

Отчёт по лабораторной работе №6

Управление процессами

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Цель работы

Получить навыки управления процессами операционной системы.

Выполнение лабораторной работы

```
dsyakovleva@dsyakovleva:~$ su
Password:
root@dsyakovleva:/home/dsyakovleva# sleep 3600 &
[1] 3405
root@dsyakovleva:/home/dsyakovleva#
root@dsyakovleva:/home/dsyakovleva# dd if=/dev/zero of=/dev/null &
[2] 3531
root@dsyakovleva:/home/dsyakovleva# sleep 7200
^Z
[3]+  Stopped                  sleep 7200
root@dsyakovleva:/home/dsyakovleva# jobs
[1]  Running                  sleep 3600 &
[2]-  Running                  dd if=/dev/zero of=/dev/null &
[3]+  Stopped                  sleep 7200
root@dsyakovleva:/home/dsyakovleva# bg 3
[3]+  sleep 7200 &
root@dsyakovleva:/home/dsyakovleva# jobs
[1]  Running                  sleep 3600 &
[2]-  Running                  dd if=/dev/zero of=/dev/null &
[3]+  Running                  sleep 7200 &
root@dsyakovleva:/home/dsyakovleva# fg 1
sleep 3600
^C
root@dsyakovleva:/home/dsyakovleva# jobs
[2]-  Running                  dd if=/dev/zero of=/dev/null &
[3]+  Running                  sleep 7200 &
root@dsyakovleva:/home/dsyakovleva# fg 2
dd if=/dev/zero of=/dev/null
^C47736287+0 records in
47736286+0 records out
24440978432 bytes (24 GB, 23 GiB) copied, 95.5181 s, 256 MB/s

root@dsyakovleva:/home/dsyakovleva# fg 3
sleep 7200
^C
root@dsyakovleva:/home/dsyakovleva# █
```

Управление заданиями

dsyakovleva@dsyakovleva:/home/dsyakovleva - top										
top - 14:22:36 up 6 min, 4 users, load average: 1.09, 1.01, 0.53										
Tasks: 290 total, 2 running, 288 sleeping, 0 stopped, 0 zombie										
%Cpu(s): 10.8 us, 11.1 sy, 0.0 ni, 76.5 id, 0.0 wa, 1.6 hi, 0.1 si, 0.0 st										
MiB Mem : 3908.5 total, 1205.0 free, 1519.6 used, 1421.4 buff/cache										
MiB Swap: 4040.0 total, 4040.0 free, 0.0 used, 2388.8 avail Mem										
PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+ COMMAND
3924	dsyakov+	20	0	226848	1780	1780	R	97.0	0.0	0:11.89 dd
2151	dsyakov+	20	0	5481008	310600	122192	S	11.9	7.8	0:17.02 gnome-shell
2972	dsyakov+	20	0	3795996	325452	96200	S	10.9	8.1	0:09.65 ptyxis
155	root	20	0	0	0	0	I	9.3	0.0	0:01.03 kworker/u29:3-events_unbound
173	root	20	0	0	0	0	I	2.3	0.0	0:00.38 kworker/u25:2-events_unbound
3957	root	20	0	231604	5436	3260	R	0.7	0.1	0:00.09 top
8	root	20	0	0	0	0	I	0.3	0.0	0:00.06 kworker/0:0-mm_percpu_wq
962	root	39	19	4292	2692	2436	S	0.3	0.1	0:00.02 alsactl
1200	root	20	0	578492	3224	2960	S	0.3	0.1	0:00.25 VBoxService
2615	dsyakov+	9	-11	322424	11992	7620	S	0.3	0.3	0:00.17 pipewire
1	root	20	0	49192	40844	10144	S	0.0	1.0	0:07.47 systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.01 kthread
3	root	20	0	0	0	0	S	0.0	0.0	0:00.00 pool_workqueue_release
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00 kworker/R-rcu_gp
5	root	0	-20	0	0	0	I	0.0	0.0	0:00.00 kworker/R-sync_wq
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00 kworker/R-slab_flushwq
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00 kworker/R-netns
9	root	20	0	0	0	0	I	0.0	0.0	0:00.04 kworker/0:1-cgroup_destroy
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00 kworker/0:0H-events_highpri
11	root	20	0	0	0	0	I	0.0	0.0	0:00.00 kworker/u24:0-events_unbound
12	root	20	0	0	0	0	I	0.0	0.0	0:00.07 kworker/u24:1-netns
13	root	0	-20	0	0	0	I	0.0	0.0	0:00.00 kworker/R-mm_percpu_wq
14	root	20	0	0	0	0	I	0.0	0.0	0:00.00 rcu_tasks_kthread
15	root	20	0	0	0	0	I	0.0	0.0	0:00.00 rcu_tasks_rude_kthread
16	root	20	0	0	0	0	I	0.0	0.0	0:00.00 rcu_tasks_trace_kthread
17	root	20	0	0	0	0	S	0.0	0.0	0:00.01 ksoftirqd/0
18	root	20	0	0	0	0	I	0.0	0.0	0:00.30 rcu_preempt
19	root	20	0	0	0	0	S	0.0	0.0	0:00.00 rcu_exp_par_gp_kthread_worker+
20	root	20	0	0	0	0	S	0.0	0.0	0:00.06 rcu_exp_gp_kthread_worker

```

dsyakovleva@dsyakovleva:/home/dsyakovleva - top
top - 14:23:04 up 6 min, 4 users, load average: 2.03, 1.23, 0.62
Tasks: 288 total, 1 running, 287 sleeping, 0 stopped, 0 zombie
%Cpu(s): 11.0 us, 8.9 sy, 0.6 ni, 78.7 id, 0.0 wa, 0.8 hi, 0.1 si, 0.0 st
MiB Mem : 3908.5 total, 1205.3 free, 1518.9 used, 1421.9 buff/cache
MiB Swap: 4040.0 total, 4040.0 free, 0.0 used, 2389.6 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
 2972 dsyakov+  20   0 3799324 328812  96200 S   10.4   8.2   0:12.70 ptxis
 2151 dsyakov+  20   0 5481008 310600 122192 S    4.4   7.8   0:19.31 gnome-shell
  158 root       20   0      0      0      0 I    1.3   0.0   0:00.57 kworker/u28:3-events_unbound
    1 root       20   0   49192  40844 10144 S    0.5   1.0   0:07.68 systemd
 4042 root       20   0 231604   5244  3196 R    0.3   0.1   0:00.10 top
   72 root       39  19      0      0      0 S    0.2   0.0   0:00.52 khugepaged
  206 root       20   0      0      0      0 I    0.2   0.0   0:00.88 kworker/u27:2-xfs-cil/dm-0
   20 root       20   0      0      0      0 S    0.1   0.0   0:00.07 rcu_exp_gp_kthread_worker
   33 root       20   0      0      0      0 S    0.1   0.0   0:00.01 ksoftirqd/2
  107 root       20   0      0      0      0 I    0.1   0.0   0:00.05 kworker/5:2-events
  173 root       20   0      0      0      0 I    0.1   0.0   0:00.39 kworker/u25:2-writeback
   709 root       20   0   25436  9604   8196 S    0.1   0.2   0:00.76 systemd-journal
   918 dbus       20   0   8080   5724   2376 S    0.1   0.1   0:01.00 dbus-broker
  1198 root       20   0   574184 2520   2392 S    0.1   0.1   0:00.25 VBoxDRMClient
  1256 root       20   0   488244 29384 14408 S    0.1   0.7   0:00.61 tuned
 2669 dsyakov+  20   0   454692  6724   6212 S    0.1   0.2   0:00.28 ibus-engine-sim
 2956 root       20   0 643416 22148 17796 S    0.1   0.6   0:00.36 fwupd
    2 root       20   0      0      0      0 S    0.0   0.0   0:00.01 kthreadd
    3 root       20   0      0      0      0 S    0.0   0.0   0:00.00 pool_workqueue_release
    4 root       0 -20      0      0      0 I    0.0   0.0   0:00.00 kworker/R-rcu_gp
    5 root       0 -20      0      0      0 I    0.0   0.0   0:00.00 kworker/R-sync_wq
    6 root       0 -20      0      0      0 I    0.0   0.0   0:00.00 kworker/R-slab_flushwq
    7 root       0 -20      0      0      0 I    0.0   0.0   0:00.00 kworker/R-netns
    8 root       20   0      0      0      0 I    0.0   0.0   0:00.06 kworker/0:0-rcu_gp
    9 root       20   0      0      0      0 I    0.0   0.0   0:00.04 kworker/0:1-cgroup_destroy
   10 root       0 -20      0      0      0 I    0.0   0.0   0:00.00 kworker/0:0H-events_highpri
   11 root       20   0      0      0      0 I    0.0   0.0   0:00.00 kworker/u24:0-events_unbound
   12 root       20   0      0      0      0 I    0.0   0.0   0:00.08 kworker/u24:1-netns
   13 root       0 -20      0      0      0 I    0.0   0.0   0:00.00 kworker/R-mm_percpu_wq
  
```

```
root@dsyakovleva:/home/dsyakovleva#  
root@dsyakovleva:/home/dsyakovleva# dd if=/dev/zero of=/dev/null &  
[1] 4518  
root@dsyakovleva:/home/dsyakovleva# dd if=/dev/zero of=/dev/null &  
[2] 4556  
root@dsyakovleva:/home/dsyakovleva# dd if=/dev/zero of=/dev/null &  
[3] 4558  
root@dsyakovleva:/home/dsyakovleva# ps aux | grep dd  
root      2  0.0  0.0    0   0 ?        S   14:16   0:00 [kthreadd]  
root     12  0.0  0.0    0   0 ?        I   14:16   0:00 [kworker/u24:1-ipv6_addrconf]  
root    109  0.0  0.0    0   0 ?        I<  14:16   0:00 [kworker/R-ipv6_addrconf]  
root   1200  0.0  0.0 578492 3224 ?        Sl   14:16   0:00 /usr/sbin/VBoxService --pidfile /var/run/vboxadd-service.sh  
dsyakov+ 2725  0.0  0.6 1036404 25008 ?        Ssl  14:17   0:00 /usr/libexec/evolution-addressbook-factory  
root     4518 98.5  0.0 226848 1780 pts/0    R   14:24   0:34 dd if=/dev/zero of=/dev/null  
root     4556 98.6  0.0 226848 1792 pts/0    R   14:24   0:30 dd if=/dev/zero of=/dev/null  
root     4558 98.4  0.0 226848 1672 pts/0    R   14:24   0:29 dd if=/dev/zero of=/dev/null  
root     4628  0.0  0.0 227688 2036 pts/0    S+  14:24   0:00 grep --color=auto dd  
root@dsyakovleva:/home/dsyakovleva#
```

Рис. 4: Запуск процессов dd


```
root@dsyakovleva:/home/dsyakovleva# dd if=/dev/zero of=/dev/null &
[1] 4518
root@dsyakovleva:/home/dsyakovleva# dd if=/dev/zero of=/dev/null &
[2] 4556
root@dsyakovleva:/home/dsyakovleva# dd if=/dev/zero of=/dev/null &
[3] 4558
root@dsyakovleva:/home/dsyakovleva# ps aux | grep dd
root      2  0.0  0.0      0  0 ?        S   14:16   0:00 [kthreadd]
root     12  0.0  0.0      0  0 ?        I   14:16   0:00 [kworker/u24:1-ipv6_addrconf]
root    109  0.0  0.0      0  0 ?        I<  14:16   0:00 [kworker/R-ipv6_addrconf]
root   1200  0.0  0.0 578492 3224 ?        Sl   14:16   0:00 /usr/sbin/VBoxService --pidfile /var/run/vboxadd-service.sh
dsyakov+ 2725  0.0  0.6 1036404 25008 ?        Ssl  14:17   0:00 /usr/libexec/evolution-addressbook-factory
root     4518 98.5  0.0 226848 1780 pts/0    R   14:24   0:34 dd if=/dev/zero of=/dev/null
root     4556 98.6  0.0 226848 1792 pts/0    R   14:24   0:30 dd if=/dev/zero of=/dev/null
root     4558 98.4  0.0 226848 1672 pts/0    R   14:24   0:29 dd if=/dev/zero of=/dev/null
root     4628  0.0  0.0 227688 2036 pts/0    S+  14:24   0:00 grep --color=auto dd
root@dsyakovleva:/home/dsyakovleva#
root@dsyakovleva:/home/dsyakovleva# renice -n 5 4518
4518 (process ID) old priority 0, new priority 5
root@dsyakovleva:/home/dsyakovleva#
```

Рис. 5: Изменение приоритета процесса

```
692 ?      Sns  0:00 /usr/sbin/alsactl -s -n 19 -c -E ALSA_CONFIG_PATH=/etc/alsa/alsactl.conf
initfile=/lib/alsa/init/00main rdaemon
995 ?      S    0:00 /usr/sbin/chronyd -F 2
1011 ?     Ssl  0:00 /usr/sbin/ModemManager
1032 ?     Ssl  0:01 /usr/bin/python3 -sP /usr/sbin/firewalld --nofork --nopid
1198 ?     Sl   0:00 /usr/bin/VBoxDRMClient
1200 ?     Sl   0:00 /usr/sbin/VBoxService --pidfile /var/run/vboxadd-service.sh

2562 ?     Ssl  0:00 \_ /usr/libexec/gvfs-goa-volume-monitor
2598 ?     Ssl  0:00 \_ /usr/libexec/evolution-calendar-factory
2615 ?     S<sl 0:00 \_ /usr/bin/pipewire
2616 ?     S<sl 0:00 \_ /usr/bin/wireplumber
2617 ?     S<sl 0:00 \_ /usr/bin/pipewire-pulse
2725 ?     Ssl  0:00 \_ /usr/libexec/evolution-addressbook-factory

2972 ?     Ssl  0:26 \_ /usr/bin/ptyxis --gapapplication-service
2984 ?     Ssl  0:00 | \_ /usr/libexec/ptyxis-agent --socket-fd=3
3074 pts/0  Ss   0:00 | \_ /usr/bin/bash
3289 pts/0  S    0:00 | \_ su
3334 pts/0  S    0:00 | \_ bash
4518 pts/0  RN   2:57 | \_ dd if=/dev/zero of=/dev/null
4556 pts/0  R    2:53 | \_ dd if=/dev/zero of=/dev/null
4558 pts/0  R    2:52 | \_ dd if=/dev/zero of=/dev/null
4912 pts/0  R+   0:00 | \_ ps fax
4913 pts/0  S+   0:00 | \_ grep --color=auto -B5 dd

ot@dsyakovleva:/home/dsyakovleva#
```

Рис. 6: Просмотр иерархии процессов

```
root@dsyakovleva:/home/dsyakovleva#  
root@dsyakovleva:/home/dsyakovleva#  
root@dsyakovleva:/home/dsyakovleva# dd if=/dev/zero of=/dev/null &  
[1] 5279  
root@dsyakovleva:/home/dsyakovleva# dd if=/dev/zero of=/dev/null &  
[2] 5288  
root@dsyakovleva:/home/dsyakovleva# dd if=/dev/zero of=/dev/null &  
[3] 5293  
root@dsyakovleva:/home/dsyakovleva# renice -n 5 5288  
5288 (process ID) old priority 0, new priority 5  
root@dsyakovleva:/home/dsyakovleva# renice -n 15 5288  
5288 (process ID) old priority 5, new priority 15  
root@dsyakovleva:/home/dsyakovleva# killall dd  
[1] Terminated dd if=/dev/zero of=/dev/null  
[2]- Terminated dd if=/dev/zero of=/dev/null  
[3]+ Terminated dd if=/dev/zero of=/dev/null  
root@dsyakovleva:/home/dsyakovleva#
```

Рис. 7: Запуск процессов dd

```
root@dsyakovleva:/home/dsyakovleva#  
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null &  
[1] 5711  
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null &  
[2] 5713  
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null  
^Z  
[3]+  Stopped                  yes > /dev/null  
root@dsyakovleva:/home/dsyakovleva# fg 3  
yes > /dev/null  
^C  
root@dsyakovleva:/home/dsyakovleva# █
```

Рис. 8: Запуск программы yes

Задание 2

```
-----
root@dsyakovleva:/home/dsyakovleva# jobs
[1]-  Running                  yes > /dev/null &
[2]+  Running                  yes > /dev/null &
root@dsyakovleva:/home/dsyakovleva# fg 2
yes > /dev/null
^C
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null
^Z
[2]+  Stopped                  yes > /dev/null
root@dsyakovleva:/home/dsyakovleva# bg 2
[2]+  yes > /dev/null &
root@dsyakovleva:/home/dsyakovleva# jobs
[1]-  Running                  yes > /dev/null &
[2]+  Running                  yes > /dev/null &
root@dsyakovleva:/home/dsyakovleva# nohup /dev/null &
[3] 6059
nohup: ignoring input and appending output to 'nohup.out'
nohup: root@dsyakovleva:/home/dsyakovleva# failed to run command '/dev/null': Permission denied

[3]+  Exit 126                  nohup /dev/null
root@dsyakovleva:/home/dsyakovleva# nohup yes > /dev/null &
[3] 6083
nohup: ignoring input and redirecting stderr to stdout
root@dsyakovleva:/home/dsyakovleva# █
```

Рис. 9: Управление заданиями yes

Задание 2

```
dsyakovleva@dsyakovleva:/home/dsyakovleva - top
```

top - 14:37:38 up 21 min, 5 users, load average: 3.31, 2.35, 1.65
Tasks: 287 total, 4 running, 283 sleeping, 0 stopped, 0 zombie
%Cpu(s): 26.2 us, 29.7 sy, 0.8 ni, 41.9 id, 0.0 wa, 1.3 hi, 0.1 si, 0.0 st
MiB Mem : 3908.5 total, 1490.1 free, 1228.3 used, 1427.9 buff/cache
MiB Swap: 4040.0 total, 4040.0 free, 0.0 used, 2680.1 avail Mem

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
5993	root	20	0	226820	1796	1796	R	98.4	0.0	1:48.31	yes
5711	root	20	0	226820	1744	1744	R	98.0	0.0	4:08.56	yes
6083	root	20	0	226820	1724	1724	R	98.0	0.0	1:09.11	yes
2151	dsyakov+	20	0	5485912	317876	122172	S	12.2	7.9	0:56.49	gnome-shell
6142	dsyakov+	20	0	3983964	212364	96516	S	9.2	5.3	0:04.01	ptyxis
5620	root	20	0	0	0	0	I	6.6	0.0	0:01.22	kworker/u27:1-flush-253:0
173	root	20	0	0	0	0	I	3.0	0.0	0:01.35	kworker/u25:2-events_unbound
55	root	20	0	0	0	0	I	1.0	0.0	0:02.47	kworker/u26:0-flush-253:0
6366	root	20	0	231604	5476	3300	R	1.0	0.1	0:00.20	top
1	root	20	0	49192	40844	10144	S	0.7	1.0	0:13.33	systemd
18	root	20	0	0	0	0	I	0.3	0.0	0:00.99	rcu_preempt
2017	root	20	0	0	0	0	I	0.3	0.0	0:03.02	kworker/u26:3-events_unbound
2	root	20	0	0	0	0	S	0.0	0.0	0:00.01	kthreadd
3	root	20	0	0	0	0	S	0.0	0.0	0:00.00	pool_workqueue_release
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-rcu_gp
5	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-sync_wq
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-slub_flushwq
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
8	root	20	0	0	0	0	I	0.0	0.0	0:00.16	kworker/0:0-events
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-events_highpri
11	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/u24:0-events_unbound
12	root	20	0	0	0	0	I	0.0	0.0	0:00.29	kworker/u24:1-netns
13	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-mm_percpu_wq
14	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks_kthread
15	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks_rude_kthread
16	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks_trace_kthread
17	root	20	0	0	0	0	S	0.0	0.0	0:00.02	ksoftirqd/0
19	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_exp_par_gp_kthread_worker+
20	root	20	0	0	0	0	S	0.0	0.0	0:00.34	rcu_exp_gp_kthread_worker

```
root@dsyakovleva:/home/dsyakovleva#  
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null &  
[1] 6568  
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null &  
[2] 6621  
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null &  
[3] 6632  
root@dsyakovleva:/home/dsyakovleva# kill 6621  
[2]- Terminated yes > /dev/null  
root@dsyakovleva:/home/dsyakovleva# fg 1  
yes > /dev/null  
^C  
root@dsyakovleva:/home/dsyakovleva#
```

Рис. 11: Завершение процессов yes

Задание 2

```
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null &
[1] 6568
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null &
[2] 6621
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null &
[3] 6632
root@dsyakovleva:/home/dsyakovleva# kill 6621
[2]- Terminated                  yes > /dev/null
root@dsyakovleva:/home/dsyakovleva# fg 1
yes > /dev/null
^C
root@dsyakovleva:/home/dsyakovleva#
root@dsyakovleva:/home/dsyakovleva# kill -1 5993
root@dsyakovleva:/home/dsyakovleva# kill -1 5711
root@dsyakovleva:/home/dsyakovleva# kill -1 6083
root@dsyakovleva:/home/dsyakovleva#
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null &
[4] 6825
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null &
[5] 6827
root@dsyakovleva:/home/dsyakovleva# killall yes
[3] Terminated                  yes > /dev/null
[4]- Terminated                  yes > /dev/null
[5]+ Terminated                  yes > /dev/null
root@dsyakovleva:/home/dsyakovleva# █
```



```
root@dsyakovleva:/home/dsyakovleva# yes > /dev/null &
[1] 6939
root@dsyakovleva:/home/dsyakovleva# nice -n 5 yes > /dev/null &
[2] 7064
root@dsyakovleva:/home/dsyakovleva# ps -l
```

F	S	UID	PID	PPID	C	PRI	NI	ADDR	SZ	WCHAN	TTY	TIME	CMD
4	S	0	6243	6205	0	80	0	-	58153	do_wai	pts/1	00:00:00	su
4	S	0	6265	6243	0	80	0	-	57575	do_wai	pts/1	00:00:00	bash
4	R	0	6939	6265	97	80	0	-	56705	-	pts/1	00:01:03	yes
4	R	0	7064	6265	97	85	5	-	56705	-	pts/1	00:00:03	yes
4	R	0	7066	6265	99	80	0	-	57682	-	pts/1	00:00:00	ps

```
root@dsyakovleva:/home/dsyakovleva# renice -n 5 6939
6939 (process ID) old priority 0, new priority 5
root@dsyakovleva:/home/dsyakovleva# ps -l
```

F	S	UID	PID	PPID	C	PRI	NI	ADDR	SZ	WCHAN	TTY	TIME	CMD
4	S	0	6243	6205	0	80	0	-	58153	do_wai	pts/1	00:00:00	su
4	S	0	6265	6243	0	80	0	-	57575	do_wai	pts/1	00:00:00	bash
4	R	0	6939	6265	97	85	5	-	56705	-	pts/1	00:01:41	yes
4	R	0	7064	6265	97	85	5	-	56705	-	pts/1	00:00:42	yes
4	R	0	7156	6265	99	80	0	-	57682	-	pts/1	00:00:00	ps

```
root@dsyakovleva:/home/dsyakovleva# killall yes
[1]- Terminated                  yes > /dev/null
[2]+ Terminated                  nice -n 5 yes > /dev/null
root@dsyakovleva:/home/dsyakovleva#
```

Рис. 13: Завершение процессов командой killall

Контрольные вопросы

- `jobs` — просмотр текущих заданий
- `Ctrl+Z` — приостановка задания
- `Ctrl+C` — завершение задания
- `fg / bg` — перевод задания в передний или фоновый режим

- `ps aux`, `ps fax` — список процессов и их иерархия
- `kill <PID>` — завершение процесса
- `killall <имя>` — завершение всех процессов с именем
- `top` — мониторинг процессов, завершение по клавише `k`
- `nice`, `renice` — управление приоритетами процессов

Итоги работы

Были приобретены практические навыки управления заданиями и процессами в Linux:

- * запуск программ в фоновом и переднем режиме,
- * приостановка и возобновление выполнения,
- * завершение отдельных процессов и групп процессов,
- * работа с приоритетами с помощью **nice** и **renice**.