

**Федеральное государственное автономное  
образовательное учреждение высшего образования**

**«Национальный исследовательский университет ИТМО»**

**факультет программной инженерии и компьютерной техники**

**Дисциплина: Операционные системы**

## **Лабораторная работа №1**

**Вариант 167745**

**Выполнил:**  
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**Цель работы:**

Знакомство с системными инструментами анализа производительности и поведения программ.

1. Количество потоков создаваемое программой;

```
ivan@ip13-Nitro-AN515-54:~/Documents/study/OS$ ./167745 &
[1] 615181
ivan@ip13-Nitro-AN515-54:~/Documents/study/OS$ ps -T -a 615181
 PID   SPID TTY      STAT   TIME COMMAND
 1993   1993 tty2    Sl+   0:00 /usr/libexec/gnome-session-binary --session=ubuntu
 1993   2048 tty2    Sl+   0:00 /usr/libexec/gnome-session-binary --session=ubuntu
 1993   2049 tty2    Sl+   0:00 /usr/libexec/gnome-session-binary --session=ubuntu
516002  516002 pts/2    T   0:00 nano /etc/apt/sources.list
615181  615181 pts/0    Sl   0:00 ./167745
615181  615182 pts/0    Sl   0:00 ./167745
615181  615183 pts/0    Sl   0:00 ./167745
615181  615184 pts/0    Sl   0:00 ./167745
615181  615185 pts/0    Sl   0:00 ./167745
615181  615186 pts/0    Sl   0:00 ./167745
615181  615187 pts/0    Sl   0:00 ./167745
615181  615188 pts/0    Sl   0:00 ./167745
615181  615189 pts/0    Sl   0:00 ./167745
615181  615190 pts/0    Sl   0:00 ./167745
615181  615191 pts/0    Sl   0:00 ./167745
615181  615192 pts/0    Sl   0:00 ./167745
615181  615193 pts/0    Sl   0:00 ./167745
615181  615194 pts/0    Sl   0:00 ./167745
615181  615195 pts/0    Sl   0:00 ./167745
615181  615196 pts/0    Sl   0:00 ./167745
615181  615197 pts/0    Sl   0:00 ./167745
615181  615198 pts/0    Sl   0:00 ./167745
615181  615199 pts/0    Rl   0:10 ./167745
615181  615200 pts/0    Rl   0:10 ./167745
615181  615201 pts/0    Rl   0:10 ./167745
615307  615307 pts/0    R+   0:00 ps -T -a 615181
ivan@ip13-Nitro-AN515-54:~/Documents/study/OS$ ps -o thcount 615181
THCNT
 21
ivan@ip13-Nitro-AN515-54:~/Documents/study/OS$
```

## htop

615181	ivan	20	0	1614M	873M	1944	S	0.0	7.4	2:51.30	/167745
615182	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:03.32	./167745
615183	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:02.03	./167745
615184	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:03.29	./167745
615185	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:02.10	./167745
615186	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:03.13	./167745
615187	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:02.06	./167745
615188	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:03.22	./167745
615189	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:02.06	./167745
615190	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:00.00	./167745
615191	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:00.00	./167745
615192	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:00.00	./167745
615193	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:00.00	./167745
615194	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:00.00	./167745
615195	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:00.00	./167745
615196	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:00.00	./167745
615197	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:00.00	./167745
615198	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:00.00	./167745
615199	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:49.99	./167745
615200	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:49.98	./167745
615201	ivan	20	0	1614M	873M	1944	S	0.0	7.4	0:49.99	./167745

2. Список файлов и сетевых соединений с которыми работает программа;  
Список файлов:

```

ivan@ip13-Nitro-AN515-54:~/Documents/study/OS$ sudo strace -e openat -f ./167745
[sudo] password for ivan:
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libstdc++-so.6", O_RDONLY|O_CLOEXEC) = 3
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libm.so.6", O_RDONLY|O_CLOEXEC) = 3
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libgcc_s.so.1", O_RDONLY|O_CLOEXEC) = 3
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libpthread.so.0", O_RDONLY|O_CLOEXEC) = 3
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
strace: Process 644037 attached
strace: Process 644038 attached
strace: Process 644039 attached
strace: Process 644040 attached
[pid 644037] openat(AT_FDCWD, "/dev/zero", O_RDONLY) = 3
[pid 644039] openat(AT_FDCWD, "/dev/zero", O_RDONLY) = 4
strace: Process 644041 attached
strace: Process 644042 attached
[pid 644041] openat(AT_FDCWD, "/dev/zero", O_RDONLY) = 5
strace: Process 644043 attached
strace: Process 644044 attached
[pid 644043] openat(AT_FDCWD, "/dev/zero", O_RDONLY) = 6
strace: Process 644045 attached
strace: Process 644046 attached
strace: Process 644047 attached
strace: Process 644048 attached
strace: Process 644049 attached
strace: Process 644050 attached
strace: Process 644051 attached
strace: Process 644052 attached
strace: Process 644053 attached
[pid 644053] openat(AT_FDCWD, "/proc/meminfo", O_RDONLY) = 11
strace: Process 644054 attached
strace: Process 644055 attached
strace: Process 644056 attached
[pid 644043] openat(AT_FDCWD, "488279190879408311", O_WRONLY|O_CREAT|O_TRUNC, 0666 <unfinished ...>
[pid 644037] openat(AT_FDCWD, "2451864942053774057", O_WRONLY|O_CREAT|O_TRUNC, 0666 <unfinished ...>
[pid 644039] openat(AT_FDCWD, "6402949763457948271", O_WRONLY|O_CREAT|O_TRUNC, 0666 <unfinished ...>
[pid 644041] openat(AT_FDCWD, "14882549174776689833", O_WRONLY|O_CREAT|O_TRUNC, 0666 <unfinished ...>
[pid 644043] <... openat resumed> = 6
[pid 644037] <... openat resumed> = 3
[pid 644039] <... openat resumed> = 4
[pid 644041] <... openat resumed> = 5
[pid 644041] openat(AT_FDCWD, "14882549174776689833", O_RDONLY) = 3
[pid 644041] openat(AT_FDCWD, "14882549174776689833", O_RDONLY) = 3
[pid 644042] openat(AT_FDCWD, "11892699575998298074", O_WRONLY|O_CREAT|O_TRUNC, 0666 <unfinished ...>
[pid 644039] openat(AT_FDCWD, "6402949763457948271", O_RDONLY) = 4
[pid 644039] openat(AT_FDCWD, "6402949763457948271", O_RDONLY) = 4
[pid 644043] openat(AT_FDCWD, "488279190879408311", O_RDONLY) = 5
[pid 644043] openat(AT_FDCWD, "488279190879408311", O_RDONLY) = 5
[pid 644037] openat(AT_FDCWD, "2451864942053774057", O_RDONLY) = 6
[pid 644037] openat(AT_FDCWD, "2451864942053774057", O_RDONLY) = 6
[pid 644042] <... openat resumed> = 3
[pid 644040] openat(AT_FDCWD, "1845952177369816948", O_WRONLY|O_CREAT|O_TRUNC, 0666 <unfinished ...>
[pid 644038] openat(AT_FDCWD, "9680032535549941385", O_WRONLY|O_CREAT|O_TRUNC, 0666 <unfinished ...>
[pid 644044] openat(AT_FDCWD, "3524250063691808895", O_WRONLY|O_CREAT|O_TRUNC, 0666) = 5

```

## Список соединений:

```

ivan@ip13-Nitro-AN515-54:~$ sudo netstat -tulpn | grep 615181
[sudo] password for ivan:
tcp      0      0 0.0.0.0:6906          0.0.0.0:*          LISTEN      615181./.167745
tcp      0      0 0.0.0.0:6907          0.0.0.0:*          LISTEN      615181./.167745
tcp      0      0 0.0.0.0:6905          0.0.0.0:*          LISTEN      615181./.167745
tcp      0      0 0.0.0.0:6908          0.0.0.0:*          LISTEN      615181./.167745

```

3. Карту памяти процесса;

```
ivan@ip13-Nitro-AN515-54:~$ pmap -p 615181
615181: ./167745
0000000000400000      232K r-x-- /home/ivan/Documents/study/OS/167745
000000000063a000       4K r---- /home/ivan/Documents/study/OS/167745
000000000063b000       4K rw--- /home/ivan/Documents/study/OS/167745
0000000000b30000      132K rw--- [ anon ]
00007f8065300000 111616K rw--- [ anon ]
00007f806c000000      132K rw--- [ anon ]
00007f806c021000 65404K ---- [ anon ]
00007f8074000000      132K rw--- [ anon ]
00007f8074021000 65404K ---- [ anon ]
00007f8078000000      132K rw--- [ anon ]
00007f8078021000 65404K ---- [ anon ]
00007f807c000000      132K rw--- [ anon ]
00007f807c021000 65404K ---- [ anon ]
00007f8087900000 334848K rw--- [ anon ]
00007f809c000000      132K rw--- [ anon ]
00007f809c021000 65404K ---- [ anon ]
00007f80a0000000      132K rw--- [ anon ]
00007f80a0021000 65404K ---- [ anon ]
00007f80a47f9000      4K ---- [ anon ]
00007f80a47fa000 8192K rw--- [ anon ]
00007f80a4ffa000      4K ---- [ anon ]
00007f80a4ffb000 8192K rw--- [ anon ]
00007f80a57fb000      4K ---- [ anon ]
00007f80a57fc000 8192K rw--- [ anon ]
00007f80a5ffc000      4K ---- [ anon ]
00007f80a5ffd000 8192K rw--- [ anon ]
00007f80a67fd000      4K ---- [ anon ]
00007f80a67fe000 8192K rw--- [ anon ]
00007f80a6ffe000      4K ---- [ anon ]
00007f80a6fff000 8192K rw--- [ anon ]
00007f80a77ff000      4K ---- [ anon ]
00007f80a7800000 8192K rw--- [ anon ]
00007f80a8000000      132K rw--- [ anon ]
00007f80a8021000 65404K ---- [ anon ]
00007f80ac000000      132K rw--- [ anon ]
00007f80ac021000 65404K ---- [ anon ]
00007f80b07f9000      4K ---- [ anon ]
00007f80b07fa000 8192K rw--- [ anon ]
00007f80b0ffa000      4K ---- [ anon ]
00007f80b0ffb000 8192K rw--- [ anon ]
00007f80b17fb000      4K ---- [ anon ]
00007f80b17fc000 8192K rw--- [ anon ]
00007f80b1ffc000      4K ---- [ anon ]
00007f80b1ffd000 8192K rw--- [ anon ]
00007f80b27fd000      4K ---- [ anon ]
00007f80b27fe000 8192K rw--- [ anon ]
00007f80b2ffe000      4K ---- [ anon ]
00007f80b2fff000 8192K rw--- [ anon ]
00007f80b37ff000      4K ---- [ anon ]
00007f80b3800000 8192K rw--- [ anon ]
00007f80b4000000      132K rw--- [ anon ]
00007f80b4021000 65404K ---- [ anon ]
00007f80b87d3000      4K ---- [ anon ]
00007f80b87d4000 8192K rw--- [ anon ]
00007f80b8fd4000      4K ---- [ anon ]
00007f80b8fd5000 8192K rw--- [ anon ]
00007f80b97d5000      4K ---- [ anon ]
```

00007f80b27fe000	8192K	rw---	[ anon ]
00007f80b2ffe000	4K	----	[ anon ]
00007f80b2ffff000	8192K	rw---	[ anon ]
00007f80b37ff000	4K	----	[ anon ]
00007f80b3800000	8192K	rw---	[ anon ]
00007f80b4000000	132K	rw---	[ anon ]
00007f80b4021000	65404K	----	[ anon ]
00007f80b87d3000	4K	----	[ anon ]
00007f80b87d4000	8192K	rw---	[ anon ]
00007f80b8fd4000	4K	----	[ anon ]
00007f80b8fd5000	8192K	rw---	[ anon ]
00007f80b97d5000	4K	----	[ anon ]
00007f80b97d6000	8192K	rw---	[ anon ]
00007f80b9fd6000	4K	----	[ anon ]
00007f80b9fd7000	8192K	rw---	[ anon ]
00007f80ba7d7000	4K	----	[ anon ]
00007f80ba7d8000	8192K	rw---	[ anon ]
00007f80baf8000	4K	----	[ anon ]
00007f80baf89000	454676K	rw---	[ anon ]
00007f80d6bde000	160K	r----	/usr/lib/x86_64-linux-gnu/libc.so.6
00007f80d6c06000	1620K	r-x--	/usr/lib/x86_64-linux-gnu/libc.so.6
00007f80d6d9b000	352K	r----	/usr/lib/x86_64-linux-gnu/libc.so.6
00007f80d6df3000	16K	r----	/usr/lib/x86_64-linux-gnu/libc.so.6
00007f80d6df7000	8K	rw---	/usr/lib/x86_64-linux-gnu/libc.so.6
00007f80d6df9000	52K	rw---	[ anon ]
00007f80d6e06000	4K	r----	/usr/lib/x86_64-linux-gnu/libpthread.so.0
00007f80d6e07000	4K	r-x--	/usr/lib/x86_64-linux-gnu/libpthread.so.0
00007f80d6e08000	4K	r----	/usr/lib/x86_64-linux-gnu/libpthread.so.0
00007f80d6e09000	4K	r----	/usr/lib/x86_64-linux-gnu/libpthread.so.0
00007f80d6e0a000	4K	rw---	/usr/lib/x86_64-linux-gnu/libpthread.so.0
00007f80d6e0b000	12K	r----	/usr/lib/x86_64-linux-gnu/libgcc_s.so.1
00007f80d6e0e000	92K	r-x--	/usr/lib/x86_64-linux-gnu/libgcc_s.so.1
00007f80d6e25000	16K	r----	/usr/lib/x86_64-linux-gnu/libgcc_s.so.1
00007f80d6e29000	4K	r----	/usr/lib/x86_64-linux-gnu/libgcc_s.so.1
00007f80d6e2a000	4K	rw---	/usr/lib/x86_64-linux-gnu/libgcc_s.so.1
00007f80d6e2b000	56K	r----	/usr/lib/x86_64-linux-gnu/libm.so.6
00007f80d6e39000	496K	r-x--	/usr/lib/x86_64-linux-gnu/libm.so.6
00007f80d6eb5000	364K	r----	/usr/lib/x86_64-linux-gnu/libm.so.6
00007f80d6f10000	4K	r----	/usr/lib/x86_64-linux-gnu/libm.so.6
00007f80d6f11000	4K	rw---	/usr/lib/x86_64-linux-gnu/libm.so.6
00007f80d6f12000	616K	r----	/usr/lib/x86_64-linux-gnu/libstdc++.so.6.0.30
00007f80d6fac000	1088K	r-x--	/usr/lib/x86_64-linux-gnu/libstdc++.so.6.0.30
00007f80d70bc000	444K	r----	/usr/lib/x86_64-linux-gnu/libstdc++.so.6.0.30
00007f80d712b000	44K	r----	/usr/lib/x86_64-linux-gnu/libstdc++.so.6.0.30
00007f80d7136000	12K	rw---	/usr/lib/x86_64-linux-gnu/libstdc++.so.6.0.30
00007f80d7139000	12K	rw---	[ anon ]
00007f80d714a000	24K	rw---	[ anon ]
00007f80d7150000	8K	r----	/usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
00007f80d7152000	168K	r-x--	/usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
00007f80d717c000	44K	r----	/usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
00007f80d7187000	4K	rw---	[ anon ]
00007f80d7188000	8K	r----	/usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
00007f80d718a000	8K	rw---	/usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
00007ffcccc5fc000	132K	rw---	[ stack ]
00007ffcccc65f000	16K	r----	[ anon ]
00007ffcccc663000	8K	r-x--	[ anon ]
ffffffffffff600000	4K	--x--	[ anon ]
total	1652984K		

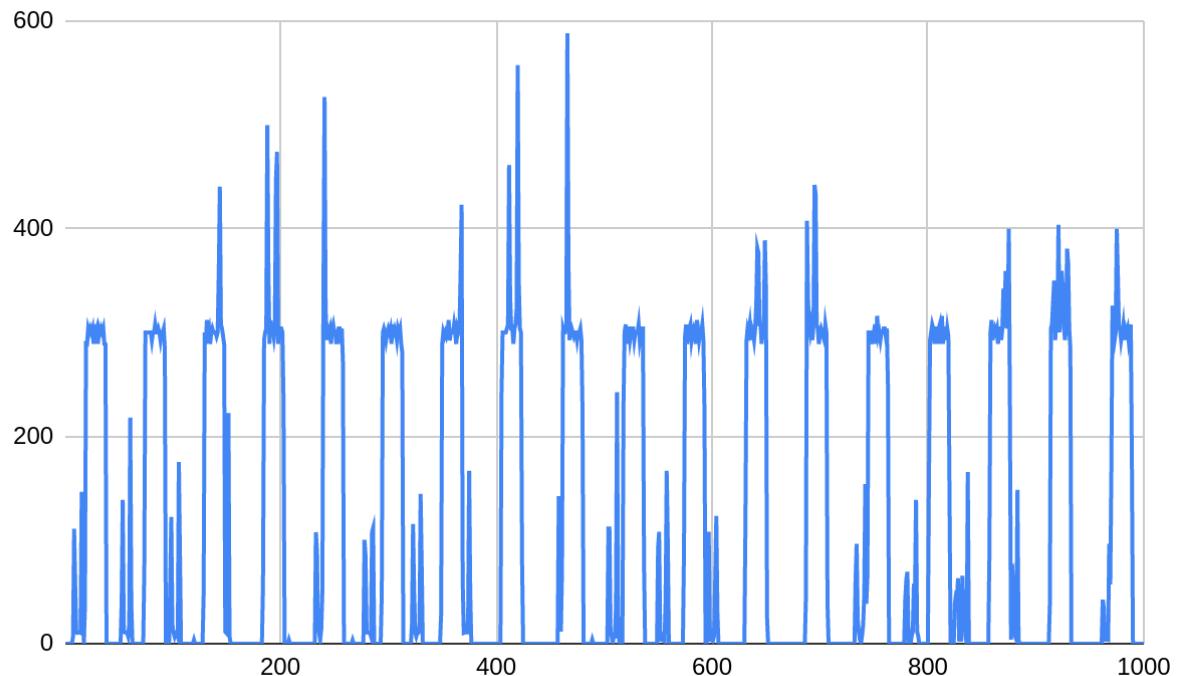
#### 4. Содержимое передаваемых по сети данных;

```
root@pi3-NL0r0:~# ./Ans15-54 $ sudo tcpdump -i any port 6906
tcpdump: data link type LINUX_SLL2
tcpdump: verbose output suppressed, use -V[el]... for full protocol decode
listening on any, link-type LINUX_SLL2 (Linux cooked v2), snapshot length 262144 bytes
0:06:40.750924 lo  In IP localhost.57474 > localhost.6906: Flags [S], seq 1203894245, win 65495, options [mss 65495,sackOK,TS val 2350339971 ecr 0,nop,wscale 7], length 0
0:06:40.750951 lo  In IP localhost.6906 > localhost.57474: Flags [R], seq 0, ack 1203894246, win 0, length 0
0:06:41.751204 lo  In IP localhost.57496 > localhost.6906: Flags [S], seq 1203894245, win 65495, options [mss 65495,sackOK,TS val 2350340972 ecr 0,nop,wscale 7], length 0
0:06:41.751231 lo  In IP localhost.6906 > localhost.57496: Flags [R], seq 0, ack 1203894246, win 0, length 0
0:06:42.751442 lo  In IP localhost.57496 > localhost.6906: Flags [S], seq 1203894251, win 65495, options [mss 65495,sackOK,TS val 2350341972 ecr 0,nop,wscale 7], length 0
0:06:42.751458 lo  In IP localhost.6906 > localhost.57496: Flags [R], seq 0, ack 1203894252, win 0, length 0
0:06:43.751734 lo  In IP localhost.6906 > localhost.57500: Flags [S], seq 1203894254, win 65495, options [mss 65495,sackOK,TS val 2350342972 ecr 0,nop,wscale 7], length 0
0:06:43.751761 lo  In IP localhost.57500 > localhost.6906: Flags [R], seq 0, ack 1203894255, win 0, length 0
0:06:44.751804 lo  In IP localhost.6906 > localhost.57500: Flags [S], seq 1203894256, win 65495, options [mss 65495,sackOK,TS val 2350343972 ecr 0,nop,wscale 7], length 0
0:06:44.751831 lo  In IP localhost.57500 > localhost.6906: Flags [R], seq 0, ack 1203894257, win 0, length 0
0:06:45.752012 lo  In IP localhost.59114 > localhost.6906: Flags [S], seq 1203894266, win 65495, options [mss 65495,sackOK,TS val 2350344972 ecr 0,nop,wscale 7], length 0
0:06:45.752012 lo  In IP localhost.6906 > localhost.59114: Flags [R], seq 0, ack 1203894261, win 0, length 0
0:06:46.752202 lo  In IP localhost.59126 > localhost.6906: Flags [S], seq 1203894263, win 65495, options [mss 65495,sackOK,TS val 2350345973 ecr 0,nop,wscale 7], length 0
0:06:46.752209 lo  In IP localhost.6906 > localhost.59126: Flags [R], seq 0, ack 1203894264, win 0, length 0
0:06:47.752288 lo  In IP localhost.59138 > localhost.6906: Flags [S], seq 1203894266, win 65495, options [mss 65495,sackOK,TS val 2350346973 ecr 0,nop,wscale 7], length 0
0:06:47.752295 lo  In IP localhost.6906 > localhost.59138: Flags [R], seq 0, ack 1203894267, win 0, length 0
0:06:48.752306 lo  In IP localhost.59146 > localhost.6906: Flags [S], seq 1203894269, win 65495, options [mss 65495,sackOK,TS val 2350347973 ecr 0,nop,wscale 7], length 0
0:06:48.752411 lo  In IP localhost.6906 > localhost.59146: Flags [R], seq 0, ack 1203894270, win 0, length 0
0:06:49.752654 lo  In IP localhost.59148 > localhost.6906: Flags [S], seq 1203894272, win 65495, options [mss 65495,sackOK,TS val 2350348973 ecr 0,nop,wscale 7], length 0
0:06:49.752668 lo  In IP localhost.6906 > localhost.59148: Flags [R], seq 0, ack 1203894273, win 0, length 0
0:06:50.752962 lo  In IP localhost.59154 > localhost.6906: Flags [S], seq 1203894275, win 65495, options [mss 65495,sackOK,TS val 2350349973 ecr 0,nop,wscale 7], length 0
0:06:50.752986 lo  In IP localhost.6906 > localhost.59154: Flags [R], seq 0, ack 1203894276, win 0, length 0
0:06:51.753115 lo  In IP localhost.6906 > localhost.59156: Flags [S], seq 1203894278, win 65495, options [mss 65495,sackOK,TS val 2350350974 ecr 0,nop,wscale 7], length 0
0:06:51.753341 lo  In IP localhost.59168 > localhost.6906: Flags [S], seq 1, ack 1, win 512, options [nop,nop,TS val 2350350974 ecr 2350350974], length 0
0:06:51.753411 lo  In IP localhost.6906 > localhost.59168: Flags [P], seq 1:4, ack 1, win 512, options [nop,nop,TS val 2350350974 ecr 2350350974], length 3
0:06:51.753432 lo  In IP localhost.6906 > localhost.59168: Flags [P..], ack 4, win 512, options [nop,nop,TS val 2350350974 ecr 2350350974], length 0
0:06:51.753432 lo  In IP localhost.6906 > localhost.59168: Flags [P..], seq 4, ack 5, win 512, options [nop,nop,TS val 2350350974 ecr 2350350974], length 0
0:06:51.753432 lo  In IP localhost.6906 > localhost.59168: Flags [P..], seq 5, ack 6, win 512, options [nop,nop,TS val 2350350974 ecr 2350350974], length 0
0:06:51.753649 lo  In IP localhost.59168 > localhost.6906: Flags [P..], ack 2, win 512, options [nop,nop,TS val 2350350974 ecr 2350350974], length 0
0:07:05.753774 lo  In IP localhost.47970 > localhost.6906: Flags [S], seq 3241991121, win 65495, options [mss 65495,sackOK,TS val 235036974 ecr 0,nop,wscale 7], length 0
0:07:05.753795 lo  In IP localhost.6906 > localhost.47970: Flags [R], seq 0, ack 3241991122, win 0, length 0
0:07:06.753968 lo  In IP localhost.47982 > localhost.6906: Flags [S], seq 3241991124, win 65495, options [mss 65495,sackOK,TS val 2350365974 ecr 0,nop,wscale 7], length 0
0:07:06.753989 lo  In IP localhost.6906 > localhost.47982: Flags [R..], seq 0, ack 3241991125, win 0, length 0
0:07:07.754112 lo  In IP localhost.47984 > localhost.6906: Flags [S], seq 3241991127, win 65495, options [mss 65495,sackOK,TS val 2350366974 ecr 0,nop,wscale 7], length 0
0:07:07.754112 lo  In IP localhost.6906 > localhost.47984: Flags [R..], seq 0, ack 3241991128, win 0, length 0
0:07:08.754285 lo  In IP localhost.47990 > localhost.6906: Flags [S], seq 3241991130, win 65495, options [mss 65495,sackOK,TS val 2350367975 ecr 0,nop,wscale 7], length 0
0:07:08.754307 lo  In IP localhost.6906 > localhost.47990: Flags [R..], seq 0, ack 3241991131, win 0, length 0
```

#### 5. Построить графики:

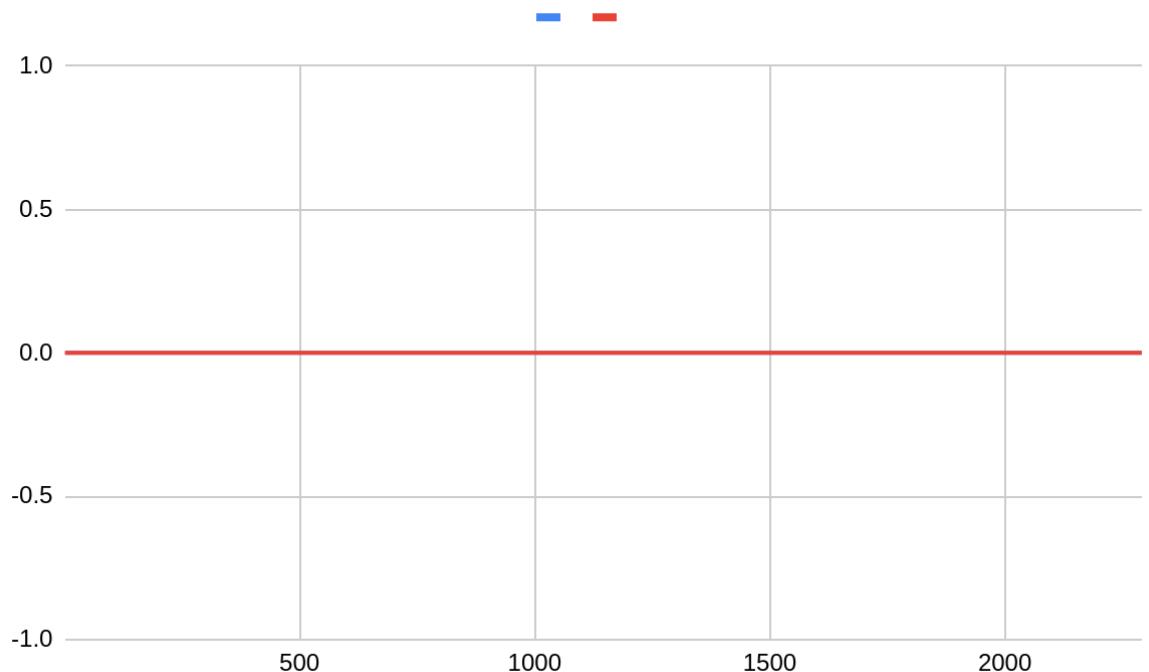
##### a. Потребления программой сри;

```
top -b -n 1000 -d 0.25 | grep 615181 | awk '{print $9}' > cpu.txt
```



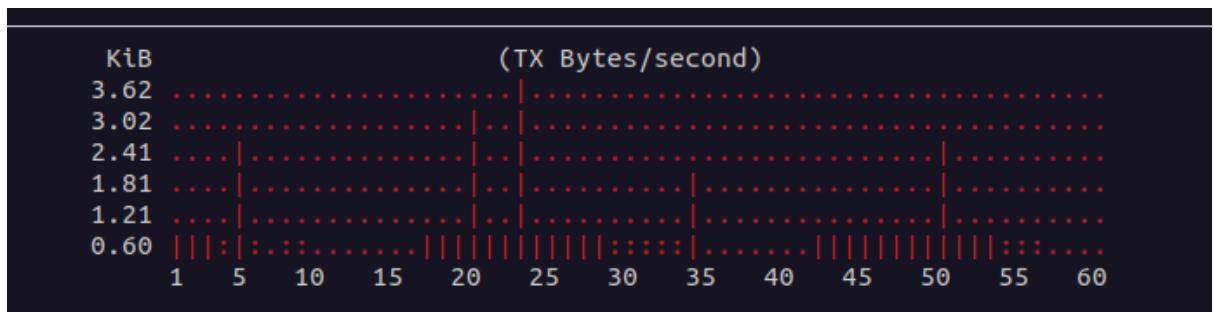
##### b. Нагрузки генерируемой программой на подсистему ввода-вывода;

```
sudo iotop -b -n 1000 -d 0.25 | grep 615181 | awk '{print $4, $6}' > io.txt
```



c. Нагрузки генерируемой программой на сетевую подсистему.





d. Смены состояния исполнения потоков;

```
top -b -H -n 20 -d 0.25 -p 615181 | awk '{print $1, $8}' > thread.txt
cat thread.txt | grep 615 > thread_state.txt
```

thread/ time	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5	2.75	3
615181	S	S	S	S	S	S	S	S	S	S	S	S
615182	S	S	S	S	S	S	S	S	S	S	S	S
615183	S	S	S	S	S	S	S	S	S	S	S	S
615184	S	S	S	S	S	S	S	S	S	S	S	S
615185	S	S	S	S	S	S	S	S	S	S	S	S
615186	S	S	S	S	S	S	S	S	S	S	S	S
615187	S	S	S	S	S	S	S	S	S	S	S	S
615188	S	S	S	S	S	S	S	S	S	S	S	S
615189	S	S	S	S	S	S	S	S	S	S	S	S
615190	S	S	S	S	S	S	S	S	S	S	S	S
615191	S	S	S	S	S	S	S	S	S	S	S	S
615192	S	S	S	S	S	S	S	S	S	S	S	S
615193	S	S	S	S	S	S	S	S	S	S	S	S
615194	S	S	S	S	S	S	S	S	S	S	S	S
615195	S	S	S	S	S	S	S	S	S	S	S	S
615196	S	S	S	S	S	S	S	S	S	S	S	S
615197	S	S	S	S	S	S	S	S	S	S	S	S
615198	S	S	S	S	S	S	S	S	S	S	S	S
615199	R	R	R	R	R	R	R	S	S	S	S	S
615200	R	R	R	R	R	R	R	S	S	S	S	S
615201	R	R	R	R	R	R	R	S	S	S	S	S