Артефакты:

1. **Измененные параметры sshd из Части 2.**

```
PermitRootLogin no

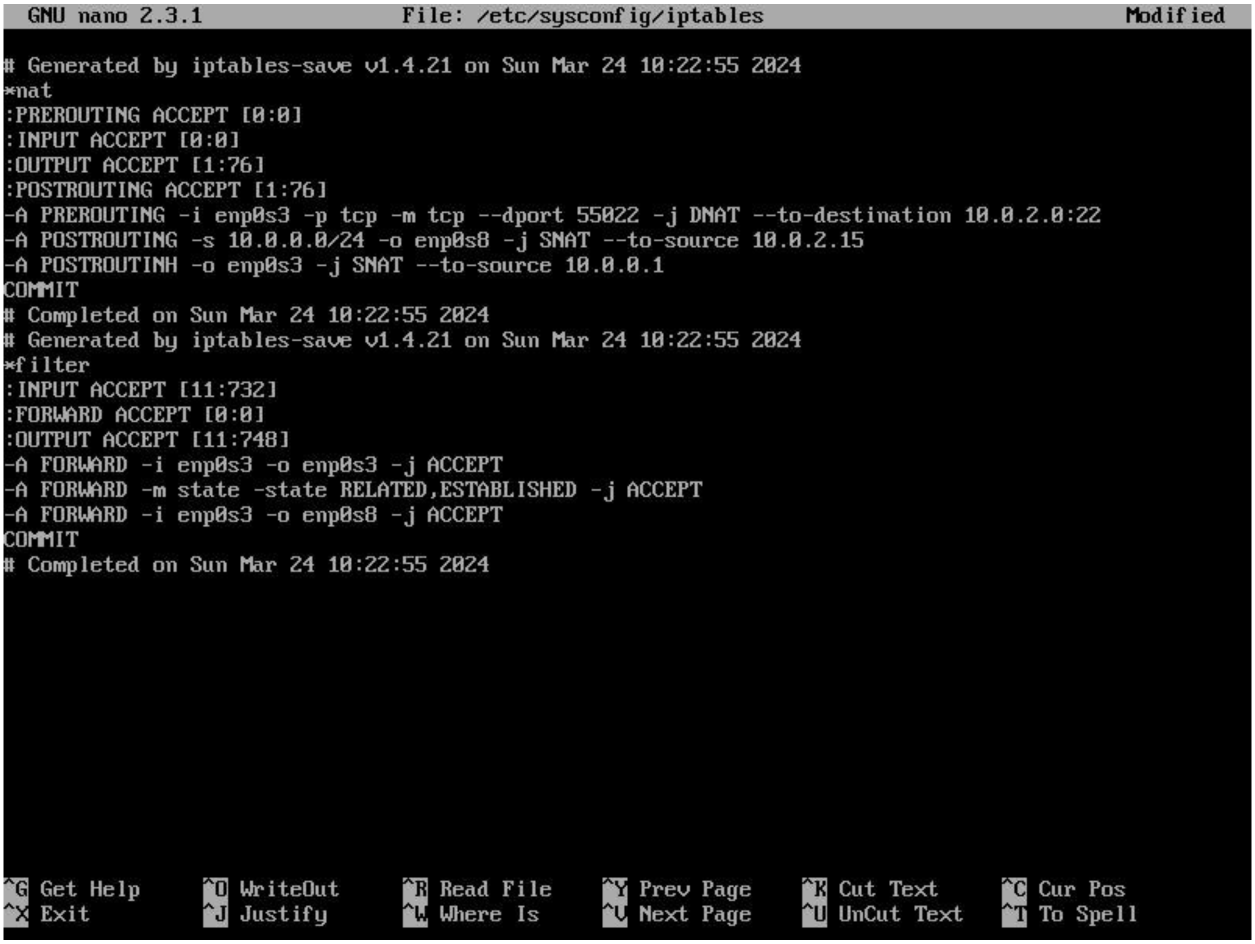
MaxAuthTries 2

LoginGraceTime 30s

UseDNS no
```

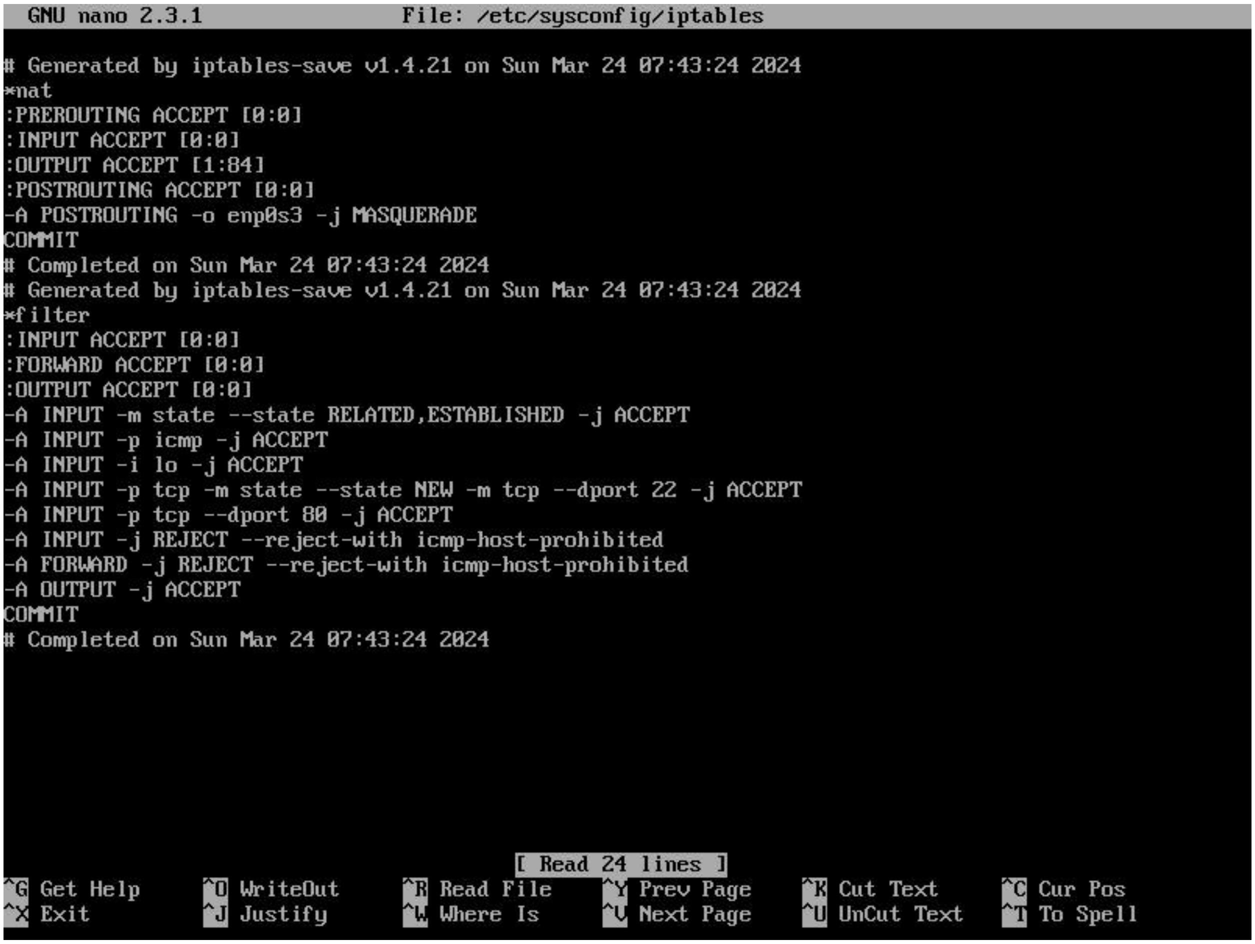
2. **Итоговые файлы /etc/sysconfig/iptables с хостов c7-1 и c7-2**

C7-1



```
# Generated by iptables-save v1.4.21 on Sun Mar 24 10:22:55 2024
*nat
:PREROUTING ACCEPT [0:0]
:INPUT ACCEPT [0:0]
:OUTPUT ACCEPT [1:76]
:POSTROUTING ACCEPT [1:76]
-A PREROUTING -i enp0s3 -p tcp -m tcp --dport 55022 -j DNAT --to-destination 10.0.2.0:22
-A POSTROUTING -s 10.0.0.0/24 -o enp0s8 -j SNAT --to-source 10.0.2.15
-A POSTROUTINH -o enp0s3 -j SNAT --to-source 10.0.0.1
COMMIT
# Completed on Sun Mar 24 10:22:55 2024
# Generated by iptables-save v1.4.21 on Sun Mar 24 10:22:55 2024
*filter
:INPUT ACCEPT [11:732]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [11:748]
-A FORWARD -i enp0s3 -o enp0s3 -j ACCEPT
-A FORWARD -m state -state RELATED,ESTABLISHED -j ACCEPT
-A FORWARD -i enp0s3 -o enp0s8 -j ACCEPT
COMMIT
# Completed on Sun Mar 24 10:22:55 2024
```

C7-2

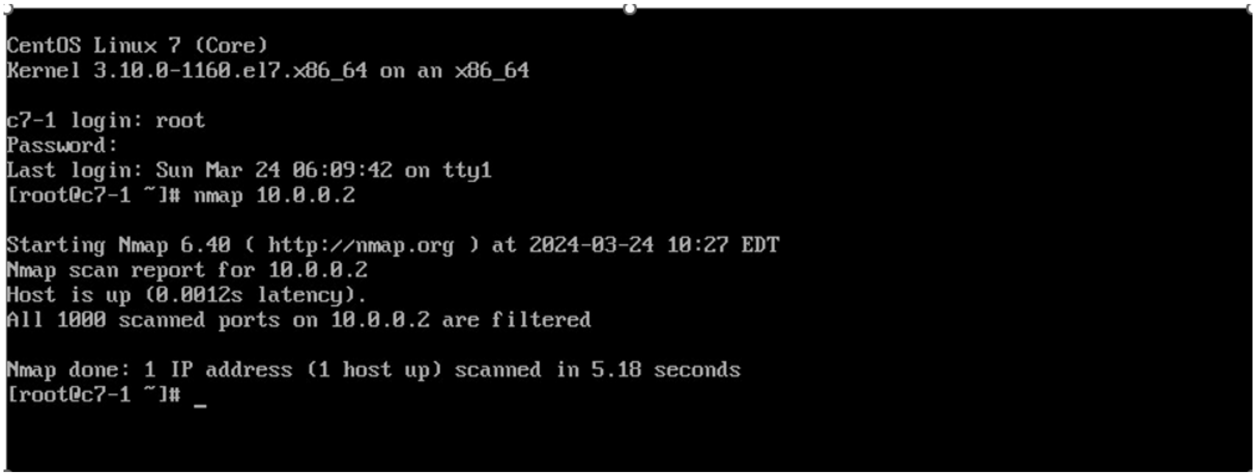


```
  GNU nano 2.3.1               File: /etc/sysconfig/iptables

# Generated by iptables-save v1.4.21 on Sun Mar 24 07:43:24 2024
*nat
:PREROUTING ACCEPT [0:0]
:INPUT ACCEPT [0:0]
:OUTPUT ACCEPT [1:84]
:POSTROUTING ACCEPT [0:0]
-A POSTROUTING -o enp0s3 -j MASQUERADE
COMMIT
# Completed on Sun Mar 24 07:43:24 2024
# Generated by iptables-save v1.4.21 on Sun Mar 24 07:43:24 2024
*filter
:INPUT ACCEPT [0:0]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [0:0]
-A INPUT -m state --state RELATED,ESTABLISHED -j ACCEPT
-A INPUT -p icmp -j ACCEPT
-A INPUT -i lo -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 22 -j ACCEPT
-A INPUT -p tcp --dport 80 -j ACCEPT
-A INPUT -j REJECT --reject-with icmp-host-prohibited
-A FORWARD -j REJECT --reject-with icmp-host-prohibited
-A OUTPUT -j ACCEPT
COMMIT
# Completed on Sun Mar 24 07:43:24 2024

                                  [ Read 24 lines ]
```

3. Команду и консольный вывод из Части 4 п.3



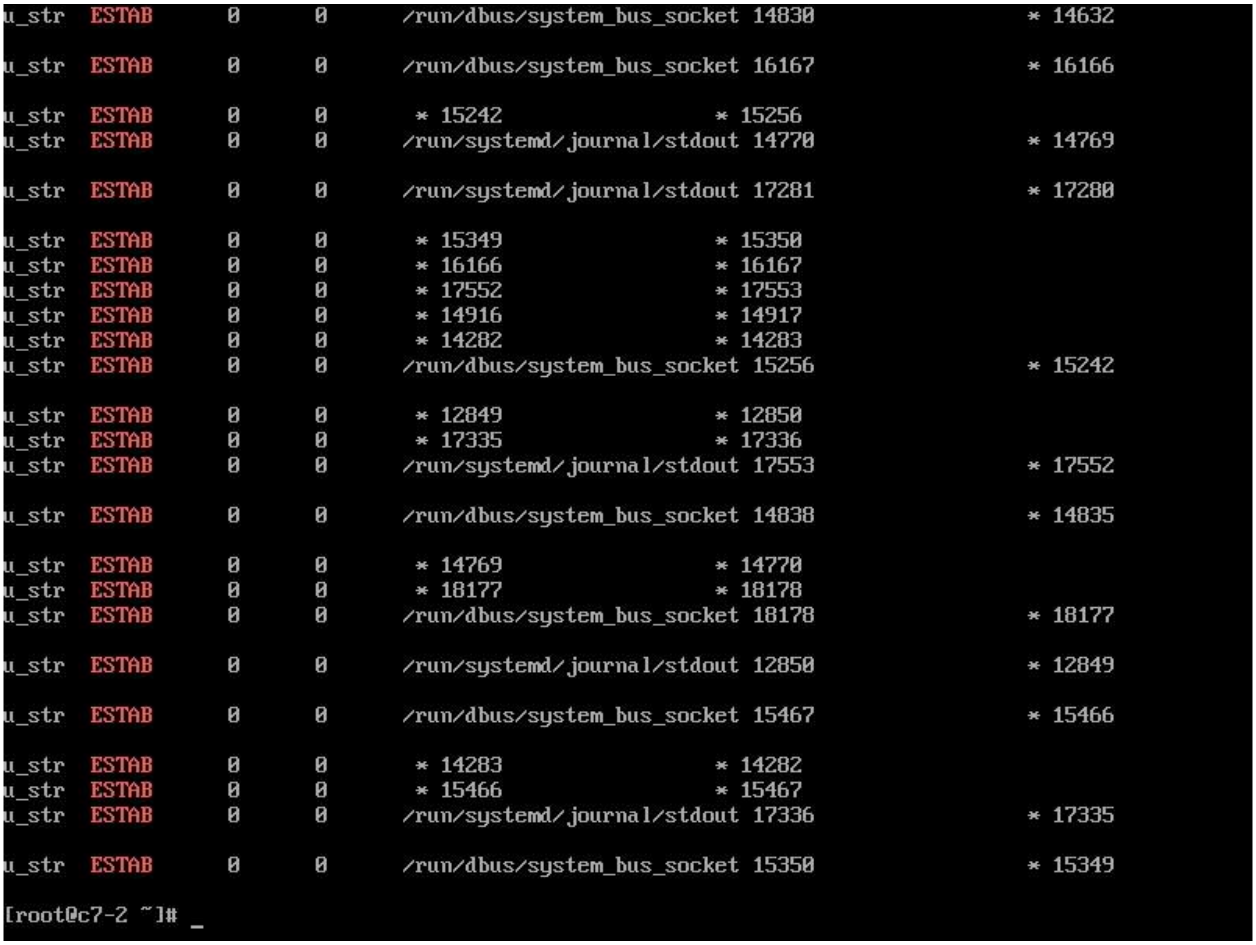
```
CentOS Linux 7 (Core)
Kernel 3.10.0-1160.el7.x86_64 on an x86_64

c7-1 login: root
Password:
Last login: Sun Mar 24 06:09:42 on tty1
[root@c7-1 ~]# nmap 10.0.0.2

Starting Nmap 6.40 ( http://nmap.org ) at 2024-03-24 10:27 EDT
Nmap scan report for 10.0.0.2
Host is up (0.0012s latency).
All 1000 scanned ports on 10.0.0.2 are filtered

Nmap done: 1 IP address (1 host up) scanned in 5.18 seconds
[root@c7-1 ~]# _
```

4. **Команды и существенные части консольного вывода Части 5, п. 1,4,8**



```
u_str  ESTAB      0      0      /run/dbus/system_bus_socket 14830                 * 14632

u_str  ESTAB      0      0      /run/dbus/system_bus_socket 16167                 * 16166

u_str  ESTAB      0      0       * 15242                * 15256
u_str  ESTAB      0      0      /run/systemd/journal/stdout 14770                 * 14769

u_str  ESTAB      0      0      /run/systemd/journal/stdout 17281                 * 17280

u_str  ESTAB      0      0       * 15349                * 15350
u_str  ESTAB      0      0       * 16166                * 16167
u_str  ESTAB      0      0       * 17552                * 17553
u_str  ESTAB      0      0       * 14916                * 14917
u_str  ESTAB      0      0       * 14282                * 14283
u_str  ESTAB      0      0      /run/dbus/system_bus_socket 15256                 * 15242

u_str  ESTAB      0      0       * 12849                * 12850
u_str  ESTAB      0      0       * 17335                * 17336
u_str  ESTAB      0      0      /run/systemd/journal/stdout 17553                 * 17552

u_str  ESTAB      0      0      /run/dbus/system_bus_socket 14838                 * 14835

u_str  ESTAB      0      0       * 14769                * 14770
u_str  ESTAB      0      0       * 18177                * 18178
u_str  ESTAB      0      0      /run/dbus/system_bus_socket 18178                 * 18177

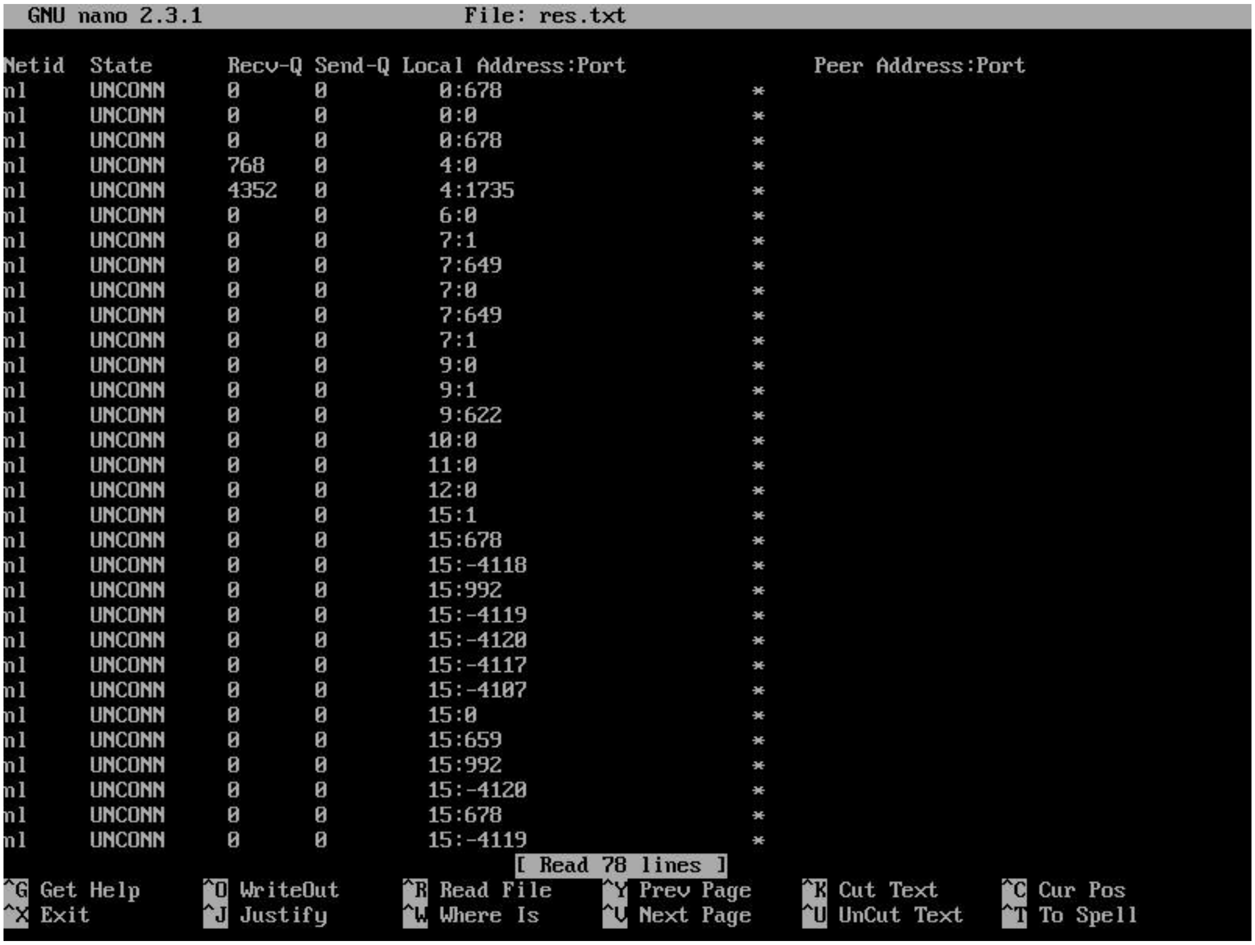
u_str  ESTAB      0      0      /run/systemd/journal/stdout 12850                 * 12849

u_str  ESTAB      0      0      /run/dbus/system_bus_socket 15467                 * 15466

u_str  ESTAB      0      0       * 14283                * 14282
u_str  ESTAB      0      0       * 15466                * 15467
u_str  ESTAB      0      0      /run/systemd/journal/stdout 17336                 * 17335

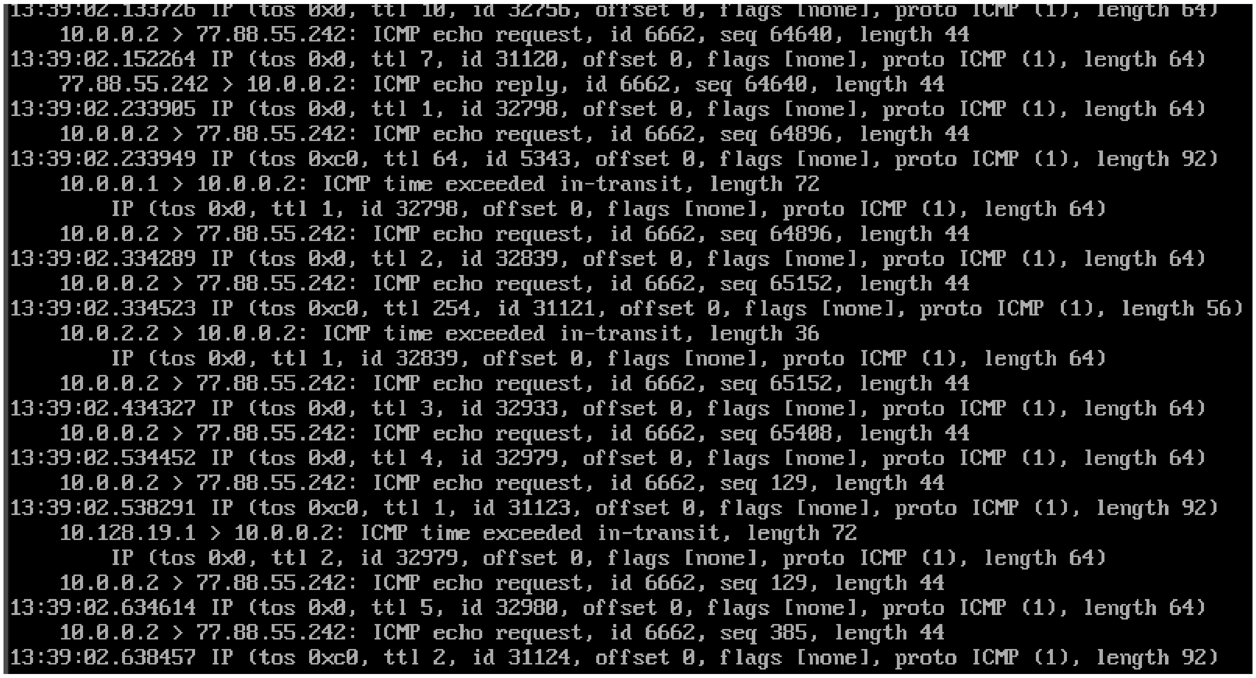
u_str  ESTAB      0      0      /run/dbus/system_bus_socket 15350                 * 15349

[root@c7-2 ~]# _
```

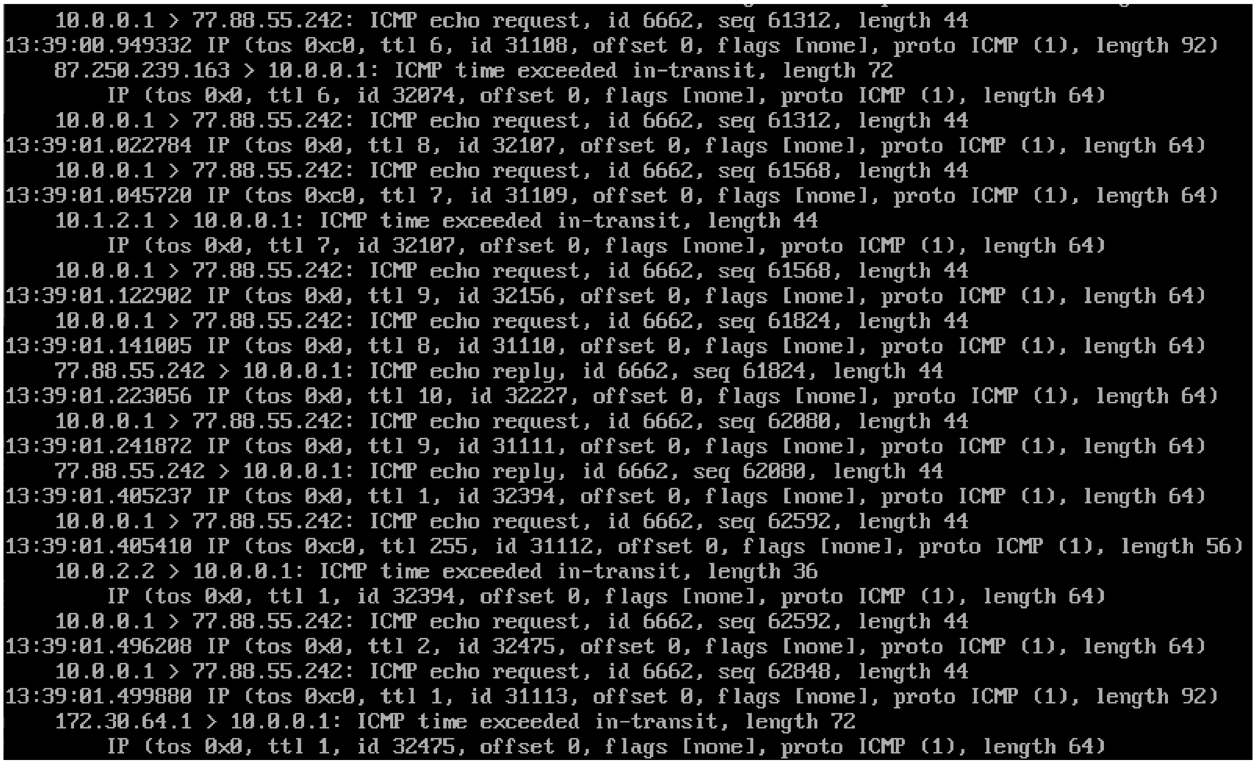


```
  GNU nano 2.3.1                         File: res.txt

Netid  State      Recv-Q Send-Q Local Address:Port                 Peer Address:Port
nl     UNCONN     0      0          0:678                    *
nl     UNCONN     0      0          0:0                      *
nl     UNCONN     0      0          0:678                    *
nl     UNCONN     768    0          4:0                      *
nl     UNCONN     4352   0          4:1735                   *
nl     UNCONN     0      0          6:0                      *
nl     UNCONN     0      0          7:1                      *
nl     UNCONN     0      0          7:649                    *
nl     UNCONN     0      0          7:0                      *
nl     UNCONN     0      0          7:649                    *
nl     UNCONN     0      0          7:1                      *
nl     UNCONN     0      0          9:0                      *
nl     UNCONN     0      0          9:1                      *
nl     UNCONN     0      0          9:622                    *
nl     UNCONN     0      0         10:0                      *
nl     UNCONN     0      0         11:0                      *
nl     UNCONN     0      0         12:0                      *
nl     UNCONN     0      0         15:1                      *
nl     UNCONN     0      0         15:678                    *
nl     UNCONN     0      0         15:-4118                  *
nl     UNCONN     0      0         15:992                    *
nl     UNCONN     0      0         15:-4119                  *
nl     UNCONN     0      0         15:-4120                  *
nl     UNCONN     0      0         15:-4117                  *
nl     UNCONN     0      0         15:-4107                  *
nl     UNCONN     0      0         15:0                      *
nl     UNCONN     0      0         15:659                    *
nl     UNCONN     0      0         15:992                    *
nl     UNCONN     0      0         15:-4120                  *
nl     UNCONN     0      0         15:678                    *
nl     UNCONN     0      0         15:-4119                  *
                                        [ Read 78 lines ]
^G Get Help     ^O WriteOut     ^R Read File    ^Y Prev Page    ^K Cut Text     ^C Cur Pos
^X Exit         ^J Justify      ^W Where Is     ^V Next Page    ^U UnCut Text   ^T To Spell
```



```
13:39:02.133726 IP (tos 0x0, ttl 10, id 32756, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.2 > 77.88.55.242: ICMP echo request, id 6662, seq 64640, length 44
13:39:02.152264 IP (tos 0x0, ttl 7, id 31120, offset 0, flags [none], proto ICMP (1), length 64)
    77.88.55.242 > 10.0.0.2: ICMP echo reply, id 6662, seq 64640, length 44
13:39:02.233905 IP (tos 0x0, ttl 1, id 32798, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.2 > 77.88.55.242: ICMP echo request, id 6662, seq 64896, length 44
13:39:02.233949 IP (tos 0xc0, ttl 64, id 5343, offset 0, flags [none], proto ICMP (1), length 92)
    10.0.0.1 > 10.0.0.2: ICMP time exceeded in-transit, length 72
        IP (tos 0x0, ttl 1, id 32798, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.2 > 77.88.55.242: ICMP echo request, id 6662, seq 64896, length 44
13:39:02.334289 IP (tos 0x0, ttl 2, id 32839, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.2 > 77.88.55.242: ICMP echo request, id 6662, seq 65152, length 44
13:39:02.334523 IP (tos 0xc0, ttl 254, id 31121, offset 0, flags [none], proto ICMP (1), length 56)
    10.0.2.2 > 10.0.0.2: ICMP time exceeded in-transit, length 36
        IP (tos 0x0, ttl 1, id 32839, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.2 > 77.88.55.242: ICMP echo request, id 6662, seq 65152, length 44
13:39:02.434327 IP (tos 0x0, ttl 3, id 32933, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.2 > 77.88.55.242: ICMP echo request, id 6662, seq 65408, length 44
13:39:02.534452 IP (tos 0x0, ttl 4, id 32979, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.2 > 77.88.55.242: ICMP echo request, id 6662, seq 129, length 44
13:39:02.538291 IP (tos 0xc0, ttl 1, id 31123, offset 0, flags [none], proto ICMP (1), length 92)
    10.128.19.1 > 10.0.0.2: ICMP time exceeded in-transit, length 72
        IP (tos 0x0, ttl 2, id 32979, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.2 > 77.88.55.242: ICMP echo request, id 6662, seq 129, length 44
13:39:02.634614 IP (tos 0x0, ttl 5, id 32980, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.2 > 77.88.55.242: ICMP echo request, id 6662, seq 385, length 44
13:39:02.638457 IP (tos 0xc0, ttl 2, id 31124, offset 0, flags [none], proto ICMP (1), length 92)
```



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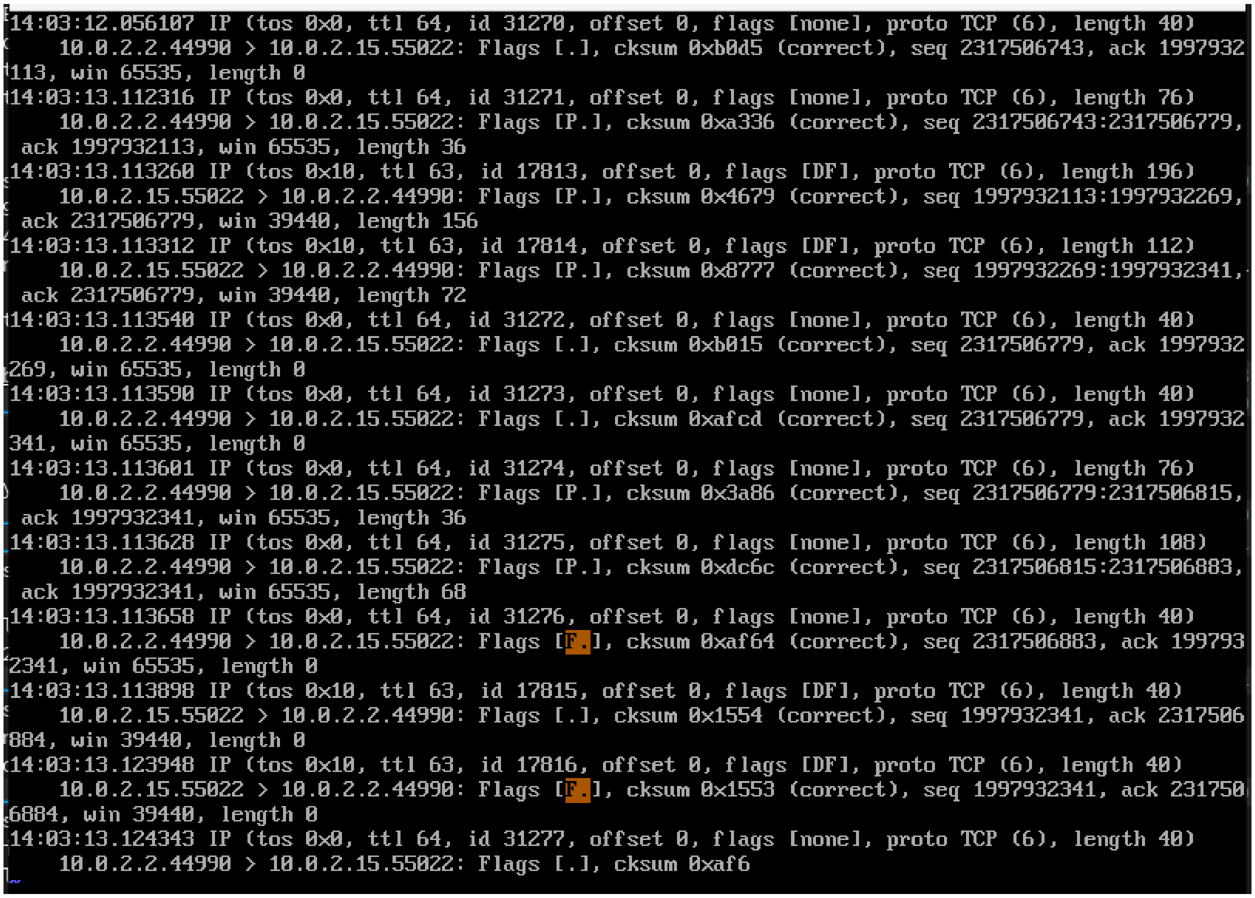
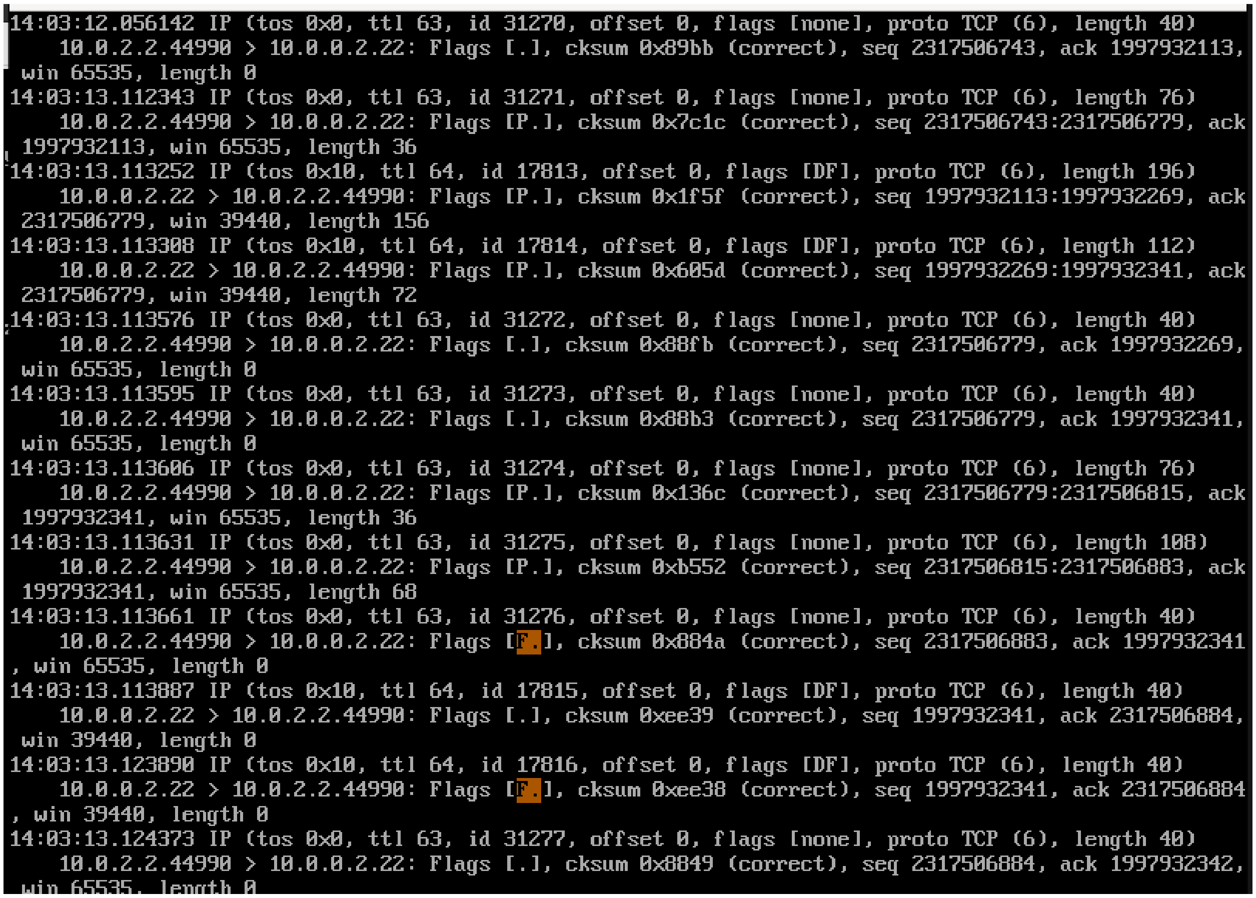
    10.0.0.1 > 77.88.55.242: ICMP echo request, id 6662, seq 61312, length 44
13:39:00.949332 IP (tos 0xc0, ttl 6, id 31108, offset 0, flags [none], proto ICMP (1), length 92)
    87.250.239.163 > 10.0.0.1: ICMP time exceeded in-transit, length 72
        IP (tos 0x0, ttl 6, id 32074, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.1 > 77.88.55.242: ICMP echo request, id 6662, seq 61312, length 44
13:39:01.022784 IP (tos 0x0, ttl 8, id 32107, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.1 > 77.88.55.242: ICMP echo request, id 6662, seq 61568, length 44
13:39:01.045720 IP (tos 0xc0, ttl 7, id 31109, offset 0, flags [none], proto ICMP (1), length 64)
    10.1.2.1 > 10.0.0.1: ICMP time exceeded in-transit, length 44
        IP (tos 0x0, ttl 7, id 32107, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.1 > 77.88.55.242: ICMP echo request, id 6662, seq 61568, length 44
13:39:01.122902 IP (tos 0x0, ttl 9, id 32156, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.1 > 77.88.55.242: ICMP echo request, id 6662, seq 61824, length 44
13:39:01.141005 IP (tos 0x0, ttl 8, id 31110, offset 0, flags [none], proto ICMP (1), length 64)
    77.88.55.242 > 10.0.0.1: ICMP echo reply, id 6662, seq 61824, length 44
13:39:01.223056 IP (tos 0x0, ttl 10, id 32227, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.1 > 77.88.55.242: ICMP echo request, id 6662, seq 62080, length 44
13:39:01.241872 IP (tos 0x0, ttl 9, id 31111, offset 0, flags [none], proto ICMP (1), length 64)
    77.88.55.242 > 10.0.0.1: ICMP echo reply, id 6662, seq 62080, length 44
13:39:01.405237 IP (tos 0x0, ttl 1, id 32394, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.1 > 77.88.55.242: ICMP echo request, id 6662, seq 62592, length 44
13:39:01.405410 IP (tos 0xc0, ttl 255, id 31112, offset 0, flags [none], proto ICMP (1), length 56)
    10.0.2.2 > 10.0.0.1: ICMP time exceeded in-transit, length 36
        IP (tos 0x0, ttl 1, id 32394, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.1 > 77.88.55.242: ICMP echo request, id 6662, seq 62592, length 44
13:39:01.496208 IP (tos 0x0, ttl 2, id 32475, offset 0, flags [none], proto ICMP (1), length 64)
    10.0.0.1 > 77.88.55.242: ICMP echo request, id 6662, seq 62848, length 44
13:39:01.499880 IP (tos 0xc0, ttl 1, id 31113, offset 0, flags [none], proto ICMP (1), length 92)
    172.30.64.1 > 10.0.0.1: ICMP time exceeded in-transit, length 72
        IP (tos 0x0, ttl 1, id 32475, offset 0, flags [none], proto ICMP (1), length 64)
```



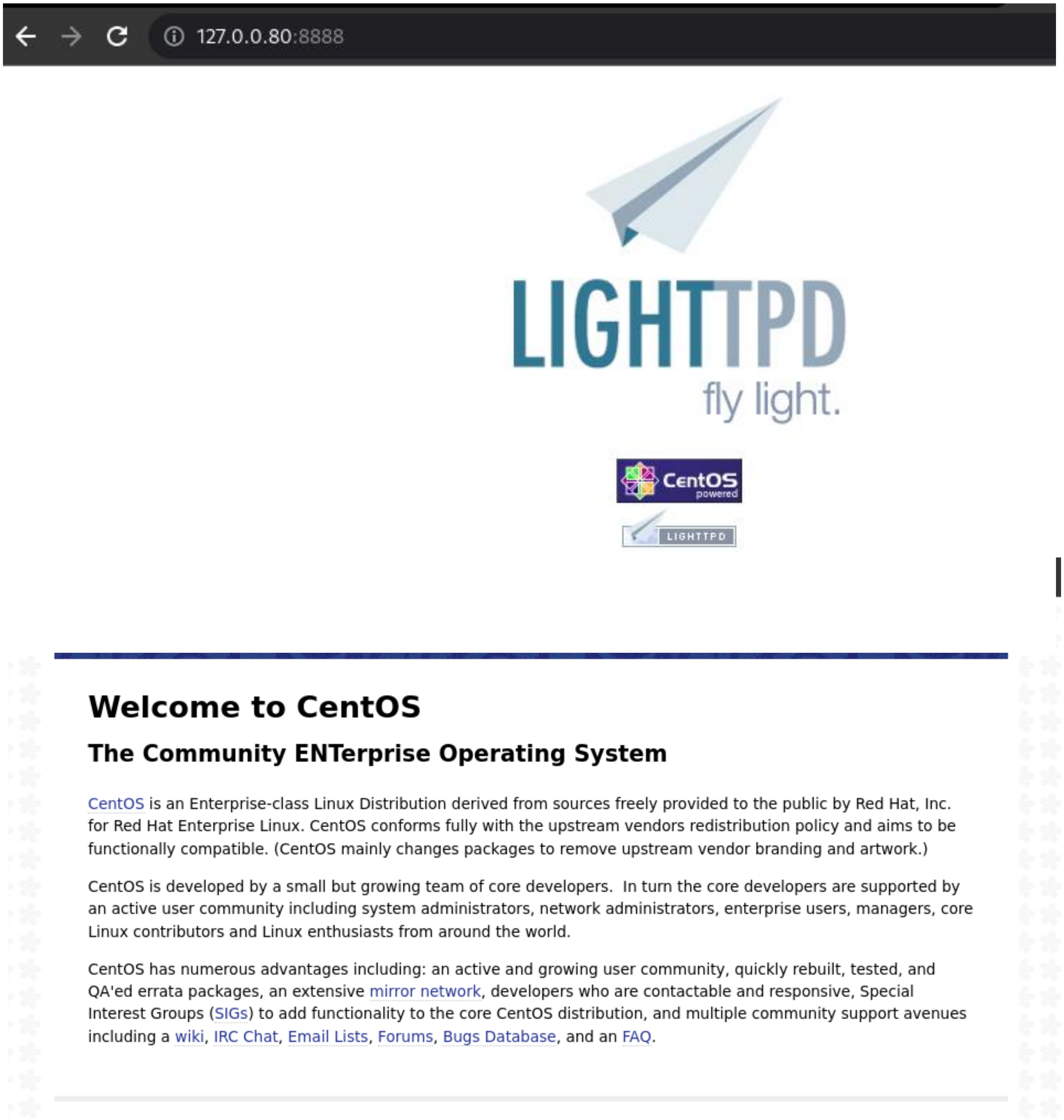
```
14:03:12.056107 IP (tos 0x0, ttl 64, id 31270, offset 0, flags [none], proto TCP (6), length 40)
    10.0.2.2.44990 > 10.0.2.15.55022: Flags [.], cksum 0xb0d5 (correct), seq 2317506743, ack 1997932
113, win 65535, length 0
14:03:13.112316 IP (tos 0x0, ttl 64, id 31271, offset 0, flags [none], proto TCP (6), length 76)
    10.0.2.2.44990 > 10.0.2.15.55022: Flags [P.], cksum 0xa336 (correct), seq 2317506743:2317506779,
 ack 1997932113, win 65535, length 36
14:03:13.113260 IP (tos 0x10, ttl 63, id 17813, offset 0, flags [DF], proto TCP (6), length 196)
    10.0.2.15.55022 > 10.0.2.2.44990: Flags [P.], cksum 0x4679 (correct), seq 1997932113:1997932269,
 ack 2317506779, win 39440, length 156
14:03:13.113312 IP (tos 0x10, ttl 63, id 17814, offset 0, flags [DF], proto TCP (6), length 112)
    10.0.2.15.55022 > 10.0.2.2.44990: Flags [P.], cksum 0x8777 (correct), seq 1997932269:1997932341,
 ack 2317506779, win 39440, length 72
14:03:13.113540 IP (tos 0x0, ttl 64, id 31272, offset 0, flags [none], proto TCP (6), length 40)
    10.0.2.2.44990 > 10.0.2.15.55022: Flags [.], cksum 0xb015 (correct), seq 2317506779, ack 1997932
269, win 65535, length 0
14:03:13.113590 IP (tos 0x0, ttl 64, id 31273, offset 0, flags [none], proto TCP (6), length 40)
    10.0.2.2.44990 > 10.0.2.15.55022: Flags [.], cksum 0xafcd (correct), seq 2317506779, ack 1997932
341, win 65535, length 0
14:03:13.113601 IP (tos 0x0, ttl 64, id 31274, offset 0, flags [none], proto TCP (6), length 76)
    10.0.2.2.44990 > 10.0.2.15.55022: Flags [P.], cksum 0x3a86 (correct), seq 2317506779:2317506815,
 ack 1997932341, win 65535, length 36
14:03:13.113628 IP (tos 0x0, ttl 64, id 31275, offset 0, flags [none], proto TCP (6), length 108)
    10.0.2.2.44990 > 10.0.2.15.55022: Flags [P.], cksum 0xdc6c (correct), seq 2317506815:2317506883,
 ack 1997932341, win 65535, length 68
14:03:13.113658 IP (tos 0x0, ttl 64, id 31276, offset 0, flags [none], proto TCP (6), length 40)
    10.0.2.2.44990 > 10.0.2.15.55022: Flags [F.], cksum 0xaf64 (correct), seq 2317506883, ack 199793
2341, win 65535, length 0
14:03:13.113898 IP (tos 0x10, ttl 63, id 17815, offset 0, flags [DF], proto TCP (6), length 40)
    10.0.2.15.55022 > 10.0.2.2.44990: Flags [.], cksum 0x1554 (correct), seq 1997932341, ack 2317506
884, win 39440, length 0
14:03:13.123948 IP (tos 0x10, ttl 63, id 17816, offset 0, flags [DF], proto TCP (6), length 40)
    10.0.2.15.55022 > 10.0.2.2.44990: Flags [F.], cksum 0x1553 (correct), seq 1997932341, ack 231750
6884, win 39440, length 0
14:03:13.124343 IP (tos 0x0, ttl 64, id 31277, offset 0, flags [none], proto TCP (6), length 40)
    10.0.2.2.44990 > 10.0.2.15.55022: Flags [.], cksum 0xaf6
```



```
14:03:12.056142 IP (tos 0x0, ttl 63, id 31270, offset 0, flags [none], proto TCP (6), length 40)
    10.0.2.2.44990 > 10.0.0.2.22: Flags [.], cksum 0x89bb (correct), seq 2317506743, ack 1997932113,
 win 65535, length 0
14:03:13.112343 IP (tos 0x0, ttl 63, id 31271, offset 0, flags [none], proto TCP (6), length 76)
    10.0.2.2.44990 > 10.0.0.2.22: Flags [P.], cksum 0x7c1c (correct), seq 2317506743:2317506779, ack
 1997932113, win 65535, length 36
14:03:13.113252 IP (tos 0x10, ttl 64, id 17813, offset 0, flags [DF], proto TCP (6), length 196)
    10.0.0.2.22 > 10.0.2.2.44990: Flags [P.], cksum 0x1f5f (correct), seq 1997932113:1997932269, ack
 2317506779, win 39440, length 156
14:03:13.113308 IP (tos 0x10, ttl 64, id 17814, offset 0, flags [DF], proto TCP (6), length 112)
    10.0.0.2.22 > 10.0.2.2.44990: Flags [P.], cksum 0x605d (correct), seq 1997932269:1997932341, ack
 2317506779, win 39440, length 72
14:03:13.113576 IP (tos 0x0, ttl 63, id 31272, offset 0, flags [none], proto TCP (6), length 40)
    10.0.2.2.44990 > 10.0.0.2.22: Flags [.], cksum 0x88fb (correct), seq 2317506779, ack 1997932269,
 win 65535, length 0
14:03:13.113595 IP (tos 0x0, ttl 63, id 31273, offset 0, flags [none], proto TCP (6), length 40)
    10.0.2.2.44990 > 10.0.0.2.22: Flags [.], cksum 0x88b3 (correct), seq 2317506779, ack 1997932341,
 win 65535, length 0
14:03:13.113606 IP (tos 0x0, ttl 63, id 31274, offset 0, flags [none], proto TCP (6), length 76)
    10.0.2.2.44990 > 10.0.0.2.22: Flags [P.], cksum 0x136c (correct), seq 2317506779:2317506815, ack
 1997932341, win 65535, length 36
14:03:13.113631 IP (tos 0x0, ttl 63, id 31275, offset 0, flags [none], proto TCP (6), length 108)
    10.0.2.2.44990 > 10.0.0.2.22: Flags [P.], cksum 0xb552 (correct), seq 2317506815:2317506883, ack
 1997932341, win 65535, length 68
14:03:13.113661 IP (tos 0x0, ttl 63, id 31276, offset 0, flags [none], proto TCP (6), length 40)
    10.0.2.2.44990 > 10.0.0.2.22: Flags [F.], cksum 0x884a (correct), seq 2317506883, ack 1997932341
, win 65535, length 0
14:03:13.113887 IP (tos 0x10, ttl 64, id 17815, offset 0, flags [DF], proto TCP (6), length 40)
    10.0.0.2.22 > 10.0.2.2.44990: Flags [.], cksum 0xee39 (correct), seq 1997932341, ack 2317506884,
 win 39440, length 0
14:03:13.123890 IP (tos 0x10, ttl 64, id 17816, offset 0, flags [DF], proto TCP (6), length 40)
    10.0.0.2.22 > 10.0.2.2.44990: Flags [F.], cksum 0xee38 (correct), seq 1997932341, ack 2317506884
, win 39440, length 0
14:03:13.124373 IP (tos 0x0, ttl 63, id 31277, offset 0, flags [none], proto TCP (6), length 40)
    10.0.2.2.44990 > 10.0.0.2.22: Flags [.], cksum 0x8849 (correct), seq 2317506884, ack 1997932342,
 win 65535, length 0
```

5. **Команду подключения из Части 7, п.1.**

```
ssh -L 127.0.0.80:8888:10.0.0.2:80 -p 43022 linh@127.0.0.8
```



Welcome to CentOS

The Community ENTerprise Operating System

CentOS is an Enterprise-class Linux Distribution derived from sources freely provided to the public by Red Hat, Inc. for Red Hat Enterprise Linux. CentOS conforms fully with the upstream vendors redistribution policy and aims to be functionally compatible. (CentOS mainly changes packages to remove upstream vendor branding and artwork.)

CentOS is developed by a small but growing team of core developers. In turn the core developers are supported by an active user community including system administrators, network administrators, enterprise users, managers, core Linux contributors and Linux enthusiasts from around the world.

CentOS has numerous advantages including: an active and growing user community, quickly rebuilt, tested, and QA'ed errata packages, an extensive mirror network, developers who are contactable and responsive, Special Interest Groups (SIGs) to add functionality to the core CentOS distribution, and multiple community support avenues including a wiki, IRC Chat, Email Lists, Forums, Bugs Database, and an FAQ.