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Институт №8 “Компьютерные науки и прикладная математика”  
Кафедра №806 “Вычислительная математика и программирование”

**Лабораторная работа №3 по курсу**  
**«Операционные системы»**

Группа: М80-206Б-22

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## Постановка задачи

### Группа вариантов 2.

Родительский процесс создает дочерний процесс. Первой строчкой пользователь в консоль родительского процесса вводит имя файла, которое будет использовано для открытия файла с таким именем на чтение. Стандартный поток ввода дочернего процесса переопределяется открытым файлом. Дочерний процесс читает команды из стандартного потока ввода. Родительский процесс выводит результат в свой стандартный поток вывода. Родительский и дочерний процесс должны быть представлены разными программами. Взаимодействие между процессами осуществляется через системные сигналы/события и/или через отображаемые файлы (memory-mapped files).

### Вариант 8.

В файле записаны команды вида: «число число число<newline>». Дочерний процесс производит деление первого числа команда, на последующие числа в команде, а результат “кладет” в map-file. Если происходит деление на 0, то дочерний (и родительский) процесс завершают свою работу с ошибкой. Проверка деления на 0 должна осуществляться на стороне дочернего процесса. Числа имеют тип int. Количество чисел может быть произвольным.

## Общий метод и алгоритм решения

Использованные системные вызовы:

- `pid_t fork(void)`; – создает дочерний процесс.
- `int execv(const char * __path, char *const * __argv)`; - предоставляет новой программе список аргументов в виде массива указателей на строки, заканчивающиеся `(char *)0`.
- `pid_t wait(int *status)`; – приостанавливает выполнение текущего процесса до тех пор, пока дочерний процесс не завершится.
- `void* mmap(void *, size_t, int, int, int, off_t)` - выделяет память или отображает файлы (или устройства) в памяти.
- `int munmap(void*, size_t)` - удаляет сопоставление с выделенной памятью.
- `int ftruncate(int, off_t)` - приводит файл к заданному размеру.
- `int shm_open(const char *, int, ...)` -

Первой строчкой пользователь в консоль родительского процесса вводит имя файла, которое будет использовано для открытия файла с таким именем на чтение. Далее происходит проверка поданного файла на чтение, и если прочитался успешно, то создается дочерний процесс. Потом в дочернем происходит копирование файлового дескриптора файла в стандартный поток ввода. Следующим шагом дочерний процесс запускает программу child.c, создает map-file и обрабатывает свой стандартный ввод (пишет результат в map-file). Потом родительский процесс читает map-file (до отметки конца результатов (т.е. -2)) и выводит полученные результаты в стандартный поток вывода, а если встречается -1 (что значит завершение программы дочернего процесса неудачей), то выводит сообщение об ошибке ("Division by zero") и завершает работу.

## Код программы

### parent.c

```
#include <stdio.h>
#include <unistd.h>
#include <stdlib.h>
#include <sys/types.h>
#include <sys/wait.h>
#include <sys/mman.h>
#include <sys/stat.h>
#include <fcntl.h>
#include <string.h>
#include <stdbool.h>

#define MEMORY_NAME "/"

int main(){

    char* filename = malloc(sizeof(char));
    struct stat statbuf;

    if(!scanf("%s", filename)){
        perror("\nScan file problem!\n");
        _exit(EXIT_FAILURE);
    }

    int fd = 0;
    fd = open(filename, O_RDONLY);
    if(fd == -1){
        perror("\nCan't open file\n");
        _exit(EXIT_FAILURE);
    }
```

```

if ( fstat(fd, &statbuf) < 0 ){
    perror("\nCan't get file size\n");
    _exit(EXIT_FAILURE);
}

pid_t pid = fork();
if (pid == -1) {
    perror("\nfork: Here is a problem\n");
    _exit(EXIT_FAILURE);
}
else if(pid == 0){ //child
    dup2(fd, STDIN_FILENO);
    char* args[] = { "./child", NULL };
    if (execv(args[0], args) == -1){
        fprintf(stderr, "Unable to exec\n");
        _exit(EXIT_FAILURE);
    }
}
else{ //parent
    wait(0);
    int fd_virt = shm_open(
        MEMORY_NAME,
        O_RDONLY,
        S_IRUSR | S_IWUSR);
    if(fd_virt == -1){
        perror("\nshm_open: here is a problem\n");
        _exit(EXIT_FAILURE);
    }
    int* virtual = (int*)mmap(
        NULL,
        statbuf.st_size,
        PROT_READ, MAP_SHARED,
        fd_virt,
        0);
    if(virtual == MAP_FAILED){
        perror("\nmmap: here is a problem\n");
        _exit(EXIT_FAILURE);
    }
    int result = 0;
    for(int i = 0; i < statbuf.st_size; i++){
        if(virtual[i] == -1){
            printf("Division by zero\n");
            if(munmap(virtual, statbuf.st_size) == -1){
                perror("munmap: Here is a problem");
                _exit(EXIT_FAILURE);
            }
        }
    }
}

```

```

    }
    if(shm_unlink(MEMORY_NAME) == -1){
        perror("munmap: Here is a problem");
        _exit(EXIT_FAILURE);
    }
    close(fd_virt);
    _exit(EXIT_FAILURE);
}
if(virtual[i] == -2){
    break;
}
printf("%d\n", virtual[i]);
}
if(munmap(virtual, statbuf.st_size) == -1){
    perror("munmap: Here is a problem");
    _exit(EXIT_FAILURE);
}
if(shm_unlink(MEMORY_NAME) == -1){
    perror("munmap: Here is a problem");
    _exit(EXIT_FAILURE);
}
close(fd_virt);
}
return 0;
}

```

### **child.c**

```

#include <stdio.h>
#include <unistd.h>
#include <stdlib.h>
#include <sys/types.h>
#include <sys/wait.h>
#include <sys/mman.h>
#include <sys/stat.h>
#include <fcntl.h>
#include <string.h>
#include <stdbool.h>

#define MEMORY_NAME "/1"

int main(){
    int fd_virt = shm_open(

```

```

    MEMORY_NAME,
    O_CREAT | O_RDWR,
    S_IRUSR | S_IWUSR);
if(fd_virt == -1){
    perror("\n(child)shm_open: here is a problem\n");
    if(shm_unlink(MEMORY_NAME) == -1){
        perror("(child)munmap: Here is a problem");
        _exit(EXIT_FAILURE);
    }
    close(fd_virt);
    _exit(EXIT_FAILURE);
}
struct stat statbuf;
if (fstat(STDIN_FILENO, &statbuf) < 0 ){
    perror("\n(child)Can't get file size\n");
    if(shm_unlink(MEMORY_NAME) == -1){
        perror("(child)munmap: Here is a problem");
        _exit(EXIT_FAILURE);
    }
    close(fd_virt);
    _exit(EXIT_FAILURE);
}
if (ftruncate(fd_virt, statbuf.st_size) == -1) {
    perror("\n(child)ftruncate: here is a problem\n");
    if(shm_unlink(MEMORY_NAME) == -1){
        perror("(child)munmap: Here is a problem");
        _exit(EXIT_FAILURE);
    }
    close(fd_virt);
    _exit(EXIT_FAILURE);
}
int* virtual = (int*)mmap(
    NULL,
    statbuf.st_size,
    PROT_WRITE | PROT_READ,
    MAP_SHARED,
    fd_virt,
    0);
if(virtual == MAP_FAILED){
    perror("\n(child)mmap: here is a problem\n");
    if(shm_unlink(MEMORY_NAME) == -1){
        perror("(child)munmap: Here is a problem");
        _exit(EXIT_FAILURE);
    }
}

```

```

        close(fd_virt);
        _exit(EXIT_FAILURE);
    }

    int c = '\0';
    int tmp = 0, res = 0;
    int end_of_str = 0;
    char* to_res = "\0";
    int count = 0;
    do{
        if(!end_of_str){
            if(c>='0' && c<='9'){
                tmp = tmp*10 + c - '0';
            }
            if(c == ' ' || c == '\n' || c == EOF){
                if(res == 0 && tmp != 0){
                    res = tmp;
                }
                else if(res != 0 && tmp != 0){
                    res /= tmp;
                }
                else if(res == 0 && tmp == 0){
                    end_of_str = 1;
                }
                else if(res != 0 && tmp == 0){
                    res = -1;
                    virtual[count] = res;
                    _exit(EXIT_FAILURE);
                }
                tmp = 0;
            }
        }
        if(c == '\n' || c == EOF){
            virtual[count] = res;
            count++;
            end_of_str = 0;
            res = 0;
        }
    }while(read(STDIN_FILENO, &c, sizeof(char)) > 0);
    res = -2; // end of work
    virtual[count] = res;
    return 0;
}

```

# Протокол работы программы

## Тестирование:

```
mishazhadnov@McB-airmi scr % ./parent
test_ok.txt
0
6
2
50
0
11
mishazhadnov@McB-airmi scr % ./parent
test_err.txt
1
3
0
Division by zero
```

## Dtrace (аналог strace):

```
mishazhadnov@McB-airmi scr % sudo dtruss -f ./parent
```

Password:

dtrace: system integrity protection is on, some features will not be available

PID/THRD	SYSCALL(args)	= return
15678/0x9045d:	fork()	= 0 0
15678/0x9045d:	munmap(0x1084EE000, 0xA0000)	= 0 0
15678/0x9045d:	munmap(0x10858E000, 0x8000)	= 0 0
15678/0x9045d:	munmap(0x108596000, 0x4000)	= 0 0
15678/0x9045d:	munmap(0x10859A000, 0x4000)	= 0 0
15678/0x9045d:	munmap(0x10859E000, 0x58000)	= 0 0
15678/0x9045d:	open("./0", 0x100000, 0x0)	= 3 0
15678/0x9045d:	fcntl(0x3, 0x32, 0x7FF7BA113290)	= 0 0
15678/0x9045d:	close(0x3)	= 0 0
15678/0x9045d:	fsgetpath(0x7FF7BA1132A0, 0x400, 0x7FF7BA113288)	= 58 0
15678/0x9045d:	fsgetpath(0x7FF7BA1132A0, 0x400, 0x7FF7BA113288)	= 14 0
15678/0x9045d:	csrrtl(0x0, 0x7FF7BA1136AC, 0x4)	= -1 1
15678/0x9045d:	__mac_syscall(0x7FF8040EFE3B, 0x2, 0x7FF7BA113510)	= 0 0



```

15678/0x9045d: csctl(0x0, 0x7FF7BA1136BC, 0x4)          = -1 1

15678/0x9045d: __mac_syscall(0x7FF8040ECDC6, 0x5A, 0x7FF7BA113650)      = 0 0

dtrace: error on enabled probe ID 1741 (ID 573: syscall::syscall:return): invalid kernel access in action #11 at DIF offset 28

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15678/0x9045d: open("/^0", 0x20100000, 0x0)              = 3 0

15678/0x9045d: openat(0x3, "System/Cryptexes/OS\0", 0x100000, 0x0)      = 4 0

15678/0x9045d: dup(0x4, 0x0, 0x0)                        = 5 0

15678/0x9045d: fstatat64(0x4, 0x7FF7BA1123F1, 0x7FF7BA1127F0)          = 0 0

15678/0x9045d: openat(0x4, "System/Library/dyld/^0", 0x100000, 0x0)      = 6 0

15678/0x9045d: fcntl(0x6, 0x32, 0x7FF7BA112480)          = 0 0

15678/0x9045d: dup(0x6, 0x0, 0x0)                        = 7 0

15678/0x9045d: dup(0x5, 0x0, 0x0)                        = 8 0

15678/0x9045d: close(0x3)                                = 0 0

15678/0x9045d: close(0x5)                                = 0 0

15678/0x9045d: close(0x4)                                = 0 0

15678/0x9045d: close(0x6)                                = 0 0

15678/0x9045d: shared_region_check_np(0x7FF7BA112D68, 0x0, 0x0)          = 0 0

15678/0x9045d: fsgetpath(0x7FF7BA1132D0, 0x400, 0x7FF7BA113208)        = 83 0

15678/0x9045d: fcntl(0x8, 0x32, 0x7FF7BA1132D0)          = 0 0

15678/0x9045d: close(0x8)                                = 0 0

15678/0x9045d: close(0x7)                                = 0 0

15678/0x9045d: getfsstat64(0x0, 0x0, 0x2)                = 7 0

15678/0x9045d: getfsstat64(0x106302AA0, 0x3B48, 0x2)      = 7 0

15678/0x9045d: getattrlist("/^0", 0x7FF7BA113210, 0x7FF7BA113180)      = 0 0

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/System/Library/dyld/dyld_shared_cache_x86_64h\0", 0x7FF7BA113548, 0x0) = 0 0

dtrace: error on enabled probe ID 1690 (ID 845: syscall::stat64:return): invalid address (0x0) in action #12 at DIF offset 12

15678/0x9045d: stat64("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr/parent\0", 0x7FF7BA1129E0, 0x0) = 0 0

15678/0x9045d: open("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr/parent\0", 0x0, 0x0) = 3 0

15678/0x9045d: mmap(0x0, 0x8468, 0x1, 0x40002, 0x3, 0x0) = 0x106201000 0

15678/0x9045d: fcntl(0x3, 0x32, 0x7FF7BA112AF0)          = 0 0

```

15678/0x9045d: close(0x3) = 0 0

15678/0x9045d: munmap(0x106201000, 0x8468) = 0 0

15678/0x9045d: stat64("/Users/mishazhadnov/Desktop/wD/OS\_labs\_3t/lab3/scr/parent/0", 0x7FF7BA112F40, 0x0) = 0 0

15678/0x9045d: stat64("/usr/lib/libSystem.B.dylib/0", 0x7FF7BA111F50, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/libSystem.B.dylib/0", 0x7FF7BA111F00, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/libSystem.B.dylib/0", 0x7FF7BA111F50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/libobjc.A.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/libobjc.A.dylib/0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/libobjc.A.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_blocks.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_blocks.dylib/0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_blocks.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libxpc.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libxpc.dylib/0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libxpc.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_trace.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_trace.dylib/0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_trace.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libcorecrypto.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libcorecrypto.dylib/0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libcorecrypto.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_malloc.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_malloc.dylib/0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_malloc.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libdispatch.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libdispatch.dylib/0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libdispatch.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_featureflags.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_featureflags.dylib/0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_featureflags.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_c.dylib/0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_c.dylib/0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_c.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/libc++.1.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/libc++.1.dylib\0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/libc++.1.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/libc++abi.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/libc++abi.dylib\0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/libc++abi.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libdyld.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libdyld.dylib\0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libdyld.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_info.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_info.dylib\0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_info.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_darwin.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_darwin.dylib\0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_darwin.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_notify.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_notify.dylib\0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_notify.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_networkextension.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_networkextension.dylib\0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_networkextension.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_asl.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_asl.dylib\0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_asl.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_symptoms.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_symptoms.dylib\0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_symptoms.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_containermanager.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_containermanager.dylib\0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_containermanager.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_configuration.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_configuration.dylib\0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_configuration.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_sandbox.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_sandbox.dylib\0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_sandbox.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libquarantine.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libquarantine.dylib\0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libquarantine.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_coreservices.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_coreservices.dylib\0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_coreservices.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_m.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_m.dylib\0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem\_m.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libmacho.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libmacho.dylib\0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libmacho.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libcommonCrypto.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libcommonCrypto.dylib\0", 0x7FF7BA10FB40, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libcommonCrypto.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libunwind.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libunwind.dylib\0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libunwind.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/liboah.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/liboah.dylib\0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/liboah.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libcopyfile.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libcopyfile.dylib\0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libcopyfile.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libcompiler\_rt.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libcompiler\_rt.dylib\0", 0x7FF7BA10FB50, 0x0) = -1 2

15678/0x9045d: stat64("/usr/lib/system/libcompiler\_rt.dylib\0", 0x7FF7BA10FBA0, 0x0) = -1 2

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15678/0x9045d: stat64("/usr/lib/system/libsystem_collections.dylib\0", 0x7FF7BA10FBA0, 0x0)      = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem_collections.dylib\0", 0x7FF7BA10FB40, 0x0)      = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem_collections.dylib\0", 0x7FF7BA10FBA0, 0x0)      = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem_secinit.dylib\0", 0x7FF7BA10FBA0, 0x0)        = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem_secinit.dylib\0", 0x7FF7BA10FB40, 0x0)        = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem_secinit.dylib\0", 0x7FF7BA10FBA0, 0x0)        = -1 2

15678/0x9045d: stat64("/usr/lib/system/libremovefile.dylib\0", 0x7FF7BA10FBA0, 0x0)          = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libremovefile.dylib\0", 0x7FF7BA10FB50, 0x0)          = -1 2

15678/0x9045d: stat64("/usr/lib/system/libremovefile.dylib\0", 0x7FF7BA10FBA0, 0x0)          = -1 2

15678/0x9045d: stat64("/usr/lib/system/libkeymgr.dylib\0", 0x7FF7BA10FBA0, 0x0)            = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libkeymgr.dylib\0", 0x7FF7BA10FB50, 0x0)            = -1 2

15678/0x9045d: stat64("/usr/lib/system/libkeymgr.dylib\0", 0x7FF7BA10FBA0, 0x0)            = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem_dnssd.dylib\0", 0x7FF7BA10FBA0, 0x0)        = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem_dnssd.dylib\0", 0x7FF7BA10FB40, 0x0)        = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem_dnssd.dylib\0", 0x7FF7BA10FBA0, 0x0)        = -1 2

15678/0x9045d: stat64("/usr/lib/system/libcache.dylib\0", 0x7FF7BA10FBA0, 0x0)            = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libcache.dylib\0", 0x7FF7BA10FB50, 0x0)            = -1 2

15678/0x9045d: stat64("/usr/lib/system/libcache.dylib\0", 0x7FF7BA10FBA0, 0x0)            = -1 2

15678/0x9045d: stat64("/usr/lib/libSystem.B.dylib\0", 0x7FF7BA10FBA0, 0x0)              = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/libSystem.B.dylib\0", 0x7FF7BA10FB50, 0x0)              = -1 2

15678/0x9045d: stat64("/usr/lib/libSystem.B.dylib\0", 0x7FF7BA10FBA0, 0x0)              = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem_darwindirectory.dylib\0", 0x7FF7BA10FBA0, 0x0)      = -1 2

15678/0x9045d: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem_darwindirectory.dylib\0", 0x7FF7BA10FB40, 0x0)      = -1 2

15678/0x9045d: stat64("/usr/lib/system/libsystem_darwindirectory.dylib\0", 0x7FF7BA10FBA0, 0x0)      = -1 2

15678/0x9045d: open("/dev/dtracehelper\0", 0x2, 0x0)      = 3 0

15678/0x9045d: ioctl(0x3, 0x80086804, 0x7FF7BA111B38)      = 0 0

15678/0x9045d: close(0x3)      = 0 0

15678/0x9045d: open("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr/parent\0", 0x0, 0x0)      = 3 0

15678/0x9045d: __mac_syscall(0x7FF804EFE3B, 0x2, 0x7FF7BA1110F0)      = 0 0

15678/0x9045d: map_with_linking_np(0x7FF7BA111040, 0x1, 0x7FF7BA111070)      = -1 22

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15678/0x9045d: close(0x3) = 0 0

15678/0x9045d: mprotect(0x105DF0000, 0x4000, 0x1) = 0 0

15678/0x9045d: shared\_region\_check\_np(0xFFFFFFFFFFFFFFFF, 0x0, 0x0) = 0 0

15678/0x9045d: mprotect(0x106300000, 0x40000, 0x1) = 0 0

15678/0x9045d: access("/AppleInternal/XBS/.isChrooted\0", 0x0, 0x0) = -1 2

15678/0x9045d: bsdthread\_register(0x7FF8043E2B9C, 0x7FF8043E2B88, 0x2000) = 1073742303 0

15678/0x9045d: getpid(0x0, 0x0, 0x0) = 15678 0

15678/0x9045d: shm\_open(0x7FF804285F42, 0x0, 0x4284388) = 3 0

15678/0x9045d: fstat64(0x3, 0x7FF7BA112060, 0x0) = 0 0

15678/0x9045d: mmap(0x0, 0x4000, 0x1, 0x40001, 0x3, 0x0) = 0x105DFA000 0

15678/0x9045d: close(0x3) = 0 0

15678/0x9045d: ioctl(0x2, 0x4004667A, 0x7FF7BA112124) = 0 0

15678/0x9045d: mprotect(0x106206000, 0x1000, 0x0) = 0 0

15678/0x9045d: mprotect(0x10620D000, 0x1000, 0x0) = 0 0

15678/0x9045d: mprotect(0x10620E000, 0x1000, 0x0) = 0 0

15678/0x9045d: mprotect(0x106215000, 0x1000, 0x0) = 0 0

15678/0x9045d: mprotect(0x106201000, 0x98, 0x1) = 0 0

15678/0x9045d: mprotect(0x106201000, 0x98, 0x3) = 0 0

15678/0x9045d: mprotect(0x106201000, 0x98, 0x1) = 0 0

15678/0x9045d: mprotect(0x105DFE000, 0x1000, 0x1) = 0 0

15678/0x9045d: mprotect(0x106216000, 0x98, 0x1) = 0 0

15678/0x9045d: mprotect(0x106216000, 0x98, 0x3) = 0 0

15678/0x9045d: mprotect(0x106216000, 0x98, 0x1) = 0 0

15678/0x9045d: mprotect(0x106201000, 0x98, 0x3) = 0 0

15678/0x9045d: mprotect(0x106201000, 0x98, 0x1) = 0 0

15678/0x9045d: mprotect(0x105DFE000, 0x1000, 0x3) = 0 0

15678/0x9045d: mprotect(0x105DFE000, 0x1000, 0x1) = 0 0

15678/0x9045d: mprotect(0x106300000, 0x40000, 0x3) = 0 0

15678/0x9045d: mprotect(0x106300000, 0x40000, 0x1) = 0 0

15678/0x9045d: issetugid(0x0, 0x0, 0x0) = 0 0

15678/0x9045d: mprotect(0x106300000, 0x40000, 0x3) = 0 0

```

15678/0x9045d: getentropy(0x7FF7BA111950, 0x20, 0x0)      = 0 0

15678/0x9045d: mprotect(0x106300000, 0x40000, 0x1)      = 0 0

15678/0x9045d: mprotect(0x106300000, 0x40000, 0x3)      = 0 0

15678/0x9045d: mprotect(0x106300000, 0x40000, 0x1)      = 0 0

15678/0x9045d: getattrlist("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr/parent\0", 0x7FF7BA112000, 0x7FF7BA112018) = 0 0

15678/0x9045d: access("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr\0", 0x4, 0x0)      = 0 0

15678/0x9045d: open("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr\0", 0x0, 0x0)      = 3 0

15678/0x9045d: fstat64(0x3, 0x7F84BE704530, 0x0)      = 0 0

15678/0x9045d: csctl(0x0, 0x7FF7BA11225C, 0x4)      = -1 1

15678/0x9045d: fgetattrlist(0x3, 0x7FF7BA112270, 0x7FF7BA112290)      = 0 0

15678/0x9045d: __mac_syscall(0x7FF80F7A36A4, 0x2, 0x7FF7BA112290)      = 0 0

15678/0x9045d:fcntl(0x3, 0x32, 0x7FF7BA111F10)      = 0 0

15678/0x9045d: close(0x3)      = 0 0

15678/0x9045d: open("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr/Info.plist\0", 0x0, 0x0)      = -1 2

15678/0x9045d: proc_info(0x2, 0x3D3E, 0xD)      = 64 0

15678/0x9045d: csops_audittoken(0x3D3E, 0x10, 0x7FF7BA112260)      = -1 22

dtrace: error on enabled probe ID 1741 (ID 573: syscall::sysctl:return): invalid kernel access in action #11 at DIF offset 28

dtrace: error on enabled probe ID 1741 (ID 573: syscall::sysctl:return): invalid kernel access in action #11 at DIF offset 28

15678/0x9045d: csops(0x3D3E, 0x0, 0x7FF7BA1126C4)      = 0 0

15678/0x9045d: mprotect(0x106300000, 0x40000, 0x3)      = 0 0

15678/0x9045d: getrlimit(0x1008, 0x7FF7BA112FA0, 0x0)      = 0 0

15678/0x9045d: fstat64(0x0, 0x7FF7BA112F88, 0x0)      = 0 0

15678/0x9045d: ioctl(0x0, 0x4004667A, 0x7FF7BA112FD4)      = 0 0

test_ok.txt

(child)fruncate: here is a problem

: Invalid argument

shm_open: here is a problem

: No such file or directory

dtrace: error on enabled probe ID 1714 (ID 961: syscall::read_nocancel:return): invalid kernel access in action #13 at DIF offset 68

15678/0x9045d: open("test_ok.txt\0", 0x0, 0x0)      = 3 0

15678/0x9045d: fstat64(0x3, 0x7FF7BA113690, 0x0)      = 0 0

15678/0x9045d: fork()      = 15683 0

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```

15683/0x904f3: fork()          = 0 0

15683/0x904f3: thread_selfid(0x0, 0x0, 0x0)      = 591091 0

15683/0x904f3: bsdthread_register(0x7FF8043E2B9C, 0x7FF8043E2B88, 0x2000)    = -1 22

15683/0x904f3: mprotect(0x106216000, 0x98, 0x3)    = 0 0

15683/0x904f3: mprotect(0x106216000, 0x98, 0x1)    = 0 0

15683/0x904f3: dup2(0x3, 0x0, 0x0)                = 0 0

dtrace: error on enabled probe ID 1688 (ID 287: syscall::execve:return): invalid address (0x105def120) in action #12 at DIF offset 12

15683/0x904f4: fork()          = 0 0

15683/0x904f4: mprotect(0x104451000, 0x8000, 0x1)    = 0 0

15683/0x904f4: thread_selfid(0x0, 0x0, 0x0)      = 591092 0

15683/0x904f4: shared_region_check_np(0x7FF7BC285900, 0x0, 0x0)            = 0 0

15683/0x904f4: thread_selfid(0x0, 0x0, 0x0)      = 591092 0

15683/0x904f4: getpid(0x0, 0x0, 0x0)             = 15683 0

15683/0x904f4: proc_info(0xF, 0x3D43, 0x0)       = 0 0

15683/0x904f4: munmap(0x1043B1000, 0xA0000)        = 0 0

15683/0x904f4: munmap(0x104451000, 0x8000)        = 0 0

15683/0x904f4: munmap(0x104459000, 0x4000)        = 0 0

15683/0x904f4: munmap(0x10445D000, 0x4000)        = 0 0

15683/0x904f4: munmap(0x104461000, 0x58000)        = 0 0

15683/0x904f4: open(".", 0, 0x100000, 0x0)        = 4 0

15683/0x904f4: fcntl(0x4, 0x32, 0x7FF7BC285290)    = 0 0

15683/0x904f4: close(0x4)                        = 0 0

15683/0x904f4: fsgetpath(0x7FF7BC2852A0, 0x400, 0x7FF7BC285288)            = 57 0

15683/0x904f4: fsgetpath(0x7FF7BC2852A0, 0x400, 0x7FF7BC285288)            = 14 0

15683/0x904f4: csctl(0x0, 0x7FF7BC2856AC, 0x4)     = -1 1

15683/0x904f4: __mac_syscall(0x7FF8040EFE3B, 0x2, 0x7FF7BC285510)          = 0 0

15683/0x904f4: csctl(0x0, 0x7FF7BC2856BC, 0x4)     = -1 1

15683/0x904f4: __mac_syscall(0x7FF8040ECDC6, 0x5A, 0x7FF7BC285650)          = 0 0

dtrace: error on enabled probe ID 1741 (ID 573: syscall::sysctl:return): invalid kernel access in action #11 at DIF offset 28

dtrace: error on enabled probe ID 1741 (ID 573: syscall::sysctl:return): invalid kernel access in action #11 at DIF offset 28

dtrace: error on enabled probe ID 1741 (ID 573: syscall::sysctl:return): invalid kernel access in action #11 at DIF offset 28

dtrace: error on enabled probe ID 1741 (ID 573: syscall::sysctl:return): invalid kernel access in action #11 at DIF offset 28

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15683/0x904f4: open("/^0", 0x20100000, 0x0)          = 4 0

15683/0x904f4: openat(0x4, "System/Cryptexes/OS\0", 0x100000, 0x0)      = 5 0

15683/0x904f4: dup(0x5, 0x0, 0x0)                  = 6 0

15683/0x904f4: fstatat64(0x5, 0x7FF7BC2843F1, 0x7FF7BC2847F0)          = 0 0

15683/0x904f4: openat(0x5, "System/Library/dyld/^0", 0x100000, 0x0)      = 7 0

15683/0x904f4: fcntl(0x7, 0x32, 0x7FF7BC284480)          = 0 0

15683/0x904f4: dup(0x7, 0x0, 0x0)                  = 8 0

15683/0x904f4: dup(0x6, 0x0, 0x0)                  = 9 0

15683/0x904f4: close(0x4)                          = 0 0

15683/0x904f4: close(0x6)                          = 0 0

15683/0x904f4: close(0x5)                          = 0 0

15683/0x904f4: close(0x7)                          = 0 0

15683/0x904f4: shared_region_check_np(0x7FF7BC284D68, 0x0, 0x0)          = 0 0

15683/0x904f4: fsgetpath(0x7FF7BC2852D0, 0x400, 0x7FF7BC285208)        = 83 0

15683/0x904f4: fcntl(0x9, 0x32, 0x7FF7BC2852D0)          = 0 0

15683/0x904f4: close(0x9)                          = 0 0

15683/0x904f4: close(0x8)                          = 0 0

15683/0x904f4: getfsstat64(0x0, 0x0, 0x2)            = 7 0

15683/0x904f4: getfsstat64(0x104202AA0, 0x3B48, 0x2)      = 7 0

15683/0x904f4: getatrlist("/^0", 0x7FF7BC285210, 0x7FF7BC285180)        = 0 0

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/System/Library/dyld/dyld_shared_cache_x86_64h\0", 0x7FF7BC285548, 0x0) = 0 0

dtrace: error on enabled probe ID 1690 (ID 845: syscall::stat64:return): invalid address (0x0) in action #12 at DIF offset 12

15683/0x904f4: stat64("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr/child\0", 0x7FF7BC2849E0, 0x0)      = 0 0

15683/0x904f4: open("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr/child\0", 0x0, 0x0)          = 4 0

15683/0x904f4: mmap(0x0, 0x8270, 0x1, 0x40002, 0x4, 0x0)      = 0x103C86000 0

15683/0x904f4: fcntl(0x4, 0x32, 0x7FF7BC284AF0)          = 0 0

15683/0x904f4: close(0x4)                          = 0 0

15683/0x904f4: munmap(0x103C86000, 0x8270)            = 0 0

15683/0x904f4: stat64("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr/child\0", 0x7FF7BC284F40, 0x0)      = 0 0

15683/0x904f4: stat64("/usr/lib/libSystem.B.dylib\0", 0x7FF7BC283F50, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/libSystem.B.dylib\0", 0x7FF7BC283F00, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/libSystem.B.dylib\0", 0x7FF7BC283F50, 0x0) = -1 2

```

15683/0x904f4: stat64("/usr/lib/libobjc.A.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/libobjc.A.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/libobjc.A.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_blocks.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_blocks.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_blocks.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libxpc.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libxpc.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libxpc.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_trace.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_trace.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_trace.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libcorecrypto.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libcorecrypto.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libcorecrypto.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_malloc.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_malloc.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_malloc.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libdispatch.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libdispatch.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libdispatch.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_featureflags.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_featureflags.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_featureflags.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_c.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_c.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_c.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/libc++.1.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/libc++.1.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/libc++.1.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/libc++abi.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/libc++abi.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/libc++abi.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libdyld.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libdyld.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libdyld.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_info.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_info.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_info.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_darwin.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_darwin.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_darwin.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_notify.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_notify.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_notify.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_networkextension.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_networkextension.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_networkextension.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_asl.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_asl.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_asl.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_symptoms.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_symptoms.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_symptoms.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_containermanager.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_containermanager.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_containermanager.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_configuration.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_configuration.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_configuration.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_sandbox.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_sandbox.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_sandbox.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libquarantine.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libquarantine.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libquarantine.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_coreservices.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_coreservices.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_coreservices.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_m.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_m.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_m.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libmacho.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libmacho.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libmacho.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libcommonCrypto.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libcommonCrypto.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libcommonCrypto.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libunwind.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libunwind.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libunwind.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/liboah.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/liboah.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/liboah.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libcopyfile.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libcopyfile.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libcopyfile.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libcompiler\_rt.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libcompiler\_rt.dylib\0", 0x7FF7BC281B50, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libcompiler\_rt.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_collections.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_collections.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_collections.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_secinit.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem\_secinit.dylib\0", 0x7FF7BC281B40, 0x0) = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem\_secinit.dylib\0", 0x7FF7BC281BA0, 0x0) = -1 2

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15683/0x904f4: stat64("/usr/lib/system/libremovefile.dylib\0", 0x7FF7BC281BA0, 0x0)      = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libremovefile.dylib\0", 0x7FF7BC281B50, 0x0)      = -1 2

15683/0x904f4: stat64("/usr/lib/system/libremovefile.dylib\0", 0x7FF7BC281BA0, 0x0)      = -1 2

15683/0x904f4: stat64("/usr/lib/system/libkeymgr.dylib\0", 0x7FF7BC281BA0, 0x0)        = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libkeymgr.dylib\0", 0x7FF7BC281B50, 0x0)        = -1 2

15683/0x904f4: stat64("/usr/lib/system/libkeymgr.dylib\0", 0x7FF7BC281BA0, 0x0)        = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem_dnssd.dylib\0", 0x7FF7BC281BA0, 0x0)    = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem_dnssd.dylib\0", 0x7FF7BC281B40, 0x0)    = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem_dnssd.dylib\0", 0x7FF7BC281BA0, 0x0)    = -1 2

15683/0x904f4: stat64("/usr/lib/system/libcache.dylib\0", 0x7FF7BC281BA0, 0x0)        = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libcache.dylib\0", 0x7FF7BC281B50, 0x0)        = -1 2

15683/0x904f4: stat64("/usr/lib/system/libcache.dylib\0", 0x7FF7BC281BA0, 0x0)        = -1 2

15683/0x904f4: stat64("/usr/lib/libSystem.B.dylib\0", 0x7FF7BC281BA0, 0x0)          = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/libSystem.B.dylib\0", 0x7FF7BC281B50, 0x0)          = -1 2

15683/0x904f4: stat64("/usr/lib/libSystem.B.dylib\0", 0x7FF7BC281BA0, 0x0)          = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem_darwindirectory.dylib\0", 0x7FF7BC281BA0, 0x0)      = -1 2

15683/0x904f4: stat64("/System/Volumes/Preboot/Cryptexes/OS/usr/lib/system/libsystem_darwindirectory.dylib\0", 0x7FF7BC281B40, 0x0)  = -1 2

15683/0x904f4: stat64("/usr/lib/system/libsystem_darwindirectory.dylib\0", 0x7FF7BC281BA0, 0x0)      = -1 2

15683/0x904f4: open("/dev/dtracehelper\0", 0x2, 0x0)      = 4 0

15683/0x904f4: ioctl(0x4, 0x80086804, 0x7FF7BC283B38)      = 0 0

15683/0x904f4: close(0x4)      = 0 0

15683/0x904f4: open("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr/child\0", 0x0, 0x0)      = 4 0

15683/0x904f4: __mac_syscall(0x7FF8040EFE3B, 0x2, 0x7FF7BC2830F0)      = 0 0

15683/0x904f4: map_with_linking_np(0x7FF7BC2830A0, 0x1, 0x7FF7BC2830D0)      = -1 22

15683/0x904f4: close(0x4)      = 0 0

15683/0x904f4: mprotect(0x103C7E000, 0x4000, 0x1)      = 0 0

15683/0x904f4: shared_region_check_np(0xFFFFFFFFFFFFFFFF, 0x0, 0x0)      = 0 0

15683/0x904f4: mprotect(0x104200000, 0x40000, 0x1)      = 0 0

15683/0x904f4: access("/AppleInternal/XBS/.isChrooted\0", 0x0, 0x0)      = -1 2

15683/0x904f4: bsdthread_register(0x7FF8043E2B9C, 0x7FF8043E2B88, 0x2000)      = 1073742303 0

15683/0x904f4: getpid(0x0, 0x0, 0x0)      = 15683 0

15683/0x904f4: shm_open(0x7FF804285F42, 0x0, 0x4284388)      = 4 0

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15683/0x904f4: fstat64(0x4, 0x7FF7BC284060, 0x0)      = 0 0

15683/0x904f4: mmap(0x0, 0x4000, 0x1, 0x40001, 0x4, 0x0) = 0x103C88000 0

15683/0x904f4: close(0x4)                            = 0 0

15683/0x904f4: ioctl(0x2, 0x4004667A, 0x7FF7BC284124) = 0 0

15683/0x904f4: mprotect(0x103C91000, 0x1000, 0x0)     = 0 0

15683/0x904f4: mprotect(0x103C98000, 0x1000, 0x0)     = 0 0

15683/0x904f4: mprotect(0x103C99000, 0x1000, 0x0)     = 0 0

15683/0x904f4: mprotect(0x103CA0000, 0x1000, 0x0)     = 0 0

15683/0x904f4: mprotect(0x103C8C000, 0x98, 0x1)       = 0 0

15683/0x904f4: mprotect(0x103C8C000, 0x98, 0x3)       = 0 0

15683/0x904f4: mprotect(0x103C8C000, 0x98, 0x1)       = 0 0

15683/0x904f4: mprotect(0x103CA1000, 0x1000, 0x1)     = 0 0

15683/0x904f4: mprotect(0x103CA2000, 0x98, 0x1)       = 0 0

15683/0x904f4: mprotect(0x103CA2000, 0x98, 0x3)       = 0 0

15683/0x904f4: mprotect(0x103CA2000, 0x98, 0x1)       = 0 0

15683/0x904f4: mprotect(0x103C8C000, 0x98, 0x3)       = 0 0

15683/0x904f4: mprotect(0x103C8C000, 0x98, 0x1)       = 0 0

15683/0x904f4: mprotect(0x103CA1000, 0x1000, 0x3)     = 0 0

15683/0x904f4: mprotect(0x103CA1000, 0x1000, 0x1)     = 0 0

15683/0x904f4: mprotect(0x104200000, 0x40000, 0x3)    = 0 0

15683/0x904f4: mprotect(0x104200000, 0x40000, 0x1)    = 0 0

15683/0x904f4: issetugid(0x0, 0x0, 0x0)              = 0 0

15683/0x904f4: mprotect(0x104200000, 0x40000, 0x3)    = 0 0

15683/0x904f4: getentropy(0x7FF7BC283950, 0x20, 0x0)  = 0 0

15683/0x904f4: mprotect(0x104200000, 0x40000, 0x1)    = 0 0

15683/0x904f4: mprotect(0x104200000, 0x40000, 0x3)    = 0 0

15683/0x904f4: mprotect(0x104200000, 0x40000, 0x1)    = 0 0

15683/0x904f4: getattrlist("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr/child\0", 0x7FF7BC284000, 0x7FF7BC284018) = 0 0

15683/0x904f4: access("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr\0", 0x4, 0x0)          = 0 0

15683/0x904f4: open("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr\0", 0x0, 0x0)          = 4 0

15683/0x904f4: fstat64(0x4, 0x7F9BC8704530, 0x0)      = 0 0

15683/0x904f4: csrtcl(0x0, 0x7FF7BC28425C, 0x4)       = -1 1

```

```

15683/0x904f4: fgetatrlst(0x4, 0x7FF7BC284270, 0x7FF7BC284290)      = 0 0

15683/0x904f4: __mac_syscall(0x7FF80F7A36A4, 0x2, 0x7FF7BC284290)  = 0 0

15683/0x904f4: fcntl(0x4, 0x32, 0x7FF7BC283F10)                  = 0 0

15683/0x904f4: close(0x4)                                          = 0 0

15683/0x904f4: open("/Users/mishazhadnov/Desktop/wD/OS_labs_3t/lab3/scr/Info.plist\0", 0x0, 0x0)  = -1 2

15683/0x904f4: proc_info(0x2, 0x3D43, 0xD)                        = 64 0

15683/0x904f4: csops_audittoken(0x3D43, 0x10, 0x7FF7BC284260)     = -1 22

dtrace: error on enabled probe ID 1741 (ID 573: syscall::syscall:return): invalid kernel access in action #11 at DIF offset 28

dtrace: error on enabled probe ID 1741 (ID 573: syscall::syscall:return): invalid kernel access in action #11 at DIF offset 28

15683/0x904f4: csops(0x3D43, 0x0, 0x7FF7BC2846C4)                  = 0 0

15683/0x904f4: mprotect(0x104200000, 0x40000, 0x3)                 = 0 0

15683/0x904f4: shm_open(0x103C7DEF8, 0x202, 0x180)                 = 4 0

15683/0x904f4: fstat64(0x0, 0x7FF7BC2856B8, 0x0)                  = 0 0

15683/0x904f4: ftruncate(0x4, 0x29, 0x0)                           = -1 22

15683/0x904f4: writev_nocancel(0x2, 0x7FF7BC284E20, 0x4)          = 56 0

15683/0x904f4: shm_unlink(0x103C7DEF8, 0x0, 0x0)                  = 0 0

15683/0x904f4: close(0x4)                                          = 0 0

15678/0x9045d: wait4(0xFFFFFFFFFFFFFFFF, 0x0, 0x0)                = 15683 0

15678/0x9045d: shm_open(0x105DEFF38, 0x0, 0x180)                  = -1 2

15678/0x9045d: writev_nocancel(0x2, 0x7FF7BA112E00, 0x4)         = 57 0

```

## **Вывод**

Данная лабораторная работа, на мой взгляд, служит отличным дополнением к первой лабораторной работе. Благодаря поставленному заданию я расширил свой функционал работы с процессами и освоил принцип реализации file-mapping.