



МИЭТ

Национальный исследовательский университет «МИЭТ»


Кафедра ПКИМС

Компьютерные технологии в научных исследованиях

Семинар №3

Построение вычислений

```
1 #!/bin/bash
2 #INPUT_SAMPLE_LIST=$1
3 cd /Volumes/PhilDrive_EMS/TestDec7/snv_postp
4
11 . paths.txt
12
30
31 echo "Debug level set for $DEBUG_LEVEL"
32 echo "log found in scripts directory"
33
50 cp $HIGH_SNP_OUT ./
51 cp $LOW_SNP_OUT ./
52 cp $GERM_SNP_OUT ./
53 # echo "${SCRIPT_DIR}/run_somatic_mu
54 if [ $DEBUG_LEVEL
55 then
56 echo "INFO: ${SCRIPT
57 `basename ${LOW_SNP
58 ${D_BAM_FILE} ${G
59
60 fi
61 ${SCRIPT_DIR}/run_somatic_mu_detection_cha
62
```





Запись текстовых данных

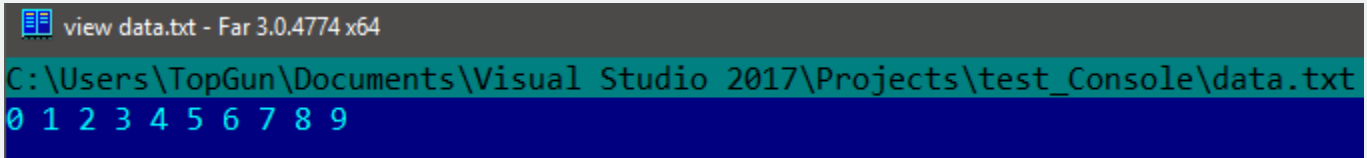
```
#include <fstream>
using namespace std;

#define ARRAY_SIZE 10

int main() {
    int mas[ARRAY_SIZE];
    for (int i = 0; i < ARRAY_SIZE; ++i)
        mas[i] = i;

    fstream file_txt("data.txt", ios::out);
    for (int i = 0; i < ARRAY_SIZE; ++i)
        file_txt << mas[i] << " ";
    file_txt.close();

    return 0;
}
```



view data.txt - Far 3.0.4774 x64

C:\Users\TopGun\Documents\Visual Studio 2017\Projects\test_Console\data.txt

0 1 2 3 4 5 6 7 8 9



Запись бинарных данных

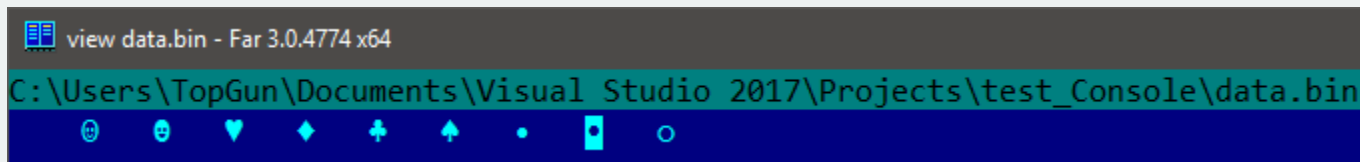
```
#include <fstream>
using namespace std;

#define ARRAY_SIZE 10

int main() {
    int mas[ARRAY_SIZE];
    for (int i = 0; i < ARRAY_SIZE; ++i)
        mas[i] = i;

    fstream file_bin("data.bin", ios::out | ios::binary);
    file_bin.write((char *)&mas, sizeof(int)*ARRAY_SIZE);
    file_bin.close();

    return 0;
}
```

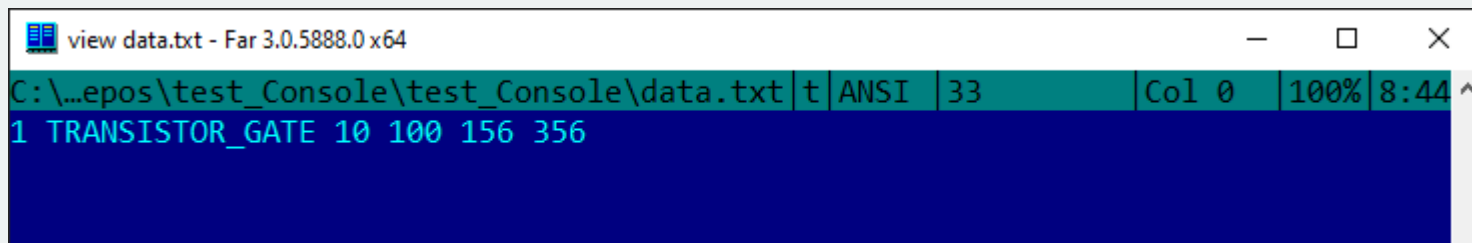


Преимущество использования бинарных данных (1)

```
struct LayoutObject {  
    int  type;  
    char name[16];  
    int  x1, y1, x2, y2;  
};
```

```
LayoutObject obj = {1, "TRANSISTOR_GATE", 10, 100, 156, 356};
```

```
fstream file_txt("data.txt", ios::out);  
file_txt << obj.type << " ";  
file_txt << obj.name << " ";  
file_txt << obj.x1 << " " << obj.y1 << " "  
        << obj.x2 << " " << obj.y2 << " ";  
file_txt.close();
```



```
view data.txt - Far 3.0.5888.0 x64  
C:\...\epos\test_Console\test_Console\data.txt | t | ANSI | 33 | Col 0 | 100% | 8:44 ^  
1 TRANSISTOR_GATE 10 100 156 356
```

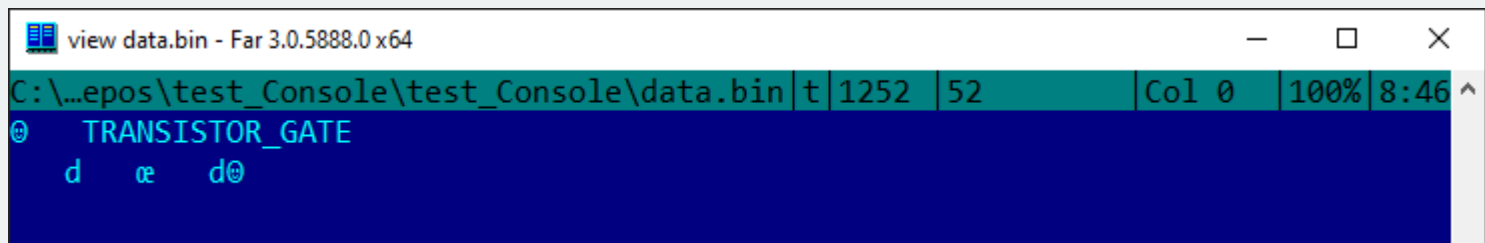


Преимущество использования бинарных данных (2)

```
struct LayoutObject {  
    int type;  
    char name[16];  
    int x1, y1, x2, y2;  
};
```

```
LayoutObject obj = {1, "TRANSISTOR_GATE", 10, 100, 156, 356};
```

```
fstream file_bin("data.bin", ios::out | ios::binary);  
file_bin.write((char *)&obj, sizeof(LayoutObject));  
file_bin.close();
```





Текстовые и бинарные данные в САПР (1)

```
view lab_3.tr0 - Far 3.0.4774 x64
C:\Users\TopGun\Documents\Visual Stud
HEADER
"PSFVersion" "1.00"
"simulator" "KSI"
"runtype" "Transient Analysis"
TYPE
"node" FLOAT DOUBLE PROP(
"key" "node"
)
"branch" FLOAT DOUBLE PROP(
"key" "branch"
)
"sweep" FLOAT DOUBLE
SWEEP
"time" "sweep"
TRACE
"group" GROUP 4
"v(1)" "node"
"v(2)" "node"
"v(3)" "node"
"i(d1:1)" "branch"
VALUE
"time" 0.000000e+00
"group"
0.000000e+00
0.000000e+00
0.000000e+00
0.000000e+00
"time" 1.000000e-09
```

```
C:\Users\TopGun\netlist.csdf - Notepad++
File Edit Search View Encoding Language Settings Macro Run Plugins Window ?
netlist.sp netlist.csdf
1 #H
2 SOURCE='SYMSPICE'
3 TITLE='* # file name: C:\Users\TopGun\netlist
4 SUBTITLE=''
5 TIME='19:39:10' DATE='28/9/2019'
6 ANALYSIS='TR' TEMPERATURE=' 2.500000E+001' SWEEPVAR='TIME'
7 COMPLEXVALUES='NO' FORMAT='1 VOLTSorAMPS;EFLOAT'
8 XBEGIN=' 0.000000e+000' XEND=' 1.000000e-009'
9 NODES=' 3'
10 #N 'v(1)' 'v(2)' 'i(v1)'
11
12 #C 0.00000000e+000 3 0.00000000e+000 0.00000000e+000
13 -0.00000000e+000
14
15 #C 2.00000000e-011 3 2.00000000e-002 1.99999998e-010
16 -1.99999998e-005
17
18 #C 4.00000000e-011 3 4.00000000e-002 3.99999996e-010
19 -3.99999996e-005
3 6.00000000e-002 5.99999994e-010
3 8.00000000e-002 7.99999992e-010
3 1.00000000e-001 9.99999990e-010
el: 0 | 0 Unix (LF) UTF-8 INS
```

```
C:\Users\TopGun\netlist.nut - Notepad++
File Edit Search View Encoding Language Settings Macro Run Plugins Window ?
netlist.sp netlist.csdf netlist.nut
1 Title: // Generated for: SymSpice
2 Date: 7:40:14 PM, Sat Sep 28, 2019
3 Plotname: Transient Analysis `tran1': time = (0.s -> 1.e-09s)
4 Flags: real
5 No. Variables: 4
6 No. Points: 50
7 Variables:
8 0 time s
9 1 1 voltage
10 2 2 voltage
11 3 vl:p current
12 Values:
13 0
14 0
15 0
16 0
17 1 2.00000000e-11
18 2.00000000e-02
19 1.99999998e-10
20 -1.99999998e-05
21 2 4.00000000e-11
22 4.00000000e-02
23 3.99999996e-10
24 -3.99999996e-05
25 3 6.00000000e-11
26 6.00000000e-02
27 5.99999994e-10
```

File length: 3780 lines: 213 Ln: 1 Col: 1 Sel: 0 | 0 Unix (LF) UTF-8 INS

Текстовые и бинарные данные в САПР (2)

The screenshot shows a Notepad++ window with two files open: `netlist.sp` and `netlist.nut`. The `netlist.nut` file is the active document and contains the following text:

```

1 Title: // Generated for: SymSpice
2 Date: 7:40:14 PM, Sat Sep 28, 2019
3 Plotname: Transient Analysis `tran1': time = (0.s -> 1.e-09s)
4 Flags: real
5 No. Variables: 4
6 No. Points: 50
7 Variables:
8     0   time   s
9     1   1   voltage
10    2   2   voltage
11    3   vl:p   current
12 Values:
13    0     0
14    0     0
15    0     0
16    0     0
17    1  2.000000000e-11
18    1  2.000000000e-02
19    1  1.99999998e-10
20    1 -1.99999998e-05
21    2  4.000000000e-11
22    2  4.000000000e-02
23    2  3.99999996e-10
24    2 -3.99999996e-05
25    3  6.000000000e-11
26    3  6.000000000e-02
27    3  5.99999994e-10

```

The status bar at the bottom indicates: `Ln: 1 Col: 1 Sel`.

```
E:\SymicaFree\test_NOT_nutbin.tr00
Title: // Generated for: SymSpice
Date: 1:22:05 PM, Thu Oct 21, 2021
Plotname: DC Analysis `dc1': vin:dc = (0.V -> 5.0 V)
Flags: real
No. Variables: 6
No. Points: 501
Variables:
    0      volt      V
    1      in        voltage
    2      out       voltage
    3      vcc       voltage
    4      vcc:p     current
    5      vin:p     current

Binary:
    @!!яяя2w@0J      S!↓Гггfюф      ?,z6G°J{?,z6G°J{0!!яяя2oS@J      S!↓Г!$L8ф      ?"z6G°J{?"z6G°J{0!!яяя1h†@J
    =pJЧ
    ?.
    =pJЧ
    @!!яяя.8&@J      S!↓Ггфb:ф      ?N°TATATATATAT°J?N°TATATATATAT°J@!!яяя.'€@J      S!↓Г→.йф      ?j(xBЦ\)?j(xBЦ\@!!яяя-9J@J      S!↓Г-y'ф
    =pH?AJЧ
    =pH@!!яяя,у_@J      S!↓Г"х1#ф      ?Бл...▲ёQм?Бл...▲ёQм@!!яэ~)м±@J      sЛЗп=гPф      ?Г333333?Г333333@!!япЛс °@J      s1(+0_+
    =pJЧ
    ?З
    =pJЧ
    @!!яяяTЕ+@J      sКМmb0Xф      ?ИQл...▲ёR?ИQл...▲ёR@!!я--Ato@J      sГёьw°Ryф      ?Й°TATATATATAT°J?Й°TATATATATAT°J@!!юbl!!Ik@J      s°2н:w%фф
    =q?HрJЧ
    =q@!!эЦ $гГ@J      sЩц.pudKф      ?OёQл...▲ё?OёQл...▲ё@!!э+y~h+@J      sГ~°,гаA0ф      ?P      ?P      @!!b1♥knŷ@J      s3Yйьц)g
    =pH?PJЧ
    =pH@!!ьдёwш8@J      sЛКLE$дЮф      ?CG°Jz6H?CG°Jz6H@!!ьдшI@8@J      sP
    $Кгг'ф      ?Сл...▲ёQм?Сл...▲ёQм@!!ьJE&оф@J      sТф0°Г"~ф      ?ТУ\ (xBЦ?ТУ\ (xBЦ@!!щwIЦь!!@J      sX▼мльfPMф      ?Y333333?Y333
    =pJЧ?YЧ
    =pJЧ@!!чГ!↑kх@J      sbгjф♥-ьф      ?Фz6G°J{?Фz6G°J{0!!цГИ!P»@J      sl0ŷсj↑мф      ?X▲ёQл...▼?X▲ёQл...▼@!!х-▲♥ -@J      sa-0X]
    =pJЧ
```




Текстовые и бинарные данные в САПР (3)

```
E:\SymicaFree\test_NOT_nutascii.tr0
Title: // Generated for: SymSpice
Date: 1:22:06 PM, Thu Oct 21, 2021
Plotname: DC Analysis `dc1': vin:dc = (0.V -> 5.0 V)
Flags: real
No. Variables: 6
No. Points: 501
Variables:
      0      volt    V
      1      in     voltage
      2      out    voltage
      3      vcc     voltage
      4      vcc:p   current
      5      vin:p   current

Values:
0      0
      0
      4.999999999e+00
      5
      -1.005000000e-11
      0
1      1.000000000e-02
      1.000000000e-02
      4.999999999e+00
      5
      -1.00500001e-11
      0
```

40 600 Байт

```
E:\SymicaFree\test_NOT_nutbin.tr0
Title: // Generated for: SymSpice
Date: 1:22:05 PM, Thu Oct 21, 2021
Plotname: DC Analysis `dc1': vin:dc = (0.V -> 5.0 V)
Flags: real
No. Variables: 6
No. Points: 501
Variables:
      0      volt    V
      1      in     voltage
      2      out    voltage
      3      vcc     voltage
      4      vcc:p   current
      5      vin:p   current

Binary:
      @!!яая2w@! S!↓Гггfwn0b ?,,z6G@!{?,z6G@!{@!!я
=pJЧ
?.
=pJЧ
@!!яая.8&@! S!↓Гггfwb:б ?N!отмтмтмтмтм!ль?N!отмтмтмтмтм!ль@!!яая.'€@! S!↓Гггfwb:б
=pH?AJЧ
=pH@!!яая,У_@! S!↓Гггx1#б ?Бл...▲ёQм?Бл...▲ёQм@!!яэ~)мф@!
=pJЧ
?3
=pJЧ
@!!яг}TЁ+@! sKМmb0XJб ?ИQл...▲ёR?ИQл...▲ёR@!!я--Ato@! sГггfwb:б
=q?HрJЧ
```

24 333 Байт

Как Linux определяет тип файла? (4)

```

mc [topgun@localhost.localdomain]:/usr/bin
/usr/bin/gcc-7 0x00000007 0%
00000000 7F 45 4C 46 01 01 01 00 00 00 00 00 00 00 00 00 .ELF
00000010 02 00 03 00 01 00 00 00 CD 84 0A 08 34 00 00 00 .....4..
00000020 70 3A 0F 00 00 00 00 00 34 00 20 00 0A 00 28 00 p:.....4..(
00000030 20 00 1F 00 06 00 00 00 34 00 00 00 34 80 04 08 .....4..4..
00000040 34 80 04 08 40 01 00 00 40 01 00 00 05 00 00 00 4...@...@..
00000050 04 00 00 00 03 00 00 00 74 01 00 00 74 81 04 08 .....t...t..
00000060 74 81 04 08 13 00 00 00 13 00 00 00 04 00 00 00 t.....
00000070 01 00 00 00 01 00 00 00 00 00 00 00 00 80 04 08 .....
00000080 00 80 04 08 E0 18 0F 00 E0 18 0F 00 05 00 00 00 .....
00000090 00 10 00 00 01 00 00 00 84 25 0F 00 84 B5 13 08 .....%
000000A0 84 B5 13 08 BC 13 00 00 6C 37 00 00 06 00 00 00 .....17....
000000B0 00 10 00 00 02 00 00 00 E0 2E 0F 00 E0 BE 13 08 .....
000000C0 E0 BE 13 08 F8 00 00 00 F8 00 00 00 06 00 00 00 .....
000000D0 04 00 00 00 04 00 00 00 88 01 00 00 88 81 04 08 .....
000000E0 88 81 04 08 44 00 00 00 44 00 00 00 04 00 00 00 ....D...D..
000000F0 04 00 00 00 07 00 00 00 84 25 0F 00 84 B5 13 08 .....%
00000100 84 B5 13 08 00 00 00 00 08 00 00 00 04 00 00 00 .....
00000110 04 00 00 00 50 E5 74 64 80 B5 0C 00 80 35 11 08 ....P.td....5..
00000120 80 35 11 08 64 36 00 00 64 36 00 00 04 00 00 00 .5..d6..d6....
00000130 04 00 00 00 51 E5 74 64 00 00 00 00 00 00 00 00 ....Q.td....
00000140 00 00 00 00 00 00 00 00 00 00 00 00 06 00 00 00 .....
00000150 10 00 00 00 52 E5 74 64 84 25 0F 00 84 B5 13 08 ....R.td.%....
1Help 2Edit 3Quit 4Ascii 5Goto 6Save 7HxSrCh 8Parse 9Format10Quit

```



Как устроены программы? (На примере MS .COM) (1)

```
#include <stdio.h>
```

```
int main() {  
    printf("Hello, world!\n");  
    return 0;  
}
```

```
.model tiny
```

```
.code
```

```
org 100h
```

```
main:
```

```
    mov AH, 09h
```

```
    lea DX, string
```

```
    int 21h
```

```
    mov AH, 4Ch
```

```
    mov AL, 00h
```

```
    int 21h
```

```
    string db "Hello, world!", 0Dh, 0Ah, '$'
```

```
end main
```



Как устроены программы? (На примере MS .COM) (3)

```
view TEST.COM - Far 3.0.3000 x86
E:\TASM50\BIN\TEST.COM
00000000: B4 09 BA 0B 01 CD 21 B4 4C CD 21 48 65 6C 6C 6F  'o°oÍ!`LÍ!Hello
00000010: 2C 20 77 6F 72 6C 64 21 0D 0A 24 , world!$
```

.model tiny

.code

org 100h

main:

mov AH, 09h

lea DX, string

int 21h

mov AH, 4Ch

mov AL, 00h

int 21h

string db "Hello, world!", 0Dh, 0Ah, '\$'

end main

Распараллеливание вычислений: процессы и потоки

Поток – (thread, нить) – базовая единица загрузки процессора



ПРОЦЕСС



поток 1



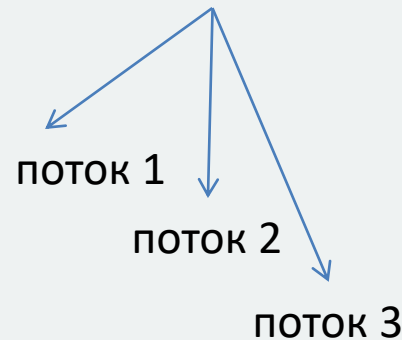
Сегмент кода
Сегмент данных



Регистры
Стек
+
идентификатор



ПРОЦЕСС





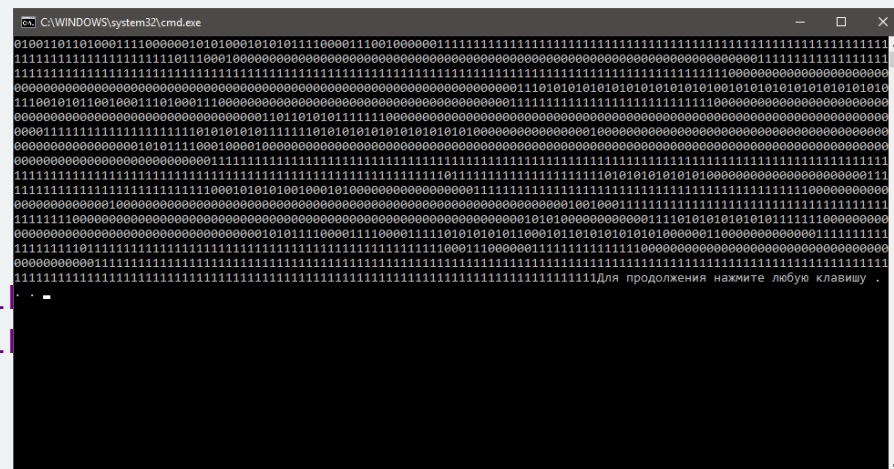
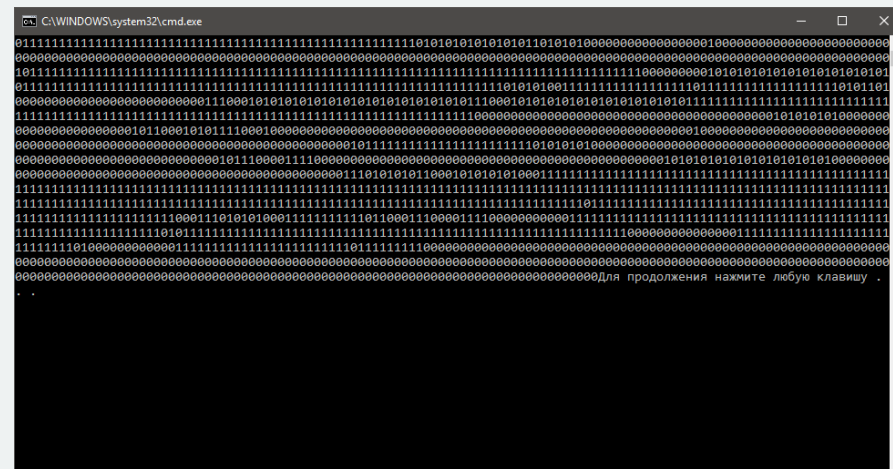
Распараллеливание расчётов: pthreads (2)

```
#include <pthread.h>
```

```
void *print_0(void *args) {  
    for (int i = 0; i < 1000; ++i)  
        printf("0");  
    return NULL;  
}
```

```
void *print_1(void *args) {  
    for (int i = 0; i < 1000; ++i)  
        printf("1");  
    return NULL;  
}
```

```
int main() {  
    pthread_t thread1, thread2;  
  
    pthread_create(&thread1, NULL, print_0, NULL);  
    pthread_create(&thread2, NULL, print_1, NULL);  
  
    pthread_join(thread1, NULL);  
    pthread_join(thread2, NULL);  
  
    return 0;  
}
```



Распараллеливание расчётов: std::threads

```
#include <thread>
```

```
void print_0() {  
    for (int i = 0; i < 1000; ++i)  
        printf("0");  
}
```

```
void print_1() {  
    for (int i = 0; i < 1000; ++i)  
        printf("1");  
}
```

```
int main() {  
    std::thread thread1(print_0);  
    std::thread thread2(print_1);  
  
    thread1.join();  
    thread2.join();  
    return 0;  
}
```

```
#include <pthread.h>
```

```
void *print_0(void *args) {  
    for (int i = 0; i < 1000; ++i)  
        printf("0");  
    return NULL;  
}
```

```
void *print_1(void *args) {  
    for (int i = 0; i < 1000; ++i)  
        printf("1");  
    return NULL;  
}
```

```
int main() {  
    pthread_t thread1, thread2;  
  
    pthread_create(&thread1, NULL, print_0, NULL);  
    pthread_create(&thread2, NULL, print_1, NULL);  
  
    pthread_join(thread1, NULL);  
    pthread_join(thread2, NULL);  
  
    return 0;  
}
```



IPC: файлы (FS change notification)

```
HANDLE FindFirstChangeNotificationA(  
    LPCSTR lpPathName,  
    BOOL    bWatchSubtree,  
    DWORD   dwNotifyFilter  
);
```

Заголовочный файл: fileapi.h

[in] dwNotifyFilter

The filter conditions that satisfy a change notification wait. This parameter can be one or more of the following values.

Value	Meaning
FILE_NOTIFY_CHANGE_FILE_NAME 0x00000001	Any file name change in the watched directory or subtree causes a change notification wait operation to return. Changes include renaming, creating, or deleting a file name.
FILE_NOTIFY_CHANGE_DIR_NAME 0x00000002	Any directory-name change in the watched directory or subtree causes a change notification wait operation to return. Changes include creating or deleting a directory.
FILE_NOTIFY_CHANGE_ATTRIBUTES 0x00000004	Any attribute change in the watched directory or subtree causes a change notification wait operation to return.
FILE_NOTIFY_CHANGE_SIZE 0x00000008	Any file-size change in the watched directory or subtree causes a change notification wait operation to return. The operating system detects a change in file size only when the file is written to the disk. For operating systems that use extensive caching, detection occurs only when the cache is sufficiently flushed.
FILE_NOTIFY_CHANGE_LAST_WRITE 0x00000010	Any change to the last write-time of files in the watched directory or subtree causes a change notification wait operation to return. The operating system detects a change to the last write-time only when the file is written to the disk. For operating systems that use extensive caching, detection occurs only when the cache is sufficiently flushed.
FILE_NOTIFY_CHANGE_SECURITY 0x00000100	Any security-descriptor change in the watched directory or subtree causes a change notification wait operation to return.

IPC: сообщения (signals, messages) (1)

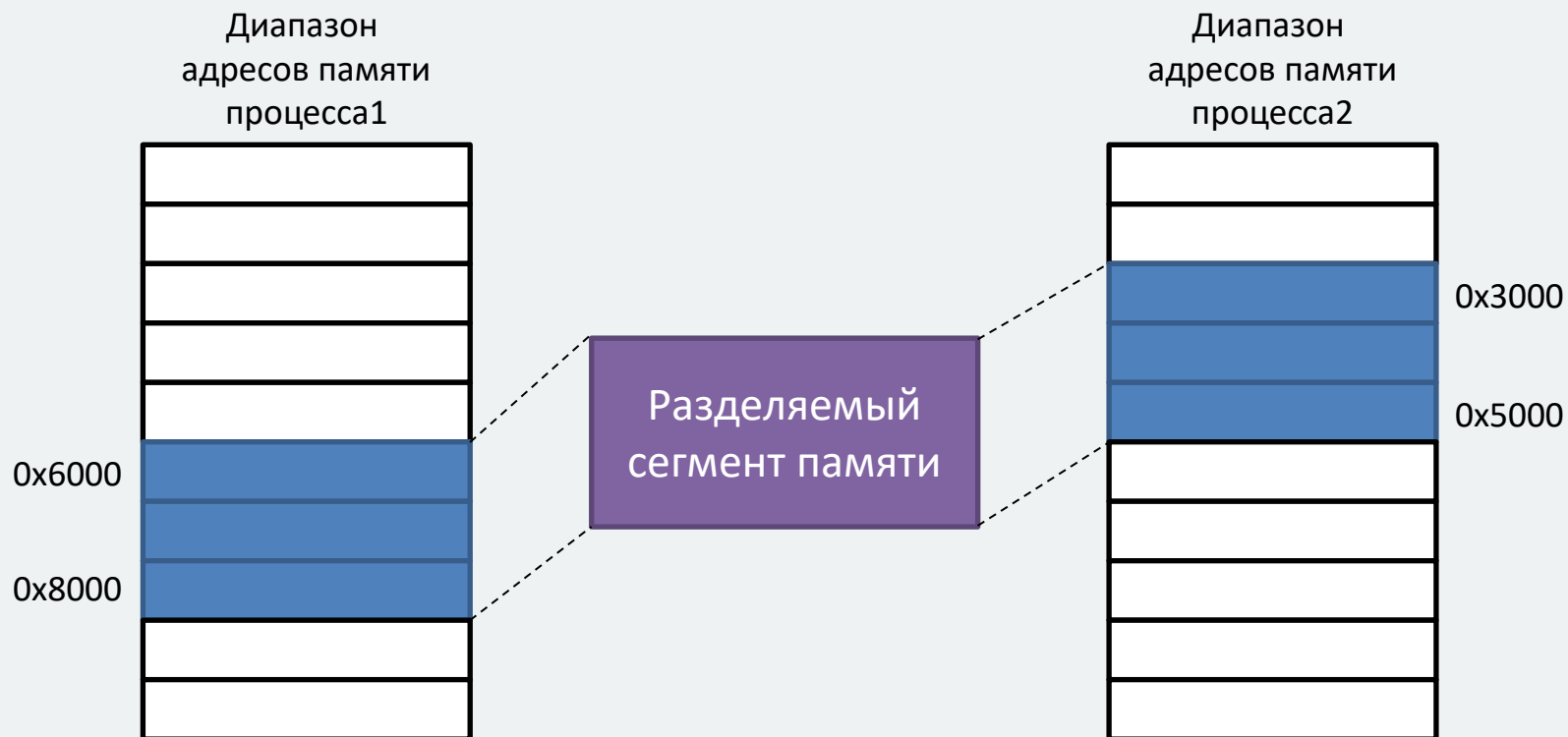


```

long __stdcall WndProcedure(HWND hWnd, UINT Msg,
                             WPARAM wParam, LPARAM lParam) {
    switch (Msg) {
        case WM_CREATE:
            ...
        case WM_SIZE:
            ...
        case WM_PAINT:
            hDC = BeginPaint(hWnd, &ps);
            OnPaint(hDC);
            EndPaint(hWnd, &ps);
            break;
        case WM_LBUTTONDOWN:
            x = LOWORD(lParam);
            y = HIWORD(lParam);
            OnLButtonDown(x, y);
            break;
        ...
    }
    return 0;
}
  
```

#define WM_CREATE	0x0001
#define WM_DESTROY	0x0002
#define WM_MOVE	0x0003
#define WM_SIZE	0x0005

IPC: разделяемая память (shared memory) (1)





IPC: разделяемая память (shared memory) (3)

```
#include <iostream>
#include <sys/ipc.h>
#include <sys/shm.h>

using namespace std;

int main() {
    key_t key = ftok("shmfile", 65);

    int shmid = shmget(key, 1024, 0666 | IPC_CREAT);

    char *str = (char*) shmat(shmid, (void *)0, 0);

    cout << "Write Data : ";
    gets(str);

    cout << "Data written in memory: " << str << endl;

    shmdt(str);

    return 0;
}
```

```
#include <iostream>
#include <sys/ipc.h>
#include <sys/shm.h>

using namespace std;

int main() {
    key_t key = ftok("shmfile", 65);

    int shmid = shmget(key, 1024, 0666 | IPC_CREAT);

    char *str = (char*) shmat(shmid, (void *)0, 0);

    cout << "Write Data : ";
    gets(str);

    cout << "Data read from memory: " << str << endl;

    shmdt(str);

    return 0;
}
```

Распараллеливание вычислений на GPU: CUDA (1)



```
int main() {
    int N = 100000;
    float *h_x = (float*)malloc(N * sizeof(float));
    float *h_y = (float*)malloc(N * sizeof(float));
    // Тут идёт инициализация массивов h_x и h_y

    float *d_x, *d_y;
    cudaMalloc(&d_x, N * sizeof(float));
    cudaMalloc(&d_y, N * sizeof(float));

    cudaMemcpy(d_x, h_x, N * sizeof(float), cudaMemcpyHostToDevice);
    cudaMemcpy(d_y, h_y, N * sizeof(float), cudaMemcpyHostToDevice);

    saxpy<<<(N+255)/256, 256>>>(N, 2.0f, d_x, d_y);

    cudaMemcpy(h_y, d_y, N * sizeof(float), cudaMemcpyDeviceToHost);

    cudaFree(d_x);
    cudaFree(d_y);
    free(h_x);
    free(h_y);
    return 0;
}

__global__
void saxpy(int n, float a, float *x, float *y) {
    int i = blockIdx.x*blockDim.x + threadIdx.x;
    if (i < n)
        y[i] = a * x[i] + y[i];
}
```



Распределённые вычисления

Компиляция:

```
$mpicc -o mpi_test mpi_test.c
```

Запуск:

```
$mpirun -np 2 ./mpi_test
```

```
$mpirun -np 5 -hosts 192.168.254.4,localhost ./mpi_test
```

```
#include <mpi.h>
#include <stdio.h>
```

```
int main(int argc, char** argv) {
    MPI_Init(NULL, NULL);
```

```
    int world_size;
    MPI_Comm_size(MPI_COMM_WORLD, &world_size);
```

```
    int world_rank;
    MPI_Comm_rank(MPI_COMM_WORLD, &world_rank);
```

```
    // Работаем...
```

```
    MPI_Finalize();
}
```

Нелокальное исполнение программ (1)

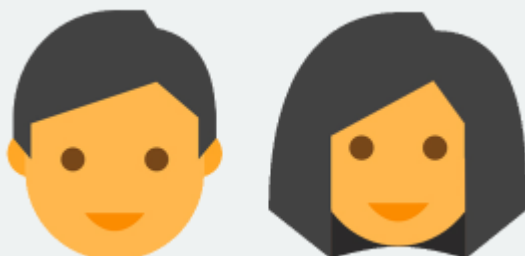


Объекты графического
интерфейса системы

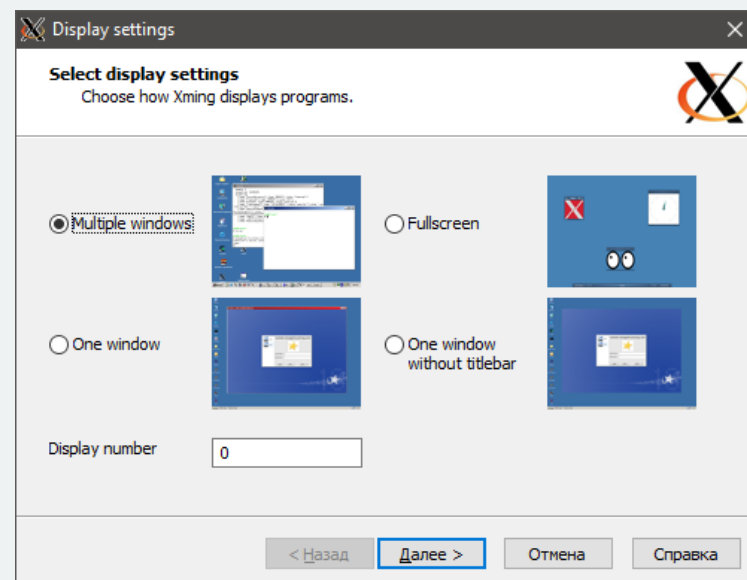
Элементы
управления

X Server

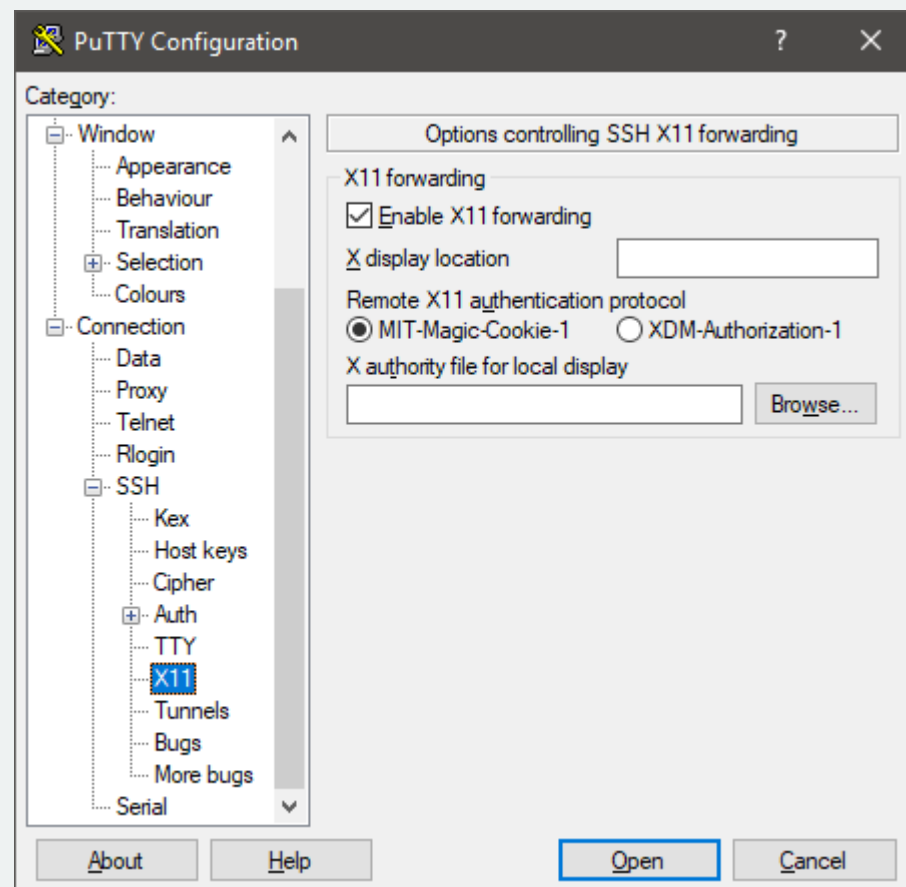
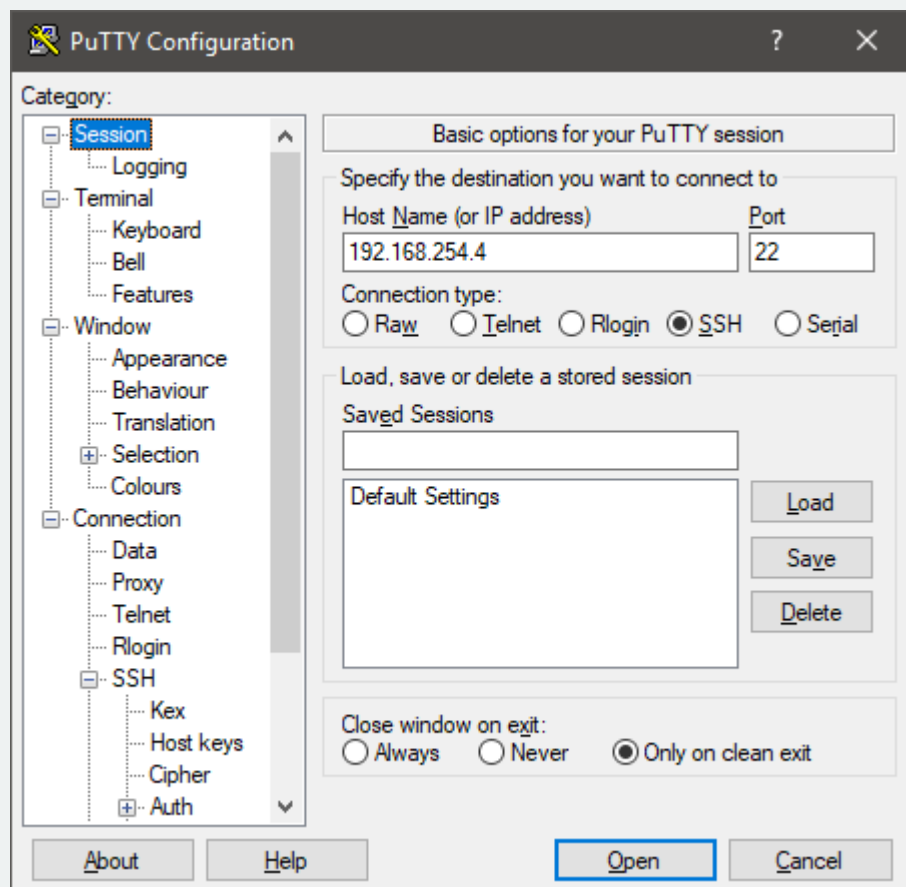
Оконный менеджер



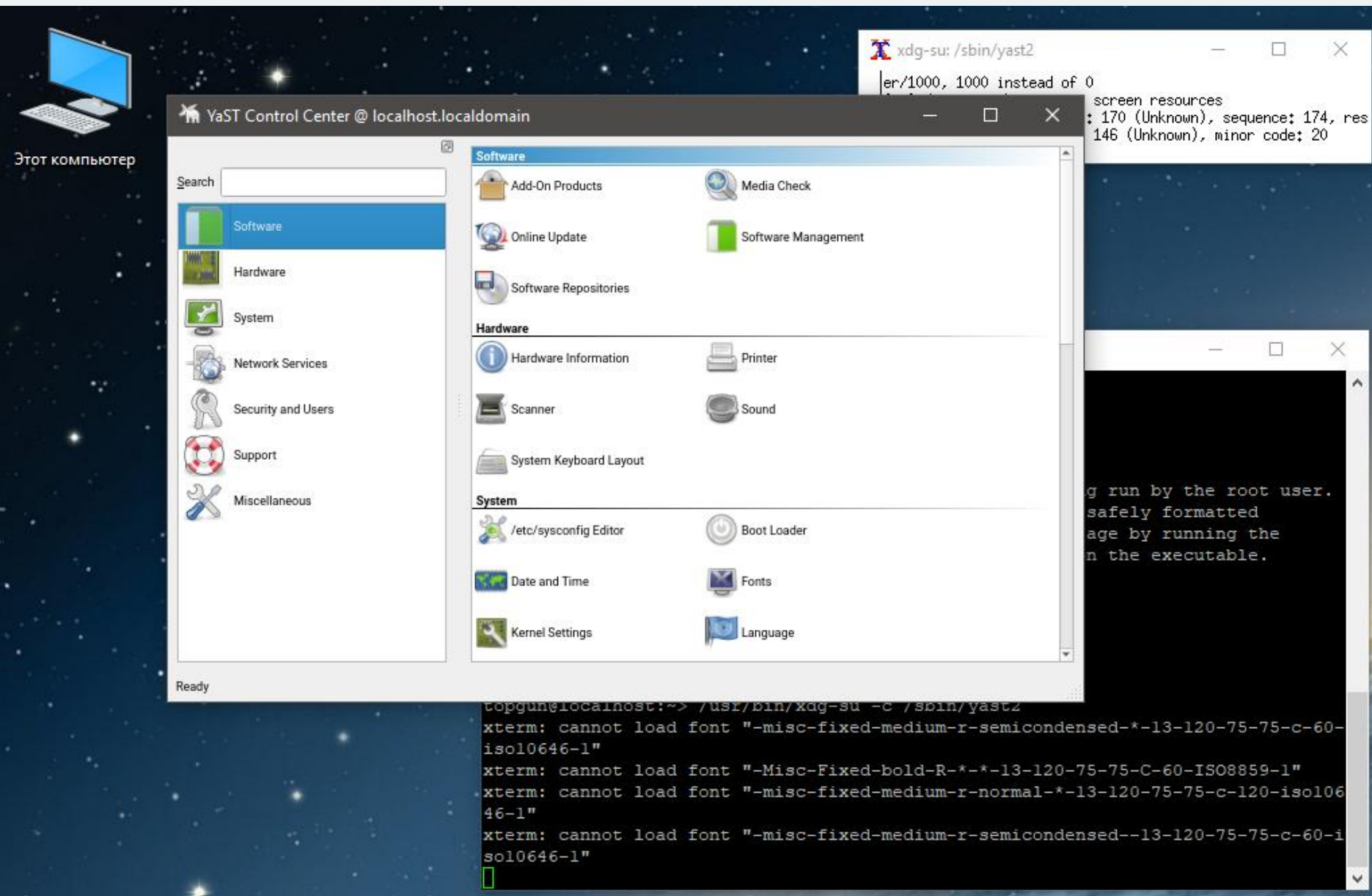
Конечные пользователи



Нелокальное исполнение программ (2)



Нелокальное исполнение программ (3)



The screenshot displays a Linux desktop environment with a dark blue background featuring a starry pattern. In the top-left corner, there is a laptop icon and the text "Этот компьютер". The main window is the "YaST Control Center @ localhost.localdomain". It has a sidebar on the left with a search bar and categories: Software, Hardware, System, Network Services, Security and Users, Support, and Miscellaneous. The "Software" category is selected. The main pane shows a grid of software management tools: Add-On Products, Media Check, Online Update, Software Management, Software Repositories, Hardware Information, Printer, Scanner, Sound, System Keyboard Layout, /etc/sysconfig Editor, Boot Loader, Date and Time, Fonts, Kernel Settings, and Language. In the bottom-left corner of the YaST window, it says "Ready".

Overlaid on the top-right of the YaST window is a terminal window titled "xdg-su: /sbin/yast2". It shows the command "er/1000, 1000 instead of 0" and some output about screen resources: "screen resources : 170 (Unknown), sequence: 174, res 146 (Unknown), minor code: 20".

Another terminal window is visible on the right side of the screen, showing a message: "g run by the root user. safely formatted age by running the n the executable."

At the bottom of the screen, a terminal window shows the command prompt "topgun@localhost:~> /usr/bin/xdg-su -c /sbin/yast2" followed by several "xterm: cannot load font" error messages for various font families like "misc-fixed-medium-r-semicondensed" and "Misc-Fixed-bold-R".