Московский Авиационный Институт

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Институт №8 "Компьютерные науки и прикладная математика"

Кафедра №806 "Вычислительная математика и программирование"

Лабораторная работа №5 по курсу

«Операционные системы»

Группа: М8О-209БВ-24

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Оценка: _____

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Постановка задачи

Цель работы:

Приобретение практических навыков диагностики работы программного обеспечения.

Задание:

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

Общий метод и алгоритм решения:

Для анализа работы программ использовалась утилита **strace**, предназначенная для трассировки системных вызовов и сигналов в операционных системах семейства Linux и других Unix-подобных ОС. Данный инструмент позволяет в реальном времени отслеживать взаимодействие пользовательского процесса с ядром операционной системы, что делает его удобным средством для отладки, поиска ошибок и анализа производительности.

Работа strace основана на механизме **ptrace**, который даёт возможность одному процессу наблюдать за выполнением другого. При запуске целевой программы под управлением strace перехватываются все системные вызовы, выполняемые при переходе из пользовательского режима в режим ядра и обратно. Для каждого вызова отображаются переданные аргументы, возвращаемое значение, а также код ошибки (errno) в случае неуспешного завершения операции.

Использование strace позволяет детально проследить работу с файлами, процессами, потоками, памятью и механизмами межпроцессного взаимодействия, что обеспечивает наглядное подтверждение корректности реализации лабораторных заданий.

Основные флаги strace:

-p PID - присоединиться к уже работающему процессу с указанным идентификатором.

-c - подсчитать статистику по системным вызовам (время, вызовы, ошибки) и вывести сводку по завершении.

-f - трассировать также все дочерние процессы, созданные с помощью fork().

-e - фильтрация вывода

-o файл - вывести вывод трассировки в указанный файл вместо stderr.

-s размер - увеличить максимальную длину выводимых строк аргументов (по умолчанию часто 32 символа).

-t - выводить время в формате ЧЧ:ММ:СС при каждом вызове.

-T - показывать время, затраченное на каждый системный вызов.

-y - подробно выводить информацию о файловых дескрипторах (пути к файлам, сокетам).

-v - более подробный (verbose) вывод для некоторых вызовов.

-h - вывести справку по использованию.

Протокол работы программы

Lab_1:

execve("./parent", ["./parent"], 0x7ffcdd5fa408 /* 27 vars */) = 0

brk(NULL)   = 0x2ef27000

mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7b3f7eda4000

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=29003, ...}) = 0

mmap(NULL, 29003, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7b3f7ed9c000

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\236\2\0\0\0\0\0@\0\0\0\0\0\0\0\220\202\36\0\0\0\0\0\0\0\0\0@\08\0\17\0@\0=\0<\0\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\0H\3\0\0\0\0\0\0H\3\0\0\0\0\0\0\10\0\0\0\0\0\0\0\3\0\0\0\4\0\0\0`$\36\0\0\0\0\0`$\36\0\0\0\0\0`$\36\0\0\0\0\0\34\0\0\0\0\0\0\0\34\0\0\0\0\0\0\0\20\0\0\0\0\0\0\0\1\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\0\0\0\0\0\0\0\350t\2\0\0\0\0\0\350t\2\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\0\5\0\0\0\200\2\0\0\0\0\0\0\200\2\0\0\0\0\0\200\2\0\0\0\0\0}A\26\0\0\0\0\0}A\26\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\0\4\0\0\0\320\30\0\0\0\0\0\0\320\30\0\0\0\0\0\320\30\0\0\0\0\0|T\5\0\0\0\0\0|T\5\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\6\0\0\0X+\36\0\0\0\0\0X;\36\0\0\0\0\0X;\36\0\0\0\0\0pK\0\0\0\0\0\0   #\1\0\0\0\0\0\20\0\0\0\0\0\0\2\0\0\6\0\0\0Y\36\0\0\0\0\0   i\36\0\0\0\0\0i\36\0\0\0\0\0@\2\0\0\0\0\0\0@\2\0\0\0\0\0\10\0\0\0\0\0\0\0\4\0\0\0\4\0\0\0\210\3\0\0\0\0\0\0\210\3\0\0\0\0\0\0\210\3\0\0\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\0H\3\0\0\0\0\0\0H\3\0\0\0\0\0\0\10\0\0\0\0\0\0\0\3\0\0\0\4\0\0\0`$\36\0\0\0\0\0`$\36\0\0\0\0\0`$\36\0\0\0\0\0\34\0\0\0\0\0\0\0\34\0\0\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\0\4\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\350t\2\0\0\0\0\0\350t\2\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\0\5\0\0\0\200\2\0\0\0\0\0\0\200\2\0\0\0\0\0\200\2\0\0\0\0\0}A\26\0\0\0\0\0}A\26\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\0\4\0\0\0\320\30\0\0\0\0\0\0\320\30\0\0\0\0\0\320\30\0\0\0\0\0|T\5\0\0\0\0\0|T\5\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\6\0\0\0X+\36\0\0\0\0\0X;\36\0\0\0\0\0X;\36\0\0\0\0\0pK\0\0\0\0\0\0   #\1\0\0\0\0\0\20\0\0\0\0\0\0\2\0\0\6\0\0\0   Y\36\0\0\0\0\0   i\36\0\0\0\0\0i\36\0\0\0\0\0@\2\0\0\0\0\0\0@\2\0\0\0\0\0\10\0\0\0\0\0\0\0\4\0\0\0\4\0\0\0\210\3\0\0\0\0\0\0\210\3\0\0\0\0\0\0\210\3\0\0\0\0\0\0   \0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\10\0\0\0\0\0\0\0\4\0\0\0\4\0\0\0\250\3\0\0\0\0\0\0\250\3\0\0\0\0\0\0\250\3\0\0\0\0\0\0$\0\0\0\0\0\0\0$\0\0\0\0\0\0\0\4\0\0\0"..., 840, 64) = 840

fstat(3, {st_mode=S_IFREG|0755, st_size=2003408, ...}) = 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\0H\3\0\0\0\0\0\0H\3\0\0\0\0\0\0\10\0\0\0\0

0\0\0\0\3\0\0\0\4\0\0\0`$\36\0\0\0\0\0`$\36\0\0\0\0\0`$\36\0\0\0\0\0\34\0\0\0\0\0\0\0\34\0\0\0\0\0\0\0\20\
0\0\0\0\0\0\0\1\0\0\0\4\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\350t\2\0\0\0\0\0\350t\2\0\0\0
\0\0\0\20\0\0\0\0\0\0\0\1\0\0\0\5\0\0\0\200\2\0\0\0\0\0\0\200\2\0\0\0\0\0\0\200\2\0\0\0\0\0}A\26\0\0\0\0\
0}A\26\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\0\4\0\0\0\320\30\0\0\0\0\0\0\320\30\0\0\0\0\0\0\320\30\0\0\0\
0\0|T\5\0\0\0\0\0|T\5\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\6\0\0\0X+\36\0\0\0\0X;\36\0\0\0\0X;\36\0\0\
0\0\0pK\0\0\0\0\0\0   #\1\0\0\0\0\0\0\20\0\0\0\0\0\0\0\2\0\0\6\0\0\0   Y\36\0\0\0\0\0   i\36\0\0\0\0\0
i\36\0\0\0\0\0@\2\0\0\0\0\0\0@\2\0\0\0\0\0\10\0\0\0\0\0\0\0\4\0\0\0\4\0\0\0\210\3\0\0\0\0\0\0\210\3\0\
0\0\0\0\210\3\0\0\0\0\0\0   \0\0\0\0\0\0\0
\0\0\0\0\0\0\0\0\10\0\0\0\0\0\0\0\4\0\0\0\4\0\0\0\250\3\0\0\0\0\0\0\250\3\0\0\0\0\0\0\250\3\0\0\0\0\0\0$\0\0
\0\0\0\0\0$\0\0\0\0\0\0\0\4\0\0\0"..., 840, 64) = 840

    mmap(NULL, 2055800, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7b3f7eba6000

    mmap(0x7b3f7ebce000, 1462272, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000) = 0x7b3f7ebce000

    mmap(0x7b3f7ed33000, 352256, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x18d000) = 0x7b3f7ed33000

    mmap(0x7b3f7ed89000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e2000) = 0x7b3f7ed89000

    mmap(0x7b3f7ed8f000, 52856, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7b3f7ed8f000

    close(3)   = 0

    mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7b3f7eba3000

    arch_prctl(ARCH_SET_FS, 0x7b3f7eba3740) = 0

    set_tid_address(0x7b3f7eba3a10)   = 5624

    set_robust_list(0x7b3f7eba3a20, 24)   = 0

    rseq(0x7b3f7eba3680, 0x20, 0, 0x53053053) = 0

    mprotect(0x7b3f7ed89000, 16384, PROT_READ) = 0

    mprotect(0x403000, 4096, PROT_READ)   = 0

    mprotect(0x7b3f7edda000, 8192, PROT_READ) = 0

    prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) = 0

    munmap(0x7b3f7ed9c000, 29003)   = 0

    getpid()   = 5624

    fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0), ...}) = 0

    getrandom("\x37\xfb\xd4\x70\x9d\x60\xa0\x47", 8, GRND_NONBLOCK) = 8

    brk(NULL)   = 0x2ef27000

    brk(0x2ef48000)   = 0x2ef48000

write(1, "Parent \320\277\321\200\320\276\321\206\320\265\321\201\321\201, PID: 5624\n", 33Parent процесс, PID: 5624

) = 33

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

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

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

rt_sigprocmask(SIG_BLOCK, ~[], [], 8)   = 0

clone(child_stack=NULL, flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLDstrace: Process 5625 attached

, child_tidptr=0x7b3f7eba3a10) = 5625

[pid 5625] set_robust_list(0x7b3f7eba3a20, 24 <unfinished ...>

[pid 5624] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>

[pid 5625] <... set_robust_list resumed>) = 0

[pid 5624] <... rt_sigprocmask resumed>NULL, 8) = 0

[pid 5624] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>

[pid 5625] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>

[pid 5624] <... rt_sigprocmask resumed>[], 8) = 0

[pid 5625] <... rt_sigprocmask resumed>NULL, 8) = 0

[pid5624] clone(child_stack=NULL,lags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLD <unfinished ...>

[pid 5625] close(4)   = 0

[pid 5625] close(5strace: Process 5626 attached

)   = 0

[pid 5626] set_robust_list(0x7b3f7eba3a20, 24 <unfinished ...>

[pid 5625] close(7 <unfinished ...>

[pid 5626] <... set_robust_list resumed>) = 0

[pid 5625] <... close resumed>)   = 0

[pid 5624] <... clone resumed>, child_tidptr=0x7b3f7eba3a10) = 5626

[pid 5626] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>

[pid 5625] close(8 <unfinished ...>

[pid 5624] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>

[pid 5626] <... rt_sigprocmask resumed>NULL, 8) = 0

[pid 5624] <... rt_sigprocmask resumed>NULL, 8) = 0

[pid 5625] <... close resumed>)   = 0

[pid 5624] close(3 <unfinished ...>

[pid 5626] close(3 <unfinished ...>

[pid 5625] dup2(3, 0 <unfinished ...>

[pid 5624] <... close resumed>)   = 0

[pid 5626] <... close resumed>)   = 0

[pid 5624] close(5 <unfinished ...>

[pid 5625] <... dup2 resumed>)   = 0

[pid 5624] <... close resumed>)   = 0

[pid 5626] close(4 <unfinished ...>

[pid 5624] close(6 <unfinished ...>

[pid 5625] dup2(6, 1 <unfinished ...>

[pid 5624] <... close resumed>)   = 0

[pid 5626] <... close resumed>)   = 0

[pid 5624] close(8 <unfinished ...>

[pid 5625] <... dup2 resumed>)   = 1

[pid 5624] <... close resumed>)   = 0

[pid 5626] close(6 <unfinished ...>

[pid 5624] write(1, "\320\222\320\262\320\265\320\264\320\270\321\202\320\265 \321\201\321\202\321\200\320\276\320\272\321\203:\n", 29 <unfinished ...>

Введите строку:

[pid 5625] execve("./child1", ["child1"], 0x7ffeb13c4348 /* 27 vars */ <unfinished ...>

[pid 5624] <... write resumed>)   = 29

[pid 5626] <... close resumed>)   = 0

[pid 5624] fstat(0, <unfinished ...>

[pid 5626] close(7 <unfinished ...>

[pid 5624] <... fstat resumed>{st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0), ...}) = 0

[pid 5626] <... close resumed>)   = 0

[pid 5624] read(0, <unfinished ...>

[pid 5626] dup2(5, 0)   = 0

[pid 5626] dup2(8, 1)   = 1

[pid 5626] execve("./child2", ["child2"], 0x7ffeb13c4348 /* 27 vars */) = 0

[pid 5625] <... execve resumed>)   = 0

[pid 5626] brk(NULL <unfinished ...>

[pid 5625] brk(NULL <unfinished ...>

[pid 5626] <... brk resumed>)   = 0x12a89000

[pid 5625] <... brk resumed>)   = 0x32058000

[pid   5626]   mmap(NULL,   8192,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>

[pid   5625]   mmap(NULL,   8192,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>

[pid 5626] <... mmap resumed>)   = 0x73a4a47ea000

[pid 5625] <... mmap resumed>)   = 0x7cebbff75000

[pid 5626] access("/etc/ld.so.preload", R_OK <unfinished ...>

[pid 5625] access("/etc/ld.so.preload", R_OK <unfinished ...>

[pid 5626] <... access resumed>)   = -1 ENOENT (No such file or directory)

[pid 5625] <... access resumed>)   = -1 ENOENT (No such file or directory)

[pid 5626] openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC <unfinished ...>

[pid 5625] openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC <unfinished ...>

[pid 5626] <... openat resumed>)   = 3

[pid 5626] fstat(3, <unfinished ...>

[pid 5625] <... openat resumed>)   = 4

[pid 5626] <... fstat resumed>{st_mode=S_IFREG|0644, st_size=29003, ...}) = 0

[pid 5625] fstat(4, <unfinished ...>

[pid 5626] mmap(NULL, 29003, PROT_READ, MAP_PRIVATE, 3, 0 <unfinished ...>

[pid 5625] <... fstat resumed>{st_mode=S_IFREG|0644, st_size=29003, ...}) = 0

[pid 5626] <... mmap resumed>)   = 0x73a4a47e2000

[pid 5625] mmap(NULL, 29003, PROT_READ, MAP_PRIVATE, 4, 0 <unfinished ...>

[pid 5626] close(3)   = 0

[pid 5625] <... mmap resumed>)   = 0x7cebbff6d000

[pid 5626] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC
<unfinished ...>

[pid 5625] close(4 <unfinished ...>

[pid 5626] <... openat resumed>)   = 3

[pid 5625] <... close resumed>)   = 0

[pid 5626] read(3, <unfinished ...>

[pid 5625] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC
<unfinished ...>

[pid   5626]   <...   read
resumed>"\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0p\236\2\0\0\0\0\0@\0\0\0\0\0\0\0\220\202\36\0

\0\0\0\0\0\0\0\0@\08\0\17\0@\0=\0<\0\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\0H\
3\0\0\0\0\0\0\0H\3\0\0\0\0\0\0\10\0\0\0\0\0\0\0\3\0\0\0\4\0\0\0`\$\36\0\0\0\0\0`\$\36\0\0\0\0\0`\$\36\0\0\0\0\
0\34\0\0\0\0\0\0\0\34\0\0\0\0\0\0\0\20\0\0\0\0\0\0\0\1\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\
0\0\0\0\0\0\350t\2\0\0\0\0\0\350t\2\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\5\0\0\0\200\2\0\0\0\0\0\200\2\0\0
\0\0\0\200\2\0\0\0\0\0}A\26\0\0\0\0\0}A\26\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\4\0\0\0\320\30\0\0\0\0
\0\0\320\30\0\0\0\0\0\0\320\30\0\0\0\0\0|T\5\0\0\0\0\0|T\5\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\6\0\0\0X+\3
6\0\0\0\0\0X;\36\0\0\0\0\0X;\36\0\0\0\0\0pK\0\0\0\0\0\0   #\1\0\0\0\0\0\0\20\0\0\0\0\0\0\0\2\0\0\0\6\0\0\0
Y\36\0\0\0\0\0   i\36\0\0\0\0\0
i\36\0\0\0\0\0@\2\0\0\0\0\0\0@\2\0\0\0\0\0\10\0\0\0\0\0\0\0\4\0\0\0\4\0\0\0\210\3\0\0\0\0\0\210\3\0\
0\0\0\0\210\3\0\0\0\0\0 \0\0\0\0\0\0\0 \0\0\0"..., 832) = 832

[pid 5625] <... openat resumed>)   = 4

[pid 5626] pread64(3, <unfinished ...>

[pid 5625] read(4, <unfinished ...>

[pid   5626]   <...   pread64
resumed>"\6\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\0H\3\0\0\0\0\0\0H\3\0\0\0\0\0\0
\10\0\0\0\0\0\0\0\3\0\0\0\4\0\0\0`\$\36\0\0\0\0\0`\$\36\0\0\0\0\0`\$\36\0\0\0\0\34\0\0\0\0\0\0\0\34\0\0\0\0
\0\0\0\20\0\0\0\0\0\0\0\1\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\0\0\0\0\0\350t\2\0\0\0\0\0\35
0t\2\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\5\0\0\0\200\2\0\0\0\0\0\200\2\0\0\0\0\0\200\2\0\0\0\0\0}A\2
6\0\0\0\0\0}A\26\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\4\0\0\0\320\30\0\0\0\0\0\320\30\0\0\0\0\0\320\
30\0\0\0\0\0|T\5\0\0\0\0\0|T\5\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\6\0\0\0X+\36\0\0\0\0\0X;\36\0\0\0\0\0X
;\36\0\0\0\0\0pK\0\0\0\0\0\0 #\1\0\0\0\0\0\0\20\0\0\0\0\0\0\0\2\0\0\0\6\0\0\0 Y\36\0\0\0\0\0 i\36\0\0\0\0\0
i\36\0\0\0\0\0@\2\0\0\0\0\0\0@\2\0\0\0\0\0\10\0\0\0\0\0\0\0\4\0\0\0\4\0\0\0\210\3\0\0\0\0\0\210\3\0\
0\0\0\0\0\210\3\0\0\0\0\0\0   \0\0\0\0\0\0\0
\0\0\0\0\0\0\0\10\0\0\0\0\0\0\0\4\0\0\0\4\0\0\0\250\3\0\0\0\0\0\250\3\0\0\0\0\0\250\3\0\0\0\0\0\0$\0\0
\0\0\0\0\0$\0\0\0\0\0\0\0\4\0\0\0"..., 840, 64) = 840

[pid   5625]   <...   read
resumed>"\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0p\236\2\0\0\0\0\0@\0\0\0\0\0\0\0\220\202\36\0
\0\0\0\0\0\0\0\0@\08\0\17\0@\0=\0<\0\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\0H\
3\0\0\0\0\0\0\0H\3\0\0\0\0\0\0\10\0\0\0\0\0\0\0\3\0\0\0\4\0\0\0`\$\36\0\0\0\0\0`\$\36\0\0\0\0\0`\$\36\0\0\0\0\
0\34\0\0\0\0\0\0\0\34\0\0\0\0\0\0\0\20\0\0\0\0\0\0\0\1\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\
0\0\0\0\0\0\350t\2\0\0\0\0\0\350t\2\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\5\0\0\0\200\2\0\0\0\0\0\200\2\0\0
\0\0\0\200\2\0\0\0\0\0}A\26\0\0\0\0\0}A\26\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\4\0\0\0\320\30\0\0\0\0
\0\0\320\30\0\0\0\0\0\0\320\30\0\0\0\0\0|T\5\0\0\0\0\0|T\5\0\0\0\0\0\20\0\0\0\0\0\0\0\1\0\0\6\0\0\0X+\3
6\0\0\0\0\0X;\36\0\0\0\0\0X;\36\0\0\0\0\0pK\0\0\0\0\0\0   #\1\0\0\0\0\0\0\20\0\0\0\0\0\0\0\2\0\0\0\6\0\0\0
Y\36\0\0\0\0\0   i\36\0\0\0\0\0
i\36\0\0\0\0\0@\2\0\0\0\0\0\0@\2\0\0\0\0\0\10\0\0\0\0\0\0\0\4\0\0\0\4\0\0\0\210\3\0\0\0\0\0\210\3\0\
0\0\0\0\0\210\3\0\0\0\0\0 \0\0\0\0\0\0\0 \0\0\0"..., 832) = 832

[pid 5626] fstat(3, <unfinished ...>

[pid 5625] pread64(4, <unfinished ...>

[pid 5626] <... fstat resumed>{st_mode=S_IFREG|0755, st_size=2003408, ...}) = 0

[pid   5625]   <...   pread64
resumed>"\6\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\0H\3\0\0\0\0\0\0H\3\0\0\0\0\0\0
\10\0\0\0\0\0\0\0\3\0\0\0\4\0\0\0`\$\36\0\0\0\0\0`\$\36\0\0\0\0\0`\$\36\0\0\0\0\34\0\0\0\0\0\0\0\34\0\0\0\0
\0\0\0\20\0\0\0\0\0\0\0\1\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\0\0\0\0\0\350t\2\0\0\0\0\0\35

0t\2\0\0\0\0\0\0\20\0\0\0\0\0\0\1\0\0\0\5\0\0\0\200\2\0\0\0\0\0\200\2\0\0\0\0\0\200\2\0\0\0\0\0}A\2
6\0\0\0\0\0}A\26\0\0\0\0\0\20\0\0\0\0\0\0\1\0\0\0\4\0\0\0\320\30\0\0\0\0\0\320\30\0\0\0\0\0\320\
30\0\0\0\0\0|T\5\0\0\0\0\0|T\5\0\0\0\0\0\20\0\0\0\0\0\0\1\0\0\0\6\0\0\0X+\36\0\0\0\0\0X;\36\0\0\0\0\0X
;\36\0\0\0\0\0pK\0\0\0\0\0\0 #\1\0\0\0\0\0\0\20\0\0\0\0\0\0\2\0\0\0\6\0\0\0 Y\36\0\0\0\0\0 i\36\0\0\0\0\0
i\36\0\0\0\0\0@\2\0\0\0\0\0\0@\2\0\0\0\0\0\10\0\0\0\0\0\0\4\0\0\0\4\0\0\0\210\3\0\0\0\0\0\210\3\0\
0\0\0\0\210\3\0\0\0\0\0\0   \0\0\0\0\0\0\0
\0\0\0\0\0\0\0\10\0\0\0\0\0\0\4\0\0\0\4\0\0\0\250\3\0\0\0\0\0\250\3\0\0\0\0\0\250\3\0\0\0\0\0$\0\0
\0\0\0\0\0$\0\0\0\0\0\0\4\0\0\0"..., 840, 64) = 840

[pid 5626] pread64(3, <unfinished ...>

[pid 5625] fstat(4, <unfinished ...>

[pid   5626]   <...   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\0H\3\0\0\0\0\0\0H\3\0\0\0\0\0\0
\10\0\0\0\0\0\0\0\3\0\0\0\4\0\0\0`$\36\0\0\0\0\0`$\36\0\0\0\0\0`$\36\0\0\0\0\0\34\0\0\0\0\0\0\34\0\0\0\
\0\0\0\20\0\0\0\0\0\0\1\0\0\0\4\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\350t\2\0\0\0\0\0\35
0t\2\0\0\0\0\0\20\0\0\0\0\0\0\1\0\0\0\5\0\0\0\200\2\0\0\0\0\0\200\2\0\0\0\0\0\200\2\0\0\0\0\0}A\2
6\0\0\0\0\0}A\26\0\0\0\0\0\20\0\0\0\0\0\0\1\0\0\0\4\0\0\0\320\30\0\0\0\0\0\320\30\0\0\0\0\0\320\
30\0\0\0\0\0|T\5\0\0\0\0\0|T\5\0\0\0\0\0\20\0\0\0\0\0\0\1\0\0\0\6\0\0\0X+\36\0\0\0\0\0X;\36\0\0\0\0\0X
;\36\0\0\0\0\0pK\0\0\0\0\0\0 #\1\0\0\0\0\0\0\20\0\0\0\0\0\0\2\0\0\0\6\0\0\0 Y\36\0\0\0\0\0 i\36\0\0\0\0\0
i\36\0\0\0\0\0@\2\0\0\0\0\0\0@\2\0\0\0\0\0\10\0\0\0\0\0\0\4\0\0\0\4\0\0\0\210\3\0\0\0\0\0\210\3\0\
0\0\0\0\210\3\0\0\0\0\0\0   \0\0\0\0\0\0\0
\0\0\0\0\0\0\0\10\0\0\0\0\0\0\4\0\0\0\4\0\0\0\250\3\0\0\0\0\0\250\3\0\0\0\0\0\250\3\0\0\0\0\0$\0\0
\0\0\0\0\0$\0\0\0\0\0\0\4\0\0\0"..., 840, 64) = 840

[pid 5625] <... fstat resumed>{st_mode=S_IFREG|0755, st_size=2003408, ...}) = 0

[pid 5626] mmap(NULL, 2055800, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0 <unfinished ...>

[pid 5625] pread64(4, <unfinished ...>

[pid 5626] <... mmap resumed>)   = 0x73a4a45ec000

[pid   5625]   <...   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\0H\3\0\0\0\0\0\0H\3\0\0\0\0\0\0
\10\0\0\0\0\0\0\0\3\0\0\0\4\0\0\0`$\36\0\0\0\0\0`$\36\0\0\0\0\0`$\36\0\0\0\0\0\34\0\0\0\0\0\0\34\0\0\0\
\0\0\0\20\0\0\0\0\0\0\1\0\0\0\4\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\350t\2\0\0\0\0\0\35
0t\2\0\0\0\0\0\20\0\0\0\0\0\0\1\0\0\0\5\0\0\0\200\2\0\0\0\0\0\200\2\0\0\0\0\0\200\2\0\0\0\0\0}A\2
6\0\0\0\0\0}A\26\0\0\0\0\0\20\0\0\0\0\0\0\1\0\0\0\4\0\0\0\320\30\0\0\0\0\0\320\30\0\0\0\0\0\320\
30\0\0\0\0\0|T\5\0\0\0\0\0|T\5\0\0\0\0\0\20\0\0\0\0\0\0\1\0\0\0\6\0\0\0X+\36\0\0\0\0\0X;\36\0\0\0\0\0X
;\36\0\0\0\0\0pK\0\0\0\0\0\0 #\1\0\0\0\0\0\0\20\0\0\0\0\0\0\2\0\0\0\6\0\0\0 Y\36\0\0\0\0\0 i\36\0\0\0\0\0
i\36\0\0\0\0\0@\2\0\0\0\0\0\0@\2\0\0\0\0\0\10\0\0\0\0\0\0\4\0\0\0\4\0\0\0\210\3\0\0\0\0\0\210\3\0\
0\0\0\0\210\3\0\0\0\0\0\0   \0\0\0\0\0\0\0
\0\0\0\0\0\0\0\10\0\0\0\0\0\0\4\0\0\0\4\0\0\0\250\3\0\0\0\0\0\250\3\0\0\0\0\0\250\3\0\0\0\0\0$\0\0
\0\0\0\0\0$\0\0\0\0\0\0\4\0\0\0"..., 840, 64) = 840

[pid   5626]   mmap(0x73a4a4614000,   1462272,   PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000 <unfinished ...>

[pid 5625] mmap(NULL, 2055800, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 4, 0
<unfinished ...>

[pid 5626] <... mmap resumed>)   = 0x73a4a4614000

[pid   5626]   mmap(0x73a4a4779000,   352256,   PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x18d000 <unfinished ...>

[pid 5625] <... mmap resumed>)   = 0x7cebbfd77000

[pid 5626] <... mmap resumed>)   = 0x73a4a4779000

[pid   5625]   mmap(0x7cebbfd9f000,   1462272,   PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 4, 0x28000 <unfinished ...>

[pid   5626]   mmap(0x73a4a47cf000,   24576,   PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e2000 <unfinished ...>

[pid 5625] <... mmap resumed>)   = 0x7cebbfd9f000

[pid 5626] <... mmap resumed>)   = 0x73a4a47cf000

[pid   5625]   mmap(0x7cebbff04000,   352256,   PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 4, 0x18d000 <unfinished ...>

[pid   5626]   mmap(0x73a4a47d5000,   52856,   PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0 <unfinished ...>

[pid 5625] <... mmap resumed>)   = 0x7cebbff04000

[pid 5626] <... mmap resumed>)   = 0x73a4a47d5000

[pid   5625]   mmap(0x7cebbff5a000,   24576,   PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 4, 0x1e2000 <unfinished ...>

[pid 5626] close(3 <unfinished ...>

[pid 5625] <... mmap resumed>)   = 0x7cebbff5a000

[pid 5626] <... close resumed>)   = 0

[pid   5625]   mmap(0x7cebbff60000,   52856,   PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0 <unfinished ...>

[pid   5626]   mmap(NULL,   12288,   PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>

[pid 5625] <... mmap resumed>)   = 0x7cebbff60000

[pid 5626] <... mmap resumed>)   = 0x73a4a45e9000

[pid 5626] arch_prctl(ARCH_SET_FS, 0x73a4a45e9740 <unfinished ...>

[pid 5625] close(4 <unfinished ...>

[pid 5626] <... arch_prctl resumed>)   = 0

[pid 5625] <... close resumed>)   = 0

[pid 5626] set_tid_address(0x73a4a45e9a10 <unfinished ...>

[pid   5625]   mmap(NULL,   12288,   PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>

[pid 5626] <... set_tid_address resumed>) = 5626

[pid 5625] <... mmap resumed>)   = 0x7cebbfd74000

[pid 5626] set_robust_list(0x73a4a45e9a20, 24 <unfinished ...>

[pid 5625] arch_prctl(ARCH_SET_FS, 0x7cebbfd74740 <unfinished ...>

[pid 5626] <... set_robust_list resumed>) = 0

[pid 5625] <... arch_prctl resumed>)   = 0

[pid 5626] rseq(0x73a4a45e9680, 0x20, 0, 0x53053053 <unfinished ...>

[pid 5625] set_tid_address(0x7cebbfd74a10 <unfinished ...>

[pid 5626] <... rseq resumed>)   = 0

[pid 5625] <... set_tid_address resumed>) = 5625

[pid 5625] set_robust_list(0x7cebbfd74a20, 24 <unfinished ...>

[pid 5626] mprotect(0x73a4a47cf000, 16384, PROT_READ <unfinished ...>

[pid 5625] <... set_robust_list resumed>) = 0

[pid 5626] <... mprotect resumed>)   = 0

[pid 5625] rseq(0x7cebbfd74680, 0x20, 0, 0x53053053 <unfinished ...>

[pid 5626] mprotect(0x403000, 4096, PROT_READ <unfinished ...>

[pid 5625] <... rseq resumed>)   = 0

[pid 5626] <... mprotect resumed>)   = 0

[pid 5626] mprotect(0x73a4a4820000, 8192, PROT_READ <unfinished ...>

[pid 5625] mprotect(0x7cebbff5a000, 16384, PROT_READ <unfinished ...>

[pid 5626] <... mprotect resumed>)   = 0

[pid 5625] <... mprotect resumed>)   = 0

[pid 5626] prlimit64(0, RLIMIT_STACK, NULL, <unfinished ...>

[pid 5625] mprotect(0x403000, 4096, PROT_READ <unfinished ...>

[pid 5626] <... prlimit64 resumed>{rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) = 0

[pid 5625] <... mprotect resumed>)   = 0

[pid 5626] munmap(0x73a4a47e2000, 29003 <unfinished ...>

[pid 5625] mprotect(0x7cebbffab000, 8192, PROT_READ <unfinished ...>

[pid 5626] <... munmap resumed>)   = 0

[pid 5625] <... mprotect resumed>)   = 0

[pid 5626] getpid(<unfinished ...>

[pid 5625] prlimit64(0, RLIMIT_STACK, NULL, <unfinished ...>

[pid 5626] <... getpid resumed>)   = 5626

[pid 5625] <... prlimit64 resumed>{rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) = 0

[pid 5626] fstat(1, <unfinished ...>

[pid 5625] munmap(0x7cebbff6d000, 29003 <unfinished ...>

[pid 5626] <... fstat resumed>{st_mode=S_IFIFO|0600, st_size=0, ...}) = 0

[pid 5625] <... munmap resumed>)   = 0

[pid 5626] getrandom("\x66\x9d\xd5\x5b\x50\xac\xd9\x56", 8, GRND_NONBLOCK) = 8

[pid 5625] getpid(<unfinished ...>

[pid 5626] brk(NULL <unfinished ...>

[pid 5625] <... getpid resumed>)   = 5625

[pid 5626] <... brk resumed>)   = 0x12a89000

[pid 5626] brk(0x12aaa000 <unfinished ...>

[pid 5625] fstat(1, <unfinished ...>

[pid 5626] <... brk resumed>)   = 0x12aaa000

[pid 5625] <... fstat resumed>{st_mode=S_IFIFO|0600, st_size=0, ...}) = 0

[pid 5626] read(0, <unfinished ...>

[pid 5625] getrandom("\xf9\xe9\x96\x3b\x58\x57\x28\xda", 8, GRND_NONBLOCK) = 8

[pid 5625] brk(NULL)   = 0x32058000

[pid 5625] brk(0x32079000)   = 0x32079000

[pid 5625] read(0, Hello World!

 <unfinished ...>

[pid 5624] <... read resumed>"Hello World!\n", 1024) = 13

[pid 5624] write(4, "Hello World!\n", 13) = 13

[pid 5625] <... read resumed>"Hello World!\n", 1024) = 13

[pid 5624] read(7, <unfinished ...>

[pid 5625] write(1, "hello world!\n", 13 <unfinished ...>

[pid 5626] <... read resumed>"hello world!\n", 1024) = 13

[pid 5625] <... write resumed>)   = 13

[pid 5626] write(1, "hello_world!\n", 13 <unfinished ...>

[pid 5625] read(0, <unfinished ...>

[pid 5626] <... write resumed>)   = 13

[pid 5624] <... read resumed>"hello_world!\n", 1023) = 13

[pid 5624] write(1, "\320\230\321\202\320\276\320\263: hello_world!\n", 23 <unfinished ...>

[pid 5626] read(0, Итог: hello_world!

 <unfinished ...>

[pid 5624] <... write resumed>)   = 23

[pid 5624] read(0, "", 1024)   = 0

[pid 5624] close(4)   = 0

[pid 5625] <... read resumed>"", 1024) = 0

[pid 5624] close(7)   = 0

[pid 5625] write(1, "Child1 \320\267\320\260\320\277\321\203\321\211\320\265\320\275, PID: 5625\nChild1 \320\267\320\260\320\262\320\265\321\200\321\210\320\265\320\275\n", 57 <unfinished ...>

[pid 5624] wait4(5625, <unfinished ...>

[pid 5626] <... read resumed>"Child1 \320\267\320\260\320\277\321\203\321\211\320\265\320\275, PID: 5625\nChild1 \320\267\320\260\320\262\320\265\321\200\321\210\320\265\320\275\n", 1024) = 57

[pid 5625] <... write resumed>)   = 57

[pid 5626] write(1, "Child1_\320\267\320\260\320\277\321\203\321\211\320\265\320\275,_PID:_5625\nChild1_\320\267\320\260\320\262\320\265\321\200\321\210\320\265\320\275\n", 57 <unfinished ...>

[pid 5625] exit_group(0 <unfinished ...>

[pid 5626] <... write resumed>)   = -1 EPIPE (Broken pipe)

[pid 5626] --- SIGPIPE {si_signo=SIGPIPE, si_code=SI_USER, si_pid=5626, si_uid=0} ---

[pid 5625] <... exit_group resumed>)   = ?

[pid 5626] +++ killed by SIGPIPE +++

[pid 5625] +++ exited with 0 +++

<... wait4 resumed>NULL, 0, NULL)   = 5625

--- SIGCHLD {si_signo=SIGCHLD, si_code=CLD_KILLED, si_pid=5626, si_uid=0, si_status=SIGPIPE, si_utime=0, si_stime=0} ---

wait4(5626, NULL, 0, NULL)   = 5626

write(1, "Parent   \320\267\320\260\320\262\320\265\321\200\321\210\320\265\320\275.\n", 25Parent завершен.

) = 25

exit_group(0)   = ?

+++ exited with 0 +++

Lab_2:

7370 execve("./main", ["./main", "4"], 0x7ffd951a1da0 /* 29 vars */) = 0
7370 brk(NULL)   = 0x3fc9b000
7370 mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75beec3d3000
7370 access("/etc/ld.so.preload", R_OK) = -1 ENOENT (No such file or directory)
7370 openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
7370 fstat(3, {st_mode=S_IFREG|0644, st_size=29003, ...}) = 0
7370 mmap(NULL, 29003, PROT_READ, MAP_PRIVATE, 3, 0) = 0x75beec3cb000

```
7370  close(3)                    = 0
7370  openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
7370  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"..., 840, 64) =
840
7370  fstat(3, {st_mode=S_IFREG|0755, st_size=2003408, ...}) = 0
7370  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"..., 840, 64) =
840
7370  mmap(NULL, 2055800, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) =
0x75beec1d5000
7370  mmap(0x75beec1fd000, 1462272, PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000) = 0x75beec1fd000
7370  mmap(0x75beec362000, 352256, PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x18d000) = 0x75beec362000
7370  mmap(0x75beec3b8000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e2000) = 0x75beec3b8000
7370  mmap(0x75beec3be000, 52856, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x75beec3be000
7370  close(3)                    = 0
7370  mmap(NULL, 12288, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75beec1d2000
7370  arch_prctl(ARCH_SET_FS, 0x75beec1d2740) = 0
7370  set_tid_address(0x75beec1d2a10)   = 7370
7370  set_robust_list(0x75beec1d2a20, 24) = 0
7370  rseq(0x75beec1d2680, 0x20, 0, 0x53053053) = 0
7370  mprotect(0x75beec3b8000, 16384, PROT_READ) = 0
7370  mprotect(0x403000, 4096, PROT_READ) = 0
7370  mprotect(0x75beec409000, 8192, PROT_READ) = 0
7370  prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024,
rlim_max=RLIM64_INFINITY}) = 0
7370  munmap(0x75beec3cb000, 29003)     = 0
7370  getrandom("\x0f\xae\x62\x25\x1f\x78\x4b\x1b", 8, GRND_NONBLOCK) = 8
7370  brk(NULL)                   = 0x3fc9b000
7370  brk(0x3fcbc000)             = 0x3fcbc000
7370  openat(AT_FDCWD, "input.txt", O_RDONLY) = 3
7370  fstat(3, {st_mode=S_IFREG|0777, st_size=34444438, ...}) = 0
7370  mmap(NULL, 20000768, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75beeaebf000
7370  close(3)                    = 0
7370  fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0), ...}) = 0
7370  write(1, "Array size: 5000000\n", 20) = 20
7370  write(1, "Max threads: 4\n", 15) = 15
7370  rt_sigaction(SIGRT_1, {sa_handler=0x75beec2654b0, sa_mask=[],
sa_flags=SA_RESTORER|SA_ONSTACK|SA_RESTART|SA_SIGINFO,
sa_restorer=0x75beec214df0}, NULL, 8) = 0
7370  rt_sigprocmask(SIG_UNBLOCK, [RTMIN RT_1], NULL, 8) = 0
7370  mmap(NULL, 8392704, PROT_NONE,
MAP_PRIVATE|MAP_ANONYMOUS|MAP_STACK, -1, 0) = 0x75beea6be000
7370  mprotect(0x75beea6bf000, 8388608, PROT_READ|PROT_WRITE) = 0
7370  rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
7370
clone3({flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLO
NE_SYSVSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
child_tid=0x75beeaebe990, parent_tid=0x75beeaebe990, exit_signal=0, stack=0x75beea6be000,
stack_size=0x7fff80, tls=0x75beeaebe6c0}, 88) = -1 ENOSYS (Function not implemented)
```

```
     7370  clone(child_stack=0x75beeaebdf70,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYS
VSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tid=[7400], tls=0x75beeaebe6c0, child_tidptr=0x75beeaebe990) = 7400
     7400  rseq(0x75beeaebe600, 0x20, 0, 0x53053053 <unfinished ...>
     7370  rt_sigprocmask(SIG_SETMASK, [],  <unfinished ...>
     7400  <... rseq resumed>)            = 0
     7370  <... rt_sigprocmask resumed>NULL, 8) = 0
     7400  set_robust_list(0x75beeaebe9a0, 24 <unfinished ...>
     7370  mmap(NULL, 8392704, PROT_NONE,
MAP_PRIVATE|MAP_ANONYMOUS|MAP_STACK, -1, 0 <unfinished ...>
     7400  <... set_robust_list resumed>)    = 0
     7370  <... mmap resumed>)            = 0x75bee9ebd000
     7400  rt_sigprocmask(SIG_SETMASK, [],  <unfinished ...>
     7370  mprotect(0x75bee9ebe000, 8388608, PROT_READ|PROT_WRITE <unfinished ...>
     7400  <... rt_sigprocmask resumed>NULL, 8) = 0
     7370  <... mprotect resumed>)         = 0
     7400  mmap(NULL, 134217728, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0
<unfinished ...>
     7370  rt_sigprocmask(SIG_BLOCK, ~[],  <unfinished ...>
     7400  <... mmap resumed>)            = 0x75bee1ebd000
     7370  <... rt_sigprocmask resumed>[], 8) = 0
     7400  munmap(0x75bee1ebd000, 34877440 <unfinished ...>
     7370  clone(child_stack=0x75beea6bcf70,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYS
VSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID <unfinished ...>
     7400  <... munmap resumed>)           = 0
     7370  <... clone resumed>, parent_tid=[7401], tls=0x75beea6bd6c0, child_tidptr=0x75beea6bd990)
= 7401
     7400  munmap(0x75bee8000000, 32231424 <unfinished ...>
     7370  rt_sigprocmask(SIG_SETMASK, [],  <unfinished ...>
     7401  rseq(0x75beea6bd600, 0x20, 0, 0x53053053 <unfinished ...>
     7370  <... rt_sigprocmask resumed>NULL, 8) = 0
     7400  <... munmap resumed>)           = 0
     7370  futex(0x75beeaebe990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 7400,
NULL, FUTEX_BITSET_MATCH_ANY <unfinished ...>
     7401  <... rseq resumed>)            = 0
     7400  mprotect(0x75bee4000000, 135168, PROT_READ|PROT_WRITE <unfinished ...>
     7401  set_robust_list(0x75beea6bd9a0, 24 <unfinished ...>
     7400  <... mprotect resumed>)         = 0
     7401  <... set_robust_list resumed>)    = 0
     7400  mmap(NULL, 8392704, PROT_NONE,
MAP_PRIVATE|MAP_ANONYMOUS|MAP_STACK, -1, 0 <unfinished ...>
     7401  rt_sigprocmask(SIG_SETMASK, [],  <unfinished ...>
     7400  <... mmap resumed>)            = 0x75bee96bc000
     7401  <... rt_sigprocmask resumed>NULL, 8) = 0
     7400  mprotect(0x75bee96bd000, 8388608, PROT_READ|PROT_WRITE <unfinished ...>
     7401  mmap(NULL, 134217728, PROT_NONE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0
<unfinished ...>
     7400  <... mprotect resumed>)         = 0
     7401  <... mmap resumed>)            = 0x75bedc000000
     7400  rt_sigprocmask(SIG_BLOCK, ~[],  <unfinished ...>
     7401  munmap(0x75bee0000000, 67108864 <unfinished ...>
     7400  <... rt_sigprocmask resumed>[], 8) = 0
     7401  <... munmap resumed>)           = 0
```

```
7400  clone(child_stack=0x75bee9ebbf70,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYS
VSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID <unfinished ...>
7401  mprotect(0x75bedc000000, 135168, PROT_READ|PROT_WRITE) = 0
7402  rseq(0x75bee9ebc600, 0x20, 0, 0x53053053 <unfinished ...>
7400  <... clone resumed>, parent_tid=[7402], tls=0x75bee9ebc6c0, child_tidptr=0x75bee9ebc990)
= 7402
7402  <... rseq resumed>)              = 0
7400  rt_sigprocmask(SIG_SETMASK, [],  <unfinished ...>
7402  set_robust_list(0x75bee9ebc9a0, 24 <unfinished ...>
7400  <... rt_sigprocmask resumed>NULL, 8) = 0
7402  <... set_robust_list resumed>)    = 0
7402  rt_sigprocmask(SIG_SETMASK, [], NULL, 8) = 0
7402  mmap(0x75bee0000000, 67108864, PROT_NONE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75bee0000000
7402  mprotect(0x75bee0000000, 135168, PROT_READ|PROT_WRITE) = 0
7401  mprotect(0x75bedc021000, 28672, PROT_READ|PROT_WRITE) = 0
7400  mprotect(0x75bee4021000, 28672, PROT_READ|PROT_WRITE <unfinished ...>
7401  openat(AT_FDCWD, "/proc/sys/vm/overcommit_memory", O_RDONLY|O_CLOEXEC
<unfinished ...>
7400  <... mprotect resumed>)          = 0
7401  <... openat resumed>)            = 3
7401  close(3 <unfinished ...>
7402  mprotect(0x75bee0021000, 28672, PROT_READ|PROT_WRITE <unfinished ...>
7400  madvise(0x75bee4022000, 24576, MADV_DONTNEED <unfinished ...>
7402  <... mprotect resumed>)          = 0
7401  <... close resumed>)             = 0
7400  <... madvise resumed>)           = 0
7402  madvise(0x75bee0022000, 24576, MADV_DONTNEED <unfinished ...>
7401  madvise(0x75bedc022000, 24576, MADV_DONTNEED <unfinished ...>
7402  <... madvise resumed>)           = 0
7401  <... madvise resumed>)           = 0
7400  madvise(0x75bee4022000, 24576, MADV_DONTNEED) = 0
7402  madvise(0x75bee0022000, 24576, MADV_DONTNEED <unfinished ...>
7401  madvise(0x75bedc022000, 24576, MADV_DONTNEED <unfinished ...>
7400  mmap(NULL, 159744, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>
7402  <... madvise resumed>)           = 0
7401  <... madvise resumed>)           = 0
7402  mmap(NULL, 159744, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>
7400  <... mmap resumed>)              = 0x75bee9695000
7402  <... mmap resumed>)              = 0x75bee966e000
7401  mmap(NULL, 159744, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>
7402  mmap(NULL, 159744, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>
7400  mmap(NULL, 159744, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>
7402  <... mmap resumed>)              = 0x75bee9620000
7401  <... mmap resumed>)              = 0x75bee9647000
7400  <... mmap resumed>)              = 0x75bee95f9000
7401  mmap(NULL, 159744, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75bee95d2000
7402  munmap(0x75bee966e000, 159744)   = 0
```

```
7402  munmap(0x75bee9620000, 159744 <unfinished ...>
7400  munmap(0x75bee9695000, 159744 <unfinished ...>
7402  <... munmap resumed>)           = 0
7401  munmap(0x75bee9647000, 159744 <unfinished ...>
7400  <... munmap resumed>)           = 0
7401  <... munmap resumed>)           = 0
7400  munmap(0x75bee95f9000, 159744 <unfinished ...>
7401  munmap(0x75bee95d2000, 159744 <unfinished ...>
7400  <... munmap resumed>)           = 0
7401  <... munmap resumed>)           = 0
7402  mprotect(0x75bee0028000, 155648, PROT_READ|PROT_WRITE) = 0
7400  mprotect(0x75bee4028000, 155648, PROT_READ|PROT_WRITE <unfinished ...>
7401  mprotect(0x75bedc028000, 155648, PROT_READ|PROT_WRITE <unfinished ...>
7400  <... mprotect resumed>)         = 0
7401  <... mprotect resumed>)         = 0
7402  mmap(NULL, 315392, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75bee966f000
7401  mmap(NULL, 315392, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>
7400  mmap(NULL, 315392, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>
7401  <... mmap resumed>)             = 0x75bee9622000
7400  <... mmap resumed>)             = 0x75bee95d5000
7402  munmap(0x75bee966f000, 315392)    = 0
7400  munmap(0x75bee95d5000, 315392 <unfinished ...>
7401  munmap(0x75bee9622000, 315392 <unfinished ...>
7400  <... munmap resumed>)           = 0
7401  <... munmap resumed>)           = 0
7402  mprotect(0x75bee004e000, 311296, PROT_READ|PROT_WRITE) = 0
7400  mprotect(0x75bee404e000, 315392, PROT_READ|PROT_WRITE <unfinished ...>
7401  mprotect(0x75bedc04e000, 311296, PROT_READ|PROT_WRITE <unfinished ...>
7400  <... mprotect resumed>)         = 0
7401  <... mprotect resumed>)         = 0
7402  mmap(NULL, 626688, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75bee9623000
7400  mmap(NULL, 626688, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>
7401  mmap(NULL, 626688, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>
7400  <... mmap resumed>)             = 0x75bee958a000
7401  <... mmap resumed>)             = 0x75bee94f1000
7402  munmap(0x75bee9623000, 626688)    = 0
7401  munmap(0x75bee94f1000, 626688 <unfinished ...>
7400  munmap(0x75bee958a000, 626688 <unfinished ...>
7401  <... munmap resumed>)           = 0
7400  <... munmap resumed>)           = 0
7402  mprotect(0x75bee009a000, 626688, PROT_READ|PROT_WRITE) = 0
7401  mprotect(0x75bedc09a000, 626688, PROT_READ|PROT_WRITE) = 0
7400  mprotect(0x75bee409b000, 622592, PROT_READ|PROT_WRITE) = 0
7402  mmap(NULL, 1253376, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75bee958a000
7401  mmap(NULL, 1253376, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75bee9458000
7400  mmap(NULL, 1253376, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75bee9326000
```

```
7402  munmap(0x75bee958a000, 1253376)  = 0
7401  munmap(0x75bee9458000, 1253376)  = 0
7400  munmap(0x75bee9326000, 1253376)  = 0
7402  mprotect(0x75bee0133000, 1249280, PROT_READ|PROT_WRITE) = 0
7401  mprotect(0x75bedc133000, 1249280, PROT_READ|PROT_WRITE) = 0
7400  mprotect(0x75bee4133000, 1249280, PROT_READ|PROT_WRITE) = 0
7402  mmap(NULL, 2502656, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75bee9459000
7401  mmap(NULL, 2502656, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75bee91f6000
7400  mmap(NULL, 2502656, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75bee8f93000
7402  munmap(0x75bee9459000, 2502656)  = 0
7401  munmap(0x75bee91f6000, 2502656 <unfinished ...>
7402  rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
7402  madvise(0x75bee96bc000, 8368128, MADV_DONTNEED <unfinished ...>
7401  <... munmap resumed>)            = 0
7402  <... madvise resumed>)           = 0
7401  mmap(NULL, 8392704, PROT_NONE,
MAP_PRIVATE|MAP_ANONYMOUS|MAP_STACK, -1, 0 <unfinished ...>
7402  exit(0 <unfinished ...>
7401  <... mmap resumed>)              = 0x75bee8792000
7400  munmap(0x75bee8f93000, 2502656 <unfinished ...>
7402  <... exit resumed>)              = ?
7401  mprotect(0x75bee8793000, 8388608, PROT_READ|PROT_WRITE <unfinished ...>
7402  +++ exited with 0 +++
7401  <... mprotect resumed>)          = 0
7400  <... munmap resumed>)            = 0
7401  rt_sigprocmask(SIG_BLOCK, ~[],  <unfinished ...>
7400  mmap(NULL, 5001216, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>
7401  <... rt_sigprocmask resumed>[], 8) = 0
7400  <... mmap resumed>)              = 0x75bee91f7000
7401  clone(child_stack=0x75bee8f91f70,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYS
VSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID <unfinished ...>
7400  mmap(NULL, 5001216, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>
7404  rseq(0x75bee8f92600, 0x20, 0, 0x53053053 <unfinished ...>
7401  <... clone resumed>, parent_tid=[7404], tls=0x75bee8f926c0, child_tidptr=0x75bee8f92990)
= 7404
7400  <... mmap resumed>)              = 0x75bee82cd000
7404  <... rseq resumed>)              = 0
7401  rt_sigprocmask(SIG_SETMASK, [],  <unfinished ...>
7404  set_robust_list(0x75bee8f929a0, 24 <unfinished ...>
7401  <... rt_sigprocmask resumed>NULL, 8) = 0
7404  <... set_robust_list resumed>)   = 0
7404  rt_sigprocmask(SIG_SETMASK, [], NULL, 8) = 0
7400  munmap(0x75bee91f7000, 5001216)  = 0
7400  munmap(0x75bee82cd000, 5001216)  = 0
7400  rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
7400  madvise(0x75beea6be000, 8368128, MADV_DONTNEED) = 0
7400  exit(0)                          = ?
7370  <... futex resumed>)             = 0
7400  +++ exited with 0 +++
```

```
7370  futex(0x75beea6bd990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 7401,
NULL, FUTEX_BITSET_MATCH_ANY <unfinished ...>
7401  rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
7401  clone(child_stack=0x75bee9ebbf70,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYS
VSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID <unfinished ...>
7405  rseq(0x75bee9ebc600, 0x20, 0, 0x53053053 <unfinished ...>
7401  <... clone resumed>, parent_tid=[7405], tls=0x75bee9ebc6c0, child_tidptr=0x75bee9ebc990)
= 7405
7405  <... rseq resumed>)              = 0
7401  rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
7405  set_robust_list(0x75bee9ebc9a0, 24 <unfinished ...>
7401  <... rt_sigprocmask resumed>NULL, 8) = 0
7405  <... set_robust_list resumed>)    = 0
7405  rt_sigprocmask(SIG_SETMASK, [], NULL, 8) = 0
7401  futex(0x75bee9ebc990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 7405,
NULL, FUTEX_BITSET_MATCH_ANY <unfinished ...>
7405  rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
7405  madvise(0x75bee96bc000, 8368128, MADV_DONTNEED) = 0
7405  exit(0)                    = ?
7405  +++ exited with 0 +++
7401  <... futex resumed>)            = 0
7404  rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
7404  clone(child_stack=0x75beeaebdf70,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYS
VSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tid=[7406], tls=0x75beeaebe6c0, child_tidptr=0x75beeaebe990) = 7406
7406  rseq(0x75beeaebe600, 0x20, 0, 0x53053053 <unfinished ...>
7404  rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
7406  <... rseq resumed>)              = 0
7404  <... rt_sigprocmask resumed>NULL, 8) = 0
7406  set_robust_list(0x75beeaebe9a0, 24) = 0
7406  rt_sigprocmask(SIG_SETMASK, [], NULL, 8) = 0
7404  futex(0x75beeaebe990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 7406,
NULL, FUTEX_BITSET_MATCH_ANY <unfinished ...>
7406  rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
7406  madvise(0x75beea6be000, 8368128, MADV_DONTNEED) = 0
7406  exit(0 <unfinished ...>
7401  rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
7406  <... exit resumed>)            = ?
7401  <... rt_sigprocmask resumed>[], 8) = 0
7406  +++ exited with 0 +++
7404  <... futex resumed>)            = 0
7401  clone(child_stack=0x75bee9ebbf70,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYS
VSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tid=[7407], tls=0x75bee9ebc6c0, child_tidptr=0x75bee9ebc990) = 7407
7407  rseq(0x75bee9ebc600, 0x20, 0, 0x53053053 <unfinished ...>
7401  rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
7407  <... rseq resumed>)            = 0
7401  <... rt_sigprocmask resumed>NULL, 8) = 0
7407  set_robust_list(0x75bee9ebc9a0, 24) = 0
7407  rt_sigprocmask(SIG_SETMASK, [], NULL, 8) = 0
7401  futex(0x75bee9ebc990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 7407,
NULL, FUTEX_BITSET_MATCH_ANY <unfinished ...>
```

7407 rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
7407 madvise(0x75bee96bc000, 8368128, MADV_DONTNEED) = 0
7404 rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>
7407 exit(0 <unfinished ...>
7404 <... rt_sigprocmask resumed>[], 8) = 0
7407 <... exit resumed>)   = ?
7404 clone(child_stack=0x75beeaebdf70,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYS
VSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID <unfinished ...>
7407 +++ exited with 0 +++
7401 <... futex resumed>)   = 0
7408 rseq(0x75beeaebe600, 0x20, 0, 0x53053053 <unfinished ...>
7404 <... clone resumed>, parent_tid=[7408], tls=0x75beeaebe6c0, child_tidptr=0x75beeaebe990)
= 7408
7408 <... rseq resumed>)   = 0
7404 rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
7408 set_robust_list(0x75beeaebe9a0, 24 <unfinished ...>
7404 <... rt_sigprocmask resumed>NULL, 8) = 0
7408 <... set_robust_list resumed>)   = 0
7408 rt_sigprocmask(SIG_SETMASK, [], NULL, 8) = 0
7404 futex(0x75beeaebe990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 7408,
NULL, FUTEX_BITSET_MATCH_ANY <unfinished ...>
7408 rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
7408 madvise(0x75beea6be000, 8368128, MADV_DONTNEED) = 0
7408 exit(0)   = ?
7404 <... futex resumed>)   = 0
7408 +++ exited with 0 +++
7401 rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
7401 clone(child_stack=0x75beeaebdf70,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYS
VSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tid=[7409], tls=0x75beeaebe6c0, child_tidptr=0x75beeaebe990) = 7409
7409 rseq(0x75beeaebe600, 0x20, 0, 0x53053053 <unfinished ...>
7401 rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
7409 <... rseq resumed>)   = 0
7401 <... rt_sigprocmask resumed>NULL, 8) = 0
7409 set_robust_list(0x75beeaebe9a0, 24) = 0
7409 rt_sigprocmask(SIG_SETMASK, [], NULL, 8) = 0
7404 rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
7404 madvise(0x75bee8792000, 8368128, MADV_DONTNEED) = 0
7404 exit(0)   = ?
7404 +++ exited with 0 +++
7401 rt_sigprocmask(SIG_BLOCK, ~[], [], 8) = 0
7401 clone(child_stack=0x75bee9ebbf70,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYS
VSEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID <unfinished ...>
7410 rseq(0x75bee9ebc600, 0x20, 0, 0x53053053 <unfinished ...>
7401 <... clone resumed>, parent_tid=[7410], tls=0x75bee9ebc6c0, child_tidptr=0x75bee9ebc990)
= 7410
7410 <... rseq resumed>)   = 0
7401 rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>
7410 set_robust_list(0x75bee9ebc9a0, 24 <unfinished ...>
7401 <... rt_sigprocmask resumed>NULL, 8) = 0
7410 <... set_robust_list resumed>)   = 0
7410 rt_sigprocmask(SIG_SETMASK, [], NULL, 8) = 0

```
    7401  futex(0x75bee9ebc990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 7410,
NULL, FUTEX_BITSET_MATCH_ANY <unfinished ...>
    7410  rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
    7410  madvise(0x75bee96bc000, 8368128, MADV_DONTNEED) = 0
    7410  exit(0 <unfinished ...>
    7409  rt_sigprocmask(SIG_BLOCK, ~[RT_1],  <unfinished ...>
    7410  <... exit resumed>)            = ?
    7409  <... rt_sigprocmask resumed>NULL, 8) = 0
    7410  +++ exited with 0 +++
    7401  <... futex resumed>)           = 0
    7409  madvise(0x75beea6be000, 8368128, MADV_DONTNEED) = 0
    7409  exit(0)                = ?
    7401  futex(0x75beeaebe990, FUTEX_WAIT_BITSET|FUTEX_CLOCK_REALTIME, 7409,
NULL, FUTEX_BITSET_MATCH_ANY <unfinished ...>
    7409  +++ exited with 0 +++
    7401  <... futex resumed>)           = -1 EAGAIN (Resource temporarily unavailable)
    7401  mprotect(0x75bedc264000, 2502656, PROT_READ|PROT_WRITE) = 0
    7401  mprotect(0x75bedc4c7000, 4997120, PROT_READ|PROT_WRITE) = 0
    7401  rt_sigprocmask(SIG_BLOCK, ~[RT_1], NULL, 8) = 0
    7401  madvise(0x75bee9ebd000, 8368128, MADV_DONTNEED) = 0
    7401  exit(0)                = ?
    7370  <... futex resumed>)           = 0
    7401  +++ exited with 0 +++
    7370  mmap(NULL, 10002432, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75bedb676000
    7370  mmap(NULL, 10002432, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x75bedacec000
    7370  munmap(0x75bedb676000, 10002432)  = 0
    7370  munmap(0x75bedacec000, 10002432)  = 0
    7370  write(1, "Sorting time: 477.49 ms\n", 24) = 24
    7370  munmap(0x75beeaebf000, 20000768)  = 0
    7370  exit_group(0)               = ?
    7370  +++ exited with 0 +++
```

Lab_3:

execve("./parent", ["./parent"], 0x7fff9e3dddb8 /* 29 vars */) = 0

brk(NULL)   = 0x37e01000

mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) =
0x7cf35fd2a000

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=29003, ...}) = 0

mmap(NULL, 29003, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7cf35fd22000

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\236\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\0\0"..., 840, 64) = 840

fstat(3, {st_mode=S_IFREG|0755, st_size=2003408, ...}) = 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\0\0"..., 840, 64) = 840

mmap(NULL, 2055800, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7cf35fb2c000

mmap(0x7cf35fb54000, 1462272, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000) = 0x7cf35fb54000

mmap(0x7cf35fcb9000, 352256, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x18d000) = 0x7cf35fcb9000

mmap(0x7cf35fd0f000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e2000) = 0x7cf35fd0f000

mmap(0x7cf35fd15000, 52856, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7cf35fd15000

close(3)   = 0

mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7cf35fb29000

arch_prctl(ARCH_SET_FS, 0x7cf35fb29740) = 0

set_tid_address(0x7cf35fb29a10)   = 10185

set_robust_list(0x7cf35fb29a20, 24)   = 0

rseq(0x7cf35fb29680, 0x20, 0, 0x53053053) = 0

mprotect(0x7cf35fd0f000, 16384, PROT_READ) = 0

mprotect(0x403000, 4096, PROT_READ)   = 0

mprotct(0x7cf35fd60000, 8192, PROT_READ) = 0

prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) = 0

munmap(0x7cf35fd22000, 29003)   = 0

openat(AT_FDCWD, "shared1.dat", O_RDWR|O_CREAT|O_TRUNC, 0666) = 3

openat(AT_FDCWD, "shared2.dat", O_RDWR|O_CREAT|O_TRUNC, 0666) = 4

openat(AT_FDCWD, "shared3.dat", O_RDWR|O_CREAT|O_TRUNC, 0666) = 5

ftruncate(3, 4096)   = 0

ftruncate(4, 4096)   = 0

ftruncate(5, 4096)   = 0

mmap(NULL, 4096, PROT_READ|PROT_WRITE, MAP_SHARED, 3, 0) = 0x7cf35fd29000

mmap(NULL, 4096, PROT_READ|PROT_WRITE, MAP_SHARED, 5, 0) = 0x7cf35fd28000

close(3)   = 0

close(4)   = 0

close(5)   = 0

rt_sigprocmask(SIG_BLOCK, ~[], [], 8)   = 0

clone(child_stack=NULL,
flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLDstrace: Process   10186
attached

, child_tidptr=0x7cf35fb29a10) = 10186

[pid 10186] set_robust_list(0x7cf35fb29a20, 24 <unfinished ...>

[pid 10185] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>

[pid 10186] <... set_robust_list resumed>) = 0

[pid 10185] <... rt_sigprocmask resumed>NULL, 8) = 0

[pid 10185] rt_sigprocmask(SIG_BLOCK, ~[], <unfinished ...>

[pid 10186] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>

[pid 10185] <... rt_sigprocmask resumed>[], 8) = 0

[pid   10185]   clone(child_stack=NULL,
flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLD <unfinished ...>

[pid 10186] <... rt_sigprocmask resumed>NULL, 8) = 0

[pid 10186] execve("./child1", ["./child1"], 0x7fff97a9b618 /* 29 vars */strace: Process 10187 attached
 <unfinished ...>

[pid 10185] <... clone resumed>, child_tidptr=0x7cf35fb29a10) = 10187

[pid 10185] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>

[pid 10187] set_robust_list(0x7cf35fb29a20, 24 <unfinished ...>

[pid 10185] <... rt_sigprocmask resumed>NULL, 8) = 0

[pid 10187] <... set_robust_list resumed>) = 0

[pid   10185]   rt_sigaction(SIGUSR2,   {sa_handler=0x401246,   sa_mask=[USR2],
sa_flags=SA_RESTORER|SA_RESTART, sa_restorer=0x7cf35fb6bdf0}, <unfinished ...>

[pid 10187] rt_sigprocmask(SIG_SETMASK, [], <unfinished ...>

[pid 10185] <... rt_sigaction resumed>{sa_handler=SIG_DFL, sa_mask=[], sa_flags=0}, 8) = 0

[pid 10187] <... rt_sigprocmask resumed>NULL, 8) = 0

[pid 10185] fstat(0, {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0), ...}) = 0

[pid 10187] execve("./child2", ["./child2"], 0x7fff97a9b618 /* 29 vars */ <unfinished ...>

[pid 10185] getrandom("\x2a\x4f\x18\x93\x11\x3d\x8e\x6a", 8, GRND_NONBLOCK) = 8

[pid 10185] brk(NULL)   = 0x37e01000

[pid 10185] brk(0x37e22000)   = 0x37e22000

[pid 10185] read(0, <unfinished ...>

[pid 10187] <... execve resumed>)   = 0

[pid 10186] <... execve resumed>)   = 0

[pid 10187] brk(NULL <unfinished ...>

[pid 10186] brk(NULL <unfinished ...>

[pid 10187] <... brk resumed>)   = 0xd622000

[pid 10186] <... brk resumed>)   = 0x3f20000

[pid 10187] mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x769e1a643000

[pid 10186] mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>

[pid 10187] access("/etc/ld.so.preload", R_OK <unfinished ...>

[pid 10186] <... mmap resumed>)   = 0x74d13a92a000

[pid 10187] <... access resumed>)   = -1 ENOENT (No such file or directory)

[pid 10186] access("/etc/ld.so.preload", R_OK <unfinished ...>

[pid 10187] openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC <unfinished ...>

[pid 10186] <... access resumed>)   = -1 ENOENT (No such file or directory)

[pid 10187] <... openat resumed>)   = 3

[pid 10187] fstat(3, <unfinished ...>

[pid 10186] openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC <unfinished ...>

[pid 10187] <... fstat resumed>{st_mode=S_IFREG|0644, st_size=29003, ...}) = 0

[pid 10186] <... openat resumed>)   = 3

[pid 10187] mmap(NULL, 29003, PROT_READ, MAP_PRIVATE, 3, 0 <unfinished ...>

[pid 10186] fstat(3, <unfinished ...>

[pid 10187] <... mmap resumed>)   = 0x769e1a63b000

[pid 10186] <... fstat resumed>{st_mode=S_IFREG|0644, st_size=29003, ...}) = 0

[pid 10187] close(3 <unfinished ...>

[pid 10186] mmap(NULL, 29003, PROT_READ, MAP_PRIVATE, 3, 0 <unfinished ...>

[pid 10187] <... close resumed>)   = 0

[pid 10186] <... mmap resumed>)   = 0x74d13a922000

[pid 10187] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC <unfinished ...>

[pid 10186] close(3 <unfinished ...>

[pid 10187] <... openat resumed>)   = 3

[pid 10186] <... close resumed>)   = 0

[pid 10187] read(3, <unfinished ...>

[pid 10186] openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC <unfinished ...>

[pid 10187] <... read resumed>"\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0p\236\2\0\0\0\0\0"..., 832) = 832

[pid 10186] <... openat resumed>)   = 3

[pid 10187] pread64(3, <unfinished ...>

[pid 10186] read(3, <unfinished ...>

[pid 10187] <... 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"..., 840, 64) = 840

[pid 10186] <... read resumed>"\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0p\236\2\0\0\0\0\0"..., 832) = 832

[pid 10187] fstat(3, <unfinished ...>

[pid 10186] pread64(3, <unfinished ...>

[pid 10187] <... fstat resumed>{st_mode=S_IFREG|0755, st_size=2003408, ...}) = 0

[pid 10186] <... 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"..., 840, 64) = 840

[pid 10187] pread64(3, <unfinished ...>

[pid 10186] fstat(3, <unfinished ...>

[pid 10187] <... 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"..., 840, 64) = 840

[pid 10186] <... fstat resumed>{st_mode=S_IFREG|0755, st_size=2003408, ...}) = 0

[pid 10187] mmap(NULL, 2055800, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0 <unfinished ...>

[pid 10186] pread64(3, <unfinished ...>

[pid 10187] <... mmap resumed>)   = 0x769e1a445000

[pid 10186] <... 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"...,
840, 64) = 840

[pid   10187]   mmap(0x769e1a46d000,   1462272,   PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000) = 0x769e1a46d000

[pid 10186] mmap(NULL, 2055800, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0
<unfinished ...>

[pid   10187]   mmap(0x769e1a5d2000,   352256,   PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x18d000 <unfinished ...>

[pid 10186] <... mmap resumed>)   = 0x74d13a72c000

[pid 10187] <... mmap resumed>)   = 0x769e1a5d2000

[pid   10186]   mmap(0x74d13a754000,   1462272,   PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000 <unfinished ...>

[pid   10187]   mmap(0x769e1a628000,   24576,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e2000 <unfinished ...>

[pid 10186] <... mmap resumed>)   = 0x74d13a754000

[pid 10187] <... mmap resumed>)   = 0x769e1a628000

[pid   10186]   mmap(0x74d13a8b9000,   352256,   PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x18d000 <unfinished ...>

[pid   10187]   mmap(0x769e1a62e000,   52856,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0 <unfinished ...>

[pid 10186] <... mmap resumed>)   = 0x74d13a8b9000

[pid 10187] <... mmap resumed>)   = 0x769e1a62e000

[pid   10186]   mmap(0x74d13a90f000,   24576,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e2000 <unfinished ...>

[pid 10187] close(3 <unfinished ...>

[pid 10186] <... mmap resumed>)   = 0x74d13a90f000

[pid 10187] <... close resumed>)   = 0

[pid   10186]   mmap(0x74d13a915000,   52856,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0 <unfinished ...>

[pid   10187]   mmap(NULL,   12288,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>

[pid 10186] <... mmap resumed>)   = 0x74d13a915000

[pid 10187] <... mmap resumed>)   = 0x769e1a442000

[pid 10186] close(3 <unfinished ...>

[pid 10187] arch_prctl(ARCH_SET_FS, 0x769e1a442740 <unfinished ...>

[pid 10186] <... close resumed>)   = 0

[pid 10187] <... arch_prctl resumed>)   = 0

[pid   10186]   mmap(NULL,   12288,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>

[pid 10187] set_tid_address(0x769e1a442a10 <unfinished ...>

[pid 10186] <... mmap resumed>)   = 0x74d13a729000

[pid 10187] <... set_tid_address resumed>) = 10187

[pid 10186] arch_prctl(ARCH_SET_FS, 0x74d13a729740 <unfinished ...>

[pid 10187] set_robust_list(0x769e1a442a20, 24 <unfinished ...>

[pid 10186] <... arch_prctl resumed>)   = 0

[pid 10187] <... set_robust_list resumed>) = 0

[pid 10186] set_tid_address(0x74d13a729a10 <unfinished ...>

[pid 10187] rseq(0x769e1a442680, 0x20, 0, 0x53053053 <unfinished ...>

[pid 10186] <... set_tid_address resumed>) = 10186

[pid 10187] <... rseq resumed>)   = 0

[pid 10186] set_robust_list(0x74d13a729a20, 24) = 0

[pid 10187] mprotect(0x769e1a628000, 16384, PROT_READ <unfinished ...>

[pid 10186] rseq(0x74d13a729680, 0x20, 0, 0x53053053 <unfinished ...>

[pid 10187] <... mprotect resumed>)   = 0

[pid 10186] <... rseq resumed>)   = 0

[pid 10187] mprotect(0x403000, 4096, PROT_READ) = 0

[pid 10186] mprotect(0x74d13a90f000, 16384, PROT_READ <unfinished ...>

[pid 10187] mprotect(0x769e1a679000, 8192, PROT_READ <unfinished ...>

[pid 10186] <... mprotect resumed>)   = 0

[pid 10187] <... mprotect resumed>)   = 0

[pid 10186] mprotect(0x403000, 4096, PROT_READ <unfinished ...>

[pid 10187] prlimit64(0, RLIMIT_STACK, NULL, <unfinished ...>

[pid 10186] <... mprotect resumed>)   = 0

[pid 10187] <... prlimit64 resumed>{rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) = 0

[pid 10186] mprotect(0x74d13a960000, 8192, PROT_READ <unfinished ...>

[pid 10187] munmap(0x769e1a63b000, 29003 <unfinished ...>

[pid 10186] <... mprotect resumed>)   = 0

[pid 10187] <... munmap resumed>)   = 0

[pid 10186] prlimit64(0, RLIMIT_STACK, NULL, <unfinished ...>

[pid 10187] openat(AT_FDCWD, "shared2.dat", O_RDONLY <unfinished ...>

[pid 10186] <... prlimit64 resumed>{rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) = 0

[pid 10186] munmap(0x74d13a922000, 29003) = 0

[pid 10186] openat(AT_FDCWD, "shared1.dat", O_RDONLY <unfinished ...>

[pid 10187] <... openat resumed>)   = 3

[pid 10186] <... openat resumed>)   = 3

[pid 10187] openat(AT_FDCWD, "shared3.dat", O_RDWR <unfinished ...>

[pid 10186] openat(AT_FDCWD, "shared2.dat", O_RDWR <unfinished ...>

[pid 10187] <... openat resumed>)   = 4

[pid 10186] <... openat resumed>)   = 4

[pid 10187] mmap(NULL, 4096, PROT_READ, MAP_SHARED, 3, 0 <unfinished ...>

[pid 10186] mmap(NULL, 4096, PROT_READ, MAP_SHARED, 3, 0 <unfinished ...>

[pid 10187] <... mmap resumed>)   = 0x769e1a642000

[pid 10186] <... mmap resumed>)   = 0x74d13a929000

[pid 10187] mmap(NULL, 4096, PROT_READ|PROT_WRITE, MAP_SHARED, 4, 0 <unfinished ...>

[pid 10186] mmap(NULL, 4096, PROT_READ|PROT_WRITE, MAP_SHARED, 4, 0 <unfinished ...>

[pid 10187] <... mmap resumed>)   = 0x769e1a641000

[pid 10186] <... mmap resumed>)   = 0x74d13a928000

[pid 10187] close(3 <unfinished ...>

[pid 10186] close(3 <unfinished ...>

[pid 10187] <... close resumed>)   = 0

[pid 10186] <... close resumed>)   = 0

[pid 10187] close(4 <unfinished ...>

[pid 10186] close(4 <unfinished ...>

[pid 10187] <... close resumed>)   = 0

[pid 10186] <... close resumed>)   = 0

[pid   10187]   rt_sigaction(SIGUSR1,   {sa_handler=0x4011d6,   sa_mask=[USR1], sa_flags=SA_RESTORER|SA_RESTART, sa_restorer=0x769e1a484df0}, <unfinished ...>

[pid   10186]   rt_sigaction(SIGUSR1,   {sa_handler=0x4011d6,   sa_mask=[USR1], sa_flags=SA_RESTORER|SA_RESTART, sa_restorer=0x74d13a76bdf0}, <unfinished ...>

[pid 10187] <... rt_sigaction resumed>{sa_handler=SIG_DFL, sa_mask=[], sa_flags=0}, 8) = 0

[pid 10186] <... rt_sigaction resumed>{sa_handler=SIG_DFL, sa_mask=[], sa_flags=0}, 8) = 0

[pid   10187   rt_sigaction(SIGTERM,   {sa_handler=0x4011d6,   sa_mask=[TERM], sa_flags=SA_RESTORER|SA_RESTART, sa_restorer=0x769e1a484df0}, <unfinished ...>

[pid   10186]   rt_sigaction(SIGTERM,   {sa_handler=0x4011d6,   sa_mask=[TERM], sa_flags=SA_RESTORER|SA_RESTART, sa_restorer=0x74d13a76bdf0}, <unfinished ...>

[pid 10187] <... rt_sigaction resumed>{sa_handler=SIG_DFL, sa_mask=[], sa_flags=0}, 8) = 0

[pid 10186] <... rt_sigaction resumed>{sa_handler=SIG_DFL, sa_mask=[], sa_flags=0}, 8) = 0

[pid 10187] pause(<unfinished ...>

[pid 10186] pause(HeLLo WoRLD

 <unfinished ...>

[pid 10185] <... read resumed>"HeLLo WoRLD\n", 1024) = 12

[pid 10185] kill(10186, SIGUSR1)   = 0

[pid 10186] <... pause resumed>)   = ? ERESTARTNOHAND (To be restarted if no handler)

[pid 10185] pause(<unfinished ...>

[pid 10186] --- SIGUSR1 {si_signo=SIGUSR1, si_code=SI_USER, si_pid=10185, si_uid=0} ---

[pid 10186] getppid()   = 10185

[pid 10186] kill(10185, SIGUSR2 <unfinished ...>

[pid 10185] <... pause resumed>)   = ? ERESTARTNOHAND (To be restarted if no handler)

[pid 10186] <... kill resumed>)   = 0

[pid 10185] --- SIGUSR2 {si_signo=SIGUSR2, si_code=SI_USER, si_pid=10186, si_uid=0} ---

[pid 10186] rt_sigreturn({mask=[]} <unfinished ...>

[pid 10185] kill(10187, SIGUSR1 <unfinished ...>

[pid 10186] <... rt_sigreturn resumed>) = -1 EINTR (Interrupted system call)

[pid 10185] <... kill resumed>)   = 0

[pid 10187] <... pause resumed>)   = ? ERESTARTNOHAND (To be restarted if no handler)

[pid 10185] rt_sigreturn({mask=[]} <unfinished ...>

[pid 10186] pause(<unfinished ...>

[pid 10185] <... rt_sigreturn resumed>) = -1 EINTR (Interrupted system call)

[pid 10187] --- SIGUSR1 {si_signo=SIGUSR1, si_code=SI_USER, si_pid=10185, si_uid=0} ---

[pid 10185] pause(<unfinished ...>

[pid 10187] getppid()   = 10185

[pid 10187] kill(10185, SIGUSR2 <unfinished ...>

[pid 10185] <... pause resumed>)   = ? ERESTARTNOHAND (To be restarted if no handler)

[pid 10187] <... kill resumed>)   = 0

[pid 10185] --- SIGUSR2 {si_signo=SIGUSR2, si_code=SI_USER, si_pid=10187, si_uid=0} ---

[pid 10187] rt_sigreturn({mask=[]} <unfinished ...>

[pid 10185] rt_sigreturn({mask=[]} <unfinished ...>

[pid 10187] <... rt_sigreturn resumed>) = -1 EINTR (Interrupted system call)

[pid 10185] <... rt_sigreturn resumed>) = -1 EINTR (Interrupted system call)

[pid 10187] pause(<unfinished ...>

[pid 10185] fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0), ...}) = 0

[pid 10185] write(1, "hello_world\n", 12hello_world

) = 12

[pid 10185] write(1, "\n", 1

)   = 1

[pid 10185] read(0, BYE BYE

"BYE BYE\n", 1024) = 8

[pid 10185] kill(10186, SIGUSR1)   = 0

[pid 10186] <... pause resumed>)   = ? ERESTARTNOHAND (To be restarted if no handler)

[pid 10185] pause(<unfinished ...>

[pid 10186] --- SIGUSR1 {si_signo=SIGUSR1, si_code=SI_USER, si_pid=10185, si_uid=0} ---

[pid 10186] getppid()   = 10185

[pid 10186] kill(10185, SIGUSR2)   = 0

[pid 10185] <... pause resumed>)   = ? ERESTARTNOHAND (To be restarted if no handler)

[pid 10186] rt_sigreturn({mask=[]} <unfinished ...>

[pid 10185] --- SIGUSR2 {si_signo=SIGUSR2, si_code=SI_USER, si_pid=10186, si_uid=0} ---

[pid 10186] <... rt_sigreturn resumed>) = -1 EINTR (Interrupted system call)

[pid 10185] kill(10187, SIGUSR1 <unfinished ...>

[pid 10186] pause(<unfinished ...>

[pid 10185] <... kill resumed>)   = 0

[pid 10187] <... pause resumed>)   = ? ERESTARTNOHAND (To be restarted if no handler)

[pid 10185] rt_sigreturn({mask=[]} <unfinished ...>

[pid 10187] --- SIGUSR1 {si_signo=SIGUSR1, si_code=SI_USER, si_pid=10185, si_uid=0} ---

[pid 10185] <... rt_sigreturn resumed>) = -1 EINTR (Interrupted system call)

[pid 10187] getppid(<unfinished ...>

[pid 10185] pause(<unfinished ...>

[pid 10187] <... getppid resumed>)   = 10185

[pid 10187] kill(10185, SIGUSR2 <unfinished ...>

[pid 10185] <... pause resumed>)   = ? ERESTARTNOHAND (To be restarted if no handler)

[pid 10187] <... kill resumed>)   = 0

[pid 10185] --- SIGUSR2 {si_signo=SIGUSR2, si_code=SI_USER, si_pid=10187, si_uid=0} ---

[pid 10187] rt_sigreturn({mask=[]} <unfinished ...>

[pid 10185] rt_sigreturn({mask=[]} <unfinished ...>

[pid 10187] <... rt_sigreturn resumed>) = -1 EINTR (Interrupted system call)

[pid 10185] <... rt_sigreturn resumed>) = -1 EINTR (Interrupted system call)

[pid 10187] pause(<unfinished ...>

[pid 10185] write(1, "bye_bye\n", 8bye_bye

)   = 8

[pid 10185] write(1, "\n", 1

)   = 1

[pid 10185] read(0, exit

"exit\n", 1024)   = 5

[pid 10185] kill(10186, SIGTERM)   = 0

[pid 10186] <... pause resumed>)   = ? ERESTARTNOHAND (To be restarted if no handler)

[pid 10185] kill(10187, SIGTERM <unfinished ...>

[pid 10186] --- SIGTERM {si_signo=SIGTERM, si_code=SI_USER, si_pid=10185, si_uid=0} ---

[pid 10185] <... kill resumed>)   = 0

[pid 10187] <... pause resumed>)   = ? ERESTARTNOHAND (To be restarted if no handler)

[pid 10185] wait4(-1, <unfinished ...>

[pid 10186] rt_sigreturn({mask=[]} <unfinished ...>

[pid 10187] --- SIGTERM {si_signo=SIGTERM, si_code=SI_USER, si_pid=10185, si_uid=0} ---

[pid 10186] <... rt_sigreturn resumed>) = -1 EINTR (Interrupted system call)

[pid 10187] rt_sigreturn({mask=[]} <unfinished ...>

[pid 10186] munmap(0x74d13a929000, 4096 <unfinished ...>

[pid 10187] <... rt_sigreturn resumed>) = -1 EINTR (Interrupted system call)

[pid 10187] munmap(0x769e1a642000, 4096 <unfinished ...>

[pid 10186] <... munmap resumed>)   = 0

[pid 10187] <... munmap resumed>)   = 0

[pid 10186] munmap(0x74d13a928000, 4096 <unfinished ...>

[pid 10187] munmap(0x769e1a641000, 4096) = 0

[pid 10187] exit_group(0)   = ?

[pid 10186] <... munmap resumed>)   = 0

[pid 10186] exit_group(0)   = ?

[pid 10187] +++ exited with 0 +++

[pid 10185] <... wait4 resumed>NULL, 0, NULL) = 10187

[pid 10186] +++ exited with 0 +++

--- SIGCHLD {si_signo=SIGCHLD, si_code=CLD_EXITED, si_pid=10187, si_uid=0, si_status=0, si_utime=0, si_stime=0} ---

wait4(-1, NULL, 0, NULL)   = 10186

munmap(0x7cf35fd29000, 4096)   = 0

munmap(0x7cf35fd28000, 4096)   = 0

exit_group(0)   = ?

+++ exited with 0 +++

Lab_4:

prog_static.c

execve("./prog_static", ["./prog_static"], 0x7ffed8ccad28 /* 30 vars */) = 0

brk(NULL)   = 0x3b59d000

mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x72f7b2c73000

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

openat(AT_FDCWD, "./glibc-hwcaps/x86-64-v3/libcalc2.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./glibc-hwcaps/x86-64-v2/libcalc2.so", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./libcalc2.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\0\0\0\0\0\0\0"..., 832) = 832

fstat(3, {st_mode=S_IFREG|0755, st_size=15184, ...}) = 0

getcwd("/workspace/lab4/src", 128)   = 20

mmap(NULL, 16400, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x72f7b2c6e000

mmap(0x72f7b2c6f000, 4096, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1000) = 0x72f7b2c6f000

mmap(0x72f7b2c70000, 4096, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x72f7b2c70000

mmap(0x72f7b2c71000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x72f7b2c71000

close(3)   = 0

openat(AT_FDCWD, "./glibc-hwcaps/x86-64-v3/libc.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD, "./glibc-hwcaps/x86-64-v2/libc.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

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

openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3

fstat(3, {st_mode=S_IFREG|0644, st_size=29003, ...}) = 0

mmap(NULL, 29003, PROT_READ, MAP_PRIVATE, 3, 0) = 0x72f7b2c66000

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\236\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"..., 840, 64) = 840

fstat(3, {st_mode=S_IFREG|0755, st_size=2003408, ...}) = 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"..., 840, 64) = 840

mmap(NULL, 2055800, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x72f7b2a70000

mmap(0x72f7b2a98000, 1462272, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000) = 0x72f7b2a98000

mmap(0x72f7b2bfd000, 352256, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x18d000) = 0x72f7b2bfd000

mmap(0x72f7b2c53000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e2000) = 0x72f7b2c53000

mmap(0x72f7b2c59000, 52856, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x72f7b2c59000

close(3)   = 0

mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x72f7b2a6d000

arch_prctl(ARCH_SET_FS, 0x72f7b2a6d740) = 0

set_tid_address(0x72f7b2a6da10)   = 5922

set_robust_list(0x72f7b2a6da20, 24)   = 0

rseq(0x72f7b2a6d680, 0x20, 0, 0x53053053) = 0

mprotect(0x72f7b2c53000, 16384, PROT_READ) = 0

mprotect(0x72f7b2c71000, 4096, PROT_READ) = 0

mprotect(0x403000, 4096, PROT_READ)   = 0

mprotect(0x72f7b2ca9000, 8192, PROT_READ) = 0

prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) = 0

munmap(0x72f7b2c66000, 29003)   = 0

fstat(0, {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0), ...}) = 0

getrandom("\xa1\x07\x1f\x45\x15\xca\x3b\xe1", 8, GRND_NONBLOCK) = 8

brk(NULL)   = 0x3b59d000

brk(0x3b5be000)   = 0x3b5be000

read(0, 1 48 18

"1 48 18\n", 1024)   = 8

fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0), ...}) = 0

write(1, "\320\235\320\236\320\224 = 6\n", 11НОД = 6

) = 11

read(0, 2 4 5

"2 4 5\n", 1024)   = 6

write(1, "\320\277\320\273\320\276\321\211\320\260\320\264\321\214 = 10.00\n", 23площадь = 10.00

) = 23

read(0, "", 1024)   = 0

exit_group(0)   = ?

+++ exited with 0 +++

prog_dynamic.c

execve("./prog_dynamic", ["./prog_dynamic"], 0x7ffedd7138f8 /* 30 vars */) = 0

brk(NULL)   = 0x20e4a000

mmap(NULL,   8192,   PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f87d51bb000

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

openat(AT_FDCWD,   "./glibc-hwcaps/x86-64-v3/libc.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

openat(AT_FDCWD,   "./glibc-hwcaps/x86-64-v2/libc.so.6", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)

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

openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3

fstat(3, {st_mode=S_IFREG|0644, st_size=29003, ...}) = 0

mmap(NULL, 29003, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7f87d51b3000

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\236\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"..., 840,
64) = 840

fstat(3, {st_mode=S_IFREG|0755, st_size=2003408, ...}) = 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"..., 840,
64) = 840

mmap(NULL, 2055800, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7f87d4fbd000

mmap(0x7f87d4fe5000,   1462272,   PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000) = 0x7f87d4fe5000

mmap(0x7f87d514a000,   352256,   PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x18d000) = 0x7f87d514a000

mmap(0x7f87d51a0000,   24576,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e2000) = 0x7f87d51a0000

mmap(0x7f87d51a6000,   52856,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f87d51a6000

close(3)   = 0

mmap(NULL,   12288,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f87d4fba000

arch_prctl(ARCH_SET_FS, 0x7f87d4fba740) = 0

set_tid_address(0x7f87d4fbaa10)   = 10807

set_robust_list(0x7f87d4fbaa20, 24)   = 0

rseq(0x7f87d4fba680, 0x20, 0, 0x53053053) = 0

mprotect(0x7f87d51a0000, 16384, PROT_READ) = 0

mprotect(0x403000, 4096, PROT_READ)   = 0

mprotect(0x7f87d51f1000, 8192, PROT_READ) = 0

prlimit64(0, RLIMIT_STACK, NULL, {rlim_cur=8192*1024, rlim_max=RLIM64_INFINITY}) = 0

munmap(0x7f87d51b3000, 29003)   = 0

getrandom("\x03\x59\x00\xaa\xec\x55\x2f\xde", 8, GRND_NONBLOCK) = 8

brk(NULL)   = 0x20e4a000

brk(0x20e6b000)   = 0x20e6b000

openat(AT_FDCWD, "./libcalc1.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\0\0\0\0\0\0\0"..., 832) = 832

fstat(3, {st_mode=S_IFREG|0755, st_size=15112, ...}) = 0

getcwd("/workspace/lab4/src", 128)   = 20

mmap(NULL, 16400, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f87d51b6000

mmap(0x7f87d51b7000, 4096, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1000) = 0x7f87d51b7000

mmap(0x7f87d51b8000, 4096, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7f87d51b8000

mmap(0x7f87d51b9000, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7f87d51b9000

close(3)   = 0

mprotect(0x7f87d51b9000, 4096, PROT_READ) = 0

fstat(0, {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0), ...}) = 0

read(0, 1 48 18

"1 48 18\n", 1024)   = 8

fstat(1, {st_mode=S_IFCHR|0620, st_rdev=makedev(0x88, 0), ...}) = 0

write(1, "\320\235\320\236\320\224 = 6\n", 11НОД = 6

) = 11

read(0, 2 4 5

"2 4 5\n", 1024)   = 6

write(1, "\320\277\320\273\320\276\321\211\320\260\320\264\321\214 = 20.00\n", 23площадь = 20.00

) = 23

read(0, 0

"0\n", 1024)   = 2

munmap(0x7f87d51b6000, 16400)   = 0

openat(AT_FDCWD, "./libcalc2.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\0\0\0\0\0\0\0"..., 832) =
832

fstat(3, {st_mode=S_IFREG|0755, st_size=15184, ...}) = 0

getcwd("/workspace/lab4/src", 128)   = 20

mmap(NULL, 16400, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) =
0x7f87d51b6000

mmap(0x7f87d51b7000,   4096,   PROT_READ|PROT_EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1000) = 0x7f87d51b7000

mmap(0x7f87d51b8000,   4096,   PROT_READ,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7f87d51b8000

mmap(0x7f87d51b9000,   8192,   PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7f87d51b9000

close(3)   = 0

mprotect(0x7f87d51b9000, 4096, PROT_READ) = 0

write(1,
"\320\277\320\265\321\200\320\265\320\272\320\273\321\216\321\207\320\265\320\275
\320\276 \320\275\320\260 2\321\203\321"..., 55переключено на 2ую реализацию

) = 55

read(0, 1 48 18

"1 48 18\n", 1024)   = 8

write(1, "\320\235\320\236\320\224 = 6\n", 11НОД = 6

) = 11

read(0, 2 4 5

"2 4 5\n", 1024)   = 6

write(1, "\320\277\320\273\320\276\321\211\320\260\320\264\321\214 = 10.00\n",
23площадь = 10.00

) = 23

read(0, "", 1024)   = 0

```
munmap(0x7f87d51b6000, 16400)        = 0
exit_group(0)                        = ?
+++ exited with 0 +++
```

Вывод

В ходе выполнения лабораторной работы были изучены и проанализированы системные вызовы, используемые в программах, реализующих различные механизмы взаимодействия с операционной системой. С помощью утилиты strace удалось наглядно отследить процессы создания и завершения процессов и потоков, работы с файлами, управления памятью, а также использования средств межпроцессного взаимодействия.

Анализ выводов strace подтвердил корректность работы программ и соответствие применяемых системных вызовов условиям лабораторных заданий. Полученные результаты показали, что использование strace является эффективным способом диагностики поведения программ на уровне ядра операционной системы.

В результате выполнения работы были закреплены практические навыки анализа низкоуровневого взаимодействия программ с ОС Linux, а также получен опыт интерпретации результатов трассировки системных вызовов.