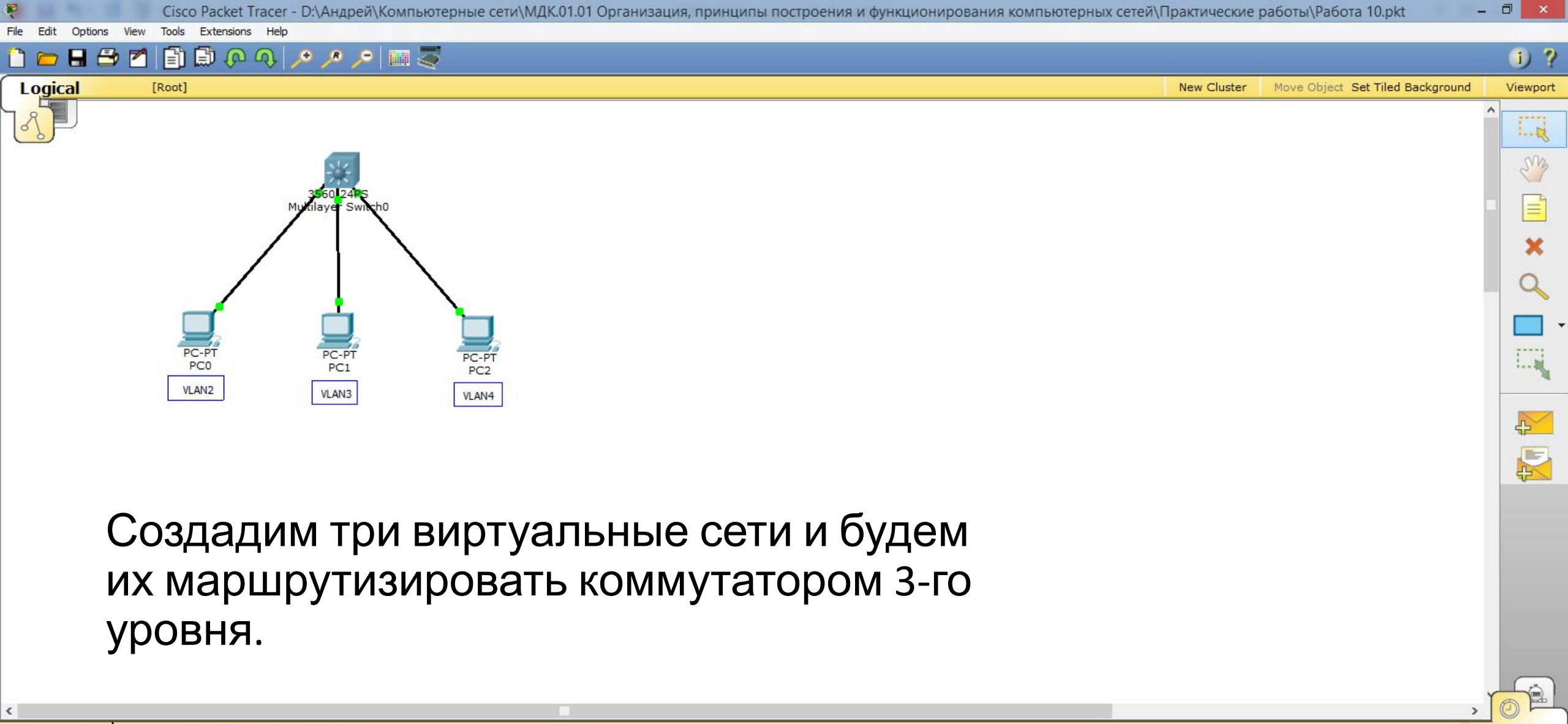
МДК.01.01

Организация, принципы построения и функционирования компьютерных сетей

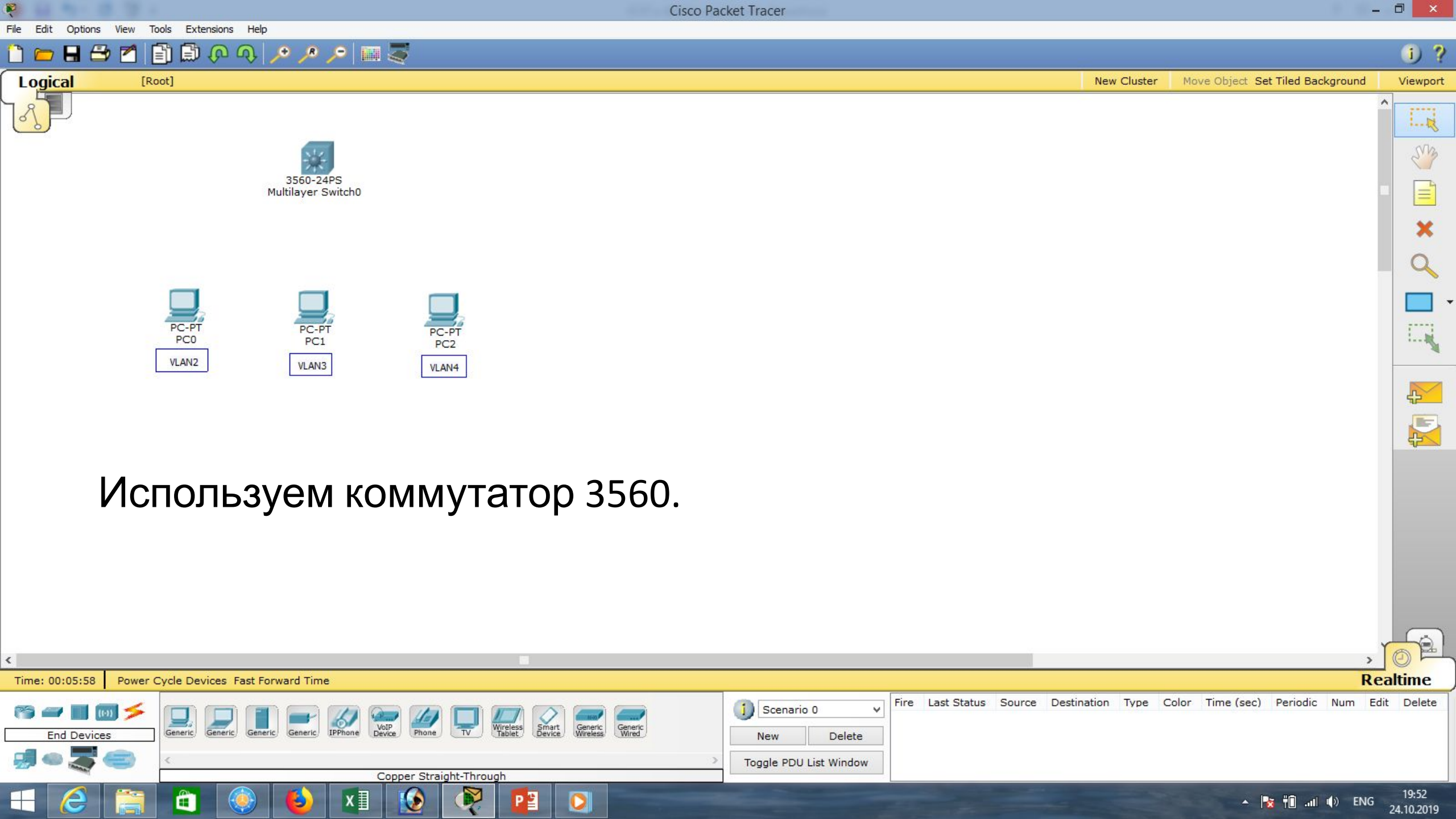
3-курс

Практические занятия

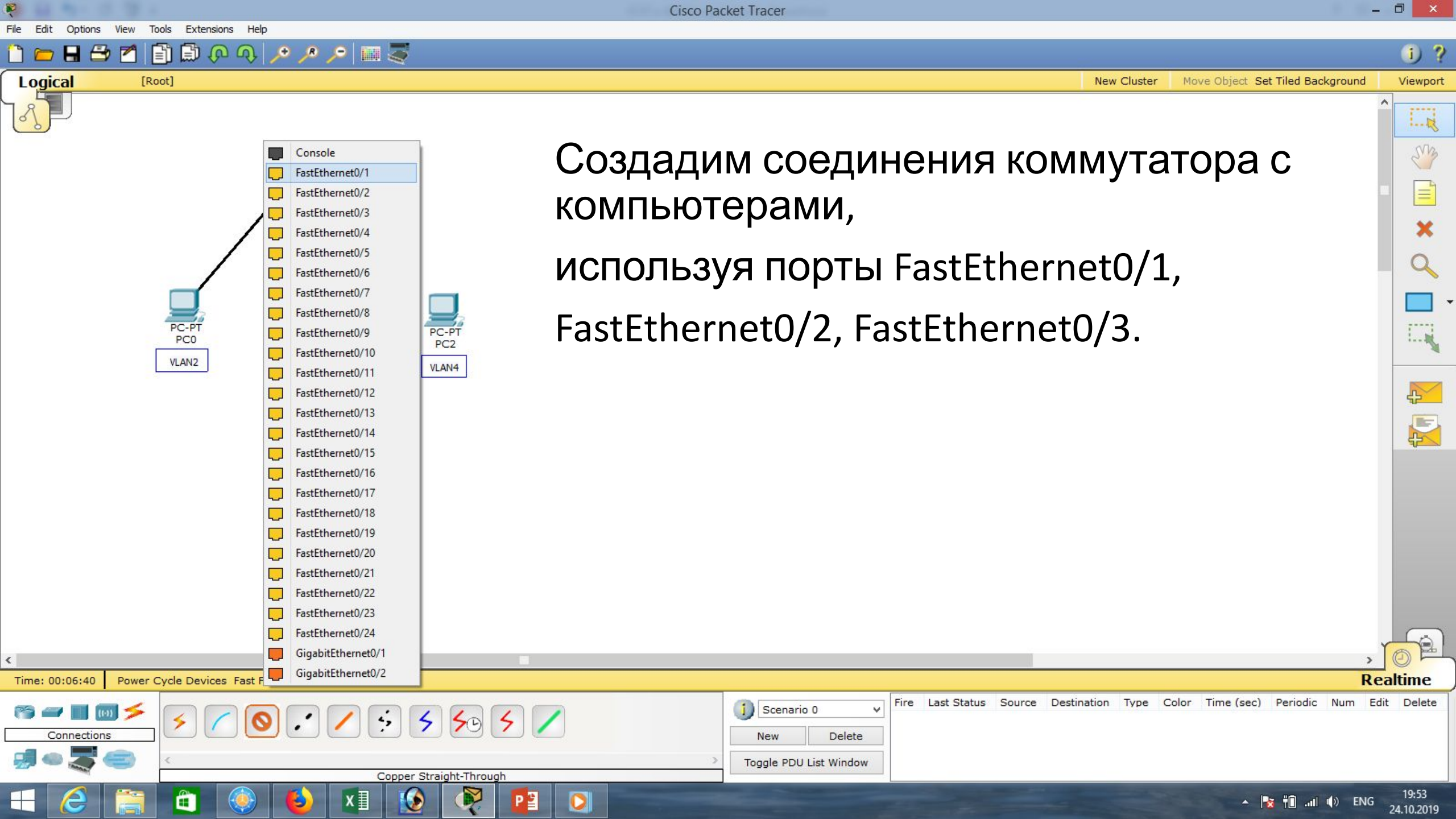
Занятие 05

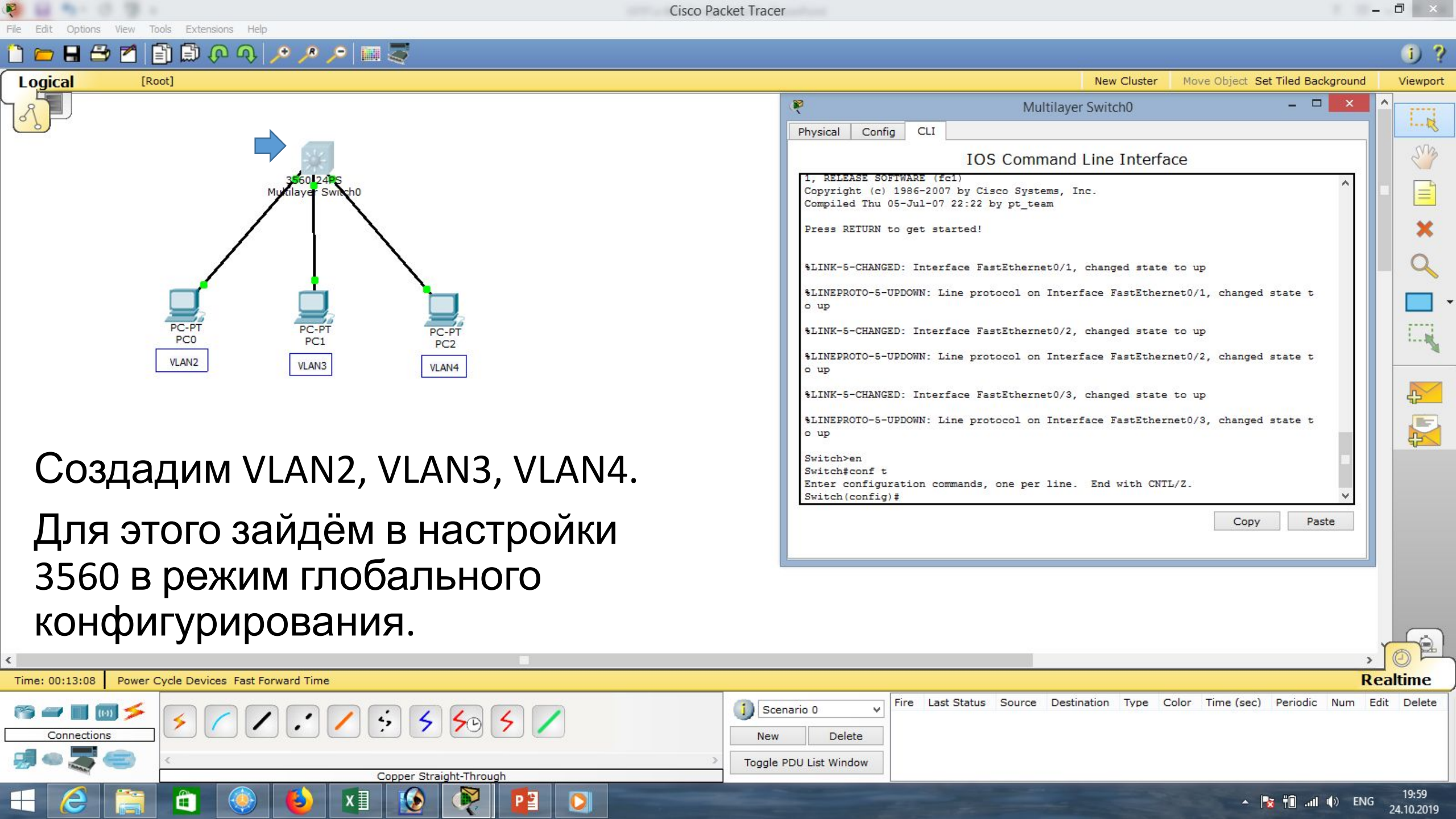


Создадим три виртуальные сети и будем их маршрутизировать коммутатором 3-го уровня.



Используем коммутатор 3560.

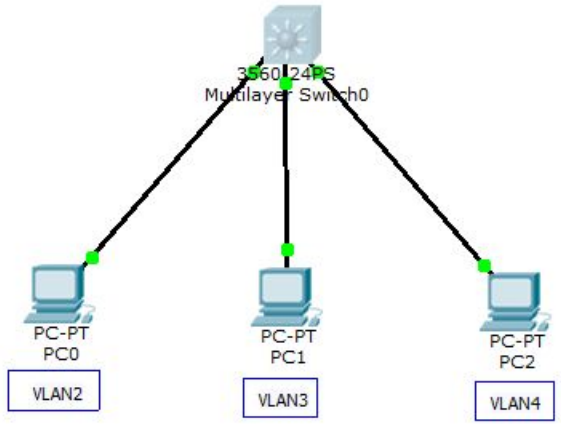

Cisco Packet Tracer
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Console
FastEthernet0/1
FastEthernet0/2
FastEthernet0/3
FastEthernet0/4
FastEthernet0/5
FastEthernet0/6
FastEthernet0/7
FastEthernet0/8
FastEthernet0/9
FastEthernet0/10
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
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
19:53
24.10.2019


Cisco Packet Tracer
File Edit Options View Tools Extensions Help
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
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
Создадим VLAN2, VLAN3, VLAN4.
Для этого зайдём в настройки 3560 в режим глобального конфигурирования.
Time: 00:13:08
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
19:59
24.10.2019

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

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 t
o up

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up

%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)#
```

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

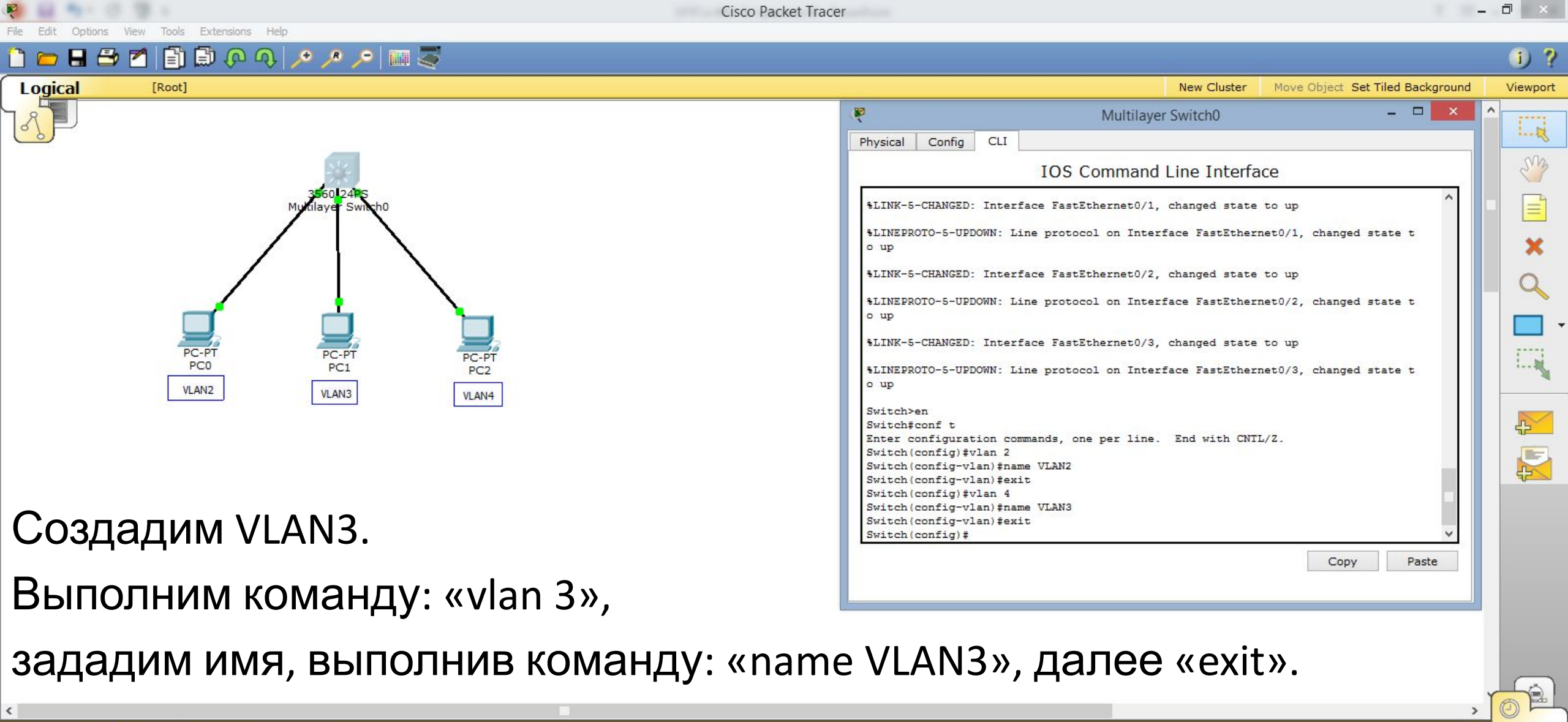
Connections

Copper Straight-Through

Scenario 0 New Delete Toggle PDU List Window

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

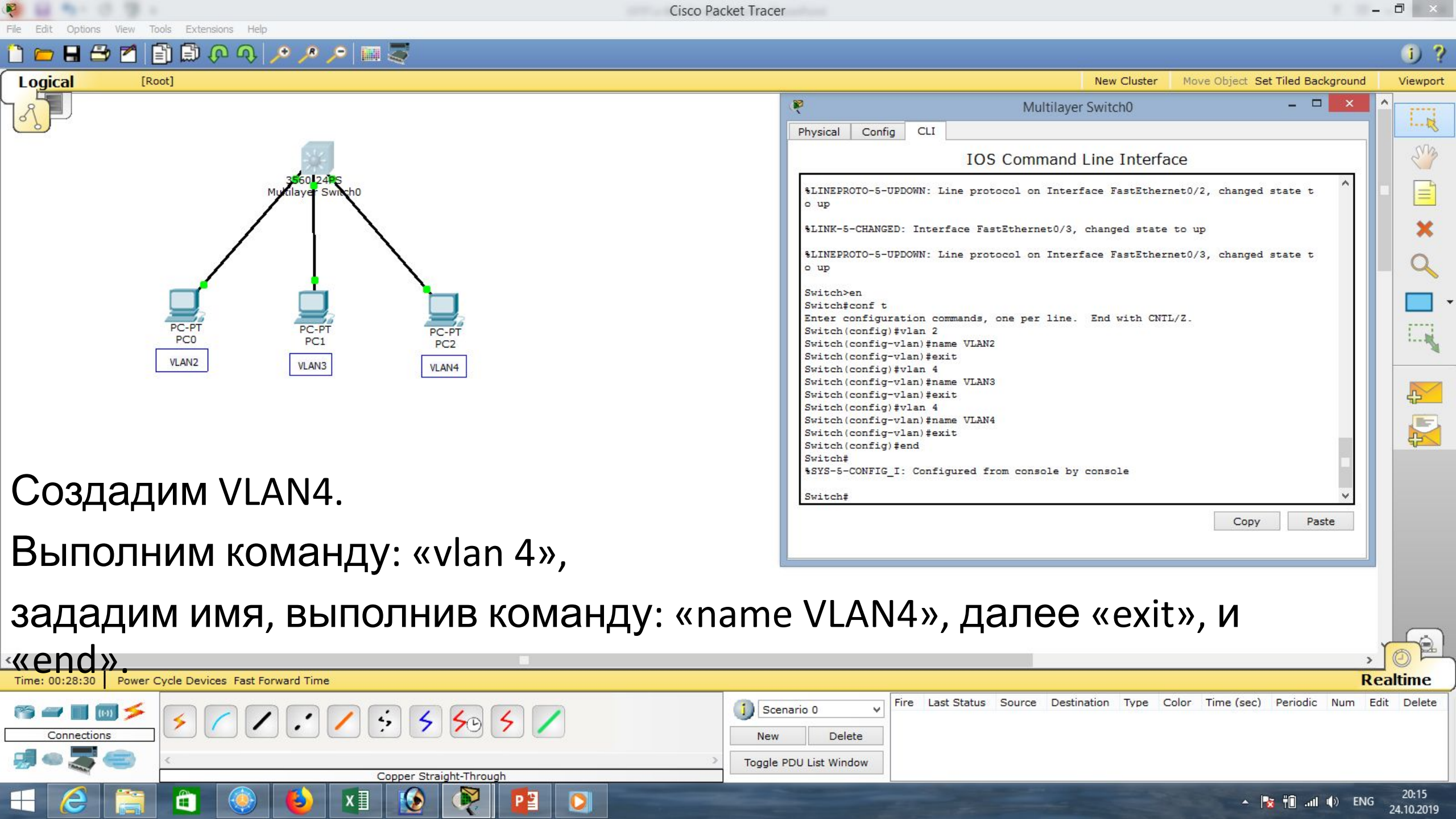
ENG 20:04 24.10.2019



Создадим VLAN3.

Выполним команду: «vlan 3»,

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



Создадим VLAN4.

Выполним команду: «vlan 4»,

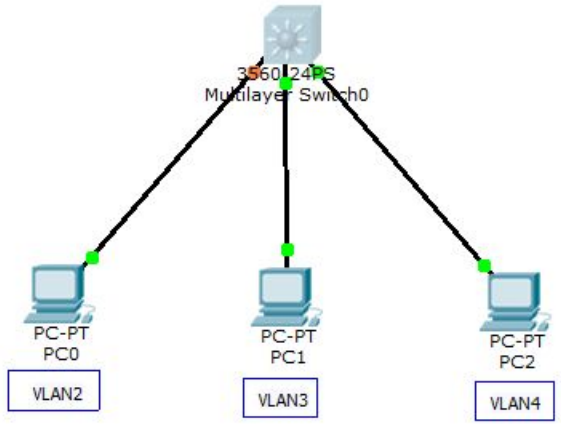
зададим имя, выполнив команду: «name VLAN4», далее «exit», и «end».

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

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

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

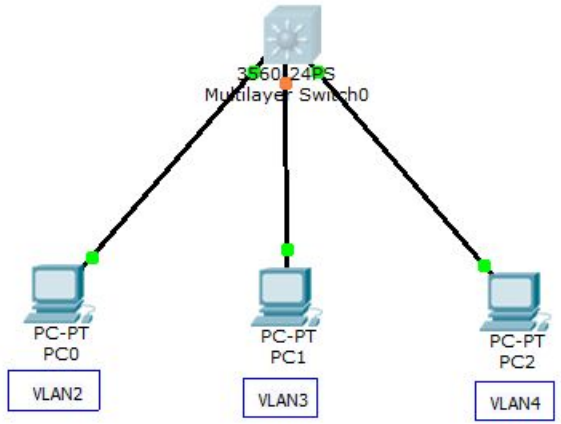
ENG 20:21 24.10.2019

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

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 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)#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

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

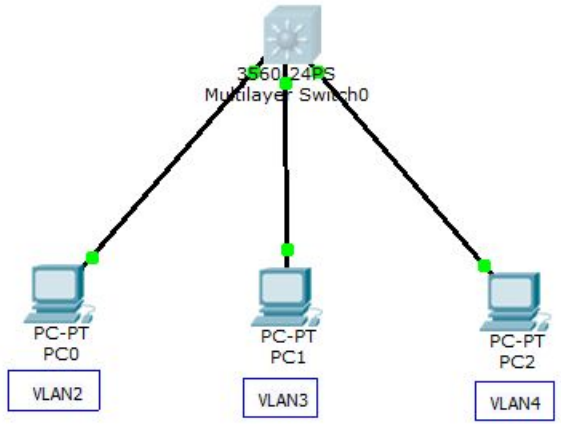
ENG 20:32 24.10.2019

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

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

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

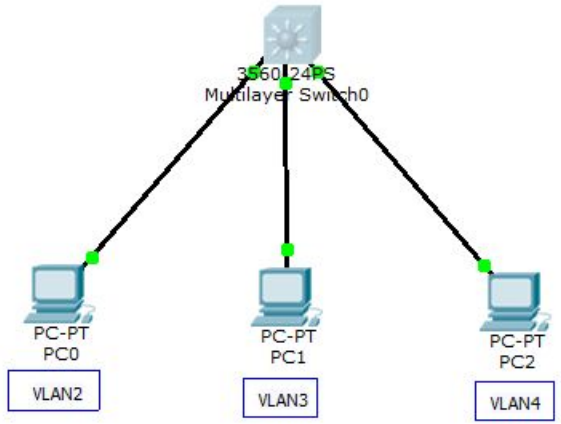
ENG 20:37 24.10.2019

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

Logical [Root]

New Cluster Move Object Set Tiled Background Viewport



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
interface FastEthernet0/1
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/2
 switchport access vlan 3
 switchport mode access
!
interface FastEthernet0/3
 switchport access vlan 4
 switchport mode access
!
interface FastEthernet0/4
!
interface FastEthernet0/5
 --More--
```

Copy Paste

Проверим наши настройки командой: «show run», видим наши порты. Т.к у нас коммутатор третьего уровня, то портам необходимо присвоить IP-адреса.

Time: 00:53:15 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

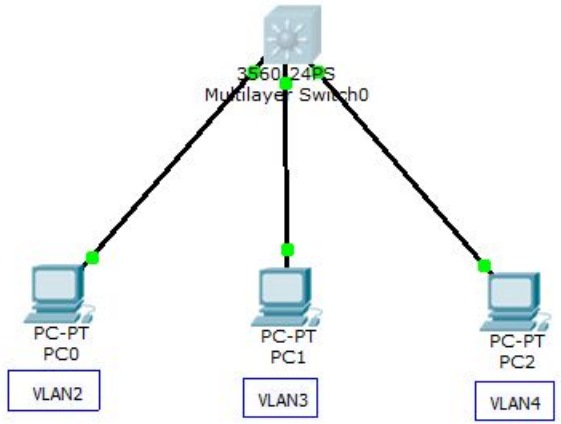
ENG 20:40 24.10.2019

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

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
          ^
% 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

Connections

Copper Straight-Through

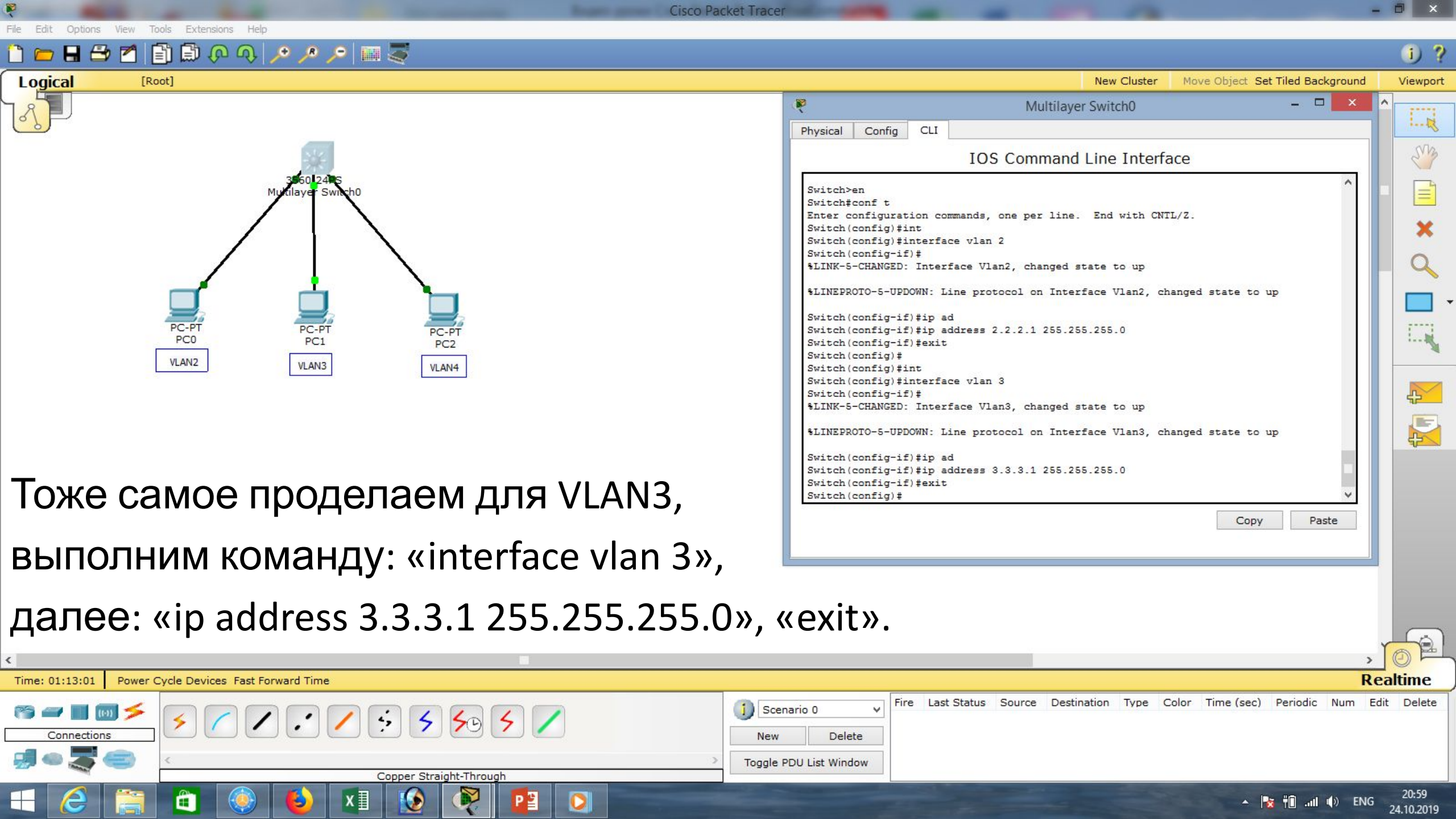
Scenario 0

New Delete

Toggle PDU List Window

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

ENG 20:53 24.10.2019



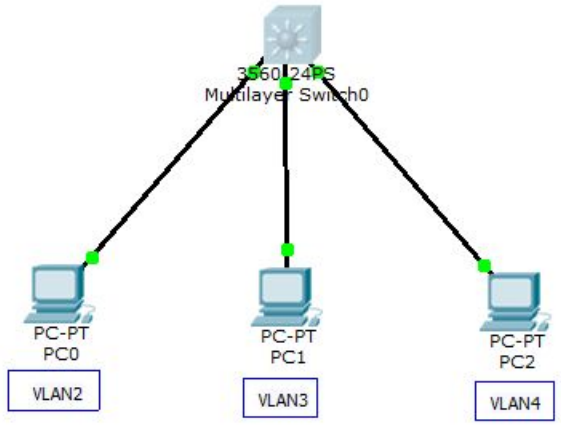
Тоже самое проделаем для VLAN3, выполним команду: «interface vlan 3», далее: «ip address 3.3.3.1 255.255.255.0», «exit».

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

Logical [Root]

New Cluster Move Object Set Tiled Background Viewport



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```
%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)#int
Switch(config)#interface vlan 4
Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan4, changed state to up

Switch(config-if)#ip add
Switch(config-if)#ip address 4.4.4.1 255.255.255.0
Switch(config-if)#and
                   ^
% Invalid input detected at '^' marker.

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

Switch#
```

Copy Paste

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

Time: 01:22:12 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

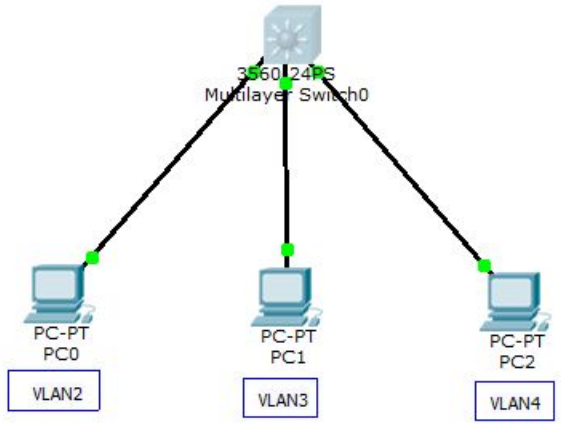
ENG 21:09 24.10.2019

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

Logical [Root]

New Cluster Move Object Set Tiled Background Viewport



Multilayer Switch0

Physical Config CLI

IOS Command Line Interface

```
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan2
 ip address 2.2.2.1 255.255.255.0
!
interface Vlan3
 ip address 3.3.3.1 255.255.255.0
!
interface Vlan4
 ip address 4.4.4.1 255.255.255.0
!
ip classless
!
!
!
!
!
!
!
line con 0
!
 --More--
```

Copy Paste

Видим ip-адреса, присвоенные нашим интерфейсам.

Time: 01:27:20 Power Cycle Devices Fast Forward Time

Realtime

Connections

Copper Straight-Through

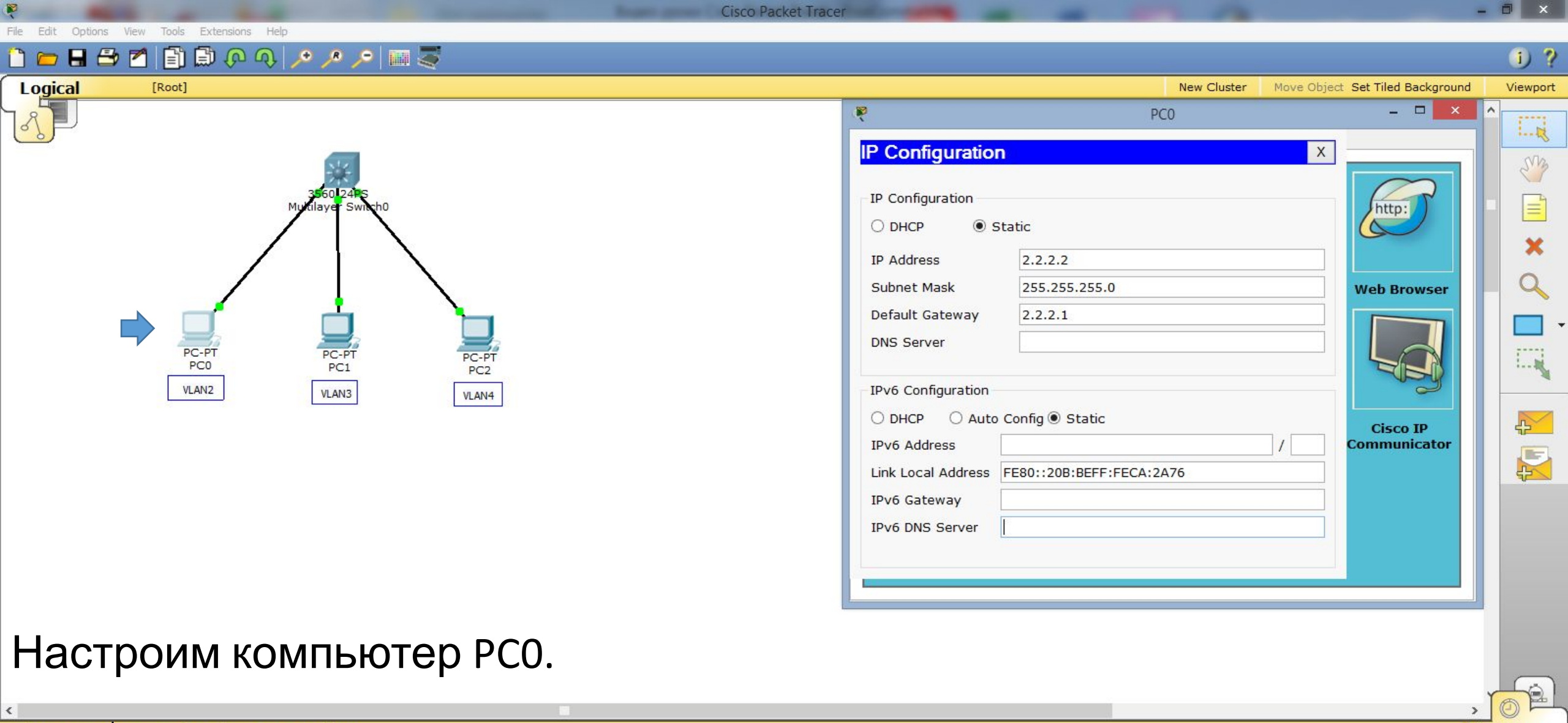
Scenario 0

New Delete

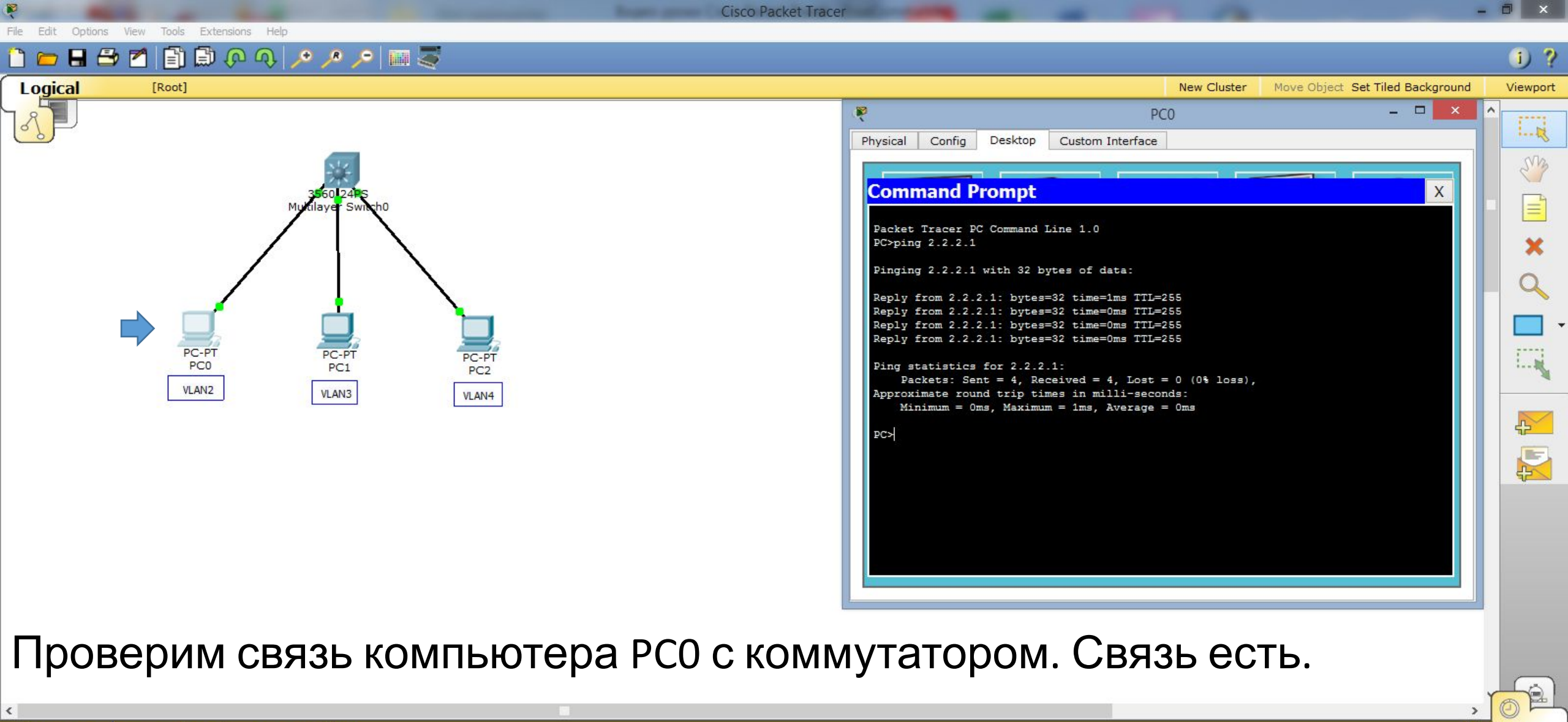
Toggle PDU List Window

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

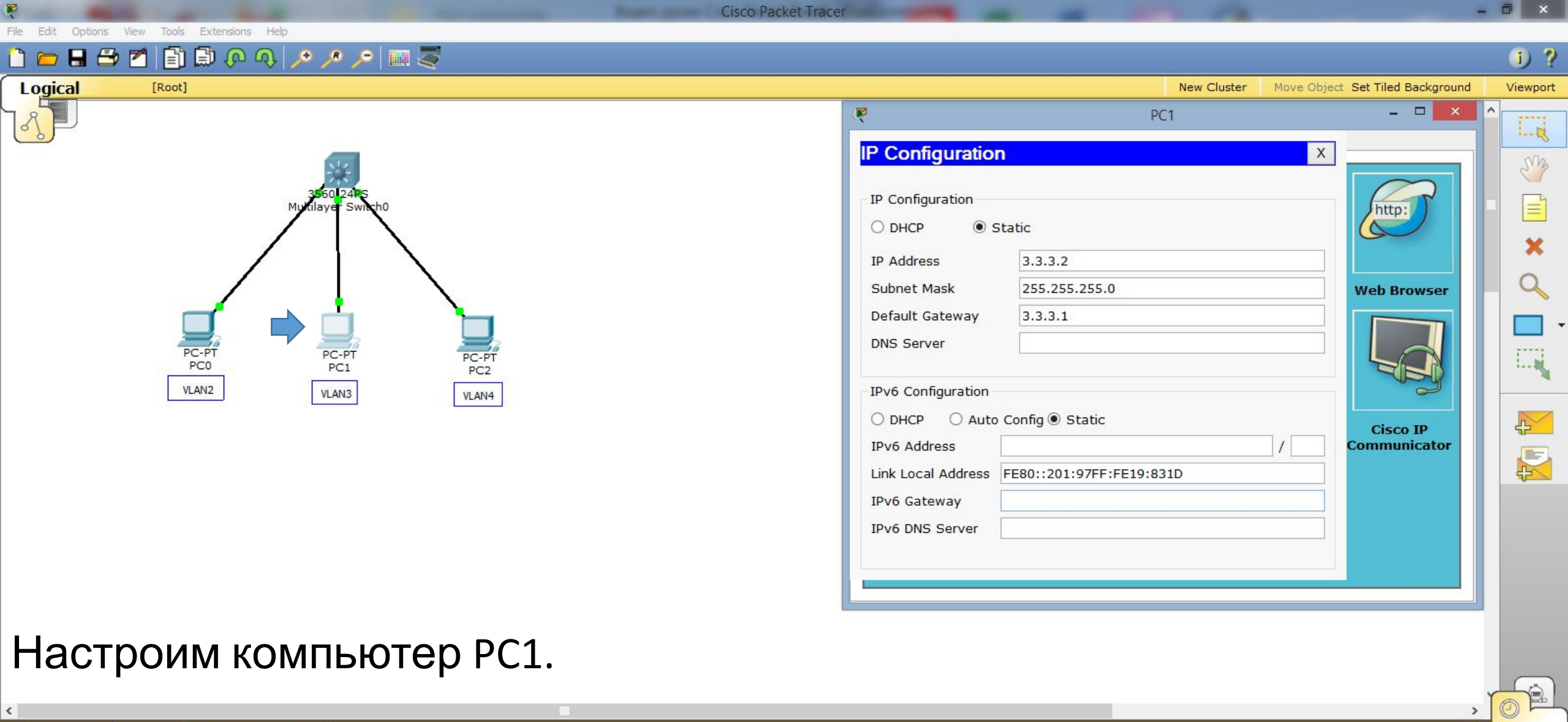
ENG 21:14 24.10.2019



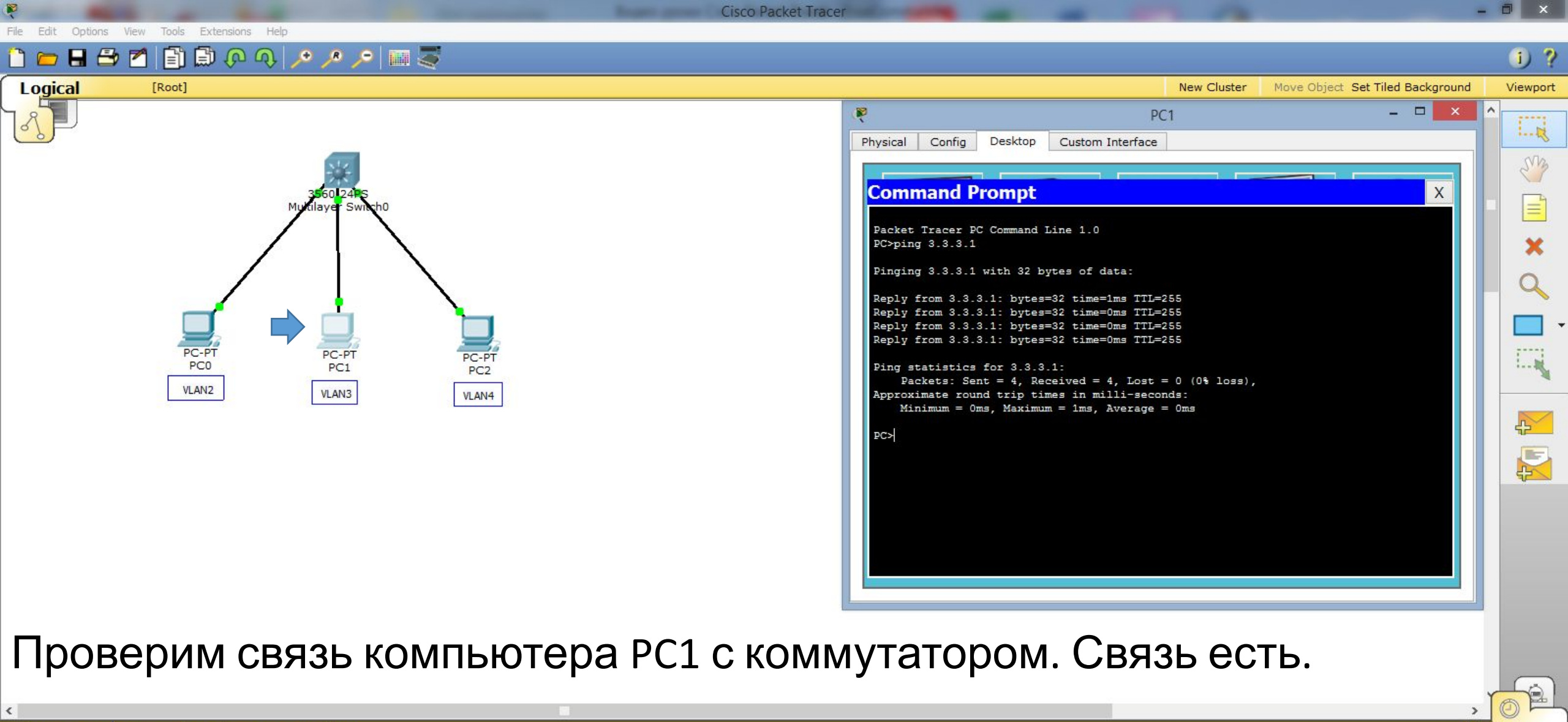
Настроим компьютер PC0.



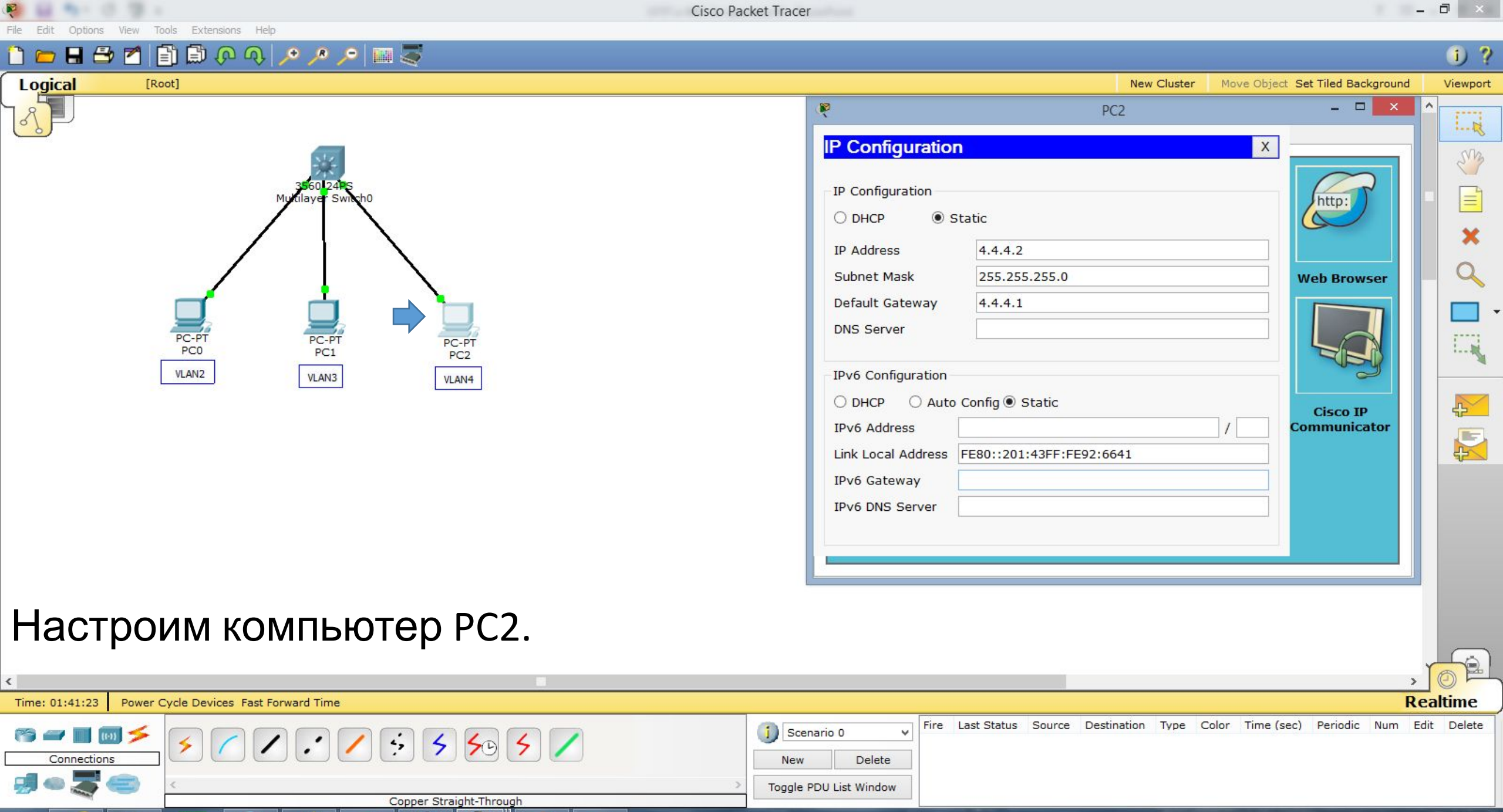
Проверим связь компьютера PC0 с коммутатором. Связь есть.



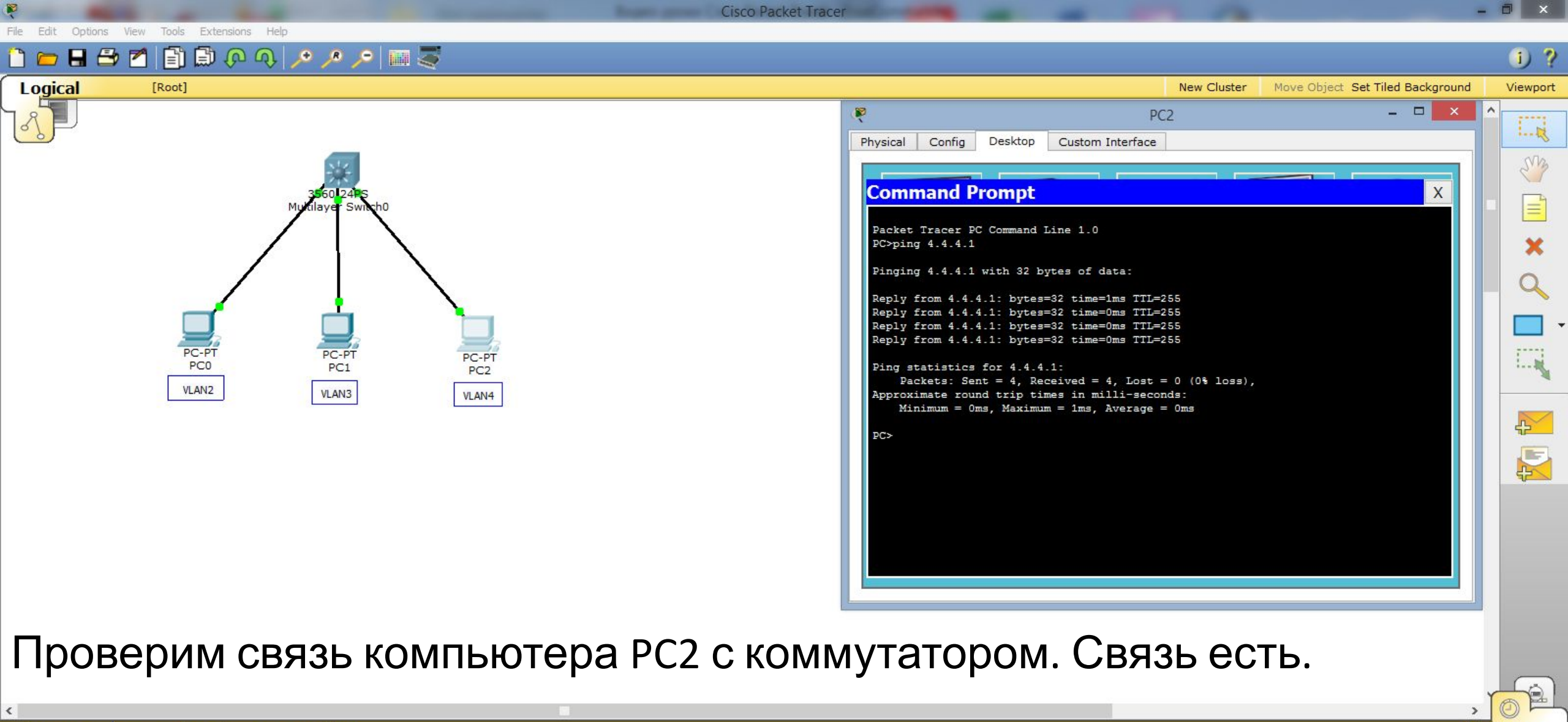
Настроим компьютер PC1.



Проверим связь компьютера PC1 с коммутатором. Связь есть.



Настроим компьютер PC2.



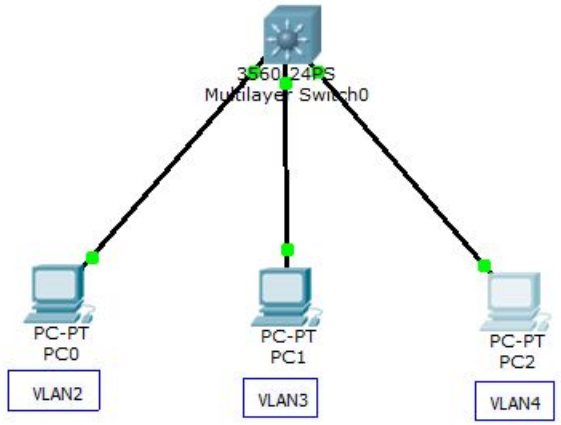
Проверим связь компьютера PC2 с коммутатором. Связь есть.

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

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

Connections

Copper Straight-Through

Scenario 0

New Delete

Toggle PDU List Window

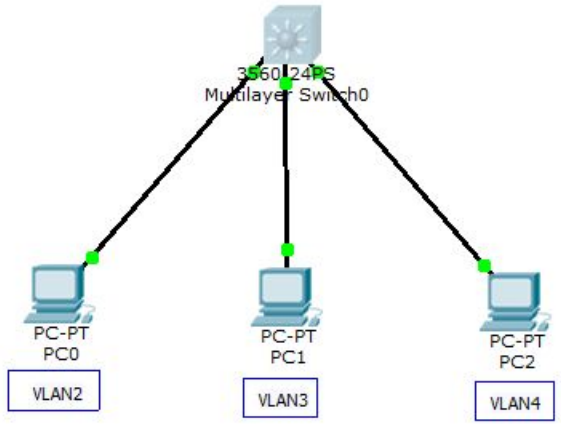
Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete

ENG 21:37 24.10.2019

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

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



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

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

Time: 01:57:24 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

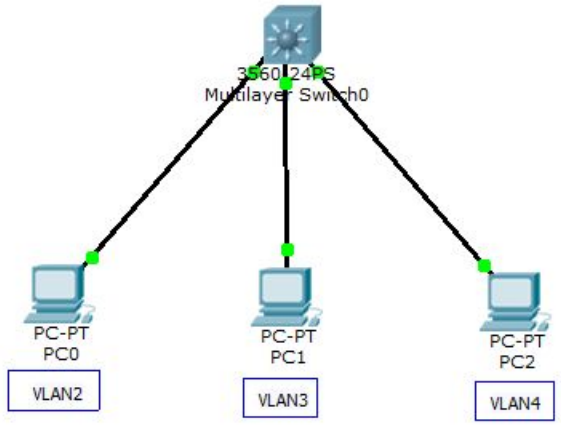
ENG 21:44 24.10.2019

Cisco Packet Tracer

File Edit Options View Tools Extensions Help

Logical [Root]

New Cluster Move Object Set Tiled Background Viewport



PC2

Physical Config Desktop Custom Interface

Command Prompt

```
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>ping 2.2.2.2

Pinging 2.2.2.2 with 32 bytes of data:

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
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>
```

Проверим связь компьютера PC2 с компьютером PC0. Связь есть.

Time: 02:03:06 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 21:50 24.10.2019

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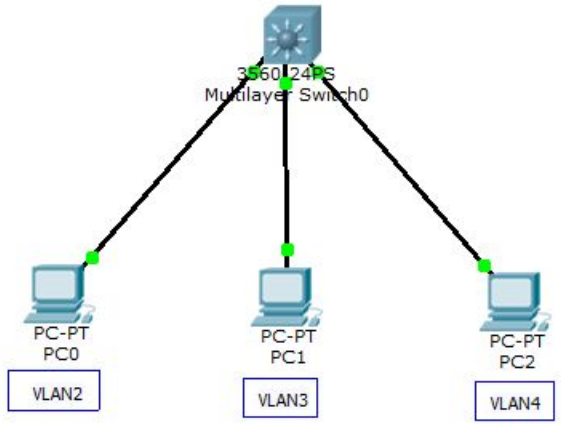
File Edit Options View Tools Extensions Help

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



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
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 = 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
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 = 0ms, Average = 0ms

PC>
```

Проверим связь компьютера PC2 с компьютером PC1. Связь есть.

Таким образом, маршрутизатор 3560 маршрутизирует три сети.

Time: 02:13:07 Power Cycle Devices Fast Forward Time Realtime

Connections

Octal

Scenario 0 New Delete Toggle PDU List Window

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

ENG 22:00 24.10.2019

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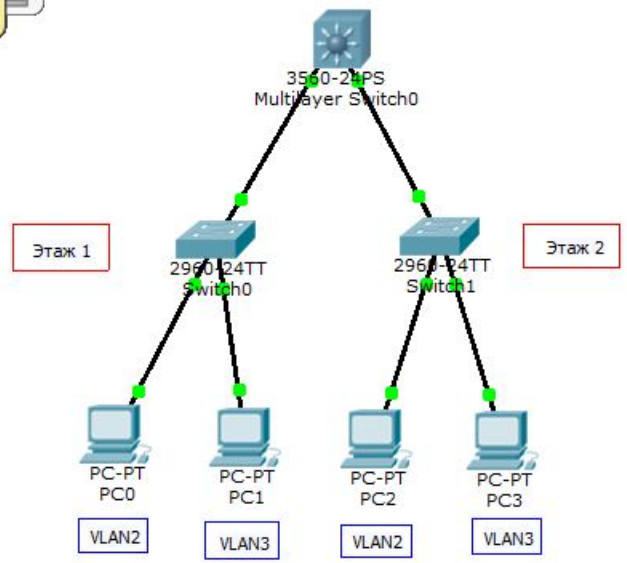
File Edit Options View Tools Extensions Help

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



Рассмотрим следующий пример.

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

Time: 26:31:34 Power Cycle Devices Fast Forward Time Realtime

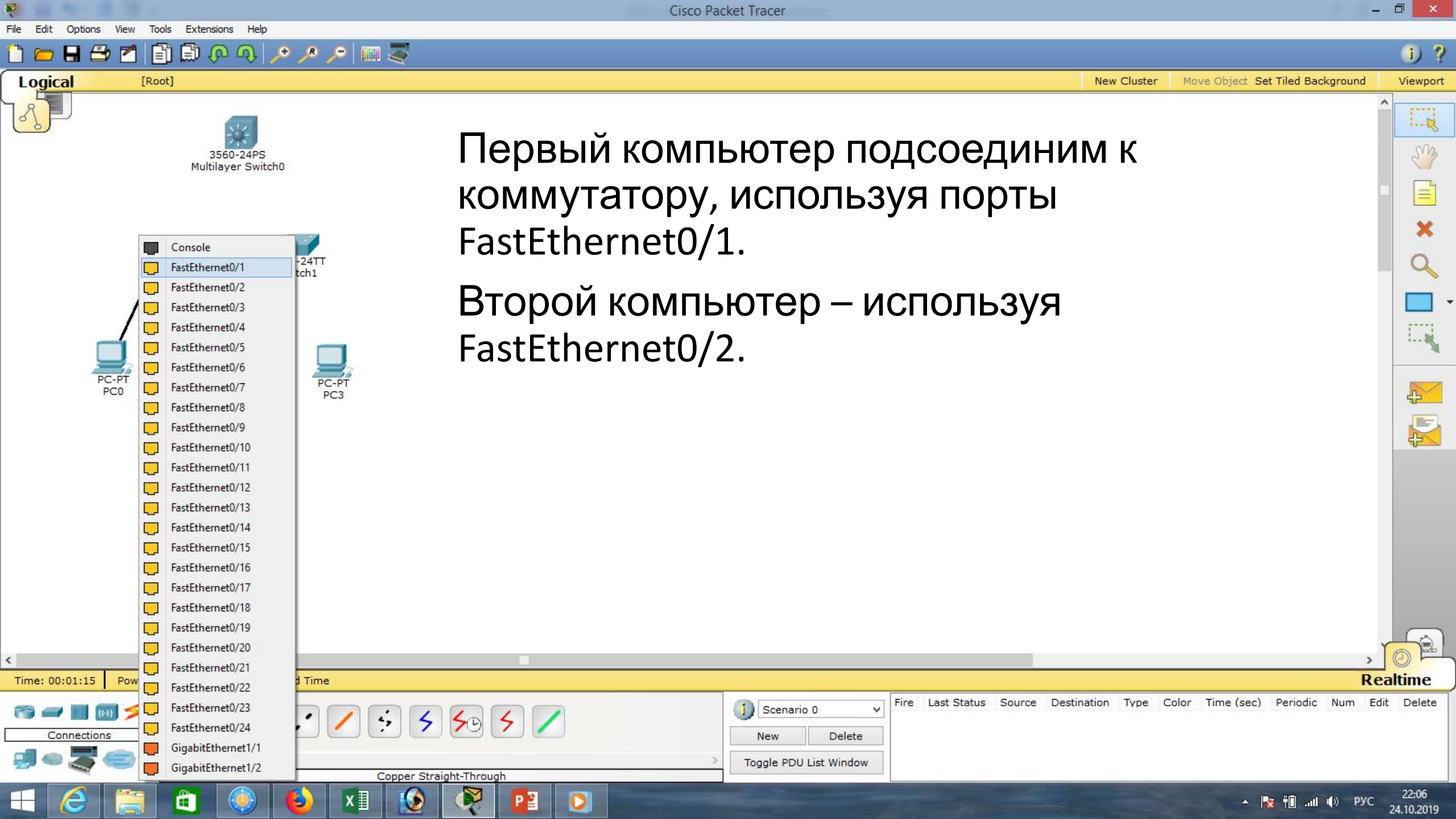
Connections

Copper Straight-Through

Scenario 0 New Delete Toggle PDU List Window

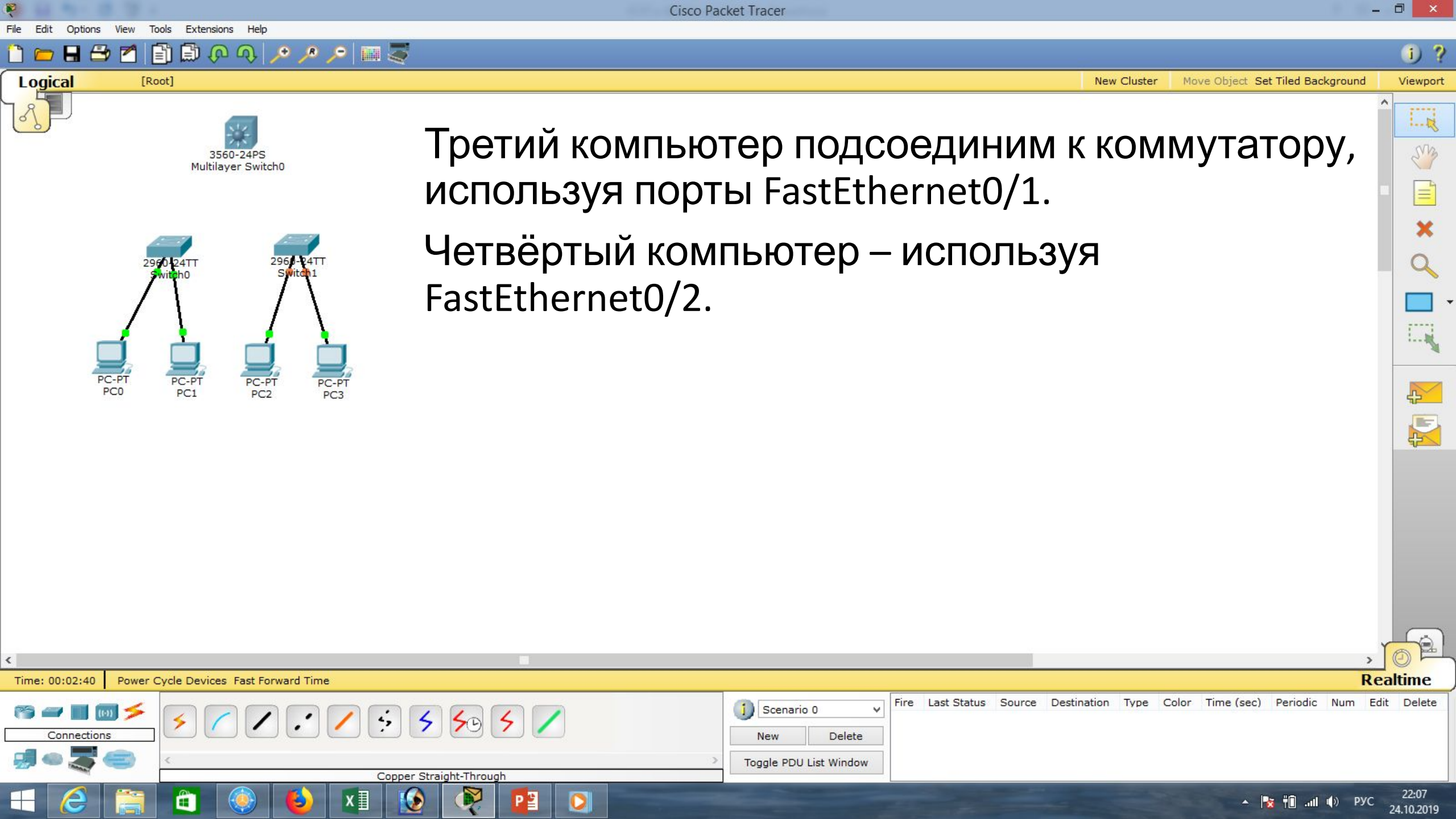
Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete

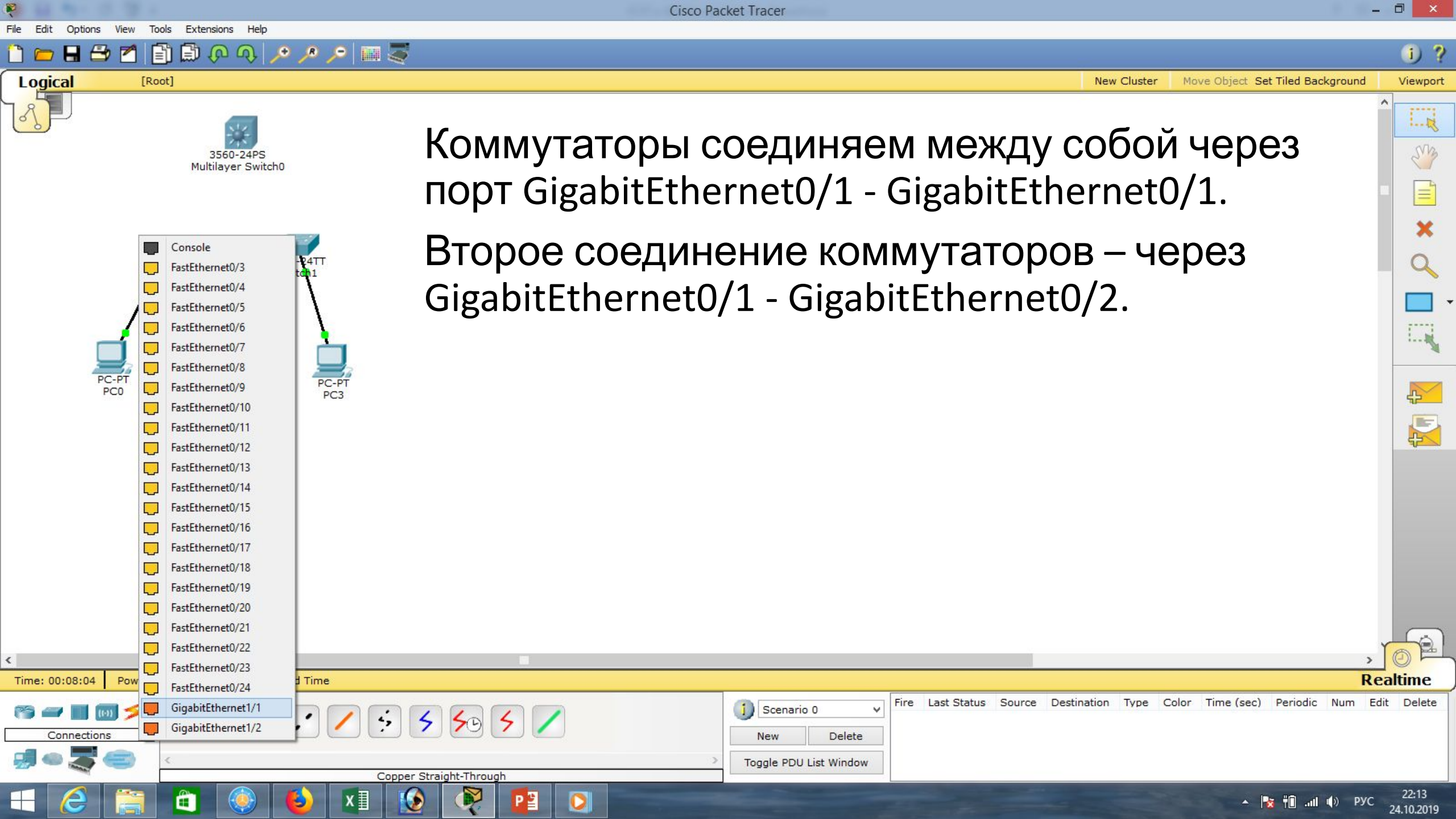
ENG 0:37 25.10.2019



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

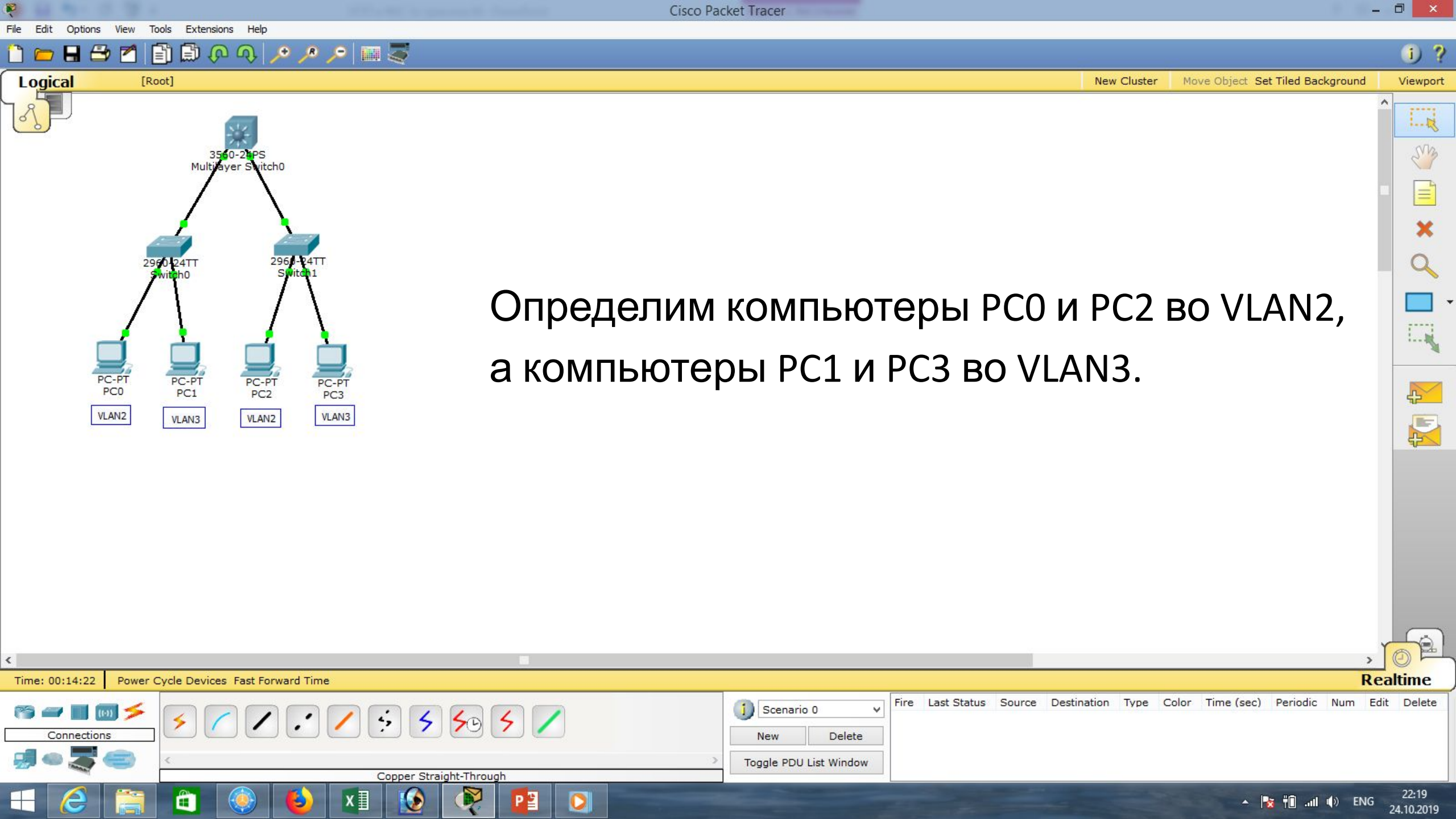
Второй компьютер – используя FastEthernet0/2.


Cisco Packet Tracer
File Edit Options View Tools Extensions Help
Logical [Root]
New Cluster Move Object Set Tiled Background Viewport
3560-24PS
Multilayer Switch0
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
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
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
РУС
22:07
24.10.2019



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

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


Cisco Packet Tracer
File Edit Options View Tools Extensions Help
Logical [Root]
New Cluster Move Object Set Tiled Background Viewport
3560-24PS
Multilayer Switch0
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
VLAN2
VLAN3
VLAN2
VLAN3
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
ENG
22:19
24.10.2019

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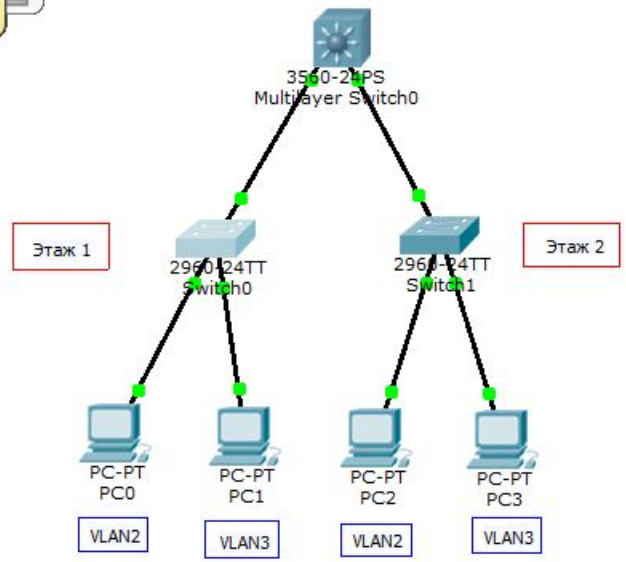
File Edit Options View Tools Extensions Help

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



Switch0

Physical Config CLI

IOS Command Line Interface

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

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up

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

%LINK-5-CHANGED: Interface GigabitEthernet1/1, changed state to up

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

Time: 00:23:53 Power Cycle Devices Fast Forward Time Realtime

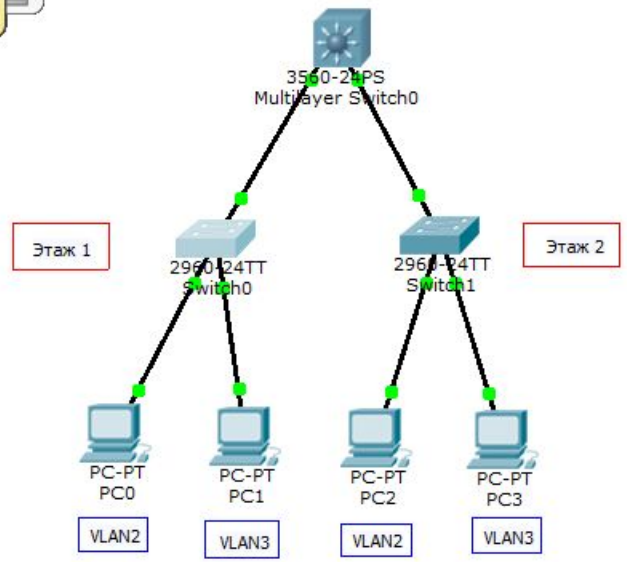
Connections

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 22:29 24.10.2019



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 stat
e 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».

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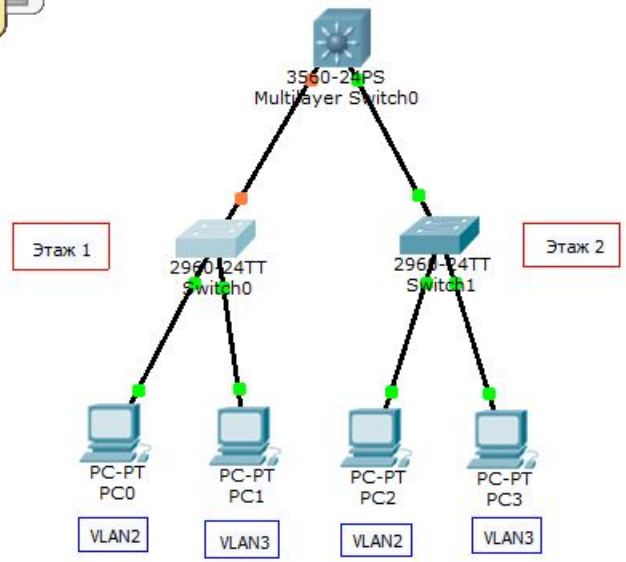
File Edit Options View Tools Extensions Help

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



Switch0

Physical Config CLI

IOS Command Line Interface

```
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)#
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 stat
e to down

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

Switch(config-if)#
```

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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 Realtime

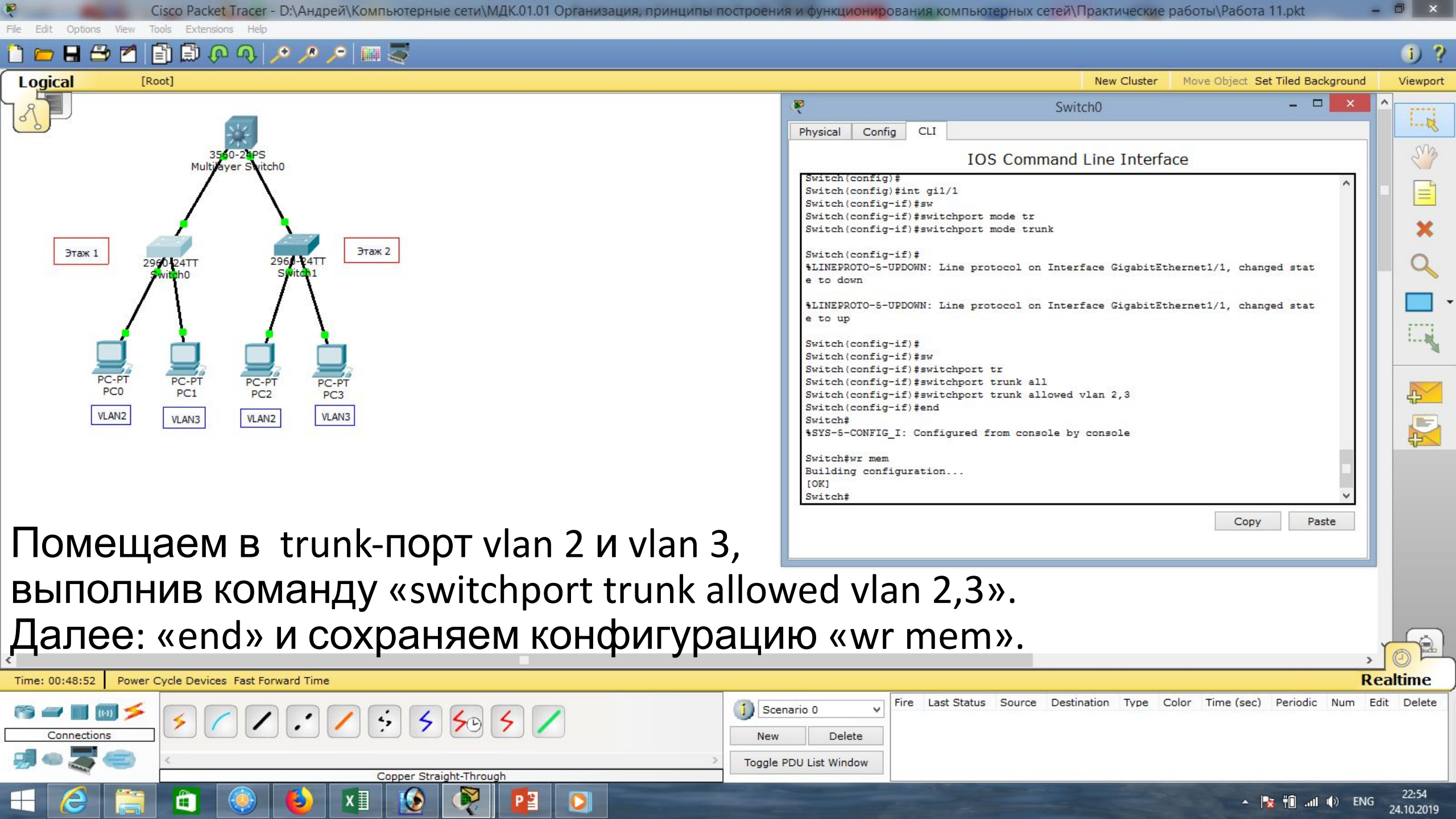
Connections

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 22:47 24.10.2019


Cisco Packet Tracer - D:\Андрей\Компьютерные сети\МДК.01.01 Организация, принципы построения и функционирования компьютерных сетей\Практические работы\Работа 11.pkt
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
3560-24PS
Multilayer Switch0
Этаж 1
Этаж 2
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
VLAN2
VLAN3
VLAN2
VLAN3
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 stat
e to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/1, changed stat
e to up
Switch(config-if)#
Switch(config-if)#sw
Switch(config-if)#switchport tr
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».
Time: 00:48:52
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
22:54
24.10.2019

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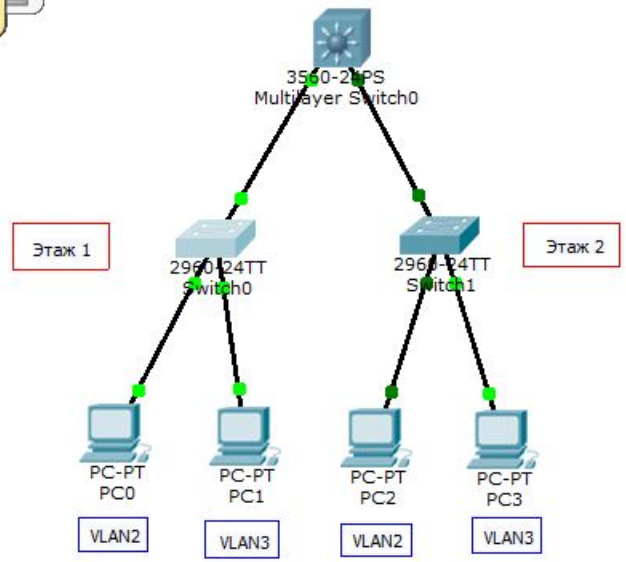
File Edit Options View Tools Extensions Help

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



Switch0

Physical Config CLI

IOS Command Line Interface

```
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--
```

Copy Paste

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

Time: 01:12:58 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 23:18 24.10.2019

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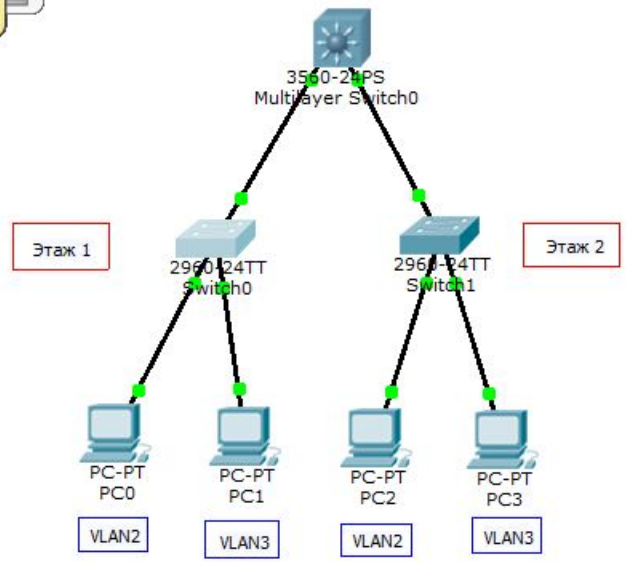
File Edit Options View Tools Extensions Help

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



Switch0

Physical Config CLI

IOS Command Line Interface

```
!
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--
```

Copy Paste

… и trunk-порт.

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

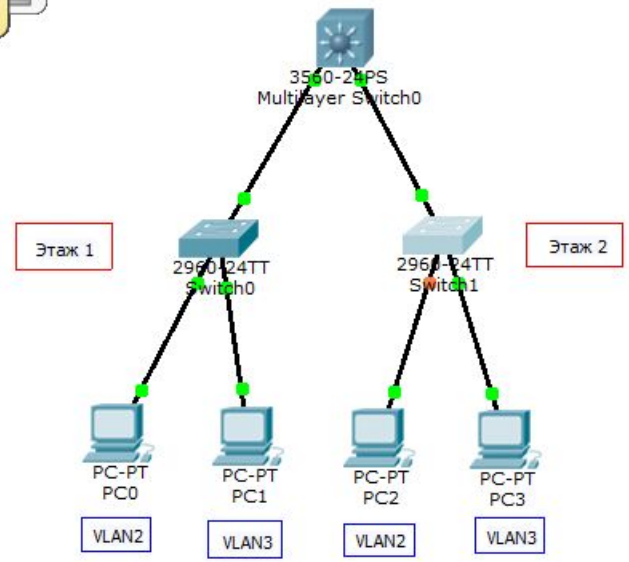
Connections

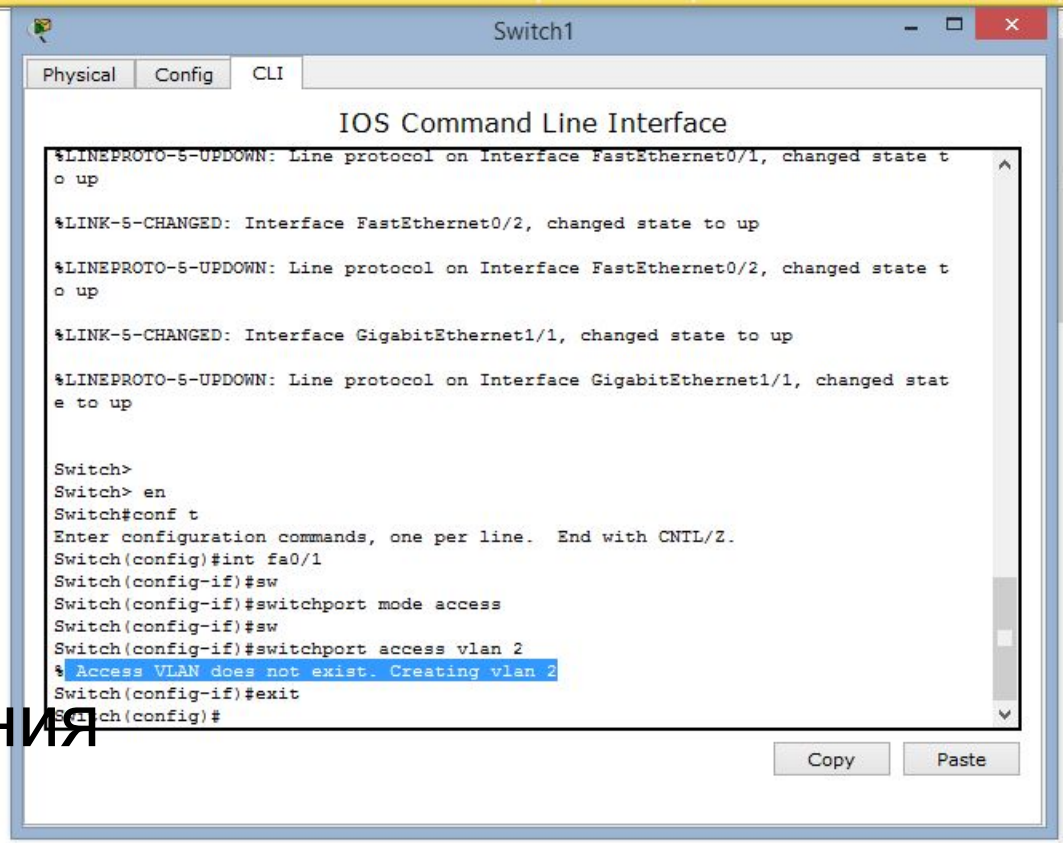
Copper Straight-Through

Scenario 0 New Delete Toggle PDU List Window

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

ENG 23:19 24.10.2019





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».

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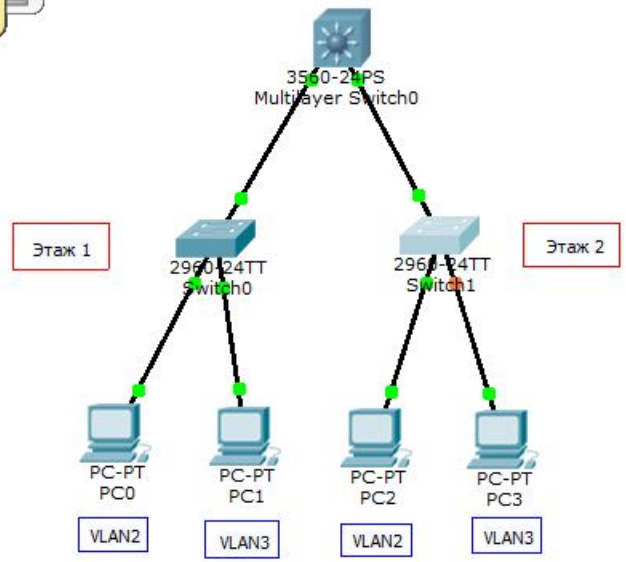
File Edit Options View Tools Extensions Help

Logical [Root]

New Cluster Move Object Set Tiled Background Viewport



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 stat
e 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».

Time: 00:59:24 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 23:04 24.10.2019

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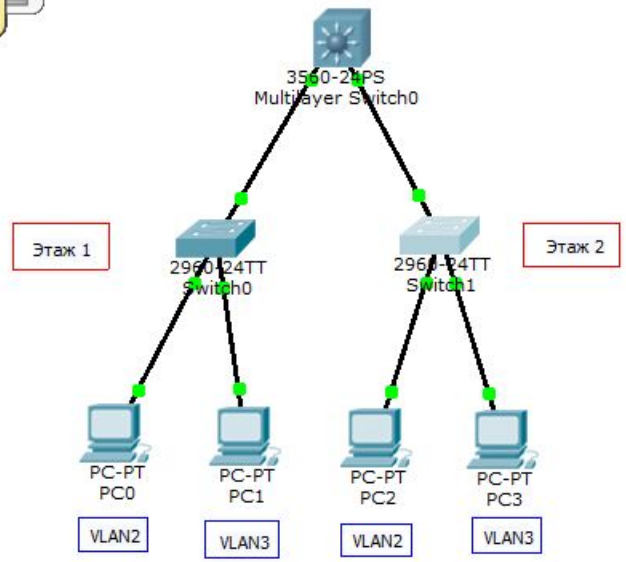
File Edit Options View Tools Extensions Help

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



Switch1

Physical Config CLI

IOS Command Line Interface

```
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 stat
e to down

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

Switch(config-if)#
```

Copy Paste

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 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 23:08 24.10.2019

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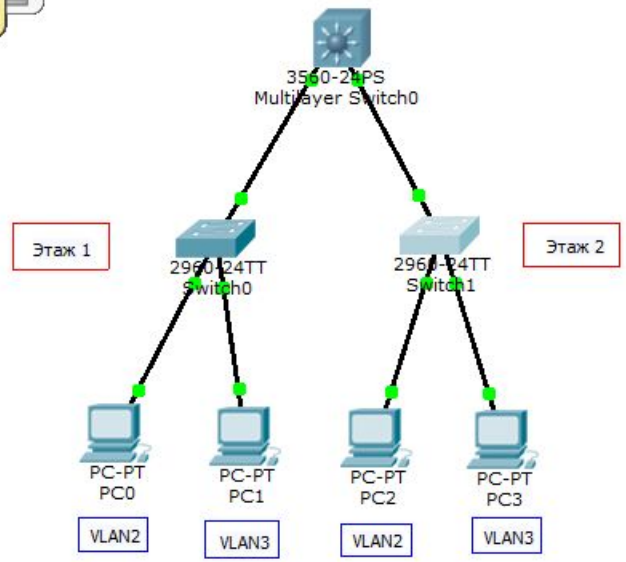
File Edit Options View Tools Extensions Help

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



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 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 stat
e to down

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

Time: 01:05:55 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 23:11 24.10.2019

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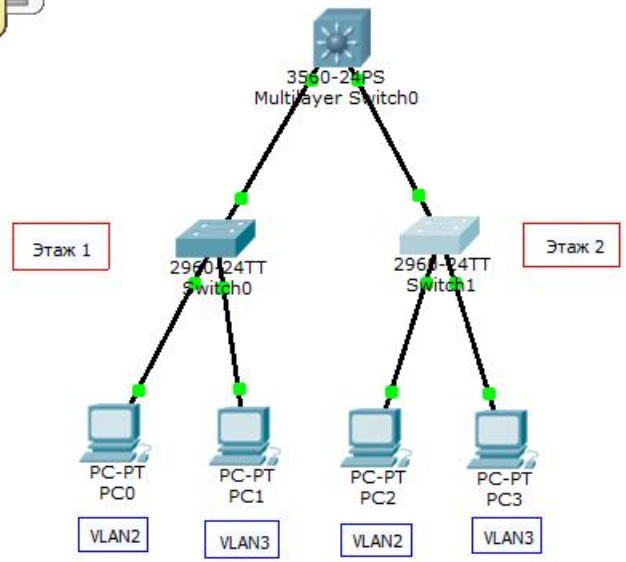
File Edit Options View Tools Extensions Help

Logical [Root]

New Cluster Move Object Set Tiled Background Viewport



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.

Time: 01:07:48 Power Cycle Devices Fast Forward Time

Realtime

Connections

Copper Straight-Through

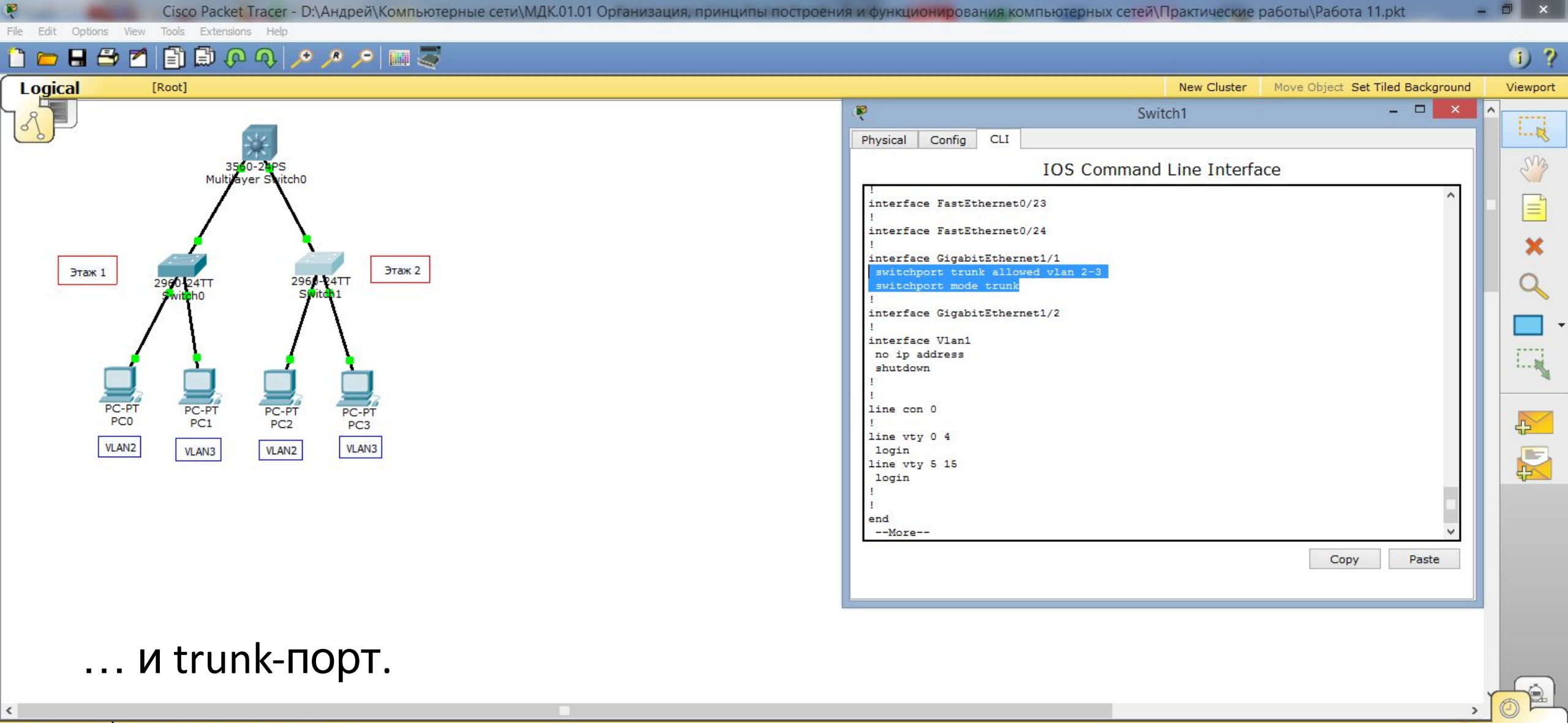
Scenario 0

New Delete

Toggle PDU List Window

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

ENG 23:13 24.10.2019


Cisco Packet Tracer - D:\Андрей\Компьютерные сети\МДК.01.01 Организация, принципы построения и функционирования компьютерных сетей\Практические работы\Работа 11.pkt
File Edit Options View Tools Extensions Help
Logical [Root]
New Cluster Move Object Set Tiled Background Viewport
3560-24PS Multilayer Switch0
Этаж 1
Этаж 2
2960-24TT Switch0
2960-24TT Switch1
PC-PT PC0
PC-PT PC1
PC-PT PC2
PC-PT PC3
VLAN2
VLAN3
VLAN2
VLAN3
Switch1
Physical Config CLI
IOS Command Line Interface
!
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--
Copy
Paste
Time: 01:11:03 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
РУС
23:16
24.10.2019

… и trunk-порт.

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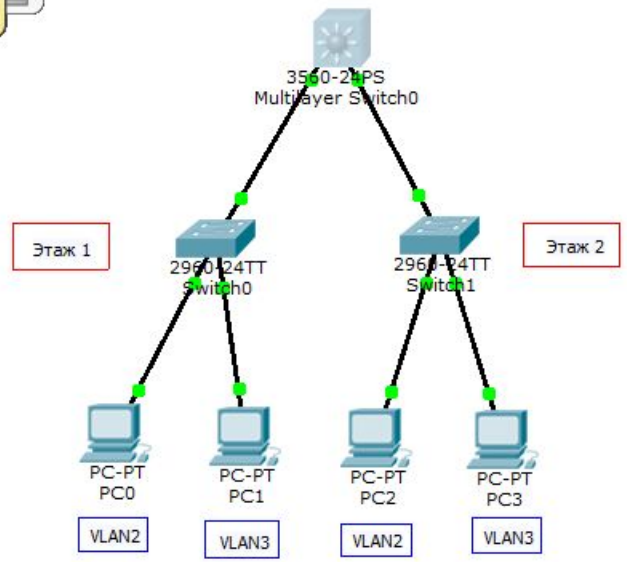
File Edit Options View Tools Extensions Help

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 GigabitEthernet0/2, changed stat
e to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed stat
e to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed stat
e to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed stat
e to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed stat
e 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 co
nfigured to "trunk" mode.
Switch(config-if)#
```

Copy Paste

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

Time: 01:18:53 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

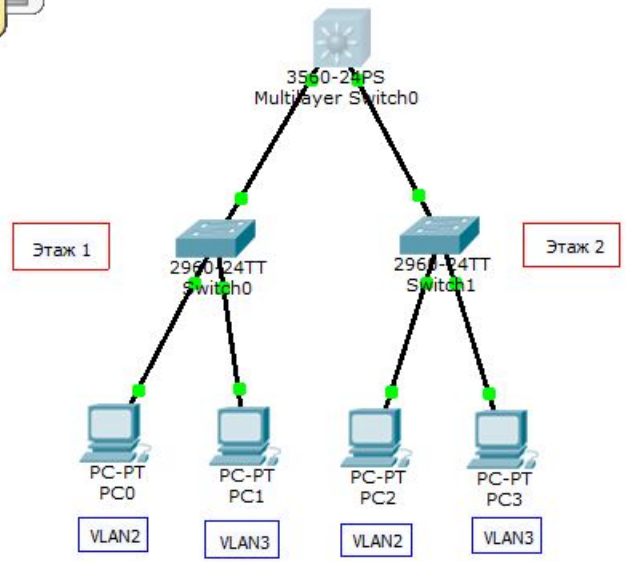
ENG 23:24 24.10.2019

Cisco Packet Tracer - D:\Андрей\Компьютерные сети\МДК.01.01 Организация, принципы построения и функционирования компьютерных сетей\Практические работы\Работа 11.pkt

File Edit Options View Tools Extensions Help

Logical [Root]

New Cluster Move Object Set Tiled Background Viewport



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 ?».

Time: 01:29:01 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

РУС 23:34 24.10.2019

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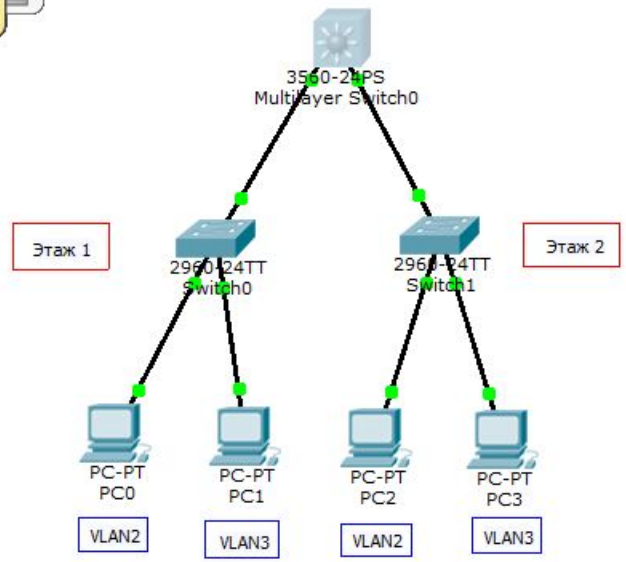
File Edit Options View Tools Extensions Help

Logical [Root]

New Cluster Move Object Set Tiled Background Viewport



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».

Time: 01:34:32 Power Cycle Devices Fast Forward Time

Realtime

Connections

Copper Straight-Through

Scenario 0 New Delete Toggle PDU List Window

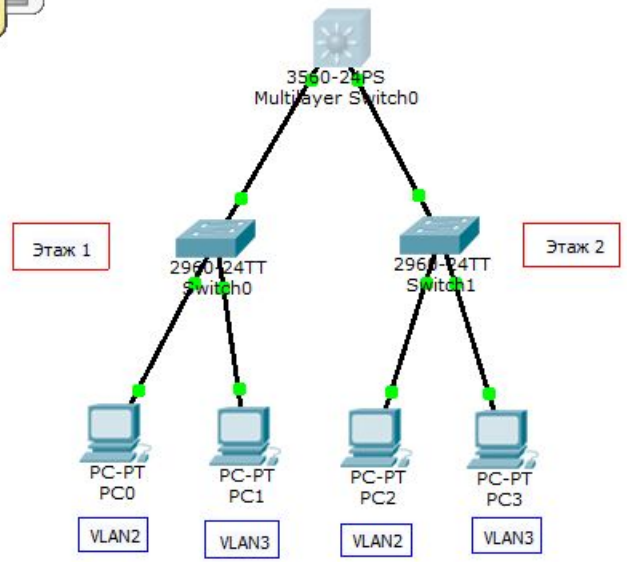
Fire	Last Status	Source	Destination	Type	Color	Time (sec)	Periodic	Num	Edit	Delete

ENG 23:39 24.10.2019

Cisco Packet Tracer - D:\Андрей\Компьютерные сети\МДК.01.01 Организация, принципы построения и функционирования компьютерных сетей\Практические работы\Работа 11.pkt

File Edit Options View Tools Extensions Help

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



Multilayer Switch0

Physical Config CLI

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)#
```

Copy Paste

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

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

Connections

Copper Straight-Through

Scenario 0 New Delete Toggle PDU List Window

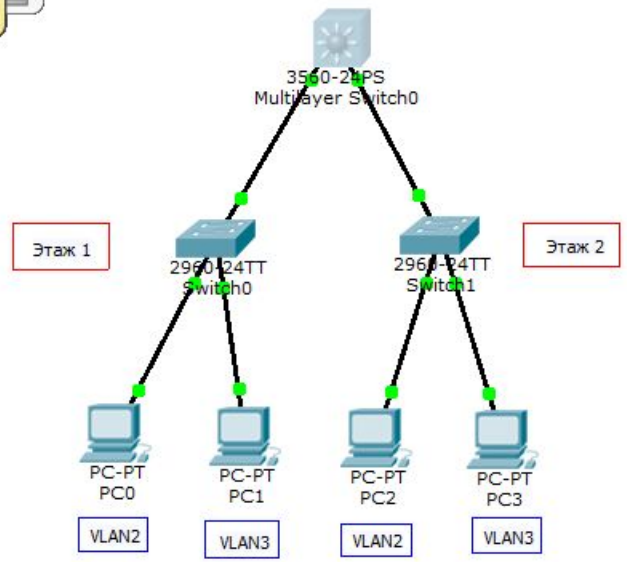
Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete

ENG 23:45 24.10.2019

Cisco Packet Tracer - D:\Андрей\Компьютерные сети\МДК.01.01 Организация, принципы построения и функционирования компьютерных сетей\Практические работы\Работа 11.pkt

File Edit Options View Tools Extensions Help

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



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».

Time: 01:45:59 Power Cycle Devices Fast Forward Time Realtime

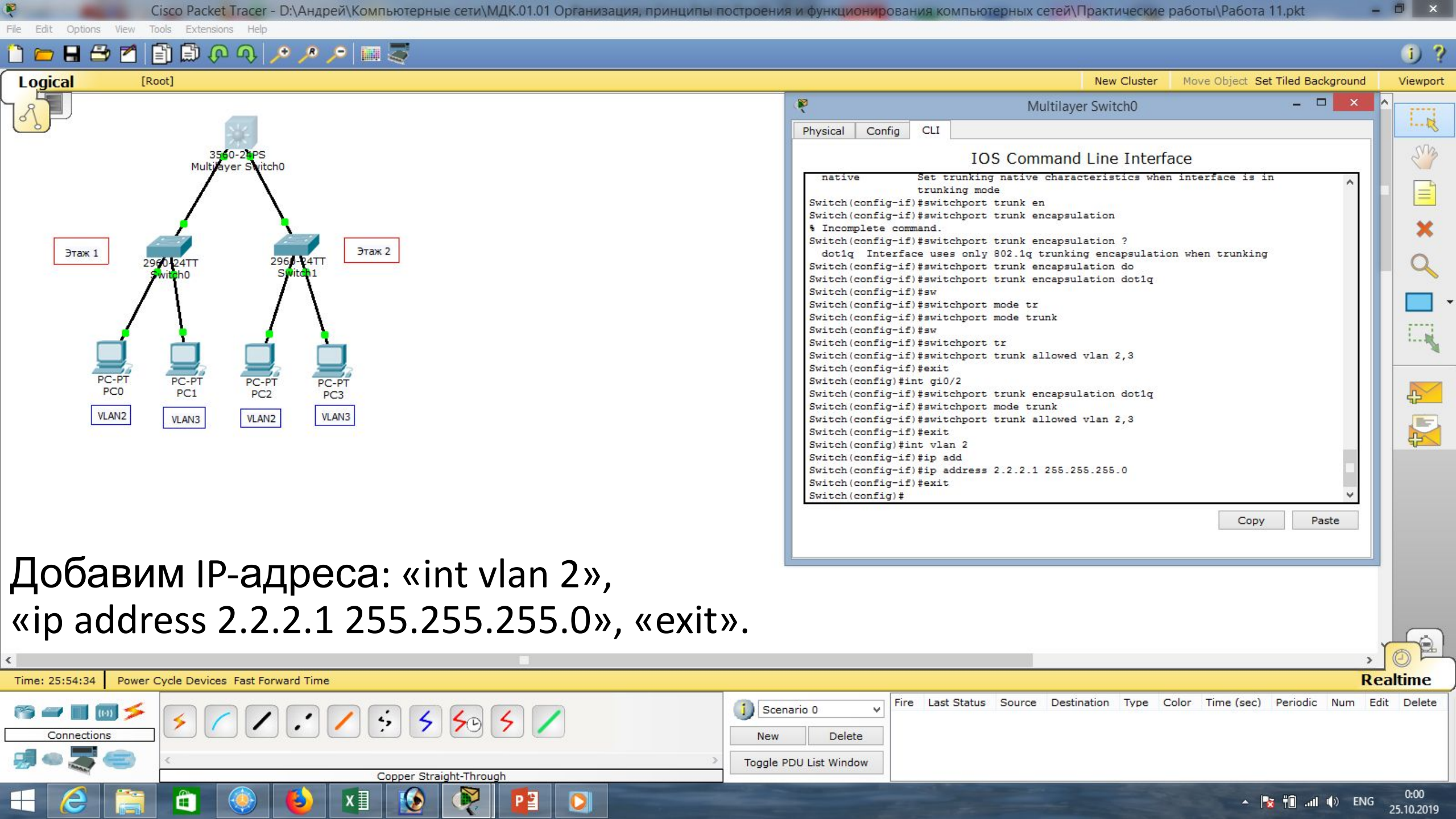
Connections

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 23:51 24.10.2019



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

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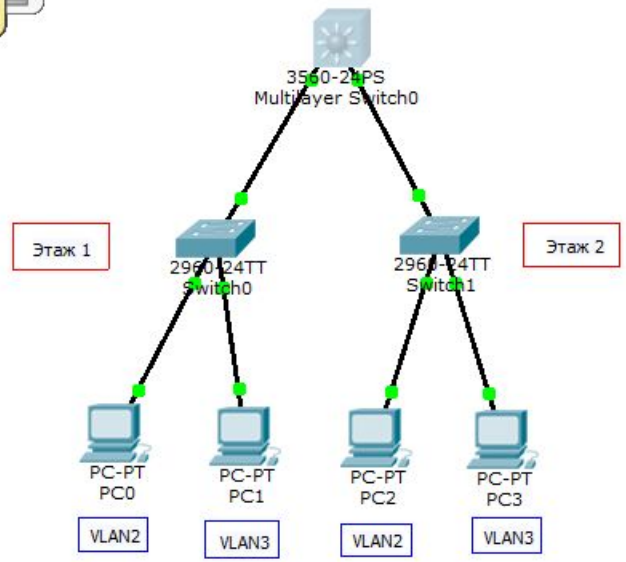
File Edit Options View Tools Extensions Help

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



Multilayer Switch0

Physical Config CLI

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)#
```

Copy Paste

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

Time: 25:59:23 Power Cycle Devices Fast Forward Time Realtime

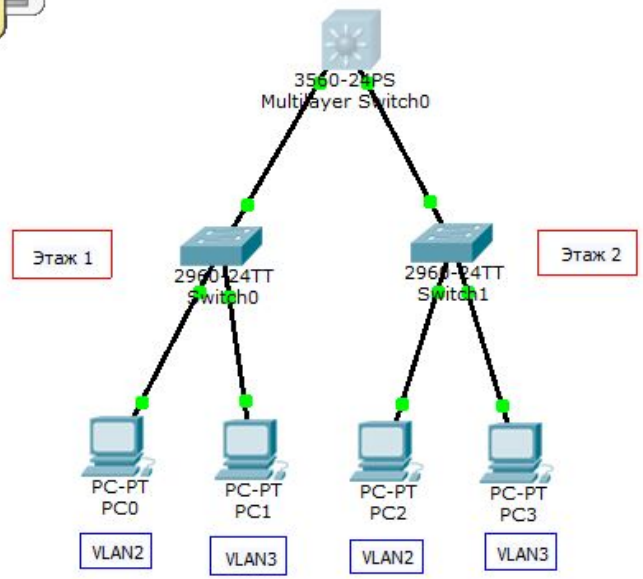
Connections

Copper Straight-Through

Scenario 0 New Delete Toggle PDU List Window

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

ENG 0:04 25.10.2019



Multilayer Switch0

Physical | Config | CLI

IOS Command Line Interface

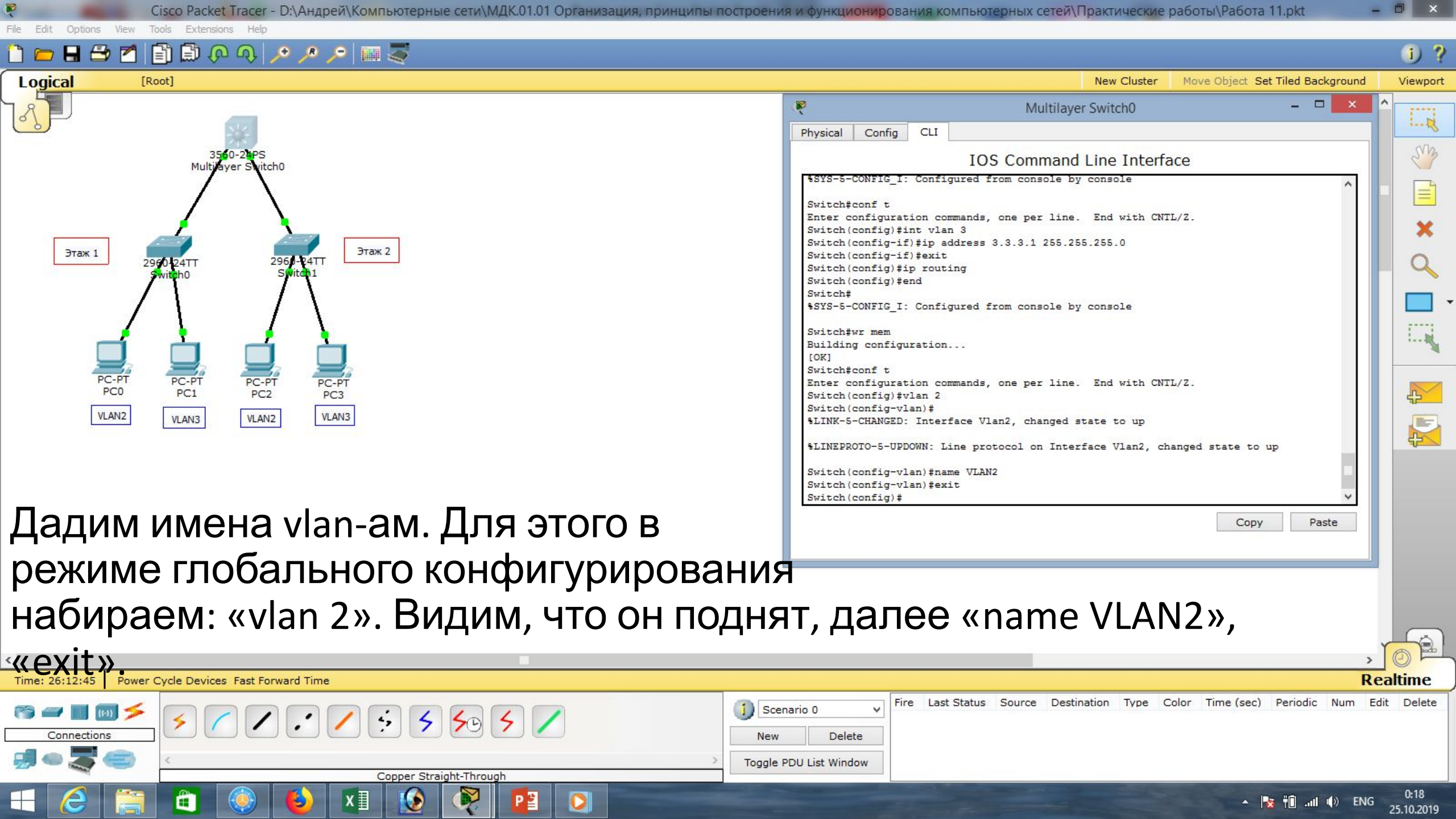
```
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan 2,3
Switch(config-if)#exit
Switch(config)#int vlan 2
Switch(config-if)#ip add
Switch(config-if)#ip address 2.2.2.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#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

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

Copy | Paste

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



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

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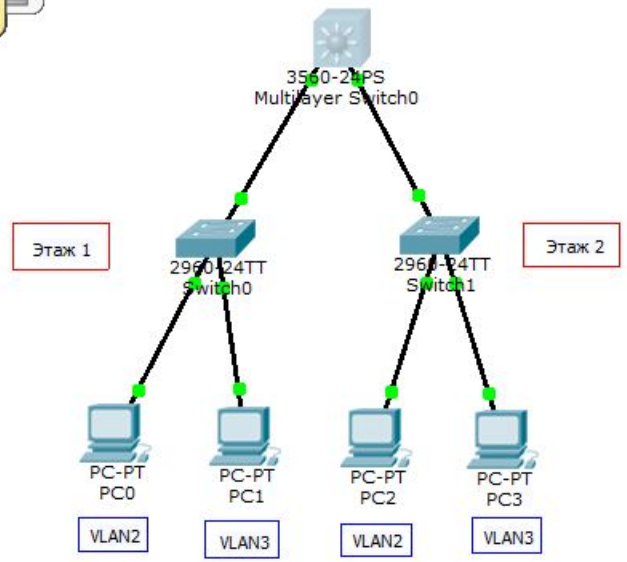
File Edit Options View Tools Extensions Help

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



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».

Time: 26:18:56 Power Cycle Devices Fast Forward Time Realtime

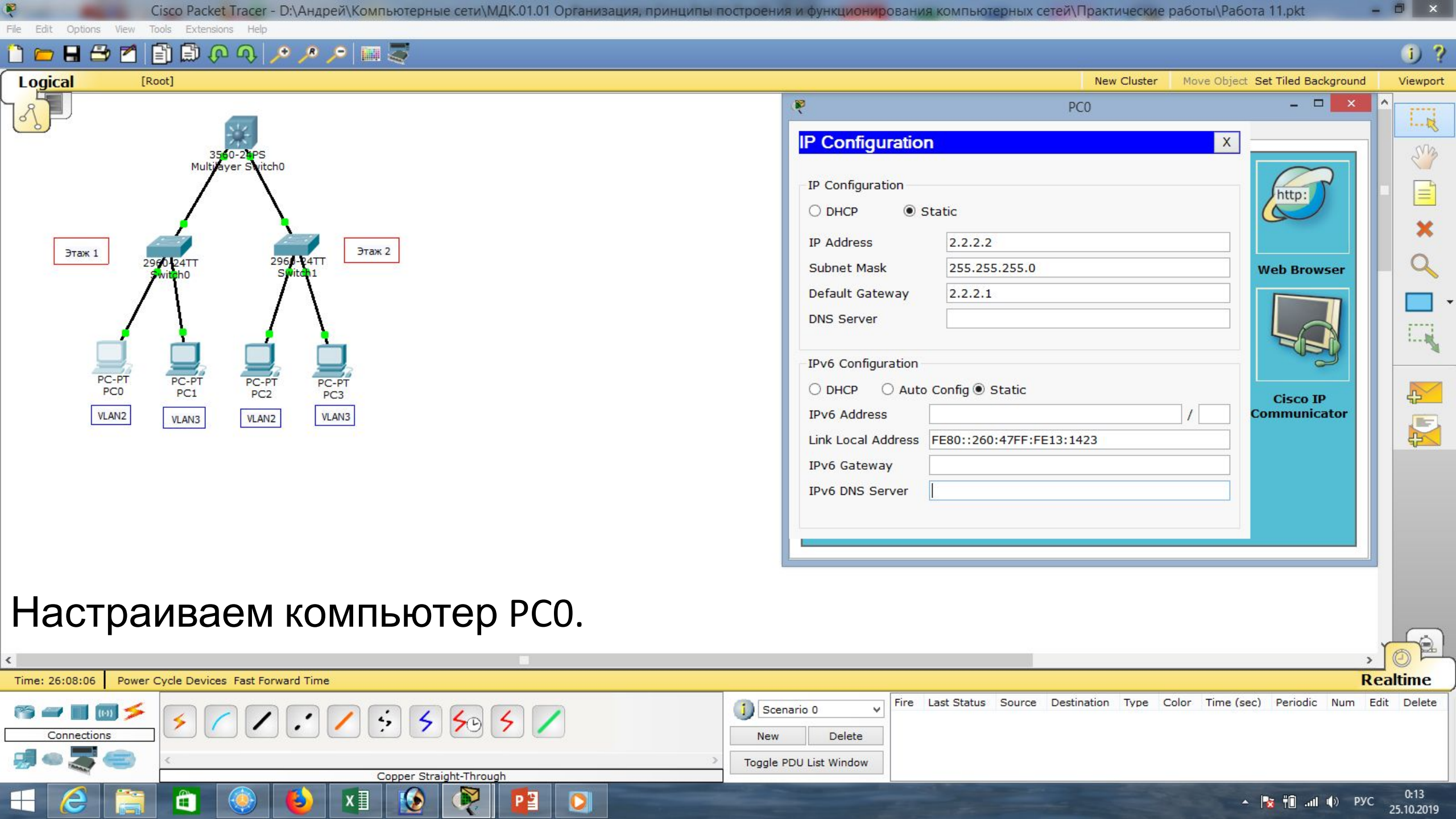
Connections

Copper Straight-Through

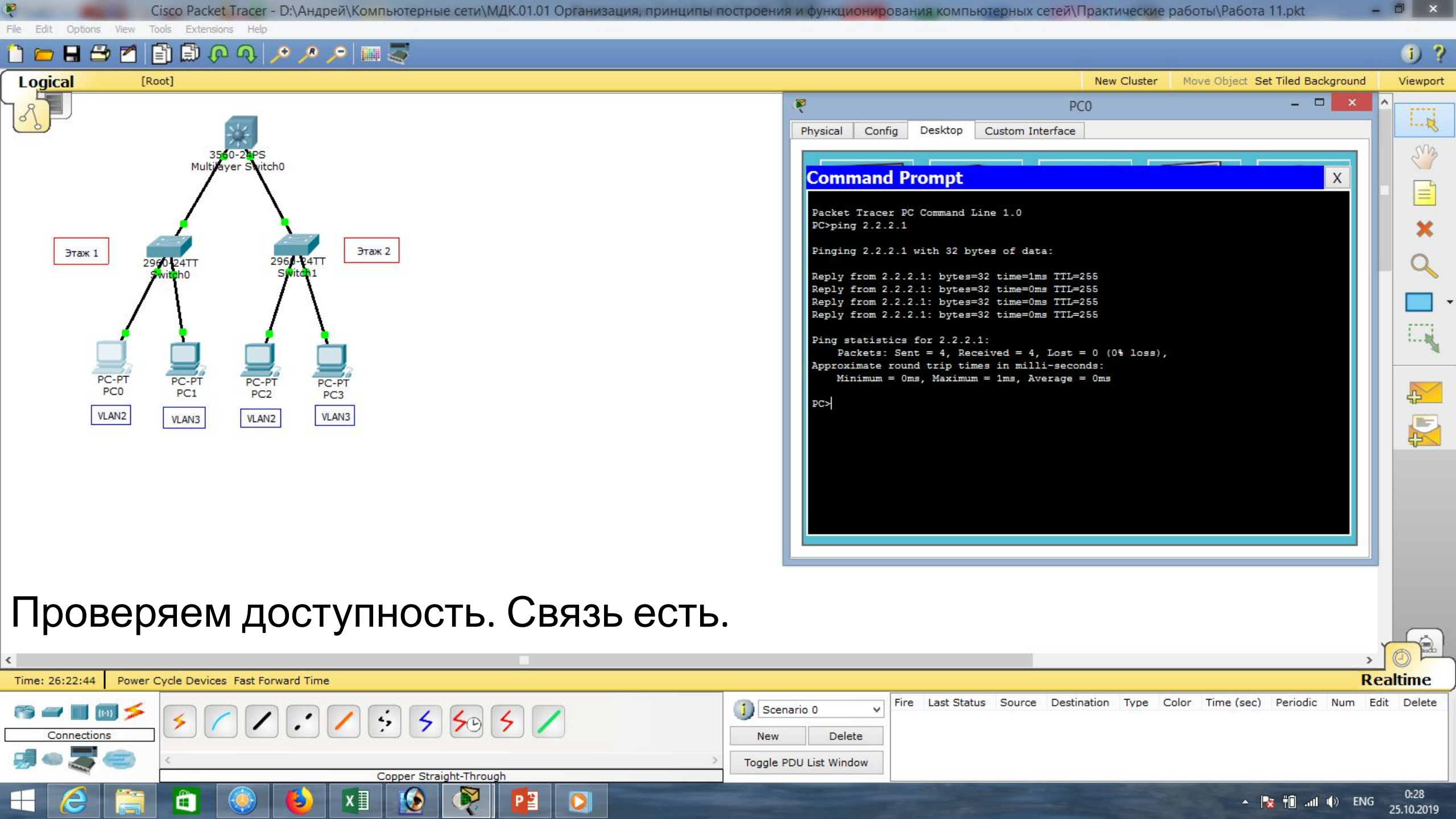
Scenario 0 New Delete Toggle PDU List Window

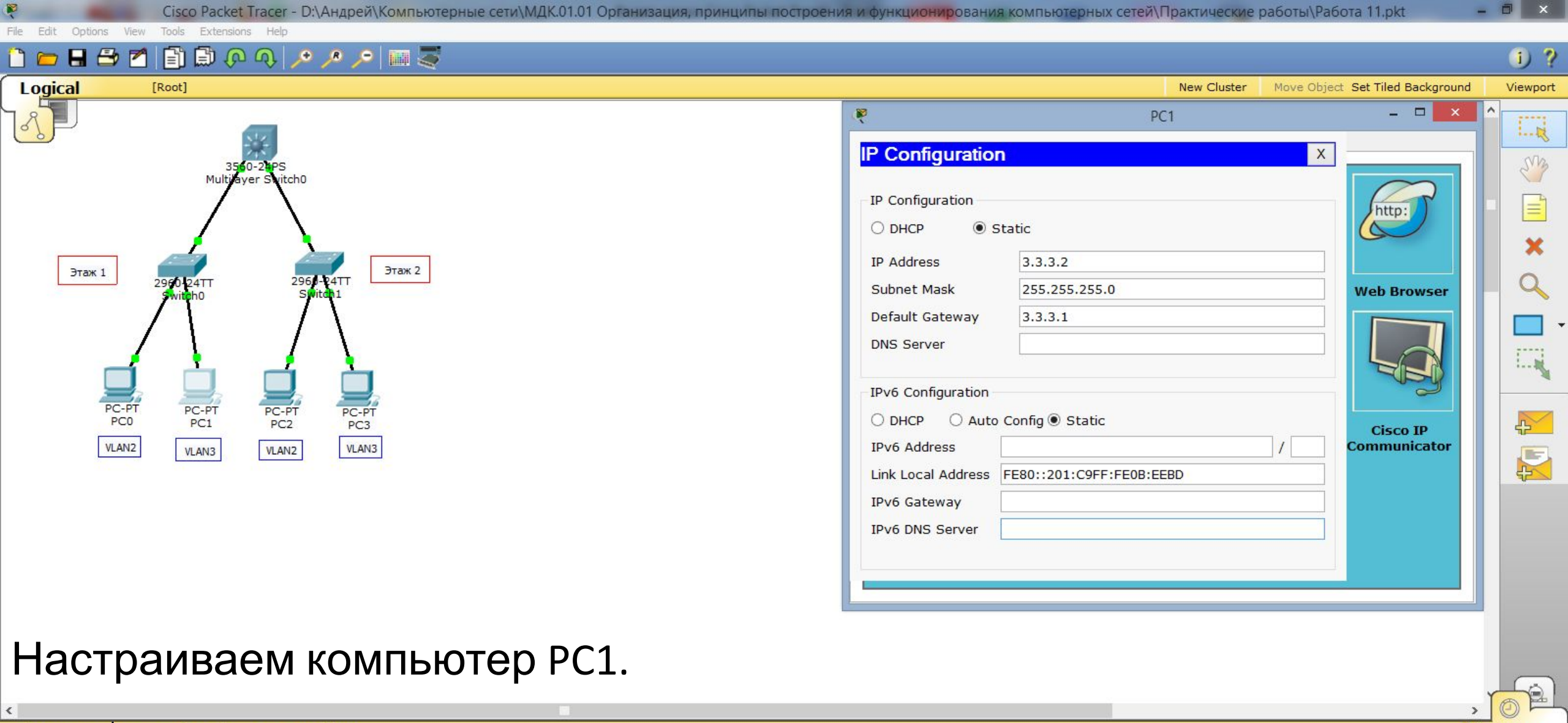
Fire | Last Status | Source | Destination | Type | Color | Time (sec) | Periodic | Num | Edit | Delete

ENG 0:24 25.10.2019

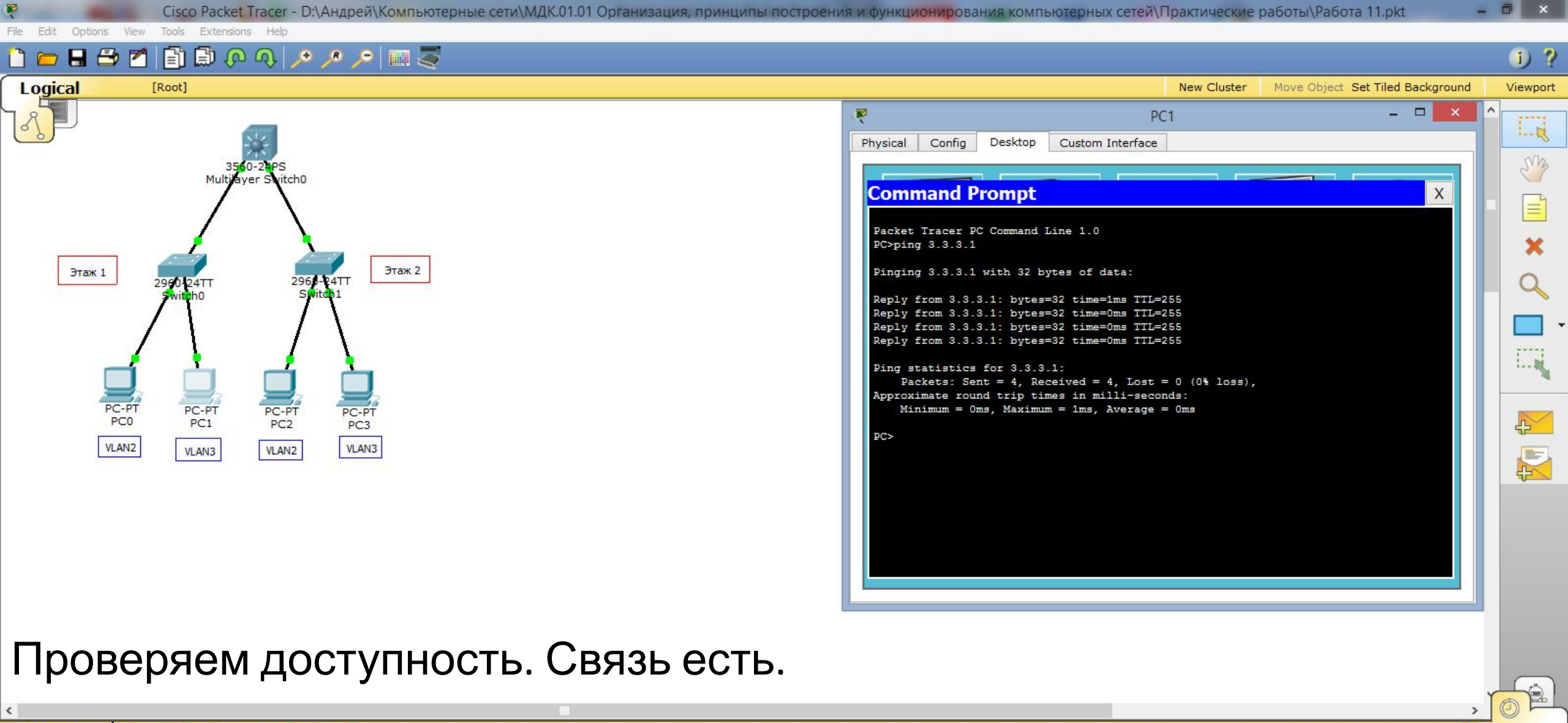


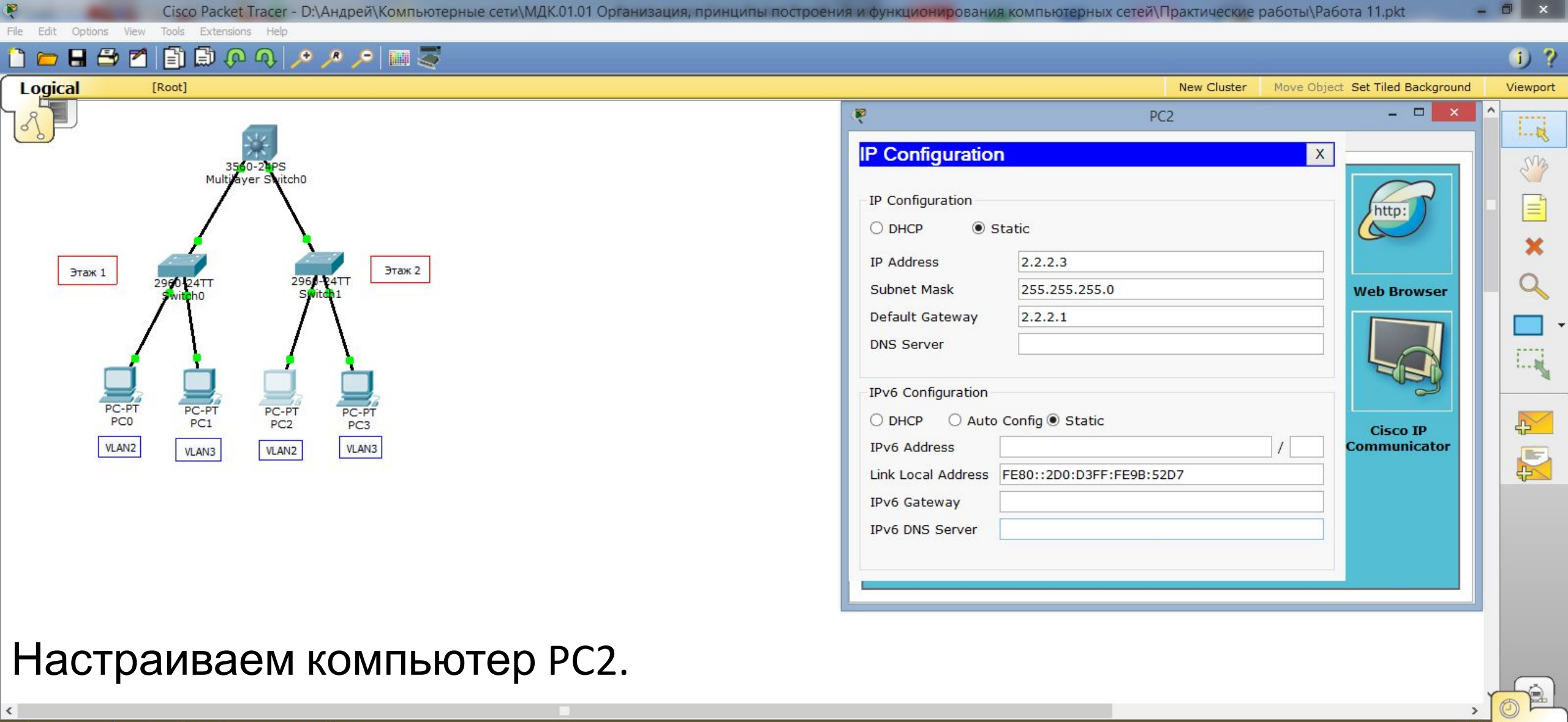
Настраиваем компьютер PC0.


Cisco Packet Tracer - D:\Андрей\Компьютерные сети\МДК.01.01 Организация, принципы построения и функционирования компьютерных сетей\Практические работы\Работа 11.pkt
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
3560-24PS
Multilayer Switch0
Этаж 1
Этаж 2
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
VLAN2
VLAN3
VLAN2
VLAN3
PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
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.
Time: 26:22:44
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
0:28
25.10.2019

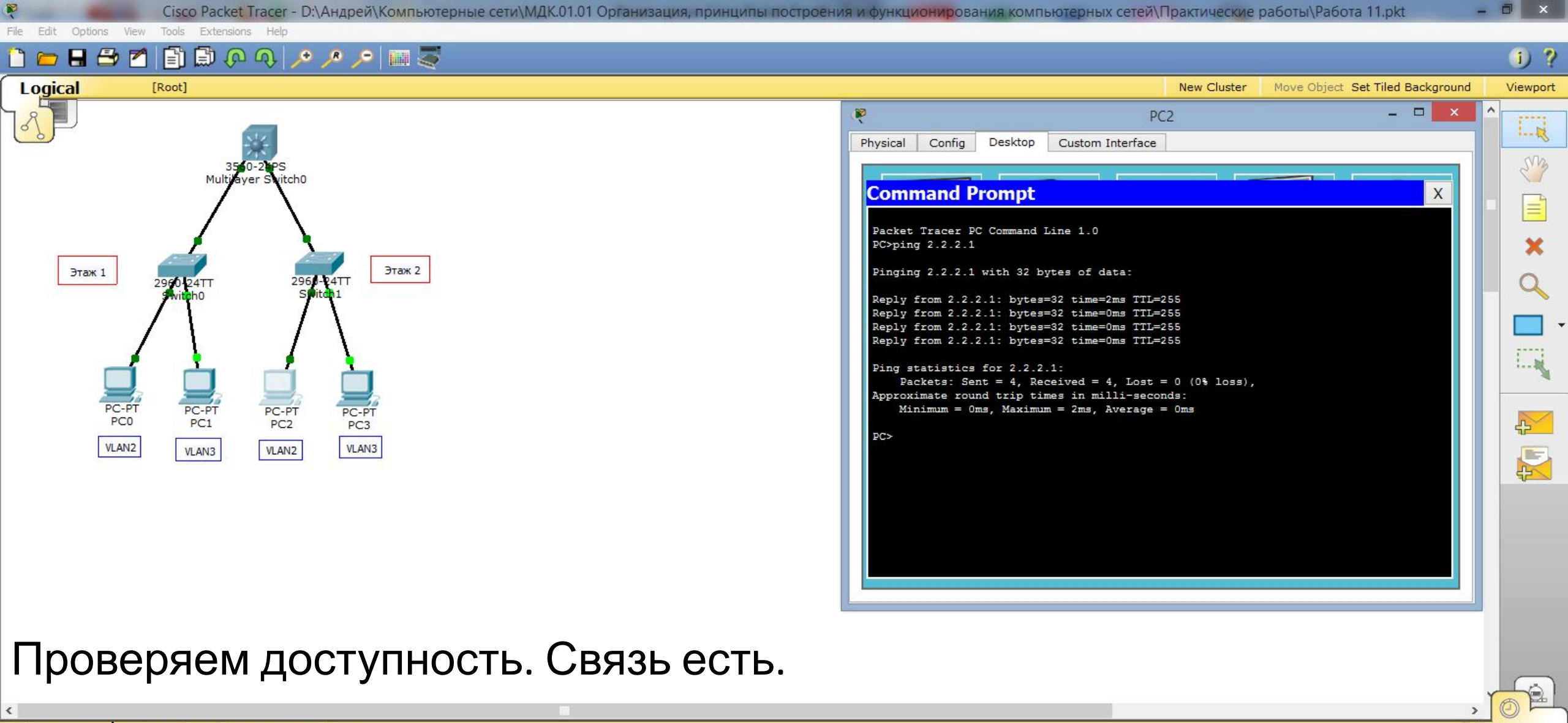


Настраиваем компьютер PC1.

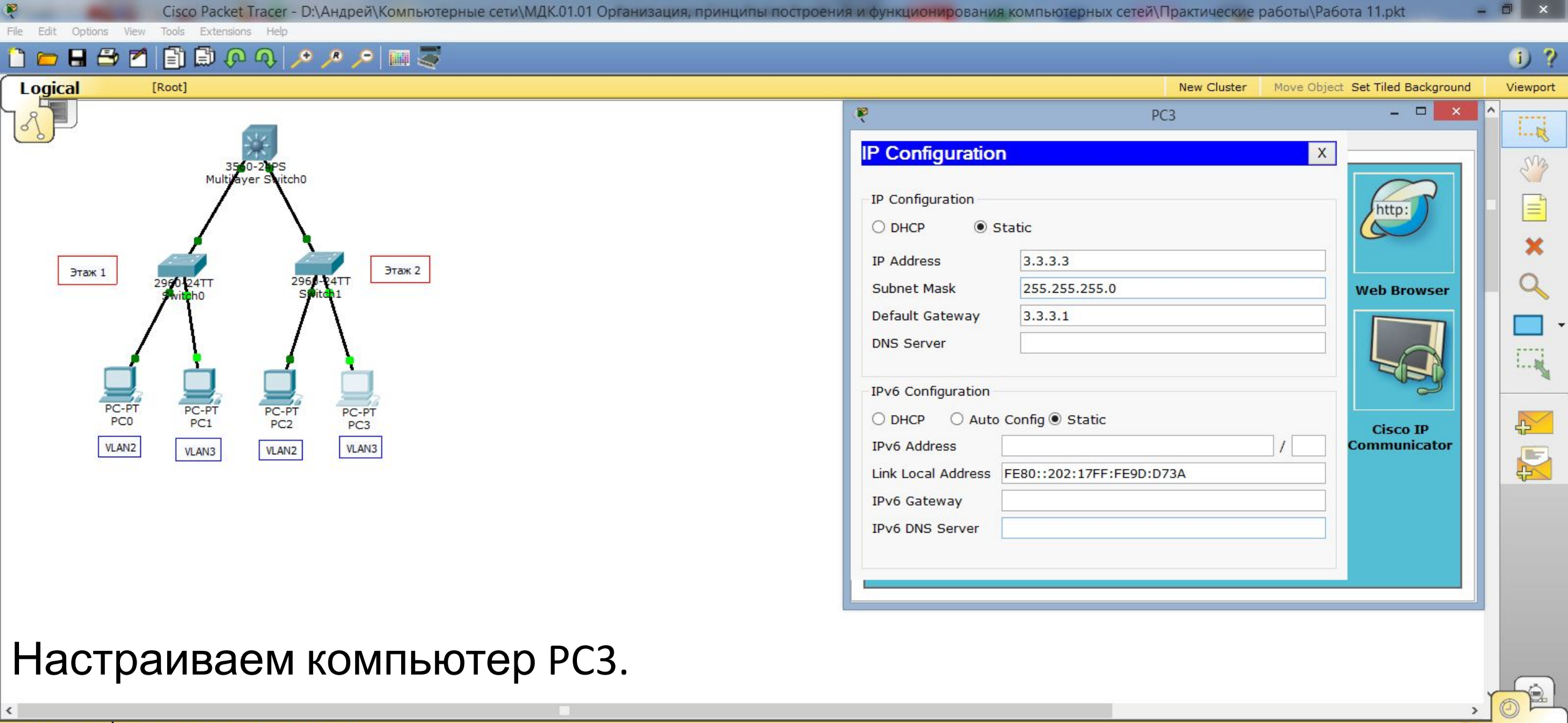

Cisco Packet Tracer - D:\Андрей\Компьютерные сети\МДК.01.01 Организация, принципы построения и функционирования компьютерных сетей\Практические работы\Работа 11.pkt
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
3560-24PS
Multilayer Switch0
Этаж 1
Этаж 2
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
VLAN2
VLAN3
VLAN2
VLAN3
PC1
Physical
Config
Desktop
Custom Interface
Command Prompt
X
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.
Time: 26:27:10
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
0:32
25.10.2019



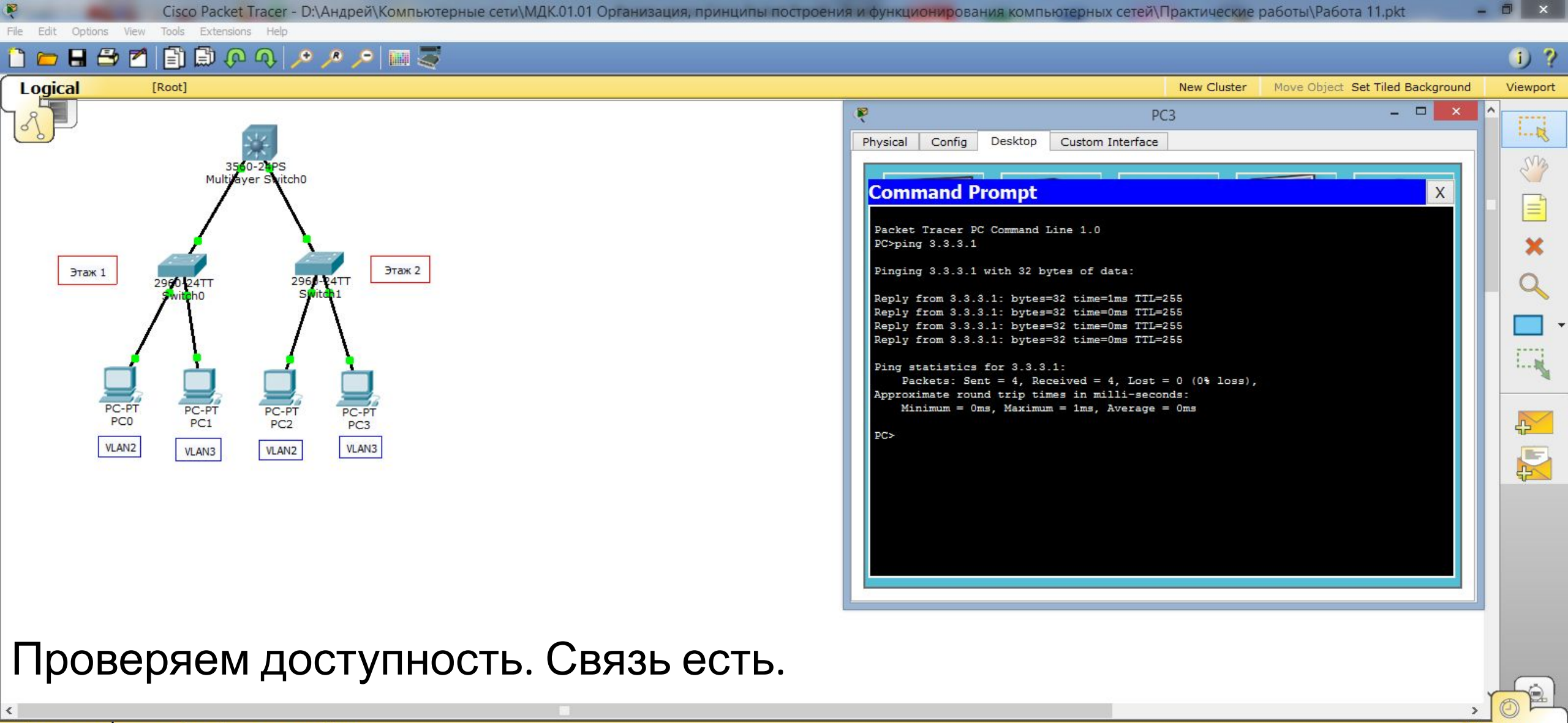
Настраиваем компьютер PC2.



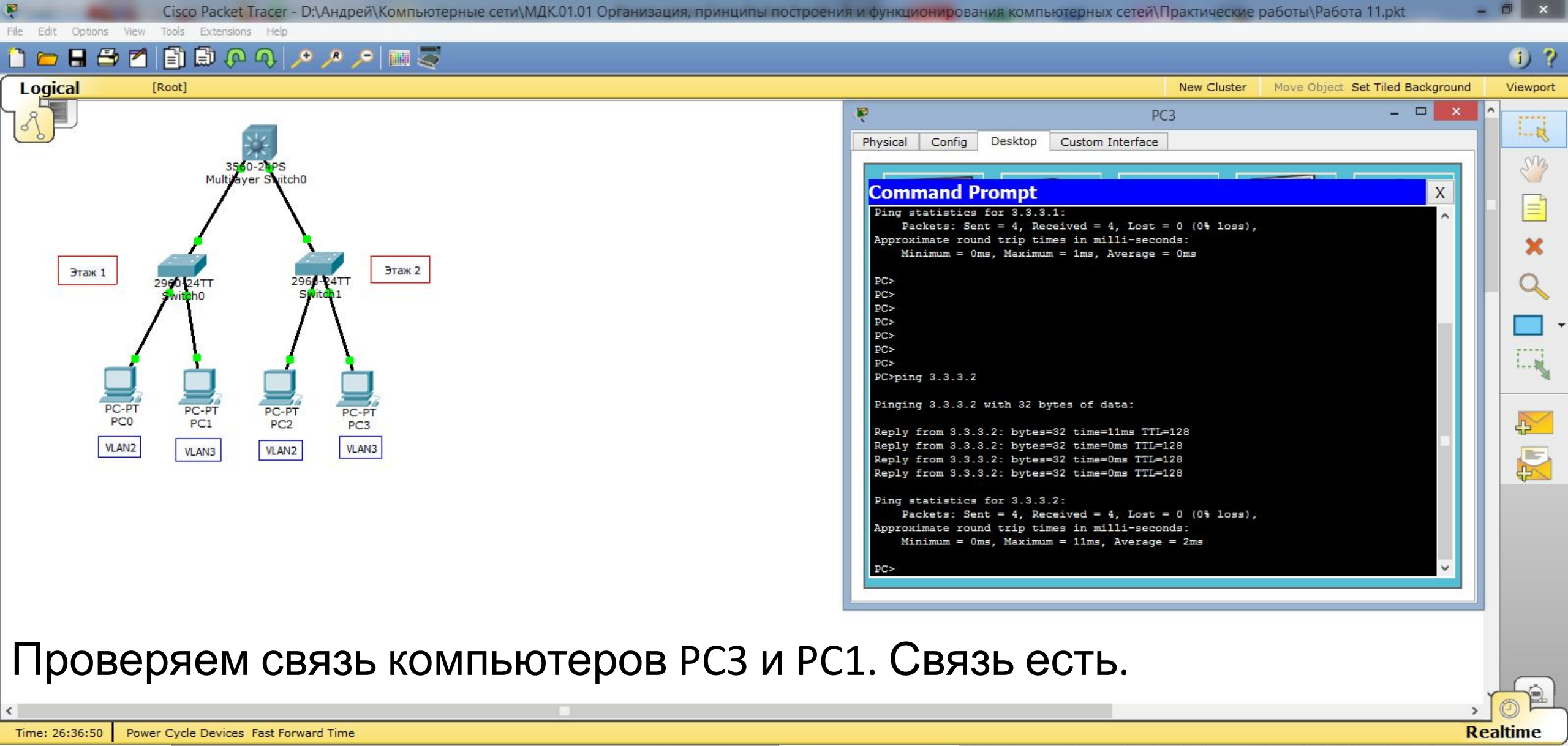
Проверяем доступность. Связь есть.



Настраиваем компьютер PC3.



Проверяем доступность. Связь есть.



Проверяем связь компьютеров PC3 и PC1. Связь есть.

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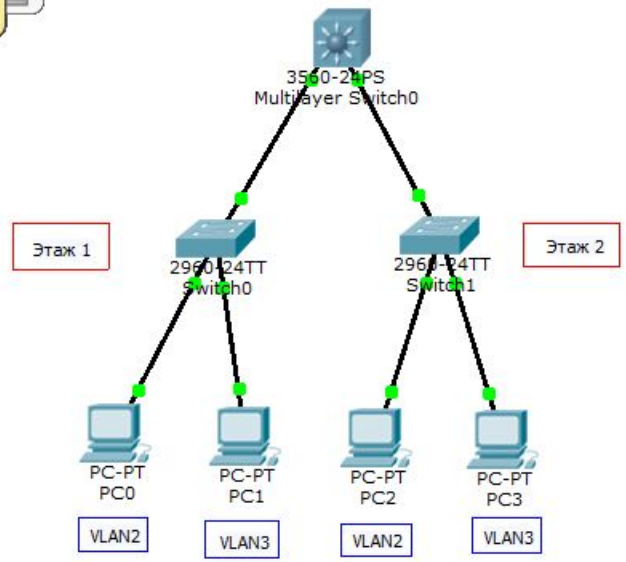
File Edit Options View Tools Extensions Help

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



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.

Time: 26:40:53 Power Cycle Devices Fast Forward Time Realtime

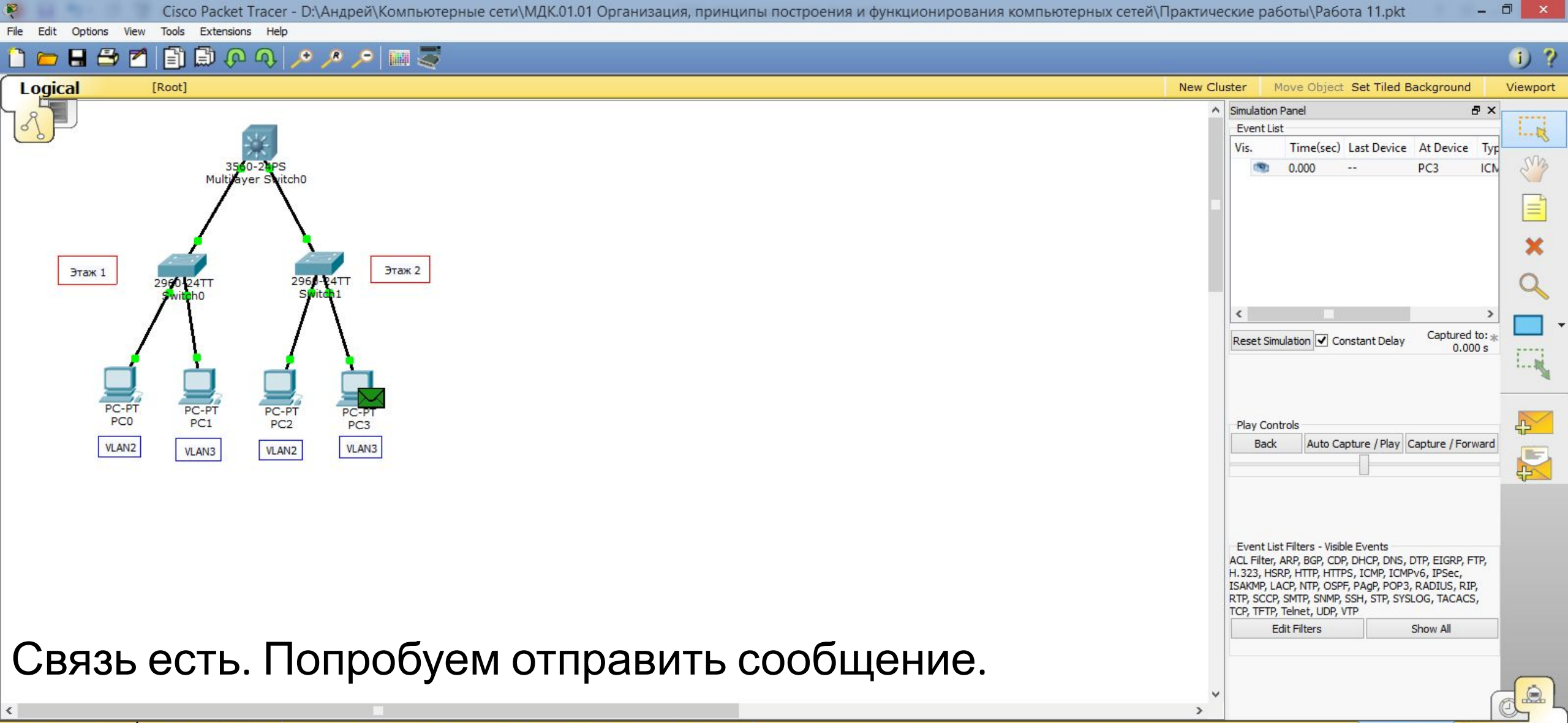
Connections

Copper Straight-Through

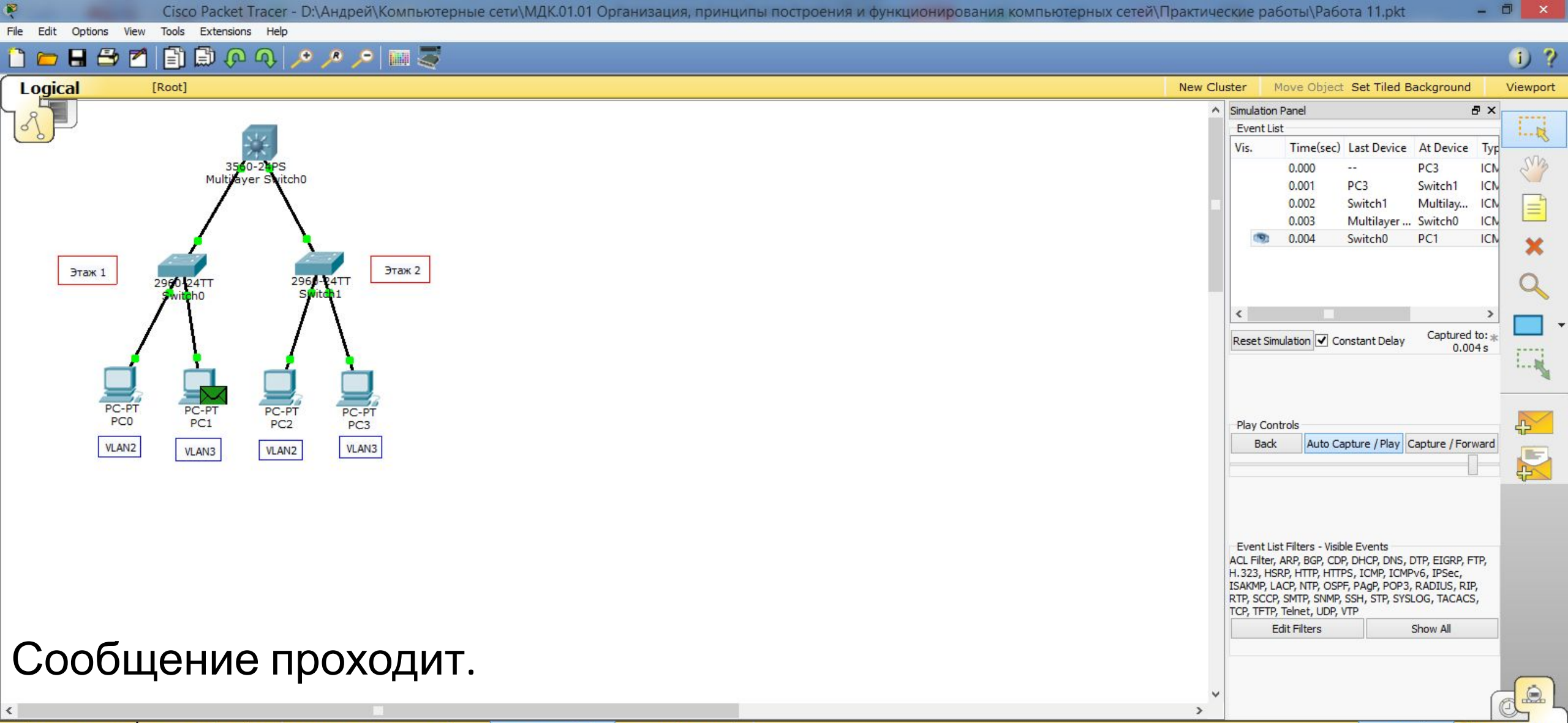
Scenario 0 New Delete Toggle PDU List Window

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

ENG 0:46 25.10.2019



Связь есть. Попробуем отправить сообщение.



Сообщение проходит.

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

Список литературы:

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2. Компьютерные сети. Принципы, технологии, протоколы, В. Олифер, Н. Олифер (5-е издание), «Питер», Москва, Санк-Петербург, 2016.
3. Компьютерные сети. Э. Таненбаум, 4-е издание, «Питер», Москва, Санк-Петербург, 2003.

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https://bigslide.ru/images/51/50961/960/img12.jpg

https://bigslide.ru/images/51/50961/960/img11.jpg

https://1.bp.blogspot.com/-qptz15WfEJE/XDoN736gSvI/AAAAAAAAAU8/ESDrBE1iP-0vt5keIdxrnh_Y6ZpF2_2tQCLcBGAs/s1600/Hybrid-Network.jpg

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Спасибо за внимание!

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