st_mode=S_IFREG|0775, st_size=7928, ...}) = 0

mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f130c3b8000

getcwd("/home/ann/os/lab5", 128)   = 18

mmap(NULL, 2101296, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f130bf8f000

mprotect(0x7f130bf90000, 2093056, PROT_NONE) = 0

mmap(0x7f130c18f000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0) = 0x7f130c18f000

close(3)   = 0

openat(AT_FDCWD, "./tls/haswell/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./tls/haswell/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./tls/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./tls/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./haswell/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./haswell/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT
(No such file or directory)

openat(AT_FDCWD, "./x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT
(No such file or directory)

openat(AT_FDCWD, "./libstdc++.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=79721, ...}) = 0

mmap(NULL, 79721, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7f130c3a4000

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) = 0x7f130bc06000

mprotect(0x7f130bd7f000, 2097152, PROT_NONE) = 0

mmap(0x7f130bf7f000, 49152, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x179000) = 0x7f130bf7f000

mmap(0x7f130bf8b000, 12352, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f130bf8b000

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\20\35\2\0\0\0\0\0"..., 832) = 832

fstat(3, {st_mode=S_IFREG|0755, st_size=2030928, ...}) = 0

mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f130b815000

mprotect(0x7f130b9fc000, 2097152, PROT_NONE) = 0

mmap(0x7f130bbfc000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) = 0x7f130bbfc000

mmap(0x7f130bc02000, 15072, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f130bc02000

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) = 0x7f130b477000

mprotect(0x7f130b614000, 2093056, PROT_NONE) = 0

mmap(0x7f130b813000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19c000) = 0x7f130b813000

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) = 0x7f130b25f000

mprotect(0x7f130b276000, 2093056, PROT_NONE) = 0

mmap(0x7f130b475000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x16000) = 0x7f130b475000

close(3)   = 0

mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f130c3a2000

mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f130c39f000

arch_prctl(ARCH_SET_FS, 0x7f130c39f740) = 0

mprotect(0x7f130bbfc000, 16384, PROT_READ) = 0

mprotect(0x7f130b475000, 4096, PROT_READ) = 0

mprotect(0x7f130b813000, 4096, PROT_READ) = 0

mprotect(0x7f130bf7f000, 40960, PROT_READ) = 0

mprotect(0x7f130c18f000, 4096, PROT_READ) = 0

mprotect(0x5589bca52000, 4096, PROT_READ) = 0

mprotect(0x7f130c3ba000, 4096, PROT_READ) = 0

munmap(0x7f130c3a4000, 79721)   = 0

brk(NULL)   = 0x5589be797000

brk(0x5589be7b8000)   = 0x5589be7b8000

fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0

write(1, "Enter command (1 or 2): ", 24Enter command (1 or 2):) = 24

fstat(0, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0

read(0, 0x5589be7a9280, 1024)   = ? ERESTARTSYS (To be restarted if SA_RESTART is set)

--- SIGWINCH {si_signo=SIGWINCH, si_code=SI_KERNEL} ---

read(0, 1

"1\n", 1024)   = 2

write(1, "Enter A, B, e: ", 15Enter A, B, e:)   = 15

read(0, 1.5 1.6 0.01

"1.5 1.6 0.01\n", 1024)   = 13

write(1, "Integral value 0.0999358\n", 25Integral value 0.0999358

) = 25

write(1, "Enter command (1 or 2): ", 24Enter command (1 or 2):) = 24

read(0, 2

"2\n", 1024)   = 2

write(1, "Enter A and B: ", 15Enter A and B:)   = 15

read(0, 34 78

"34 78\n", 1024)   = 6

write(1, "PrimeCount in [a; b] 10\n", 24PrimeCount in [a; b] 10

) = 24

write(1, "Enter command (1 or 2): ", 24Enter command (1 or 2):) = 24

read(0, "", 1024)   = 0

exit_group(0)   = ?

+++ exited with 0 +++

Strace2

ann@ann:~/os/lab5$ strace ./main2.out

execve("./main2.out", ["./main2.out"], 0x7ffe89199cf0 /* 63 vars */) = 0

brk(NULL)   = 0x560921bbf000

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=79721, ...}) = 0

mmap(NULL, 79721, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7fb6f07a3000

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) = 0x7fb6f07a1000

mmap(NULL, 2109712, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE,

3, 0) = 0x7fb6f038a000

mprotect(0x7fb6f038d000, 2093056, PROT_NONE) = 0

mmap(0x7fb6f058c000, 8192, PROT_READ|PROT_WRITE,

MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7fb6f058c000

close(3)   = 0

openat(AT_FDCWD, "./tls/haswell/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1

ENOENT (No such file or directory)

openat(AT_FDCWD, "./tls/haswell/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT

(No such file or directory)

openat(AT_FDCWD, "./tls/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT

(No such file or directory)

openat(AT_FDCWD, "./tls/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No

such file or directory)

openat(AT_FDCWD, "./haswell/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1

ENOENT (No such file or directory)

openat(AT_FDCWD, "./haswell/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT

(No such file or directory)

openat(AT_FDCWD, "./x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT

(No such file or directory)

openat(AT_FDCWD, "./libstdc++.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, "/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) = 0x7fb6f0001000

mprotect(0x7fb6f017a000, 2097152, PROT_NONE) = 0

mmap(0x7fb6f037a000, 49152, PROT_READ|PROT_WRITE,

MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x179000) = 0x7fb6f037a000

mmap(0x7fb6f0386000, 12352, PROT_READ|PROT_WRITE,

MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fb6f0386000

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\20\35\2\0\0\0\0\0"..., 832) = 832

fstat(3, {st_mode=S_IFREG|0755, st_size=2030928, ...}) = 0

mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7fb6efc10000

mprotect(0x7fb6efdf7000, 2097152, PROT_NONE) = 0

mmap(0x7fb6efff7000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) = 0x7fb6efff7000

mmap(0x7fb6efffd000, 15072, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fb6efffd000

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) = 0x7fb6ef872000

mprotect(0x7fb6efa0f000, 2093056, PROT_NONE) = 0

mmap(0x7fb6efc0e000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x19c000) = 0x7fb6efc0e000

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) = 0x7fb6ef65a000

mprotect(0x7fb6ef671000, 2093056, PROT_NONE) = 0

mmap(0x7fb6ef870000, 8192, PROT_READ|PROT_WRITE,

MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x16000) = 0x7fb6ef870000

close(3)   = 0

mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7fb6f079f000

mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7fb6f079c000

arch_prctl(ARCH_SET_FS, 0x7fb6f079c740) = 0

mprotect(0x7fb6efff7000, 16384, PROT_READ) = 0

mprotect(0x7fb6ef870000, 4096, PROT_READ) = 0

mprotect(0x7fb6efc0e000, 4096, PROT_READ) = 0

mprotect(0x7fb6f037a000, 40960, PROT_READ) = 0

mprotect(0x7fb6f058c000, 4096, PROT_READ) = 0

mprotect(0x560920fa2000, 4096, PROT_READ) = 0

mprotect(0x7fb6f07b7000, 4096, PROT_READ) = 0

munmap(0x7fb6f07a3000, 79721)   = 0

brk(NULL)   = 0x560921bbf000

brk(0x560921be0000)   = 0x560921be0000

fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0

write(1, "Enter num library: ", 19Enter num library:)   = 19

fstat(0, {st_mode=S_IFCHR|0620, st_rdev=makedev(136, 0), ...}) = 0

read(0, 1

"1\n", 1024)   = 2

openat(AT_FDCWD, "./tls/haswell/x86_64/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./tls/haswell/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./tls/x86_64/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./tls/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./haswell/x86_64/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./haswell/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./x86_64/libd1.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./libd1.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`\5\0\0\0\0\0\0"..., 832) = 832

fstat(3, {st_mode=S_IFREG|0775, st_size=7928, ...}) = 0

getcwd("/home/ann/os/lab5", 128)   = 18

mmap(NULL, 2101296, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7fb6ef458000

mprotect(0x7fb6ef459000, 2093056, PROT_NONE) = 0

mmap(0x7fb6ef658000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0) = 0x7fb6ef658000

close(3)   = 0

mprotect(0x7fb6ef658000, 4096, PROT_READ) = 0

write(1, "Enter command: 0, 1 or 2: ", 26Enter command: 0, 1 or 2:) = 26

read(0, 1

"1\n", 1024)   = 2

write(1, "Enter A, B, e: ", 15Enter A, B, e:)   = 15

read(0, 1.4 1.5 0.001

"1.4 1.5 0.001\n", 1024)   = 14

write(1, "Integral value 0.0982371\n", 25Integral value 0.0982371

) = 25

write(1, "Enter command: 0, 1 or 2: ", 26Enter command: 0, 1 or 2:) = 26

read(0, 0

"0\n", 1024)   = 2

munmap(0x7fb6ef458000, 2101296)   = 0

openat(AT_FDCWD, "./tls/haswell/x86_64/libd2.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./tls/haswell/libd2.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./tls/x86_64/libd2.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No

such file or directory)

openat(AT_FDCWD, "./tls/libd2.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./haswell/x86_64/libd2.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./haswell/libd2.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./x86_64/libd2.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./libd2.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\0\30\0\0\0\0\0\0\0"..., 832) = 832

fstat(3, {st_mode=S_IFREG|0775, st_size=19464, ...}) = 0

getcwd("/home/ann/os/lab5", 128)   = 18

mmap(NULL, 2109792, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7fb6ef456000

mprotect(0x7fb6ef459000, 2093056, PROT_NONE) = 0

mmap(0x7fb6ef658000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7fb6ef658000

close(3)   = 0

mprotect(0x7fb6ef658000, 4096, PROT_READ) = 0

write(1, "Change library\n", 15Change library
)   = 15

write(1, "Enter command: 0, 1 or 2: ", 26Enter command: 0, 1 or 2:) = 26

read(0, 2
"2\n", 1024)   = 2

write(1, "Enter A and B: ", 15Enter A and B:)   = 15

read(0, 2 7
"2 7\n", 1024)   = 4

write(1, "PrimeCount in [a; b] 4\n", 23PrimeCount in [a; b] 4
) = 23

write(1, "Enter command: 0, 1 or 2: ", 26Enter command: 0, 1 or 2:) = 26

read(0, "", 1024)   = 0

munmap(0x7fb6ef456000, 2109792)   = 0

exit_group(0)   = ?

+++ exited with 0 +++

Лабораторная работа №6-8

Ниже представлена работа с очередью сообщений, основанной на сокетах

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=8955, nl_groups=00000000}, [12]) = 0

sendto(9, {{len=20, type=RTM_GETLINK, flags=NLM_F_REQUEST|NLM_F_DUMP, seq=1640791805, 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=1296, type=RTM_NEWLINK, flags=NLM_F_MULTI, seq=1640791805, pid=8955}, {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=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=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=13785, tx_packets=13785, rx_bytes=831821, tx_bytes=831821, 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=100, nla_type=IFLA_STATS}, {rx_packets=13785, tx_packets=13785, rx_bytes=831821, tx_bytes=831821, 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_type=IFLA_XDP}, {{nla_len=5, nla_type=IFLA_XDP_ATTACHED}, 0}}, {{nla_len=756, nla_type=IFLA_AF_SPEC},

"\x84\x00\x02\x00\x80\x00\x01\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=1304, type=RTM_NEWLINK,
flags=NLM_F_MULTI, seq=1640791805, pid=8955}, {ifi_family=AF_UNSPEC, ifi_type=ARPHRD_ETHER, ifi_index=if_nametoindex("eno1"), ifi_flags=IFF_UP|IFF_BROADCAST|IFF_MULTICAST, ifi_change=0}, [{{nla_len=9, nla_type=IFLA_IFNAME}, "eno1"}, {{nla_len=8, nla_type=IFLA_TXQLEN}, 1000}, {{nla_len=5, nla_type=IFLA_OPERSTATE}, 2}, {{nla_len=5, nla_type=IFLA_LINKMODE}, 0}, {{nla_len=8, nla_type=IFLA_MTU}, 1500}, {{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=IFLA_CARRIER}, 0}, {{nla_len=13, nla_type=IFLA_QDISC}, "fq_codel"}, {{nla_len=8, nla_type=IFLA_CARRIER_CHANGES}, 1}, {{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_??? */}, "\x01\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}, "\xb0\x0c\xd1\xea\x46\x8f"}, {{nla_len=10, nla_type=IFLA_BROADCAST}, "\xff\xff\xff\xff\xff\xff"}, {{nla_len=196,

nla_type=IFLA_STATS64}, {rx_packets=0, tx_packets=0, rx_bytes=0, tx_bytes=0, 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=100, nla_type=IFLA_STATS}, {rx_packets=0, tx_packets=0, rx_bytes=0, tx_bytes=0, 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_type=IFLA_XDP}, {{nla_len=5, nla_type=IFLA_XDP_ATTACHED}, 0}}, {{nla_len=756, nla_type=IFLA_AF_SPEC},

"\x84\x00\x02\x00\x80\x00\x01\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) = 2600
recvmsg(9, {msg_name={sa_family=AF_NETLINK, nl_pid=0, nl_groups=00000000}, msg_namelen=12, msg_iov=[{iov_base={{len=1296, type=RTM_NEWLINK, flags=NLM_F_MULTI, seq=1640791805, pid=8955}, {ifi_family=AF_UNSPEC, ifi_type=ARPHRD_ETHER, ifi_index=if_nametoindex("wlo1"), ifi_flags=IFF_UP|IFF_BROADCAST|IFF_RUNNING|IFF_MULTICAST|0x10000, ifi_change=0}, [{{nla_len=9, nla_type=IFLA_IFNAME}, "wlo1"}, {{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=IFLA_GROUP}, 0}, {{nla_len=8, nla_type=IFLA_PROMISCUITY}, 0}, {{nla_len=8, nla_type=IFLA_NUM_TX_QUEUES}, 4}, {{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=IFLA_CARRIER}, 1}, {{nla_len=7, nla_type=IFLA_QDISC}, "mq"}, {{nla_len=8, nla_type=IFLA_CARRIER_CHANGES}, 2}, {{nla_len=5, nla_type=IFLA_PROTO_DOWN}, 0}, {{nla_len=8, nla_type=0x2f /* IFLA_??? */}, "\x01\x00\x00\x00"}, {{nla_len=8, nla_type=0x30 /* IFLA_??? */}, "\x01\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}, "\xd4\x3b\x04\x3a\xa7\x82"}, {{nla_len=10,
nla_type=IFLA_BROADCAST}, "\xff\xff\xff\xff\xff\xff"}, {{nla_len=196,
nla_type=IFLA_STATS64}, {rx_packets=30530, tx_packets=19500, rx_bytes=25906404,
tx_bytes=4949527, 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=100, nla_type=IFLA_STATS}, {rx_packets=30530,
tx_packets=19500, rx_bytes=25906404, tx_bytes=4949527, 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_type=IFLA_XDP},
{{nla_len=5, nla_type=IFLA_XDP_ATTACHED}, 0}}, {{nla_len=756,
nla_type=IFLA_AF_SPEC},
"\x84\x00\x02\x00\x80\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) = 1296
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=1640791805, pid=8955}, 0}, iov_len=4096}], msg_iovlen=1,
msg_controllen=0, msg_flags=0}, 0) = 20
sendto(9, {{len=20, type=RTM_GETADDR, flags=NLM_F_REQUEST|NLM_F_DUMP,
seq=1640791806, 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=1640791806, pid=8955}, {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=224, tstamp=224}}]}, {{len=88, type=RTM_NEWADDR, flags=NLM_F_MULTI, seq=1640791806, pid=8955}, {ifa_family=AF_INET, ifa_prefixlen=24, ifa_flags=0, ifa_scope=RT_SCOPE_UNIVERSE, ifa_index=if_nametoindex("wlo1")}, [{{nla_len=8, nla_type=IFA_ADDRESS}, 192.168.1.64}, {{nla_len=8, nla_type=IFA_LOCAL}, 192.168.1.64}, {{nla_len=8, nla_type=IFA_BROADCAST}, 192.168.1.255}, {{nla_len=9, nla_type=IFA_LABEL}, "wlo1"}, {{nla_len=8, nla_type=IFA_FLAGS}, IFA_F_NOPREFIXROUTE}, {{nla_len=20, nla_type=IFA_CACHEINFO}, {ifa_prefered=79771, ifa_valid=79771, cstamp=1205, tstamp=660738}}]}], iov_len=4096}], msg_iovlen=1, msg_controllen=0, msg_flags=0}, 0) = 164
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=1640791806, pid=8955}, {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=224, tstamp=224}}, {{nla_len=8, nla_type=IFA_FLAGS}, IFA_F_PERMANENT}]}, {{len=72, type=RTM_NEWADDR, flags=NLM_F_MULTI, seq=1640791806, pid=8955}, {ifa_family=AF_INET6, ifa_prefixlen=128, ifa_flags=0, ifa_scope=RT_SCOPE_UNIVERSE, ifa_index=if_nametoindex("wlo1")}, [{{nla_len=20, nla_type=IFA_ADDRESS}, 2a00:1370:8137:6796:1484:6013:4b01:bc7}, {{nla_len=20, nla_type=IFA_CACHEINFO}, {ifa_prefered=577, ifa_valid=577, cstamp=1361, tstamp=661844}}, {{nla_len=8, nla_type=IFA_FLAGS}, IFA_F_NOPREFIXROUTE}]}, {{len=72, type=RTM_NEWADDR, flags=NLM_F_MULTI, seq=1640791806, pid=8955}, {ifa_family=AF_INET6, ifa_prefixlen=64, ifa_flags=IFA_F_SECONDARY, ifa_scope=RT_SCOPE_UNIVERSE, ifa_index=if_nametoindex("wlo1")}, [{{nla_len=20, nla_type=IFA_ADDRESS}, 2a00:1370:8137:6796:1dfd:c02b:dba8:950c}, {{nla_len=20, nla_type=IFA_CACHEINFO}, {ifa_prefered=311, ifa_valid=311, cstamp=1202, tstamp=661844}}, {{nla_len=8, nla_type=IFA_FLAGS}, IFA_F_SECONDARY}]}, {{len=72, type=RTM_NEWADDR, flags=NLM_F_MULTI, seq=1640791806, pid=8955}, {ifa_family=AF_INET6, ifa_prefixlen=64, ifa_flags=0, ifa_scope=RT_SCOPE_UNIVERSE, ifa_index=if_nametoindex("wlo1")}, [{{nla_len=20, nla_type=IFA_ADDRESS}, 2a00:1370:8137:6796:ad39:a00d:5808:4400},

{{nla_len=20, nla_type=IFA_CACHEINFO}, {ifa_prefered=311, ifa_valid=311, cstamp=1202, tstamp=661844}}, {{nla_len=8, nla_type=IFA_FLAGS}, IFA_F_MANAGETEMPADDR|IFA_F_NOPREFIXROUTE}]}, {{len=72, type=RTM_NEWADDR, flags=NLM_F_MULTI, seq=1640791806, pid=8955}, {ifa_family=AF_INET6, ifa_prefixlen=64, ifa_flags=IFA_F_SECONDARY, ifa_scope=RT_SCOPE_UNIVERSE, ifa_index=if_nametoindex("wlo1")}, [{{nla_len=20, nla_type=IFA_ADDRESS}, fd60:e320:1618:1:1dfd:c02b:dba8:950c}, {{nla_len=20, nla_type=IFA_CACHEINFO}, {ifa_prefered=311, ifa_valid=311, cstamp=1202, tstamp=661844}}, {{nla_len=8, nla_type=IFA_FLAGS}, IFA_F_SECONDARY}]}, {{len=72, type=RTM_NEWADDR, flags=NLM_F_MULTI, seq=1640791806, pid=8955}, {ifa_family=AF_INET6, ifa_prefixlen=64, ifa_flags=0, ifa_scope=RT_SCOPE_UNIVERSE, ifa_index=if_nametoindex("wlo1")}, [{{nla_len=20, nla_type=IFA_ADDRESS}, fd60:e320:1618:1:a2d2:41d3:2efe:aa5e}, {{nla_len=20, nla_type=IFA_CACHEINFO}, {ifa_prefered=311, ifa_valid=311, cstamp=1202, tstamp=661844}}, {{nla_len=8, nla_type=IFA_FLAGS}, IFA_F_MANAGETEMPADDR|IFA_F_NOPREFIXROUTE}]}, {{len=72, type=RTM_NEWADDR, flags=NLM_F_MULTI, seq=1640791806, pid=8955}, {ifa_family=AF_INET6, ifa_prefixlen=64, ifa_flags=IFA_F_PERMANENT, ifa_scope=RT_SCOPE_LINK, ifa_index=if_nametoindex("wlo1")}, [{{nla_len=20, nla_type=IFA_ADDRESS}, fe80::e44:a50:7435:c1b8}, {{nla_len=20, nla_type=IFA_CACHEINFO}, {ifa_prefered=4294967295, ifa_valid=4294967295, cstamp=1000, tstamp=661844}}, {{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) = 504
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=1640791806, pid=8955}, 0}, iov_len=4096}], msg_iovlen=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(3005), sin_addr=inet_addr("127.0.0.1")}, 16) = 0
listen(9, 100)   = 0

getsockname(9, {sa_family=AF_INET, sin_port=htons(3005), 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

clone(child_stack=NULL,

flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLD,

child_tidptr=0x7fd9d73ece50) = 8998

futex(0x7fd9d69a1918, FUTEX_WAKE_PRIVATE, 1) = 1

poll([{fd=8, events=POLLIN}], 1, -1)   = 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, -1)   = 1 ([{fd=8, revents=POLLIN}])

read(8, "\1\0\0\0\0\0\0\0", 8)   = 8

write(6, "\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(1, "OK: 8998\n", 9OK: 8998

)   = 9

write(1, "command:", 8command:)   = 8

read(0, create 9

"create 9\n", 1024)   = 9

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, -1)   = 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, -1)   = 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: 9049\n", 9OK: 9049

)   = 9

write(1, "command:", 8command:)   = 8

```
read(0, exec 9
"exec 9\n", 1024)              = 7
read(0, qwertyhjklkjhgfd
"qwertyhjklkjhgfd\n", 1024)    = 17
read(0, j
"j\n", 1024)                   = 2
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, -1)    = 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)
```

Вывод

Я познакомилась с работой утилиты strace, часто пользовалась флагом –f, который позволяет следить за всеми процессами, это очень помогает при работе с синхронизацией процессов. Также утилита может быть дополнением к отладчику, чтобы следить не только за изменением переменных, но и за системными вызовами. Уверена, эта утилита ещё не раз пригодится мне в учёбе.