

Московский Авиационный Институт
(Национальный Исследовательский Университет)
Институт №8 “Компьютерные науки и прикладная математика”
Кафедра №806 “Вычислительная математика и программирование”

Лабораторная работа №8 по курсу
«Операционные системы»

Группа: М8О-203Б-23

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Оценка: _____

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Постановка задачи

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

Что такое strace?

Протокол выполнения

```
9467 execve("./parent", ["/parent"], 0x7ffdad017788 /* 26 vars */) = 0
9467 brk(NULL) = 0x5579fbc26000
9467 mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f1eda8fc000
9467 access("/etc/ld.so.preload", R_OK) = -1 ENOENT (No such file or directory)
9467 openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
9467 newfstatat(3, "", {st_mode=S_IFREG|0644, st_size=21051, ...}, AT_EMPTY_PATH) = 0
9467 mmap(NULL, 21051, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7f1eda8f6000
9467 openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
9467 newfstatat(3, "", {st_mode=S_IFREG|0755, st_size=2220400, ...}, AT_EMPTY_PATH) = 0
9467 mmap(NULL, 2264656, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f1eda6cd000
9467 mprotect(0x7f1eda6f5000, 2023424, PROT_NONE) = 0
9467 mmap(0x7f1eda6f5000, 1658880, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x28000) = 0x7f1eda6f5000
9467 mmap(0x7f1eda88a000, 360448, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1bd000) = 0x7f1eda88a000
9467 mmap(0x7f1eda8e3000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x215000) = 0x7f1eda8e3000
9467 mmap(0x7f1eda8e9000, 52816, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f1eda8e9000
9467 mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f1eda6ca000
9467 mprotect(0x7f1eda8e3000, 16384, PROT_READ) = 0
9467 mprotect(0x5579e0370000, 4096, PROT_READ) = 0
9467 mprotect(0x7f1eda936000, 8192, PROT_READ) = 0
9467 munmap(0x7f1eda8f6000, 21051) = 0
9467 openat(AT_FDCWD, "/dev/shm/shared_memory", O_RDWR|O_CREAT|O_NOFOLLOW|O_CLOEXEC, 0666) = 3
9467 mmap(NULL, 1024, PROT_READ|PROT_WRITE, MAP_SHARED, 3, 0) = 0x7f1eda935000
9467 clone(child_stack=NULL, flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLD, child_tidptr=0x7f1eda6caa10) = 9468
9467 clone(child_stack=NULL, flags=CLONE_CHILD_CLEARTID|CLONE_CHILD_SETTID|SIGCHLD <unfinished ...>
9468 execve("./child1", ["/child1"], 0x7fff7aae0728 /* 26 vars */ <unfinished ...>
```

9467 <... clone resumed>, child_tidptr=0x7f1eda6caa10) = 9469

9467 newfstatat(1, "", {st_mode=S_IFCHR|0600, st_rdev=makedev(0x88, 0x6), ...}, AT_EMPTY_PATH) = 0

9469 execve("./child2", ["/child2"], 0x7fff7aae0728 /* 26 vars */ <unfinished ...>

9468 <... execve resumed> = 0

9467 brk(NULL <unfinished ...>

9469 <... execve resumed> = 0

9468 brk(NULL <unfinished ...>

9467 <... brk resumed> = 0x5579fbc26000

9469 brk(NULL <unfinished ...>

9467 brk(0x5579fbc47000 <unfinished ...>

9468 <... brk resumed> = 0x55879160c000

9467 <... brk resumed> = 0x5579fbc47000

9469 <... brk resumed> = 0x5653089a7000

9467 newfstatat(0, "", {st_mode=S_IFCHR|0600, st_rdev=makedev(0x88, 0x6), ...}, AT_EMPTY_PATH) = 0

9468 mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f416856d000

9469 mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>

9468 access("/etc/ld.so.preload", R_OK <unfinished ...>

9469 <... mmap resumed> = 0x7f7925713000

9468 <... access resumed> = -1 ENOENT (No such file or directory)

9469 access("/etc/ld.so.preload", R_OK <unfinished ...>

9468 openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC <unfinished ...>

9469 <... access resumed> = -1 ENOENT (No such file or directory)

9468 <... openat resumed> = 3

9469 openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC <unfinished ...>

9468 newfstatat(3, "", <unfinished ...>

9469 <... openat resumed> = 3

9468 <... newfstatat resumed>{st_mode=S_IFREG|0644, st_size=21051, ...}, AT_EMPTY_PATH) = 0

9469 newfstatat(3, "", <unfinished ...>

9468 mmap(NULL, 21051, PROT_READ, MAP_PRIVATE, 3, 0 <unfinished ...>

9469 <... newfstatat resumed>{st_mode=S_IFREG|0644, st_size=21051, ...}, AT_EMPTY_PATH) = 0

9468 <... mmap resumed> = 0x7f4168567000

9469 mmap(NULL, 21051, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7f792570d000

9468 openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3

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9469 openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
9469 newfstatat(3, "", {st_mode=S_IFREG|0755, st_size=2220400, ...}, AT_EMPTY_PATH) = 0
9468 newfstatat(3, "", {st_mode=S_IFREG|0755, st_size=2220400, ...}, AT_EMPTY_PATH) = 0
9469 mmap(NULL, 2264656, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f79254e4000
9469 mprotect(0x7f792550c000, 2023424, PROT_NONE <unfinished ...>
9468 mmap(NULL, 2264656, PROT_READ, MAP_PRIVATE|MAP_DENYWRITE, 3, 0 <unfinished ...>
9469 <... mprotect resumed>)          = 0
9469 mmap(0x7f792550c000, 1658880, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3,
0x28000 <unfinished ...>
9468 <... mmap resumed>)              = 0x7f416833e000
9469 <... mmap resumed>)              = 0x7f792550c000
9469 mmap(0x7f79256a1000, 360448, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1bd000
<unfinished ...>
9468 mprotect(0x7f4168366000, 2023424, PROT_NONE <unfinished ...>
9469 <... mmap resumed>)              = 0x7f79256a1000
9468 <... mprotect resumed>)          = 0
9469 mmap(0x7f79256fa000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3,
0x215000 <unfinished ...>
9468 mmap(0x7f4168366000, 1658880, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3,
0x28000 <unfinished ...>
9469 <... mmap resumed>)              = 0x7f79256fa000
9468 <... mmap resumed>)              = 0x7f4168366000
9469 mmap(0x7f7925700000, 52816, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1,
0 <unfinished ...>
9468 mmap(0x7f41684fb000, 360448, PROT_READ, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1bd000
<unfinished ...>
9469 <... mmap resumed>)              = 0x7f7925700000
9468 <... mmap resumed>)              = 0x7f41684fb000
9468 mmap(0x7f4168554000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3,
0x215000) = 0x7f4168554000
9469 mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0 <unfinished ...>
9468 mmap(0x7f416855a000, 52816, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1,
0 <unfinished ...>
9469 <... mmap resumed>)              = 0x7f79254e1000
9468 <... mmap resumed>)              = 0x7f416855a000
9468 mmap(NULL, 12288, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f416833b000
9469 mprotect(0x7f79256fa000, 16384, PROT_READ) = 0

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9469 mprotect(0x5652f7faa000, 4096, PROT_READ) = 0

9469 mprotect(0x7f792574d000, 8192, PROT_READ) = 0

9469 munmap(0x7f792570d000, 21051) = 0

9468 mprotect(0x7f4168554000, 16384, PROT_READ) = 0

9468 mprotect(0x55877a9eb000, 4096, PROT_READ) = 0

9469 openat(AT_FDCWD, "/dev/shm/shared_memory", O_RDWR|O_NOFOLLOW|O_CLOEXEC <unfinished ...>

9468 mprotect(0x7f41685a7000, 8192, PROT_READ <unfinished ...>

9469 <... openat resumed>) = 3

9468 <... mprotect resumed>) = 0

9469 mmap(NULL, 1024, PROT_READ|PROT_WRITE, MAP_SHARED, 3, 0) = 0x7f792574c000

9468 munmap(0x7f4168567000, 21051) = 0

9468 openat(AT_FDCWD, "/dev/shm/shared_memory", O_RDWR|O_NOFOLLOW|O_CLOEXEC) = 3

9468 mmap(NULL, 1024, PROT_READ|PROT_WRITE, MAP_SHARED, 3, 0) = 0x7f41685a6000

9467 kill(9468, SIGUSR1) = 0

9468 --- SIGUSR1 {si_signo=SIGUSR1, si_code=SI_USER, si_pid=9467, si_uid=0} ---

9468 kill(9467, SIGUSR1) = 0

9467 --- SIGUSR1 {si_signo=SIGUSR1, si_code=SI_USER, si_pid=9468, si_uid=0} ---

9467 kill(9469, SIGUSR2) = 0

9469 --- SIGUSR2 {si_signo=SIGUSR2, si_code=SI_USER, si_pid=9467, si_uid=0} ---

9469 kill(9467, SIGUSR2) = 0

9467 --- SIGUSR2 {si_signo=SIGUSR2, si_code=SI_USER, si_pid=9469, si_uid=0} ---

9467 kill(9468, SIGINT) = 0

9467 kill(9469, SIGINT <unfinished ...>

9468 --- SIGINT {si_signo=SIGINT, si_code=SI_USER, si_pid=9467, si_uid=0} ---

9467 <... kill resumed>) = 0

9467 wait4(9468, <unfinished ...>

9469 --- SIGINT {si_signo=SIGINT, si_code=SI_USER, si_pid=9467, si_uid=0} ---

9468 munmap(0x7f41685a6000, 1024) = 0

9469 munmap(0x7f792574c000, 1024) = 0

9468 exit_group(0) = ?

9469 exit_group(0) = ?

9468 +++ exited with 0 +++

9467 <... wait4 resumed>NULL, 0, NULL) = 9468

```

9469 +++ exited with 0 +++

9467 --- SIGCHLD {si_signo=SIGCHLD, si_code=CLD_EXITED, si_pid=9468, si_uid=0, si_status=0, si_utime=0, si_stime=0}

9467 wait4(9469, NULL, 0, NULL) = 9469

9467 munmap(0x7f1eda935000, 1024) = 0

9467 unlink("/dev/shm/shared_memory") = 0

9467 exit_group(0) = ?

9467 +++ exited with 0 +++

Заключение

Выполнив работу я получила навыки использование strace.