"Операционные системы" Лабораторная работа №1 (часть 2) Авдейкина ИУ7-53Б

Процесс "зомби"

```
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab 01/02$ ps -al
                       PPID C PRI NI ADDR SZ WCHAN TTY
2416 2 80 0 - 233111 ep_pol tty
2416 0 80 0 - 55760 do_pol tty2
      UTD
                PID
                                                                            TIME CMD
                                                                        00:03:03 Xorg
     1000
               2419
                                        0 - 233111 ep pol tty2
                                       0 - 55760 do_pol tty2
0 S
     1000
               2561
                                                                       00:00:00 gnome-session-b
             22765 18604 1 80 0 - 1302032 do_pol pts/0 00:01:30 anki
4 S 1000
                                        0 - 1302032 00_pcc - .
0 - 70914 do_pol pts/0
             22796 22765 0 80
22797 22765 0 80
0 S
     1000
                                                                        00:00:00 OtWebEngineProc
                                        0 - 70914 do_wai pts/0
                                                                        00:00:00 QtWebEngineProc
4 S
     1000
             22799 22797 0 80 0 - 70921 do_pol pts/0
                                                                       00:00:00 OtWebEngineProc
     1000
             22818 22799 0 80 0 - 296404599 futex_ pts/0 00:00:00 QtWebEngineProc
22826 22799 0 80 0 - 296530510 futex_ pts/0 00:00:02 QtWebEngineProc
22827 22799 0 80 0 - 296530510 futex_ pts/0 00:00:01 QtWebEngineProc
1 S
     1000
     1000
1 S
     1000
             24605 22799 0 80 0 - 296607108 futex_ pts/0 00:00:07 QtWebEngineProc
1 S 1000
             25227 25103 35 80 0 - 693 - 25228 25227 35 80 0 - 693 -
     1000
                                                            pts/1
                                                                       00:00:01 a.out
1 R 1000
                                                                        00:00:01 a.out
                                                             pts/1
            25229 25145 0 80 0 - 3168 -
4 R 1000
                                                             pts/2
                                                                        00:00:00 ps
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ kill 25228
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ kill 25228
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ ps -al
              PID PPID C PRI NI ADDR SZ WCHAN TTY
2419 2416 2 80 0 - 233111 - tty2
2561 2416 0 80 0 - 55760 do_pol tty2
F S
      UID
                                                                            TIME CMD
4 S
     1000
                                                                        00:03:04 Xorg
     1000
0 S
                                                                        00:00:00 gnome-session-b
4 S 1000
             22765 18604 1 80 0 - 1302032 do_pol pts/0 00:01:30 anki
                                        0 - 1302032 00_pct plan
0 - 70914 do_pol pts/0
             22796 22765 0 80
22797 22765 0 80
0 S
     1000
                                                                       00:00:00 OtWebEngineProc
                                        0 - 70914 do_wai pts/0
4 S
                                                                        00:00:00 QtWebEngineProc
     1000
             22799 22797 0 80 0 - 70921 do_pol pts/0
                                                                       00:00:00 OtWebEngineProc
     1000
             22818 22799 0 80 0 - 296404599 futex_ pts/0 00:00:00 QtWebEngineProc
22826 22799 0 80 0 - 296530510 futex_ pts/0 00:00:02 QtWebEngineProc
22827 22799 0 80 0 - 296530115 futex_ pts/0 00:00:01 QtWebEngineProc
     1000
1 S
1 S
     1000
1 S
     1000
             24605 22799 0 80 0 - 296607108 futex_ pts/0 00:00:07 QtWebEngineProc
1 S 1000
                                        0 - 693 - pts/1
0 - 0 - pts/1
                       25103 39 80
     1000
             25227
                                                                       00:00:04 a.out
             25228 25227 26 80
1 Z 1000
                                                             pts/1
                                                                        00:00:02 a.out <defunct>
                                         0 - 3168 -
4 R 1000
             25230
                      25145 0 80
                                                                        00:00:00 ps
                                                             pts/2
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ kill 25227
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ ps -al
                       PPID C PRI NI ADDR SZ WCHAN TTY
               PID
                                                                            TIME CMD
                       2416  2  80  0 - 233111 futex_ tty2
2416  0  80  0 - 55760 do_pol tty2
4 R 1000
                                                                        00:03:04 Xorg
               2419
0 S
     1000
                                                                        00:00:00 gnome-session-b
               2561
             22765 18604 1 80 0 - 1302032 do_pol pts/0 00:01:30 anki
     1000
4 S
                                        0 - 70914 do_pol pts/0
0 S
     1000
             22796 22765 0 80
                                                                        00:00:00 QtWebEngineProc
             22797 22765 0 80
22799 22797 0 80
4 S
     1000
                                        0 - 70914 do_wai pts/0
                                                                        00:00:00 OtWebEngineProc
                                        0 - 70921 do_pol pts/0
5 S
     1000
                                                                       00:00:00 QtWebEngineProc
              22818 22799 0 80 0 - 296404599 futex_ pts/0 00:00:00 QtWebEngineProc
1 S 1000
                                        0 - 296530510 futex_ pts/0 00:00:00 QtWebEngineProc
0 - 296530115 futex_ pts/0 00:00:01 QtWebEngineProc
0 - 296607108 futex_ pts/0 00:00:07 QtWebEngineProc
             22826 22799 0 80
22827 22799 0 80
     1000
1 S
1 S
     1000
              24605 22799 0 80
1 S 1000
             25232 25145 0 80 0 - 3168 -
4 R 1000
                                                            pts/2
                                                                     00:00:00 ps
```

Процесс-сирота

```
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ ps -al
                       PPID C PRI NI ADDR SZ WCHAN TTY
                PID
      UID
                                                                                TIME CMD
                                         4 S
                         2416 2 80
      1000
                2419
                         2416 0 80
0 S 1000
               2561
4 S 1000 22765 18604 1 80 0 - 1302032 do_pol pts/0 00:01:30 anki
             22796 22765 0 80 0 - 70914 do_pol pts/0 00:00:00 QtWebEngineProc 22797 22765 0 80 0 - 70914 do_wai pts/0 00:00:00 QtWebEngineProc 22799 22797 0 80 0 - 70921 do_pol pts/0 00:00:00 QtWebEngineProc
0 S 1000
      1000
4 S
     1000
5 S
             22818 22799 0 80 0 - 296404599 futex_ pts/0 00:00:00 QtWebEngineProc
1 S 1000
             22826 22799 0 80 0 - 296522314 futex_ pts/0 00:00:02 QtWebEngineProc
22827 22799 0 80 0 - 296521919 futex_ pts/0 00:00:01 QtWebEngineProc
24605 22799 0 80 0 - 296607108 futex_ pts/0 00:00:07 QtWebEngineProc
1 S 1000
1 S
      1000
1 S 1000
              pts/1
0 R 1000
                                                                           00:00:01 a.out
             25237
1 R 1000
                                                                           00:00:01 a.out
                                                                pts/1
4 R
      1000
                                                                pts/2
                                                                           00:00:00 ps
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ kill 25236
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ ps -al
               PID PPID C PRI NI ADDR SZ WCHAN TTY
2419 2416 2 80 0 - 233623 ep_pol tty
F S
      UID
                                                                                TIME CMD
4 S
               2419 2416 2 80 0 - 233623 ep_pol tty2 00:03:04 Xorg
2561 2416 0 80 0 - 55760 do pol tty2 00:00:00 gnome-session-b
      1000
0 S 1000
             22765 18604 1 80 0 - 1302032 do_pol pts/0 00:01:30 anki
4 S 1000
             22796 22765 0 80 0 - 70914 do_pol pts/0 00:00:00 QtWebEngineProc 22797 22765 0 80 0 - 70914 do_wai pts/0 00:00:00 QtWebEngineProc 22799 22797 0 80 0 - 70921 do_pol pts/0 00:00:00 QtWebEngineProc
0 S
      1000
4 S
     1000
5 S 1000
             22818 22799 0 80 0 - 296404599 futex_pts/0 00:00:00 QtWebEngineProc
1 S 1000
              22826 22799 0 80 0 - 296522314 futex_ pts/0 00:00:02 QtWebEngineProc 22827 22799 0 80 0 - 296521919 futex_ pts/0 00:00:01 QtWebEngineProc
1 S
      1000
1 S
     1000
              24605 22799 0 80 0 - 296607108 futex_ pts/0 00:00:07 QtWebEngineProc
1 S 1000
1 S 1000
                        2283 36 80 0 - 693 wait_w pts/1 00:00:06 a.out
25145 0 80 0 - 3168 - pts/2 00:00:00 ps
              25237
     1000
              25240
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ kill 25237
```

Hardlink, softlink

```
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ ln main.c hardlink
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ ll
total 32
drwxrwxr-x 2 sheglar sheglar 4096 окт 3 11:16 ./
drwxrwxr-х 4 sheglar sheglar 4096 сен 12 17:05 ../
-гwxгwxr-x 1 sheglar sheglar 16088 сен 26 17:49 a.out*
-rw-rw-r-- 2 sheglar sheglar 320 сен 26 17:49 hardlink
-rw-rw-r-- 2 sheglar sheglar 320 сен 26 17:49 main.c
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ ls -li
total 24
527198 -гwxгwxг-х 1 sheglar sheglar 16088 сен 26 17:49 a.out
527201 -гw-гw-г-- 2 sheglar sheglar 320 сен 26 17:49 hardlink
527201 -гw-гw-г-- 2 sheglar sheglar 320 сен 26 17:49 main.c
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ ln -s main.c softlink
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ ls -li
total 24
527198 -гwxгwxr-х 1 sheglar sheglar 16088 сен 26 17:49 a.out
527201 -гw-гw-г-- 2 sheglar sheglar 320 сен 26 17:49 hardlink
527201 -гw-гw-г-- 2 sheglar sheglar 320 сен 26 17:49 main.c
525354 lrwxrwxrwx 1 sheglar sheglar 6 okt 3 11:16 softlink -> main.c
```

Pipeline

```
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ tee < pipe
Test!
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ []</pre>
```

Изменение приоритета (NI, nice)

\$./a.out:

```
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ ps -al
F S
     UID
            PID
                    PPID C PRI NI ADDR SZ WCHAN TTY
                                                               TIME CMD
                    2416 2 80
2416 0 80
4 S
    1000
            2419
                                 0 - 233112 ep pol tty2
                                                           00:03:12 Xorq
                                 0 - 55760 do_pol tty2
0 S
    1000
            2561
                                                           00:00:00 gnome-session-b
                                 0 - 1302032 do_pol pts/0 00:01:30 anki
          22765 18604 1 80
4 S 1000
0 S 1000
           22796 22765 0 80 0 - 70914 do_pol pts/0 00:00:00 QtWebEngineProc
4 S
    1000
           22797
                   22765 0 80
22797 0 80
                                5 S
    1000
           22799
                  22799 0 80 0 - 296404599 futex_ pts/0 00:00:00 QtWebEngineProc
1 S 1000
           22818
1 S 1000
                   22799 0 80 0 - 296522314 futex_ pts/0 00:00:02 QtWebEngineProc
           22826
                   22799 0 80 0 - 296521919 futex_ pts/0 00:00:01 QtWebEngineProc 22799 0 80 0 - 296607108 futex_ pts/0 00:00:07 QtWebEngineProc
1 S
    1000
           22827
1 5
    1000
           24605
                  25103 30 80 0 - 693 - pts/1 00:00:01 a.out
0 R 1000
           25306
                  25306 30 80 0 - 693 - pts/1 00:00:01 a.c
25145 0 80 0 - 3168 - pts/2 00:00:00 ps
           25307
1 R 1000
                                                           00:00:01 a.out
4 R 1000
          25308
```

\$ nice -n 10 ./a.out

```
sheglar@sheglar-fx506ii:~/bmstu/05/os/lab_01/02$ ps -al
F S UTD
            PTD
                    PPID C PRI NI ADDR SZ WCHAN TTY
                                                               TIME CMD
4 S 1000
            2419
                    2416 2 80
                                 0 - 233111 ep_pol tty2
                                                           00:03:12 Xorq
                                 0 - 55760 do_pol tty2
    1000
                                                           00:00:00 gnome-session-b
9 5
            2561
                    2416 0 80
           22765 18604 1 80
22796 22765 0 80
                                 0 - 1302032 do_pol pts/0 00:01:30 anki
    1000
                                0 - 70914 do_pol pts/0 00:00:00 QtWebEngineProc
9 S
    1000
4 S 1000
           22797 22765 0 80
                                0 - 70914 do_wai pts/0
                                                           00:00:00 QtWebEngineProc
                                0 - 70921 do_pol pts/0 00:00:00 QtWebEngineProc
                  22797 0 80
5 S
    1000
           22799
                                 0 - 296404599 futex_ pts/0 00:00:00 QtWebEngineProc
                   22799 0 80
    1000
           22818
1 S
                  22799 0 80 0 - 296522314 futex_ pts/0 00:00:02 QtWebEngineProc
    1000
1 S
           22826
1 S 1000
           22827 22799 0 80 0 - 296521919 futex_ pts/0 00:00:01 QtWebEngineProc
1 S 1000
           24605
                  22799 0 80 0 - 296607108 futex_ pts/0 00:00:07 QtWebEngineProc
           25320 25103 30 90 10 - 693 - pts/1 00:00:00 a.out
25321 25320 30 90 10 - 693 - pts/1 00:00:00 a.out
9 R
    1000
1 R 1000
                                                  pts/1
4 R 1000
           25322 25145 0 80 0 - 3168 - _ pts/2 00:00:00 ps
```