МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ

федеральное государственное автономное образовательное учреждение высшего образования

Санкт-Петербургский национальный исследовательский университет информационных технологий,

механики и оптики

Мегафакультет трансляционных информационных технологий Факультет информационных технологий и программирования

Лабораторная работа №5

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Проверил

Осипов Святослав

Эксперимент 1

Первый этап:

[3498.796068]	[830]	0	830	6592	3	94208	302	0	smartd
[3498.796810]	[831]	0	831	105552	0	446464	507	0	bzzz
[3498.797643]	[833]	81	833	17719	131	163840	101	-900	dbus-daemon
[3498.798525]	[834]	70	834	20688	19	176128	103	0	avahi-daemon
[3498.799539]	[841]	997	841	4718	0	69632	39	0	lsmd
[3498.800664]	[846]	70	846	20655	0	151552	108	0	avahi-daemon
[3498.802301]	[850]	991	850	40057	0	200704	207	0	rngd
[3498.803184]	[852]	0	852	77886	0	180224	172	0	gssproxy
[3498.805614]	[865]	0	865	107190	17	442368	618	0	sssd_be
[3498.807139]	[867]	0	867	107778	89	458752	322	0	sssd_nss
[3498.807942]	[870]	0	870	124680	0	466944	5501	0	firewalld
[3498.808804]	[872]	0	872	24459	216	221184	448	0	systemd-logind
[3498.811370]	[883]	0	883	170193	121	430080	530	0	NetworkManager
[3498.813049]	[892]	0	892	23242	0	204800	233	-1000	sshd
[3498.814325]	[894]	0	894	158766	131	450560	3574	0	tuned
[3498.815647]	[1124]	0	1124	61463	0	118784	232	0	crond
[3498.817052]	[1129]	0	1129	10656	0	110592	50	0	atd
[3498.818150]	[1471]	0	1471	33689	0	270336	239	0	login
[3498.819549]	[1488]	1000	1488	23463	3	212992	362	0	systemd
[3498.820517]	[1493]	1000	1493	61685	0	319488	1308	0	(sd-pam)
[3498.821135]	[1499]		1499	58620	1	86016	504	0	bash
[3498.822337]	[1602]	1000	1602	64235	1	151552	8677	0	mem.bash
[3498.823505]	[45706]			64235	0	126976	8677	0	mem.bash
[3498.824588]				56876	1	86016	1322	0	mem.bash
[3498.825164]	[52151]			56876	0	61440	1322	0	mem.bash
[3498.827219]				56711	1	86016	1167	0	mem.bash
[3498.828425]				56711	0	57344	1167	0	mem.bash
[3498.829056]	[57808]	1000 5	57808	56942	507	86016	880	0	mem.bash
[3498.829861]	[64582]	1000 6	54582	97202	10708	405504	30899	0	mem.bash
[3498.830517]	[64587]	1000 6	54587	611672	409945	4526080	146166	0	mem.bash
[3498.831116]			54589	80843	236	249856	132		crond
					64587 (m	nem.bash)	total-um:2	446688kB, and	on-rss:1639780kB
, file-rss:0kB, shmem-rss:0kB, UID:1000									
[3498.939385] oom_reaper: reaped process 64587 (mem.bash), now anon-rss:0kB, file-rss:0kB, shmem-rs									
s:0kB									
Killed .									
[user@localhost lab5]\$									

Top

```
Tasks: 108 total, 3 running, 97 sleeping, 8 stopped, 0 zombie

pCpu(s): 82.3 us, 16.0 sy, 0.0 ni, 0.0 id, 0.0 wa, 1.7 hi, 0.0 si, 0.0 st

MiB Mem: 1827.1 total, 1475.2 free, 255.2 used, 96.7 buff/cache

MiB Swap: 820.0 total, 572.4 free, 247.6 used. 1450.1 avail Mem
                                                            VIRT RES
        PID USER
                                                                                             SHR S %CPU %MEM
                                                                                                                                              TIME+ COMMAND
                                       PR NI
                                                                                            2968 R
0 S
4156 S
0 S
                                                                                                                                         0:04.77 mem.bash
0:00.55 ksoftirqd/0
0:02.05 systemd
0:00.00 kthreadd
0:00.00 rcu_gp
                                                                                                             97.3
0.3
0.0
                                       20
20
20
20
20
                                                                                                                            6.2
0.0
0.4
0.0
    64650 user
                                                         335480 115960
                                                 0
0
0
            9 root
            1 root
2 root
3 root
                                                         179200
                                                                             6584
                                                                    0
                                                                                   0
                                        0 -20
                                                                    0
                                                                                   0
                                                                                                               0.0
                                                                                                                            0.0
```

```
top — 16:45:37 up 1:08, 2 users, load average: 1.04, 0.44, 0.36
Tasks: 108 total, 4 running, 96 sleeping, 8 stopped, 0 zombie
%Cpu(s): 82.6 us, 15.7 sy, 0.0 ni, 0.0 id, 0.0 wa, 1.7 hi, 0.0 si, 0.0 st
MiB Mem: 1827.1 total, 938.7 free, 786.4 used, 102.0 buff/cache
MiB Swap: 820.0 total, 572.4 free, 247.6 used. 916.2 avail Mem
       PID USER
                                PR NI
                                                 VIRT RES
                                                                           SHR S ::CPU ::MEM
                                                                                                                 TIME+ COMMAND
                                              878396 659008
                                                                                                              0:28.36 mem.bash
0:00.64 ksoftirqd/0
                                                                         2968 R
    64650 user
                                                                                       97.7
                                                                                                  35.2
                                                                                        0.3
           9 root
                                                                              0 S
                                20
                                        0
                                                                                                   0.0
                                                     0
                                                                 0
                                                                                                             0:00.01 top
0:02.05 systemd
                                                                                        0.3
    64651 user
                                              274272
                                                              4892
                                                                          4112 R
                                                                                                   0.3
                                2Й
                                        и
                                20
                                        0
                                                                          4156 S
                                              179200
                                                             6584
                                                                                                   0.4
           1 root
                                                                                                              0:00.00 kthreadd
           2 root
                                2Й
                                        И
                                                                              0 S
                                                                                         0.0
                                                                                                   0.0
                                                     Я
                                                                  и
                                3 running, 97 sleeping,
5.6 sy, 0.0 ni, 0.0 id,
total, 743.0 free,
Tasks: 108 total,
                                                                                8 stopped
1dsκs. 100 total) 5 fam.
/Cpu(s): 82.4 us, 15.6 sy,
1iB Mem : 1827.1 total,
1iB Swap: 820.0 total,
                                                                             0.0 wa, 1.7 hi, 0.3 si, 0.0 st
980.0 used, 104.0 buff/cache
                                                  572.4 free,
                                                                                                       721.5 avail Mem
                                                                             247.6 used.
      PID USER
                                                VIRT
                                                              RES
                                                                           SHR S :: CPU :: MEM
                                                                                                                  TIME+ COMMAND
                              PR NI
   64650 user
                               20
                                       0
                                           1076396 857008
                                                                         2968 R
                                                                                       97.3
                                                                                                  45.8
                                                                                                              0:37.15 mem.bash
                                                                                         0.3
                                                                                                              0:00.67 ksoftirqd/0
          9 root
                               20
                                       0
                                                                             0 S
                                                                                                              0:02.05 systemd
0:00.00 kthreadd
                               20
                                       0
                                             179200
                                                             6584
                                                                         4156 S
                                                                                         0.0
          1 root
                                                                                                    0.4
                                                                              0 S
          2 root
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0.0
                                                                                                             0:00.00 rcu_gp
0:00.00 rcu par
                                0 -20
                                                     0
                                                                  0
          3 root
                                                                              0 I
                                                                                                   0.0
                                    -20
                                 Й
                                                                                                    0.0
          4 root
                                                      и
                                                                  И
 top - 16:46:14 up 1:09, 2 users, load average: 1.75, 0.70, 0.45
Tasks: 108 total, 4 running, 96 sleeping, 8 stopped, 0 zombie
xCpu(s): 81.1 us, 16.8 sy, 0.0 ni, 0.0 id, 0.0 wa, 1.7 hi, 0.3 si, 0.0 st
MiB Mem: 1827.1 total, 129.1 free, 1587.1 used, 110.9 buff/cache
MiB Swap: 820.0 total, 572.4 free, 247.6 used. 111.0 avail Mem
                                                                                                                 TIME+ COMMAND
        PID USER
                                PR NI
                                                 VIRT
                                                              RES
                                                                           SHR S %CPU %MEM
                                                                                                             1:04.06 mem.bash
0:00.76 ksoftirqd/0
0:02.05 systemd
0:00.00 kthreadd
                                        И 1696796
     64650 user
                                                                          2968 R
                                2Й
                                                              1.4g
                                                                                       97.7
                                                                                                  79.0
           9 root
                                                                                        0.3
                                                                                                   0.0
                                20
                                        0
                                                                              0 S
                                                      И
                                                                                        0.0
0.0
                                                                                                   0.4
0.0
                                              179200
                                                             6584
                                                                          4156 S
            1 root
                                20
                                        И
                                                                              ЯS
           2 root
                                2Й
                                        и
                                                       И
                                                                  И
                                                                                                             0:00.00 rcu_gp
0:00.00 rcu_par_gp
            3 root
                                  И -2И
                                                                  и
                                                                               0
                                                                                         0.0
                                                                                                   0.0
                                                       И
                                                                                         0.0
            4 root
                                  N -2N
                                                       И
                                                                  И
                                                                               И
                                                                                  I
                                                                                                   0.0
 top — 16:46:29 up 1:09, 2 users, load average: 1.96, 0.80, 0.49
Tasks: 108 total, 3 running, 97 sleeping, 8 stopped, 0 zombie
%Cpu(s): 78.3 us, 19.3 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.0 hi, 0.3 si, 0.0 st
MIB Mem: 1827.1 total, 65.0 free, 1728.5 used, 33.6 buff/cache
MIB Swap: 820.0 total, 399.1 free, 420.9 used. 8.8 avail Mem
                                                                                                               TIME+ COMMAND
       PID USER
                                                VIRT
                                                                          SHR S %CPU %MEM
                               PR NI
                                                              RES
                                                                                                            1:18.62 mem.bash
0:06.66 kswapd0
    64650 user
                               20
                                       0 2015576
                                                             1.6g
                                                                          568 R
                                                                                      93.3
                                                                                                89.3
                                                                                                 0.0
0.0
          47 root
                               20
                                        0
                                                     Ø
                                                                             0 S
                                                                                       2.9
                                                                                                            0:00.83 ksoftirqd/0
0:00.05 kworker/0:0-events_power_ef+
           9 root
                                                                             0 S
                                                                                       0.6
                               20
                                        И
                                                     И
                                                                 И
    64644 root
                               20
                                        Й
                                                     И
                                                                 и
                                                                             и
                                                                                       0.3
                                                                                                  0.0
                                                                                                           0:02.05 systemd
0:00.00 kthreadd
           1 root
                               20
                                        и
                                             179200
                                                              548
                                                                          148 S
                                                                                       0.0
                                                                                                  0.0
           2 root
3 root
                                                                             0 S
                               20
                                       0
                                                     0
                                                                 И
                                                                                       0.0
                                                                                                 0.0
                                                                                                           0:00.00 rcu_gp
0:00.00 rcu_par_gp
                                                                             0 I
                                                     Ø
                                                                 0
                                                                                       0.0
                                                                                                  0.0
                                 И -2И
                                                                                       0.0
                                                                                                  0.0
           4 root
                                                     и
                                                                 и
                                                                             и
  top - 16:46:36 up
                                  1:09,
                                                               load average: 2.04, 0.84, 0.50
                                             2 users,
  Tasks: 108 total, 4 running, 96 sleeping, 8 stopped, 0 zombie

\( \times \text{Cpu(s): 77.6 us, 18.9 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.8 hi, 0.6 si, 0.0 st

MiB Mem: 1827.1 total, 74.0 free, 1719.3 used, 33.7 buff/cache

MiB Swap: 820.0 total, 258.3 free, 561.7 used. 17.9 avail Mem
                                                                           SHR S %CPU %MEM
                                                                                                                TIME+ COMMAND
         PID USER
                                 PR NI
                                                 VIRT
                                                              RES
                                                                                                             1:24.65 mem.bash
0:06.90 kswapd0
                                                              1.6g
Ø
                                                                           568 R
0 S
      64650 user
                                         0 2139392
                                                                                      92.1
                                                                                                 88.2
          47 root
                                 20
                                                                                        3.6
                                                                                                   0.0
            9 root
                                 20
                                         0
                                                                  Ø
                                                                              Ø R
                                                                                        0.3
                                                                                                             0:00.86 ksoftirqd/0
                                                       0
                                                                                                   0.0
                                 20
                                         0
                                              635064
                                                               584
                                                                           172 S
                                                                                                             0:00.83 tuned
         894 root
                                                                                        0.3
                                                                                                   0.0
     64652 user
                                 20
                                         0
                                              274272
                                                              1384
                                                                           964 R
                                                                                        0.3
                                                                                                   0.1
                                                                                                             0:00.05 top
                                              179200
                                                                           140
            1 root
                                 20
                                                               172
                                                                                  S
                                                                                         0.0
                                                                                                             0:02.05 systemd
                                                                                                             Θ:ΘΘ.ΘΘ kthread
 top - 16:46:55 up 1:09, 2 users, load average: 2.01, 0.91, 0.54
Tasks: 107 total, 2 running, 97 sleeping, 8 stopped, 0 zombie
2Cpu(s): 0.0 us, 0.7 sy, 0.0 ni, 97.0 id, 1.7 wa, 0.7 hi, 0.0 si, 0.0 st
MiB Mem: 1827.1 total, 1697.0 free, 90.6 used, 39.4 buff/cache
MiB Swap: 820.0 total, 520.1 free, 299.9 used. 1643.5 avail Mem
     4184.439977] [
                                              0
                                                    852
                               8521
                                                                 77886
                                                                                       0
                                                                                              180224
                                                                                                                                             0 gssproxy
                                                                                                                  172
                                                                                                           0:00.46 systemd-journal
0:00.16 oom_reaper
0:00.18 NetworkManager
0:02.06 systemd
0:00.00 kthreadd
                                                                                      0.7
                               20
                                        0
                                               94000
                                                            2496
                                                                        2340 S
        650 root
                                                                                                 0.1
          19 root
                               20
                                        И
                                                    И
                                                                0
                                                                             0 S
                                                                                      0.3
                                                                                                 0.0
                               20
                                             680772
                                                               84
                                                                             Ø S
                                                                                      0.3
                                                                                                 0.0
        883 root
                                        0
                                                              260
                                20
                                             179200
                                                                             0 S
                                                                                       0.0
                                                                                                 0.0
           1 root
                                        0
                                                                                s
                                20
                                                                 0
                                                                             0
                                                                                       0.0
                                                                                                 0.0
              root
```

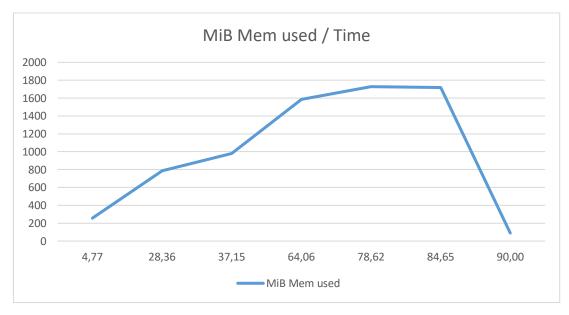
Dmesg | grep "mem.bash"

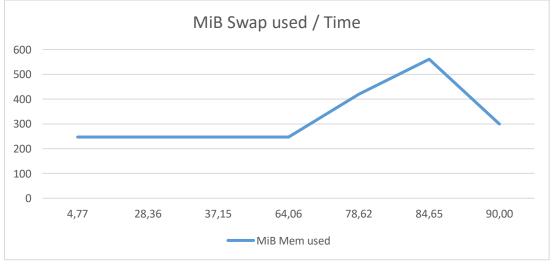
Последние 2 записи о скрипте в системном журнале

```
rss:0kB
[ 2113.339796] [ 1632] 1000 1632 663614 421718 4947960 186339 0 newmom.b
[ 2113.340416] Out of memory: Killed process 1632 (newmom.bash) total-un:2654456kB, anon-rss:
kB, file=rss:0kB, shmem=rss:0kB, UID:1000
[ 2113.502552] oom_rcaper: reaped process 1632 (newmom.bash), now anon-rss:0kB, file=rss:0kB,
rss:0kB
[ 2803.137908] [ 1678] 1000 1678 664142 421212 4956160 187361 0 nom.bash
[ 2803.138387] Out of memory: Killed process 1678 (nom.bash) total-un:2656568kB, anon-rss:168
file=rss:0kB, shmem=rss:0kB, UID:1000
[ 2803.225722] oom_reaper: reaped process 1678 (nom.bash), now anon-rss:0kB, file=rss:0kB, sh
:0kB
[ user@localhost lab5]$ ____
```

Последняя строка report.log

[user@localhost lab5]\$ cat report.log | tail -n 1 31000000





Второй этап:

```
top - 17:08:35 up 1:31, 2 users, load average: 0.69, 0.67, 0.47
Tasks: 109 total, 4 running, 96 sleeping, 9 stopped, 0 zombie
¿Cpu(s): 82.3 us, 15.7 sy, 0.0 ni, 0.0 id, 0.0 wa, 1.7 hi, 0.3 si, 0.0 st
1iB Mem : 1827.1 total, 1513.0 free, 226.9 used, 87.1 buff/cache
1iB Swap: 820.0 total, 522.5 free, 297.5 used. 1483.2 avail Mem
  5261.2291971 [ 8651
                                          0 865
                                                          107190
                                                                                                            619
                                                                                                                                       0 sssd be
                                                                                        442368
                                                                                 16
                                   0 289016 69468
                                                                   2932 R 48.8
3092 R 48.5
                            20
                                                                                                      0:02.87 mem2.bash
  64701 user
                                                                                            3.7
                                    ø
                                                                                            3.7
0.0
                                                                                                      0:02.87 mem.bash
0:01.37 ksoftirqd/0
  64700 user
                            2Й
                                         287696
                                                     68560
         9 root
                             20
                                    0
                                                 и
                                                           0
                                                                        0 S
                                                                                  0.3
         1 root
                                                                                                      0:02.11 systemd
                                          179200
                                                        5504
                                                                    3760 S
                             20
                                    0
                                                                                  0.0
                                                                                            0.3
         2 root
                             20
                                    0
                                                  0
                                                             0
                                                                        0 S
                                                                                  0.0
                                                                                            0.0
                                                                                                      0:00.00 kthreadd
                                                                        0 I
0 I
         3 root
                              0
                                 -20
                                                                                            0.0
                                                                                                      0:00.00 rcu_gp
                                                             0
                                                                                  0.0
                                                                                                     0:00.00 rcu_par_gp
0:00.00 kworker/0:0H-kblockd
         4 root
                              0 -20
                                                  0
                                                             0
                                                                                  0.0
                                                                                            0.0
                                                                        0 I
                                                                                            0.0
                              0 -20
                                                  0
                                                             0
                                                                                  0.0
         6 root
op - 17:08:38 up 1:31, 2 users, load average: 0.69, 0.67, 0.47

lasks: 109 total, 4 running, 96 sleeping, 9 stopped, 0 zombie

Cpu(s): 82.3 us, 16.0 sy, 0.0 ni, 0.0 id, 0.0 wa, 1.7 hi, 0.0 si, 0.0 st

liB Mem : 1827.1 total, 1450.0 free, 289.4 used, 87.7 buff/cache

liB Swap: 820.0 total, 522.5 free, 297.5 used. 1420.4 avail Mem
  5261.2291971 [ 865]
                                             0 865
                                                                                             442368
                                                             107190
                                                                                                                                              0 sssd be
                                                                                      16
                                                                                                                  619
                                      0 319772 100504
                                                                       3092 R
                                                                                     48.8
48.5
                                                                                                5.4
5.4
0.0
  64700 user
                                                                                                            0:04.34 mem.bash
                              2Й
                                                                        2932 R
                                                                                                            0:04.33 mem2.bash
  64701 user
                              20
                                      0
                                            320828 101412
                                                                                                           0:01.38 ksoftirqd/0
0:00.41 rcu_sched
0:02.11 systemd
0:00.00 kthreadd
                                                                                      0.3
0.3
         9 root
                              20
                                      0
                                                    0
                                                                0
                                                                            0 S
       10 root
                                                                            0 R
                              2Й
                                      и
                                                    и
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                                                                                                 0.0
                                                           5504
         1 root
                              20
                                      0
                                            179200
                                                                        3760 S
                                                                                       0.0
                                                                                                 0.3
                              20
                                                                            0 S
                                                                                       0.0
0.0
                                                                                                 0.0
a a
         2 root
                                      0
                                                   0
                                                                0
top - 17:08:44 up 1:31, 2 users, load average: 0.95, 0.72, 0.49
Tasks: 109 total, 6 running, 94 sleeping, 9 stopped, 0 zombie
%Cpu(s): 82.8 us, 15.2 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.0 hi, 0.0 si, 0.0 st
MiB Mem : 1827.1 total, 1332.3 free, 405.9 used, 88.9 buff/cache
MiB Swap: 820.0 total, 522.5 free, 297.5 used. 1303.3 avail Mem
   5261.2291971 [ 8651
                                            0 865 107190
378248 158848 36
                                                                                              442368
                                                                                      16
                                                                                                                   619
                                                                                                                                               0 sssd be
                                                                                                            0:07.30 mem.bash
0:07.25 mem2.bash
                                                                        3092 R
   64700 user
                               20
                                       0
                                                                                     49.0
                                                                                                  8.5
                                            381548 162132
                                                                        2932 R
                                                                                     48.0
                                                                                                  8.7
   64701 user
                               20
                                       0
                                                                                                            0:02.11 systemd
0:00.00 kthreadd
                                                                                      0.0
0.0
         1 root
                                                            5504
                                                                        3760 S
                               2Й
                                       и
                                             179200
                                                                                                  0.3
                                                                                                  0.0
          2 root
                               20
                                       0
                                                     0
                                                                 и
                                                                             0 S
          3 root
                                                                             0 I
                                0 -20
                                                     0
                                                                 0
                                                                                       0.0
                                                                                                  0.0
                                                                                                            0:00.00 rcu_gp
                                                                                                           0:00.00 rcu_par_gp
0:00.00 kworker/0:0H-kblockd
                                                                                       0.0
                                                                                                  0.0
0.0
                                0 -20
                                                     0
                                                                 0
                                                                             0 I
          4 root
                                                                 и
                                     -2B
                                                     и
                                                                             и
          6 root
top - 17:08:59 up 1:31, 2 users, load average: 1.48, 0.85, 0.54
Tasks: 109 total, 4 running, 96 sleeping, 9 stopped, 0 zombie
2Cpu(s): 81.8 us, 16.5 sy, 0.0 ni, 0.0 id, 0.0 wa, 1.7 hi, 0.0 si, 0.0 st
MiB Mem: 1827.1 total, 1025.4 free, 709.7 used, 92.0 buff/cache
MiB Swap: 820.0 total, 522.5 free, 297.5 used. 997.9 avail Mem
                                                                         90 16 442368
2932 R 48.8 17.1
   5261.2291971 [ 865]
                                               0 865
                                                                107190
                                                                                               442368
                                                                                                                                                  0 sssd be
                                                                                                                     619
                                                                                                               0:14.59 mem2.bash
0:14.62 mem.bash
                                       0 538760 319476
                               20
   64701 user
                                            531500 312232
                                                                          3092 R
   64700 user
                               20
                                        0
                                                                                      48.2 16.7
                                                                                                               0:01.46 ksoftirqd/0
0:00.42 rcu_sched
         9 root
                               20
                                        0
                                                      0
                                                                  0
                                                                              0 S
                                                                                        0.3
                                                                                                    0.0
        10 root
                               20
                                       и
                                                      и
                                                                  и
                                                                               0 R
                                                                                          0.3
                                                                                                    0.0
                                                                                                              0:02.11 systemd
0:00.00 kthreadd
0:00.00 rcu_gp
                               20
                                       0
                                             179200
                                                             5504
                                                                          3760 S
                                                                                          0.0
                                                                                                    0.3
          1 root
                                                                                                    0.0
          2 root
                               20
                                       0
                                                      0
                                                                  0
                                                                               0 S
                                                                                          0.0
          3 root
                                 0 -20
                                                                                                    0.0
                                                      0
                                                                  0
                                                                               0
                                                                                          0.0
                                 0 -20
                                                      0
                                                                  0
                                                                               0 I
                                                                                         0.0
                                                                                                    0.0
                                                                                                               0:00.00 rcu par qp
          4 root
top - 17:09:05 up 1:31, 2 users, load average: 1.87, 0.96, 0.58
Tasks: 109 total, 4 running, 96 sleeping, 9 stopped, 0 zombie

\( \times \text{Cpu(s)}: 82.0 us, 15.6 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.4 hi, 0.0 si, 0.0 st

MIB Mem : 1827.1 total, 908.9 free, 825.1 used, 93.1 buff/cache

MIB Swap: 820.0 total, 522.5 free, 297.5 used. 882.0 avail Mem
                                                                                               442368
   5261.2291971 [
                               8651
                                               и
                                                     865
                                                                107190
                                                                                        16
                                                                                                                                                  0 sssd_be
                                                                                                              0:17.55 mem.bash
0:17.49 mem2.bash
0:01.48 ksoftirqd/0
0:00.97 top
                                                                                      48.7 19.8
48.0 20.2
                                        0 590108 370840
   64700 user
                               20
                                                                          3092 R
                               20
                                                                          2932 R
   64701 user
                                        0 598028 378612
                                                                                         0.3
0.3
                                20
          9 root
                                        0
                                                      0
                                                                  0
                                                                              0 S
                                                                                                   0.0
    64688 user
                               20
                                        0
                                             274272
                                                              1904
                                                                          1508 R
                                                                                                    0.1
                                                                                                               0:02.11 systemd
0:00.00 kthreadd
                                            179200
                                                                          3760 S
                                                                                                   0.3
          1 root
                               20
                                        0
                                                             5504
                                                                                         0.0
           2 root
                                20
                                                                               0 S
                                        0
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                                                                  0
                                                                                         0.0
                                                                                                    0.0
           3 root
                                                                  0
                                                                               0 I
                                                                                          0.0
                                                                                                               0:00.00 rcu_qp
                                 и
                                     -20
                                                      0
                                                                                                    0.0
```

```
top - 17:09:08 up 1:32, 2 users, load average: 1.87, 0.96, 0.58
Tasks: 109 total, 5 running, 95 sleeping, 9 stopped, 0 zombie

CCpu(s): 81.4 us, 15.9 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.4 hi, 0.3 si, 0.0 st

MiB Mem : 1827.1 total, 850.9 free, 882.5 used, 93.7 buff/cache

MiB Swap: 820.0 total, 522.5 free, 297.5 used. 824.3 avail Mem
   5261.2291971 [ 865]
                                         0 865
                                                      107190
                                                                             16
                                                                                   442368
                                                                                                      619
                                                                                                                                0 sssd_be
                                  0 627992 408444
0 618752 399616
                                                                2932 R 48.7 21.8
3092 R 48.3 21.4
                           20
                                                                                                0:18.95 mem2.bash
0:19.00 mem.bash
   64701 user
   64700 user
                           20
                           20
                                                                                      0.0
                                                                                                 0:01.49 ksoftirgd/0
        9 root
                                   0
                                               0
                                                          0
                                                                    0 S
                                                                             0.3
   64696 root
                                                                             0.3
0.0
                                                                                       0.0
                                                                                                 0:00.01 kworker/0:2-events_power_ef+
                           20
                                   0
                                               0
                                                          0
                                                                     0 R
                           20
                                        179200
                                                     5504
                                                                 3760 S
                                                                                                 0:02.11 systemd
         1 root
                                   0
                                                                                       0.3
                                                                                                 0:00.00 kthreadd
         2 root
                           20
                                                          0
                                                                     0 S
                                                                              0.0
                                                                                       0.0
                                  0
                                               0
                             0 -20
                                               0
                                                          0
                                                                     0 I
                                                                             0.0
                                                                                      0.0
                                                                                                0:00.00 rcu_gp
         3 root
top - 17:09:14 up 1:32, 2 users, load average: 2.04, 1.01, 0.60
Tasks: 109 total, 5 running, 95 sleeping, 9 stopped, 0 zombie

CCpu(s): 81.8 us, 15.5 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.7 hi, 0.0 si, 0.0 st

MiB Mem : 1827.1 total, 737.7 free, 994.6 used, 94.8 buff/cache

MiB Swap: 820.0 total, 522.5 free, 297.5 used. 711.7 avail Mem
   5261.229197] [ 865]
                                          0 865 107190
                                                                              16
                                                                                     442368
                                                                                                        619
                                                                                                                                 0 sssd be
                                                                 3092 R 48.5 24.4
2932 R 48.2 24.9
                                   0 675908 4566400 685412 465996
                                                                                                  0:21.93 mem.bash
0:21.85 mem2.bash
   64700 user
                            20
   64701 user
                            20
                                                                                       0.0
                                                                                                  0:01.51 ksoftirqd/0
        9 root
                                   0
                                               0
                                                          0
                                                                              0.3
                            20
                                                                      0 S
        10 root
                            20
                                   Ø
                                                0
                                                           0
                                                                      0 R
                                                                               0.3
                                                                                        0.0
                                                                                                  0:00.43 rcu_sched
                                                                                                 0:02.11 systemd
0:00.00 kthreadd
                                   0
                                        179200
                                                      5504
         1 root
                            20
                                                                 3760 S
                                                                               0.0
                                                                                        0.3
                                                                                        0.0
                                                                      0 S
                                                                               0.0
         2 root
                            20
                                  и
                                               и
                                                           и
         3 root
                             0 -20
                                                0
                                                           0
                                                                      0 I
                                                                               0.0
                                                                                        0.0
                                                                                                 0:00.00 rcu_gp
                                                                                                  <u> 0:00 00 rcu nar m</u>
                                 -2Я
                                                и
                                                           и
                                                                      и
top - 17:89:17 up 1:32, 2 users, load average: 2.20, 1.06, 0.61
Tasks: 109 total, 4 running, 96 sleeping, 9 stopped, 0 zombie

CCpu(s): 82.6 us, 15.0 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.0 hi, 0.3 si, 0.0 st

MiB Mem: 1827.1 total, 678.4 free, 1053.3 used, 95.4 buff/cache
MiB Mem : 1827.1 total,
MiB Swap: 820.0 total,
                                            678.4 free,
522.5 free,
                                                                     297.5 used.
                                                                                             652.6 avail Mem
  5261.2291971 [ 865]
                                          0 865
                                                        107190
                                                                               16
                                                                                      442368
                                                                                                         619
                                                                                                                                   0 sssd be
                                                                  3092 R
                                                                              48.8 26.0
                            20
                                   0
                                        705608 486208
                                                                                                   0:23.40 mem.bash
  64700 user
  64701 user
                                         715772 496356
                                                                  2932 R
                                                                                                   0:23.31 mem2.bash
                            20
                                    0
                                                                               48.5
                                                                                        26.5
                                                                                                   0:01.52 ksoftirqd/0
         9 root
                            20
                                   0
                                                и
                                                           и
                                                                      0 S
                                                                               0.3
                                                                                         0.0
         1 root
                                         179200
                                                       5504
                                                                  3760 S
                            20
                                   0
                                                                                0.0
                                                                                         0.3
                                                                                                   0:02.11 systemd
                            20
                                  0
                                                0
                                                           0
                                                                      0 S
                                                                                0.0
                                                                                         0.0
                                                                                                   0:00.00 kthreadd
         2 root
                                                                                                   0:00.00 rcu_gp
         3 root
                             0 -20
                                                                      0 I
                                                                                         0.0
                                                0
                                                           И
                                                                                0.0
                                                                                                   0:00.00 rcu_par_gp
         4 root
                             0 -20
                                                0
                                                           0
                                                                      0 I
                                                                                0.0
                                                                                         0.0
top - 17:09:20 up 1:32, 2 users, load average: 2.34, 1.11, 0.63
Tasks: 109 total, 5 running, 95 sleeping, 9 stopped, 0 zombie

\( \times \text{Cpu(s)}: 82.3 us, 15.6 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.0 hi, 0.0 si, 0.0 st

MIB Mem : 1827.1 total, 619.1 free, 1112.0 used, 95.9 buff/cache
MiB Mem : 1827.1 total,
MiB Swap: 820.0 total,
                                                                  1112.0 used,
297.5 used.
                                             522.5 free,
                                                                                            593.6 avail Mem
   5261.2291971 [ 8651
                                         0 865
                                                         107190
                                                                              16
                                                                                     442368
                                                                                                        619
                                                                                                                                 0 sssd be
                                        735308 516040
                                                                              48.7 27.6
                                                                 3092 R
                                                                                                  0:24.87 mem.bash
   64700 user
                            20
                                   0
                                                                                                  0:24.78 mem2.bash
                                         746000 526452
                                                                 2932 R
                                                                              48.7
   64701 user
                            20
                                   0
                                                                                       28.1
                                                                                                 0:01.53 ksoftirqd/0
0:02.11 systemd
0:00.00 kthreadd
                            20
                                                                     A S
                                                                                        0.0
         9 root
                                   и
                                               и
                                                          и
                                                                               0.3
         1 root
                            20
                                   0
                                         179200
                                                      5504
                                                                 3760 S
                                                                               0.0
                                                                                         0.3
                                  0
                                               0
                                                                      0 S
                                                                               0.0
         2 root
                            20
                                                           0
                                                                                        0.0
                                                                                                  0:00.00 rcu_gp
         3 root
                             0 -20
                                                0
                                                           0
                                                                      0 I
                                                                               0.0
                                                                                         0.0
                                  20
                                                a
                                                           a
                                                                      a
                                                                                                  0.00 00
top - 17:09:23 up 1:32, 2 users, load average: 2.34, 1.11, 0.63

Tasks: 109 total, 4 running, 96 sleeping, 9 stopped, 0 zombie

\( \times \) 20.0 us, 16.3 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.4 hi, 0.3 si, 0.0 st

MiB Mem : 1827.1 total, 560.4 free, 1170.1 used, 96.5 buff/cache

MiB Swap: 820.0 total, 522.5 free, 297.5 used. 535.2 avail Mem
   5261.2291971 [
                           8651
                                          0 865
                                                        107190
                                                                                     442368
                                                                                                                                 0 sssd_be
                                                                              16
                                                                 2932 R
3092 R
                                                                             48.5 29.8
                                                                                                  0:26.24 mem2.bash
0:26.32 mem.bash
                                        776360 556812
   64701 user
                            20
                                   0
                                        764480 545080
   64700 user
                            20
                                   0
                                                                             48.2
                                                                                      29.1
        9 root
                            20
                                              0
                                                                     0 S
                                                                               0.3
                                                                                       0.0
                                                                                                  0:01.54 ksoftirgd/0
                                                         и
                                                                                       0.1
                                                                                                  0:00.99 top
                                                                 1508 R
   64688 user
                            20
                                   0
                                        274272
                                                      1904
                                                                               0.3
                                                                                                  0:02.11 systemd
                            20
                                        179200
                                                                 3760 S
         1 root
                                   0
                                                      5504
                                                                               0.0
         2 root
                            20
                                   0
                                               0
                                                           0
                                                                     0 S
                                                                               0.0
                                                                                        0.0
                                                                                                 0:00.00 kthreadd
                                                                                                  0:00.00 rcu m
```

```
top - 17:09:32 up 1:32, 2 users, load average: 2.60, 1.20, 0.67
Tasks: 109 total, 4 running, 96 sleeping, 9 stopped, 0 zombie
zCpu(s): 81.9 us, 16.0 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.1 hi, 0.0 si, 0.0 st
MiB Mem : 1827.1 total, 389.2 free, 1339.6 used, 98.2 buff/cache
MiB Swap: 820.0 total, 522.5 free, 297.5 used. 364.9 avail Mem
   5261.2291971 [ 865]
                                               0
                                                     865
                                                                107190
                                                                                               442368
                                                                                                                                                 0 sssd_be
                                                                                                              0:30.71 mem.bash
0:30.63 mem2.bash
                                        0 849620 630352
                                                                                      49.0 33.7
   64700 user
                               20
                                                                         3092 R
                                                                          2932 R
   64701 user
                                        0
                                             864404 644988
                                                                                       48.7
                               20
                                                                                                  34.5
                                                                                                              0:01.57 ksoftirqd/0
0:00.02 kworker/0:2-events_power_ef+
         9 root
                               20
                                        0
                                                     0
                                                                  0
                                                                              0 S
                                                                                         0.3
                                                                                                   0.0
   64696 root
                                                      и
                                                                               ЙΙ
                               20
                                       0
                                                                  и
                                                                                         0.3
                                                                                                    0.0
                                                                                                              0:02.11 systemd
0:00.00 kthreadd
                                              179200
                                                             5504
          1 root
                               20
                                        0
                                                                          3760 S
                                                                                         0.0
                                                                                                    0.3
                               20
                                       0
                                                      0
                                                                  0
                                                                               0 S
                                                                                         0.0
                                                                                                    0.0
          2 root
                                                                                                              0:00.00 rcu_gp
3 root 6 20 G
4 root 8 20 G
top - 17:89:35 up 1:32, 2 users, load average: 2.71, 1.55,
top - 17:89:35 up 1:32, 2 users, load average: 2.71, 1.55,
Tasks: 109 total, 5 running, 95 sleeping, 9 stopped, 0 zombie
2Cpu(s): 80.8 us, 16.5 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.4 hi, 0.3 si, 0.0 st
M:B Mem : 1827.1 total, 331.2 free, 1397.1 used, 98.8 buff/cache
4:B Mem : 1827.1 total, 522.5 free, 297.5 used. 307.1 avail Mem
                                 0 -20
                                                                               ЯΙ
                                                                                         0.0
          3 root
                                                      и
                                                                  и
                                                                                                    0.0
                                                                                             442368
   5261.2291971 [ 865]
                                             0 865
                                                             107190
                                                                                     16
                                                                                                                                             0 sssd_be
                                                                                                          0:32.10 mem2.bash
0:32.16 mem.bash
                                            893708 674292
                                                                       2932 R
3092 R
                                      Ø
   64701 user
                              20
                                                                                     48.7
                                                                                              36.0
   64700 user
                                            878924 659656
                                                                                     48.0
                              20
                                                                                               35.3
                                       и
                                                                                                           0:01.58 ksoftirqd/0
        9 root
                                                   0
                               20
                                       и
                                                              и
                                                                          ЯS
                                                                                     0.3
                                                                                                0.0
                                                                        1508 R
                                                                                                           0:01.00 top
   64688 user
                               20
                                       0
                                            274272
                                                            1904
                                                                                      0.3
                                                                                                 0.1
                                                                                                          0:02.11 systemd
                               20
                                            179200
                                                           5504
                                                                       3760 S
                                                                                      0.0
                                                                                                0.3
          1 root
                                       0
 top - 17:09:38 up 1:32, 2 users, load average: 2.71, 1.25, 0.69
Tasks: 109 total, 5 running, 95 sleeping, 9 stopped, 0 zombie
%Cpu(s): 80.8 us, 16.8 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.4 hi, 0.0 si, 0.0 st
MiB Mem: 1827.1 total, 272.4 free, 1455.3 used, 99.4 buff/cache
MiB Swap: 820.0 total, 522.5 free, 297.5 used. 248.6 avail Mem
    5261.2291971 [
                               8651
                                               0
                                                      865
                                                                107190
                                                                                       16
                                                                                               442368
                                                                                                                                                0 sssd_be
                                             923804 704388
908492 689224
                                                                                      48.5 37.6
    64701 user
                                20
                                        0
                                                                         2932 R
                                                                                                             0:33.56 mem2.bash
    64700 user
                                                                          3092 R
                                                                                      48.2
                                                                                                             0:33.61 mem.bash
                                20
                                        0
                                                                                                 36.8
                                                                                         0.3
0.3
           9 root
                                20
                                        0
                                                      0
                                                                  0
                                                                              0 S
                                                                                                   0.0
                                                                                                             0:01.59 ksoftirgd/0
                                                                                                             0:00.44 rcu_sched
          10 root
                                20
                                        0
                                                      0
                                                                  0
                                                                              0 R
                                                                                                   0.0
                                                                                                             0:02.11 systemd
0:00.00 kthreadd
                                              179200
           1 root
                                20
                                        0
                                                             5504
                                                                         3760 S
                                                                                         0.0
                                                                                                   0.3
           2 root
                                20
                                        0
                                                                              0 S
                                                                                         0.0
                                                                                                   0.0
                                                      0
                                                                  0
                                                                                                             0:00.00 rcu_qp
           3 root
                                 0 - 20
                                                      0
                                                                  0
                                                                               0 I
                                                                                         0.0
                                                                                                   0.0
                                                                  0
                                                                               0 I
                                                                                                             0:00.00 rcu_par_gp
           4 root
                                  0 -20
                                                      0
                                                                                         0.0
                                                                                                   0.0
top - 17:09:47 up 1:32, 2 users, load average: 2.91, 1.34, 0.72
Tasks: 109 total, 5 running, 95 sleeping, 9 stopped, 0 zombie

\( \times \text{Cpu(s)}: \text{81.2 us, 17.1 sy, 0.0 ni, 0.0 id, 0.0 wa, 1.7 hi, 0.0 si, 0.0 st} \)

MIB Mem : 1827.1 total, 94.2 free, 1631.7 used, 101.1 buff/cache

MIB Swap: 820.0 total, 522.5 free, 297.5 used. 71.4 avail Mem
                                                                                             442368
   5261.2291971 [ 8651
                                                               107190
                                              0
                                                   865
                                                                                      16
                                                                                                                   619
                                                                                                                                              0 sssd be
                                                                                                           0:38.04 mem.bash
0:37.94 mem2.bash
0:01.02 top
                                                                        3092 R 48.8 41.6
    64700 user
                               20
                                       0 997856 778720
                                       0 1014620 795204
                                                                        2932 R
    64701 user
                               20
                                                                                     48.8 42.5
                                                                                       0.7
0.0
                                                                        1508 R
                                       0
                                                            1904
                                                                                                 0.1
    64688 user
                               20
                                            274272
                                                                                                           0:02.11 systemd
0:00.00 kthreadd
0:00.00 rcu_gp
          1 root
                               20
                                       0
                                            179200
                                                            5504
                                                                        3760 S
                                                                                                 0.3
                                                                                                 0.0
0.0
                                                                                       0.0
          2 root
                               20
                                       0
                                                     0
                                                                 0
                                                                             0 S
                                                                                       0.0
          3 root
                                И -2И
                                                     И
                                                                 и
                                                                             ЙΙ
                                 0 -20
           4 root
                                                     0
                                                                 0
                                                                             0 I
                                                                                       0.0
                                                                                                 0.0
                                                                                                            0:00.00 rcu_par_gp
                                                                 0
                                                                                                            0:00.00 kworker/0:0H-kblockd
          6 root
                                0 -20
                                                     0
                                                                             0 I
                                                                                       0.0
                                                                                                 0.0
top - 17:09:50 up 1:32, 2 users, load average: 3.00, 1.38, 0.74
Tasks: 109 total, 5 running, 95 sleeping, 9 stopped, 0 zombie

CCpu(s): 80.7 us, 16.6 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.4 hi, 0.3 si, 0.0 st
MiB Mem: 1827.1 total, 73.8 free, 1687.8 used, 65.4 buff/cache
MiB Swap: 820.0 total, 522.5 free, 297.5 used. 33.1 avail Mem
   5261.2291971 [
                             8651
                                            0 865
                                                            107190
                                                                                   16
                                                                                           442368
                                                                                                               619
                                                                                                                                         0 sssd be
                                      0 1043792 824244
                                                                                  48.7 44.1
                                                                     2932 R
                                                                                                        0:39.41 mem2.bash
   64701 user
                              20
                                                                                                        0:39.49 mem.bash
0:01.62 ksoftirqd/0
                                                                      3092 R
                                                                                  48.0 43.1
   64700 user
                              20
                                      0
                                         1026104 806968
                                                                          0 S
         9 root
                              20
                                      0
                                                   0
                                                              0
                                                                                    0.3
                                                                                              0.0
                                                                                                        0:12.74 kswapd0
0:02.11 systemd
0:00.00 kthreadd
        47 root
                                      0
                                                   0
                                                                          0 S
                                                                                              0.0
                              20
                                                              0
                                                                                    0.3
                                                                     3760 S
                                                                                              0.3
0.0
          1 root
                              20
                                           179200
                                                         5504
                                      и
                                                                                    0.0
                                                                          0 S
                                                                                    0.0
          2 root
                              20
                                      и
                                                   0
                                                              0
```

```
top - 17:09:53 up 1:32, 2 users, load average: 3.00, 1.38, 0.74
Tasks: 109 total, 4 running, 96 sleeping, 9 stopped, 0 zombie
2Cpu(s): 78.1 us, 18.5 sy, 0.0 ni, 0.9 id, 0.0 wa, 2.2 hi, 0.3 si, 0.0 st
MiB Mem: 1827.1 total, 73.5 free, 1718.9 used, 34.6 buff/cache
MiB Swap: 820.0 total, 488.8 free, 331.2 used. 17.7 avail Mem
    5261.2291971 [ 865]
                                           0 865
                                                          107190
                                                                                 16
                                                                                        442368
                                                                                                                                      0 sssd be
                                                                                                           619
                                     0 1057256 818856
                                                                                                     0:41.03 mem.bash
    64700 user
                             20
                                                                     576 R 47.1 43.8
                                     0 1075868 837476
                             20
                                                                      576 R 46.5 44.8
                                                                                                      0:40.93 mem2.bash
    64701 user
                                                                                                     0:12.82 kswapd0
0:01.64 ksoftirqd/0
0:01.03 top
                                                                                           0.0
        47 root
                             20
                                     0
                                                 0
                                                            0
                                                                        0 S
                                                                                  2.4
0.6
         9 root
                                                                        ØR
                             20
                                                  0
                                     0
                                                            и
   64688 user
                                     0
                                        274272
                             20
                                                          416
                                                                       20 R
                                                                                  0.3
                                                                                           0.0
                                     0
                                          179200
                                                        2012
                                                                     268 S
                                                                                                     0:02.11 systemd
          1 root
                             2Й
                                                                                  0.0
                                                                                           0.1
top - 17:10:06 up 1:32, 2 users, load average: 3.60, 1.60, 0.82
Tasks: 110 total, 6 running, 95 sleeping, 9 stopped, 0 zombie
zCpu(s): 77.5 us, 19.0 sy, 0.0 ni, 0.0 id, 0.0 wa, 3.2 hi, 0.3 si, 0.0 st
MiB Mem : 1827.1 total, 70.2 free, 1715.1 used, 41.7 buff/cache
MiB Swap: 820.0 total, 257.9 free, 562.1 used. 18.1 avail Mem
   5261.2291971 [
                                          0 865
                           8651
                                                          107190
                                                                               16
                                                                                       442368
                                                                                                                                   0 sssd be
                                   0 1169720 814976
                                                                    576 R 45.9 43.6
                                                                                                   0:46.73 mem.bash
   64700 user
                            20
                                    0 1190576 832492
                                                                    576 R 45.0
                                                                                        44.5
                                                                                                    0:46.58 mem2.bash
   64701 user
                            20
                                                                       0 S
                                                                                          0.0
                                                                                                   0:13.21 kswapd0
                            20
                                    0
                                                0
                                                                                2.9
        47 root
                                                          0
         9 root
                                                                                0.7
                                                                                                   0:01.70 ksoftirqd/0
                            20
                                    0
                                                 0
                                                            0
                                                                       0 S
                                                                                          0.0
          1 root
                            20
                                         179200
                                                       5152
                                                                  3296 S
                                                                                0.3
                                                                                                   0:02.12 systemd
                                    0
                                                                                          0.3
                                                                                0.3
0.3
                                                                                                   0:00.31 dbus-daemon
0:00.46 systemd-logind
      833 dbus
                                                                                          0.1
                            20
                                    0
                                          70876
                                                       1944
                                                                  1440 S
                                                                                          0.2
                                                       3216
                                          97836
      872 root
                            20
                                    0
                                                                  2816 R
 top - 17:10:12 up 1:33, 2 users, load average: 3.71, 1.65, 0.84
Tasks: 110 total, 4 running, 97 sleeping, 9 stopped, 0 zombie

\( \times \) 78.0 us, 19.3 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.4 hi, 0.3 si, 0.0 st

MIB Mem : 1827.1 total, 77.0 free, 1717.8 used, 32.2 buff/cache

MIB Swap: 820.0 total, 153.0 free, 667.0 used. 19.9 avail Mem
                                                                     16 442368
576 R 47.5 44.6
    5261.2291971 [ 865]
                                           0 865
                                                         107190
                                                                                                                                     0 sssd_be
                                                                                                     0:49.41 mem2.bash
0:49.53 mem.bash
    64701 user
                             20
                                    0 1248392 835192
                                     0 1226348 817420
                                                                               46.8 43.7
    64700 user
                             20
                                                                     576 R
                                                                                 2.3
0.3
         47 root
                             20
                                     0
                                                 0
                                                           0
                                                                        0 S
                                                                                           0.0
                                                                                                     0:13.39 kswapd0
                                                                                                     0:01.73 ksoftirqd/0
0:00.08 systemd
         9 root
                             20
                                     0
                                                  0
                                                             0
                                                                        0 S
                                                                                           0.0
                                           93852
      1488 user
                             20
                                     0
                                                         1516
                                                                    1324 S
                                                                                  0.3
                                                                                           0.1
                                                                                                     0:02.12 systemd
                                          179200
                                                                    1884 S
          1 root
                             20
                                     И
                                                         3740
                                                                                  0.0
                                                                                           0.2
          2 root
                             20
                                     и
                                                 и
                                                            и
                                                                        0 S
                                                                                  И.И
                                                                                           0.0
                                                                                                     0:00.00 kthreadd
top - 17:10:39 up 1:33, 2 users, load average: 3.54, 1.81, 0.92
Tasks: 109 total, 4 running, 96 sleeping, 9 stopped, 0 zombie

\( \times \text{Cpu(s)}: 82.2 us, 15.8 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.0 hi, 0.0 si, 0.0 st

MiB Mem : 1827.1 total, 560.0 free, 1224.4 used, 42.6 buff/cache

MiB Swap: 820.0 total, 264.7 free, 555.3 used. 508.0 avail Mem
MiB Mem : 1827.1 total,
MiB Swap: 820.0 total,
   5594.9099961 [
                           8671
                                         0
                                               867
                                                          107778
                                                                              83
                                                                                     458752
                                                                                                                                  0 sssd_nss
                                                                                                         331
  64700 user
                                                      1.1g
                                                                              97.3 61.6
0.3 0.0
                            20 0 1637000
                                                                 1668 R
                                                                                                  1:10.03 mem.bash
                                                                                                  0:01.83 ksoftirqd/0
0:02.12 systemd
                            20
         9 root
                                   0
                                               И
                                                                    0 S
         1 root
                            20
                                   0
                                        179200
                                                       3200
                                                                  1464 S
                                                                               0.0
                                                                                         0.2
                                                                      0 S
                                                                                                  0:00.00 kthreadd
         2 root
                            20
                                  0
                                                                               0.0
                                                                                         0.0
                                                И
                                                           0
                                                                                                  0:00.00 rcu_gp
0:00.00 rcu_par_gp
                             0 -20
                                                и
                                                           и
                                                                      0 I
                                                                               0.0
                                                                                         0.0
         3 root
                             0 -20
                                                                      0 I
                                                                               0.0
         4 root
                                                0
                                                           0
                                                                                         0.0
                             0 -20
                                                                      0 I
                                                                               0.0
                                                                                                  0:00.00 kworker/0:0H-kblockd
         6 root
                                                0
                                                           0
                                                                                         0.0
                             0 -20
                                                0
                                                           0
                                                                      0 I
                                                                               0.0
                                                                                        0.0
                                                                                                  0:00.00 mm_percpu_wq
         8 root
top - 17:10:48 up 1:33, 2 users, load average: 3.50, 1.83, 0.93
Tasks: 109 total, 3 running, 97 sleeping, 9 stopped, 0 zombie

\( \times \text{Cpu(s)}: 81.5 us, 16.5 sy, 0.0 ni, 0.0 id, 0.0 wa, 1.7 hi, 0.3 si, 0.0 st

MIB Mem: 1827.1 total, 388.2 free, 1394.1 used, 44.7 buff/cache

MIB Swap: 820.0 total, 264.7 free, 555.3 used. 337.2 avail Mem
    5594.9099961 [
                                          0 867
                                                           107778
                            8671
                                                                               83
                                                                                       458752
                                                                                                                                  0 sssd nss
                                                                   1668 R
                                                                             97.7
                                   0 1810316
                                                                                                   1:18.80 mem.bash
    64700 user
                             20
                                                       1.3g
                                                                                        70.8
        9 root
                             20
                                                                               0.3
                                                                                                   0:01.86 ksoftirgd/0
                                    и
                                                 и
                                                                       0 S
                                                                                          0.0
                                                                                0.3
    64706 root
                             20
                                    0
                                                 0
                                                            0
                                                                       0 I
                                                                                          0.0
                                                                                                   0:00.02 kworker/0:3-ata_sff
                                                                                                   0:02.12 systemd
0:00.00 kthreadd
                             20
                                         179200
                                                       3200
                                                                   1464 S
                                                                                0.0
          1 root
                                    и
                                                                                          0.2
          2 root
                             20
                                  0
                                                 0
                                                            0
                                                                       0 S
                                                                                0.0
                                                                                          0.0
          3 root
                                                                       0 I
0 I
                              0 -20
                                                                                                   0:00.00 rcu_qp
                                                 0
                                                            0
                                                                                0.0
                                                                                          0.0
                                                                                0.0
                                                                                          0.0
                              0 -20
                                                 0
                                                            0
                                                                                                   0:00.00 rcu_par_gp
          4 root
                                                                       0 I
                                                                                                   0:00.00 kworker/0:0H-kblockd
          6 root
                              \theta = 2\theta
                                                            0
                                                                                0.0
                                                                                          0.0
                                                 и
          8 root
                              0 - 20
                                                 0
                                                            0
                                                                       0
                                                                                0.0
                                                                                          0.0
                                                                                                   0:00.00 mm percpu wg
```

```
top - 17:10:54 up 1:33, 2 users, load average: 3.42, 1.87, 0.96
Tasks: 109 total, 3 running, 97 sleeping, 9 stopped, 0 zombie

2Cpu(s): 81.5 us, 16.1 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.0 hi, 0.3 si, 0.0 st

MIB Mem: 1827.1 total, 270.6 free, 1510.4 used, 46.0 buff/cache
                 820.0 total,
                                       264.8 free,
                                                            555.2 used.
MiB Swap:
                                                                                 220.3 avail Mem
  5594.9099961 [ 867]
                                    Й
                                         867
                                                   107778
                                                                           458752
                                                                                                                  ear_beer 0
                                                                    83
                                                                                            331
                               0 1929116
                                                          1668 R
                                                                    97.3
                                                                                       1:24.64 mem.bash
  64700 user
                                                1.4g
                        20
                                                                             77.2
        9 root
                        20
                                                             0 S
                                                                     0.3
                                                                              0.0
                                                                                      0:01.87 ksoftirqd/0
        1 root
                        20
                               0
                                    179200
                                                3200
                                                          1464 S
                                                                      0.0
                                                                              0.2
                                                                                      0:02.12 systemd 0:00.00 kthreadd
        2 root
                        20
                               и
                                          И
                                                    И
                                                             0 S
                                                                      0.0
                                                                              0.0
        3 root
                         0 -20
                                                             0 I
                                                                                      0:00.00 rcu_gp
                                          0
                                                    0
                                                                      0.0
                                                                              0.0
                                                                                      0:00.00 rcu_par_gp
0:00.00 kworker/0:0H-kblockd
                          0 -20
                                          0
                                                    0
                                                             0 I
                                                                      0.0
        4 root
                                                                              0.0
        6 root
                          0 -20
                                          0
                                                    0
                                                             0 I
                                                                      0.0
                                                                              0.0
                                          Й
                                                    Й
                                                             ЙΙ
                                                                                      0:00.00 mm_percpu_wq
                          0 -20
                                                                      0.0
                                                                              0.0
        8 root
top - 17:11:00 up 1:33,
                                                  load average: 3.39, 1.89, 0.97
                                    2 users,
Tasks: 109 total, 3 running, 97 sleeping, 9 stopped, 0 zombie

%Cpu(s): 81.8 us, 16.2 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.0 hi, 0.0 si, 0.0 st

MiB Mem: 1827.1 total, 153.4 free, 1626.4 used, 47.3 buff/cache

MiB Swap: 820.0 total, 264.8 free, 555.2 used. 103.7 avail Mem
   5594.9099961 [ 8671
                                     0 867
                                                    107778
                                                                      83
                                                                             458752
                                                                                              331
                                                                                                                     0 sssd_nss
                                                                      97.3 83.5
0.3 0.0
   64700 user
                         20
                                0 2047652
                                                 1.5g
                                                           1668 R
                                                                                        1:30.49 mem.bash
                                                                                        0:01.89 ksoftirqd/0
        9 root
                                0
                                                     ŏ
                                                              0 S
                         20
                                           0
        1 root
                                                                                        0:02.12 systemd 0:00.00 kthreadd
                         20
                                0
                                     179200
                                                 3200
                                                           1464 S
                                                                       0.0
                                                                                0.2
                                                                       0.0
        2 root
                         20
                                0
                                                               0
                                                                                0.0
                                           0
                                                     0
                                                                                        0:00.00 rcu_gp
        3 root
                          0 -20
                                           И
                                                     0
                                                               0 I
                                                                        0.0
                                                                                0.0
         4 root
                          0 -20
                                           0
                                                     и
                                                               ЙΙ
                                                                                        0:00.00 rcu_par_gp
                                                                        0.0
                                                                                0.0
                                                                                        0:00.00 kworker/0:0H-kblockd
        6 root
                          0 -20
                                           0
                                                     0
                                                               0
                                                                        0.0
                                                                                0.0
                                                                                        0:00 00 mm percou
top - 17:11:13 up 1:34, 2 users, load average: 3.33, 1.93, 0.99
Tasks: 109 total, 3 running, 97 sleeping, 9 stopped, 0 zombie

**Cpu(s): 78.9 us, 18.4 sy, 0.0 ni, 0.0 id, 0.0 wa, 2.3 hi, 0.3 si, 0.0 st

**MiB Mem : 1827.1 total, 67.1 free, 1729.2 used, 30.8 buff/cache

**MiB Supple 920.0 total, 126.4 free, 1729.2 used, 9.4 supple Mem
                                                             1729.2 used,
693.6 used.
MiB Mem : 1827.1 total,
MiB Swap: 820.0 total,
MiB Swap:
                                         126.4 free,
                                                                                      9.4 avail Mem
   5594.9099961 [
                         8671
                                      0
                                                                              458752
                                           867
                                                    107778
                                                                      83
                                                                                                                     ear_beer 0
                                                                                               331
   64700 user
                                0 2288420
                                                 1.6g
                                                             604 R
                                                                      93.1
                                                                               88.9
                                                                                         1:42.20 mem.bash
                         20
                                                                        2.6
       47 root
                         20
                                                               0 S
                                                                                         0:14.50 kswapd0
                                0
                                           0
                                                                                0.0
                                                                                         0:01.94 ksoftirqd/0
0:02.12 systemd
        9 root
                         20
                                0
                                                               0 S
                                                                        0.3
                                                                                0.0
                                           И
                                                     и
         1 root
                         20
                                0
                                     179200
                                                  1612
                                                               0 S
                                                                        0.0
                                                                                0.1
        2 root
                         20
                                0
                                                                0 S
                                                                                0.0
                                                                                         0:00.00 kthreadd
                                           И
                                                     И
                                                                        0.0
                                                                                        0:00.00 rcu_gp
0:00.00 rcu_par_gp
0:00 00 kworker/0:0H-kblockd
        3 root
                          0 -20
                                            0
                                                     0
                                                               0 I
                                                                        0.0
                                                                                0.0
                                                                        0.0
                                                                                0.0
         4 root
                          0 -20
                                           0
                                                     0
                                                               0
                          и
                               -2A
                                            a
                                                     a
                                                                a
                                                                        я я
                                                                                ρи
  5594.9099961 [
                          8671
                                       и
                                           867
                                                                              458752
                                                     107778
                                                                       83
                                                                                                                     ezn_beze 0
                                                                                         1:45.13 mem.bash
0:14.59 kswapd0
                                 0 2344652
    64700 user
                          20
                                                  1.6g
                                                             604 R
                                                                       93.6 89.1
                                                                        2.9
0.6
                           20
                                  0
                                            0
                                                                Ø D
                                                                                0.0
         47 root
          9 root
                                                                                         0:01.96 ksoftirgd/0
                                  0
                                                                0 S
                                                                                 0.0
                           20
                                            и
                                                      0
                                                                                         0:01.15 top
0:02.12 systemd
0:00.00 kthreadd
    64688 user
                           20
                                  Ø
                                      274272
                                                    400
                                                                0 R
                                                                        0.3
                                                                                 0.0
          1 root
                           20
                                  0
                                      179200
                                                   1480
                                                                0 S
                                                                         0.0
                                                                                 0.1
                                                                0 S
                                                                        0.0
                                                                                0.0
          2 root
                           20
                                 0
                                             0
                                                      0
                                                                                         0:00.00 rcu_gp
                            0 -20
                                             0
                                                      0
                                                                0 I
                                                                                0.0
          3 root
                                                                        0.0
                                                                                         0:00.00 rcu_par_gp
                                                                                0.0
          4 root
                            и
                               -20
                                             и
                                                      И
                                                                и
                                                                   T
                                                                        0.0
```

```
2028.8568651 Out of memory: Killed process 1618 (neumen.bash) total-vm:392504kB, anon-rss:file-rss:464kB, shmem-rss:0kB, UID:1000
 2829.0809261 com_reaper: reaped process 1618 (neumen.bash), now anon-rss:0kB, file-rss:0kB
 2081.7115931 newmem.bash invoked oom-killer: gfp_mask=8x6208ca(GFP_HIGHUSER_MOVABLE), nodem

 order=0, oom_score_adj=0

 2881.712349] neumen.bash cpuset=/ mens_allowed=0

2081.713175] CPU: 8 PID: 1628 Comm: neumem.bash Kdump: loaded Tainted: 6

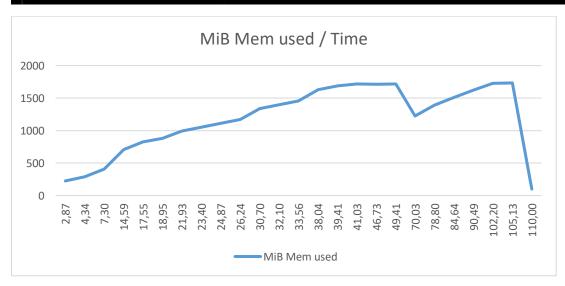
- 4.18.8-193.e18.x86_64 #1

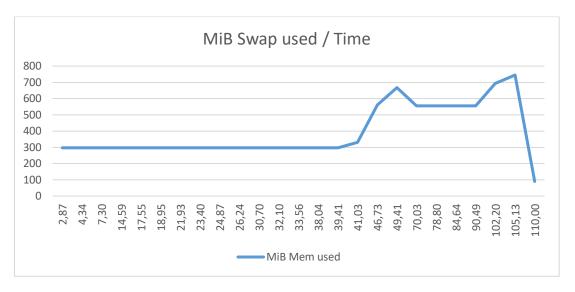
2081.776981] [ 1628] 1080 1620 361763 212152 2523136 94047

2081.777375] [ 1632] 1080 1632 358133 210198 2498568 92367
                                                                                                                                        8 newmen.l
 2001.777791J Out of memory: Killed process 1620 (neumen.bash) total-un:1447052kB, anon-rss file-rss:0kB, shmem-rss:0kB, UID:1000
 2081.8698381 oom_reaper: reaped process 1620 (neumen.bash), now anon-rss:0kB, file-rss:0kB,
2113.3397961 [ 1632] 1000 1632 663614 421718 4947968 186339 8 newmen.l
2113.3404161 Out of memory: Killed process 1632 (newmen.bash) total-un:2654456kB, anon-rss:
B, file-rss:0kB, shmen-rss:0kB, UID:1000
 Z113.5025521 oon_reaper: reaped process 1632 (neumen.bash), now anon-rss:0kB, file-rss:0kB,
 ss:OkB
2803.137908] [ 1678] 1000 1678 664142 421212 4956160 187361 0 ncm.bash
2803.138387] Out of memory: Killed process 1678 (mcm.bash) total-um:2656568kB, anom-rss:168
file-rss:0kB, shmem-rss:0kB, UID:1000
2803.225722] oom_rcaper: reaped process 1678 (mcm.bash), now anom-rss:0kB, file-rss:0kB, sh
3461.485692] [ 1695] 1800 1695 664464 422236 4952864 186676 8 mcm2.bas
3461.486382] Out of memory: Killed process 1695 (mcm2.bash) total-um:2657856kB, amon-rss:16
file-rss:8kB, shmen-rss:8kB, UID:1800
3461.659136] oom_reaper: reaped process 1695 (mcm2.bash), now amon-rss:8kB, file-rss:8kB, s
 :OkB
user@localhost lab51$
```

Report

```
[user@localhost lab5]$ cat report.log | tail -n 1
31000000
[user@localhost lab5]$ cat report2.log | tail -n 1
15000000
[user@localhost lab5]$
```





Сначала выполнения программы процесс занимает только физическую память, а когда она заканчивается место в физ памяти, то начинается использоваться раздел подкачки, а когда заканчивается свободное место в разделе подкачки происходит аварийное завершение программы.

Во втором этапе, как только заканчивается свободное пространство в MiB Swap, происходит аварийное завершение одного из процессов. Освободившееся от этого место занимается оставшимся процессом, который также аварийно завершается, когда свободная память заканчивается.

Эксперимент 2

```
11 running, 98 steeping.
2.0 sy, 0.0 ni, 0.0 id,
      117 total,
                                                         8 stopped,
                                                                         0 zombie
Cpu(s): 96.0 us, 2.0 sy
iB Mem : 1827.1 total,
iB Swap: 820.0 total,
                                                     0.0 wa,
863.3 used,
                                                                  2.0 hi,
                                                                             0.0 si, 0.0 st
                                  877.4 free,
                                                                         86.3 buff/cache
                                  670.6 free,
                                                     149.4 used.
                                                                        846.8 avail Mem
13377.2152731 [
                    8521
                               0
                                              77886
                                                                   180224
                                                                                                      0 gssproxy
                              304988
255092
                                                            10.3
10.3
10.0
                                                                     4.6
1.9
9.9
                          0
                                        85548
                                                                             0:01.53 newmem.bash
65190 user
                    20
                                                   2916 R
 65200 user
                     20
                           0
                                         35660
                                                                             0:00.60 newmem.bash
65184 user
                    20
                                                                             0:03.38 newmem
                          Ø
                              405704
                                       186152
                                                                     5.6
3.8
                    20
20
                                                            10.0
10.0
65188 user
                           0
                              324392
                                       105260
                                                   3104
                                                                             0:01.86 newmem.bash
                              291260
                                                                             0:01.27
65192 user
                                         71884
                                                                                       newmem
                                                                     2.7
2.2
7.0
3.2
                     20
                              269612
                                                             10.0
65196 user
                                         50148
                                                                             0:00.88 newmem.bash
                     20
                                                             10.0
65198 user
                              260240
                                         40608
                                                                             0:00.73 newmem.
                    20
20
                                                              9.6
9.6
65186 user
                              351188
                                       131872
                                                   3040
                                                                             0:02.35
                                                                                      newmem.bash
                              278984
                                                                             0:01.05 newmem.bash
65194 user
                     20
                                                                             0:00.47
                              247568
                                         28104
 65202
        user
                                                                                       newmem.bash
```

При значении N в 10 раз меньше, чем критическое и при K = 10 ни один из процессов не завершился аварийно

При значении N в 10 раз меньше, чем критическое и при K = 30

```
[13589.927587] newmem.bash invoked oom-killer: gfp_mask=0x6280ca(GFP_HIGHUSER_MOVABLEI__GFP_ZERO),
demask=(null), order=0, oom_score_adj=0
13589.9282701 newmem.bash cpuset=/ mems_allowed=0
[13589.928656] CPU: 0 PID: 2924 Comm: newmem.bash Kdump: loaded Tainted: G
  - 4.18.0-193.e18.x86_64 #1
13589.9772161 [ 2920]
                           0 2920
                                     114362
                                                37357
                                                        544768
                                                                                     0 newmem.bash
13589.977551] [ 2922]
                             2922
                                     112580
                                                        532480
                                                                  22256
                           0
                                                34861
                                                                                     0 newmem.bash
13589.977867] [ 2924]
                           0
                             2924
                                     112250
                                                36276
                                                        528384
                                                                  20528
                                                                                     0 newmem.bash
13589.9782251 [ 2926]
                                                                                     0 newmem.bash
                           0
                              2926
                                     104198
                                                32567
                                                        471040
                                                                  16164
13589.978816] [ 2928]
                                     108752
                                                37054
                           И
                              2928
                                                        503808
                                                                  16115
                                                                                     0 newmem.bash
[13589.979203] [ 2930]
                              2930
                                     107762
                                                36162
                                                        491520
                                                                   16139
                                                                                     0 neumem.bash
13589.9795151 [ 29321
13589.9798071 [ 2934]
                           0
                                     105551
                                                35540
                              2932
                                                        483328
                                                                  14444
                                                                                     0 newmem.bash
                           0
                              2934
                                     103736
                                                34890
                                                        462848
                                                                   13249
                                                                                     0 newmem.bash
13589.980145] [ 2936]
                              2936
                                     102944
                           0
                                                35314
                                                        466944
                                                                  12156
                                                                                     0 newmem.bash
13589.980527] [ 2938]
                           0
                              2938
                                     101393
                                                32898
                                                        442368
                                                                  13001
                                                                                     0 newnem.bash
13589.9808691 [ 2940]
                           0
                              2940
                                     103439
                                                36186
                                                        458752
                                                                                     0 newmem.bash
                                                                  11780
[13589.981236] [ 2942]
                           0
                              2942
                                      98555
                                                33045
                                                        417792
                                                                   9994
                                                                                     0 neumem.bash
13589.9815911 Out of memory: Killed process 2920 (newmem.bash) total-um:457448kB, anon-rss:148940kB
file-rss:488kB, shmem-rss:0kB, UID:0
13590.014759] oom_reaper: reaped process 2920 (newmem.bash), now anon-rss:0kB, file-rss:0kB, shmem-
ss:0kB
```

Из-за большого количества запусков newmem.bash происходит заполнение памяти быстрее чем освобождается из-за того, что они бы завершались сами

При снижении N до \sim 1030000 и K = 30 не происходит аварийного завершения программ. При увеличении значения часть программ начинает завершаться аварийно