

# ECE4016 Assignment 03: Part 2. Network Design Simulation

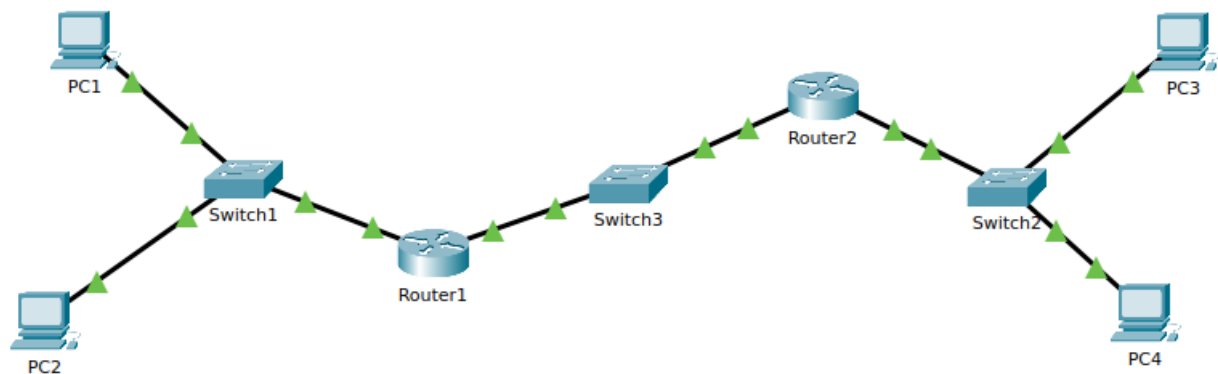
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## Task 1

### I. Configuration

In this task, we have 4 PCs, 3 Switches and 2 Routers. The topology of this task is as following:



For **PCs**, configuration of **IPv4 Address**, **Subnet Mask** and **Default Gateway** is needed.

- PC1:

PC1

Physical

Config

Desktop

Programming

Attributes

IP Configuration

X

Interface

FastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.1.10

Subnet Mask

255.255.255.0

Default Gateway

192.168.1.1

DNS Server

0.0.0.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::201:64FF:FEAC:5E91

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

- PC2:

PC2

Physical

Config

Desktop

Programming

Attributes

IP Configuration

X

Interface

FastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.1.11

Subnet Mask

255.255.255.0

Default Gateway

192.168.1.1

DNS Server

0.0.0.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::290:2BFF:FEAA:307D

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

- PC3:

PC3

Physical

Config

Desktop

Programming

Attributes

IP Configuration

X

Interface

FastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.168.3.10

Subnet Mask

255.255.255.0

Default Gateway

192.168.3.1

DNS Server

0.0.0.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::210:11FF:FEC1:E491

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

- PC4:

The screenshot shows a configuration window for a device labeled "PC4". The window has a title bar with standard minimize, maximize, and close buttons. Below the title bar are five tabs: "Physical", "Config", "Desktop" (which is selected), "Programming", and "Attributes".

Under the "Desktop" tab, there is a section titled "IP Configuration" with a blue header bar and a close button (X). Below this header is a dropdown menu labeled "Interface" with "FastEthernet0" selected. The "IP Configuration" section contains two radio buttons: "DHCP" (unselected) and "Static" (selected). Below these are four text input fields: "IPv4 Address" (192.168.3.11), "Subnet Mask" (255.255.255.0), "Default Gateway" (192.168.3.1), and "DNS Server" (0.0.0.0).

Below the IP Configuration section is the "IPv6 Configuration" section. It also has two radio buttons: "Automatic" (unselected) and "Static" (selected). Below these are four text input fields: "IPv6 Address" (empty), "Link Local Address" (FE80::2D0:BCFF:FE4D:C7B4), "Default Gateway" (empty), and "DNS Server" (empty).

Below the IPv6 Configuration section is the "802.1X" section. It starts with a checkbox "Use 802.1X Security" which is unchecked. Below this is a dropdown menu for "Authentication" set to "MD5". At the bottom of this section are two text input fields for "Username" and "Password", both of which are empty.

At the very bottom of the window, there is a checkbox labeled "Top" which is also unchecked.

For **Routers**, configuration of interfaces and RIP Routing is needed.



- Router1:

Router1

Physical
**Config**
CLI
Attributes

**GLOBAL**

Settings

Algorithm Settings

**ROUTING**

Static

RIP

**SWITCHING**

VLAN Database

**INTERFACE**

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

GigabitEthernet0/0/0

Port Status

☒ On

Bandwidth

☒ 1000 Mbps
 ☐ 100 Mbps
 ☐ 10 Mbps
 ☒ Auto

Duplex

☐ Half Duplex
 ☒ Full Duplex
 ☒ Auto

MAC Address

00E0.F77E.1501

IP Configuration

IPv4 Address

192.168.1.1

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

```

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console
          
```

☐ Top

Router1

Physical
**Config**
CLI
Attributes

**GLOBAL**

Settings

Algorithm Settings

**ROUTING**

Static

RIP

**SWITCHING**

VLAN Database

**INTERFACE**

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

GigabitEthernet0/0/1

Port Status

☒ On

Bandwidth

☒ 1000 Mbps
 ☐ 100 Mbps
 ☐ 10 Mbps
 ☒ Auto

Duplex

☐ Half Duplex
 ☒ Full Duplex
 ☒ Auto

MAC Address

00E0.F77E.1502

IP Configuration

IPv4 Address

192.168.2.1

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

```

Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console
          
```

Router(config-if)#exit  
Router(config)#interface GigabitEthernet0/0/1  
Router(config-if)#

☐ Top

Router1

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

RIP Routing

Network

Network Address

192.168.1.0

192.168.2.0

Add

Remove

Equivalent IOS Commands

Router(config)#router rip  
Router(config-router)#  
Router(config-router)#end  
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#interface GigabitEthernet0/0/0  
Router(config-if)#  
%SYS-5-CONFIG\_I: Configured from console by console  
  
Router(config-if)#exit  
Router(config)#interface GigabitEthernet0/0/1  
Router(config-if)#  
Router(config-if)#exit  
Router(config)#router rip  
Router(config-router)#

☐ Top

where interface `GigabitEthernet0/0/0` connects to Switch1 and `GigabitEthernet0/0/1`





- Router2:

Router2

Physical
**Config**
CLI
Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

GigabitEthernet0/0/0

Port Status

☒ On

Bandwidth

☒ 1000 Mbps
 ☐ 100 Mbps
 ☐ 10 Mbps
 ☒ Auto

Duplex

☐ Half Duplex
 ☒ Full Duplex
 ☒ Auto

MAC Address

00E0.B0B0.0E01

IP Configuration

IPv4 Address

192.168.2.2

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

```

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console
          
```

☐ Top

Router2

Physical
**Config**
CLI
Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

GigabitEthernet0/0/1

Port Status

☒ On

Bandwidth

☒ 1000 Mbps
 ☐ 100 Mbps
 ☐ 10 Mbps
 ☒ Auto

Duplex

☐ Half Duplex
 ☒ Full Duplex
 ☒ Auto

MAC Address

00E0.B0B0.0E02

IP Configuration

IPv4 Address

192.168.3.1

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

```

Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console
          
```

Router(config-if)#exit  
Router(config)#interface GigabitEthernet0/0/1  
Router(config-if)#

☐ Top

Router2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

RIP Routing

Network

Network Address

192.168.2.0

192.168.3.0

Add

Remove

Equivalent IOS Commands

Router(config)#router rip  
Router(config-router)#  
Router(config-router)#end  
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#interface GigabitEthernet0/0/0  
Router(config-if)#  
%SYS-5-CONFIG\_I: Configured from console by console  
  
Router(config-if)#exit  
Router(config)#interface GigabitEthernet0/0/1  
Router(config-if)#  
Router(config-if)#exit  
Router(config)#router rip  
Router(config-router)#

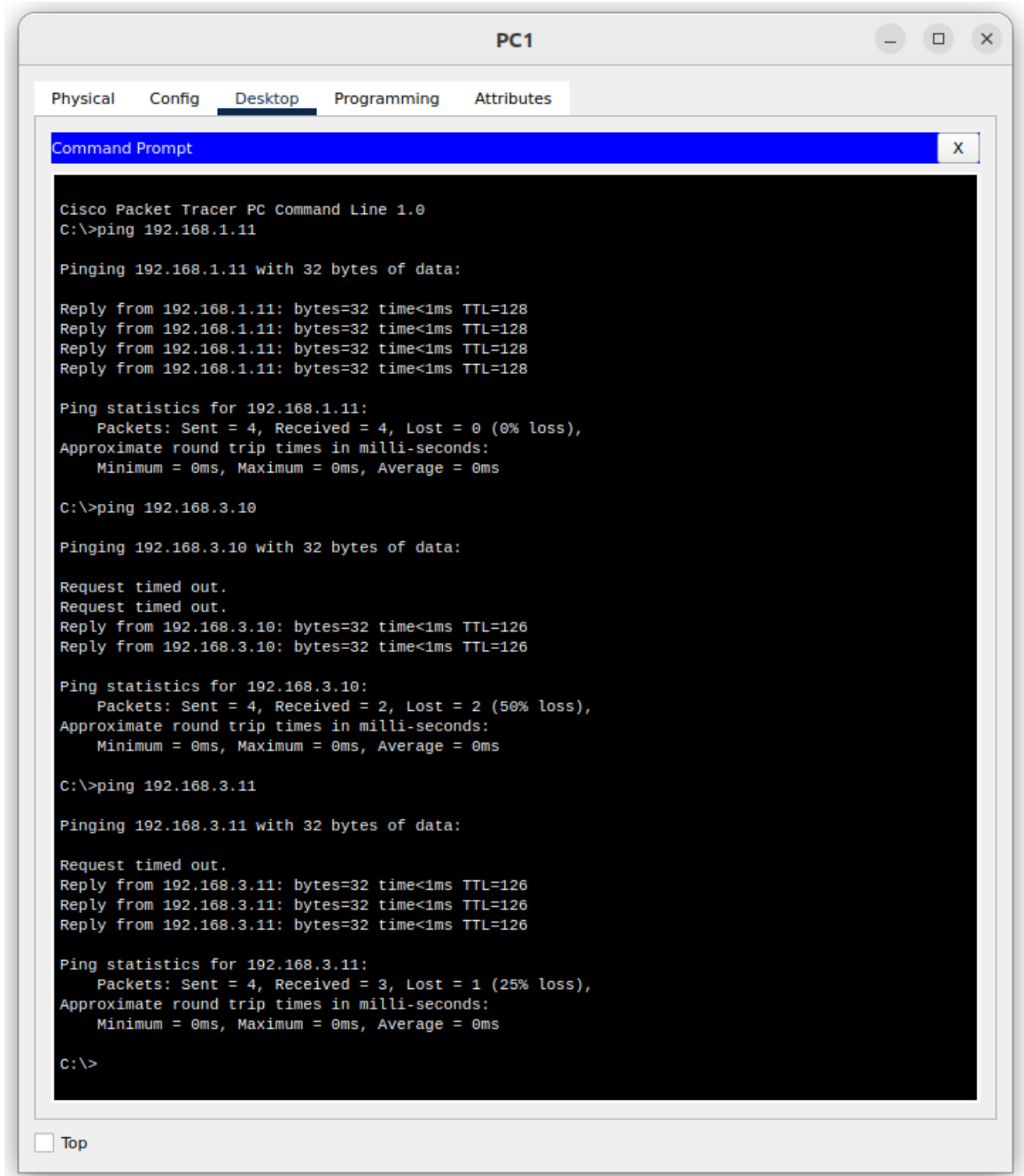
☐ Top

where interface `GigabitEthernet0/0/0` connects to Switch1 and `GigabitEthernet0/0/1`.

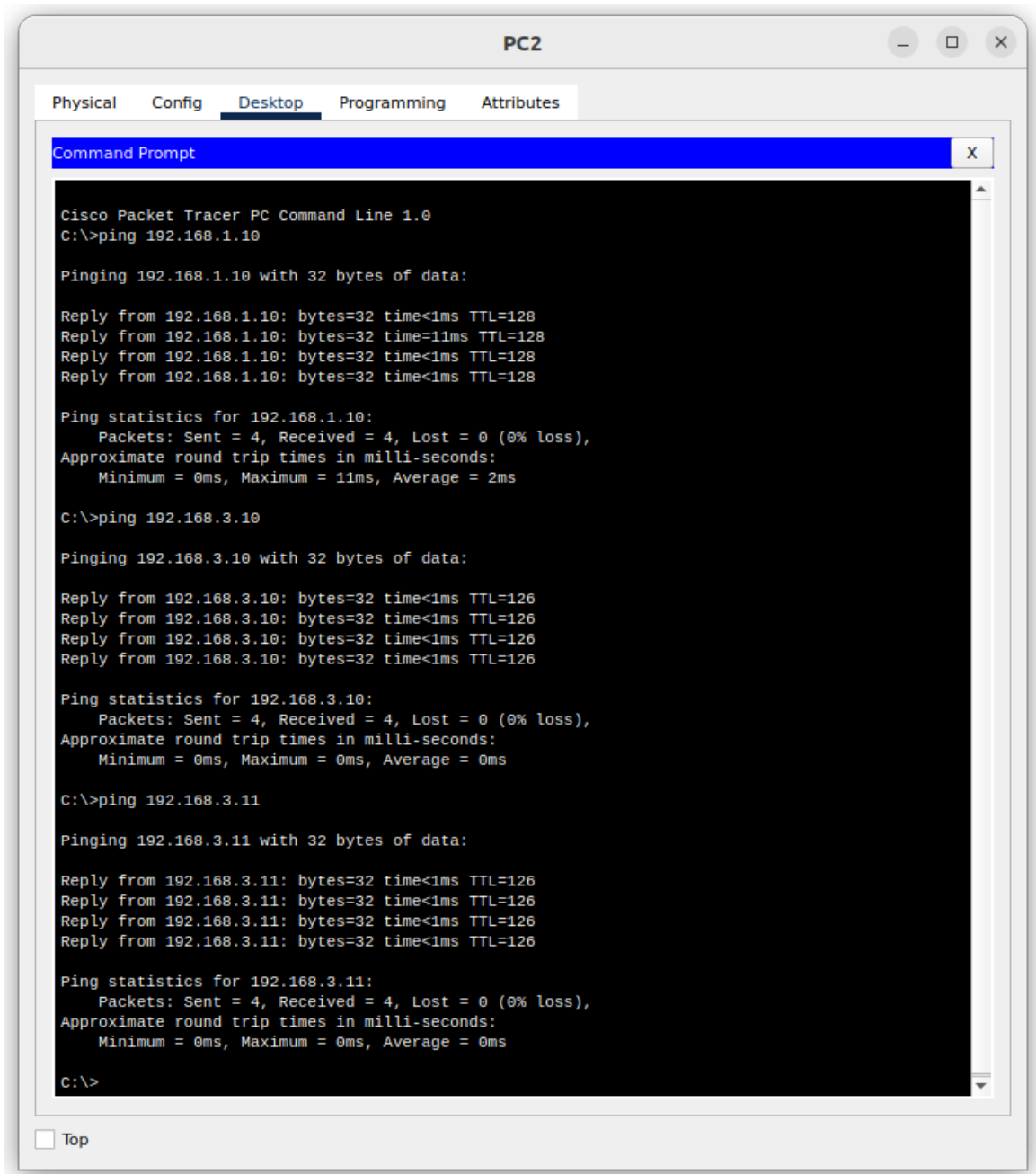
## II. Network test

We test the network connection between PCs by `ping` command.

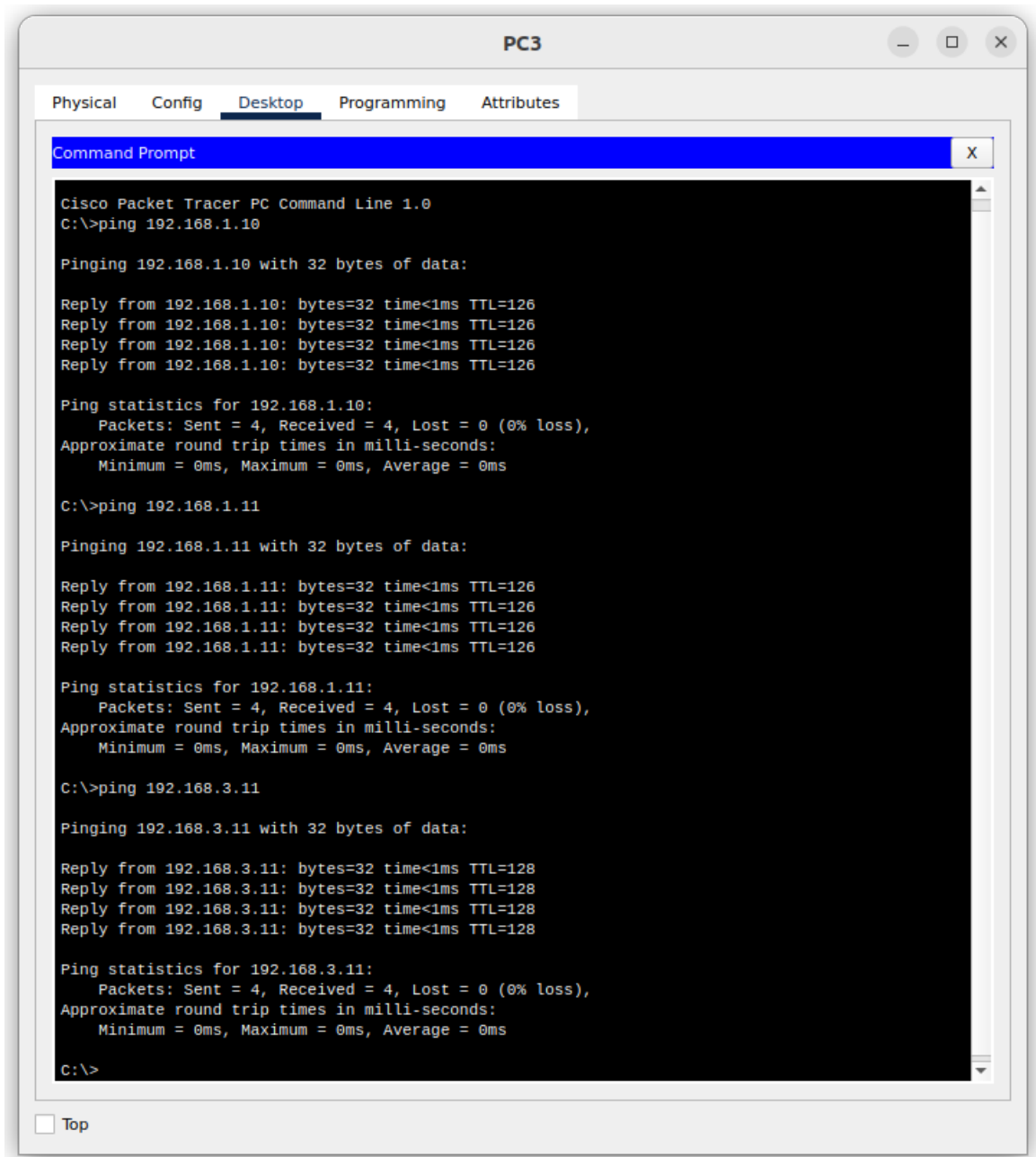
- PC1 pinging PC2/3/4:



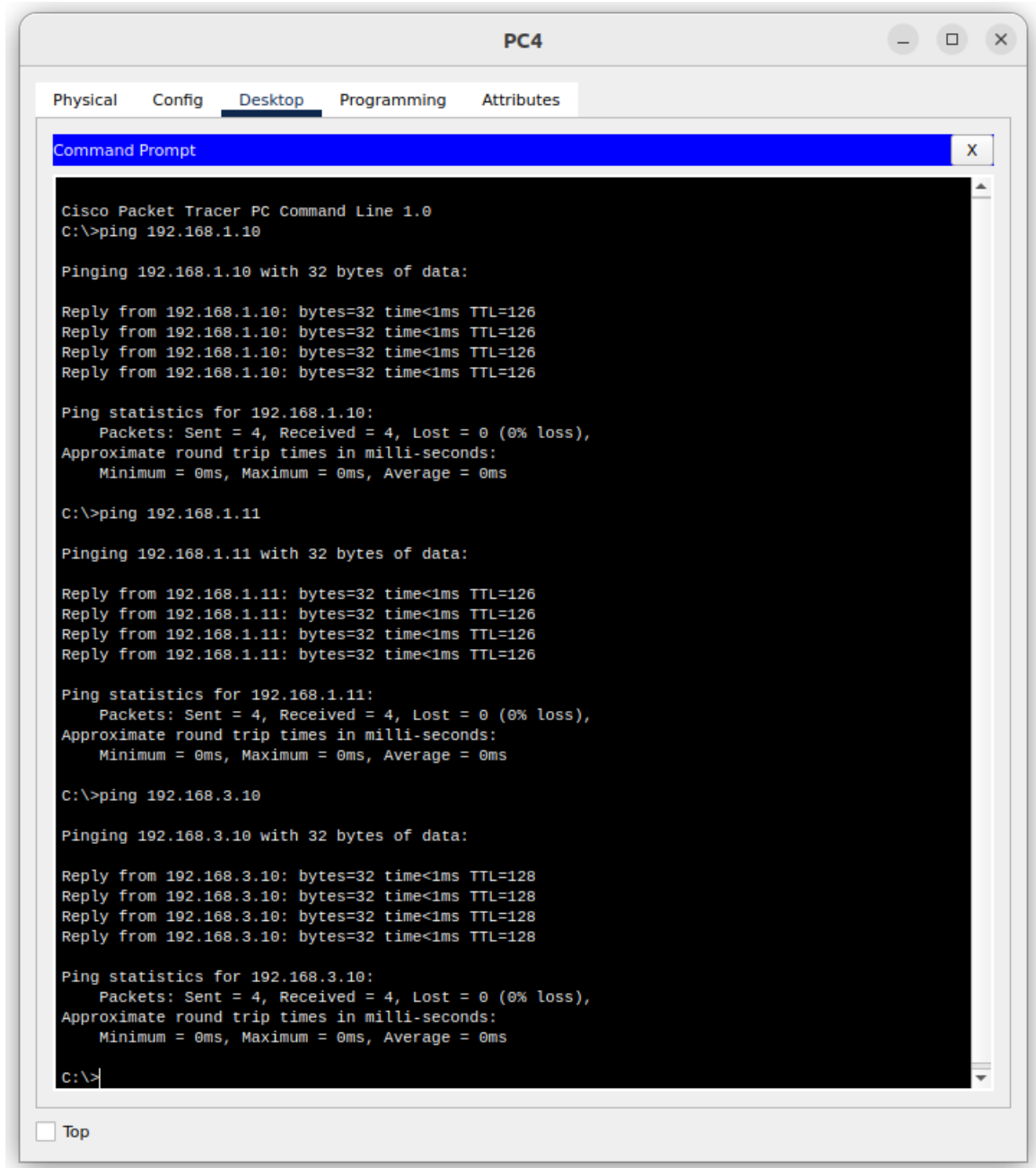
- PC2 pinging PC1/3/4:



- PC3 pinging PC1/2/4:



- PC4 pinging PC1/2/3:

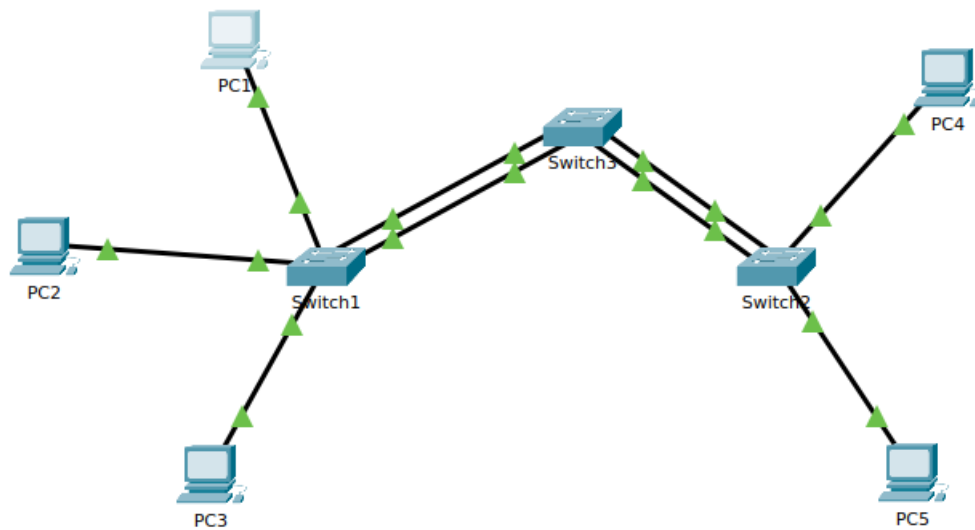


Time out may occur when first few times we ping from 192.168.1.\* to 192.168.3.\*. The reason of first ping lost is the device has no entries in its ARP table for the destination. It needs to send an ARP request to destination MAC address in order to properly forward the packet.

## Task 2

### I. Configuration

In this task, we have 5 PCs and 3 Switches. The topology of this task is as following:



For **PCs**, configuration of **IPv4 Address and Subnet Mask** is needed.

- PC1:

**PC1**

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.12.10.11

Subnet Mask 255.255.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::2E0:B0FF:FEE1:5075

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

☐ Top

\*\*



- PC2:

PC2

Physical

Config

Desktop

Programming

Attributes

IP Configuration

X

Interface

FastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.12.10.12

Subnet Mask

255.255.0.0

Default Gateway

0.0.0.0

DNS Server

0.0.0.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::260:47FF:FE2D:6C84

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

- PC3:

PC3

Physical

Config

Desktop

Programming

Attributes

IP Configuration

X

Interface

FastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

192.12.20.13

Subnet Mask

255.255.0.0

Default Gateway

0.0.0.0

DNS Server

0.0.0.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

/

Link Local Address

FE80::210:11FF:FE05:AD56

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

- PC4:

PC4

Physical

Config

Desktop

Programming

Attributes

IP Configuration

X

Interface

FastEthernet0

IP Configuration

DHCP

Static

IPv4 Address

192.12.10.14

Subnet Mask

255.255.0.0

Default Gateway

0.0.0.0

DNS Server

0.0.0.0

IPv6 Configuration

Automatic

Static

IPv6 Address

/

Link Local Address

FE80::201:C9FF:FE9E:782C

Default Gateway

DNS Server

802.1X

Use 802.1X Security

Authentication

MD5

Username

Password

Top

- PC5:

The image shows a configuration window titled "PC5" with tabs for Physical, Config, Desktop, Programming, and Attributes. The "Desktop" tab is active, displaying the "IP Configuration" section for the "FastEthernet0" interface. The "Static" option is selected for IP configuration, with fields for IPv4 Address (192.12.20.15), Subnet Mask (255.255.0.0), Default Gateway (0.0.0.0), and DNS Server (0.0.0.0). The "IPv6 Configuration" section shows the "Static" option selected, with fields for IPv6 Address, Link Local Address (FE80::202:16FF:FED6:AD7E), Default Gateway, and DNS Server. The "802.1X" section has the "Use 802.1X Security" checkbox unchecked, with fields for Authentication (MD5), Username, and Password. A "Top" button is located at the bottom left.

PC5

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.12.20.15

Subnet Mask 255.255.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::202:16FF:FED6:AD7E

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

☐ Top

For Switches, the modification of VLAN database and interfaces is needed.



- Switch1:

Switch1

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/1

Port Status

Bandwidth

Duplex

Access

VLAN

10

Tx Ring Limit

10

On

100 Mbps

10 Mbps

Auto

Half Duplex

Full Duplex

Auto

Equivalent IOS Commands

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to up

Switch(config-if)#exit
Switch(config)#interface FastEthernet0/1
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/1
Switch(config-if)#
```

Top

Switch1

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/2

Port Status

Bandwidth

Duplex

Access

VLAN

10

Tx Ring Limit

10

On

100 Mbps

10 Mbps

Auto

Half Duplex

Full Duplex

Auto

Equivalent IOS Commands

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

Switch(config-if)#exit
Switch(config)#interface FastEthernet0/1
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/1
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/2
Switch(config-if)#
```

Top

Switch1

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/3

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

Port Status

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

☐ Half Duplex

☒ Full Duplex

☒ Auto

Bandwidth

Duplex

Access

VLAN

20

Tx Ring Limit

10

Equivalent IOS Commands

Switch(config-if)#exit  
Switch(config)#interface FastEthernet0/1  
Switch(config-if)#  
Switch(config-if)#exit  
Switch(config)#interface FastEthernet0/1  
Switch(config-if)#  
Switch(config-if)#exit  
Switch(config)#interface FastEthernet0/2  
Switch(config-if)#  
Switch(config-if)#exit  
Switch(config)#interface FastEthernet0/3  
Switch(config-if)#

☐ Top

These three interfaces are connected to PC1, PC2 and PC3

The screenshot shows the configuration window for Switch1, specifically the 'Config' tab. The left sidebar shows the 'INTERFACE' section with a list of interfaces from FastEthernet0/1 to FastEthernet0/10. FastEthernet0/4 is selected. The main area shows the configuration for FastEthernet0/4. The 'Port Status' is set to 'On'. The 'Bandwidth' is set to '100 Mbps'. The 'Duplex' is set to 'Full Duplex'. The 'Access' mode is selected, and the 'VLAN' is set to '10'. The 'Tx Ring Limit' is set to '10'. Below the configuration area, there is a section for 'Equivalent IOS Commands' which lists the following commands:

```
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/1
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/2
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/3
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/4
Switch(config-if)#
```

At the bottom left, there is a 'Top' button.

The screenshot shows the configuration window for Switch1, specifically the 'Config' tab. The left sidebar shows the 'INTERFACE' section with a list of interfaces from FastEthernet0/1 to FastEthernet0/10. FastEthernet0/5 is selected. The main area shows the configuration for FastEthernet0/5. The 'Port Status' is set to 'On'. The 'Bandwidth' is set to '100 Mbps'. The 'Duplex' is set to 'Full Duplex'. The 'Access' mode is selected, and the 'VLAN' is set to '20'. The 'Tx Ring Limit' is set to '10'. Below the configuration area, there is a section for 'Equivalent IOS Commands' which lists the following commands:

```
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/2
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/3
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/4
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/5
Switch(config-if)#
```

At the bottom left, there is a 'Top' button.

These two interfaces are connected to Switch3.



- Switch2

Switch2

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/1

Port Status

Bandwidth

Duplex

Access

VLAN

10

Tx Ring Limit

10

On

100 Mbps 10 Mbps

Auto

Half Duplex Full Duplex

Auto

Equivalent IOS Commands

Switch>enable

Switch#

Switch#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#interface FastEthernet0/1

Switch(config-if)#

Top

Switch2

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/2

Port Status

Bandwidth

Duplex

Access

VLAN

20

Tx Ring Limit

10

On

100 Mbps 10 Mbps

Auto

Half Duplex Full Duplex

Auto

Equivalent IOS Commands

Switch>enable

Switch#

Switch#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#interface FastEthernet0/1

Switch(config-if)#

Switch(config-if)#exit

Switch(config)#interface FastEthernet0/2

Switch(config-if)#

Top

These two interfaces are connected to Switch3.

Switch2

Physical **Config** CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings
- SWITCHING**
- VLAN Database
- INTERFACE**
- FastEthernet0/1
- FastEthernet0/2
- FastEthernet0/3
- FastEthernet0/4**
- FastEthernet0/5
- FastEthernet0/6
- FastEthernet0/7
- FastEthernet0/8
- FastEthernet0/9
- FastEthernet0/10

**FastEthernet0/4**

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

Access  VLAN

Tx Ring Limit

Equivalent IOS Commands

```
Switch>enable
Switch#
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface FastEthernet0/1
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/2
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/4
Switch(config-if)#
```

☐ Top

Switch2

Physical **Config** CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings
- SWITCHING**
- VLAN Database
- INTERFACE**
- FastEthernet0/1
- FastEthernet0/2
- FastEthernet0/3
- FastEthernet0/4
- FastEthernet0/5**
- FastEthernet0/6
- FastEthernet0/7
- FastEthernet0/8
- FastEthernet0/9
- FastEthernet0/10

**FastEthernet0/5**

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

Access  VLAN

Tx Ring Limit

Equivalent IOS Commands

```
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface FastEthernet0/1
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/2
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/4
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/5
Switch(config-if)#
```

☐ Top

These two interfaces are connected to PC4 and PC5.

- Switch3

In Switch3, we have 4 interfaces, 2 of them have VLAN 10 and 2 of them have VLAN 20, connected to Switch1 and Switch2 respectively.

The screenshot shows the configuration window for Switch3, specifically for the FastEthernet0/1 interface. The window has tabs for Physical, Config (selected), CLI, and Attributes. On the left, there is a sidebar with a tree view containing GLOBAL, Settings, Algorithm Settings, SWITCHING, VLAN Database, and INTERFACE. Under INTERFACE, the list of interfaces is shown, with FastEthernet0/1 selected. The main area displays the configuration for FastEthernet0/1. The Port Status is set to On. Bandwidth is set to 100 Mbps. Duplex is set to Full Duplex. The Access mode is selected, and the VLAN is set to 10. The Tx Ring Limit is set to 10. Below the configuration area, there is a section for Equivalent IOS Commands, which contains the following commands: Switch>enable, Switch#, Switch#configure terminal, Enter configuration commands, one per line. End with CNTL/Z., Switch(config)#interface FastEthernet0/1, and Switch(config-if)#. At the bottom left, there is a checkbox labeled Top.

Switch3

Physical **Config** CLI Attributes

**GLOBAL**

Settings

Algorithm Settings

**SWITCHING**

VLAN Database

**INTERFACE**

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/1

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

Access VLAN 10

Tx Ring Limit 10

Equivalent IOS Commands

```
Switch>enable
Switch#
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface FastEthernet0/1
Switch(config-if)#
```

☐ Top

The screenshot shows the configuration window for Switch3, specifically for the FastEthernet0/2 interface. The window has tabs for Physical, Config (selected), CLI, and Attributes. On the left, there is a sidebar with a tree view containing GLOBAL, Settings, Algorithm Settings, SWITCHING, VLAN Database, and INTERFACE. Under INTERFACE, the list of interfaces is shown, with FastEthernet0/2 selected. The main area displays the configuration for FastEthernet0/2. The Port Status is set to On. Bandwidth is set to 100 Mbps. Duplex is set to Full Duplex. The Access mode is selected, and the VLAN is set to 20. The Tx Ring Limit is set to 10. Below the configuration area, there is a section for Equivalent IOS Commands, which contains the following commands: Switch>enable, Switch#, Switch#configure terminal, Enter configuration commands, one per line. End with CNTL/Z., Switch(config)#interface FastEthernet0/1, Switch(config-if)#, Switch(config-if)#exit, Switch(config)#interface FastEthernet0/2, and Switch(config-if)#. At the bottom left, there is a checkbox labeled Top.

Switch3

Physical **Config** CLI Attributes

**GLOBAL**

Settings

Algorithm Settings

**SWITCHING**

VLAN Database

**INTERFACE**

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/2

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

Access VLAN 20

Tx Ring Limit 10

Equivalent IOS Commands

```
Switch>enable
Switch#
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface FastEthernet0/1
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/2
Switch(config-if)#
```

☐ Top

Switch3

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/3

Port Status

☒ On

Bandwidth

☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex

☐ Half Duplex ☒ Full Duplex ☒ Auto

AccessVLAN

10

Tx Ring Limit

10

Equivalent IOS Commands

Switch>enable  
Switch#  
Switch#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Switch(config)#interface FastEthernet0/1  
Switch(config-if)#  
Switch(config-if)#exit  
Switch(config)#interface FastEthernet0/2  
Switch(config-if)#  
Switch(config-if)#exit  
Switch(config)#interface FastEthernet0/3  
Switch(config-if)#

☐ Top

Switch3

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/4

Port Status

☒ On

Bandwidth

☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex

☐ Half Duplex ☒ Full Duplex ☒ Auto

AccessVLAN

20

Tx Ring Limit

10

Equivalent IOS Commands

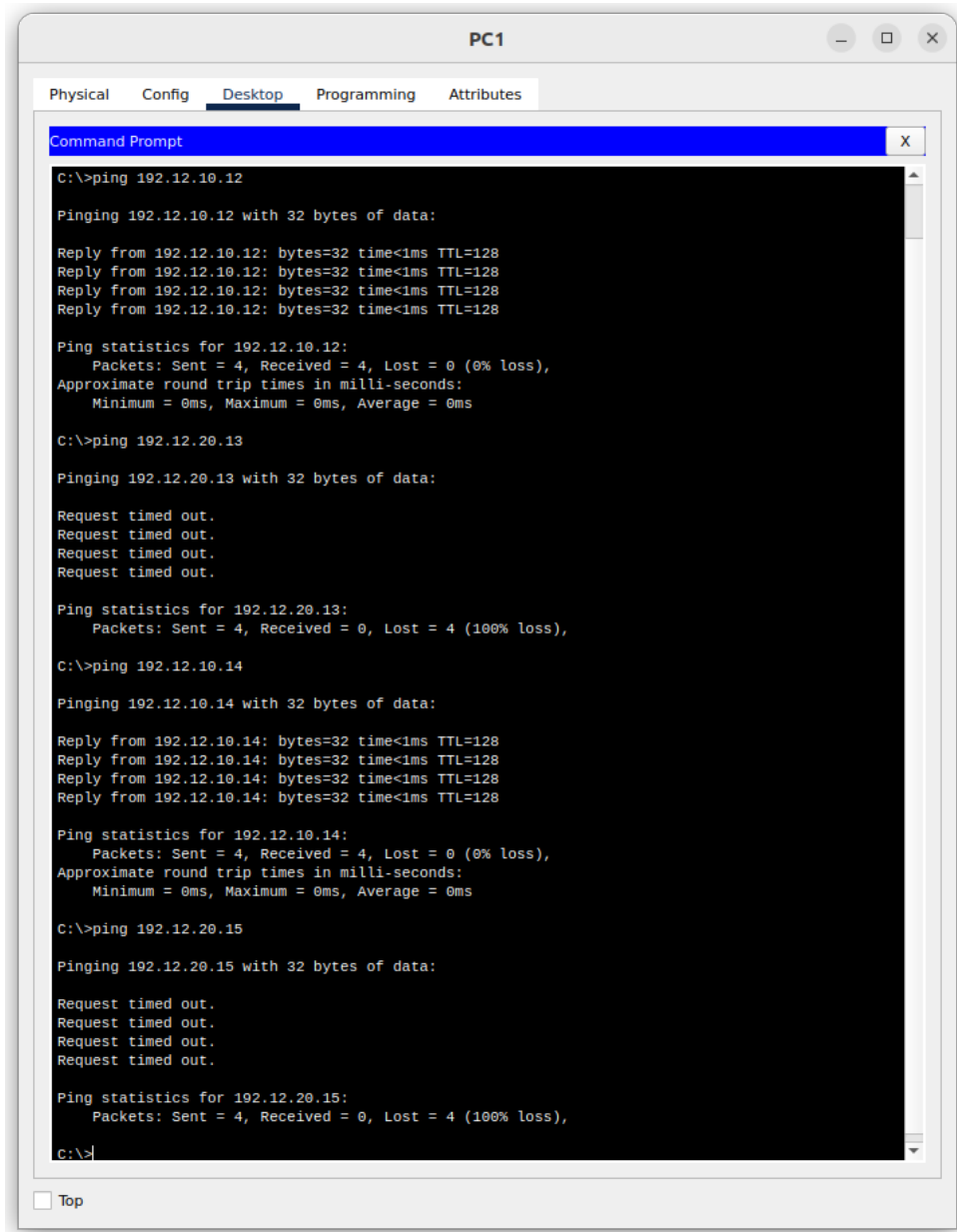
Enter configuration commands, one per line. End with CNTL/Z.  
Switch(config)#interface FastEthernet0/1  
Switch(config-if)#  
Switch(config-if)#exit  
Switch(config)#interface FastEthernet0/2  
Switch(config-if)#  
Switch(config-if)#exit  
Switch(config)#interface FastEthernet0/3  
Switch(config-if)#  
Switch(config-if)#exit  
Switch(config)#interface FastEthernet0/4  
Switch(config-if)#

☐ Top

## II. Network test

We test network connection between PCs by `ping` command.

- PC1 pinging



The screenshot shows a Windows-style window titled "PC1" with tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active, displaying a "Command Prompt" window. The command prompt shows the execution of the `ping` command for three different IP addresses. The first two pings (to 192.12.10.12 and 192.12.10.14) are successful, showing 0% loss. The third ping (to 192.12.20.13) fails, showing 100% loss.

```
C:\>ping 192.12.10.12

Pinging 192.12.10.12 with 32 bytes of data:

Reply from 192.12.10.12: bytes=32 time<1ms TTL=128
Reply from 192.12.10.12: bytes=32 time<1ms TTL=128
Reply from 192.12.10.12: bytes=32 time<1ms TTL=128
Reply from 192.12.10.12: bytes=32 time<1ms TTL=128

Ping statistics for 192.12.10.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.12.20.13

Pinging 192.12.20.13 with 32 bytes of data:

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

Ping statistics for 192.12.20.13:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 192.12.10.14

Pinging 192.12.10.14 with 32 bytes of data:

Reply from 192.12.10.14: bytes=32 time<1ms TTL=128
Reply from 192.12.10.14: bytes=32 time<1ms TTL=128
Reply from 192.12.10.14: bytes=32 time<1ms TTL=128
Reply from 192.12.10.14: bytes=32 time<1ms TTL=128

Ping statistics for 192.12.10.14:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.12.20.15

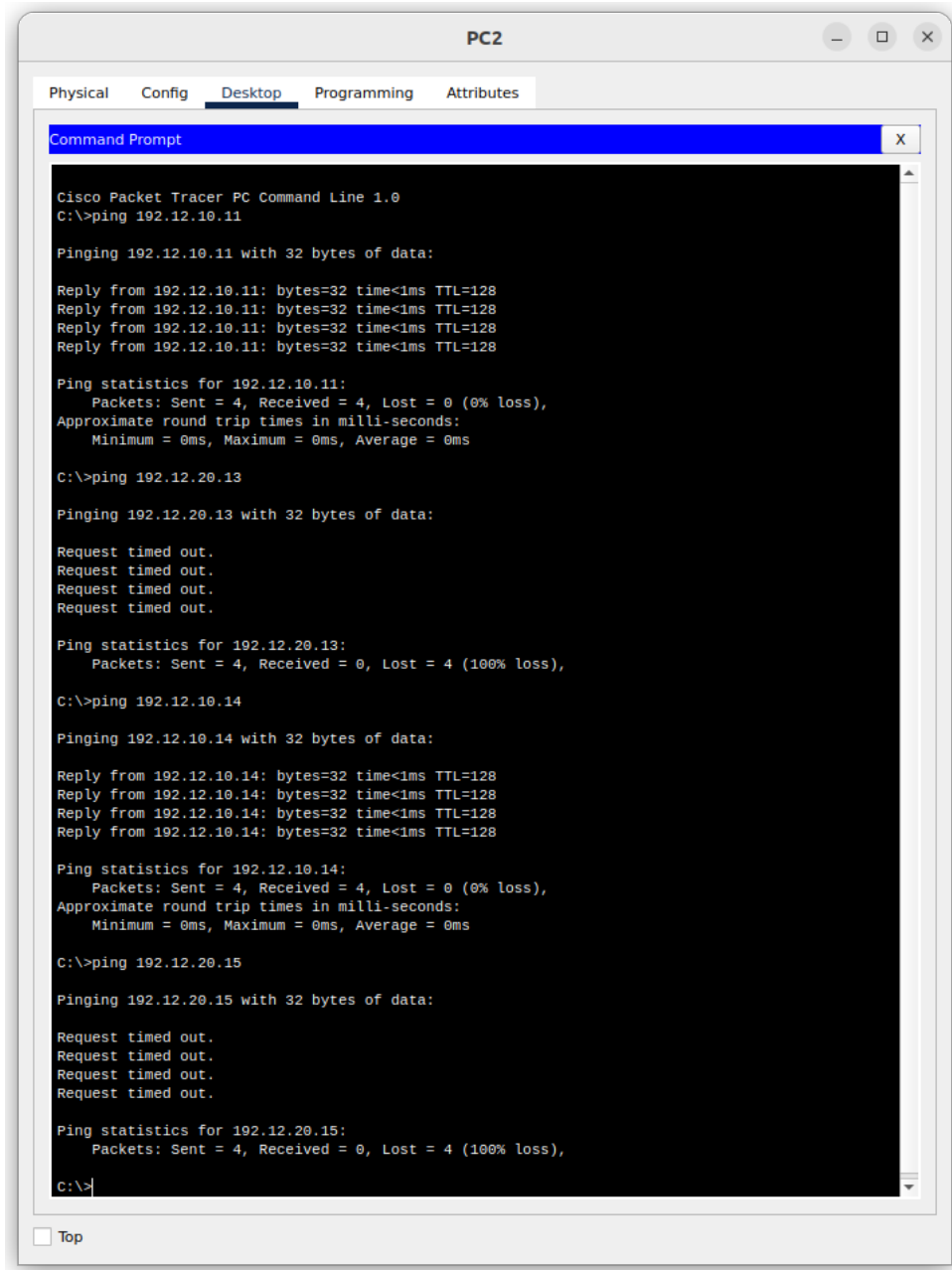
Pinging 192.12.20.15 with 32 bytes of data:

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

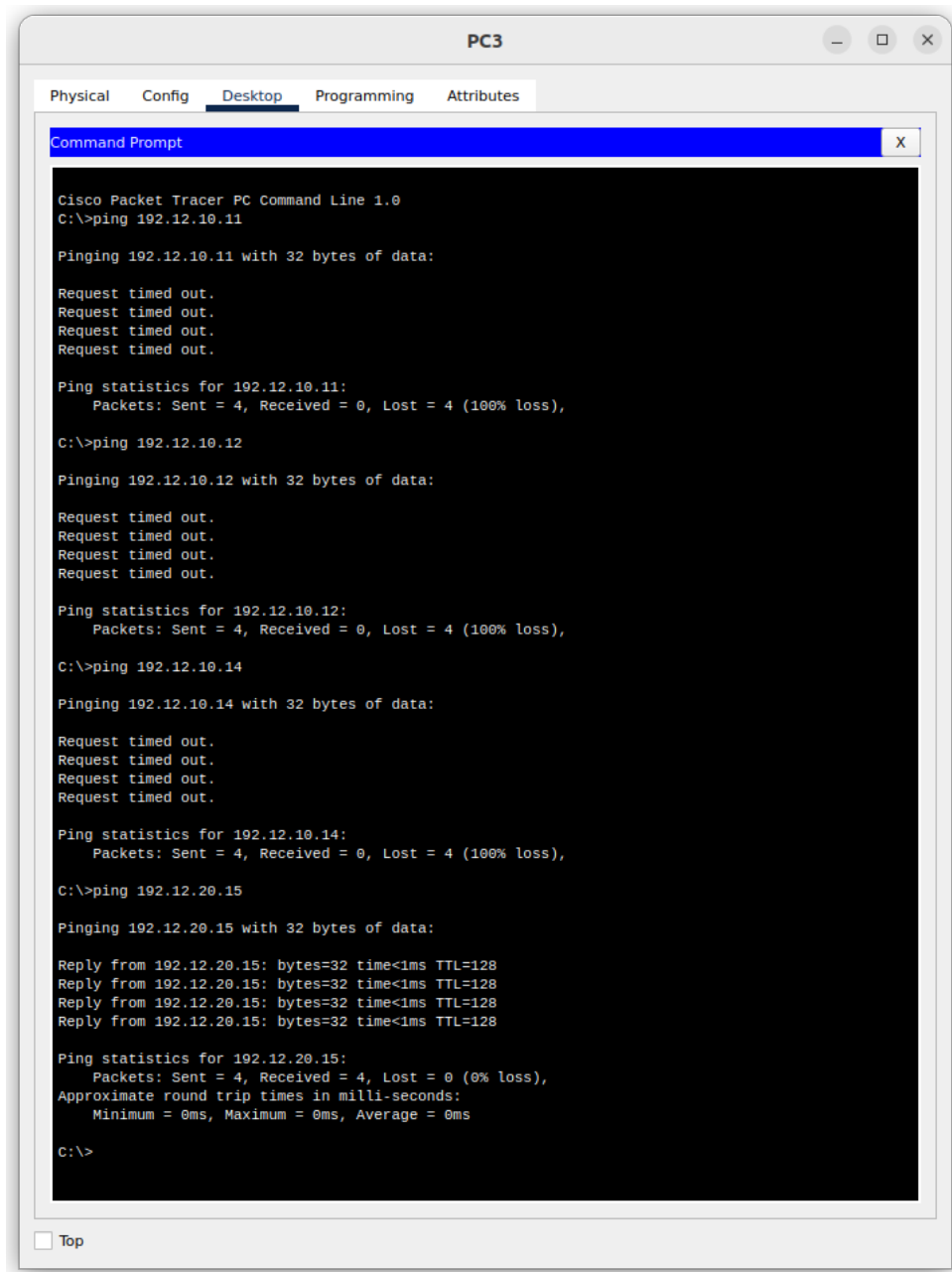
Ping statistics for 192.12.20.15:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

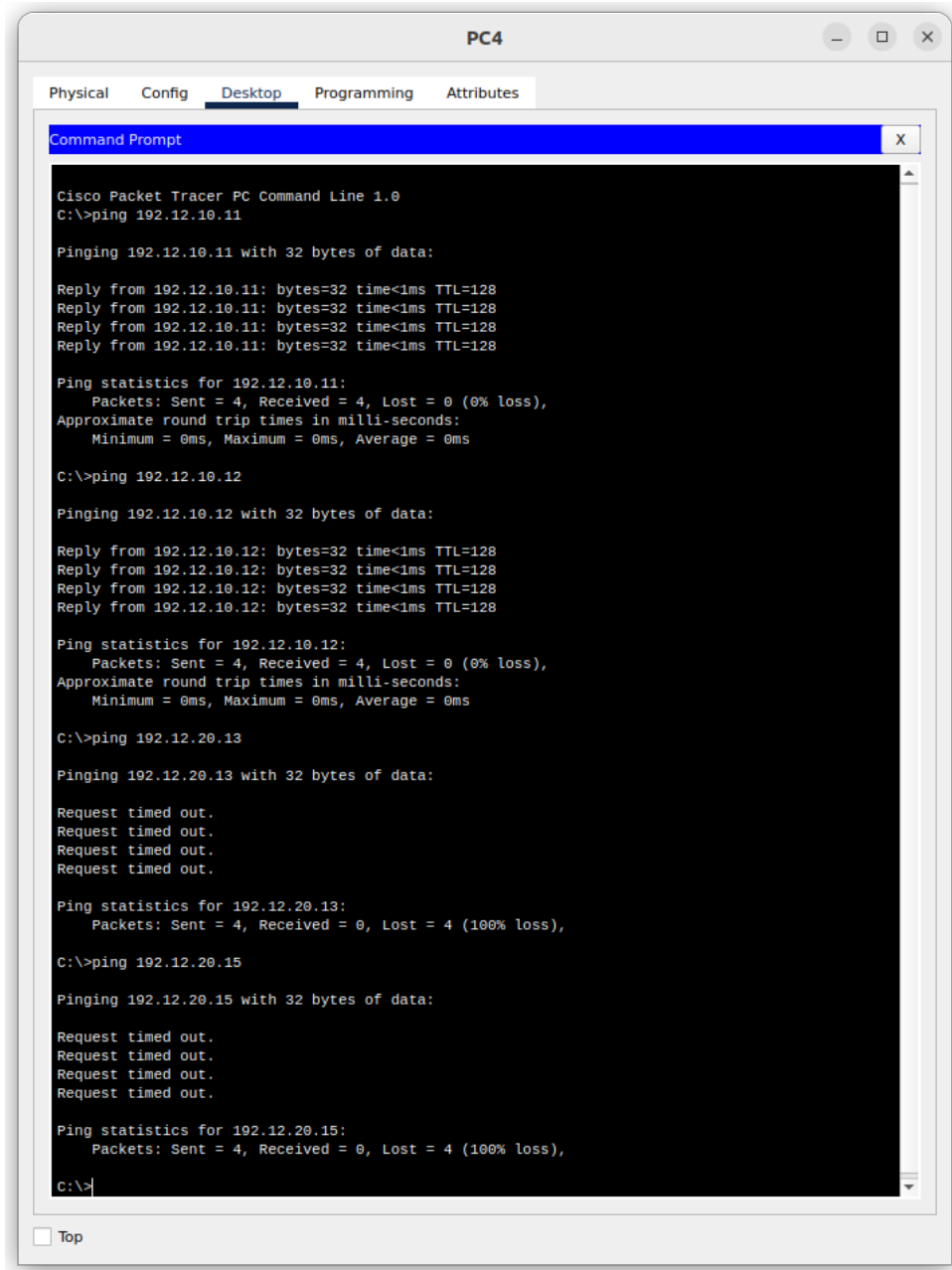
- PC2 pingging



- PC3 pinging

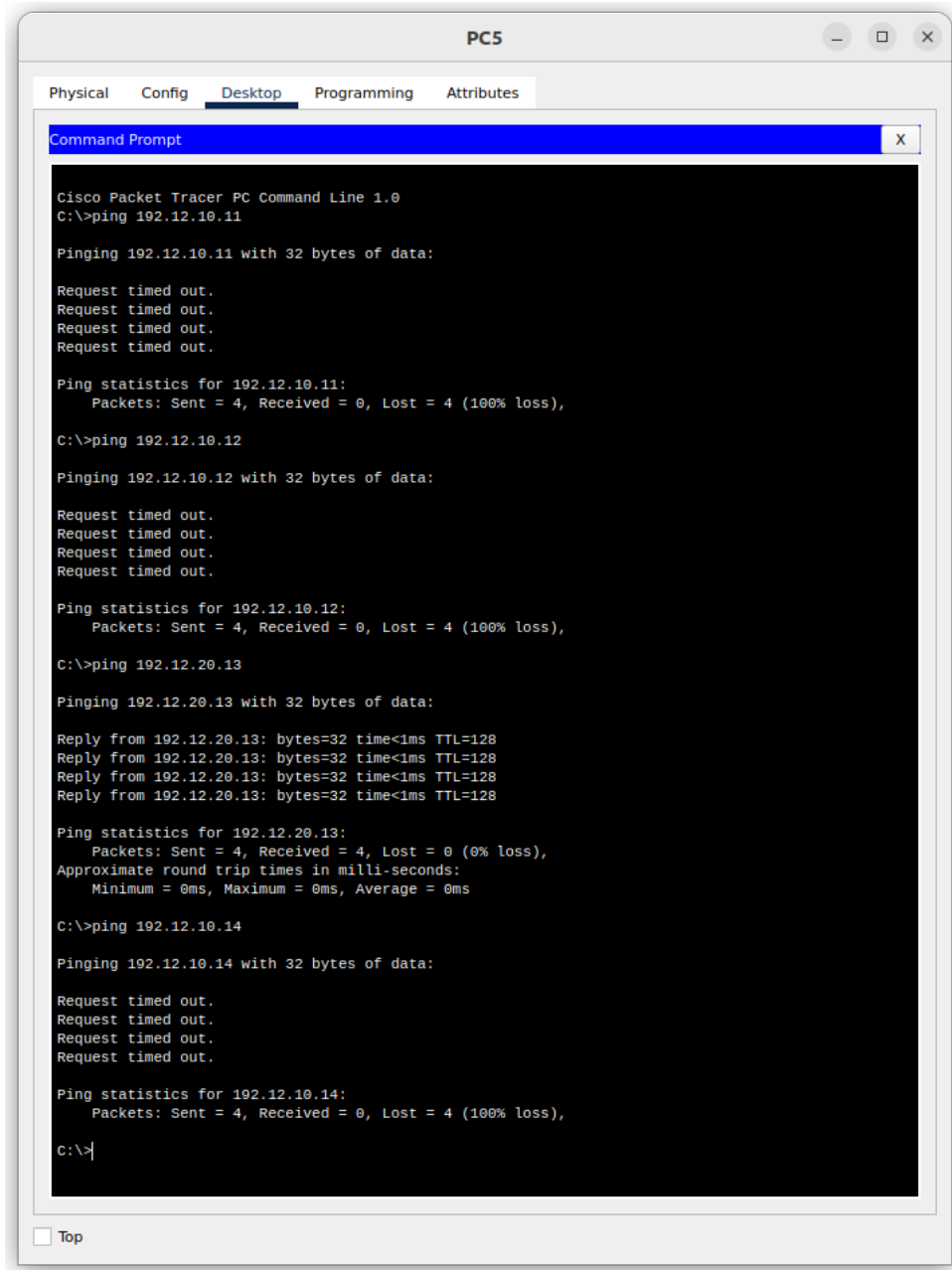


- PC4 pinging





- PC5 pinging



From the test results, we found that PC 1,2 and 4 can communicate with each other but cannot communicate with PC 3 and 5, while PC 3 and 5 can communicate with each other but cannot communicate with PC 1, 2 and 4.

PC 1, 2 and 4 have VLAN 10; PC 3 and 5 have VLAN 20.

In conclusion, only PCs with same VLAN can communicate with each other.