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Кафедра «Информационных технологий и систем»

Дисциплина «Операционные системы»

Отчет по лабораторной работе

«Организация FS в UNIX. Работа с файлами. Понятие о memory mapped files.»

Выполнил студент группы 9091

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**Цель лабораторной работы**

Цель работы: познакомиться с FS и memory mapped files в UNIX. Научиться работать с файлами в UNIX.

**Исходный текст программы**

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| main.c |
| #include "stdio.h"  #include "fcntl.h"  #include "stdlib.h"  #include "unistd.h"  #include "sys/stat.h"  #include "sys/mman.h"  #include "sys/types.h"  int main(int argv, char\* argc[])  {  if(argv <= 2)  {  printf("Error! Not enough arguments! There are 2 arguments required: input file name, output file name\n");  return -1;  }  const char\* inputFilename = argc[1];  const char\* outputFilename = argc[2];  int inputFile = open(inputFilename, O\_RDONLY, 0600);  if(inputFile < 0)  {  printf("Error! Couldn't create or open file!");  return -1;  }  struct stat inputFileStat;  if(fstat(inputFile, &inputFileStat) == -1)  {  printf("Error! Couldn't get stat");  return -1;  }  int outputFile = open(outputFilename, O\_RDWR | O\_CREAT, 0600);  if(outputFile < 0)  {  printf("Error! Couldn't create or open file!");  return -1;  }  int maxlength = inputFileStat.st\_size;  ftruncate(outputFile, maxlength);  char\* mmapOutputFile = (char\*) mmap(NULL, maxlength, PROT\_WRITE | PROT\_READ, MAP\_SHARED, outputFile, 0);  if(mmapOutputFile == MAP\_FAILED)  {  printf("Error with mmap()! \n");  return -1;  }    close(outputFile);  ssize\_t outputLength = read(inputFile, mmapOutputFile, maxlength);  close(inputFile);  printf("Input file symbols count: %i\n", maxlength);  printf("Output file symbols count: %li\n", outputLength);  munmap((void\*)mmapOutputFile, maxlength);  return 0;  } |

**Результат выполнения программы**

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| Вывод в терминале |
| >> make  gcc main.c -o main  ./main input output  Input file symbols count: 862  Output file symbols count: 862 |

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| --- |
| Input File |
| mmap() creates a new mapping in the virtual address space of the call‐  ing process. The starting address for the new mapping is specified in  addr. The length argument specifies the length of the mapping (which  must be greater than 0).  If addr is NULL, then the kernel chooses the (page-aligned) address at  which to create the mapping; this is the most portable method of creat‐  ing a new mapping.  If addr is not NULL, then the kernel takes it as a  hint about where to place the mapping; on Linux, the kernel will pick a  nearby page boundary (but always above or equal to the value specified  by /proc/sys/vm/mmap\_min\_addr) and attempt to create the mapping there.  If another mapping already exists there, the kernel picks a new address  that may or may not depend on the hint. The address of the new mapping  is returned as the result of the call. |

|  |
| --- |
| Output file |
| mmap() creates a new mapping in the virtual address space of the call‐  ing process. The starting address for the new mapping is specified in  addr. The length argument specifies the length of the mapping (which  must be greater than 0).  If addr is NULL, then the kernel chooses the (page-aligned) address at  which to create the mapping; this is the most portable method of creat‐  ing a new mapping.  If addr is not NULL, then the kernel takes it as a  hint about where to place the mapping; on Linux, the kernel will pick a  nearby page boundary (but always above or equal to the value specified  by /proc/sys/vm/mmap\_min\_addr) and attempt to create the mapping there.  If another mapping already exists there, the kernel picks a new address  that may or may not depend on the hint. The address of the new mapping  is returned as the result of the call. |

**Вывод:**

В ходе выполнения лабораторной работы, я познакомился с FS и memory mapped files в UNIX. Научиться работать с файлами в UNIX.