Лабораторная работа №6

Управление процессами

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Цель работы



Получить навыки управления процессами операционной системы Linux.

Ход выполнения

Управление заданиями

```
admazurkevich@admazurkevich:/home/admazurkevich
\oplus
admazurkevich@admazurkevich:~$ su
Password:
root@admazurkevich:/home/admazurkevich#
root@admazurkevich:/home/admazurkevich# sleep 3600 &
[1] 3479
root@admazurkevich:/home/admazurkevich# dd if=/dev/zero of=/dev/null &
[2] 3583
root@admazurkevich:/home/admazurkevich# sleep 7200
[3]+ Stopped
                             sleep 7200
root@admazurkevich:/home/admazurkevich# jobs
[1] Running
                            sleep 3600 &
[2]- Running
                             dd if=/dev/zero of=/dev/null &
[3]+ Stopped
                             sleep 7200
root@admazurkevich:/home/admazurkevich# bg 3
[3]+ sleep 7200 &
root@admazurkevich:/home/admazurkevich# fg 1
sleep 3600
root@admazurkevich:/home/admazurkevich# fg 2
dd if=/dev/zero of=/dev/null
^C112685355+0 records in
112685354+0 records out
57694901248 bytes (58 GB, 54 GiB) copied, 75.4878 s, 764 MB/s
root@admazurkevich:/home/admazurkevich# fg 3
sleep 7200
root@admazurkevich:/home/admazurkevich#
```

Рис. 1: Список запущенных заданий

Управление заданиями

```
top - 15:06:38 up 0 min, 4 users, load average: 0.47, 0.34, 0.17
Tasks: 260 total, 2 running, 258 sleeping, 0 stopped, 0 zombie
%Cpu(s): 11.6 us, 16:3 sy, 0.0 ni, 72.1 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MLB Mem: 3909.0 total, 1080.4 free, 1419.7 used, 1419.4 buff/cache
MLB Swap: 0.4040.0 total, 4040.0 free, 0.0 used, 2489.3 avail Mem
```

| PID | USER | PR | NI | VIRT | RES | SHR S | %CPU | %MEM | TIME+ COMMAND |
|------|----------|-----|-----|--------|-------|---------|------|------|---|
| 3905 | admazur+ | 20 | 0 | 226848 | 1808 | 1808 R | 90.9 | 0.0 | 0:24.67 dd |
| 1 | root | 20 | Ø | 49192 | 41140 | 10216 S | 0.0 | 1.0 | 0:01.15 systemd |
| 2 | root | 20 | Ø | Ø | Ø | 0 S | 0.0 | 0.0 | 0:00.00 kthreadd |
| 3 | root | 20 | Ø | Ø | Ø | 0 S | 0.0 | 0.0 | 0:00.00 pool_workqueue_release |
| 4 | root | 0 | -20 | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.00 kworker/R-rcu_gp |
| 5 | root | 0 | -20 | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.00 kworker/R-sync_wq |
| 6 | root | 0 | -20 | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.00 kworker/R-slub_flushwq |
| 7 | root | 0 | -20 | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.00 kworker/R-netns |
| 8 | root | 20 | 0 | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.02 kworker/0:0-events |
| 10 | root | 0 | -20 | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.00 kworker/0:0H-xfs-log/dm-0 |
| 11 | root | 20 | Ø | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.00 kworker/u16:0-events_unbound |
| 12 | root | 20 | Ø | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.02 kworker/u16:1-netns |
| 13 | root | Ø | -20 | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.00 kworker/R-mm_percpu_wq |
| 14 | root | 20 | Ø | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.00 rcu_tasks_kthread |
| 15 | root | 20 | 0 | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.00 rcu_tasks_rude_kthread |
| | root | 20 | 0 | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.00 rcu_tasks_trace_kthread |
| 17 | root | 20 | 0 | Ø | Ø | 0 S | 0.0 | 0.0 | 0:00.00 ksoftirqd/0 |
| 18 | root | 20 | 0 | Ø | Ø | 0 I | 0.0 | 0.0 | 0:00.04 rcu_preempt |
| 19 | root | 20 | Ø | Ø | Ø | 0 S | 0.0 | 0.0 | 0:00.00 rcu_exp_par_gp_kthread_worker/0 |
| 20 | root | 20 | 0 | Ø | Ø | 0 S | 0.0 | 0.0 | 0:00.01 rcu_exp_gp_kthread_worker |
| | root | rt | 0 | Ø | Ø | 0 S | 0.0 | 0.0 | 0:00.00 migration/0 |
| | root | -51 | Ø | Ø | Ø | 0 S | 0.0 | 0.0 | 0:00.00 idle_inject/0 |
| | root | 20 | Ø | Ø | Ø | Ø S | 0.0 | 0.0 | 0:00.00 cpuhp/0 |
| | root | 20 | Ø | Ø | Ø | 0 S | 0.0 | 0.0 | 0:00.00 cpuhp/1 |
| 25 | root | -51 | 0 | Ø | Ø | 0 S | 0.0 | 0.0 | 0:00.00 idle_inject/1 |
| | root | rt | 0 | Ø | Ø | 0 S | 0.0 | 0.0 | 0:00.14 migration/1 |
| 27 | root | 20 | 0 | 0 | Ø | 0 S | 0.0 | 0.0 | 0:00.00 ksoftirqd/1 |

Рис. 2: Процесс dd в top

Управление заданиями

```
top - 15:07:16 up 7 min, 4 users, load average: 0.73, 0.43, 0.20
Tasks: 260 total, 2 running, 258 sleeping, 0 stopped, 0 zombie
MCpu(s): 5.8 us, 0.1 sy, 0.1 ni, 05.8 id, 0.0 ws, 0.2 hi, 0.0 si, 0.0 st
MIB Mem: 3909.0 total, 162.9 free, 1465.7 used, 1420.0 buff/cache
MIB Swap: 4040.0 total, 4040.0 free, 0.0 used, 2443.3 avail Mem
```

| PID | USER | PR | NI | VIRT | RES | SHR : | S %CPL | %MEM | TIME+ COMMAND |
|------|----------|-----|-----|---------|--------|--------|--------|------|---|
| | admazur+ | 20 | 0 | | | 96656 | | | 0:03.01 ptyxis |
| 2150 | admazur+ | 20 | ø | 4850896 | 311748 | 123120 | R 2.2 | 7.8 | 0:03.98 gnome-shell |
| 707 | root | 20 | 0 | Ø | Ø | 0 | I Ø.8 | 0.0 | 0:00.20 kworker/u17:4-events_unbound |
| 1 | root | 20 | 0 | 49192 | 41140 | 10216 | S 0.0 | 1.0 | 0:01.17 systemd |
| 2 | root | 20 | 0 | Ø | 0 | 0 | S 0.0 | 0.0 | 0:00.00 kthreadd |
| 3 | root | 20 | 0 | Ø | 0 | 0 | S 0.0 | 0.0 | 0:00.00 pool_workqueue_release |
| 4 | root | 0 | -20 | Ø | 0 | 0 | I 0.0 | 0.0 | 0:00.00 kworker/R-rcu_gp |
| 5 | root | 0 | -20 | Ø | 0 | 0 | I 0.0 | 0.0 | 0:00.00 kworker/R-sync_wq |
| 6 | root | 0 | -20 | Ø | 0 | 0 | I 0.0 | 0.0 | 0:00.00 kworker/R-slub_flushwq |
| 7 | root | 0 | -20 | Ø | 0 | 0 | I Ø.0 | 0.0 | 0:00.00 kworker/R-netns |
| 8 | root | 20 | 0 | Ø | 0 | 0 | I 0.0 | 0.0 | 0:00.02 kworker/0:0-events |
| 10 | root | 0 | -20 | Ø | 0 | 0 | | | 0:00.00 kworker/0:0H-xfs-log/dm-0 |
| | root | 20 | 0 | Ø | 0 | 0 | | 0.0 | 0:00.00 kworker/u16:0-events_unbound |
| | root | 20 | 0 | Ø | 0 | 0 | | | 0:00.03 kworker/u16:1-netns |
| 13 | root | 0 | -20 | Ø | 0 | 0 | I 0.0 | 0.0 | 0:00.00 kworker/R-mm_percpu_wq |
| 14 | root | 20 | 0 | Ø | 0 | Ø | | 0.0 | 0:00.00 rcu_tasks_kthread |
| 15 | root | 20 | 0 | Ø | 0 | Ø | I Ø.0 | 0.0 | 0:00.00 rcu_tasks_rude_kthread |
| | root | 20 | 0 | Ø | 0 | 0 | | 0.0 | 0:00.00 rcu_tasks_trace_kthread |
| 17 | root | 20 | 0 | | 0 | 0 | | 0.0 | 0:00.00 ksoftirqd/0 |
| | root | 20 | 0 | Ø | 0 | 0 | | 0.0 | 0:00.04 rcu_preempt |
| | root | 20 | 0 | | 0 | 0 | | | 0:00.00 rcu_exp_par_gp_kthread_worker/0 |
| | root | 20 | 0 | _ | 0 | 0 | | | 0:00.01 rcu_exp_gp_kthread_worker |
| | root | rt | 0 | _ | 0 | 0 | | | 0:00.00 migration/0 |
| | root | -51 | 0 | Ø | 0 | 0 | | | 0:00.00 idle_inject/0 |
| | root | 20 | 0 | | 0 | 0 | | | 0:00.00 cpuhp/0 |
| | root | 20 | 0 | - | 0 | 0 | | | 0:00.00 cpuhp/1 |
| 25 | root | -51 | 0 | Ø | 0 | 0 | S 0.0 | 0.0 | 0:00.00 idle_inject/1 |

Рис. 3: Завершение процесса dd в top

Управление процессами

```
.....
root@admazurkevich:/home/admazurkevich# dd if=/dev/zero of=/dev/zero &
Γ11 4261
root@admazurkevich:/home/admazurkevich# dd if=/dev/zero of=/dev/zero &
[2] 4263
root@admazurkevich:/home/admazurkevich# dd if=/dev/zero of=/dev/zero &
[3] 4265
root@admazurkevich:/home/admazurkevich# ps aux I grep dd
root
             2 0.0 0.0
                                                  14:59
                                                          0:00 [kthreadd]
             92 0.0 0.0
                                   0 ?
                                                  14:59
                                                         0:00 [kworker/R-ipv6 addrconf]
root
root
           1155 0.0 0.0 578492 3140 ?
                                              S1 14:59
                                                          0:00 /usr/sbin/VBoxService --pidfile /var/run/vboxadd-s
ervice sh
admazur+
          2525 0.0 0.6 962676 25636 ?
                                              Ssl 15:01
                                                          0:00 /usr/libexec/evolution-addressbook-factory
root
           4261 99.5 0.0 226848 1760 pts/0
                                                  15:08 0:12 dd if=/dev/zero of=/dev/zero
root
          4263 98.7 0.0 226848 1752 pts/0 R 15:08 0:10 dd if=/dev/zero of=/dev/zero
           4265 99.2 0.0 226848 1816 pts/0 R 15:08 0:10 dd if=/dev/zero of=/dev/zero
root
root
           4291 0.0 0.0 227688 2028 pts/0 S+ 15:08 0:00 grep --color=auto dd
root@admazurkevich:/home/admazurkevich# renice -n 5 4261
4261 (process ID) old priority 0, new priority 5
root@admazurkevich:/home/admazurkevich# ps fax I grep -B5 dd
               STAT TIME COMMAND
   PID TTY
     2 ?
                      0:00 [kthreadd]
    82 ?
                      0:00 \ [kworker/R-kthrotld]
    87 ?
               Τc
                      0:00 \ [kworker/R-acpi thermal pm]
    88 ?
                      0:00 \ [kworker/R-kmpath rdacd]
                      0:00 \ [kworker/R-kaluad]
    89 ?
               T <
    91 ?
               Τ<
                      0:00 \ [kworker/R-mld]
    92 ?
                Ι<
                      0:00 \ [kworker/R-ipv6 addrconf]
                      0:00 /usr/sbin/alsactl -s -n 19 -c -E ALSA_CONFIG_PATH=/etc/alsa/alsactl.conf --initfile=/lib
   928 ?
                SNe
/alsa/init/00main rdaemon
   052.2
                      0:00 /uer/ebin/ebronyd -F 2
```

Рис. 4: Поиск процессов dd

Управление процессами

```
Process Exited from Signal 9
                                                                                                       Restart
    91 ?
                      0:00 \ [kworker/R-mld]
    92 ?
                      0:00 \ [kworker/R-ipv6_addrconf]
   928 ?
                      0:00 /usr/sbin/alsactl -s -n 19 -c -E ALSA_CONFIG_PATH=/etc/alsa/alsactl.conf --initfile=/lib
/alsa/init/00main rdaemon
               S
                      0:00 /usr/sbin/chronyd -F 2
   953 ?
   960 ?
                      0:00 /usr/sbin/ModemManager
   961 ?
                     0:00 /usr/bin/python3 -sP /usr/sbin/firewalld --nofork --nopid
  1153 2
                      0:00 /usr/bin/VBoxDRMClient
                      0:00 /usr/sbin/VBoxService --pidfile /var/run/vboxadd-service.sh
  1155 ?
  2431 ?
                      0:00 \_ /usr/bin/qjs -m /usr/share/qnome-shell/org.qnome.ScreenSaver
               Ssl
  2455 2
                     0:00 \ /usr/libexec/evolution-calendar-factory
  2479 ?
               Ssl
                     0:00 \ /usr/libexec/goa-identity-service
  2480 ?
                     0:00 \ /usr/libexec/qvfs-mtp-volume-monitor
  2502 ?
                     0:00 \ /usr/libexec/gvfs-gphoto2-volume-monitor
  2525 ?
               Ssl
                      0:00 \ /usr/libexec/evolution-addressbook-factory
                      0:04 \_ /usr/bin/ptyxis --gapplication-service
  3241 ?
  3249 ?
                      0:00 | \ /usr/libexec/ptyxis-agent --socket-fd=3
  3315 pts/0
                                   \ /usr/bin/bash
                      0:00
  3390 pts/0
                                    | \_ su
                      0:00 1
  3423 pts/0
                      0:00 |
                                           \ bash
  4261 pts/0
                                               \ dd if=/dev/zero of=/dev/zero
                     1:06
  4263 pts/0
                     1:05
                                               \ dd if=/dev/zero of=/dev/zero
  4265 pts/0 R
                     1:04
                                               \ dd if=/dev/zero of=/dev/zero
  4415 pts/0 R+
                      0:00
                                               \ ps fax
  4416 pts/0 S+
                      0:00
                                               \ grep --color=auto -B5 dd
root@admazurkevich:/home/admazurkevich# kill -9 3315
Hangup
```

Рис. 5: Завершение родительского процесса и дочерних dd

```
aumazurkevichmaumazurkevich.~a
 admazurkevich@admazurkevich:~$ su
 Password:
 root@admazurkevich:/home/admazurkevich# dd if=/dev/zero of=/dev/null &
 [1] 4885
 root@admazurkevich:/home/admazurkevich# dd if=/dev/zero of=/dev/null &
 Γ21 4887
 root@admazurkevich:/home/admazurkevich# dd if=/dev/zero of=/dev/null &
 [3] 4889
 root@admazurkevich:/home/admazurkevich# renice -n 5 4885
 4885 (process ID) old priority 0, new priority 5
 root@admazurkevich:/home/admazurkevich# renice -n 15 4885
 4885 (process ID) old priority 5, new priority 15
 root@admazurkevich:/home/admazurkevich# killall dd
 [2]- Terminated
                             dd if=/dev/zero of=/dev/null
 [1]- Terminated
                              dd if=/dev/zero of=/dev/null
 [3]+ Terminated
                              dd if=/dev/zero of=/dev/null
root@admazurkevich:/home/admazurkevich#
```

Рис. 6: Запуск, изменение приоритета и завершение процессов dd

```
root@admazurkevich:/home/admazurkevich# yes > /dev/null &
[1] 5097
root@admazurkevich:/home/admazurkevich# ves > /dev/null
^7
Γ2]+
     Stopped
                             ves > /dev/null
root@admazurkevich:/home/admazurkevich# ves > /dev/null
^C
root@admazurkevich:/home/admazurkevich#
root@admazurkevich:/home/admazurkevich# jobs
[1]-
     Running
                              ves > /dev/null &
Γ21+
     Stopped
                              ves > /dev/null
root@admazurkevich:/home/admazurkevich#
```

Рис. 7: Фоновые и приостановленные процессы yes

```
root@admazurkevich:/home/admazurkevich#
root@admazurkevich:/home/admazurkevich# jobs
              yes > /dev/null &
[1]- Runnina
              ves > /dev/null
[2]+ Stopped
root@admazurkevich:/home/admazurkevich# fg 1
ves > /dev/null
root@admazurkevich:/home/admazurkevich#
root@admazurkevich:/home/admazurkevich# jobs
[2]+ Stopped
               ves > /dev/null
root@admazurkevich:/home/admazurkevich# bg 2
[2]+ yes > /dev/null &
root@admazurkevich:/home/admazurkevich# jobs
             yes > /dev/null &
[2]+ Running
root@admazurkevich:/home/admazurkevich# nohup yes > /dev/null &
F31 5275
nohup: ignoring input and redirecting stderr to stdout
root@admazurkevich:/home/admazurkevich# jobs
             yes > /dev/null &
nohup ves > /dev/n
[2]- Runnina
                           nohup ves > /dev/null &
root@admazurkevich:/home/admazurkevich#
```

Рис. 8: Запуск yes c nohup

Задание 2

```
top - 15:15:49 up 15 min, 5 users, load average: 1.27, 1.57, 0.95
Tasks: 262 total, 3 running, 259 sleeping, 0 stopped, 0 zombie
%Cpu(s): 7.7 us, 19.2 sy, 0.0 ni, 73.1 id, 0.0 va, 0.0 hi, 0.0 si, 0.0 st
MLB Mem: 3999.0 total, 1334.3 free, 156.3 used, 1457.5 buff/cache
MLB Swap: 4040.0 total, 4040.0 free, 0.0 used, 2552.7 avail Mem
```

| | USER | PR | NI | VIRT | RES | SHR | | %CPU | %MEM | TIME+ | COMMAND |
|------|------|-----|-----|--------|-------|-------|---|-------|------|---------|---------------------------------|
| 5109 | root | 20 | 0 | 226820 | 1760 | 1760 | R | 100.0 | 0.0 | 0:36.17 | yes |
| 5275 | root | 20 | 0 | 226820 | 1716 | 1716 | R | 100.0 | 0.0 | 0:19.27 | yes |
| 1 | root | 20 | 0 | 49192 | 41140 | 10216 | S | 0.0 | 1.0 | 0:01.62 | systemd |
| 2 | root | 20 | 0 | 0 | Ø | Ø | S | 0.0 | 0.0 | 0:00.00 | kthreadd |
| 3 | root | 20 | 0 | 0 | Ø | 0 | S | 0.0 | 0.0 | 0:00.00 | pool_workqueue_release |
| 4 | root | Ø | -20 | 0 | Ø | 0 | Ι | 0.0 | 0.0 | 0:00.00 | kworker/R-rcu_gp |
| 5 | root | Ø | -20 | 0 | Ø | Ø | Ι | 0.0 | 0.0 | 0:00.00 | kworker/R-sync_wq |
| 6 | root | Ø | -20 | 0 | Ø | Ø | Ι | 0.0 | 0.0 | 0:00.00 | kworker/R-slub_flushwq |
| 7 | root | Ø | -20 | 0 | Ø | Ø | Ι | 0.0 | 0.0 | 0:00.00 | kworker/R-netns |
| 8 | root | 20 | 0 | 0 | Ø | Ø | Ι | 0.0 | 0.0 | 0:00.02 | kworker/0:0-mm_percpu_wq |
| 10 | root | 0 | -20 | 0 | Ø | Ø | Ι | 0.0 | 0.0 | 0:00.01 | kworker/0:0H-xfs-log/dm-0 |
| 11 | root | 20 | 0 | 0 | Ø | Ø | Ι | 0.0 | 0.0 | 0:00.00 | kworker/u16:0-events_unbound |
| 12 | root | 20 | Ø | 0 | Ø | Ø | Ι | 0.0 | 0.0 | 0:00.05 | kworker/u16:1-netns |
| 13 | root | Ø | -20 | 0 | Ø | Ø | Ι | 0.0 | 0.0 | 0:00.00 | kworker/R-mm_percpu_wq |
| 14 | root | 20 | 0 | 0 | Ø | Ø | Ι | 0.0 | 0.0 | 0:00.00 | rcu_tasks_kthread |
| 15 | root | 20 | 0 | 0 | Ø | Ø | Ι | 0.0 | 0.0 | 0:00.00 | rcu_tasks_rude_kthread |
| 16 | root | 20 | Ø | 0 | Ø | Ø | Ι | 0.0 | 0.0 | 0:00.00 | rcu_tasks_trace_kthread |
| 17 | root | 20 | 0 | 0 | Ø | Ø | S | 0.0 | 0.0 | 0:00.00 | ksoftirgd/0 |
| 18 | root | 20 | 0 | 0 | Ø | Ø | Ι | 0.0 | 0.0 | 0:00.12 | rcu preempt |
| 19 | root | 20 | 0 | 0 | Ø | Ø | S | 0.0 | 0.0 | 0:00.00 | rcu_exp_par_qp_kthread_worker/0 |
| 20 | root | 20 | 0 | 0 | Ø | Ø | S | 0.0 | 0.0 | 0:00.08 | rcu_exp_qp_kthread_worker |
| 21 | root | rt | 0 | 0 | Ø | Ø | S | 0.0 | 0.0 | 0:00.00 | migration/0 |
| 22 | root | -51 | 0 | 0 | 0 | Ø | S | 0.0 | 0.0 | | idle_inject/0 |
| 23 | root | 20 | 0 | 0 | 0 | Ø | S | 0.0 | 0.0 | | cpuhp/0 |
| 24 | root | 20 | 0 | 0 | Ø | Ø | S | 0.0 | 0.0 | | cpuhp/1 |
| | root | -51 | 0 | Ø | 0 | 0 | | 0.0 | 0.0 | | idle_inject/1 |
| 26 | root | rt | 0 | 0 | Ø | 0 | S | 0.0 | 0.0 | | migration/1 |

```
root@admazurkevich:/home/admazurkevich# yes > /dev/null &
[1] 5566
root@admazurkevich:/home/admazurkevich# yes > /dev/null &
F21 5571
root@admazurkevich:/home/admazurkevich# ves > /dev/null &
[3] 5583
root@admazurkevich:/home/admazurkevich# kill 5583
[3]+ Terminated
                             ves > /dev/null
root@admazurkevich:/home/admazurkevich#
root@admazurkevich:/home/admazurkevich# fg 2
ves > /dev/null
^C
root@admazurkevich:/home/admazurkevich#
root@admazurkevich:/home/admazurkevich# kill -1 5566
                             ves > /dev/null
[1]+ Hangup
root@admazurkevich:/home/admazurkevich# kill -1 5109
root@admazurkevich:/home/admazurkevich#
root@admazurkevich:/home/admazurkevich# kill -1 5275
root@admazurkevich:/home/admazurkevich#
root@admazurkevich:/home/admazurkevich# ves > /dev/null &
Γ11 5844
root@admazurkevich:/home/admazurkevich# ves > /dev/null &
Γ21 5846
root@admazurkevich:/home/admazurkevich# yes > /dev/null &
F31 5848
root@admazurkevich:/home/admazurkevich# ves > /dev/null &
[4] 5850
root@admazurkevich:/home/admazurkevich# killall ves
[4]+ Terminated
                             ves > /dev/null
[1] Terminated
                             yes > /dev/null
[2]- Terminated
                             ves > /dev/null
[3]+ Terminated
                             ves > /dev/null
root@admazurkevich:/home/admazurkevich#
root@admazurkevich:/home/admazurkevich#
```

```
root@admazurkevich:/home/admazurkevich# ves > /dev/null &
[1] 5980
root@admazurkevich:/home/admazurkevich# nice -n 5 yes > /dev/null &
[2] 6004
root@admazurkevich:/home/admazurkevich# ps -l
F S
     UID
             PID
                    PPID C PRI NI ADDR SZ WCHAN TTY
                                                               TIME CMD
4 5
            5317
                    3954 Ø 8Ø
                                 0 - 58153 do wai pts/2
                                                           00:00:00 su
4 5
            5343
                    5317 0 80 0 - 57575 do wai pts/2
                                                          00:00:00 bash
4 R
            5980
                    5343 99 80 0 - 56705 -
                                                  pts/2
                                                          00:00:09 ves
4 R
            6004
                    5343 98 85 5 - 56705 -
                                                  pts/2
                                                           00:00:02 ves
4 R
            6006
                    5343 0 80 0 - 57682 -
                                                  pts/2
                                                           00:00:00 ps
root@admazurkevich:/home/admazurkevich# renice -n 5 5980
5980 (process ID) old priority 0, new priority 5
root@admazurkevich:/home/admazurkevich# ps -l
F S
     UID
             PID
                    PPID C PRI NI ADDR SZ WCHAN TTY
                                                               TIME CMD
4 S
            5317
                    3954 Ø 8Ø
                                 0 - 58153 do wai pts/2
                                                          00:00:00 su
4 5
            5343
                    5317
                         0
                            80
                                 0 - 57575 do wai pts/2
                                                          00:00:00 bash
4 R
            5980
                    5343 99 85
                                5 - 56705 -
                                                  pts/2
                                                          00:00:54 ves
4 R
            6004
                    5343 99 85
                                5 - 56705 -
                                                  pts/2
                                                          00:00:47 ves
4 R
            6103
                    5343 0 80 0 - 57682 -
                                                  pts/2
                                                           00:00:00 ps
root@admazurkevich:/home/admazurkevich# killall ves
[1]- Terminated
                            yes > /dev/null
[2]+ Terminated
                             nice -n 5 ves > /dev/null
root@admazurkevich:/home/admazurkevich#
```

Рис. 11: Изменение приоритета процессов yes

Выводы по проделанной работе

В ходе лабораторной работы были освоены:

- управление заданиями и процессами в Linux;
- использование jobs, fg, bg, kill, killall, ps, top;
- изменение приоритетов процессов с помощью nice и renice;
- применение **nohup** для независимого запуска процессов.

Полученные навыки формируют основу администрирования процессов и позволяют эффективно управлять ресурсами системы.