

Linux administration

PART 1

```
top - 06:39:41 up 39 min, 1 user, load average: 0.34, 0.54, 0.25
Tasks: 117 total, 1 running, 116 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.2 sy, 0.0 ni, 99.8 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 981.0 total, 306.8 free, 216.8 used, 457.5 buff/cache
MiB Swap: 1750.0 total, 1746.0 free, 4.0 used, 595.9 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1	root	20	0	103516	13216	8604	S	0.0	1.3	0:04.37	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_par_gp
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
8	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_wq
9	root	20	0	0	0	0	S	0.0	0.0	0:00.12	ksoftirqd/0
10	root	20	0	0	0	0	I	0.0	0.0	0:01.58	rcu_sched
11	root	rt	0	0	0	0	S	0.0	0.0	0:00.02	migration/0
12	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/0
14	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
15	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/1
16	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/1
17	root	rt	0	0	0	0	S	0.0	0.0	0:00.34	migration/1
18	root	20	0	0	0	0	S	0.0	0.0	0:00.11	ksoftirqd/1
19	root	20	0	0	0	0	I	0.0	0.0	0:01.20	kworker/1:0-events
20	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/1:0H-kblockd
21	root	20	0	0	0	0	S	0.0	0.0	0:00.04	kdevtmpfs
22	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	netns
23	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_tasks_kthre
24	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kauditd
25	root	20	0	0	0	0	S	0.0	0.0	0:00.00	khungtaskd
26	root	20	0	0	0	0	S	0.0	0.0	0:00.00	oom_reaper
27	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	writeback
28	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kcompactd0
29	root	25	5	0	0	0	S	0.0	0.0	0:00.00	ksmd
30	root	39	19	0	0	0	S	0.0	0.0	0:00.00	khugepaged
77	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kintegrityd
78	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kblockd
79	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	blkcg_punt_bio

Screenshot 1 – Процессы и их состояния

```
(cgroup, ipc, mnt, net, pid, user, uts)
-p, --show-pids      show PIDs; implies -c
-s, --show-parents  show parents of the selected process
-S, --ns-changes     show namespace transitions
-t, --thread-names   show full thread names
-T, --hide-threads  hide threads, show only processes
-u, --uid-changes    show uid transitions
-U, --unicode        use UTF-8 (Unicode) line drawing characters
-V, --version        display version information
-Z, --security-context
                    show SELinux security contexts

PID      start at this PID; default is 1 (init)
USER     show only trees rooted at processes of this user

user1@host1:~$ pstree -h 1066
user1@host1:~$ pstree -h
systemd--accounts-daemon--2*[{accounts-daemon}]
|--atd
|--cron
|--dbus-daemon
|--irqbalance--{irqbalance}
|--login--bash--pstree
|--multipathd--6*[{multipathd}]
|--networkd-dispat
|--polkitd--2*[{polkitd}]
|--rsyslogd--3*[{rsyslogd}]
|--snapd--10*[{snapd}]
|--systemd--(sd-pam)
|--systemd-journal
|--systemd-logind
|--systemd-network
|--systemd-resolve
|--systemd-timesyn--{systemd-timesyn}
|--systemd-udev
--unattended-upgr--{unattended-upgr}

user1@host1:~$ _
```

Screenshot 2 – pstree дерево системного процесса

```

processor      : 0
vendor_id     : AuthenticAMD
cpu family    : 21
model         : 2
model name    : AMD FX(tm)-8300 Eight-Core Processor
stepping      : 0
microcode     : 0x6000626
cpu MHz       : 3311.064
cache size    : 2048 KB
physical id   : 0
siblings      : 2
core id       : 0
cpu cores     : 2
apicid        : 0
initial apicid : 0
fpu           : yes
fpu_exception : yes
cpuid level   : 13
wp            : yes
flags         : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mm
x fxsr sse sse2 ht syscall nx mmxext fxsr_opt rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid
  extd_apicid tsc_known_freq nri pclmulqdq ssse3 cx16 sse4_1 sse4_2 x2apic popcnt aes xsave avx hyper
visor lahf_lm cmp_legacy cr8_legacy abm sse4a misalignsse 3dnowprefetch ssbd vmmcall arat
bugs          : fxsavleak sysret_ss_attrs null_seg spectre_v1 spectre_v2 spec_store_bypass
bogomips      : 6622.12
TLB size      : 1536 4K pages
clflush size   : 64
cache_alignment : 64
address sizes  : 48 bits physical, 48 bits virtual
power management:

processor      : 1
vendor_id     : AuthenticAMD
cpu family    : 21
model         : 2
model name    : AMD FX(tm)-8300 Eight-Core Processor
:

```

Screenshot 3 – cруinfo вывод информации о процессоре

```

557 ?      00:00:00 jbd2/sda2-8
558 ?      00:00:00 ext4-rsv-conver
559 ?      00:00:00 loop3
560 ?      00:00:00 loop4
561 ?      00:00:00 loop5
562 ?      00:00:00 loop6
582 ?      00:00:00 systemd-timesyn
623 ?      00:00:00 systemd-network
625 ?      00:00:00 bond0
629 ?      00:00:00 systemd-resolve
641 ?      00:00:00 accounts-daemon
644 ?      00:00:00 cron
645 ?      00:00:00 dbus-daemon
650 ?      00:00:00 irqbalance
652 ?      00:00:00 networkd-dispat
653 ?      00:00:00 rsyslogd
656 ?      00:00:01 snapd
657 ?      00:00:00 systemd-logind
659 ?      00:00:00 atd
698 ?      00:00:00 unattended-upgr
715 ?      00:00:00 polkitd
995 tty1   00:00:00 login
1074 ?     00:00:00 systemd
1075 ?     00:00:00 (sd-pam)
1080 tty1   00:00:00 bash
1109 ?     00:00:00 kworker/u4:2-events_power_efficient
1125 tty1   00:00:00 less
1126 ?     00:00:00 kworker/u4:0-events_power_efficient
1129 tty1   00:00:00 ps
user1@host1:~$ ps au | less
USER      PID  %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         995   0.0   0.4   5996   4196 tty1    Ss   07:23   0:00 /bin/login -p --
user1     1080   0.0   0.5   7068   5192 tty1    S    07:23   0:00 -bash
user1     1125   0.0   0.2   4620   2256 tty1    T    07:31   0:00 less
user1     1131   0.0   0.3   7648   3388 tty1    R+   07:35   0:00 ps au
user1     1132   0.0   0.2   4620   2276 tty1    S+   07:35   0:00 less
(END)

```

Screenshot 4 – ps вывод процессов

```

1 [ 0.0%] Tasks: 29, 26 thr, 81 kthr; 1 running
2 [ 0.0%] Load average: 0.01 0.01 0.00
Mem[|||||] 147M/981M] Uptime: 00:38:21
Sup[ 0K/1.71G]

  PID USER   PRI  NI  VIRT   RES   SHR  S  CPU% MEM%   TIME+  Command
1548 user1    20   0  5244  3936  3208  R   0.7  0.4   0:00.55 htop
   1 root      20   0   99M 11664  8532  S   0.0  1.2   0:01.85 /sbin/init maybe-ubiquity
   2 root      20   0     0     0     0  S   0.0  0.0   0:00.00 kthreadd
   3 root      0 -20     0     0     0  I   0.0  0.0   0:00.00 rcu_gp
   4 root      0 -20     0     0     0  I   0.0  0.0   0:00.00 rcu_par_gp
   6 root      0 -20     0     0     0  I   0.0  0.0   0:00.00 kworker/0:0H-kblockd
   8 root      0 -20     0     0     0  I   0.0  0.0   0:00.00 mm_percpu_wq
   9 root     20   0     0     0     0  S   0.0  0.0   0:00.03 ksoftirqd/0
  10 root     20   0     0     0     0  I   0.0  0.0   0:01.34 rcu_sched
  11 root      RT   0     0     0     0  S   0.0  0.0   0:00.01 migration/0
  12 root     -51   0     0     0     0  S   0.0  0.0   0:00.00 idle_inject/0
  13 root     20   0     0     0     0  I   0.0  0.0   0:00.34 kworker/0:1-events
  14 root     20   0     0     0     0  S   0.0  0.0   0:00.00 cpuhp/0
  15 root     20   0     0     0     0  S   0.0  0.0   0:00.00 cpuhp/1
  16 root     -51   0     0     0     0  S   0.0  0.0   0:00.00 idle_inject/1
  17 root      RT   0     0     0     0  S   0.0  0.0   0:00.35 migration/1
  18 root     20   0     0     0     0  S   0.0  0.0   0:00.04 ksoftirqd/1
  20 root      0 -20     0     0     0  I   0.0  0.0   0:00.00 kworker/1:0H-kblockd
  21 root     20   0     0     0     0  S   0.0  0.0   0:00.01 kdevtmpfs
  22 root      0 -20     0     0     0  I   0.0  0.0   0:00.00 netns
  23 root     20   0     0     0     0  S   0.0  0.0   0:00.00 rcu_tasks_kthre
  24 root     20   0     0     0     0  S   0.0  0.0   0:00.00 kauditd
  25 root     20   0     0     0     0  S   0.0  0.0   0:00.00 khungtaskd
  26 root     20   0     0     0     0  S   0.0  0.0   0:00.00 oom_reaper
  27 root      0 -20     0     0     0  I   0.0  0.0   0:00.00 writeback
  28 root     20   0     0     0     0  S   0.0  0.0   0:00.00 kcompactd0
  29 root     25   5     0     0     0  S   0.0  0.0   0:00.00 ksmd
  30 root     39  19     0     0     0  S   0.0  0.0   0:00.00 khugepaged
  76 root      0 -20     0     0     0  I   0.0  0.0   0:00.00 kintegrityd
F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice F8Nice + F9Kill F10Quit

```

Screenshot 5 – htop выводение процессов, зеленым отмечены kernel процессы

```

root      1514      2  0      0      0      1 07:44 ?      00:00:00 [kworker/1:0-cgroup_destroy]
root      1521      2  0      0      0      1 07:55 ?      00:00:00 [kworker/u4:0-events_power_effic
ient]
root      1549      2  0      0      0      0 07:58 ?      00:00:00 [kworker/0:0-events]
root      1562      2  0      0      0      1 08:06 ?      00:00:00 [kworker/u4:1-events_unbound]
root      1571      2  0      0      0      0 08:08 ?      00:00:00 [kworker/0:2-events]

[21]+  Stopped                  ps -FU root | less
user1@host1:~$ ps -FU user1 | less
UID      PID      PPID  C    SZ    RSS  PSR  STIME  TTY      TIME  CMD
user1    1074      1    0   4675 10048   1 07:23 ?      00:00:00 /lib/systemd/systemd --user
user1    1075    1074   0 25866  3516   1 07:23 ?      00:00:00 (sd-pam)
user1    1080     995   0  1767  5192   0 07:23 tty1    00:00:00 -bash
user1    1125    1080   0  1155  2256   0 07:31 tty1    00:00:00 less
user1    1132    1080   0  1155  2276   0 07:35 tty1    00:00:00 less
user1    1147    1080   0  1155  2260   0 07:36 tty1    00:00:00 less
user1    1149    1080   0  1155  2256   0 07:36 tty1    00:00:00 less
user1    1516    1080   0  1155  2256   0 07:44 tty1    00:00:00 less
user1    1518    1080   0  1155  2284   0 07:45 tty1    00:00:00 less
user1    1556    1080   0  1155  2192   0 08:03 tty1    00:00:00 less
user1    1557    1080   0 2011  4004   0 08:04 tty1    00:00:00 top
user1    1559    1080   0  1155  2256   0 08:05 tty1    00:00:00 less
user1    1561    1080   0  1155  2276   0 08:05 tty1    00:00:00 less
user1    1564    1080   0  1155  2276   0 08:06 tty1    00:00:00 less
user1    1566    1080   0  1155  2288   0 08:06 tty1    00:00:00 less
user1    1568    1080   0  1155  2280   0 08:07 tty1    00:00:00 less
user1    1570    1080   0  1155  2276   0 08:07 tty1    00:00:00 less
user1    1573    1080   0  1155  2280   0 08:08 tty1    00:00:00 less
user1    1575    1080   0  1155  2280   0 08:08 tty1    00:00:00 less
user1    1577    1080   0  1155  2232   0 08:08 tty1    00:00:00 less
user1    1579    1080   0  1155  2260   0 08:08 tty1    00:00:00 less
user1    1581    1080   0  1155  2228   0 08:08 tty1    00:00:00 less
user1    1588    1080   0  1155  2260   0 08:11 tty1    00:00:00 less
user1    1590    1080   0  1155  2280   0 08:11 tty1    00:00:00 less
user1    1592    1080   0  1912  3412   1 08:12 tty1    00:00:00 ps -FU user1
user1    1593    1080   0  1155  2260   0 08:12 tty1    00:00:00 less
(END)

```

Screenshot 6 – ps -FU выводение процессов выбраного пользователя

```

UID      PID      PPID  C  STIME TTY          TIME CMD
root        2        0  0  07:20 ?           00:00:00 [kthreadd]
root        3        2  0  07:20 ?           00:00:00 [rcu_gp]
root        4        2  0  07:20 ?           00:00:00 [rcu_par_gp]
root        6        2  0  07:20 ?           00:00:00 [kworker/0:0H-kblockd]
root        8        2  0  07:20 ?           00:00:00 [mm_percpu_wq]
root        9        2  0  07:20 ?           00:00:00 [ksoftirqd/0]
root       10        2  0  07:20 ?           00:00:04 [rcu_sched]
root       11        2  0  07:20 ?           00:00:00 [migration/0]
root       12        2  0  07:20 ?           00:00:00 [idle_inject/0]
root       13        2  0  07:20 ?           00:00:00 [kworker/0:1-events]
root       14        2  0  07:20 ?           00:00:00 [cpuhp/0]
root       15        2  0  07:20 ?           00:00:00 [cpuhp/1]
root       16        2  0  07:20 ?           00:00:00 [idle_inject/1]
root       17        2  0  07:20 ?           00:00:00 [migration/1]
root       18        2  0  07:20 ?           00:00:00 [ksoftirqd/1]
root       20        2  0  07:20 ?           00:00:00 [kworker/1:0H-kblockd]
root       21        2  0  07:20 ?           00:00:00 [kdevtmpfs]
root       22        2  0  07:20 ?           00:00:00 [netns]
root       23        2  0  07:20 ?           00:00:00 [rcu_tasks_kthre]
root       24        2  0  07:20 ?           00:00:00 [kauditd]
root       25        2  0  07:20 ?           00:00:00 [khungtaskd]
root       26        2  0  07:20 ?           00:00:00 [oom_reaper]
root       27        2  0  07:20 ?           00:00:00 [writeback]
root       28        2  0  07:20 ?           00:00:00 [kcompactd0]
root       29        2  0  07:20 ?           00:00:00 [ksmd]
root       30        2  0  07:20 ?           00:00:00 [khugepaged]
root       76        2  0  07:20 ?           00:00:00 [kintegrityd]
root       77        2  0  07:20 ?           00:00:00 [kblockd]
root       78        2  0  07:20 ?           00:00:00 [blkcg_punt_bio]
root       79        2  0  07:20 ?           00:00:00 [tpm_dev_wq]
root       80        2  0  07:20 ?           00:00:00 [ata_sff]
root       81        2  0  07:20 ?           00:00:00 [md]
root       82        2  0  07:20 ?           00:00:00 [edac-poller]
root       83        2  0  07:20 ?           00:00:00 [devfreq_wq]
root       84        2  0  07:20 ?           00:00:04 [kworker/1:1-events]
:

```

Screenshot 7- ps -aux вывод запущенных процессов

```

top - 09:32:37 up 2:12, 1 user, load average: 0.00, 0.00, 0.00
Tasks: 127 total, 1 running, 102 sleeping, 24 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.0 sy, 0.0 ni, 100.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 981.0 total, 307.7 free, 153.6 used, 519.8 buff/cache
MiB Swap: 1750.0 total, 1750.0 free, 0.0 used, 675.2 avail Mem

```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1074	user1	20	0	18700	10048	8340	S	0.0	1.0	0:00.09	systemd
1075	user1	20	0	103464	3516	20	S	0.0	0.3	0:00.00	(sd-pam)
1080	user1	20	0	7068	5192	3492	S	0.0	0.5	0:00.18	bash
1125	user1	20	0	4620	2256	1996	T	0.0	0.2	0:00.05	less
1132	user1	20	0	4620	2276	2012	T	0.0	0.2	0:00.00	less
1147	user1	20	0	4620	2260	1996	T	0.0	0.2	0:00.01	less
1149	user1	20	0	4620	2256	1996	T	0.0	0.2	0:00.00	less
1516	user1	20	0	4620	2256	1992	T	0.0	0.2	0:00.00	less
1518	user1	20	0	4620	2284	2024	T	0.0	0.2	0:00.04	less
1556	user1	20	0	4620	2192	1928	T	0.0	0.2	0:00.01	less
1557	user1	20	0	8044	4004	3336	T	0.0	0.4	0:00.64	top
1559	user1	20	0	4620	2256	1992	T	0.0	0.2	0:00.12	less
1561	user1	20	0	4620	2276	2016	T	0.0	0.2	0:00.01	less
1564	user1	20	0	4620	2276	2012	T	0.0	0.2	0:00.08	less
1566	user1	20	0	4620	2288	2024	T	0.0	0.2	0:00.01	less
1568	user1	20	0	4620	2280	2016	T	0.0	0.2	0:00.00	less
1570	user1	20	0	4620	2276	2016	T	0.0	0.2	0:00.00	less
1573	user1	20	0	4620	2280	2016	T	0.0	0.2	0:00.01	less
1575	user1	20	0	4620	2280	2020	T	0.0	0.2	0:00.00	less
1577	user1	20	0	4620	2232	1968	T	0.0	0.2	0:00.01	less
1579	user1	20	0	4620	2260	1996	T	0.0	0.2	0:00.01	less
1581	user1	20	0	4620	2228	1964	T	0.0	0.2	0:00.00	less
1588	user1	20	0	4620	2260	1996	T	0.0	0.2	0:00.09	less
1590	user1	20	0	4620	2280	2016	T	0.0	0.2	0:00.05	less
1593	user1	20	0	4620	2260	1996	T	0.0	0.2	0:00.01	less
1636	user1	20	0	4620	2260	1996	T	0.0	0.2	0:00.13	less
1638	user1	20	0	8060	4052	3368	T	0.0	0.4	0:00.00	top
1639	user1	20	0	8060	4040	3368	R	0.0	0.4	0:01.24	top

Screenshot 8- top процессы выбранного пользователя

```

Help for Interactive Commands - procps-ng UNKNOWN
Window 1:Def: Cumulative mode Off. System: Delay 3.0 secs; Secure mode Off.

Z,B,E,e Global: 'Z' colors; 'B' bold; 'E'/'e' summary/task memory scale
l,t,m Toggle Summary: 'l' load avg; 't' task/cpu stats; 'm' memory info
0,1,2,3,I Toggle: '0' zeros; '1/2/3' cpus or numa node views; 'I' Irix mode
f,F,X Fields: 'f'/'F' add/remove/order/sort; 'X' increase fixed-width

L,&,<,> . Locate: 'L'/'&' find/again; Move sort column: '<'/'>' left/right
R,H,J,C . Toggle: 'R' Sort; 'H' Threads; 'J' Num justify; 'C' Coordinates
c,i,S,j . Toggle: 'c' Cmd name/line; 'i' Idle; 'S' Time; 'j' Str justify
x,y . Toggle highlights: 'x' sort field; 'y' running tasks
z,b . Toggle: 'z' color/mono; 'b' bold/reverse (only if 'x' or 'y')
u,U,o,O . Filter by: 'u'/'U' effective/any user; 'o'/'O' other criteria
n,#,^0 . Set: 'n'/'#' max tasks displayed; Show: Ctrl+'0' other filter(s)
V,v . Toggle: 'V' forest view; 'v' hide/show forest view children

k,r Manipulate tasks: 'k' kill; 'r' renice
d or s Set update interval
W,Y Write configuration file 'W'; Inspect other output 'Y'
q Quit
( commands shown with '.' require a visible task display window )
Press 'h' or '?' for help with Windows,
Type 'q' or <Esc> to continue

```

Screenshot 9 – top help команда

```

top - 09:36:50 up 2:16, 1 user, load average: 0.00, 0.00, 0.00
Tasks: 128 total, 1 running, 102 sleeping, 25 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.2 sy, 0.0 ni, 99.8 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 981.0 total, 306.6 free, 154.6 used, 519.8 buff/cache
MiB Swap: 1750.0 total, 1750.0 free, 0.0 used, 674.1 avail Mem

```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1641	user1	20	0	8064	3852	3316	R	0.3	0.4	0:01.23	top
1	root	20	0	102104	11664	8532	S	0.0	1.2	0:01.88	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_par_gp
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
8	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_wq
9	root	20	0	0	0	0	S	0.0	0.0	0:00.04	ksoftirqd/0
10	root	20	0	0	0	0	I	0.0	0.0	0:04.35	rcu_sched
11	root	rt	0	0	0	0	S	0.0	0.0	0:00.05	migration/0
12	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/0
13	root	20	0	0	0	0	I	0.0	0.0	0:00.34	kworker/0:1-events
14	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
15	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/1
16	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/1
17	root	rt	0	0	0	0	S	0.0	0.0	0:00.39	migration/1
18	root	20	0	0	0	0	S	0.0	0.0	0:00.05	ksoftirqd/1
20	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/1:0H-kblockd
21	root	20	0	0	0	0	S	0.0	0.0	0:00.01	kdevtmpfs
22	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	netns
23	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_tasks_kthre
24	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kauditd
25	root	20	0	0	0	0	S	0.0	0.0	0:00.00	khungtaskd
26	root	20	0	0	0	0	S	0.0	0.0	0:00.00	oom_reaper
27	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	writeback
28	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kcompactd0
29	root	25	5	0	0	0	S	0.0	0.0	0:00.00	ksmd
30	root	39	19	0	0	0	S	0.0	0.0	0:00.00	khugepaged
76	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kintegrityd
77	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kblockd

Screenshot 10 – top по загрузженности процессора

```

top - 09:39:35 up 2:19, 1 user, load average: 0.00, 0.00, 0.00
Tasks: 127 total, 1 running, 101 sleeping, 25 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.0 sy, 0.0 ni, 100.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 981.0 total, 306.6 free, 154.6 used, 519.8 buff/cache
MiB Swap: 1750.0 total, 1750.0 free, 0.0 used, 674.1 avail Mem
Renice PID 84 to value 10

```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
84	root	20	0	0.0m	0.0m	0.0m	I	0.1	0.0	0:04.92	kworker/1:1-ata_sff
191	root	-51	0	0.0m	0.0m	0.0m	S	0.1	0.0	0:00.88	irq/18-vmwgfx
539	root	rt	0	273.6m	17.6m	8.0m	S	0.1	1.8	0:01.32	multipathd
656	root	20	0	765.7m	27.6m	16.0m	S	0.1	2.8	0:01.85	snaped
1571	root	20	0	0.0m	0.0m	0.0m	I	0.1	0.0	0:02.31	kworker/0:2-events
1641	user1	20	0	7.9m	3.8m	3.2m	R	0.1	0.4	0:01.44	top
1	root	20	0	99.7m	11.4m	8.3m	S	0.0	1.2	0:01.88	systemd
2	root	20	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	kthreadd
3	root	0	-20	0.0m	0.0m	0.0m	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0.0m	0.0m	0.0m	I	0.0	0.0	0:00.00	rcu_par_gp
6	root	0	-20	0.0m	0.0m	0.0m	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
8	root	0	-20	0.0m	0.0m	0.0m	I	0.0	0.0	0:00.00	mm_percpu_wq
9	root	20	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.04	ksoftirqd/0
10	root	20	0	0.0m	0.0m	0.0m	I	0.0	0.0	0:04.37	rcu_sched
11	root	rt	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.05	migration/0
12	root	-51	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	idle_inject/0
13	root	20	0	0.0m	0.0m	0.0m	I	0.0	0.0	0:00.34	kworker/0:1-events
14	root	20	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	cpuhp/0
15	root	20	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	cpuhp/1
16	root	-51	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	idle_inject/1
17	root	rt	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.40	migration/1
18	root	20	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.05	ksoftirqd/1
20	root	0	-20	0.0m	0.0m	0.0m	I	0.0	0.0	0:00.00	kworker/1:0H-kblockd
21	root	20	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.01	kdevtmpfs
22	root	0	-20	0.0m	0.0m	0.0m	I	0.0	0.0	0:00.00	netns
23	root	20	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	rcu_tasks_kthre
24	root	20	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	kauditd
25	root	20	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	khungtaskd
26	root	20	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	oom_reaper
27	root	0	-20	0.0m	0.0m	0.0m	I	0.0	0.0	0:00.00	writeback

Screenshot 11 – top renice PID 84 повышение приоритета процесса

```

top - 09:45:53 up 2:25, 1 user, load average: 0.00, 0.00, 0.00
Tasks: 128 total, 1 running, 102 sleeping, 25 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.0 sy, 0.0 ni, 100.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 981.0 total, 306.2 free, 155.1 used, 519.8 buff/cache
MiB Swap: 1750.0 total, 1750.0 free, 0.0 used, 673.6 avail Mem
Send pid 1080 signal [15/sigterm] 1

```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
555	root	0	-20	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	loop1
556	root	0	-20	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.01	loop2
557	root	20	0	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	jbd2/sda2-8
558	root	0	-20	0.0m	0.0m	0.0m	I	0.0	0.0	0:00.00	ext4-rsv-conver
559	root	0	-20	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	loop3
560	root	0	-20	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	loop4
561	root	0	-20	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.10	loop5
562	root	0	-20	0.0m	0.0m	0.0m	S	0.0	0.0	0:00.00	loop6
582	systemd+	20	0	88.3m	6.4m	5.5m	S	0.0	0.6	0:00.12	systemd-timesyn
623	systemd+	20	0	26.3m	8.0m	7.0m	S	0.0	0.8	0:00.11	systemd-network
625	root	0	-20	0.0m	0.0m	0.0m	I	0.0	0.0	0:00.00	bond0
629	systemd+	20	0	23.5m	12.1m	8.2m	S	0.0	1.2	0:00.12	systemd-resolve
641	root	20	0	228.9m	7.2m	6.4m	S	0.0	0.7	0:00.21	accounts-daemon
644	root	20	0	5.4m	2.9m	2.7m	S	0.0	0.3	0:00.01	cron
645	message+	20	0	7.5m	4.7m	4.0m	S	0.0	0.5	0:00.07	dbus-daemon
650	root	20	0	79.9m	3.9m	3.6m	S	0.0	0.4	0:00.24	irqbalance
652	root	20	0	25.7m	17.5m	10.0m	S	0.0	1.8	0:00.08	networkd-dispat
653	syslog	20	0	219.1m	4.8m	3.8m	S	0.0	0.5	0:00.01	rsyslogd
656	root	20	0	765.7m	27.8m	16.0m	S	0.0	2.8	0:01.87	snaped
657	root	20	0	16.7m	7.8m	6.9m	S	0.0	0.8	0:00.13	systemd-logind
659	daemon	20	0	3.7m	2.3m	2.1m	S	0.0	0.2	0:00.00	atd
698	root	20	0	102.7m	20.3m	12.8m	S	0.0	2.1	0:00.10	unattended-upgr
715	root	20	0	227.3m	6.8m	6.2m	S	0.0	0.7	0:00.01	polkitd
995	root	20	0	5.9m	4.1m	3.3m	S	0.0	0.4	0:00.01	login
1074	user1	20	0	18.3m	9.8m	8.1m	S	0.0	1.0	0:00.09	systemd
1075	user1	20	0	101.0m	3.4m	0.0m	S	0.0	0.3	0:00.00	(sd-pam)
1080	user1	20	0	6.9m	5.1m	3.4m	S	0.0	0.5	0:00.19	bash
1125	user1	20	0	4.5m	2.2m	1.9m	T	0.0	0.2	0:00.05	less
1132	user1	20	0	4.5m	2.2m	2.0m	T	0.0	0.2	0:00.00	less
1147	user1	20	0	4.5m	2.2m	1.9m	T	0.0	0.2	0:00.01	less

Screenshot 12 – kill and send signal 1 удаление процесса с сигналом 1 закрытие терминала

```

Ubuntu 20.04.2 LTS host1 tty1

host1 login: user1
Password:
Welcome to Ubuntu 20.04.2 LTS (GNU/Linux 5.4.0-80-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Mon Aug  2 09:47:48 UTC 2021

System load:  0.0               Processes:            109
Usage of /:   56.3% of 8.79GB   Users logged in:     0
Memory usage: 20%              IPv4 address for enp0s3: 10.0.2.15
Swap usage:   0%

 * Super-optimized for small spaces - read how we shrank the memory
   footprint of MicroK8s to make it the smallest full K8s around.

   https://ubuntu.com/blog/microk8s-memory-optimisation

63 updates can be installed immediately.
0 of these updates are security updates.
To see these additional updates run: apt list --upgradable

Last login: Mon Aug  2 07:23:56 UTC 2021 on tty1
user1@host1:~$ jobs
user1@host1:~$ nano Linux_host1 &
[1] 1804
user1@host1:~$ jobs
[1]+  Stopped                  nano Linux_host1
user1@host1:~$

```

Screenshot 13 – jobs запущенные фоновые процессы

```

GNU nano 4.8                               Linux_host1                               Modified
123

[ New File ]

^G Get Help      ^O Write Out    ^W Where Is    ^K Cut Text    ^J Justify    ^C Cur Pos    M-U Undo
^X Exit          ^R Read File    ^_ Replace     ^U Paste Text  ^T To Spell   ^_ Go To Line M-E Redo

```

Screenshot 14 – fg 1 Открытые первого фонового процесса

```
%Cpu(s):  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :   981.0 total,   160.6 free,   167.1 used,   653.4 buff/cache
MiB Swap:  1750.0 total,  1747.5 free,    2.5 used.   639.2 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1	root	20	0	103576	12904	8364	S	0.0	1.3	0:12.54	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_par_gp
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
8	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_wq
9	root	20	0	0	0	0	S	0.0	0.0	0:00.19	ksoftirqd/0
10	root	20	0	0	0	0	I	0.0	0.0	0:05.47	rcu_sched
11	root	rt	0	0	0	0	S	0.0	0.0	0:00.07	migration/0
12	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/0
14	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
15	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/1
16	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/1
17	root	rt	0	0	0	0	S	0.0	0.0	0:00.41	migration/1
18	root	20	0	0	0	0	S	0.0	0.0	0:00.20	ksoftirqd/1
20	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/1:0H-kblockd
21	root	20	0	0	0	0	S	0.0	0.0	0:00.01	kdevtmpfs
22	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	netns
23	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_tasks_kthre
24	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kauditd
25	root	20	0	0	0	0	S	0.0	0.0	0:00.00	khungtaskd
26	root	20	0	0	0	0	S	0.0	0.0	0:00.00	oom_reaper
27	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	writeback
28	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kcompactd0
29	root	25	5	0	0	0	S	0.0	0.0	0:00.00	ksmd
30	root	39	19	0	0	0	S	0.0	0.0	0:00.00	khugepaged
76	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kintegrityd
77	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kblockd
78	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	blkcg_punt_bio
79	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	tpm_dev_wq

```
[2]+  Stopped                  top
user1@host1:~$ bg %2
```

Screenshot 15 – bg %2 отправить в фоновый режим

```
user1@host1:~$
user1@host1:~$
user1@host1:~$
user1@host1:~$
user1@host1:~$
user1@host1:~$
user1@host1:~$
user1@host1:~$ sudo time ./skr
time: cannot run ./skr: No such file or directory
Command exited with non-zero status 127
0.00user 0.00system 0:00.00elapsed ?%CPU (0avgtext+0avgdata 988maxresident)k
0inputs+0outputs (0major+24minor)pagefaults 0swaps
user1@host1:~$ sudo time ./skr.sh
Sleeping for 5 sec
completed
root
0.00user 0.00system 0:05.00elapsed 0%CPU (0avgtext+0avgdata 3596maxresident)k
0inputs+0outputs (0major+469minor)pagefaults 0swaps
user1@host1:~$ sudo ./skr.sh
Sleeping for 5 sec
completed
root
user1@host1:~$ _
```

Screenshot 16 – sleep 5 команда для остановки процесса на время

Part 2

```
user1@host1: ~
Microsoft Windows [Version 10.0.19042.1110]
(c) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.

C:\WINDOWS\system32>ssh root@localhost -p 8022
root@localhost's password:
Permission denied, please try again.
root@localhost's password:
Permission denied, please try again.
root@localhost's password:
root@localhost: Permission denied (publickey,password).

C:\WINDOWS\system32>ssh user1@localhost -p 8022
user1@localhost's password:
Welcome to Ubuntu 20.04.2 LTS (GNU/Linux 5.4.0-77-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Tue Aug  3 07:25:57 UTC 2021

System load:  0.12           Processes:            208
Usage of /:   93.4% of 8.79GB Users logged in:             1
Memory usage: 54%           IPv4 address for enp0s3: 10.0.2.15
Swap usage:   0%

=> / is using 93.4% of 8.79GB

 * Super-optimized for small spaces - read how we shrank the memory
   footprint of MicroK8s to make it the smallest full K8s around.
```

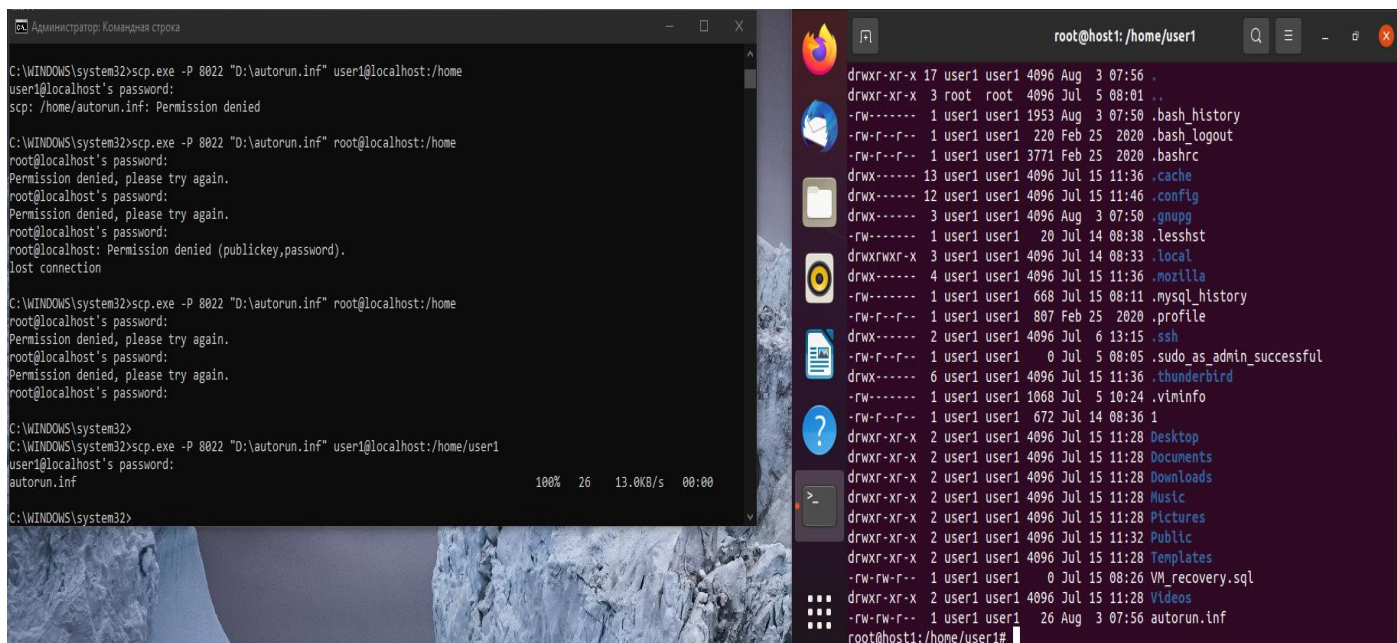
Screenshot 18 – вход no ssh

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.18362.778]
(c) 2019 Microsoft Corporation. All rights reserved.

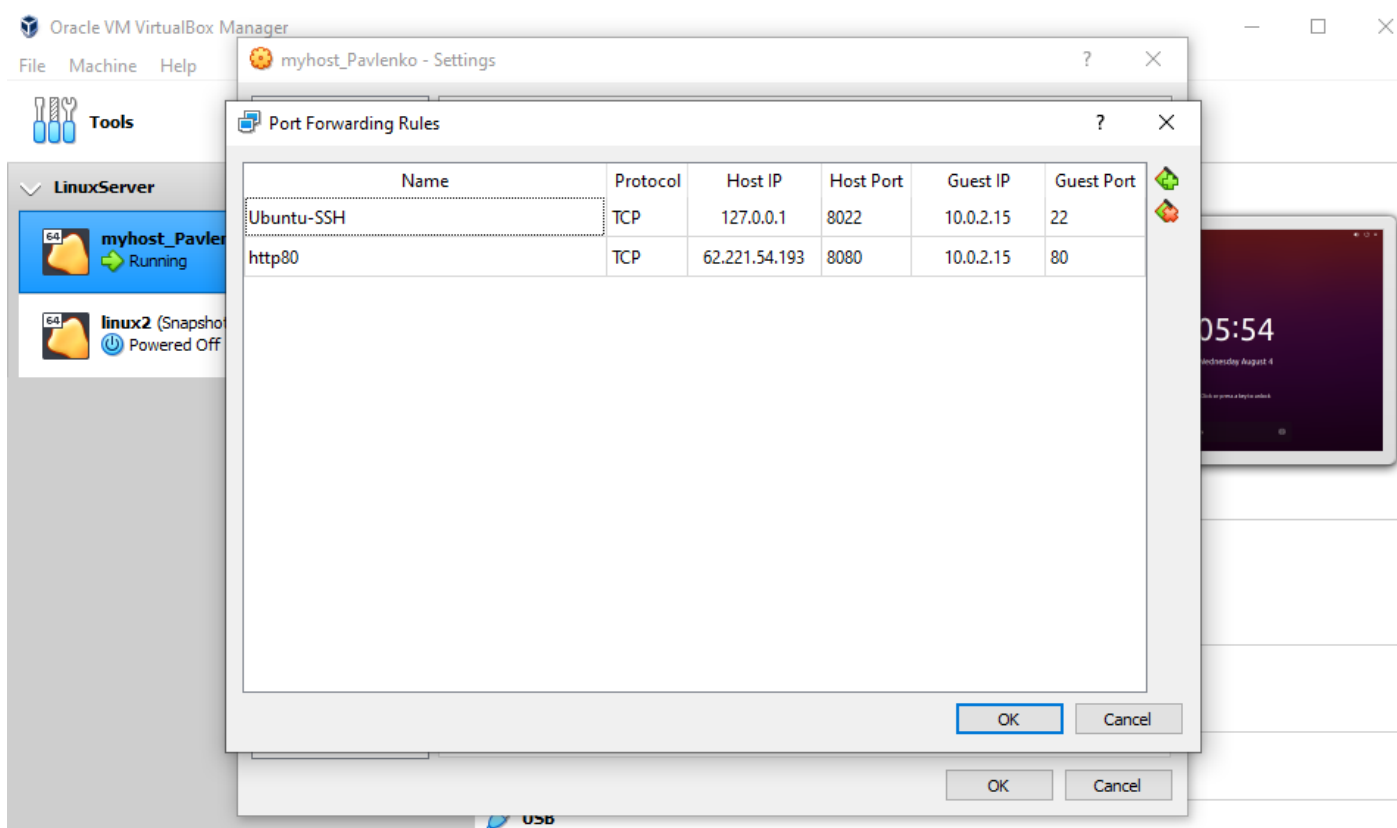
C:\Users\Dejan>ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (C:\Users\Dejan/.ssh/id_rsa):
C:\Users\Dejan/.ssh/id_rsa already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in C:\Users\Dejan/.ssh/id_rsa.
Your public key has been saved in C:\Users\Dejan/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:HbFmWKfZ4ahf2MtKCbGNI0CsKYeeNuHn4eL9smyme64 dejan@DESKTOP-VCSD786
The key's randomart image is:
+---[RSA 2048]---+
| ..      o o    |
| ..      o X .   |
| +.      . O o   |
| =...     . = +   |
| +.O . + S O o   |
| * O . = O + .   |
| . = . . . + O   |
| .oB      . .    |
| .EX=+.         |
+---[SHA256]-----+

C:\Users\Dejan>
```

Screenshot 19 – Создание ssh ключа через командную строку Windows



Screenshot 20 – scp.exe отправка файла от хоста на ssh сервер



Screenshot 21 – Проброс портов через Oracle

```
root@host1: /home/user1
GNU nano 4.8 /etc/ssh/sshd_config
# $OpenBSD: sshd_config,v 1.103 2018/04/09 20:41:22 tj Exp $

# This is the sshd server system-wide configuration file. See
# sshd_config(5) for more information.

# This sshd was compiled with PATH=/usr/bin:/bin:/usr/sbin:/sbin

# The strategy used for options in the default sshd_config shipped with
# OpenSSH is to specify options with their default value where
# possible, but leave them commented. Uncommented options override the
# default value.

Include /etc/ssh/sshd_config.d/*.conf

#Port 22
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::

HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_ecdsa_key
#HostKey /etc/ssh/ssh_host_ed25519_key

# Ciphers and keying
#RekeyLimit default none

^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos   M-U Undo     M-A Mark Text
^X Exit      ^R Read File  ^\ Replace  ^U Paste Text ^T To Spell  ^_ Go To Line M-F Redo     M-6 Copy Text
```

Screenshot 22 – Настройка файла config ssh сервера