Московский Авиационный Институт

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Факультет информационных технологий и прикладной математики

Кафедра вычислительной математики и программирования

**Лабораторная работа №1 по курсу**

**«Операционные системы»**

**Приобретение практических навыков диагностики работы программного обеспечения.**

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1. **Постановка задачи**

При выполнении последующих лабораторных работ необходимо продемонстрировать ключевые системные вызовы, которые в них используются.

Используемые утилиты: strace, ltrace.

1. **Описание используемых утилит**

Strace — это утилита Linux, отслеживающая системные вызовы, которые представляют собой механизм трансляции, обеспечивающий интерфейс между процессом и операционной системой. Использование данной утилиты позволяет понять, что процесс пытается сделать в данное время. Strace может быть полезен при отладке программ.

Для удобства работы с протоколом утилиты можно использовать следующие ключи:

* -o file – Перенаправить протокол утилиты в файл file
* -e trace=filters – Указать выражения, по которым будут фильтроваться системные вызовы. Например -e trace=write,%process задаёт фильтрацию по системным вызовам write и по группе системных вызовов, связанных с межпроцессорным взаимодействием.
* -f – Отслеживать системные вызовы в дочерних процессах
* -y – Заменить в протоколе все файловые дескрипторы на имена соответствующих им файлов (где возможно).
* -p file – Отслеживать только обращения к файлу file
* -k – Отображать стек вызовов

Ltrace – это утилита Linux, отслеживающая системные вызовы, связанные с динамическими библиотеками. Использование данной утилиты очень похоже на использование strace.

1. **Примеры использования утилит**

Ниже приведены протоколы strace лабораторных работ. Ключевые строки в протоколе будут выделены красным цветом.

***Лабораторная работа 2 – взаимодействие между процессами***

parsifal@DESKTOP-3G70RV4:~/OS/Lab2$ strace -o log.txt ./parent

Введите строки:

Qfw FUK KCGCfufFT1

Результат работы:

qfw\_fuk\_\_\_kcgcfufft1

parsifal@DESKTOP-3G70RV4:~/OS/Lab2$ cat log.txt

execve("./parent", ["./parent"], 0x7fffc785c070 /\* 27 vars \*/) = 0

brk(NULL) = 0x7fffb8a10000

arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7fffc0b78700) = -1 EINVAL (Invalid argument)

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=32310, ...}) = 0

mmap(NULL, 32310, PROT\_READ, MAP\_PRIVATE, 3, 0) = 0x7f90d7968000

close(3) = 0

openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libc.so.6", O\_RDONLY|O\_CLOEXEC) = 3

read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\360q\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\20\0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0", 32, 848) = 32

pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\363\377?\332\200\270\27\304d\245n\355Y\377\t\334"..., 68, 880) = 68

fstat(3, {st\_mode=S\_IFREG|0755, st\_size=2029224, ...}) = 0

mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7f90d79a0000

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\20\0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0", 32, 848) = 32

pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\363\377?\332\200\270\27\304d\245n\355Y\377\t\334"..., 68, 880) = 68

mmap(NULL, 2036952, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f90d7770000

mprotect(0x7f90d7795000, 1847296, PROT\_NONE) = 0

mmap(0x7f90d7795000, 1540096, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x25000) = 0x7f90d7795000

mmap(0x7f90d790d000, 303104, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x19d000) = 0x7f90d790d000

mmap(0x7f90d7958000, 24576, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1e7000) = 0x7f90d7958000

mmap(0x7f90d795e000, 13528, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7f90d795e000

close(3) = 0

arch\_prctl(ARCH\_SET\_FS, 0x7f90d79a1380) = 0

mprotect(0x7f90d7958000, 12288, PROT\_READ) = 0

mprotect(0x7f90d79aa000, 4096, PROT\_READ) = 0

mprotect(0x7f90d799d000, 4096, PROT\_READ) = 0

munmap(0x7f90d7968000, 32310) = 0

pipe([3, 4]) = 0

pipe([5, 6]) = 0

clone(child\_stack=NULL, flags=CLONE\_CHILD\_CLEARTID|CLONE\_CHILD\_SETTID|SIGCHLD, child\_tidptr=0x7f90d79a1650) = 606

fstat(1, {st\_mode=S\_IFCHR|0620, st\_rdev=makedev(0x88, 0), ...}) = 0

brk(NULL) = 0x7fffb8a10000

brk(0x7fffb8a31000) = 0x7fffb8a31000

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\320\270:\n", 29) = 29

fstat(0, {st\_mode=S\_IFCHR|0620, st\_rdev=makedev(0x88, 0), ...}) = 0

read(0, "Qfw FUK KCGCfufFT1\n", 1024) = 21

read(0, "", 1024) = 0

close(3) = 0

write(4, "Qfw FUK KCGCfufFT1\n\0\0", 23) = 23

close(4) = 0

--- SIGCHLD {si\_signo=SIGCHLD, si\_code=CLD\_EXITED, si\_pid=606, si\_uid=1000, si\_status=0, si\_utime=0, si\_stime=0} ---

pipe([3, 4]) = 0

clone(child\_stack=NULL, flags=CLONE\_CHILD\_CLEARTID|CLONE\_CHILD\_SETTID|SIGCHLD, child\_tidptr=0x7f90d79a1650) = 607

close(5) = 0

close(6) = 0

close(4) = 0

read(3, "q", 1) = 1

--- SIGCHLD {si\_signo=SIGCHLD, si\_code=CLD\_EXITED, si\_pid=607, si\_uid=1000, si\_status=0, si\_utime=0, si\_stime=0} ---

read(3, "f", 1) = 1

read(3, "w", 1) = 1

read(3, "\_", 1) = 1

read(3, "f", 1) = 1

read(3, "u", 1) = 1

read(3, "k", 1) = 1

read(3, "\_", 1) = 1

read(3, "\_", 1) = 1

read(3, "\_", 1) = 1

read(3, "k", 1) = 1

read(3, "c", 1) = 1

read(3, "g", 1) = 1

read(3, "c", 1) = 1

read(3, "f", 1) = 1

read(3, "u", 1) = 1

read(3, "f", 1) = 1

read(3, "f", 1) = 1

read(3, "t", 1) = 1

read(3, "1", 1) = 1

read(3, "\n", 1) = 1

read(3, "\0", 1) = 1

close(3) = 0

write(1, "\n", 1) = 1

write(1, "\320\240\320\265\320\267\321\203\320\273\321\214\321\202\320\260\321\202 \321\200\320\260\320\261\320\276\321\202\321\213:"..., 33) = 33

write(1, "qfw\_fuk\_\_\_kcgcfufft1\n", 21) = 21

write(1, "\n", 1) = 1

exit\_group(0) = ?

+++ exited with 0 +++

P.S. Для работы с необходимыми опциями выполним в терминале команду:

**«strace -f -e trace=write,read -o strace.txt ./parent».**

Таким образом, в файле **strace.txt** будет содержаться информация о системных вызовах **read()** и **write()**, а так же дерево процессов. При этом к каждой строке вывода добавляется **pid** процесса, делающего системный вывод

parsifal@DESKTOP-3G70RV4:~/OS/Lab2$ strace -f -e trace=write,read,pipe -o strace.txt ./parent

Введите строки:

udwYDFY FC

Результат работы:

udwydfy\_\_fc

parsifal@DESKTOP-3G70RV4:~/OS/Lab2$ cat strace.txt

562 read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\360q\2\0\0\0\0\0"..., 832) = 832

562 pipe([3, 4]) = 0

562 pipe([5, 6]) = 0

562 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\320\270:\n", 29) = 29

562 read(0, <unfinished ...>

563 read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\360q\2\0\0\0\0\0"..., 832) = 832

563 read(0, <unfinished ...>

562 <... read resumed>"udwYDFY FC", 1024) = 11

562 read(0, "\n", 1024) = 1

562 read(0, "", 1024) = 0

562 write(4, "udwYDFY FC\n\0\0", 14) = 14

563 <... read resumed>"udwYDFY FC\n\0\0", 4096) = 14

563 read(0, <unfinished ...>

562 pipe( <unfinished ...>

563 <... read resumed>"", 4096) = 0

562 <... pipe resumed>[3, 4]) = 0

563 write(1, "udwydfy fc\n\0\0\0\0", 16) = 16

563 +++ exited with 0 +++

562 --- SIGCHLD {si\_signo=SIGCHLD, si\_code=CLD\_EXITED, si\_pid=563, si\_uid=1000, si\_status=0, si\_utime=0, si\_stime=0} ---

562 read(3, <unfinished ...>

564 read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\360q\2\0\0\0\0\0"..., 832) = 832

564 read(0, "u", 1) = 1

564 read(0, "d", 1) = 1

564 read(0, "w", 1) = 1

564 read(0, "y", 1) = 1

564 read(0, "d", 1) = 1

564 read(0, "f", 1) = 1

564 read(0, "y", 1) = 1

564 read(0, " ", 1) = 1

564 read(0, " ", 1) = 1

564 read(0, "f", 1) = 1

564 read(0, "c", 1) = 1

564 read(0, "\n", 1) = 1

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

564 write(1, "udwydfy\_\_fc\n\0", 13) = 13

562 <... read resumed>"u", 1) = 1

562 read(3, "d", 1) = 1

562 read(3, <unfinished ...>

564 +++ exited with 0 +++

562 <... read resumed>"w", 1) = 1

562 --- SIGCHLD {si\_signo=SIGCHLD, si\_code=CLD\_EXITED, si\_pid=564, si\_uid=1000, si\_status=0, si\_utime=0, si\_stime=0} ---

562 read(3, "y", 1) = 1

562 read(3, "d", 1) = 1

562 read(3, "f", 1) = 1

562 read(3, "y", 1) = 1

562 read(3, "\_", 1) = 1

562 read(3, "\_", 1) = 1

562 read(3, "f", 1) = 1

562 read(3, "c", 1) = 1

562 read(3, "\n", 1) = 1

562 read(3, "\0", 1) = 1

562 write(1, "\n", 1) = 1

562 write(1, "\320\240\320\265\320\267\321\203\320\273\321\214\321\202\320\260\321\202 \321\200\320\260\320\261\320\276\321\202\321\213:"..., 33) = 33

562 write(1, "udwydfy\_\_fc\n", 12) = 12

562 write(1, "\n", 1) = 1

562 +++ exited with 0 +++

***Лабораторная работа 3 – взаимодействие между потоками***

**parsifal@DESKTOP-3G70RV4:~/OS/Lab3$ cat t.txt**

**5**

**1 2 3 4 5**

**2 3 4 6 7**

**7 8 9 0 1**

**1 2 4 7 8**

**3 4 5 8 9**

**3**

**1parsifal@DESKTOP-3G70RV4:~/OS/Lab3$ strace -f -e trace="%process,write" -o strace\_log.txt ./main 4 < t.txt > /dev/null**

**parsifal@DESKTOP-3G70RV4:~/OS/Lab3$ cat strace\_log.txt**

**3805 execve("./main", ["./main", "4"], 0x7fffccd22c10 /\* 27 vars \*/) = 0**

**3805 arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7fffc2d85470) = -1 EINVAL (Invalid argument)**

**3805 arch\_prctl(ARCH\_SET\_FS, 0x7f1e7aff0740) = 0**

**3805 clone(child\_stack=0x7f1e7afdffb0, flags=CLONE\_VM|CLONE\_FS|CLONE\_FILES|CLONE\_SIGHAND|CLONE\_THREAD|CLONE\_SYSVSEM|CLONE\_SETTLS|CLONE\_PARENT\_SETTID|CLONE\_CHILD\_CLEARTID, parent\_tid=[3806], tls=0x7f1e7afe0700, child\_tidptr=0x7f1e7afe09d0) = 3806**

**3805 clone(child\_stack=0x7f1e7a7cffb0, flags=CLONE\_VM|CLONE\_FS|CLONE\_FILES|CLONE\_SIGHAND|CLONE\_THREAD|CLONE\_SYSVSEM|CLONE\_SETTLS|CLONE\_PARENT\_SETTID|CLONE\_CHILD\_CLEARTID, parent\_tid=[3807], tls=0x7f1e7a7d0700, child\_tidptr=0x7f1e7a7d09d0) = 3807**

**3805 clone(child\_stack=0x7f1e79fbffb0, flags=CLONE\_VM|CLONE\_FS|CLONE\_FILES|CLONE\_SIGHAND|CLONE\_THREAD|CLONE\_SYSVSEM|CLONE\_SETTLS|CLONE\_PARENT\_SETTID|CLONE\_CHILD\_CLEARTID <unfinished ...>**

**3806 exit(0 <unfinished ...>**

**3805 <... clone resumed>, parent\_tid=[3808], tls=0x7f1e79fc0700, child\_tidptr=0x7f1e79fc09d0) = 3808**

**3806 <... exit resumed>) = ?**

**3806 +++ exited with 0 +++**

**3807 exit(0 <unfinished ...>**

**3805 clone(child\_stack=0x7f1e797affb0, flags=CLONE\_VM|CLONE\_FS|CLONE\_FILES|CLONE\_SIGHAND|CLONE\_THREAD|CLONE\_SYSVSEM|CLONE\_SETTLS|CLONE\_PARENT\_SETTID|CLONE\_CHILD\_CLEARTID <unfinished ...>**

**3807 <... exit resumed>) = ?**

**3807 +++ exited with 0 +++**

**3805 <... clone resumed>, parent\_tid=[3809], tls=0x7f1e797b0700, child\_tidptr=0x7f1e797b09d0) = 3809**

**3808 exit(0) = ?**

**3808 +++ exited with 0 +++**

**3809 exit(0) = ?**

**3809 +++ exited with 0 +++**

**3805 write(1, "Enter size of matrix: Enter wind"..., 128) = 128**

**3805 exit\_group(0) = ?**

**3805 +++ exited with 0 +++**

***Лабораторная работа 4 – отображаемые файлы***

parsifal@DESKTOP-3G70RV4:~/OS/Lab4$ strace -o log.txt ./parent

Введите строки:

MrYaaaaUUuuuu?

Nya Crya cvA

beWARe of tHe

WeEpiNg aNgeLs

Or... ..

Puffff!!

Результат работы:

mryaaaauuuuuu?

nya\_crya\_cva

beware\_\_\_of\_the\_

\_\_\_\_weeping\_angels

or...\_\_..

puffff!!

parsifal@DESKTOP-3G70RV4:~/OS/Lab4$ cat log.txt

execve("./parent", ["./parent"], 0x7fffefbb3ef0 /\* 27 vars \*/) = 0

brk(NULL) = 0x7fffd6c56000

arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7fffdf4cbac0) = -1 EINVAL (Invalid argument)

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=30788, ...}) = 0

mmap(NULL, 30788, PROT\_READ, MAP\_PRIVATE, 3, 0) = 0x7fad40b25000

close(3) = 0

openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libc.so.6", O\_RDONLY|O\_CLOEXEC) = 3

read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\360q\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\20\0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0", 32, 848) = 32

pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\363\377?\332\200\270\27\304d\245n\355Y\377\t\334"..., 68, 880) = 68

fstat(3, {st\_mode=S\_IFREG|0755, st\_size=2029224, ...}) = 0

mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7fad40b20000

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\20\0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0", 32, 848) = 32

pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\363\377?\332\200\270\27\304d\245n\355Y\377\t\334"..., 68, 880) = 68

mmap(NULL, 2036952, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7fad408f0000

mprotect(0x7fad40915000, 1847296, PROT\_NONE) = 0

mmap(0x7fad40915000, 1540096, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x25000) = 0x7fad40915000

mmap(0x7fad40a8d000, 303104, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x19d000) = 0x7fad40a8d000

mmap(0x7fad40ad8000, 24576, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1e7000) = 0x7fad40ad8000

mmap(0x7fad40ade000, 13528, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7fad40ade000

close(3) = 0

arch\_prctl(ARCH\_SET\_FS, 0x7fad40b21380) = 0

mprotect(0x7fad40ad8000, 12288, PROT\_READ) = 0

mprotect(0x7fad40b30000, 4096, PROT\_READ) = 0

mprotect(0x7fad40b1d000, 4096, PROT\_READ) = 0

munmap(0x7fad40b25000, 30788) = 0

brk(NULL) = 0x7fffd6c56000

brk(0x7fffd6c77000) = 0x7fffd6c77000

fstat(1, {st\_mode=S\_IFCHR|0620, st\_rdev=makedev(0x88, 0), ...}) = 0

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\320\270:\n", 29) = 29

fstat(0, {st\_mode=S\_IFCHR|0620, st\_rdev=makedev(0x88, 0), ...}) = 0

read(0, "MrYaaaaUUuuuu?\n", 1024) = 15

read(0, "Nya Crya cvA\n", 1024) = 13

read(0, "beWARe of tHe \n", 1024) = 17

read(0, " WeEpiNg aNgeLs\n", 1024) = 19

read(0, "Or... ..\n", 1024) = 10

read(0, "Puffff!!\n", 1024) = 9

read(0, "", 1024) = 0

openat(AT\_FDCWD, "file.txt", O\_RDWR|O\_CREAT, 0600) = 3

write(3, "MrYaaaaUUuuuu?\nNya Crya cvA\nbeWA"..., 83) = 83

fstat(3, {st\_mode=S\_IFREG|0600, st\_size=83, ...}) = 0

mmap(NULL, 83, PROT\_READ|PROT\_WRITE, MAP\_SHARED, 3, 0) = 0x7fad40b2c000

close(3) = 0

clone(child\_stack=NULL, flags=CLONE\_CHILD\_CLEARTID|CLONE\_CHILD\_SETTID|SIGCHLD, child\_tidptr=0x7fad40b21650) = 439

wait4(439, [{WIFEXITED(s) && WEXITSTATUS(s) == 0}], 0, NULL) = 439

--- SIGCHLD {si\_signo=SIGCHLD, si\_code=CLD\_EXITED, si\_pid=439, si\_uid=1000, si\_status=0, si\_utime=0, si\_stime=0} ---

clone(child\_stack=NULL, flags=CLONE\_CHILD\_CLEARTID|CLONE\_CHILD\_SETTID|SIGCHLD, child\_tidptr=0x7fad40b21650) = 440

wait4(440, [{WIFEXITED(s) && WEXITSTATUS(s) == 0}], 0, NULL) = 440

--- SIGCHLD {si\_signo=SIGCHLD, si\_code=CLD\_EXITED, si\_pid=440, si\_uid=1000, si\_status=0, si\_utime=0, si\_stime=0} ---

write(1, "\n", 1) = 1

write(1, "\320\240\320\265\320\267\321\203\320\273\321\214\321\202\320\260\321\202 \321\200\320\260\320\261\320\276\321\202\321\213:"..., 33) = 33

write(1, "mryaaaauuuuuu?\nnya\_crya\_cva\nbewa"..., 83) = 83

write(1, "\n", 1) = 1

unlink("file.txt") = 0

munmap(0x7fad40b2c000, 83) = 0

exit\_group(0) = ?

+++ exited with 0 +++

***Лабораторная работа 5 – динамические библиотеки***

**1) ltrace static**

**\_\_isoc99\_scanf(0x7f7857000a47, 0x7ffffcf6b894, 0x7ffffcf6b9c8, 0x7f78570009c0) = 1**

**\_\_isoc99\_scanf(0x7f7857000a44, 0x7ffffcf6b898, 0x7ffffcf6b89c, 16) = 2**

**GCF(123, 9, 0x7f78569dd8d0, 24) = 3**

**\_\_printf\_chk(1, 0x7f7857000a4a, 123, 9) = 15**

**\_\_isoc99\_scanf(0x7f7857000a47, 0x7ffffcf6b894, 0x7f78569dd8c0, 0) = 1**

**\_\_isoc99\_scanf(0x7f7857000a5b, 0x7ffffcf6b8a0, 0x7ffffcf6b8a4, 16) = 2**

**Square(0, 2, 0x7f78569dd8d0, 0x7ffffcf6b351) = 2**

**\_\_printf\_chk(1, 0x7f7857000a61, 0x7f78569dd8d0, 0x7ffffcf6b351) = 19**

**\_\_isoc99\_scanf(0x7f7857000a47, 0x7ffffcf6b894, 0x7f78569dd8c0, 0) = 0xffffffff**

**+++ exited (status 0) +++**

**2) ltrace dynamic**

**dlopen("./libfunctions1.so", 2) = 0x7fffc3083280**

**dlsym(0x7fffc3083280, "GCF") = 0x7f42a55e05b4**

**dlsym(0x7fffc3083280, "Square") = 0x7f42a55e059a**

**\_\_isoc99\_scanf(0x7f42a6200cdf, 0x7fffcae19150, 1, 0) = 1**

**\_\_isoc99\_scanf(0x7f42a6200cb5, 0x7fffcae19154, 0x7fffcae19158, 16) = 2**

**printf("GCF(%d,%d) = %d\n", 123, 9, 3) = 15**

**\_\_isoc99\_scanf(0x7f42a6200cdf, 0x7fffcae19150, 0, 0) = 1**

**\_\_isoc99\_scanf(0x7f42a6200ccc, 0x7fffcae1915c, 0x7fffcae19160, 16) = 2**

**printf("Square = %f\n", 12.000000) = 19**

**\_\_isoc99\_scanf(0x7f42a6200cdf, 0x7fffcae19150, 0, 0) = 1**

**dlclose(0x7fffc3083280) = 0**

**dlopen("./libfunctions2.so", 2) = 0x7fffc3083280**

**dlsym(0x7fffc3083280, "GCF") = 0x7f42a55e063d**

**dlsym(0x7fffc3083280, "Square") = 0x7f42a55e05ea**

**\_\_isoc99\_scanf(0x7f42a6200cdf, 0x7fffcae19150, 1, 0) = 1**

**\_\_isoc99\_scanf(0x7f42a6200ccc, 0x7fffcae1915c, 0x7fffcae19160, 16) = 2**

**printf("Square = %f\n", 6.000000) = 18**

**\_\_isoc99\_scanf(0x7f42a6200cdf, 0x7fffcae19150, 0, 0) = 1**

**\_\_isoc99\_scanf(0x7f42a6200cb5, 0x7fffcae19154, 0x7fffcae19158, 16) = 2**

**printf("GCF(%d,%d) = %d\n", 175, 15, 5) = 16**

**\_\_isoc99\_scanf(0x7f42a6200cdf, 0x7fffcae19150, 0, 0) = 0xffffffff**

**dlclose(0x7fffc3083280) = 0**

**+++ exited (status 0) +++**

***Лабораторная работа 6 – очереди сообщений***

**parsifal@DESKTOP-3G70RV4:~/OS/Lab6-8$ ./control**

**create 2 -1**

**OK: 4163**

**create 3 -1**

**OK: 4168**

**create 2 -1**

**Error: already exists!**

**cerate 5 4**

**Incorrect comand!**

**Incorrect comand!**

**Incorrect comand!**

**create 5 4**

**Error: parent not found!**

**remove 3**

**OK**

**pingall**

**OK: -1**

**exec 2 5 1 2 3 4 5**

**OK: 15**

**exit**

**parsifal@DESKTOP-3G70RV4:~/OS/Lab6-8$ strace -o log.txt ./control**

**create 2 -1**

**OK: 4154**

**exit**

**parsifal@DESKTOP-3G70RV4:~/OS/Lab6-8$ cat log.txt**

**execve("./control", ["./control"], 0x7ffff9a3d9e0 /\* 27 vars \*/) = 0**

**brk(NULL) = 0x7fffe0bc4000**

**arch\_prctl(0x3001 /\* ARCH\_??? \*/, 0x7fffe8368b50) = -1 EINVAL (Invalid argument)**

**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=32310, ...}) = 0**

**mmap(NULL, 32310, PROT\_READ, MAP\_PRIVATE, 3, 0) = 0x7f513ab98000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libzmq.so.5", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0`z\1\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=675776, ...}) = 0**

**mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7f513abd0000**

**mmap(NULL, 678128, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513aaf0000**

**mmap(0x7f513ab06000, 430080, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x16000) = 0x7f513ab06000**

**mmap(0x7f513ab6f000, 126976, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x7f000) = 0x7f513ab6f000**

**mmap(0x7f513ab8e000, 32768, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x9d000) = 0x7f513ab8e000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libstdc++.so.6", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\240\341\t\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=1952928, ...}) = 0**

**mmap(NULL, 1968128, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a900000**

**mprotect(0x7f513a996000, 1286144, PROT\_NONE) = 0**

**mmap(0x7f513a996000, 983040, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x96000) = 0x7f513a996000**

**mmap(0x7f513aa86000, 299008, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x186000) = 0x7f513aa86000**

**mmap(0x7f513aad0000, 57344, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1cf000) = 0x7f513aad0000**

**mmap(0x7f513aade000, 10240, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7f513aade000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libgcc\_s.so.1", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\3405\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=104984, ...}) = 0**

**mmap(NULL, 107592, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a8e0000**

**mmap(0x7f513a8e3000, 73728, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x3000) = 0x7f513a8e3000**

**mmap(0x7f513a8f5000, 16384, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x15000) = 0x7f513a8f5000**

**mmap(0x7f513a8f9000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x18000) = 0x7f513a8f9000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libc.so.6", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\360q\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\20\0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0", 32, 848) = 32**

**pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\363\377?\332\200\270\27\304d\245n\355Y\377\t\334"..., 68, 880) = 68**

**fstat(3, {st\_mode=S\_IFREG|0755, st\_size=2029224, ...}) = 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**

**pread64(3, "\4\0\0\0\20\0\0\0\5\0\0\0GNU\0\2\0\0\300\4\0\0\0\3\0\0\0\0\0\0\0", 32, 848) = 32**

**pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\363\377?\332\200\270\27\304d\245n\355Y\377\t\334"..., 68, 880) = 68**

**mmap(NULL, 2036952, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a6e0000**

**mprotect(0x7f513a705000, 1847296, PROT\_NONE) = 0**

**mmap(0x7f513a705000, 1540096, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x25000) = 0x7f513a705000**

**mmap(0x7f513a87d000, 303104, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x19d000) = 0x7f513a87d000**

**mmap(0x7f513a8c8000, 24576, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1e7000) = 0x7f513a8c8000**

**mmap(0x7f513a8ce000, 13528, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7f513a8ce000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libsodium.so.23", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\200\302\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=355016, ...}) = 0**

**mmap(NULL, 357384, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a680000**

**mmap(0x7f513a68c000, 229376, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xc000) = 0x7f513a68c000**

**mmap(0x7f513a6c4000, 73728, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x44000) = 0x7f513a6c4000**

**mmap(0x7f513a6d6000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x55000) = 0x7f513a6d6000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libpgm-5.2.so.0", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\240L\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=302056, ...}) = 0**

**mmap(NULL, 321584, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a630000**

**mmap(0x7f513a634000, 163840, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x4000) = 0x7f513a634000**

**mmap(0x7f513a65c000, 118784, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x2c000) = 0x7f513a65c000**

**mmap(0x7f513a679000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x48000) = 0x7f513a679000**

**mmap(0x7f513a67b000, 14384, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7f513a67b000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libnorm.so.1", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0\257\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=690344, ...}) = 0**

**mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7f513a620000**

**mmap(NULL, 1420000, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a4c0000**

**mmap(0x7f513a4ca000, 421888, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xa000) = 0x7f513a4ca000**

**mmap(0x7f513a531000, 217088, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x71000) = 0x7f513a531000**

**mmap(0x7f513a566000, 16384, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xa5000) = 0x7f513a566000**

**mmap(0x7f513a56a000, 723680, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7f513a56a000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libgssapi\_krb5.so.2", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0P\321\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=309712, ...}) = 0**

**mmap(NULL, 312128, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a470000**

**mmap(0x7f513a47b000, 204800, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xb000) = 0x7f513a47b000**

**mmap(0x7f513a4ad000, 49152, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x3d000) = 0x7f513a4ad000**

**mmap(0x7f513a4b9000, 16384, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x48000) = 0x7f513a4b9000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libpthread.so.0", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\220\201\0\0\0\0\0\0"..., 832) = 832**

**pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0O\305\3743\364B\2216\244\224\306@\261\23\327o"..., 68, 824) = 68**

**fstat(3, {st\_mode=S\_IFREG|0755, st\_size=157224, ...}) = 0**

**pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0O\305\3743\364B\2216\244\224\306@\261\23\327o"..., 68, 824) = 68**

**mmap(NULL, 140408, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a44d000**

**mmap(0x7f513a454000, 69632, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x7000) = 0x7f513a454000**

**mmap(0x7f513a465000, 20480, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x18000) = 0x7f513a465000**

**mmap(0x7f513a46a000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1c000) = 0x7f513a46a000**

**mmap(0x7f513a46c000, 13432, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7f513a46c000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libm.so.6", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\300\363\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=1369352, ...}) = 0**

**mmap(NULL, 1368336, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a2fe000**

**mmap(0x7f513a30d000, 684032, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xf000) = 0x7f513a30d000**

**mmap(0x7f513a3b4000, 618496, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xb6000) = 0x7f513a3b4000**

**mmap(0x7f513a44b000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x14c000) = 0x7f513a44b000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libkrb5.so.3", 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 ?\2\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=902016, ...}) = 0**

**mmap(NULL, 904640, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a220000**

**mprotect(0x7f513a242000, 700416, PROT\_NONE) = 0**

**mmap(0x7f513a242000, 397312, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x22000) = 0x7f513a242000**

**mmap(0x7f513a2a3000, 299008, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x83000) = 0x7f513a2a3000**

**mmap(0x7f513a2ed000, 65536, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xcc000) = 0x7f513a2ed000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libk5crypto.so.3", 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\240D\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=191040, ...}) = 0**

**mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7f513a210000**

**mmap(NULL, 196696, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a1d0000**

**mprotect(0x7f513a1d4000, 172032, PROT\_NONE) = 0**

**mmap(0x7f513a1d4000, 114688, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x4000) = 0x7f513a1d4000**

**mmap(0x7f513a1f0000, 53248, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x20000) = 0x7f513a1f0000**

**mmap(0x7f513a1fe000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x2d000) = 0x7f513a1fe000**

**mmap(0x7f513a200000, 88, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7f513a200000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libcom\_err.so.2", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\200$\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=22600, ...}) = 0**

**mmap(NULL, 24744, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a1c0000**

**mmap(0x7f513a1c2000, 8192, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x2000) = 0x7f513a1c2000**

**mmap(0x7f513a1c4000, 4096, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x4000) = 0x7f513a1c4000**

**mmap(0x7f513a1c5000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x4000) = 0x7f513a1c5000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libkrb5support.so.0", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\3605\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=56096, ...}) = 0**

**mmap(NULL, 58344, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a1b0000**

**mmap(0x7f513a1b3000, 28672, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x3000) = 0x7f513a1b3000**

**mmap(0x7f513a1ba000, 12288, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xa000) = 0x7f513a1ba000**

**mmap(0x7f513a1bd000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xc000) = 0x7f513a1bd000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libkeyutils.so.1", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0@\"\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=22600, ...}) = 0**

**mmap(NULL, 24592, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a1a0000**

**mmap(0x7f513a1a2000, 8192, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x2000) = 0x7f513a1a2000**

**mmap(0x7f513a1a4000, 4096, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x4000) = 0x7f513a1a4000**

**mmap(0x7f513a1a5000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x4000) = 0x7f513a1a5000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libresolv.so.2", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0 G\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=101320, ...}) = 0**

**mmap(NULL, 113280, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a180000**

**mprotect(0x7f513a184000, 81920, PROT\_NONE) = 0**

**mmap(0x7f513a184000, 65536, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x4000) = 0x7f513a184000**

**mmap(0x7f513a194000, 12288, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x14000) = 0x7f513a194000**

**mmap(0x7f513a198000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x17000) = 0x7f513a198000**

**mmap(0x7f513a19a000, 6784, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7f513a19a000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libdl.so.2", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0 \22\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=18816, ...}) = 0**

**mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7f513a170000**

**mmap(NULL, 20752, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a160000**

**mmap(0x7f513a161000, 8192, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x1000) = 0x7f513a161000**

**mmap(0x7f513a163000, 4096, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x3000) = 0x7f513a163000**

**mmap(0x7f513a164000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x3000) = 0x7f513a164000**

**close(3) = 0**

**mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7f513a150000**

**mmap(NULL, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_ANONYMOUS, -1, 0) = 0x7f513a140000**

**arch\_prctl(ARCH\_SET\_FS, 0x7f513a151600) = 0**

**mprotect(0x7f513a8c8000, 12288, PROT\_READ) = 0**

**mprotect(0x7f513a164000, 4096, PROT\_READ) = 0**

**mprotect(0x7f513a198000, 4096, PROT\_READ) = 0**

**mprotect(0x7f513a1a5000, 4096, PROT\_READ) = 0**

**mprotect(0x7f513a1bd000, 4096, PROT\_READ) = 0**

**mprotect(0x7f513a46a000, 4096, PROT\_READ) = 0**

**mprotect(0x7f513a1c5000, 4096, PROT\_READ) = 0**

**mprotect(0x7f513a1fe000, 4096, PROT\_READ) = 0**

**mprotect(0x7f513a2ed000, 57344, PROT\_READ) = 0**

**mprotect(0x7f513a44b000, 4096, PROT\_READ) = 0**

**mprotect(0x7f513a4b9000, 8192, PROT\_READ) = 0**

**mprotect(0x7f513a8f9000, 4096, PROT\_READ) = 0**

**mprotect(0x7f513aad0000, 45056, PROT\_READ) = 0**

**mprotect(0x7f513a566000, 12288, PROT\_READ) = 0**

**mprotect(0x7f513a679000, 4096, PROT\_READ) = 0**

**mprotect(0x7f513a6d6000, 4096, PROT\_READ) = 0**

**mprotect(0x7f513ab8e000, 28672, PROT\_READ) = 0**

**mprotect(0x7f513abe5000, 4096, PROT\_READ) = 0**

**mprotect(0x7f513abcd000, 4096, PROT\_READ) = 0**

**munmap(0x7f513ab98000, 32310) = 0**

**set\_tid\_address(0x7f513a1518d0) = 4153**

**set\_robust\_list(0x7f513a1518e0, 24) = 0**

**rt\_sigaction(SIGRTMIN, {sa\_handler=0x7f513a454bf0, sa\_mask=[], sa\_flags=SA\_RESTORER|SA\_SIGINFO, sa\_restorer=0x7f513a4623c0}, NULL, 8) = 0**

**rt\_sigaction(SIGRT\_1, {sa\_handler=0x7f513a454c90, sa\_mask=[], sa\_flags=SA\_RESTORER|SA\_RESTART|SA\_SIGINFO, sa\_restorer=0x7f513a4623c0}, NULL, 8) = 0**

**rt\_sigprocmask(SIG\_UNBLOCK, [RTMIN RT\_1], NULL, 8) = 0**

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

**brk(NULL) = 0x7fffe0bc4000**

**brk(0x7fffe0be5000) = 0x7fffe0be5000**

**gettimeofday({tv\_sec=1621064014, tv\_usec=102374}, {tz\_minuteswest=0, tz\_dsttime=0}) = 0**

**futex(0x7f513aade6bc, FUTEX\_WAKE\_PRIVATE, 2147483647) = 0**

**futex(0x7f513aade6c8, FUTEX\_WAKE\_PRIVATE, 2147483647) = 0**

**clock\_gettime(CLOCK\_REALTIME\_COARSE, {tv\_sec=1621064014, tv\_nsec=103668300}) = 0**

**openat(AT\_FDCWD, "/sys/devices/system/cpu/online", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "0-3\n", 8192) = 4**

**close(3) = 0**

**openat(AT\_FDCWD, "/sys/devices/system/cpu", O\_RDONLY|O\_NONBLOCK|O\_CLOEXEC|O\_DIRECTORY) = 3**

**fstat(3, {st\_mode=S\_IFDIR|0755, st\_size=0, ...}) = 0**

**getdents64(3, /\* 9 entries \*/, 32768) = 240**

**getdents64(3, /\* 0 entries \*/, 32768) = 0**

**close(3) = 0**

**getpid() = 4153**

**sched\_getaffinity(4153, 128, [0, 1, 2, 3]) = 64**

**openat(AT\_FDCWD, "/etc/nsswitch.conf", O\_RDONLY|O\_CLOEXEC) = 3**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=510, ...}) = 0**

**read(3, "# /etc/nsswitch.conf\n#\n# Example"..., 512) = 510**

**read(3, "", 512) = 0**

**close(3) = 0**

**openat(AT\_FDCWD, "/etc/ld.so.cache", O\_RDONLY|O\_CLOEXEC) = 3**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=32310, ...}) = 0**

**mmap(NULL, 32310, PROT\_READ, MAP\_PRIVATE, 3, 0) = 0x7f513ab98000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/tls/haswell/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/x86\_64-linux-gnu/tls/haswell/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/tls/haswell/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/x86\_64-linux-gnu/tls/haswell", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/tls/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/x86\_64-linux-gnu/tls/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/tls/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/x86\_64-linux-gnu/tls", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/haswell/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/x86\_64-linux-gnu/haswell/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/haswell/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/x86\_64-linux-gnu/haswell", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/x86\_64-linux-gnu/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/x86\_64-linux-gnu", {st\_mode=S\_IFDIR|0755, st\_size=512, ...}) = 0**

**openat(AT\_FDCWD, "/usr/lib/x86\_64-linux-gnu/tls/haswell/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/x86\_64-linux-gnu/tls/haswell/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/x86\_64-linux-gnu/tls/haswell/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/x86\_64-linux-gnu/tls/haswell", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/x86\_64-linux-gnu/tls/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/x86\_64-linux-gnu/tls/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/x86\_64-linux-gnu/tls/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/x86\_64-linux-gnu/tls", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/x86\_64-linux-gnu/haswell/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/x86\_64-linux-gnu/haswell/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/x86\_64-linux-gnu/haswell/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/x86\_64-linux-gnu/haswell", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/x86\_64-linux-gnu/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/x86\_64-linux-gnu/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/x86\_64-linux-gnu/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/x86\_64-linux-gnu", {st\_mode=S\_IFDIR|0755, st\_size=512, ...}) = 0**

**openat(AT\_FDCWD, "/lib/tls/haswell/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/tls/haswell/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/tls/haswell/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/tls/haswell", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/tls/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/tls/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/tls/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/tls", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/haswell/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/haswell/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/haswell/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/haswell", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/lib/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/lib", {st\_mode=S\_IFDIR|0755, st\_size=512, ...}) = 0**

**openat(AT\_FDCWD, "/usr/lib/tls/haswell/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/tls/haswell/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/tls/haswell/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/tls/haswell", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/tls/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/tls/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/tls/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/tls", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/haswell/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/haswell/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/haswell/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/haswell", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/x86\_64/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib/x86\_64", 0x7fffe8365ba0) = -1 ENOENT (No such file or directory)**

**openat(AT\_FDCWD, "/usr/lib/libnss\_db.so.2", O\_RDONLY|O\_CLOEXEC) = -1 ENOENT (No such file or directory)**

**stat("/usr/lib", {st\_mode=S\_IFDIR|0755, st\_size=512, ...}) = 0**

**munmap(0x7f513ab98000, 32310) = 0**

**openat(AT\_FDCWD, "/etc/ld.so.cache", O\_RDONLY|O\_CLOEXEC) = 3**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=32310, ...}) = 0**

**mmap(NULL, 32310, PROT\_READ, MAP\_PRIVATE, 3, 0) = 0x7f513ab98000**

**close(3) = 0**

**openat(AT\_FDCWD, "/lib/x86\_64-linux-gnu/libnss\_files.so.2", O\_RDONLY|O\_CLOEXEC) = 3**

**read(3, "\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\3005\0\0\0\0\0\0"..., 832) = 832**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=51832, ...}) = 0**

**mmap(NULL, 79672, PROT\_READ, MAP\_PRIVATE|MAP\_DENYWRITE, 3, 0) = 0x7f513a120000**

**mmap(0x7f513a123000, 28672, PROT\_READ|PROT\_EXEC, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0x3000) = 0x7f513a123000**

**mmap(0x7f513a12a000, 8192, PROT\_READ, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xa000) = 0x7f513a12a000**

**mmap(0x7f513a12c000, 8192, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_DENYWRITE, 3, 0xb000) = 0x7f513a12c000**

**mmap(0x7f513a12e000, 22328, PROT\_READ|PROT\_WRITE, MAP\_PRIVATE|MAP\_FIXED|MAP\_ANONYMOUS, -1, 0) = 0x7f513a12e000**

**close(3) = 0**

**mprotect(0x7f513a12c000, 4096, PROT\_READ) = 0**

**munmap(0x7f513ab98000, 32310) = 0**

**openat(AT\_FDCWD, "/etc/protocols", O\_RDONLY|O\_CLOEXEC) = 3**

**lseek(3, 0, SEEK\_CUR) = 0**

**fstat(3, {st\_mode=S\_IFREG|0644, st\_size=2932, ...}) = 0**

**read(3, "# Internet (IP) protocols\n#\n# Up"..., 512) = 512**

**lseek(3, 0, SEEK\_CUR) = 512**

**read(3, "teway-gateway protocol\nipencap\t4"..., 512) = 512**

**lseek(3, 0, SEEK\_CUR) = 1024**

**read(3, "33\tDCCP\t\t# Datagram Congestion C"..., 512) = 512**

**lseek(3, 0, SEEK\_CUR) = 1536**

**read(3, "06]\nah\t51\tIPSEC-AH\t# Authenticat"..., 512) = 512**

**lseek(3, 0, SEEK\_CUR) = 2048**

**read(3, "tocol\netherip\t97\tETHERIP\t\t# Ethe"..., 512) = 512**

**lseek(3, 0, SEEK\_CUR) = 2560**

**read(3, "r 135 Mobility-Header # Mobility"..., 512) = 372**

**lseek(3, 0, SEEK\_CUR) = 2932**

**read(3, "", 512) = 0**

**close(3) = 0**

**gettimeofday({tv\_sec=1621064014, tv\_usec=128448}, NULL) = 0**

**eventfd2(0, EFD\_CLOEXEC) = 3**

**fcntl(3, F\_GETFL) = 0x2 (flags O\_RDWR)**

**fcntl(3, F\_SETFL, O\_RDWR|O\_NONBLOCK) = 0**

**fcntl(3, F\_GETFL) = 0x802 (flags O\_RDWR|O\_NONBLOCK)**

**fcntl(3, F\_SETFL, O\_RDWR|O\_NONBLOCK) = 0**

**getrandom("\x1c\xab\x2e\x1d\x87\x30\x3e\xb9\x37\x02\xb5\xe6\x23\xf8\xdb\xe6", 16, 0) = 16**

**getrandom("\x4e\x83\xcd\xc8\x5f\x93\x02\x6c\x82\x35\x0b\x20\x3e\x27\x3d\x43", 16, 0) = 16**

**fstat(0, {st\_mode=S\_IFCHR|0620, st\_rdev=makedev(0x88, 0), ...}) = 0**

**read(0, "create 2 -1\n", 1024) = 12**

**clone(child\_stack=NULL, flags=CLONE\_CHILD\_CLEARTID|CLONE\_CHILD\_SETTID|SIGCHLD, child\_tidptr=0x7f513a1518d0) = 4154**

**eventfd2(0, EFD\_CLOEXEC) = 4**

**fcntl(4, F\_GETFL) = 0x2 (flags O\_RDWR)**

**fcntl(4, F\_SETFL, O\_RDWR|O\_NONBLOCK) = 0**

**fcntl(4, F\_GETFL) = 0x802 (flags O\_RDWR|O\_NONBLOCK)**

**fcntl(4, F\_SETFL, O\_RDWR|O\_NONBLOCK) = 0**

**clock\_gettime(CLOCK\_MONOTONIC, {tv\_sec=17988, tv\_nsec=305114500}) = 0**

**epoll\_create1(EPOLL\_CLOEXEC) = 5**

**epoll\_ctl(5, EPOLL\_CTL\_ADD, 4, {0, {u32=3770529072, u64=140736963917104}}) = 0**

**epoll\_ctl(5, EPOLL\_CTL\_MOD, 4, {EPOLLIN, {u32=3770529072, u64=140736963917104}}) = 0**

**mmap(NULL, 8392704, PROT\_NONE, MAP\_PRIVATE|MAP\_ANONYMOUS|MAP\_STACK, -1, 0) = 0x7f5139910000**

**mprotect(0x7f5139911000, 8388608, PROT\_READ|PROT\_WRITE) = 0**

**clone(child\_stack=0x7f513a10fd30, flags=CLONE\_VM|CLONE\_FS|CLONE\_FILES|CLONE\_SIGHAND|CLONE\_THREAD|CLONE\_SYSVSEM|CLONE\_SETTLS|CLONE\_PARENT\_SETTID|CLONE\_CHILD\_CLEARTID, parent\_tid=[4155], tls=0x7f513a110700, child\_tidptr=0x7f513a1109d0) = 4155**

**eventfd2(0, EFD\_CLOEXEC) = 6**

**fcntl(6, F\_GETFL) = 0x2 (flags O\_RDWR)**

**fcntl(6, F\_SETFL, O\_RDWR|O\_NONBLOCK) = 0**

**fcntl(6, F\_GETFL) = 0x802 (flags O\_RDWR|O\_NONBLOCK)**

**fcntl(6, F\_SETFL, O\_RDWR|O\_NONBLOCK) = 0**

**clock\_gettime(CLOCK\_MONOTONIC, {tv\_sec=17988, tv\_nsec=307361000}) = 0**

**epoll\_create1(EPOLL\_CLOEXEC) = 7**

**epoll\_ctl(7, EPOLL\_CTL\_ADD, 6, {0, {u32=3770531120, u64=140736963919152}}) = 0**

**epoll\_ctl(7, EPOLL\_CTL\_MOD, 6, {EPOLLIN, {u32=3770531120, u64=140736963919152}}) = 0**

**mmap(NULL, 8392704, PROT\_NONE, MAP\_PRIVATE|MAP\_ANONYMOUS|MAP\_STACK, -1, 0) = 0x7f5139100000**

**mprotect(0x7f5139101000, 8388608, PROT\_READ|PROT\_WRITE) = 0**

**clone(child\_stack=0x7f51398ffd30, flags=CLONE\_VM|CLONE\_FS|CLONE\_FILES|CLONE\_SIGHAND|CLONE\_THREAD|CLONE\_SYSVSEM|CLONE\_SETTLS|CLONE\_PARENT\_SETTID|CLONE\_CHILD\_CLEARTID, parent\_tid=[4156], tls=0x7f5139900700, child\_tidptr=0x7f51399009d0) = 4156**

**clock\_gettime(CLOCK\_MONOTONIC, {tv\_sec=17988, tv\_nsec=308280700}) = 0**

**eventfd2(0, EFD\_CLOEXEC) = 8**

**fcntl(8, F\_GETFL) = 0x2 (flags O\_RDWR)**

**fcntl(8, F\_SETFL, O\_RDWR|O\_NONBLOCK) = 0**

**fcntl(8, F\_GETFL) = 0x802 (flags O\_RDWR|O\_NONBLOCK)**

**fcntl(8, F\_SETFL, O\_RDWR|O\_NONBLOCK) = 0**

**poll([{fd=8, events=POLLIN}], 1, 0) = 0 (Timeout)**

**socket(AF\_NETLINK, SOCK\_RAW|SOCK\_CLOEXEC, NETLINK\_ROUTE) = 9**

**bind(9, {sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, 12) = 0**

**getsockname(9, {sa\_family=AF\_NETLINK, nl\_pid=4153, nl\_groups=00000000}, [12]) = 0**

**clock\_gettime(CLOCK\_REALTIME\_COARSE, {tv\_sec=1621064019, tv\_nsec=835082200}) = 0**

**sendto(9, "\24\0\0\0\22\0\1\3Sy\237`\0\0\0\0\0\0\0\0", 20, 0, {sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, 12) = 20**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=80, type=0x10 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064019, pid=4153}, "\x00\x00\x01\x00\x04\x00\x00\x00\x43\x10\x00\x00\x00\x00\x00\x00\x0a\x00\x01\x00\xfc\xaa\x14\x20\x7f\x3d\x00\x00\x08\x00\x1b\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 80**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=80, type=0x10 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064019, pid=4153}, "\x00\x00\x01\x00\x07\x00\x00\x00\x43\x10\x00\x00\x00\x00\x00\x00\x0a\x00\x01\x00\x00\x50\x56\xc0\x00\x01\x00\x00\x08\x00\x1b\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 80**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=80, type=0x10 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064019, pid=4153}, "\x00\x00\x01\x00\x05\x00\x00\x00\x43\x10\x00\x00\x00\x00\x00\x00\x0a\x00\x01\x00\x00\x50\x56\xc0\x00\x08\x00\x00\x08\x00\x1b\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 80**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=76, type=0x10 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064019, pid=4153}, "\x00\x00\x04\x03\x01\x00\x00\x00\x49\x00\x00\x00\x00\x00\x00\x00\x0a\x00\x01\x00\x00\x00\x00\x00\x00\x00\x00\x00\x08\x00\x1b\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 76**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=80, type=0x10 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064019, pid=4153}, "\x00\x00\x01\x00\x08\x00\x00\x00\x40\x00\x00\x00\x00\x00\x00\x00\x0a\x00\x01\x00\x00\xff\x78\x0b\xbb\xc3\x00\x00\x08\x00\x1b\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 80**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=20, type=NLMSG\_DONE, flags=NLM\_F\_MULTI, seq=1621064019, pid=4153}, 0}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 20**

**sendto(9, "\24\0\0\0\26\0\1\3Ty\237`\0\0\0\0\0\0\0\0", 20, 0, {sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, 12) = 20**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=60, type=0x14 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064020, pid=4153}, "\x02\x18\x00\x00\x04\x00\x00\x00\x08\x00\x01\x00\xc0\xa8\x00\x0c\x08\x00\x04\x00\xc0\xa8\x00\xff\x14\x00\x06\x00\xc3\x49\x01\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 60**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=64, type=0x14 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064020, pid=4153}, "\x0a\x40\x00\xfd\x04\x00\x00\x00\x14\x00\x01\x00\xfe\x80\x00\x00\x00\x00\x00\x00\xfc\x6d\x29\x99\x2d\xf4\x30\xa3\x14\x00\x06\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 64**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=60, type=0x14 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064020, pid=4153}, "\x02\x18\x00\x00\x07\x00\x00\x00\x08\x00\x01\x00\xc0\xa8\xe4\x01\x08\x00\x04\x00\xc0\xa8\xe4\xff\x14\x00\x06\x00\x50\x06\x00\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 60**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=64, type=0x14 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064020, pid=4153}, "\x0a\x40\x00\xfd\x07\x00\x00\x00\x14\x00\x01\x00\xfe\x80\x00\x00\x00\x00\x00\x00\x49\xd9\x30\x1a\xd0\x91\xe0\x04\x14\x00\x06\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 64**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=60, type=0x14 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064020, pid=4153}, "\x02\x18\x00\x00\x05\x00\x00\x00\x08\x00\x01\x00\xc0\xa8\x91\x01\x08\x00\x04\x00\xc0\xa8\x91\xff\x14\x00\x06\x00\x50\x06\x00\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 60**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=64, type=0x14 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064020, pid=4153}, "\x0a\x40\x00\xfd\x05\x00\x00\x00\x14\x00\x01\x00\xfe\x80\x00\x00\x00\x00\x00\x00\x1d\xc1\xa7\xe6\xc6\x51\xa7\x79\x14\x00\x06\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 64**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=60, type=0x14 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064020, pid=4153}, "\x02\x08\x00\x00\x01\x00\x00\x00\x08\x00\x01\x00\x7f\x00\x00\x01\x08\x00\x04\x00\x7f\xff\xff\xff\x14\x00\x06\x00\xff\xff\xff\xff"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 60**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=64, type=0x14 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064020, pid=4153}, "\x0a\x80\x00\xfe\x01\x00\x00\x00\x14\x00\x01\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x01\x14\x00\x06\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 64**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=60, type=0x14 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064020, pid=4153}, "\x02\x10\x00\x00\x08\x00\x00\x00\x08\x00\x01\x00\xa9\xfe\x9b\x77\x08\x00\x04\x00\xa9\xfe\xff\xff\x14\x00\x06\x00\xff\xff\xff\xff"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 60**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=64, type=0x14 /\* NLMSG\_??? \*/, flags=NLM\_F\_MULTI, seq=1621064020, pid=4153}, "\x0a\x40\x00\xfd\x08\x00\x00\x00\x14\x00\x01\x00\xfe\x80\x00\x00\x00\x00\x00\x00\x05\xcb\x5b\xc9\x1a\x2c\x9b\x77\x14\x00\x06\x00"...}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 64**

**recvmsg(9, {msg\_name={sa\_family=AF\_NETLINK, nl\_pid=0, nl\_groups=00000000}, msg\_namelen=12, msg\_iov=[{iov\_base={{len=20, type=NLMSG\_DONE, flags=NLM\_F\_MULTI, seq=1621064020, pid=4153}, 0}, iov\_len=4096}], msg\_iovlen=1, msg\_controllen=0, msg\_flags=0}, 0) = 20**

**close(9) = 0**

**socket(AF\_INET, SOCK\_STREAM|SOCK\_CLOEXEC, IPPROTO\_TCP) = 9**

**setsockopt(9, SOL\_SOCKET, SO\_REUSEADDR, [1], 4) = 0**

**bind(9, {sa\_family=AF\_INET, sin\_port=htons(4042), sin\_addr=inet\_addr("127.0.0.1")}, 16) = 0**

**listen(9, 100) = 0**

**getsockname(9, {sa\_family=AF\_INET, sin\_port=htons(4042), sin\_addr=inet\_addr("127.0.0.1")}, [128->16]) = 0**

**getsockname(9, {sa\_family=AF\_INET, sin\_port=htons(4042), sin\_addr=inet\_addr("127.0.0.1")}, [128->16]) = 0**

**write(6, "\1\0\0\0\0\0\0\0", 8) = 8**

**write(8, "\1\0\0\0\0\0\0\0", 8) = 8**

**poll([{fd=8, events=POLLIN}], 1, 0) = 1 ([{fd=8, revents=POLLIN}])**

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

**poll([{fd=8, events=POLLIN}], 1, 0) = 0 (Timeout)**

**clock\_gettime(CLOCK\_MONOTONIC, {tv\_sec=17988, tv\_nsec=315827700}) = 0**

**poll([{fd=8, events=POLLIN}], 1, 5000) = 1 ([{fd=8, revents=POLLIN}])**

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

**poll([{fd=8, events=POLLIN}], 1, 0) = 0 (Timeout)**

**write(6, "\1\0\0\0\0\0\0\0", 8) = 8**

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

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

**poll([{fd=8, events=POLLIN}], 1, 0) = 0 (Timeout)**

**write(6, "\1\0\0\0\0\0\0\0", 8) = 8**

**fstat(1, {st\_mode=S\_IFCHR|0620, st\_rdev=makedev(0x88, 0), ...}) = 0**

**write(1, "OK: 4154\n", 9) = 9**

**read(0, "exit\n", 1024) = 5**

**poll([{fd=8, events=POLLIN}], 1, 0) = 0 (Timeout)**

**write(6, "\1\0\0\0\0\0\0\0", 8) = 8**

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

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

**--- SIGCHLD {si\_signo=SIGCHLD, si\_code=CLD\_EXITED, si\_pid=4154, si\_uid=1000, si\_status=0, si\_utime=0, si\_stime=0} ---**

**poll([{fd=8, events=POLLIN}], 1, 0) = 0 (Timeout)**

**poll([{fd=8, events=POLLIN}], 1, 0) = 0 (Timeout)**

**write(6, "\1\0\0\0\0\0\0\0", 8) = 8**

**lseek(0, -1, SEEK\_CUR) = -1 ESPIPE (Illegal seek)**

**exit\_group(0) = ?**

**+++ exited with 0 +++**

1. **Выводы**

Утилиты strace и ltrace – простые и надежные инструменты для отслеживания системных вызовов. Они полезны при отладке и тестировании программ. Несмотря на то, что на первый взгляд протоколы этих утилит кажутся чересчур объёмными и непонятными, при помощи различных ключей можно отфильтровать их «на свой вкус».

Утилита strace позволяет отслеживать большинство системных вызовов. Но если требуется пронаблюдать за более узкими аспектами работы программ, то на помощь придёт ltrace (для отслеживания вызовов динамических библиотек), ftrace (для отслеживания работы операционной системы), perf, SystemTap и многие другие.

Данные утилиты пригодились мне для изучения принципов работы системных вызовов и поиска ошибок в моих лабораторных работах.