CSEC 744 Network Security

Name : Shriram Karpoora Sundara Pandian Course

Title : Physical Security

Lab : 1

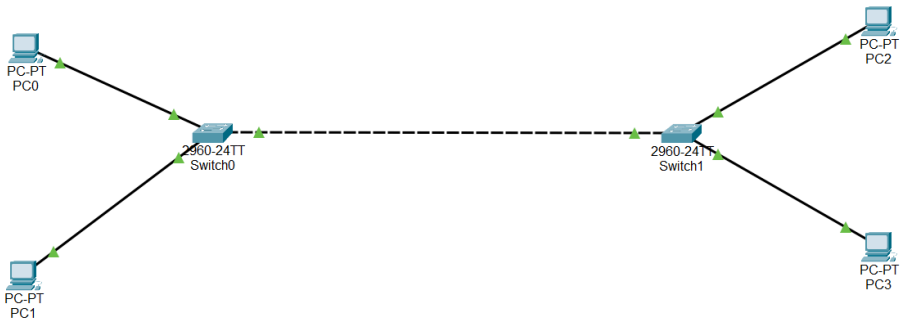
Chapter : 9

Exercise 9. 01 :

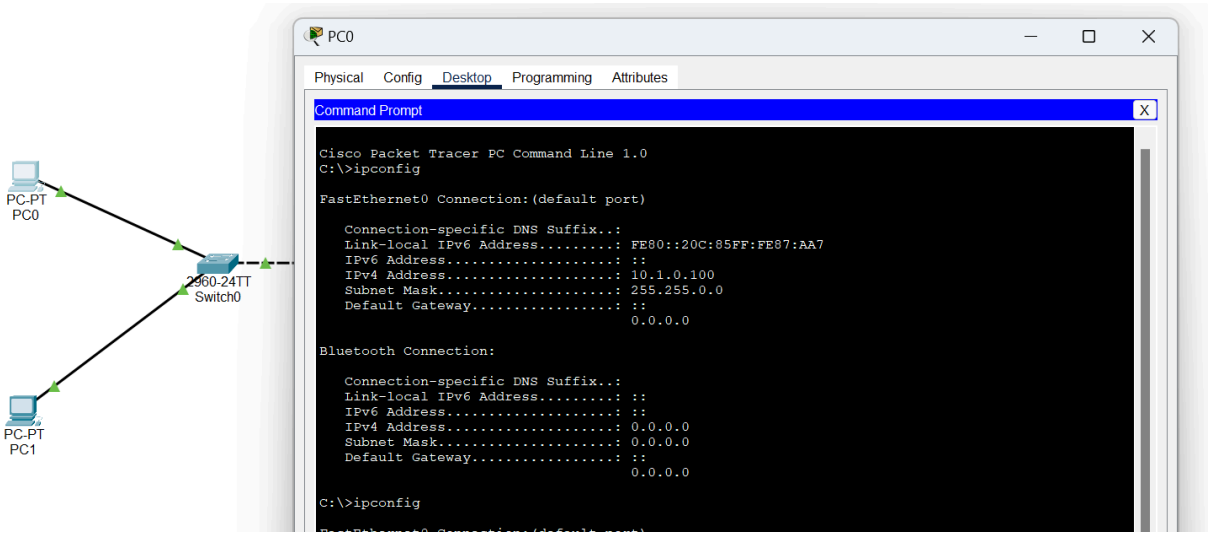
Step 1 : Setting up Cisco Packet Tracer

O.

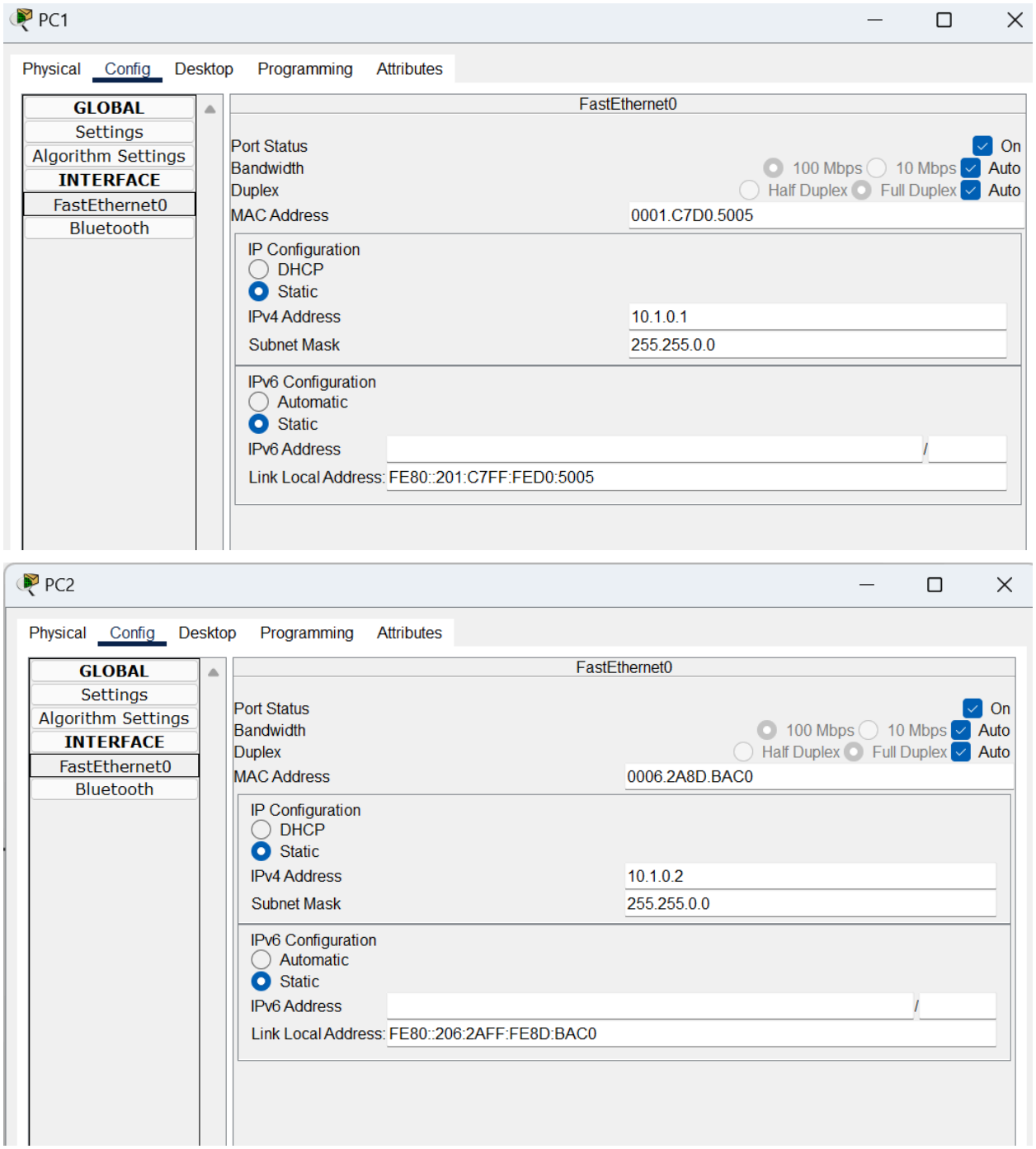
Step 2 :
E.

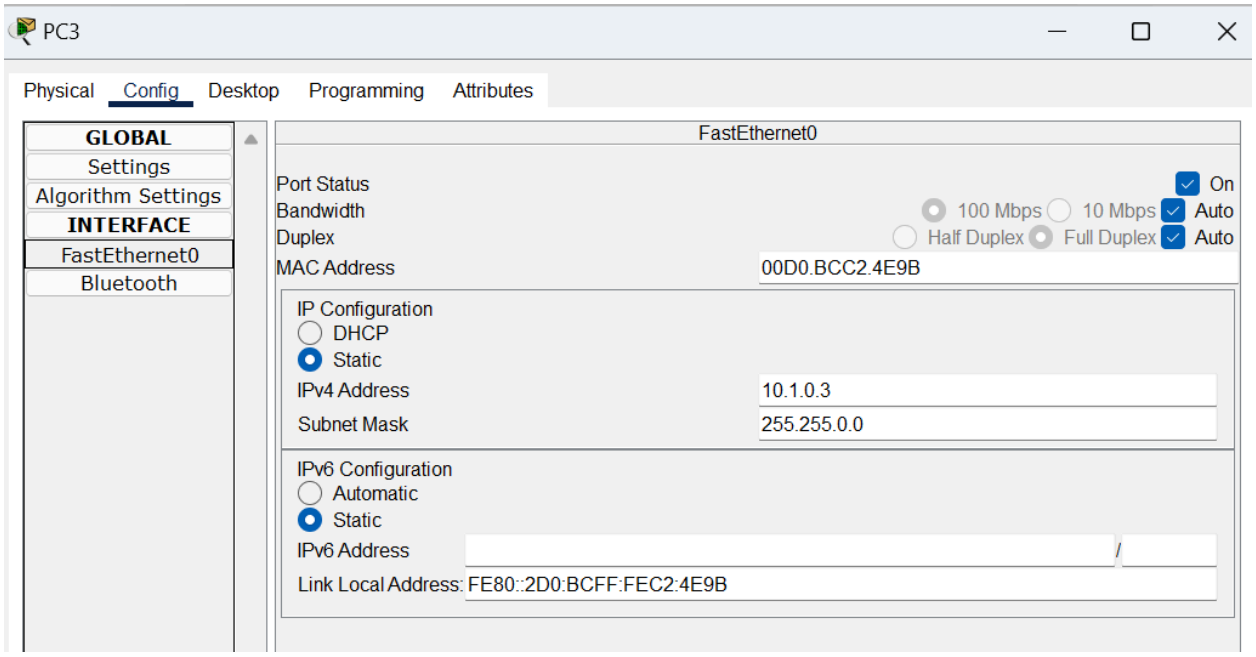


Step 3 :
E.



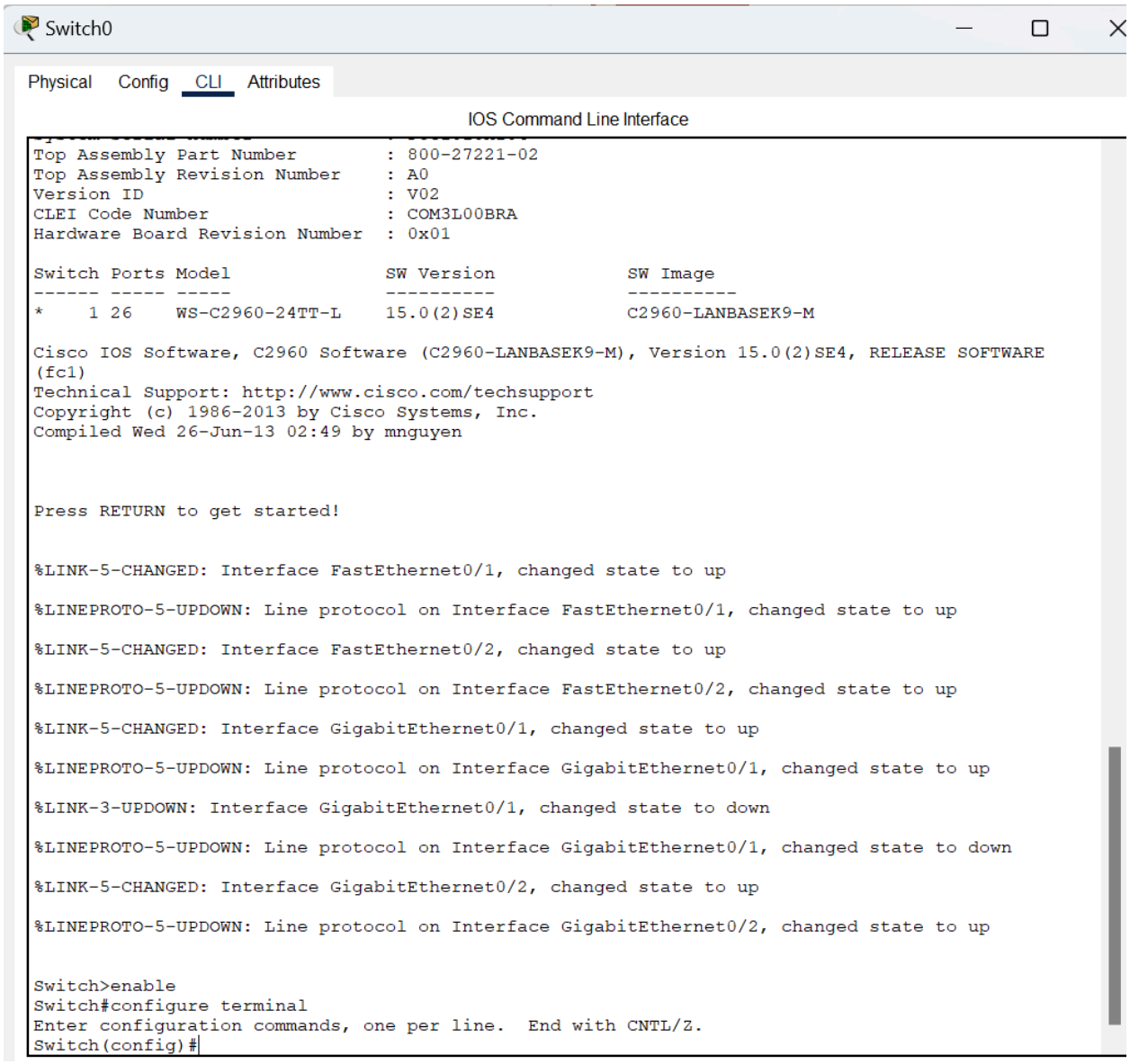
F.


PC1
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
FastEthernet0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0001.C7D0.5005
IP Configuration
DHCP
Static
IPv4 Address
10.1.0.1
Subnet Mask
255.255.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address:
FE80::201:C7FF:FED0:5005
PC2
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
FastEthernet0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0006.2A8D.BAC0
IP Configuration
DHCP
Static
IPv4 Address
10.1.0.2
Subnet Mask
255.255.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address:
FE80::206:2AFF:FE8D:BAC0


PC3
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
FastEthernet0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
00D0.BCC2.4E9B
IP Configuration
DHCP
Static
IPv4 Address
10.1.0.3
Subnet Mask
255.255.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address:
FE80::2D0:BCFF:FEC2:4E9B

Step 4 :

B.




```
% Ambiguous command:  "en"
Switch(config)#en?
enable  end
```

C.

```
% Ambiguous command:  "en"
Switch(config)#en?
enable  end
Switch(config)#host?
hostname
Switch(config)#hostname S0
S0(config)#
```

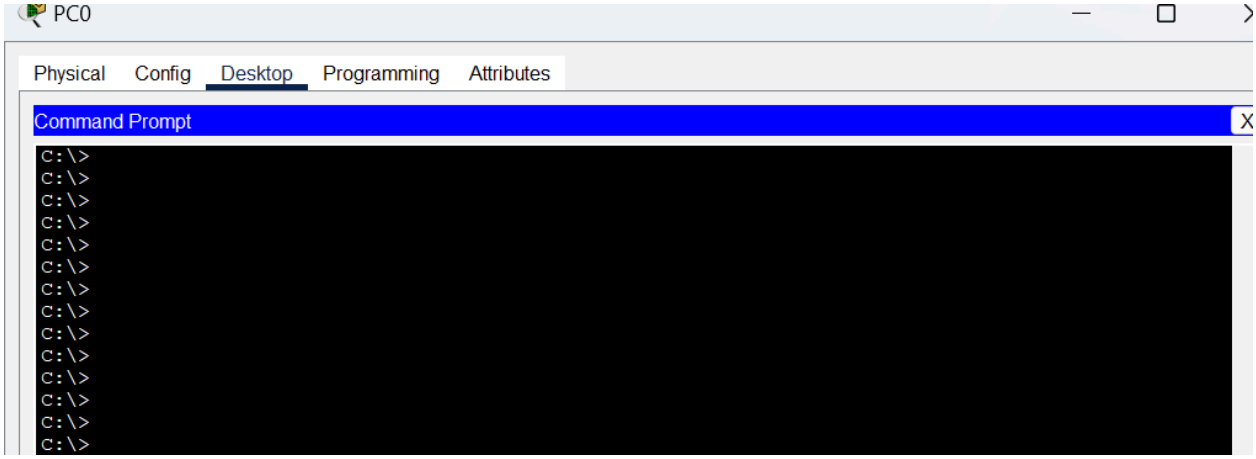
D.

```
S0#
S0#exit



S0 con0 is now available



Press RETURN to get started.









S0>
S0>
S0>
S0>
S0>
```

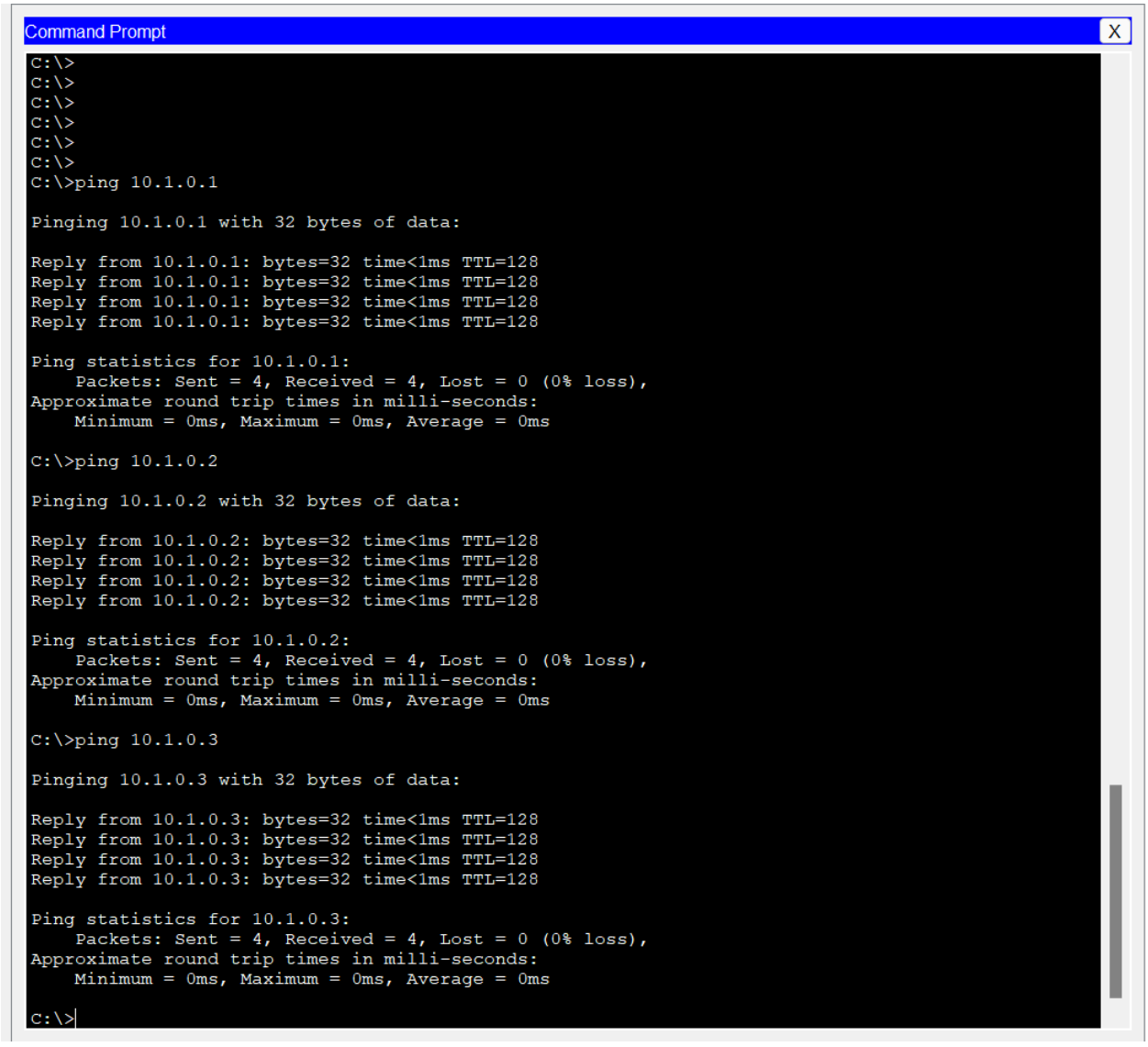
E.

```
Switch>
Switch>enable
Switch#host?
% Unrecognized command
Switch#confi?
configure
Switch#configure ?
  terminal  Configure from the terminal
  <cr>
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname?
hostname
Switch(config)#hostname S1
S1(config)#END
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#
```

F.


PC0
Physical
Config
Desktop
Programming
Attributes
Command Prompt
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>

G.


Command Prompt
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>ping 10.1.0.1
Pinging 10.1.0.1 with 32 bytes of data:
Reply from 10.1.0.1: bytes=32 time<1ms TTL=128
Reply from 10.1.0.1: bytes=32 time<1ms TTL=128
Reply from 10.1.0.1: bytes=32 time<1ms TTL=128
Reply from 10.1.0.1: bytes=32 time<1ms TTL=128
Ping statistics for 10.1.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 10.1.0.2
Pinging 10.1.0.2 with 32 bytes of data:
Reply from 10.1.0.2: bytes=32 time<1ms TTL=128
Reply from 10.1.0.2: bytes=32 time<1ms TTL=128
Reply from 10.1.0.2: bytes=32 time<1ms TTL=128
Reply from 10.1.0.2: bytes=32 time<1ms TTL=128
Ping statistics for 10.1.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 10.1.0.3
Pinging 10.1.0.3 with 32 bytes of data:
Reply from 10.1.0.3: bytes=32 time<1ms TTL=128
Reply from 10.1.0.3: bytes=32 time<1ms TTL=128
Reply from 10.1.0.3: bytes=32 time<1ms TTL=128
Reply from 10.1.0.3: bytes=32 time<1ms TTL=128
Ping statistics for 10.1.0.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>

H.

```
S0>enable
S0#show mac-address-table
          Mac Address Table
-------------------------------------------

Vlan    Mac Address       Type        Ports
----    -----------       --------    -----

   1    0001.c7d0.5005    DYNAMIC     Fa0/2
   1    0002.4a77.d31a    DYNAMIC     Gig0/2
   1    0006.2a8d.bac0    DYNAMIC     Gig0/2
   1    000c.8587.0aa7    DYNAMIC     Fa0/1
   1    00d0.bcc2.4e9b    DYNAMIC     Gig0/2
S0#
```

From Pc 0

```
Invalid Command.

C:\>ipconfig /all

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Physical Address.................: 000C.8587.0AA7
   Link-local IPv6 Address.........: FE80::20C:85FF:FE87:AA7
   IPv6 Address....................: ::
   IPv4 Address....................: 10.1.0.100
   Subnet Mask.....................: 255.255.0.0
```

```
Vlan    Mac Address       Type        Ports
----    -----------       --------    -----

   1    0001.c7d0.5005    DYNAMIC     Fa0/2
   1    0002.4a77.d31a    DYNAMIC     Gig0/2
   1    0006.2a8d.bac0    DYNAMIC     Gig0/2
   1    000c.8587.0aa7    DYNAMIC     Fa0/1
   1    00d0.bcc2.4e9b    DYNAMIC     Gig0/2
S0#
```

Switch 1 (Mac Address)

```
S1>enable
S1#show interface g0/2
GigabitEthernet0/2 is up, line protocol is up (connected)
  Hardware is Lance, address is 0002.4a77.d31a (bia 0002.4a77.d31a)
 BW 1000000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s
  input flow-control is off, output flow-control is off
```

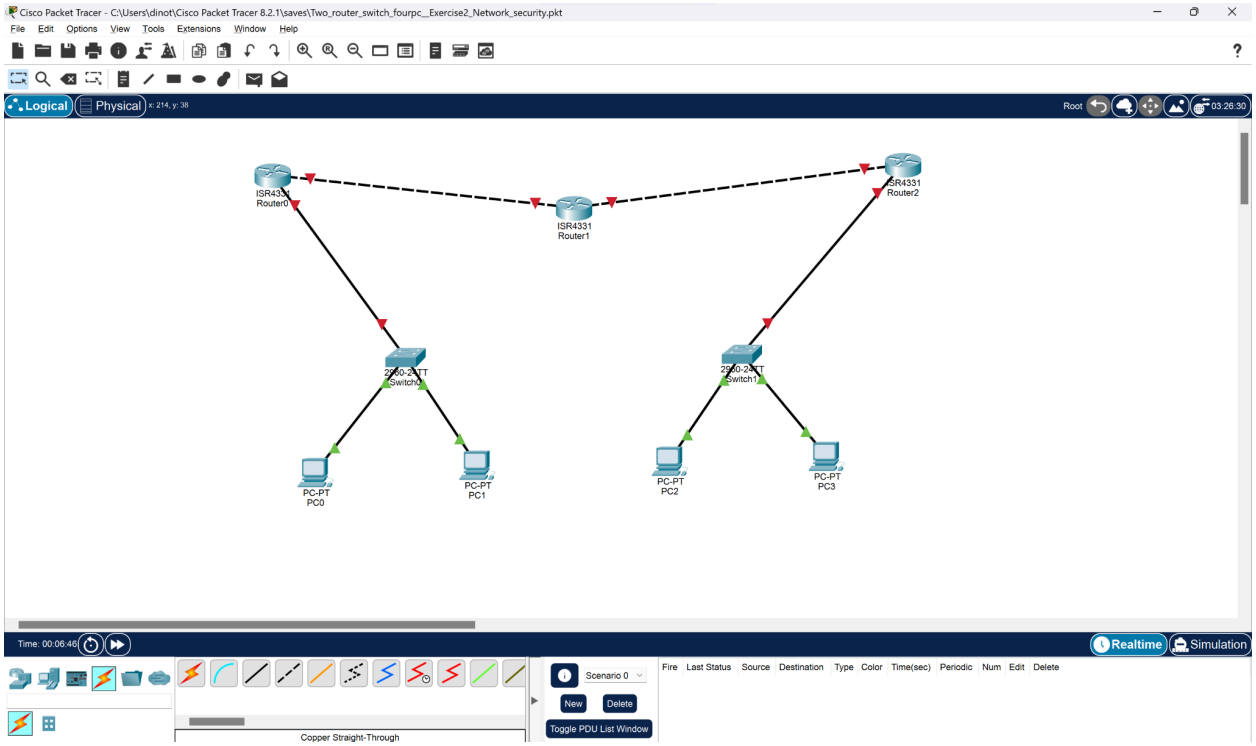
SAT of Switch 0 :

```
-------------------------------------------

Vlan    Mac Address       Type        Ports
----    -----------       --------    -----

   1    0001.c7d0.5005    DYNAMIC     Fa0/2
   1    0002.4a77.d31a    DYNAMIC     Gig0/2
   1    0006.2a8d.bac0    DYNAMIC     Gig0/2
   1    000c.8587.0aa7    DYNAMIC     Fa0/1
   1    00d0.bcc2.4e9b    DYNAMIC     Gig0/2
S0#show interface g0/2
GigabitEthernet0/2 is up, line protocol is up (connected)
  Hardware is Lance, address is 0060.5c0d.dd1a (bia 0060.5
```

Exercise 9. 02 :

Step 1 :

F.



Step 2 :

G.

```
R0(config-if)#ip address 10.1.0.99 255.255.0.0
R0(config-if)#no shutdown

R0(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up
```

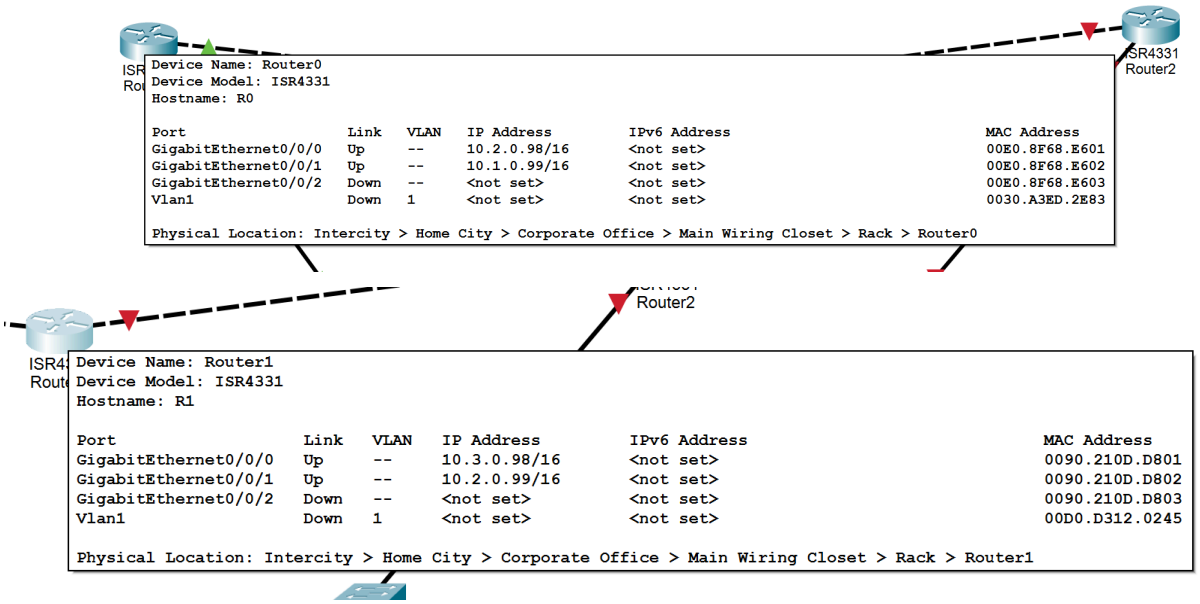
I.

```
R0(config-if)#interface g0/0/0
R0(config-if)#ip address 10.2.0.98 255.255.0.0
R0(config-if)#no shutdown

R0(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up
```

Step 3 :

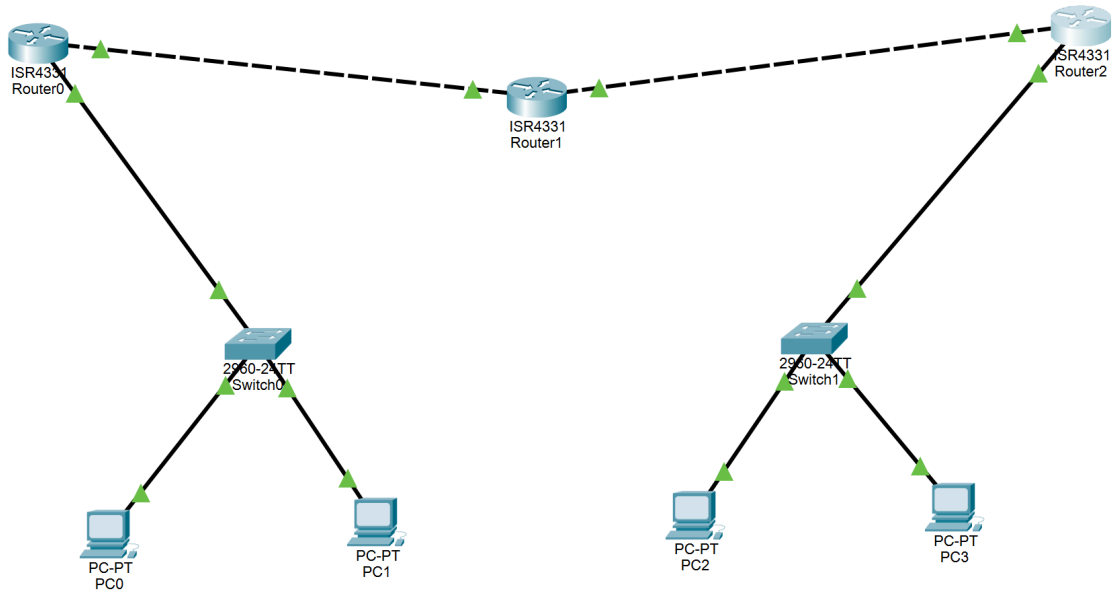
A.

```
Router>enable
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R1
R1(config)#interface g0/0/1
R1(config-if)#ip address 10.2.0.99 255.255.0.0
R1(config-if)#no shutdown

R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up

R1(config-if)#interface g0/0/0
R1(config-if)#ip address 10.3.0.98 255.255.0.0
R1(config-if)#no shut

R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up
```

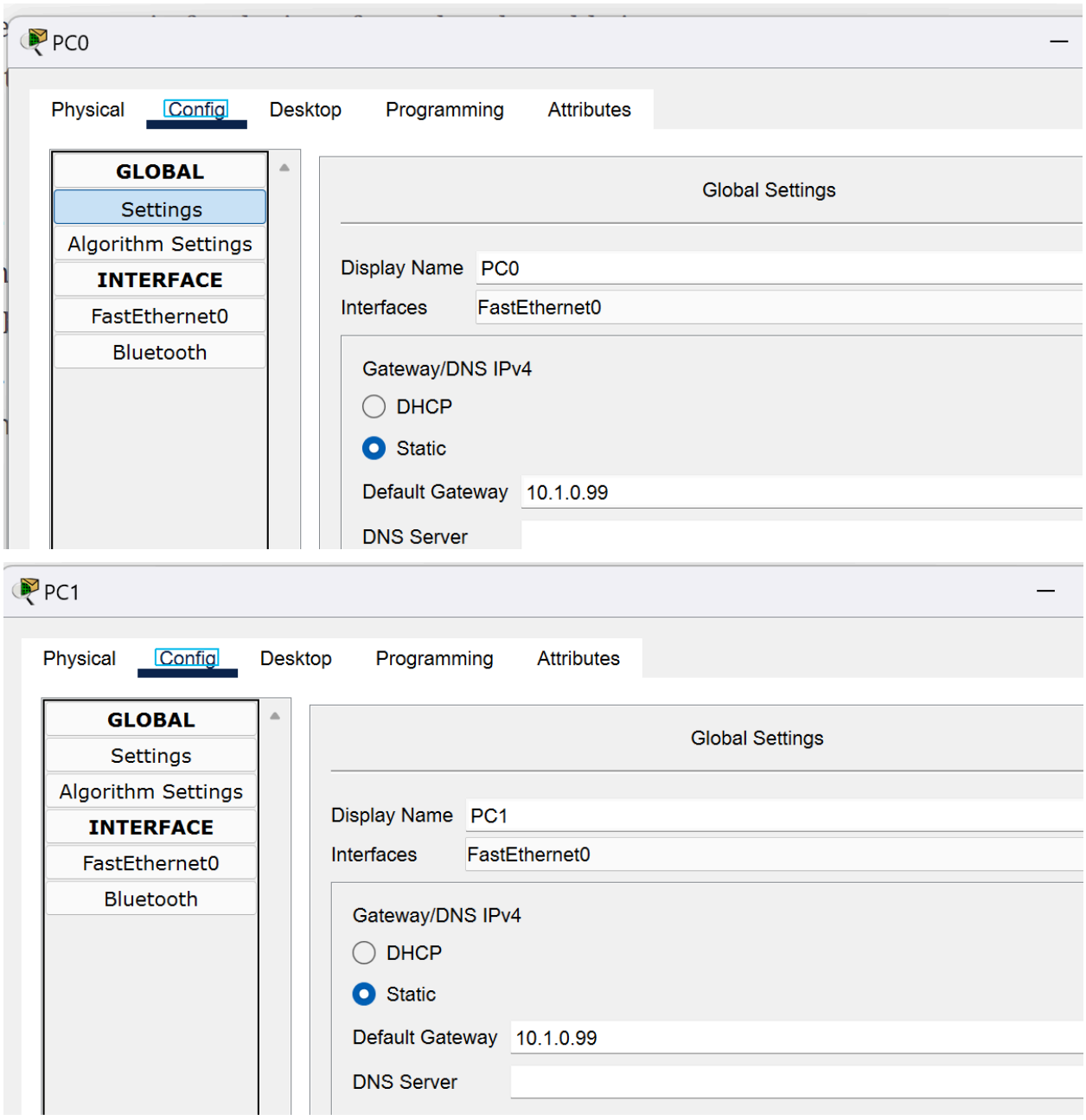


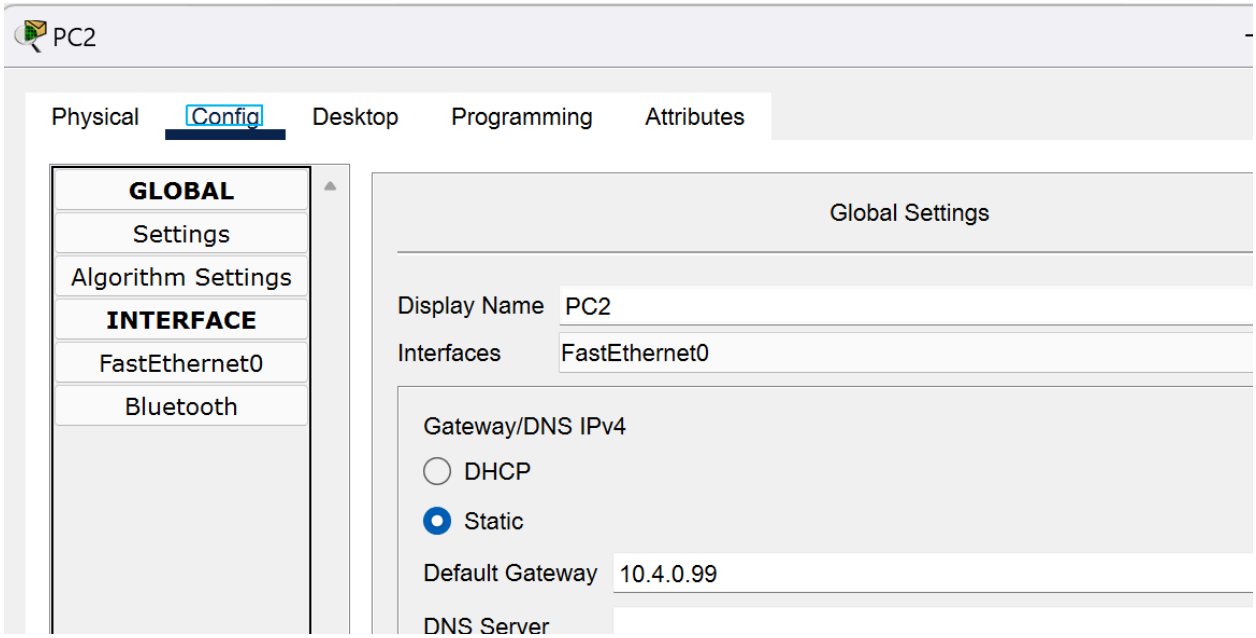
B.

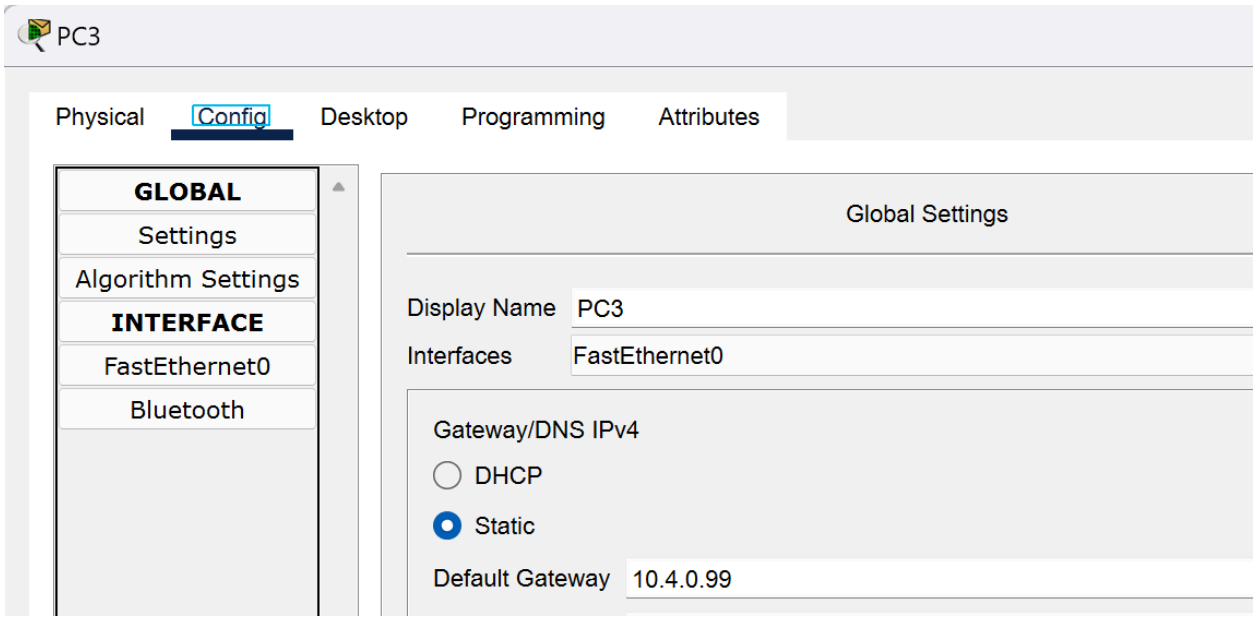
```
Router>enable
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R2
R2(config)#interface g0/0/1
R2(config-if)#ip address 10.3.0.99 255.255.0.0
R2(config-if)#no shut

R2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up

R2(config-if)#interface g0/0/0
R2(config-if)#ip address 10.4.0.99 255.255.0.0
R2(config-if)#no shut

R2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
```



C.


PC0
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
Global Settings
Display Name
PC0
Interfaces
FastEthernet0
Gateway/DNS IPv4
DHCP
Static
Default Gateway
10.1.0.99
DNS Server
PC1
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
Global Settings
Display Name
PC1
Interfaces
FastEthernet0
Gateway/DNS IPv4
DHCP
Static
Default Gateway
10.1.0.99
DNS Server


PC2
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
Global Settings
Display Name
PC2
Interfaces
FastEthernet0
Gateway/DNS IPv4
DHCP
Static
Default Gateway
10.4.0.99
DNS Server


PC3
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
Global Settings
Display Name
PC3
Interfaces
FastEthernet0
Gateway/DNS IPv4
DHCP
Static
Default Gateway
10.4.0.99

D.

```
C:\>ping 10.1.0.99

Pinging 10.1.0.99 with 32 bytes of data:

Reply from 10.1.0.99: bytes=32 time<1ms TTL=255
Reply from 10.1.0.99: bytes=32 time<1ms TTL=255
Reply from 10.1.0.99: bytes=32 time<1ms TTL=255
Reply from 10.1.0.99: bytes=32 time<1ms TTL=255

Ping statistics for 10.1.0.99:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

```
C:\>ping 10.4.0.99

Pinging 10.4.0.99 with 32 bytes of data:

Reply from 10.4.0.99: bytes=32 time<1ms TTL=255
Reply from 10.4.0.99: bytes=32 time<1ms TTL=255
Reply from 10.4.0.99: bytes=32 time<1ms TTL=255
Reply from 10.4.0.99: bytes=32 time<1ms TTL=255

Ping statistics for 10.4.0.99:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

E.

```
R0#show ip route
Codes: L - local, C - connected, S - static, 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

     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       10.1.0.0/16 is directly connected, GigabitEthernet0/0/1
L       10.1.0.99/32 is directly connected, GigabitEthernet0/0/1
C       10.2.0.0/16 is directly connected, GigabitEthernet0/0/0
L       10.2.0.98/32 is directly connected, GigabitEthernet0/0/0
```

```
R1>
R1>enable
R1#show ip route
Codes: L - local, C - connected, S - static, 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

     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       10.2.0.0/16 is directly connected, GigabitEthernet0/0/1
L       10.2.0.99/32 is directly connected, GigabitEthernet0/0/1
C       10.3.0.0/16 is directly connected, GigabitEthernet0/0/0
L       10.3.0.98/32 is directly connected, GigabitEthernet0/0/0
```

```
R2>enable
R2#show ip route
Codes: L - local, C - connected, S - static, 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

     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       10.3.0.0/16 is directly connected, GigabitEthernet0/0/1
L       10.3.0.99/32 is directly connected, GigabitEthernet0/0/1
C       10.4.0.0/16 is directly connected, GigabitEthernet0/0/0
L       10.4.0.99/32 is directly connected, GigabitEthernet0/0/0
```

F.

```
C:\>ping 10.4.0.3

Pinging 10.4.0.3 with 32 bytes of data:

Reply from 10.1.0.99: Destination host unreachable.
```

```
R0>enable
R0#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R0(config)#ip route 10.3.0.0 255.255.0.0 10.2.0.99
R0(config)#ip route 10.4.0.0 255.255.0.0 10.2.0.99
R0(config)#exit
R0#
%SYS-5-CONFIG_I: Configured from console by console

R0#show ip route
Codes: L - local, C - connected, S - static, 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

     10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
C       10.1.0.0/16 is directly connected, GigabitEthernet0/0/1
L       10.1.0.99/32 is directly connected, GigabitEthernet0/0/1
C       10.2.0.0/16 is directly connected, GigabitEthernet0/0/0
L       10.2.0.98/32 is directly connected, GigabitEthernet0/0/0
S       10.3.0.0/16 [1/0] via 10.2.0.99
S       10.4.0.0/16 [1/0] via 10.2.0.99

R0#
```

G.

```
C:\>tracert 10.4.0.3

Tracing route to 10.4.0.3 over a maximum of 30 hops:

  1    0 ms      1 ms      0 ms      10.1.0.99
  2    *         *         *         Request timed out.
  3    *         *         *         Request timed out.
  4    *         *         *         Request timed out.
  5    *         *         *         Request timed out.
  6    *         *         *         Request timed out.
  7    *         *         *         Request timed out.
  8    *         *         *         Request timed out.
  9    *         *         *         Request timed out.
  10    *         *         *         Request timed out.
  11    *         0 ms      *         Request timed out.
  12    0 ms      *         0 ms      10.2.0.99
```

```
R1>enable
R1#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#ip route 10.1.0.0 255.255.0.0 10.2.0.98
R1(config)#ip route 10.4.0.0 255.255.0.0 10.3.0.99
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#show ip route
Codes: L - local, C - connected, S - static, 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

     10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
S       10.1.0.0/16 [1/0] via 10.2.0.98
C       10.2.0.0/16 is directly connected, GigabitEthernet0/0/1
L       10.2.0.99/32 is directly connected, GigabitEthernet0/0/1
C       10.3.0.0/16 is directly connected, GigabitEthernet0/0/0
L       10.3.0.98/32 is directly connected, GigabitEthernet0/0/0
S       10.4.0.0/16 [1/0] via 10.3.0.99
```

H.

```
C:\>ping 10.4.0.3

Pinging 10.4.0.3 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 10.4.0.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

I.

```
R2>enable
R2#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ip route 0.0.0.0 0.0.0.0 10.3.0.98
R2(config)#show ip route
             ^
% Invalid input detected at '^' marker.

R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#show ip route
Codes: L - local, C - connected, S - static, 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 10.3.0.98 to network 0.0.0.0

     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       10.3.0.0/16 is directly connected, GigabitEthernet0/0/1
L       10.3.0.99/32 is directly connected, GigabitEthernet0/0/1
C       10.4.0.0/16 is directly connected, GigabitEthernet0/0/0
L       10.4.0.99/32 is directly connected, GigabitEthernet0/0/0
S*   0.0.0.0/0 [1/0] via 10.3.0.98
```

J.

```
C:\>ping 10.4.0.3

Pinging 10.4.0.3 with 32 bytes of data:

Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125

Ping statistics for 10.4.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

K

```
C:\>tracert 10.4.0.3

Tracing route to 10.4.0.3 over a maximum of 30 hops:

  1    0 ms      0 ms      0 ms      10.1.0.99
  2    0 ms      0 ms      0 ms      10.2.0.99
  3    1 ms      0 ms      0 ms      10.3.0.99
  4    0 ms      1 ms      1 ms      10.4.0.3

Trace complete.
```

Step 4 :

A.

```
R0#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R0(config)#no ip route 10.3.0.0 255.255.0.0
R0(config)#no ip route 10.4.0.0 255.255.0.0
R0(config)#exit
R0#
%SYS-5-CONFIG_I: Configured from console by console

R0#show ip route
Codes: L - local, C - connected, S - static, 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

     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       10.1.0.0/16 is directly connected, GigabitEthernet0/0/1
L       10.1.0.99/32 is directly connected, GigabitEthernet0/0/1
C       10.2.0.0/16 is directly connected, GigabitEthernet0/0/0
L       10.2.0.98/32 is directly connected, GigabitEthernet0/0/0
```

B.

```
R1#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#no ip route 10.1.0.0 255.255.0.0
R1(config)#no ip route 10.4.0.0 255.255.0.0
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console
w
Building configuration...
[OK]
R1#show ip route
Codes: L - local, C - connected, S - static, 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

     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       10.2.0.0/16 is directly connected, GigabitEthernet0/0/1
L       10.2.0.99/32 is directly connected, GigabitEthernet0/0/1
C       10.3.0.0/16 is directly connected, GigabitEthernet0/0/0
L       10.3.0.98/32 is directly connected, GigabitEthernet0/0/0
```

C.

```
R2#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#no ip route 0.0.0.0 0.0.0.0
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#show ip route
Codes: L - local, C - connected, S - static, 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

     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       10.3.0.0/16 is directly connected, GigabitEthernet0/0/1
L       10.3.0.99/32 is directly connected, GigabitEthernet0/0/1
C       10.4.0.0/16 is directly connected, GigabitEthernet0/0/0
L       10.4.0.99/32 is directly connected, GigabitEthernet0/0/0
```

D, E :

```
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#network 10.0.0.0.255.255.255 area 0
                           ^
% Invalid input detected at '^' marker.

R2(config-router)#network 10.0.0.0 0.255.255.255 area 0
R2(config-router)#end
R2#
```

F.

```
R1(config-router)#network 10.0.0.0 0.255.255.255 area 0
R1(config-router)#
01:18:29: %OSPF-5-ADJCHG: Process 1, Nbr 10.2.0.98 on GigabitEthernet0/0/1 from LOADING to
FULL, Loading Done

01:18:32: %OSPF-5-ADJCHG: Process 1, Nbr 10.4.0.99 on GigabitEthernet0/0/0 from LOADING to
FULL, Loading Done
```

In all routers

```
Gateway of last resort is not set

     10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
C       10.1.0.0/16 is directly connected, GigabitEthernet0/0/1
L       10.1.0.99/32 is directly connected, GigabitEthernet0/0/1
C       10.2.0.0/16 is directly connected, GigabitEthernet0/0/0
L       10.2.0.98/32 is directly connected, GigabitEthernet0/0/0
O       10.3.0.0/16 [110/2] via 10.2.0.99, 00:00:53, GigabitEthernet0/0/0
O       10.4.0.0/16 [110/3] via 10.2.0.99, 00:00:43, GigabitEthernet0/0/0
```

```
     10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
O       10.1.0.0/16 [110/2] via 10.2.0.98, 00:02:39, GigabitEthernet0/0/1
C       10.2.0.0/16 is directly connected, GigabitEthernet0/0/1
L       10.2.0.99/32 is directly connected, GigabitEthernet0/0/1
C       10.3.0.0/16 is directly connected, GigabitEthernet0/0/0
L       10.3.0.98/32 is directly connected, GigabitEthernet0/0/0
O       10.4.0.0/16 [110/2] via 10.3.0.99, 00:02:39, GigabitEthernet0/0/0
```

G.

```
Ping statistics for 10.1.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.4.0.2

Pinging 10.4.0.2 with 32 bytes of data:

Reply from 10.4.0.2: bytes=32 time<1ms TTL=125
Reply from 10.4.0.2: bytes=32 time<1ms TTL=125
Reply from 10.4.0.2: bytes=32 time<1ms TTL=125
Reply from 10.4.0.2: bytes=32 time=1ms TTL=125

Ping statistics for 10.4.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.4.0.3

Pinging 10.4.0.3 with 32 bytes of data:

Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125

Ping statistics for 10.4.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

```
Pinging 10.1.0.100 with 32 bytes of data:

Reply from 10.1.0.100: bytes=32 time<1ms TTL=128
Reply from 10.1.0.100: bytes=32 time<1ms TTL=128
Reply from 10.1.0.100: bytes=32 time<1ms TTL=128
Reply from 10.1.0.100: bytes=32 time<1ms TTL=128

Ping statistics for 10.1.0.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.4.0.2

Pinging 10.4.0.2 with 32 bytes of data:

Reply from 10.4.0.2: bytes=32 time<1ms TTL=125
Reply from 10.4.0.2: bytes=32 time=1ms TTL=125
Reply from 10.4.0.2: bytes=32 time<1ms TTL=125
Reply from 10.4.0.2: bytes=32 time=1ms TTL=125

Ping statistics for 10.4.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.4.0.3

Pinging 10.4.0.3 with 32 bytes of data:

Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time=1ms TTL=125
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125

Ping statistics for 10.4.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

```
Pinging 10.1.0.100 with 32 bytes of data:

Reply from 10.1.0.100: bytes=32 time<1ms TTL=125
Reply from 10.1.0.100: bytes=32 time<1ms TTL=125
Reply from 10.1.0.100: bytes=32 time<1ms TTL=125
Reply from 10.1.0.100: bytes=32 time<1ms TTL=125

Ping statistics for 10.1.0.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.1.0.1

Pinging 10.1.0.1 with 32 bytes of data:

Reply from 10.1.0.1: bytes=32 time<1ms TTL=125
Reply from 10.1.0.1: bytes=32 time<1ms TTL=125
Reply from 10.1.0.1: bytes=32 time<1ms TTL=125
Reply from 10.1.0.1: bytes=32 time<1ms TTL=125

Ping statistics for 10.1.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.4.0.3

Pinging 10.4.0.3 with 32 bytes of data:

Reply from 10.4.0.3: bytes=32 time=7ms TTL=128
Reply from 10.4.0.3: bytes=32 time<1ms TTL=128
Reply from 10.4.0.3: bytes=32 time<1ms TTL=128
Reply from 10.4.0.3: bytes=32 time<1ms TTL=128

Ping statistics for 10.4.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 7ms, Average = 1ms
```

```
Pinging 10.1.0.100 with 32 bytes of data:

Reply from 10.1.0.100: bytes=32 time<1ms TTL=125
Reply from 10.1.0.100: bytes=32 time<1ms TTL=125
Reply from 10.1.0.100: bytes=32 time<1ms TTL=125
Reply from 10.1.0.100: bytes=32 time<1ms TTL=125

Ping statistics for 10.1.0.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>png 10.1.0.1
Invalid Command.

C:\>ping 10.4.0.2

Pinging 10.4.0.2 with 32 bytes of data:

Reply from 10.4.0.2: bytes=32 time<1ms TTL=128
Reply from 10.4.0.2: bytes=32 time<1ms TTL=128
Reply from 10.4.0.2: bytes=32 time<1ms TTL=128
Reply from 10.4.0.2: bytes=32 time<1ms TTL=128

Ping statistics for 10.4.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.1.0.1

Pinging 10.1.0.1 with 32 bytes of data:

Reply from 10.1.0.1: bytes=32 time<1ms TTL=125
Reply from 10.1.0.1: bytes=32 time<1ms TTL=125
Reply from 10.1.0.1: bytes=32 time<1ms TTL=125
Reply from 10.1.0.1: bytes=32 time<1ms TTL=125

Ping statistics for 10.1.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

H.

```
C:\>tracert 10.4.0.3

Tracing route to 10.4.0.3 over a maximum of 30 hops:

  1    0 ms      0 ms      1 ms      10.1.0.99
  2    0 ms      0 ms      0 ms      10.2.0.99
  3    0 ms      0 ms      1 ms      10.3.0.99
  4    0 ms      0 ms      0 ms      10.4.0.3

Trace complete.
```

Exercise 9. 03 :

Step 1 :
A.

```
S1>enable
```

B.

```
S1>enable
S1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#enable secret bob
S1(config)#exit
```

C.
After typing the password bob, i got into the privilege mode.

```
S1>enable
Password:
S1#
```

Step 2 :
A, B, C :

```
S1#
S1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#line con 0
S1(config-line)#password alice
S1(config-line)#login
S1(config-line)#exit
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#exit
```

D.

```
Press RETURN to get started.



User Access Verification

Password:

S1>
```

Step 3 :

A, B :

```
S1>enable
Password:
S1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#username shriram password kp
S1(config)#line con 0
S1(config-line)#login local
S1(config-line)#no password
S1(config-line)#exit
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#exit
```

C.

```
Press RETURN to get started!



User Access Verification

Username: shriram
Password:

S1>
```

After giving password KP i got access to the router.

Step 4 :

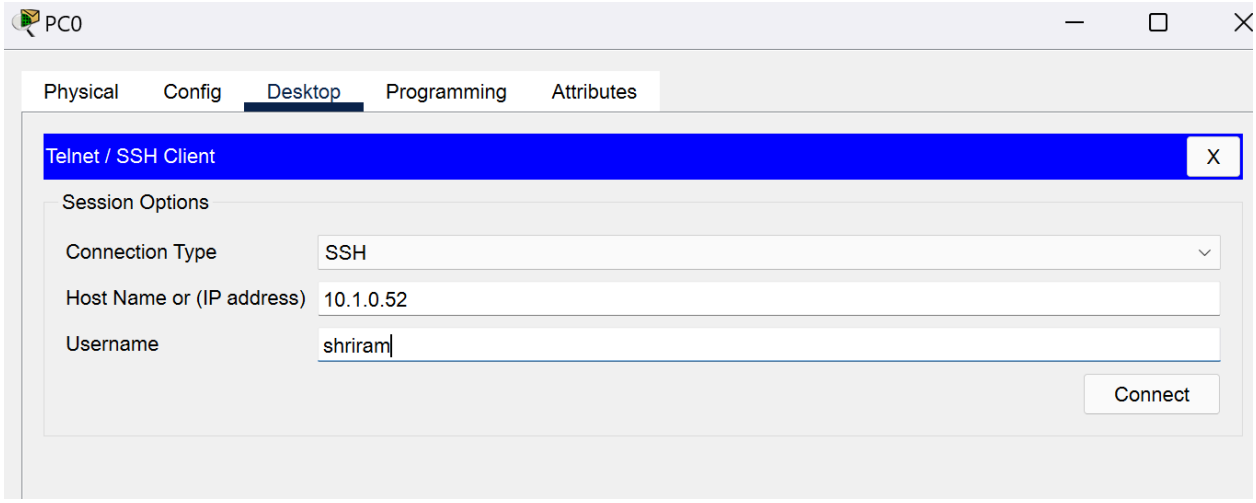
A.

```
S1>enable
Password:
S1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#interface vlan 1
S1(config-if)#ip address 10.1.0.52 255.255.0.0
S1(config-if)#no shutdown

S1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

S1(config-if)#exit
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#ip default gateway 10.1.0.99
      ^
% Invalid input detected at '^' marker.

S1#
S1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#ip default-gateway 10.1.0.99
      ^
% Invalid input detected at '^' marker.

S1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#ip default-gateway 10.1.0.99
```

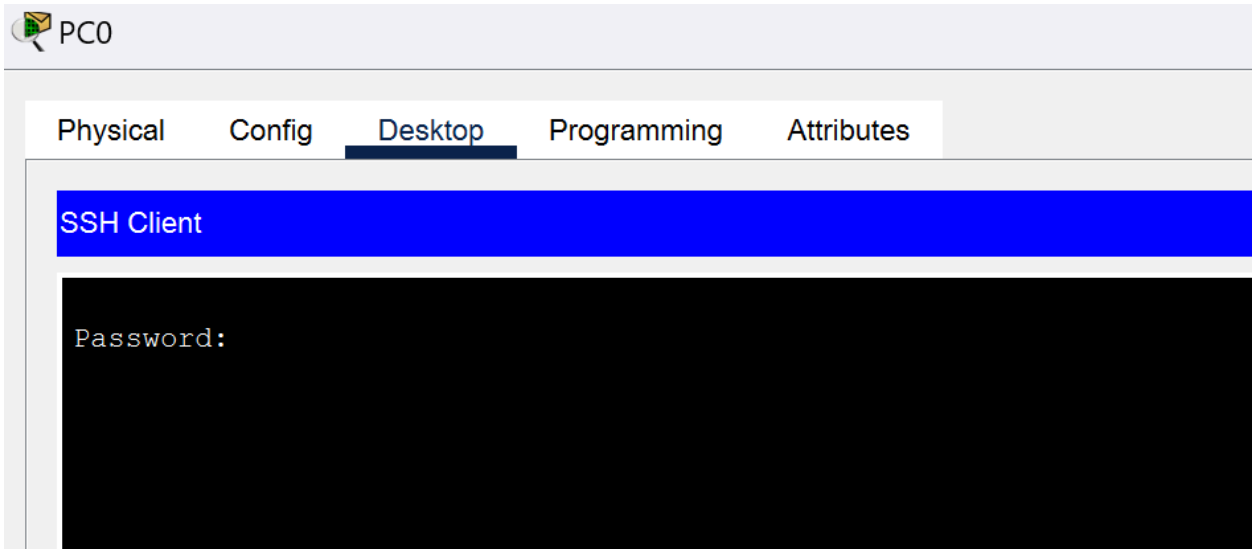
B.

```
S1(config)#hostname S0
S0(config)#ip domain-name weissman.edu
S0(config)#crypto key generate rsa
The name for the keys will be: S0.weissman.edu
Choose the size of the key modulus in the range of 360 to 4096 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.

How many bits in the modulus [512]: 2048
% Generating 2048 bit RSA keys, keys will be non-exportable...[OK]

S0(config)#ip ssh version 2
*Mar 1 4:12:59.38: %SSH-5-ENABLED: SSH 1.99 has been enabled
S0(config)#line vty 0 15
S0(config-line)#login local
S0(config-line)#transport input ssh
```

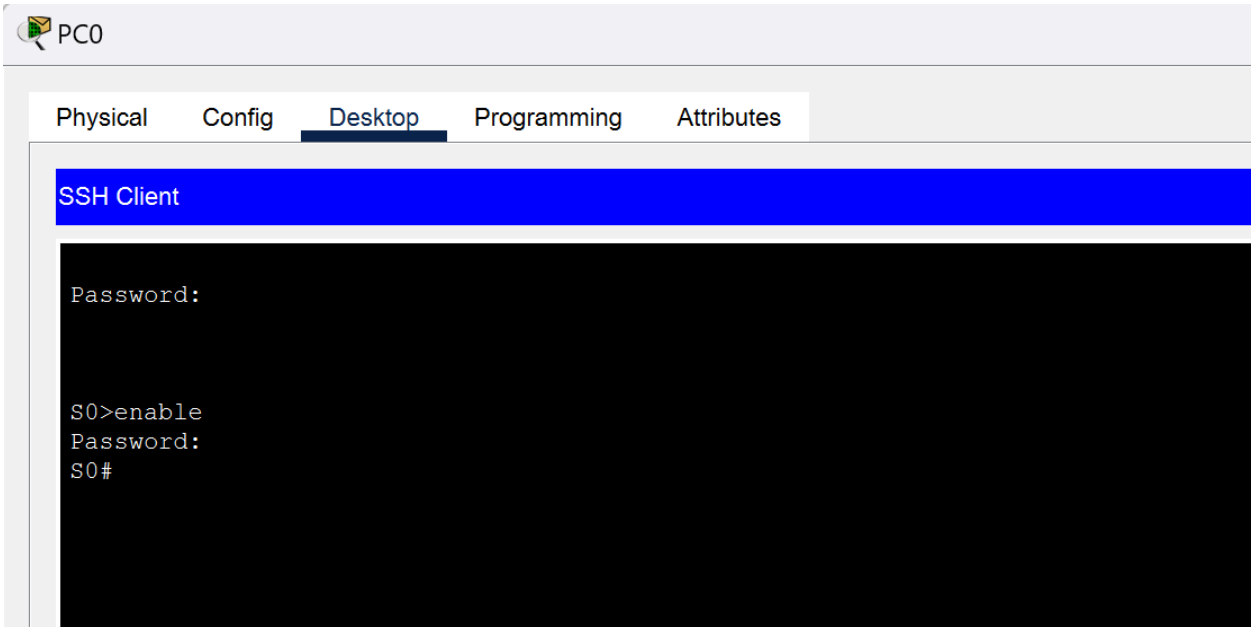
C.


PC0
Physical
Config
Desktop
Programming
Attributes
Telnet / SSH Client
X
Session Options
Connection Type
SSH
Host Name or (IP address)
10.1.0.52
Username
shriram
Connect

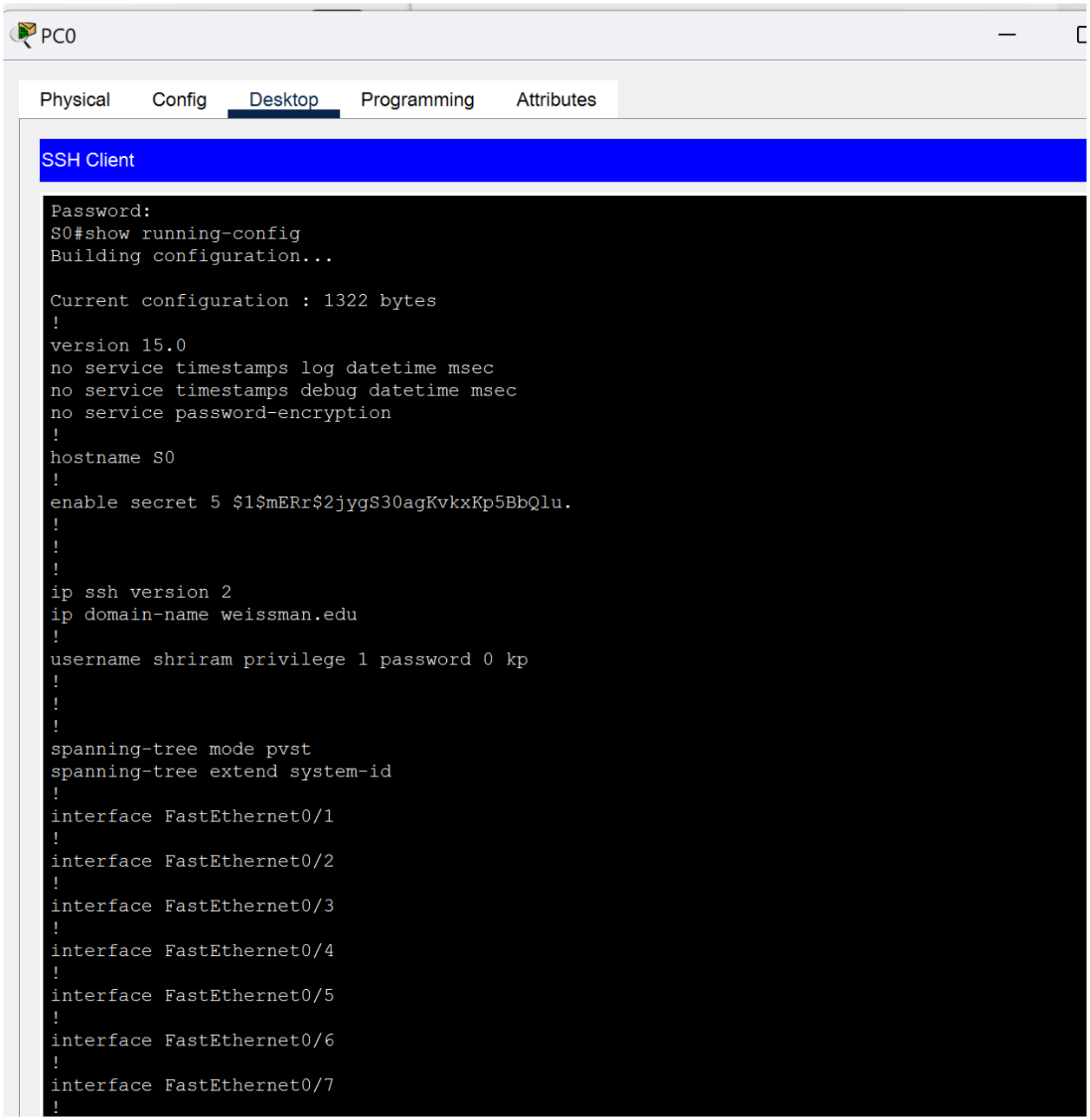
D.


PC0
Physical
Config
Desktop
Programming
Attributes
SSH Client
Password:

E.


PC0
Physical
Config
Desktop
Programming
Attributes
SSH Client
Password:
S0>enable
Password:
S0#

F.


PC0
Physical
Config
Desktop
Programming
Attributes
SSH Client
Password:
S0#show running-config
Building configuration...
Current configuration : 1322 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname S0
!
enable secret 5 1mERr$2jygS30agKvkxKp5BbQlu.
!
!
!
ip ssh version 2
ip domain-name weissman.edu
!
username shriram privilege 1 password 0 kp
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
!
interface FastEthernet0/2
!
interface FastEthernet0/3
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!

```
!
interface Vlan1
 ip address 10.1.0.52 255.255.0.0
!
ip default-gateway 10.1.0.99
!
!
!
!
line con 0
 login local
!
line vty 0 4
 login local
 transport input ssh
line vty 5 15
 login local
 transport input ssh
!
!
!
!
end
```

G.

```
S0#
S0#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
S0#
```

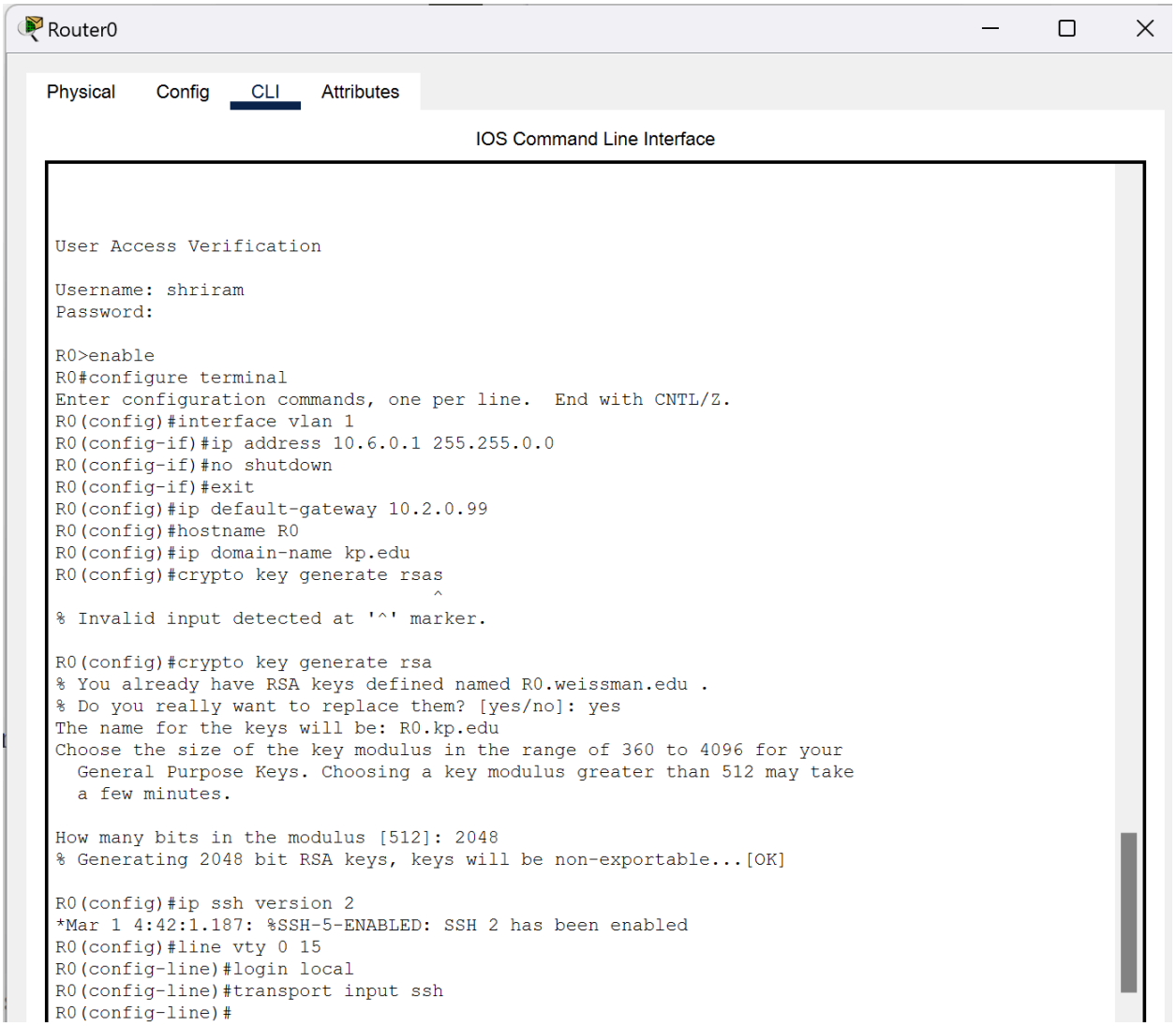
H.

```
S0#show ip ssh
SSH Enabled - version 2.0
Authentication timeout: 120 secs; Authentication retries: 3
```

I.

```
S0#show ssh
Connection      Version Mode Encryption                    Hmac        State
Username
0               1.99    IN   aes128-cbc      hmac-sha1     Session Started         shriram
0               1.99    OUT  aes128-cbc      hmac-sha1     Session Started         shriram
%No SSHv1 server connections running.
```

J.


Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
User Access Verification
Username: shriram
Password:
R0>enable
R0#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R0(config)#interface vlan 1
R0(config-if)#ip address 10.6.0.1 255.255.0.0
R0(config-if)#no shutdown
R0(config-if)#exit
R0(config)#ip default-gateway 10.2.0.99
R0(config)#hostname R0
R0(config)#ip domain-name kp.edu
R0(config)#crypto key generate rsas
^
% Invalid input detected at '^' marker.
R0(config)#crypto key generate rsa
% You already have RSA keys defined named R0.weissman.edu .
% Do you really want to replace them? [yes/no]: yes
The name for the keys will be: R0.kp.edu
Choose the size of the key modulus in the range of 360 to 4096 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.
How many bits in the modulus [512]: 2048
% Generating 2048 bit RSA keys, keys will be non-exportable...[OK]
R0(config)#ip ssh version 2
*Mar 1 4:42:1.187: %SSH-5-ENABLED: SSH 2 has been enabled
R0(config)#line vty 0 15
R0(config-line)#login local
R0(config-line)#transport input ssh
R0(config-line)#

Lab Analysis :

1. Yes, a switch has a MAC address for all its interface helps to organize and use them accordingly for the connections.
2. No, a switch is layer 2 device, so it can't have a IP address technically, but using ssh or vlan configuration we can remotely access the switch using IP address.
3. Static routing is good for local network and having 2 or 3 routers connected makes it easy and there is no metrics involved as metrics are 0 for static routing. Dynamic routing makes it complex for simple network if it is involved in small network.
4. Dynamic routing are good for big networks with lot of routers and mechanisms like load balancing happens based on the metrics for calculating the best path for reaching the end device in a network.
5. We can configure different types of password to enter into the global configuration mode, or privilege escalation mode or to setup ssh connection etc.

Quiz :

1. SAT
2. Next hop
3. SSH
4. Hashed
5. Routing table.