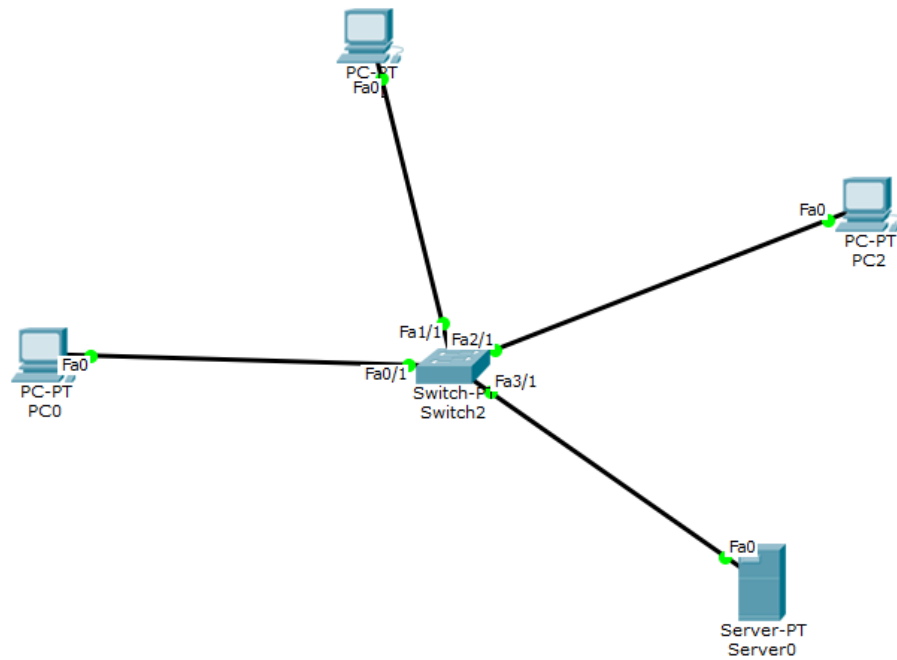


Title: Configure DHCP within a LAN and outside LAN.

a) Within LAN

Topology:



Server:

Server0

Physical

Config

Services

Desktop

Custom Interface

SERVICES

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

DHCP

Interface

FastEthernet0

Service

☒ On☐ Off

Pool Name

serverPool

Default Gateway

0.0.0.0

DNS Server

0.0.0.0

Start IP Address :

10

0

0

10

Subnet Mask:

255

0

0

0

Maximum number of Users :

512

TFTP Server:

0.0.0.0

Add

Save

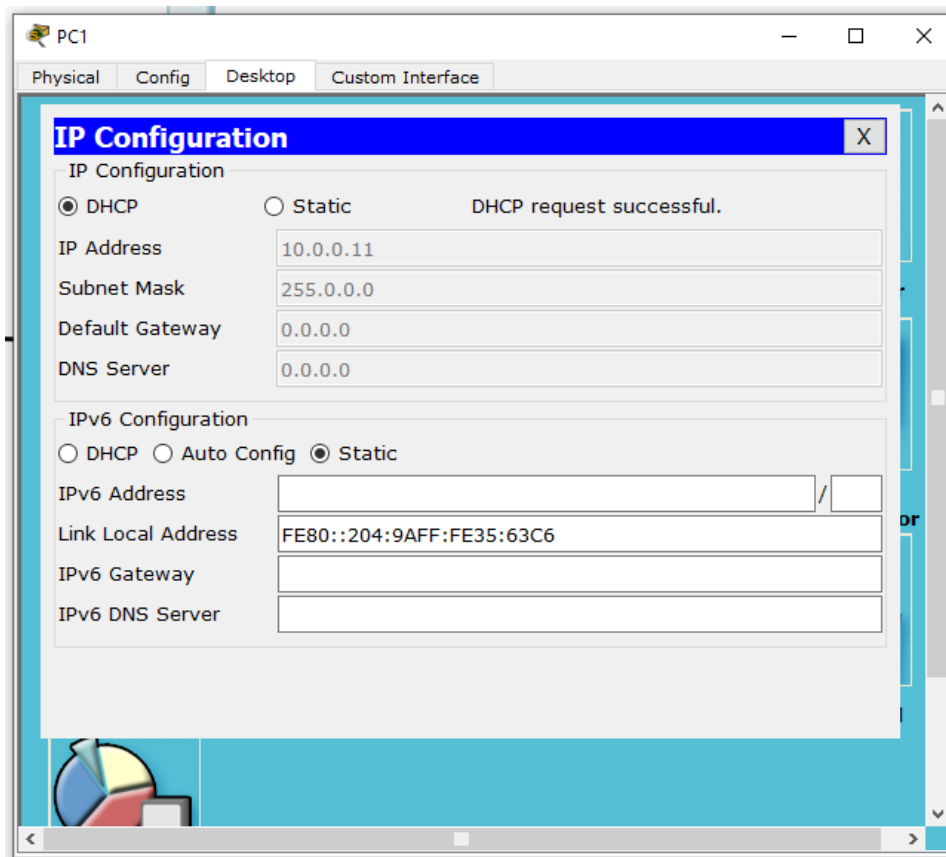
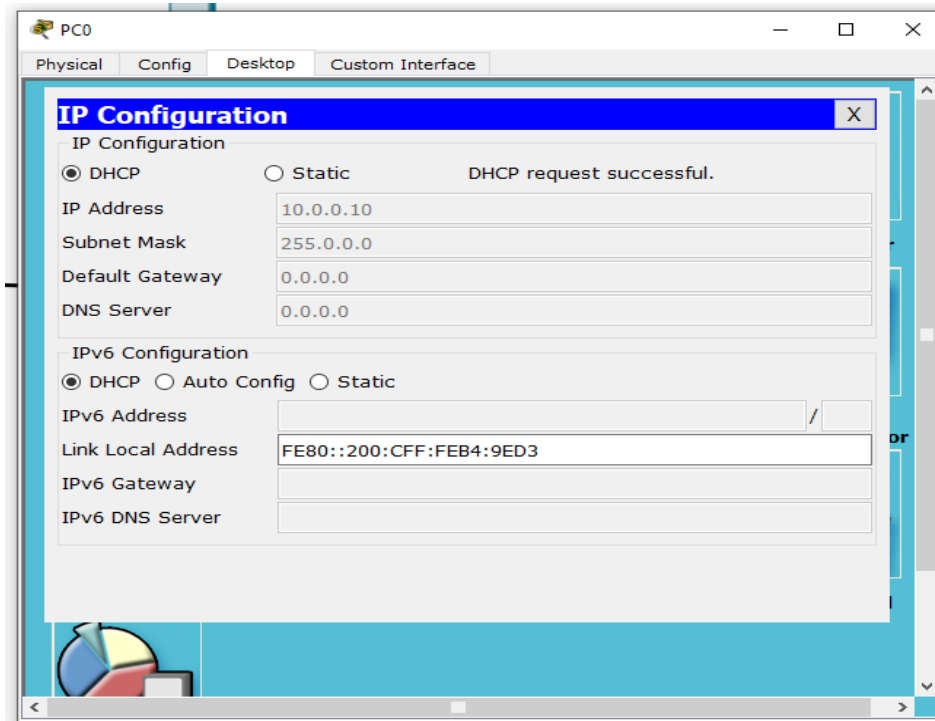
Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP
server...	0.0.0.0	0.0.0.0	10.0.0.10	255.0.0.0	512	0.0.0.0

<

>

## Obtaining IP:



PC2

Physical Config Desktop Custom Interface

### IP Configuration

IP Configuration

☒ DHCP ☐ Static DHCP request successful.

IP Address 10.0.0.12

Subnet Mask 255.0.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::20A:41FF:FE8D:8C37

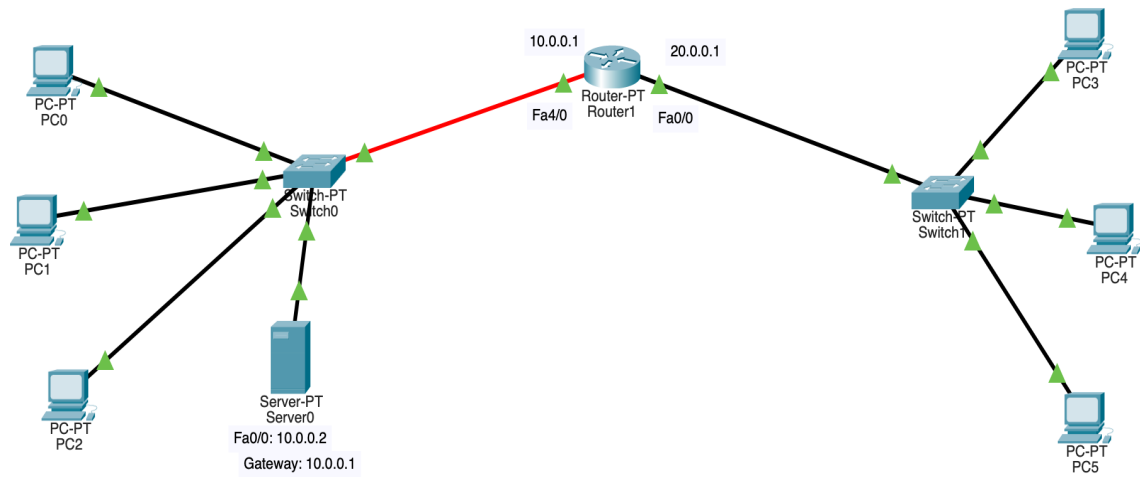
IPv6 Gateway

IPv6 DNS Server

## b)Outside LAN

### I. Single Router

Topology:



## Server:

Server0

PhysicalConfigServicesDesktopProgrammingAttributes

SERVICES

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

DHCP

InterfaceFastEthernet0ServiceOnOff

Pool NameserverPool2

Default Gateway10.0.0.1

DNS Server0.0.0.0

Start IP Address : 200010

Subnet Mask: 255000

Maximum Number of Users : 512

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

AddSaveRemove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
serverPool2	10.0.0.1	0.0.0.0	20.0.0.10	255.0.0.0	512	0.0.0.0	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	10.0.0.10	255.0.0.0	512	0.0.0.0	0.0.0.0

Top

## Router:

Router1

PhysicalConfigCLIAttributes

IOS Command Line Interface

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

Router>enable  
Router#  
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#interface FastEthernet0/0  
Router(config-if)#  
Router(config-if)#exit  
Router(config)#interface FastEthernet0/0  
Router(config-if)#ip helper-address 10.0.0.2  
Router(config-if)#  
Router(config-if)#exit  
Router(config)#interface FastEthernet0/0  
Router(config-if)#  
Router(config-if)#exit  
Router(config)#interface FastEthernet4/0  
Router(config-if)#ip helper-address 10.0.0.2  
Router(config-if)#

## Obtaining IP:

PC0

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface FastEthernet0 [v]

IP Configuration

☒ DHCP ☐ Static DHCP request successful.

IPv4 Address 10.0.0.14

Subnet Mask 255.0.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::201:96FF:FE4B:2763

Default Gateway

DNS Server

PC3

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface FastEthernet0 [v]

IP Configuration

☒ DHCP ☐ Static DHCP request successful.

IPv4 Address 20.0.0.16

Subnet Mask 255.0.0.0

Default Gateway 10.0.0.1

DNS Server 0.0.0.0

IPv6 Configuration

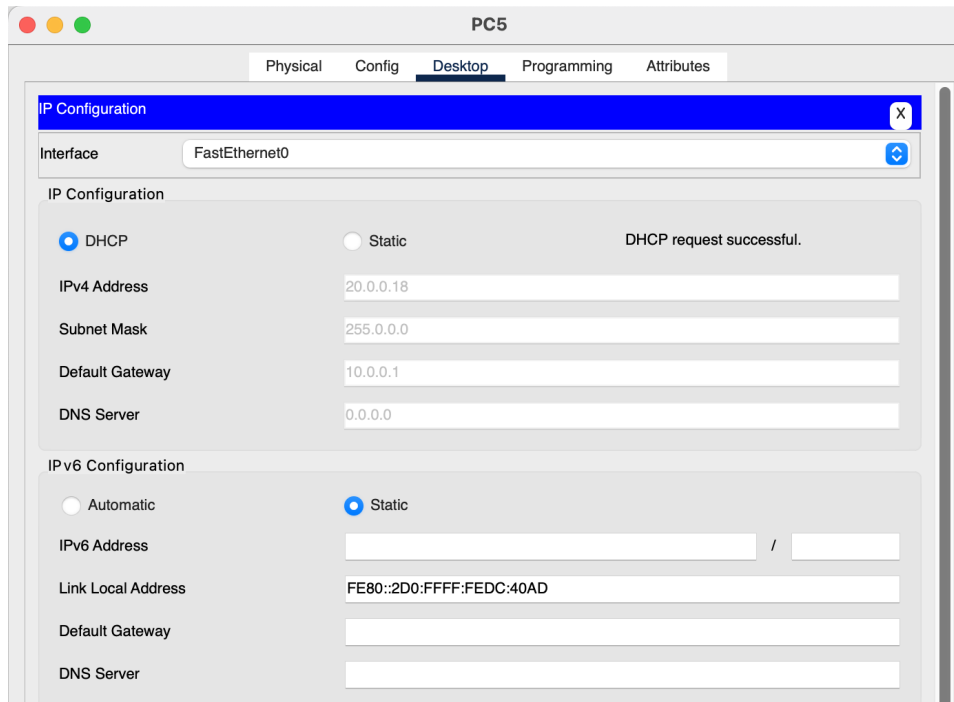
☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::201:43FF:FE7A:C755

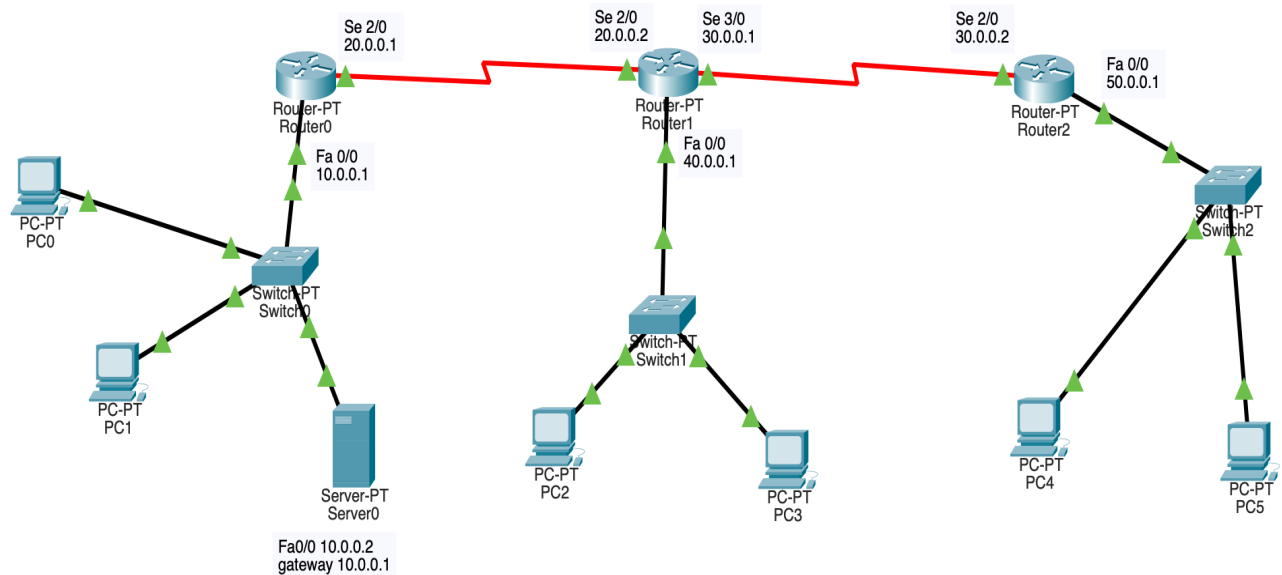
Default Gateway

DNS Server



## II. Multiple Routers

Topology:





Server:

Server0

PhysicalConfigServicesDesktopProgrammingAttributes

SERVICES

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

DHCP

InterfaceFastEthernet0ServiceOnOff

Pool NameserverPool

Default Gateway0.0.0.0

DNS Server0.0.0.0

Start IP Address : 100010

Subnet Mask: 255000

Maximum Number of Users : 512

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

AddSaveRemove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
serverPool3	10.0.0.1	0.0.0.0	50.0.0.10	255.0.0.0	512	0.0.0.0	0.0.0.0
serverPool2	10.0.0.1	0.0.0.0	40.0.0.10	255.0.0.0	512	0.0.0.0	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	10.0.0.10	255.0.0.0	512	0.0.0.0	0.0.0.0

☐ Top

## Router: setting IP route

```
Router0

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

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/0
C    20.0.0.0/8 is directly connected, Serial2/0

Router>configure terminal
^
% Invalid input detected at '^' marker.

Router>
Router>
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#ip route 30.0.0.0 255.0.0.0 20.0.0.2
Router(config)#ip route 40.0.0.0 255.0.0.0 20.0.0.2
Router(config)#ip route 50.0.0.0 255.0.0.0 20.0.0.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/0
C    20.0.0.0/8 is directly connected, Serial2/0
S    30.0.0.0/8 [1/0] via 20.0.0.2
S    40.0.0.0/8 [1/0] via 20.0.0.2
S    50.0.0.0/8 [1/0] via 20.0.0.2
```

```
Router1

Physical  Config  CLI  Attributes

IOS Command Line Interface

Router>
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#ip route 50.0.0.0 255.0.0.0 30.0.0.2
Router(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.1
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#exit

Router con0 is now available

Press RETURN to get started.

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

Gateway of last resort is not set

S    10.0.0.0/8 [1/0] via 20.0.0.1
C    20.0.0.0/8 is directly connected, Serial2/0
C    30.0.0.0/8 is directly connected, Serial3/0
C    40.0.0.0/8 is directly connected, FastEthernet0/0
S    50.0.0.0/8 [1/0] via 30.0.0.2
```

```
Router2

Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#ip route 10.0.0.0 255.0.0.0 30.0.0.1
Router(config)#ip route 20.0.0.0 255.0.0.0 30.0.0.1
Router(config)#ip route 40.0.0.0 255.0.0.0 30.0.0.1
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
exit

Router con0 is now available

Press RETURN to get started.

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

Gateway of last resort is not set

S    10.0.0.0/8 [1/0] via 30.0.0.1
S    20.0.0.0/8 [1/0] via 30.0.0.1
C    30.0.0.0/8 is directly connected, Serial2/0
S    40.0.0.0/8 [1/0] via 30.0.0.1
C    50.0.0.0/8 is directly connected, FastEthernet0/0
```

## Setting IP helper address-

```
Router1

Physical  Config  CLI  Attributes

IOS Command Line Interface

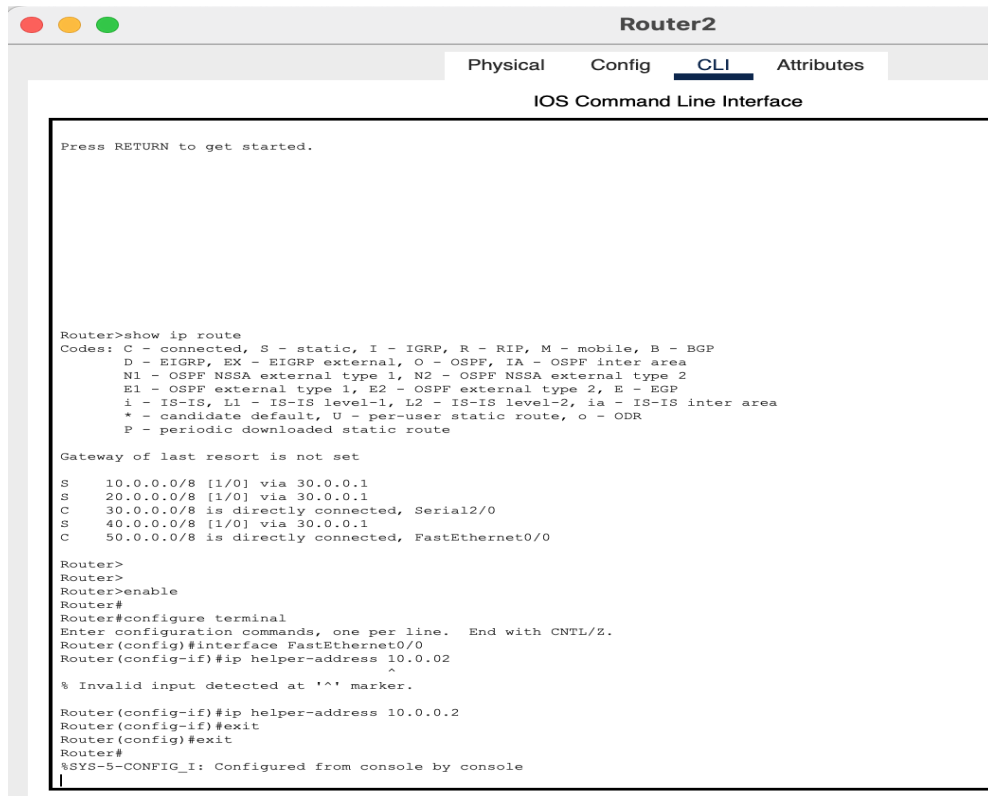
Press RETURN to get started.

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

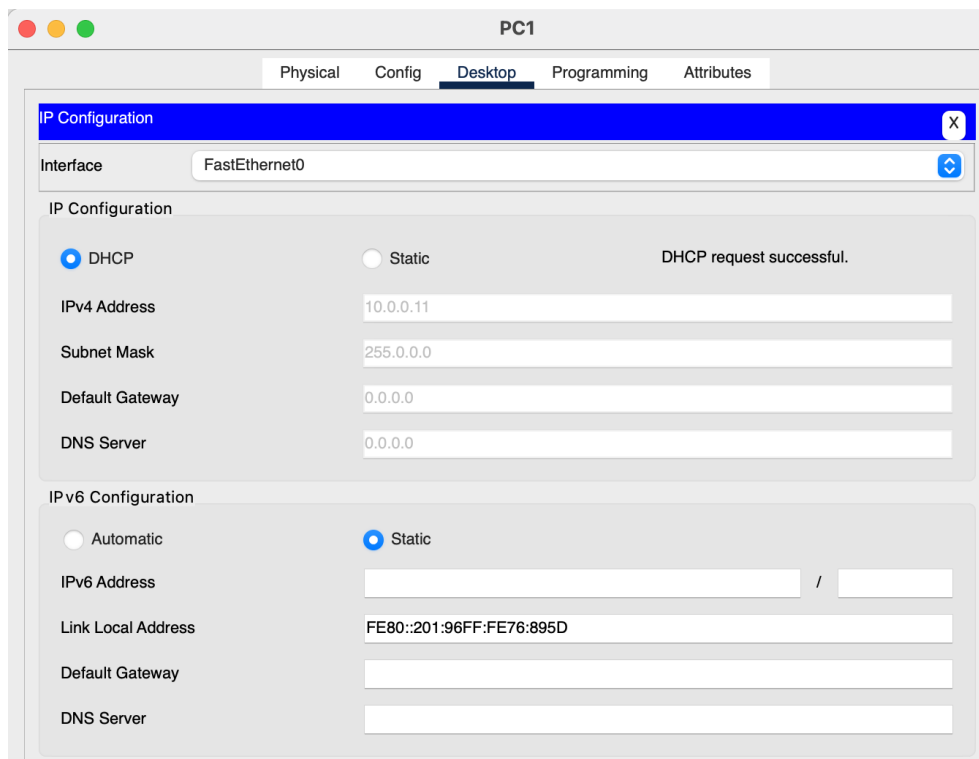
Gateway of last resort is not set

S    10.0.0.0/8 [1/0] via 20.0.0.1
C    20.0.0.0/8 is directly connected, Serial2/0
C    30.0.0.0/8 is directly connected, Serial3/0
C    40.0.0.0/8 is directly connected, FastEthernet0/0
S    50.0.0.0/8 [1/0] via 30.0.0.2

Router>
Router>
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip helper-address 10.0.0.2
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```



Obtaining IP:



PC3

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☒ DHCP☐ Static

DHCP request successful.

IPv4 Address

40.0.0.12

Subnet Mask

255.0.0.0

Default Gateway

10.0.0.1

DNS Server

0.0.0.0

IPv6 Configuration

☐ Automatic☒ Static

IPv6 Address

/

Link Local Address

FE80::205:5EFF:FE8C:2873

Default Gateway

DNS Server

PC5

PhysicalConfigDesktopProgrammingAttributes

IP Configuration

InterfaceFastEthernet0

IP Configuration

☒ DHCP☐ Static

DHCP request successful.

IPv4 Address

50.0.0.11

Subnet Mask

255.0.0.0

Default Gateway

10.0.0.1

DNS Server

0.0.0.0

IPv6 Configuration

☐ Automatic☒ Static

IPv6 Address

/

Link Local Address

FE80::20C:85FF:FE78:42EC

Default Gateway

DNS Server