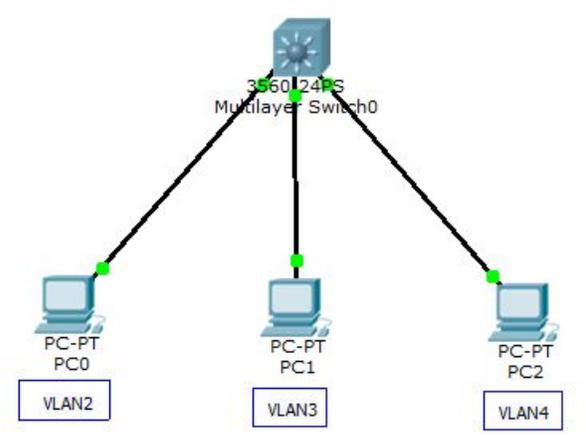


МДК.01.01

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

Практические занятия

Занятие 05



Создадим три виртуальные сети и будем их маршрутизировать коммутатором 3-го уровня.

Connections

Phone

Scenario 0

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

New Delete

Toggle PDU List Window



Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport

3560-24PS
Multilayer Switch0



PC-PT
PC0

VLAN2



PC-PT
PC1

VLAN3



PC-PT
PC2

VLAN4

Используем коммутатор 3560.

Time: 00:05:58 Power Cycle Devices Fast Forward Time

Realtime

End Devices



Copper Straight-Through

Scenario 0

New

Delete

Toggle PDU List Window

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





Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



Console

- FastEthernet0/1
- FastEthernet0/2
- FastEthernet0/3
- FastEthernet0/4
- FastEthernet0/5
- FastEthernet0/6
- FastEthernet0/7
- FastEthernet0/8
- FastEthernet0/9
- FastEthernet0/10
- FastEthernet0/11
- FastEthernet0/12
- FastEthernet0/13
- FastEthernet0/14
- FastEthernet0/15
- FastEthernet0/16
- FastEthernet0/17
- FastEthernet0/18
- FastEthernet0/19
- FastEthernet0/20
- FastEthernet0/21
- FastEthernet0/22
- FastEthernet0/23
- FastEthernet0/24
- GigabitEthernet0/1
- GigabitEthernet0/2

PC-PT PC0
VLAN2

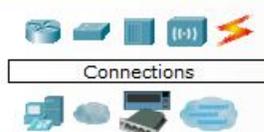
PC-PT PC2
VLAN4

Создадим соединения коммутатора с компьютерами, используя порты FastEthernet0/1, FastEthernet0/2, FastEthernet0/3.



Time: 00:06:40 Power Cycle Devices Fast F

Realtime



Copper Straight-Through

Scenario 0

New

Delete

Toggle PDU List Window

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





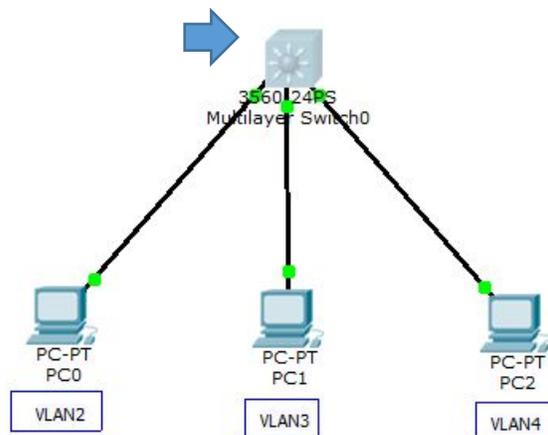
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



Создадим VLAN2, VLAN3, VLAN4.
Для этого зайдём в настройки
3560 в режим глобального
конфигурирования.

Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```
1, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Thu 05-Jul-07 22:22 by pt_team

Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
```

Copy Paste

Time: 00:13:08 Power Cycle Devices Fast Forward Time

Realtime



Copper Straight-Through

Scenario 0

New

Delete

Toggle PDU List Window

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





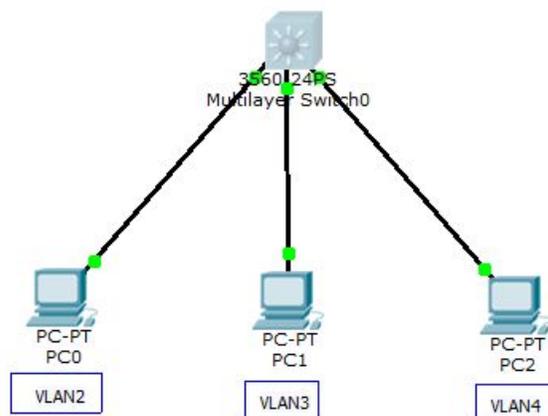
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```
Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 2
Switch(config-vlan)#name VLAN2
Switch(config-vlan)#exit
Switch(config)#
```

Copy Paste

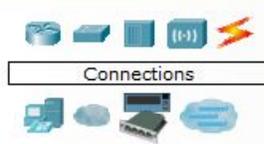
Создадим VLAN2.

Выполним команду: «vlan 2»,

зададим имя, выполнив команду: «name VLAN2», далее «exit».

Time: 00:18:00 Power Cycle Devices Fast Forward Time

Realtime



Copper Straight-Through

Scenario 0

New

Delete

Toggle PDU List Window

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





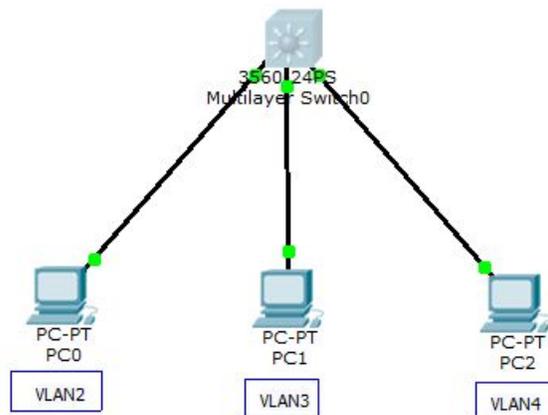
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 2
Switch(config-vlan)#name VLAN2
Switch(config-vlan)#exit
Switch(config)#vlan 4
Switch(config-vlan)#name VLAN3
Switch(config-vlan)#exit
Switch(config)#
```

Copy Paste

Создадим VLAN3.

Выполним команду: «vlan 3»,

зададим имя, выполнив команду: «name VLAN3», далее «exit».

Time: 00:24:05 Power Cycle Devices Fast Forward Time

Realtime

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





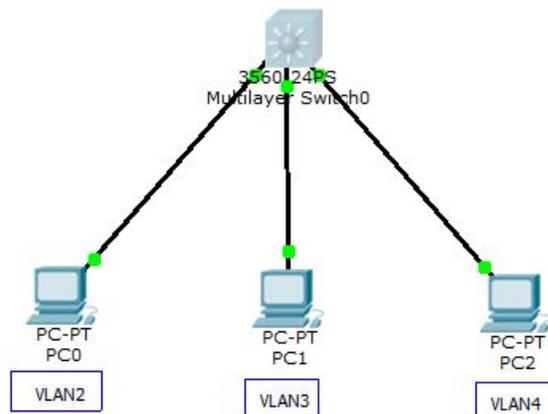
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state t
o up

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state t
o up

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 2
Switch(config-vlan)#name VLAN2
Switch(config-vlan)#exit
Switch(config)#vlan 4
Switch(config-vlan)#name VLAN3
Switch(config-vlan)#exit
Switch(config)#vlan 4
Switch(config-vlan)#name VLAN4
Switch(config-vlan)#exit
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#

```

Copy Paste

Создадим VLAN4.

Выполним команду: «vlan 4»,

зададим имя, выполнив команду: «name VLAN4», далее «exit», и «end».

Time: 00:28:30 Power Cycle Devices Fast Forward Time

Realtime



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



ENG

20:15
24.10.2019



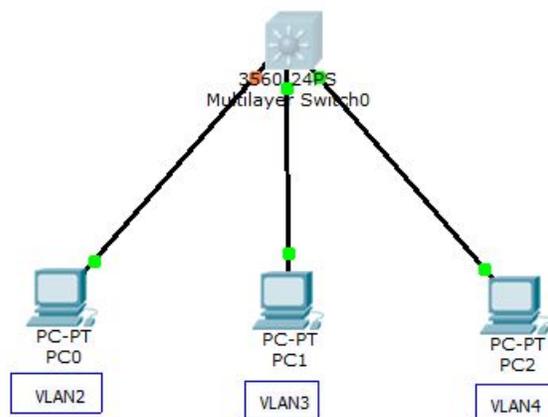
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 2
Switch(config-vlan)#name VLAN2
Switch(config-vlan)#exit
Switch(config)#vlan 4
Switch(config-vlan)#name VLAN3
Switch(config-vlan)#exit
Switch(config)#vlan 4
Switch(config-vlan)#name VLAN4
Switch(config-vlan)#exit
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int
Switch(config)#interface fa0/1
Switch(config-if)#swi
Switch(config-if)#switchport mode acc
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport acc
Switch(config-if)#switchport access vlan 2
Switch(config-if)#exit
Switch(config)#
```

Copy Paste

В режиме глобального конфигурирования определим порт FastEthernet0/1 во VLAN2. Выполним команду: «interface fa0/1», далее: «switchport mode access», «switchport access vlan 2», «exit».

Time: 00:34:17 Power Cycle Devices Fast Forward Time

Realtime



Copper Straight-Through

Scenario 0

New

Delete

Toggle PDU List Window

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





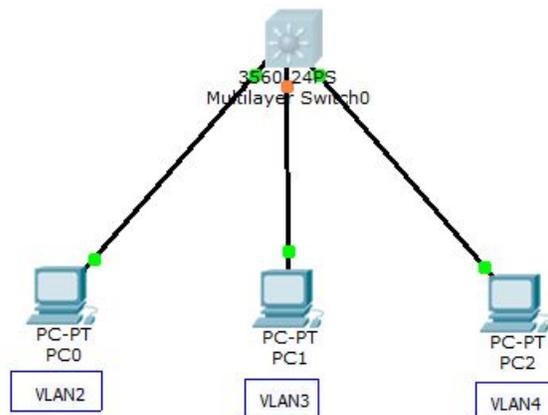
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```
Switch(config-vlan)#name VLAN4
Switch(config-vlan)#exit
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

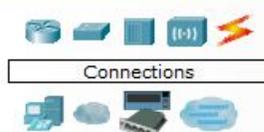
Switch#conf t
Enter configuration commands, one per line. End with CNTRL/Z.
Switch(config)#int
Switch(config)#interface fa0/1
Switch(config-if)#swi
Switch(config-if)#switchport mode acc
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport acc
Switch(config-if)#switchport access vlan 2
Switch(config-if)#exit
Switch(config)#int
Switch(config)#interface fa0/2
Switch(config-if)#sw
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport access vlan 3
% Access VLAN does not exist. Creating vlan 3
Switch(config-if)#exit
Switch(config)#
```

Copy Paste

Определим порт FastEthernet0/2 во VLAN3.
Выполним команду: «interface fa0/2»,
далее: «switchport mode access», «switchport access vlan 3», «exit».

Time: 00:45:25 | Power Cycle Devices Fast Forward Time

Realtime



Copper Straight-Through

Scenario 0

New

Delete

Toggle PDU List Window

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





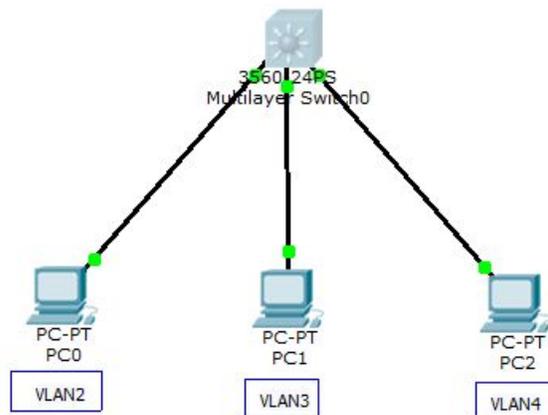
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

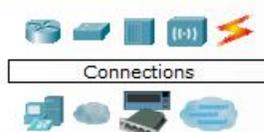
```
Switch(config-if)#switchport mode acc
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport acc
Switch(config-if)#switchport access vlan 2
Switch(config-if)#exit
Switch(config)#int
Switch(config)#interface fa0/2
Switch(config-if)#sw
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport access vlan 3
% Access VLAN does not exist. Creating vlan 3
Switch(config-if)#exit
Switch(config)#
Switch(config)#int
Switch(config)#interface fa0/3
Switch(config-if)#sw
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport access vlan 4
Switch(config-if)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console
Switch#
```

Copy Paste

Определим порт FastEthernet0/3 во VLAN4.
Выполним команду: «interface fa0/3»,
далее: «switchport mode access», «switchport access vlan 4», «end».

Time: 00:50:16 Power Cycle Devices Fast Forward Time

Realtime



Copper Straight-Through

Scenario 0

New

Delete

Toggle PDU List Window

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





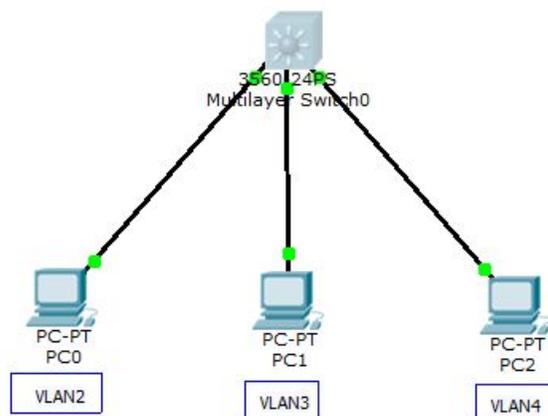
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```
Switch>
Switch>
Switch>
Switch>
Switch>
Switch>conf t
Switch>
^
% Invalid input detected at '^' marker.

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int
Switch(config)#interface vlan 2
Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to up

Switch(config-if)#ip ad
Switch(config-if)#ip address 2.2.2.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#
```

Copy Paste

В режиме глобального конфигурирования выполним команду: «interface vlan 2», далее: «ip address 2.2.2.1 255.255.255.0», «exit».

Time: 01:07:04 | Power Cycle Devices Fast Forward Time

Realtime



Copper Straight-Through



Scenario 0

New

Delete

Toggle PDU List Window

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





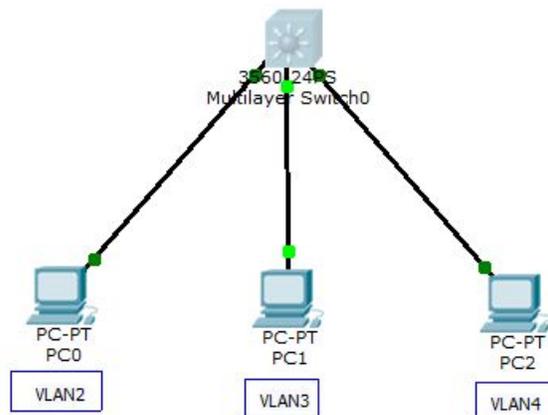
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int
Switch(config)#interface vlan 2
Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to up

Switch(config-if)#ip ad
Switch(config-if)#ip address 2.2.2.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#
Switch(config)#int
Switch(config)#interface vlan 3
Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan3, changed state to up

Switch(config-if)#ip ad
Switch(config-if)#ip address 3.3.3.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#
```

Copy Paste

Тоже самое сделаем для VLAN3, выполним команду: «interface vlan 3», далее: «ip address 3.3.3.1 255.255.255.0», «exit».

Time: 01:13:01 Power Cycle Devices Fast Forward Time

Realtime



Scenario 0

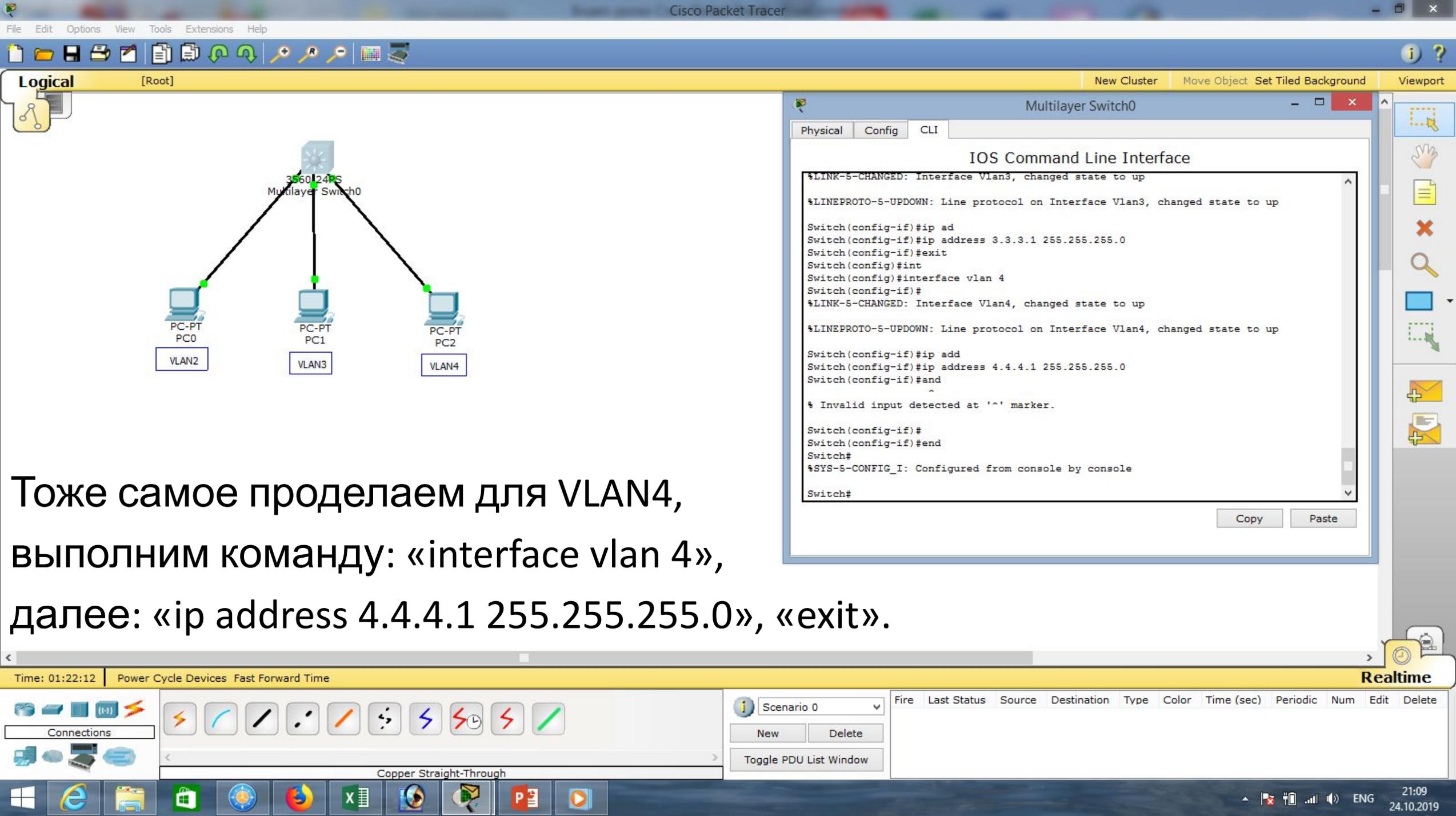
New

Delete

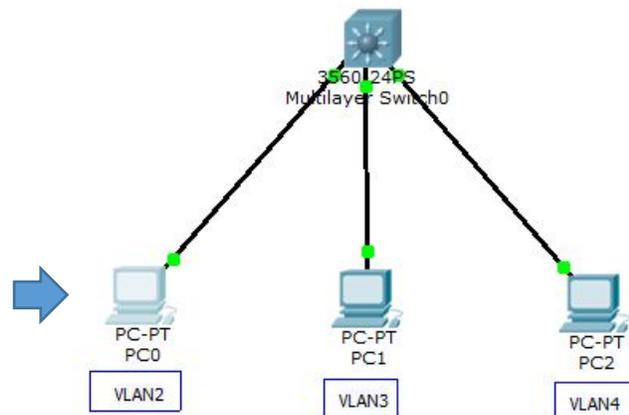
Toggle PDU List Window

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





Тоже самое сделаем для VLAN4, выполним команду: «interface vlan 4», далее: «ip address 4.4.4.1 255.255.255.0», «exit».



IP Configuration

IP Configuration

DHCP Static

IP Address: 2.2.2.2

Subnet Mask: 255.255.255.0

Default Gateway: 2.2.2.1

DNS Server:

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address: /

Link Local Address: FE80::208:BEFF:FECA:2A76

IPv6 Gateway:

IPv6 DNS Server:

Web Browser

Cisco IP Communicator

Настроим компьютер PC0.

Connections

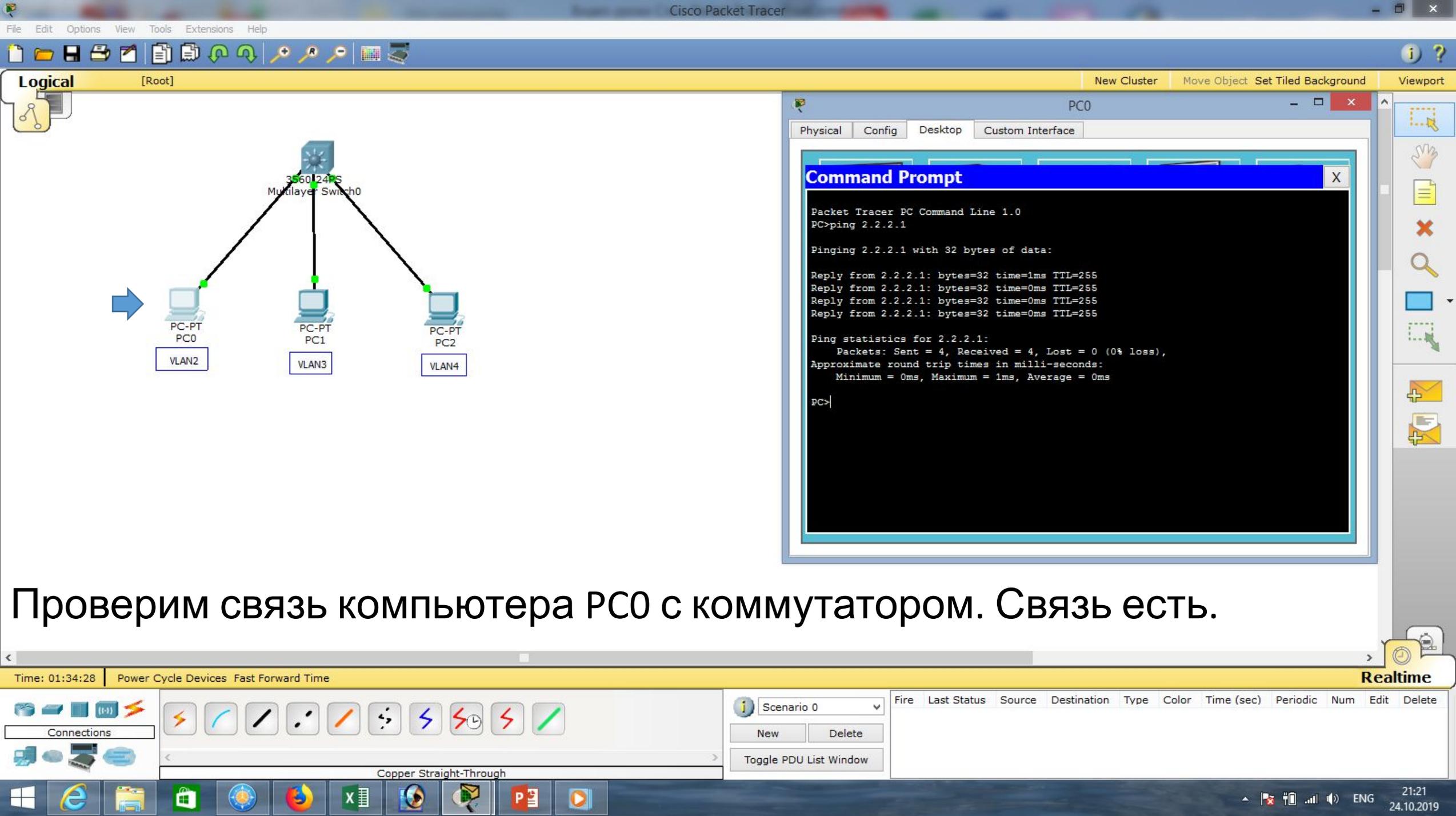
Copper Straight-Through

Scenario 0

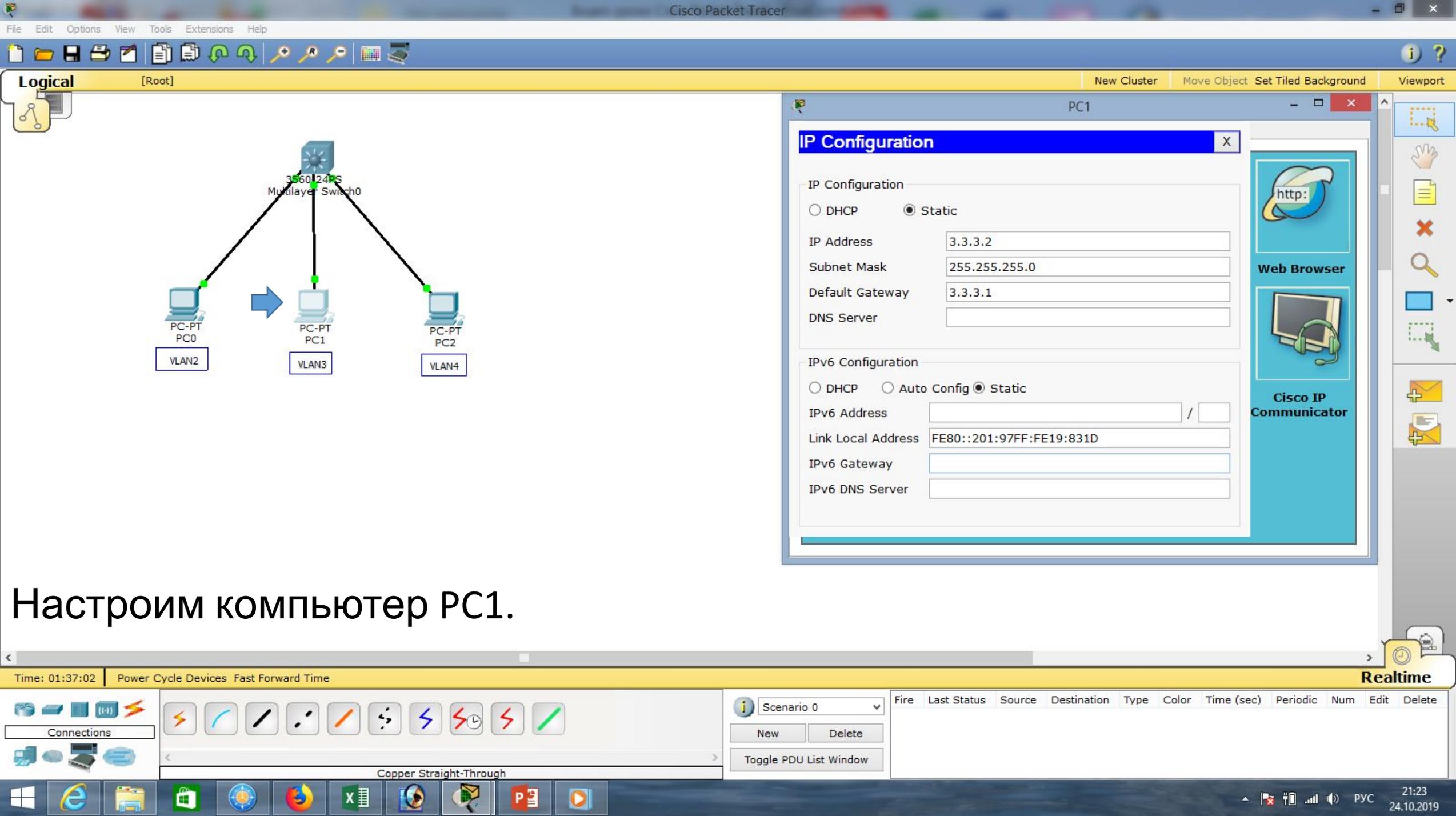
| Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete |
|------|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|
|------|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|

New Delete

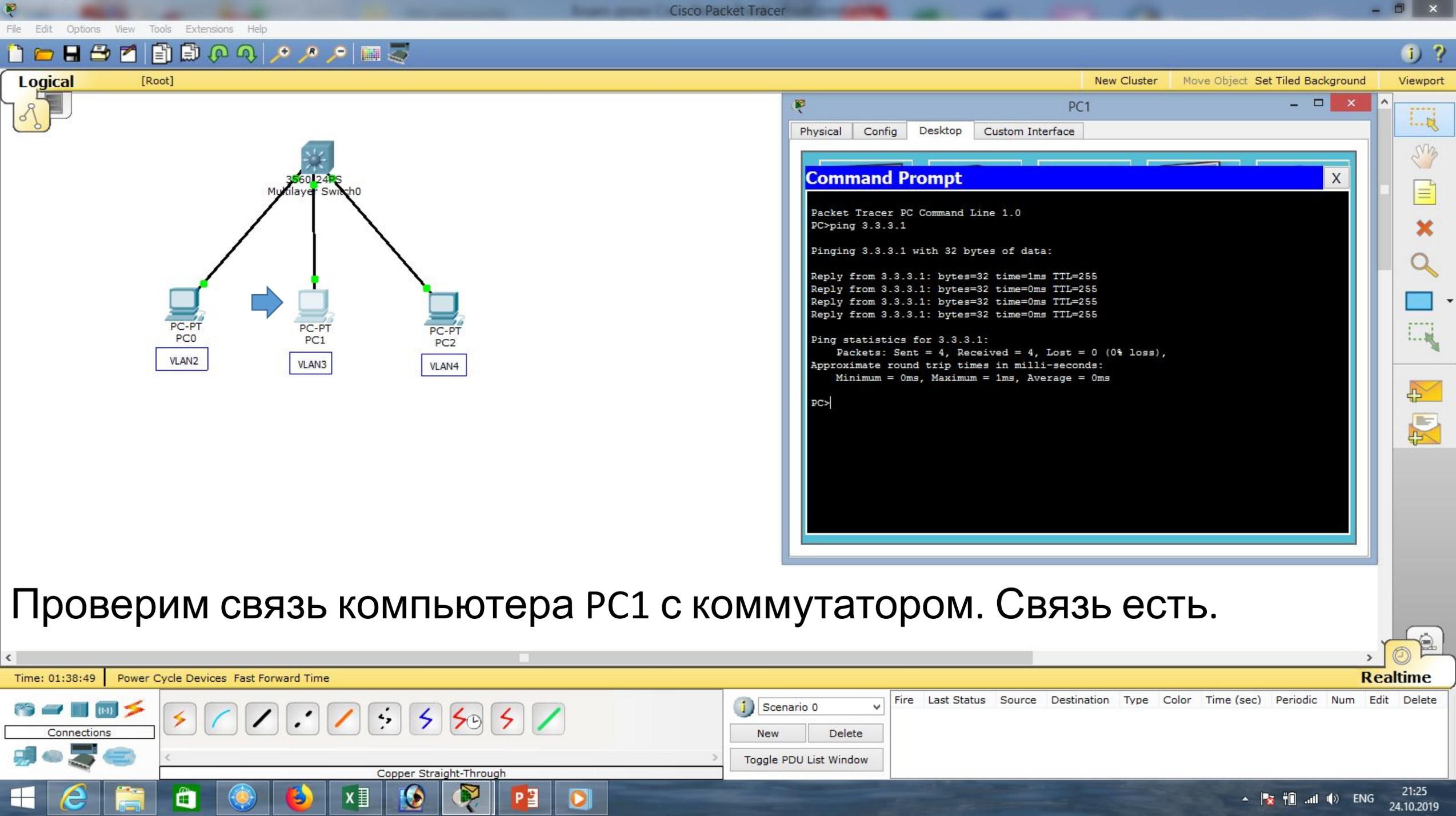
Toggle PDU List Window



Проверим связь компьютера PC0 с коммутатором. Связь есть.



Настроим компьютер PC1.



Проверим связь компьютера PC1 с коммутатором. Связь есть.



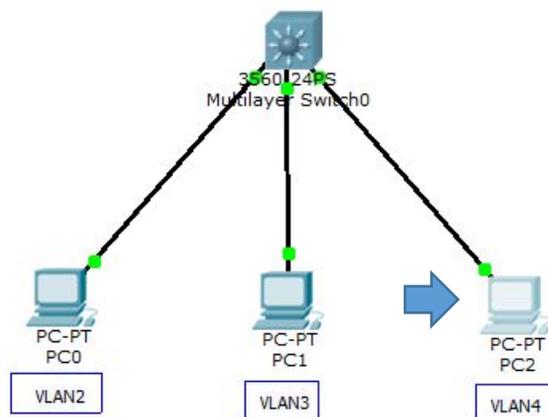
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



IP Configuration

IP Configuration

DHCP Static

IP Address: 4.4.4.2

Subnet Mask: 255.255.255.0

Default Gateway: 4.4.4.1

DNS Server:

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address: /

Link Local Address: FE80::201:43FF:FE92:6641

IPv6 Gateway:

IPv6 DNS Server:

Web Browser

Cisco IP Communicator

Настроим компьютер PC2.

Time: 01:41:23 | Power Cycle Devices Fast Forward Time

Realtime

Connections



Copper Straight-Through

Scenario 0

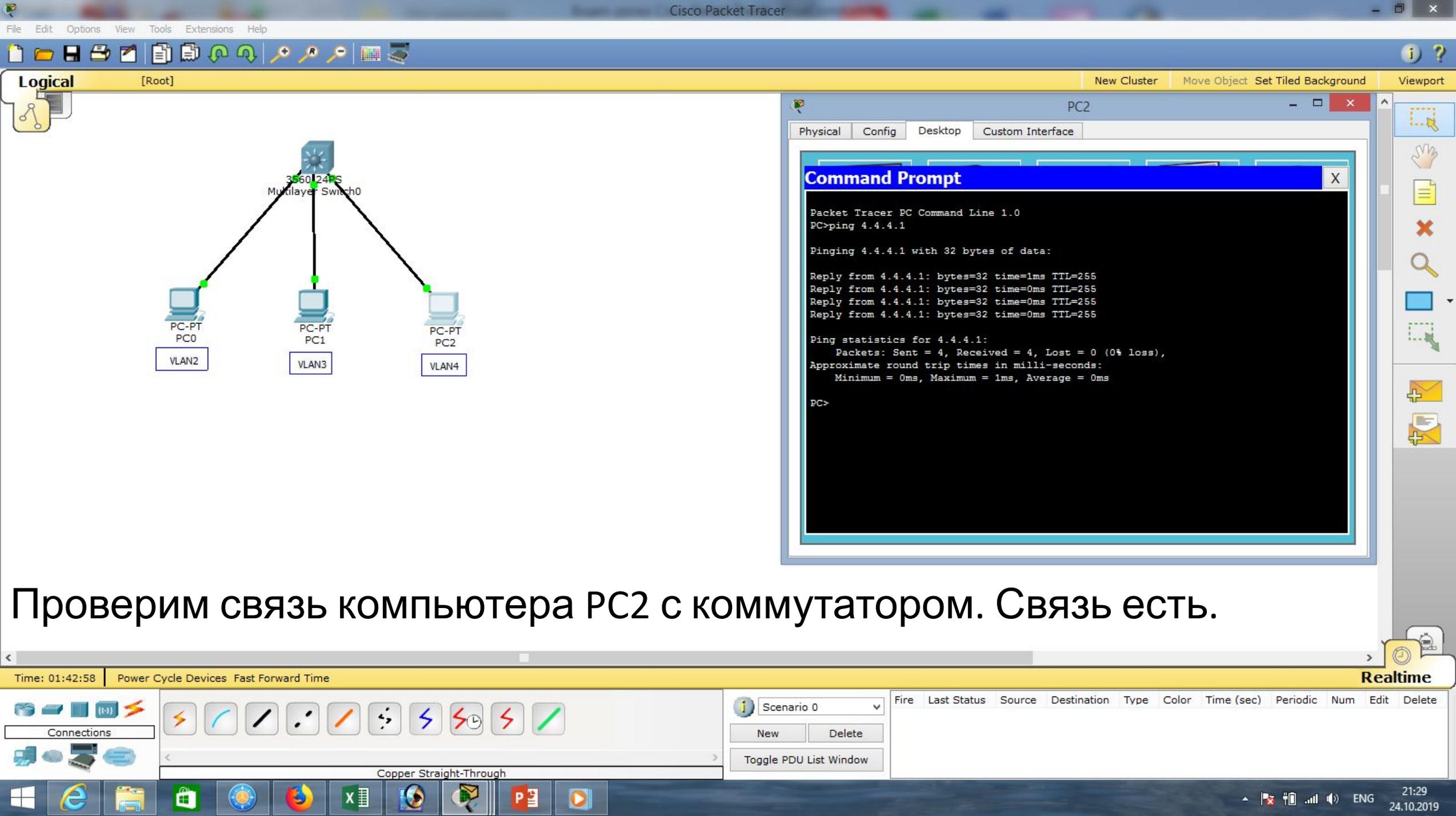
New

Delete

Toggle PDU List Window

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





Проверим связь компьютера PC2 с коммутатором. Связь есть.



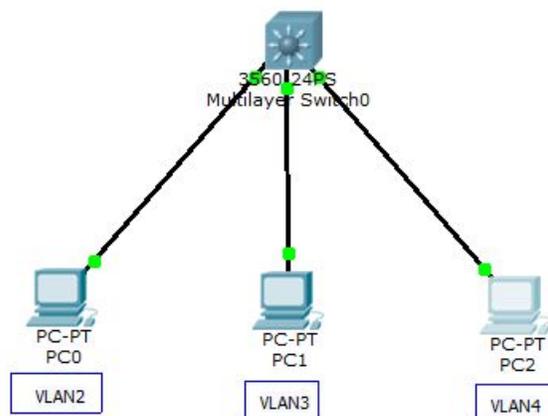
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



PC2

Physical Config Desktop Custom Interface

Command Prompt

```
PC>ping 4.4.4.1

Pinging 4.4.4.1 with 32 bytes of data:

Reply from 4.4.4.1: bytes=32 time=0ms TTL=255

Ping statistics for 4.4.4.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>ping 2.2.2.2

Pinging 2.2.2.2 with 32 bytes of data:

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

Ping statistics for 2.2.2.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>
```

Проверим связь компьютера PC2 с компьютером PC0. Связь нет, т.к. они находятся в разных VLAN-ах. Чтобы связь между VLAN-ми появилась, коммутатору необходимо разрешить маршрутизировать трафик.

Time: 01:50:59 | Power Cycle Devices Fast Forward Time

Realtime



Copper Straight-Through

Scenario 0

New

Delete

Toggle PDU List Window

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





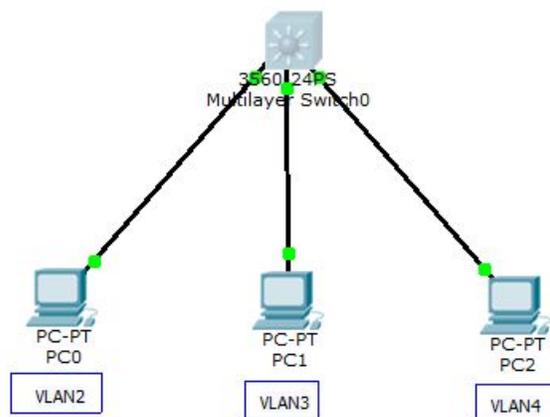
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



Для этого войдём в настройки коммутатора, в режиме глобального конфигурирования выполним команду: «ip routing», «end». Сохраним конфигурацию: «wr mem».

Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

Press RETURN to get started.

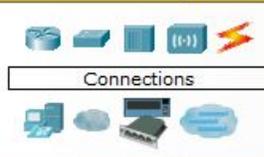
```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#ip rout
Switch(config)#ip routing
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

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

Copy Paste

Time: 01:57:24 Power Cycle Devices Fast Forward Time

Realtime



Copper Straight-Through

Scenario 0

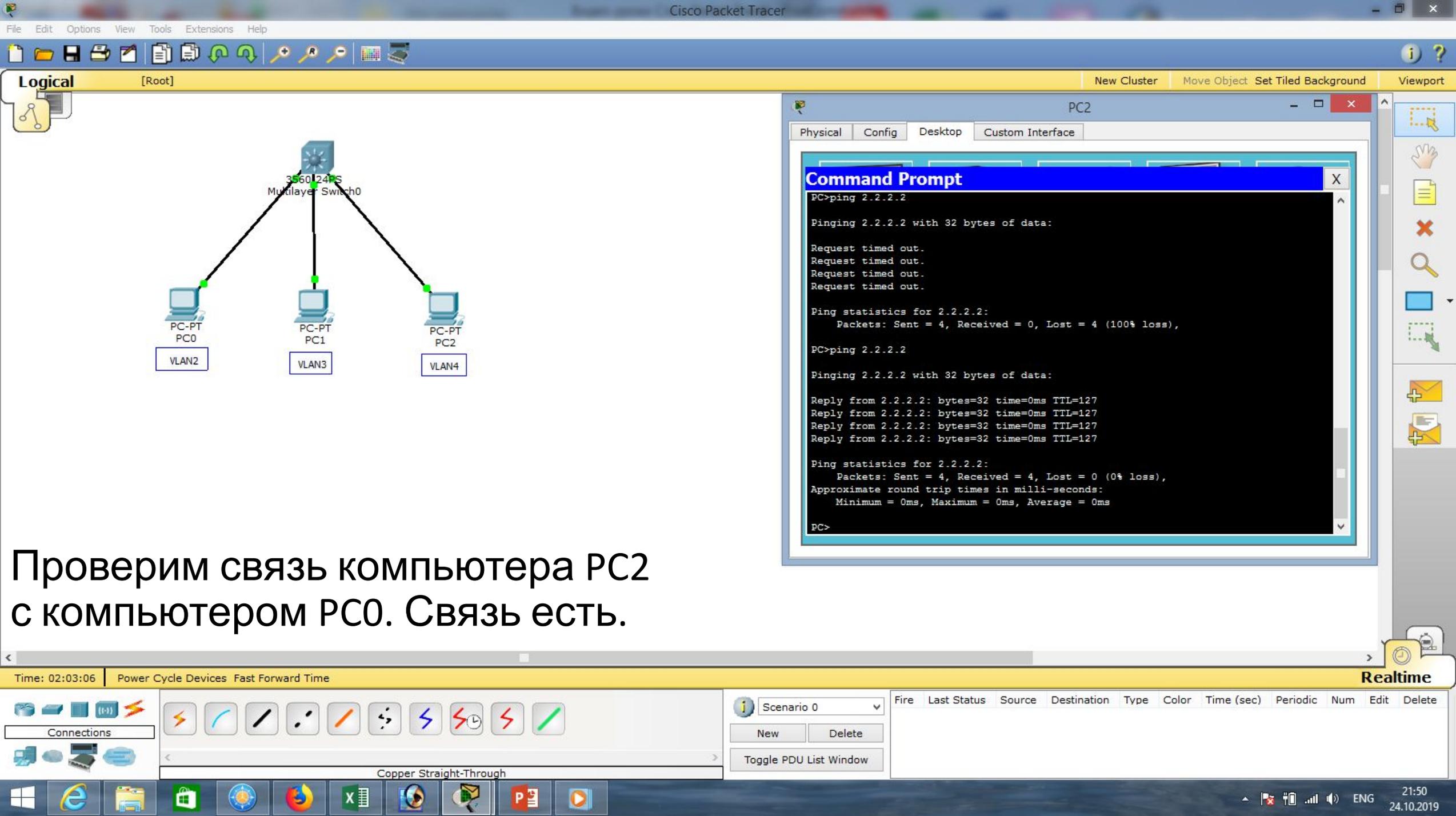
New

Delete

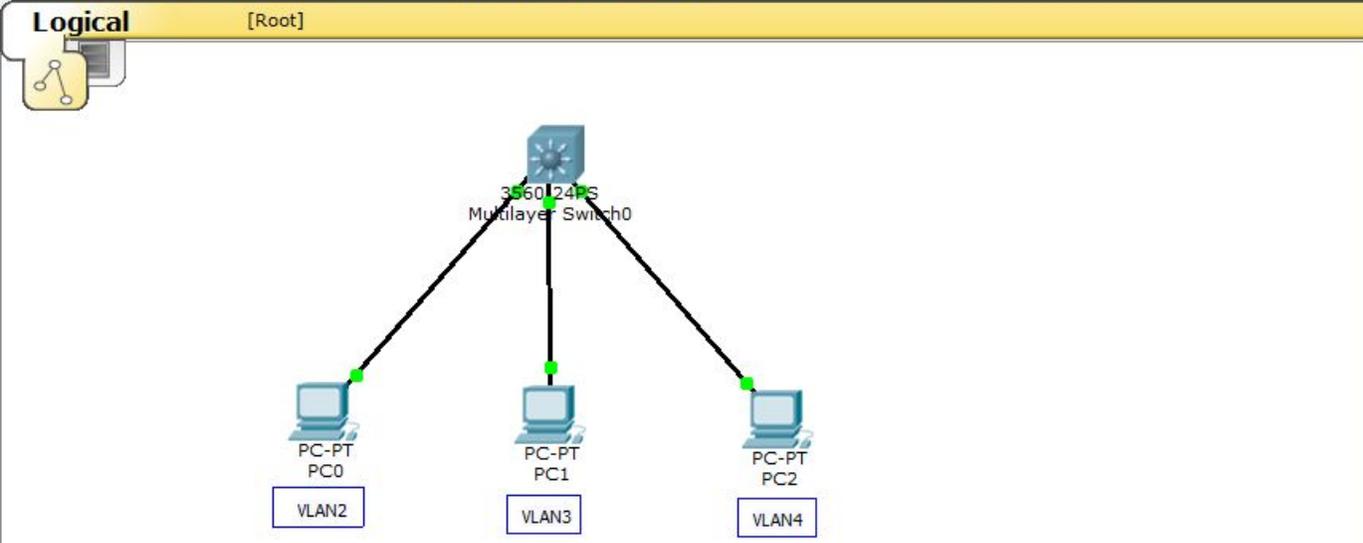
Toggle PDU List Window

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





Проверим связь компьютера PC2 с компьютером PC0. Связь есть.



PC2

Physical Config Desktop Custom Interface

Command Prompt

```
Pinging 2.2.2.2 with 32 bytes of data:  
Reply from 2.2.2.2: bytes=32 time=0ms TTL=127  
  
Ping statistics for 2.2.2.2:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 0ms, Maximum = 0ms, Average = 0ms  
  
PC>ping 3.3.3.1  
  
Pinging 3.3.3.1 with 32 bytes of data:  
Reply from 3.3.3.1: bytes=32 time=0ms TTL=255  
  
Ping statistics for 3.3.3.1:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 0ms, Maximum = 0ms, Average = 0ms  
  
PC>
```

Проверим связь компьютера PC2 с компьютером PC1. Связь есть.

Таким образом, маршрутизатор 3560 маршрутизирует три сети.

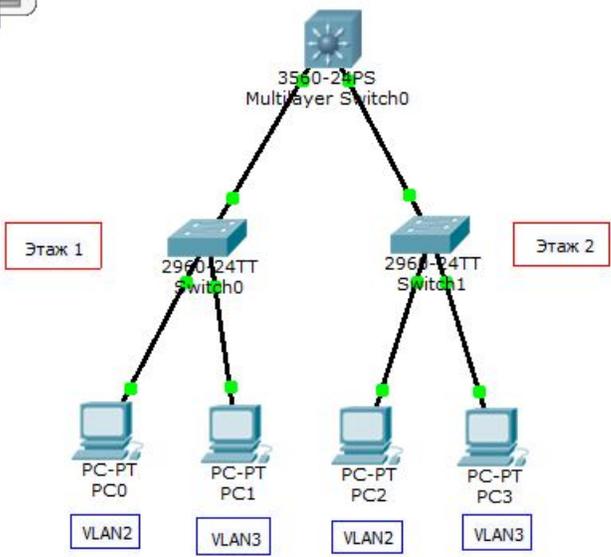
Connections

Scenario 0

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

New Delete

Toggle PDU List Window



Рассмотрим следующий пример.

Пусть PC0 и PC2 принадлежат VLAN2, а PC1 и PC3 – VLAN3.

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



Logical

[Root]

New Cluster

Move Object Set Tiled Background

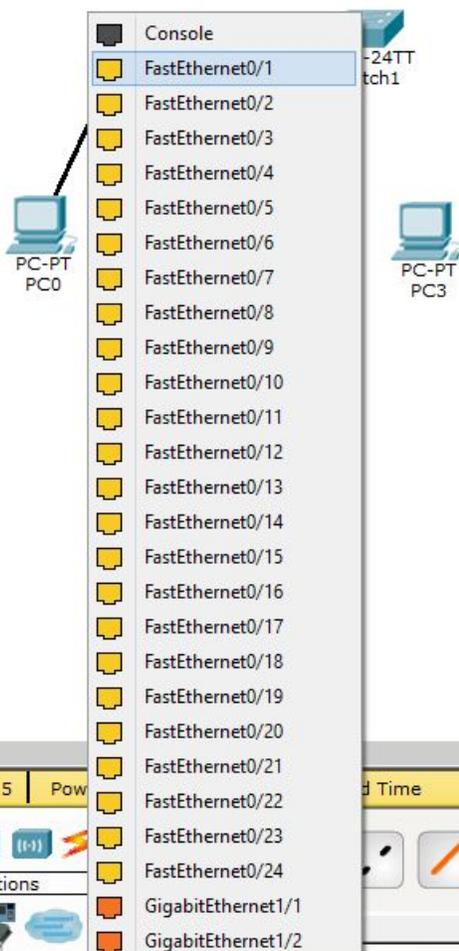
Viewport



3560-24PS
Multilayer Switch0

Первый компьютер подсоединим к коммутатору, используя порты FastEthernet0/1.

Второй компьютер – используя FastEthernet0/2.



Console

- FastEthernet0/1
- FastEthernet0/2
- FastEthernet0/3
- FastEthernet0/4
- FastEthernet0/5
- FastEthernet0/6
- FastEthernet0/7
- FastEthernet0/8
- FastEthernet0/9
- FastEthernet0/10
- FastEthernet0/11
- FastEthernet0/12
- FastEthernet0/13
- FastEthernet0/14
- FastEthernet0/15
- FastEthernet0/16
- FastEthernet0/17
- FastEthernet0/18
- FastEthernet0/19
- FastEthernet0/20
- FastEthernet0/21
- FastEthernet0/22
- FastEthernet0/23
- FastEthernet0/24
- GigabitEthernet1/1
- GigabitEthernet1/2

Time: 00:01:15 | Power

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 |
|------|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|
|------|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|

Realtime





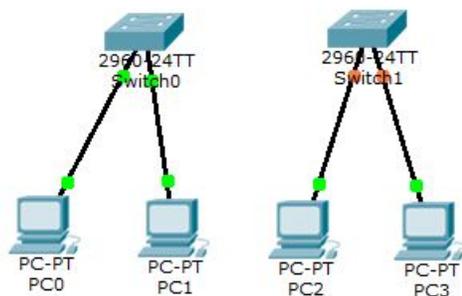
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport

3560-24PS
Multilayer Switch

Третий компьютер подсоединим к коммутатору, используя порты FastEthernet0/1.

Четвёртый компьютер – используя FastEthernet0/2.



Time: 00:02:40 | Power Cycle Devices Fast Forward Time

Realtime



Copper Straight-Through

Scenario 0

New Delete

Toggle PDU List Window

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





Logical

[Root]

New Cluster

Move Object Set Tiled Background

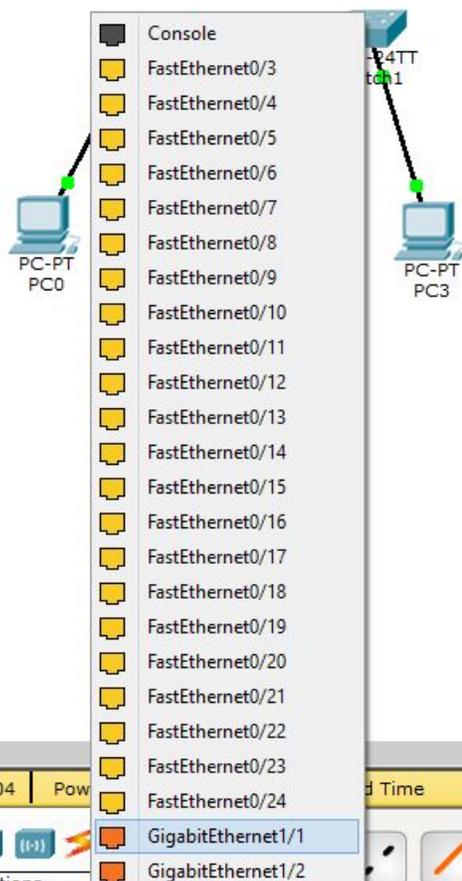
Viewport



3560-24PS
Multilayer Switch

Коммутаторы соединяем между собой через порт GigabitEthernet0/1 - GigabitEthernet0/1.

Второе соединение коммутаторов – через GigabitEthernet0/1 - GigabitEthernet0/2.



Time: 00:08:04

Connections

Time



Copper Straight-Through

Scenario 0

New

Delete

Toggle PDU List Window

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

Realtime





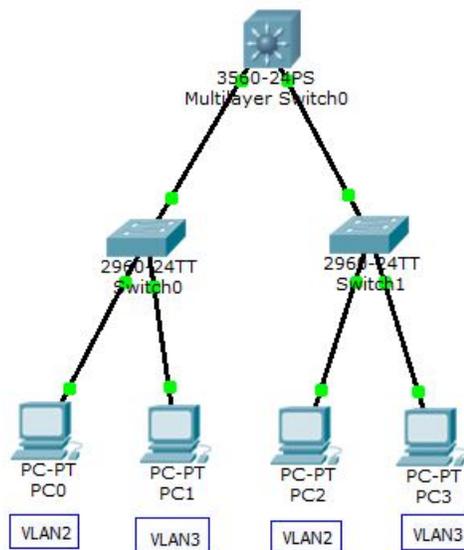
Logical

[Root]

New Cluster

Move Object Set Tiled Background

Viewport



Определим компьютеры PC0 и PC2 во VLAN2,
а компьютеры PC1 и PC3 во VLAN3.

Time: 00:14:22 | Power Cycle Devices Fast Forward Time

Realtime



Connections



Copper Straight-Through

Scenario 0

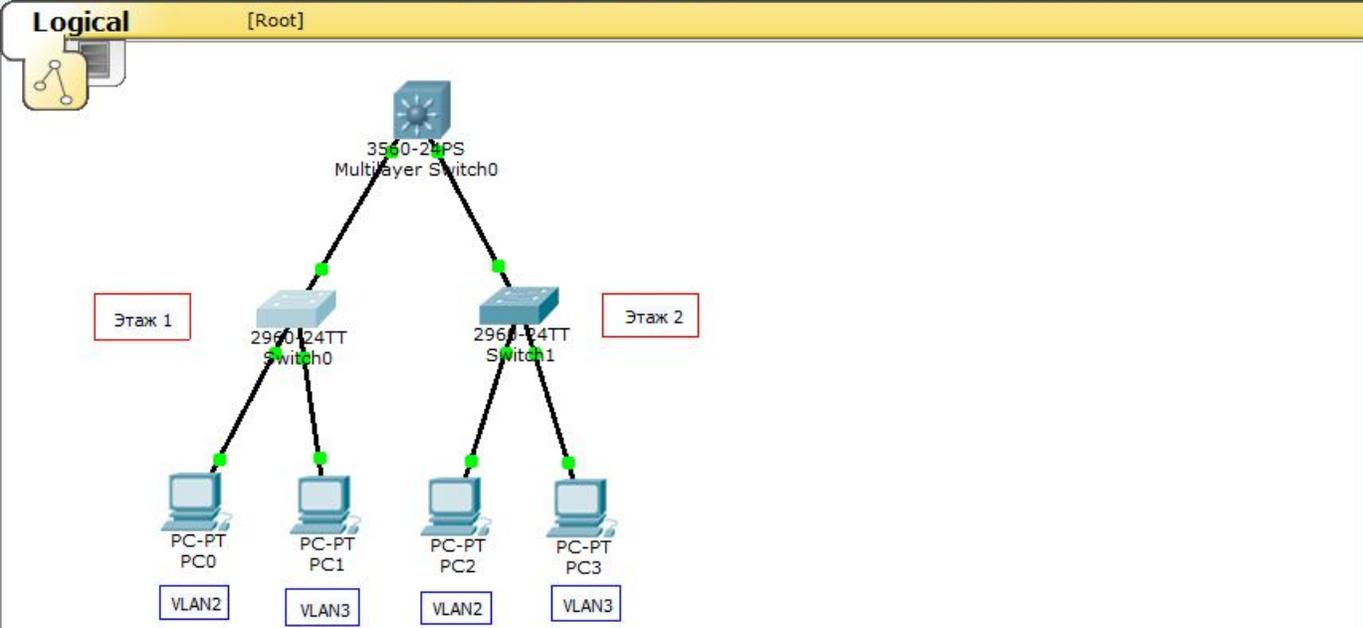
New

Delete

Toggle PDU List Window

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





Switch0

Physical Config CLI

IOS Command Line Interface

```

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface GigabitEthernet1/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed state to up

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int fa 0/1
Switch(config-if)#sw
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport access vlan 2
% Access VLAN does not exist. Creating vlan 2
Switch(config-if)#exit
Switch(config)#
  
```

Copy Paste

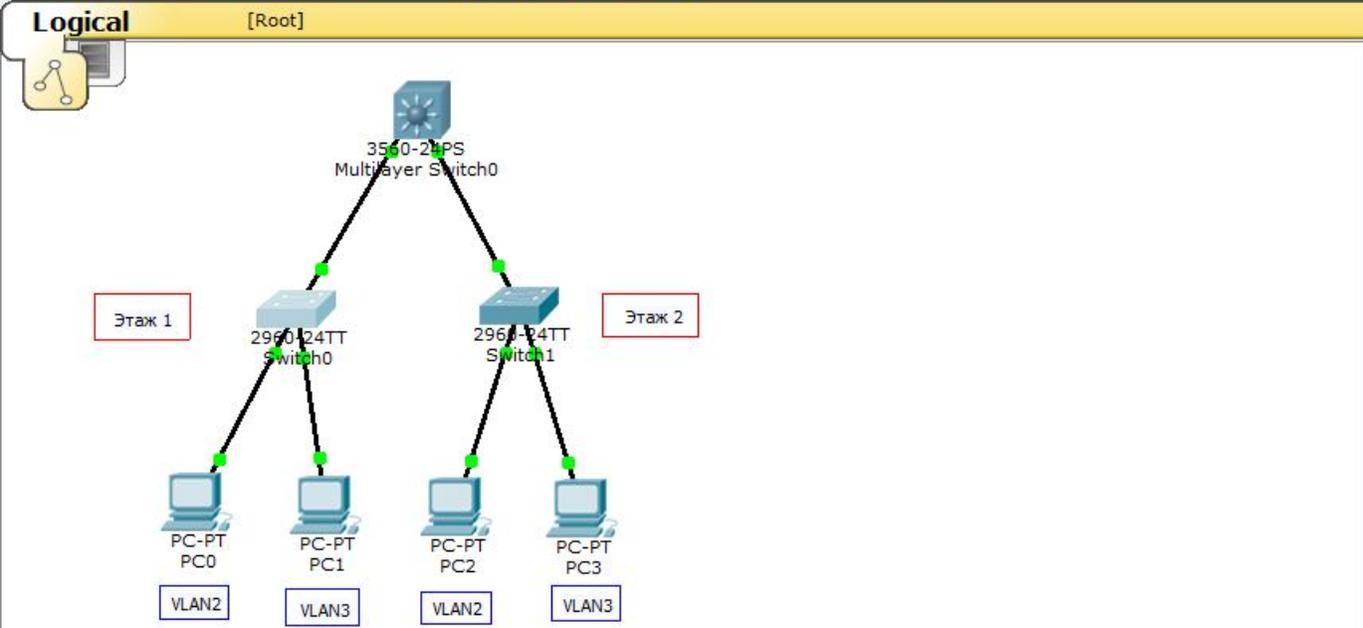
Настроим коммутатор 1-го этажа.
 В режиме глобального конфигурирования
 определим FastEthernet0/1 во vlan 2
 выполним команды: «interface fa0/1», «switchport mode access»,
 «switchport access vlan 2». Видим, что vlan 2 создан. Далее: «exit».

Connections

Copper Straight-Through

Scenario 0

| Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete |
|---|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|
| <p>New Delete</p> <p>Toggle PDU List Window</p> | | | | | | | | | | |



Switch0

Physical Config CLI

IOS Command Line Interface

```

o up
%LINK-5-CHANGED: Interface GigabitEthernet1/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed state to up

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int fa 0/1
Switch(config-if)#sw
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport access vlan 2
% Access VLAN does not exist. Creating vlan 2
Switch(config-if)#exit
Switch(config)#int fa0/2
Switch(config-if)#sw
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport access vlan 3
% Access VLAN does not exist. Creating vlan 3
Switch(config-if)#exit
Switch(config)#
  
```

Copy Paste

Определим FastEthernet0/2 во vlan 3 выполним команды: «interface fa0/2», «switchport mode access», «switchport access vlan 3». Видим, что vlan 3 создан. Далее: «exit».

Connections

Copper Straight-Through

Scenario 0

| Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete |
|---|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|
| <p>New Delete</p> <p>Toggle PDU List Window</p> | | | | | | | | | | |

The screenshot displays the Cisco Packet Tracer interface. On the left, a network diagram shows a hierarchical structure: a central 3560-24PS Multilayer Switch0 at the top, connected to two 2960-24TT Switch0 and Switch1 below it. These two switches are further connected to four PC-PT devices (PC0, PC1, PC2, PC3). The diagram is divided into two sections labeled 'Этаж 1' and 'Этаж 2'. On the right, the 'Switch0' configuration window is open, showing the 'CLI' tab with the following text:

```
Switch(config-if)#
Switch(config-if)#
Switch(config-if)#
Switch(config-if)#e[it
^
% Invalid input detected at '^' marker.

Switch(config-if)#exit
Switch(config)#
Switch(config)#
Switch(config)#
Switch(config)#
Switch(config)#int gi1/1
Switch(config)#sw
Switch(config-if)#switchport mode tr
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed stat
e to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed stat
e to up

Switch(config-if)#
```

Below the diagram, there is a large text overlay in Russian: «Создаём trunk-порт для соединения с центральным коммутатором: «interface gi1/1», «switchport mode trunk». Видим, что trunk-порт создан.»

Создаём trunk-порт для соединения с центральным коммутатором: «interface gi1/1», «switchport mode trunk». Видим, что trunk-порт создан.

Time: 00:42:24 | Power Cycle Devices Fast Forward Time

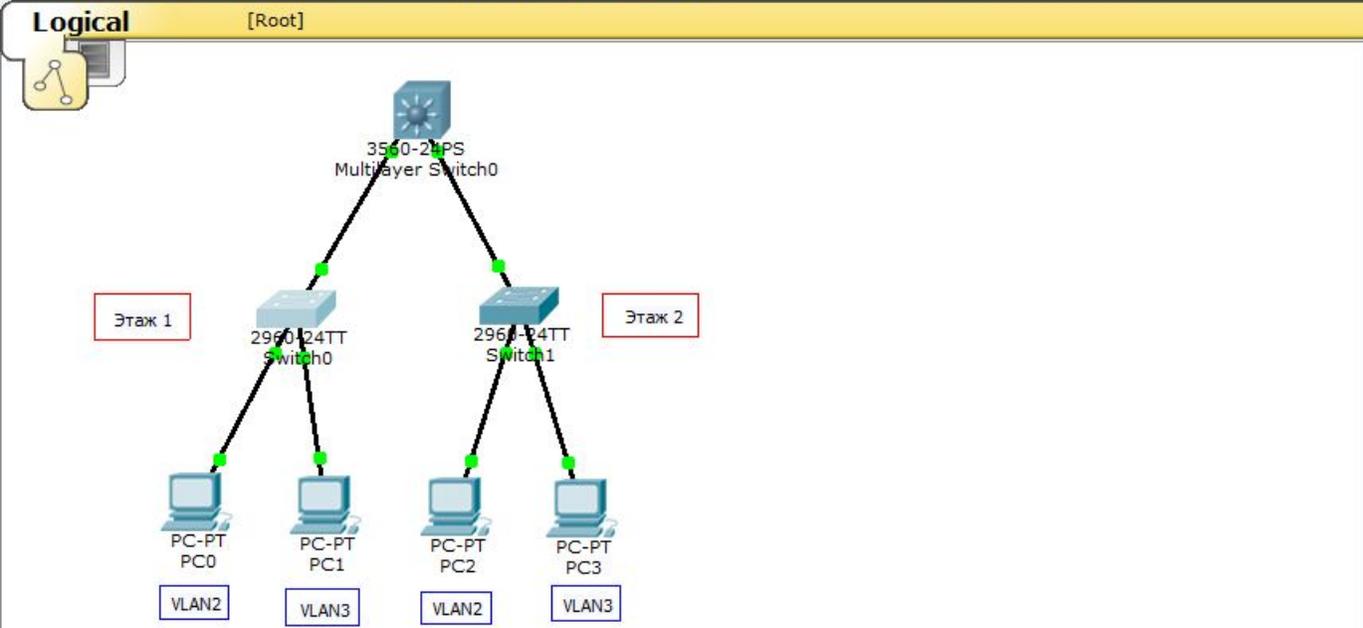
Connections

Copper Straight-Through

Scenario 0

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

Windows taskbar at the bottom shows the date 24.10.2019 and time 22:47.



Switch0

Physical Config CLI

IOS Command Line Interface

```

Switch(config)#
Switch(config)#int gi1/1
Switch(config-if)#sw
Switch(config-if)#switchport mode tr
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed state to up

Switch(config-if)#
Switch(config-if)#sw
Switch(config-if)#switchport tx
Switch(config-if)#switchport trunk all
Switch(config-if)#switchport trunk allowed vlan 2,3
Switch(config-if)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

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

```

Copy Paste

Помещаем в trunk-порт vlan 2 и vlan 3, выполнив команду «switchport trunk allowed vlan 2,3». Далее: «end» и сохраняем конфигурацию «wr mem».

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: a central 3560-21PS Multilayer Switch0 at the top, connected to two 2960-24TT Switch0 and Switch1. These switches are further connected to four PC-PT devices (PC0, PC1, PC2, PC3) arranged in two rows labeled 'Этаж 1' and 'Этаж 2'. Each PC is associated with a VLAN (VLAN2 or VLAN3). On the right, the CLI window for Switch0 shows the following configuration:

```
Switch>  
Switch>en  
Switch#show run  
Building configuration...  
  
Current configuration : 1195 bytes  
!  
version 12.2  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname Switch  
!  
!  
!  
spanning-tree mode pvst  
!  
interface FastEthernet0/1  
switchport access vlan 2  
switchport mode access  
!  
interface FastEthernet0/2  
switchport access vlan 3  
--More--
```

Смотрим конфигурацию: «show run».
Видим, два наших порта.

Time: 01:12:58 | 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

23:18 24.10.2019

The image shows the Cisco Packet Tracer interface. On the left, a network diagram is displayed under the 'Logical' tab. It features a central '3500-24PS MultiLayer Switch0' at the top, connected to two '2960-24TT Switch0' and '2960-24TT Switch1' below it. These two switches are further connected to four 'PC-PT' devices (PC0, PC1, PC2, PC3). The diagram is organized into two levels: 'Этаж 1' (Floor 1) containing the two intermediate switches, and 'Этаж 2' (Floor 2) containing the four PCs. Each PC is associated with a specific VLAN: PC0 and PC2 are in VLAN2, while PC1 and PC3 are in VLAN3. On the right, the 'Switch0' configuration window is open, showing the 'CLI' tab. The 'IOS Command Line Interface' contains the following configuration commands:

```
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet1/1
switchport trunk allowed vlan 2-3
switchport mode trunk
!
interface GigabitEthernet1/2
!
interface Vlan1
no ip address
shutdown
!
!
line con 0
!
!
line vty 0 4
login
line vty 5 15
login
!
!
end
--More--
```

Buttons for 'Copy' and 'Paste' are visible at the bottom of the CLI window.

... и trunk-порт.

Time: 01:14:11 | Power Cycle Devices Fast Forward Time

Connections

Copper Straight-Through

Scenario 0

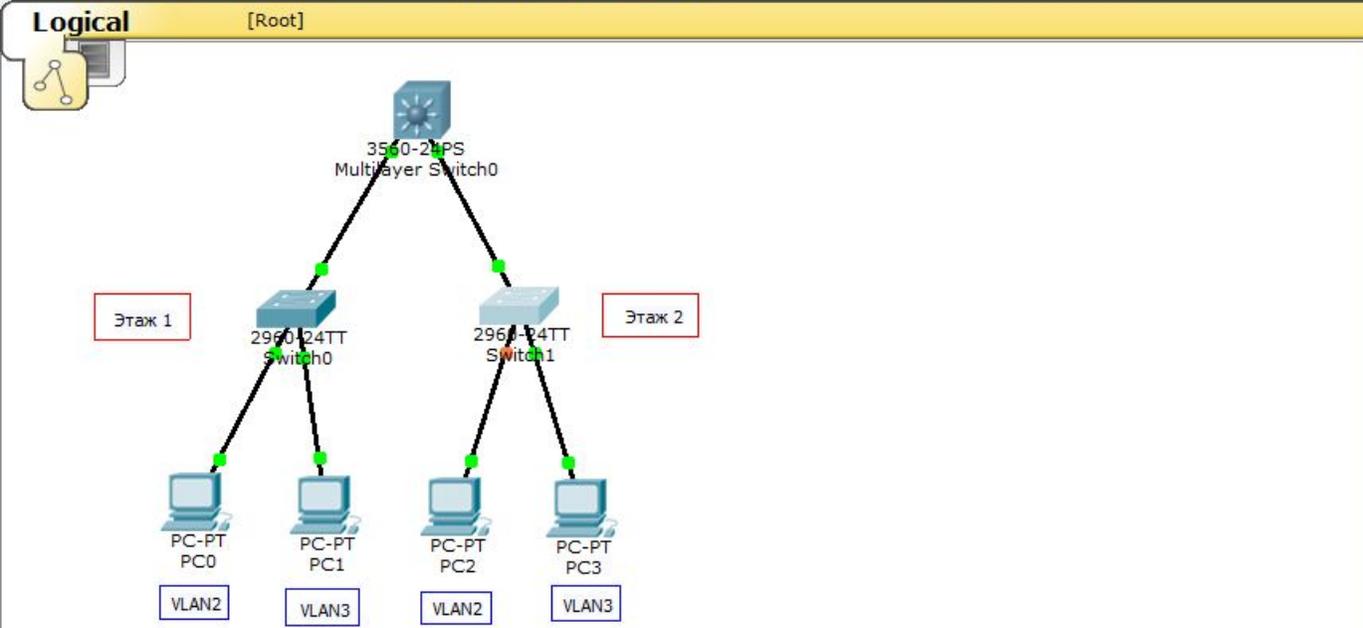
| Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete |
|------|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|
|------|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|

New Delete

Toggle PDU List Window

Realtime

23:19 24.10.2019



Switch1

Physical Config CLI

IOS Command Line Interface

```

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface GigabitEthernet1/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed state to up

Switch>
Switch> en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int fa0/1
Switch(config-if)#sw
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport access vlan 2
% Access VLAN does not exist. Creating vlan 2
Switch(config-if)#exit
Switch(config)#
  
```

Copy Paste

Настроим коммутатор 2-го этажа. В режиме глобального конфигурирования определим FastEthernet0/1 во vlan 2 выполним команды: «interface fa0/1», «switchport mode access», «switchport access vlan 2». Видим, что vlan 2 создан. Далее: «exit».

Connections

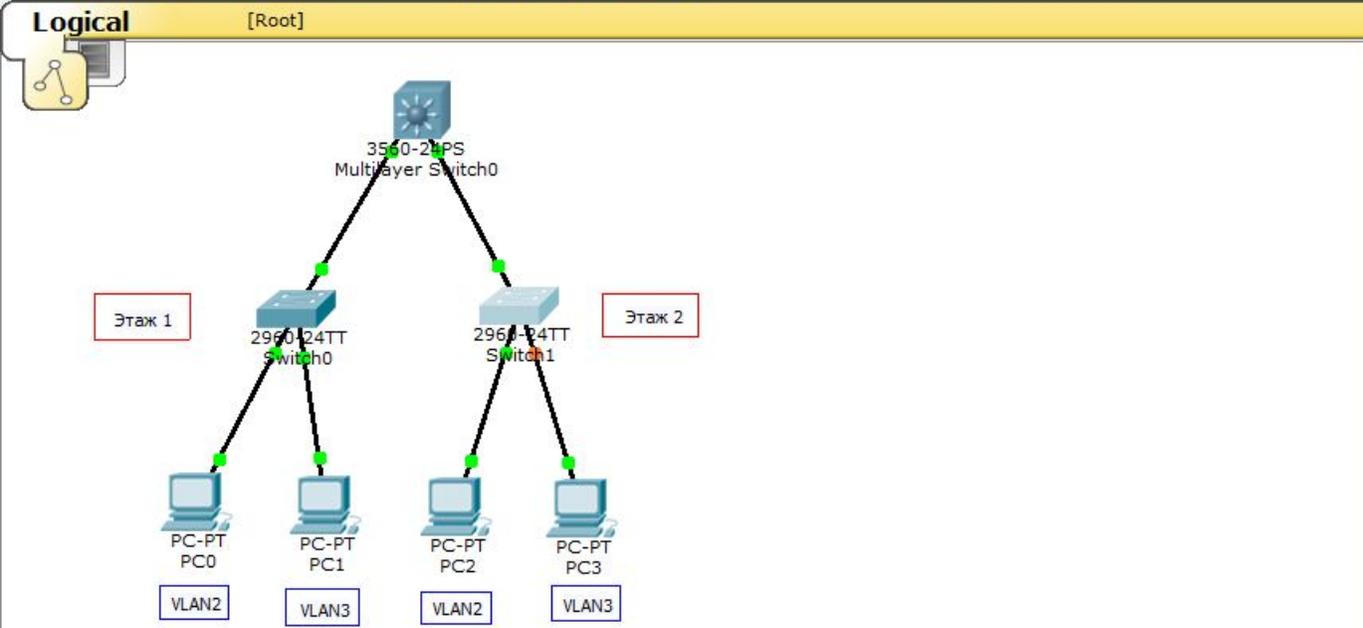
Copper Straight-Through

Scenario 0

New Delete

Toggle PDU List Window

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



Switch1

Physical Config CLI

IOS Command Line Interface

```
%LINK-5-CHANGED: Interface GigabitEthernet1/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed state to up

Switch>
Switch> en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int fa0/1
Switch(config-if)#sw
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport access vlan 2
% Access VLAN does not exist. Creating vlan 2
Switch(config-if)#exit
Switch(config)#int fa0/2
Switch(config-if)#sw
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport access vlan 3
% Access VLAN does not exist. Creating vlan 3
Switch(config-if)#exit
Switch(config)#
```

Copy Paste

Определим FastEthernet0/2 во vlan 3 выполним команды: «interface fa0/2», «switchport mode access», «switchport access vlan 3». Видим, что vlan 3 создан. Далее: «exit».

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 central 3560-24PS Multilayer Switch0 connected to two 2960-24TT Switch0 and Switch1. Below these are four PC-PT devices (PC0-PC3) connected to the edge switches. Labels 'Этаж 1' and 'Этаж 2' are present. Below the PC icons are labels 'VLAN2' and 'VLAN3'. On the right, the 'Switch1' CLI window is open, showing the following configuration commands:

```
Switch(config-if)#sw
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport access vlan 2
% Access VLAN does not exist. Creating vlan 2
Switch(config-if)#exit
Switch(config)#int fa0/2
Switch(config-if)#sw
Switch(config-if)#switchport mode access
Switch(config-if)#sw
Switch(config-if)#switchport access vlan 3
% Access VLAN does not exist. Creating vlan 3
Switch(config-if)#exit
Switch(config)#int gi1/1
Switch(config-if)#sw
Switch(config-if)#switchport mode tr
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed state to up

Switch(config-if)#
```

Создаём trunk-порт для соединения с центральным коммутатором: «interface gi1/1», «switchport mode trunk». Видим, что trunk-порт создан.

Time: 01:03:14 | Power Cycle Devices Fast Forward Time

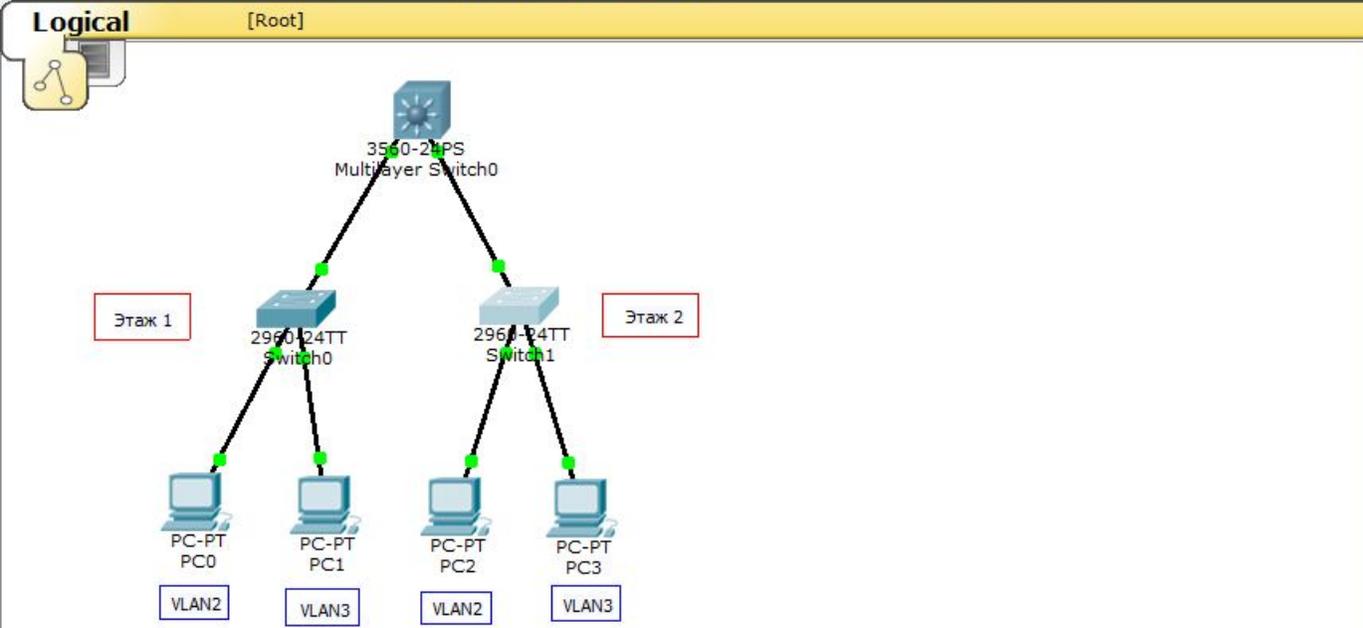
Connections

Copper Straight-Through

Scenario 0

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

ENG 23:08 24.10.2019



Switch1

Physical Config CLI

IOS Command Line Interface

```

Switch(config-if)#switchport access vlan 3
% Access VLAN does not exist. Creating vlan 3
Switch(config-if)#exit
Switch(config)#int g1/1
Switch(config-if)#sw
Switch(config-if)#switchport mode tr
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed state to up

Switch(config-if)#sw
Switch(config-if)#switchport tr
Switch(config-if)#switchport trunk allowed vlan 2,3
Switch(config-if)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

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

```

Copy Paste

Помещаем в trunk-порт vlan 2 и vlan 3, выполнив команду «switchport trunk allowed vlan 2,3». Далее: «end» и сохраняем конфигурацию «wr mem».

Connections

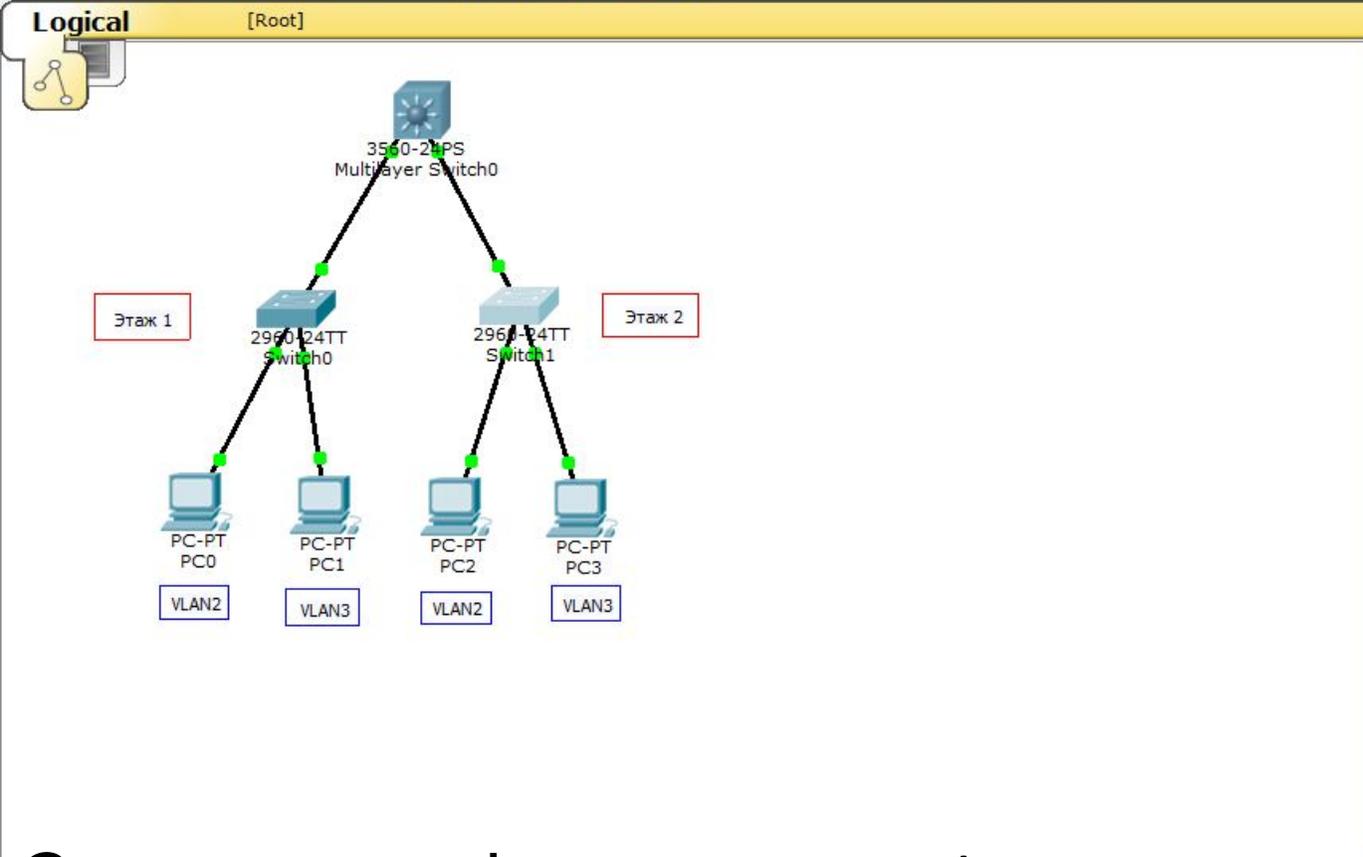
Copper Straight-Through

Scenario 0

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

New Delete

Toggle PDU List Window



Switch1

Physical Config CLI

IOS Command Line Interface

```

Building configuration...
[OK]
Switch#show run
Building configuration...

Current configuration : 1195 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch
!
!
!
!
!
spanning-tree mode pvst
!
interface FastEthernet0/1
switchport access vlan 2
switchport mode access
!
interface FastEthernet0/2
switchport access vlan 3
--More--

```

Copy Paste

Смотрим конфигурацию: «show run».
Видим, два наших порта.

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 topology is shown with a central 3560-24PS Multilayer Switch0 at the top. Below it are two 2960-24TT Switches, labeled 'Этаж 1' (Floor 1) and 'Этаж 2' (Floor 2). Each floor switch is connected to four PC-PT devices (PC0-PC3). The PCs are grouped into VLAN2 and VLAN3. On the right, the CLI window for Switch1 is open, showing the following configuration:

```
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet1/1
switchport trunk allowed vlan 2-3
switchport mode trunk
!
interface GigabitEthernet1/2
!
interface Vlan1
no ip address
shutdown
!
line con 0
!
line vty 0 4
login
line vty 5 15
login
!
end
--More--
```

... и trunk-порт.

Time: 01:11:03 | Power Cycle Devices Fast Forward Time

Connections

Copper Straight-Through

Scenario 0

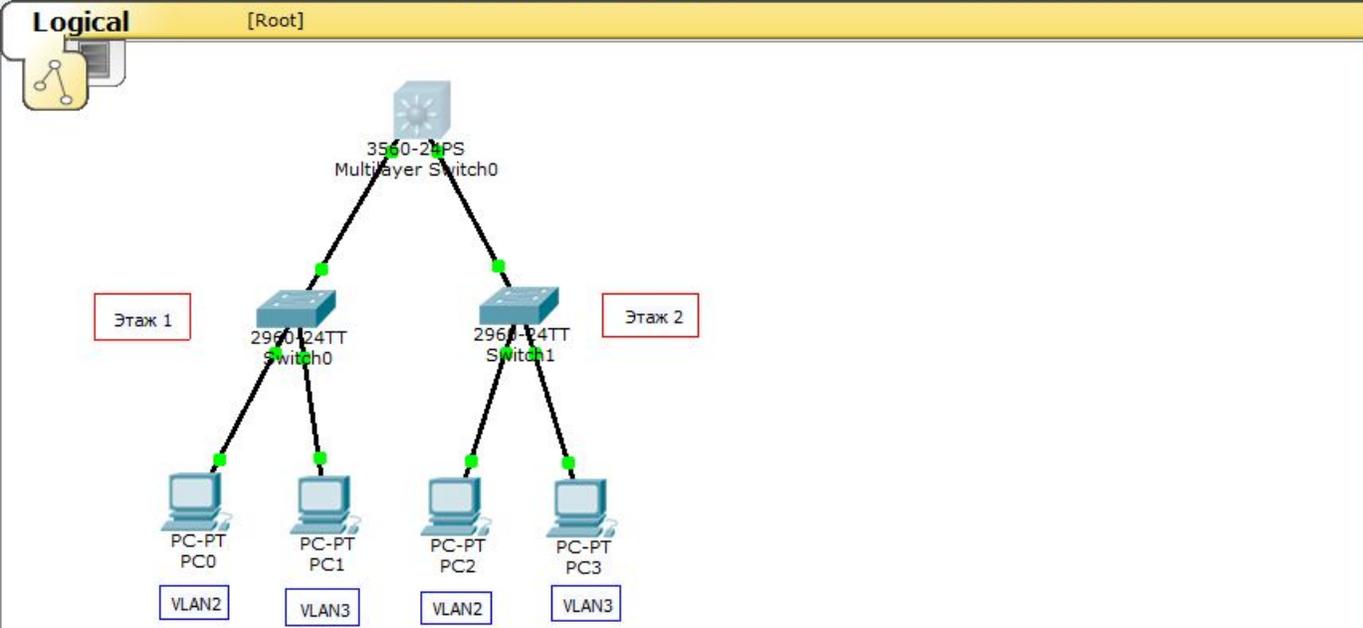
| Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete |
|------|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|
|------|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|

New Delete

Toggle PDU List Window

Realtime

23:16 24.10.2019



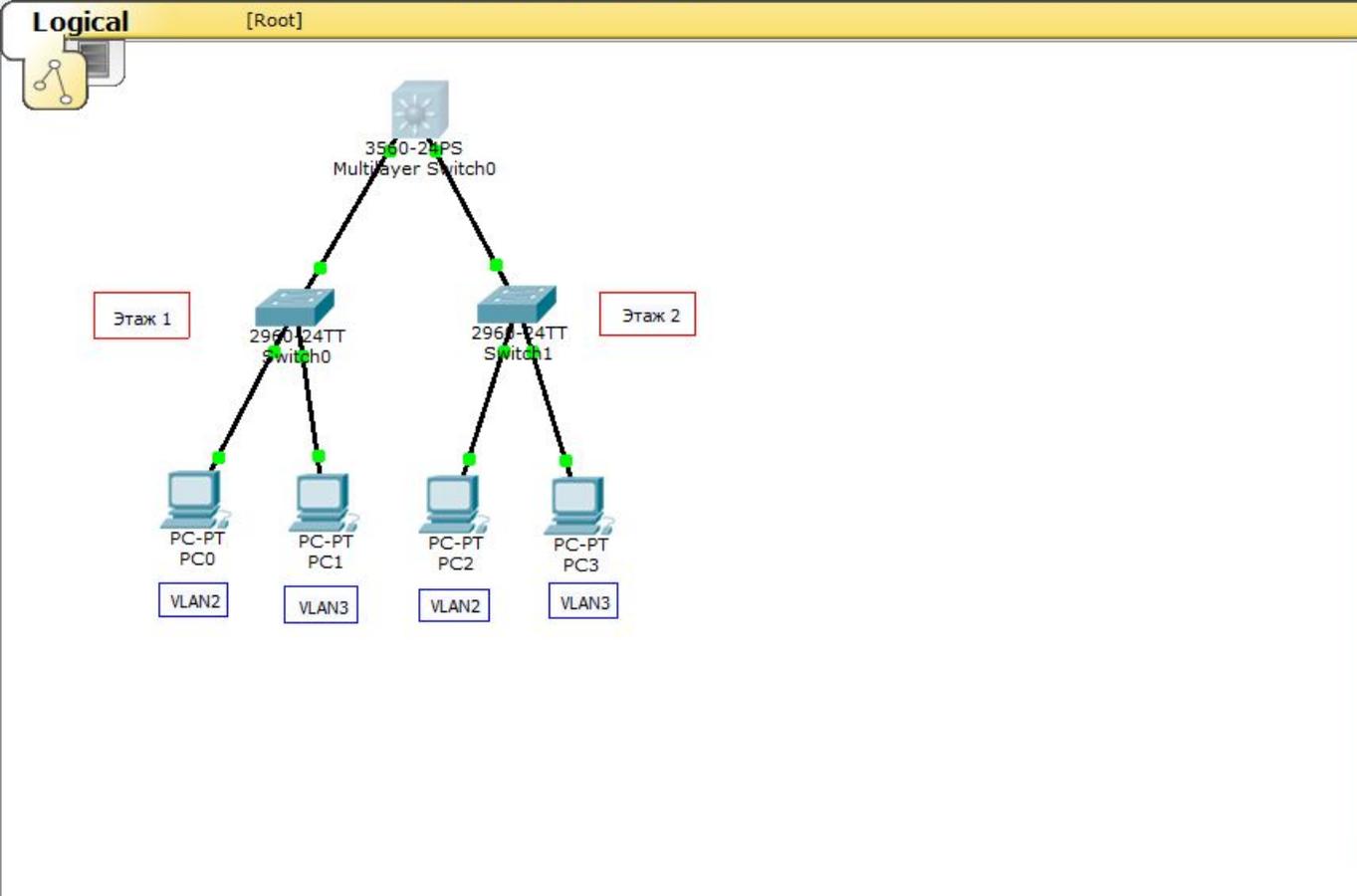
```
Multilayer Switch0
Physical Config CLI
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int gi0/1
Switch(config-if)#sw
Switch(config-if)#switchport mode tr
Switch(config-if)#switchport mode trunk
Command rejected: An interface whose trunk encapsulation is "Auto" can not be configured to "trunk" mode.
Switch(config-if)#
```

Настроим центральный коммутатор.
В режиме глобального конфигурирования настроим GigabitEthernet0/1 в trunk.
выполним команды: «interface gi0/1», «switchport mode trunk».

Connections Copper Straight-Through

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

New Delete Toggle PDU List Window



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```
channel-group Etherchannel/port bundling configuration
channel-protocol Select the channel protocol (LACP, PAgP)
delay Specify interface throughput delay
description Interface specific description
duplex Configure duplex operation.
exit Exit from interface configuration mode
hold-queue Set hold queue depth
mac-address Manually set interface MAC address
mdix Set Media Dependent Interface with Crossover
no Negate a command or set its defaults
power Power configuration
service-policy Configure QoS Service Policy
shutdown Shutdown the selected interface
spanning-tree Spanning Tree Subsystem
speed Configure speed operation.
storm-control storm configuration
switchport Set switching mode characteristics
tx-ring-limit Configure PA level transmit ring limit

Switch(config-if)#sw
Switch(config-if)#switchport trunk ?
  allowed Set allowed VLAN characteristics when interface is in trunking mode
  encapsulation Set trunking encapsulation when interface is in trunking mode
  native Set trunking native characteristics when interface is in trunking mode
Switch(config-if)#switchport trunk
```

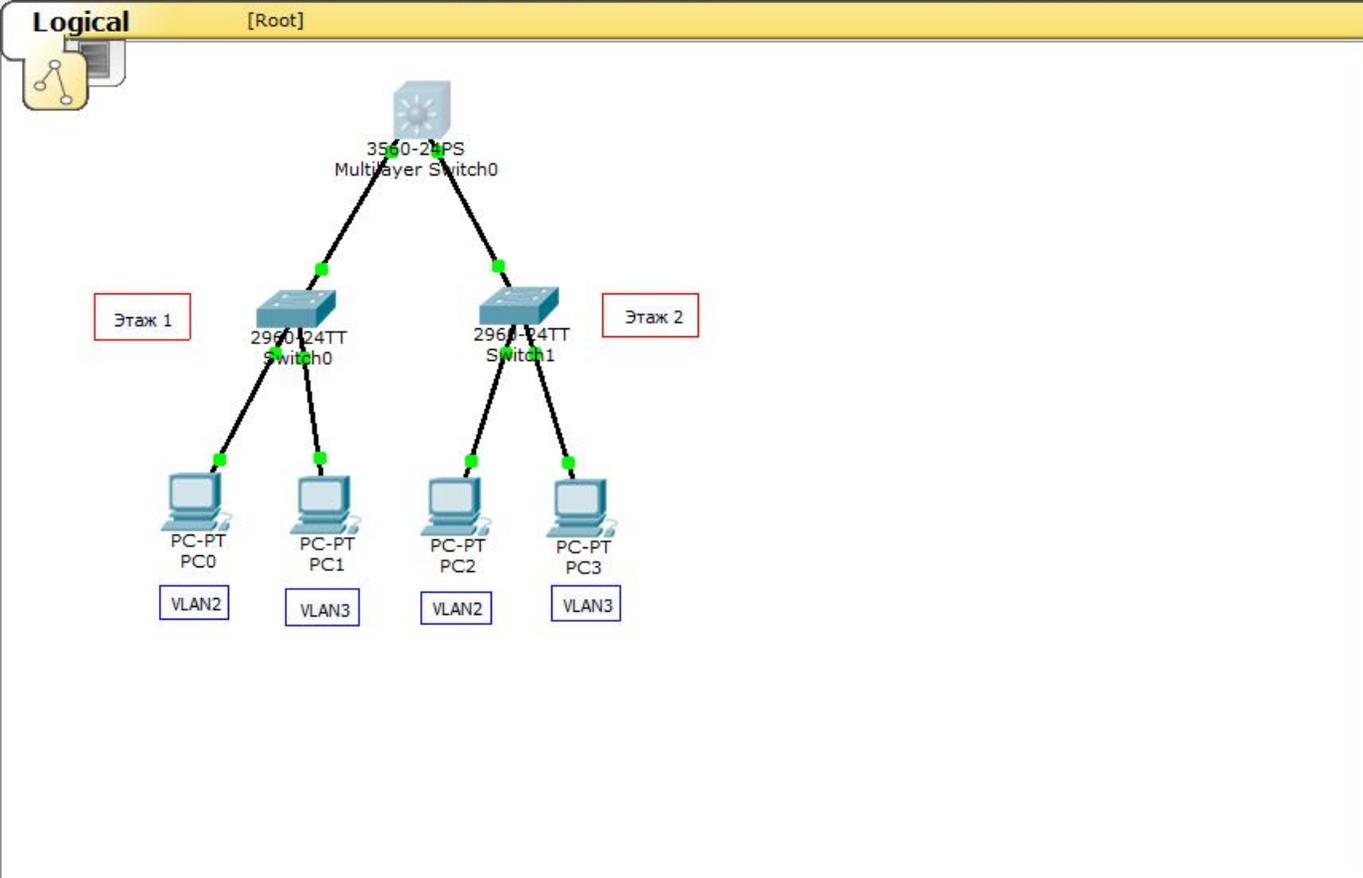
Copy Paste

Далее набираем: «switchport trunk?».

Connections

Copper Straight-Through

| Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete |
|------------------------|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|
| Scenario 0 | | | | | | | | | | |
| New Delete | | | | | | | | | | |
| Toggle PDU List Window | | | | | | | | | | |



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```

mac-address      Manually set interface MAC address
mdix             Set Media Dependent Interface with Crossover
no              Negate a command or set its defaults
power           Power configuration
service-policy   Configure QoS Service Policy
shutdown        Shutdown the selected interface
spanning-tree   Spanning Tree Subsystem
speed           Configure speed operation.
storm-control    storm configuration
switchport      Set switching mode characteristics
tx-ring-limit   Configure PA level transmit ring limit

Switch(config-if)#sw
Switch(config-if)#switchport trunk ?
  allowed       Set allowed VLAN characteristics when interface is in trunking
                mode
  encapsulation Set trunking encapsulation when interface is in trunking mode
  native        Set trunking native characteristics when interface is in
                trunking mode

Switch(config-if)#switchport trunk en
Switch(config-if)#switchport trunk encapsulation
% Incomplete command.
Switch(config-if)#switchport trunk encapsulation ?
  dot1q        Interface uses only 802.1q trunking encapsulation when trunking
Switch(config-if)#switchport trunk encapsulation do
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#

```

Copy Paste

Выбираем: «encapsulation ?», далее набираем «dot1q».

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 |
|------|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|
| | | | | | | | | | | |

The image shows the Cisco Packet Tracer interface. On the left, a network diagram is displayed under the 'Logical' tab. At the top, a '3500-24PS Multilayer Switch0' is connected to two '2960-24TT Switch0' and '2960-24TT Switch1'. The left switch is labeled 'Этаж 1' and the right 'Этаж 2'. Each switch is connected to two PC-PT devices (PC0, PC1 on the left; PC2, PC3 on the right). The PCs are grouped into VLAN2 and VLAN3. On the right, a 'Multilayer Switch0' configuration window is open, showing the 'CLI' tab with the following text:

```
IOS Command Line Interface
speed          Configure speed operation.
storm-control  storm configuration
switchport     Set switching mode characteristics
tx-ring-limit  Configure PA level transmit ring limit
Switch(config-if)#sw
Switch(config-if)#switchport trunk ?
    allowed    Set allowed VLAN characteristics when interface is in trunking
               mode
    encapsulation Set trunking encapsulation when interface is in trunking mode
    native     Set trunking native characteristics when interface is in
               trunking mode
Switch(config-if)#switchport trunk en
Switch(config-if)#switchport trunk encapsulation
% Incomplete command.
Switch(config-if)#switchport trunk encapsulation ?
    dot1q     Interface uses only 802.1q trunking encapsulation when trunking
Switch(config-if)#switchport trunk encapsulation do
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#sw
Switch(config-if)#switchport mode tr
Switch(config-if)#switchport mode trunk
Switch(config-if)#sw
Switch(config-if)#switchport tr
Switch(config-if)#switchport trunk allowed vlan 2,3
Switch(config-if)#exit
Switch(config)#
```

Далее набираем: «interface gi0/1», «switchport trunk allowed vlan 2,3», «exit».

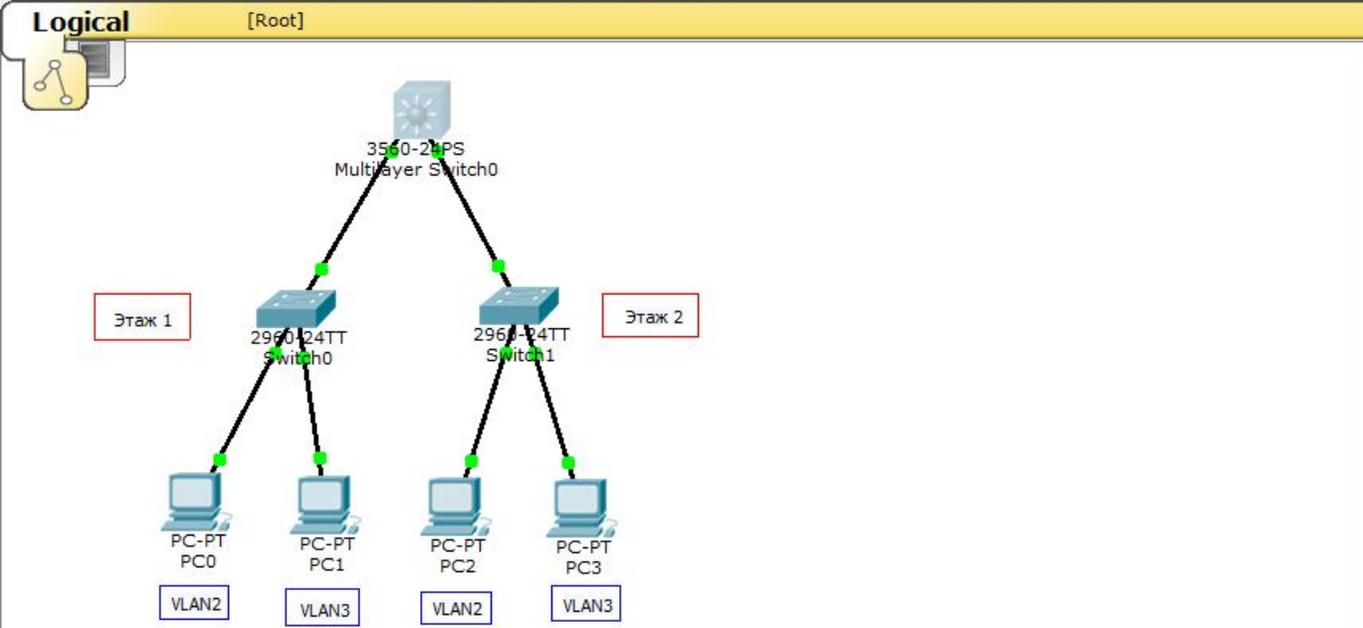
Time: 01:40:02 | Power Cycle Devices | Fast Forward Time

Connections: Copper Straight-Through

Scenario 0

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

23:45 24.10.2019



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```

Switch(config-if)#switchport trunk ?
  allowed      Set allowed VLAN characteristics when interface is in trunking
                mode
  encapsulation Set trunking encapsulation when interface is in trunking mode
  native       Set trunking native characteristics when interface is in
                trunking mode
Switch(config-if)#switchport trunk en
Switch(config-if)#switchport trunk encapsulation
% Incomplete command.
Switch(config-if)#switchport trunk encapsulation ?
  dot1q        Interface uses only 802.1q trunking encapsulation when trunking
Switch(config-if)#switchport trunk encapsulation do
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#sw
Switch(config-if)#switchport mode tr
Switch(config-if)#switchport mode trunk
Switch(config-if)#sw
Switch(config-if)#switchport tr
Switch(config-if)#switchport trunk allowed vlan 2,3
Switch(config-if)#exit
Switch(config)#int gi0/2
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan 2,3
Switch(config-if)#exit
Switch(config)#

```

Copy Paste

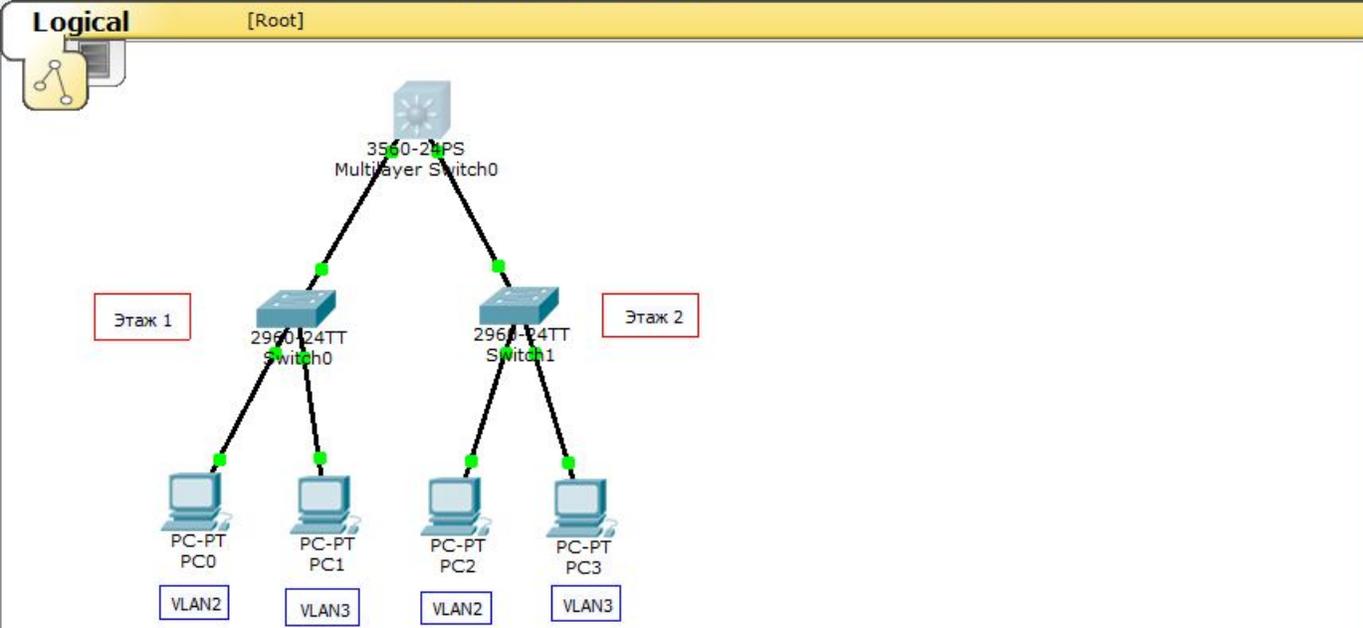
Настроим GigabitEthernet0/2 в trunk, ВЫПОЛНИМ КОМАНДЫ: «interface gi0/2», «switchport trunk encapsulation dot1q», «switchport mode trunk», «switchport trunk allowed vlan 2,3», «exit».

Connections

Copper Straight-Through

Scenario 0

| Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete |
|---|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|
| <p>New Delete</p> <p>Toggle PDU List Window</p> | | | | | | | | | | |



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```

native          Set trunking native characteristics when interface is in
                  trunking mode
Switch(config-if)#switchport trunk en
Switch(config-if)#switchport trunk encapsulation
% Incomplete command.
Switch(config-if)#switchport trunk encapsulation ?
  dot1q  Interface uses only 802.1q trunking encapsulation when trunking
Switch(config-if)#switchport trunk encapsulation do
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#sw
Switch(config-if)#switchport mode tr
Switch(config-if)#switchport mode trunk
Switch(config-if)#sw
Switch(config-if)#switchport tr
Switch(config-if)#switchport trunk allowed vlan 2,3
Switch(config-if)#exit
Switch(config)#int gi0/2
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan 2,3
Switch(config-if)#exit
Switch(config)#int vlan 2
Switch(config-if)#ip add
Switch(config-if)#ip address 2.2.2.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#
  
```

Copy Paste

Добавим IP-адреса: «int vlan 2», «ip address 2.2.2.1 255.255.255.0», «exit».

Connections

Copper Straight-Through

Scenario 0

| Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete |
|---|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|
| <p>New Delete</p> <p>Toggle PDU List Window</p> | | | | | | | | | | |

File Edit Options View Tools Extensions Help

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

```

IOS Command Line Interface

Switch(config-if)#sw
Switch(config-if)#switchport mode tr
Switch(config-if)#switchport mode trunk
Switch(config-if)#sw
Switch(config-if)#switchport tr
Switch(config-if)#switchport trunk allowed vlan 2,3
Switch(config-if)#exit
Switch(config)#int gi0/2
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan 2,3
Switch(config-if)#exit
Switch(config)#int vlan 2
Switch(config-if)#ip add
Switch(config-if)#ip address 2.2.2.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int vlan 3
Switch(config-if)#ip address 3.3.3.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#

```

Time: 25:59:23 | 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

0:04 25.10.2019

Добавим IP-адреса: «int vlan 3», «ip address 3.3.3.1 255.255.255.0», «exit».

Cisco Packet Tracer - D:\Андрей\Компьютерные сети\мдк.01.01. Организация, принципы построения и функционирования сетей\графика\рабочий_абаб_1.prk

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

```
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan 2,3
Switch(config-if)#exit
Switch(config)#int vlan 2
Switch(config-if)#ip address 2.2.2.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int vlan 3
Switch(config-if)#ip address 3.3.3.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#ip routing
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

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

Сразу включаем: «ip routing», «end», сохраняем конфигурацию: «wr mem».

Time: 26:04:00 | Power Cycle Devices Fast Forward Time

Connections

Copper Straight-Through

Scenario 0

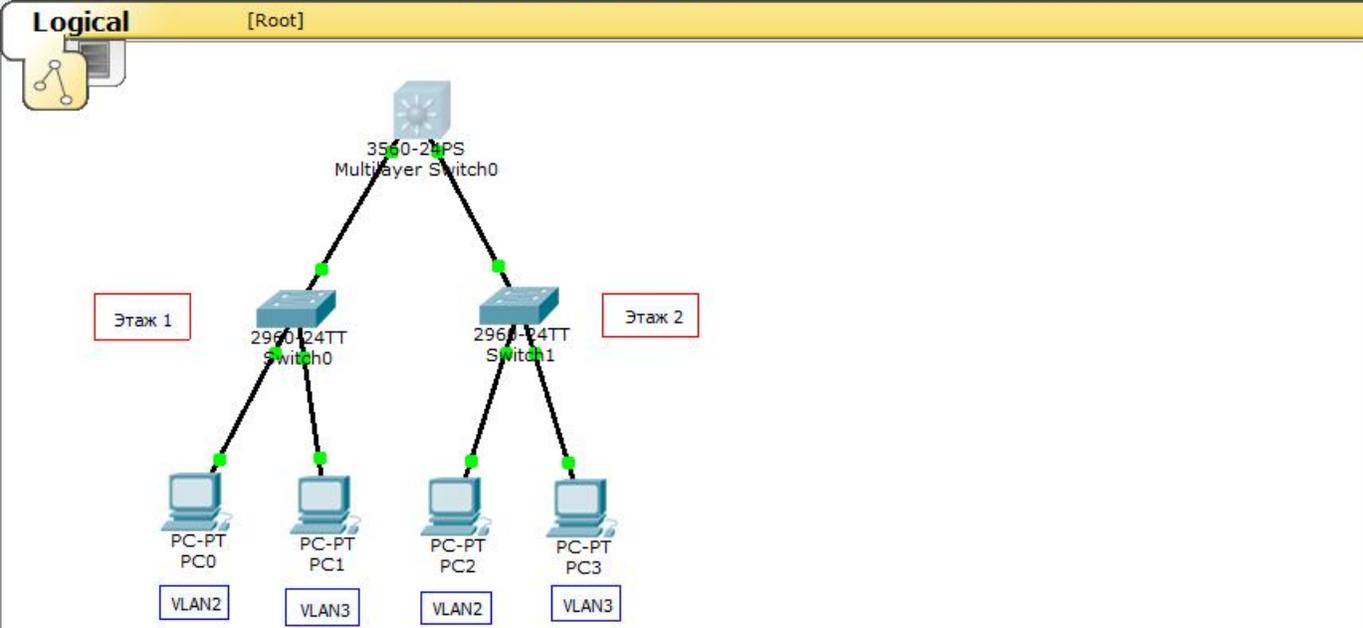
| Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete |
|------|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|
|------|-------------|--------|-------------|------|-------|------------|----------|-----|------|--------|

New Delete

Toggle PDU List Window

Realtime

0:09



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```

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

Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int vlan 3
Switch(config-if)#ip address 3.3.3.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#ip routing
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#wr mem
Building configuration...
[OK]
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 2
Switch(config-vlan)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to up

Switch(config-vlan)#name VLAN2
Switch(config-vlan)#exit
Switch(config)#
  
```

Copy Paste

Дадим имена vlan-ам. Для этого в режиме глобального конфигурирования набираем: «vlan 2». Видим, что он поднят, далее «name VLAN2», «exit».

Connections

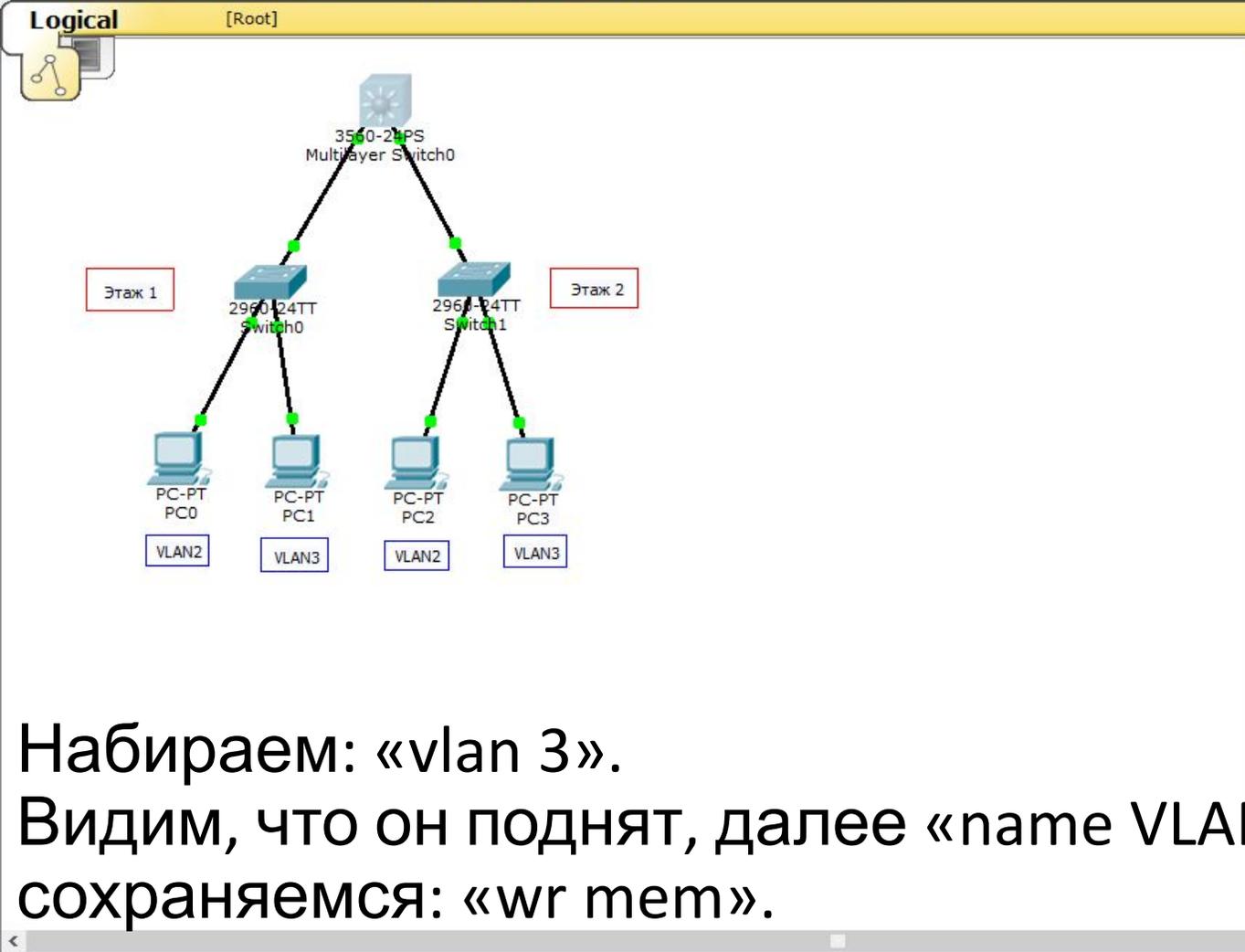
Copper Straight-Through

Scenario 0

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

New Delete

Toggle PDU List Window



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```

Switch(config)#vlan 2
Switch(config-vlan)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to up

Switch(config-vlan)#name VLAN2
Switch(config-vlan)#exit
Switch(config)#vlan 3
Switch(config-vlan)#
%LINK-5-CHANGED: Interface Vlan3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan3, changed state to up

Switch(config-vlan)#name VLAN3
Switch(config-vlan)#exit
Switch(config)#
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

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

Copy Paste

Набираем: «vlan 3».
 Видим, что он поднят, далее «name VLAN3», «exit», «end»,
 сохраняемся: «wr mem».

Connections

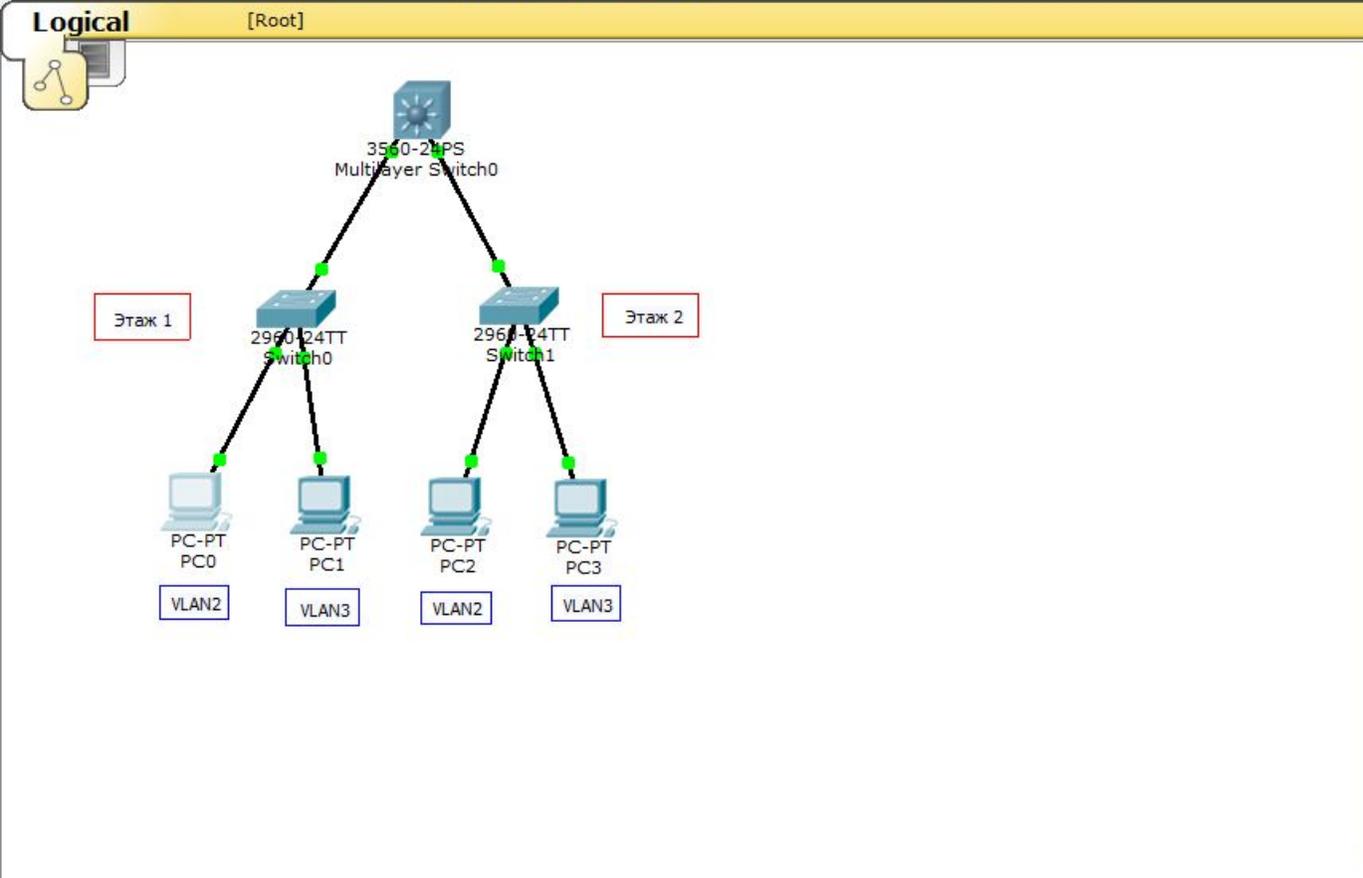
Copper Straight-Through

Scenario 0

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

New Delete

Toggle PDU List Window



IP Configuration

IP Configuration

DHCP Static

IP Address: 2.2.2.2

Subnet Mask: 255.255.255.0

Default Gateway: 2.2.2.1

DNS Server:

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address: /

Link Local Address: FE80::260:47FF:FE13:1423

IPv6 Gateway:

IPv6 DNS Server:

Web Browser

Cisco IP Communicator

Настраиваем компьютер PC0.

Connections

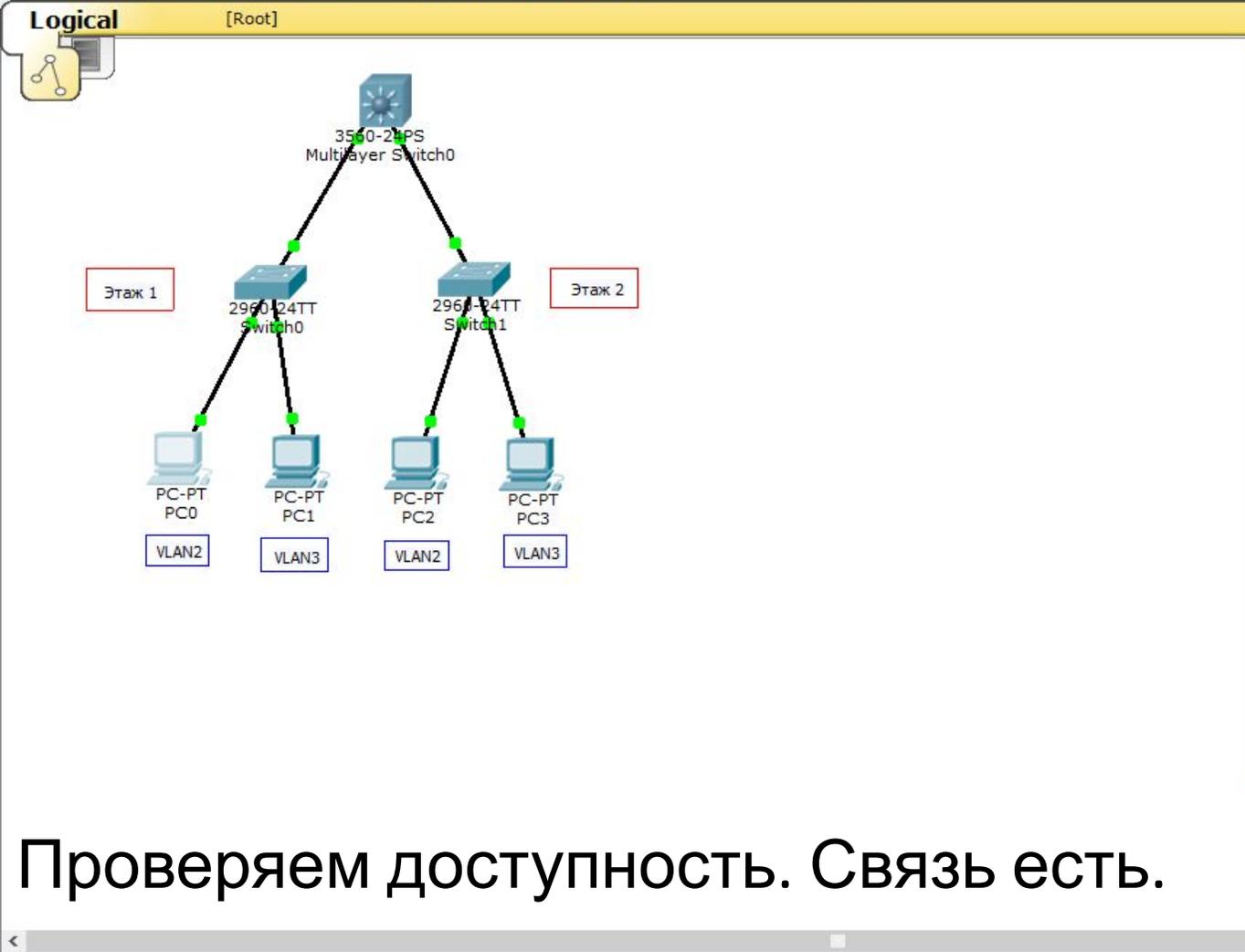
Copper Straight-Through

Scenario 0

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

New Delete

Toggle PDU List Window



PC0

Physical Config Desktop Custom Interface

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 2.2.2.1

Pinging 2.2.2.1 with 32 bytes of data:

Reply from 2.2.2.1: bytes=32 time=1ms TTL=255
Reply from 2.2.2.1: bytes=32 time=0ms TTL=255
Reply from 2.2.2.1: bytes=32 time=0ms TTL=255
Reply from 2.2.2.1: bytes=32 time=0ms TTL=255

Ping statistics for 2.2.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

Проверяем доступность. Связь 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: a central 3560-24PS Multilayer Switch0 at the top, connected to two 2960-24TT Switch0 and 2960-24TT Switch1 below it. These switches are further connected to four PC-PT devices (PC0, PC1, PC2, PC3) at the bottom. The diagram is divided into two sections labeled 'Этаж 1' (Floor 1) and 'Этаж 2' (Floor 2). PC0 and PC1 are connected to Switch0, while PC2 and PC3 are connected to Switch1. VLAN2 and VLAN3 are indicated for the PC connections. On the right, the 'IP Configuration' window for PC1 is open, showing the following settings:

- IP Configuration: DHCP, Static
- IP Address: 3.3.3.2
- Subnet Mask: 255.255.255.0
- Default Gateway: 3.3.3.1
- DNS Server: (empty)
- IPv6 Configuration: DHCP, Auto Config, Static
- IPv6 Address: (empty) / (empty)
- Link Local Address: FE80::201:C9FF:FE0B:EEBD
- IPv6 Gateway: (empty)
- IPv6 DNS Server: (empty)

Additional icons for 'Web Browser' and 'Cisco IP Communicator' are visible in the configuration panel.

Настраиваем компьютер PC1.

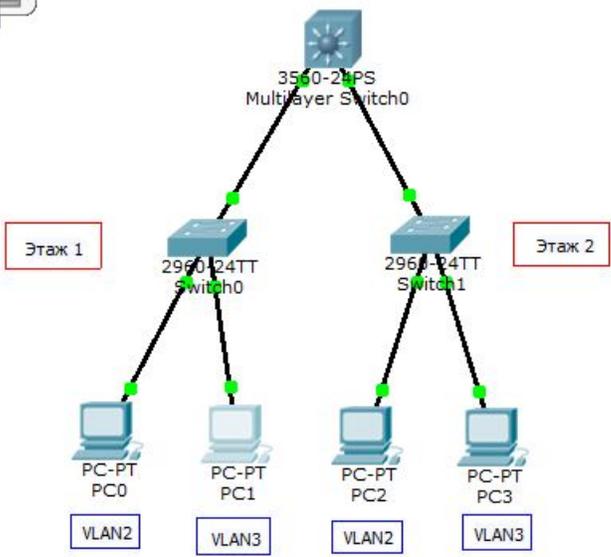
Time: 26:25:36 | Power Cycle Devices | Fast Forward Time

Connections: Copper Straight-Through

Scenario 0

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

0:31 25.10.2019



PC1

Physical Config Desktop Custom Interface

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 3.3.3.1

Pinging 3.3.3.1 with 32 bytes of data:

Reply from 3.3.3.1: bytes=32 time=1ms TTL=255
Reply from 3.3.3.1: bytes=32 time=0ms TTL=255
Reply from 3.3.3.1: bytes=32 time=0ms TTL=255
Reply from 3.3.3.1: bytes=32 time=0ms TTL=255

Ping statistics for 3.3.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

Проверяем доступность. Связь 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 software interface. On the left, a network diagram is shown with a hierarchical structure. At the top is a '3560-24PS Multilayer Switch0'. Below it are two '2960-24TT Switch0' and '2960-24TT Switch1'. The bottom layer consists of four 'PC-PT' devices labeled PC0, PC1, PC2, and PC3. Red boxes on the diagram label the top switch as 'Этаж 1' and the bottom switches as 'Этаж 2'. Below each PC icon is a box indicating its VLAN assignment: PC0 and PC2 are in 'VLAN2', while PC1 and PC3 are in 'VLAN3'. On the right side of the interface, the 'IP Configuration' window for PC2 is open. It shows the 'Static' IP configuration option selected. The IP Address is set to '2.2.2.3', the Subnet Mask to '255.255.255.0', and the Default Gateway to '2.2.2.1'. The IPv6 configuration section shows 'Static' selected with a Link Local Address of 'FE80::2D0:D3FF:FE9B:52D7'. The interface also features a toolbar with various tools like 'Web Browser' and 'Cisco IP Communicator' on the right, and a 'Connections' toolbar at the bottom.

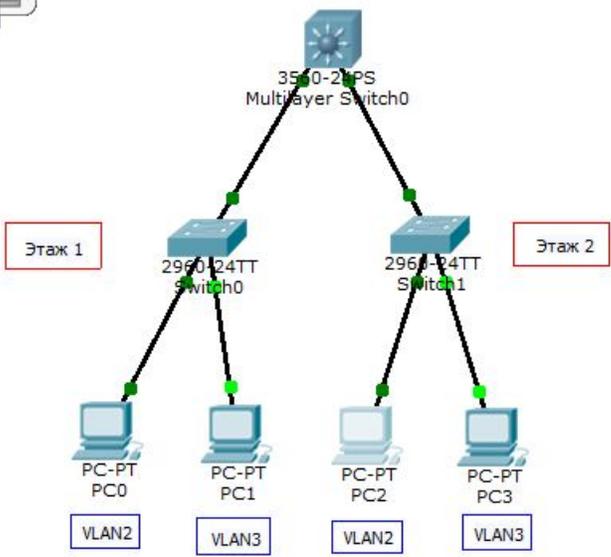
Настраиваем компьютер PC2.

Time: 26:29:11 | Power Cycle Devices | Fast Forward Time

Scenario 0

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

Windows taskbar at the bottom shows icons for Internet Explorer, File Explorer, Google Chrome, Microsoft Excel, and Microsoft PowerPoint. The system tray in the bottom right corner displays the date and time: 25.10.2019, 0:34.



PC2

Physical Config Desktop Custom Interface

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 2.2.2.1

Pinging 2.2.2.1 with 32 bytes of data:

Reply from 2.2.2.1: bytes=32 time=2ms TTL=255
Reply from 2.2.2.1: bytes=32 time=0ms TTL=255
Reply from 2.2.2.1: bytes=32 time=0ms TTL=255
Reply from 2.2.2.1: bytes=32 time=0ms TTL=255

Ping statistics for 2.2.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

PC>
```

Проверяем доступность. Связь есть.

Connections

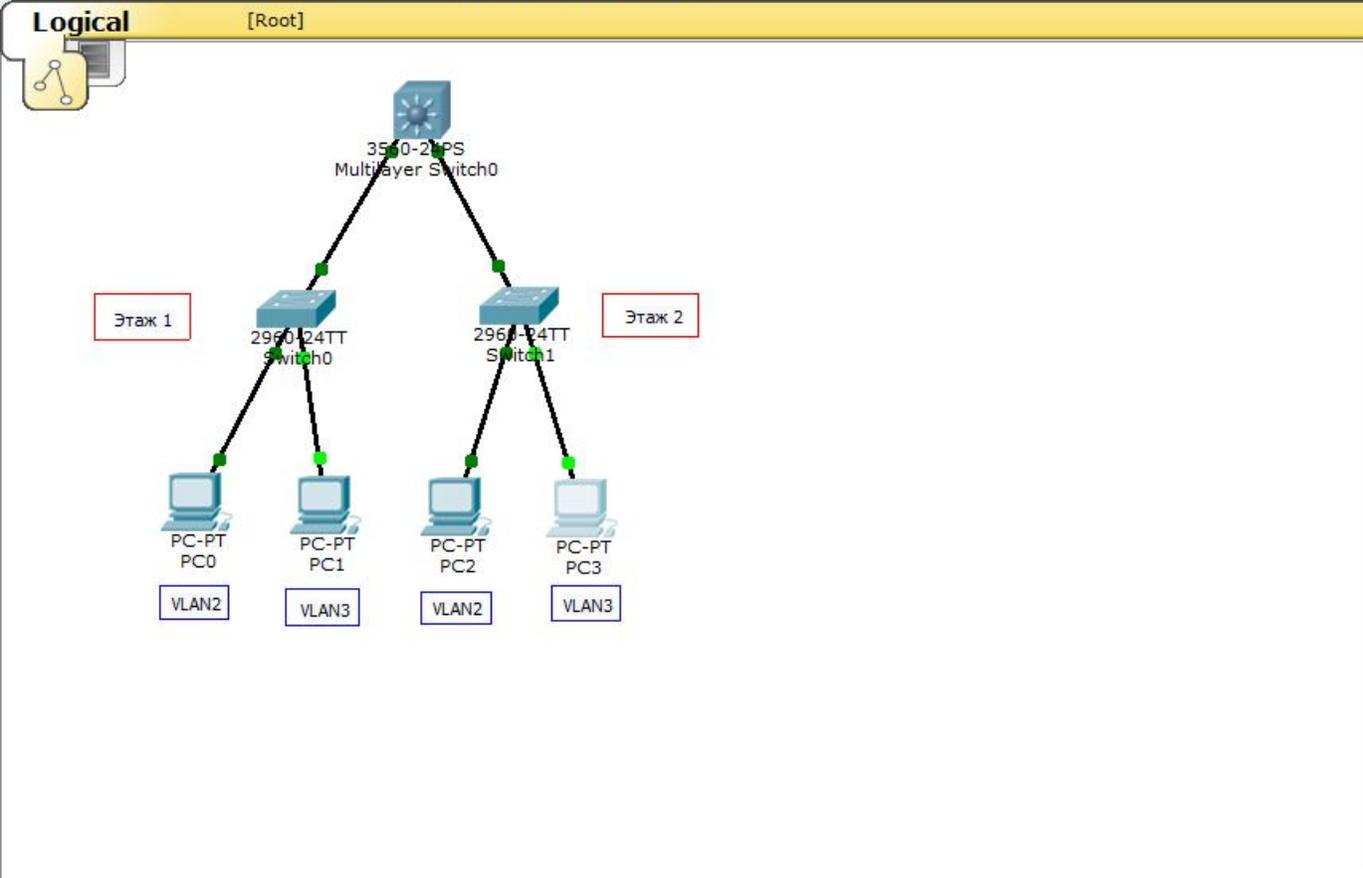
Copper Straight-Through

Scenario 0

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

New Delete

Toggle PDU List Window



IP Configuration

IP Configuration

DHCP Static

IP Address: 3.3.3.3

Subnet Mask: 255.255.255.0

Default Gateway: 3.3.3.1

DNS Server:

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address: /

Link Local Address: FE80::202:17FF:FE9D:D73A

IPv6 Gateway:

IPv6 DNS Server:

Web Browser

Cisco IP Communicator

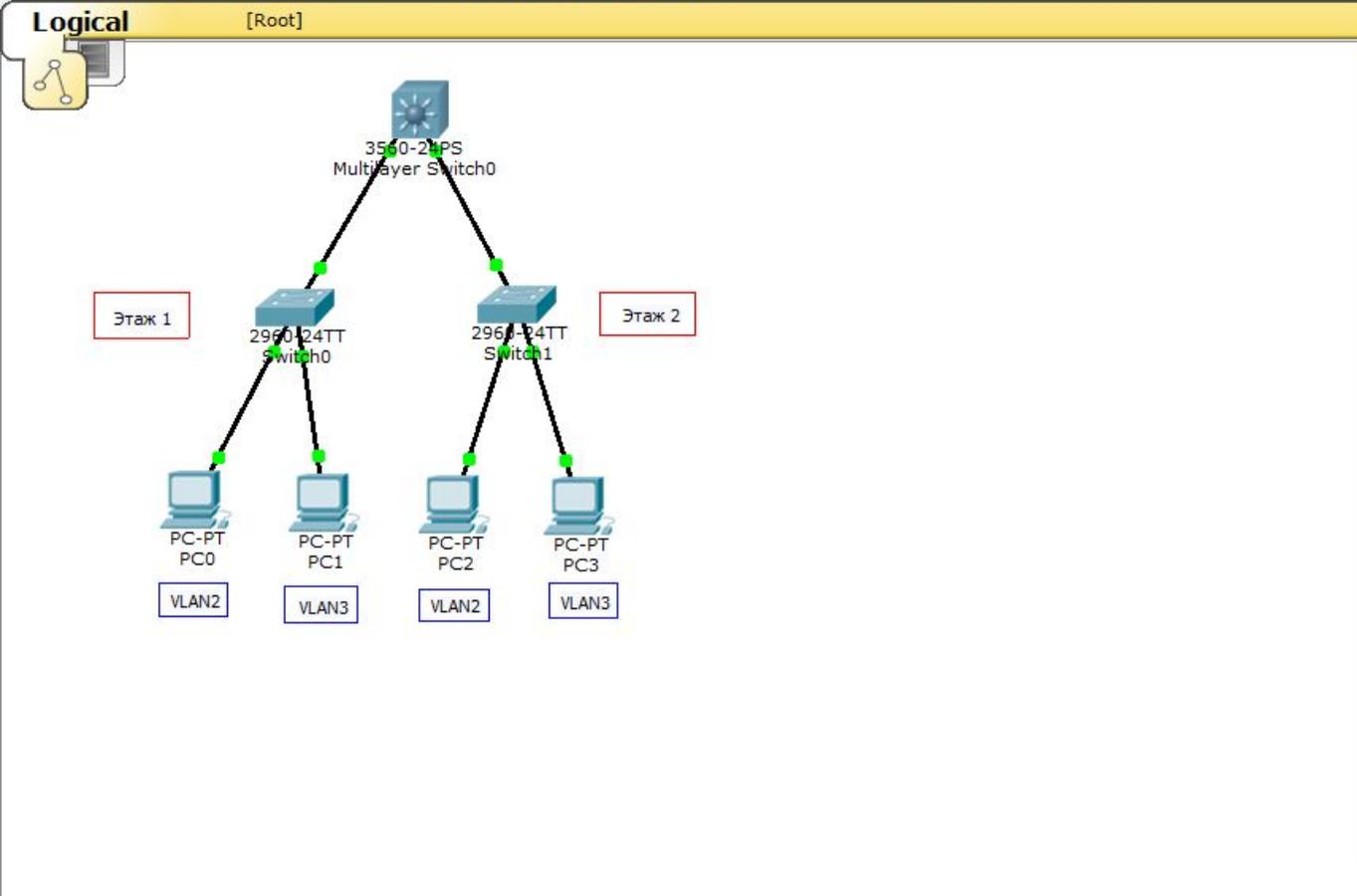
Настраиваем компьютер PC3.

Connections

Copper Straight-Through

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

New Delete Toggle PDU List Window



PC3

Physical Config Desktop Custom Interface

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 3.3.3.1

Pinging 3.3.3.1 with 32 bytes of data:

Reply from 3.3.3.1: bytes=32 time=1ms TTL=255
Reply from 3.3.3.1: bytes=32 time=0ms TTL=255
Reply from 3.3.3.1: bytes=32 time=0ms TTL=255
Reply from 3.3.3.1: bytes=32 time=0ms TTL=255

Ping statistics for 3.3.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

Проверяем доступность. Связь 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 is shown with a hierarchical structure. At the top is a 3500-24PS Multilayer Switch0. Below it are two 2960-24TT Switch0 and Switch1. Under Switch0 are two PC-PT devices (PC0 and PC1), and under Switch1 are two PC-PT devices (PC2 and PC3). The diagram is divided into two levels: 'Этаж 1' (Floor 1) containing the switches and 'Этаж 2' (Floor 2) containing the PCs. VLANs are assigned to the PCs: PC0 and PC2 are in VLAN2, while PC1 and PC3 are in VLAN3. On the right, a 'Command Prompt' window for PC3 is open, showing the results of a ping command to 3.3.3.2. The output indicates that the connection is successful with 0% loss.

```
Command Prompt
Ping statistics for 3.3.3.1:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
PC>
PC>
PC>
PC>
PC>
PC>
PC>ping 3.3.3.2

Pinging 3.3.3.2 with 32 bytes of data:

Reply from 3.3.3.2: bytes=32 time=11ms TTL=128
Reply from 3.3.3.2: bytes=32 time=0ms TTL=128
Reply from 3.3.3.2: bytes=32 time=0ms TTL=128
Reply from 3.3.3.2: bytes=32 time=0ms TTL=128

Ping statistics for 3.3.3.2:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 11ms, Average = 2ms

PC>
```

Проверяем связь компьютеров PC3 и PC1. Связь есть.

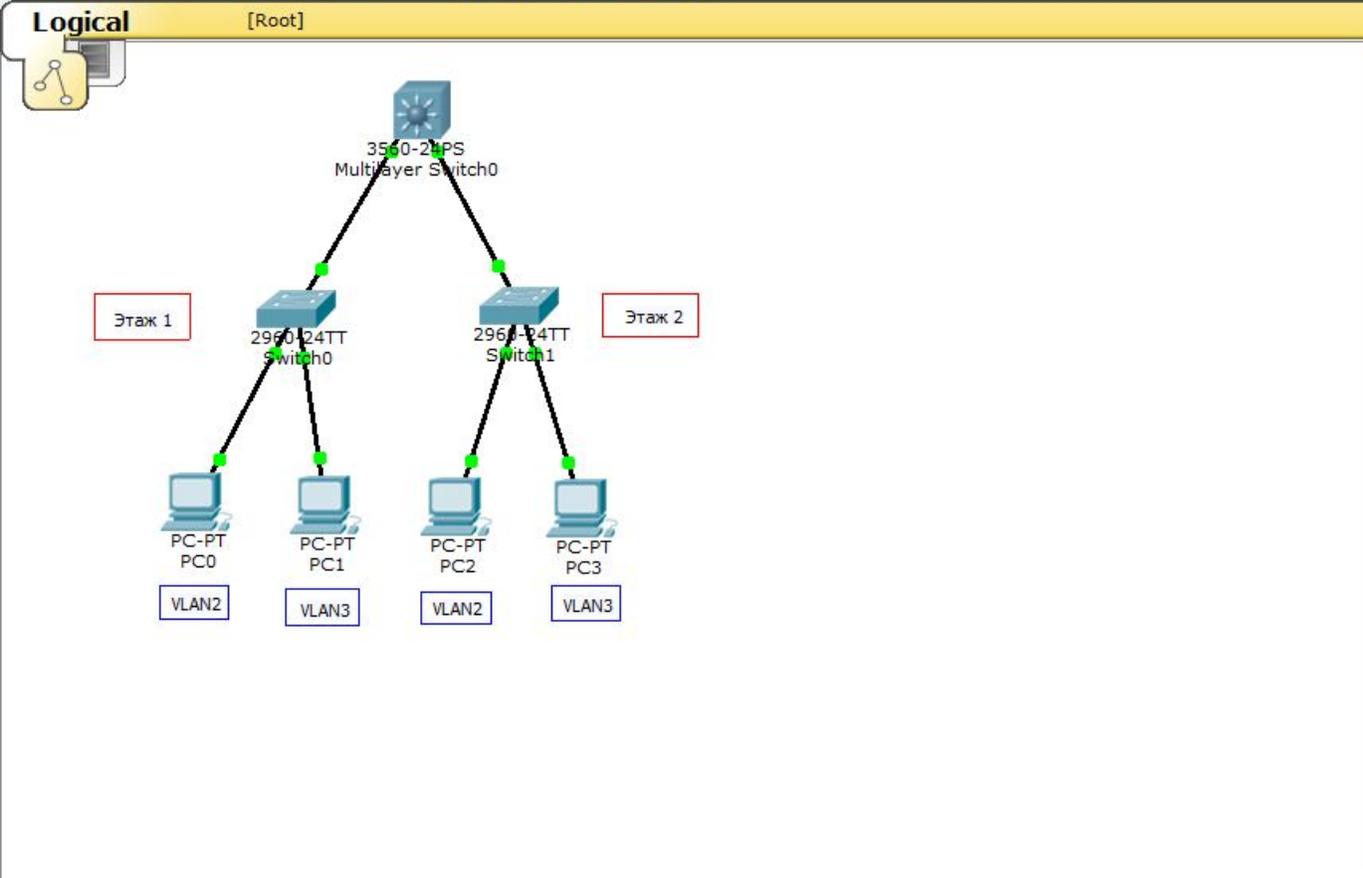
Time: 26:36:50 | Power Cycle Devices | Fast Forward Time | Realtime

Scenario 0

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

Connections | Copper Straight-Through

Windows taskbar: Internet Explorer, File Explorer, Firefox, Microsoft Excel, PowerPoint, and other applications are visible.



PC3

Physical Config Desktop Custom Interface

Command Prompt

```
Pinging 3.3.3.2 with 32 bytes of data:
Reply from 3.3.3.2: bytes=32 time=11ms TTL=128
Reply from 3.3.3.2: bytes=32 time=0ms TTL=128
Reply from 3.3.3.2: bytes=32 time=0ms TTL=128
Reply from 3.3.3.2: bytes=32 time=0ms TTL=128

Ping statistics for 3.3.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 2ms

PC>ping 2.2.2.2

Pinging 2.2.2.2 with 32 bytes of data:
Reply from 2.2.2.2: bytes=32 time=1ms TTL=127
Reply from 2.2.2.2: bytes=32 time=0ms TTL=127
Reply from 2.2.2.2: bytes=32 time=0ms TTL=127
Reply from 2.2.2.2: bytes=32 time=0ms TTL=127

Ping statistics for 2.2.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

Проверяем связь компьютеров PC3 и PC2. Связь 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

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 |
|-------------------------------------|-----------|-------------|-----------|------|
| <input checked="" type="checkbox"/> | 0.000 | -- | PC3 | ICM |

Reset Simulation Constant Delay Captured to: * 0.000 s

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

Связь есть. Попробуем отправить сообщение.

Time: 26:45:12.305 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

Connections

Copper Straight-Through

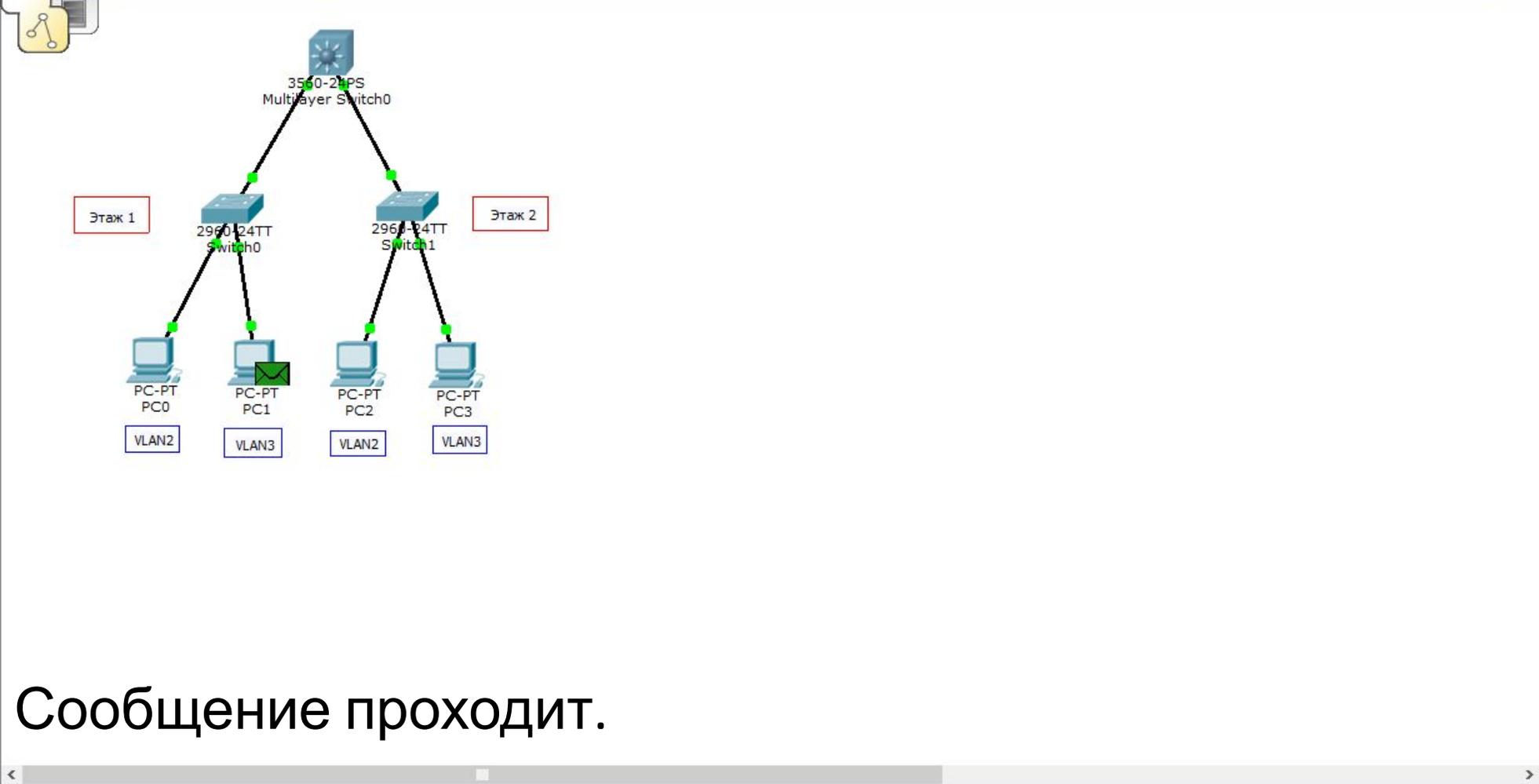
Scenario 0

New Delete

Toggle PDU List Window

| Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete |
|-------------------------------------|-------------|--------|-------------|------|-------|------------|----------|-----|--------|----------|
| <input checked="" type="checkbox"/> | In Progress | PC3 | PC1 | ICMP | Green | 0.000 | N | 0 | (edit) | (delete) |

Event List Simulation



Simulation Panel

Event List

| Vis. | Time(sec) | Last Device | At Device | Type |
|-------------------------------------|-----------|----------------|-------------|------|
| | 0.000 | -- | PC3 | ICMP |
| | 0.001 | PC3 | Switch1 | ICMP |
| | 0.002 | Switch1 | Multilay... | ICMP |
| | 0.003 | Multilayer ... | Switch0 | ICMP |
| <input checked="" type="checkbox"/> | 0.004 | Switch0 | PC1 | ICMP |

Reset Simulation Constant Delay Captured to: * 0.004 s

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 проходит.

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 |
|-------------------------------------|-------------|--------|-------------|------|-------|------------|----------|-----|--------|----------|
| <input checked="" type="checkbox"/> | In Progress | PC3 | PC1 | ICMP | Green | 0.000 | N | 0 | (edit) | (delete) |

| 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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2. Компьютерные сети. Принципы, технологии, протоколы, В. Олифер, Н. Олифер (5-е издание), «Питер», Москва, Санкт-Петербург, 2016.
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Спасибо за внимание!

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