PROJECT

ON

“College Network”

SUBMITTED IN DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING PARTIAL

REQUIREMENT OF B.TECH ELECTRONICS AND COMMUNICATION ENGINEERING
In
B.Tech Electronics & Communication Engineering

INFOWIZ SOFTWARE SOLUTION :-

SUBMITTED BY
Komal kumari
5th sem ECE
Roll No:18lec002

BADDI UNIVERSITY OF EMERGING SCIENCE AND TECHNOLOGY
HIMACHAL PRADESH

Certificate

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This is to certify that Mr. / Ms. Komal Kumari S/D/o. Sh. Karan Singh

of Badi Dri, Solan has successfully done more than One Hundred and Twenty Hours (120 hrs.)

on Networking from June, 2019 to July, 2019

During the tenure of the above course, we found him/her a hardworking & innovative individual.

We wish him/her a very bright and prosperous future.

Authorised Signatory

Managing Director

Chandigarh : 0172 4567888, 98885 00888, 98886 00888 Bathinda : 0164 5007088, 90235 00888, 90236 00888

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Certificate

No. Infowiz/6w2019/2424

This is certified that Mr./Ms. Komal Kumari S/D/o. Sh. Karan Singh

of Baddi Uni, Solan has successfully undergone Training Course Networking

From June, 2019 to July, 2019. During the tenure of the above course, we found him/her

hardworking & innovative individual.

We wish him/her a very bright and prosperous future.

Komal Garg
Technical Head

Managing Director

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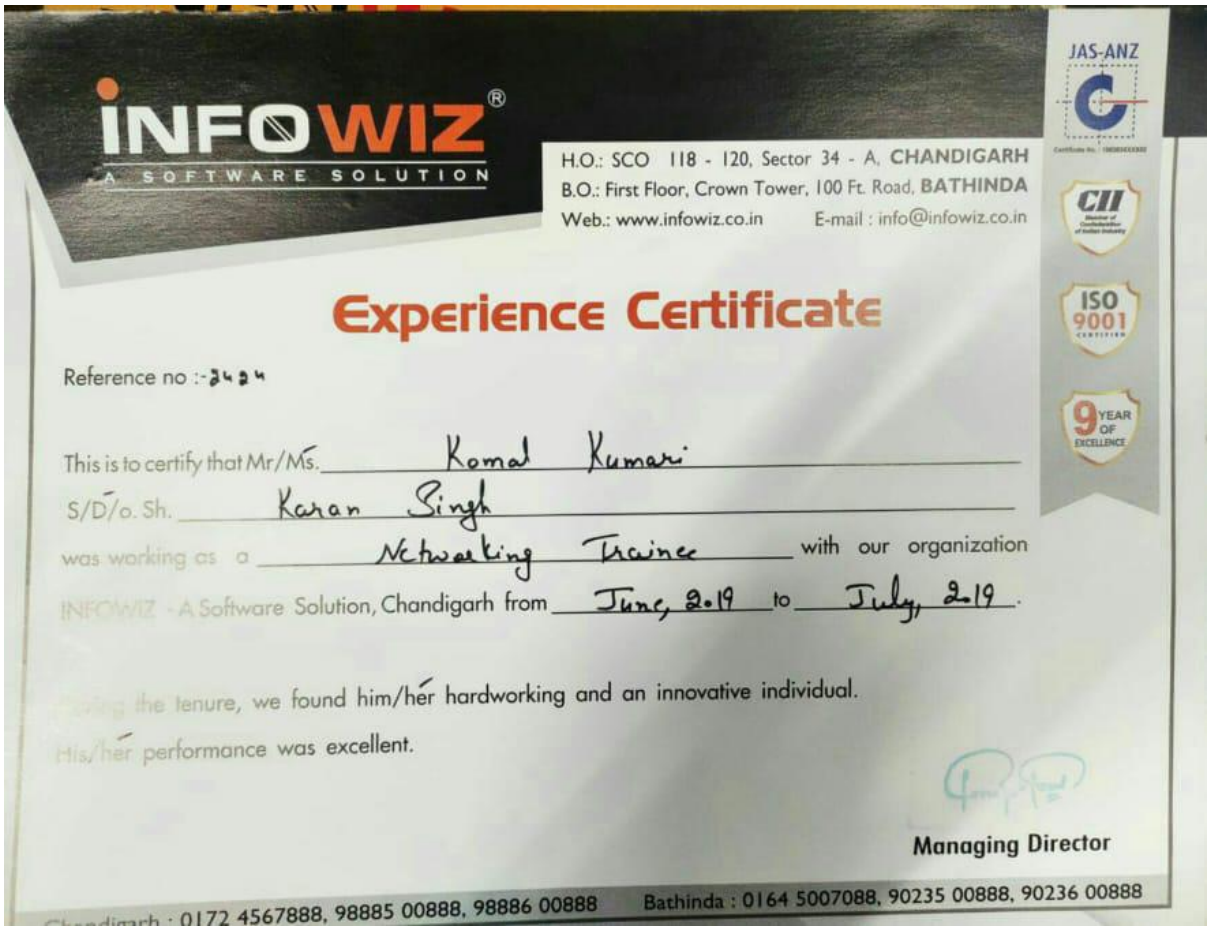

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Reference no :- 424

This is to certify that Mr/Ms. Komal Kumari
S/D/o. Sh. Karan Singh
was working as a Networking Trainee with our organization
INFOWIZ - A Software Solution, Chandigarh from June, 2019 to July, 2019.

During the tenure, we found him/her hardworking and an innovative individual.
His/her performance was excellent.

Managing Director

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COMPANY PROFILE

INFOWIZ is a 7 years young organization with ISO Certification which has been working in the field of IT, Embedded System and has been providing its clients with exceptional quality in Web Design, Web Development, and SEO services. Our clients range from small, medium to large scale Business houses & individuals. We also provide the offshore companies of US, UK, France, Ireland, Canada and Australia with quality and timely Web and SEO services. INFOWIZ is an organization which is established in the field of Web Development (PHP & .NET), JAVA (Core as well as Advance), iPhone & Android Applications, Embedded systems (AVR, PIC & ARM), ROBOTICS and Networking (MCSE, CCNA & RHSE). INFOWIZ does not boost itself from being the best Development Company but enjoys a reputable position among top Web Development and Electronics companies because of our timely delivery and quality work. Our skilled team of professionals makes sure that the product is developed as per the customer's needs and also keeping the customer informed about the development of their project from time to time. We do not only emphasize on formulating an attractive solution to our clients but also believe in providing a workable solution.

INFOWIZ offers research-based Search Engine Marketing products that help achieve greater insights into customer's online business. Our Research & Development arm offers SEO tools for SEM professionals. INFOWIZ also provides Technical Support & Consultancy to Software Companies like Sagitech solutions Panchkula, Jarc infotech Mohali, Infonet Solution, Delhi, etc.

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10.	REDISTRIBUTION OF ROUTING	
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12.	SECURITY	

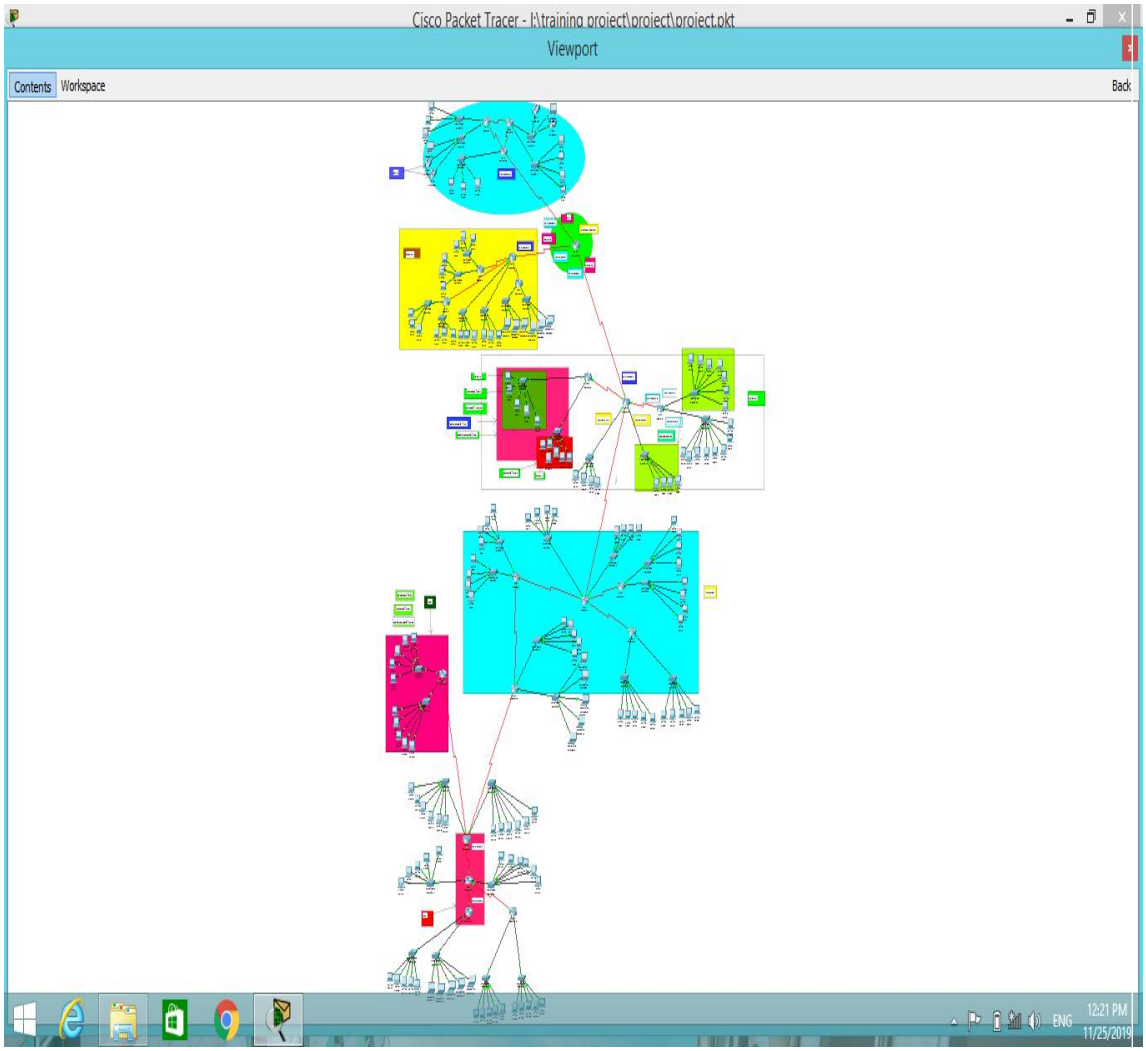
ACKNOWLEDGEMENT

I am done training from infowiz pvt. ltd. During in 2 month i have learnt lot of thing in networking as like how to make network ,how to ip Addressing of device on network which use internet and how to keep security on network.
I have to thank Er.Manish sir for advising me during this project.

Therefore ,I am grateful to the people in the Infowiz pvt.ltd for the chance to take training .

Further I want to thank all student which is done networking with me.

Snapshot


Cisco Packet Tracer - I:\training project\project\project.pkt
Viewport
Contents
Workspace
Back
ENG
12:21 PM
11/25/2019

Chapter-1

1.1 WHAT IS COMPUTER NETWORK:-

Computer network is a group of computer,ip phones and other device Which can be communicate to each other through a network.

Aim of computer network:-

->Resources sharing among various devices.

Component for computer network-:

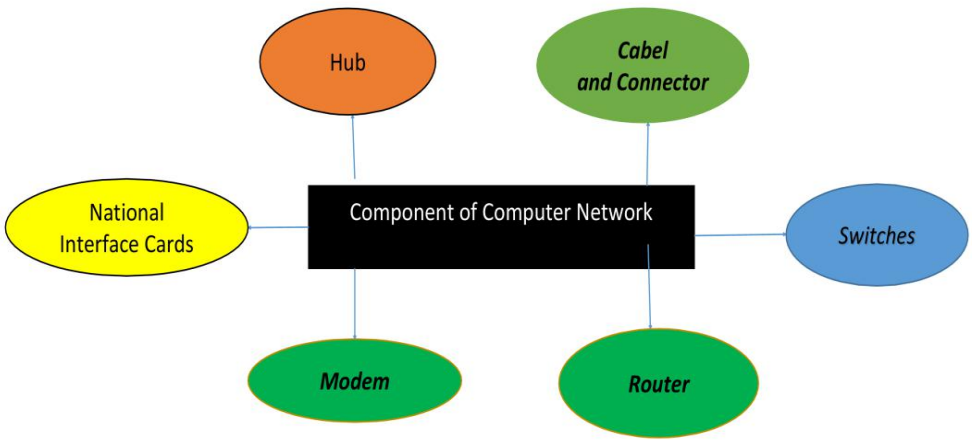


Fig-1,1

NIC(National Interface Cards)-:

NIC is a device that helps the computer to communicate with another Device.The network interface cards contains the hardware addresses the data-link layer protocol use this address to identify the system on the network so that it transfers the data to the correct destination.

There are two types of NIC: wireless NIC and wired NIC.

Wireless NIC:- All the modern laptops use the wireless NIC. In Wireless NIC, a connection is made using the antenna that employs the **radio wave technology**.

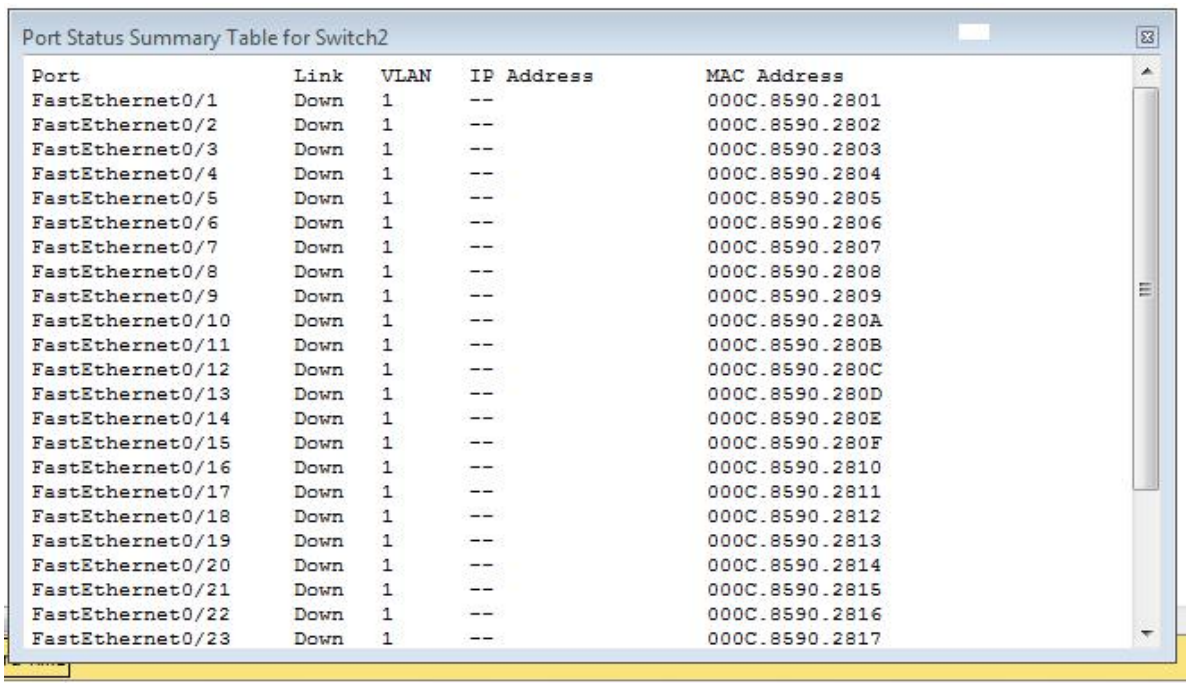
Wired NIC:- Cables use the **wired NIC** to transfer the data over the medium.

Hub:-

Hub is a central device that splits the network connection into multiple devices. When computer requests for information from a computer, it sends the request to the Hub. Hub distributes this request to all the interconnected computers.

Switch:-

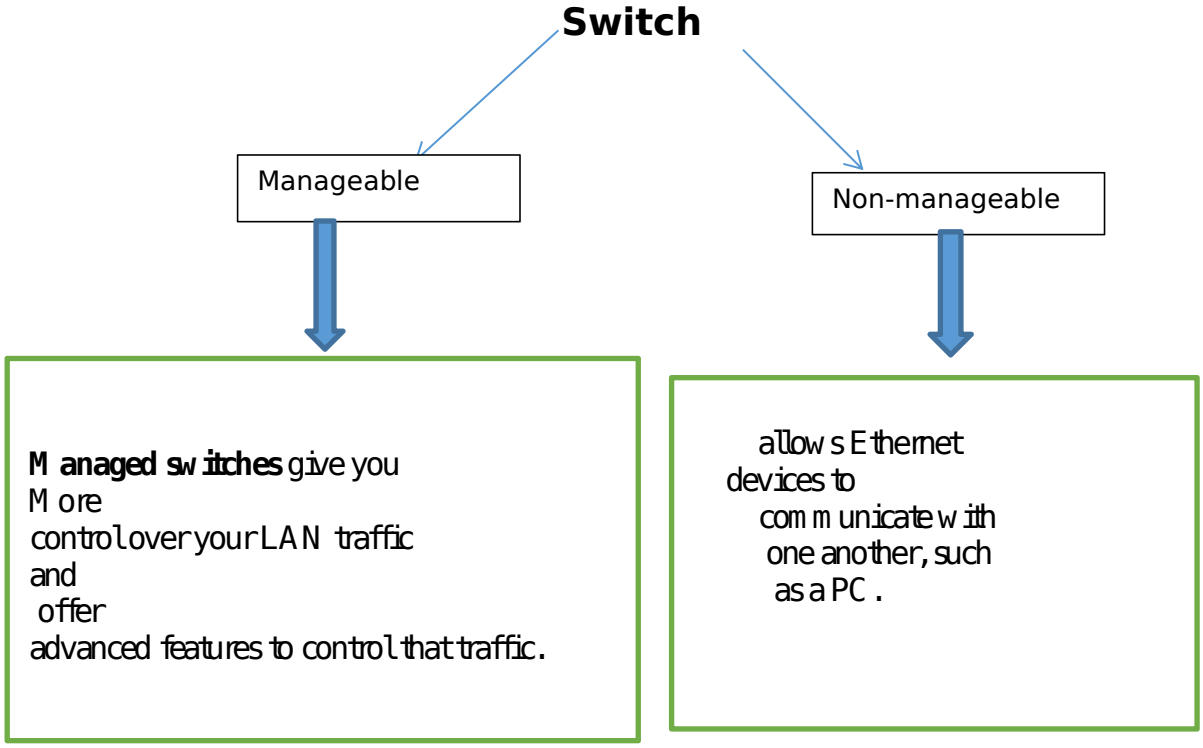
Switch is also used to connect multiple workstation.Switch is more intelligent than hub.It has special kind of memory Mac address/Filter/Look up table.



Port Status Summary Table for Switch2

Port	Link	VLAN	IP Address	MAC Address
FastEthernet0/1	Down	1	--	000C.8590.2801
FastEthernet0/2	Down	1	--	000C.8590.2802
FastEthernet0/3	Down	1	--	000C.8590.2803
FastEthernet0/4	Down	1	--	000C.8590.2804
FastEthernet0/5	Down	1	--	000C.8590.2805
FastEthernet0/6	Down	1	--	000C.8590.2806
FastEthernet0/7	Down	1	--	000C.8590.2807
FastEthernet0/8	Down	1	--	000C.8590.2808
FastEthernet0/9	Down	1	--	000C.8590.2809
FastEthernet0/10	Down	1	--	000C.8590.280A
FastEthernet0/11	Down	1	--	000C.8590.280B
FastEthernet0/12	Down	1	--	000C.8590.280C
FastEthernet0/13	Down	1	--	000C.8590.280D
FastEthernet0/14	Down	1	--	000C.8590.280E
FastEthernet0/15	Down	1	--	000C.8590.280F
FastEthernet0/16	Down	1	--	000C.8590.2810
FastEthernet0/17	Down	1	--	000C.8590.2811
FastEthernet0/18	Down	1	--	000C.8590.2812
FastEthernet0/19	Down	1	--	000C.8590.2813
FastEthernet0/20	Down	1	--	000C.8590.2814
FastEthernet0/21	Down	1	--	000C.8590.2815
FastEthernet0/22	Down	1	--	000C.8590.2816
FastEthernet0/23	Down	1	--	000C.8590.2817

->Switch reads Mac address & it store in filter table.switch sends the message directly from source to the destination.



->Manageable switch use also console cabel for extension properties of switch.

Cabel & Connectors:-

Cable is a transmission media that transmits the communication signals.

There are three types of cables:-

1). Twisted pair cable
2). Coaxial cable
3). Fiber optic cable

1).Twisted pair cable:-

It is a high-speed cable that transmits the data over **1Gbps** or more.

2).Coaxial cable:-

Coaxial cable resembles like a TV installation cable. Coaxial cable is more expensive than twisted pair cable, but it provides the high data transmission speed.

3).Fiber optic cable:-

Fibre optic cable is a high-speed cable that transmits the data using light beams. It provides high data transmission speed as compared to other cables. It is more expensive as compared to other cables, so it is installed at the government level.

Router:-

Router is a device that connects the LAN to the internet. The router is mainly used to connect the distinct networks or connect the internet to multiple computers.

Modem:-

Modem connects the computer to the internet over the existing telephone line. A modem is not integrated with the computer motherboard. A modem is a separate part on the PC slot found on the motherboard.

NETWORK MODEL

A communication subsystem is a complex piece of Hardware and software. Early attempts for implementing the software for such subsystems were based on a single, complex, unstructured program with many interacting component.

-> In a layered approach, networking concept is divided into several layers, and each layer is assigned a particular task.

The basic elements of layered architecture are services, protocols, and interfaces.

Service: It is a set of actions that a layer provides to the higher layer.

Protocol: It defines a set of rules that a layer uses to exchange the information with peer entity. These rules mainly concern about both

the contents and order of the messages used.

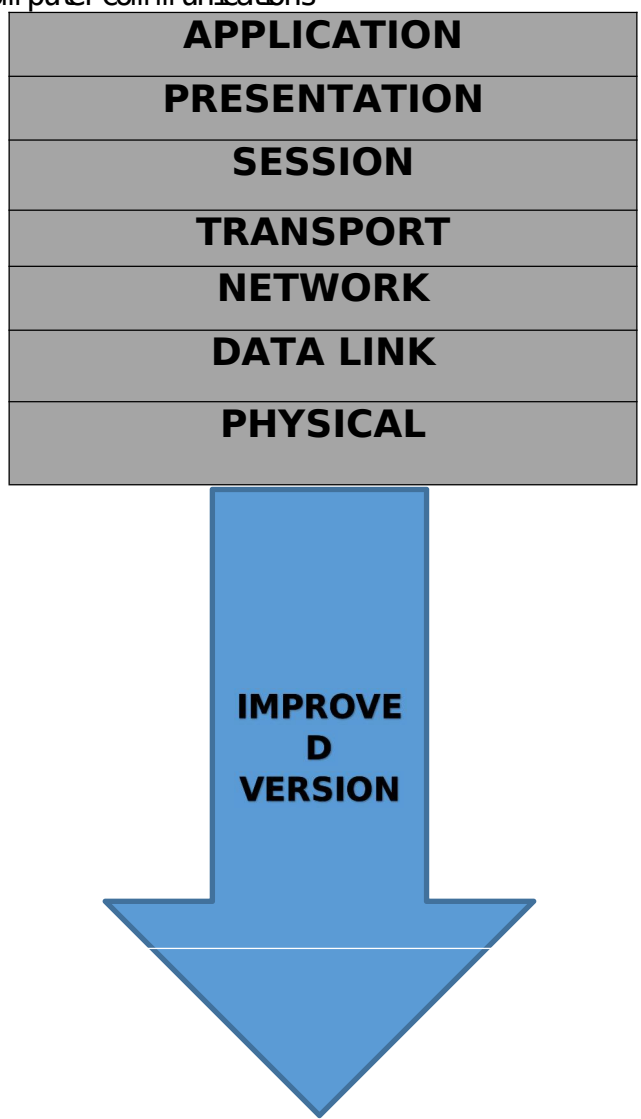
Interface: It is a way through which the message is transferred from one layer to another layer.

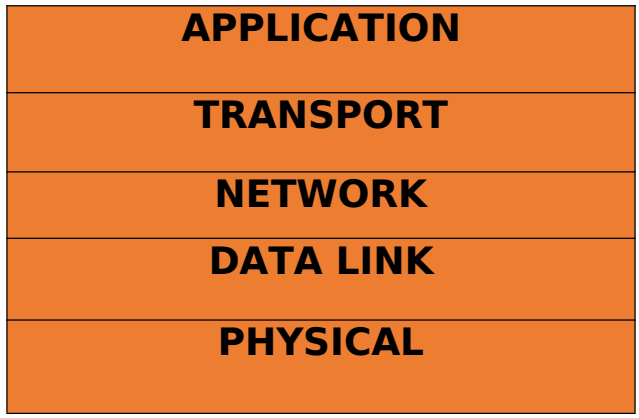
OSI MODEL

OSI stands for **Open System Interconnection** is a reference model that describes how information from a software application in one computer moves through a physical medium to the software application in another computer.

-> OSI consists of seven layers, and each layer performs a particular network function.

-> OSI model was developed by the International Organization for Standardization (ISO) in 1984, and it is now considered as an architectural model for the inter-computer communications





TCP/IP MODEL

1) .PHYSICAL LAYER:-

It provides a physical medium through which bits are transferred.

Example:- router,nic cards,hub,switch,cable & connector etc.

2) .DATA LINk LAYER:-

The **data link layer** is the protocol **layer** in a program that handles the

moving of **data** into and out of a physical **link** in a **network.**

->It use for error free transfer of data frames.

-> It provides a reliable and efficient communication between two or more devices.

Example:- protocols are Ethernet for local area networks (multi-node), the

Point-to-Point Protocol (PPP), HDLC and ADCCP for point-to-point (dual-node) connections.

3) .NETWORK LAYER:-

It is responsible for moving packet from source to destination.

Four important function of network layer.

Internetworking: An internetworking is the main responsibility of the network layer. It provides a logical connection between different devices.

Addressing: A Network layer adds the source and destination address to the header of the frame. Addressing is used to identify the device on the

internet.

Routing: Routing is the major component of the network layer, and it determines the best optimal path out of the multiple paths from source to the destination.

Packetizing: A Network Layer receives the packets from the upper layer and converts them into packets. This process is known as Packetizing. It is achieved by internet protocol (IP).

Examples:- Internet Protocol,Internet Control Message Protocol (ICMP or "ping"),Internet Gateway Management Protocol (IGMP),IPX/SPX.

4) .TRANSPORT LAYER:-(TCP/UDP)

It provides reliable massage delivery from process to processes.

The two protocols used in this layer are:

a).Transmission Control Protocol

->It is a standard protocol that allows the systems to communicate over the internet.

->It establishes and maintains a connection between hosts.

->When data is sent over the TCP connection, then the TCP protocol divides the data into smaller units known as segments. Each segment travels over the internet using multiple routes, and they arrive in different orders at the destination. The transmission control protocol reorders the packets in the correct order at the receiving end.

b).User Datagram Protocol

->User Datagram Protocol is a transport layer protocol.

->It is an unreliable transport protocol as in this case receiver does not send any acknowledgment when the packet is received, the sender does

not wait for any acknowledgment. Therefore, this makes a protocol unreliable.

5).SESSION LAYER:-

It is used to establish,manage and terminate the session.

Functions of Session layer:-

Dialog control: Session layer acts as a dialog controller that creates a dialog between two processes or we can say that it allows the communication between two processes which can be either half-duplex or full-duplex.

Synchronization: Session layer adds some checkpoints when transmitting the data in a sequence. If some error occurs in the middle of the transmission of data, then the transmission will take place again from the checkpoint. This process is known as Synchronization and recovery.

6).PRESENTATION LAYER:-

It is responsible for translation,compression and encryption.

Functions of Presentation layer:

Translation: The processes in two systems exchange the information in the form of character strings, numbers and so on. Different computers use different encoding methods, the presentation layer handles the Interoperability between the different encoding methods. It converts the

data from sender-dependent format into a common format and changes the common format into receiver-dependent format at the receiving end.

Encryption: Encryption is needed to maintain privacy. Encryption is a process of converting the sender-transmitted information into another form and sends the resulting message over the network.

Compression: Data compression is a process of compressing the data, I.e., it reduces the number of bits to be transmitted. Data compression is very important in multimedia such as text, audio, video.

Example:-presentation layer protocols are SSL, HTTP/HTML (agent), FTP (server), AppleTalk Filing Protocol, Telnet, and so on.

7) **.APPLICATION LAYER:-**

This layer provides service to the user.

Functions of Application layer:-

File transfer, access, and management (FTAM):

An application layer allows a user to access the files in a remote computer, to retrieve the files from a computer and to manage the files in a remote computer.

Mail services: An application layer provides the facility for email forwarding and storage.

Directory services: An application provides the distributed database sources and is used to provide that global information about various objects.

TCP/IP MODEL

Tcp/ip model is improved model of osi model.Tcp/Ip is connection full model.

->In this model three layer as session,presentation and application are merge and get one layer known as Application layer.

Application	SMTP,FTP,Telnet,
presentation	
Session	
Transport	TCP,UDP
Network	IP,ICMP,IGMP,ARP,RARP
Data link	
Physical layer	

Chapter-3

IP Addressing:-It supports unique addressing for computer on a network.

IP(Internet protocol):-

IP(Internet protocol) is the primary network protocol used on the

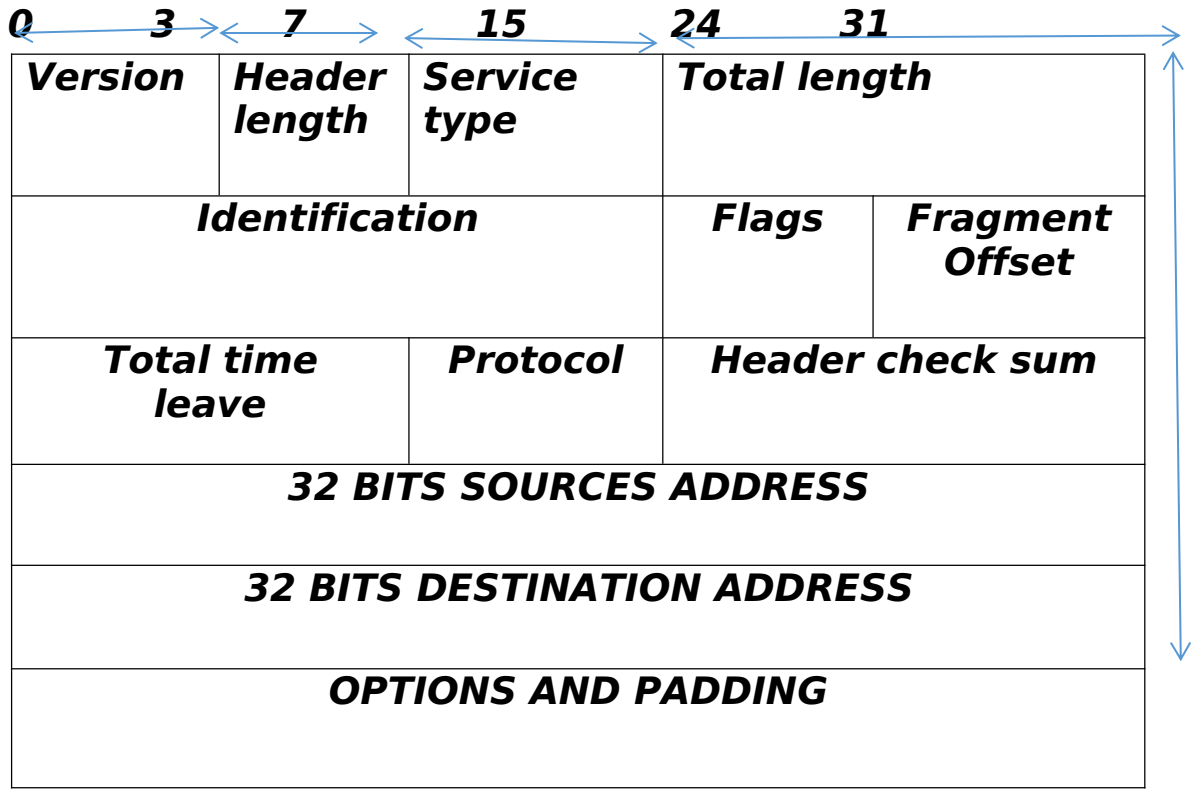
internet,developed in the 1970s.On the internet and many other

networks,together with TCP.

IPV4(4 byte) ***IPV6(***16 byte)

->This is a layer 3 of the OSI model.

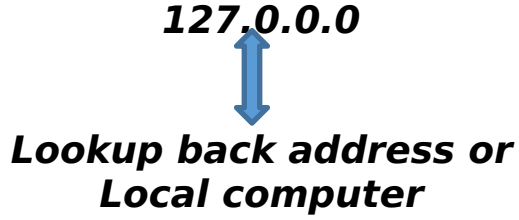
IPV4(IP Version 4)

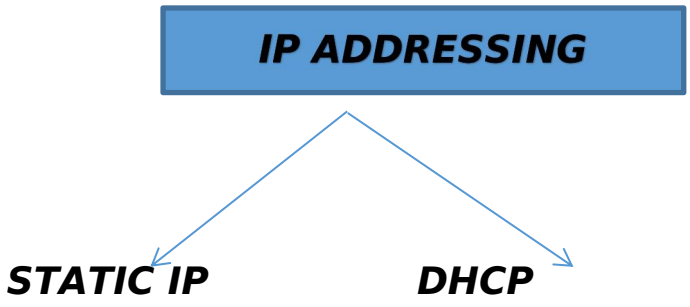


***IP ADDRESS CLASSES* :-**

*FIVE different **IP** address classes.*

Class Name	***range***
A	***1-127***
B	***128-191***
C	***192-223***
D	***224-239***
E	***240-254***



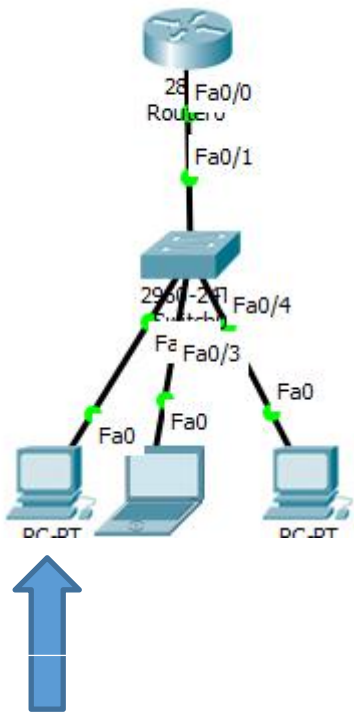


Static IP:-

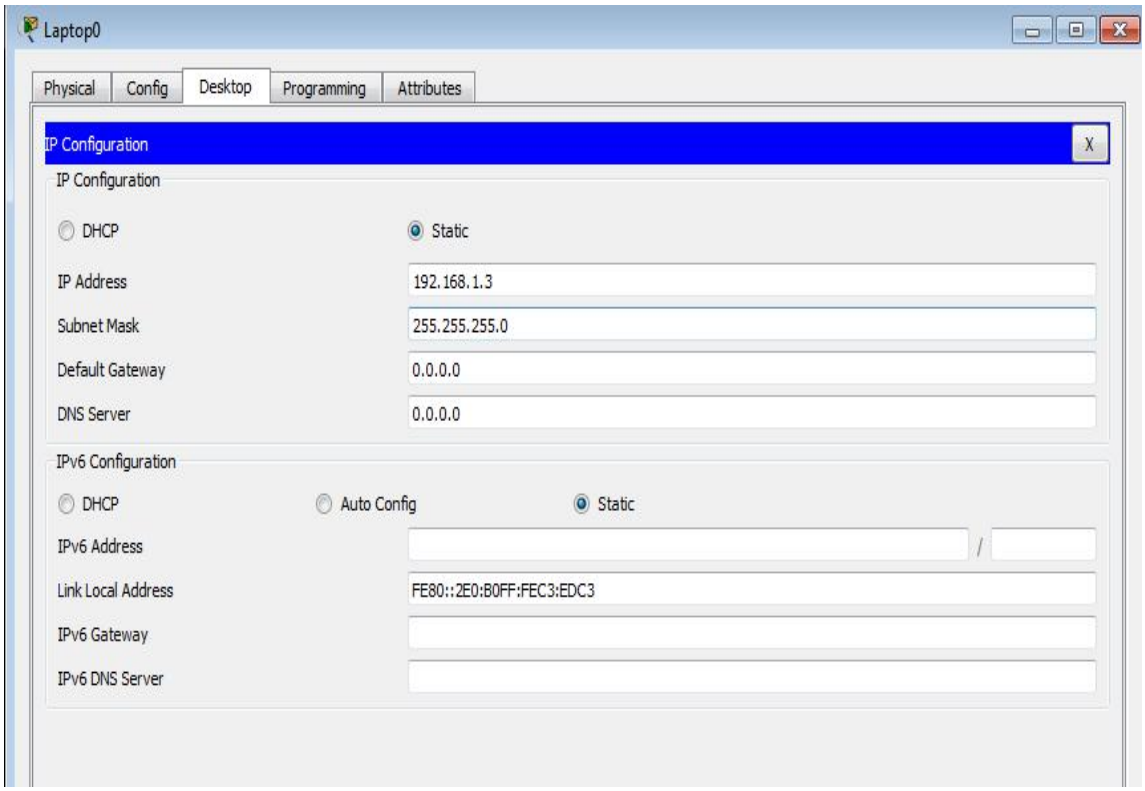
Ip addressing is a scheme by which ip address is assign statically all the device which are communicate to each other.

Ip assign method:-

First a network is create by the help of router ,switch,cabel and Pc or laptop or any other device which are communicate to each other



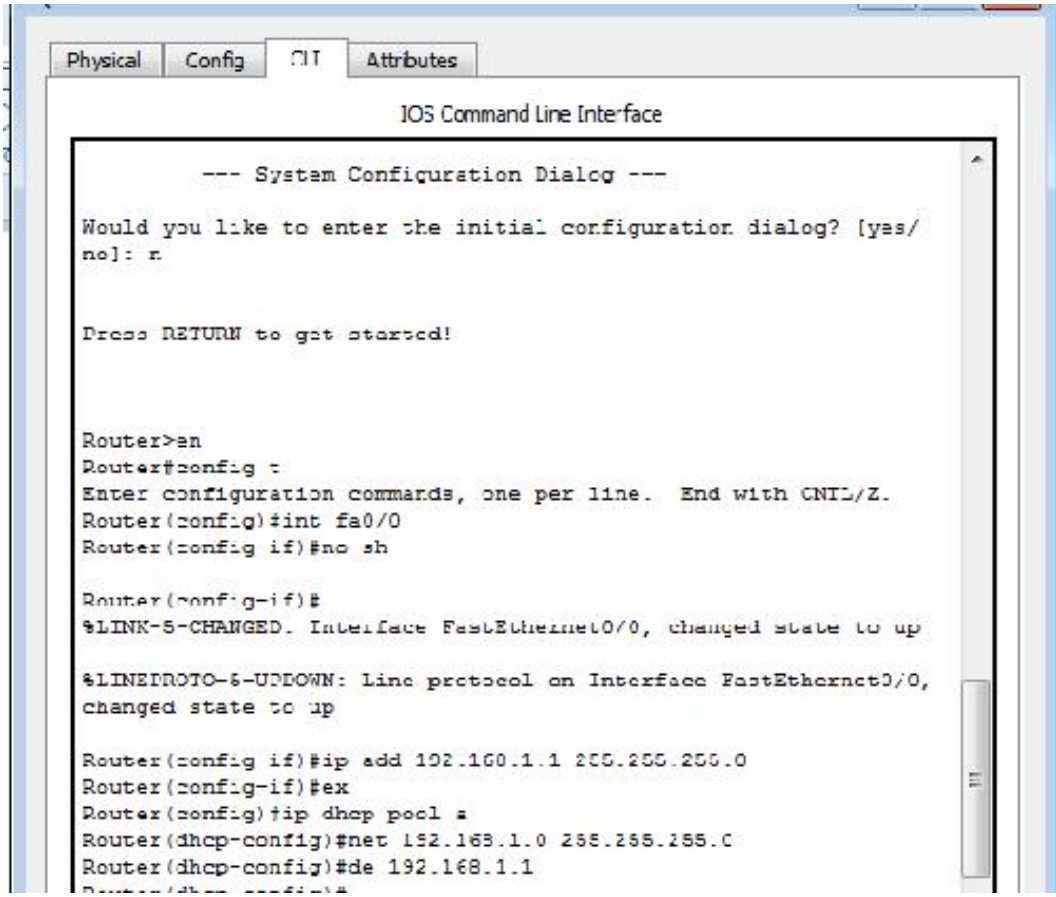
Click on Pc0 and after then ip configure then



DHCP(Dynamic host configure protocol):-
Ip address is assign dynamically when click on dhcp for any device which are communicate to each other.

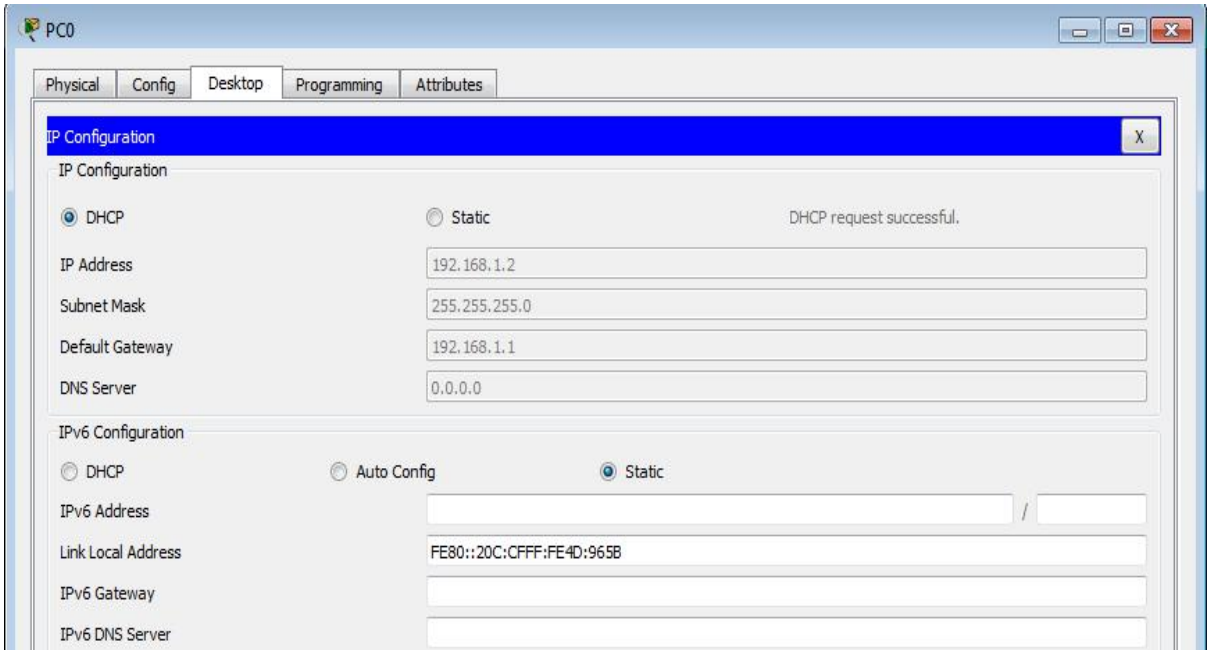
Command on Router:-(for dhcp ip)

```
Router>en
Router#config t
Router(config)#int fa0/0
Router(config-if)#no sh
Router(config-if)#ip add 192.168.1.1 255.255.255.0
Router(config-if)#ex
Router(config)#ip dhcp pool a
Router(config-dhcp)#net 192.168.1.0 255.255.255.0
Router(config-dhcp)#de 192.168.1.1
Router(config-dhcp)#ex
```



Method of dhcp ip after command given:-

Click on any device which are connected network host after then click on ip configure and then click on dhcp.



Testing of connection on network:-

Choose one sender and other is receiver.

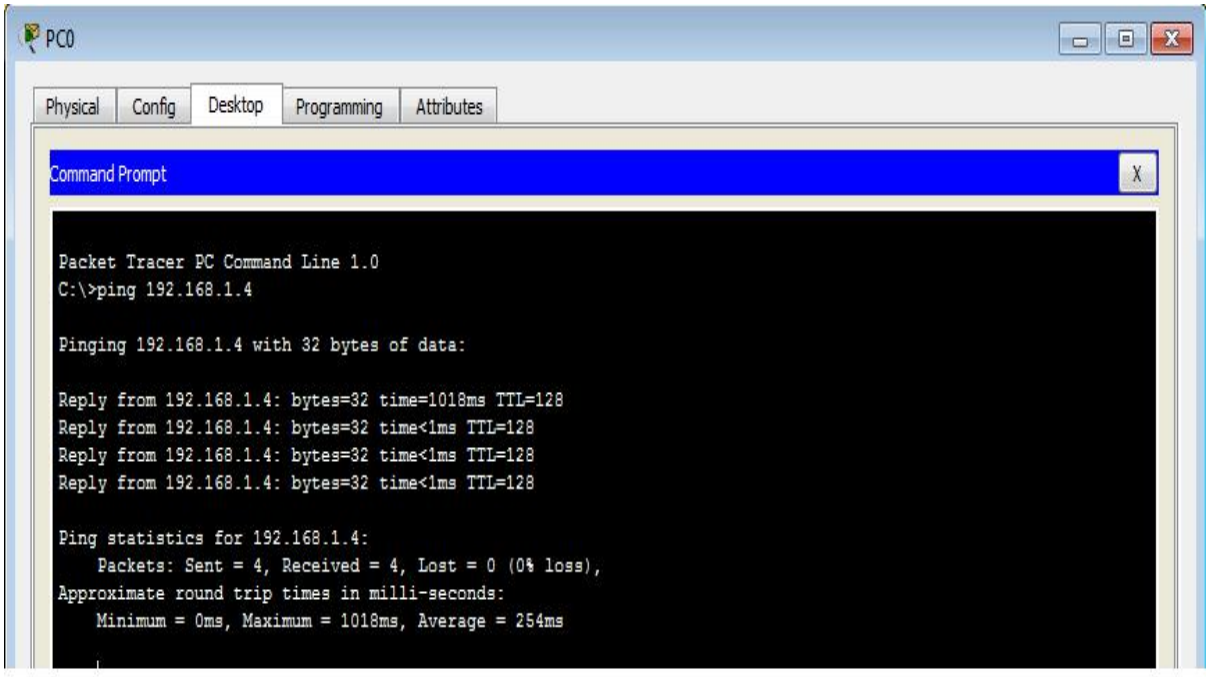
Click on sender pc and go on Desktop and then click and go

On command prompt write command:-

C:\>ping receiver_ip_address

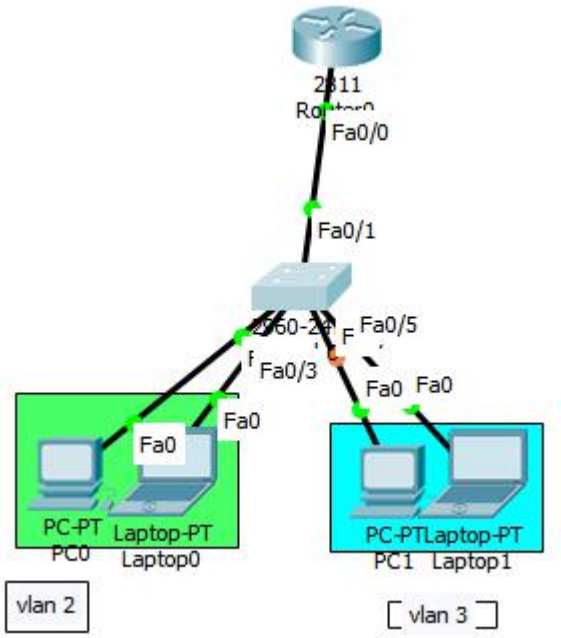
Example:-

C:\>ping 192.168.1.4



Virtual area network(vlan):-

Vlan is a method by which create multiple network on one switch.
->One vlan create only one network.



Command for create Vlan:-

```
Switch>en
Switch#config t
Switch(config)#vl 2
Switch(config-vlan)#vl 3
Switch(config-vlan)#ex
Switch(config)#int r fa0/2-3
Switch(config-if)#sw m a
Switch(config-if-range)#sw a vl 2
Switch(config-if-range)#ex
Switch(config)#int r fa0/4-5
Switch(config-if range)#sw m a
Switch(config-if-range)#sw a vl 3
```

Vlan was created on switch:-
Vlan 2
Vlan 3
And command use:- Switch#sh vl

fa0/2,fa0/3 → Vlan 2

Fa0/4,fa0/5 → Vlan 3

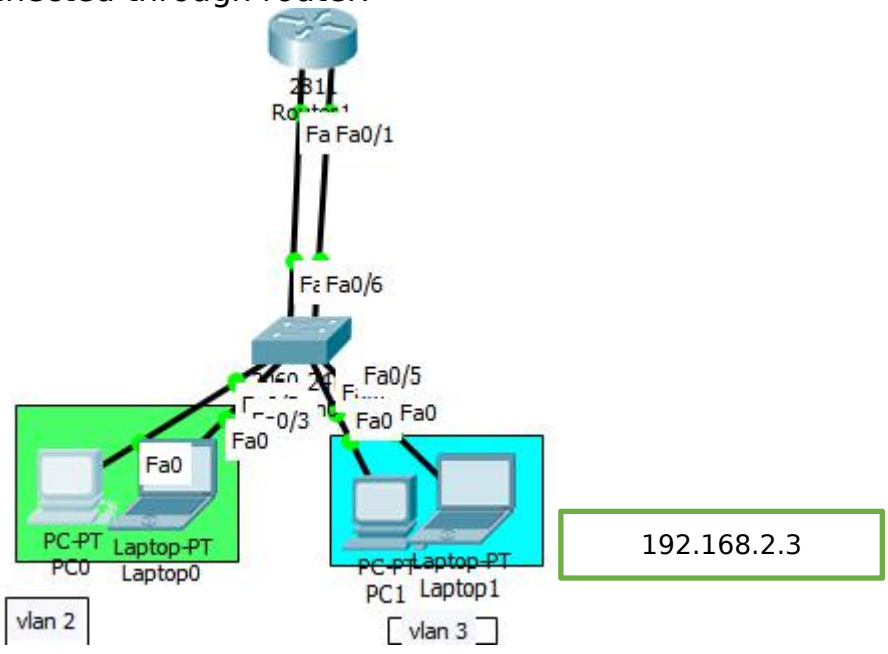
IOS Command Line Interface

```
Switch>en
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#int r fa0/2-3
Switch(config-if-range)#vl 2
Switch(config-vlan)#sw m a
                   ^
% Invalid input detected at '^' marker.

Switch(config-vlan)#ex
Switch(config)#int r fa0/2-3
Switch(config-if-range)#sw m a
Switch(config-if-range)#sw vl 2
                           ^
% Invalid input detected at '^' marker.

Switch(config-if-range)#sw a vl 2
Switch(config-if-range)#ex
Switch(config)#vl 3
Switch(config-vlan)#ex
Switch(config)#int r fa0/4-5
Switch(config-if-range)#sw m a
Switch(config-if-range)#sw a vl 3
Switch(config-if-range)#
```

Here two network was created:-
Network 192.168.1.0
Network 192.168.2.0

Intervlan

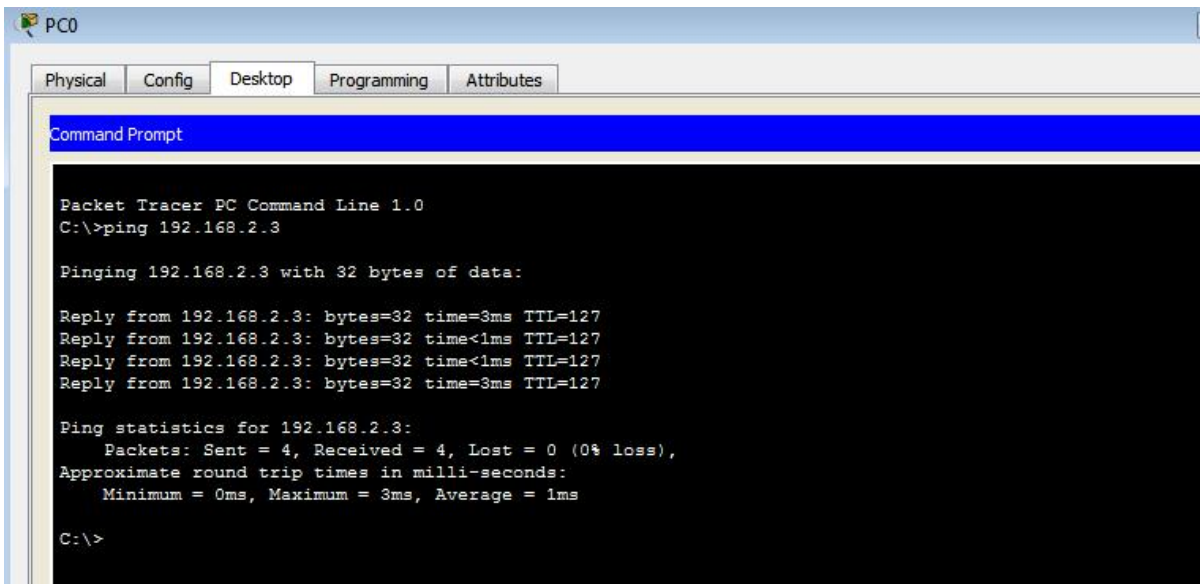
Intervlan is a method by which different network is created on Switch and communication is takes place by the help of number of cabel connected through router.



First dhcp ip is give all the device through dhcp ip command.

After then on switch this command is give.

```
Switch>en
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#int fa0/5
Switch(config-if)#sw m a
Switch(config-if)#sw a vl 2
Switch(config-if)#int fa0/6
Switch(config-if)#sw m a
Switch(config-if)#sw a vl 3
Switch(config-if)#vl 2
Switch(config-vlan)#vl 3
Switch(config-vlan)#ex
Switch(config)#int r fa0/2-3
Switch(config-if-range)#sw m a
Switch(config-if-range)#sw a vl 2
Switch(config-if-range)#int r fa0/4-5
Switch(config-if-range)#sw m a
Switch(config-if-range)#sw a vl 3
Switch(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to
```



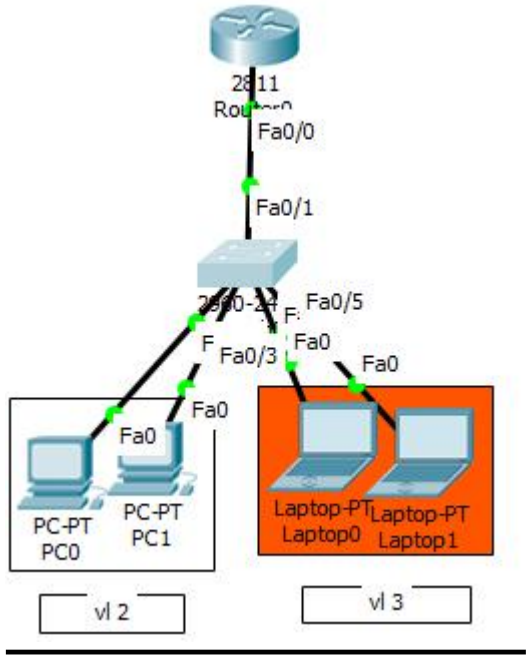
***Disadvantage*:-**

Here multiple cabel is use for multiple vlan or network.

Router on stick

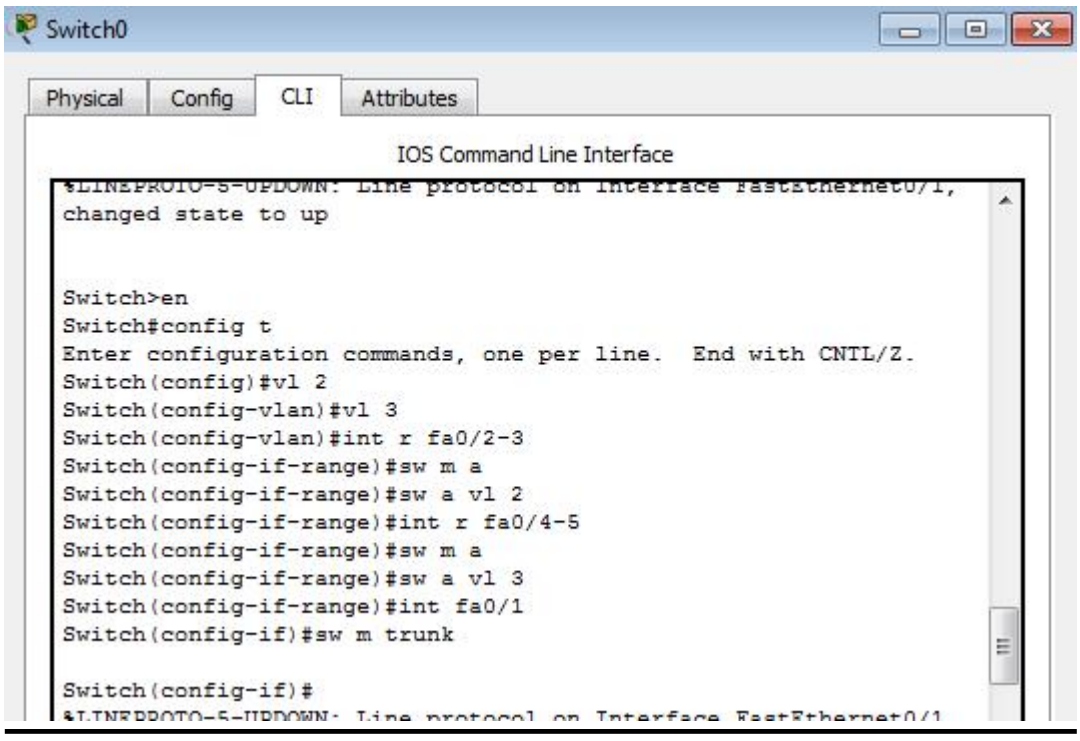
Router on stick is a improved version of intervlan.In this network

Dhcp ip is given by one trunk cabe on switch.



```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int fa0/0.1
Router(config-subif)#no sh
Router(config-subif)#en dot1q 2
Router(config-subif)#ip add 192.168.1.1 255.255.255.0
Router(config-subif)#ip dhcp pool a
Router(dhcp-config)#net 192.168.1.0 255.255.255.0
Router(dhcp-config)#de 192.168.1.1
Router(dhcp-config)#int fa0/0.2
Router(config-subif)#no sh
Router(config-subif)#ip add 192.168.2.1 255.255.255.0

% Configuring IP routing on a LAN subinterface is only allowed if that
subinterface is already configured as part of an IEEE 802.10, IEEE 802.1Q,
or ISL vLAN.

Router(config-subif)#en dot1q 3
Router(config-subif)#ip add 192.168.2.1 255.255.255.0
Router(config-subif)#ip dhcp pool b
Router(dhcp-config)#net 192.168.2.0 255.255.255.0
Router(dhcp-config)#de 192.168.2.1
Router(dhcp-config)#int fa0/0
Router(config-if)#no sh

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

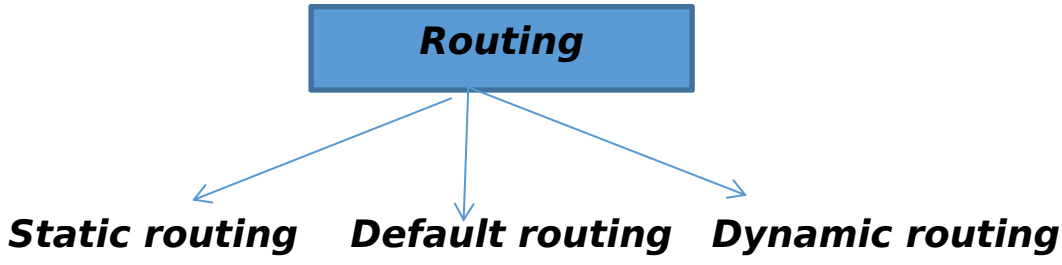
VLAN



Routing

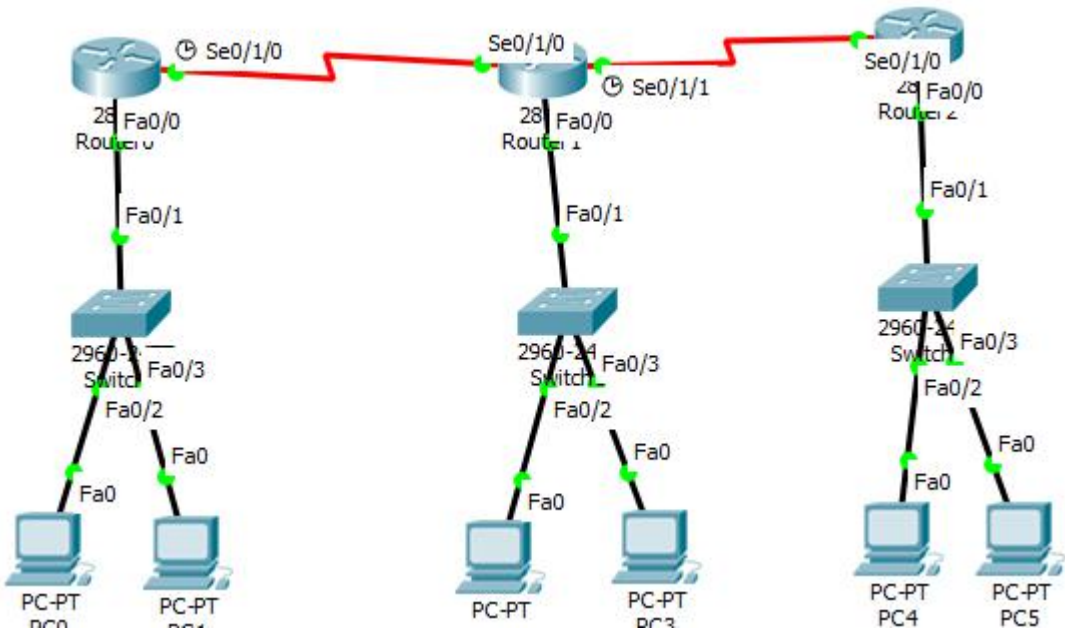
Routing is a method by which communicate one router to another router through routing.

Types of routing:-



STATIC ROUTING

In Static routing all indirect network give by statically.

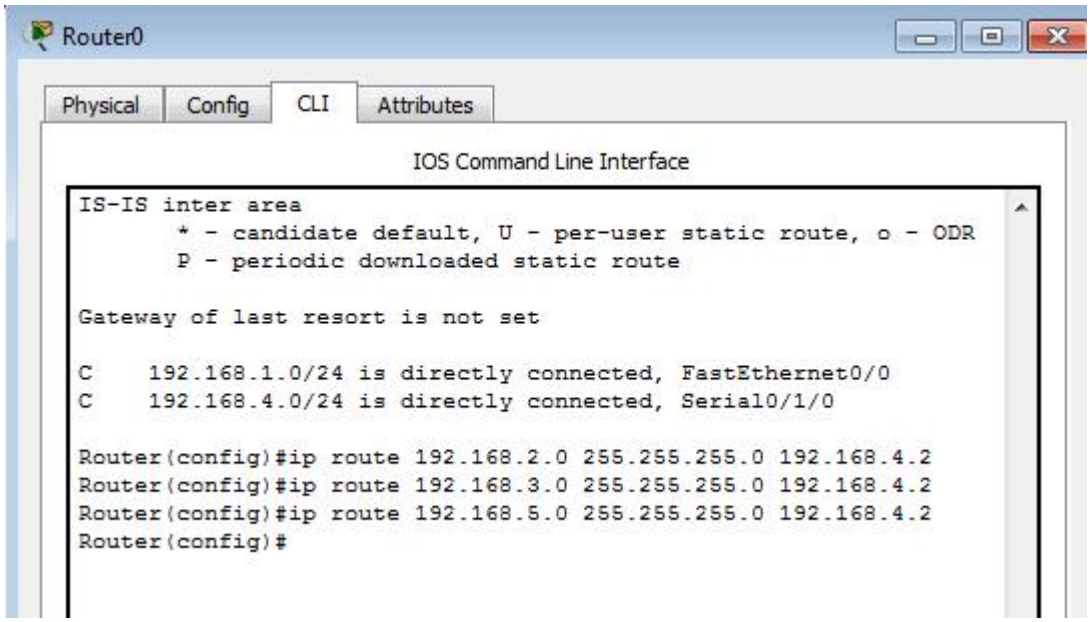


Static routing command:-

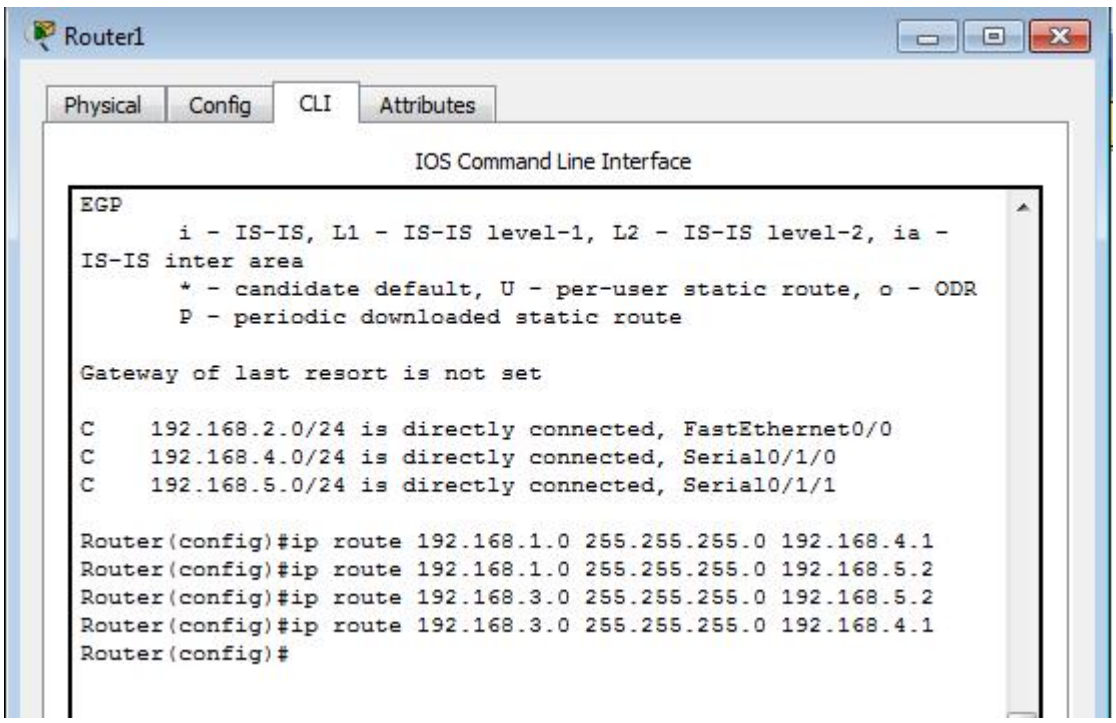
Router(config)#ip route destination_network netmask next_hope_address

->First dhcp ip is given all the device .

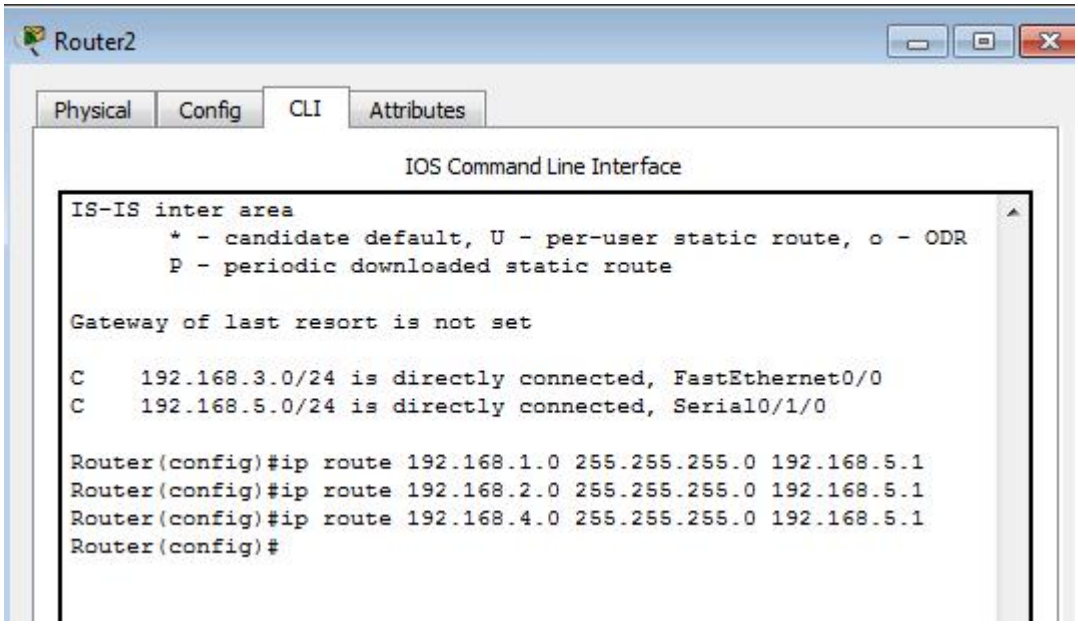
#Command on Router1



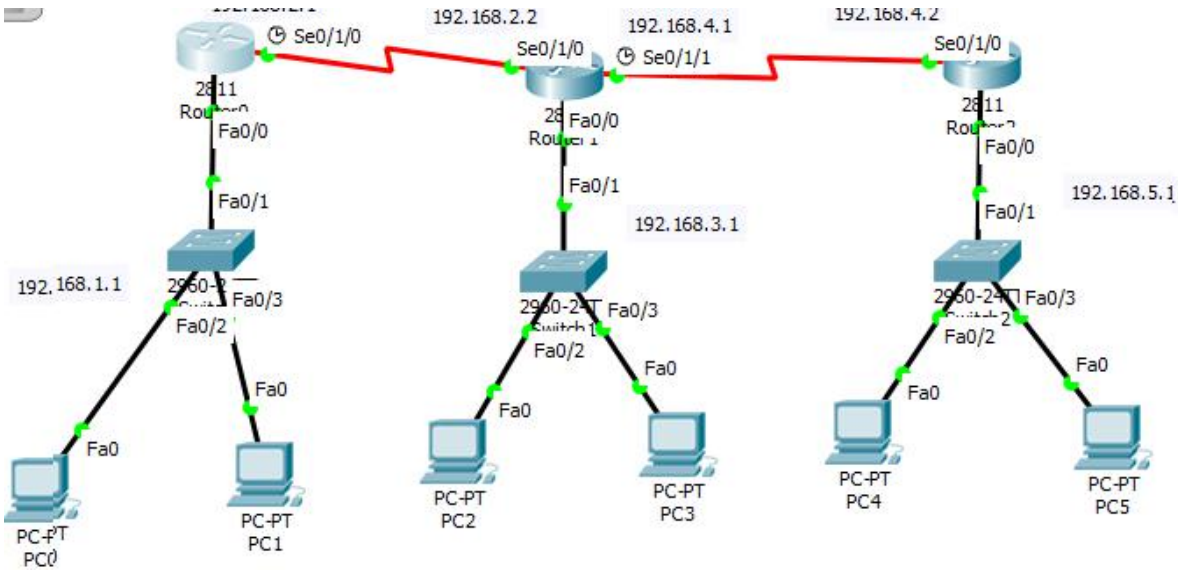
Command on Router2:-

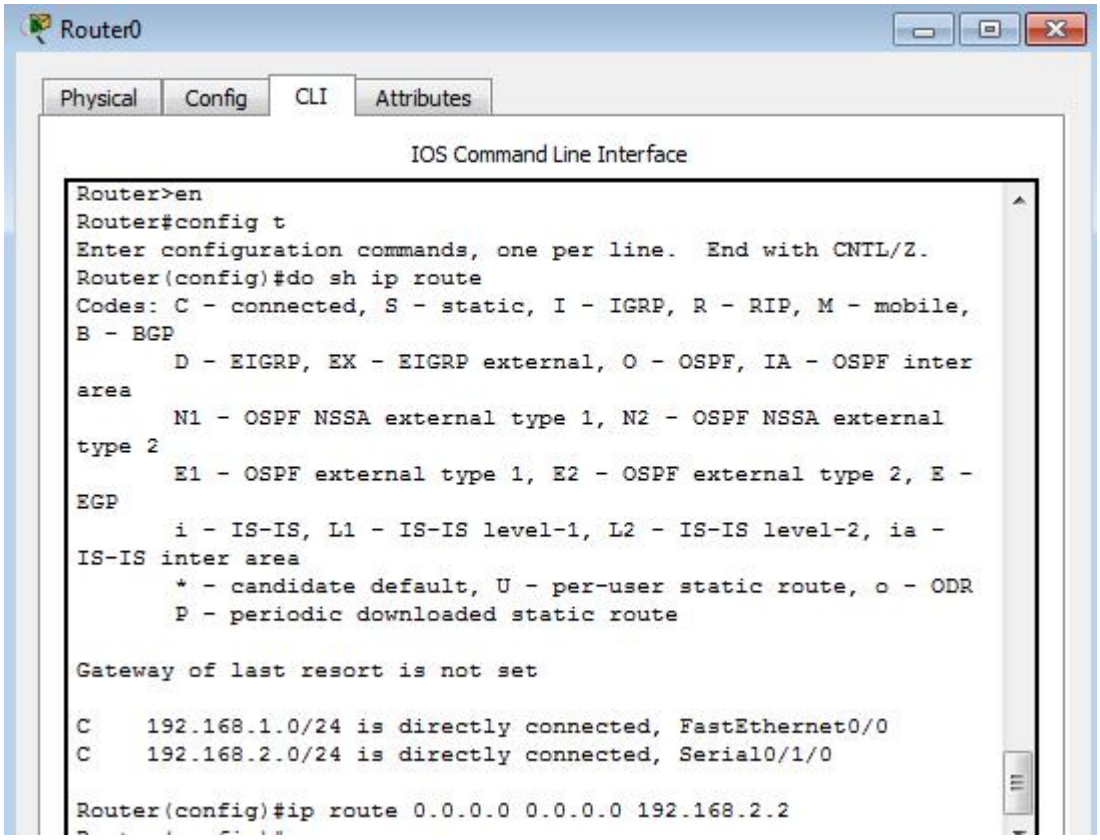


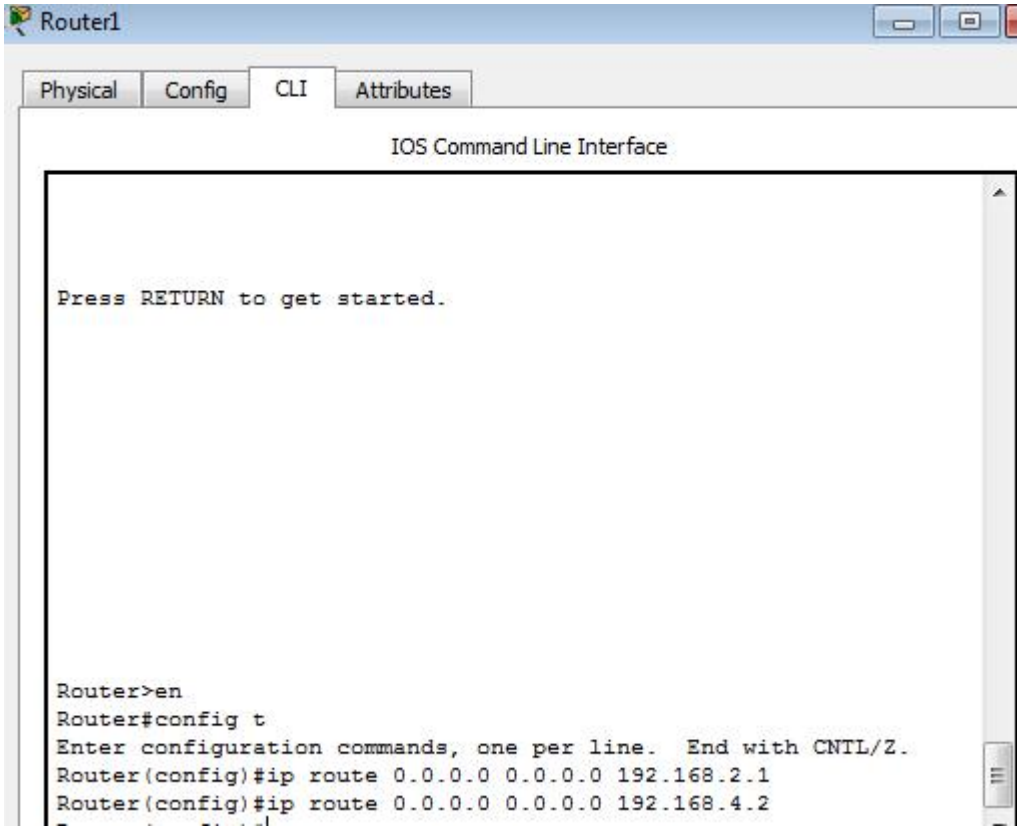
Command on Router3:-

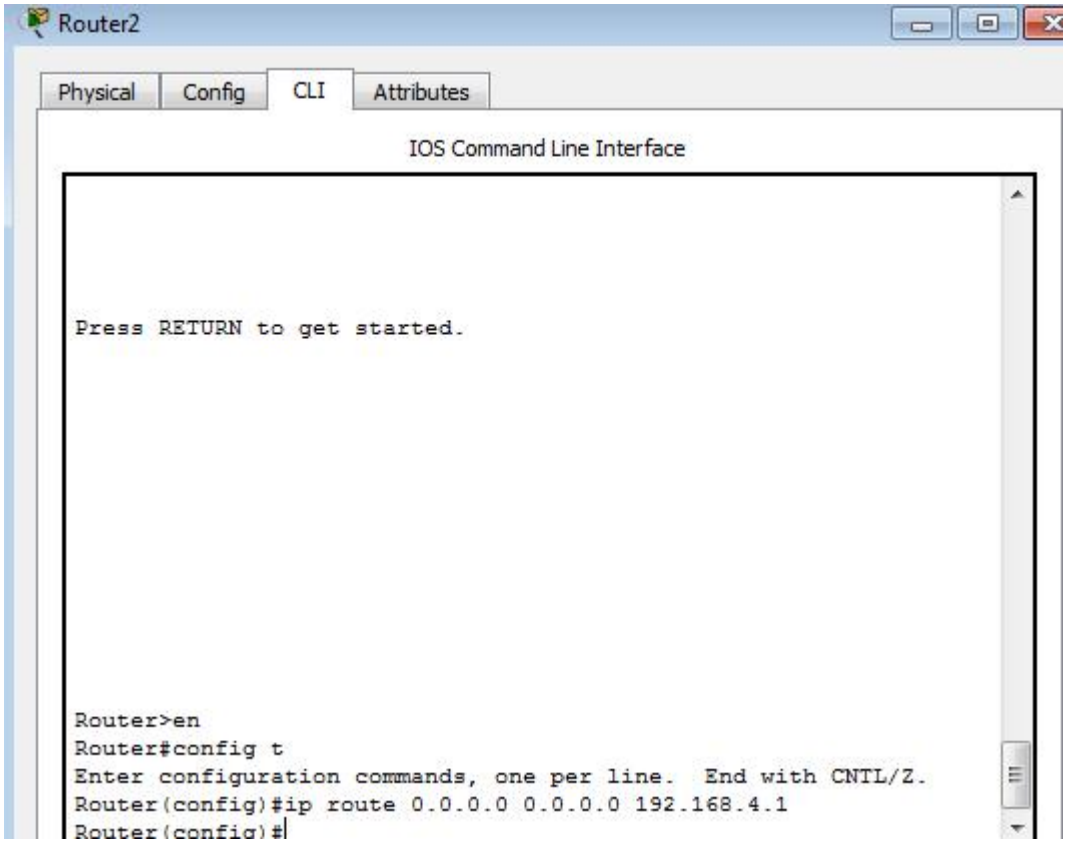


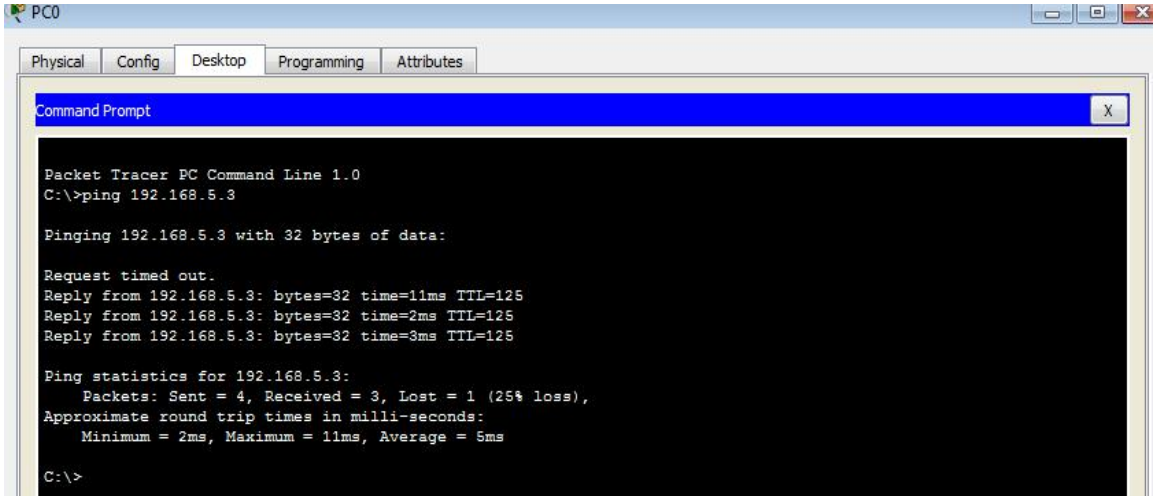
Default routing




Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#do sh 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 192.168.1.0/24 is directly connected, FastEthernet0/0
C 192.168.2.0/24 is directly connected, Serial0/1/0
Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.2.2


Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started.
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.2.1
Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.4.2

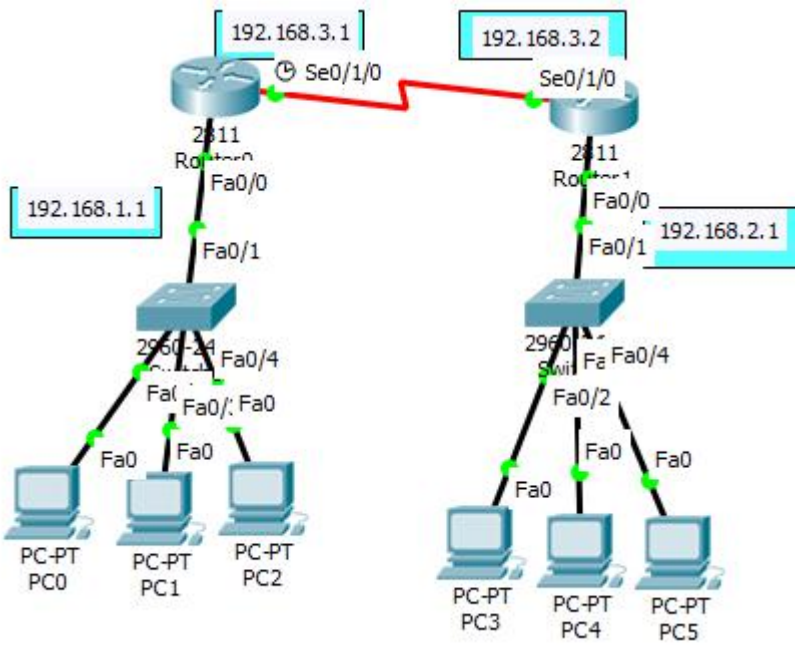

Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started.
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.4.1
Router(config)#



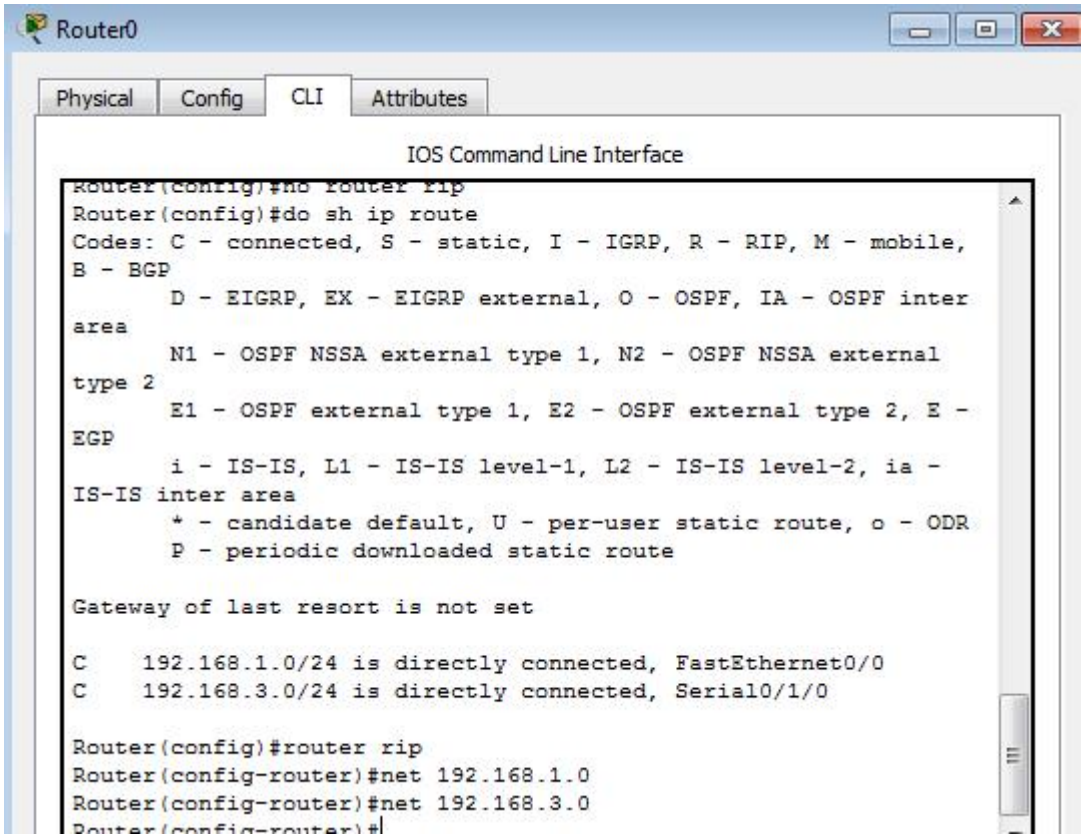
DYNAMIC ROUTING

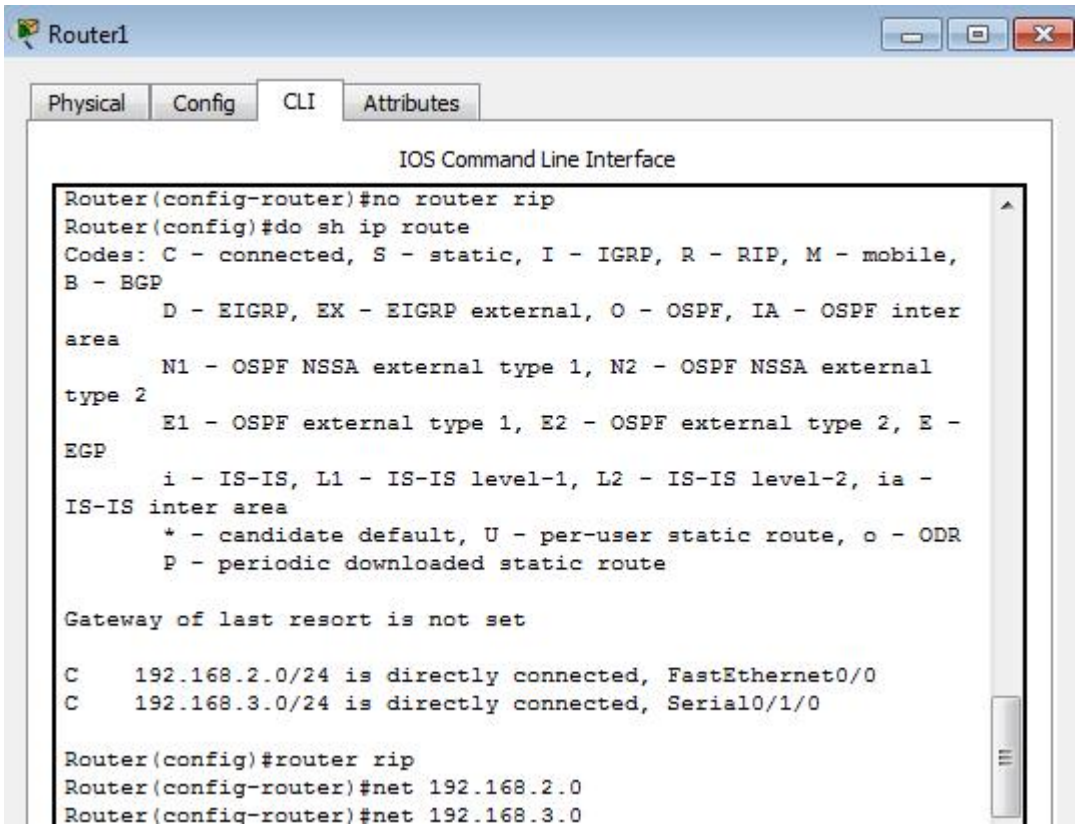
1).RIP 2). EIGRP 3).OSPF

a).SINGLE AREA b).MULTIPLE AREA

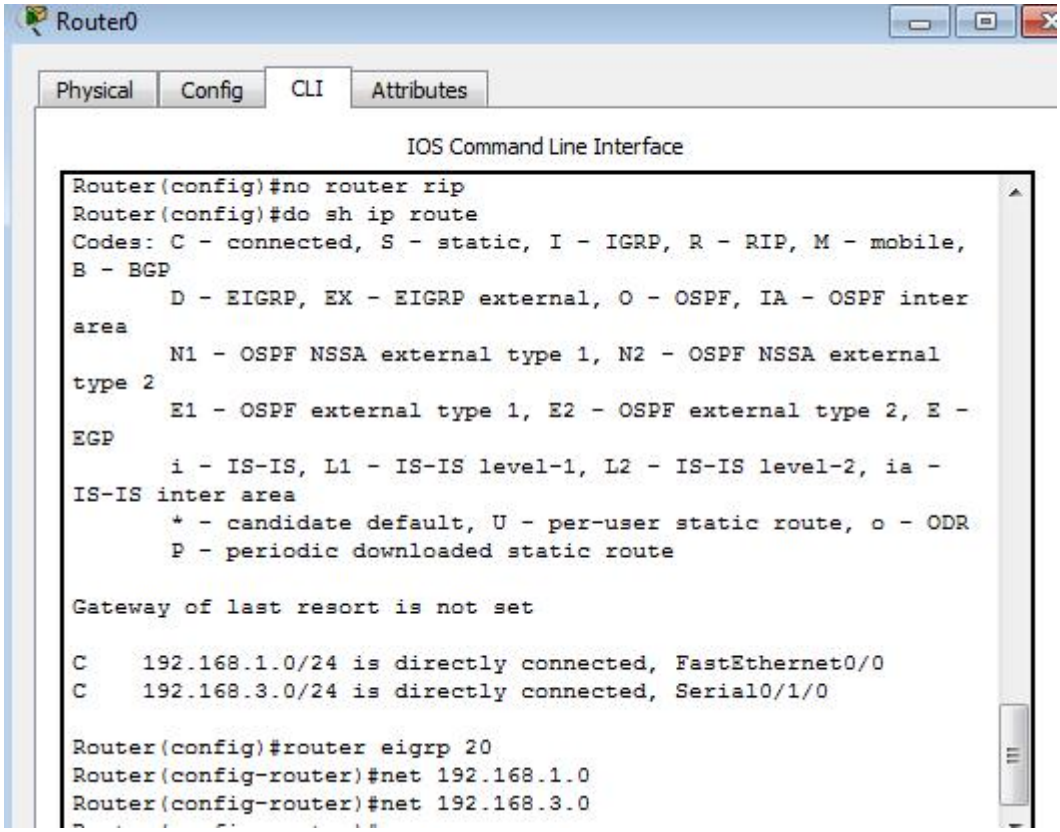


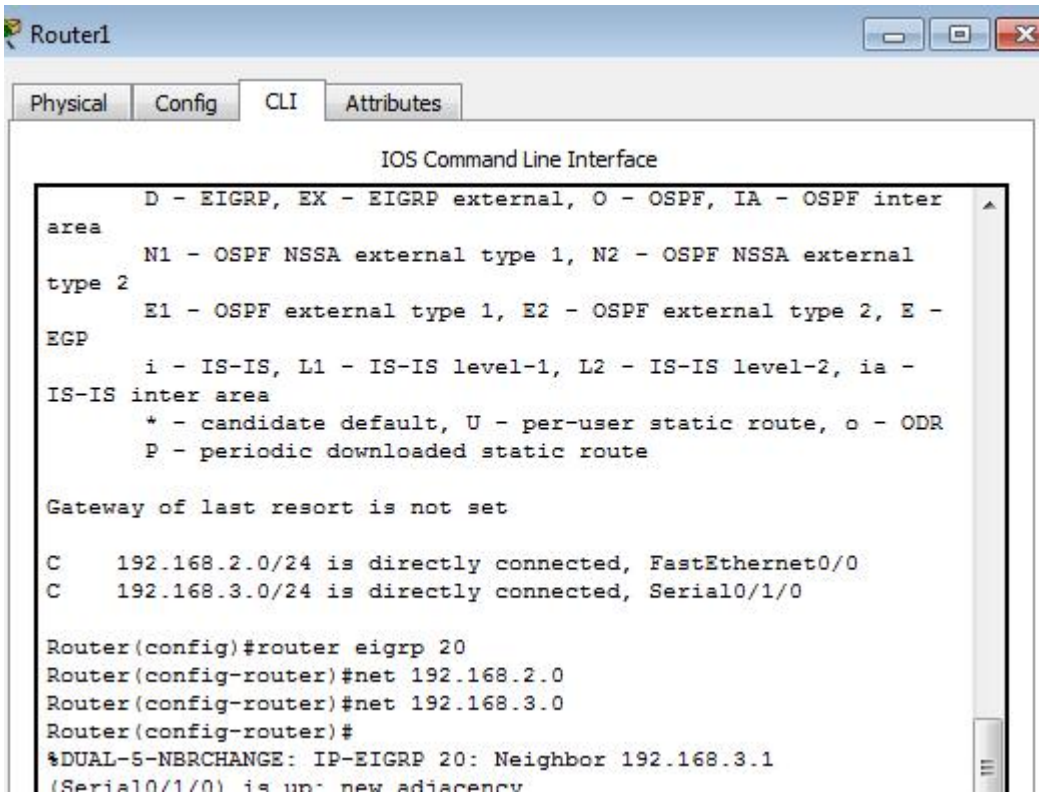
1).RIP ROUTING



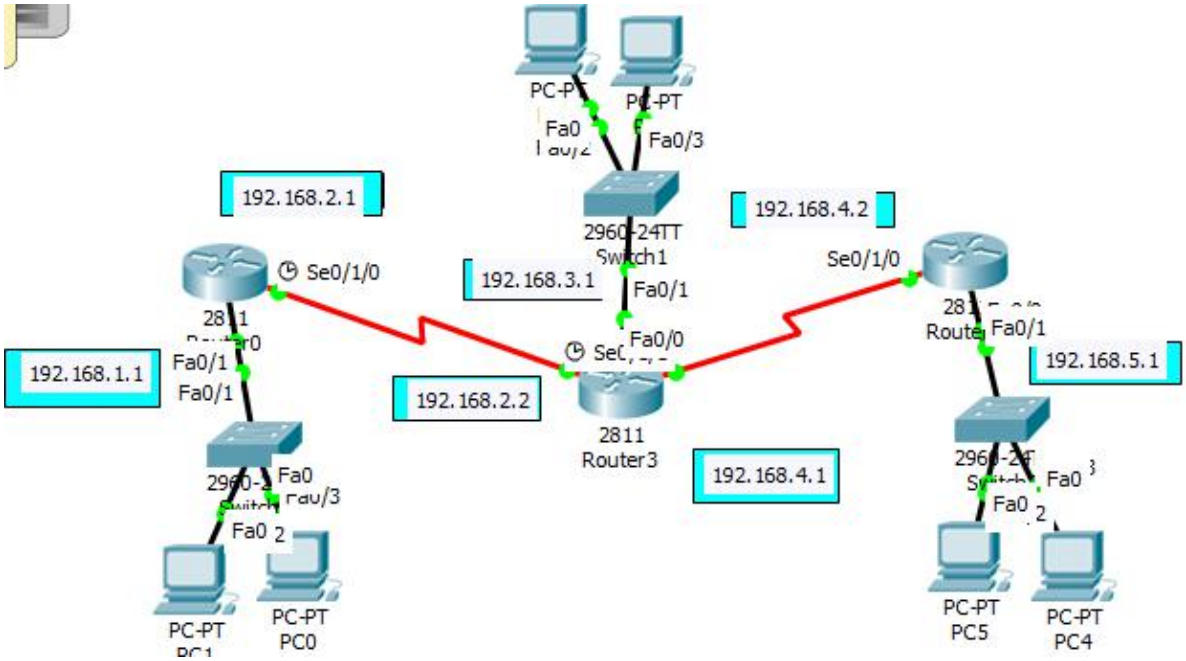


2).EIGRP ROUTING

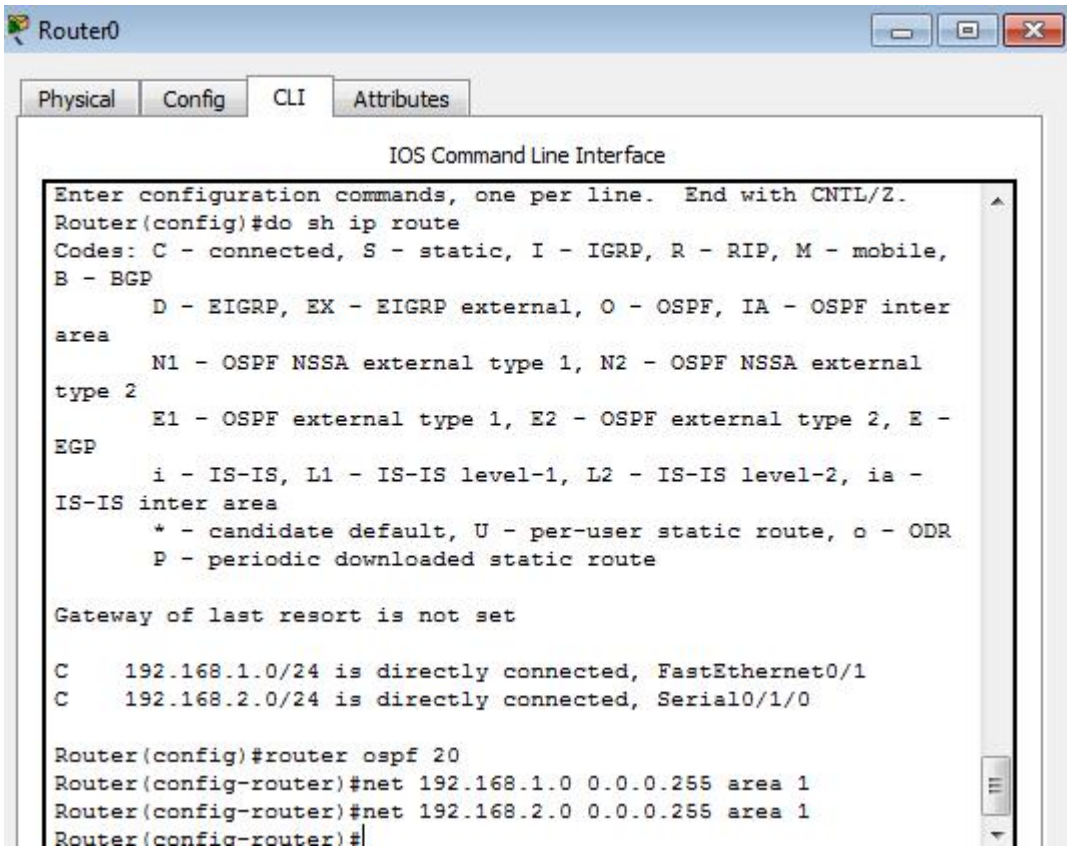


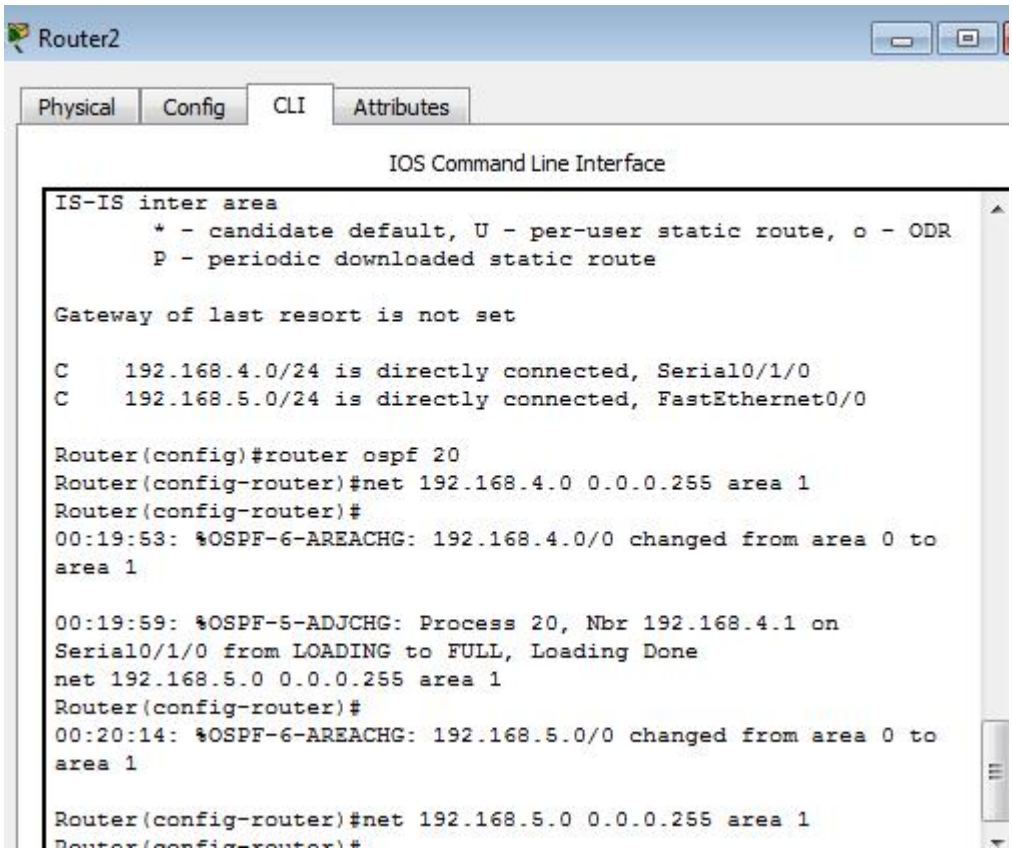


3).OSPF ROUTING

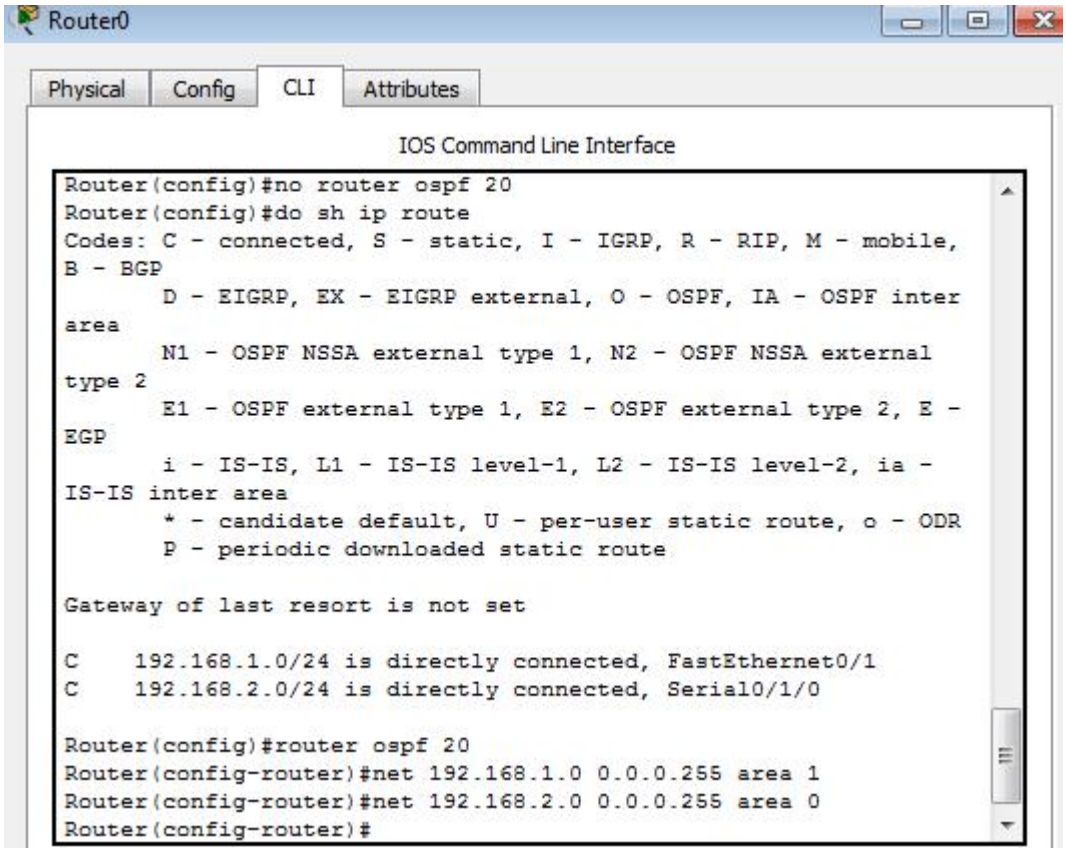


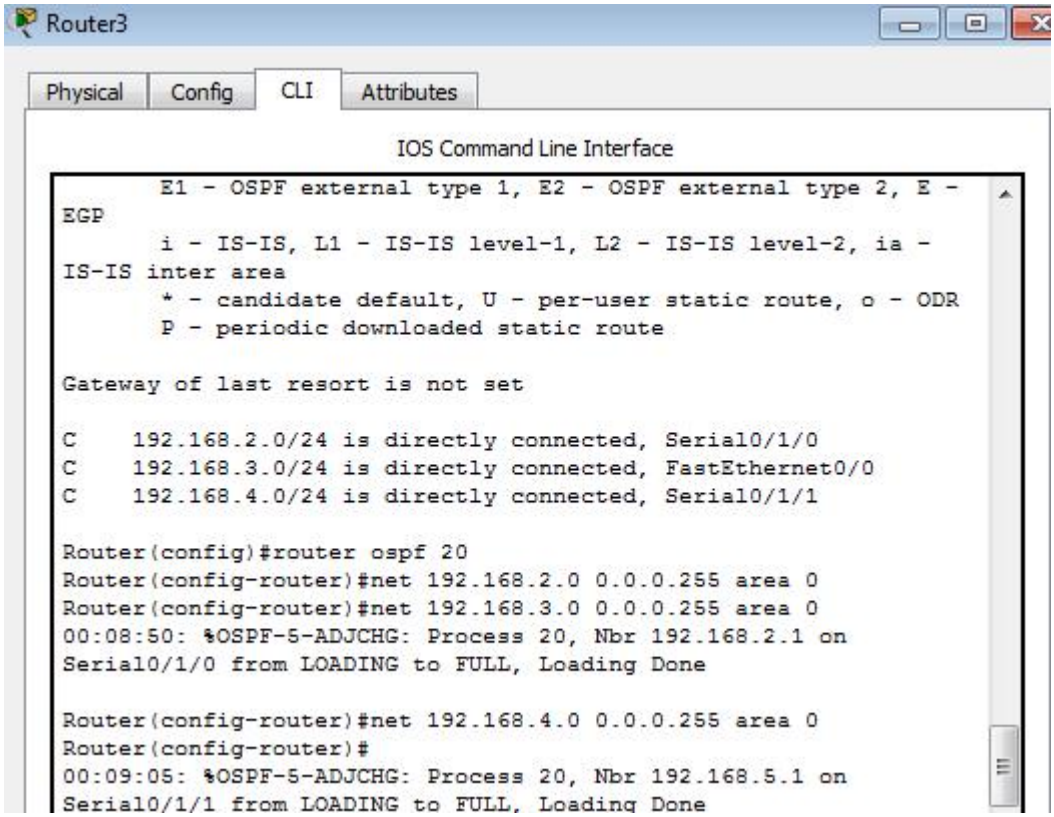
a).SINGLE AREA ROUTING

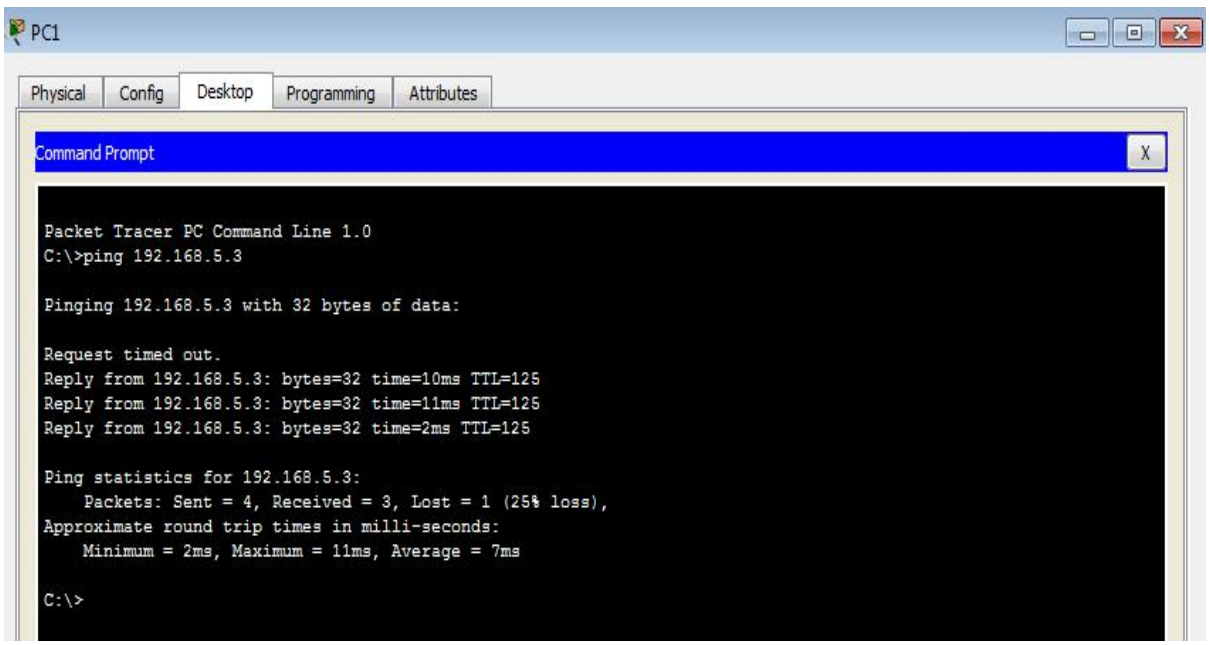




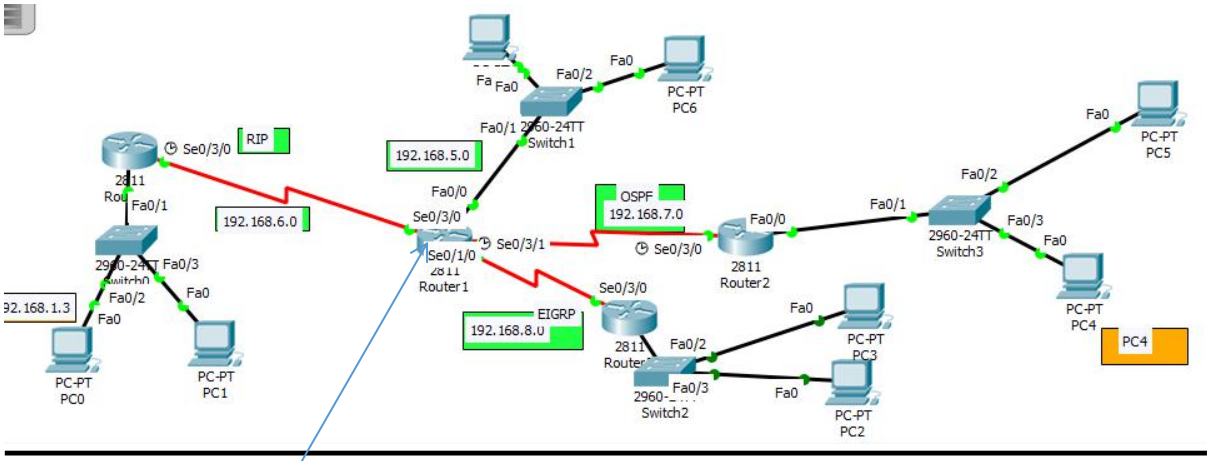
MULTIPLE AREA ROUTING




Router3
Physical
Config
CLI
Attributes
IOS Command Line Interface
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 192.168.2.0/24 is directly connected, Serial0/1/0
C 192.168.3.0/24 is directly connected, FastEthernet0/0
C 192.168.4.0/24 is directly connected, Serial0/1/1
Router(config)#router ospf 20
Router(config-router)#net 192.168.2.0 0.0.0.255 area 0
Router(config-router)#net 192.168.3.0 0.0.0.255 area 0
00:08:50: %OSPF-5-ADJCHG: Process 20, Nbr 192.168.2.1 on Serial0/1/0 from LOADING to FULL, Loading Done
Router(config-router)#net 192.168.4.0 0.0.0.255 area 0
Router(config-router)#
00:09:05: %OSPF-5-ADJCHG: Process 20, Nbr 192.168.5.1 on Serial0/1/1 from LOADING to FULL, Loading Done


PC1
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.5.3
Pinging 192.168.5.3 with 32 bytes of data:
Request timed out.
Reply from 192.168.5.3: bytes=32 time=10ms TTL=125
Reply from 192.168.5.3: bytes=32 time=11ms TTL=125
Reply from 192.168.5.3: bytes=32 time=2ms TTL=125
Ping statistics for 192.168.5.3:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 11ms, Average = 7ms
C:\>

REDISTRIBUTION OF ROUTING



Redistribution on this router

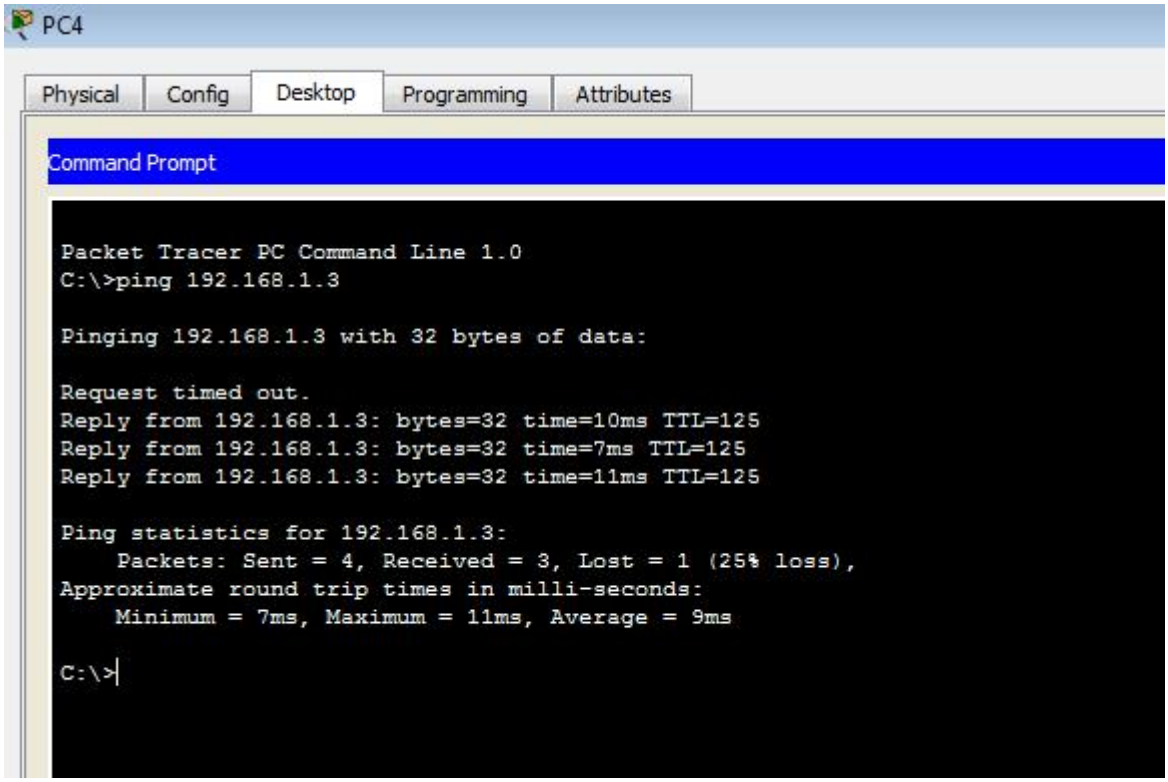
```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router rip
Router(config-router)#re
Router(config-router)#redistribute eigrp 10 metric 2
Router(config-router)#redistribute ospf 10 metric 3
Router(config-router)#router eigrp 10
Router(config-router)#re
Router(config-router)#redistribute rip metric ?
  <1-4294967295>  Bandwidth metric in Kbits per second
Router(config-router)#redistribute rip metric 150000 ?
  <0-4294967295>  EIGRP delay metric, in 10 microsecond units
Router(config-router)#redistribute rip metric 150000 20000?
<0-4294967295>
Router(config-router)#redistribute rip metric 150000 20000 ?
  <0-255>  EIGRP reliability metric where 255 is 100% reliable
Router(config-router)#redistribute rip metric 150000 20000 150 ?
  <1-255>  EIGRP Effective bandwidth metric (Loading) where 255 is 100% loaded
Router(config-router)#redistribute rip metric 150000 20000 150 100 ?
  <1-65535>  EIGRP MTU of the path
Router(config-router)#redistribute rip metric 150000 20000 150 100 15000
Router(config-router)#redistribute ospf 10 metric 150000 20000 150 100 15000
Router(config-router)#router ospf 10
Router(config-router)#router rip subnets
                     ^
% Invalid input detected at '^' marker.

Router(config-router)#red rip subnets
Router(config-router)#red eigrp 10 subnets
```

RIP REDISTRIBUTION

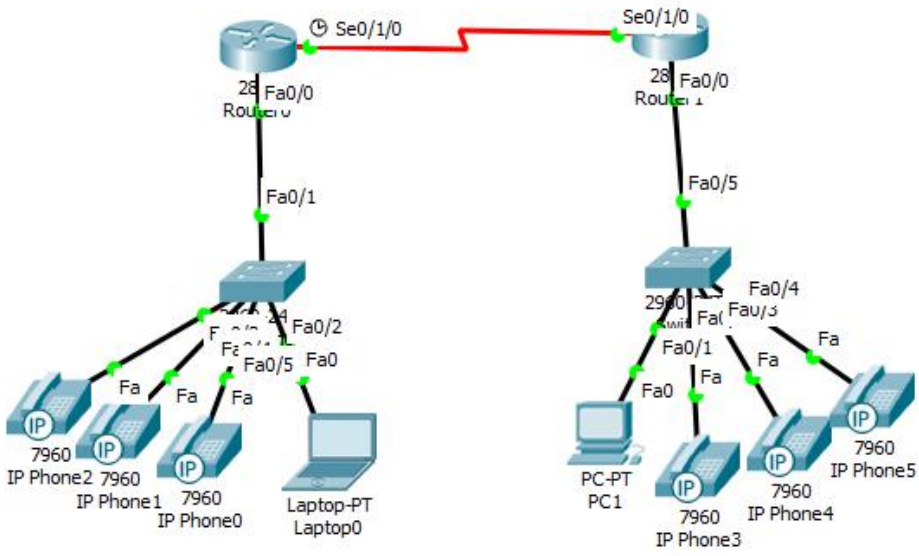
EIGRP REDISTRIBUTION

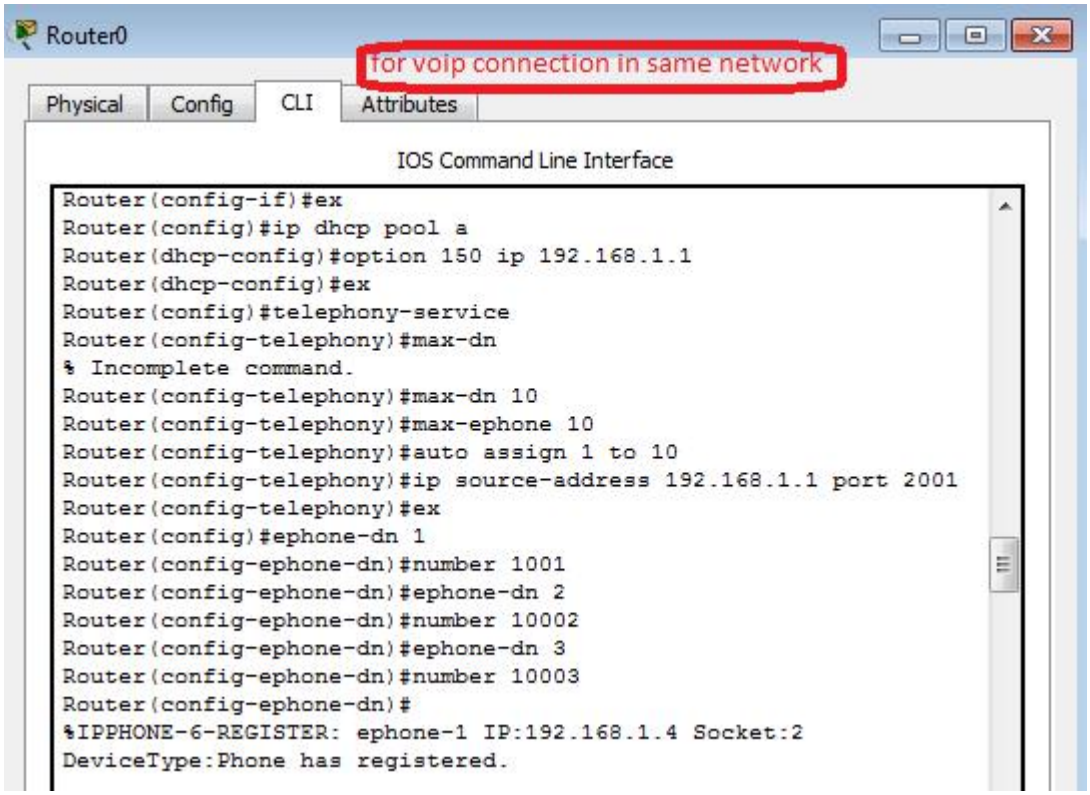
OSPF REDISTRIBUTION

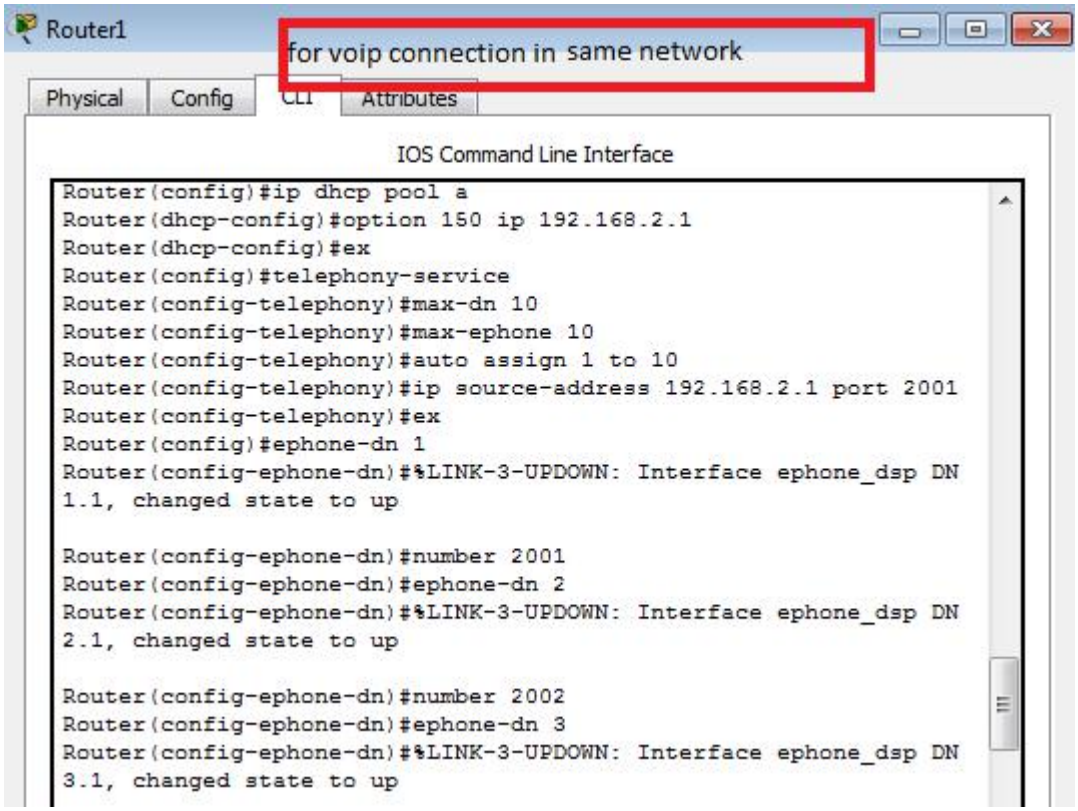
Tesing of connection



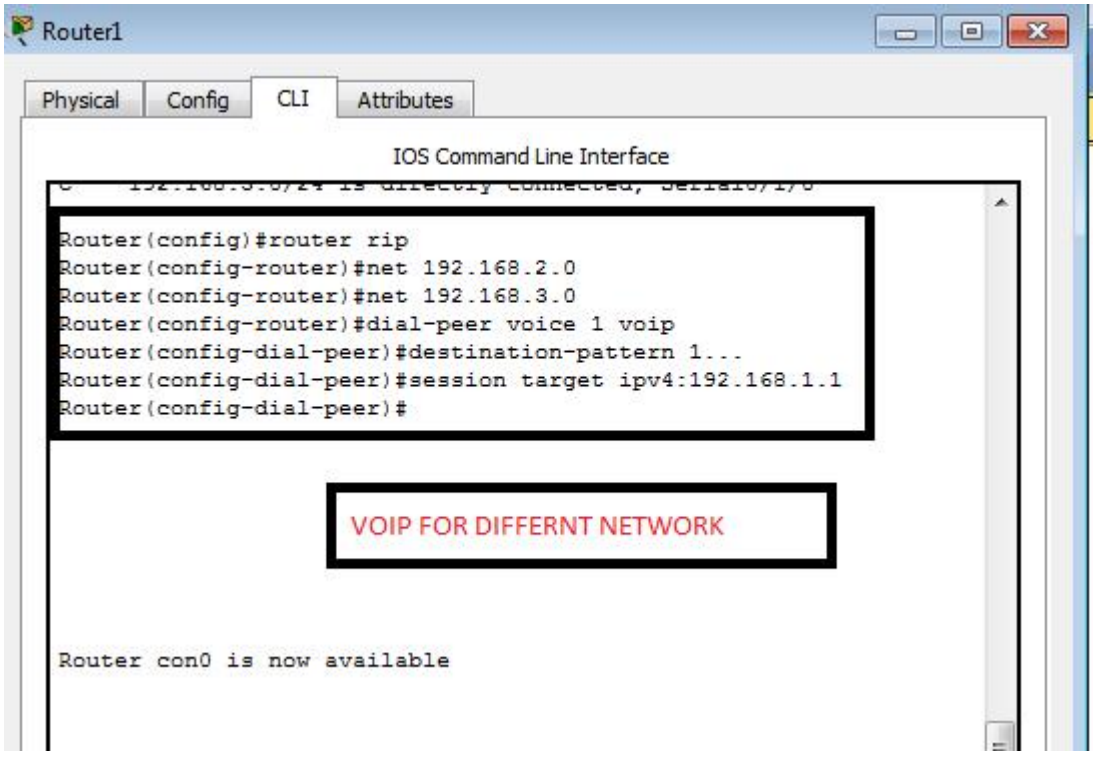
VOIP(VOICE OVER IP FORMAT)




Router0
for voip connection in same network
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config-if)#ex
Router(config)#ip dhcp pool a
Router(dhcp-config)#option 150 ip 192.168.1.1
Router(dhcp-config)#ex
Router(config)#telephony-service
Router(config-telephony)#max-dn
% Incomplete command.
Router(config-telephony)#max-dn 10
Router(config-telephony)#max-ephone 10
Router(config-telephony)#auto assign 1 to 10
Router(config-telephony)#ip source-address 192.168.1.1 port 2001
Router(config-telephony)#ex
Router(config)#ephone-dn 1
Router(config-ephone-dn)#number 1001
Router(config-ephone-dn)#ephone-dn 2
Router(config-ephone-dn)#number 10002
Router(config-ephone-dn)#ephone-dn 3
Router(config-ephone-dn)#number 10003
Router(config-ephone-dn)#
%IPPHONE-6-REGISTER: ephone-1 IP:192.168.1.4 Socket:2
DeviceType:Phone has registered.

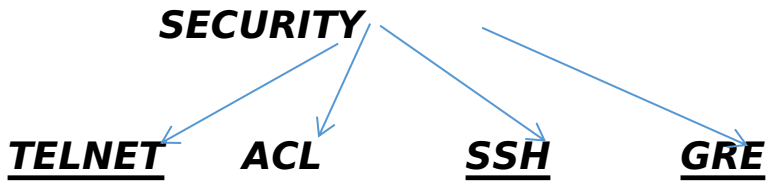

Router1
for voip connection in same network
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config)#ip dhcp pool a
Router(dhcp-config)#option 150 ip 192.168.2.1
Router(dhcp-config)#ex
Router(config)#telephony-service
Router(config-telephony)#max-dn 10
Router(config-telephony)#max-ephone 10
Router(config-telephony)#auto assign 1 to 10
Router(config-telephony)#ip source-address 192.168.2.1 port 2001
Router(config-telephony)#ex
Router(config)#ephone-dn 1
Router(config-ephone-dn)#%LINK-3-UPDOWN: Interface ephone_dsp DN
1.1, changed state to up
Router(config-ephone-dn)#number 2001
Router(config-ephone-dn)#ephone-dn 2
Router(config-ephone-dn)#%LINK-3-UPDOWN: Interface ephone_dsp DN
2.1, changed state to up
Router(config-ephone-dn)#number 2002
Router(config-ephone-dn)#ephone-dn 3
Router(config-ephone-dn)#%LINK-3-UPDOWN: Interface ephone_dsp DN
3.1, changed state to up


Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config)#router rip
Router(config-router)#net 192.168.1.0
Router(config-router)#net 192.168.3.0
Router(config-router)#dial-peer voice 1 voip
Router(config-dial-peer)#destination-pattern 2...
Router(config-dial-peer)#session target ipv4:192.168.2.1
Router(config-dial-peer)#
VOIP FOR OTHER

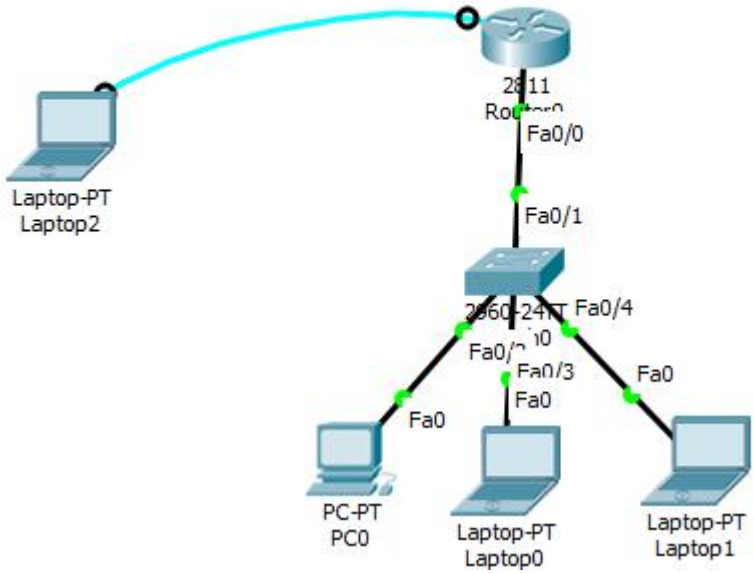

Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config)#router rip
Router(config-router)#net 192.168.2.0
Router(config-router)#net 192.168.3.0
Router(config-router)#dial-peer voice 1 voip
Router(config-dial-peer)#destination-pattern 1...
Router(config-dial-peer)#session target ipv4:192.168.1.1
Router(config-dial-peer)#
VOIP FOR DIFFERNT NETWORK
Router con0 is now available

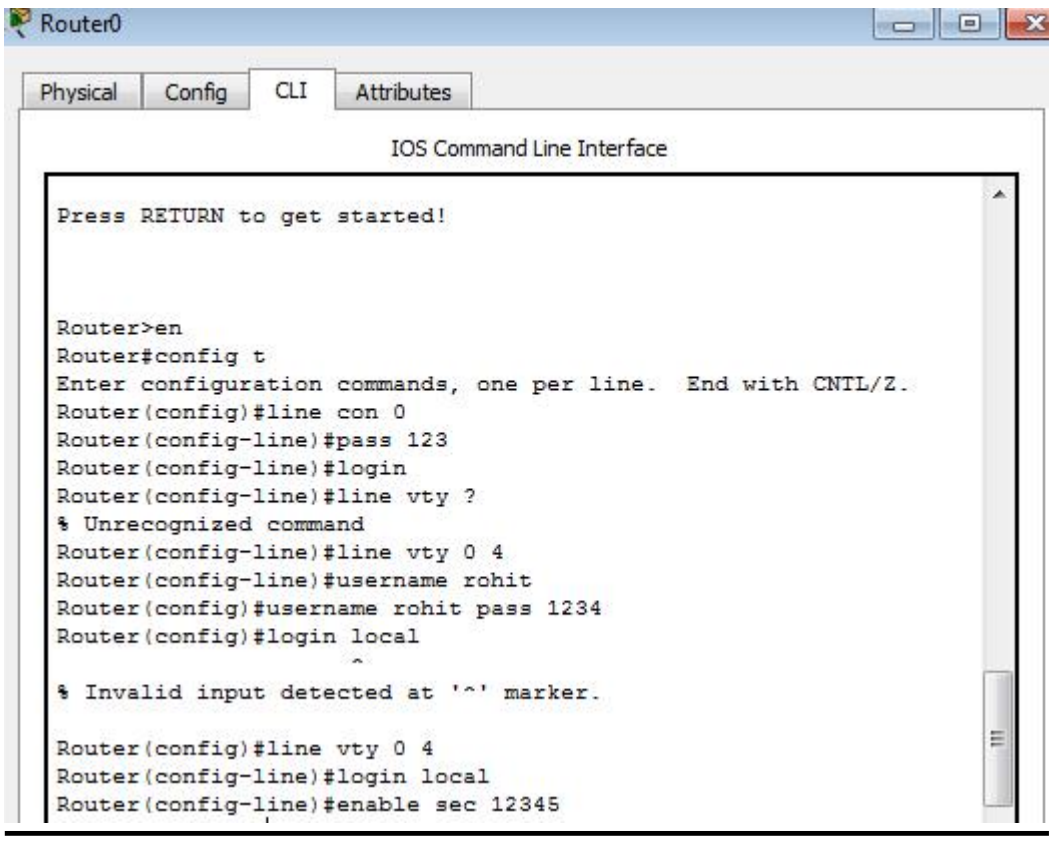

IP Phone2
Physical
Config
GUI
Attributes
CISCO IP PHONE
7960
01:58a 03/01/93
10003
To: 2003
Ring Out

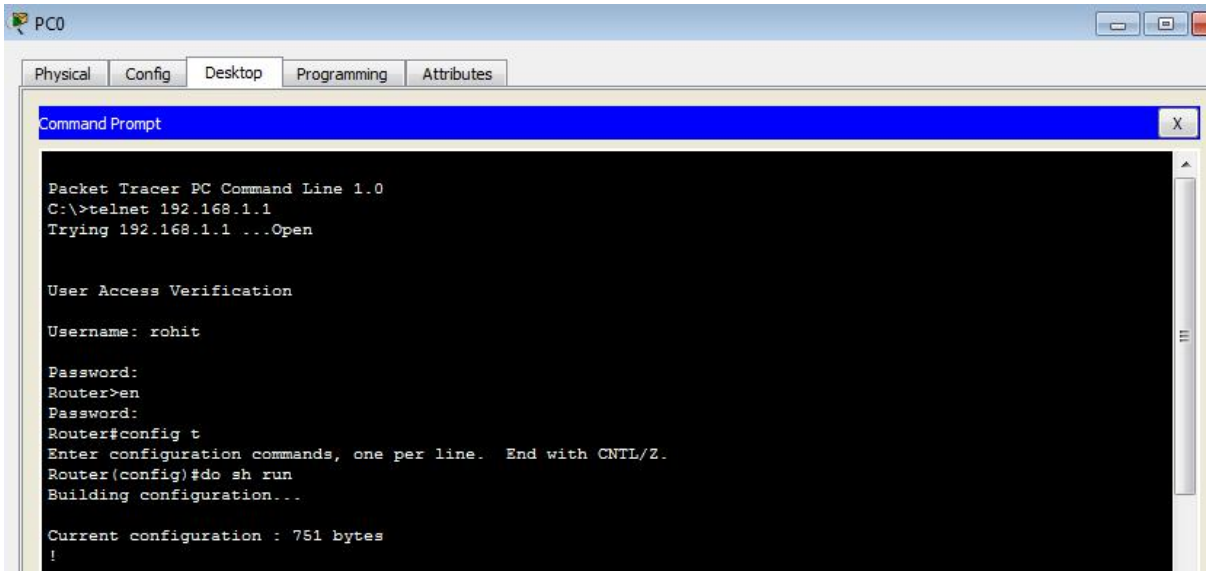

IP Phone3
Physical
Config
GUI
Attributes
The phone is ringing
CISCO IP PHONE
7960
01:58a 03/01/93
2003
From: 10003
messages
directories
services
settings
VOLUME


SECURITY
TELNET
ACL
SSH
GRE

TELNET

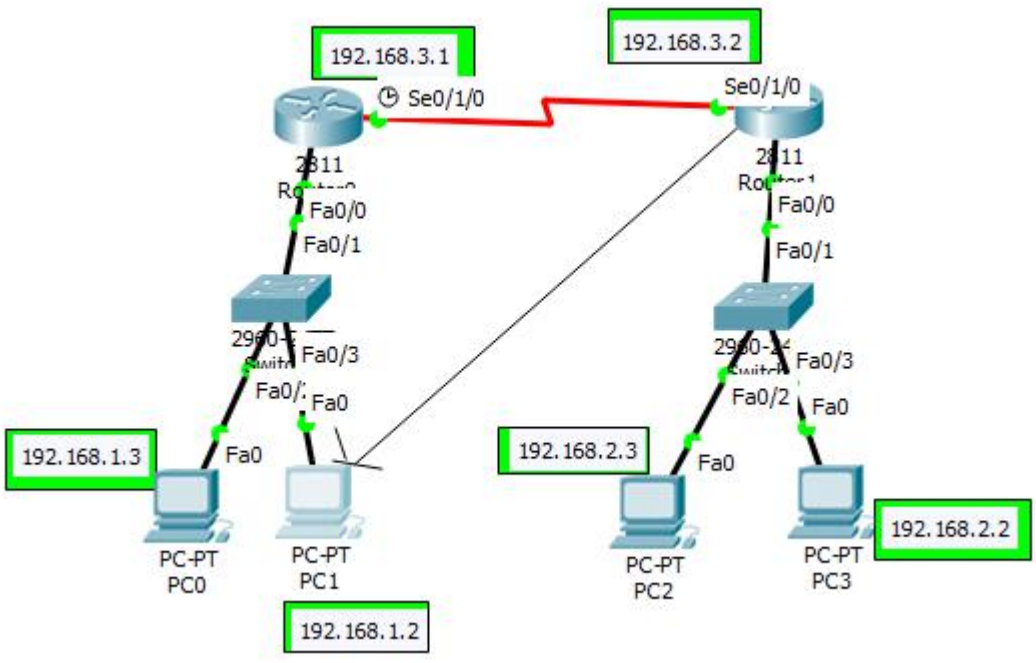

2811
Fa0/0
Fa0/1
Fa0/4
Fa0/3
Fa0
Fa0
Fa0
Laptop-PT
Laptop2
PC-PT
PC0
Laptop-PT
Laptop0
Laptop-PT
Laptop1


Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started!
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#line con 0
Router(config-line)#pass 123
Router(config-line)#login
Router(config-line)#line vty ?
% Unrecognized command
Router(config-line)#line vty 0 4
Router(config-line)#username rohit
Router(config)#username rohit pass 1234
Router(config)#login local
% Invalid input detected at '^' marker.
Router(config)#line vty 0 4
Router(config-line)#login local
Router(config-line)#enable sec 12345



ACL(ACCESS CONTROL LIST)

STANDARD ***EXTENDED***



```
Router(config)#do sh access-list 1
Router(config)#acc
Router(config)#access-list 1deny h 192.168.1.2
                              ^
% Invalid input detected at '^' marker.

Router(config)#access-list 1 deny h 192.168.1.2
Router(config)#access-list 1 permit any
Router(config)#int fa0/0
Router(config-if)#ip acce
Router(config-if)#ip access-group 1 out
```

PC1

Physical | Config | Desktop | Programming | Attributes

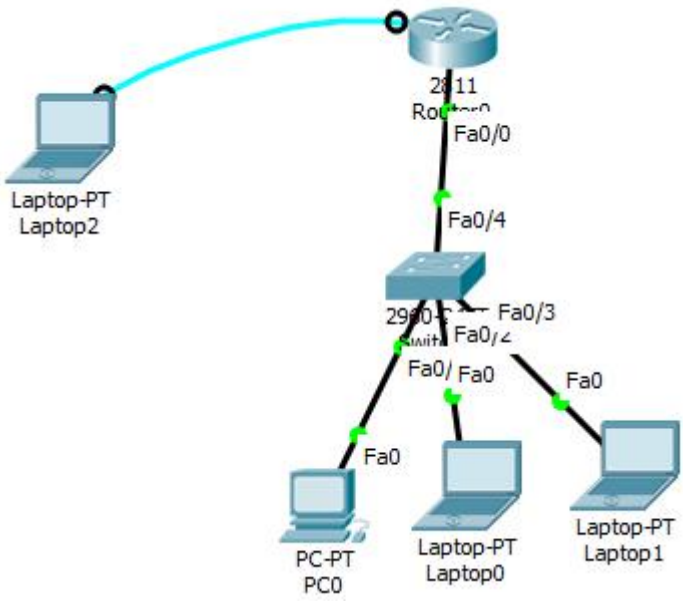
Command Prompt

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.2: bytes=32 time=12ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126
Reply from 192.168.2.2: bytes=32 time=10ms TTL=126

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 12ms, Average = 7ms

C:\>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.3.2: Destination host unreachable.
Reply from 192.168.3.2: Destination host unreachable.
Reply from 192.168.3.2: Destination host unreachable.
Reply from 192.168.3.2: Destination host unreachable.
```

no acl apply

when acl apply

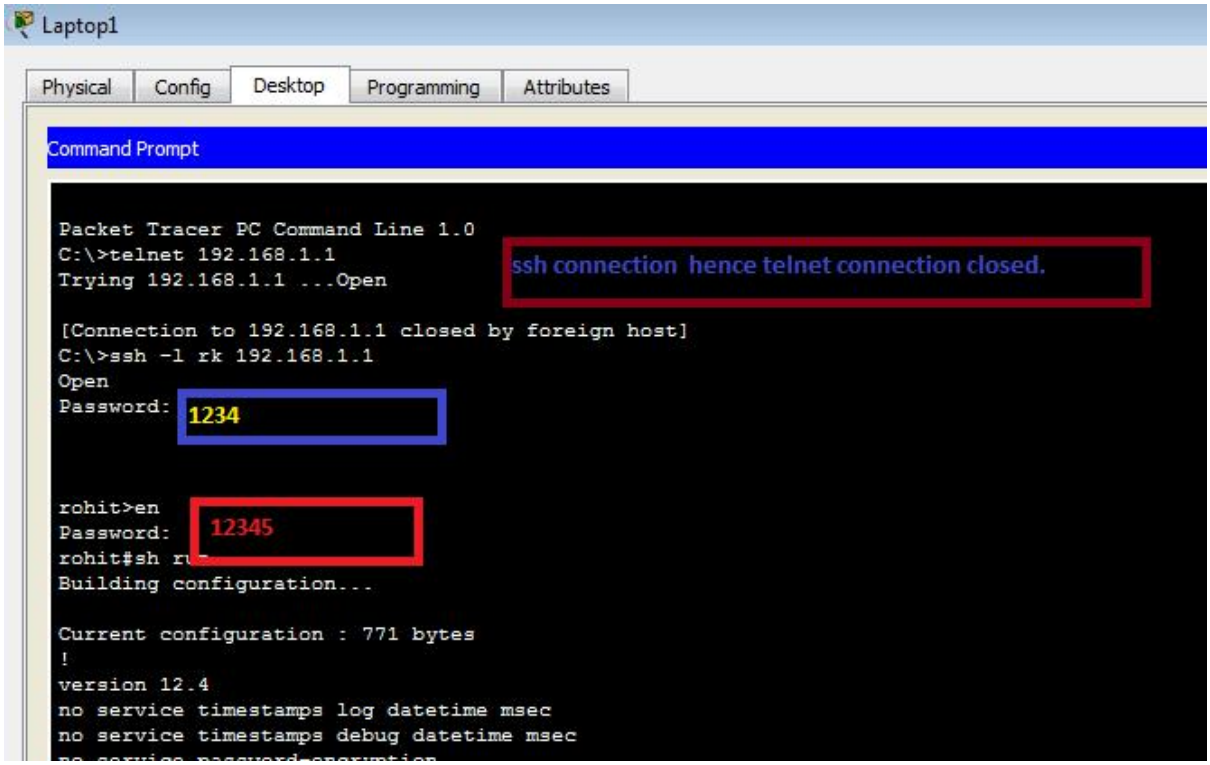
SECURE SHELL(ssh)



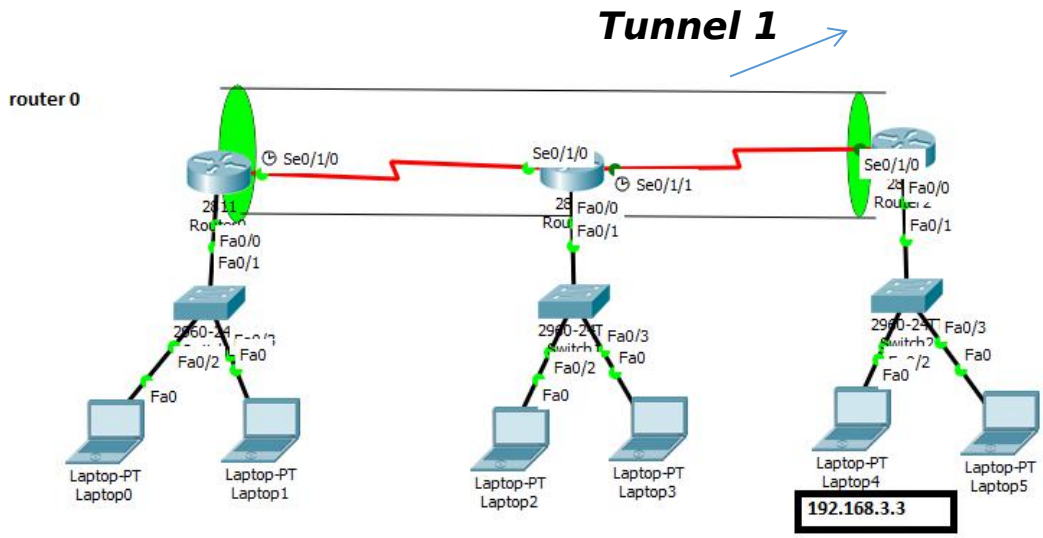
Router0

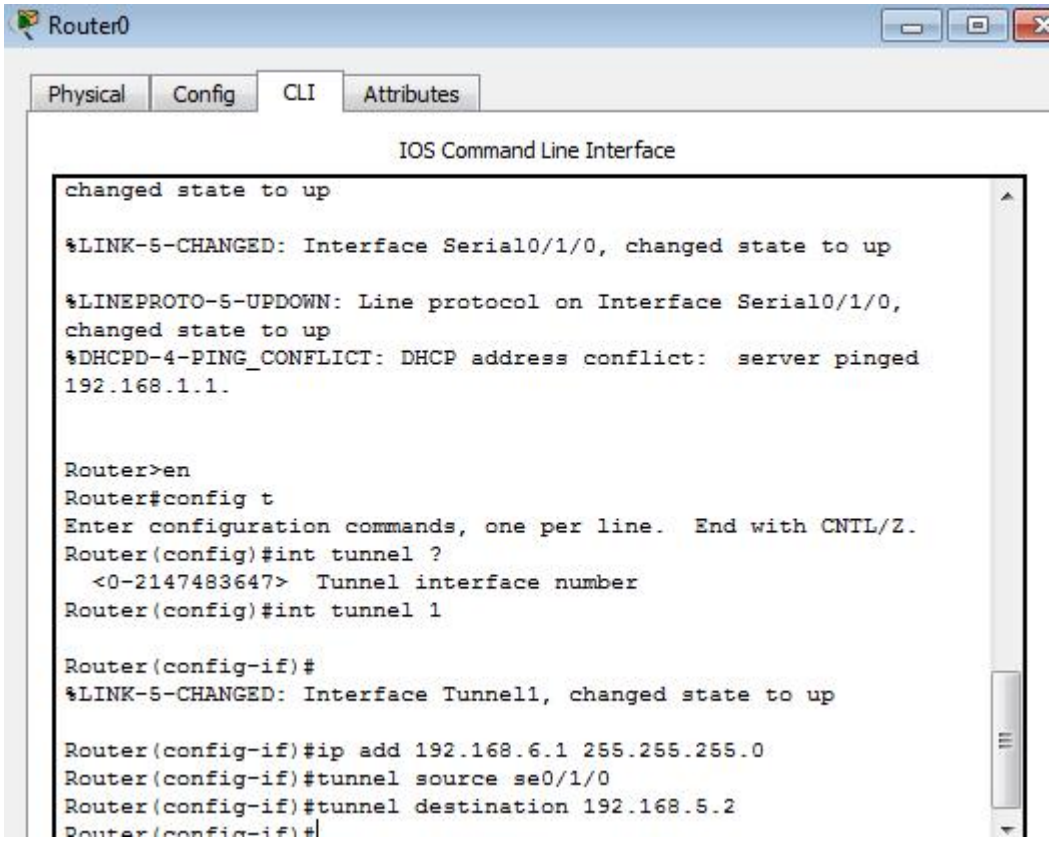
Physical | Config | CLI | Attributes

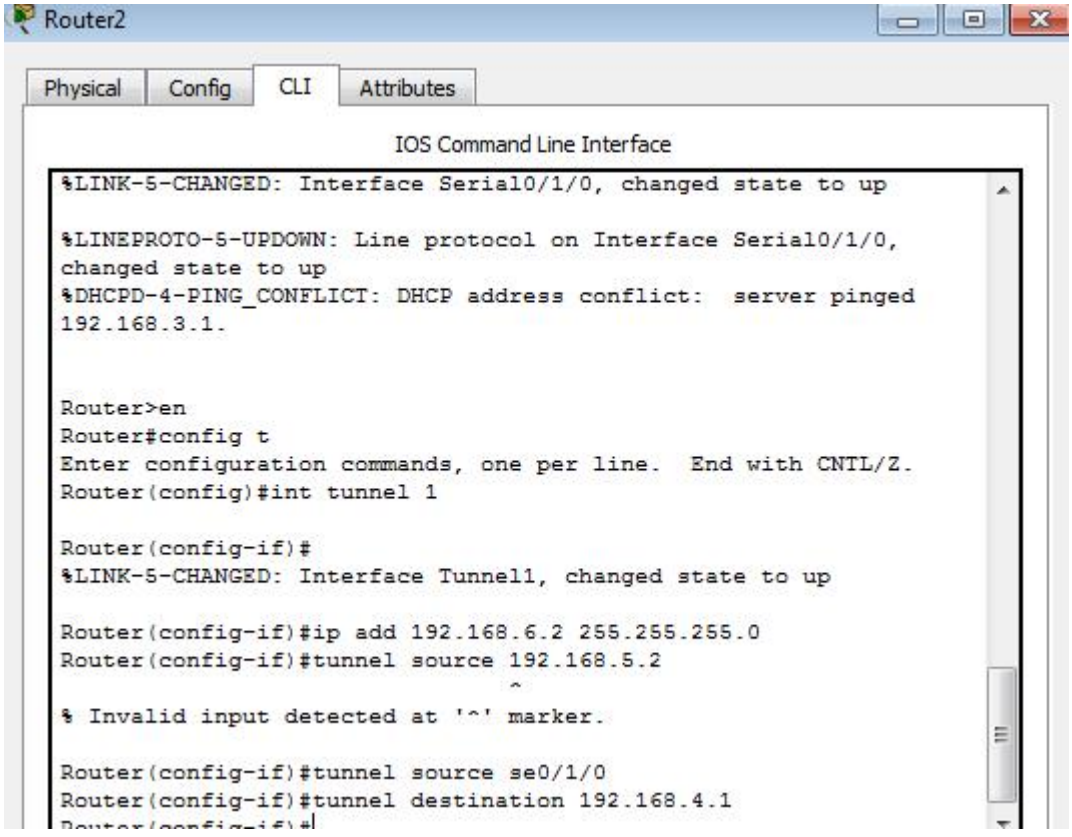
```
Router(config)#hostname rohit
rohit(config)#ip domain name codehack
rohit(config)#crypto key generate rsa
The name for the keys will be: rohit.codehack
Choose the size of the key modulus in the range of 360 to 2048 for y
  General Purpose Keys. Choosing a key modulus greater than 512 may
  a few minutes.

How many bits in the modulus [512]: ?
% A decimal number between 360 and 2048
How many bits in the modulus [512]: % A decimal number between 360 a
How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]

rohit(config)#line vty 0 4
*Mar 1 0:10:15.215:  %SSH-5-ENABLED: SSH 1.99 has been enabled
rohit(config-line)#transport input ssh
rohit(config-line)#line vty 0 4
rohit(config-line)#username rk
rohit(config)#username rk pass 1234
rohit(config)#secret enable 12345
                  ^
% Invalid input detected at '^' marker.
```

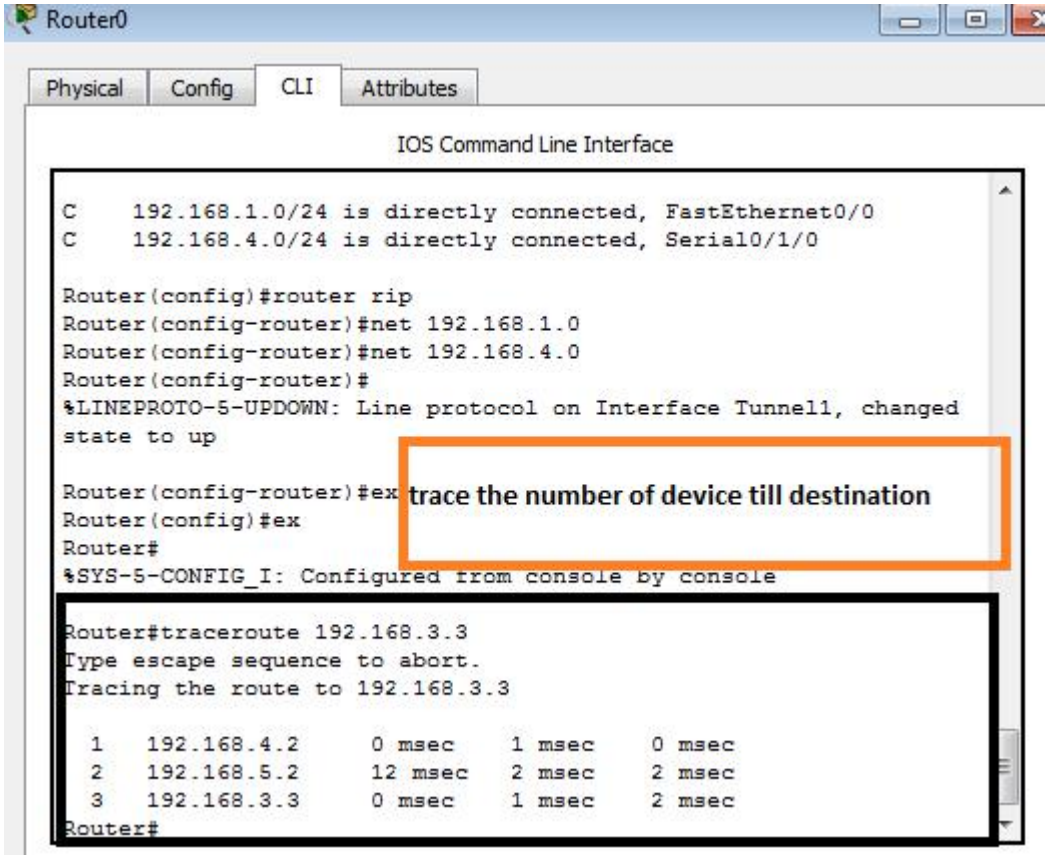


Generic routing encapsulation(gre)




Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
changed state to up
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0,
changed state to up
%DHCPD-4-PING_CONFLICT: DHCP address conflict: server pinged
192.168.1.1.
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int tunnel ?
<0-2147483647> Tunnel interface number
Router(config)#int tunnel 1
Router(config-if)#
%LINK-5-CHANGED: Interface Tunnel1, changed state to up
Router(config-if)#ip add 192.168.6.1 255.255.255.0
Router(config-if)#tunnel source se0/1/0
Router(config-if)#tunnel destination 192.168.5.2


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0,
changed state to up
%DHCPD-4-PING_CONFLICT: DHCP address conflict: server pinged
192.168.3.1.
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int tunnel 1
Router(config-if)#
%LINK-5-CHANGED: Interface Tunnel1, changed state to up
Router(config-if)#ip add 192.168.6.2 255.255.255.0
Router(config-if)#tunnel source 192.168.5.2
^
% Invalid input detected at '^' marker.
Router(config-if)#tunnel source se0/1/0
Router(config-if)#tunnel destination 192.168.4.1


Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
C 192.168.1.0/24 is directly connected, FastEthernet0/0
C 192.168.4.0/24 is directly connected, Serial0/1/0
Router(config)#router rip
Router(config-router)#net 192.168.1.0
Router(config-router)#net 192.168.4.0
Router(config-router)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel1, changed state to up
Router(config-router)#ex
Router(config)#ex
Router#
%SYS-5-CONFIG_I: Configured from console by console
trace the number of device till destination
Router#traceroute 192.168.3.3
Type escape sequence to abort.
Tracing the route to 192.168.3.3
1 192.168.4.2 0 msec 1 msec 0 msec
2 192.168.5.2 12 msec 2 msec 2 msec
3 192.168.3.3 0 msec 1 msec 2 msec
Router#