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FAISAL UNIVERSITY
COLLEGE OF COMPUTER SCIENCE
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وزارة التعليم
جامعة الإمام
عبدالرحمن بن فيصل
كلية علوم الحاسب
وتقنية المعلومات

جامعة الإمام عبد الرحمن بن فيصل
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY

Communication & Network Fundamentals

Network Project

Network for a small organization

Student	ID Number

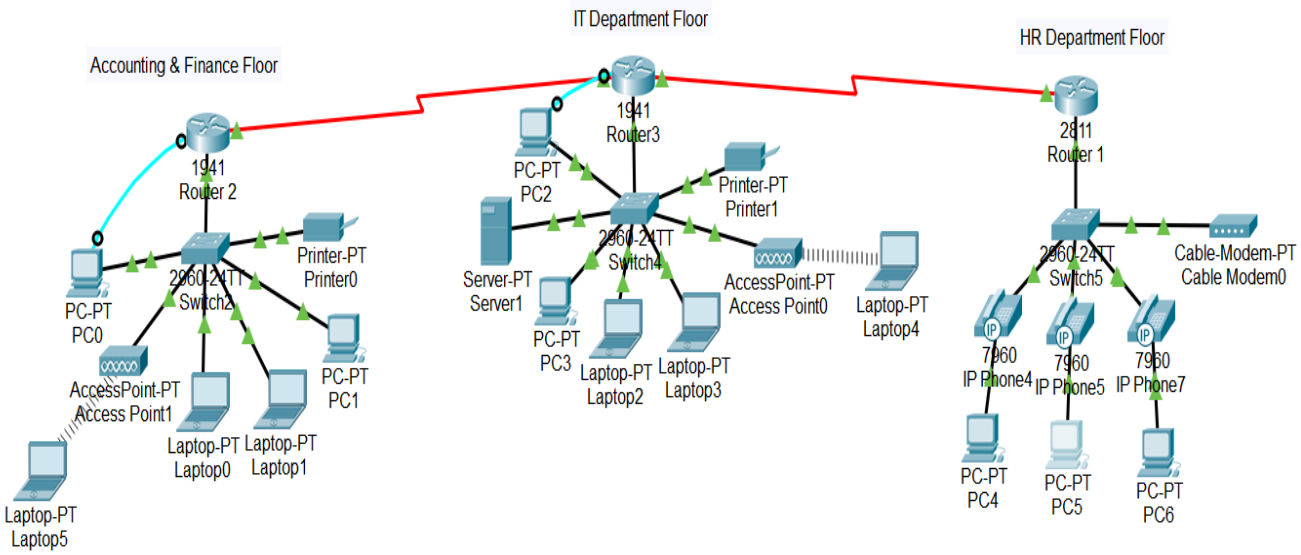
Group: L5F06

Instructor:

We designed and configured a network for a small business organization that have a small building of three floors. In the organization, each floor has a different department. These departments are the IT department, HR department, and Accounting and Finance department. The organization needed to connect these departments to facilitate collaborative work between employees in different departments and the exchange of information and knowledge.

As for our topology we choose the 5th topology from the project manual and we adjusted the topology according to the organization need. We used the program Packet tracer version 7.1.2 to demonstrate our topology of the network. In the network each router represents a different department on a different floor and each department has it is own local area network.

The demonstrated topology:

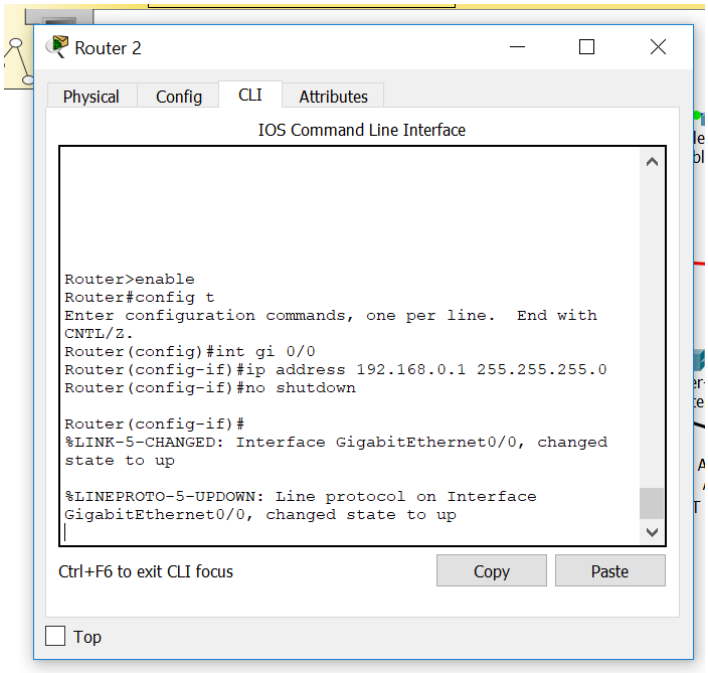


As for our work we started by setting up our equipment to match our network topology. Afterward, we filled our addressing table for the network.

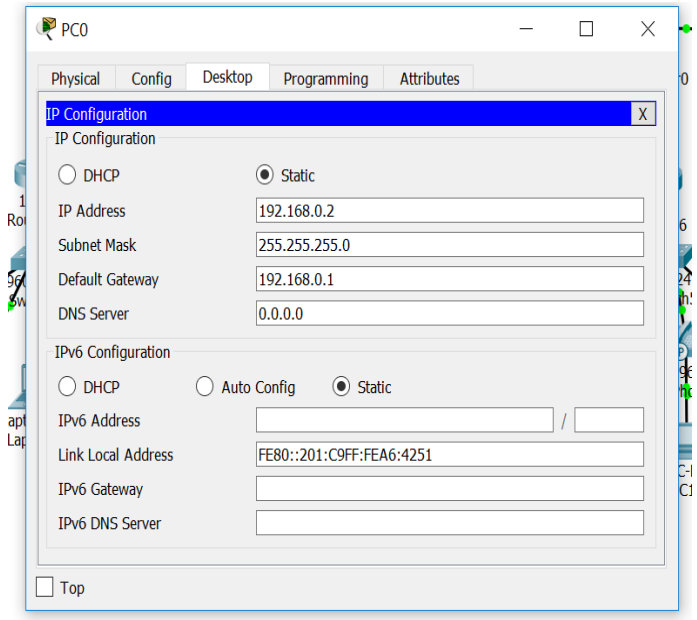
Device	Interface	IP Address	Subnet Mask	Default Gateway
Router 2	Giga Ethernet 0/0	192.1	255.255.255.0	-
Router 2	Serial 0/0/0	10.1.	255.255.255.252	-
PC 0	Fast Ethernet	192.1	255.255.255.0	192.
PC 1	Fast Ethernet	192.1	255.255.255.0	192.
Laptop 0	Fast Ethernet	192.1	255.255.255.0	192.
Laptop 1	Fast Ethernet	192.1	255.255.255.0	192.
Laptop 5	Wireless	192.1	255.255.255.0	192.
Printer 0	Fast Ethernet	192.1	255.255.255.0	192.
Router 3	Fast Ethernet 0/0	192.1	255.255.255.0	
Router 3	Serial 0/0	10.1.	255.255.255.252	
Router 3	Serial 0/1/1	10.1.	255.255.255.252	
PC 2	Fast Ethernet	192.1	255.255.255.0	192.
PC 3	Fast Ethernet	192.1	255.255.255.0	192.
Laptop 2	Fast Ethernet	192.1	255.255.255.0	192.
Laptop 3	Fast Ethernet	192.1	255.255.255.0	192.
Laptop 4	Wireless	192.1	255.255.255.0	192.
Printer 1	Fast Ethernet	192.1	255.255.255.0	192.
Server 1	Fast Ethernet	192.1	255.255.255.0	192.
Router 1	Fast Ethernet 0/0	192.1	255.255.255.0	
Router 1	Serial 0/1/1	10.1.	255.255.255.252	
PC 4	Fast Ethernet	192.1	255.255.255.0	192.
PC 5	Fast Ethernet	192.1	255.255.255.0	192.
PC6	Fast Ethernet	192.1	255.255.255.0	192.

After filling the addressing table, we started configuring our routers and other devices according to the table. We did the following steps for every router and device. (We only captured the process for one device of each type)

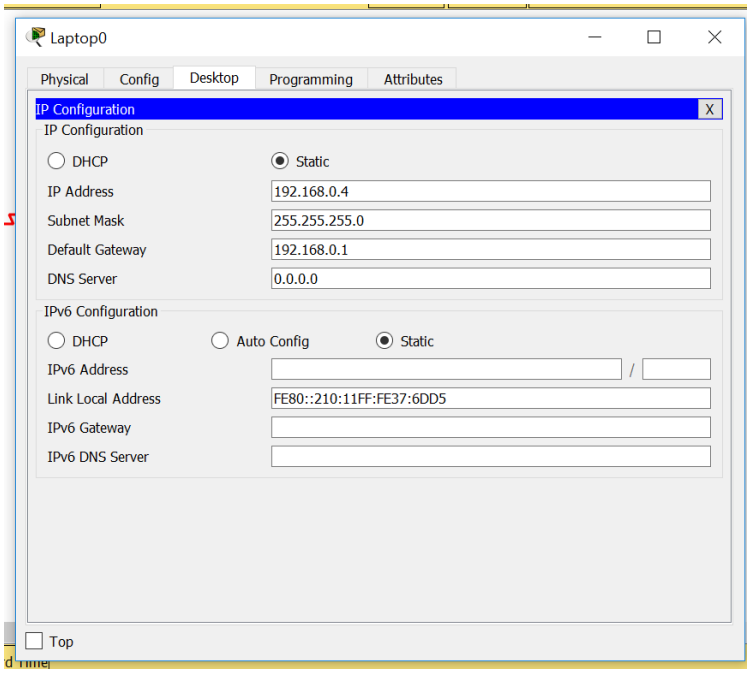
1- Configuring the interface IP address and activating the interface of a router.



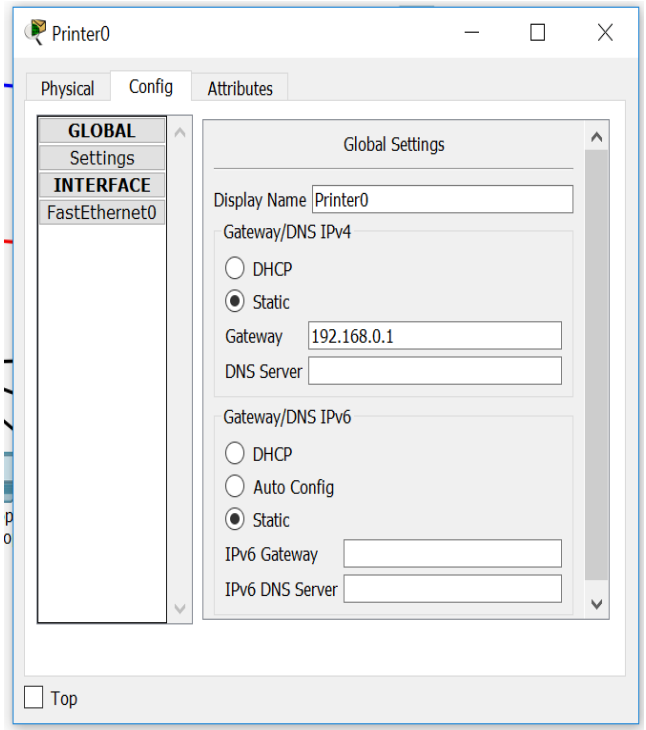
2- Configuring the IP address and default gateway for the PC.

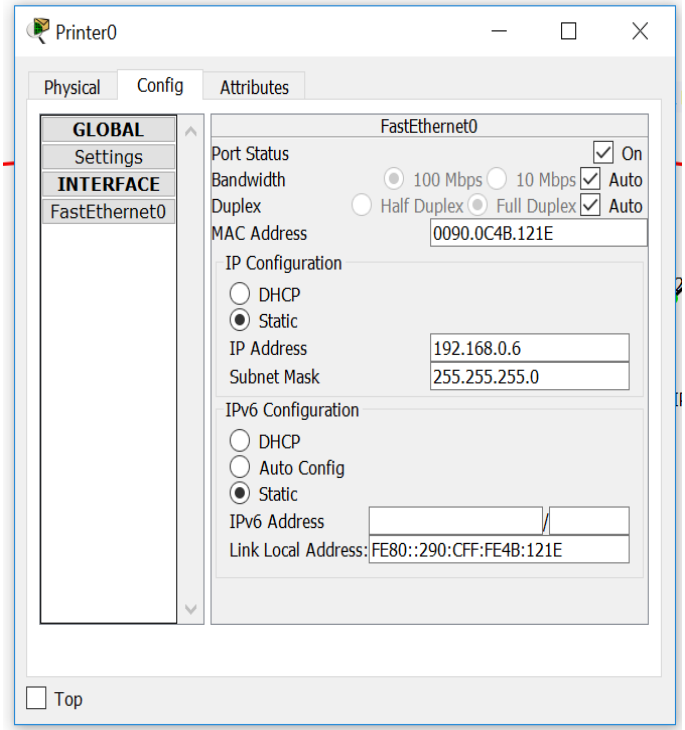


3- Configuring the IP address and default gateway for the Laptop.

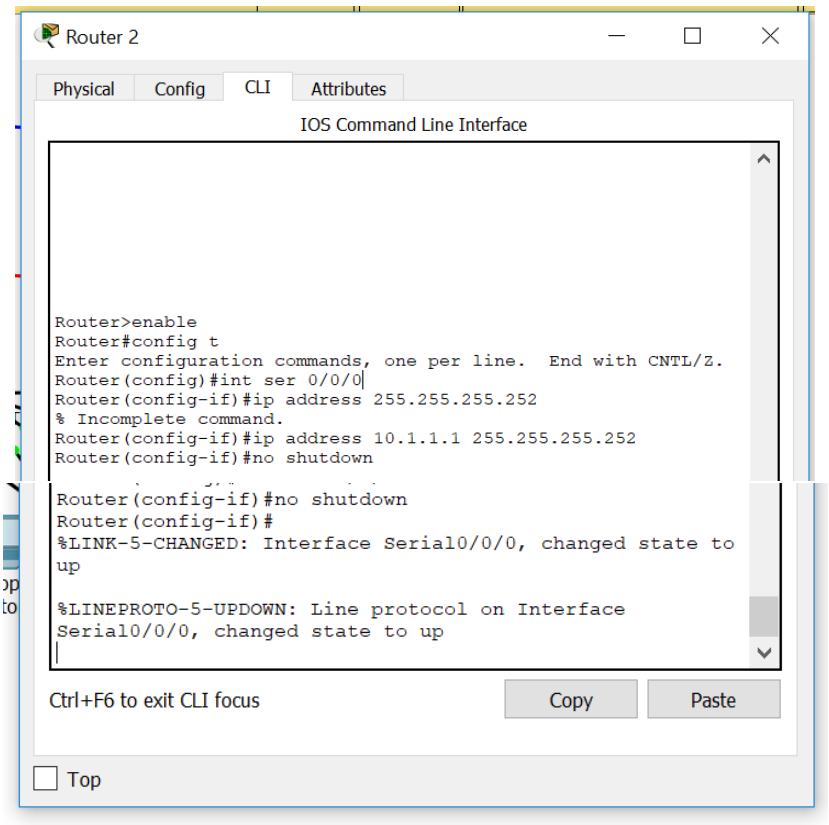


4- Configuring the IP address and default gateway for the Printer (and we did the same for the server).

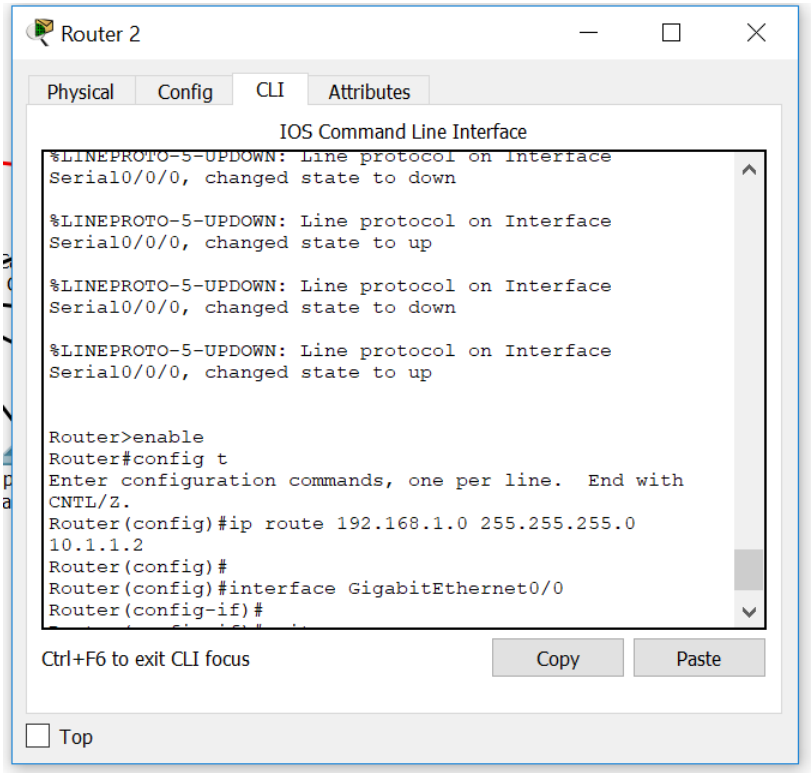




5- Configuring the serial interface IP address and activating the serial interface of a router. (to enable connect routers together)

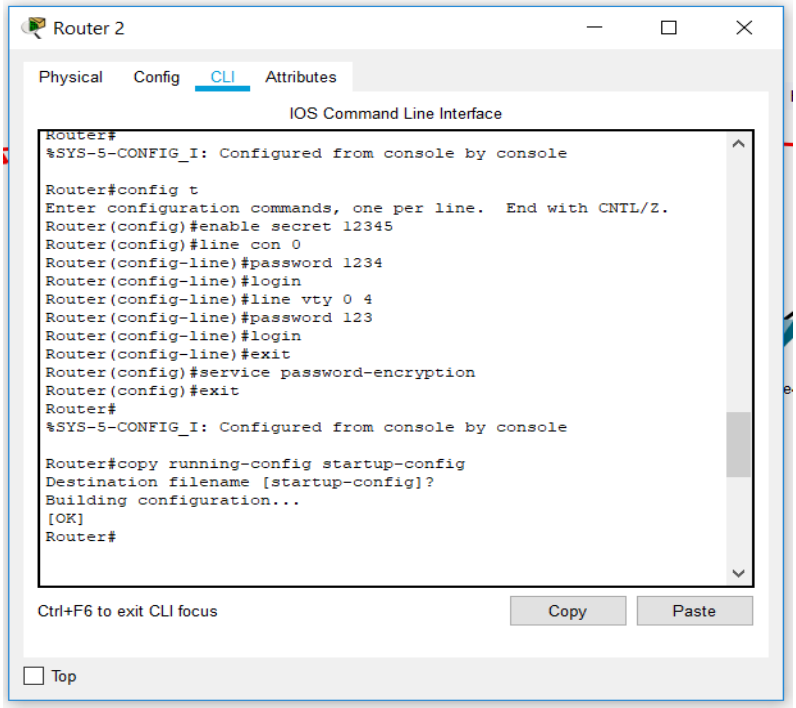


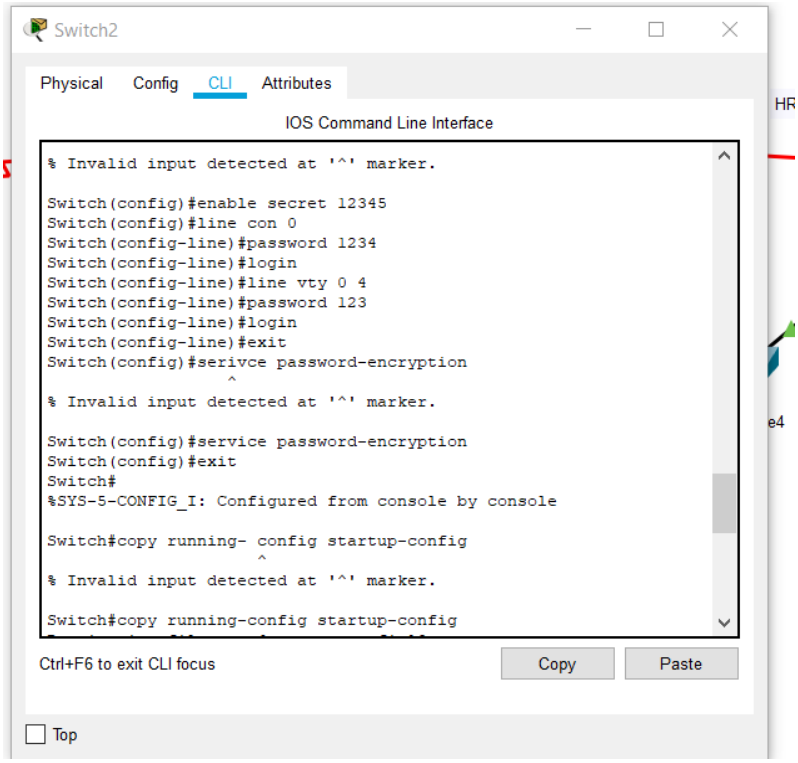
6 - Adding to the route table to allow communication between devices on different networks.



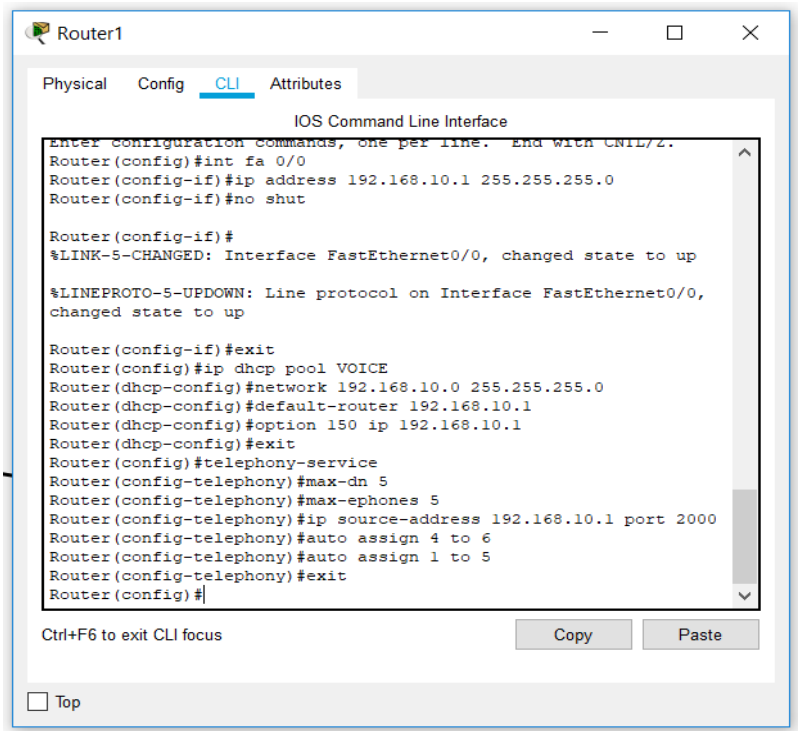
7- Assigning different types of passwords on the privileged and the terminal mode for router and switch.

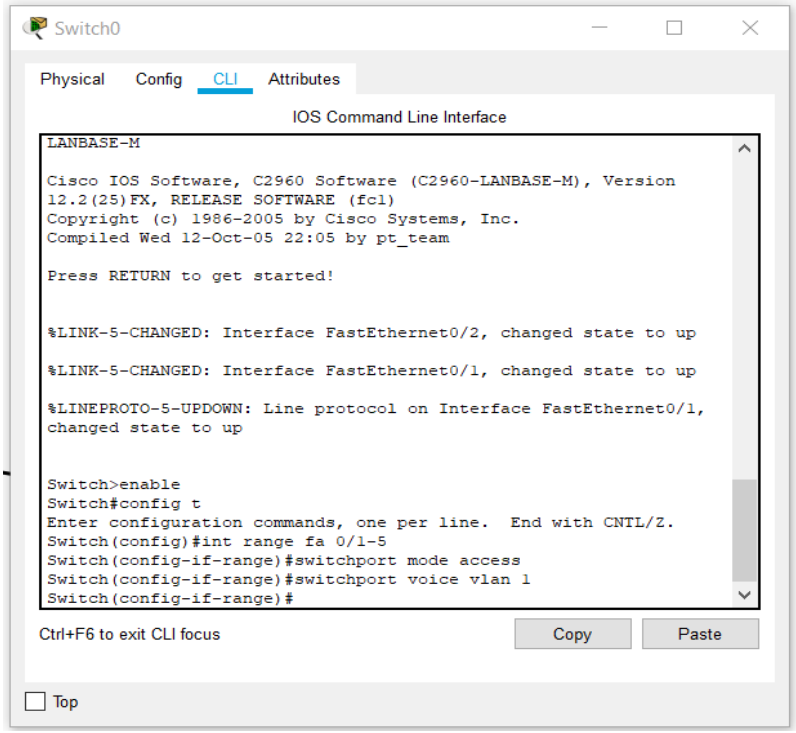
- On the privileged EXEC password is 12345.
- On the console password is 1234.
- On the VTY password is 123.

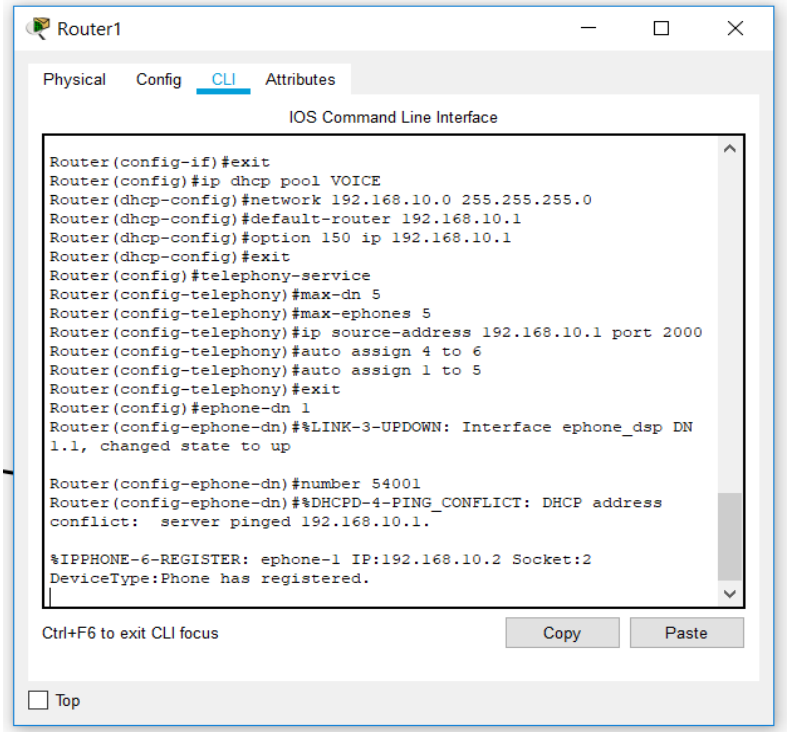


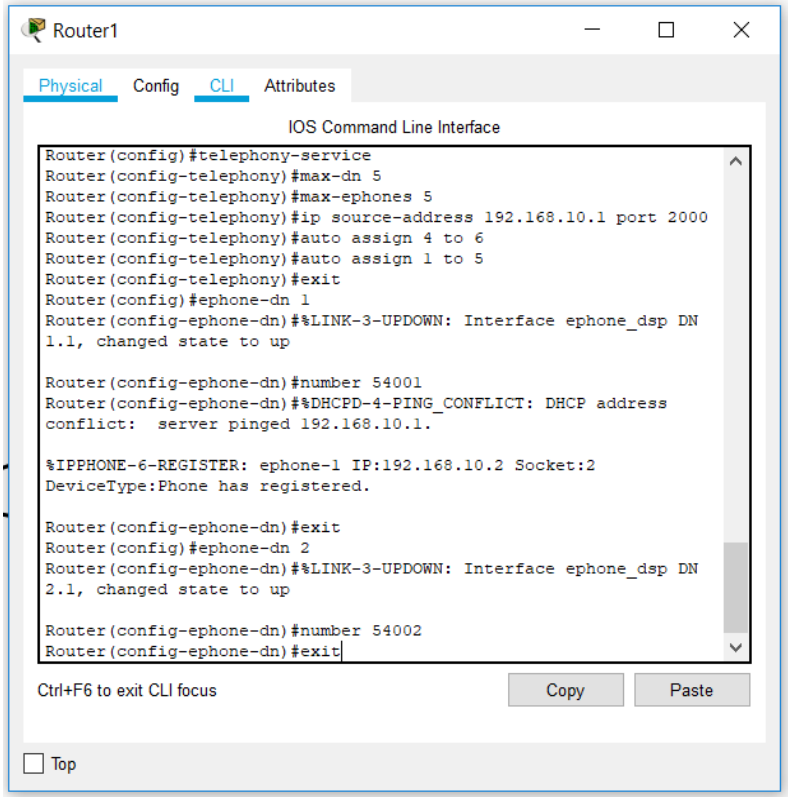


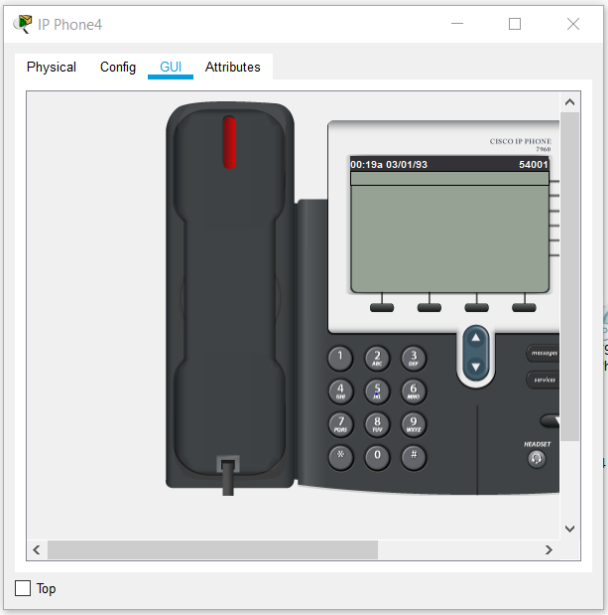
8- The configurations of IP-voice for the phones.

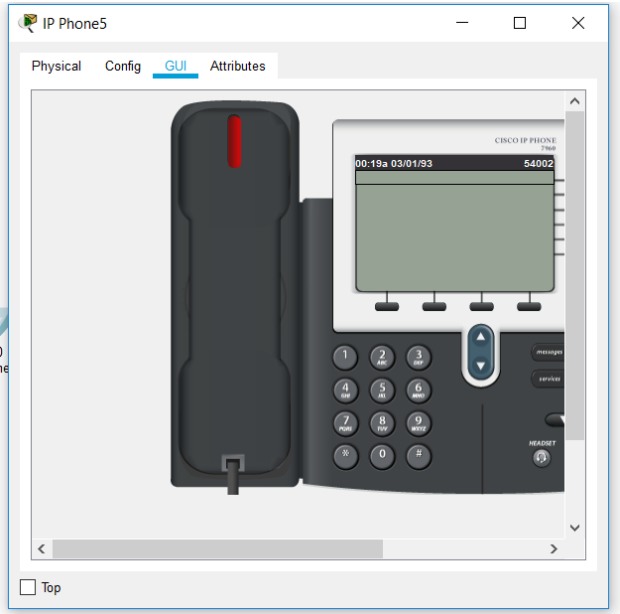




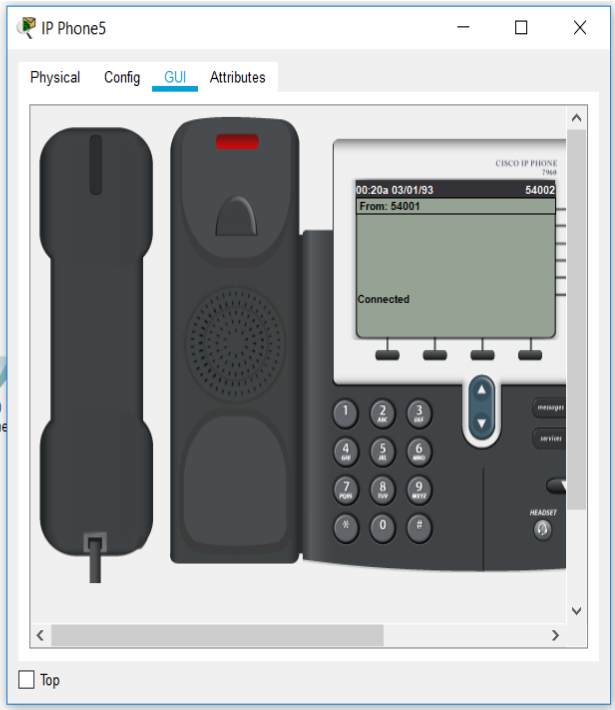

Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config-if)#exit
Router(config)#ip dhcp pool VOICE
Router(dhcp-config)#network 192.168.10.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.10.1
Router(dhcp-config)#option 150 ip 192.168.10.1
Router(dhcp-config)#exit
Router(config)#telephony-service
Router(config-telephony)#max-dn 5
Router(config-telephony)#max-ephones 5
Router(config-telephony)#ip source-address 192.168.10.1 port 2000
Router(config-telephony)#auto assign 4 to 6
Router(config-telephony)#auto assign 1 to 5
Router(config-telephony)#exit
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 54001
Router(config-ephone-dn)#%DHCPD-4-PING_CONFLICT: DHCP address
conflict: server pinged 192.168.10.1.
%IPPHONE-6-REGISTER: ephone-1 IP:192.168.10.2 Socket:2
DeviceType:Phone has registered.
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config)#telephony-service
Router(config-telephony)#max-dn 5
Router(config-telephony)#max-ephones 5
Router(config-telephony)#ip source-address 192.168.10.1 port 2000
Router(config-telephony)#auto assign 4 to 6
Router(config-telephony)#auto assign 1 to 5
Router(config-telephony)#exit
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 54001
Router(config-ephone-dn)#%DHCPD-4-PING_CONFLICT: DHCP address
conflict: server pinged 192.168.10.1.
%IPPHONE-6-REGISTER: ephone-1 IP:192.168.10.2 Socket:2
DeviceType:Phone has registered.
Router(config-ephone-dn)#exit
Router(config)#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 54002
Router(config-ephone-dn)#exit
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


IP Phone4
Physical
Config
GUI
Attributes
CISCO IP PHONE 7960
00:19a 03/01/93
54001
Top

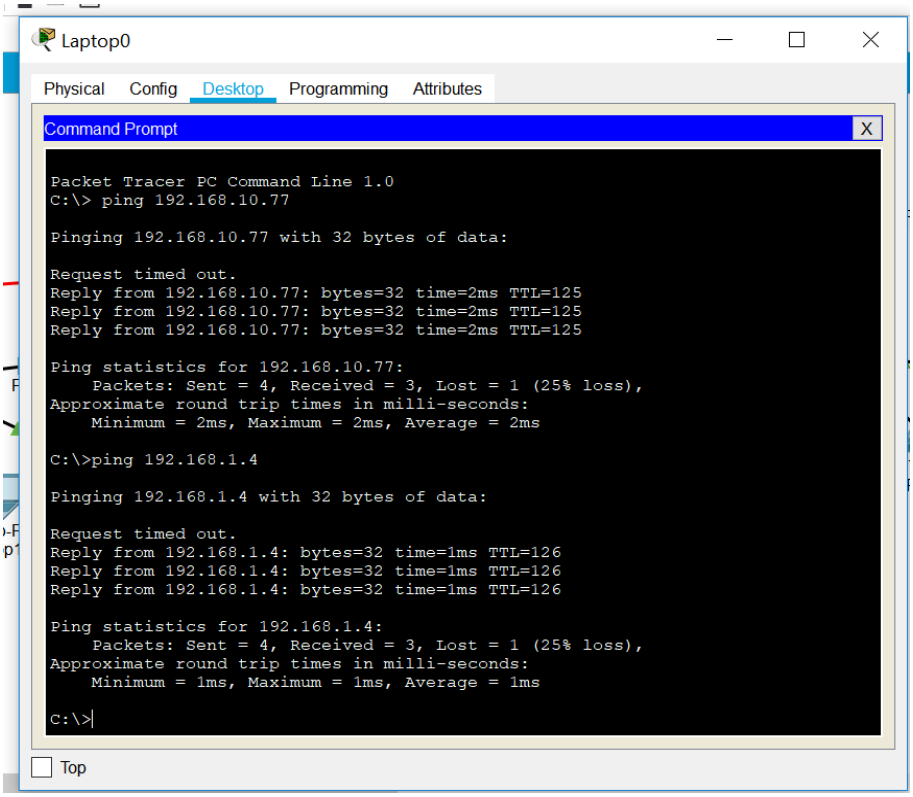

IP Phone5
Physical
Config
GUI
Attributes
CISCO IP PHONE 7960
00:19a 03/01/93
54002
Top


IP Phone4
Physical
Config
GUI
Attributes
CISCO IP PHONE 7960
00:20a 03/01/93
54001
To: 54002
Connected
Top

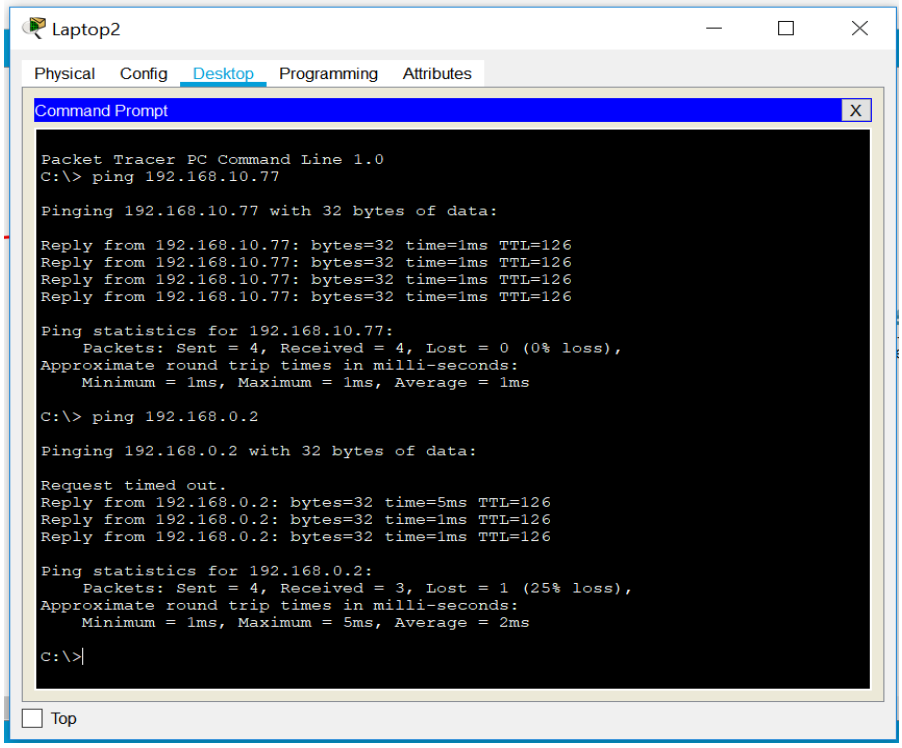

IP Phone5
Physical
Config
GUI
Attributes
CISCO IP PHONE 7960
00:20a 03/01/93
54002
From: 54001
Connected
Top

9- Verifying the connectivity between devices through the command Ping:

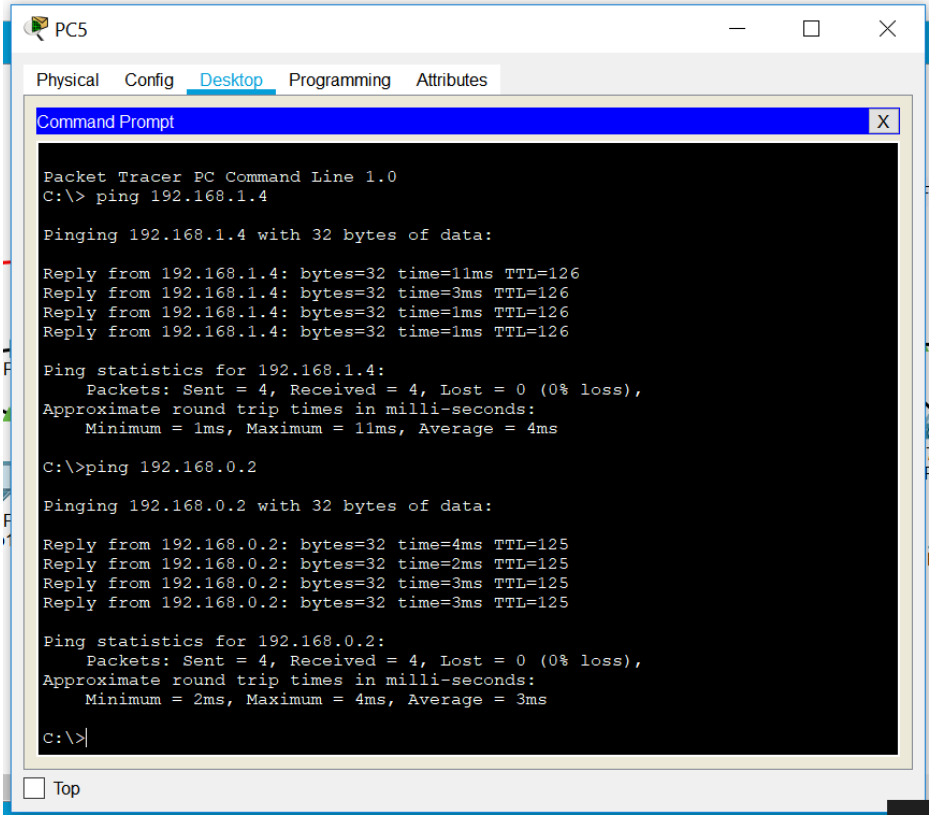
1- Device on the network 192.168.0.0 and verifying it connectivity to other devices on other networks in the topology.



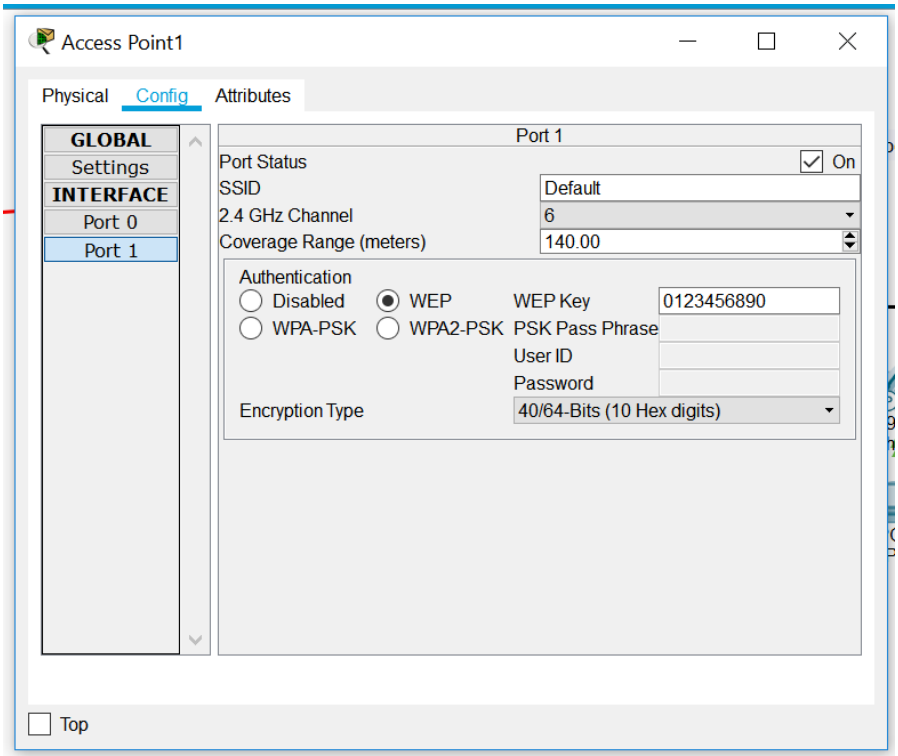
2- Device on the network 192.168.1.0 and verifying it connectivity to other devices on other networks in the topology.



3- Device on the network 192.168.10.0 and verifying it connectivity to other devices on other networks in the topology.



10- For the access point we assigned a password for the port:



By configuring each router, switch and device on the topology we created a fully connected and functional network for the organization. The demonstrated topology is as shown down below.