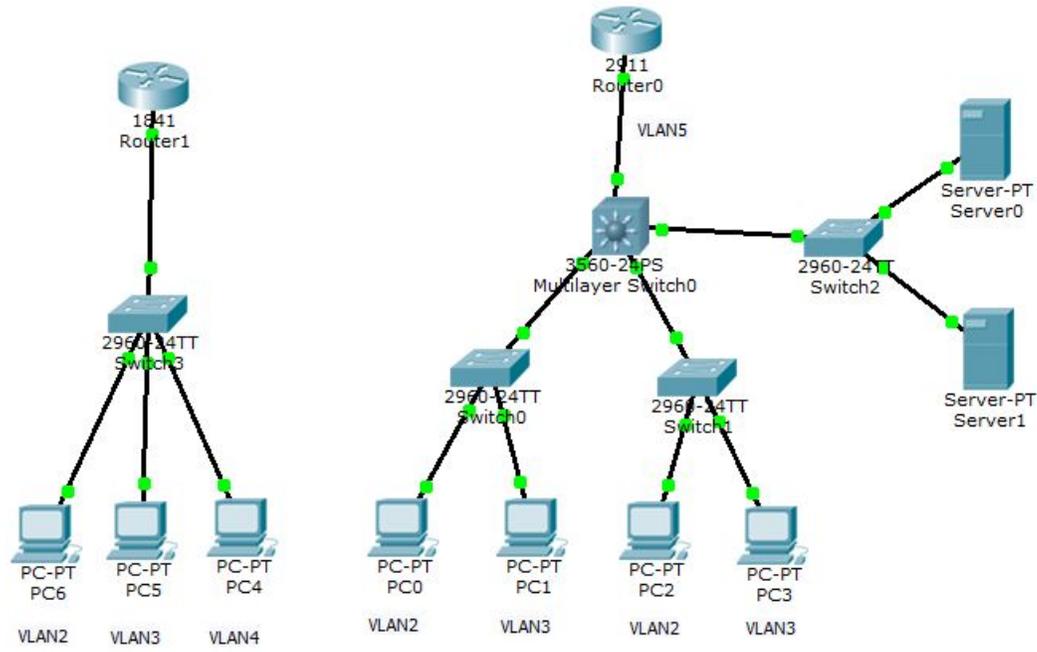


МДК.01.01

**Организация, принципы
построения и функционирования
компьютерных сетей
3-курс**

Практические занятия

Занятие 07



Создадим единую сеть из двух сегментов, созданных ранее.

Connections

Copper Straight-Through

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

New Delete

Toggle PDU List Window

The screenshot displays the Cisco Packet Tracer interface. On the left, a network diagram shows a hierarchical structure. At the top is Router1 (1841) connected to Switch3 (2960-24TT). Switch3 is connected to three PCs (PC6, PC5, PC4) in VLANs 2, 3, and 4. A blue arrow points to Router0 (1841) at the top of a second diagram. Router0 is connected to Switch0 (3560-24PS Multilayer Switch) via Gig0/0/11. Switch0 is connected to Switch1 (2960-24TT) and Switch2 (2960-24TT) via Gig0/1. Switch1 is connected to two PCs (PC0, PC1) in VLANs 2 and 3. Switch2 is connected to two PCs (PC2, PC3) in VLANs 2 and 3, and two servers (Server-PT Server0 and Server-PT Server1). On the right, the CLI window for Router0 is open, showing the 'IOS Command Line Interface'. The prompt is 'Router0>'. The user has entered 'en' to enter enable mode and 'show run' to display the current configuration. The output shows 'Building configuration...' and 'Current configuration : 640 bytes'. The interface includes 'Copy' and 'Paste' buttons.

Проверим ip-адрес порта Gig 0/0 у Router0. Набираем «en», «show run».

Time: 01:04:58 | Power Cycle Devices | Fast Forward Time | Realtime

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

Scenario 0

New Delete

Toggle PDU List Window

Copper Straight-Through

Windows taskbar: 21:36 11.2019

The screenshot displays the Cisco Packet Tracer interface. On the left, a network diagram shows Router0 (2911) connected to Multilayer Switch0 (3560-24PS). Multilayer Switch0 is connected to three 2960-24TT switches (Switch0, Switch1, Switch2). Switch0 is connected to PC-PT PC0, PC1, PC2, and PC3. Switch1 is connected to PC-PT PC4, PC5, and PC6. Switch2 is connected to Server-PT Server0 and Server-PT Server1. Router0 is also connected to another 2960-24TT switch (Switch3), which is connected to PC-PT PC4, PC5, and PC6. The diagram is divided into VLANs: VLAN2, VLAN3, and VLAN4. A blue arrow points from the left diagram to the right diagram, indicating a transition or configuration change.

On the right, the Router0 CLI window shows the following configuration and output:

```
IOS Command Line Interface

!
line aux 0
!
line vty 0 4
  login
!
!
!
end

Router#ping 192.168.55.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.55.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router#ping 192.168.22.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.22.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

Router#
```

Проверим соединение с компьютером PC0: «ping 192.168.22.2».
Соединения пока нет, т.к связь компьютеров осуществляется через 3560.

Time: 01:13 Power Cycle Devices Fast Forward Time

Connections

Copper Straight-Through

Scenario 0

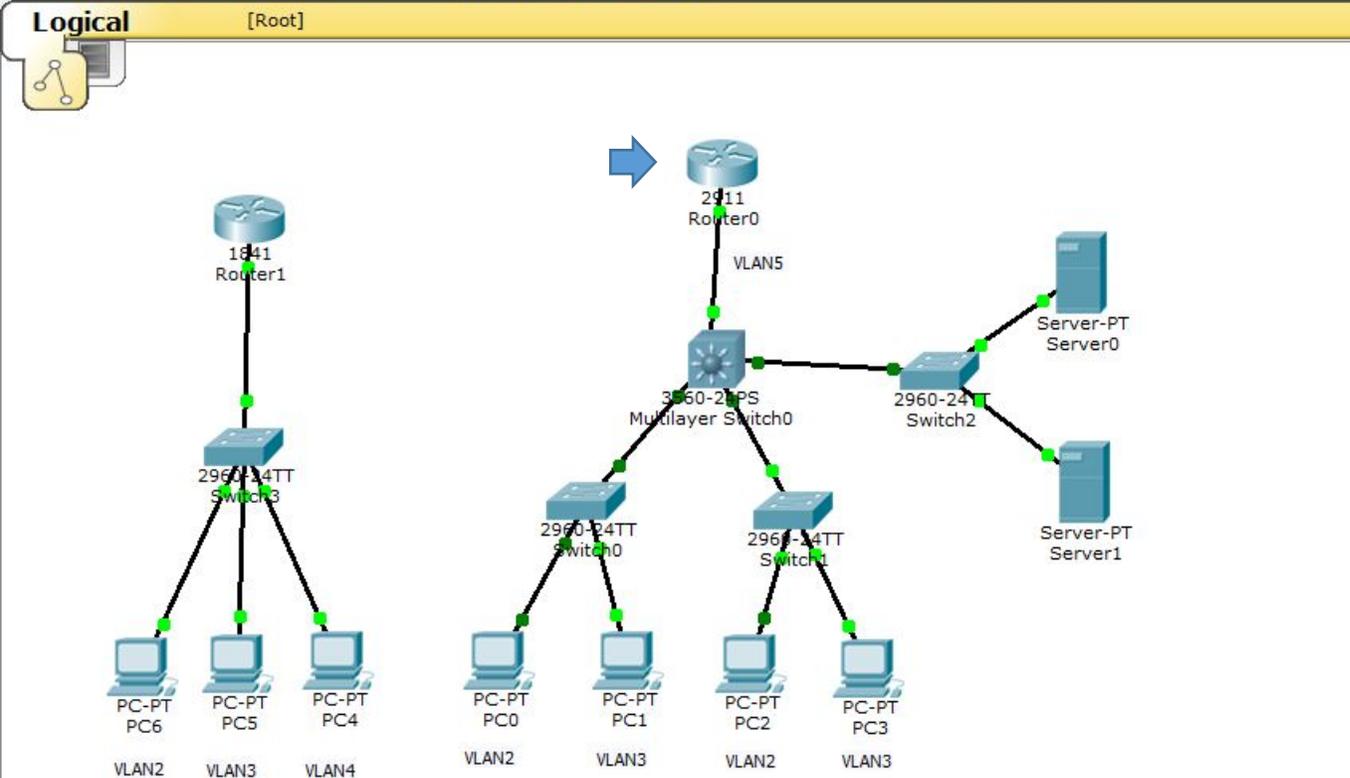
Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

New Delete

Toggle PDU List Window

Realtime

21:49 07.11.2019



```
Router0
Physical Config CLI
IOS Command Line Interface

line vty 0 4
 login
 !
 !
 !
end

Router#ping 192.168.55.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.55.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router#ping 192.168.22.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.22.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

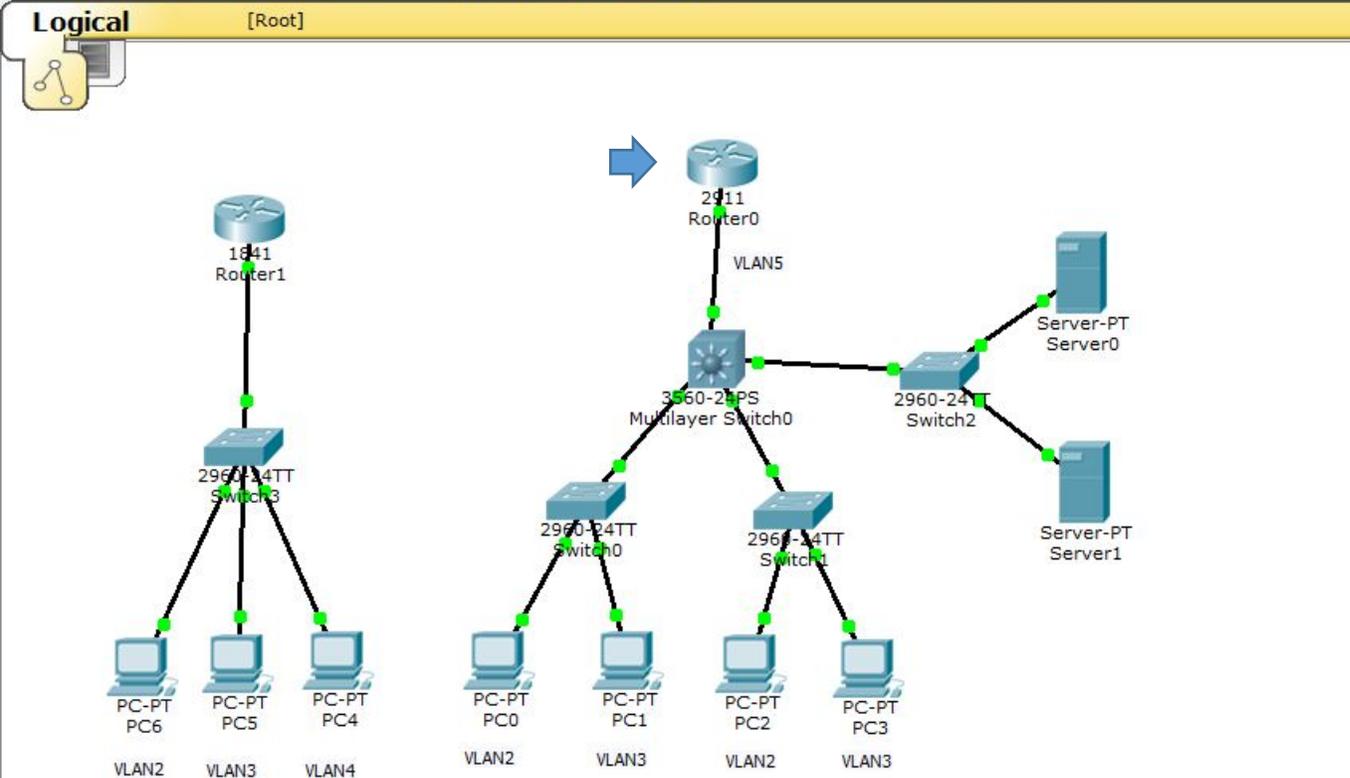
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip rou
Router(config)#ip route 192.168.22.0 255.255.255.0 192.168.55.2
```

Указываем для Router0, какие подсети ему нужно маршрутизировать.
Набираем: «conf t», «ip route 192.168.22.0 255.255.255.0 192.168.55.2».

Connections

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete

Toggle PDU List Window



Router0

Physical Config CLI

IOS Command Line Interface

```
Router#ping 192.168.55.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.55.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router#ping 192.168.22.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.22.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip rou
Router(config)#ip route 192.168.22.0 255.255.255.0 192.168.55.2
Router(config)#ip route 192.168.33.0 255.255.255.0 192.168.55.2
Router(config)#ip route 192.168.44.0 255.255.255.0 192.168.55.2
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
```

Copy Paste

Также нам нужна сеть:
«ip route 192.168.33.0 255.255.255.0 192.168.55.2» и
«ip route 192.168.44.0 255.255.255.0 192.168.55.2», далее «end» .

Connections

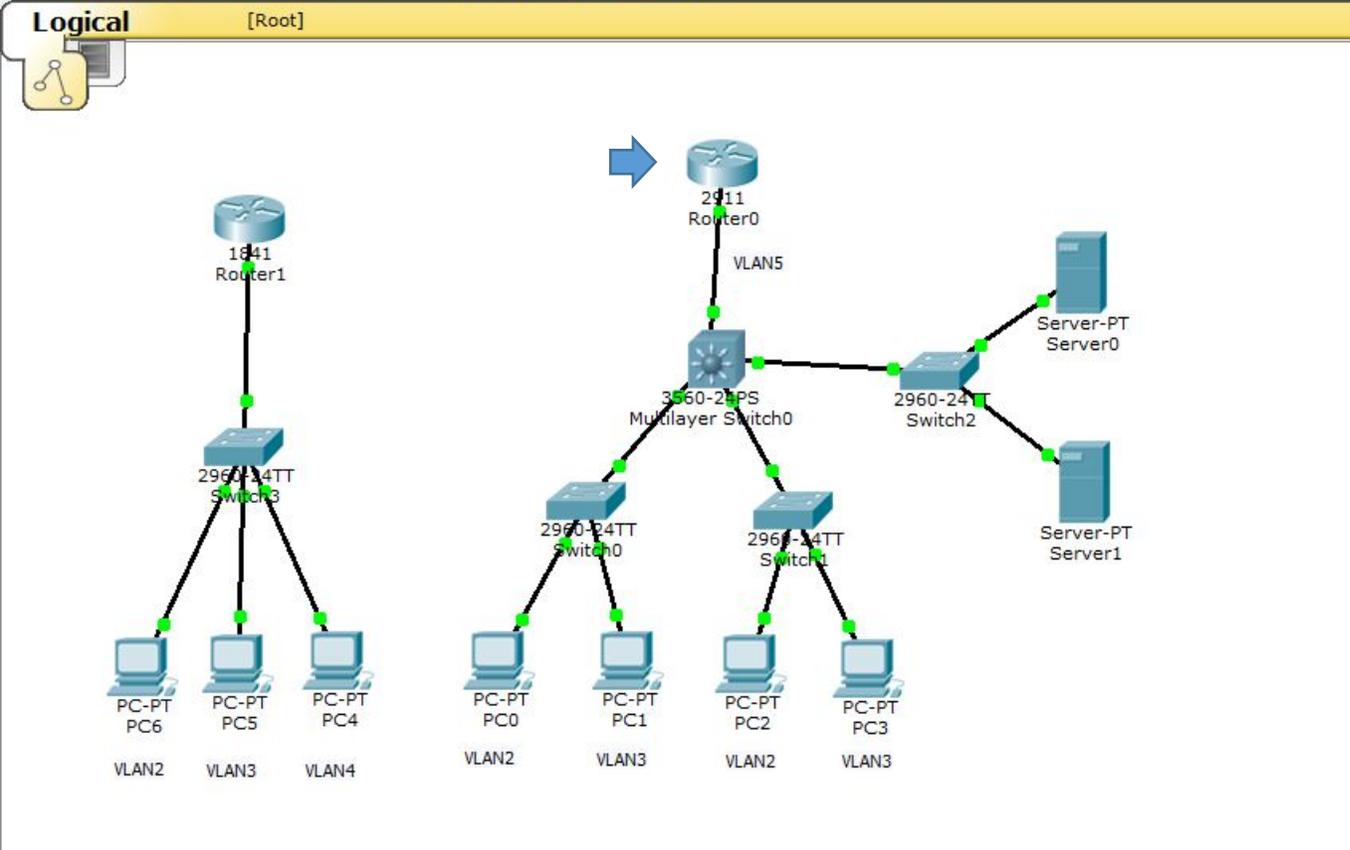
Copper Straight-Through

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

New Delete

Toggle PDU List Window



```
Router0
Physical Config CLI
IOS Command Line Interface

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip rou
Router(config)#ip route 192.168.22.0 255.255.255.0 192.168.55.2
Router(config)#ip route 192.168.33.0 255.255.255.0 192.168.55.2
Router(config)#ip route 192.168.44.0 255.255.255.0 192.168.55.2
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#ping 192.168.22.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.22.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/2 ms

Router#ping 192.168.22.3

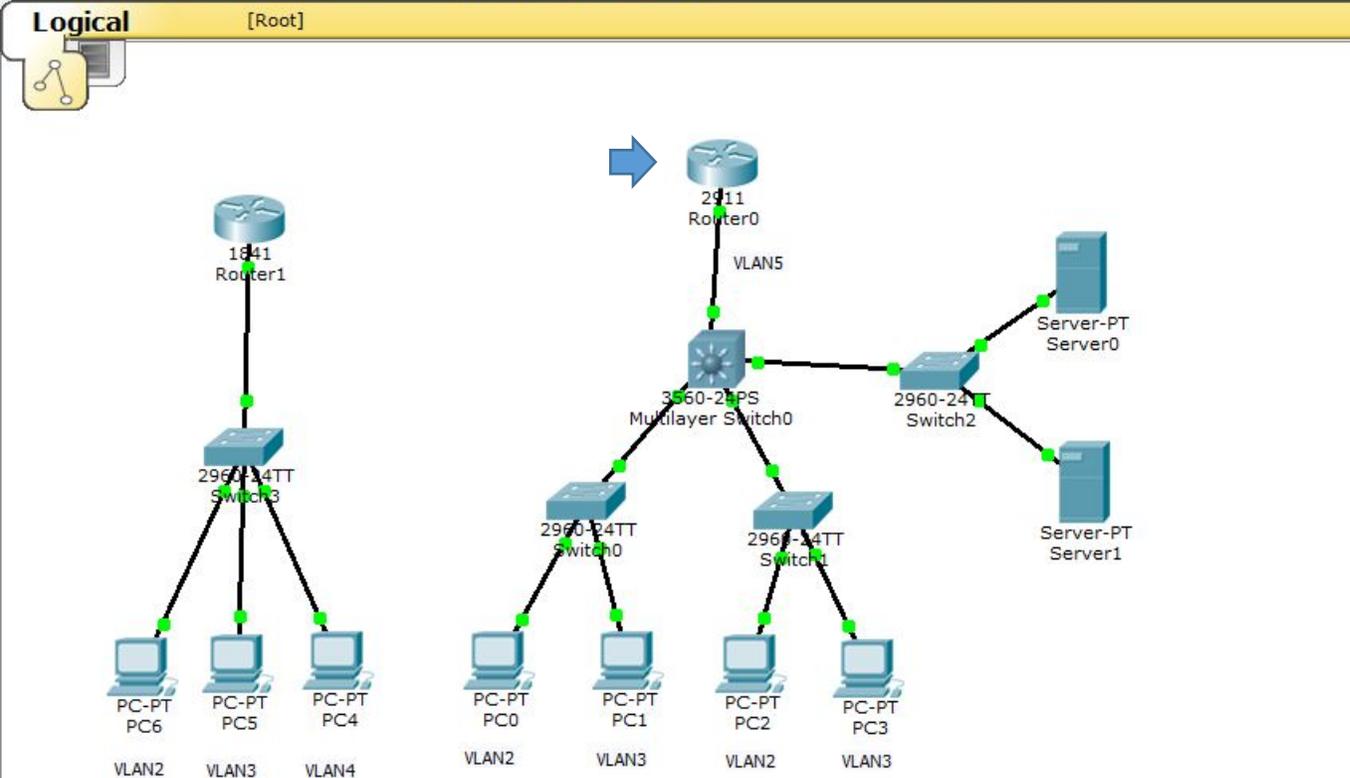
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.22.3, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms

Router#
```

Проверим соединение с компьютером PC0: «ping 192.168.22.2», есть.
С компьютером PC2: «ping 192.168.22.3», есть.

Connections Copper Straight-Through Scenario 0 New Delete Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------



Router0

Physical Config CLI

IOS Command Line Interface

```
Sending 5, 100-byte ICMP Echos to 192.168.22.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/2 ms

Router#ping 192.168.22.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.22.3, timeout is 2 seconds:
!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms

Router#ping 192.168.33.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.33.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/1/7 ms

Router#ping 192.168.33.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.33.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router#
```

Copy Paste

На всякий случай проверим соединения с компьютерами из других сегментов PC1: «ping 192.168.33.2», есть, PC3: «ping 192.168.33.3», есть.

Connections

Copper Straight-Through

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

New Delete

Toggle PDU List Window

The screenshot displays the Cisco Packet Tracer interface. On the left, a network diagram shows a hierarchical structure: Router1 (1841) is connected to Switch3 (2960-24TT), which is connected to three PCs (PC6, PC5, PC4) in VLANs 2, 3, and 4. Router0 (2111) is connected to Switch0 (3560-24PS Multilayer Switch), which is connected to two PCs (PC0, PC1) in VLANs 2 and 3. Switch0 is also connected to Switch2 (2960-24TT), which is connected to two servers (Server-PT Server0 and Server-PT Server1). A blue arrow points from Router1 to Router0, indicating a connection.

On the right, the CLI window for Router0 shows the following output:

```
IOS Command Line Interface
Sending 5, 100-byte ICMP Echos to 192.168.33.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/1/7 ms

Router#ping 192.168.33.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.33.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router#ping 192.168.44.2

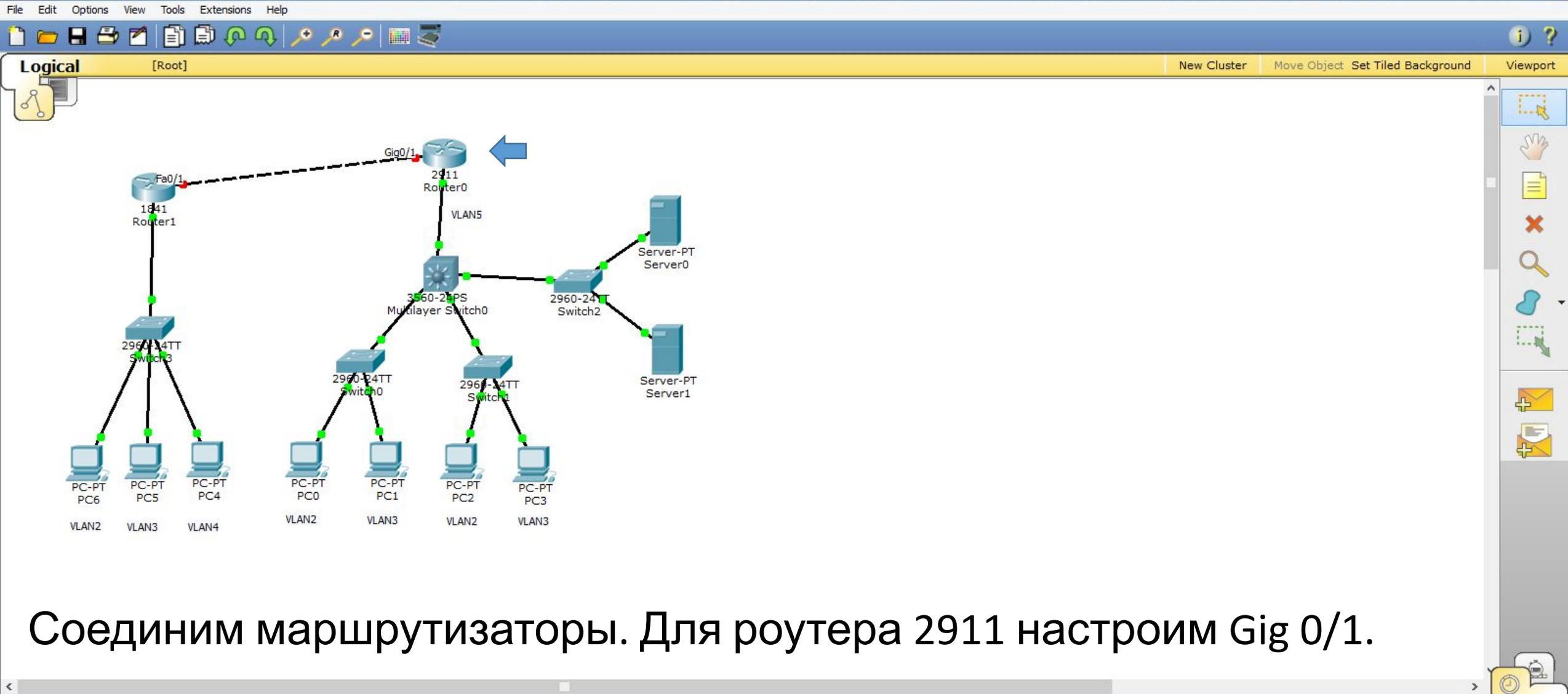
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.44.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/2 ms

Router#ping 192.168.44.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.44.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router#
```

А также проверим соединения с серверами Server0: «ping 192.168.44.2», есть, Server1: «ping 192.168.44.3», есть.



Соединим маршрутизаторы. Для роутера 2911 настроим Gig 0/1.

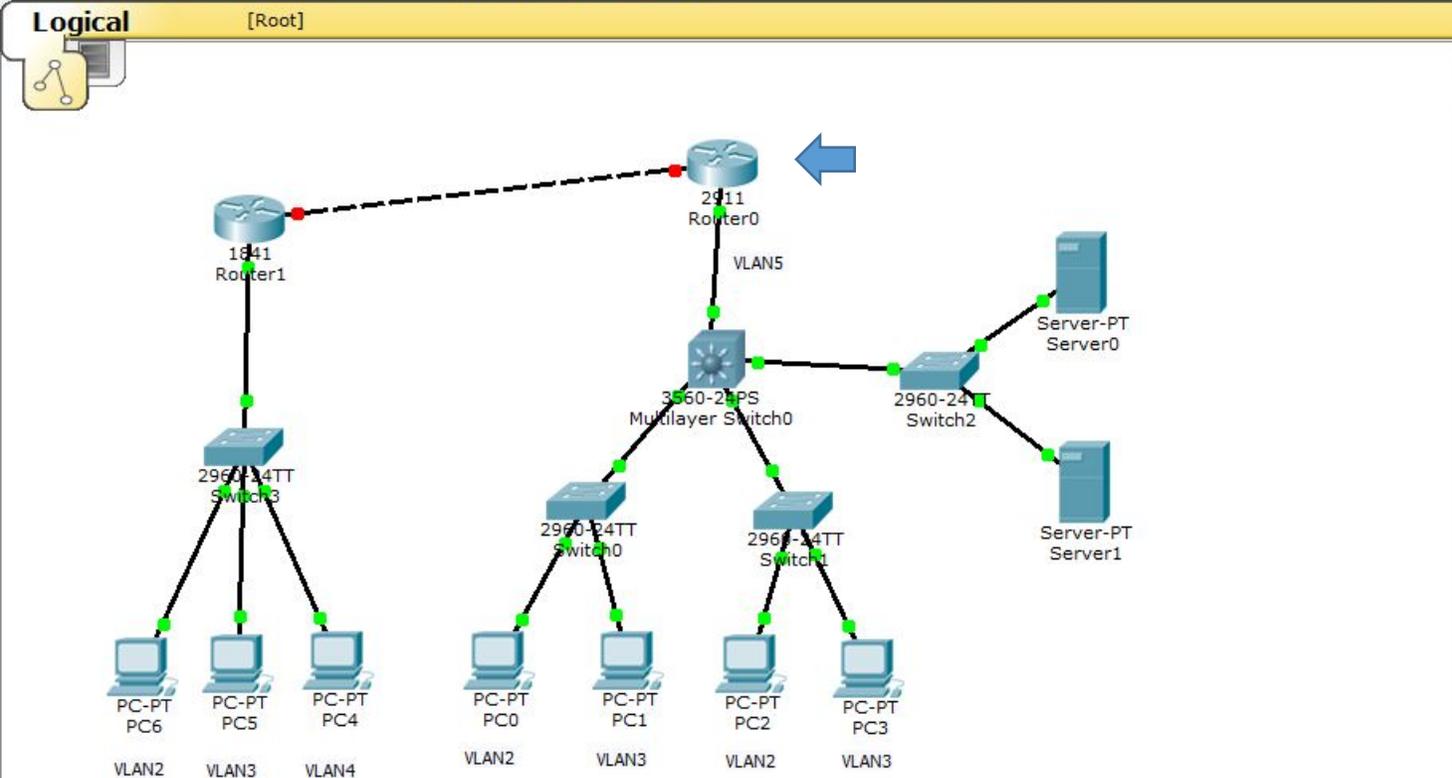
Time: 01:50:18 | Power Cycle Devices | Fast Forward Time | Realtime

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

Automatically Choose Connection Type

Windows taskbar: 22:22 07.11.2019



```
Router0
Physical Config CLI
IOS Command Line Interface
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.44.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int gig
Router(config)#int gigabitEthernet 0/1
Router(config-if)#no sh
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#ip add
Router(config-if)#ip address 192.168.70.1 255.255.255.252
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
Building configuration...
[OK]
Router#
```

Набираем: «conf t», «int gigabitEthernet 0/1», «no shutdown», «ip address 192.168.70.1 255.255.255.252», «end», «wr mem».

Connections

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

Toggle PDU List Window

Automatically Choose Connection Type



```

Router1
Physical Config CLI
IOS Command Line Interface
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa 0/1
Router(config-if)#no sh
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Router(config-if)#no sh
Router(config-if)#no shutdown
Router(config-if)#
Router(config-if)#ipadd
Router(config-if)#ip add
Router(config-if)#ip address 192.168.70.2 255.255.255.252
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
Building configuration...
[OK]
Router#
Copy Paste

```

Для роутера 1841 настроим Fa 0/1. Выбираем: «en», «conf t», «int fa 0/1», «no shutdown», «ip address 192.168.70.2 255.255.255.252», «end», «wr mem».

Connections

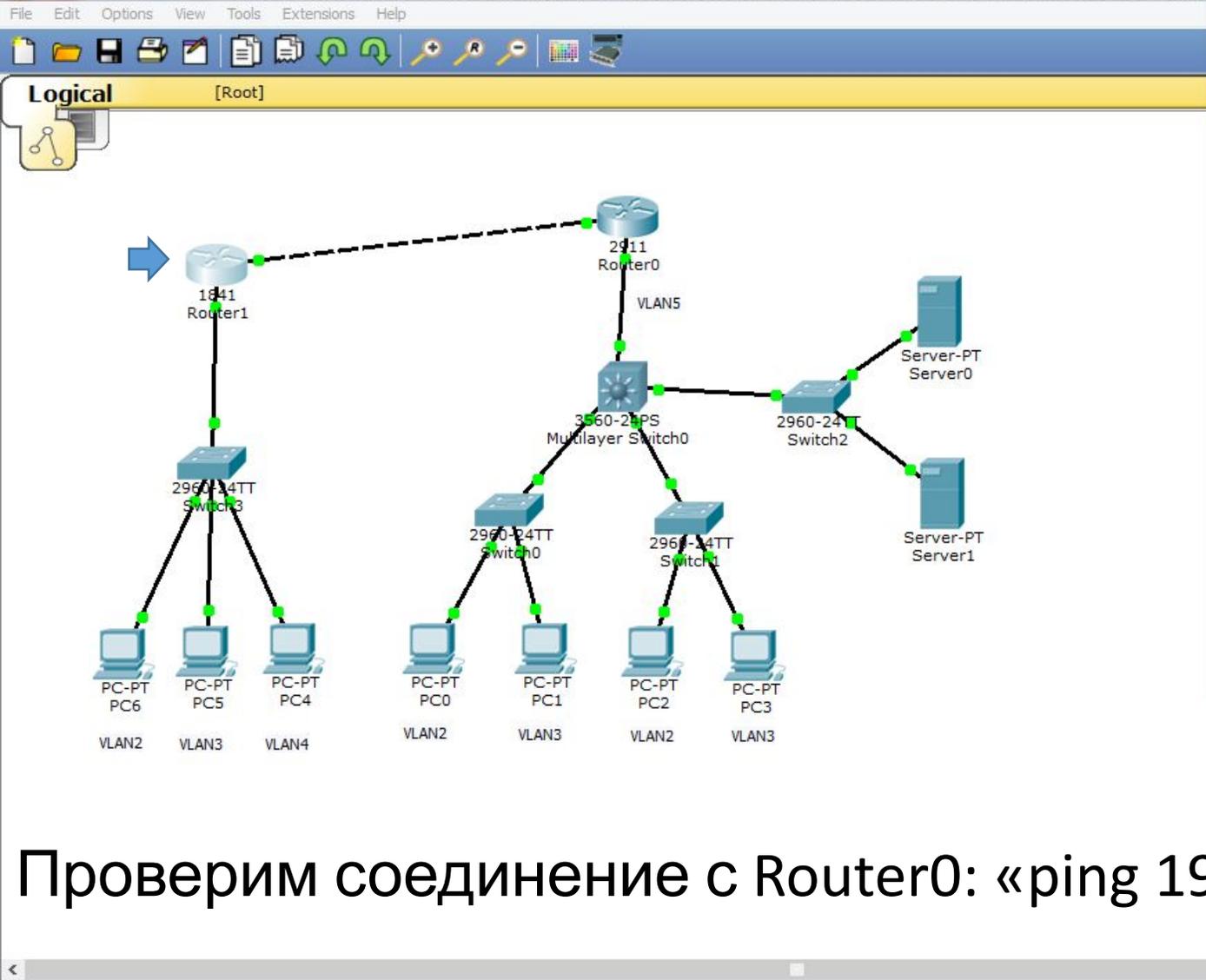
Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete

Automatically Choose Connection Type

New Delete

Toggle PDU List Window



```
Router1
Physical Config CLI
IOS Command Line Interface

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Router(config-if)#no sh
Router(config-if)#no shutdown
Router(config-if)#
Router(config-if)#ipadd
Router(config-if)#ip add
Router(config-if)#ip address 192.168.70.2 255.255.255.252
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
Building configuration...
[OK]
Router#
Router#ping 192.168.70.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.70.1, timeout is 2 seconds:
!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms

Router#
```

Проверим соединение с Router0: «ping 192.168.70.1», связь есть.

Connections

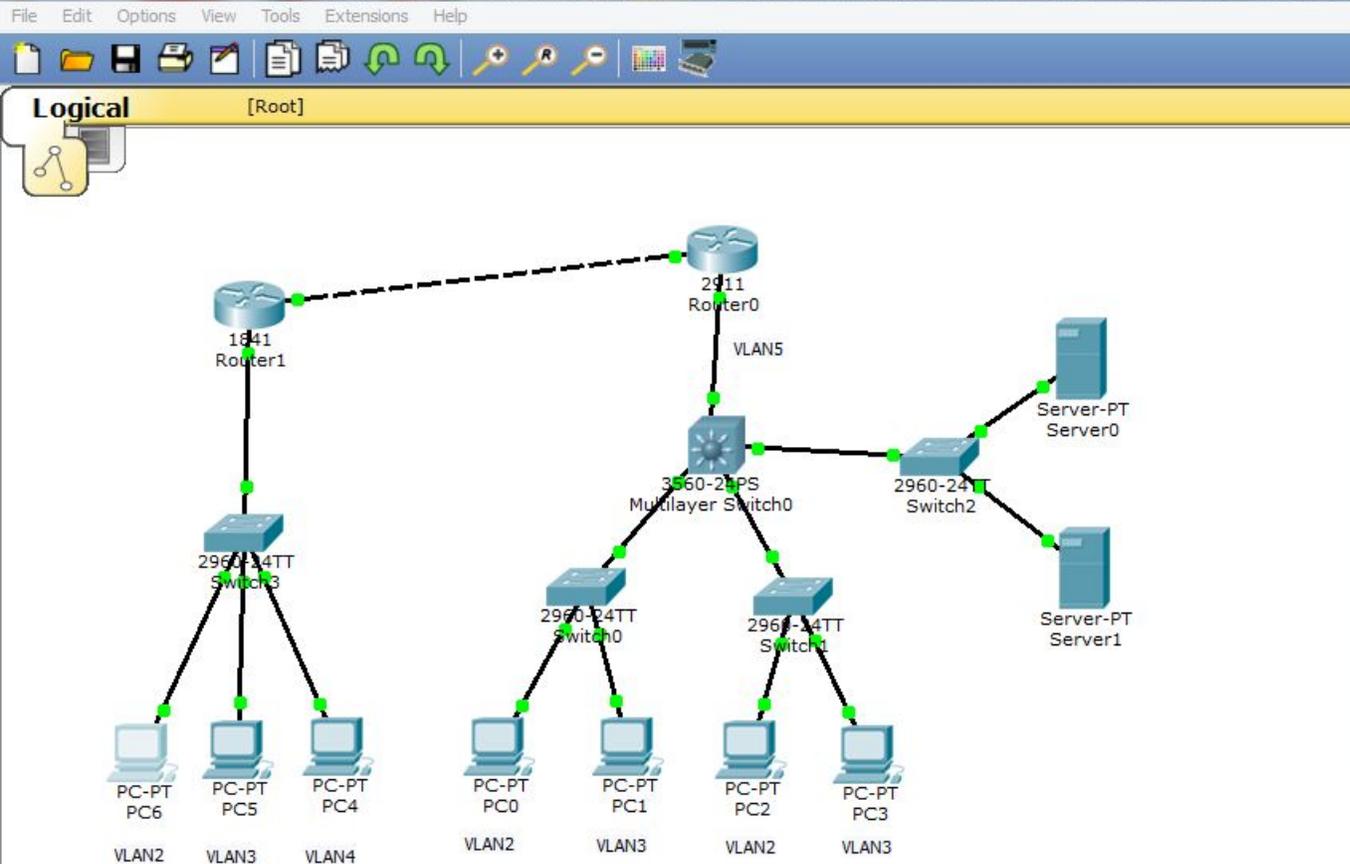
Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

New Delete

Toggle PDU List Window

Automatically Choose Connection Type



PC6

Physical Config Desktop Custom Interface

Command Prompt

```
PC>ping 192.168.4.2

Pinging 192.168.4.2 with 32 bytes of data:

Reply from 192.168.4.2: bytes=32 time=0ms TTL=127
Reply from 192.168.4.2: bytes=32 time=0ms TTL=127
Reply from 192.168.4.2: bytes=32 time=0ms TTL=127
Reply from 192.168.4.2: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.4.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>ping 192.168.22.2

Pinging 192.168.22.2 with 32 bytes of data:

Reply from 192.168.2.1: Destination host unreachable.

Ping statistics for 192.168.22.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>
```

Проверим соединение между компьютерами PC6 и PC0:
«ping 192.168.22.2», связи нет, т.к. Router1 не знает маршрута.

Time: 02:20:30 | Power Cycle Devices Fast Forward Time

Connections

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

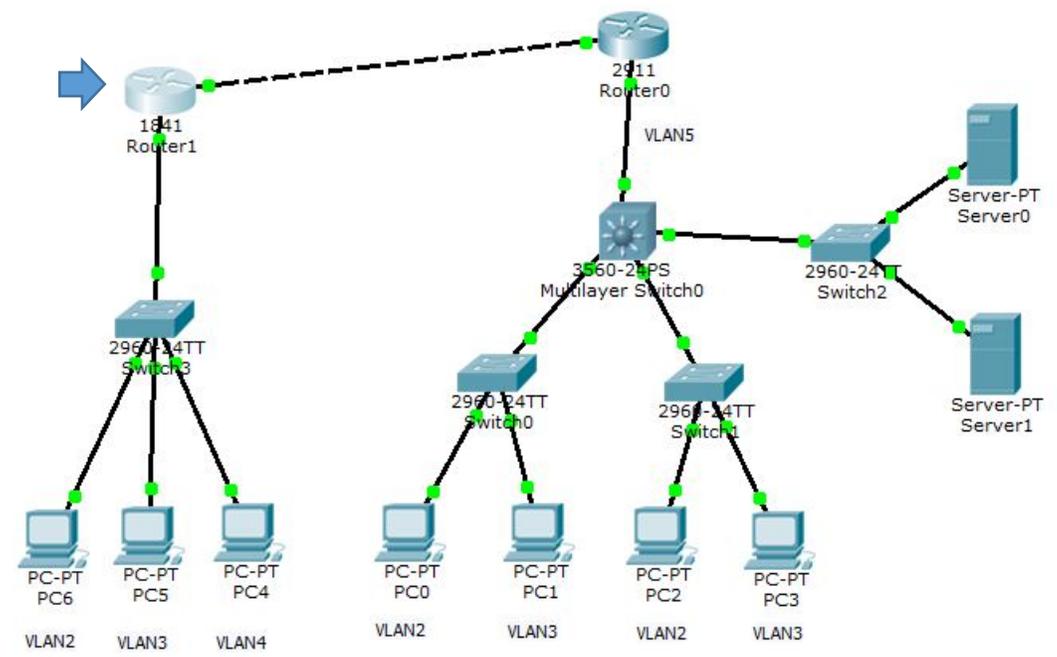
Automatically Choose Connection Type

New Delete

Toggle PDU List Window

Realtime

22:52 07.11.2019



Router1

Physical Config CLI

IOS Command Line Interface

```

%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
Building configuration...
[OK]
Router#
Router#ping 192.168.70.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.70.1, timeout is 2 seconds:
!!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip add
Router(config)#ip rou
Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.70.1
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
Building configuration...
[OK]
Router#

```

Copy Paste

Для Router1 пропишем маршрут по умолчанию для соседних подсетей. Набираем: «conf t», «ip route 0.0.0.0 0.0.0.0 192.168.70.1», «end», «wr mem»

Connections

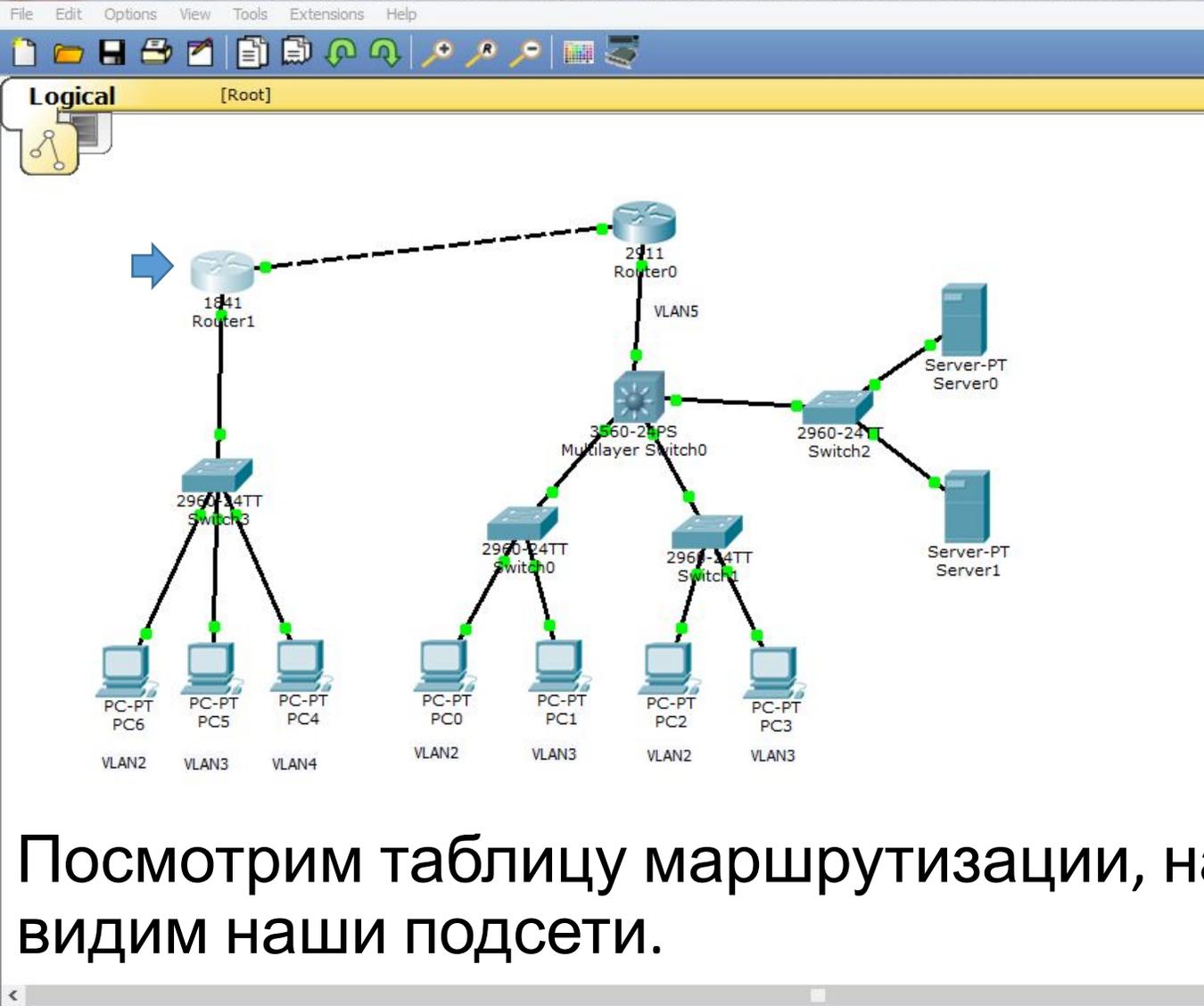
Automatically Choose Connection Type

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete

New Delete

Toggle PDU List Window



Router1

Physical Config CLI

IOS Command Line Interface

```

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

Router#wr mem
Building configuration...
[OK]
Router#show ip r
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 192.168.70.1 to network 0.0.0.0

C    192.168.2.0/24 is directly connected, FastEthernet0/0.2
C    192.168.3.0/24 is directly connected, FastEthernet0/0.3
C    192.168.4.0/24 is directly connected, FastEthernet0/0.4
     192.168.70.0/30 is subnetted, 1 subnets
C      192.168.70.0 is directly connected, FastEthernet0/1
S*   0.0.0.0/0 [1/0] via 192.168.70.1
Router#
  
```

Copy Paste

Посмотрим таблицу маршрутизации, набираем: «show ip route», видим наши подсети.

Connections

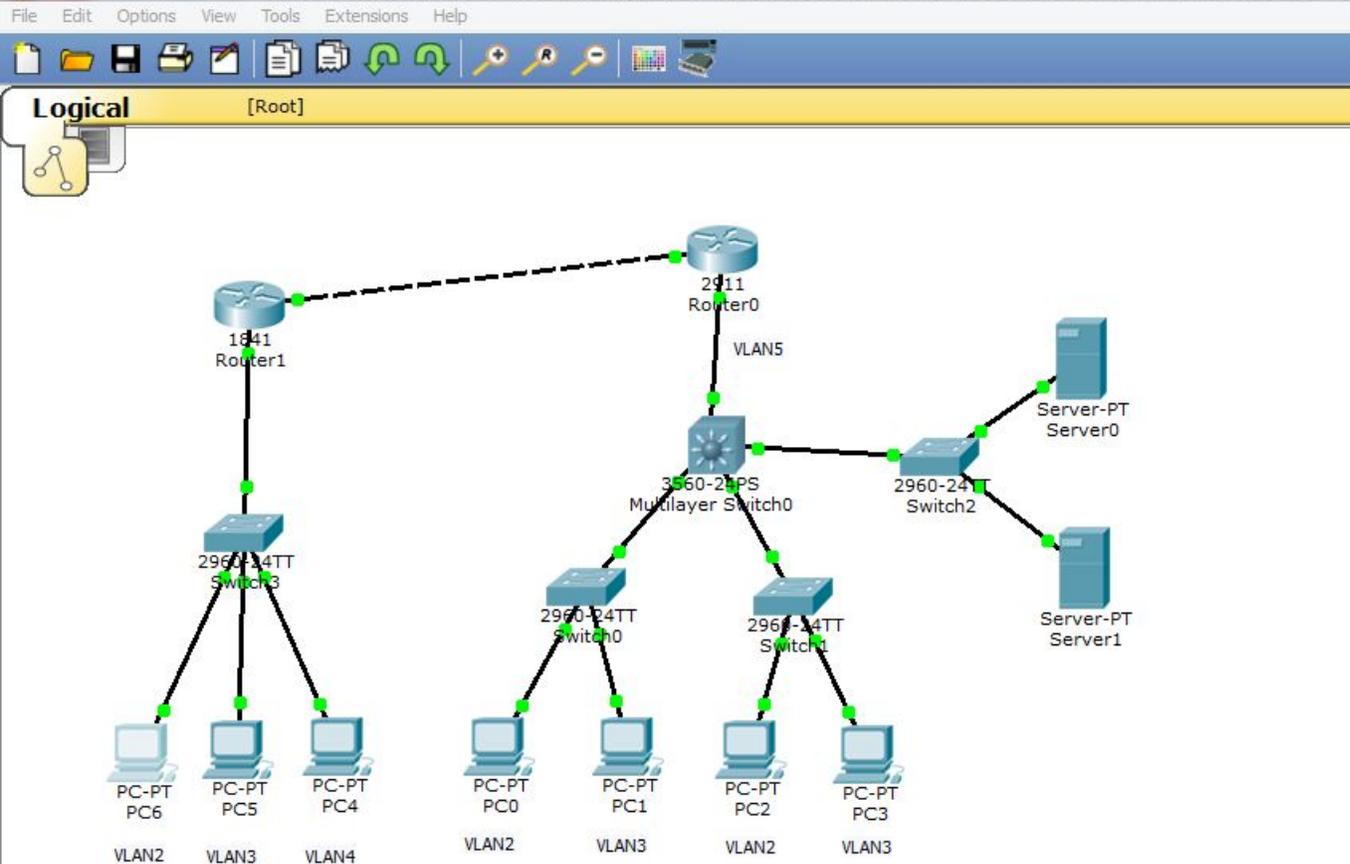
Automatically Choose Connection Type

Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete



PC6

Physical Config Desktop Custom Interface

Command Prompt

```
Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>ping 192.168.22.2

Pinging 192.168.22.2 with 32 bytes of data:

Reply from 192.168.2.1: Destination host unreachable.

Ping statistics for 192.168.22.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>ping 192.168.22.2

Pinging 192.168.22.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.22.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>
```

Проверим ещё раз соединение между компьютерами PC6 и PC0: «ping 192.168.22.2», связи ещё нет, т.к. нет обратной связи PC0 с PC6.

Time: 02:40:31 | Power Cycle Devices Fast Forward Time

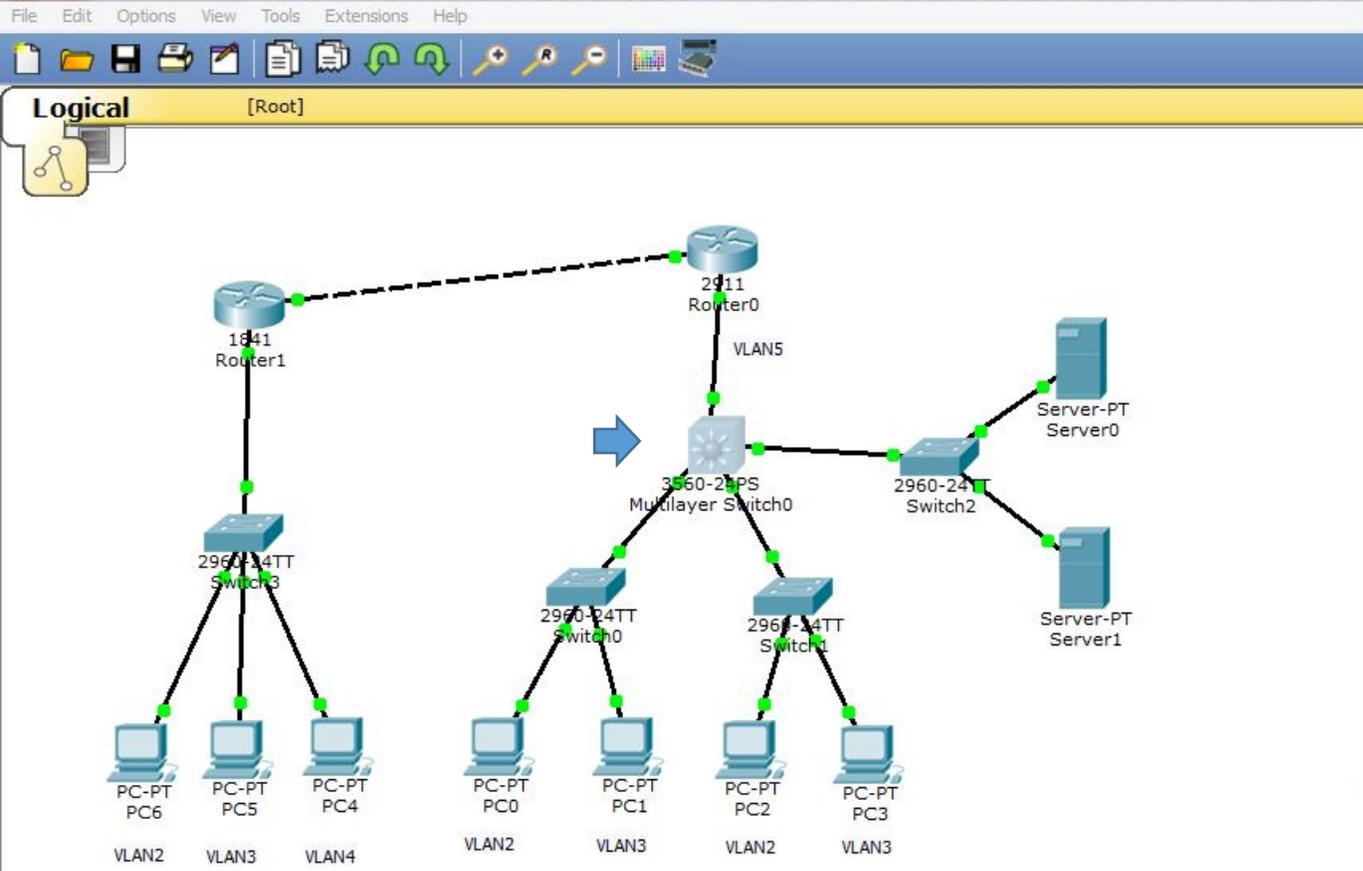
Connections

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

Automatically Choose Connection Type

Windows taskbar: 23:13 07.11.2019



```
IOS Command Line Interface
Press RETURN to get started.

Switch>
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#ip route 0.0.0.0 0.0.0.0 192.168.55.1
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#wr mem
Building configuration...
[OK]
Switch#
```

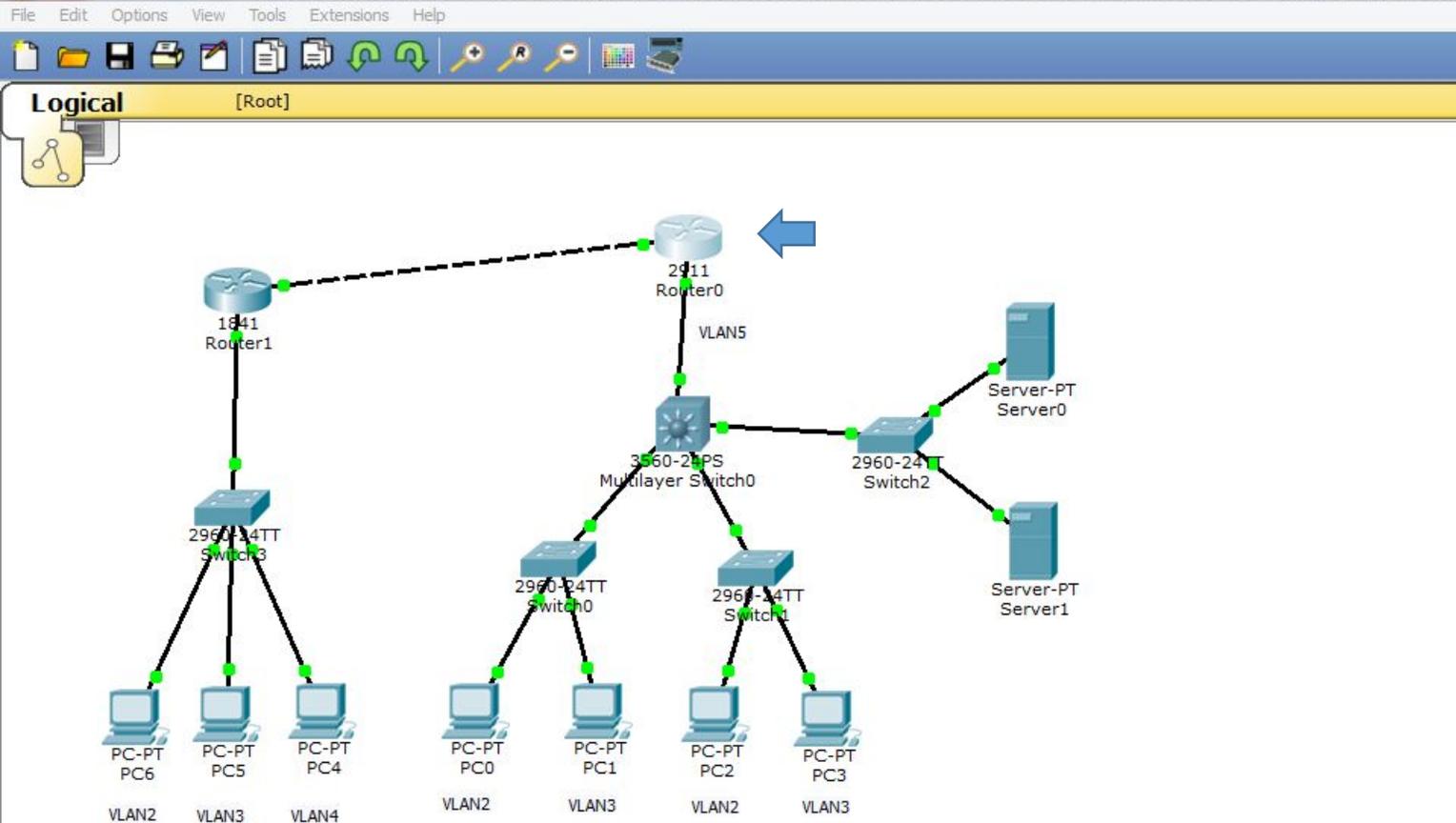
Настроим коммутатор 3560, зададим маршрут по умолчанию, набираем: «en», «conf t», «ip route 0.0.0.0 0.0.0.0 192.168.55.1», «end», «wr mem»

Time: 02:46:53 | Power Cycle Devices | Fast Forward Time | Realtime

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

Scenario 0 | New | Delete | Toggle PDU List Window

Windows taskbar: 23:19 07.11.2019



```
Router0
Physical Config CLI
IOS Command Line Interface
Press RETURN to get started.

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.70.2
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
Building configuration...
[OK]
Router#
```

Переходим к настройке маршрутизатора 2911.
Пропишем подсеть 192.168.2.0 через 192.168.70.2, набираем: «en», «conf t», «ip route 192.168.2.0 255.255.255.0 192.168.70.2», «end», «wr mem».

Time: 02:57:27 | Power Cycle Devices Fast Forward Time

Connections

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

Automatically Choose Connection Type

Windows taskbar: 23:30 07.11.2019

Cisco Packet Tracer - D:\Андрей\Компьютерные сети\МДК.01.01 Организация, принципы построения и функционирования компьютерных сетей\Практические работы\Работа 16.plt

File Edit Options View Tools Extensions Help

Logical [Root]

```

Router0
-----
Physical Config CLI
IOS Command Line Interface

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.70.2
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
Building configuration...
[OK]
Router#ping 192.168.2.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router#
  
```

Проверим соединение с PC6: «ping 192.168.2.2», связь есть.

Time: 03:03:45 Power Cycle Devices Fast Forward Time

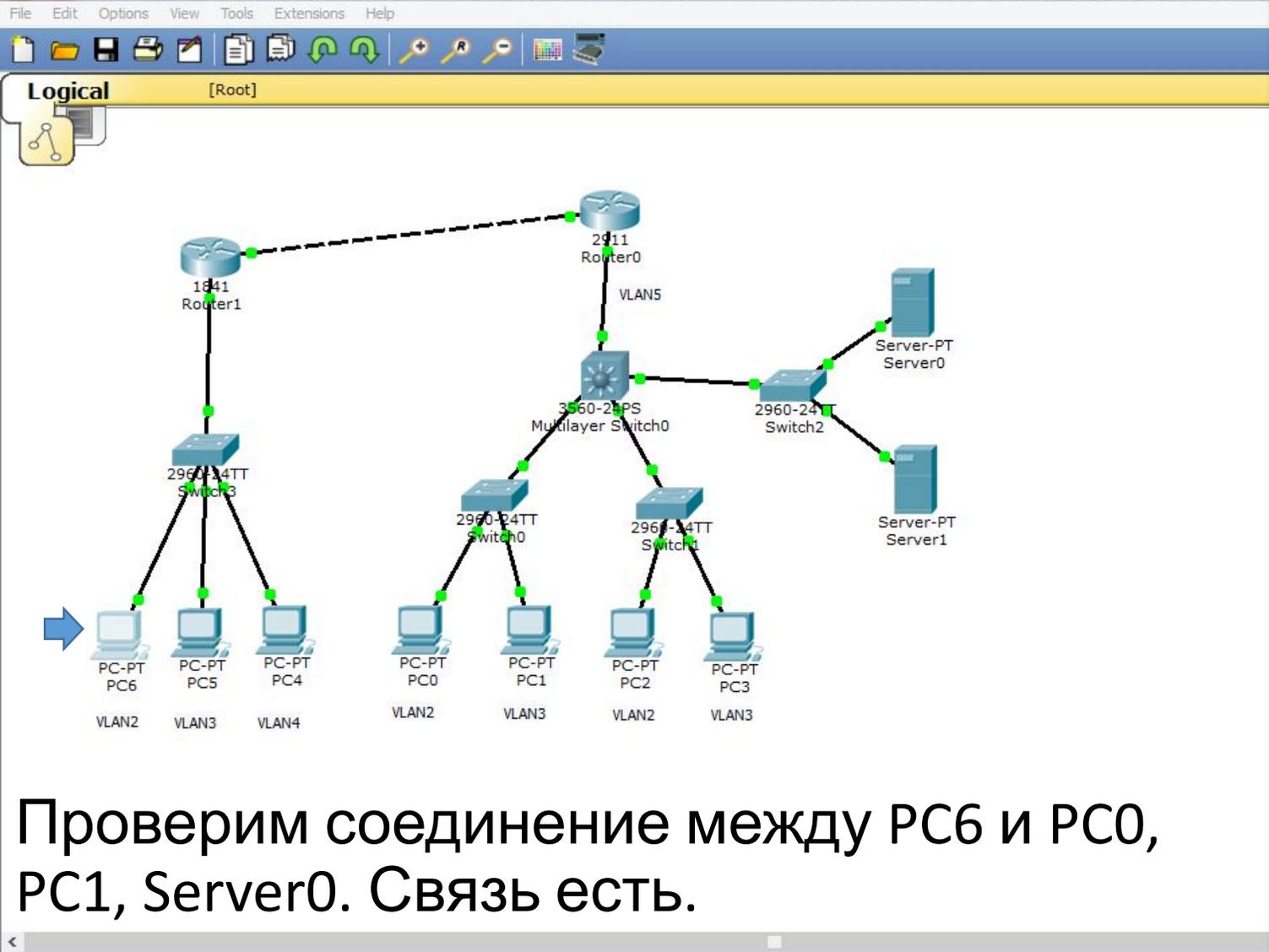
Connections

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete

Automatically Choose Connection Type

Windows Taskbar: 23:36 07.11.2019



PC6

Physical Config Desktop Custom Interface

Command Prompt

```

ping statistics for 192.168.22.2:
  Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>ping 192.168.22.2

Pinging 192.168.22.2 with 32 bytes of data:

Reply from 192.168.22.2: bytes=32 time=40ms TTL=125
Reply from 192.168.22.2: bytes=32 time=12ms TTL=125
Reply from 192.168.22.2: bytes=32 time=11ms TTL=125
Reply from 192.168.22.2: bytes=32 time=12ms TTL=125

Ping statistics for 192.168.22.2:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
  Minimum = 11ms, Maximum = 40ms, Average = 18ms

PC>ping 192.168.33.2

Pinging 192.168.33.2 with 32 bytes of data:

Reply from 192.168.33.2: bytes=32 time=13ms TTL=125
Reply from 192.168.33.2: bytes=32 time=12ms TTL=125
Reply from 192.168.33.2: bytes=32 time=10ms TTL=125
Reply from 192.168.33.2: bytes=32 time=12ms TTL=125

Ping statistics for 192.168.33.2:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
  Minimum = 10ms, Maximum = 13ms, Average = 11ms

PC>ping 192.168.44.2

Pinging 192.168.44.2 with 32 bytes of data:

Reply from 192.168.44.2: bytes=32 time=11ms TTL=125
Reply from 192.168.44.2: bytes=32 time=12ms TTL=125
Reply from 192.168.44.2: bytes=32 time=12ms TTL=125
Reply from 192.168.44.2: bytes=32 time=10ms TTL=125

Ping statistics for 192.168.44.2:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
  Minimum = 10ms, Maximum = 12ms, Average = 11ms

PC>

```

Проверим соединение между PC6 и PC0, PC1, Server0. Связь есть.

Connections

Automatically Choose Connection Type

Scenario 0

New Delete

Toggle PDU List Window

Cisco Packet Tracer - D:\Андрей\Компьютерные сети\МДК.01.01 Организация, принципы построения и функционирования компьютерных сетей\Практические работы\Работа 16.plt

File Edit Options View Tools Extensions Help

Logical [Root]

Router0 CLI

IOS Command Line Interface

```

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

Router#wr mem
Building configuration...
[OK]
Router#ping 192.168.2.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.2, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 192.168.3.0 255.255.255.0 192.168.70.2
Router(config)#ip route 192.168.4.0 255.255.255.0 192.168.70.2
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
Building configuration...
[OK]
Router#

```

Copy Paste

Также в настройке маршрутизатора 2911 пропишем подсеть 192.168.3.0 и 192.168.4.0 через 192.168.70.2, набираем: «conf t», «ip route 192.168.3.0 255.255.255.0 192.168.70.2», «ip route 192.168.4.0 255.255.255.0 192.168.70.2», «end», «wr mem».

Time: 03:13:18 | Power Cycle Devices Fast Forward Time

Connections

Automatically Choose Connection Type

Scenario 0

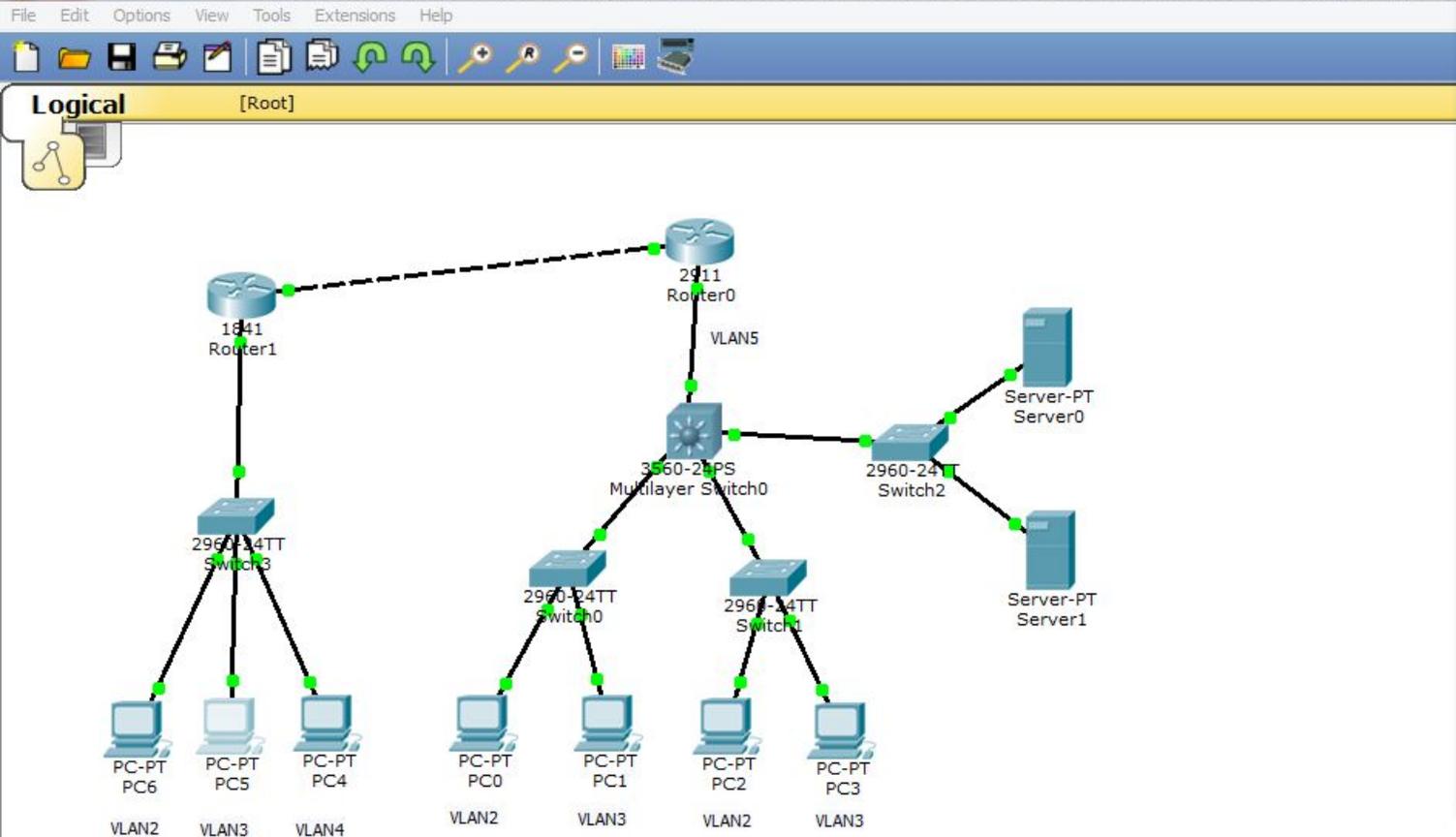
Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete

New Delete

Toggle PDU List Window

Realtime

23:46 07.11.2019



PC5

Physical Config Desktop Custom Interface

Command Prompt

```
PC>ping 192.168.22.2

Pinging 192.168.22.2 with 32 bytes of data:

Reply from 192.168.22.2: bytes=32 time=11ms TTL=125
Reply from 192.168.22.2: bytes=32 time=12ms TTL=125
Reply from 192.168.22.2: bytes=32 time=12ms TTL=125
Reply from 192.168.22.2: bytes=32 time=12ms TTL=125

Ping statistics for 192.168.22.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 11ms, Maximum = 12ms, Average = 11ms

PC>ping 192.168.33.2

Pinging 192.168.33.2 with 32 bytes of data:

Reply from 192.168.33.2: bytes=32 time=12ms TTL=125
Reply from 192.168.33.2: bytes=32 time=10ms TTL=125
Reply from 192.168.33.2: bytes=32 time=12ms TTL=125
Reply from 192.168.33.2: bytes=32 time=12ms TTL=125

Ping statistics for 192.168.33.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 12ms, Average = 11ms

PC>
```

Проверим соединение между компьютерами PC5 и PC0, PC1:
«ping 192.168.22.2», связи есть, «ping 192.168.33.2», связи есть.

Time: 03:20:10 | Power Cycle Devices Fast Forward Time

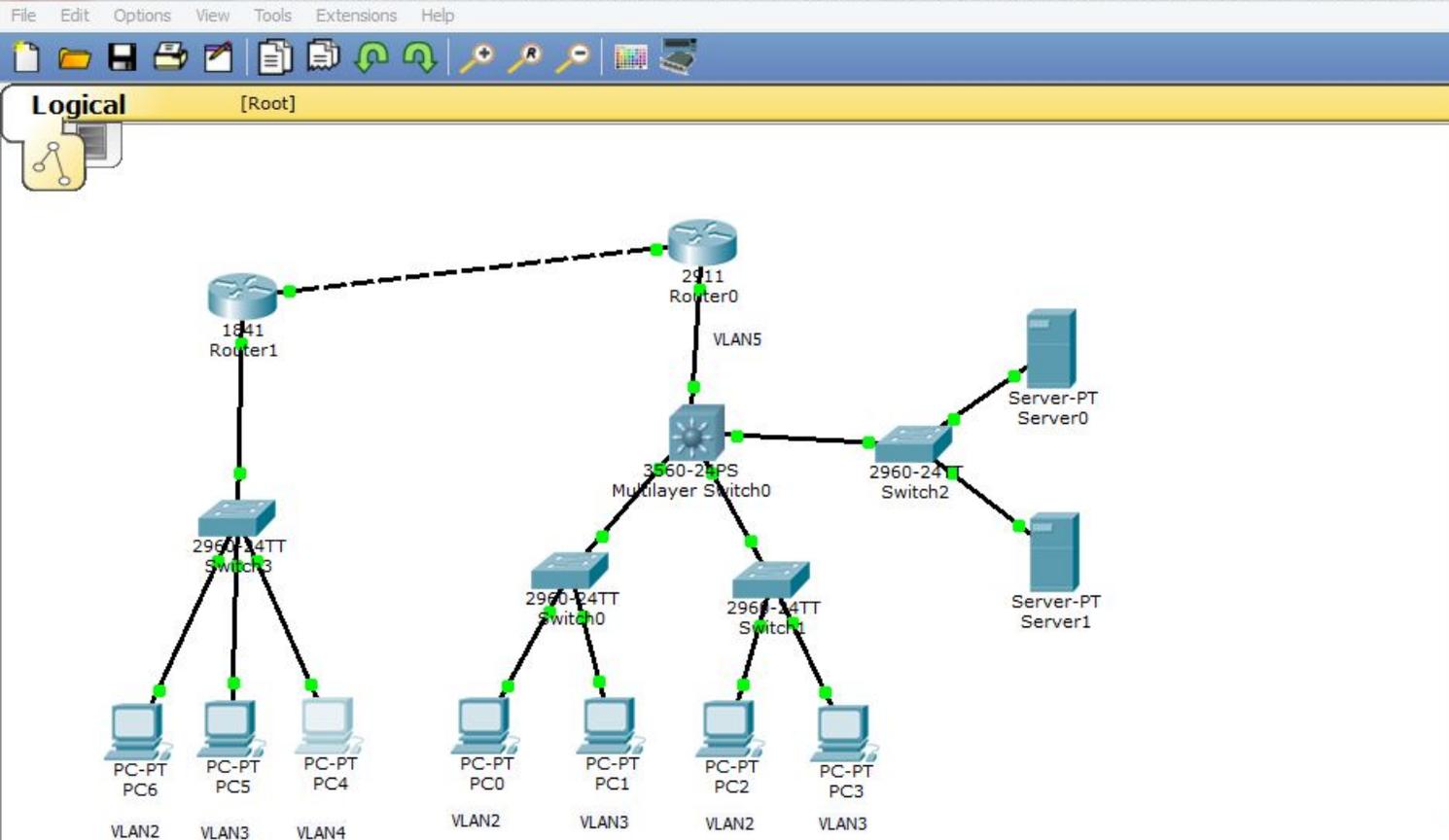
Connections

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

Automatically Choose Connection Type

Windows taskbar: 23:53 07.11.2019



```
PC4
Physical Config Desktop Custom Interface
Command Prompt
PC>ping 192.168.22.2
Pinging 192.168.22.2 with 32 bytes of data:
Reply from 192.168.22.2: bytes=32 time=13ms TTL=125
Reply from 192.168.22.2: bytes=32 time=13ms TTL=125
Reply from 192.168.22.2: bytes=32 time=10ms TTL=125
Reply from 192.168.22.2: bytes=32 time=12ms TTL=125
Ping statistics for 192.168.22.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 13ms, Average = 12ms
PC>ping 192.168.33.2
Pinging 192.168.33.2 with 32 bytes of data:
Reply from 192.168.33.2: bytes=32 time=11ms TTL=125
Reply from 192.168.33.2: bytes=32 time=9ms TTL=125
Reply from 192.168.33.2: bytes=32 time=25ms TTL=125
Reply from 192.168.33.2: bytes=32 time=12ms TTL=125
Ping statistics for 192.168.33.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 9ms, Maximum = 25ms, Average = 14ms
PC>
```

Проверим соединение между компьютерами PC4 и PC0, PC1:
«ping 192.168.22.2», связи есть, «ping 192.168.33.2», связи есть.

Time: 03:23:41 | Power Cycle Devices Fast Forward Time

Connections

Automatically Choose Connection Type

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

Windows taskbar: 23:56 07.11.2019

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster Move Object Set Tiled Background Viewport

Port	Link	IP Address	IPv6 Address	MAC Address
FastEthernet0	Up	192.168.22.3/24	<not set>	0009.7CA2.D936

Gateway: 192.168.22.1
DNS Server: <not set>
Line Number: <not set>

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Typ
------	-----------	-------------	-----------	-----

Reset Simulation Constant Delay Captured to: * (no captures)

Play Controls

Back Auto Capture / Play Capture / Forward

Event List Filters - Visible Events

ACL Filter, ARP, BGP, CDP, DHCP, DNS, DTP, EIGRP, FTP, H.323, HSRP, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NTP, OSPF, PAgP, POP3, RADIUS, RIP, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters Show All

Пробуем отправить сообщение с PC6 на PC2.

Time: 03:26:07.910 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward Event List Simulation

Connections

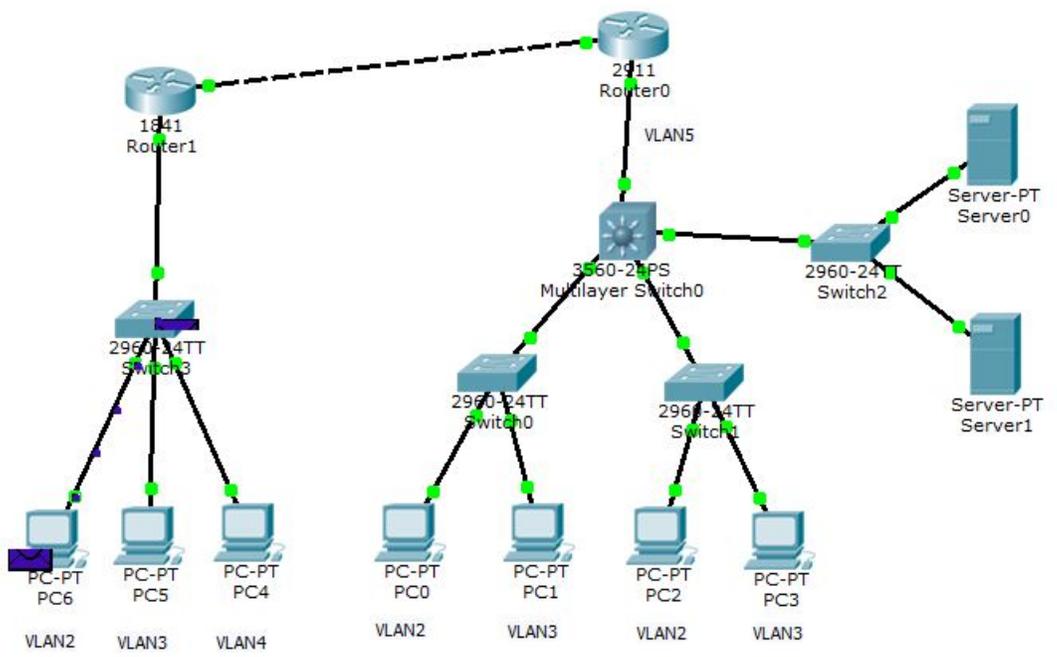
Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

Automatically Choose Connection Type



Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC6	ICM
<input checked="" type="checkbox"/>	0.003	PC6	Switch3	ICM

Reset Simulation Constant Delay Capturing... *

Play Controls

Back Auto Capture / Play Capture / Forward

Event List Filters - Visible Events

ACL Filter, ARP, BGP, CDP, DHCP, DNS, DTP, EIGRP, FTP, H.323, HSRP, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NTP, OSPF, PAP, POP3, RADIUS, RIP, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters Show All

Сообщение с отправляется.

Connections

Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
<input checked="" type="checkbox"/>	In Progress	PC6	PC2	ICMP	Blue	0.000	N	0	(edit)	(delete)

Automatically Choose Connection Type

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster Move Object Set Tiled Background Viewport

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC6	ICMP
	0.003	PC6	Switch3	ICMP
	0.005	Switch3	Router1	ICMP
	0.007	Router1	Router0	ICMP
	0.010	Router0	Multilay...	ICMP
	0.012	Multilayer ...	Switch1	ICMP
☑	0.014	Switch1	PC2	ICMP

Reset Simulation Constant Delay Capturing... *

Play Controls

Back Auto Capture / Play Capture / Forward

Event List Filters - Visible Events

ACL Filter, ARP, BGP, CDP, DHCP, DNS, DTP, EIGRP, FTP, H.323, HSRP, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NTP, OSPF, PAgP, POP3, RADIUS, RIP, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters Show All

Сообщение с проходит и возвращается ответ.

Time: 03:28:48.075 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward Event List Simulation

Scenario 0

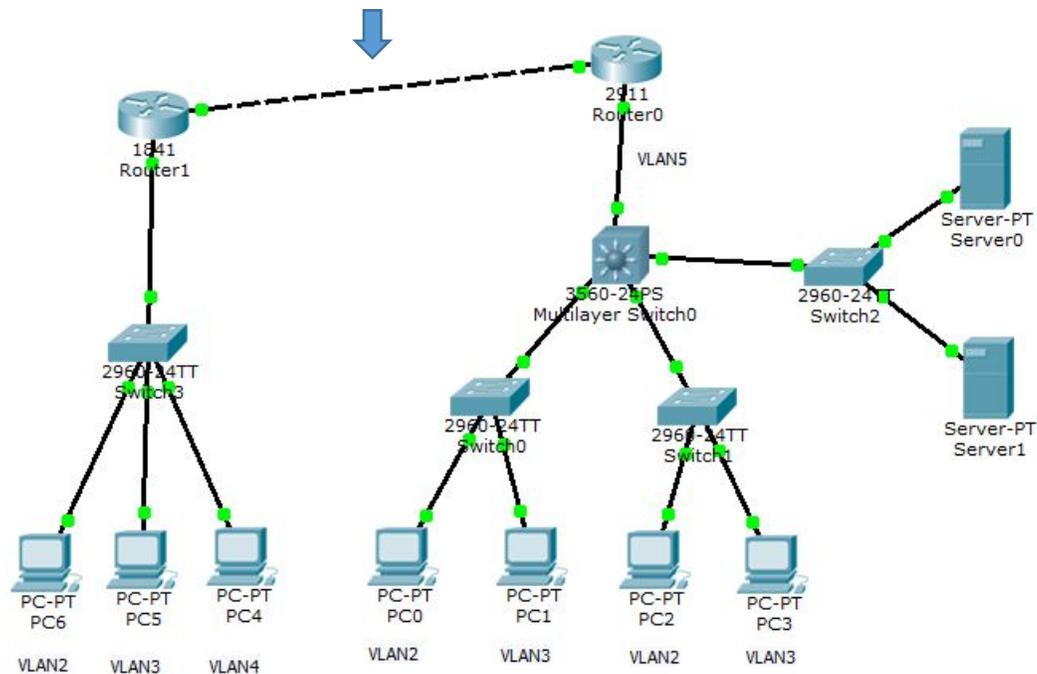
New Delete Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
●	In Progress	PC6	PC2	ICMP	■	0.000	N	0	(edit)	(delete)

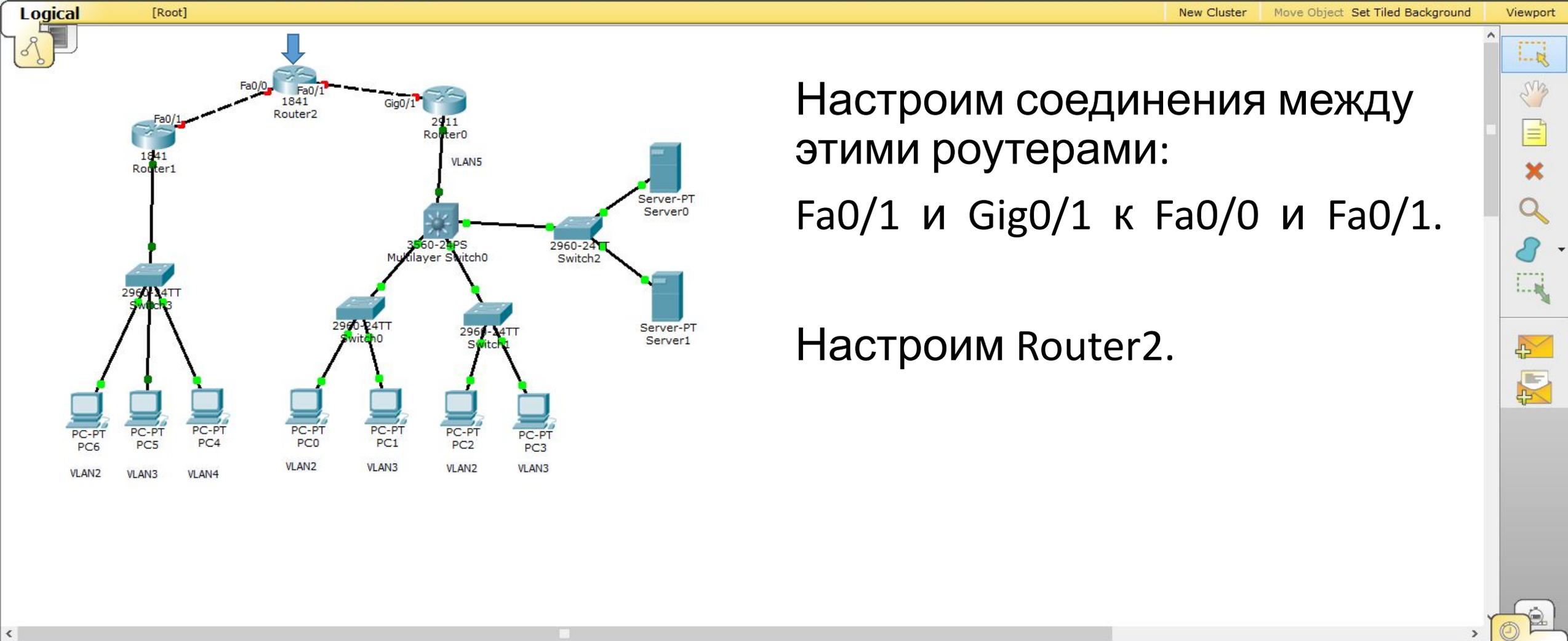
Connections

Automatically Choose Connection Type

Windows taskbar: 0:05 08.11.2019



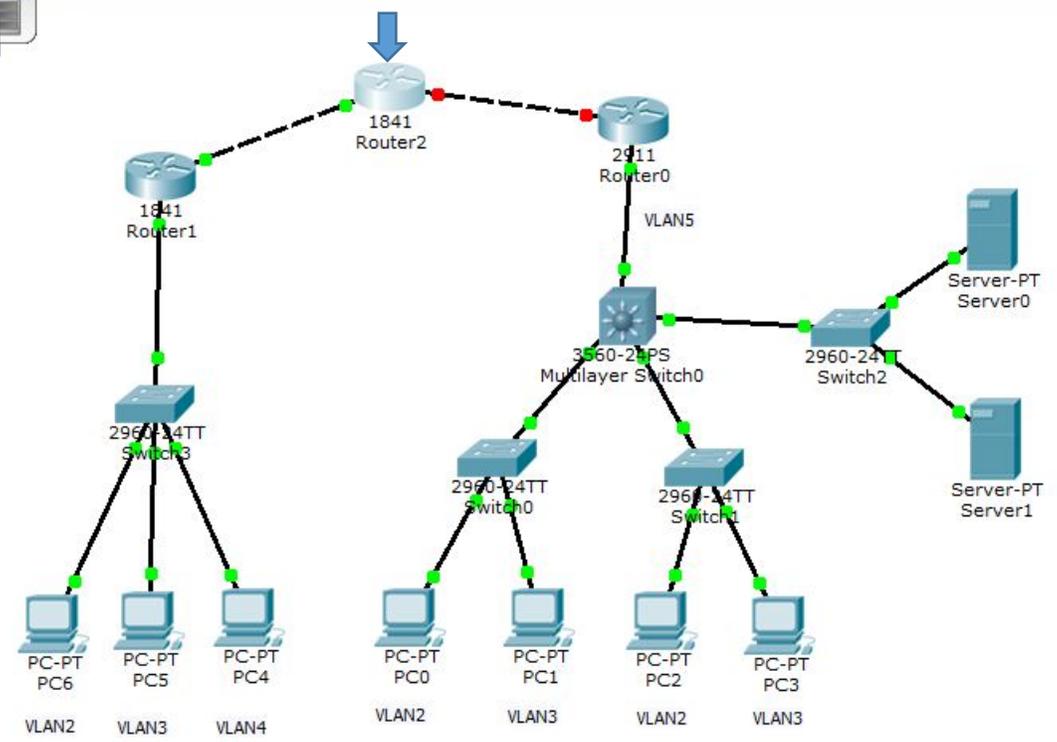
Мы построили сеть, состоящую из двух филиалов.
Попробуем её немного усложнить, добавив ещё один роутер 1841 между двумя уже имеющимися роутерами.



Настроим соединения между этими роутерами:

Fa0/1 и Gig0/1 к Fa0/0 и Fa0/1.

Настроим Router2.



Router2

Physical Config CLI

IOS Command Line Interface

```

--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#no shut
Router(config-if)#no shutdown

Router(config-if)#
%LINK-S-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-S-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#ip add
Router(config-if)#ip address 192.168.70.1 255.255.255.0
Router(config-if)#exit
Router(config)#
  
```

Copy Paste

Набираем: «en», «conf t», «int fa0/0», «no shutdown», «ip address 192.168.70.1 255.255.255.0», «exit».

Connections

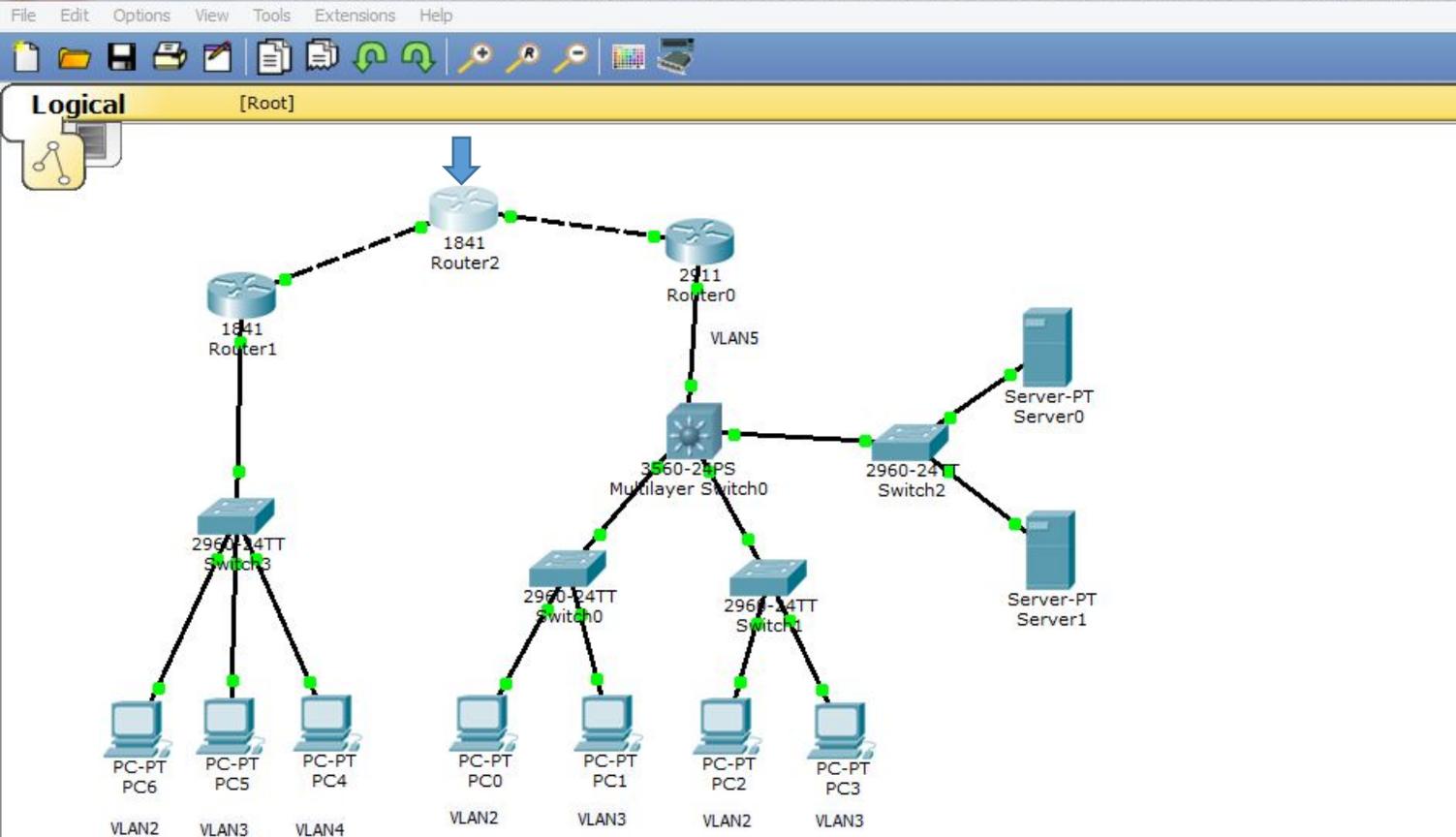
Automatically Choose Connection Type

Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete



```
Router2
Physical Config CLI
IOS Command Line Interface

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#ip add
Router(config-if)#ip address 192.168.70.1 255.255.255.0
Router(config-if)#exit
Router(config)#int fa 0/1
Router(config-if)#no shu
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Router(config-if)#ip address 192.168.80.1 255.255.255.0
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
Building configuration...
[OK]
Router#
```

Copy Paste

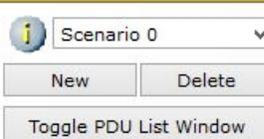
Настраиваем другой порт, набираем: «int fa0/1», «no shutdown», «ip address 192.168.80.1 255.255.255.0», «end», «wr mem».

Time: 03:51:13 Power Cycle Devices Fast Forward Time

Realtime

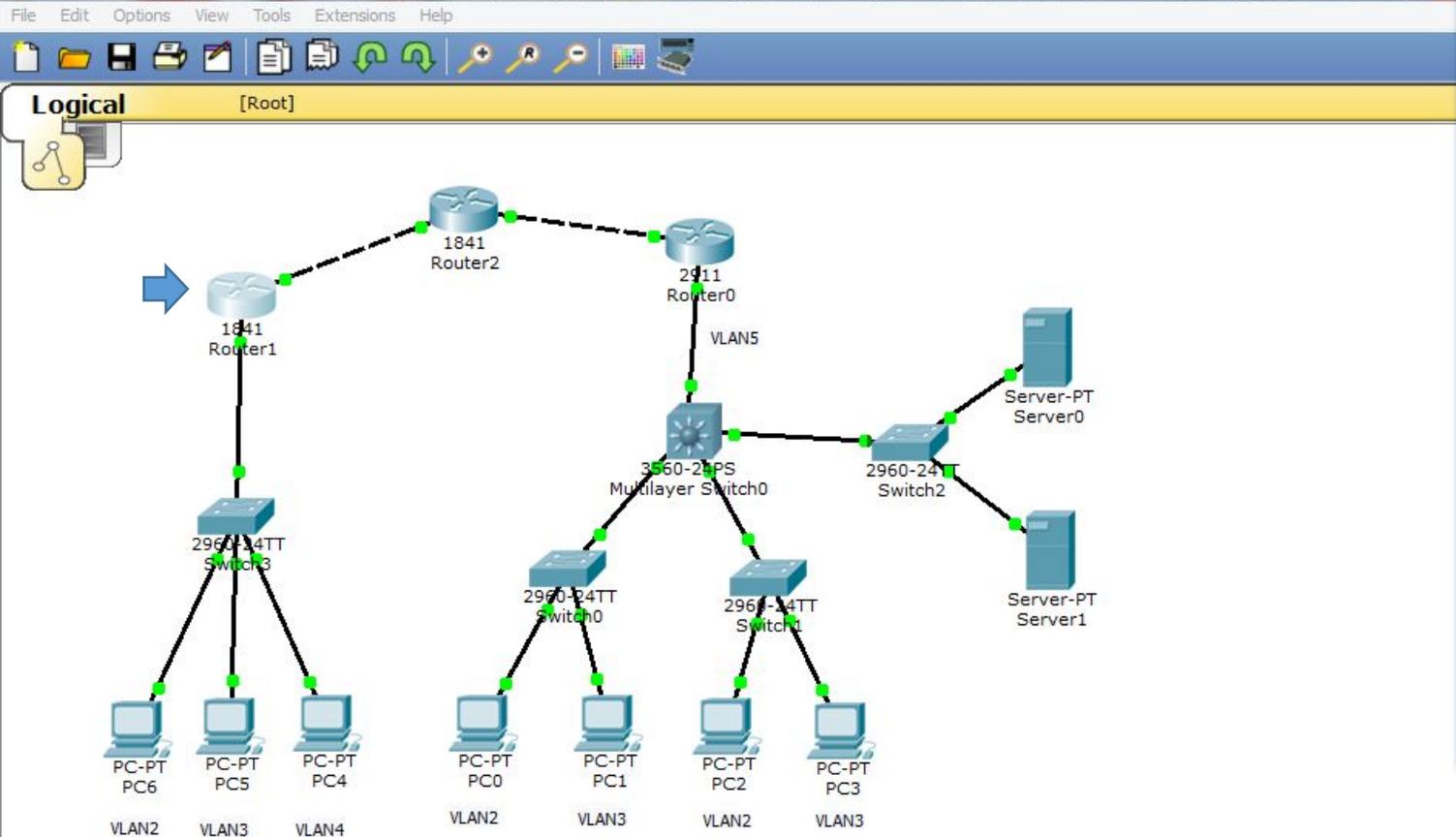


Automatically Choose Connection Type



Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------





Router1

Physical Config CLI

IOS Command Line Interface

```

!
interface FastEthernet0/0.2
 encapsulation dot1Q 2
 ip address 192.168.2.1 255.255.255.0
!
interface FastEthernet0/0.3
 encapsulation dot1Q 3
 ip address 192.168.3.1 255.255.255.0
!
interface FastEthernet0/0.4
 encapsulation dot1Q 4
 ip address 192.168.4.1 255.255.255.0
!
interface FastEthernet0/1
 ip address 192.168.70.2 255.255.255.252
 duplex auto
 speed auto
!
interface Vlan1
 no ip address
 shutdown
!
ip classless
 ip route 0.0.0.0 0.0.0.0 192.168.70.1
!

```

Copy Paste

Проверим настройки Router1, набираем: «en», «shou run», нужно поменять маску для FastEthernet0/1.

Connections

Automatically Choose Connection Type

Scenario 0

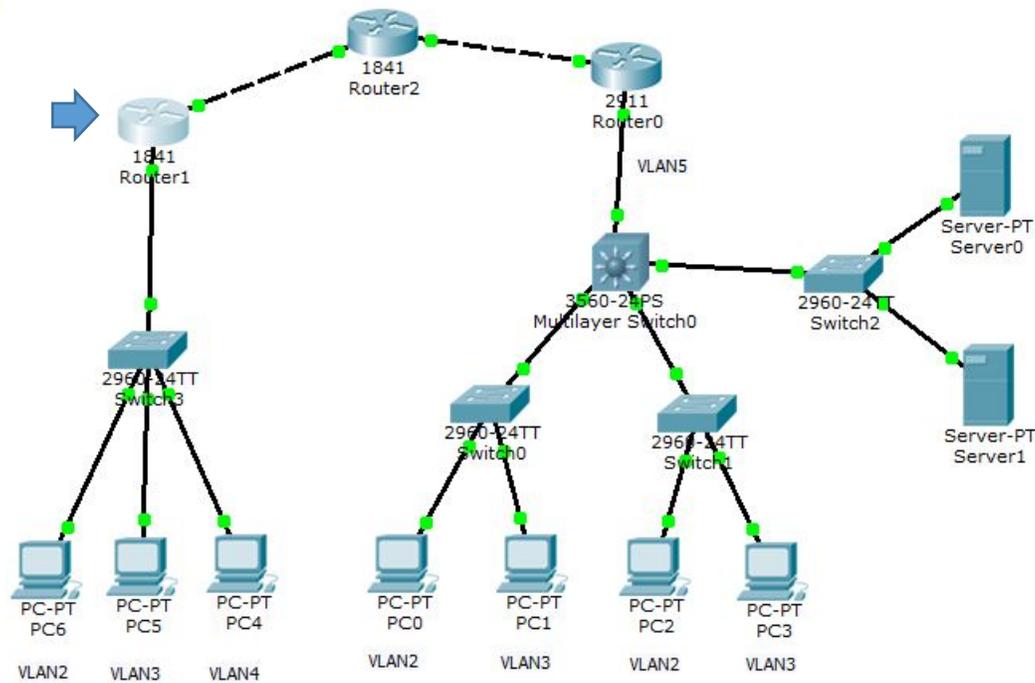
Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete

New Delete

Toggle PDU List Window



Logical [Root]



Router1

Physical Config CLI

IOS Command Line Interface

```
!
!
line con 0
!
line aux 0
!
line vty 0 4
  login
!
!
!
end

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa 0/1
Router(config-if)#ip address 192.168.70.2 255.255.255.0
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

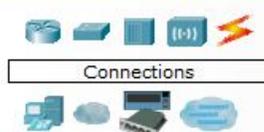
Router#wr mem
Building configuration...
[OK]
Router#
```

Copy Paste

Набираем: «conf t», «int fa 0/1», «ip address 192.168.70.2 255.255.255.0», «end», «wr mem».

Time: 04:06:39 Power Cycle Devices Fast Forward Time

Realtime



Automatically Choose Connection Type

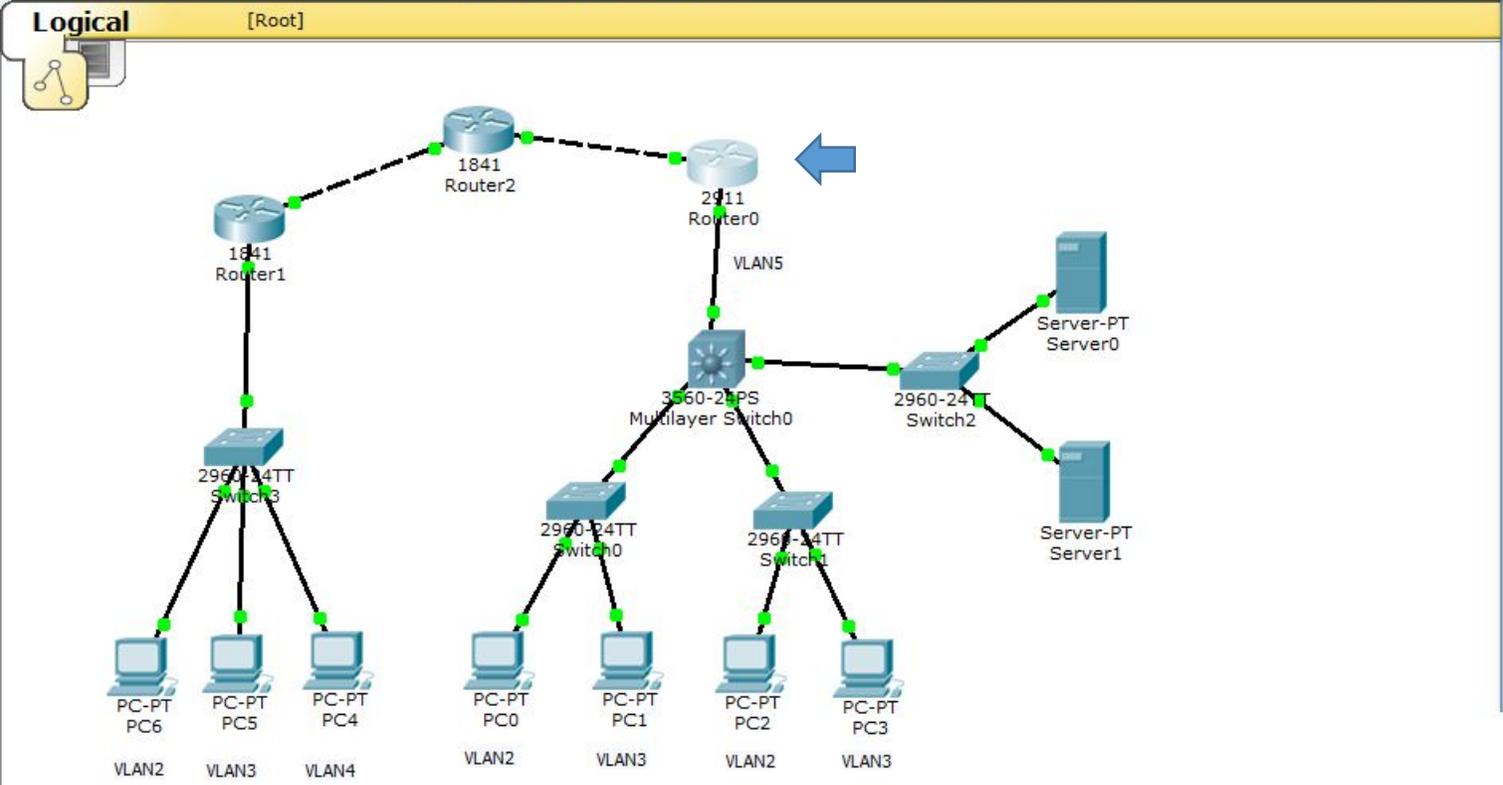
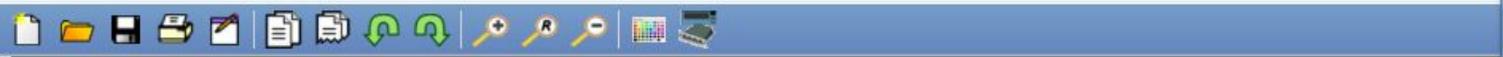
Scenario 0

New Delete

Toggle PDU List Window

Fire Last Status Source Destination Type Color Time (sec) Periodic Num Edit Delete





Router0

Physical Config CLI

IOS Command Line Interface

```
!
interface GigabitEthernet0/1
 ip address 192.168.70.1 255.255.255.252
 duplex auto
 speed auto
!
interface GigabitEthernet0/2
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
ip classless
 ip route 192.168.22.0 255.255.255.0 192.168.55.2
 ip route 192.168.33.0 255.255.255.0 192.168.55.2
 ip route 192.168.44.0 255.255.255.0 192.168.55.2
 ip route 192.168.2.0 255.255.255.0 192.168.70.2
 ip route 192.168.3.0 255.255.255.0 192.168.70.2
 ip route 192.168.4.0 255.255.255.0 192.168.70.2
!
!
```

Copy Paste

Проверим настройки на роутере 2911, набираем: «en», «show run»,
нужно изменить маршруты и ip-адрес на GigabitEthernet0/1.

Connections

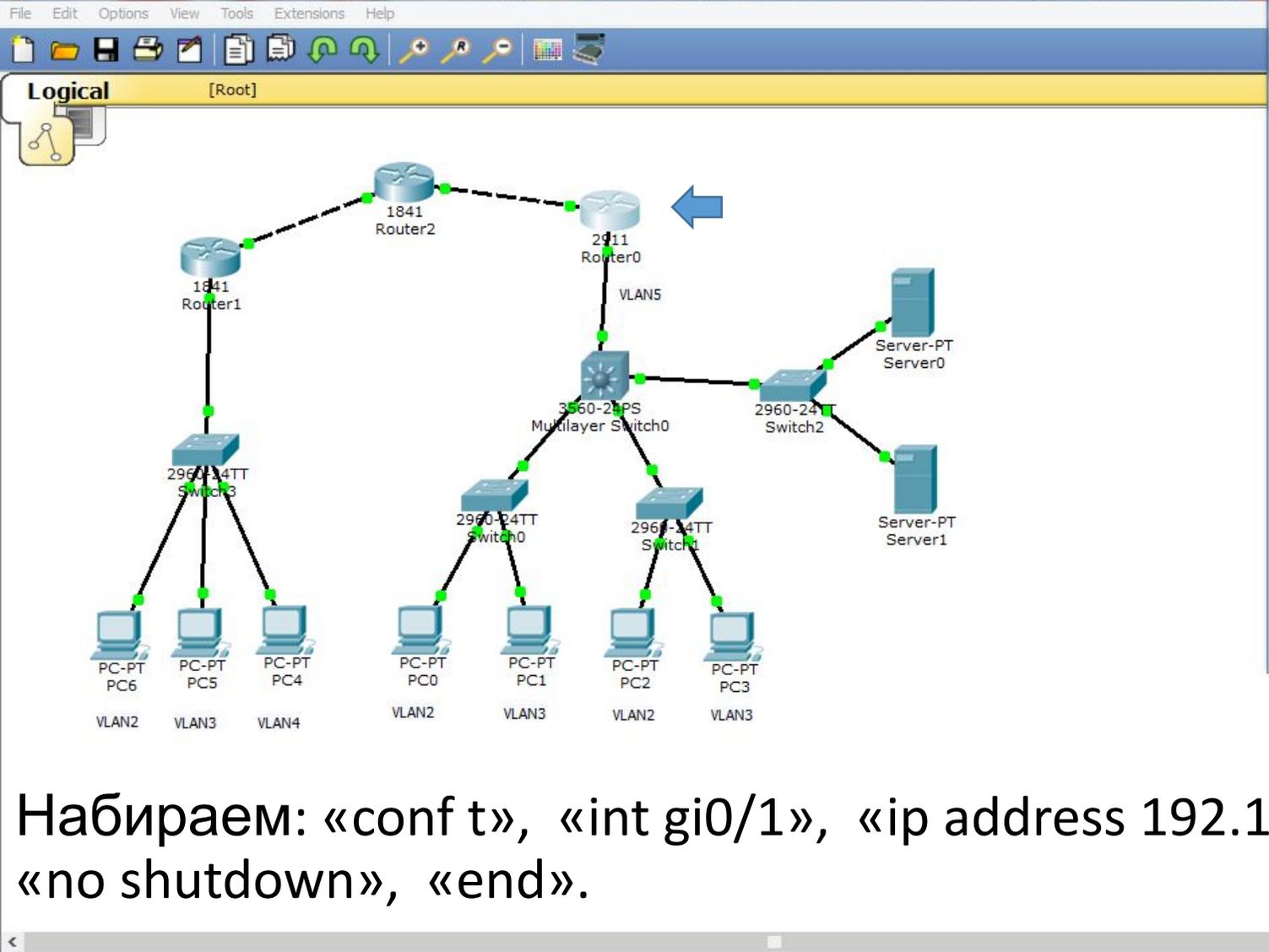
Automatically Choose Connection Type

Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------



Router0

Physical Config CLI

IOS Command Line Interface

```

!
!
!
line con 0
!
line aux 0
!
line vty 0 4
  login
!
!
!
end

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int gi0/1
Router(config-if)#ip address 192.168.80.2 255.255.255.0
Router(config-if)#no sh
Router(config-if)#no shutdown
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#
  
```

Copy Paste

Набираем: «conf t», «int gi0/1», «ip address 192.168.80.2 255.255.255.0», «no shutdown», «end».

Connections

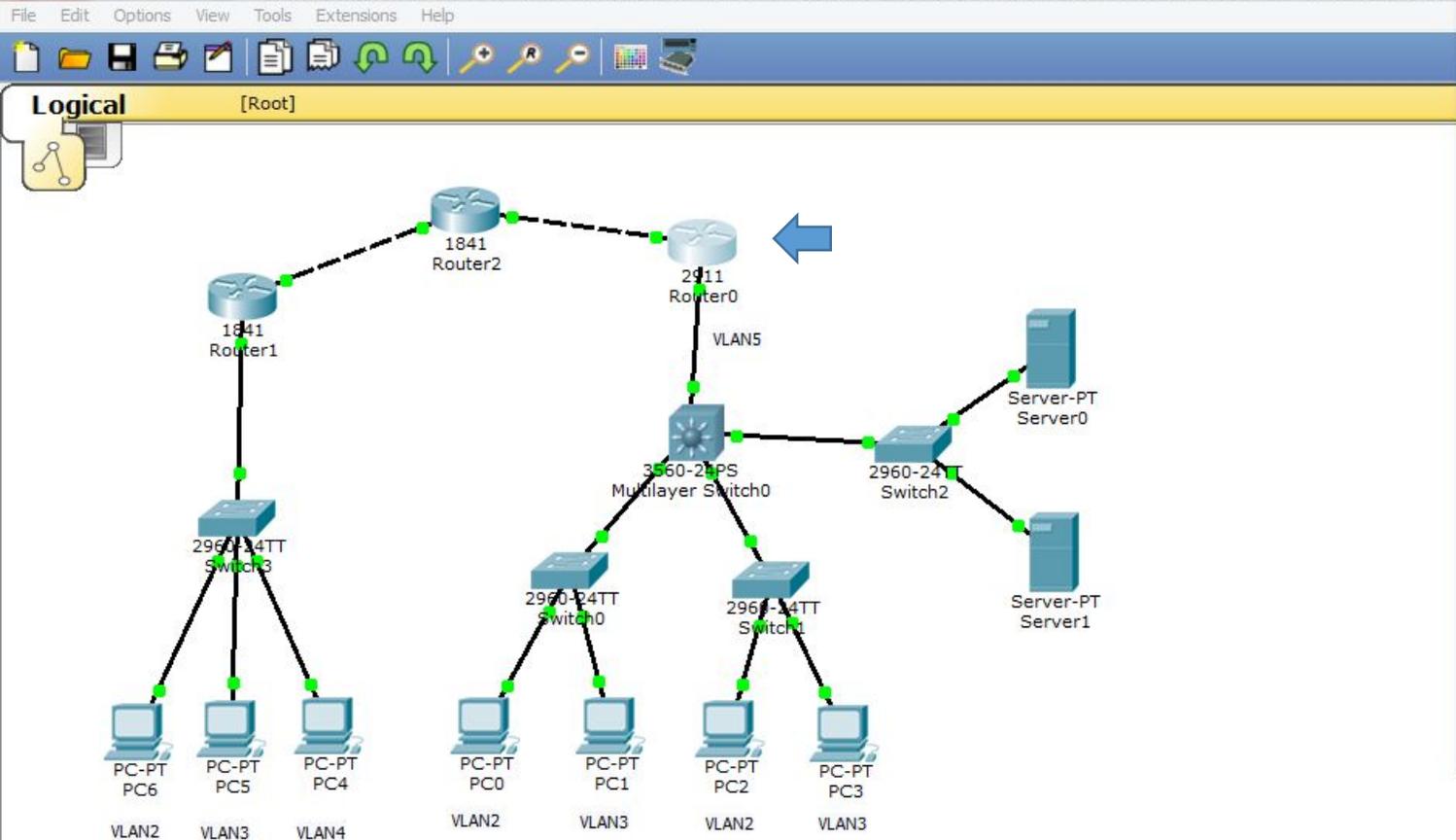
Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete

New Delete

Toggle PDU List Window

Automatically Choose Connection Type



```
Router0
Physical Config CLI
IOS Command Line Interface
interface GigabitEthernet0/1
ip address 192.168.80.2 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/2
no ip address
duplex auto
speed auto
shutdown
!
interface Vlan1
no ip address
shutdown
!
ip classless
ip route 192.168.22.0 255.255.255.0 192.168.55.2
ip route 192.168.33.0 255.255.255.0 192.168.55.2
ip route 192.168.44.0 255.255.255.0 192.168.55.2
ip route 192.168.2.0 255.255.255.0 192.168.70.2
ip route 192.168.3.0 255.255.255.0 192.168.70.2
ip route 192.168.4.0 255.255.255.0 192.168.70.2
!
!
!
```

Copy Paste

Проверим изменения в настройках, набираем: «show run», видим, что изменился ip-адрес на GigabitEthernet0/1. Вместо трёх маршрутов укажем один по умолчанию, т.к. выход из филиала осуществляется через один интерфейс.

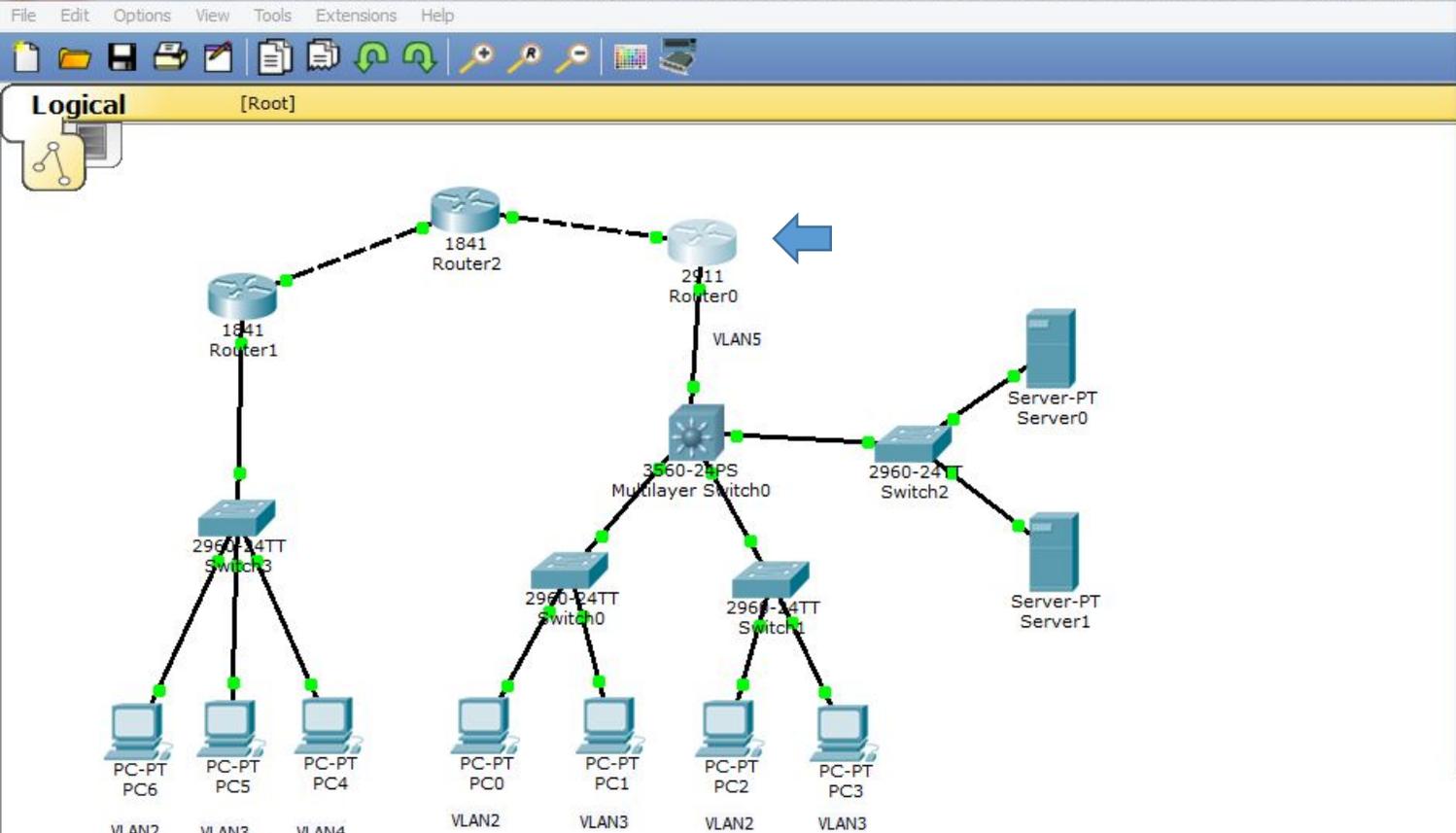
Realtime

Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

Automatically Choose Connection Type

Windows taskbar: 1:05 08.11.2019



Router0

Physical Config CLI

IOS Command Line Interface

```

!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
  login
!
!
!
!
end

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip route 192.168.2.0 255.255.255.0 192.168.70.2
Router(config)#no ip route 192.168.3.0 255.255.255.0 192.168.70.2
Router(config)#no ip route 192.168.4.0 255.255.255.0 192.168.70.2
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#

```

Copy Paste

Удаляем три старые маршрута, набираем: «conf t»,
 «no ip route 192.168.2.0 255.255.255.0 192.168.70.2»,
 «no ip route 192.168.3.0 255.255.255.0 192.168.70.2»,
 «no ip route 192.168.4.0 255.255.255.0 192.168.70.2», «end».

Time: 04:40:31 | Power Cycle Devices Fast Forward Time Realtime

Connections

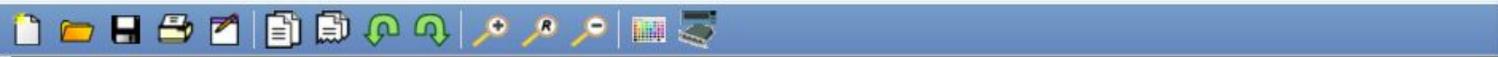
Automatically Choose Connection Type

Scenario 0

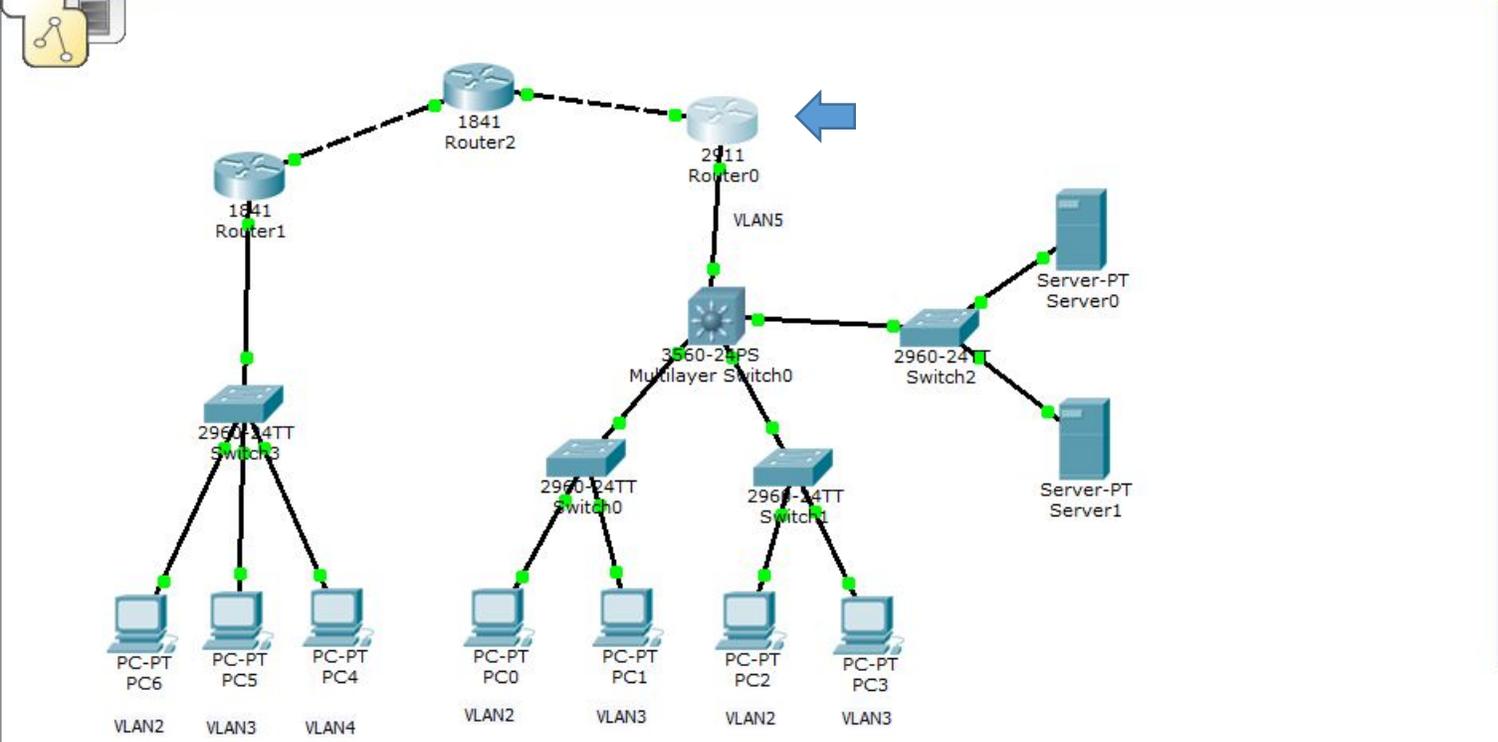
New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete



Logical [Root]



Router0

Physical Config CLI

IOS Command Line Interface

```
!
line vty 0 4
 login
!
!
!
!
end

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip route 192.168.2.0 255.255.255.0 192.168.70.2
Router(config)#no ip route 192.168.3.0 255.255.255.0 192.168.70.2
Router(config)#no ip route 192.168.4.0 255.255.255.0 192.168.70.2
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#ping 192.168.80.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.80.1, timeout is 2 seconds:
..!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms

Router#
```

Copy Paste

Проверим связь с Router2, набираем: «ping 192.168.80.1», связь есть.

Time: 04:43:05 Power Cycle Devices Fast Forward Time

Connections

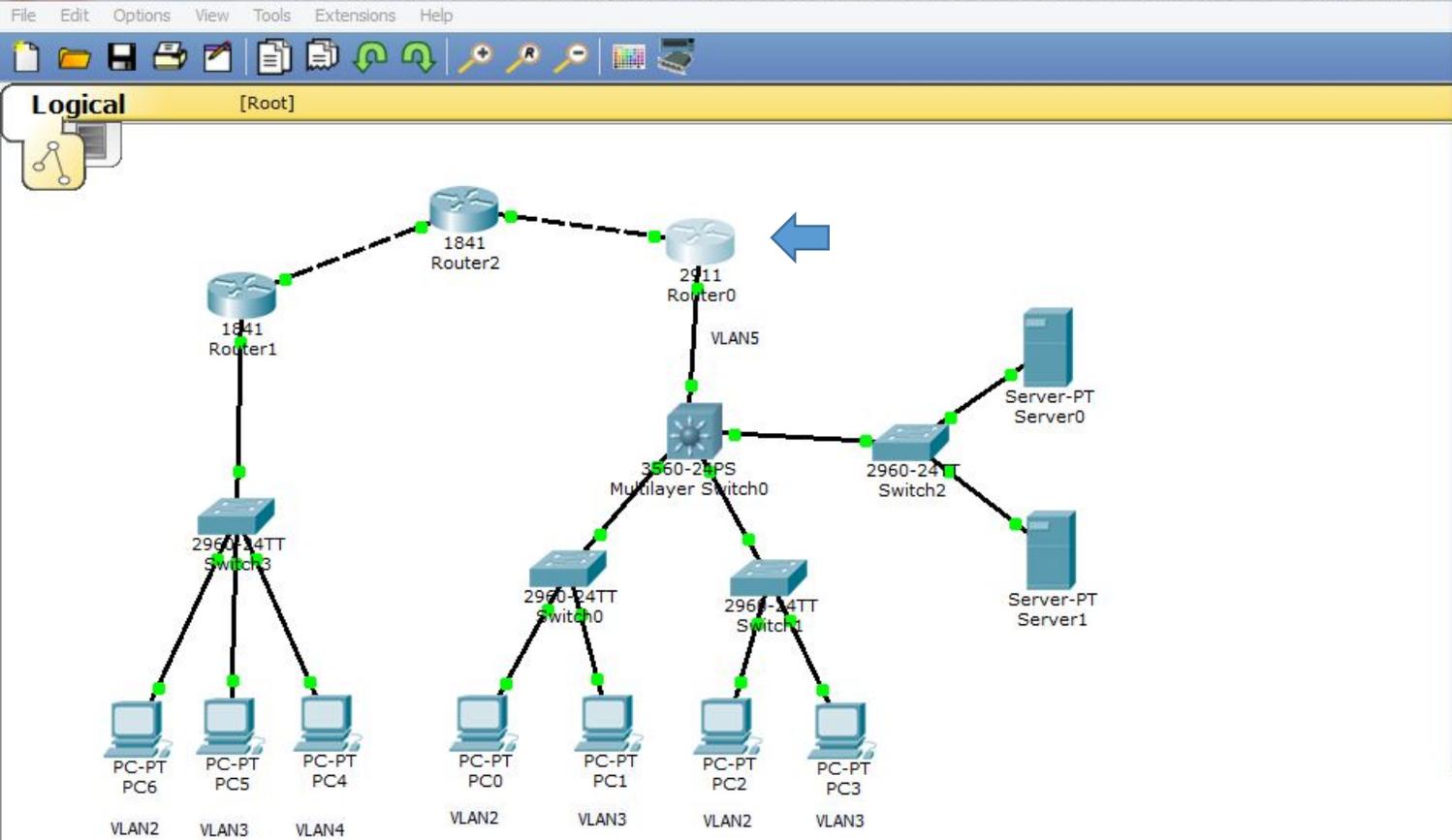
Automatically Choose Connection Type

Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------



```
Router0
Physical Config CLI
IOS Command Line Interface
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip route 192.168.2.0 255.255.255.0 192.168.70.2
Router(config)#no ip route 192.168.3.0 255.255.255.0 192.168.70.2
Router(config)#no ip route 192.168.4.0 255.255.255.0 192.168.70.2
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#ping 192.168.80.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.80.1, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.80.1
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
Building configuration...
[OK]
Router#
```

Copy Paste

Создадим маршрут по умолчанию через 192.168.80.1, набираем: «conf t», «ip route 0.0.0.0 0.0.0.0 192.168.80.1», «end», «wr mem».

Connections

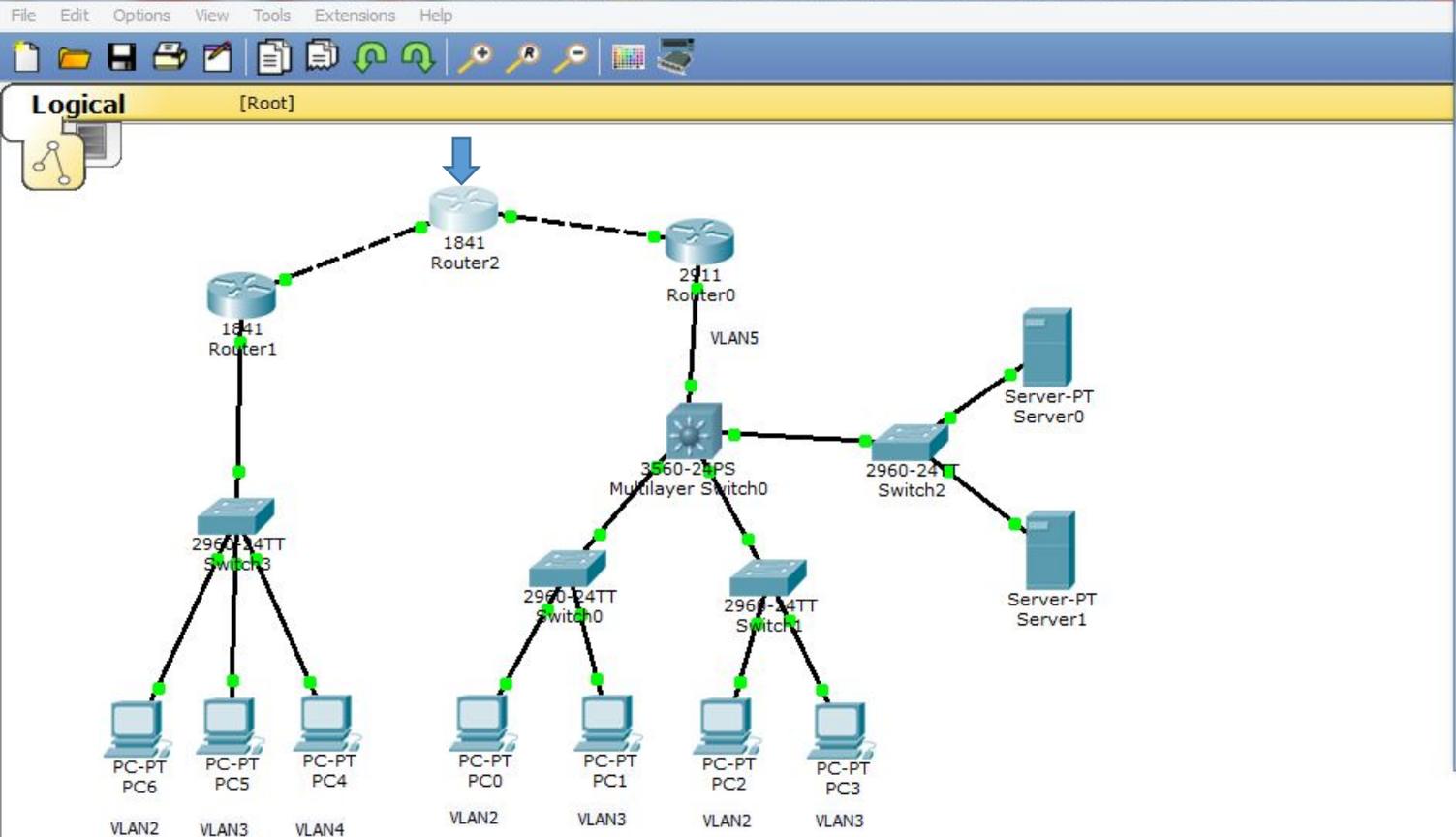
Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
------	-------------	--------	-------------	------	-------	------------	----------	-----	------	--------

New Delete

Toggle PDU List Window

Automatically Choose Connection Type



Router2

Physical Config CLI

IOS Command Line Interface

```

Press RETURN to get started.

Router>
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.70.2
Router(config)#ip route 192.168.3.0 255.255.255.0 192.168.70.2
Router(config)#ip route 192.168.4.0 255.255.255.0 192.168.70.2
Router(config)#0.2
^
% Invalid input detected at '^' marker.

Router(config)#
  
```

Copy Paste

Для Router2 настроим подсети 192.168.2.0, 192.168.3.0, 192.168.4.0 через 192.168.70.2, набираем: «en», «conf t», «ip route 192.168.2.0 255.255.255.0 192.168.70.2», «ip route 192.168.3.0 255.255.255.0 192.168.70.2», «ip route 192.168.4.0 255.255.255.0 192.168.70.2».

Time: 04:59:10 | Power Cycle Devices Fast Forward Time

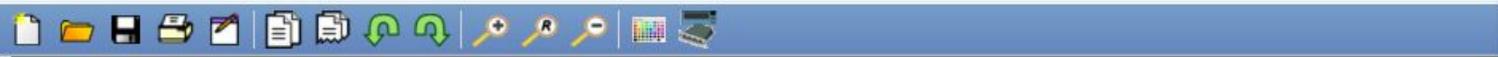
Realtime

Scenario 0

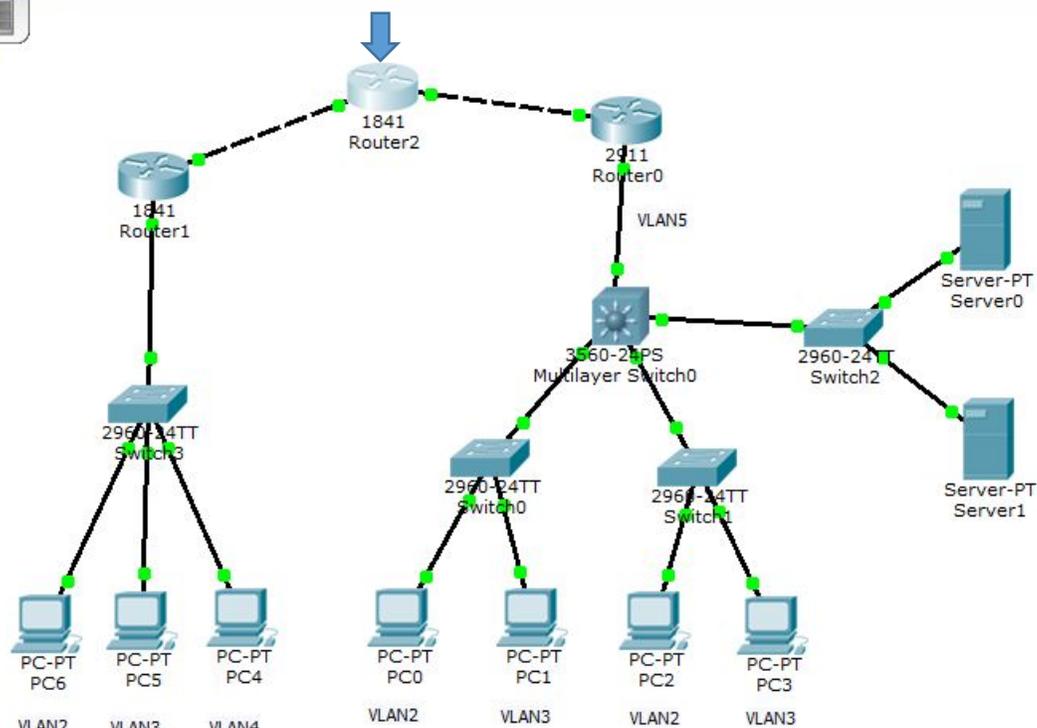
Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete

Automatically Choose Connection Type

Windows taskbar: 1:38 08.11.2019



Logical [Root]



Router2

Physical Config CLI

IOS Command Line Interface

```

Router>
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.70.2
Router(config)#ip route 192.168.3.0 255.255.255.0 192.168.70.2
Router(config)#ip route 192.168.4.0 255.255.255.0 192.168.70.2
Router(config)#0.2
^
% Invalid input detected at '^' marker.

Router(config)#ip route 192.168.22.0 255.255.255.0 192.168.80.2
Router(config)#ip route 192.168.33.0 255.255.255.0 192.168.80.2
Router(config)#ip route 192.168.44.0 255.255.255.0 192.168.80.2
Router(config)#
Router#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
Building configuration...
[OK]
Router#

```

Copy Paste

А подсети 192.168.22.0, 192.168.33.0, 192.168.44.0 настраиваем через 192.168.80.2, набираем: «ip route 192.168.22.0 255.255.255.0 192.168.80.2», «ip route 192.168.33.0 255.255.255.0 192.168.80.2», «ip route 192.168.44.0 255.255.255.0 192.168.80.2», «end», «wr mem».

Time: 05:06:29 Power Cycle Devices Fast Forward Time Realtime

Connections

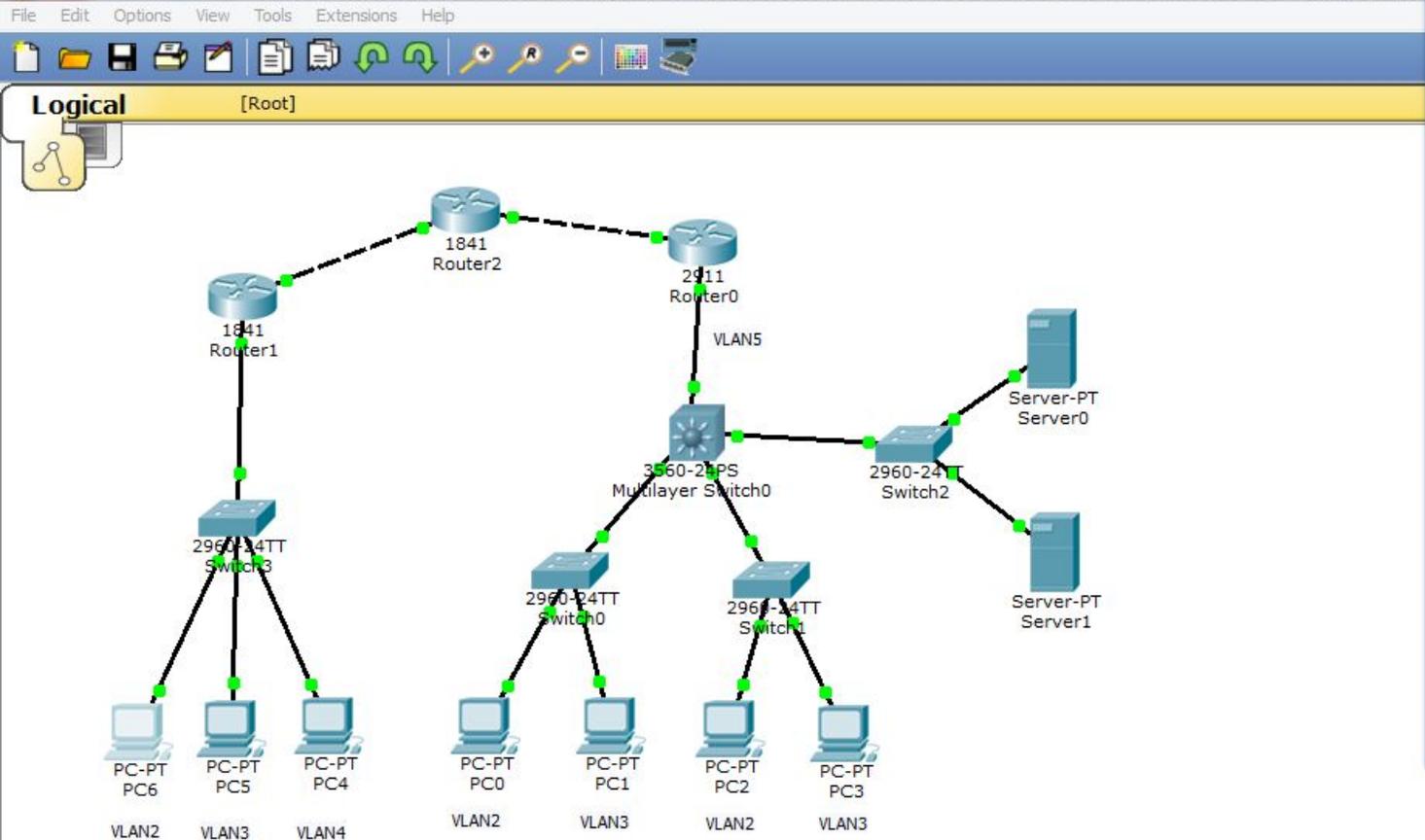
Automatically Choose Connection Type

Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete



PC6

Physical Config Desktop Custom Interface

Command Prompt

```

Pinging 192.168.33.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.33.2: bytes=32 time=10ms TTL=124
Reply from 192.168.33.2: bytes=32 time=12ms TTL=124
Reply from 192.168.33.2: bytes=32 time=14ms TTL=124

Ping statistics for 192.168.33.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 14ms, Average = 12ms

PC>ping 192.168.22.2

Pinging 192.168.22.2 with 32 bytes of data:

Reply from 192.168.22.2: bytes=32 time=11ms TTL=124
Reply from 192.168.22.2: bytes=32 time=14ms TTL=124
Reply from 192.168.22.2: bytes=32 time=10ms TTL=124
Reply from 192.168.22.2: bytes=32 time=12ms TTL=124

Ping statistics for 192.168.22.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 14ms, Average = 11ms

PC>

```

Проверим соединение между PC6 и PC0, PC1, Server0.
Связь есть.

Connections

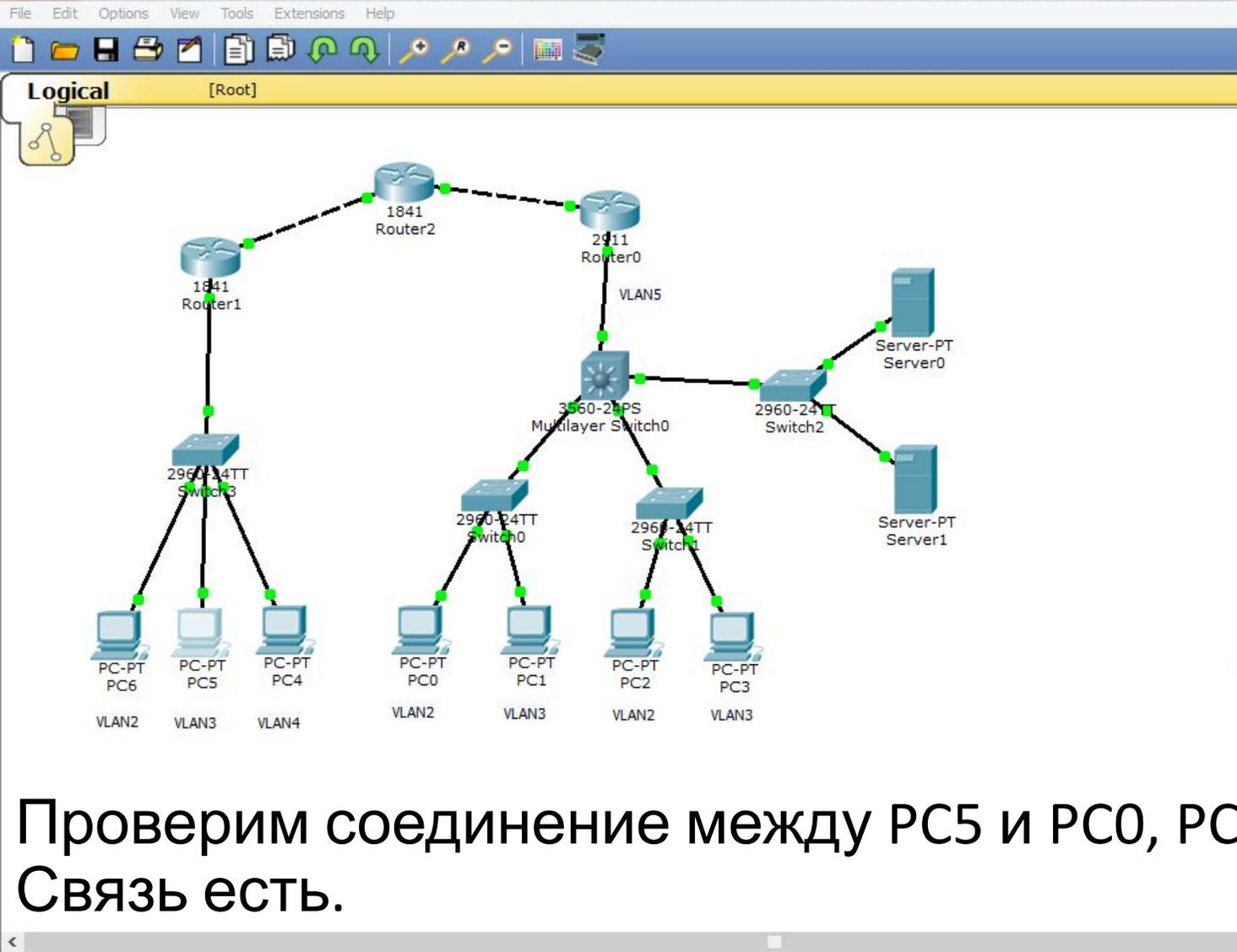
Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete

Automatically Choose Connection Type

New Delete

Toggle PDU List Window



PC5

Physical Config Desktop Custom Interface

Command Prompt

```

Pinging 192.168.33.2 with 32 bytes of data:

Reply from 192.168.33.2: bytes=32 time=10ms TTL=124
Reply from 192.168.33.2: bytes=32 time=14ms TTL=124
Reply from 192.168.33.2: bytes=32 time=11ms TTL=124
Reply from 192.168.33.2: bytes=32 time=13ms TTL=124

Ping statistics for 192.168.33.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 14ms, Average = 12ms

PC>ping 192.168.44.2

Pinging 192.168.44.2 with 32 bytes of data:

Reply from 192.168.44.2: bytes=32 time=12ms TTL=124
Reply from 192.168.44.2: bytes=32 time=11ms TTL=124
Reply from 192.168.44.2: bytes=32 time=10ms TTL=124
Reply from 192.168.44.2: bytes=32 time=11ms TTL=124

Ping statistics for 192.168.44.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 12ms, Average = 11ms

PC>
  
```

Проверим соединение между PC5 и PC0, PC1, Server0.
Связь есть.

Connections

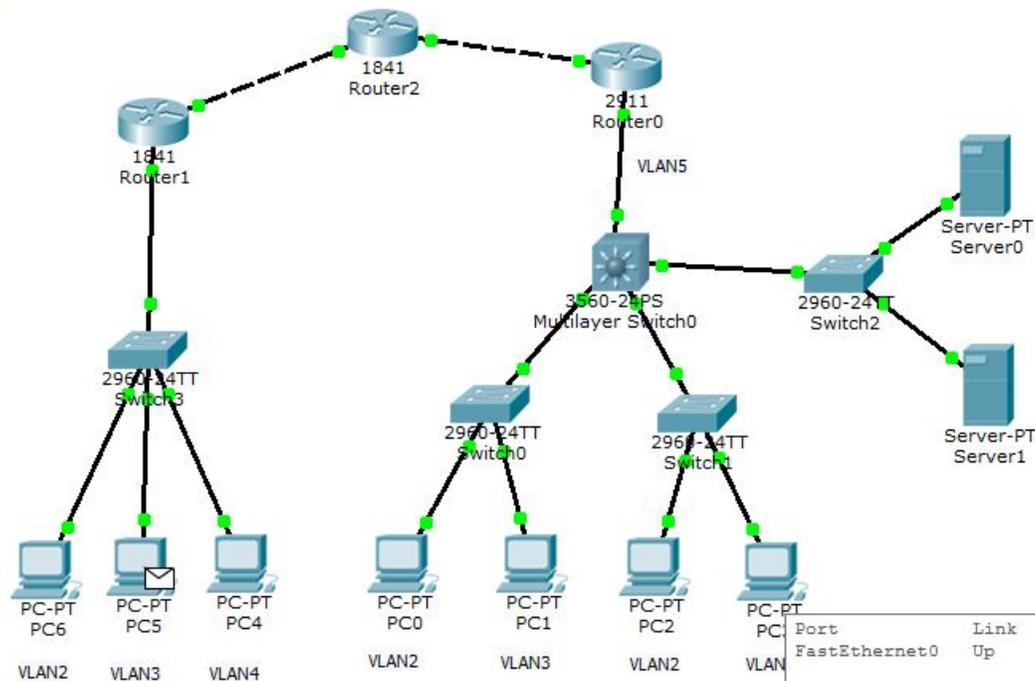
Scenario 0

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete

Automatically Choose Connection Type

New Delete

Toggle PDU List Window



Port	Link	IP Address	IPv6 Address	MAC Address
FastEthernet0	Up	192.168.33.3/24	<not set>	000D.BD37.5D8B

Gateway: 192.168.33.1
 DNS Server: <not set>
 Line Number: <not set>

Physical Location: Intercity, Home City, Corporate Office, Wiring Closet

Пробуем отправить сообщение с PC5 на PC3.

Connections

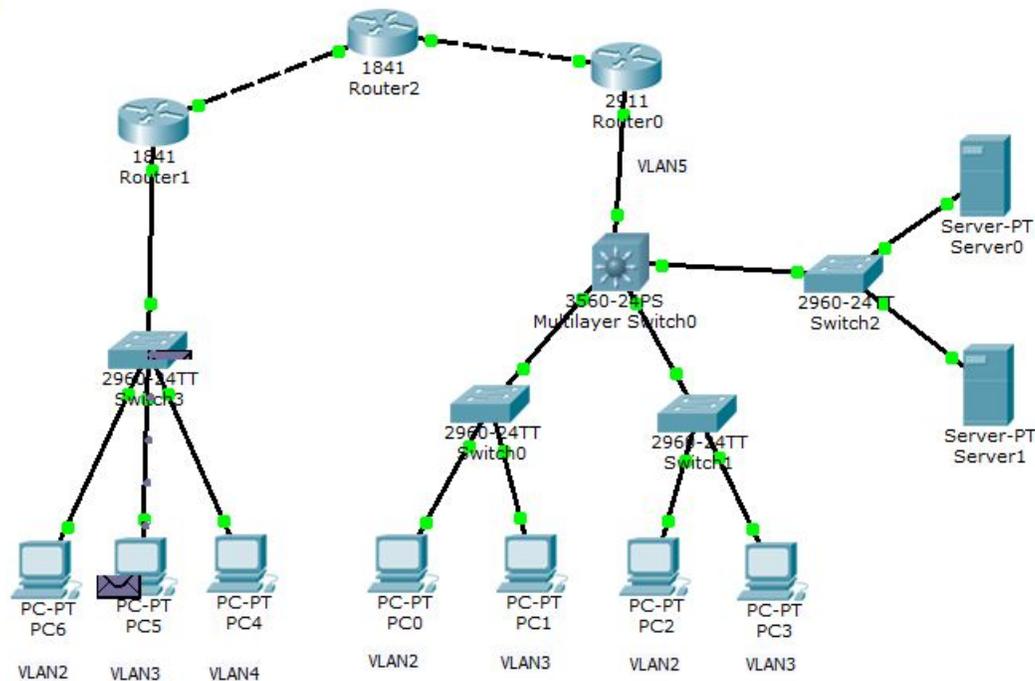
Automatically Choose Connection Type

Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete



Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC5	ICM
<input checked="" type="checkbox"/>	0.001	PC5	Switch3	ICM

Reset Simulation Constant Delay Capturing... *

Play Controls

Back Auto Capture / Play Capture / Forward

Event List Filters - Visible Events

ACL Filter, ARP, BGP, CDP, DHCP, DNS, DTP, EIGRP, FTP, H.323, HSRP, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NTP, OSPF, PAP, POP3, RADIUS, RIP, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters Show All

Сообщение с отправляется.

Connections

Automatically Choose Connection Type

Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
<input checked="" type="checkbox"/>	In Progress	PC5	PC3	ICMP		0.000	N	0	(edit)	(delete)



Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC5	ICMP
	0.001	PC5	Switch3	ICMP
	0.003	Switch3	Router1	ICMP
	0.006	Router1	Router2	ICMP
	0.008	Router2	Router0	ICMP
	0.009	Router0	Multilay...	ICMP
	0.012	Multilayer ...	Switch1	ICMP
	0.014	Switch1	PC3	ICMP

Reset Simulation Constant Delay Capturing... *

Play Controls

Back Auto Capture / Play Capture / Forward

Event List Filters - Visible Events

ACL Filter, ARP, BGP, CDP, DHCP, DNS, DTP, EIGRP, FTP, H.323, HSRP, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, LACP, NTP, OSPF, PAgP, POP3, RADIUS, RIP, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters Show All

Сообщение с проходит и возвращается ответ.
То есть у нас существует связь между филиалами через три маршрутизатора посредством статической маршрутизации.

Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete
<input checked="" type="checkbox"/>	In Progress	PC5	PC3	ICMP	Blue	0.000	N	0	(edit)	(delete)

Automatically Choose Connection Type

Маска подсети	Маска в двоичной системе	Префикс	Количество адресов	Обратная маска
255.255.255.255	11111111.11111111.11111111.11111111	/32	1	0.0.0.0
255.255.255.254	11111111.11111111.11111111.11111110	/31	2	0.0.0.1
255.255.255.252	11111111.11111111.11111111.11111100	/30	4	0.0.0.3
255.255.255.248	11111111.11111111.11111111.11111000	/29	8	0.0.0.7
255.255.255.240	11111111.11111111.11111111.11110000	/28	16	0.0.0.15
255.255.255.224	11111111.11111111.11111111.11100000	/27	32	0.0.0.31
255.255.255.192	11111111.11111111.11111111.11000000	/26	64	0.0.0.63
255.255.255.128	11111111.11111111.11111111.10000000	/25	128	0.0.0.127
255.255.255.0	11111111.11111111.11111111.00000000	/24	256	0.0.0.255
255.255.254.0	11111111.11111111.11111110.00000000	/23	512	0.0.1.255
255.255.252.0	11111111.11111111.11111100.00000000	/22	1024	0.0.3.255
255.255.248.0	11111111.11111111.11111000.00000000	/21	2048	0.0.7.255
255.255.240.0	11111111.11111111.11110000.00000000	/20	4096	0.0.15.255
255.255.224.0	11111111.11111111.11100000.00000000	/19	8192	0.0.31.255
255.255.192.0	11111111.11111111.11000000.00000000	/18	16384	0.0.63.255
255.255.128.0	11111111.11111111.10000000.00000000	/17	32768	0.0.127.255
255.255.0.0	11111111.11111111.00000000.00000000	/16	65536	0.0.255.255
255.254.0.0	11111111.11111110.00000000.00000000	/15	131072	0.1.255.255
255.252.0.0	11111111.11111100.00000000.00000000	/14	262144	0.3.255.255
255.248.0.0	11111111.11111000.00000000.00000000	/13	524288	0.7.255.255
255.240.0.0	11111111.11110000.00000000.00000000	/12	1048576	0.15.255.255

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Спасибо за внимание!

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