Introduction:

A full-fledged network for an organization with multiple subnets.is a network that is divided into smaller networks called subnets. This type of network is typically used in larger organizations, such as corporations or universities, to manage and control the flow of data within the organization. University of Scholars, is an enterprise like East West University, owns many computers, with a complex network infrastructure. Apart from wired internet access to all the classrooms, labs, employee PCs, library and other administrative and academic wings, the university also provides wireless internet access for every campus. On top of that the university runs a complex networked systems to support several of its business process like admissions, advising, results, eTender, library management, accounts and so on.

Objectives:

In this project I will complete a model of a complex network by discovering the interconnectivity of the systems and subnetworks, which will reflect the University's structure and facilities, features within the network.

Tools:

A full-fledged network for an organization with multiple subnets typically includes the following components:

Routers: These devices connect the different subnets and allow communication between them. They also act as a gateway to the internet.

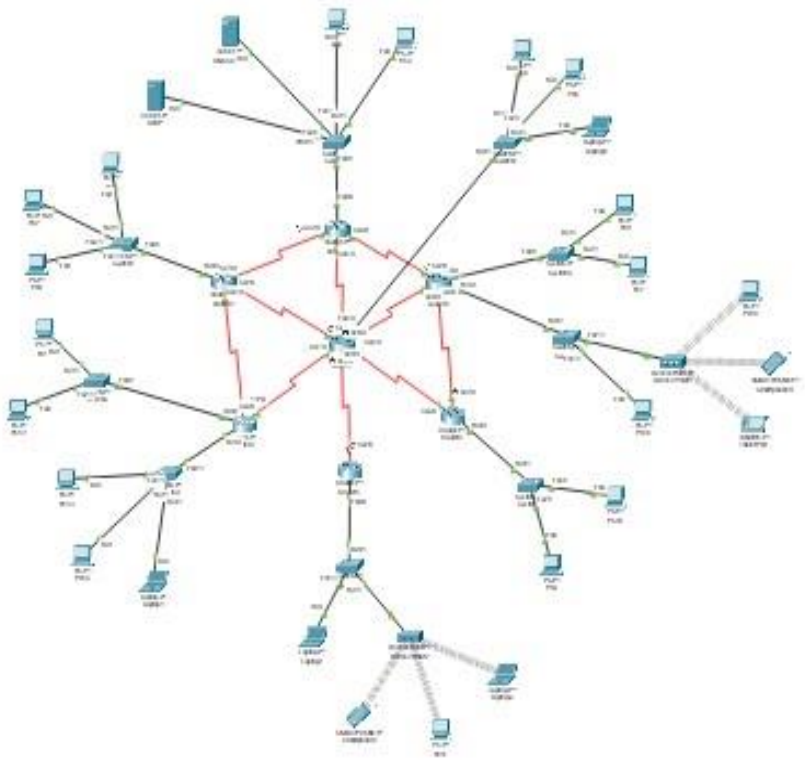
Switches: These devices are used to connect devices within a subnet and provide a central point for data to flow through.

Wireless Access Points (WAPs): These devices provide wireless connectivity to devices within a subnet.

Dns Server: This device provides centralized services such as file storage, email, and application hosting.

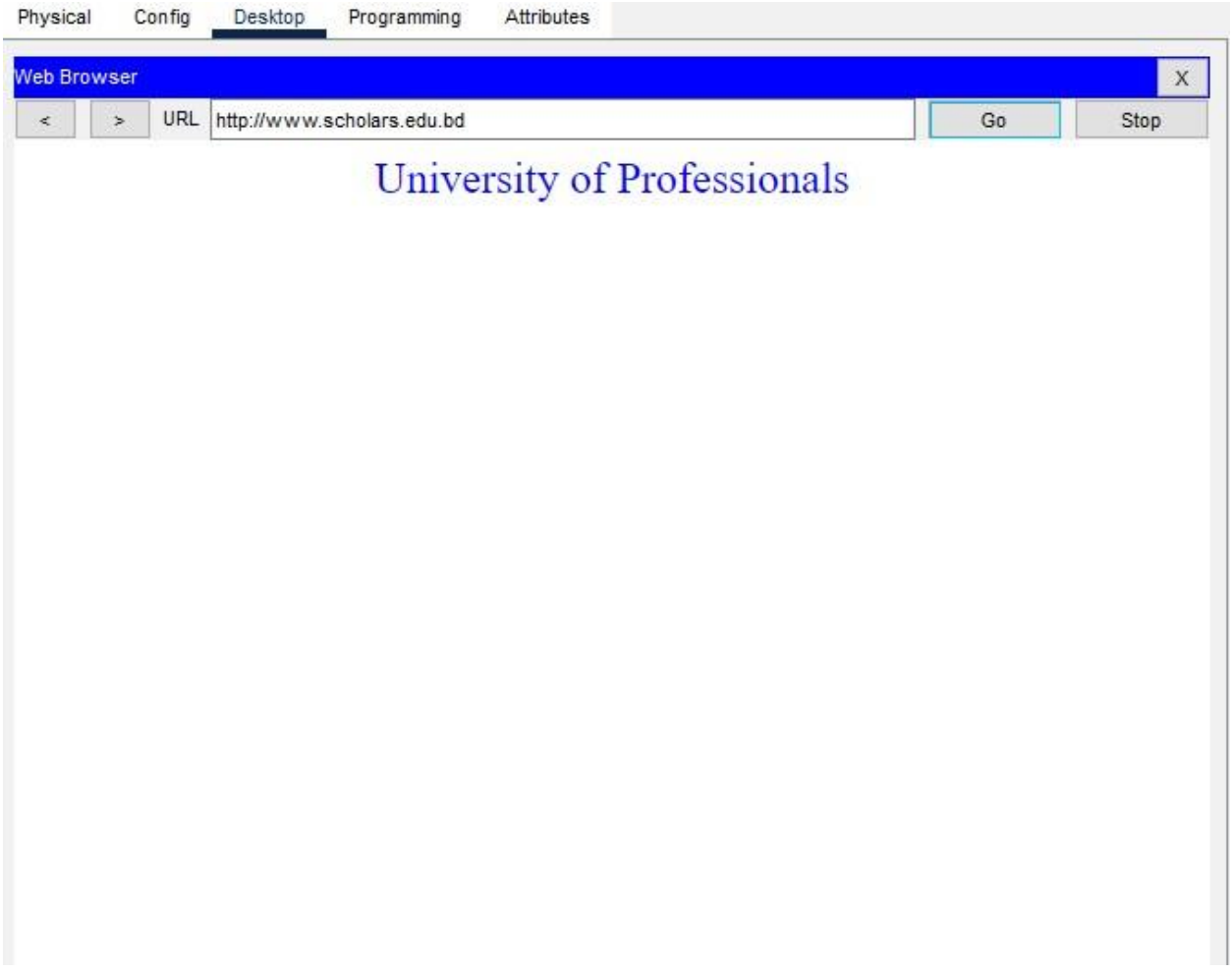
DHCP Server: A DHCP (Dynamic Host Configuration Protocol) server is a device on a network that automatically assigns IP addresses to devices connected to the network.

Networks Connectivity:



How it works:

The network consists of a few PCs connected via a switch. I Use a switch to connect additional computers and wireless devices. These PCs' use can be used to categorize them. Some computers, for example, will be used for the lab, while others may be used for counseling. Some may be used for personal purposes by faculty members. I utilized various IP classes in this case. Class A, B, and C are all implanted here. Multiple switches can also be connected with another switch. Access point router is used to provide wireless connection. A hardware device asks a DNS server to supply the address and obtain the real IP from the web server when we write any URL. All of the data for web pages is on a web server. Any requesting device can visit these websites. I used only one DHCP server to provide IP to connect PC. And also used the same DHCP server as DNS server. Here is an example of a web page of University of Professionals.



Network Ip for the host:

10.0.1.254

10.0.6.1

11.0.1.254

12.0.1.254

13.0.1.254

14.0.1.254

15.0.1.254

17.0.1.254

Router Connectors Networks:

41.0.0.1

42.0.0.1

43.0.0.1

44.0.0.1

45.0.0.1

46.0.0.1

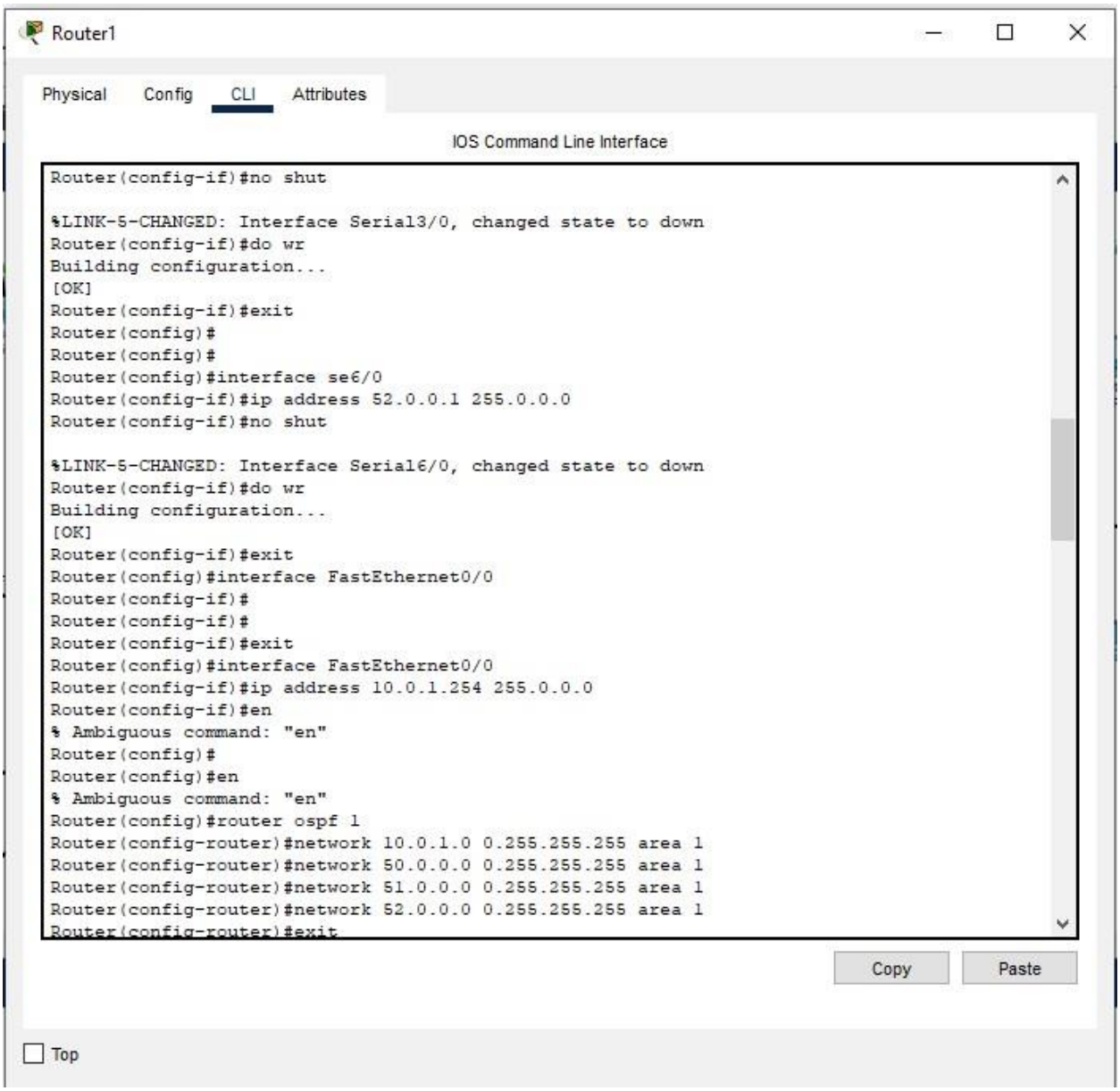
48.0.0.1

50.0.0.1

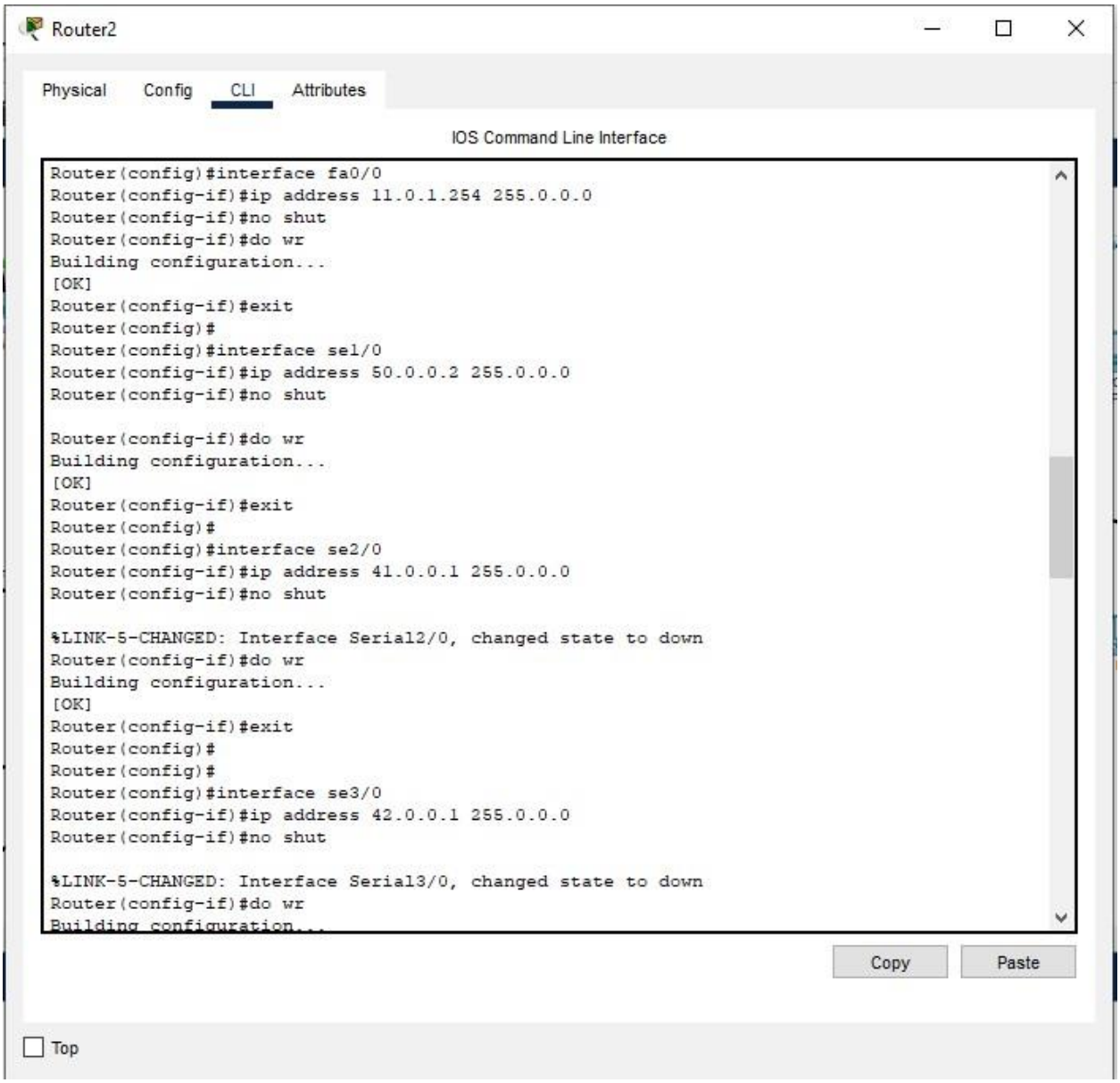
51.0.0.1

52.0.0.1

Router to Router Connection:

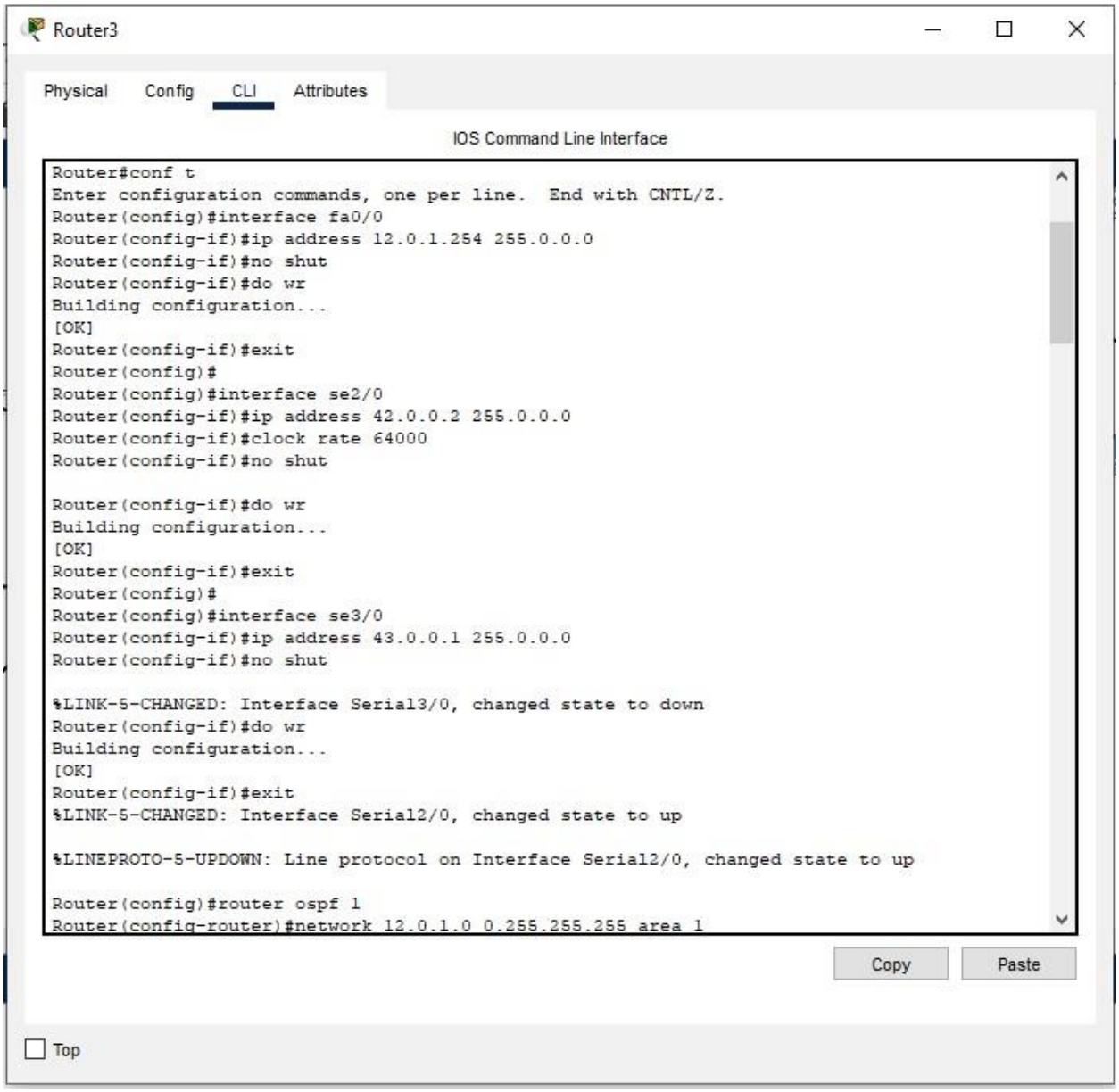

Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#
Router(config)#interface se6/0
Router(config-if)#ip address 52.0.0.1 255.0.0.0
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial6/0, changed state to down
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 10.0.1.254 255.0.0.0
Router(config-if)#en
% Ambiguous command: "en"
Router(config)#
Router(config)#en
% Ambiguous command: "en"
Router(config)#router ospf 1
Router(config-router)#network 10.0.1.0 0.255.255.255 area 1
Router(config-router)#network 50.0.0.0 0.255.255.255 area 1
Router(config-router)#network 51.0.0.0 0.255.255.255 area 1
Router(config-router)#network 52.0.0.0 0.255.255.255 area 1
Router(config-router)#exit
Copy
Paste
Top

Router-1


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config)#interface fa0/0
Router(config-if)#ip address 11.0.1.254 255.0.0.0
Router(config-if)#no shut
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#interface se1/0
Router(config-if)#ip address 50.0.0.2 255.0.0.0
Router(config-if)#no shut
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#interface se2/0
Router(config-if)#ip address 41.0.0.1 255.0.0.0
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#
Router(config)#interface se3/0
Router(config-if)#ip address 42.0.0.1 255.0.0.0
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#do wr
Building configuration...
Copy
Paste
Top

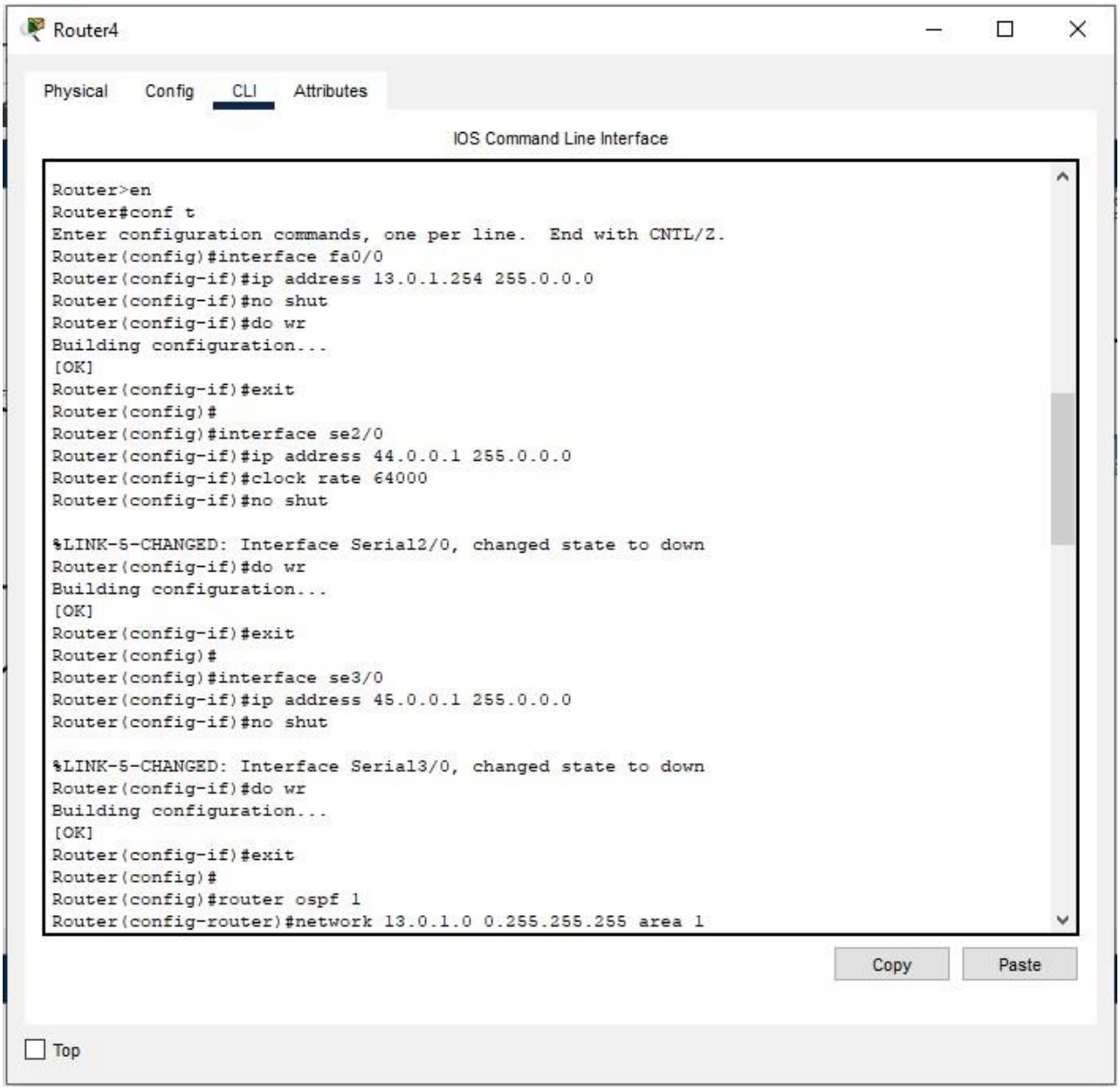
Router-2

Router-3


Router3
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fa0/0
Router(config-if)#ip address 12.0.1.254 255.0.0.0
Router(config-if)#no shut
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#interface se2/0
Router(config-if)#ip address 42.0.0.2 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#interface se3/0
Router(config-if)#ip address 43.0.0.1 255.0.0.0
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config)#router ospf 1
Router(config-router)#network 12.0.1.0 0.255.255.255 area 1
Copy
Paste
Top

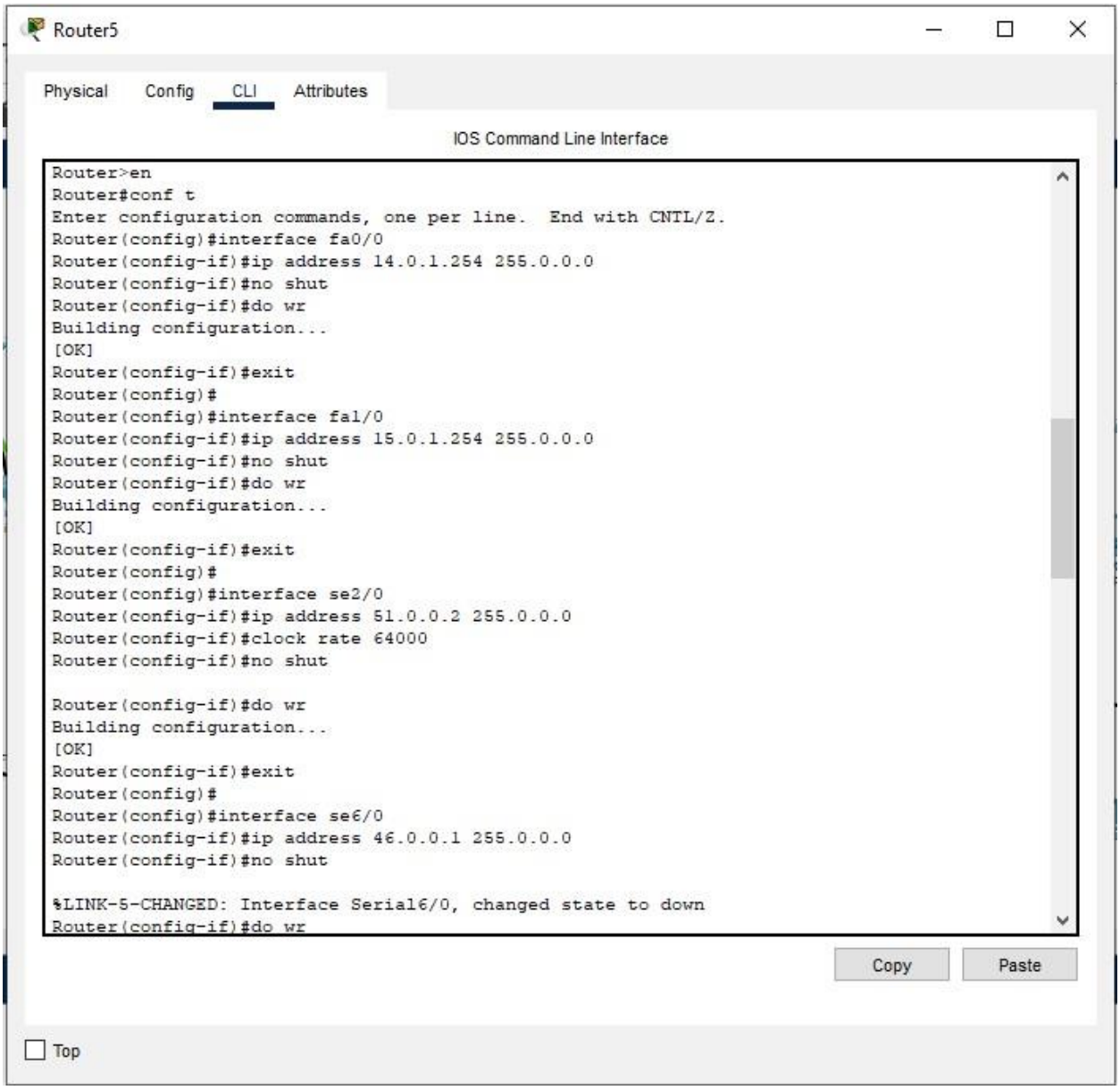
Router-4

Router-5


Router4
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fa0/0
Router(config-if)#ip address 13.0.1.254 255.0.0.0
Router(config-if)#no shut
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#interface se2/0
Router(config-if)#ip address 44.0.0.1 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#interface se3/0
Router(config-if)#ip address 45.0.0.1 255.0.0.0
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#router ospf 1
Router(config-router)#network 13.0.1.0 0.255.255.255 area 1
Copy
Paste
Top

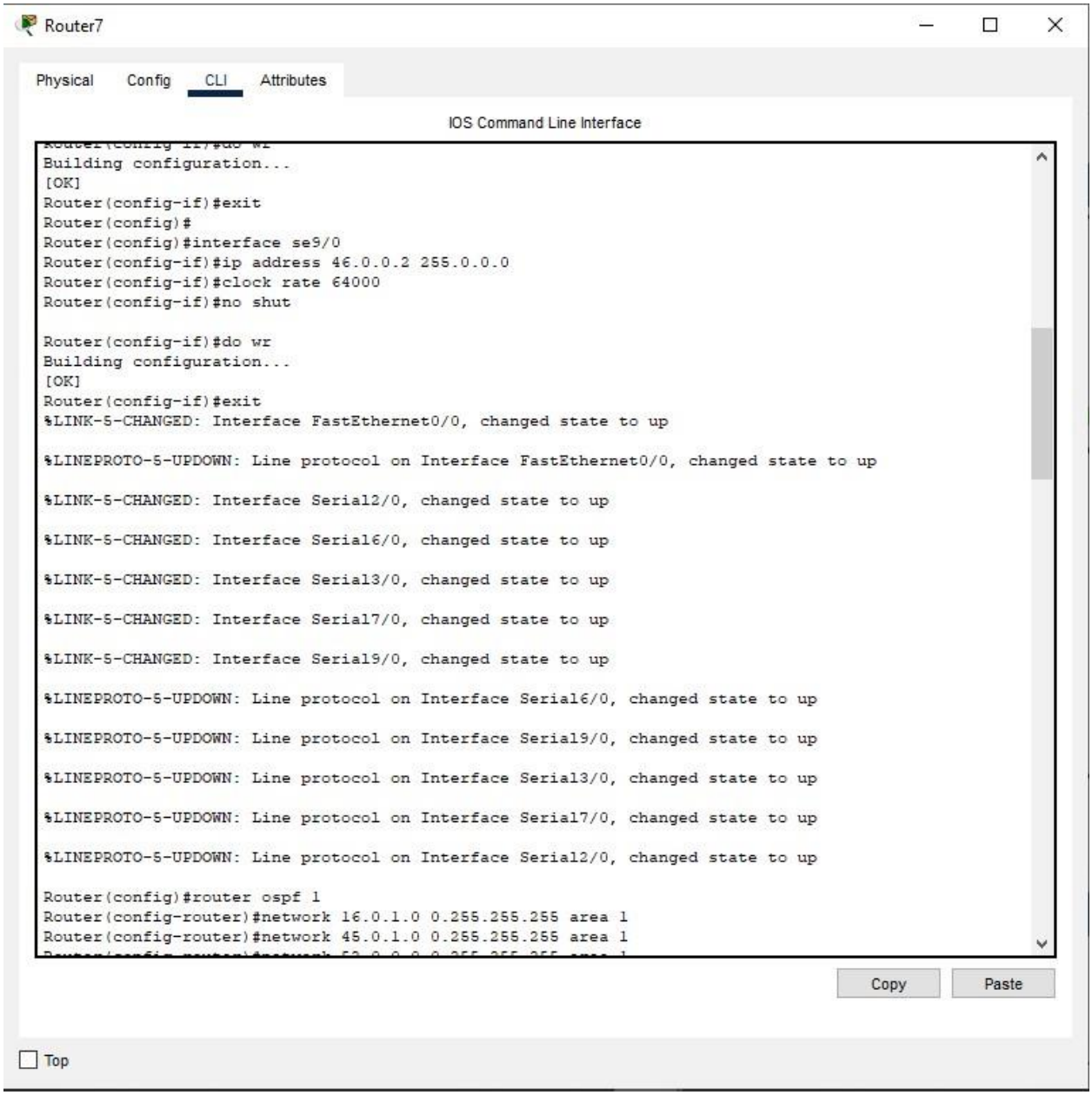
Router-6

Router-7

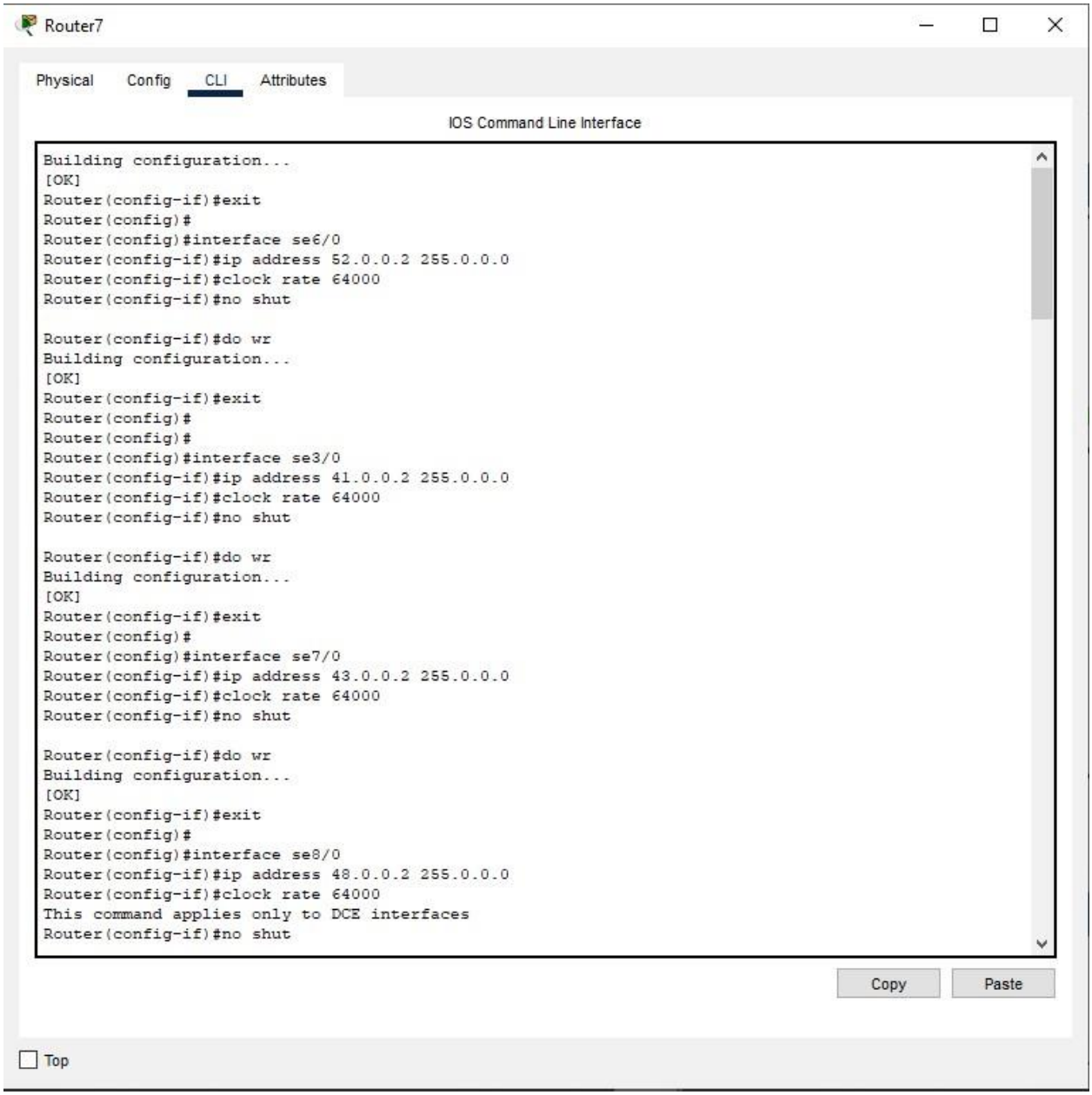

Router5
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fa0/0
Router(config-if)#ip address 14.0.1.254 255.0.0.0
Router(config-if)#no shut
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#interface fa1/0
Router(config-if)#ip address 15.0.1.254 255.0.0.0
Router(config-if)#no shut
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#interface se2/0
Router(config-if)#ip address 51.0.0.2 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#interface se6/0
Router(config-if)#ip address 46.0.0.1 255.0.0.0
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial6/0, changed state to down
Router(config-if)#do wr
Copy
Paste
Top

Router-8

Router-9


Router7
Physical
Config
CLI
Attributes
IOS Command Line Interface
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#
Router(config)#interface se9/0
Router(config-if)#ip address 46.0.0.2 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#exit
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINK-5-CHANGED: Interface Serial6/0, changed state to up
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
%LINK-5-CHANGED: Interface Serial7/0, changed state to up
%LINK-5-CHANGED: Interface Serial9/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial6/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial9/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial7/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config)#router ospf 1
Router(config-router)#network 16.0.1.0 0.255.255.255 area 1
Router(config-router)#network 45.0.1.0 0.255.255.255 area 1
Copy
Paste
Top

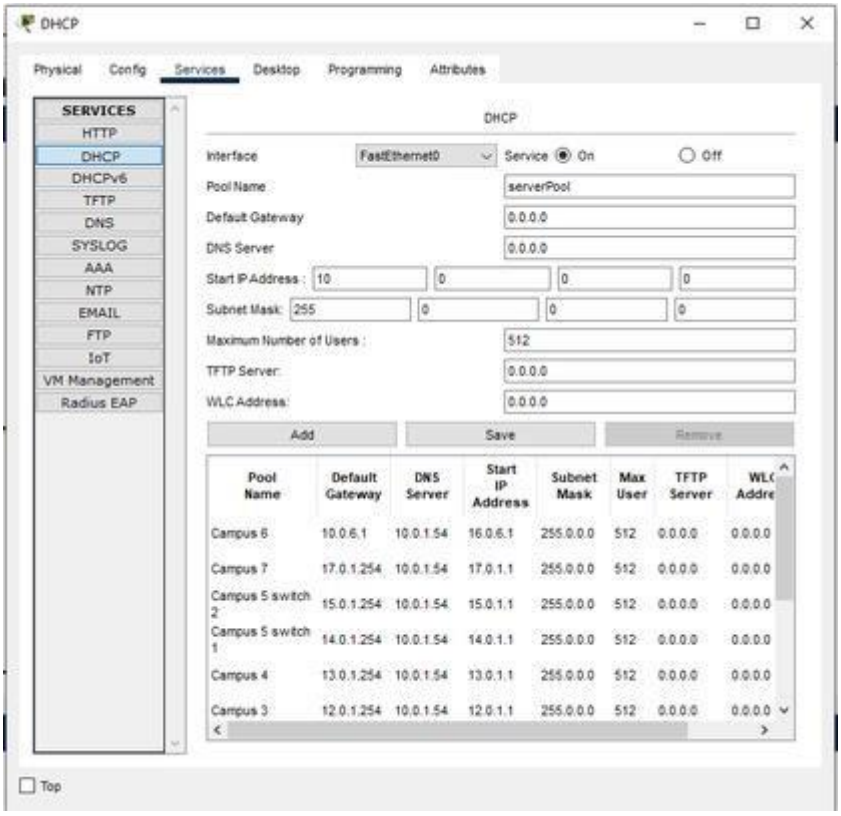
Router-6



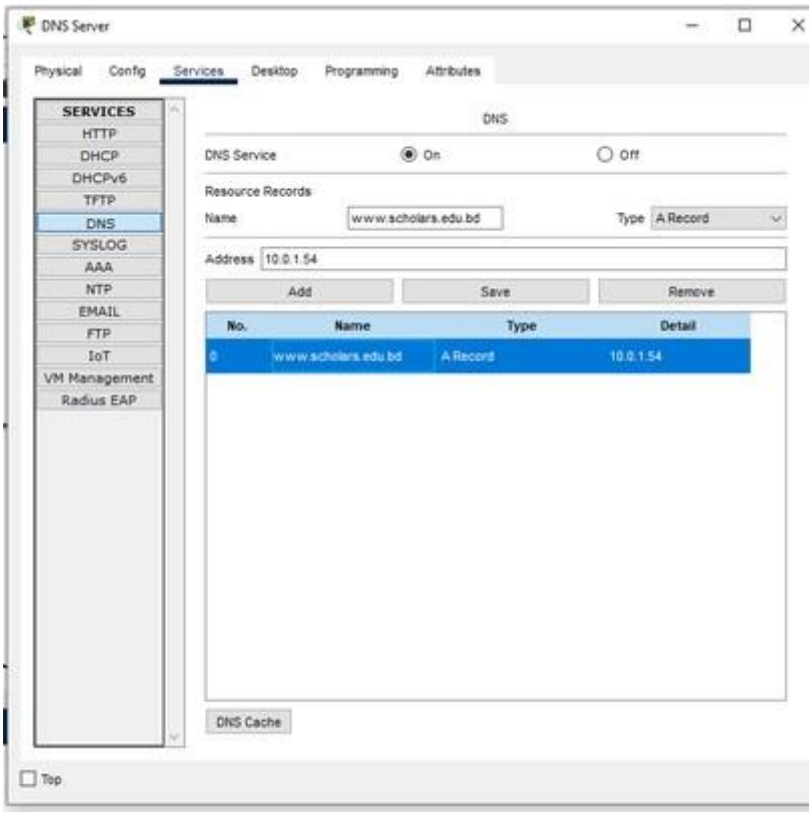
Router-7

DHCP Server IP: 10.0.1.154

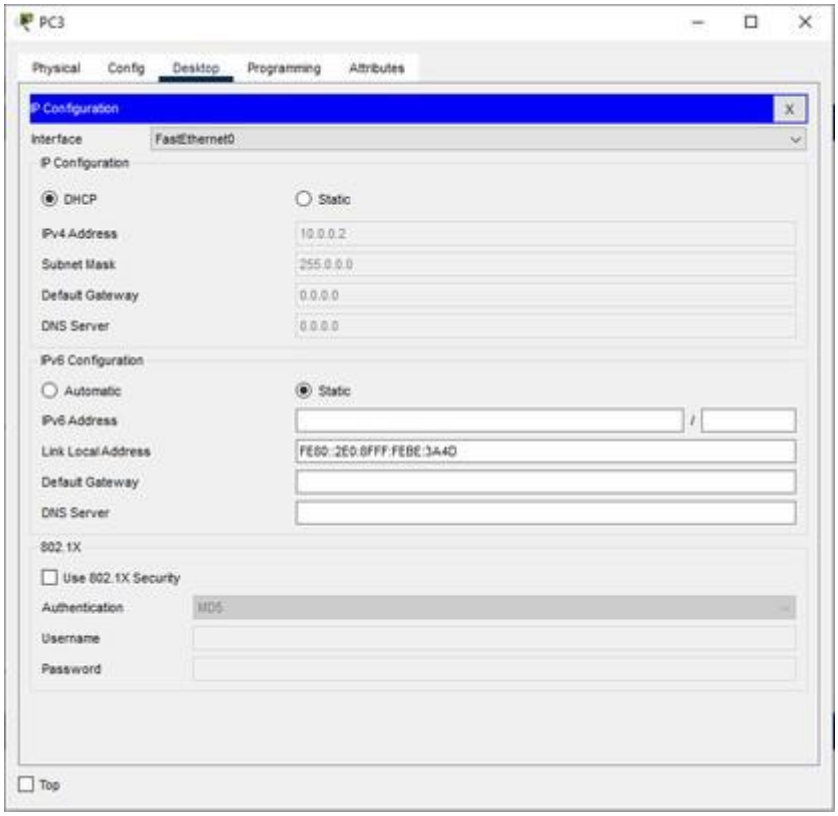
Server configuration:



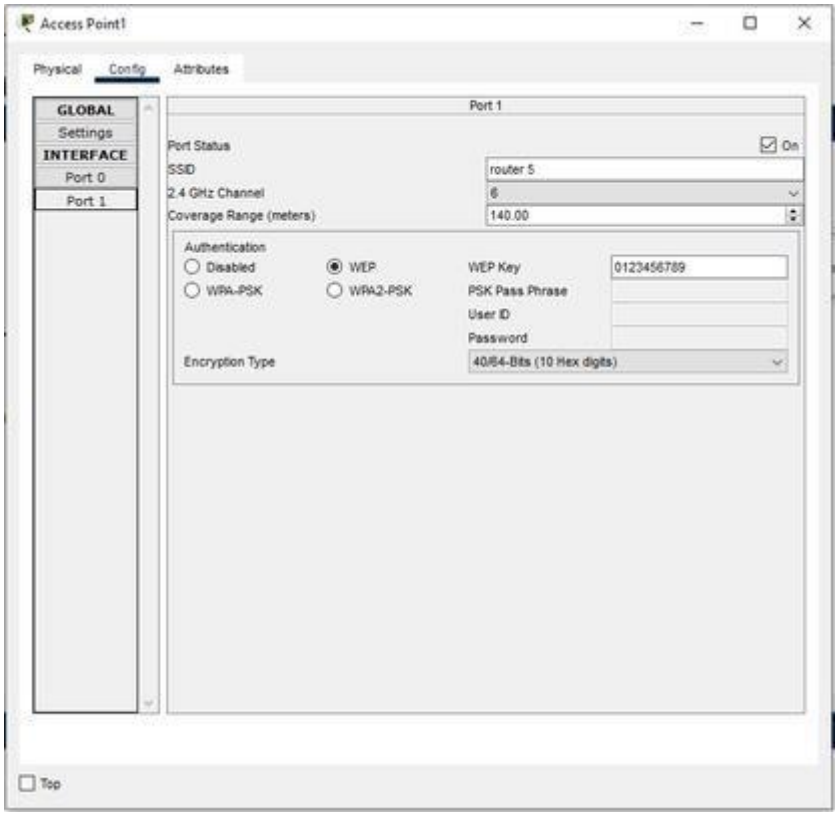
DHCP Server


DNS Server
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DNS
DNS Service
On
Off
Resource Records
Name
www.scholars.edu.bd
Type
A Record
Address
10.0.1.54
Add
Save
Remove
No.
Name
Type
Detail
0
www.scholars.edu.bd
A Record
10.0.1.54
DNS Cache
Top

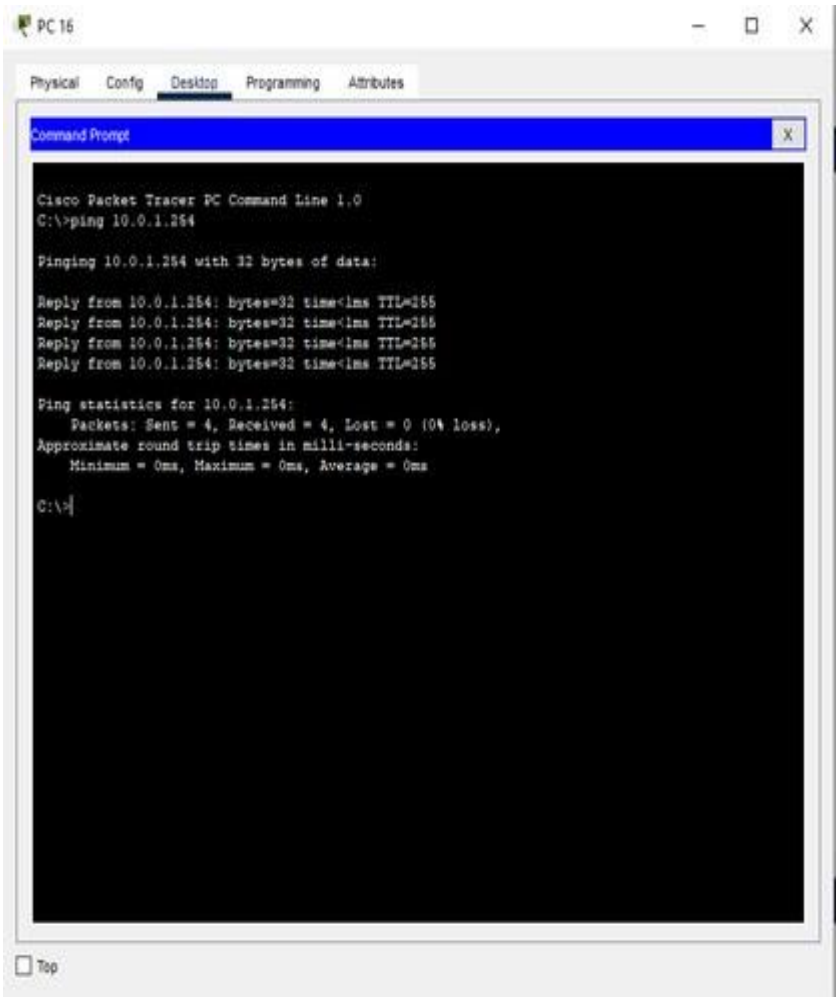
DNS SERVER



IP configuration of PC



IP configuration of wireless Devices



Pinging messages between pcs

Conclusion:

A full-fledged network for an organization with multiple subnets requires careful planning and consideration of the organization's specific needs and requirements. This network is a vital component for any organization to function effectively and securely. In this Project only one DHCP server is used. All the IP addresses in the PCs of all networks are connected by DHCP. All three Ip classes are implanted here. DNS and web server are also used here.