VOIP(Voice Over Internet Protocol) AND VPN(Virtual Private Network)

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Network Devices Used in Projects

- Router : Connecting the switches
- Switches : Connecting Pcs and Ipphones.
- PCs : For User Interactions.
- IPphones : For VOIP Communication (End Device).

VOIP ADVANTAGES

- Lower Costs
- Phone Features (Call waiting, Call Forwarding, Conference Calling, Video Calling).
- Long Ranges (Works with internet Connection)

VOIP DISADVANTAGES

- Reliable Internet Connection Required
- Latency and Jitter
- Problem in Location Tracking

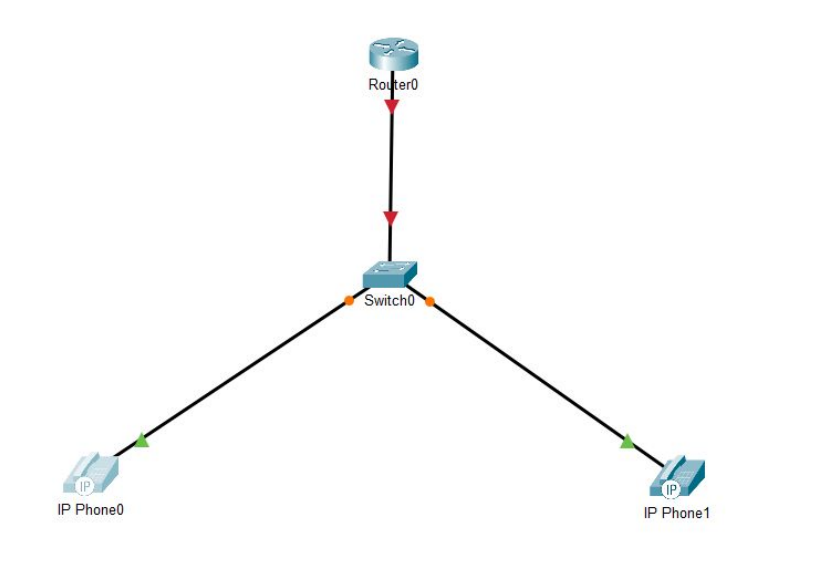
VPN Advantages

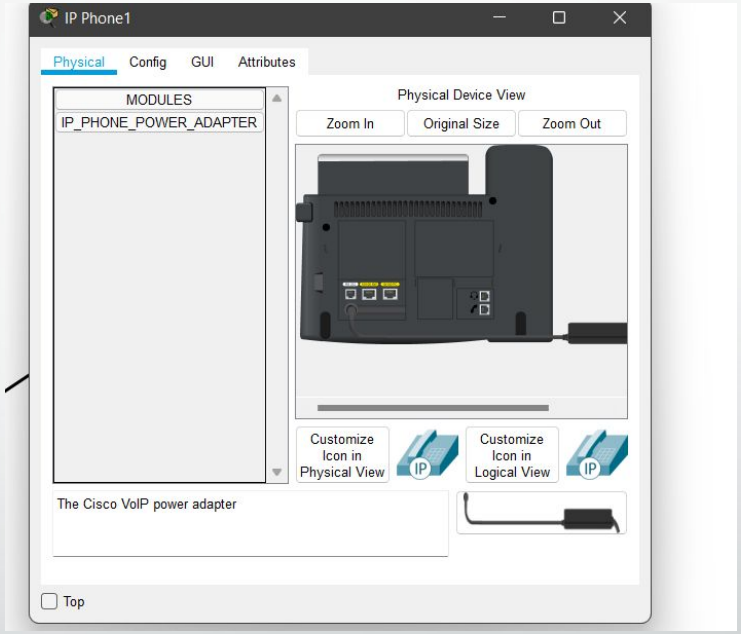
- Hides Private Information
- Reduce Support Costs
- Secure your Network

VPN DISADVANTAGES

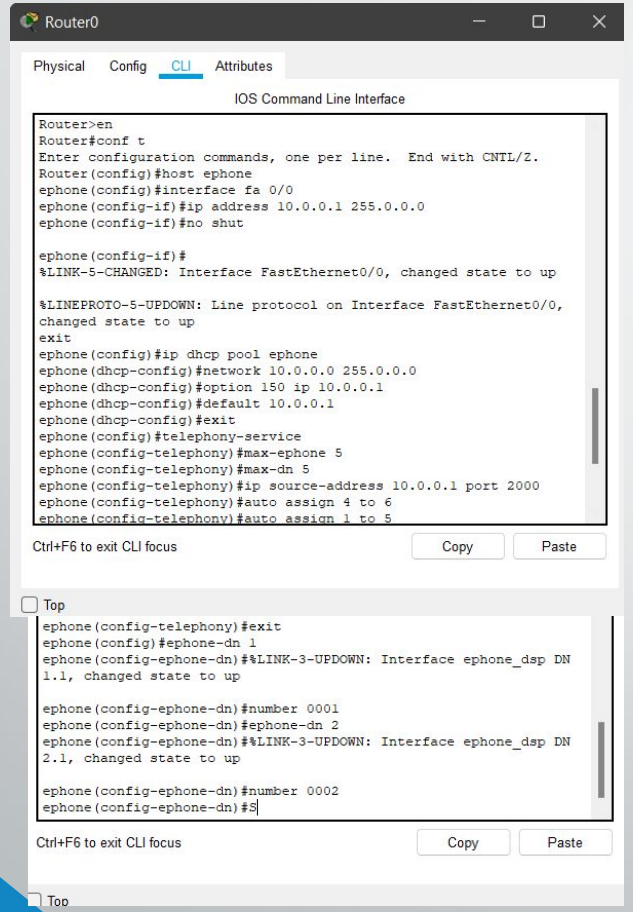
- Lower Internet Speed
- Complex Configurations

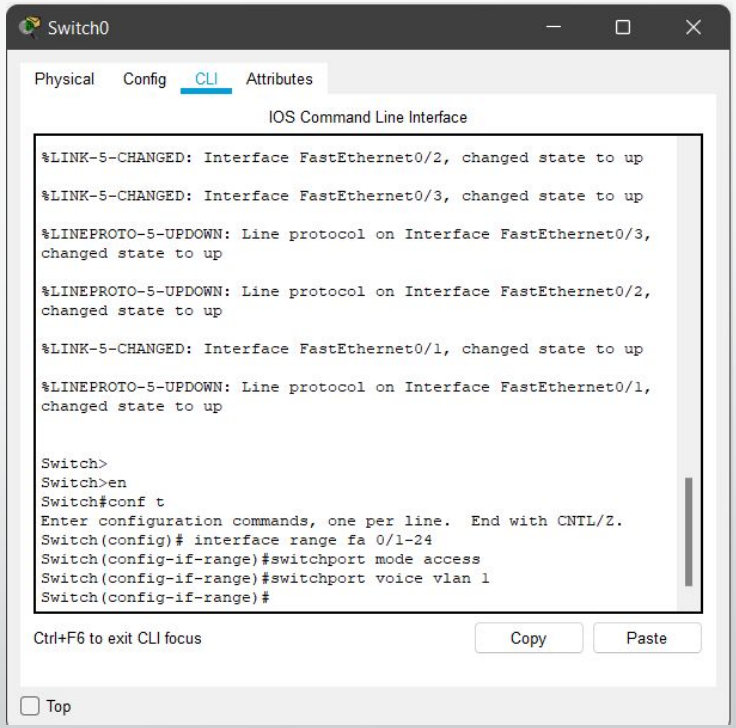
DEMO (VOIP)


Router0
Switch0
IP Phone0
IP Phone1

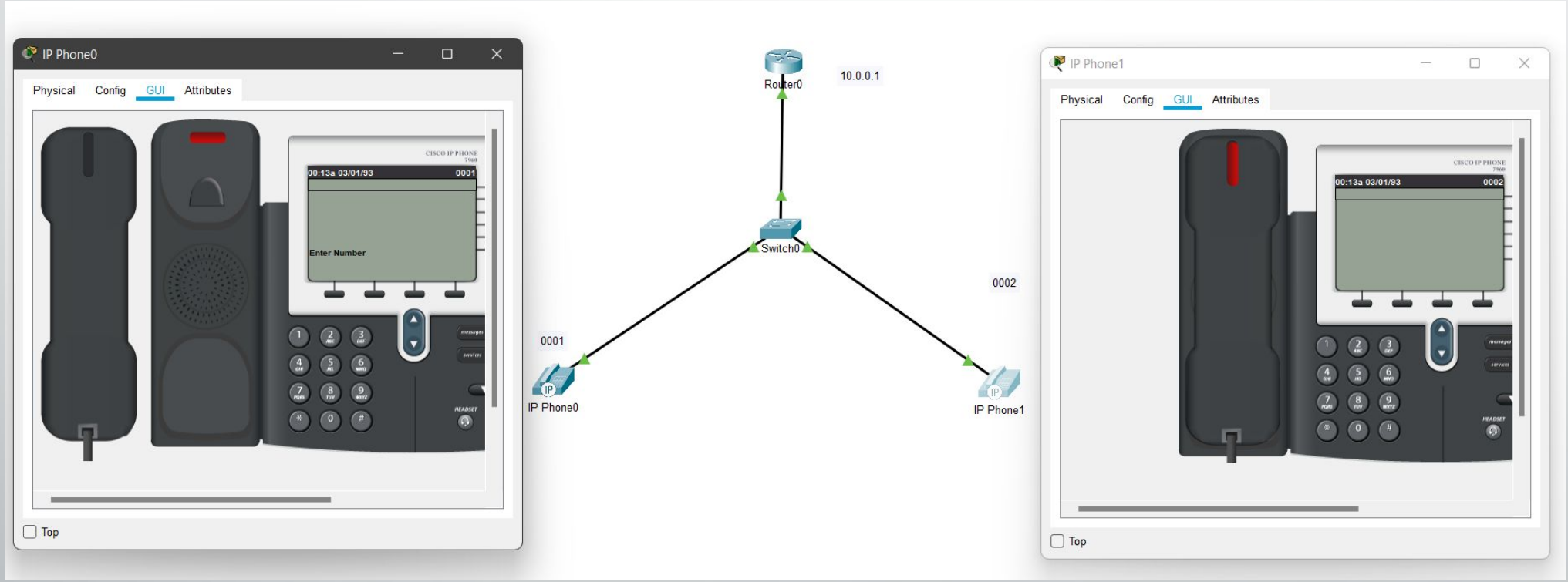

IP Phone1
Physical
Config
GUI
Attributes
MODULES
IP_PHONE_POWER_ADAPTER
Physical Device View
Zoom In
Original Size
Zoom Out
Customize Icon in Physical View
Customize Icon in Logical View
The Cisco VoIP power adapter
Top

DEMO

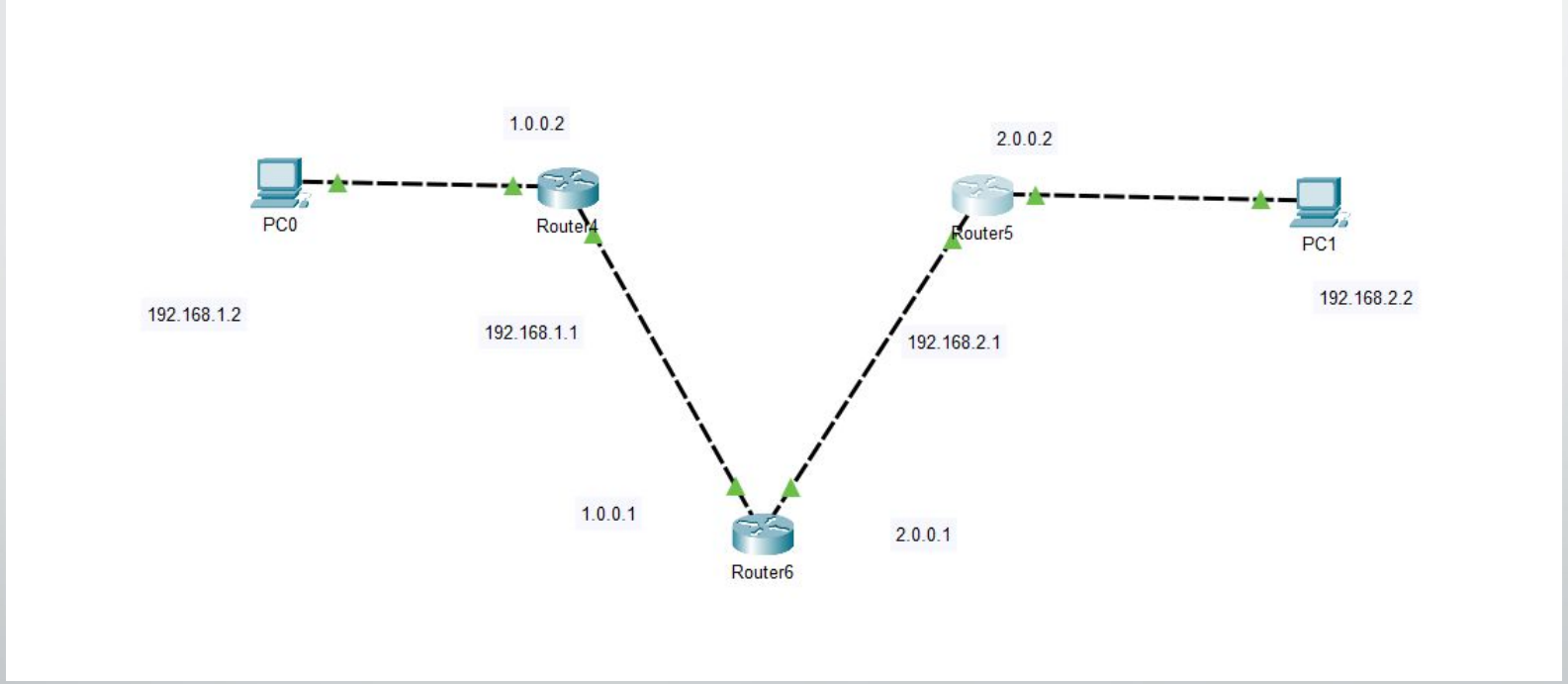

Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#host ephone
ephone(config)#interface fa 0/0
ephone(config-if)#ip address 10.0.0.1 255.0.0.0
ephone(config-if)#no shut
ephone(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0,
changed state to up
exit
ephone(config)#ip dhcp pool ephone
ephone(dhcp-config)#network 10.0.0.0 255.0.0.0
ephone(dhcp-config)#option 150 ip 10.0.0.1
ephone(dhcp-config)#default 10.0.0.1
ephone(dhcp-config)#exit
ephone(config)#telephony-service
ephone(config-telephony)#max-ephone 5
ephone(config-telephony)#max-dn 5
ephone(config-telephony)#ip source-address 10.0.0.1 port 2000
ephone(config-telephony)#auto assign 4 to 6
ephone(config-telephony)#auto assign 1 to 5
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
ephone(config-telephony)#exit
ephone(config)#ephone-dn 1
ephone(config-ephone-dn)#%LINK-3-UPDOWN: Interface ephone_dsp DN
1.1, changed state to up
ephone(config-ephone-dn)#number 0001
ephone(config-ephone-dn)#ephone-dn 2
ephone(config-ephone-dn)#%LINK-3-UPDOWN: Interface ephone_dsp DN
2.1, changed state to up
ephone(config-ephone-dn)#number 0002
ephone(config-ephone-dn)#5
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


Switch0
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3,
changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2,
changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up
Switch>
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# interface range fa 0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport voice vlan 1
Switch(config-if-range)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

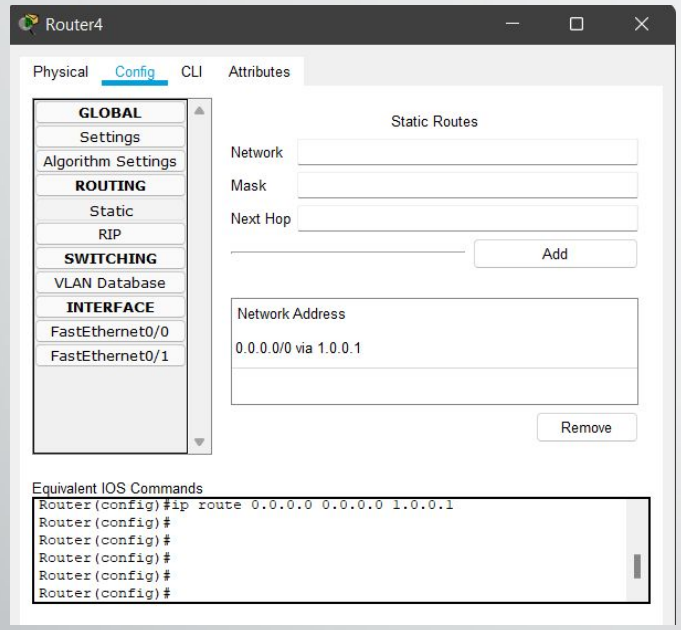
DEMO

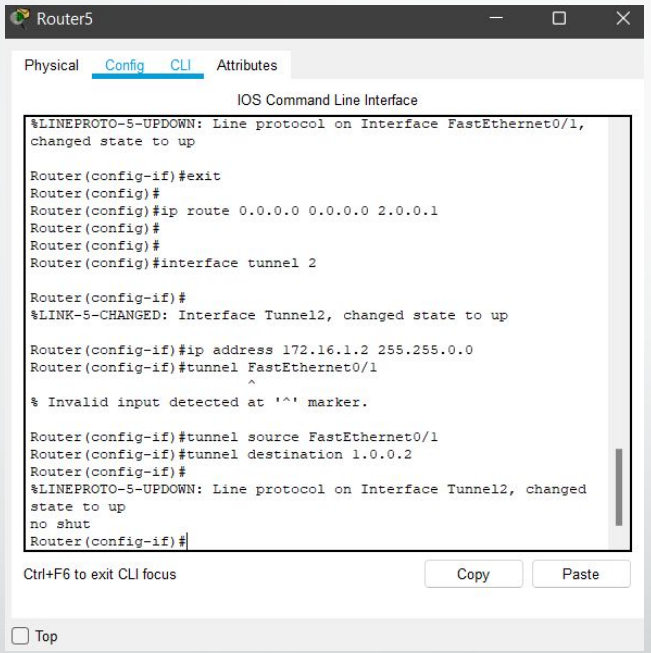

IP Phone0
Physical
Config
GUI
Attributes
00:13a 03/01/93
0001
Enter Number
Top
Router0
10.0.0.1
Switch0
0001
0002
IP Phone0
IP Phone1
IP Phone1
Physical
Config
GUI
Attributes
00:13a 03/01/93
0002
Top

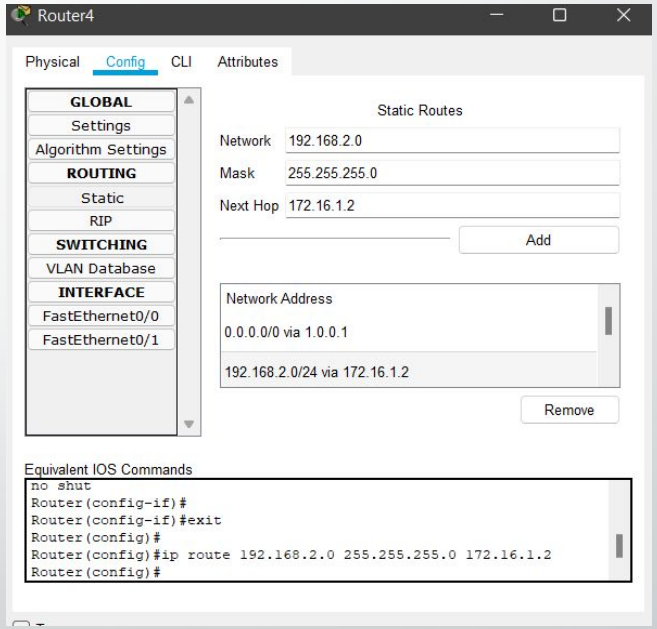
DEMO (VPN)


1.0.0.2
2.0.0.2
PC0
Router4
Router5
PC1
192.168.1.2
192.168.1.1
192.168.2.1
192.168.2.2
1.0.0.1
2.0.0.1
Router6

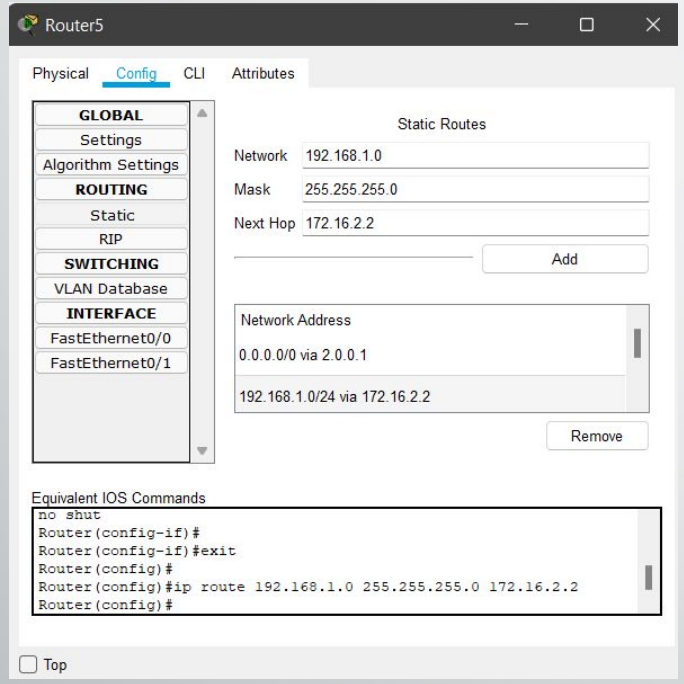
DEMO

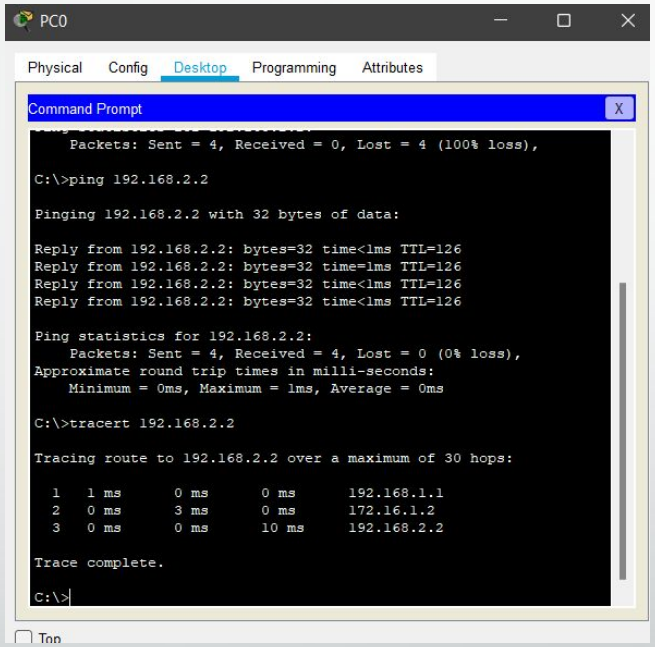

Router4
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Static Routes
Network
Mask
Next Hop
Add
Network Address
0.0.0.0/0 via 1.0.0.1
Remove
Equivalent IOS Commands
Router(config)#ip route 0.0.0.0 0.0.0.0 1.0.0.1
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#

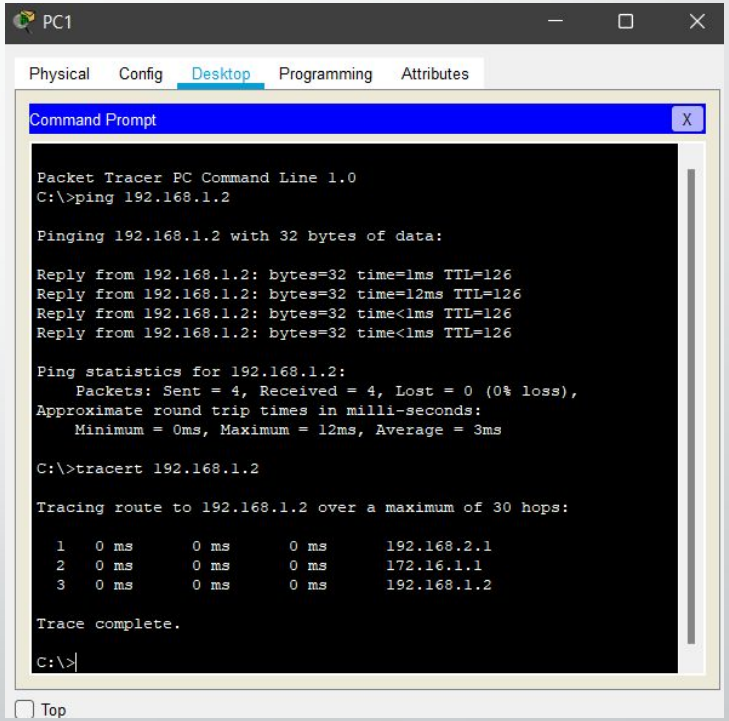

Router5
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
Router(config-if)#exit
Router(config)#
Router(config)#ip route 0.0.0.0 0.0.0.0 2.0.0.1
Router(config)#
Router(config)#
Router(config)#interface tunnel 2
Router(config-if)#
%LINK-5-CHANGED: Interface Tunnel2, changed state to up
Router(config-if)#ip address 172.16.1.2 255.255.0.0
Router(config-if)#tunnel FastEthernet0/1
^
% Invalid input detected at '^' marker.
Router(config-if)#tunnel source FastEthernet0/1
Router(config-if)#tunnel destination 1.0.0.2
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel2, changed state to up
no shut
Router(config-if)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


Router4
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Static Routes
Network
192.168.2.0
Mask
255.255.255.0
Next Hop
172.16.1.2
Add
Network Address
0.0.0.0/0 via 1.0.0.1
192.168.2.0/24 via 172.16.1.2
Remove
Equivalent IOS Commands
no shut
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#ip route 192.168.2.0 255.255.255.0 172.16.1.2
Router(config)#

DEMO


Router5
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Static Routes
Network 192.168.1.0
Mask 255.255.255.0
Next Hop 172.16.2.2
Add
Network Address
0.0.0.0/0 via 2.0.0.1
192.168.1.0/24 via 172.16.2.2
Remove
Equivalent IOS Commands
no shut
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#ip route 192.168.1.0 255.255.255.0 172.16.2.2
Router(config)#
Top


PC0
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>ping 192.168.2.2
Pinging 192.168.2.2 with 32 bytes of data:
Reply from 192.168.2.2: bytes=32 time<1ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126
Reply from 192.168.2.2: bytes=32 time<1ms TTL=126
Reply from 192.168.2.2: bytes=32 time<1ms TTL=126
Ping statistics for 192.168.2.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>tracert 192.168.2.2
Tracing route to 192.168.2.2 over a maximum of 30 hops:
1 1 ms 0 ms 0 ms 192.168.1.1
2 0 ms 3 ms 0 ms 172.16.1.2
3 0 ms 0 ms 10 ms 192.168.2.2
Trace complete.
C:\>


PC1
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.2
Pinging 192.168.1.2 with 32 bytes of data:
Reply from 192.168.1.2: bytes=32 time=1ms TTL=126
Reply from 192.168.1.2: bytes=32 time=12ms TTL=126
Reply from 192.168.1.2: bytes=32 time<1ms TTL=126
Reply from 192.168.1.2: bytes=32 time<1ms TTL=126
Ping statistics for 192.168.1.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 12ms, Average = 3ms
C:\>tracert 192.168.1.2
Tracing route to 192.168.1.2 over a maximum of 30 hops:
1 0 ms 0 ms 0 ms 192.168.2.1
2 0 ms 0 ms 0 ms 172.16.1.1
3 0 ms 0 ms 0 ms 192.168.1.2
Trace complete.
C:\>
Top

IMPACT : VOIP

- Long hours of Connectivity for long time
- Reliable connection
- Ease of Video conferencing.

IMPACT : VPN

- Privacy and secure connection
- Sometimes can access blocked websites.

Conclusion

These Network Technologies evolved in a way , so it can surpass expectation and needs of previous generation and it may have drawbacks and it can be replaced with future technologies.

VPN provides security and privacy which lead way for TOR Networks which has lots and lots anonymous routers.