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**Лабораторная работа №1 по курсу
«Операционные системы»**

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Репозиторий

Постановка задачи

Подробно рассказать о каждом системном вызове из утилиты strace на примере лабораторной работы №4.

Описание работы strace

execve — открывает файл на исполнение.

brk — изменяет расположение маркера окончания неинициализированных данных, который определяет конец сегмента данных процесса.

arch_prctl — устанавливает состояние процесса или потока, зависящее от архитектуры.

openat — открывает файл в определенной директории.

newfstatat — возвращает информацию о файле в буфер.

close — закрывает файловый дескриптор.

mmap — создает новое отображение памяти в адресном пространстве процесса.

ftruncate — устанавливает файлу необходимый размер.

munmap — удаляет отображение.

Демонстрация работы strace

```
ggame@ggame:~/OS/lab4/t1/build$ strace -f ./main < test
execve("./main", ["/main"], 0x7ffd1340f848 /* 45 vars */) = 0
brk(NULL)                                = 0x55f0a5a9a000
arch_prctl(0x3001 /* ARCH_??? */, 0x7ffe6b071e40) = -1 EINVAL (Недопустимый аргумент)
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) =
0x7f3174316000
access("/etc/ld.so.preload", R_OK)       = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD, "/usr/local/cuda/lib64/glibc-hwcaps/x86-64-v3/libstdc++.so.6",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/glibc-hwcaps/x86-64-v3", 0x7ffe6b071060,
0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD, "/usr/local/cuda/lib64/glibc-hwcaps/x86-64-v2/libstdc++.so.6",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/glibc-hwcaps/x86-64-v2", 0x7ffe6b071060,
0) = -1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64/libstdc++.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64/x86_64", 0x7ffe6b071060, 0) = -
1 ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64/libstdc++.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64", 0x7ffe6b071060, 0) = -1
ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64/libstdc++.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
```

```

newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64", 0x7ffe6b071060, 0) = -1
ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD, "/usr/local/cuda/lib64/tls/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1
ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/tls", 0x7ffe6b071060, 0) = -1 ENOENT (Нет
такого файла или каталога)
openat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64/x86_64/libstdc++.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64/x86_64", 0x7ffe6b071060, 0) = -1
ENOENT (Нет такого файла или каталога)
openat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) =
-1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64", 0x7ffe6b071060, 0) = -1 ENOENT
(Нет такого файла или каталога)
openat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) =
-1 ENOENT (Нет такого файла или каталога)
newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64", 0x7ffe6b071060, 0) = -1 ENOENT
(Нет такого файла или каталога)
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=86613, ...}, AT_EMPTY_PATH) = 0
mmap(NULL, 86613, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7f3174300000
close(3) = 0
openat(AT_FDCWD, "/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\0\0\0\0\0\0\0\0\0\0\0"...
, 832) = 832
newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=2252096, ...}, AT_EMPTY_PATH) = 0
mmap(NULL, 2267328, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f31740d6000
mmap(0x7f3174170000, 1114112, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x9a000) = 0x7f3174170000
mmap(0x7f3174280000, 454656, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3,
0x1aa000) = 0x7f3174280000
mmap(0x7f31742ef000, 57344, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE,
3, 0x218000) = 0x7f31742ef000
mmap(0x7f31742fd000, 10432, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS,
-1, 0) = 0x7f31742fd000
close(3) = 0
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\0\0\0\0\0\0\0\0\0\0\0"...
, 832) = 832
newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=125488, ...}, AT_EMPTY_PATH) = 0
mmap(NULL, 127720, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f31740b6000
mmap(0x7f31740b9000, 94208, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE,
3, 0x3000) = 0x7f31740b9000
mmap(0x7f31740d0000, 16384, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3,
0x1a000) = 0x7f31740d0000
mmap(0x7f31740d4000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE,
3, 0x1d000) = 0x7f31740d4000
close(3) = 0
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\0\0\0\0\0\0\0\0\0\0\0"...
, 832) = 832
pread64(3, "\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0"...
, 784, 64) = 784
pread64(3, "\4\0\0\0 \0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0"...
, 48, 848) = 48
pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\211\303\313\205\371\345PFwdq\376\320^\
304A"...
, 68, 896) = 68
newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=2216304, ...}, AT_EMPTY_PATH) = 0
pread64(3, "\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0"...
, 784, 64) = 784
mmap(NULL, 2260560, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f3173e8e000

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mmap(0x7f3173eb6000, 1658880, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x28000) = 0x7f3173eb6000
mmap(0x7f317404b000, 360448, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3,
0x1bd000) = 0x7f317404b000
mmap(0x7f31740a3000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE,
3, 0x214000) = 0x7f31740a3000
mmap(0x7f31740a9000, 52816, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS,
-1, 0) = 0x7f31740a9000
close(3) = 0
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\3\0>\0\1\0\0\0\0\0\0\0\0\0\0\0\0\0\0"..., 832) =
832
newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=940560, ...}, AT_EMPTY_PATH) = 0
mmap(NULL, 942344, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f3173da7000
mmap(0x7f3173db5000, 507904, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE,
3, 0xe000) = 0x7f3173db5000
mmap(0x7f3173e31000, 372736, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3,
0x8a000) = 0x7f3173e31000
mmap(0x7f3173e8c000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE,
3, 0xe4000) = 0x7f3173e8c000
close(3) = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) =
0x7f3173da5000
arch_prctl(ARCH_SET_FS, 0x7f3173da63c0) = 0
set_tid_address(0x7f3173da6690) = 7723
set_robust_list(0x7f3173da66a0, 24) = 0
rseq(0x7f3173da6d60, 0x20, 0, 0x53053053) = 0
mprotect(0x7f31740a3000, 16384, PROT_READ) = 0
mprotect(0x7f3173e8c000, 4096, PROT_READ) = 0
mprotect(0x7f31740d4000, 4096, PROT_READ) = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) =
0x7f3173da3000
mprotect(0x7f31742ef000, 45056, PROT_READ) = 0
mprotect(0x55f0a51b0000, 4096, PROT_READ) = 0
mprotect(0x7f3174350000, 8192, PROT_READ) = 0
prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) = 0
munmap(0x7f3174300000, 86613) = 0
getrandom("\xa8\xad\xad\x10\xf5\x66\x6d\x15", 8, GRND_NONBLOCK) = 8
brk(NULL) = 0x55f0a5a9a000
brk(0x55f0a5abb000) = 0x55f0a5abb000
futexp(0x7f31742fd77c, FUTEX_WAKE_PRIVATE, 2147483647) = 0
newfstatat(0, "", {st_mode=S_IFREG|0664, st_size=65, ...}, AT_EMPTY_PATH) = 0
read(0, "#ifndef mashina turinga h \n#de"..., 4096) = 65
read(0, "", 4096) = 0
openat(AT_FDCWD, "/dev/shm/main.back", O_RDWR|O_CREAT|O_NOFOLLOW|O_CLOEXEC, 0644) = 3
openat(AT_FDCWD, "/dev/shm/sem.main.semaphore", O_RDWR|O_NOFOLLOW) = 4
newfstatat(4, "", {st_mode=S_IFREG|0644, st_size=32, ...}, AT_EMPTY_PATH) = 0
mmap(NULL, 32, PROT_READ|PROT_WRITE, MAP_SHARED, 4, 0) = 0x7f317434f000
close(4) = 0
ftruncate(3, 66) = 0
mmap(NULL, 66, PROT_READ|PROT_WRITE, MAP_SHARED, 3, 0) = 0x7f3174315000
clone(child_stack=NULL, flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLD,
child_tidptr=0x7f3173da6690) = 7724
strace: Process 7724 attached
[pid 7724] set_robust_list(0x7f3173da66a0, 24) = 0
[pid 7724] munmap(0x7f3174315000, 66) = 0
[pid 7724] close(3) = 0
[pid 7724] munmap(0x7f317434f000, 32) = 0
[pid 7724] execve("child1", ["child1"], 0x7ffe6b072018 /* 45 vars */) = 0
[pid 7724] brk(NULL) = 0x55e766236000
[pid 7724] arch_prctl(0x3001 /* ARCH_??? */, 0x7ffd0e8bcac0) = -1 EINVAL
(Недопустимый аргумент)
[pid 7724] mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) =
0x7f3173fe1000
[pid 7724] access("/etc/ld.so.preload", R_OK) = -1 ENOENT (Нет такого файла или
каталога)

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[pid 7724] openat(AT_FDCWD, "/usr/local/cuda/lib64/glibc-hwcaps/x86-64-v3/libstdc++
+.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/glibc-hwcaps/x86-64-v3",
0x7ffd0e8bbce0, 0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] openat(AT_FDCWD, "/usr/local/cuda/lib64/glibc-hwcaps/x86-64-v2/libstdc++
+.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/glibc-hwcaps/x86-64-v2",
0x7ffd0e8bbce0, 0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] openat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64/x86_64/libstdc++
+.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64/x86_64",
0x7ffd0e8bbce0, 0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] openat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64/libstdc++
+.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64", 0x7ffd0e8bbce0,
0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] openat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64/libstdc++
+.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64", 0x7ffd0e8bbce0,
0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] openat(AT_FDCWD, "/usr/local/cuda/lib64/tls/libstdc++
+.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/tls", 0x7ffd0e8bbce0, 0) = -1
ENOENT (Нет такого файла или каталога)
[pid 7724] openat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64/x86_64/libstdc++
+.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64/x86_64",
0x7ffd0e8bbce0, 0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] openat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64/libstdc++
+.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64", 0x7ffd0e8bbce0, 0) =
-1 ENOENT (Нет такого файла или каталога)
[pid 7724] openat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64/libstdc++
+.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7724] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64", 0x7ffd0e8bbce0, 0) =
-1 ENOENT (Нет такого файла или каталога)
[pid 7724] openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
[pid 7724] newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=86613, ...},
AT_EMPTY_PATH) = 0
[pid 7724] mmap(NULL, 86613, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7f371fe8b000
[pid 7724] close(3) = 0
[pid 7724] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libstdc++
+.so.6", O_RDONLY|O_CLOEXEC) = 3
[pid 7724] read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\3\0>\
0\1\0\0\0\0\0\0\0\0\0\0"... , 832) = 832
[pid 7724] newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=2252096, ...},
AT_EMPTY_PATH) = 0
[pid 7724] mmap(NULL, 2267328, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) =
0x7f371fc61000
[pid 7724] mmap(0x7f371fcfb000, 1114112, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x9a000) = 0x7f371fcfb000
[pid 7724] mmap(0x7f371fe0b000, 454656, PROT_READ, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x1aa000) = 0x7f371fe0b000
[pid 7724] mmap(0x7f371fe7a000, 57344, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x218000) = 0x7f371fe7a000
[pid 7724] mmap(0x7f371fe88000, 10432, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|
MAP_ANONYMOUS, -1, 0) = 0x7f371fe88000
[pid 7724] close(3) = 0
[pid 7724] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libgcc_s.so.1", O_RDONLY|
O_CLOEXEC) = 3
[pid 7724] read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\3\0>\
0\1\0\0\0\0\0\0\0\0\0\0"... , 832) = 832

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[pid 7724] newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=125488, ...},
AT_EMPTY_PATH) = 0
[pid 7724] mmap(NULL, 127720, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) =
0x7f371fc41000
[pid 7724] mmap(0x7f371fc44000, 94208, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x3000) = 0x7f371fc44000
[pid 7724] mmap(0x7f371fc5b000, 16384, PROT_READ, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x1a000) = 0x7f371fc5b000
[pid 7724] mmap(0x7f371fc5f000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x1d000) = 0x7f371fc5f000
[pid 7724] close(3) = 0
[pid 7724] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) =
3
[pid 7724] read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0P\
237\2\0\0\0\0\0"... , 832) = 832
[pid 7724] pread64(3, "\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\
0\0\0\0\0\0\0"... , 784, 64) = 784
[pid 7724] pread64(3, "\4\0\0\0 \0\0\0\5\0\0\0GNU\
0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0"... , 48, 848) = 48
[pid 7724] pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\211\303\313\205\371\345PFwdq\
376\320^\304A"... , 68, 896) = 68
[pid 7724] newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=2216304, ...},
AT_EMPTY_PATH) = 0
[pid 7724] pread64(3, "\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\
0\0\0\0\0\0\0"... , 784, 64) = 784
[pid 7724] mmap(NULL, 2260560, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) =
0x7f371fa19000
[pid 7724] mmap(0x7f371fa41000, 1658880, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x28000) = 0x7f371fa41000
[pid 7724] mmap(0x7f371fbd6000, 360448, PROT_READ, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x1bd000) = 0x7f371fbd6000
[pid 7724] mmap(0x7f371fc2e000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x214000) = 0x7f371fc2e000
[pid 7724] mmap(0x7f371fc34000, 52816, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|
MAP_ANONYMOUS, -1, 0) = 0x7f371fc34000
[pid 7724] close(3) = 0
[pid 7724] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libm.so.6", O_RDONLY|O_CLOEXEC) =
3
[pid 7724] read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\
0\1\0\0\0\0\0\0\0\0\0\0\0\0\0\0"... , 832) = 832
[pid 7724] newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=940560, ...},
AT_EMPTY_PATH) = 0
[pid 7724] mmap(NULL, 942344, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) =
0x7f371f932000
[pid 7724] mmap(0x7f371f940000, 507904, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0xe000) = 0x7f371f940000
[pid 7724] mmap(0x7f371f9bc000, 372736, PROT_READ, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x8a000) = 0x7f371f9bc000
[pid 7724] mmap(0x7f371fa17000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0xe4000) = 0x7f371fa17000
[pid 7724] close(3) = 0
[pid 7724] mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) =
0x7f371f930000
[pid 7724] arch_prctl(ARCH_SET_FS, 0x7f371f9313c0) = 0
[pid 7724] set_tid_address(0x7f371f931690) = 7724
[pid 7724] set_robust_list(0x7f371f9316a0, 24) = 0
[pid 7724] rseq(0x7f371f931d60, 0x20, 0, 0x53053053) = 0
[pid 7724] mprotect(0x7f371fc2e000, 16384, PROT_READ) = 0
[pid 7724] mprotect(0x7f371fa17000, 4096, PROT_READ) = 0
[pid 7724] mprotect(0x7f371fc5f000, 4096, PROT_READ) = 0
[pid 7724] mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) =
0x7f371f92e000
[pid 7724] mprotect(0x7f371fe7a000, 45056, PROT_READ) = 0
[pid 7724] mprotect(0x55e765c72000, 4096, PROT_READ) = 0
[pid 7724] mprotect(0x7f371fedb000, 8192, PROT_READ) = 0

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```

[pid 7724] prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024,
rlim_max=RLIM64_INFINITY}) = 0
[pid 7724] munmap(0x7f371fe8b000, 86613) = 0
[pid 7724] getrandom("\xc8\x22\xfb\x20\xa6\x5b\x12\x5f", 8, GRND_NONBLOCK) = 8
[pid 7724] brk(NULL) = 0x55e766236000
[pid 7724] brk(0x55e766257000) = 0x55e766257000
[pid 7724] futex(0x7f371fe8877c, FUTEX_WAKE_PRIVATE, 2147483647) = 0
[pid 7724] openat(AT_FDCWD, "/dev/shm/main.back", O_RDWR|O_NOFOLLOW|O_CLOEXEC) = 3
[pid 7724] newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=66, ...}, AT_EMPTY_PATH)
= 0
[pid 7724] mmap(NULL, 66, PROT_READ|PROT_WRITE, MAP_SHARED, 3, 0) = 0x7f371feda000
[pid 7724] openat(AT_FDCWD, "/dev/shm/sem.main.semaphore", O_RDWR|O_NOFOLLOW) = 4
[pid 7724] newfstatat(4, "", {st_mode=S_IFREG|0644, st_size=32, ...}, AT_EMPTY_PATH)
= 0
[pid 7724] mmap(NULL, 32, PROT_READ|PROT_WRITE, MAP_SHARED, 4, 0) = 0x7f371fea0000
[pid 7724] close(4) = 0
[pid 7724] clone(child_stack=NULL, flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|
SIGCHLDstrace: Process 7725 attached
, child_tidptr=0x7f371f931690) = 7725
[pid 7725] set_robust_list(0x7f371f9316a0, 24 <unfinished ...>
[pid 7724] exit_group(0 <unfinished ...>
[pid 7725] <... set_robust_list resumed>) = 0
[pid 7724] <... exit_group resumed> = ?
[pid 7725] munmap(0x7f371feda000, 66) = 0
[pid 7725] close(3 <unfinished ...>
[pid 7724] +++ exited with 0 +++
[pid 7723] --- SIGCHLD {si_signo=SIGCHLD, si_code=CLD_EXITED, si_pid=7724,
si_uid=1000, si_status=0, si_etime=0, si_stime=0} ---
[pid 7725] <... close resumed> = 0
[pid 7725] munmap(0x7f371fea0000, 32) = 0
[pid 7725] execve("child2", ["child2"], 0x7ffd0e8bcc98 /* 45 vars */) = 0
[pid 7725] brk(NULL) = 0x55b5cd475000
[pid 7725] arch_prctl(0x3001 /* ARCH_??? */, 0x7fff17f79c90) = -1 EINVAL
(Недопустимый аргумент)
[pid 7725] mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) =
0x7f2975ace000
[pid 7725] access("/etc/ld.so.preload", R_OK) = -1 ENOENT (Нет такого файла или
каталога)
[pid 7725] openat(AT_FDCWD, "/usr/local/cuda/lib64/glibc-hwcaps/x86-64-v3/libstdc+
+.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/glibc-hwcaps/x86-64-v3",
0x7fff17f78eb0, 0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] openat(AT_FDCWD, "/usr/local/cuda/lib64/glibc-hwcaps/x86-64-v2/libstdc+
+.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/glibc-hwcaps/x86-64-v2",
0x7fff17f78eb0, 0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] openat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64/x86_64/libstdc++.so.6",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64/x86_64",
0x7fff17f78eb0, 0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] openat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64/libstdc++.so.6",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64", 0x7fff17f78eb0,
0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] openat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64/libstdc++.so.6",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/tls/x86_64", 0x7fff17f78eb0,
0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] openat(AT_FDCWD, "/usr/local/cuda/lib64/tls/libstdc++.so.6", O_RDONLY|
O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/tls", 0x7fff17f78eb0, 0) = -1
ENOENT (Нет такого файла или каталога)
[pid 7725] openat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64/x86_64/libstdc++.so.6",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64/x86_64",
0x7fff17f78eb0, 0) = -1 ENOENT (Нет такого файла или каталога)

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[pid 7725] openat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64", 0x7fff17f78eb0, 0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] openat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64/x86_64", 0x7fff17f78eb0, 0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] openat(AT_FDCWD, "/usr/local/cuda/lib64/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] newfstatat(AT_FDCWD, "/usr/local/cuda/lib64", 0x7fff17f78eb0, 0) = -1 ENOENT (Нет такого файла или каталога)
[pid 7725] openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
[pid 7725] newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=86613, ...}, AT_EMPTY_PATH) = 0
[pid 7725] mmap(NULL, 86613, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7f2975ab8000
[pid 7725] close(3) = 0
[pid 7725] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libstdc++.so.6", O_RDONLY|O_CLOEXEC) = 3
[pid 7725] read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0"... , 832) = 832
[pid 7725] newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=2252096, ...}, AT_EMPTY_PATH) = 0
[pid 7725] mmap(NULL, 2267328, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f297588e000
[pid 7725] mmap(0x7f2975928000, 1114112, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x9a000) = 0x7f2975928000
[pid 7725] mmap(0x7f2975a38000, 454656, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1aa000) = 0x7f2975a38000
[pid 7725] mmap(0x7f2975aa7000, 57344, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x218000) = 0x7f2975aa7000
[pid 7725] mmap(0x7f2975ab5000, 10432, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f2975ab5000
[pid 7725] close(3) = 0
[pid 7725] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libgcc_s.so.1", O_RDONLY|O_CLOEXEC) = 3
[pid 7725] read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\0\0\0\0\0"... , 832) = 832
[pid 7725] newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=125488, ...}, AT_EMPTY_PATH) = 0
[pid 7725] mmap(NULL, 127720, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f297586e000
[pid 7725] mmap(0x7f2975871000, 94208, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x3000) = 0x7f2975871000
[pid 7725] mmap(0x7f2975888000, 16384, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1a000) = 0x7f2975888000
[pid 7725] mmap(0x7f297588c000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1d000) = 0x7f297588c000
[pid 7725] close(3) = 0
[pid 7725] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
[pid 7725] read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\3\0>\0\1\0\0\0P\237\2\0\0\0\0\0"... , 832) = 832
[pid 7725] pread64(3, "\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0"... , 784, 64) = 784
[pid 7725] pread64(3, "\4\0\0\0 \0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0"... , 48, 848) = 48
[pid 7725] pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\211\303\313\205\371\345PFwdq\376\320^\304A"... , 68, 896) = 68
[pid 7725] newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=2216304, ...}, AT_EMPTY_PATH) = 0
[pid 7725] pread64(3, "\6\0\0\0\4\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0@\0\0\0\0\0\0\0"... , 784, 64) = 784
[pid 7725] mmap(NULL, 2260560, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f2975646000
```

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[pid 7725] mmap(0x7f297566e000, 1658880, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x28000) = 0x7f297566e000
[pid 7725] mmap(0x7f2975803000, 360448, PROT_READ, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x1bd000) = 0x7f2975803000
[pid 7725] mmap(0x7f297585b000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x214000) = 0x7f297585b000
[pid 7725] mmap(0x7f2975861000, 52816, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|
MAP_ANONYMOUS, -1, 0) = 0x7f2975861000
[pid 7725] close(3) = 0
[pid 7725] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libm.so.6", O_RDONLY|O_CLOEXEC) =
3
[pid 7725] read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\3\0>\
0\1\0\0\0\0\0\0\0\0\0\0"... , 832) = 832
[pid 7725] newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=940560, ...},
AT_EMPTY_PATH) = 0
[pid 7725] mmap(NULL, 942344, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) =
0x7f297555f000
[pid 7725] mmap(0x7f297556d000, 507904, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0xe000) = 0x7f297556d000
[pid 7725] mmap(0x7f29755e9000, 372736, PROT_READ, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0x8a000) = 0x7f29755e9000
[pid 7725] mmap(0x7f2975644000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|
MAP_DENYWRITE, 3, 0xe4000) = 0x7f2975644000
[pid 7725] close(3) = 0
[pid 7725] mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) =
0x7f297555d000
[pid 7725] arch_prctl(ARCH_SET_FS, 0x7f297555e3c0) = 0
[pid 7725] set_tid_address(0x7f297555e690) = 7725
[pid 7725] set_robust_list(0x7f297555e6a0, 24) = 0
[pid 7725] rseq(0x7f297555ed60, 0x20, 0, 0x53053053) = 0
[pid 7725] mprotect(0x7f297585b000, 16384, PROT_READ) = 0
[pid 7725] mprotect(0x7f2975644000, 4096, PROT_READ) = 0
[pid 7725] mprotect(0x7f297588c000, 4096, PROT_READ) = 0
[pid 7725] mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) =
0x7f297555b000
[pid 7725] mprotect(0x7f2975aa7000, 45056, PROT_READ) = 0
[pid 7725] mprotect(0x55b5cc5d1000, 4096, PROT_READ) = 0
[pid 7725] mprotect(0x7f2975b08000, 8192, PROT_READ) = 0
[pid 7725] prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024,
rlim_max=RLIM64_INFINITY}) = 0
[pid 7725] munmap(0x7f2975ab8000, 86613) = 0
[pid 7725] getrandom("\x1a\xb8\xbc\x73\xe8\xbc\x42\xd4", 8, GRND_NONBLOCK) = 8
[pid 7725] brk(NULL) = 0x55b5cd475000
[pid 7725] brk(0x55b5cd496000) = 0x55b5cd496000
[pid 7725] futex(0x7f2975ab577c, FUTEX_WAKE_PRIVATE, 2147483647) = 0
[pid 7725] openat(AT_FDCWD, "/dev/shm/main.back", O_RDWR|O_NOFOLLOW|O_CLOEXEC) = 3
[pid 7725] newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=66, ...}, AT_EMPTY_PATH)
= 0
[pid 7725] mmap(NULL, 66, PROT_READ|PROT_WRITE, MAP_SHARED, 3, 0) = 0x7f2975b07000
[pid 7725] openat(AT_FDCWD, "/dev/shm/sem.main.semaphore", O_RDWR|O_NOFOLLOW) = 4
[pid 7725] newfstatat(4, "", {st_mode=S_IFREG|0644, st_size=32, ...}, AT_EMPTY_PATH)
= 0
[pid 7725] mmap(NULL, 32, PROT_READ|PROT_WRITE, MAP_SHARED, 4, 0) = 0x7f2975acd000
[pid 7725] close(4) = 0
[pid 7723] futex(0x7f317434f000, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 0, NULL,
FUTEX_BITSET_MATCH_ANY <unfinished ...>
[pid 7725] ftruncate(3, 66) = 0
[pid 7725] close(3) = 0
[pid 7725] clock_nanosleep(CLOCK_REALTIME, 0, {tv_sec=0, tv_nsec=53248000}, NULL) = 0
[pid 7725] futex(0x7f2975acd000, FUTEX_WAKE, 1) = 1
[pid 7723] <... futex resumed> = 0
[pid 7725] munmap(0x7f2975acd000, 32 <unfinished ...>
[pid 7723] newfstatat(1, "", <unfinished ...>
[pid 7725] <... munmap resumed> = 0
[pid 7723] <... newfstatat resumed>{st_mode=S_IFCHR|0620, st_rdev=makedev(0x88,
0), ...}, AT_EMPTY_PATH) = 0

```

```
[pid 7723] write(1, "#IFDEF__MASHINA_TURINGA_H__\n", 29 <unfinished ...>
#IFDEF__MASHINA_TURINGA_H__
[pid 7725] exit_group(0 <unfinished ...>
[pid 7723] <... write resumed>          = 29
[pid 7723] write(1, "#DEFINE__MASHINA_TURINGA_H__\n", 29 <unfinished ...>
[pid 7725] <... exit_group resumed>)    = ?
#DEFINE__MASHINA_TURINGA_H__
[pid 7723] <... write resumed>          = 29
[pid 7723] write(1, "#ENDIF\n", 7#ENDIF
)                                         = 7
[pid 7723] exit_group(0)                 = ?
[pid 7725] +++ exited with 0 +++
+++ exited with 0 +++
```

Вывод

Проделав лабораторную работу, я приобрёл навыки, необходимые для работы с strace, а также изучил системные вызовы.

