

1. Настроить сеть согласно схеме в файле
<https://disk.yandex.ru/d/hegGC7woXSjz0g> где:

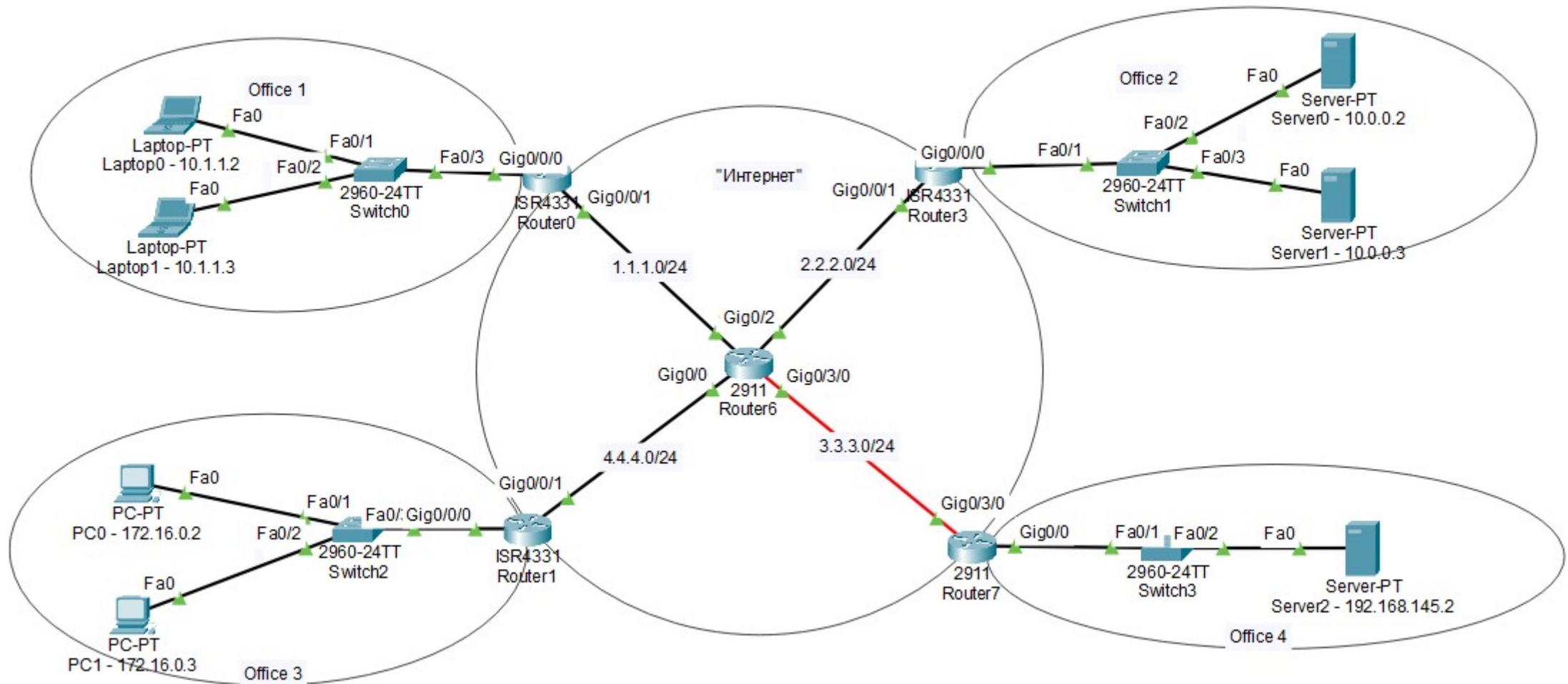
Office 1 - сеть 10.1.1.0/24

Office 2 - сеть 10.0.0.0/16

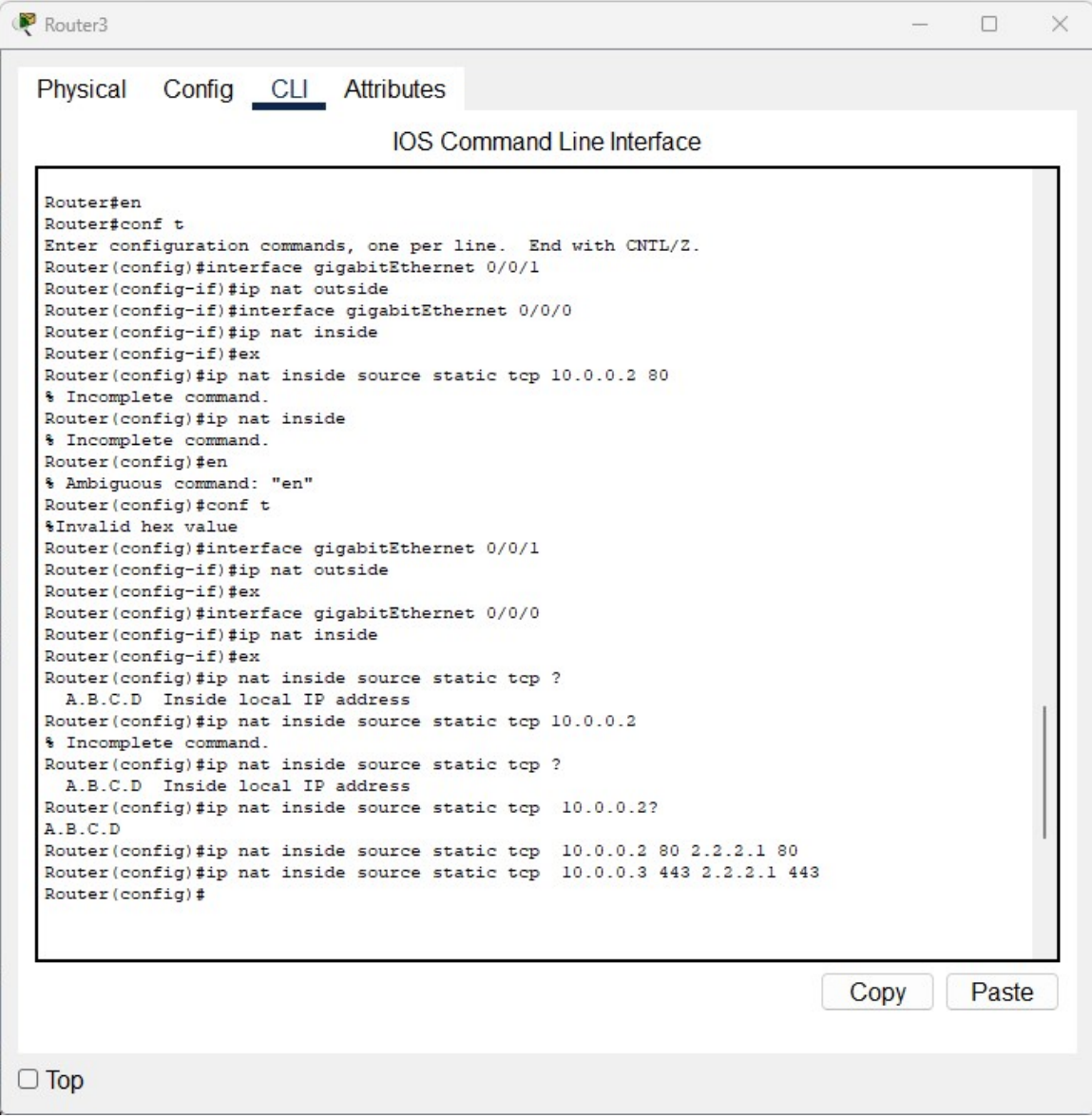
Office 3 - сеть 172.16.0.0/16

Office 4 - сеть 192.168.145.0/24

Где "Интернет" - там имитация Интернета с помощью OSPF, выберите сами публичные сети между роутерами.



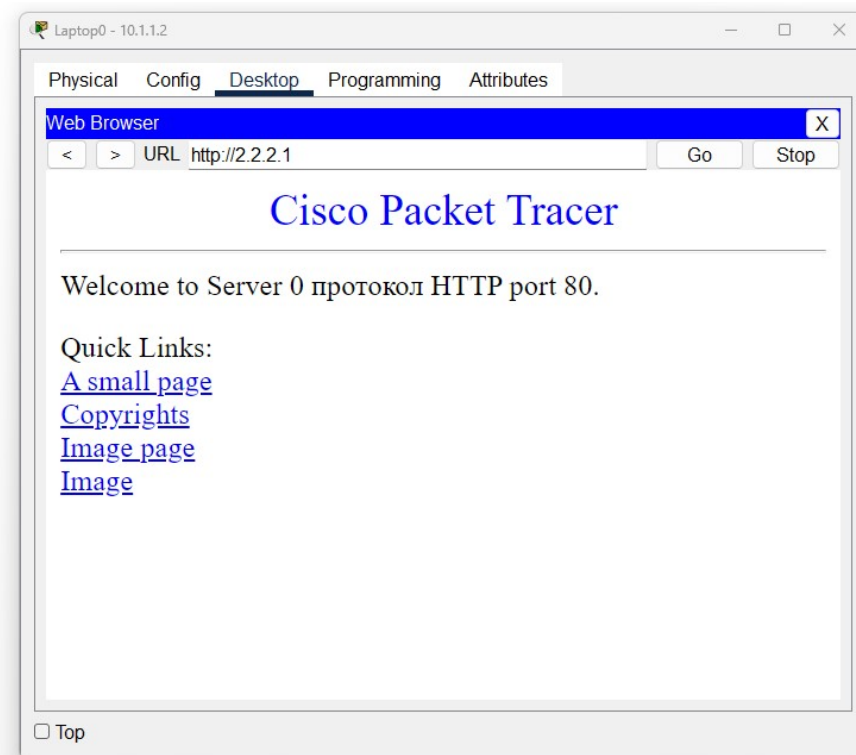
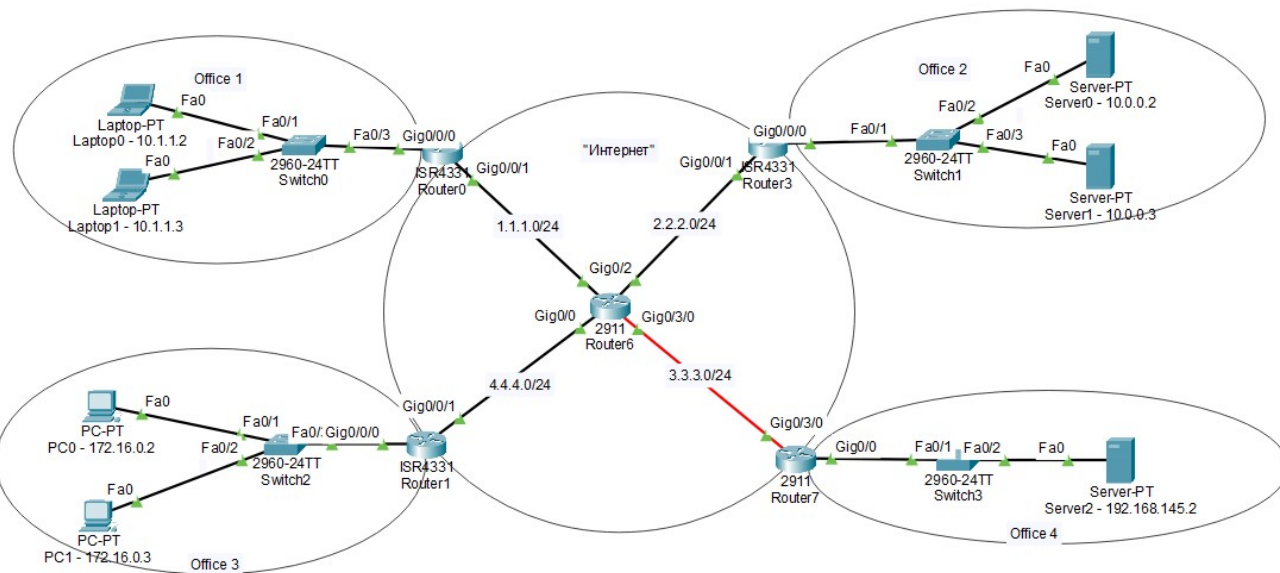
Задача 1. Настроить на Port Forwarding на сервера в Office 2. Server0 должен предоставлять HTTP по 80му порту, а Server1 должен предоставлять HTTPS по 443 порту. Странички должны быть разные.

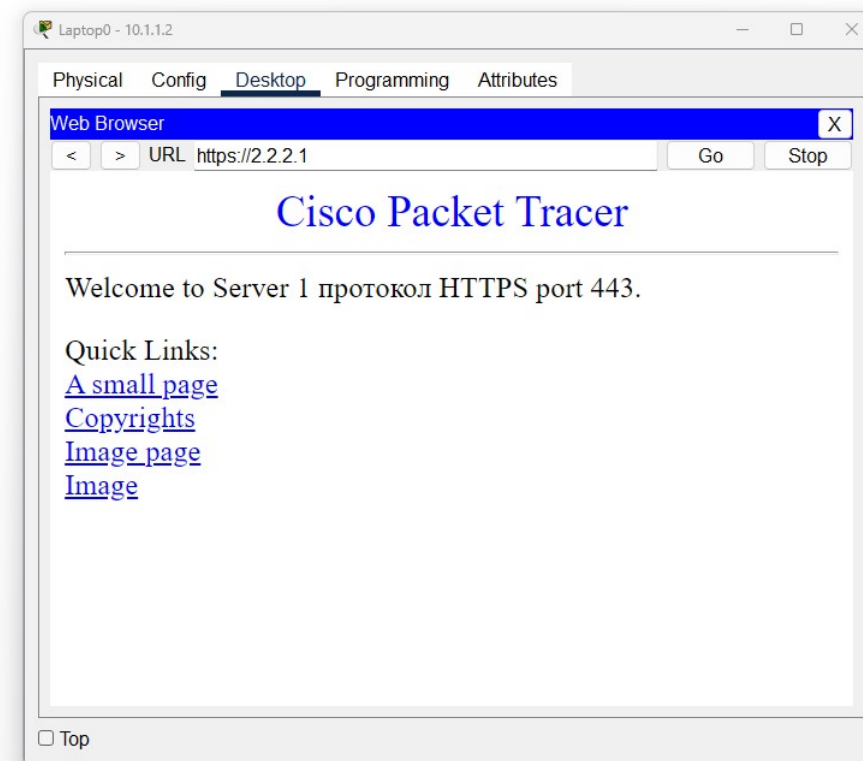
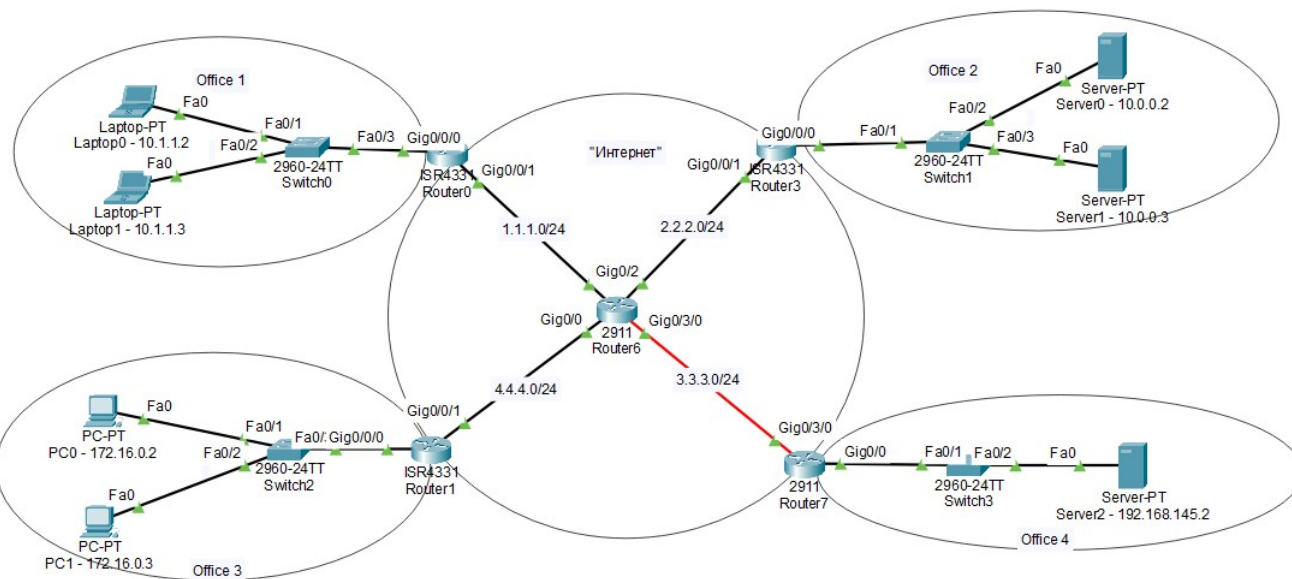


The screenshot shows a Cisco Packet Tracer console window for Router3. The window has tabs for Physical, Config, CLI, and Attributes, with the CLI tab selected. The title bar says "Router3". The main area is titled "IOS Command Line Interface" and contains the following text:

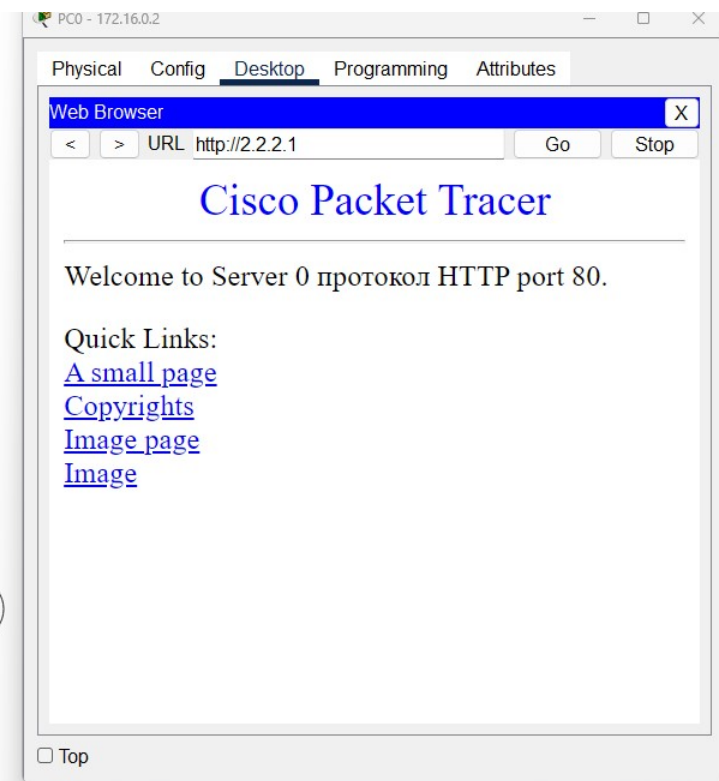
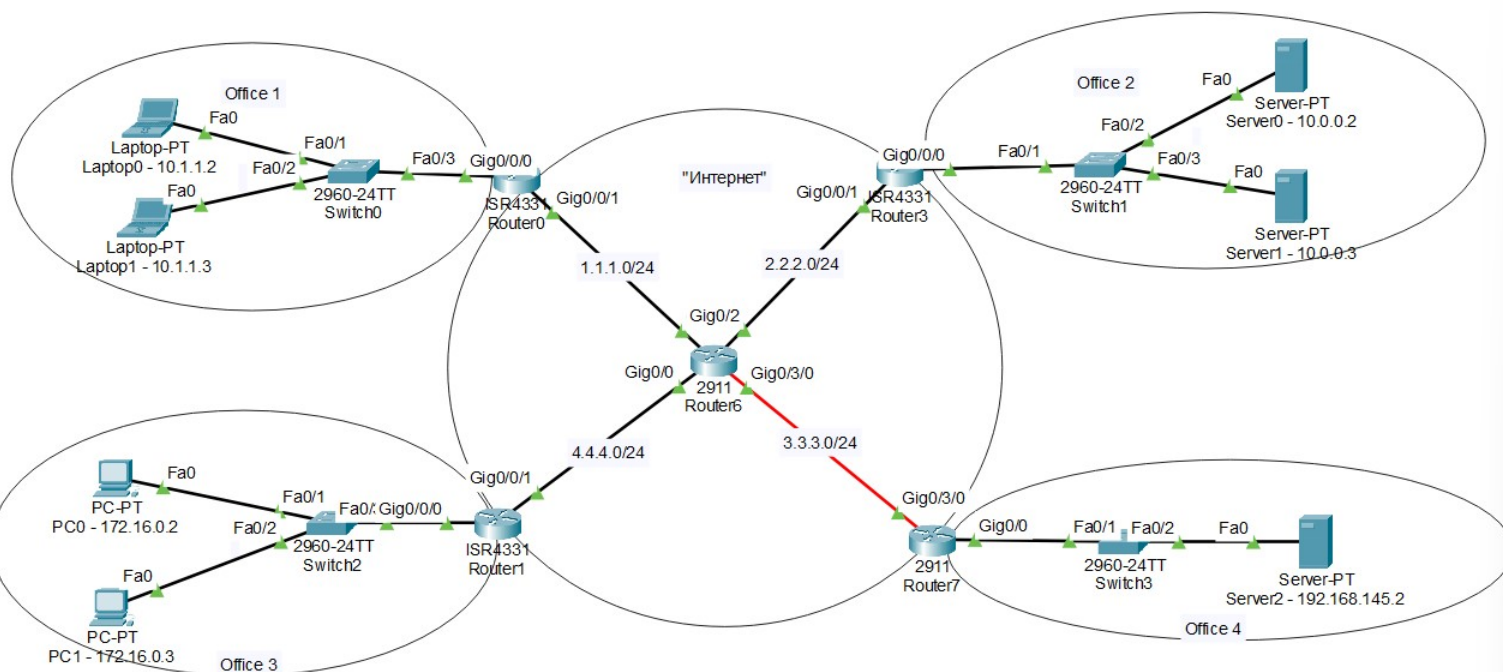
```
Router#en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitEthernet 0/0/1
Router(config-if)#ip nat outside
Router(config-if)#interface gigabitEthernet 0/0/0
Router(config-if)#ip nat inside
Router(config-if)#ex
Router(config)#ip nat inside source static tcp 10.0.0.2 80
% Incomplete command.
Router(config)#ip nat inside
% Incomplete command.
Router(config)#en
% Ambiguous command: "en"
Router(config)#conf t
%Invalid hex value
Router(config)#interface gigabitEthernet 0/0/1
Router(config-if)#ip nat outside
Router(config-if)#ex
Router(config)#interface gigabitEthernet 0/0/0
Router(config-if)#ip nat inside
Router(config-if)#ex
Router(config)#ip nat inside source static tcp ?
  A.B.C.D  Inside local IP address
Router(config)#ip nat inside source static tcp 10.0.0.2
% Incomplete command.
Router(config)#ip nat inside source static tcp ?
  A.B.C.D  Inside local IP address
Router(config)#ip nat inside source static tcp 10.0.0.2?
A.B.C.D
Router(config)#ip nat inside source static tcp 10.0.0.2 80 2.2.2.1 80
Router(config)#ip nat inside source static tcp 10.0.0.3 443 2.2.2.1 443
Router(config)#
```

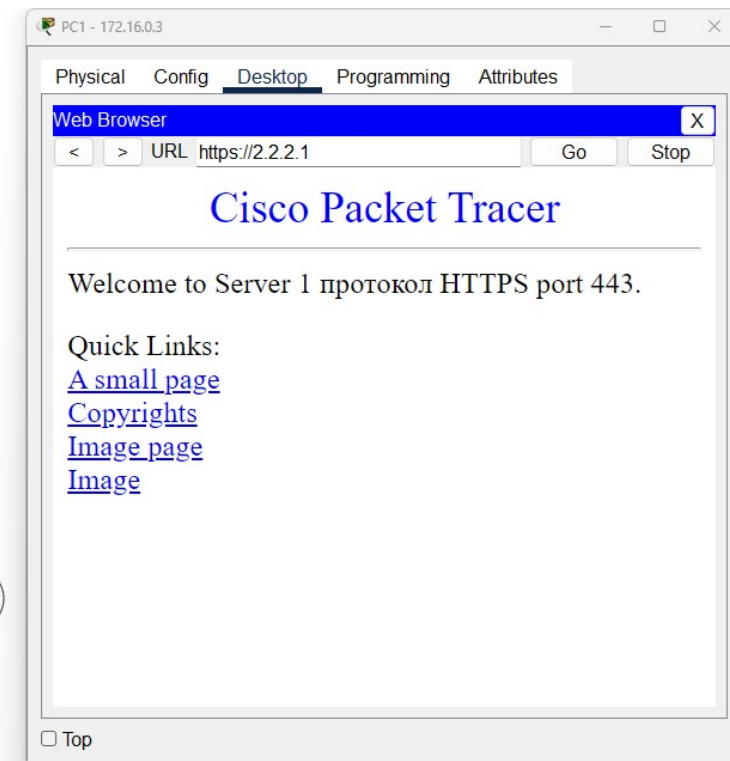
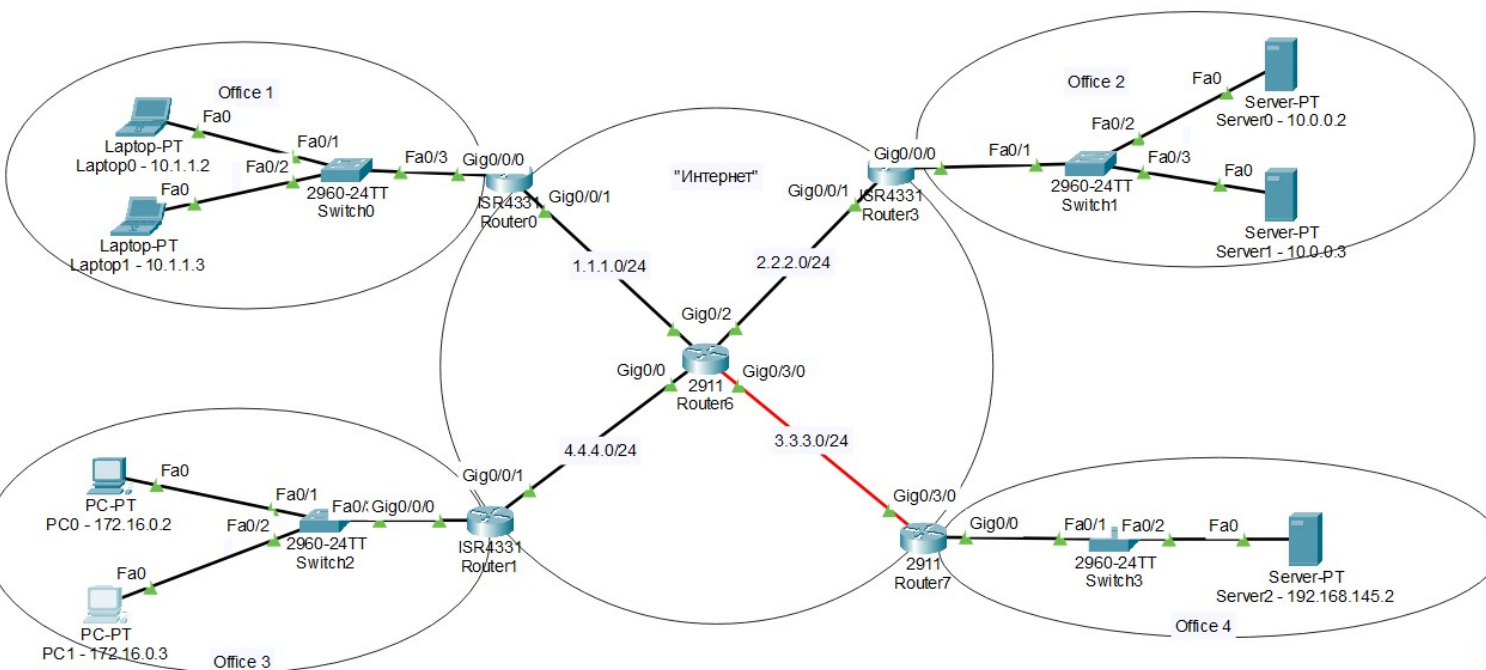
At the bottom right of the console window, there are "Copy" and "Paste" buttons. At the bottom left, there is a "Top" button.

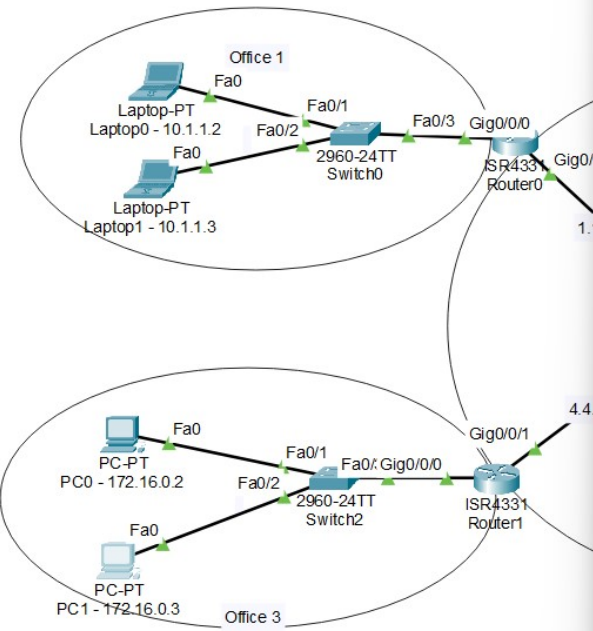




Задача 2. Настроить PAT в Office 3 для компьютеров, чтобы они выходили в интернет под одним публичным IP адресом на Router1.







Router1

Physical Config CLI Attributes

IOS Command Line Interface

```
top 4.4.4.1:1038 172.16.0.3:1038 2.2.2.1:80 2.2.2.1:80
Router#sh ip nat translations
Pro Inside global Inside local Outside local Outside global
tcp 4.4.4.1:1028 172.16.0.3:1028 2.2.2.1:443 2.2.2.1:443
tcp 4.4.4.1:1029 172.16.0.3:1029 2.2.2.1:443 2.2.2.1:443
tcp 4.4.4.1:1030 172.16.0.3:1030 2.2.2.1:443 2.2.2.1:443
tcp 4.4.4.1:1031 172.16.0.3:1031 2.2.2.1:443 2.2.2.1:443
tcp 4.4.4.1:1032 172.16.0.3:1032 2.2.2.1:80 2.2.2.1:80
tcp 4.4.4.1:1033 172.16.0.3:1033 2.2.2.1:80 2.2.2.1:80
tcp 4.4.4.1:1034 172.16.0.3:1034 2.2.2.1:80 2.2.2.1:80
tcp 4.4.4.1:1035 172.16.0.3:1035 2.2.2.1:80 2.2.2.1:80
tcp 4.4.4.1:1036 172.16.0.3:1036 2.2.2.1:80 2.2.2.1:80
tcp 4.4.4.1:1037 172.16.0.3:1037 2.2.2.1:80 2.2.2.1:80
tcp 4.4.4.1:1038 172.16.0.3:1038 2.2.2.1:80 2.2.2.1:80
tcp 4.4.4.1:1039 172.16.0.3:1039 2.2.2.1:80 2.2.2.1:80
tcp 4.4.4.1:1040 172.16.0.3:1040 2.2.2.1:80 2.2.2.1:80
tcp 4.4.4.1:1041 172.16.0.3:1041 2.2.2.1:80 2.2.2.1:80
tcp 4.4.4.1:1042 172.16.0.3:1042 2.2.2.1:80 2.2.2.1:80
tcp 4.4.4.1:1043 172.16.0.3:1043 2.2.2.1:443 2.2.2.1:443
tcp 4.4.4.1:1044 172.16.0.3:1044 2.2.2.1:443 2.2.2.1:443
tcp 4.4.4.1:1045 172.16.0.3:1045 2.2.2.1:443 2.2.2.1:443
tcp 4.4.4.1:1046 172.16.0.3:1046 2.2.2.1:443 2.2.2.1:443
tcp 4.4.4.1:1047 172.16.0.3:1047 2.2.2.1:443 2.2.2.1:443
tcp 4.4.4.1:1048 172.16.0.3:1048 2.2.2.1:443 2.2.2.1:443
tcp 4.4.4.1:1049 172.16.0.3:1049 2.2.2.1:443 2.2.2.1:443
tcp 4.4.4.1:1050 172.16.0.3:1050 2.2.2.1:443 2.2.2.1:443
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
```

Copy Paste

Top

PC1 - 172.16.0.3

Physical Config Desktop Programming Attributes

Web Browser

< > URL https://2.2.2.1 Go Stop

Cisco Packet Tracer

Welcome to Server 1 протокол HTTPS port 443.

Quick Links:

- [A small page](#)
- [Copyrights](#)
- [Image page](#)
- [Image](#)

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Задача 3. Связать сети Office 1 и Office 4 с помощью GRE. Предоставит трейс с Laptop0 до Server2.

Router0

Physical Config CLI Attributes

IOS Command Line Interface

```
Router(config)#sh int tu 333
^
% Invalid input detected at '^' marker.

Router(config)#ex
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#sh int tu 333
Tunnel333 is up, line protocol is up (connected)
  Hardware is Tunnel
  Internet address is 172.16.0.1/24
  MTU 17916 bytes, BW 100 Kbit/sec, DLY 50000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation TUNNEL, loopback not set
  Keepalive not set
  Tunnel source 1.1.1.1 (GigabitEthernet0/0/1), destination 3.3.3.1
  Tunnel protocol/transport GRE/IP
    Key disabled, sequencing disabled
    Checksumming of packets disabled
  Tunnel TTL 255
  Fast tunneling enabled
  Tunnel transport MTU 1476 bytes
  Tunnel transmit bandwidth 8000 (kbps)
  Tunnel receive bandwidth 8000 (kbps)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 1
  Queueing strategy: fifo
  Output queue: 0/0 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
--More--
```

Copy Paste

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Router7

Physical Config CLI Attributes

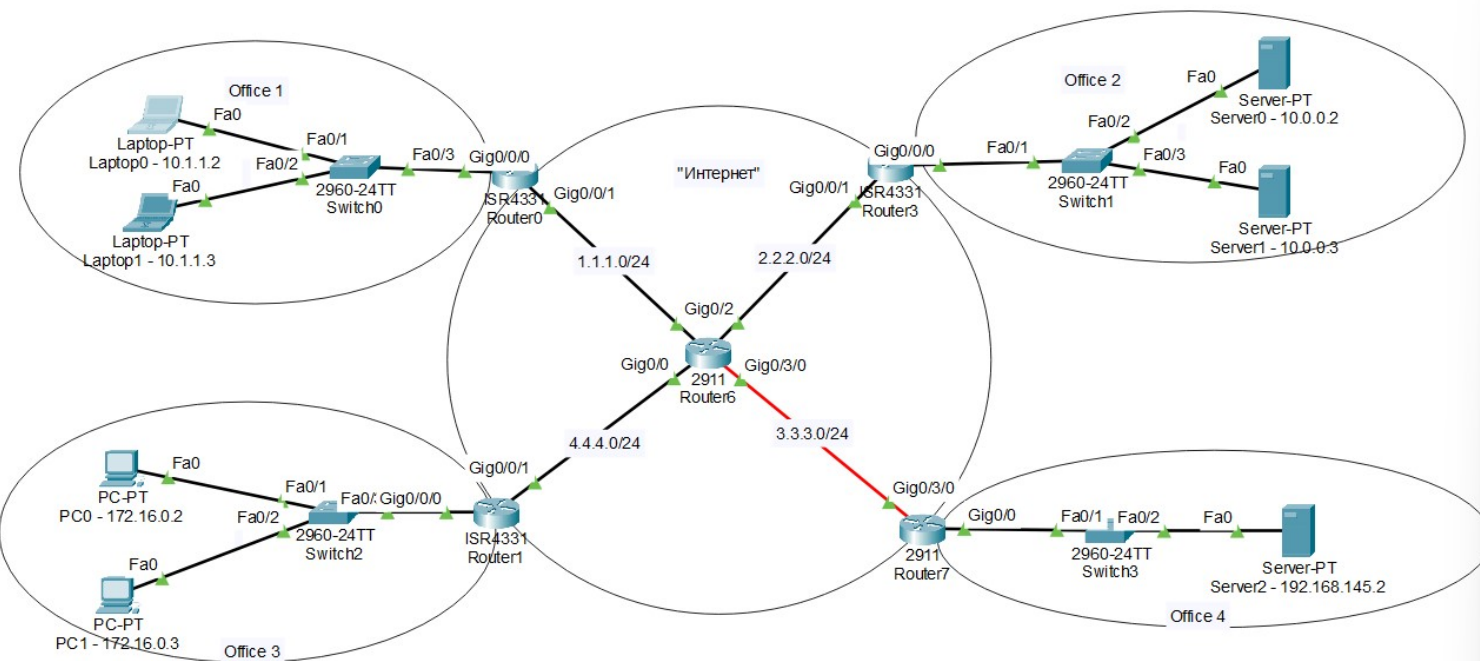
IOS Command Line Interface

```
Router(config)#2
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
Router#
Router#
Router#sh int tu 333
Tunnel333 is up, line protocol is up (connected)
  Hardware is Tunnel
  Internet address is 172.16.0.2/24
  MTU 17916 bytes, BW 100 Kbit/sec, DLY 50000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation TUNNEL, loopback not set
  Keepalive not set
  Tunnel source 3.3.3.1 (GigabitEthernet0/3/0), destination 1.1.1.1
  Tunnel protocol/transport GRE/IP
    Key disabled, sequencing disabled
    Checksumming of packets disabled
  Tunnel TTL 255
  Fast tunneling enabled
  Tunnel transport MTU 1476 bytes
  Tunnel transmit bandwidth 8000 (kbps)
  Tunnel receive bandwidth 8000 (kbps)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 1
  Queueing strategy: fifo
  Output queue: 0/0 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 input packets with dribble condition detected
    0 packets output, 0 bytes, 0 underruns
--More--
```

Copy Paste

☐ Top



Laptop0 - 10.1.1.2

Physical Config **Desktop** Programming Attributes

Command Prompt

```
Tracing route to 192.168.145.2 over a maximum of 30 hops:

  1  0 ms   1 ms   0 ms   10.1.1.1
  2  1 ms   0 ms   0 ms   172.16.0.2
  3  0 ms   0 ms   0 ms   192.168.145.2

Trace complete.

C:\>tracert 192.168.145.2

Tracing route to 192.168.145.2 over a maximum of 30 hops:

  1  0 ms   0 ms   0 ms   10.1.1.1
  2  0 ms   0 ms   0 ms   172.16.0.2
  3  0 ms   0 ms   0 ms   192.168.145.2

Trace complete.

C:\>ping 192.168.145.2

Pinging 192.168.145.2 with 32 bytes of data:

Reply from 192.168.145.2: bytes=32 time<1ms TTL=126
Reply from 192.168.145.2: bytes=32 time<1ms TTL=126
Reply from 192.168.145.2: bytes=32 time<1ms TTL=126
Reply from 192.168.145.2: bytes=32 time<1ms TTL=126

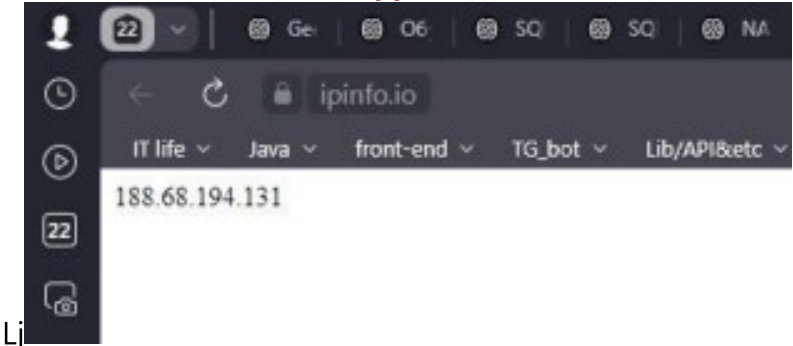
Ping statistics for 192.168.145.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

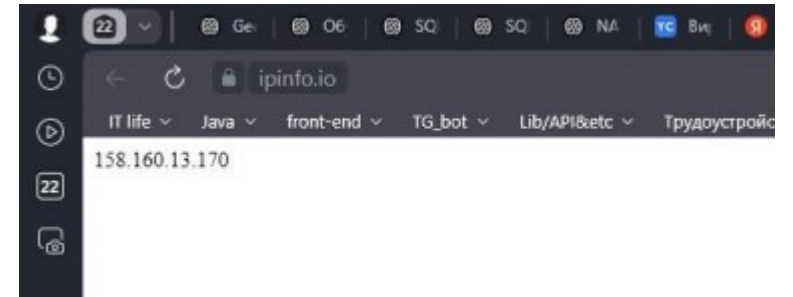
☐ Top

Задача 4. Доделать OpenVPN (или Wireguard) если не успели. Предоставит скриншот публичного IP до и после подключения через VPN + скриншот вывода команды ip addr.

До



После



root@vm-cloud: /home/fedotoff144

```
Scanning processes...
Scanning candidates...
Scanning linux images...

Restarting services...
Service restarts being deferred:
  systemctl restart packagekit.service
  systemctl restart unattended-upgrades.service

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@vm-cloud:/home/fedotoff144#
root@vm-cloud:/home/fedotoff144#
root@vm-cloud:/home/fedotoff144#
root@vm-cloud:/home/fedotoff144# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether d0:0d:19:8e:7d:c6 brd ff:ff:ff:ff:ff:ff
    altname enp138s0
    altname ens8
    inet 10.129.0.6/24 metric 100 brd 10.129.0.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::d20d:19ff:fe8e:7dc6/64 scope link
        valid_lft forever preferred_lft forever
3: as0t0: <POINTOPOINT,MULTICAST,NOARP,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UNKNOWN group default qlen 200
    link/none
    inet 172.27.224.1/22 scope global as0t0
        valid_lft forever preferred_lft forever
    inet6 fe80::860a:ad5b:28e3:6efd/64 scope link stable-privacy
        valid_lft forever preferred_lft forever
4: as0t1: <POINTOPOINT,MULTICAST,NOARP,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UNKNOWN group default qlen 200
    link/none
    inet 172.27.228.1/22 scope global as0t1
        valid_lft forever preferred_lft forever
    inet6 fe80::790d:3d08:2e31:b28d/64 scope link stable-privacy
        valid_lft forever preferred_lft forever
5: as0t2: <POINTOPOINT,MULTICAST,NOARP,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UNKNOWN group default qlen 200
    link/none
    inet 172.27.232.1/22 scope global as0t2
        valid_lft forever preferred_lft forever
    inet6 fe80::34c9:9639:1257:88d6/64 scope link stable-privacy
        valid_lft forever preferred_lft forever
6: as0t3: <POINTOPOINT,MULTICAST,NOARP,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UNKNOWN group default qlen 200
    link/none
    inet 172.27.236.1/22 scope global as0t3
        valid_lft forever preferred_lft forever
    inet6 fe80::9dcl:875a:5f3f:c205/64 scope link stable-privacy
        valid_lft forever preferred_lft forever
root@vm-cloud:/home/fedotoff144#
```

