Московский Авиационный Институт

(Национальный Исследовательский Университет)

Факультет информационных технологий и прикладной математики

Кафедра вычислительной математики и программирования

**Лабораторная работа №1 по курсу**

**«Операционные системы»**

Студент: Рылов Александр Дмитриевич

Группа: М8О-207Б-21

Преподаватель: Миронов Евгений Сергеевич

Оценка: \_\_\_\_\_\_\_\_\_\_\_

Дата: \_\_\_\_\_\_\_\_\_\_\_

Подпись: \_\_\_\_\_\_\_\_\_\_\_

Москва, 2022

**Содержание**

1. Репозиторий
2. Постановка задачи
3. Описание работы strace
4. Демонстрация работы strace
5. Вывод

**Репозиторий**

https://github.com/Brokiloene/os

**Постановка задачи**

Подробно рассказать о каждом системном вызове из утилиты strace на примере лабораторной работы №2.

**Описание работы strace**

execve — открывает файл на исполнение.

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

arch\_prtcl — устанавливает состояние процесса или потока, зависящее от архитектуры.

access - для проверки существования файла

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.**

**void \*mmap(void \*addr, size\_t length, int prot, int flags,**

**int fd, off\_t offset);**

**addr — указатель на область памяти, рядом с которой следует сделать отображение**

**length — длина отображения**

**prot — флаги для memory protection**

**flags — флаги для отображения памяти**

**offset — сдвиг для length (отображение не всего файла)**

ftruncate — устанавливает файлу необходимый размер.

munmap — удаляет отображение.

mprotect − контролирует доступ к области памяти.

set\_robust\_list - запрашивает ядро записать начало списка надёжных фьютексов, принадлежащего вызывающей нити

rt\_sigaction - получает и изменяет обработчик сигнала.

rt\_sigprocmask - используется для проверки или настройки сигнальной маски текущего процесса.

set\_tid\_address - устанавливает у вызывающей нити значение clear\_child\_tid равным tidptr (В ядре для каждой нити хранится два атрибута (адреса): set\_child\_tid и clear\_child\_tid. Их значение по умолчанию равно NULL)

futex - предоставляет программам метод для ожидания пока определённое условие не станет истинным

fstatat — требует права выполнения (поиска) на все каталоги, указанные в полном имени файла pathname. (опрашиваемый файл задаётся в виде файлового дескриптора fd.)

statfs - возвращает информацию о смонтированной файловой системе

clone - создаёт новый процесс подобно fork

clock\_nanosleep - позволяет вызывающей нити приостановить работу на некоторое время с наносекундной точностью

lseek - позволяет задавать смещение, которое будет находиться за существующим концом файла (но это не изменяет размер файла)

exit\_group - завершает исполнение всех потоков процесса.

**read — считывание из файлового дескриптора**

**read(int fd, void \*buf, size\_t count);**

**fd — файловый дескриптор**

**buf — указатель куда считывать**

**count — количество байт, которое надо считать**

**openat — открыть файл**

**int openat(int dirfd, const char \*pathname, int flags);**

**dirfd — папка, относительно которой ищется pathname**

**pathname — путь к файлу**

**Демонстрация работы strace**

user@brokiloene:~/Desktop/all/os/lab\_2/src$ strace -f ./main

execve("./main", ["./main"], 0x7ffdb48df638 /\* 56 vars \*/) = 0

brk(NULL) = 0x558b42454000

arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7ffc9c46f900) = -1 EINVAL (Invalid argument)

mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7f698db94000

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

newfstatat(3, "", {st\_mode=S\_IFREG|0644, st\_size=121559, ...}, AT\_EMPTY\_PATH) = 0

mmap(NULL, 121559, PROT\_READ, MAP\_PRIVATE, 3, 0) = 0x7f698db76000

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\0P\237\2\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\0i8\235HZ\227\223\333\350s\360\352,\223\340."..., 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) = 0x7f698d94e000

mmap(0x7f698d976000, 1658880, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x28000) = 0x7f698d976000

mmap(0x7f698db0b000, 360448, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1bd000) = 0x7f698db0b000

mmap(0x7f698db63000, 24576, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x214000) = 0x7f698db63000

mmap(0x7f698db69000, 52816, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7f698db69000

close(3) = 0

mmap(NULL, 12288, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7f698d94b000

arch\_prctl(ARCH\_SET\_FS, 0x7f698d94b740) = 0

set\_tid\_address(0x7f698d94ba10) = 17574

set\_robust\_list(0x7f698d94ba20, 24) = 0

rseq(0x7f698d94c0e0, 0x20, 0, 0x53053053) = 0

mprotect(0x7f698db63000, 16384, PROT\_READ) = 0

mprotect(0x558b41ffc000, 4096, PROT\_READ) = 0

mprotect(0x7f698dbce000, 8192, PROT\_READ) = 0

prlimit64(0, RLIMIT\_STACK, NULL, {rlim\_cur=8192\*1024, rlim\_max=RLIM64\_INFINITY}) = 0

munmap(0x7f698db76000, 121559) = 0

pipe2([3, 4], 0) = 0

pipe2([5, 6], 0) = 0

pipe2([7, 8], 0) = 0

clone(child\_stack=NULL, flags=CLONE\_CHILD\_CLEARTID|CLONE\_CHILD\_SETTID|SIGCHLDstrace: Process 17575 attached

, child\_tidptr=0x7f698d94ba10) = 17575

[pid 17574] clone(child\_stack=NULL, flags=CLONE\_CHILD\_CLEARTID|CLONE\_CHILD\_SETTID|SIGCHLD <unfinished ...>

[pid 17575] set\_robust\_list(0x7f698d94ba20, 24) = 0

[pid 17575] close(5strace: Process 17576 attached

<unfinished ...>

[pid 17574] <... clone resumed>, child\_tidptr=0x7f698d94ba10) = 17576

[pid 17575] <... close resumed>) = 0

[pid 17574] close(3 <unfinished ...>

[pid 17576] set\_robust\_list(0x7f698d94ba20, 24 <unfinished ...>

[pid 17575] close(4 <unfinished ...>

[pid 17574] <... close resumed>) = 0

[pid 17576] <... set\_robust\_list resumed>) = 0

[pid 17575] <... close resumed>) = 0

[pid 17574] close(5 <unfinished ...>

[pid 17575] close(7 <unfinished ...>

[pid 17574] <... close resumed>) = 0

[pid 17576] close(3 <unfinished ...>

[pid 17575] <... close resumed>) = 0

[pid 17574] close(6 <unfinished ...>

[pid 17576] <... close resumed>) = 0

[pid 17574] <... close resumed>) = 0

[pid 17575] close(8 <unfinished ...>

[pid 17574] close(8 <unfinished ...>

[pid 17576] close(4 <unfinished ...>

[pid 17574] <... close resumed>) = 0

[pid 17575] <... close resumed>) = 0

[pid 17576] <... close resumed>) = 0

[pid 17575] dup2(3, 0 <unfinished ...>

[pid 17574] getrandom( <unfinished ...>

[pid 17576] close(6 <unfinished ...>

[pid 17574] <... getrandom resumed>"\x9e\x9d\xe8\x69\x5f\x93\x42\x37", 8, GRND\_NONBLOCK) = 8

[pid 17575] <... dup2 resumed>) = 0

[pid 17576] <... close resumed>) = 0

[pid 17574] brk(NULL <unfinished ...>

[pid 17575] dup2(6, 1 <unfinished ...>

[pid 17574] <... brk resumed>) = 0x558b42454000

[pid 17576] close(7 <unfinished ...>

[pid 17574] brk(0x558b42475000 <unfinished ...>

[pid 17575] <... dup2 resumed>) = 1

[pid 17574] <... brk resumed>) = 0x558b42475000

[pid 17576] <... close resumed>) = 0

[pid 17575] close(3 <unfinished ...>

[pid 17574] newfstatat(0, "", <unfinished ...>

[pid 17576] dup2(5, 0 <unfinished ...>

[pid 17574] <... newfstatat resumed>{st\_mode=S\_IFCHR|0620, st\_rdev=makedev(0x88, 0), ...}, AT\_EMPTY\_PATH) = 0

[pid 17575] <... close resumed>) = 0

[pid 17574] read(0, <unfinished ...>

[pid 17576] <... dup2 resumed>) = 0

[pid 17575] close(6 <unfinished ...>

[pid 17576] dup2(8, 1 <unfinished ...>

[pid 17575] <... close resumed>) = 0

[pid 17576] <... dup2 resumed>) = 1

[pid 17576] close(5 <unfinished ...>

[pid 17575] execve("./child", ["child"], 0x7ffc9c46fad8 /\* 56 vars \*/ <unfinished ...>

[pid 17576] <... close resumed>) = 0

[pid 17576] close(8) = 0

[pid 17576] execve("./child2", ["child2"], 0x7ffc9c46fad8 /\* 56 vars \*/ <unfinished ...>

[pid 17575] <... execve resumed>) = 0

[pid 17575] brk(NULL) = 0x5588e29a3000

[pid 17575] arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7fffc865f2b0 <unfinished ...>

[pid 17576] <... execve resumed>) = 0

[pid 17575] <... arch\_prctl resumed>) = -1 EINVAL (Invalid argument)

[pid 17576] brk(NULL <unfinished ...>

[pid 17575] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 17576] <... brk resumed>) = 0x55ba7ba8d000

[pid 17575] <... mmap resumed>) = 0x7f8b7e685000

[pid 17576] arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7ffeb962a300 <unfinished ...>

[pid 17575] access("/etc/ld.so.preload", R\_OK <unfinished ...>

[pid 17576] <... arch\_prctl resumed>) = -1 EINVAL (Invalid argument)

[pid 17575] <... access resumed>) = -1 ENOENT (No such file or directory)

[pid 17576] mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 17575] openat(AT\_FDCWD, "/etc/ld.so.cache", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 17576] <... mmap resumed>) = 0x7f1601239000

[pid 17575] <... openat resumed>) = 3

[pid 17576] access("/etc/ld.so.preload", R\_OK <unfinished ...>

[pid 17575] newfstatat(3, "", <unfinished ...>

[pid 17576] <... access resumed>) = -1 ENOENT (No such file or directory)

[pid 17575] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=121559, ...}, AT\_EMPTY\_PATH) = 0

[pid 17576] openat(AT\_FDCWD, "/etc/ld.so.cache", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 17575] mmap(NULL, 121559, PROT\_READ, MAP\_PRIVATE, 3, 0 <unfinished ...>

[pid 17576] <... openat resumed>) = 3

[pid 17575] <... mmap resumed>) = 0x7f8b7e667000

[pid 17576] newfstatat(3, "", <unfinished ...>

[pid 17575] close(3 <unfinished ...>

[pid 17576] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=121559, ...}, AT\_EMPTY\_PATH) = 0

[pid 17575] <... close resumed>) = 0

[pid 17576] mmap(NULL, 121559, PROT\_READ, MAP\_PRIVATE, 3, 0) = 0x7f160121b000

[pid 17575] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libc.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 17576] close(3 <unfinished ...>

[pid 17575] <... openat resumed>) = 3

[pid 17576] <... close resumed>) = 0

[pid 17575] read(3, <unfinished ...>

[pid 17576] openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libc.so.6", O\_RDONLY|O\_CLOEXEC <unfinished ...>

[pid 17575] <... read resumed>"\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 17576] <... openat resumed>) = 3

[pid 17575] pread64(3, <unfinished ...>

[pid 17576] read(3, <unfinished ...>

[pid 17575] <... pread64 resumed>"\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 17576] <... read resumed>"\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 17575] pread64(3, <unfinished ...>

[pid 17576] pread64(3, <unfinished ...>

[pid 17575] <... pread64 resumed>"\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 17576] <... pread64 resumed>"\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 17575] pread64(3, <unfinished ...>

[pid 17576] pread64(3, <unfinished ...>

[pid 17575] <... pread64 resumed>"\4\0\0\0\24\0\0\0\3\0\0\0GNU\0i8\235HZ\227\223\333\350s\360\352,\223\340."..., 68, 896) = 68

[pid 17576] <... pread64 resumed>"\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 17575] newfstatat(3, "", <unfinished ...>

[pid 17576] pread64(3, <unfinished ...>

[pid 17575] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=2216304, ...}, AT\_EMPTY\_PATH) = 0

[pid 17576] <... pread64 resumed>"\4\0\0\0\24\0\0\0\3\0\0\0GNU\0i8\235HZ\227\223\333\350s\360\352,\223\340."..., 68, 896) = 68

[pid 17575] pread64(3, <unfinished ...>

[pid 17576] newfstatat(3, "", <unfinished ...>

[pid 17575] <... pread64 resumed>"\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 17576] <... newfstatat resumed>{st\_mode=S\_IFREG|0644, st\_size=2216304, ...}, AT\_EMPTY\_PATH) = 0

[pid 17575] mmap(NULL, 2260560, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0 <unfinished ...>

[pid 17576] pread64(3, <unfinished ...>

[pid 17575] <... mmap resumed>) = 0x7f8b7e43f000

[pid 17576] <... pread64 resumed>"\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 17575] mmap(0x7f8b7e467000, 1658880, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x28000 <unfinished ...>

[pid 17576] mmap(NULL, 2260560, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0 <unfinished ...>

[pid 17575] <... mmap resumed>) = 0x7f8b7e467000

[pid 17576] <... mmap resumed>) = 0x7f1600ff3000

[pid 17575] mmap(0x7f8b7e5fc000, 360448, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1bd000 <unfinished ...>

[pid 17576] mmap(0x7f160101b000, 1658880, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x28000 <unfinished ...>

[pid 17575] <... mmap resumed>) = 0x7f8b7e5fc000

[pid 17576] <... mmap resumed>) = 0x7f160101b000

[pid 17575] mmap(0x7f8b7e654000, 24576, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x214000 <unfinished ...>

[pid 17576] mmap(0x7f16011b0000, 360448, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1bd000 <unfinished ...>

[pid 17575] <... mmap resumed>) = 0x7f8b7e654000

[pid 17576] <... mmap resumed>) = 0x7f16011b0000

[pid 17575] mmap(0x7f8b7e65a000, 52816, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 17576] mmap(0x7f1601208000, 24576, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x214000 <unfinished ...>

[pid 17575] <... mmap resumed>) = 0x7f8b7e65a000

[pid 17576] <... mmap resumed>) = 0x7f1601208000

[pid 17576] mmap(0x7f160120e000, 52816, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 17575] close(3 <unfinished ...>

[pid 17576] <... mmap resumed>) = 0x7f160120e000

[pid 17575] <... close resumed>) = 0

[pid 17576] close(3 <unfinished ...>

[pid 17575] mmap(NULL, 12288, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 17576] <... close resumed>) = 0

[pid 17575] <... mmap resumed>) = 0x7f8b7e43c000

[pid 17576] mmap(NULL, 12288, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0 <unfinished ...>

[pid 17575] arch\_prctl(ARCH\_SET\_FS, 0x7f8b7e43c740 <unfinished ...>

[pid 17576] <... mmap resumed>) = 0x7f1600ff0000

[pid 17575] <... arch\_prctl resumed>) = 0

[pid 17576] arch\_prctl(ARCH\_SET\_FS, 0x7f1600ff0740 <unfinished ...>

[pid 17575] set\_tid\_address(0x7f8b7e43ca10 <unfinished ...>

[pid 17576] <... arch\_prctl resumed>) = 0

[pid 17575] <... set\_tid\_address resumed>) = 17575

[pid 17576] set\_tid\_address(0x7f1600ff0a10 <unfinished ...>

[pid 17575] set\_robust\_list(0x7f8b7e43ca20, 24 <unfinished ...>

[pid 17576] <... set\_tid\_address resumed>) = 17576

[pid 17575] <... set\_robust\_list resumed>) = 0

[pid 17576] set\_robust\_list(0x7f1600ff0a20, 24 <unfinished ...>

[pid 17575] rseq(0x7f8b7e43d0e0, 0x20, 0, 0x53053053 <unfinished ...>

[pid 17576] <... set\_robust\_list resumed>) = 0

[pid 17575] <... rseq resumed>) = 0

[pid 17576] rseq(0x7f1600ff10e0, 0x20, 0, 0x53053053) = 0

[pid 17575] mprotect(0x7f8b7e654000, 16384, PROT\_READ) = 0

[pid 17576] mprotect(0x7f1601208000, 16384, PROT\_READ <unfinished ...>

[pid 17575] mprotect(0x5588e156d000, 4096, PROT\_READ <unfinished ...>

[pid 17576] <... mprotect resumed>) = 0

[pid 17575] <... mprotect resumed>) = 0

[pid 17576] mprotect(0x55ba7a81a000, 4096, PROT\_READ <unfinished ...>

[pid 17575] mprotect(0x7f8b7e6bf000, 8192, PROT\_READ <unfinished ...>

[pid 17576] <... mprotect resumed>) = 0

[pid 17575] <... mprotect resumed>) = 0

[pid 17576] mprotect(0x7f1601273000, 8192, PROT\_READ) = 0

[pid 17575] prlimit64(0, RLIMIT\_STACK, NULL, {rlim\_cur=8192\*1024, rlim\_max=RLIM64\_INFINITY}) = 0

[pid 17576] prlimit64(0, RLIMIT\_STACK, NULL, {rlim\_cur=8192\*1024, rlim\_max=RLIM64\_INFINITY}) = 0

[pid 17575] munmap(0x7f8b7e667000, 121559 <unfinished ...>

[pid 17576] munmap(0x7f160121b000, 121559 <unfinished ...>

[pid 17575] <... munmap resumed>) = 0

[pid 17576] <... munmap resumed>) = 0

[pid 17575] read(0, <unfinished ...>

[pid 17576] read(0, HELLO HELLO HELLO

<unfinished ...>

[pid 17574] <... read resumed>"HELLO HELLO HELLO\n", 1024) = 24

[pid 17574] write(4, "\30\0\0\0", 4) = 4

[pid 17575] <... read resumed>"\30\0\0\0", 4) = 4

[pid 17574] write(4, "HELLO HELLO HELLO\0", 24) = 24

[pid 17575] getrandom( <unfinished ...>

[pid 17574] read(7, <unfinished ...>

[pid 17575] <... getrandom resumed>"\x51\x3f\xd0\x9a\x1e\x8f\x41\xe4", 8, GRND\_NONBLOCK) = 8

[pid 17575] brk(NULL) = 0x5588e29a3000

[pid 17575] brk(0x5588e29c4000) = 0x5588e29c4000

[pid 17575] read(0, "HELLO HELLO HELLO\0", 24) = 24

[pid 17575] write(1, "\30\0\0\0", 4) = 4

[pid 17576] <... read resumed>"\30\0\0\0", 4) = 4

[pid 17575] write(1, "hello hello hello\0", 24 <unfinished ...>

[pid 17576] getrandom( <unfinished ...>

[pid 17575] <... write resumed>) = 24

[pid 17576] <... getrandom resumed>"\x3d\xa0\x4f\x19\x44\xc3\x9c\x79", 8, GRND\_NONBLOCK) = 8

[pid 17575] read(0, <unfinished ...>

[pid 17576] brk(NULL) = 0x55ba7ba8d000

[pid 17576] brk(0x55ba7baae000) = 0x55ba7baae000

[pid 17576] read(0, "hello hello hello\0", 24) = 24

[pid 17576] write(1, "\30\0\0\0", 4) = 4

[pid 17574] <... read resumed>"\30\0\0\0", 4) = 4

[pid 17576] write(1, "hello hello hello\0\0\0\0\0\0\0", 24 <unfinished ...>

[pid 17574] read(7, <unfinished ...>

[pid 17576] <... write resumed>) = 24

[pid 17574] <... read resumed>"hello hello hello\0\0\0\0\0\0\0", 24) = 24

[pid 17576] read(0, <unfinished ...>

[pid 17574] newfstatat(1, "", {st\_mode=S\_IFCHR|0620, st\_rdev=makedev(0x88, 0), ...}, AT\_EMPTY\_PATH) = 0

[pid 17574] write(1, "hello hello hello\n", 18hello hello hello

) = 18

[pid 17574] read(0, "", 1024) = 0

[pid 17574] exit\_group(6) = ?

[pid 17574] +++ exited with 6 +++

[pid 17575] <... read resumed>"", 4) = 0

[pid 17575] exit\_group(0) = ?

[pid 17576] <... read resumed>"", 4) = 0

[pid 17575] +++ exited with 0 +++

exit\_group(0) = ?

+++ exited with 0 +++

**Вывод**

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