

# VISVESVARAYATECHNOLOGICALUNIVERSITY

“JnanaSangama”, Belgaum -590014, Karnataka.



## LAB REPORT

on

## COURSE TITLE

*Submitted by*

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*in partial fulfillment for the award of the degree of*

**BACHELOROFENGINEERING**

*in*

**COMPUTER SCIENCE AND ENGINEERING**



**B.M.S. COLLEGE OF ENGINEERING**

(Autonomous Institution under VTU)

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**B. M. S. College of Engineering,**

**Bull Temple Road, Bangalore 560019**

(Affiliated To Visvesvaraya Technological University, Belgaum)

**Department of Computer Science and Engineering**



### **CERTIFICATE**

This is to certify that the Lab work entitled "**COMPUTER NETWORKS**" carried out by **AKANSHA JAIN (1BM21CS012)**, who is bonafide student of B. M. S. College of Engineering. It is in partial fulfillment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visvesvaraya Technological University, Belgaum during the year 2023. The Lab report has been approved as it satisfies the academic requirements in respect of a **Computer Networks - (22CS4PCCON)** work prescribed for the said degree.

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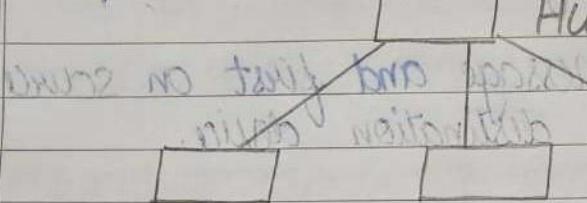
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## Experiment : 1

Aim: Create a topology and sending a simple PDU to destination using hub connecting devices and message

Topology :

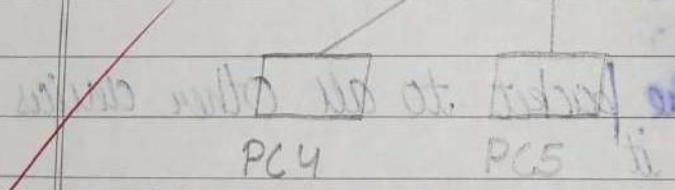
Hub: (dut of transmission)



bus port (station port)  
hub port (primary port)

Switch:

using more ports than number of stations  
dut of hub



combination Hub and switch

\* Simple PDU transmission (switch)

HUB

6. Observe the packet transmission and acknowledgement hearing procedure

Observation: (Hub)

1. The packet transmission starts from source device and reaches the hub
2. Hub sends ~~the packet~~ to all other devices connected to it
3. The ~~destination~~ device receives the packets and sends back an acknowledgement

~~the destination device ignores the packet~~

The packet transmission takes place in the

~~Approximate round trip times in milli-seconds~~

minimum = 0 ms, Maximum : 0 ms, Average : 2ms

Switch 1012 and switch 1012 without timer off

Switch 1012 and switch 1012

Switch 1012 and switch 1012 with some timer off

off

high priority with minimum switch between them off

large number of short transmission to one target and bringing low off

switch 1012 with priority switch off transmission off

high priority

## Switch

### Procedure:

- \* Select the end devices and changes their address.
- \* Select switch as the connecting devices.
- \* Select copper straight through as connection between the end devices and switches.
- \* Connect fastethernet to switch ports.
- \* Add simple PDU from source to destination device.
- \* Bring APDU using command prompt in device.

### Observation:

- \* The packet transmission starts from source and reaches the switch.
- \* Switch sends the packet to all devices to it.
- \* The destination devices receives the packet and sends an acknowledgement back to source if it has received the packet.

for further transmission.

- \* Other devices do not receive the next transmission.

### Result

PC > ping 10.0.0.1

pinging 10.0.0.1 with 32 bytes of data

5th

Reply from 10.0.0.1 bytes = 32 time =

Ping statistics for 10.0.0.1:

Packets: Sent = 4, Received = 4, Lost = 0

Approximate round trip time in ms:

Minimum = 2ms, Maximum = 8ms, Average =

### Hub and Switch

#### ~~Procedure:~~

- Select the end devices and change them to
- Select hubs for end devices and for devices. Select switch as connecting device.
- Select copper straight through as connection for both the end devices and hubs.
- Select auto MDI-X for both the end devices.

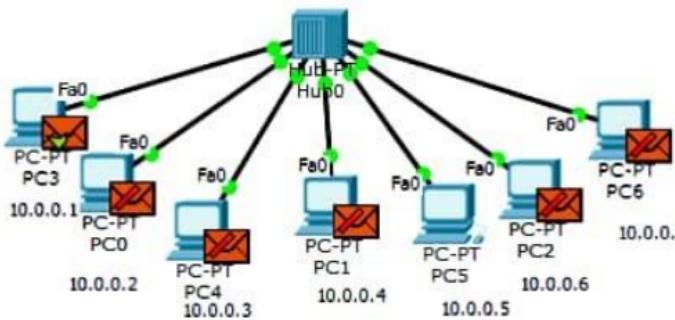
device and reaches the hub

- Hub sends packet to switch and from switch it sends to another hub.
- Hub sends the packet to all other devices connected to it.
- The destination device receives the packet and sends back an acknowledgement stating it has received the packet.
- Other device ignore the packet
- The packet transmission takes place in the above scenario everytime

8/10  
✓  
22/6/23

✓  
22/6/23

• Chlorophyll is a green pigment found in plants.  
• It is used for photosynthesis.  
• Chlorophyll is found in the leaves of plants.  
• It is a green pigment.  
• It is used for photosynthesis.  
• It is found in the leaves of plants.



Time: 00:43:08.145 | Power Cycle Devices | PLAY CONTROLS: Back | Auto Capture / Play | Capture / Forward | Event List | Simulation

**Connections**

Copper Straight-Through

**Event List**

Vis.	Time(sec)	Last Device	At Device	Type	Info
	0.002	Hub0	PC2	ICMP	
	0.002	Hub0	PC6	ICMP	
	0.003	PC5	Hub0	ICMP	
⌚	0.004	Hub0	PC3	ICMP	
⌚	0.004	Hub0	PC0	ICMP	
⌚	0.004	Hub0	PC4	ICMP	
⌚	0.004	Hub0	PC1	ICMP	
⌚	0.004	Hub0	PC2	ICMP	
⌚	0.004	Hub0	PC6	ICMP	

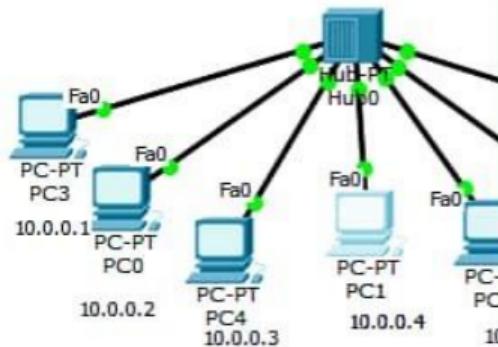
Reset Simulation  Constant Delay  
Captured to: \* 716.838 s

Play Controls: Back | Auto Capture / Play | Capture / Forward

Event List Filters - Visible Events

ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP

Edit Filters | Show All/None



PC1

Physical Config Desktop Custom Interface

### Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.2

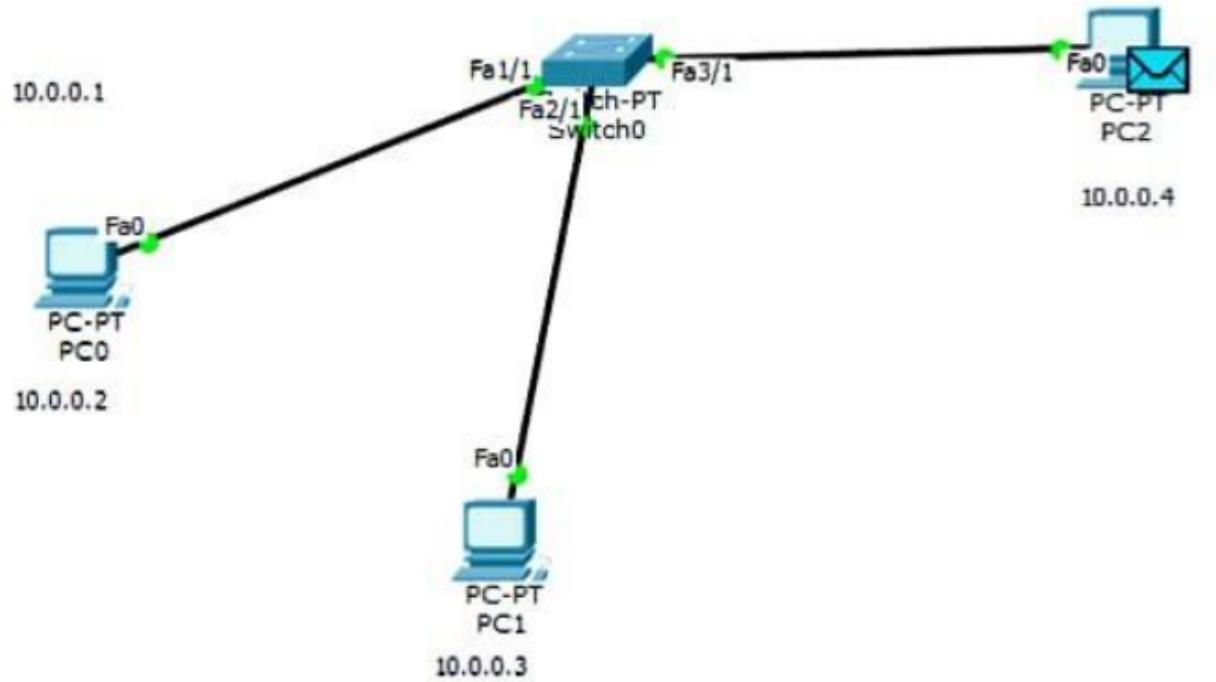
Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=0ms TTL=128

Ping statistics for 10.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>
```





0.000	--	PC0	ICMP
0.001	PC0	Switch0	ICMP
0.002	Switch0	PC2	ICMP

Constant Delay

Captured to: \*  
0.002 s

#### Play Controls

#### Event List Filters - Visible Events

ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP



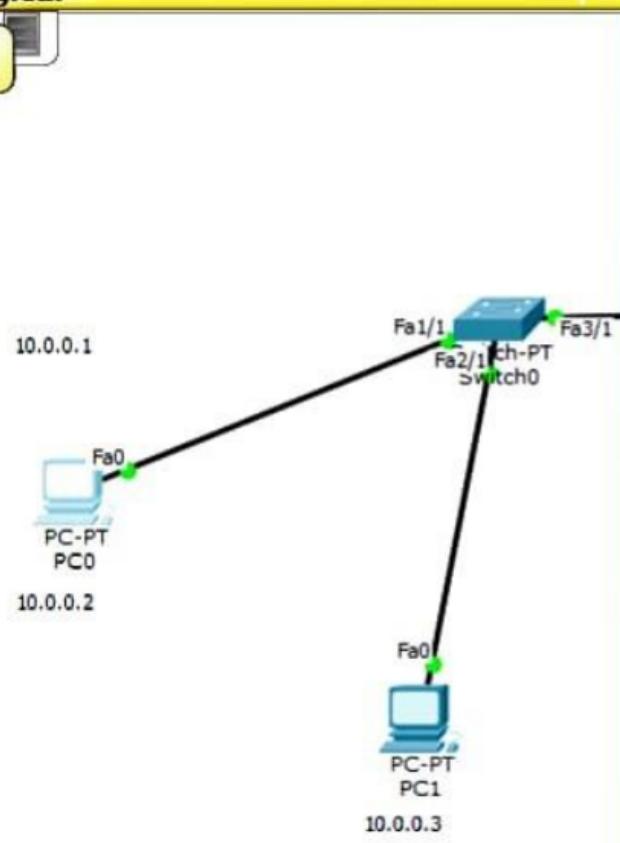
Time: 00:03:21.838

Power Cycle Devices

PLAY CONTROLS:

Event List

Simulation



PC0

Physical Config Desktop Custom Interface

## Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.4

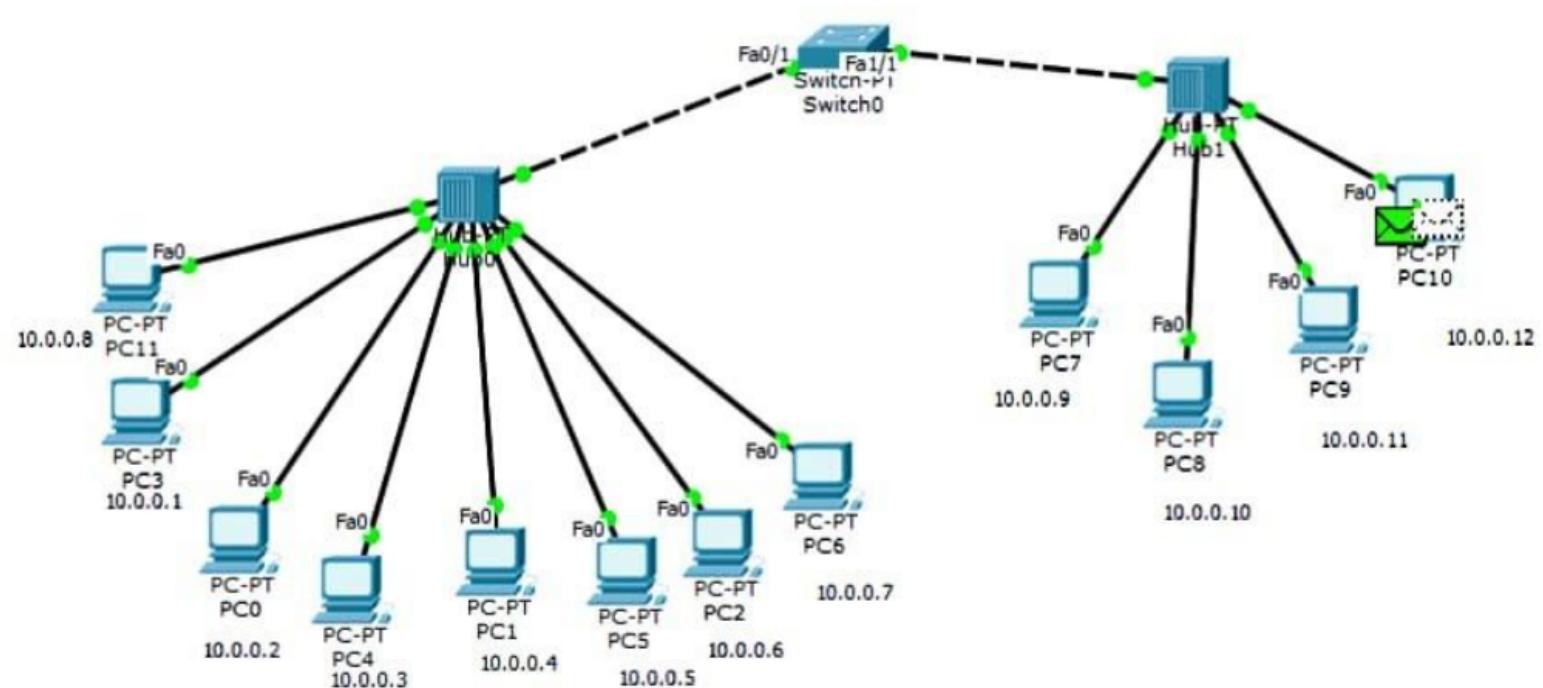
Pinging 10.0.0.4 with 32 bytes of data:

Reply from 10.0.0.4: bytes=32 time=0ms TTL=128
Reply from 10.0.0.4: bytes=32 time=1ms TTL=128
Reply from 10.0.0.4: bytes=32 time=0ms TTL=128
Reply from 10.0.0.4: bytes=32 time=0ms TTL=128

Ping statistics for 10.0.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>|
```





### Simulation Panel

**Event List**

Vis.	Time(sec)	Last Device	At Device	Type	Info
	0.002	Hub0	PC2	ICMP	
	0.002	Hub0	PC6	ICMP	
	0.002	Hub0	Switch0	ICMP	
	0.003	Switch0	Hub1	ICMP	
	0.004	Hub1	PC7	ICMP	
	0.004	Hub1	PC8	ICMP	
	0.004	Hub1	PC9	ICMP	
	0.004	Hub1	PC10	ICMP	
	0.005	PC10	Hub1	ICMP	

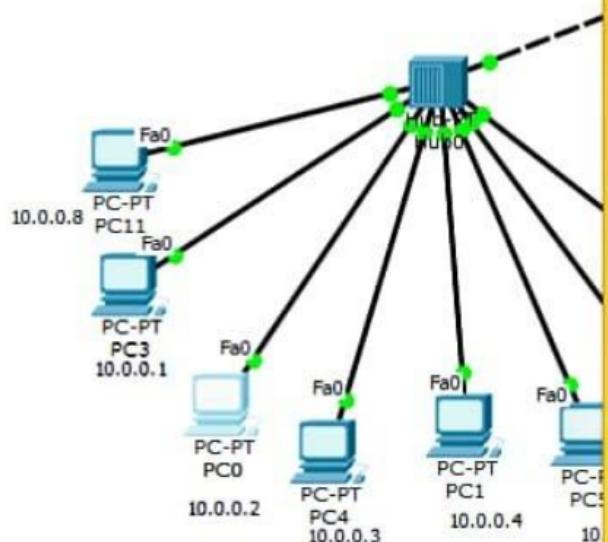
**Reset Simulation**  Constant Delay      Capturing...

**Play Controls**

Back  Capture / Forward

**Event List Filters - Visible Events**

ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP



PC0

Physical Config Desktop Custom Interface

Command Prompt X

```
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:

Reply from 10.0.0.10: bytes=32 time=0ms TTL=128
Reply from 10.0.0.10: bytes=32 time=1ms TTL=128
Reply from 10.0.0.10: bytes=32 time=0ms TTL=128
Reply from 10.0.0.10: bytes=32 time=1ms TTL=128

Ping statistics for 10.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```



bring responses, destination unreachable, request time out, reply

2a.

Aim:

To configure IP address to routers in packet tracer and get ping responses - request time out, reply

\* Always in route put gateway

Topology:

10.0.0.10 Router 0 20.0.0.20

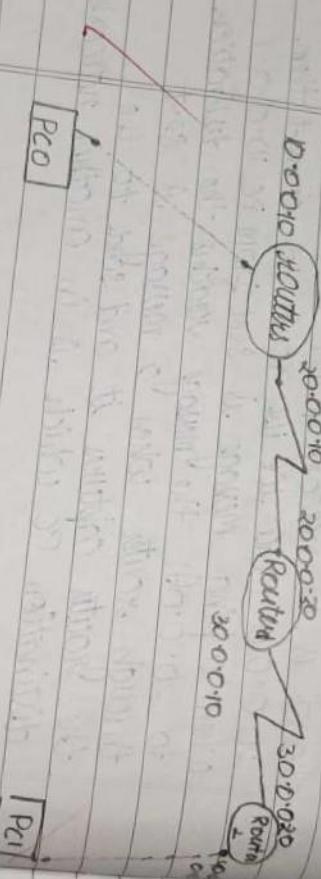


Procedure:

- 2 PCs are connected to a switch using copper cross cable
- IP addresses are set for PCs and router
- IP address for Router is set by giving Jefferson command

Topo  
topology  
destination host  
unreachable

### Topology:



### Procedure:

- Connect PC to corresponding router using cross-over cable
- Connect routers using serial - DCE
- Set IP address for all PCs
- Configure IP address to routers by giving commands in CLI

- After all IPs are set, ping PC to its own host unreachable host message
- route the IPs to the adjacent IP following commands for router - router(config) # ip route

255.0  
router(config) # ip route 255.0.0.0 255.

for router 1 -

router1# router(config) # ip route 255.0.0.0 255.0.0.0 20.0.0.1 30.0.0.1  
router(config) # ip route 40.0.0.0 255.0.0.0 30.0.0.1

for router 2 - router(config) # ip route 255.0.0.0 255.0.0.0 10.0.0.1

router(config) # ip route 10.0.0.0 255.0.0.0 10.0.0.1

After this is done, bring PC reply messages.

### Observation:

PC0 is in network 10.0.0.0 and PC1 is in network 40.0.0.0. True the 3 routers in between which initially directly connect 10.0.0.0, 20.0.0.0, 30.0.0.0 and 40.0.0.0 when a ping message is sent from 10.0.0.1 to 40.0.0.1 it doesn't reach the destination. Instead it only reaches the first router and gives destination host unreachable message.

After setting the routers know about other adjacent network we send a ping message from 40.0.0.1 to 10.0.0.1 to get distinct result.

The message reaches the destination.

Result :

① PC > ping 40.0.0.1  
ping 40.0.0.1 with 32 bytes of data

Reply from 10.0.0.10 destination host unreachable  
Reply from 10.0.0.10 destination host unreachable  
Reply from 10.0.0.10 destination host unreachable  
Reply from 10.0.0.10 destination host unreachable

Ping statistics for 40.0.0.1  
Packets sent = 4 received = 0 lost = 4 (100% loss)

② PC > ping 40.0.0.1  
ping 40.0.0.1 with 32 bytes of data

Packet  
Appro  
minin  
ping

Show

ping 10.0.0.1 with 32 bytes  
Reply from 10.0.0.10: bytes=32  
TTL=128

Reply from 10.0.0.10 bytes=32 +time  
Reply from 10.0.0.10 bytes=32 time  
Reply from 10.0.0.10 bytes=32 time  
Reply from 10.0.0.10 bytes=32 time

ping statics for 10.0.0.1:

\_packets\_ sent = 4 received = 4 loss  
approximate round trip times in ms  
minimum = 1ms, max = 16ms, average

Show ip route?

(1)

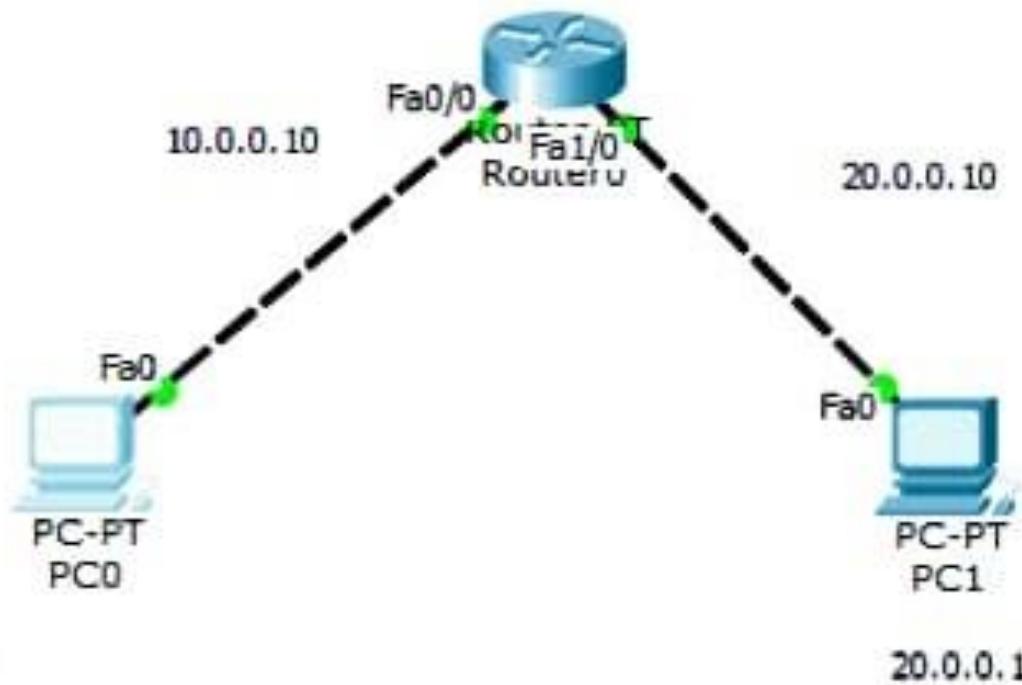
After ping it will not run  
because no ip route is given

in router 0 what is the error

ip route

hable  
adable  
cockable  
rockable

ip route



Press RETURN to get started!

```
Router>enable
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#ip address 10.0.0.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
exit
Router(config)#how ip route
^
% Invalid input detected at '^' marker.

Router(config)#show ip route
^
% Invalid input detected at '^' marker.

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
Router#
```

```
Router#enable
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet1/0
Router(config-if)#ip address 20.0.0.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up
exit
Router(config)#show ip route
      *
% Invalid input detected at '``' marker.

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, FastEthernet1/0
Router#
```

## Command Prompt

```
PC>ping 20.0.0.1
```

Pinging 20.0.0.1 with 32 bytes of data:

Request timed out.

Reply from 20.0.0.1: bytes=32 time=1ms TTL=127

Reply from 20.0.0.1: bytes=32 time=12ms TTL=127

Reply from 20.0.0.1: bytes=32 time=0ms TTL=127

Ping statistics for 20.0.0.1:

Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 12ms, Average = 4ms

```
PC>ping 20.0.0.1
```

Pinging 20.0.0.1 with 32 bytes of data:

Reply from 20.0.0.1: bytes=32 time=0ms TTL=127

Ping statistics for 20.0.0.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

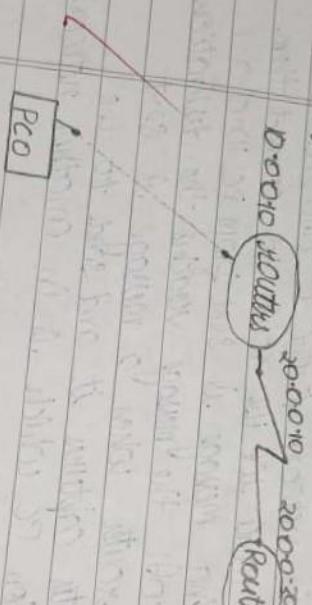
Minimum = 0ms, Maximum = 0ms, Average = 0ms



packets. Shows explore the ping response, destination timed out, reply.

Aim: To configure IP address to router and get ping response reply.

### Topology:



### Procedure:

- Connect PC to corresponding opposite cross-over
- Connect routers using serial - DCE
- Set IP address for all PCs
- Configure IP address commands in CLI

- After all IPs are set, ping from host unreachable host
- Router the IPs to the ad following commands

for router0 - router(config)

router(config)

for router1 -

router1# router(config)

router(config) # ip rou

for router2 - router(config)

router(config)

After this is done, b  
reply messages.

minimum = 1ms, max = 16ms, average = 6ms.

Show ip route?

(90) After picking it up will not renderable  
Satisfied  
the screen is now in full screen.  
in Router 0 ~~will~~ ~~can't~~ do this no.

route (Cisco) #

ip route

10.0.1.10 0.0.0.0 10.0.1.1 2

enable

enable

enable

enable

ip route

10.0.1.10 0.0.0.0 10.0.1.1 2  
10.0.1.10 0.0.0.0 10.0.1.1 2

enable

enable

enable

enable

ip route

10.0.1.10 0.0.0.0 10.0.1.1 2  
10.0.1.10 0.0.0.0 10.0.1.1 2

enable

enable

enable

enable

ip route







Reply from 10.0.0.1 by

Ping statistics for 10.0.0.1:

Packets: sent = 0, Recv = 0

Approximate round trip

Minimum: 1 ms, Max:

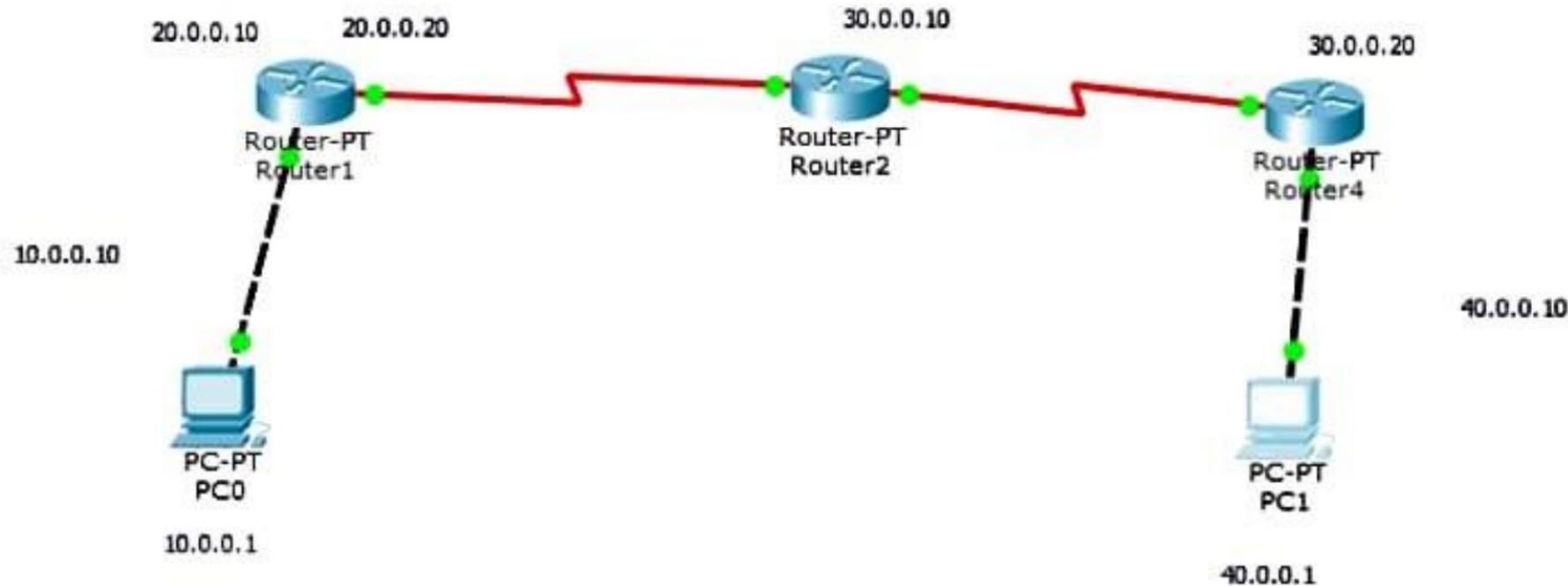
PC >

Observation:

After setting the routes,

reaching f. the messa<sup>ge</sup>  
any loss.

10.0



## IOS Command Line Interface

Press RETURN to get started!

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#ip address 10.0.0.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

Router(config-if)#exit
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.10 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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
Router#
```

Press RETURN to get started!

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.20 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
*LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#
*LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#interface serial 3/0
Router(config-if)#ip address 30.0.0.10 255.0.0.0
Router(config-if)#no shut

*LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#exit
Router(config)#exit
Router#
*SYS-5-CONFIG_I: Configured from console by console

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    20.0.0.0/8 is directly connected, Serial2/0
Router#
```

```
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#interface serial 2/0  
Router(config-if)#ip address 30.0.0.20 255.0.0.0  
Router(config-if)#no shut  
  
Router(config-if)#  
*LINK-5-CHANGED: Interface Serial2/0, changed state to up  
  
Router(config-if)#exit  
*LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up  
  
Router(config)#interface fastethernet0/0  
Router(config-if)#ip address 40.0.0.10 255.0.0.0  
Router(config-if)#no shut  
  
Router(config-if)#  
*LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up  
  
*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up  
  
Router(config-if)#exit  
Router(config)#show ip route  
^  
* Invalid input detected at '^' marker.  
  
Router(config)#exit  
Router#  
*SYS-5-CONFIG_I: Configured from console by console  
  
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    30.0.0.0/8 is directly connected, Serial2/0  
C    40.0.0.0/8 is directly connected, FastEthernet0/0  
Router#
```

Physical Config Desktop Custom Interface

## Command Prompt

Open the PC command line

Packet Tracer PC Command Line 1.0

PC>ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

Reply from 10.0.0.10: Destination host unreachable.

Ping statistics for 40.0.0.1:

Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>

Physical    Config    CLI

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 30.0.0.0 255.0.0.0 20.0.0.20
Router(config)#ip route 40.0.0.0 255.0.0.0 20.0.0.20
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

```
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
S 30.0.0.0/8 [1/0] via 20.0.0.20
S 40.0.0.0/8 [1/0] via 20.0.0.20
```

```
Router#
```

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.0
Router(config)#ip route 40.0.0.0 255.0.0.0 30.0.0.20
Router(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.10
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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 20.0.0.0
                  [1/0] via 20.0.0.10
C      20.0.0.0/8 is directly connected, Serial2/0
C      30.0.0.0/8 is directly connected, Serial3/0
S      40.0.0.0/8 [1/0] via 30.0.0.20
Router#
```

```
C 40.0.0.0/8 is directly connected, FastEthernet0/0
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 10.0.0.0 255.0.0.0 30.0.0.10
Router(config)#ip route 20.0.0.0 255.0.0.0 30.0.0.10
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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 30.0.0.10
S    20.0.0.0/8 [1/0] via 30.0.0.10
C    30.0.0.0/8 is directly connected, Serial2/0
C    40.0.0.0/8 is directly connected, FastEthernet0/0
Router#
```



PC1



Physical Config Desktop Custom Interface

## Command Prompt



Packet Tracer PC Command Line 1.0

PC>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1: bytes=32 time=15ms TTL=125

Reply from 10.0.0.1: bytes=32 time=8ms TTL=125

Reply from 10.0.0.1: bytes=32 time=16ms TTL=125

Reply from 10.0.0.1: bytes=32 time=3ms TTL=125

Ping statistics for 10.0.0.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 3ms, Maximum = 16ms, Average = 10ms

PC>

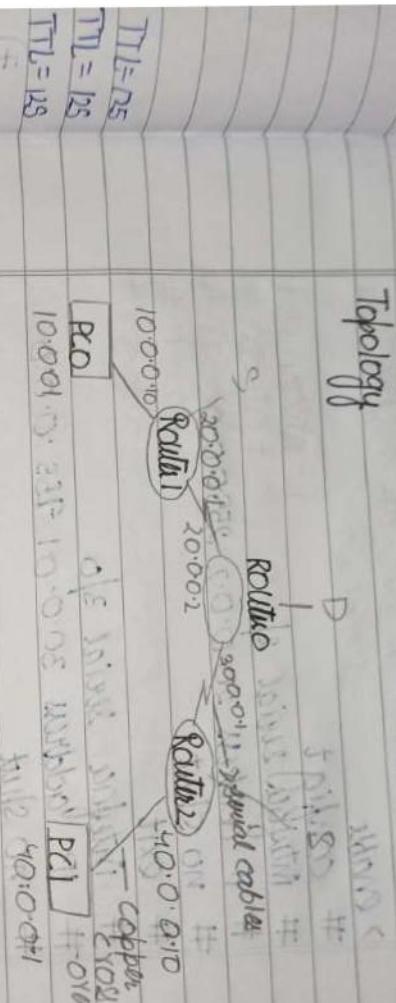
14/7/23

Topic

Aim

Configure default and static route for a connection of routers

### Topology



### Procedure:

1. Select 3 generic routers and two PCs as end devices. Connect the PCs to different routers with copper over connect both the routers.
2. Set the IP addresses of PCs and gateway. Set the network address in all the routers.

# ip address 10.0.0.10 255.0.0.0  
# no shut  
# exit

similarity for router-0

> enable  
# config-t  
# interface serial 2/0  
# IP address 20.0.0.2 255.0.0.0  
# no shut  
# exit  
# interface serial 3/0  
# IP address 30.0.0.1 255.0.0.0  
# no shut  
# exit

For router-2

> enable  
# config-t  
# interface fastethernet 0/0  
# IP address 40.0.0.10 255.0.0.0  
# no shut  
# exit  
# interface serial 2/0  
# IP address 30.0.0.2 255.0.0.0  
# no shut  
# exit

For route-1 & route-2 we are configuring  
routing and for route-0 static routing  
is done.

For route-1

```
# config t
# ip route 0.0.0.0 20.0.0.2
# no shut
# exit
```

Show ip rout

c 10.0.0.0/8 is directly connected  
Fastethernet 0/0

c 20.0.0.0/8 is directly connected serial 0

s 1 0.0.0.0/0 0/0 via 20.0.0.2

Similarly for route-2

```
# config t
# exit
```

Show ip rout

For route-0 (static routing)

```
# config t
# ip route 10.0.0.0 255.0.0.0 20.0.0.0
# ip route 40.0.0.0 255.0.0.0 30.0.0.0
# exit
```

printing 40 bytes of data

~~Replay from 10.0.0.1~~ 10.0.0.0 10

PC > ping 10.0.0.1 with 32 bytes of data.

ping 10.0.0.1 with 32 bytes of data.

Request timed out

Reply from 10.0.0.1 bytes = 32 time = 6ms TTL = 125

Reply from 10.0.0.1 bytes = 32 time = 2ms TTL = 125

Reply from 10.0.0.1 bytes = 32 time = 12ms TTL = 125

bytes = 32 time = 6ms TTL = 125

100%  
100%

100%  
100%

100%  
100%

100%  
100%

100%  
100%

100%  
100%

100%  
100%

100%  
100%

100%  
100%

100%  
100%

100%  
100%

100%  
100%

100%  
100%

100%  
100%

## IOS Command Line Interface

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#ip address 10.0.0.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

Router(config-if)#exit
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 20.0.0.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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
      ? - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/0
```

## IOS Command Line Interface

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.2 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config)#interface serial 3/0
Router(config-if)#ip address 30.0.0.1 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#exit
Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.1
Router(config)#ip route 40.0.0.0 255.0.0.0 30.0.0.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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
```

Physical Config CLI

## IOS Command Line Interface

```
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.2 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#i
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config)#interface serial 3/0
Router(config-if)#ip address 30.0.0.1 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.1
Router(config)#ip route 40.0.0.0 255.0.0.0 30.0.0.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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
Router#
```

## IOS Command Line Interface

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#ip address 30.0.0.2 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config)#interface fastethernet0/0
Router(config-if)#ip address 40.0.0.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 30.0.0.1
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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, - - - local route
```

## IOS Command Line Interface

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config)#interface fastethernet0/0
Router(config-if)#ip address 40.0.0.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

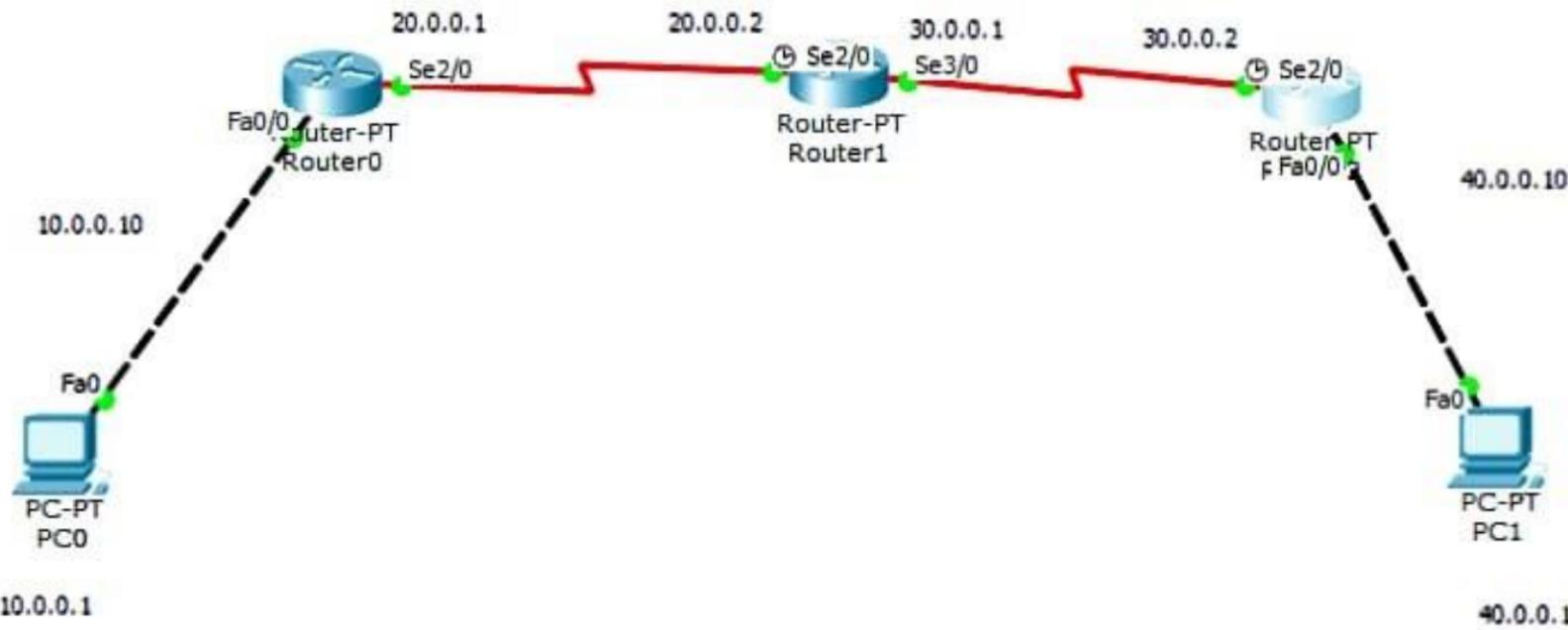
Router(config-if)#exit
Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 30.0.0.1
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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 30.0.0.1 to network 0.0.0.0

C    30.0.0.0/8 is directly connected, Serial2/0
C    40.0.0.0/8 is directly connected, FastEthernet0/0
S+   0.0.0.0/0 [1/0] via 30.0.0.1
Router#
```



PC0

Physical Config Desktop Custom Interface

## Command Prompt

X

```
Packet Tracer PC Command Line 1.0  
PC>ping 40.0.0.1
```

```
Pinging 40.0.0.1 with 32 bytes of data:
```

```
Request timed out.
```

```
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
```

```
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
```

```
Reply from 40.0.0.1: bytes=32 time=6ms TTL=125
```

```
Ping statistics for 40.0.0.1:
```

```
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss).
```

```
Approximate round trip times in milli-seconds:
```

```
    Minimum = 2ms, Maximum = 6ms, Average = 3ms
```

```
PC>
```

Fao  
PC-PT  
PCO

Server-PT  
Server-O  
ad  
ac  
st

### Procedure:

- connect a switch, PC and a server to form a LAN
- set PC's IP address by clicking on it and go to config then in last but optioned address as 10.0.0.1 and Subnet mask
- Set Server IP address as 10.0.0.2 and subnet mask respectively.
- go to PC's desktop and click on wdb you will get a default display.
- To make a change in server, we need to make changes in server services
- go to start → ser...

Again go to PC  $\rightarrow$  desktop  $\rightarrow$  web browser and type 10.0.0.2 you will see the content that is changed.

Next goto server  $\rightarrow$  services  $\rightarrow$  DNS and switch on the services. Now add a domain name and type the IP address as 10.0.0.2 Press Add & save it.

Again go to PC desktop web browser and type the given domain name item we can see the CV which has been created earlier.

Observation:

If you wanted to go to a certain website you open web browser and type domain name of website or we you can also type the IP address instead if you know that website IP address.

~~So we can't remember IP address of all website. DNS server will search through its cache to find a matching IP address for that Domain name & when it finds it will resolve that domain name to IP address of website, and that is done that computer is able to communicate with a webserver & retrieve the webpage.~~

CV

Nambha Jain

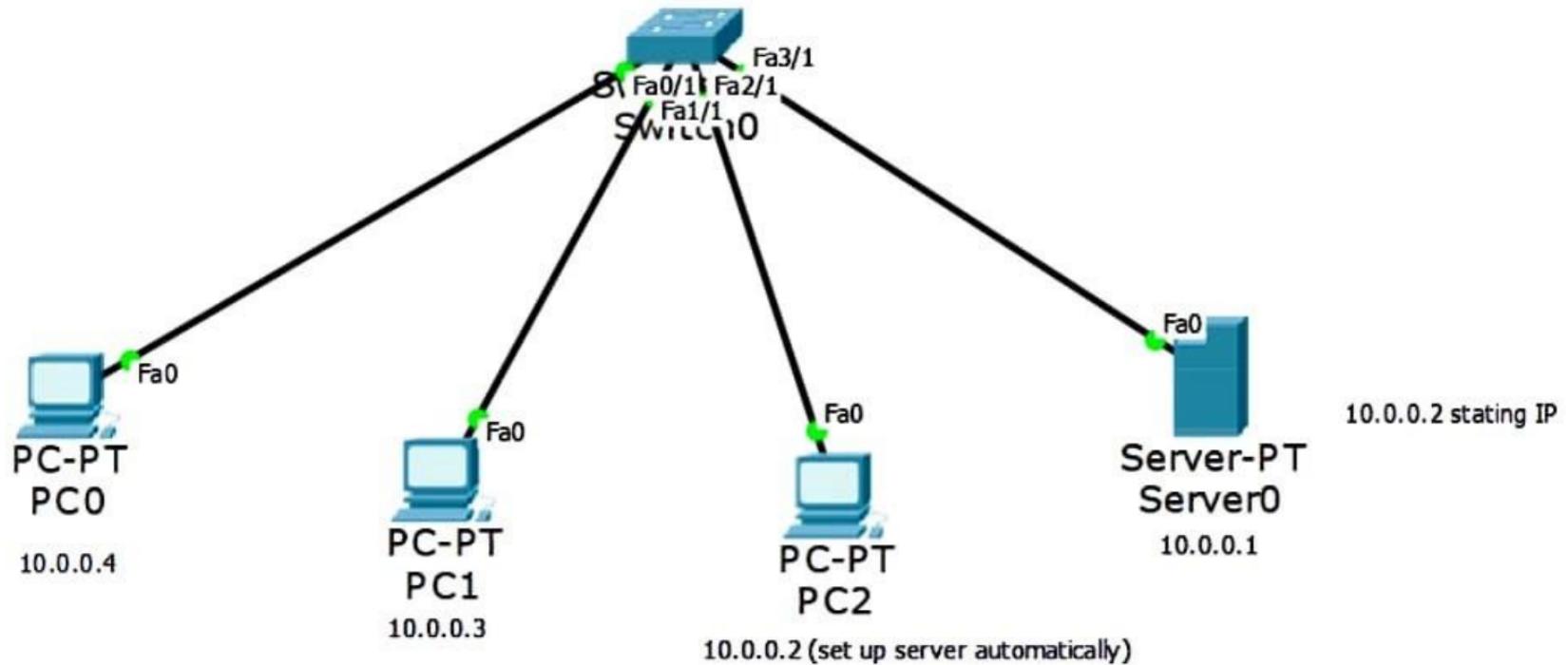
USN: 113M21CS012

Mobkno: 9389840610

Image:







[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** 10.0.0.20**DNS Server** 0.0.0.0**Start IP Address :** 10 0 0 2**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
serverPool	10.0.0.20	0.0.0.0	10.0.0.2	255.0.0.0	512	0.0.0.0



Physical

Config

Desktop

Custom Interface

## Command Prompt

Packet Tracer PC Command Line 1.0

PC>ping 10.0.0.2

Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=1ms TTL=128

Reply from 10.0.0.2: bytes=32 time=1ms TTL=128

Reply from 10.0.0.2: bytes=32 time=0ms TTL=128

Reply from 10.0.0.2: bytes=32 time=0ms TTL=128

Ping statistics for 10.0.0.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes=32 time=1ms TTL=128

Reply from 10.0.0.3: bytes=32 time=12ms TTL=128

Reply from 10.0.0.3: bytes=32 time=0ms TTL=128

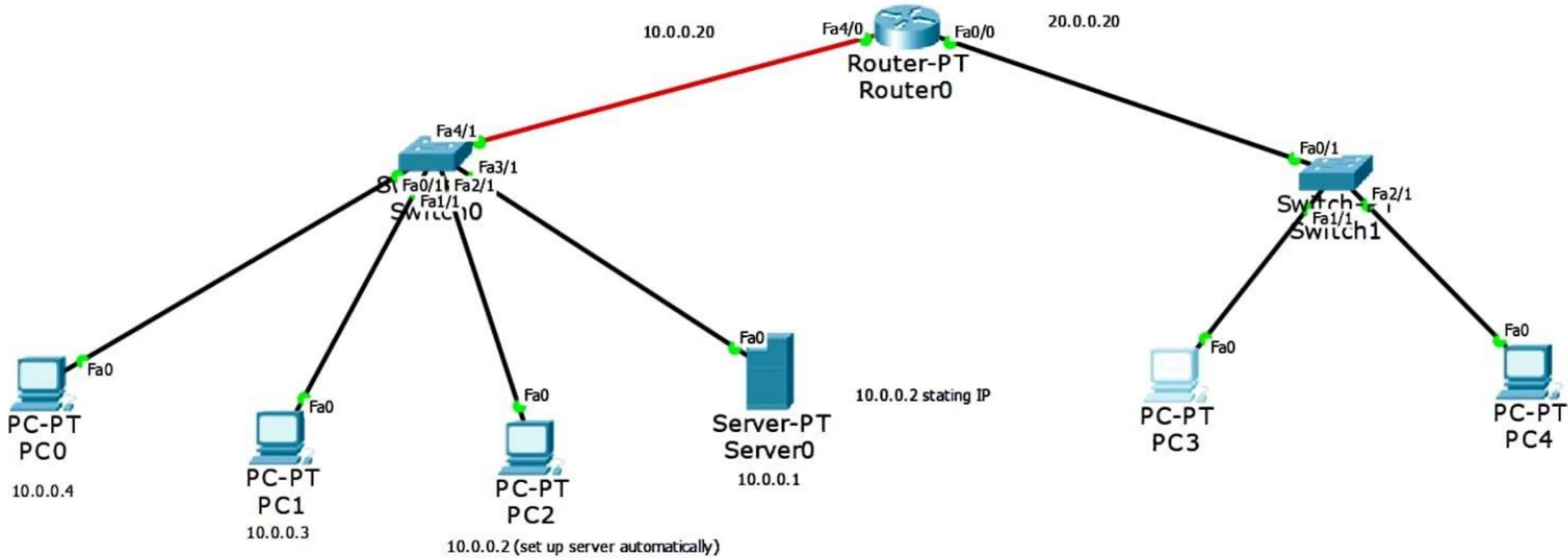
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128

Ping statistics for 10.0.0.3:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 12ms, Average = 3ms



SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP

## DHCP

Interface	FastEthernet0	Service	<input checked="" type="radio"/> On	<input type="radio"/> Off
Pool Name	serverPool			
Default Gateway	10.0.0.20			
DNS Server	0.0.0.0			
Start IP Address :	10 0 0 2 -----			
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
serverPool1	20.0.0.20	0.0.0.0	20.0.0.2	255.0.0.0	512	0.0.0.0
serverPool	10.0.0.20	0.0.0.0	10.0.0.2	255.0.0.0	512	0.0.0.0

Activate Windows  
Go to Settings to activate Windows.

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet4/0, changed state to up  
exit
```

```
Router(config)#interface fastethernet0/0  
Router(config-if)#ip address 20.0.0.20 255.0.0.0  
Router(config-if)#no shut
```

```
Router(config-if)#  
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
```

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

```
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, FastEthernet4/0  
C      20.0.0.0/8 is directly connected, FastEthernet0/0
```

```
Router#config t
```

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

```
Router(config)#interface fastethernet0/0  
Router(config-if)#ip helper-address 10.0.0.1  
Router(config-if)#no shut  
Router(config-if)#exit  
Router(config)#exit
```



Physical

Config

Desktop

Custom Interface

## IP Configuration

X

### IP Configuration

DHCP       Static      DHCP request successful.

IP Address      20.0.0.4

Subnet Mask      255.0.0.0

Default Gateway      20.0.0.20

DNS Server      0.0.0.0

### IPv6 Configuration

DHCP  Auto Config  Static

IPv6 Address      /

Link Local Address      FE80::2E0:F7FF:FE6B:D733

IPv6 Gateway

IPv6 DNS Server



ROUTER

EDITOR

FIREWALL

PC>ping 20.0.0.2

Pinging 20.0.0.2 with 32 bytes of data:

Reply from 20.0.0.2: bytes=32 time=1ms TTL=127

Reply from 20.0.0.2: bytes=32 time=0ms TTL=127

Reply from 20.0.0.2: bytes=32 time=0ms TTL=127

Reply from 20.0.0.2: bytes=32 time=0ms TTL=127

Ping statistics for 20.0.0.2:

  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

  Approximate round trip times in milli-seconds:

    Minimum = 0ms, Maximum = 1ms, Average = 0ms

/ 40.0.0.1 - IP 40.0.0.10 gateway - PCI

go to Router CLI mode and execute the following commands

- 1- No
- 2- Enable
- 3- Config T
- 4- Interface FastEthernet 0/0
- 5- IP address 40.0.0.10 255.0.0.0
- 6- NO Shut

till step -9 and type no shut

- only for route to Router connection execute all step also execute the step 11 only for the Router connection which has a closed symbol at start.

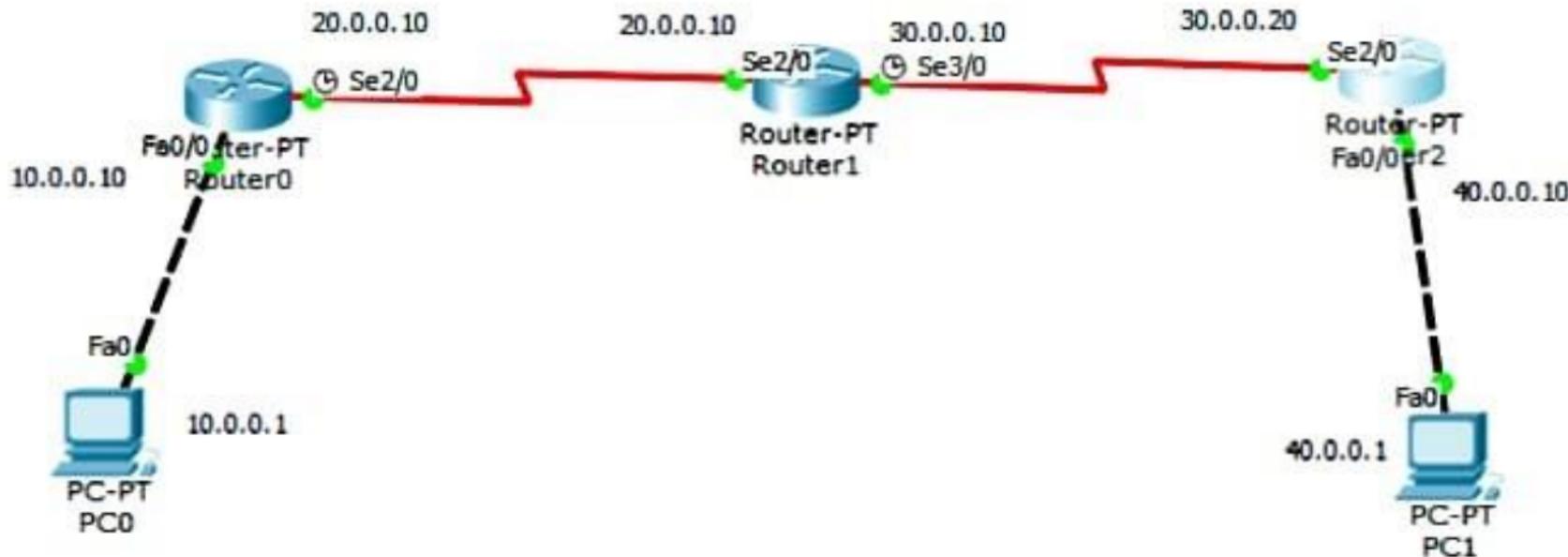
- Repeat these steps for all routers
- At last now go to each router and type show IP route
- Here IP address associated with that Router will be labelled as C and other IP addresses are labelled as R
- lastly go to PC and ping a message to PC using ping destination IP address command.

### Observation :

- Routing information protocol (rip) is dynamic routing protocol that uses hop count as a routing metric to find distance - vector routing protocol.
- Hop count is the no. of routers coming in b/w source and destination.
- Updates of the Network are exchanged periodically
- Update of routing information are always

~~1/12/23~~

: positioned



```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#ip address 10.0.0.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

Router(config-if)#exit
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.10 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#clock rate 64000
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#exit
Router(config)#
%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 rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#no shut
^
% Invalid input detected at '^' marker.

Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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
```

## IOS Command Line Interface

```
Router#config terminal
-
% Invalid input detected at `--` marker.

Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

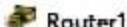
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      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
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C        20.0.0.0/8 is directly connected, Serial2/0
C        20.0.0.20/32 is directly connected, Serial2/0
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
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C        20.0.0.0/8 is directly connected, Serial2/0
C        20.0.0.20/32 is directly connected, Serial2/0
R        30.0.0.0/8 [120/1] via 20.0.0.20, 00:00:12, Serial2/0
R        40.0.0.0/8 [120/2] via 20.0.0.20, 00:00:12, Serial2/0
Router#
```



```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.20 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#e
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

% Ambiguous command: "e"
Router(config-if)#exit
Router(config)#interface serial 3/0
      ^
% Invalid input detected at '^' marker.

Router(config)#ip address 30.0.0.10 255.0.0.0
      ^
% Invalid input detected at '^' marker.

Router(config)#interface serial 3/0
Router(config-if)#ip address 30.0.0.10 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#clock rate 64000
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#exit
Router(config)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up

Router(config)#route rip
Router(config-router)#network 20.0.0.0
Router(config-router)#network 30.0.0.0
Router(config-router)#exit
Router(config)#exit
```

ROUTER CONSOLE IS NOW AVAILABLE

Press RETURN to get started.

```
Router>enable
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

```
R    10.0.0.0/8 [120/1] via 20.0.0.10, 00:00:20, Serial2/0
      20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C        20.0.0.0/8 is directly connected, Serial2/0
C        20.0.0.10/32 is directly connected, Serial2/0
      30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C        30.0.0.0/8 is directly connected, Serial3/0
C        30.0.0.20/32 is directly connected, Serial3/0
R    40.0.0.0/8 [120/1] via 30.0.0.20, 00:00:26, Serial3/0
Router#
```



```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#ip address 30.0.0.20 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#interface fastethernet 0/0
Router(config-if)#ip address 40.0.0.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 30.0.0.0
Router(config-router)#network 40.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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
```

## IOS Command Line Interface

```
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)$exit
Router(config)#interface fastethernet 0/0
Router(config-if)#ip address 40.0.0.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

Router(config-if)$exit
Router(config)#router rip
Router(config-router)#network 30.0.0.0
Router(config-router)#network 40.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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

R    10.0.0.0/8 [120/2] via 30.0.0.10, 00:00:12, Serial2/0
R    20.0.0.0/8 [120/1] via 30.0.0.10, 00:00:12, Serial2/0
      30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C        30.0.0.0/8 is directly connected, Serial2/0
C        30.0.0.10/32 is directly connected, Serial2/0
C        40.0.0.0/8 is directly connected, FastEthernet0/0
Router#
```

Physical Config Desktop Custom Interface

## Command Prompt

X

```
PC>ping 40.0.0.1
```

```
Pinging 40.0.0.1 with 32 bytes of data:
```

```
Request timed out.
```

```
Reply from 40.0.0.1: bytes=32 time=15ms TTL=125
```

```
Reply from 40.0.0.1: bytes=32 time=9ms TTL=125
```

```
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
```

```
Ping statistics for 40.0.0.1:
```

```
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
    Minimum = 2ms, Maximum = 15ms, Average = 8ms
```

```
PC>ping 40.0.0.1
```

```
Pinging 40.0.0.1 with 32 bytes of data:
```

```
Reply from 40.0.0.1: bytes=32 time=20ms TTL=125
```

```
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
```

```
Reply from 40.0.0.1: bytes=32 time=13ms TTL=125
```

```
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
```

```
Ping statistics for 40.0.0.1:
```

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
    Minimum = 2ms, Maximum = 20ms, Average = 9ms
```

```
PC>
```

Physical Config Desktop Custom Interface

## Command Prompt

X

Packet Tracer PC Command Line 1.0

PC>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1: bytes=32 time=3ms TTL=125

Reply from 10.0.0.1: bytes=32 time=16ms TTL=125

Reply from 10.0.0.1: bytes=32 time=11ms TTL=125

Reply from 10.0.0.1: bytes=32 time=2ms TTL=125

Ping statistics for 10.0.0.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 16ms, Average = 8ms

PC>|

- Configure the IP address and gateway according to the topology seen above.

- Configure each of the routers according to the IP addresses given in topology.
- Encapsulation type and clock rate need to be set as done in RIP protocol experiments.

Router 1:

```
R1 (config)# router OSPF 1  
R1 (config-router)# router-id 1.1.1.1  
R1 (config-router)# network 10.0.0.0 0.255.255.255  
R1 (config-router)# area 3
```

```
R1 (config-router)# network 20.0.0.0 0.255.255.255  
R1 (config-router)# area 1
```

```
R1 (config-router)# exit
```

R3 config- router # network 46.0.0.0 255.255.

R3 config-route # exit

R3 config-route ip route 192.168.1.1 255.255.255.255

4 To keep the routes active we have to

Configure ~~the~~ interface loopback.

Route 1:

Router#

R1 config-if # interface loopback 0

R1 config-if # ip address 192.168.1.252

255.255.0.0 19

R1 config-if # no shutdown.

Router#

ip

loopback

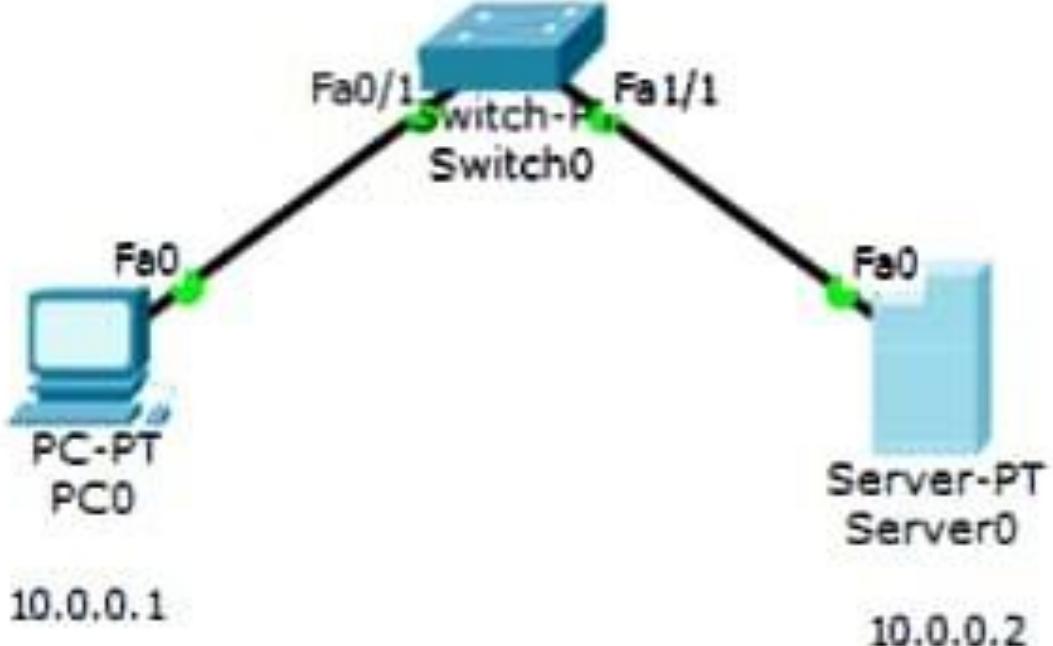
0

ip

loopback

0

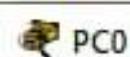
R1 config-if # ip address 192.168.1.253 255.255.0.0



[Physical](#)   [Config](#)[Services](#)[Desktop](#)[Custom Interface](#)**SERVICES**[HTTP](#)[DHCP](#)[DHCPv6](#)[TFTP](#)[DNS](#)[SYSLOG](#)[AAA](#)[NTP](#)[EMAIL](#)[FTP](#)File Name: 

```
<html>
<center><font size='+2' color='blue'>Cisco Packet
Tracer</font></center>
<hr>BMS College of Engineering. Opening doors to new
opportunities. Mind Wide Open.
<p>Quick Links:
<br><a href='helloworld.html'>A small page</a>
<br><a href='copyrights.html'>Copyrights</a>
<br><a href='image.html'>Image page</a>
<br><a href='cscopthologo177x111.jpg'>Image</a>
</html>
```

[File Manager](#)[Save](#)



PC0

- □ ×

[Physical](#) [Config](#) [Desktop](#) [Custom Interface](#)

## Web Browser

X

< > URL  Go Stop

# Cisco Packet Tracer

---

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[Image](#)

Physical Config Services Desktop Custom Interface

**SERVICES**

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

**DNS**

DNS Service

 On Off

## Resource Records

Name

Type 

Address

No.	Name	Type	Detail
0	bmscecse	A Record	10.0.0.2

[Physical](#)   [Config](#)[Services](#)[Desktop](#)[Custom Interface](#)**SERVICES**

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

File Name: index.html

```
<html>
<center><font size='+2' color='blue'>BMS College of
Engineering</font></center>
<hr>Aditi's CV. Opening doors to new opportunities. Mind Wide
Open.
<p>Quick Links:
<br><a href='languages.html'>Languages I know</a>
<br><a href='image.html'>Image page</a>
<br><a href='cscoptlogo177x111.jpg'>Image</a>
</html>
```

[File Manager](#)[Save](#)

[Physical](#)   [Config](#)[Services](#)[Desktop](#)[Custom Interface](#)**SERVICES**

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

File Name: languages.html

```
<html>
  Languages: HTML, CSS, Java, C, AQL, MongoDB
  <br><a href='index.html'>Back</a>
</html>
```

[File Manager](#)[Save](#)

&lt;

&gt;

URL

http://BMSCECSE

Go

Stop

## BMS College of Engineering

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Quick Links:

[Languages I know](#)

[Image page](#)

[Image](#)



PC0

— □ ×

Physical Config

Desktop

Custom Interface

## Web Browser

X

< > URL http://BMSCECSE/languages.html

Go

Stop

LAgues: HTML, CSS, Jave, C, AQL, MongoDB

[Back](#)

3. Encapsulation PPP and clock rate need to be set as done in RIP protocol experiments

Route 1:

```
R1 (config)# route ospf 1  
R1 (config-route)# route-id 1.1.1.1  
R1 (config-route)# network 10.0.0.0 255.255.255.0
```

```
R1 (config-route)# network 20.0.0.0 255.255.255.0
```

```
R1 (config-route)# exit
```

Configure my interface loopback.

Rauth 1:

Super User

R1 (config)# interface loopback 0  
R1 (config-if)# ip address 172.16.1.252  
R1 (config-if)# no shutdown

Router2: ~~~~~~  
R2 (config-if)# interface loopback 0  
R2 (config-if)# ip address 172.16.1.253 255.255.0.0

Req

Rep

Rep

Rep

1 config router1 # area 1 virtual link xxx

router2: R2(config)# router ospf 1  
R2(config-router)# area 1 virtual-link 1.1.1.1  
R2(config-router)# exit

Finally, After creating virtual link, show ip  
route for all routers

Result:

PC > ping 10.0.0.10  
pinging 10.0.0.10 with 32 bytes of data

Request timed out

Reply from 10.0.0.10 bytes=32 time=10ms TTL=125  
Reply from 10.0.0.10 bytes=32 time=2ms TTL=125

Reply from 40.0.0.8 bytes 32

Packets: Sent = 4 Received = 3

Approx round-trip

Minimum = 2ms Maximum = 10ms

Route 1:

show ip route

O IA 10.0.0.0/8 [110/65] via  
serial 2/0

20.0.0.0/8 is variably subnetted

C 20.0.0.0/8 is directly connected

C 20.0.0.0/32 is directly connected

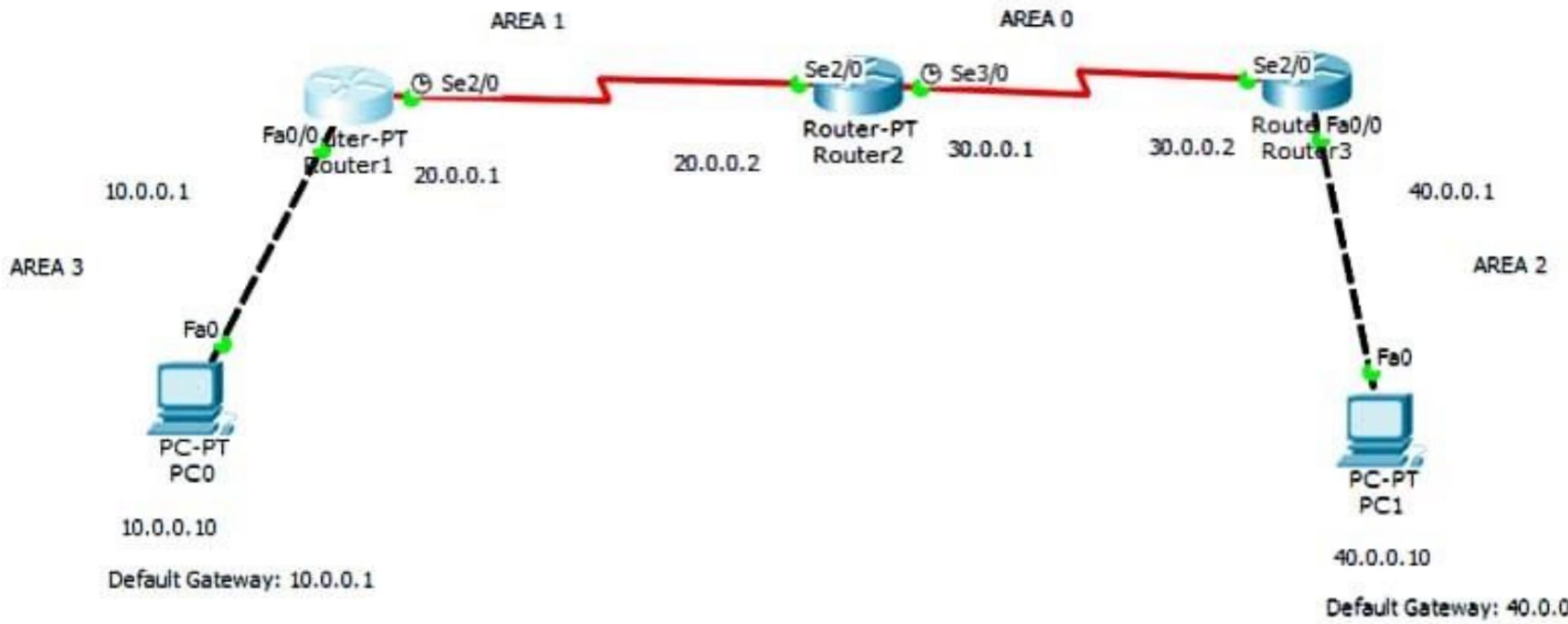
30.0.0.0/8 is variably subnetted

C 30.0.0.0/8 is directly connected

30.0.0.0/32 is directly connected

8/0  
C  
3/8/23

OIA 40.0.0.0/8 [110/65] via  
serial 3/0



```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#ip address 10.0.0.1 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

Router(config-if)#exit
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#encapsulation PPP
Router(config-if)#clock rate 64000
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#
Router(config-if)#exit
Router(config)#
%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)#router-id 1.1.1.1
Router(config-router)#network 10.0.0.0 0.255.255.255 area 3
Router(config-router)#network 20.0.0.0 0.255.255.255 area 1
Router(config-router)#exit
Router(config)#
00:14:36: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial2/0 from LOADING to FULL, Loading Done

Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#interface loopback 0

Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up
```

```
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#interface loopback 0

Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

Router(config-if)#ip address 172.16.1.252 255.255.0.0
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#router ospf 1
Router(config-router)#area 1 virtual-link 2.2.2.2
Router(config-router)#
00:26:12: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on OSPF_VL0 from LOADING to FULL, Loading Done

Router(config-router)#+exit|
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C        20.0.0.0/8 is directly connected, Serial2/0
C        20.0.0.2/32 is directly connected, Serial2/0
O    30.0.0.0/8 [110/129] via 20.0.0.2, 00:03:32, Serial2/0
O IA 40.0.0.0/8 [110/129] via 20.0.0.2, 00:03:32, Serial2/0
C    172.16.0.0/16 is directly connected, Loopback0
Router#
```

## IOS Command Line Interface

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.2 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#exit
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
t
Router(config)#interface serial 3/0
Router(config-if)#ip address 30.0.0.1 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#clock rate 64000
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#exit
Router(config)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up

Router(config)#router ospf 1
Router(config-router)#router-id 2.2.2.2
Router(config-router)#network 20.0.0.0 0.255.255.255 area 1
Router(config-router)#network 30.0.0.0 0.
00:14:11: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial2/0 from LOADING to FULL, Loading Done
255.255.255 area 0
Router(config-router)#exit
Router(config)#
00:15:26: %OSPF-5-ADJCHG: Process 1, Nbr 3.3.3.3 on Serial3/0 from LOADING to FULL, Loading Done

Router(config)#interface serial 3/0
Router(config-if)#ip address 30.0.0.1 255.0.0.0
Router(config-if)#interface loopback 0

Router(config-if)#

```

## IOS Command Line Interface

```

Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

Router(config-if)#ip address 172.16.1.252 255.255.0.0
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#router ospf 1
Router(config-router)#area 1 virtual
00:25:21: %OSPF-4-ERRRCV: Received invalid packet: mismatch area ID, from backbone area must be virtual-link but not found from 20.0.0.2, Serial2/0
-link 1.1.1.1
00:26:31: %OSPF-4-ERRRCV: Received invalid packet: mismatch area ID, from backbone area must be virtual-link but not found from 20.0.0.2, Serial2/0

Router(config-router)#exit
Router(config)#
00:26:46: %OSPF-6-ADJCHG: Process 1, Nbr 1.1.1.1 on OSPF_VL0 from LOADING to FULL, Loading Done

Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console

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

O IA 10.0.0.0/8 [110/65] via 20.0.0.1, 00:05:24, Serial2/0
  20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    20.0.0.0/8 is directly connected, Serial2/0
C    20.0.0.1/32 is directly connected, Serial2/0
  30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    30.0.0.0/8 is directly connected, Serial3/0
C    30.0.0.2/32 is directly connected, Serial3/0
O IA 40.0.0.0/8 [110/65] via 30.0.0.2, 00:14:32, Serial3/0
C  172.16.0.0/16 is directly connected, Loopback0

```

## IOS Command Line Interface

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#ip address 30.0.0.2 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#int
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
erface fastethernet0/0
Router(config-if)#ip address 40.0.0.1 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
exit
Router(config)#router ospf 1
Router(config-router)#router-id 3.3.3.3
Router(config-router)#network 30.0.0.0 0.255.255.255 area 0
Router(config-router)#netwr
00:15:23: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial2/0 from LOADING to FULL, Loading
Router(config-router)#network 40.0.0.0 0.255.255.255 area 2
Router(config-router)#exit
Router(config)#interface serial 2/0
Router(config-if)#ip address 30.0.0.2 255.0.0.0
Router(config-if)#interface loopback 0

Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

Router(config-if)#ip address 172.16.1.254 255.255.0.0
Router(config-if)#no shut
Router(config-if)#exit
```

## IOS Command Line Interface

```
Router(config-router)#
Router(config-router)#netwr
00:16:23: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial2/0 from LOADING to FULL, Loading
Router(config-router)#network 40.0.0.0 0.255.255.255 area 2
Router(config-router)#exit
Router(config)#interface serial 2/0
Router(config-if)#ip address 30.0.0.2 255.0.0.0
Router(config-if)#interface loopback 0

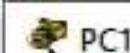
Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

Router(config-if)#ip address 172.16.1.254 255.255.0.0
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#interface serial 2/0
Router(config-if)#encapsulation ppp
Router(config-if)#exit
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

O IA 10.0.0.0/8 [110/129] via 30.0.0.1, 00:01:16, Serial2/0
O IA 20.0.0.0/8 [110/128] via 30.0.0.1, 00:11:35, Serial2/0
      30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       30.0.0.0/8 is directly connected, Serial2/0
C       30.0.0.1/32 is directly connected, Serial2/0
C       40.0.0.0/8 is directly connected, FastEthernet0/0
C       172.16.0.0/16 is directly connected, Loopback0
Router#
```



PC1



Physical Config Desktop Custom Interface

## Command Prompt



PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:

Request timed out.

Reply from 10.0.0.10: bytes=32 time=10ms TTL=125

Reply from 10.0.0.10: bytes=32 time=2ms TTL=125

Reply from 10.0.0.10: bytes=32 time=9ms TTL=125

Ping statistics for 10.0.0.10:

Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 10ms, Average = 7ms

PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:

Reply from 10.0.0.10: bytes=32 time=11ms TTL=125

Reply from 10.0.0.10: bytes=32 time=21ms TTL=125

Reply from 10.0.0.10: bytes=32 time=2ms TTL=125

Reply from 10.0.0.10: bytes=32 time=20ms TTL=125

Ping statistics for 10.0.0.10:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 21ms, Average = 13ms

PC>



PC0

- X

Physical Config Desktop Custom Interface

## Command Prompt

X

Packet Tracer PC Command Line 1.0

PC>ping 40.0.0.10

Pinging 40.0.0.10 with 32 bytes of data:

Reply from 40.0.0.10: bytes=32 time=10ms TTL=125

Reply from 40.0.0.10: bytes=32 time=27ms TTL=125

Reply from 40.0.0.10: bytes=32 time=10ms TTL=125

Reply from 40.0.0.10: bytes=32 time=2ms TTL=125

Ping statistics for 40.0.0.10:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 27ms, Average = 12ms

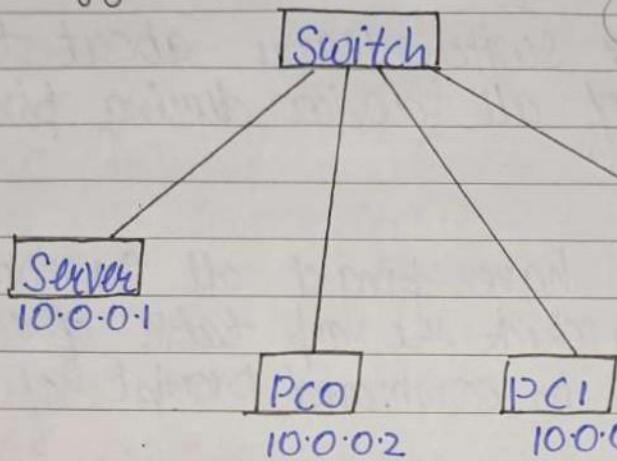
PC>

725

Time:

To construct simple LAN and  
concept and operation of A  
Protocol (ARP)

Topology:



0:11,

marks

Procedure:

1) Select a switch; server and them to the switch as shown above

2) Connect them with copper wire

3) Set the IP addresses of switch as shown

4) Select the inspect tool from t  
and open the ARP table

you can check the arp table of each device in command prompt of PC's

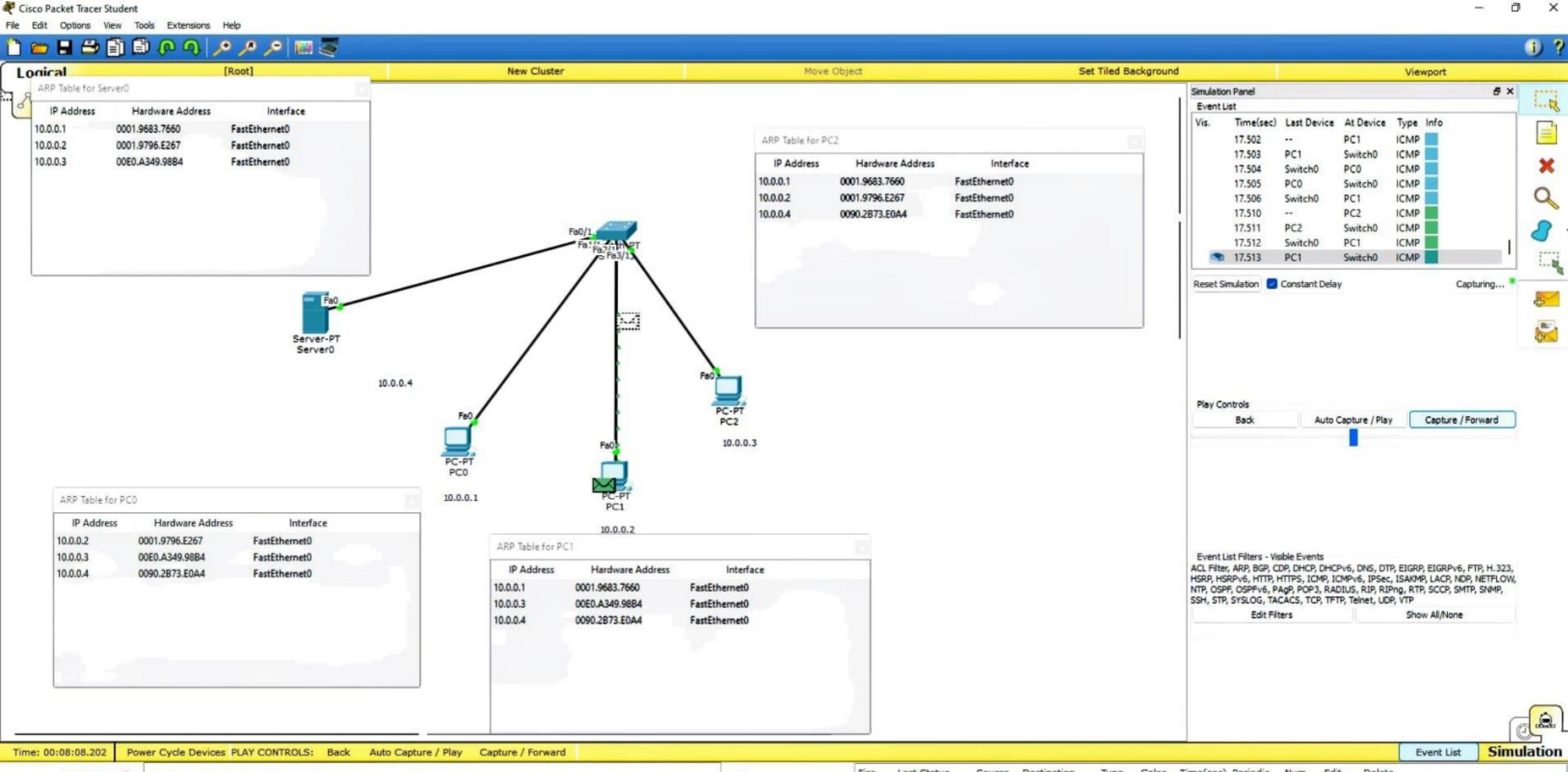
> arp -a

Internet address	Physical address	Type
10.0.0.1	0060.47a4.0e3	Dynamic
10.0.0.2	0060.47e5.1415	Dynamic
10.0.0.3	0005.5ea6.0b46	Dynamic

- q)  
In switch → CLI you can check the mac address of the device as follow  
Switch > show mac address-table

pinged devices and the switch stores like  
MAC address in the ARP table for future  
pining. ARP learns about the MAC address  
by pining all the devices and the right  
device responds with the acknowledgement

(P)  
MAC



Physical Config CLI

## IOS Command Line Interface

```
1 0090.2b73.e0a4 DYNAMIC Fa0/1
1 00e0.a349.98b4 DYNAMIC Fa3/1
```

```
Switch>arp -a
```

```
^|
```

```
% Invalid input detected at '^' marker.
```

```
Switch>show mac address-table
```

```
Mac Address Table
```

Vlan	Mac Address	Type	Ports
----	-----	-----	-----
1	0001.9683.7660	DYNAMIC	Fa1/1
1	0001.9796.e267	DYNAMIC	Fa2/1
1	0090.2b73.e0a4	DYNAMIC	Fa0/1
1	00e0.a349.98b4	DYNAMIC	Fa3/1

```
Switch>show mac address-table
```

```
Mac Address Table
```

Vlan	Mac Address	Type	Ports
----	-----	-----	-----
1	0001.9683.7660	DYNAMIC	Fa1/1
1	0001.9796.e267	DYNAMIC	Fa2/1
1	0090.2b73.e0a4	DYNAMIC	Fa0/1
1	00e0.a349.98b4	DYNAMIC	Fa3/1

```
Switch>
```

Physical Config Desktop Custom Interface

## Command Prompt

X

Packet Tracer PC Command Line 1.0

PC>ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:

Reply from 10.0.0.4: bytes=32 time=8ms TTL=128

Reply from 10.0.0.4: bytes=32 time=4ms TTL=128

Reply from 10.0.0.4: bytes=32 time=4ms TTL=128

Reply from 10.0.0.4: bytes=32 time=4ms TTL=128

Ping statistics for 10.0.0.4:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 4ms, Maximum = 8ms, Average = 5ms

PC>arp -a

Internet Address	Physical Address	Type
10.0.0.3	00e0.a349.98b4	dynamic
10.0.0.4	0090.3b73.e0a4	dynamic

PC>

## Command Prompt

Packet Tracer PC Command Line 1.0

PC>ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:

Reply from 10.0.0.4: bytes=32 time=8ms TTL=128

Reply from 10.0.0.4: bytes=32 time=4ms TTL=128

Reply from 10.0.0.4: bytes=32 time=4ms TTL=128

Reply from 10.0.0.4: bytes=32 time=4ms TTL=128

Ping statistics for 10.0.0.4:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 4ms, Maximum = 8ms, Average = 6ms

PC>arp -a

Internet Address	Physical Address	Type
10.0.0.4	0090.2b73.e0a4	dynamic

PC>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1: bytes=32 time=8ms TTL=128

Reply from 10.0.0.1: bytes=32 time=4ms TTL=128

Reply from 10.0.0.1: bytes=32 time=4ms TTL=128

Reply from 10.0.0.1: bytes=32 time=4ms TTL=128

Ping statistics for 10.0.0.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 4ms, Maximum = 8ms, Average = 6ms

PC>

## Command Prompt

Packet Tracer PC Command Line 1.0

PC>arp -a  
No ARP Entries Found

PC>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

|  
Reply from 10.0.0.1: bytes=32 time=8ms TTL=128  
Reply from 10.0.0.1: bytes=32 time=4ms TTL=128  
Reply from 10.0.0.1: bytes=32 time=4ms TTL=128  
Reply from 10.0.0.1: bytes=32 time=4ms TTL=128

Ping statistics for 10.0.0.1:

  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
  Approximate round trip times in milli-seconds:  
    Minimum = 4ms, Maximum = 8ms, Average = 5ms

PC>arp -a

Internet Address	Physical Address	Type
10.0.0.1	0001.9693.7660	dynamic

PC>ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:

Reply from 10.0.0.4: bytes=32 time=8ms TTL=128  
Reply from 10.0.0.4: bytes=32 time=4ms TTL=128  
Reply from 10.0.0.4: bytes=32 time=4ms TTL=128  
Reply from 10.0.0.4: bytes=32 time=4ms TTL=128

Ping statistics for 10.0.0.4:

  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
  Approximate round trip times in milli-seconds:  
    Minimum = 4ms, Maximum = 8ms, Average = 5ms

PC>ping 10.0.0.2

Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=8ms TTL=128  
Reply from 10.0.0.2: bytes=32 time=4ms TTL=128  
Reply from 10.0.0.2: bytes=32 time=4ms TTL=128  
Reply from 10.0.0.2: bytes=32 time=4ms TTL=128

Ping statistics for 10.0.0.2:

  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
  Approximate round trip times in milli-seconds:  
    Minimum = 4ms, Maximum = 8ms, Average = 5ms

PC>arp -a

Internet Address	Physical Address	Type
10.0.0.1	0001.9693.7660	dynamic
10.0.0.2	0001.9796.e267	dynamic
10.0.0.4	0090.2b73.e0a4	dynamic

PC>

BRINK

PC0

PC1

PC2

PC3

PC4

PC5

PC6

PC7

PC8

PC9

PC10

PC11

PC12

PC13

PC14

PC15

PC16

### Procedure:

- \* take a router a switch four pc's and drop them in the workspace choose 1841 switch.
- \* we copper straight through connection to connect all four pcs to the switch and connect the switch to the router
- \* set the IP address and the gateway for all PCs
- \* In the switch → config → select VLAN

Q) Stp in Router (VLAN) # exits 3 & 5 pt with  
apply completed

existing

3  
Router# config t  
Router Config# interface Fastethernet 0/0.1  
Router Config# encapsulation dot 1+20

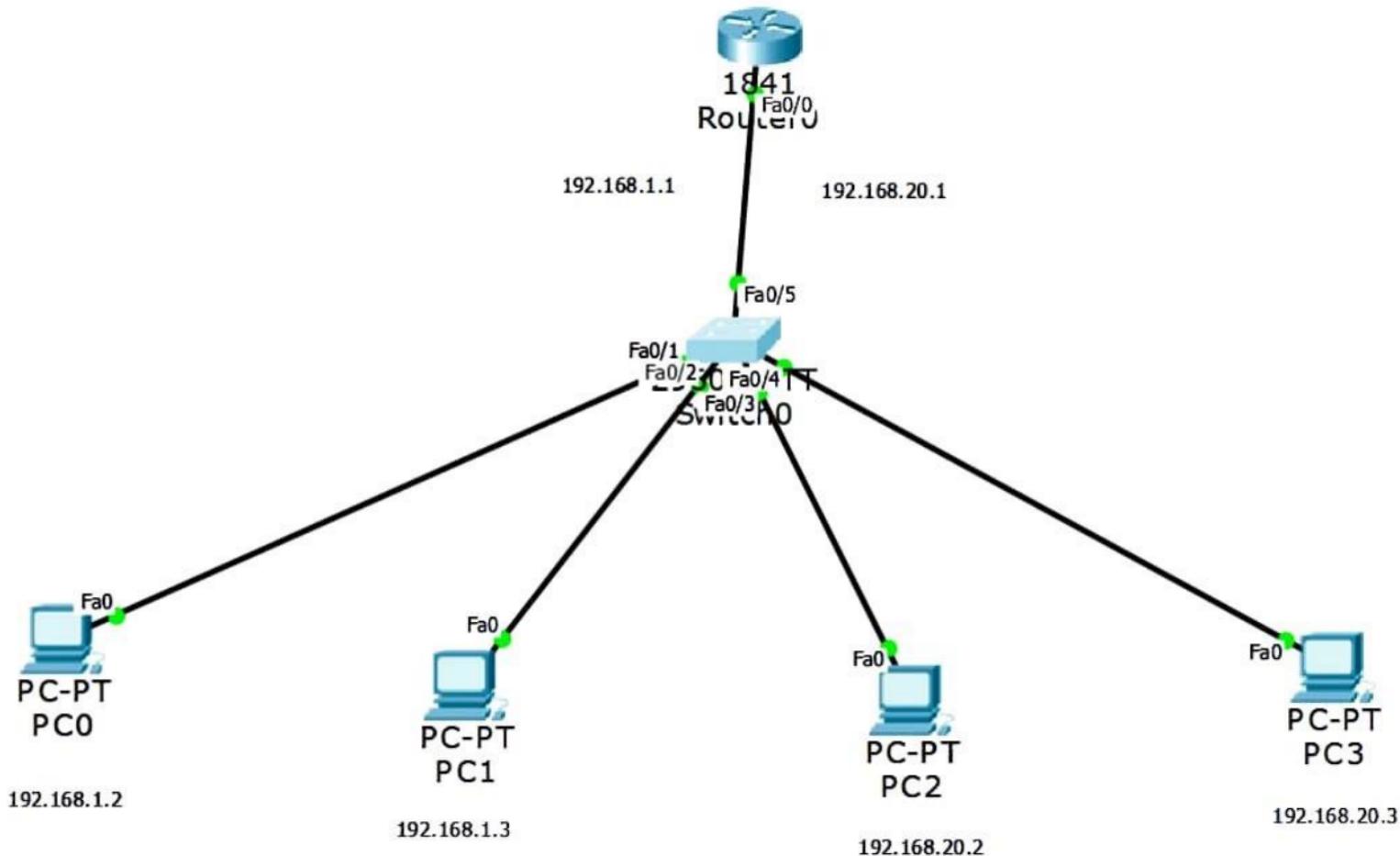
Router Config-subif# ip address 192.168.20.1  
255.255.255.0

Router Config-subif# no shut

Router Config-subif# exit

### Observation

n  
Ditch  
d  
all  
  
~~Virtual local area network broadcast domain that is positioned and isolated in complete network at data link layer. The PCs in the experiment communicate through a wireless LAN.~~



**GLOBAL**

Settings

Algorithm Settings

**SWITCH**

VLAN Database

**INTERFACE**

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

**Equivalent IOS Commands**

```
Switch(config-if)#
Switch(config-if)#
Switch(config-if)#switchport access vlan 1
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#
```

## VLAN Configuration

VLAN Number

VLAN Name

**Add****Remove**

VLAN No

VLAN Name

1 default

20 NEWVLAN

1002 fddi-default

Physical    Config    CLI

**INTERFACE**

astEthernet0/  
astEthernet0/1  
astEthernet0/1

**FastEthernet0/5****Port Status** On

Bandwidth  100 Mbps  10 Mbps  Auto

Duplex  Half Duplex  Full Duplex  Auto

Trunk

VLAN

1-1005

**Tx Ring Limit**

10

- 1:default
- 20:NEWVLAN
- 1002:fddi-default

**Equivalent IOS Commands**

```
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/6
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/5
Switch(config-if)#

```

**GLOBAL**

Settings

Algorithm Settings

**SWITCH**

VLAN Database

**INTERFACE**

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

**Equivalent IOS Commands**

```
Switch(config-if)#
Switch(config-if)#
Switch(config-if)#switchport access vlan 1
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#
```

## VLAN Configuration

VLAN Number

VLAN Name

**Add****Remove**

VLAN No	VLAN Name
1	default
20	NEWVLAN
1002	fddi-default



Physical Config CLI

**INTERFACE**

astEthernet0/

astEthernet0/1

astEthernet0/1

**FastEthernet0/1****Port Status** On**Bandwidth**  100 Mbps  10 Mbps  Auto**Duplex**  Half Duplex  Full Duplex  Auto**Access**

VLAN

1

**Tx Ring Limit**

10

**Equivalent IOS Commands**

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

```

<b>GLOBAL</b>
Settings
Algorithm Settings
<b>ROUTING</b>
Static
RIP
<b>SWITCHING</b>
VLAN Database
<b>INTERFACE</b>
FastEthernet0/0
FastEthernet0/1

**VLAN Number****VLAN Name****VLAN Configuration****Add****Remove****VLAN No****VLAN Name**

1	default
20	NEWVLAN
1002	fddi-default
1003	token-ring-default
1004	fddinet-default
1005	trnet-default

**Equivalent IOS Commands**

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
exit
Router(config)#int fa 0/0.1
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.1, changed state to up

Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#no shut
Router(config-subif)#exit
Router(config)#
Router(config)#exit
Router#vlan database
% Warning: It is recommended to configure VLAN from config mode,
as VLAN database mode is being deprecated. Please consult user
documentation for configuring VTP/VLAN in config mode.

Router(vlan)#
%SYS-5-CONFIG_I: Configured from console by console
```

--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

```
Router>enable
Router#vlan database
% Warning: It is recommended to configure VLAN from config mode,
as VLAN database mode is being deprecated. Please consult user
documentation for configuring VTP/VLAN in config mode.

Router(vlan)#vlan 20 name NEWVLAN
VLAN 20 modified:
  Name: NEWVLAN
Router(vlan)#exit
APPLY completed.
Exiting....
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int fa0/5
%Invalid interface type and number
Router(config)#int fa0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
exit
Router(config)#int fa 0/0.1
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.1, changed state to up

Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#no shut
Router(config-subif)#exit
Router(config)#

```



PC0



Physical    Config    Desktop    Custom Interface

## Command Prompt



```
PC>ping 192.168.20.2
```

```
Pinging 192.168.20.2 with 32 bytes of data:
```

```
Request timed out.
```

```
Ping statistics for 192.168.20.2:
```

```
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

```
PC>ping 192.168.20.2
```

```
Pinging 192.168.20.2 with 32 bytes of data:
```

```
Request timed out.
```

```
Reply from 192.168.20.2: bytes=32 time=0ms TTL=127
```

```
Reply from 192.168.20.2: bytes=32 time=1ms TTL=127
```

```
Reply from 192.168.20.2: bytes=32 time=1ms TTL=127
```

```
Ping statistics for 192.168.20.2:
```

```
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

```
PC>
```

## Configuring Wireless

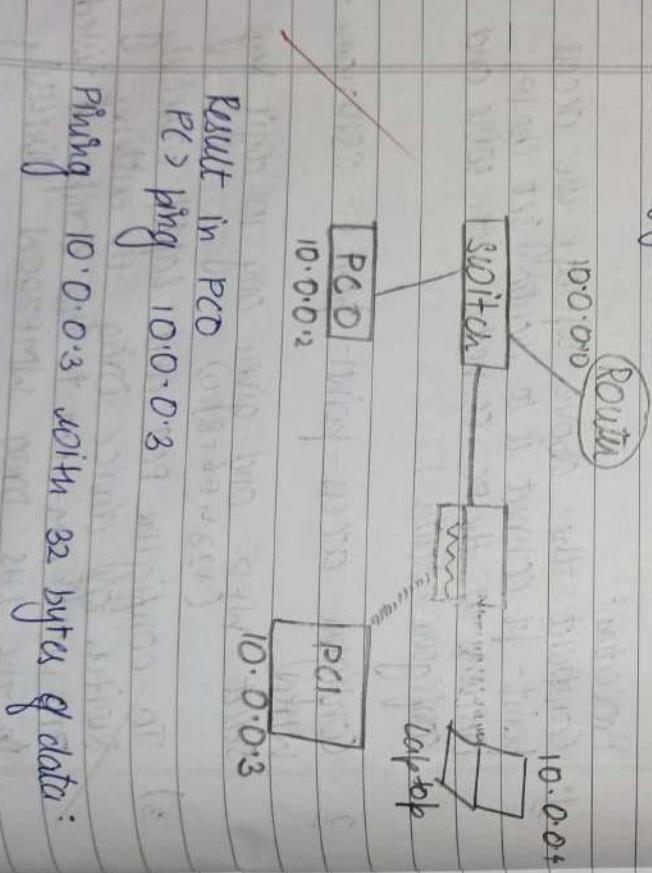
2) Configure access-point - port 1 - SSID name →

WIFI

Set WEP and given any 10 digit key  
(1234567890)

- 3) To configure PC9 and Laptop wirelessly.  
Switch off device Drag the existing PT-HOST-NM-LAN to the component listed  
In the LHS Drag WMP300N wirelessly

## Topology



Result in PC0

PC > ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

ch  
mit  
ruler  
us

Reply from 100.0.3 by  
Reply from 10.0.0.3 by  
Reply from 10.0.0.3 by  
Reply from 10.0.0.3 by

## Ping Statistics for

packets sent = 4 received  
approximate roundtrip  
minimum = 6ms maximum

## Observation:

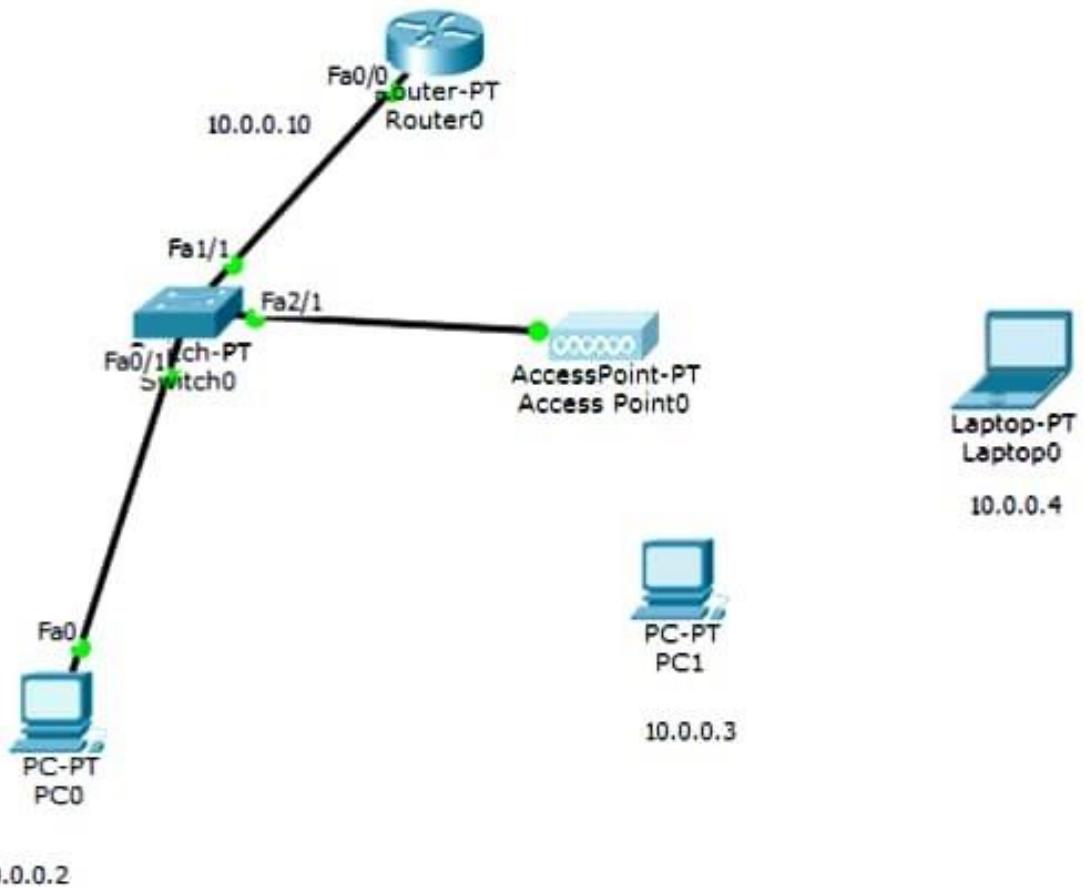
1) wireless local area network  
group of connected computer devices that form a radio transmission path

2) After the WLAN connection appears in the access point

10/10

✓  
17/18/23





[Physical](#)   [Config](#)   [CLI](#)

## IOS Command Line Interface

```
--- software, version 0.0.0 ---  
4 FastEthernet/IEEE 802.3 interface(s)  
2 Low-speed serial(sync/async) network interface(s)  
32K bytes of non-volatile configuration memory.  
63488K bytes of ATA CompactFlash (Read/Write)
```

```
--- System Configuration Dialog ---
```

```
Continue with configuration dialog? [yes/no]: n
```

```
Press RETURN to get started!
```

```
Router>enable  
Router#config t  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#interface fastethernet 0/0  
Router(config-if)#ip address 10.0.0.10 255.0.0.0  
Router(config-if)#no shut  
  
Router(config-if)#  
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to  
up  
exit  
Router(config)#
```

[Copy](#)[Paste](#)

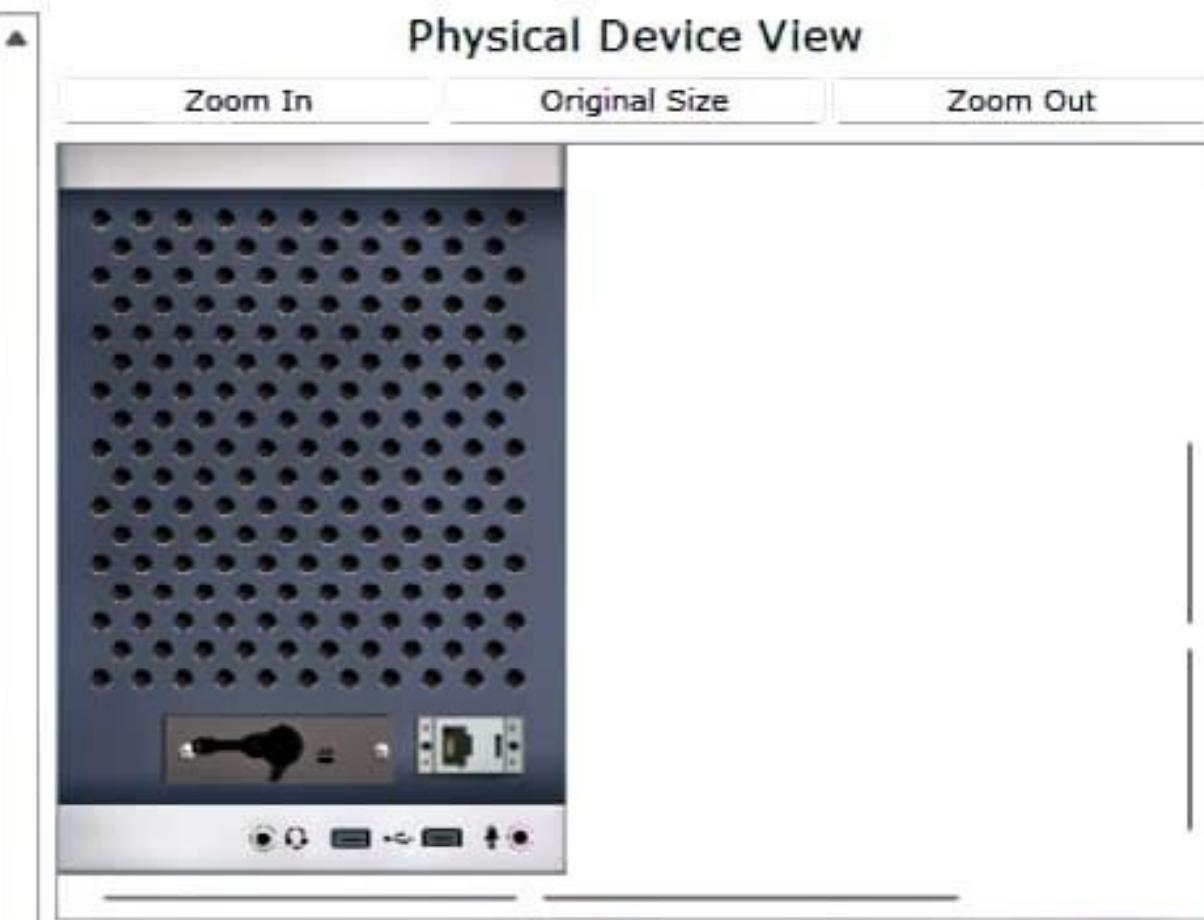
Access Point0

Physical Config

<b>GLOBAL</b>		
Settings		
<b>INTERFACE</b>		
Port 0		
Port 1		
Port 1		
Port Status		<input checked="" type="checkbox"/> On
SSID		WLAN
Channel		6
Authentication		
<input type="radio"/> Disabled <input checked="" type="radio"/> WEP		WEP Key 1234567890
<input type="radio"/> WPA-PSK <input type="radio"/> WPA2-PSK		PSK Pass Phrase
Encryption Type		40/64-Bits (10 Hex digits)

Physical Config Desktop Custom Interface

MODULES
WMP300N
PT-HOST-NM-1AM
PT-HOST-NM-1CE
PT-HOST-NM-1CFE
PT-HOST-NM-1CGE
PT-HOST-NM-1FFE
PT-HOST-NM-1FGE
PT-HOST-NM-1W
PT-HOST-NM-1W-A
PT-HOST-NM-3G/4G
PT-HEADPHONE
PT-MICROPHONE
PT-CAMERA
PT-USB-HARD-DRIVE



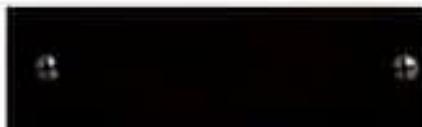
Customize  
Icon in  
Physical View



Customize  
Icon in  
Logical View



The Linksys-WMP300N module provides one 2.4GHz wireless interface suitable for connection to wireless networks. The module supports protocols that use Ethernet for LAN access.





PC1



Physical Config Desktop Custom Interface

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

Wireless0

**Wireless0** On

Port Status

54 Mbps

Bandwidth

MAC Address

0090.2BB0.8A1B

SSID

WLAN

## Authentication

- Disabled  WEP      WEP Key 1234567890
- WPA-PSK  WPA2-PSK PSK Pass Phrase

- WPA       WPA2

User ID

Password

Encryption Type

40/64-Bits (10 Hex digits)

## IP Configuration

- DHCP

- Static

IP Address

10.0.0.3

Subnet Mask

255.0.0.0

## IPv6 Configuration

- DHCP

- Auto Config

- Static

[Physical](#)   [Config](#)   [Desktop](#)   [Custom Interface](#)

MODULES
WPC300N
PT-LAPTOP-NM-1AM
PT-LAPTOP-NM-1CE
PT-LAPTOP-NM-1CFE
PT-LAPTOP-NM-1CGE
PT-LAPTOP-NM-1FFE
PT-LAPTOP-NM-1FGE
PT-LAPTOP-NM-1W
PT-LAPTOP-NM-1W-A
PT-LAPTOP-NM-3G/4G
PT-HEADPHONE
PT-MICROPHONE
PT-CAMERA
PT-USB-HARD-DRIVE

## Physical Device View

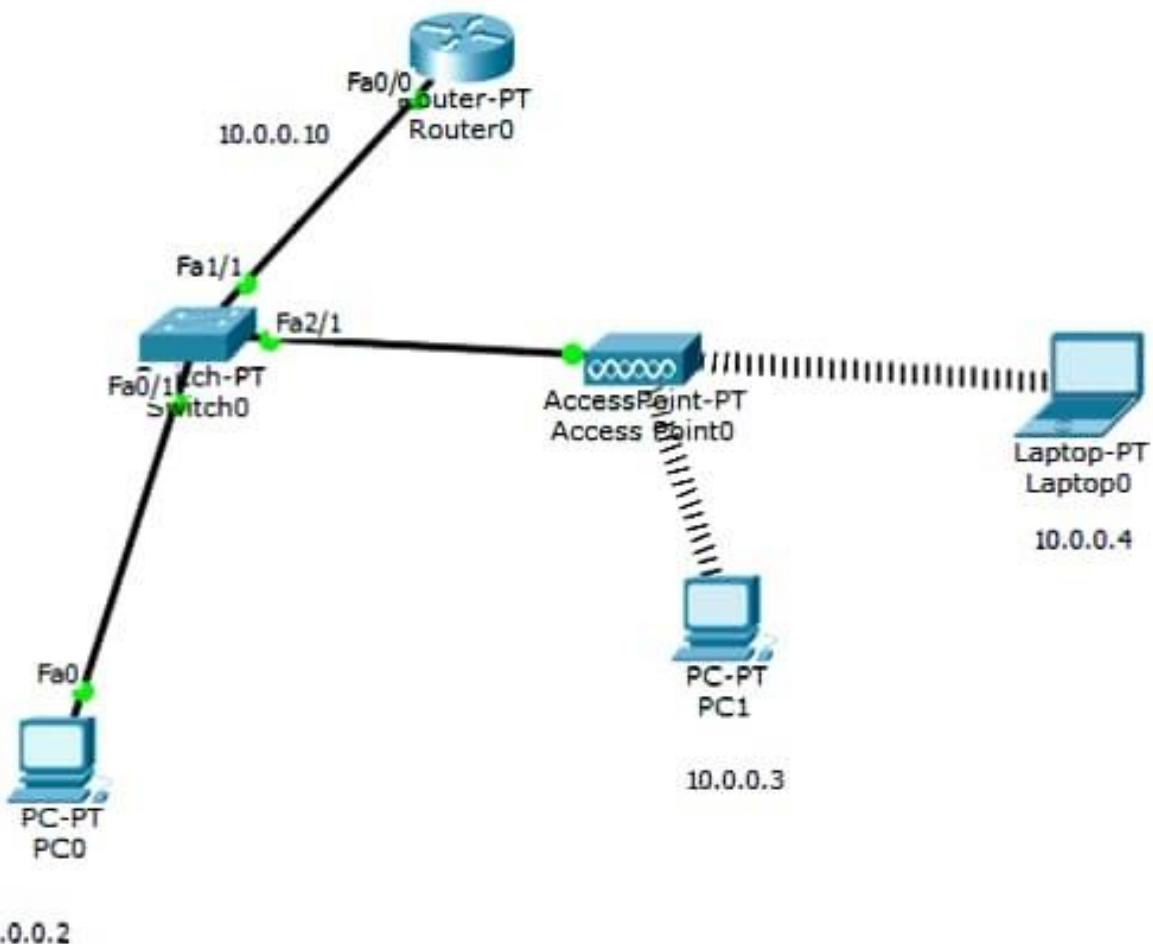
[Zoom In](#)[Original Size](#)[Zoom Out](#)[Customize  
Icon in  
Physical View](#)[Customize  
Icon in  
Logical View](#)

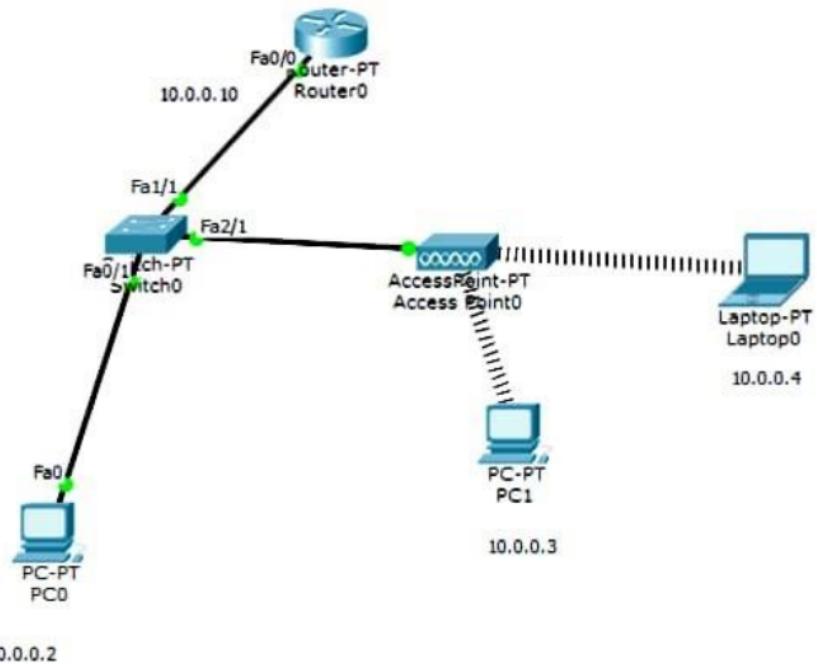
The Linksys-WPC300N module provides one 2.4GHz wireless interface suitable for connection to wireless networks. The module supports protocols that use Ethernet for LAN access.



Physical Config Desktop Custom Interface

<b>GLOBAL</b>			
Settings			
Algorithm Settings			
<b>INTERFACE</b>			
Wireless0			
<b>Wireless0</b>			
Port Status	<input checked="" type="checkbox"/> On		
Bandwidth	48 Mbps		
MAC Address	0030.A3C6.9EE5		
SSID	WLAN		
Authentication			
<input type="radio"/> Disabled	<input checked="" type="radio"/> WEP	WEP Key	1234567890
<input type="radio"/> WPA-PSK	<input type="radio"/> WPA2-PSK	PSK Pass Phrase	
<input type="radio"/> WPA	<input type="radio"/> WPA2	User ID	
		Password	
Encryption Type	40/64-Bits (10 Hex digits)		
IP Configuration			
<input type="radio"/> DHCP			
<input checked="" type="radio"/> Static			
IP Address	10.0.0.4		
Subnet Mask	255.0.0.0		
IPv6 Configuration			
<input type="radio"/> DHCP			
<input type="radio"/> Auto Config			
<input checked="" type="radio"/> Static			





PC0

Physical Config Desktop Custom Interface

## Command Prompt X

```

Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes=32 time=21ms TTL=128
Reply from 10.0.0.3: bytes=32 time=13ms TTL=128
Reply from 10.0.0.3: bytes=32 time=6ms TTL=128
Reply from 10.0.0.3: bytes=32 time=8ms TTL=128

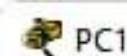
Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 6ms, Maximum = 21ms, Average = 12ms

PC>ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:

Reply from 10.0.0.4: bytes=32 time=20ms TTL=128
Reply from 10.0.0.4: bytes=32 time=11ms TTL=128
Reply from 10.0.0.4: bytes=32 time=4ms TTL=128
Reply from 10.0.0.4: bytes=32 time=8ms TTL=128

Ping statistics for 10.0.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 20ms, Average = 10ms
  
```



PC1



Physical Config Desktop Custom Interface

## Command Prompt



Packet Tracer PC Command Line 1.0

PC>ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes=32 time=1ms TTL=128

Reply from 10.0.0.3: bytes=32 time=6ms TTL=128

Reply from 10.0.0.3: bytes=32 time=0ms TTL=128

Reply from 10.0.0.3: bytes=32 time=4ms TTL=128

Ping statistics for 10.0.0.3:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 6ms, Average = 2ms

PC>ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:

Reply from 10.0.0.4: bytes=32 time=28ms TTL=128

Reply from 10.0.0.4: bytes=32 time=18ms TTL=128

Reply from 10.0.0.4: bytes=32 time=14ms TTL=128

Reply from 10.0.0.4: bytes=32 time=12ms TTL=128

Ping statistics for 10.0.0.4:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 12ms, Maximum = 28ms, Average = 18ms



Physical Config Desktop Custom Interface

## Command Prompt

X

```
PC>ping 10.0.0.3
```

```
Pinging 10.0.0.3 with 32 bytes of data:
```

```
Reply from 10.0.0.3: bytes=32 time=21ms TTL=128
```

```
Reply from 10.0.0.3: bytes=32 time=18ms TTL=128
```

```
Reply from 10.0.0.3: bytes=32 time=14ms TTL=128
```

```
Reply from 10.0.0.3: bytes=32 time=19ms TTL=128
```

```
Ping statistics for 10.0.0.3:
```

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
    Minimum = 14ms, Maximum = 21ms, Average = 18ms
```

```
PC>ping 10.0.0.2
```

```
Pinging 10.0.0.2 with 32 bytes of data:
```

```
Reply from 10.0.0.2: bytes=32 time=11ms TTL=128
```

```
Reply from 10.0.0.2: bytes=32 time=13ms TTL=128
```

```
Reply from 10.0.0.2: bytes=32 time=12ms TTL=128
```

```
Reply from 10.0.0.2: bytes=32 time=11ms TTL=128
```

```
Ping statistics for 10.0.0.2:
```

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
    Minimum = 11ms, Maximum = 13ms, Average = 11ms
```

```
PC>
```

RCC

Copper  
over  
RJ45

(Router)

10.0.2

### Procedure

- 1) Configure Topology as above. Use copper cables over wire RJ45 to connect both configure IP address and gateway and the routes generally.

### In Router CLI

Router > enable

Router # Config t

Router (config) # hostname R1

R1 (config) # enable secret 1!

R1 (config) # interface fastethernet 0/0

R1 (config) # ip address 10.0.0.1 255.0.0.0

R1 (config) # no shut

R1 (config) # line vty 0 5

R1 (config-line) # login.

set

rl (config-line)# password po  
rl (config-line) # exit

rl # exit

Building configuration ..

Result

In PC0

PC > ping 10.0.0.1

pinging 10.0.0.1 with 32 bytes of data

0.0  
Reply from 10.0.0.1 bytes=32 time=2ms TTL=255  
Reply from 10.0.0.1 bytes=32 time=13ms TTL=255  
Reply from 10.0.0.1 bytes=32 time=6ms TTL=255  
Reply from 10.0.0.1 bytes=32 time=0ms TTL=255

word

ping statistics from 10.0.0.1  
packet sent = 4 received = 4 lost = 0

January 10 10.18 is directly connected  
to 10.0.0.18

#

observation

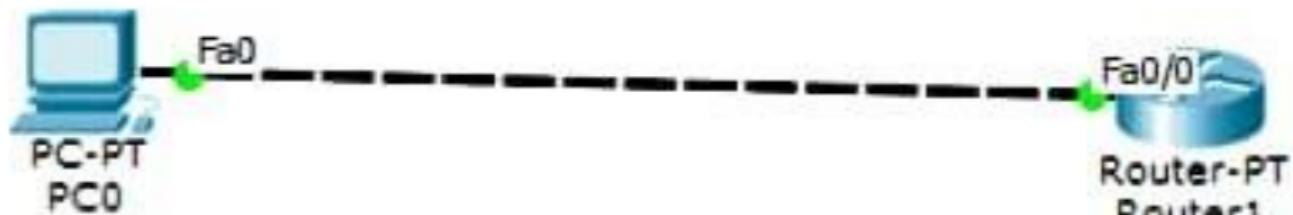
1) Telnet is used by terminal emulation programs that allows you to log into a remote host

2) we logged into 10.0.0.1 IP device through 10.0.0.2 IP device

3) The password typed is not visible

10/10  
N/A/23





10.0.0.2

10.0.0.1

```
Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang
```

```
PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
.
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)
```

```
--- System Configuration Dialog ---
```

```
Continue with configuration dialog? [yes/no]: n
```

```
Press RETURN to get started!
```

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname r1
r1(config)#enable secret p1
r1(config)#interface fastethernet 0/0
r1(config-if)#ip address 10.0.0.1 255.0.0.0
r1(config-if)#no shut

r1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

r1(config-if)#line vty 0 5
r1(config-line)#login
% Login disabled on line 132, until 'password' is set
% Login disabled on line 133, until 'password' is set
% Login disabled on line 134, until 'password' is set
% Login disabled on line 135, until 'password' is set
% Login disabled on line 136, until 'password' is set
% Login disabled on line 137, until 'password' is set
r1(config-line)#password p0
r1(config-line)#
r1(config-line)#exit
r1(config)#exit
r1#
%SYS-5-CONFIG_I: Configured from console by console

r1#wr
Building configuration...
[OK]
r1#
```

## Command Prompt

Packet Tracer PC Command Line 1.0

PC>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1: bytes=32 time=0ms TTL=255

Ping statistics for 10.0.0.1:

    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

    Approximate round trip times in milli-seconds:

        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>telnet 10.0.0.1

Trying 10.0.0.1 ...Open

User Access Verification

Password:

r1>enable

Password:

r1#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

r1#

g) PC and configure all the routers

for youth

```
# enable
# config t
# interface fastEthernet 0/0
# ip address 10.0.0.16 255.0.0.0
# no shut
# exit
# ip route 30.0.0.0 255.0.0.0 20.0.0.1
```

# ip address 200.0.0.1  
# no shut

# exit

# interface fastethernet 0/0  
# ip address 200.0.0.10 255.0.0.0

#  
# no shut

# exit

#  
# if youth 10.0.0.0 255.0.0.0 30.0.0.10  
#  
# if young 20.0.0.0 255.0.0.0 30.0.0.10

old Simulation mode, select simple mode and  
select same destination PC

$TTL = 255$

PDU information at Router 0

Inbound PDU details

$TTL = 255$

Outbounds PDU details

$TTL = 254$

PDU information at Router 1

Inbound PDU details

$TTL = 254$

Outbound PDU details

$TTL = 253$

PDU information at Router 2

Inbound PDU details

$TTL = 253$

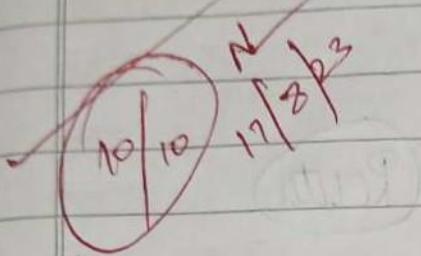
Outbound PDU details:

$TTL = 252$



## Observation:

The TTL is reduced by 1  
TTL is a mechanism which  
number of hops between source





```
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang
```

```
PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)
```

--- System Configuration Dialog ---

```
Continue with configuration dialog? [yes/no]: n
```

```
Press RETURN to get started!
```

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet 10.0.0.10 255.0.0.0
% Invalid input detected at '^' marker.

Router(config)#interface fastethernet 0/0
Router(config-if)#ip address 10.0.0.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#exit
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.10 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#exit
Router(config)#exit
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 30.0.0.0 255.0.0.0 20.0.0.20
Router(config)#ip route 40.0.0.0 255.0.0.0 20.0.0.20
Router(config)#exit
Router#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

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

%LINK-5-CHANGED: Interface Serial2/0, changed state to up

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

```
Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang
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PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
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Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)
```

```
--- System Configuration Dialog ---
```

```
Continue with configuration dialog? [yes/no]: n
```

```
Press RETURN to get started!
```

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#ip address 20.0.0.20 255.0.0.0
Router(config-if)#no shut

Router(config-if)#exit
Router(config)#interface serial 3/0
Router(config-if)#ip address 30.0.0.10 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#exit
Router(config)#exit
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.10
Router(config)#ip route 40.0.0.0 255.0.0.0 30.0.0.20
Router(config)#exit
Router#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

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

%LINK-5-CHANGED: Interface Serial3/0, changed state to up

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

subject to restrictions as set forth in subparagraph  
(c) of the Commercial Computer Software - Restricted  
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cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, California 95134-1706

Cisco Internetwork Operating System Software  
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)  
Technical Support: <http://www.cisco.com/techsupport>  
Copyright (c) 1986-2005 by cisco Systems, Inc.  
Compiled Wed 27-Apr-04 19:01 by miwang

PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory  
Processor board ID PT0123 (0123)  
PT2005 processor: part number 0, mask 01  
Bridging software.  
X.25 software, Version 3.0.0.  
4 FastEthernet/IEEE 802.3 interface(s)  
2 Low-speed serial(sync/async) network interface(s)  
32K bytes of non-volatile configuration memory.  
63488K bytes of ATA CompactFlash (Read/Write)

--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#ip address 30.0.0.20 255.0.0.0
Router(config-if)#no shut

Router(config-if)#exit
Router(config)#interface fastethernet 0/0
Router(config-if)#ip address 40.0.0.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#exit
Router(config)#ip route 10.0.0.0 255.0.0.0 30.0.0.10
Router(config)#ip route 20.0.0.0 255.0.0.0 30.0.0.10
Router(config)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

## PDU Information at Device: PC0

## OSI Model      Outbound PDU Details

## PDU Formats

PREAMBLE: 101010...1011	DEST MAC: 00E0.F939.53CB	SRC MAC: 0009.7C05.ED79
TYPE: 0x800	DATA (VARIABLE LENGTH)	FCS: 0x0

IP

0	4	8	16	19	31 Bits
4	IHL	DSCP: 0x0		TL: 28	
		ID: 0x2	0x0	0x0	
TTL: 255		PRO: 0x1		CHKSUM	
		SRC IP: 10.0.0.1			
		DST IP: 40.0.0.1			
		OPT: 0x0		0x0	
		DATA (VARIABLE LENGTH)			

ICMP

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	
ID: 0x3		SEQ NUMBER: 2	

## PDU Information at Device: Router0

x

OSI Model    Inbound PDU Details    Outbound PDU Details

## PDU Formats

Ethernet II

0	4	8	14	19	Bytes
PREAMBLE: 101010...1011	DEST MAC: 00E0.F939.53CB		SRC MAC: 0009.7C05.ED79		
TYPE: 0x800	DATA (VARIABLE LENGTH)		FCS: 0x0		

IP

0	4	8	16	19	31 Bits
4	IHL	DSCP: 0x0	TL: 28		
ID: 0x1	0x0		0x0		
TTL: 255	PRO: 0x1		CHKSUM		
SRC IP: 10.0.0.1					
DST IP: 40.0.0.1					
OPT: 0x0		0x0			
DATA (VARIABLE LENGTH)					

ICMP

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	
ID: 0x2	SEQ NUMBER: 1		

## PDU Information at Device: Router0



OSI Model    Inbound PDU Details    Outbound PDU Details

## 1 PDU Formats

HDLC

0	8	16	32	32+x	48+x	56+x
FLG: 0111 1110	ADR: 0x8f	CONTROL: 0x0	DATA: (VARIABLE LENGTH)	FCS: 0x0	FLG: 0111 1110	

IP

0	4	8	16	19	31 Bits
4	IHL	DSCP: 0x0		TL: 28	
		ID: 0x1	0x0	0x0	
TTL: 254		PRO: 0x1		CHKSUM	
		SRC IP: 10.0.0.1			
		DST IP: 40.0.0.1			
		OPT: 0x0		0x0	
		DATA (VARIABLE LENGTH)			

ICMP

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	
ID: 0x2		SEQ NUMBER: 1	

## PDU Information at Device: Router1

x

OSI Model    Inbound PDU Details    Outbound PDU Details

## PDU Formats

HDLC

0	8	16	32	32+x	40+x	56+x
FLG: 0111 1110	ADR: 0x8f	CONTROL: 0x0	DATA: (VARIABLE LENGTH)	FCS: 0x0	FLG: 0111 1110	

IP

0	4	8	16	19	31 Bits
4	IHL	DSCP: 0x0		TL: 28	
		ID: 0xa	0x0	0x0	
TTL: 254		PRO: 0x1		CHKSUM	
		SRC IP: 10.0.0.1			
		DST IP: 40.0.0.1			
		OPT: 0x0		0x0	
		DATA (VARIABLE LENGTH)			

ICMP

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	
ID: 0x4		SEQ NUMBER: 6	

## PDU Information at Device: Router1

x

OSI Model

Inbound PDU Details

Outbound PDU Details

## 1 PDU Formats

HDLC

0	8	16	32	32+x	48+x	56+x
FLG: 0111 1110	ADR: 0x0f	CONTROL: 0x0	DATA: (VARIABLE LENGTH)	FCS: 0x0	FLG: 0111 1110	

IP

0	4	8	16	19	31 Bits
4	IHL	DSCP: 0x0		TL: 28	
		ID: 0xa	0x0	0x0	
TTL: 253		PRO: 0x1		CHKSUM	
		SRC IP: 10.0.0.1			
		DST IP: 40.0.0.1			
		OPT: 0x0		0x0	
		DATA (VARIABLE LENGTH)			

ICMP

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	
ID: 0x4		SEQ NUMBER: 6	

## PDU Information at Device: Router2

x

[OSI Model](#)    [Inbound PDU Details](#)    [Outbound PDU Details](#)

## 1 PDU Formats

HDLC

0	8	16	32	32+x	40+x	56+x
FLG: 0111 1110	ADR: 0x8f	CONTROL: 0x0	DATA: (VARIABLE LENGTH)	FCS: 0x0	FLG: 0111 1110	

IP

0	4	8	16	19	31 Bits
4	IHL	DSCP: 0x0		TL: 28	
		ID: 0xa	0x0	0x0	
TTL: 253		PRO: 0x1		CHKSUM	
		SRC IP: 10.0.0.1			
		DST IP: 40.0.0.1			
		OPT: 0x0		0x0	
		DATA (VARIABLE LENGTH)			

ICMP

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	
ID: 0x4		SEQ NUMBER: 6	

## PDU Information at Device: Router2

x

OSI Model    Inbound PDU Details    Outbound PDU Details

## 1 PDU Formats

Ethernet II

0	4	8	14	19	Bytes
PREAMBLE: 101010...1011		DEST MAC: 0010.111B.DD8E		SRC MAC: 00D0.FF93.1A78	
TYPE: 0x800		DATA (VARIABLE LENGTH)		FCS: 0x0	

IP

0	4	8	16	19	31 Bits
	4	IHL	DSCP: 0x0	TL: 28	
		ID: 0xa	0x0	0x0	
TTL: 252		PRO: 0x1		CHKSUM	
		SRC IP: 10.0.0.1			
		DST IP: 40.0.0.1			
		OPT: 0x0		0x0	
		DATA (VARIABLE LENGTH)			

ICMP

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	
ID: 0x4		SEQ NUMBER: 6	

# PDU Information at Device: PC1

x

OSI Model    Inbound PDU Details    Outbound PDU Details

## 1.1 PDU Formats

### Ethernet II

0	4	8	14	19	Bytes
	PREAMBLE: 101010...1011		DEST MAC: 0010.111B.DD8E	SRC MAC: 00D0.FF93.1A78	
TYPE: 0x800		DATA (VARIABLE LENGTH)		FCS: 0x0	

### IP

0	4	8	16	19	31 Bits
	IHL	DSCP: 0x0		TL: 28	
	ID: 0xa		0x0	0x0	
TTL: 252	PRO: 0x1			CHKSUM	
	SRC IP: 10.0.0.1				
	DST IP: 40.0.0.1				
	OPT: 0x0			0x0	
	DATA (VARIABLE LENGTH)				

### ICMP

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	
ID: 0x4		SEQ NUMBER: 6	

cycle-2

## Experiment 1

Aim To write program for receiver using CRC - Cyclic Redundancy Check (16-bits)

```
# include <stdio.h>
# define <string.h>
# define N 8
char data[20];
char check_value[30];
char poly[10];
int dataLength,i,j;
```

void XOR

{

```
for(j=1;j<N;j++)
    check_value[j] = !(check_value[j]);
}
```

On

Q9

void receiver()

{

```
printf("Enter the received data:");
scanf("%s",data);
```

```
printf("Data received : %s",data);
```

```
for(i=0;(i<N-1) && (check_value[i]==0);i++);
```

```
do {
    if (data[i] == '1')
        XOR (^) i XOR
    for (j=0; j<N-1; j++)
        check value [j] = check value [j]
```

```
check value [j] = data [j]
} while (i <= data.length + 1)
```

```
int main ()
```

```
{
```

```
printf ("\\n Enter data to")
scanf ("\\s", data);
```

```
data_length = strlen (data)
for (i = data_length; i < 32;
    data[i] = 0;
```

```
printf ("\\n data Paddded
crc());
```

```
i ("\\n CRC value is ")
printf ("\\n CRC value is ");
```

```
data[i-1];
```

```
return 0;
```

```
1 #include<stdio.h>
2 #include<string.h>
3 #define N strlen(divisor)
4 char data[28];
5 char rem[28];
6 char divisor[10];
7 int dlength,i,j;
8 void XOR(){
9     for(j = 1;j < N; j++)
10         rem[j] = (( rem[j] == divisor[j])?'0':'1');
11 }
12 }
13
14 void receiver(){
15
16     printf("Enter the received data: ");
17     scanf("%s", data);
18     printf("\n\n");
19     printf("Data received: %s", data);
20
21     crc();
22
23     for(i=0;(i<N-1) && (rem[i]!='1');i++);
24         if(i<N-1)
25             printf("\nError detected\n\n");
26         else
27             printf("\nNo error detected\n\n");
28 }
29
30 void crc(){
31
32     for(i=0;i<N;i++)
33         rem[i]=data[i];
34     do{
35
36         if(rem[0]=='1')
37             XOR();
38
39         for(j=0;j<N-1;j++)
40             rem[j]=rem[j+1];
41
42         rem[j]=data[i++];
43     }
44     while(i<=dlength+16);
45
46 }
47
48 int main()
49 { int c=0;
50
51     printf("\nEnter data to be transmitted: ");
52     scanf("%s",data);
53     printf("\nEnter the Divisor: ");
54     scanf("%s",divisor);
55     dlength=strlen(data);
56     for(i=dlength;i<dlength+16;i++)
57         data[i]='0';
58     printf("\n");
59     printf("\n Data padded with 16 zeros : %s",data);
60     printf("\n");
61     crc();
62     printf("\nCRC or Check value is : %s",rem);
63     printf("\n rem strlen is : %d ", strlen(rem));
64     for(i=dlength+13;i<dlength+16;i++)
65     {
66         //printf("\n %s",data);
67         data[i]= rem[c++];
68     }
69     printf("\n");
70     printf("\n Final data to be sent : %s",data);
71     printf("\n\n");
72
73     receiver();
74     return 0;
75 }
```

Enter data to be transmitted: 1001101

Enter the Divisor: 1011

Data padded with 16 zeros : 10011010000000000000000000

CRC or Check value is : 111

Final data to be sent : 10011010000000000000111

Enter the received data: 10011010000000000000111

Data received: 10011010000000000000111

No error detected

Enter data to be transmitted: 1001101

Enter the Divisor: 1011

Data padded with 16 zeros : 10011010000000000000000000

CRC or Check value is : 111

Final data to be sent : 10011010000000000000111

Enter the received data: 10011000000000000000111

Data received: 10011000000000000000111

Error detected

=> write a program for congestion  
#include <stdio.h>

int main()

int incoming, outgoing, buck-size;

printf("Enter Bucket Size")

scanf("%d", &buck-size)

printf("Enter outgoing rate")

scanf("%d", &outgoing)

printf("Enter no of inputs")

scanf("%d", &n);

while(n != 0)

printf("Enter the incoming")

scanf("%d", &incoming)

if (incoming <= (buck-size -  
store + outgoing))

printf("Bucket buffer size  
store, buck-size);

else

printf("Dropped %d no of  
incoming - (bucket-size -

printf("%d Dropped %d no of  
incoming - (bucket-size - store))

printf("Bucket buffer size %d  
store, buck-size);

y

with cutting rate: 2000

with number of input: 2000

with one

Enter the incoming parker

→ ~~input~~ → ~~output~~ → ~~input~~ → ~~output~~

```
1 #include<stdio.h>
2
3 int main(){
4     int in, out, bsize, n, available = 0;
5     printf("Enter the bucket size: ");
6     scanf("%d", &bsize);
7     printf("Enter the outgoing rate: ");
8     scanf("%d", &out);
9     printf("Enter the no of inputs: ");
10    scanf("%d", &n);
11
12    while (n != 0) {
13        printf("Enter the incoming packet size : ");
14        scanf("%d", &in);
15        printf("Incoming packet size %d\n", in);
16        if (in <= (bsize - available)){
17            available += in;
18            printf("Bucket buffer size %d out of %d\n", available, bsize);
19        } else {
20            printf("Dropped %d no of packets\n", in - (bsize - available));
21            printf("Bucket buffer size %d out of %d\n", available, bsize);
22            available = bsize;
23        }
24        available = available - out;
25        printf("After outgoing %d packets left out of %d in buffer\n", available, bsize);
26        n--;
27    }
28 }
```

```
Enter the bucket size: 1000
Enter the outgoing rate: 200
Enter the no of inputs: 6
Enter the incoming packet size : 200
Incoming packet size 200
Bucket buffer size 200 out of 1000
After outgoing 0 packets left out of 1000 in buffer
Enter the incoming packet size : 400
Incoming packet size 400
Bucket buffer size 400 out of 1000
After outgoing 200 packets left out of 1000 in buffer
Enter the incoming packet size : 100
Incoming packet size 100
Bucket buffer size 300 out of 1000
After outgoing 100 packets left out of 1000 in buffer
Enter the incoming packet size : 300
Incoming packet size 300
Bucket buffer size 400 out of 1000
After outgoing 200 packets left out of 1000 in buffer
Enter the incoming packet size : 2000
Incoming packet size 2000
Dropped 1200 no of packets
Bucket buffer size 200 out of 1000
After outgoing 800 packets left out of 1000 in buffer
Enter the incoming packet size : 200
Incoming packet size 200
Bucket buffer size 1000 out of 1000
After outgoing 800 packets left out of 1000 in buffer
```

Q

TCP

Using UDP sockets write client to make client sending and server to send file if requested file if

A

TCP

client UDP.py

from socket import \*

ServerName = 12000

Server Port socket = socket()

sentence = input("Enter the

Client socket sendto (bytes)

file contents = ClientSocket.

print ("From Server\n")

print (filecontents)

ClientSocket.close()

point (in sent contents of sentence file)  
file · close ()  
connection socket · close ()

output

run server UDP · j

The server is ready to receive

Run client UDP · j : file file name : server UDP · j  
Ready from server

File Edit Format Run Options Window Help

```
from socket import*
serverName = '127.0.0.1'
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_STREAM)
clientSocket.connect((serverName, serverPort))
sentence = input("\nEnter file name: ")
clientSocket.send(sentence.encode())
filecontents = clientSocket.recv(1024).decode()
print('\nFrom server:\n')
print(filecontents)
clientSocket.close()
```

File Edit Format Run Options Window Help

```
from socket import *
serverName="127.0.0.1"
serverPort =12000
serverSocket =socket(AF_INET, SOCK_STREAM)
serverSocket.bind((serverName, serverPort))
serverSocket.listen(1)
while 1:
    print("The server is ready to receive")
    connectionSocket, addr =serverSocket.accept()
    sentence= connectionSocket.recv(1024).decode()
    file= open(sentence, "r")
    l=file.read(1024)
    connectionSocket.send(l.encode())
    print('\nSent contenotes of' + sentence)
    file.close()
    connectionSocket.close()
```

File Edit Shell Options Window Help

Python 3.7.3 (v3.7.3:ef4ec6ed12, Mar 25 2019, 21:26:53) [MSC v.1916 32 bit (Inte  
1)] on win32

Type "help", "copyright", "credits" or "license()" for more information.

>>>

RESTART: C:/Users/Student/AppData/Local/Programs/Python/Python37-32/ServerTCP.p  
y

The server is ready to receive

Sent contents of ServerTCP.py

The server is ready to receive

File Edit Shell Debug Options Window Help

Type help, copyright, credits or license() for more information

>>>

RESTART: C:/Users/Student/AppData/Local/Programs/Python/Python37-32/C1

Traceback (most recent call last):

  File "C:/Users/Student/AppData/Local/Programs/Python/Python37-32/C1",  
    clientSocket.connect((serverName, serverPort))

NameError: name 'clientSocket' is not defined

>>>

RESTART: C:/Users/Student/AppData/Local/Programs/Python/Python37-32/C1

Enter file name: ServerTCP.py

From server:

```
from socket import *
serverName="127.0.0.1"
serverPort =12000
serverSocket =socket(AF_INET, SOCK_STREAM)
serverSocket.bind((serverName, serverPort))
serverSocket.listen(1)
while 1:
    print("The server is ready to recieve")
    connectionSocket, addr =serverSocket.accept()
    sentence= connectionSocket.recv(1024).decode()
    file= open(sentence, "r")
    l=file.read(1024)
    connectionSocket.send(l.encode())
    print('\nSent contentes of' + sentence)
    file.close()
    connectionSocket.close()
```

>>>

```
fileContent, serverAddress = clientSocket.recvfrom(2048)
print("In reply from server\n")
print(fileContent.decode("utf-8"))
# for i in fileContent:
#     print(str(i), end = '')
clientSocket.close()
```

- 4.1.19

socket

socket module  
with socket  
library we can make  
connections

serverSocket.sendto (bytestring('utf-8'),  
clientAddress)

5. print ("In Sent contents of 'and'")

print (Sentence)

```
# for i in Sentence: print i, # prints  
# print (str(i), end = '') # prints  
file.close() # closes file #
```

Result -

Chat window  
Enter the file name: sevenTCP.py  
Content of the file are displayed

File Edit Format Run Options Window Help

```
from socket import *
serverName = "127.0.0.1"

serverPort = 12000
clientSocket = socket(AF_INET, SOCK_DGRAM)
sentence = input("\nEnter file name: ")
clientSocket.sendto(bytes(sentence, "utf-8"), (serverName, serverPort))
filecontents, serverAddress = clientSocket.recvfrom(2048)
print ('\nReply from Server:\n')
print (filecontents.decode("utf-8"))
clientSocket.close()
```

File Edit Format Run Options Window Help

```
from socket import *
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))
print ("The server is ready to receive")
while 1:
    sentence, clientAddress = serverSocket.recvfrom(2048)
    sentence = sentence.decode("utf-8")
    file=open(sentence, "r")
    con=file.read(2048)
    serverSocket.sendto(bytes(con, "utf-8"),clientAddress)
    print ('\nSent contents of ', end = ' ')
    print (sentence)
    file.close()
```

```
= RESTART: C:/Users/Aditi/AppData/Local/Programs/Python/Python311/ServerUDP.py =  
The server is ready to receive
```

```
Sent contents of ServerUDP.py
```

```
= RESTART: C:/Users/Aditi/AppData/Local/Programs/Python/Python311/ClientUDP.py =
```

```
Enter file name: ServerUDP.py
```

```
Reply from Server:
```

```
from socket import *
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))
print ("The server is ready to receive")
while 1:
    sentence, clientAddress = serverSocket.recvfrom(2048)
    sentence = sentence.decode("utf-8")
    file=open(sentence,"r")
    con=file.read(2048)
    serverSocket.sendto(bytes(con,"utf-8"),clientAddress)
    print ('\nSent contents of ', end = ' ')
    print (sentence)
    file.close()
```

```
>>
```

## Server Window

The Server is ready to receive  
contents of server TCP port

The server is ready to receive

contents of server TCP port  
server is ready to receive

server is ready to receive

and identifying a packet. A color-coded identification of packet types, which can be customized. It provides analysis that identifies the protocol being used by deaggregating the port number shown in the packet header.