1) Familiarization of Network Devices

2) Connection via Cross Cables

HOST 1

------

IP Address : 192.168.1.1

Subnet Mask : 255.255.255.0

Default Gateway : 10.0.0.1

PC>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=31ms TTL=128

Reply from 192.168.1.2: bytes=32 time=31ms TTL=128

Reply from 192.168.1.2: bytes=32 time=31ms TTL=128

Reply from 192.168.1.2: bytes=32 time=31ms TTL=128

Ping statistics for 192.168.1.2:

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

Approximate round trip times in milli-seconds:

Minimum = 31ms, Maximum = 31ms, Average = 31ms

HOST 2

------

IP Address : 192.168.1.2

Subnet Mask : 255.255.255.0

Default Gateway : 10.0.0.1

PC>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=60ms TTL=128

Reply from 192.168.1.1: bytes=32 time=30ms TTL=128

Reply from 192.168.1.1: bytes=32 time=30ms TTL=128

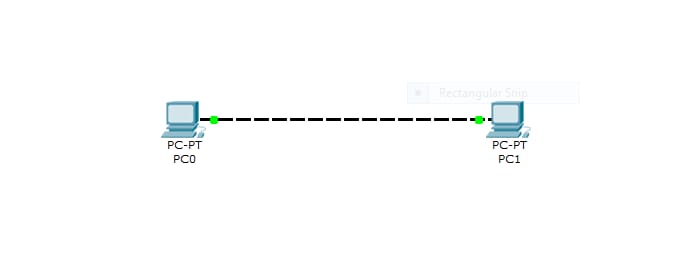
Reply from 192.168.1.1: bytes=32 time=30ms TTL=128

Ping statistics for 192.168.1.1:

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

Approximate round trip times in milli-seconds:

Minimum = 30ms, Maximum = 60ms, Average = 37ms



3) Connection via a Hub

HOST 1

------

IP Address : 192.168.1.1

Subnet Mask : 255.255.255.0

Default Gateway : 10.0.0.1

PC>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=124ms TTL=128

Reply from 192.168.1.2: bytes=32 time=63ms TTL=128

Reply from 192.168.1.2: bytes=32 time=62ms TTL=128

Reply from 192.168.1.2: bytes=32 time=62ms TTL=128

Ping statistics for 192.168.1.2:

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

Approximate round trip times in milli-seconds:

Minimum = 62ms, Maximum = 124ms, Average = 77ms

HOST 2

------

IP Address : 192.168.1.2

Subnet Mask : 255.255.255.0

Default Gateway : 10.0.0.1

PC>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=62ms TTL=128

Reply from 192.168.1.1: bytes=32 time=62ms TTL=128

Reply from 192.168.1.1: bytes=32 time=63ms TTL=128

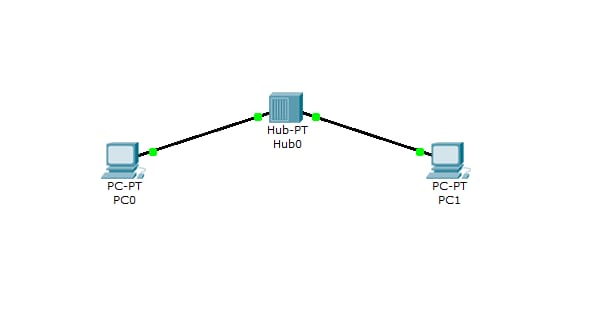
Reply from 192.168.1.1: bytes=32 time=62ms TTL=128

Ping statistics for 192.168.1.1:

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

Approximate round trip times in milli-seconds:

Minimum = 62ms, Maximum = 63ms, Average = 62ms



4) Connection via a Switch.

HOST 1

------

IP Address : 192.168.1.1

Subnet Mask : 255.255.255.0

Default Gateway : 10.0.0.1

PC>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=62ms TTL=128

Reply from 192.168.1.2: bytes=32 time=63ms TTL=128

Reply from 192.168.1.2: bytes=32 time=63ms TTL=128

Reply from 192.168.1.2: bytes=32 time=63ms TTL=128

Ping statistics for 192.168.1.2:

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

Approximate round trip times in milli-seconds:

Minimum = 62ms, Maximum = 63ms, Average = 62ms

HOST 2

------

IP Address : 192.168.1.2

Subnet Mask : 255.255.255.0

Default Gateway : 10.0.0.1

PC>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=62ms TTL=128

Reply from 192.168.1.1: bytes=32 time=47ms TTL=128

Reply from 192.168.1.1: bytes=32 time=63ms TTL=128

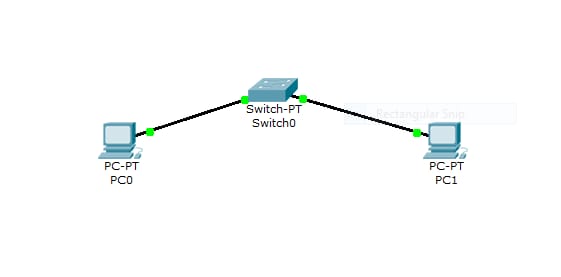
Reply from 192.168.1.1: bytes=32 time=62ms TTL=128

Ping statistics for 192.168.1.1:

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

Approximate round trip times in milli-seconds:

Minimum = 47ms, Maximum = 63ms, Average = 58ms



5) IPv4 Addressing

Switch 1

--------

1) Assign hostname to a switch.

Switch>enable

Switch#configure terminal

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

Switch(config)#hostname S1

S1(config)#

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

2) Secure access to the console line.

S1(config)#line console 0

S1(config-line)#password aswin

S1(config-line)#login

S1(config-line)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

3) Secure access to the vty lines.

S1(config)#line vty 0 15

S1(config-line)#password aswin

S1(config-line)#login

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

4) Secure privileged Exec mode access (Encrypted Password).

S1(config-line)#enable secret aswink

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

5) Encrypt all plain text passwords.

S1(config-line)#service password-encryption

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

6) Configure a MOTD banner.

S1(config-line)#banner motd "Warning!"

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

7) Configure the IP address on interface VLAN 1 on the switch.

S1(config)#interface vlan1

S1(config-if)#ip address 192.168.0.2 255.255.255.0

S1(config-if)#ip default-gateway 192.168.0.1

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Switch 2

--------

1) Assign hostname to a switch.

Switch>enable

Switch#configure terminal

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

Switch(config)#hostname S2

S2(config)#

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

2) Secure access to the console line.

S2(config)#line console 0

S2(config-line)#password aswin

S2(config-line)#login

S2(config-line)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

3) Secure access to the vty lines.

S2(config)#line vty 0 15

S2(config-line)#password aswin

S2(config-line)#login

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

4) Secure privileged Exec mode access (Encrypted Password).

S2(config-line)#enable secret aswink

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

5) Encrypt all plain text passwords.

S2(config-line)#service password-encryption

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

6) Configure a MOTD banner.

S2(config-line)#banner motd "Warning!"

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

7) Configure the IP address on interface VLAN 1 on the switch.

S2(config)#interface vlan1

S2(config-if)#ip address 192.168.1.2 255.255.255.0

S2(config-if)#ip default-gateway 192.168.1.1

Router

------

1) Assign hostname to a router.

Router>enable

Router#configure terminal

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

Router(config)#hostname R1

R1(config)#

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

2) Secure access to the console line.

R1(config)#line console 0

R1(config-line)#password aswin

R1(config-line)#login

R1(config-line)#exit

R1(config)#

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

3) Secure privileged Exec mode access (PlainText Password).

R1(config)#enable password class

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

4) Secure privileged Exec mode access (Encrypted Password).

R1(config)#enable secret aswink

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

5) Secure access to the vty lines.

R1(config)#line vty 0 15

R1(config-line)#password aswin

R1(config-line)#login

R1(config-line)#exit

R1(config)#

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

6) Encrypt all plain text passwords.

R1(config)#service password-encryption

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

7) Configure a MOTD banner.

R1(config)#banner motd “Unauthorized access is strictly prohibited”

R1(config)#exit

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8) Configure GigabitEthernet0/0 and GigabitEthernet0/1 interfaces.

R1(config)#interface GigabitEthernet0/0

R1(config-if)#ip address 192.168.0.1 255.255.255.192

R1(config-if)#no shutdown

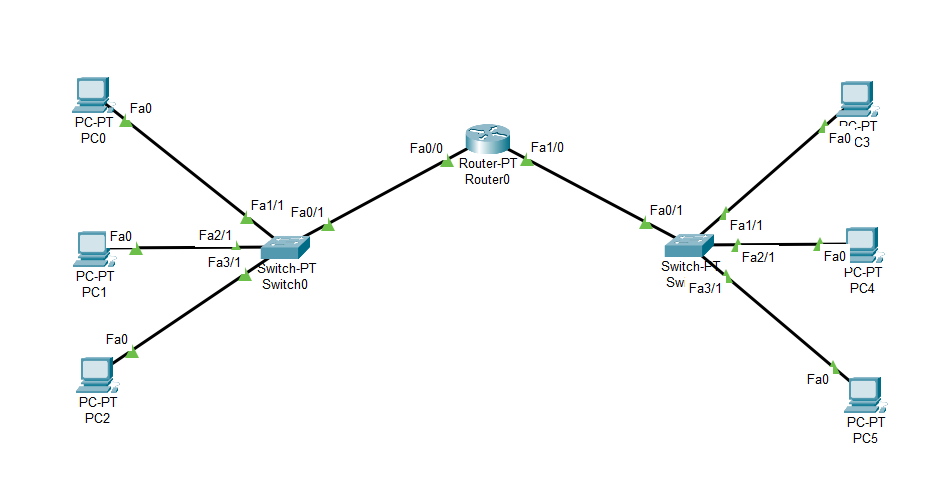
R1(config)#interface GigabitEthernet0/1

R1(config-if)#ip address 192.168.0.65 255.255.255.192

R1(config-if)#no shutdown

Output

Ping the PCs.



6) Static Routing

Router 1

--------

Step 1 : Configuring and assigning the IP address on router.

Router>enable

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#ip address 10.0.0.1 255.0.0.0

Router(config-if)#no shutdown

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

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

Router(config-if)#exit

Router(config)#interface Serial2/0

Router(config-if)#ip address 15.0.0.1 255.0.0.0

Router(config-if)#no shutdown

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

Router(config-if)#exit

Router(config)#

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

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

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 2 : Check the routing table on router.

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, FastEthernet0/0

C 15.0.0.0/8 is directly connected, Serial2/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Administratively define the static route.

Router(config)#ip route 20.0.0.0 255.0.0.0 15.0.0.2

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 4 : Check the routing table of the router.

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, FastEthernet0/0

C 15.0.0.0/8 is directly connected, Serial2/0

S 20.0.0.0/8 [1/0] via 15.0.0.2

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 5 : Verify the connection of both host.

HOST 1

------

IP Address : 10.0.0.10

Subnet Mask : 255.0.0.0

Default Gateway : 10.0.0.1

PC>ping 20.0.0.10

Pinging 20.0.0.10 with 32 bytes of data:

Reply from 20.0.0.10: bytes=32 time=140ms TTL=126

Reply from 20.0.0.10: bytes=32 time=140ms TTL=126

Reply from 20.0.0.10: bytes=32 time=156ms TTL=126

Reply from 20.0.0.10: bytes=32 time=156ms TTL=126

Ping statistics for 20.0.0.10:

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

Approximate round trip times in milli-seconds:

Minimum = 140ms, Maximum = 156ms, Average = 148ms

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Router 2

--------

Step 1 : Configuring and assigning the IP address on router.

Router>enable

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#ip address 10.0.0.1 255.0.0.0

Router(config-if)#no shutdown

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

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

Router(config-if)#exit

Router(config)#interface Serial2/0

Router(config-if)#ip address 15.0.0.1 255.0.0.0

Router(config-if)#no shutdown

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

Router(config-if)#exit

Router(config)#

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

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

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 2 : Check the routing table on router.

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

S 10.0.0.0/8 [1/0] via 15.0.0.1

C 15.0.0.0/8 is directly connected, Serial2/0

C 20.0.0.0/8 is directly connected, FastEthernet0/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Administratively define the static route.

Router(config)#ip route 10.0.0.0 255.0.0.0 15.0.0.1

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Step 4 : Check the routing table of the router.

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, FastEthernet0/0

C 15.0.0.0/8 is directly connected, Serial2/0

S 20.0.0.0/8 [1/0] via 15.0.0.2

Step 5 : Verify the connection of both host.

HOST 2

------

IP Address : 20.0.0.10

Subnet Mask : 255.0.0.0

Default Gateway : 20.0.0.1

PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:

Reply from 10.0.0.10: bytes=32 time=141ms TTL=126

Reply from 10.0.0.10: bytes=32 time=141ms TTL=126

Reply from 10.0.0.10: bytes=32 time=125ms TTL=126

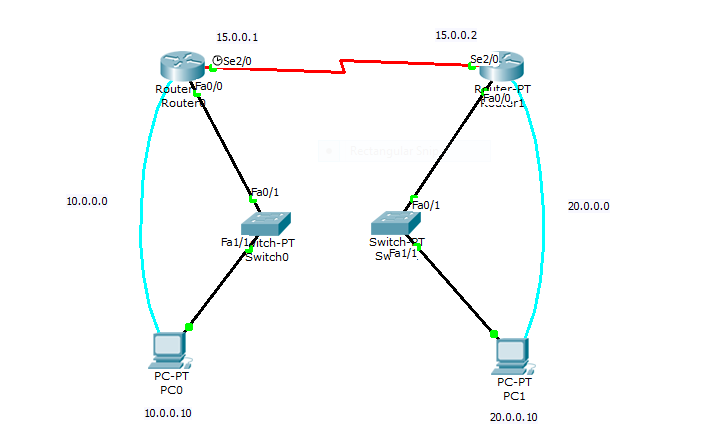
Reply from 10.0.0.10: bytes=32 time=156ms TTL=126

Ping statistics for 10.0.0.10:

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

Approximate round trip times in milli-seconds:

Minimum = 125ms, Maximum = 156ms, Average = 140ms



7) RIP

Router 1

--------

Step 1 : Configuring and assigning the IP address on router.

Router>enable

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#ip address 192.168.1.1 255.255.255.0

Router(config-if)#no shutdown

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

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

Router(config-if)#exit

Router(config)#interface Serial2/0

Router(config-if)#ip address 10.0.0.1 255.0.0.0

Router(config-if)#no shutdown

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

Router(config-if)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 2 : Check the routing table on router.

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.1.0/24 is directly connected, FastEthernet0/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Administratively define the RIP networks.

Router(config)#router rip

Router(config-router)#network 192.168.1.0

Router(config-router)#network 10.0.0.0

Router(config-router)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 4 : Check the routing table of the router.

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Serial2/0

C 192.168.1.0/24 is directly connected, FastEthernet0/0

R 192.168.2.0/24 [120/1] via 10.0.0.2, 00:00:17, Serial2/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 5 : Verify the connection of both host.

IP Address : 192.168.1.2

Subnet Mask : 255.255.255.0

Default Gateway : 192.168.1.1

PC>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=156ms TTL=126

Reply from 192.168.2.2: bytes=32 time=156ms TTL=126

Reply from 192.168.2.2: bytes=32 time=124ms TTL=126

Reply from 192.168.2.2: bytes=32 time=140ms 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 = 124ms, Maximum = 156ms, Average = 144ms

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Router 2

--------

Step 1 : Configuring and assigning the IP address on router.

Router>enable

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#ip address 192.168.2.1 255.255.255.0

Router(config-if)#no shutdown

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

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

Router(config-if)#exit

Router(config)#interface Serial2/0

Router(config-if)#ip address 10.0.0.2 255.0.0.0

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#exit

Step 2 : Check the routing table on router.

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.2.0/24 is directly connected, FastEthernet0/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Administratively define the RIP networks.

Router(config)#router rip

Router(config-router)#network 192.168.2.0

Router(config-router)#network 10.0.0.0

Router(config-router)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 4 : Check the routing table of the router.

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Serial2/0

R 192.168.1.0/24 [120/1] via 10.0.0.1, 00:00:12, Serial2/0

C 192.168.2.0/24 is directly connected, FastEthernet0/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 5 : Verify the connection of both host.

IP Address : 192.168.2.2

Subnet Mask : 255.255.255.0

Default Gateway : 192.168.2.1

PC>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=128ms TTL=126

Reply from 192.168.1.2: bytes=32 time=156ms TTL=126

Reply from 192.168.1.2: bytes=32 time=157ms TTL=126

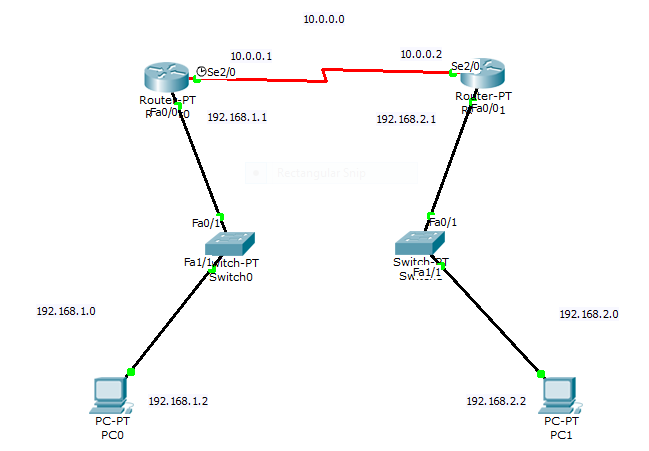
Reply from 192.168.1.2: bytes=32 time=140ms TTL=126

Ping statistics for 192.168.1.2:

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

Approximate round trip times in milli-seconds:

Minimum = 128ms, Maximum = 157ms, Average = 145ms



8) EIGRP

Step 1 : Configuring and assigning the IP address on routers.

Router 1

--------

Router>enable

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#ip address 192.168.1.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#exit

Router(config)#interface Serial2/0

Router(config-if)#ip address 10.0.0.1 255.0.0.0

Router(config-if)#no shutdown

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

Router(config-if)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Router 2

--------

Router>enable

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#ip address 192.168.2.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#exit

Router(config)#interface Serial2/0

Router(config-if)#ip address 10.0.0.2 255.0.0.0

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 2 : Check the routing table of routers.

Router 1

--------

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Serial2/0

C 192.168.2.0/24 is directly connected, FastEthernet0/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Router 2

--------

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Serial2/0

C 192.168.1.0/24 is directly connected, FastEthernet0/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Administratively define the EIGRP networks.

Router 1

--------

Router(config)#router eigrp 1

Router(config-router)#network 192.168.1.0 255.255.255.0

Router(config-router)#network 10.0.0.0 255.0.0.0

Router(config-router)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Router 2

--------

Router(config)#router eigrp 1

Router(config-router)#network 192.168.2.0 255.255.255.0

Router(config-router)#network 10.0.0.0 255.0.0.0

Router(config-router)#

%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 10.0.0.1 (Serial2/0) is up: new adjacency

Router(config-router)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 4 : Check the routing table of the routers.

Router 1

--------

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Serial2/0

C 192.168.1.0/24 is directly connected, FastEthernet0/0

D 192.168.2.0/24 [90/20514560] via 10.0.0.2, 00:01:46, Serial2/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Router 2

--------

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Serial2/0

D 192.168.1.0/24 [90/20514560] via 10.0.0.1, 00:01:15, Serial2/0

C 192.168.2.0/24 is directly connected, FastEthernet0/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 5 : Verify the connection of both hosts.

Router 1

--------

IP Address : 192.168.1.2

Subnet Mask : 255.255.255.0

Default Gateway : 192.168.1.1

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=14ms TTL=126

Reply from 192.168.2.2: bytes=32 time=1ms TTL=126

Reply from 192.168.2.2: bytes=32 time=11ms TTL=126

Reply from 192.168.2.2: bytes=32 time=2ms 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 = 1ms, Maximum = 14ms, Average = 7ms

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Router 2

--------

IP Address : 192.168.2.2

Subnet Mask :255.255.255.0

Default Gateway : 192.168.2.1

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=13ms TTL=126

Reply from 192.168.1.2: bytes=32 time=10ms TTL=126

Reply from 192.168.1.2: bytes=32 time=9ms TTL=126

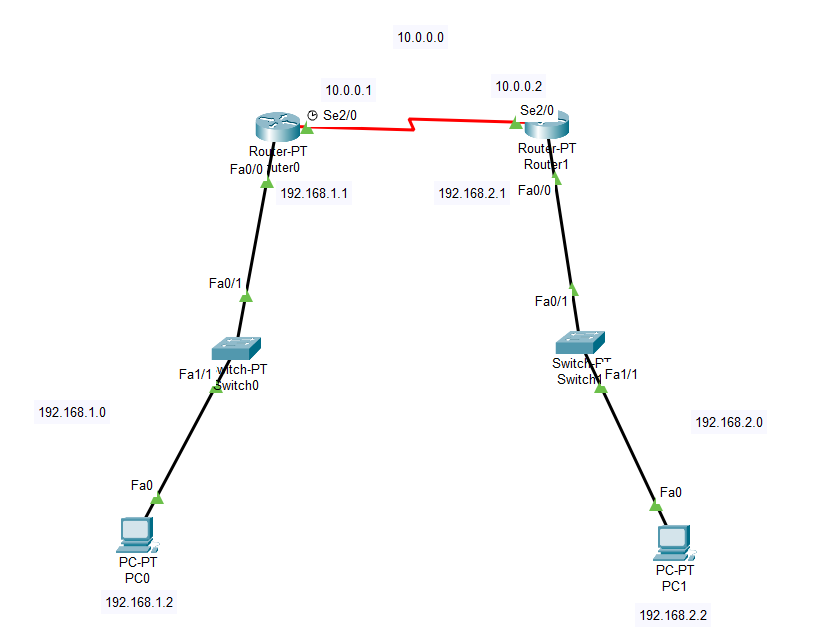
Reply from 192.168.1.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.1.2:

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

Approximate round trip times in milli-seconds:

Minimum = 1ms, Maximum = 13ms, Average = 8ms



9) OSPF

Step 1 : Configuring and assigning the IP address on router.

Router 1

--------

Router>enable

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#ip address 192.168.10.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#exit

Router(config)#interface Serial2/0

Router(config-if)#ip address 192.168.20.1 255.255.255.0

Router(config-if)#no shutdown

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

Router(config-if)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Router 2

--------

Router>enable

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#ip address 192.168.30.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#exit

Router(config)#interface Serial2/0

Router(config-if)#ip address 192.168.20.2 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#

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

Router(config-if)#exit

Router(config)#

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

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 2 : Check the routing table of the routers.

Router 1

--------

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.10.0/24 is directly connected, FastEthernet0/0

C 192.168.20.0/24 is directly connected, Serial2/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Router 2

--------

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.20.0/24 is directly connected, Serial2/0

C 192.168.30.0/24 is directly connected, FastEthernet0/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Administratively define the OSPF networks.

Router 1

--------

Router(config)#router ospf 1

Router(config-router)#network 192.168.10.0 0.0.0.255 area 0

Router(config-router)#network 192.168.20.0 0.0.0.255 area 0

Router(config-router)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Router 2

--------

Router(config)#router ospf 1

Router(config-router)#network 192.168.20.0 0.0.0.255 area 0

00:16:55: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.20.1 on Serial2/0 from

LOADING to FULL, Loading Done

Router(config-router)#network 192.168.30.0 0.0.0.255 area 0

Router(config-router)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 4 : Check the routing table of the routers.

Router 1

--------

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.10.0/24 is directly connected, FastEthernet0/0

C 192.168.20.0/24 is directly connected, Serial2/0

O 192.168.30.0/24 [110/65] via 192.168.20.2, 00:02:23, Serial2/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Router 2

--------

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

O 192.168.10.0/24 [110/65] via 192.168.20.1, 00:01:28, Serial2/0

C 192.168.20.0/24 is directly connected, Serial2/0

C 192.168.30.0/24 is directly connected, FastEthernet0/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 5 : Verify the connection of both hosts.

Host 1

--------

IP Address : 192.168.10.2

Subnet Mask : 255.255.255.0

Default Gateway : 192.168.10.1

C:\>ping 192.168.30.2

Pinging 192.168.30.2 with 32 bytes of data:

Reply from 192.168.30.2: bytes=32 time=13ms TTL=126

Reply from 192.168.30.2: bytes=32 time=1ms TTL=126

Reply from 192.168.30.2: bytes=32 time=1ms TTL=126

Reply from 192.168.30.2: bytes=32 time=11ms TTL=126

Ping statistics for 192.168.30.2:

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

Approximate round trip times in milli-seconds:

Minimum = 1ms, Maximum = 13ms, Average = 6ms

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Host 2

--------

IP Address : 192.168.30.2

Subnet Mask :255.255.255.0

Default Gateway : 192.168.30.1

C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time=15ms TTL=126

Reply from 192.168.10.2: bytes=32 time=1ms TTL=126

Reply from 192.168.10.2: bytes=32 time=1ms TTL=126

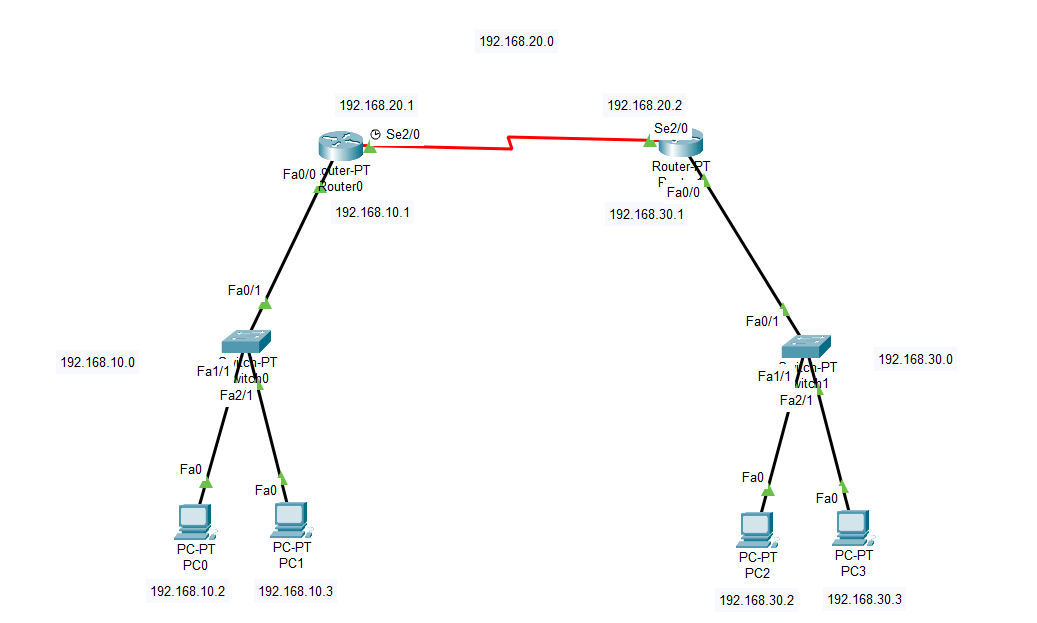
Reply from 192.168.10.2: bytes=32 time=12ms TTL=126

Ping statistics for 192.168.10.2:

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

Approximate round trip times in milli-seconds:

Minimum = 1ms, Maximum = 15ms, Average = 7ms



10) VLAN

Step 1 : Configure the VLAN within the switch.

Switch>enable

Switch#configure terminal

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

Switch(config)#vlan 2

Switch(config-vlan)#name FrontOffice

Switch(config-vlan)#exit

Switch(config)#vlan 3

Switch(config-vlan)#name BackOffice

Switch(config-vlan)#exit

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Step 2 : Assign the specified interfaces in the specific VLANs

and define the access ports.

Switch(config)#interface FastEthernet0/1

Switch(config-if)#switchport access vlan 2

Switch(config-if)#exit

Switch(config)#interface FastEthernet1/1

Switch(config-if)#switchport access vlan 2

Switch(config-if)#exit

Switch(config)#interface FastEthernet2/1

Switch(config-if)#switchport access vlan 3

Switch(config-if)#exit

Switch(config)#interface FastEthernet3/1

Switch(config-if)#switchport access vlan 3

Switch(config-if)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Verify the connections between hosts.

Host 1

------

PC>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time=63ms TTL=128

Reply from 192.168.10.3: bytes=32 time=62ms TTL=128

Reply from 192.168.10.3: bytes=32 time=62ms TTL=128

Reply from 192.168.10.3: bytes=32 time=63ms TTL=128

Ping statistics for 192.168.10.3:

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

Approximate round trip times in milli-seconds:

Minimum = 62ms, Maximum = 63ms, Average = 62ms

Host 2

------

PC>ping 192.168.10.5

Pinging 192.168.10.5 with 32 bytes of data:

Reply from 192.168.10.5: bytes=32 time=62ms TTL=128

Reply from 192.168.10.5: bytes=32 time=63ms TTL=128

Reply from 192.168.10.5: bytes=32 time=62ms TTL=128

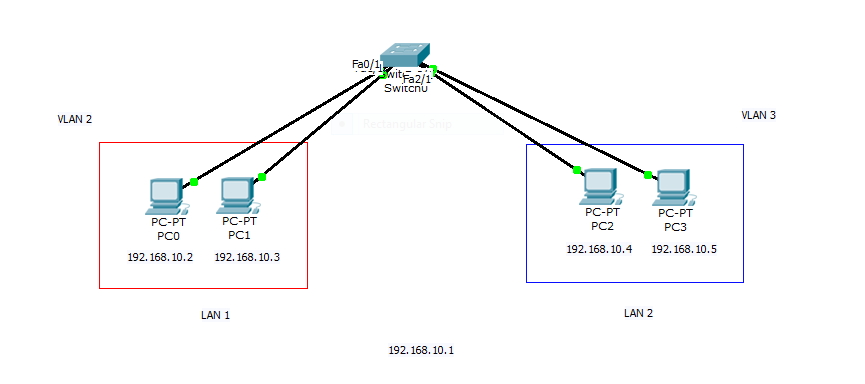
Reply from 192.168.10.5: bytes=32 time=62ms TTL=128

Ping statistics for 192.168.10.5:

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

Approximate round trip times in milli-seconds:

Minimum = 62ms, Maximum = 63ms, Average = 62ms



11) Inter VLAN

Switch

------

Step 1 : Configure the VLAN within the switch.

Switch>enable

Switch#configure terminal

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

Switch(config)#vlan 10

Switch(config-vlan)#name FrontOffice

Switch(config-vlan)#exit

Switch(config)#vlan 20

Switch(config-vlan)#name MidOfiice

Switch(config-vlan)#exit

Switch(config)#vlan 30

Switch(config-vlan)#name BackOffice

Switch(config-vlan)#exit

Switch(config)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 2 : Assign the specified interfaces in the specific VLANs

and define the access ports and trunk ports.

Switch(config)#interface FastEthernet1/1

Switch(config-if)#switchport access vlan 10

Switch(config-if)#switchport mode access

Switch(config-if)#exit

Switch(config)#interface FastEthernet2/1

Switch(config-if)#switchport access vlan 20

Switch(config-if)#switchport mode access

Switch(config-if)#exit

Switch(config)#interface FastEthernet3/1

Switch(config-if)#switchport access vlan 30

Switch(config-if)#switchport mode access

Switch(config-if)#exit

Switch(config)#interface FastEthernet0/1

Switch(config-if)#no shutdown

Switch(config-if)#switchport mode trunk

Switch(config-if)#exit

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Step 3 : Verify the connection of hosts.

C:\>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

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

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

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

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

Ping statistics for 192.168.20.2:

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

Approximate round trip times in milli-seconds:

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

C:\>ping 192.168.30.2

Pinging 192.168.30.2 with 32 bytes of data:

Reply from 192.168.30.2: bytes=32 time<1ms TTL=127

Reply from 192.168.30.2: bytes=32 time<1ms TTL=127

Reply from 192.168.30.2: bytes=32 time<1ms TTL=127

Reply from 192.168.30.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.30.2:

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

Approximate round trip times in milli-seconds:

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

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Router

------

Step 1 : Configure router with dot1Q encapsulation by making each

of sub-interfaces.

Router>enable

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#exit

Router(config)#interface FastEthernet0/0.10

Router(config-subif)#

%LINK-5-CHANGED: Interface FastEthernet0/0.10, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.10, changed state to up

Router(config-subif)#encapsulation dot1Q 10

Router(config-subif)#ip address 192.168.10.1 255.255.255.0

Router(config-subif)#exit

Router(config)#interface FastEthernet0/0.20

Router(config-subif)#

%LINK-5-CHANGED: Interface FastEthernet0/0.20, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.20, changed state to up

Router(config-subif)#encapsulation dot1Q 20

Router(config-subif)#ip address 192.168.20.1 255.255.255.0

Router(config-subif)#exit

Router(config)#interface FastEthernet0/0.30

Router(config-subif)#

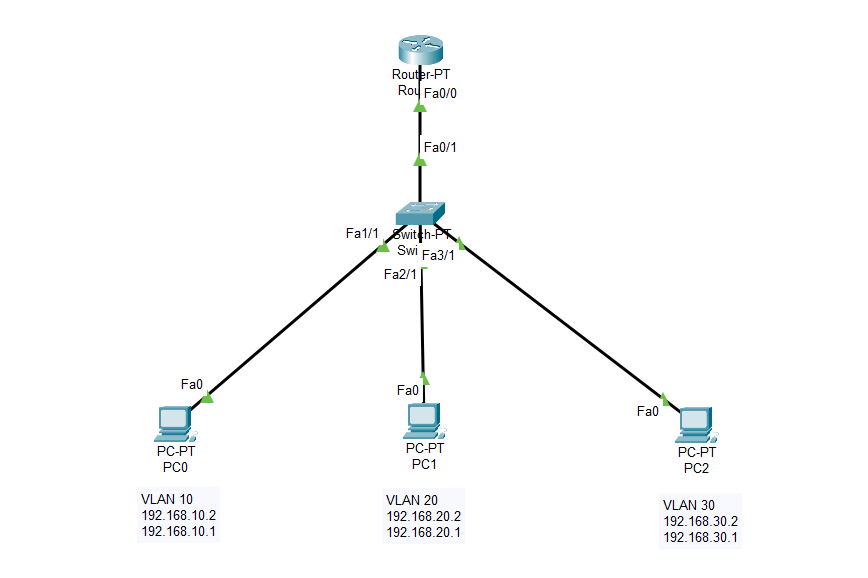
%LINK-5-CHANGED: Interface FastEthernet0/0.30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.30, changed state to up

Router(config-subif)#encapsulation dot1Q 30

Router(config-subif)#ip address 192.168.30.1 255.255.255.0

Router(config-subif)#exit



12) HTTP

Step 1 : Assign IP addresses to PCs.

Host 1

------

IP Address : 10.10.10.1

Subnet Mask : 255.0.0.0

Default Gateway : 10.10.10.0

Host 2

------

IP Address : 10.10.10.2

Subnet Mask : 255.0.0.0

Default Gateway : 10.10.10.0

Host 3

------

IP Address : 10.10.10.3

Subnet Mask : 255.0.0.0

Default Gateway : 10.10.10.0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 2 : Assign the IP address on server.

IP Address : 10.10.10.0

Subnet Mask : 255.0.0.0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Verify the connection between server and hosts.

PC>ping 10.10.10.0

Pinging 10.10.10.0 with 32 bytes of data:

Reply from 10.10.10.0: bytes=32 time=63ms TTL=128

Reply from 10.10.10.0: bytes=32 time=31ms TTL=128

Reply from 10.10.10.0: bytes=32 time=62ms TTL=128

Reply from 10.10.10.0: bytes=32 time=62ms TTL=128

Ping statistics for 10.10.10.0:

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

Approximate round trip times in milli-seconds:

Minimum = 31ms, Maximum = 63ms, Average = 54ms

HTML Document On Server

-----------------------

<html>

<center><font size='+2' color='blue'>Cisco Packet Tracer</font></center>

<hr>Helo, Good Morning.

<p>Quick Links:

<br><a href='helloworld.html'>A small page</a>

<br><a href='copyrights.html'>Copyrights</a>

<br><a href='image.html'>Image page</a>

<br><a href='image.jpg'>Image</a>

</html>

Webpage at URL http://10.10.10.0

---------------------------------

Helo, Good Morning.

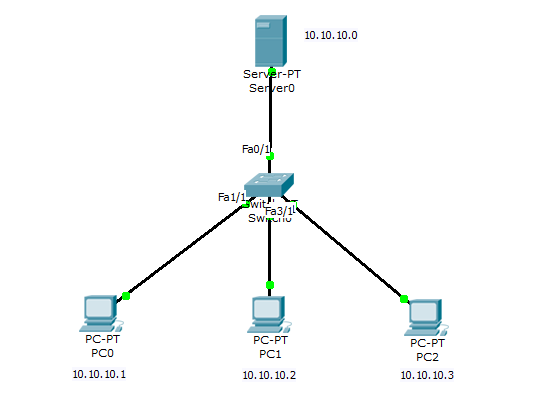
Quick Links:

A small page

Copyrights

Image page

Image



13) FTP

Step 1 : Assign the IP on hosts.

Host 1

------

IP Address : 10.10.10.1

Subnet Mask : 255.0.0.0

Default Gateway : 10.10.10.0

Host 2

------

IP Address : 10.10.10.2

Subnet Mask : 255.0.0.0

Default Gateway : 10.10.10.0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 2 : Assign the IP address on the server.

IP Address : 10.10.10.0

Subnet Mask : 255.0.0.0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Verify the connection between server and hosts.

PC>ping 10.10.10.0

Pinging 10.10.10.0 with 32 bytes of data:

Reply from 10.10.10.0: bytes=32 time=62ms TTL=128

Reply from 10.10.10.0: bytes=32 time=47ms TTL=128

Reply from 10.10.10.0: bytes=32 time=63ms TTL=128

Reply from 10.10.10.0: bytes=32 time=63ms TTL=128

Ping statistics for 10.10.10.0:

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

Approximate round trip times in milli-seconds:

Minimum = 47ms, Maximum = 63ms, Average = 58ms

PC>ipconfig

IP Address......................: 10.10.10.1

Subnet Mask.....................: 255.0.0.0

Default Gateway.................: 10.10.10.0

PC>ftp 10.10.10.0

Trying to connect...10.10.10.0

Connected to 10.10.10.0

220- Welcome to PT Ftp server

Username:Aswin

331- Username ok, need password

Password:

230- Logged in

(passive mode On)

ftp>help

?

cd

delete

dir

get

help

passive

put

pwd

quit

rename

ftp>dir

Listing /ftp directory from 10.10.10.0:

0 : c1841-advipservicesk9-mz.124-15.T1.bin 33591768

1 : c1841-ipbase-mz.123-14.T7.bin 13832032

2 : c1841-ipbasek9-mz.124-12.bin 16599160

3 : c2600-advipservicesk9-mz.124-15.T1.bin 33591768

4 : c2600-i-mz.122-28.bin 5571584

5 : c2600-ipbasek9-mz.124-8.bin 13169700

6 : c2800nm-advipservicesk9-mz.124-15.T1.bin 50938004

7 : c2800nm-ipbase-mz.123-14.T7.bin 5571584

8 : c2800nm-ipbasek9-mz.124-8.bin 15522644

9 : c2950-i6q4l2-mz.121-22.EA4.bin 3058048

10 : c2950-i6q4l2-mz.121-22.EA8.bin 3117390

11 : c2960-lanbase-mz.122-25.FX.bin 4414921

12 : c2960-lanbase-mz.122-25.SEE1.bin 4670455

13 : c3560-advipservicesk9-mz.122-37.SE1.bin 8662192

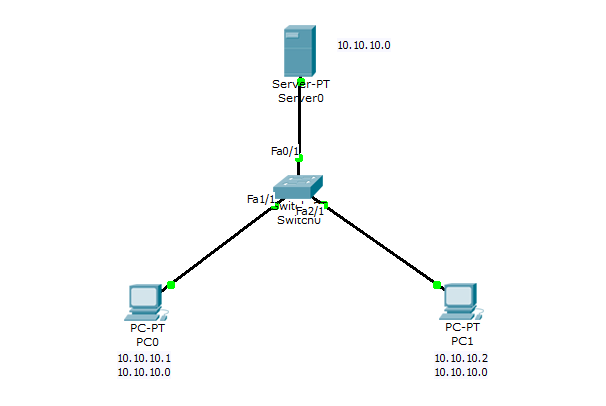
14 : pt1000-i-mz.122-28.bin 5571584

15 : pt3000-i6q4l2-mz.121-22.EA4.bin 3117390

ftp>delete pt3000-i6q4l2-mz.121-22.EA4.bin

Deleting file pt3000-i6q4l2-mz.121-22.EA4.bin from 10.10.10.0: ftp>

[Deleted file pt3000-i6q4l2-mz.121-22.EA4.bin successfully ]



14) DHCP

Step 1 : Configure the router.

Router>enable

Router#configure terminal

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

Router(config)#interface FastEthernet0/0

Router(config-if)#ip address 192.168.1.1 255.255.255.0

Router(config-if)#no shutdown

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

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

Router(config-if)#exit

Router(config)#ip dhcp POOL ABC-POOL

Router(dhcp-config)#network 192.168.1.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.1.254

Router(dhcp-config)#dns-server 192.168.1.1

Router(dhcp-config)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 2 : Enable DHCP in all hosts.

IP Address : 192.168.1.3

Subnet Mask : 255.255.255.0

Default Gateway : 0.0.0.0

IP Address : 192.168.1.4

Subnet Mask : 255.255.255.0

Default Gateway : 0.0.0.0

IP Address : 192.168.1.2

Subnet Mask : 255.255.255.0

Default Gateway : 0.0.0.0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Verify the connection of hosts.

PC>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=109ms TTL=128

Reply from 192.168.1.2: bytes=32 time=62ms TTL=128

Reply from 192.168.1.2: bytes=32 time=62ms TTL=128

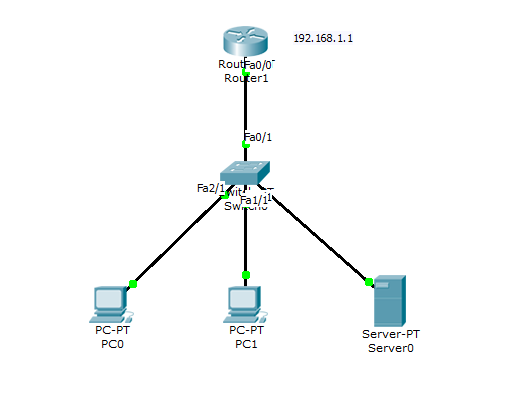
Reply from 192.168.1.2: bytes=32 time=62ms TTL=128

Ping statistics for 192.168.1.2:

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

Approximate round trip times in milli-seconds:

Minimum = 62ms, Maximum = 109ms, Average = 73ms



15) TELNET

Step 1 : Assign IP address to the PC.

IP Address : 192.168.1.2

Subnet Mask : 255.255.255.0

Default Gateway : 192.168.1.2

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 2 : Assign IP address to the router.

Router>enable

Router#configure terminal

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

Router(config)#hostname R1

R1(config)#interface FastEthernet0/0

R1(config-if)#ip address 192.168.1.1 255.255.255.0

R1(config-if)#no shutdown

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

R1(config-if)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Assign password to IOS command line.

R1(config)#enable secret aswink

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 4 : Assign passwords to the vty ports and IOS command line.

R1(config)#line vty 0 5

R1(config-line)#login

% Login disabled on line 66, until 'password' is set

% Login disabled on line 67, until 'password' is set

% Login disabled on line 68, until 'password' is set

% Login disabled on line 69, until 'password' is set

% Login disabled on line 70, until 'password' is set

% Login disabled on line 71, until 'password' is set

R1(config-line)#password aswin

R1(config-line)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 5 : Save the configuration.

R1#wr

Building configuration...

[OK]

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 6 : Verify the connectivity.

PC>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=10ms TTL=255

Reply from 192.168.1.1: bytes=32 time=4ms TTL=255

Reply from 192.168.1.1: bytes=32 time=4ms TTL=255

Reply from 192.168.1.1: bytes=32 time=5ms TTL=255

Ping statistics for 192.168.1.1:

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

Approximate round trip times in milli-seconds:

Minimum = 4ms, Maximum = 10ms, Average = 5ms

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 7 : Access the router through telnet.

PC>telnet 192.168.1.1

Trying 192.168.1.1 ...Open

User Access Verification

Password:

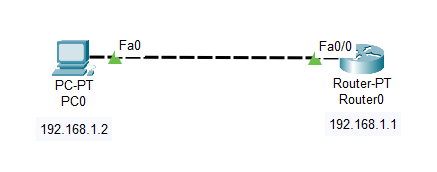
R1>enable

Password:

R1#configure terminal

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

R1(config)#



16) ACL

Step 1 : Configure and assign the IP address on router.

Router 1

--------

Router>enable

Router#configure terminal

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

Router(config)#hostname R1

R1(config)#interface Serial2/0

R1(config-if)#ip address 15.0.0.1 255.0.0.0

R1(config-if)#clock rate 64000

R1(config-if)#no shutdown

R1(config)#interface FastEthernet0/0

R1(config-if)#ip address 10.0.0.1 255.0.0.0

R1(config-if)#no shutdown

Router 2

--------

Router>enable

Router#configure terminal

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

Router(config)#hostname R2

R2(config)#interface Serial2/0

R2(config-if)#ip address 15.0.0.2 255.0.0.0

R2(config-if)#no shutdown

R2(config)#interface FastEthernet0/0

R2(config-if)#ip address 20.0.0.1 255.0.0.0

R2(config-if)#no shutdown

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 2 : Check the routing table on router.

Router 1

--------

R1#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

Router 2

--------

R2#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Enable RIP protocol on router.

Router 1

--------

R1(config)#router rip

R1(config-router)#network 10.0.0.0

R1(config-router)#network 15.0.0.0

R1(config-router)#exit

Router 2

--------

R2(config)#router rip

R2(config-router)#network 20.0.0.0

R2(config-router)#network 15.0.0.0

R2(config-router)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 4 : Check the routing table on router after enabling RIP

on all routers.

Router 1

--------

R1#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, FastEthernet0/0

C 15.0.0.0/8 is directly connected, Serial2/0

R 20.0.0.0/8 [120/1] via 15.0.0.2, 00:00:04, Serial2/0

Router 2

--------

R2#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

R 10.0.0.0/8 [120/1] via 15.0.0.1, 00:00:13, Serial2/0

C 15.0.0.0/8 is directly connected, Serial2/0

C 20.0.0.0/8 is directly connected, FastEthernet0/0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 5 : Verify all the connectivity before applying ACL.

C:\>ping 20.0.0.10

Pinging 20.0.0.10 with 32 bytes of data:

Reply from 20.0.0.10: bytes=32 time=15ms TTL=126

Reply from 20.0.0.10: bytes=32 time=1ms TTL=126

Reply from 20.0.0.10: bytes=32 time=10ms TTL=126

Reply from 20.0.0.10: bytes=32 time=29ms TTL=126

Ping statistics for 20.0.0.10:

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

Approximate round trip times in milli-seconds:

Minimum = 1ms, Maximum = 29ms, Average = 13ms

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 6 : Apply standard ACL on router R2.

R2(config)#access-list 10 deny host 10.0.0.10

R2(config)#access-list 10 permit any

R2(config)#interface FastEthernet0/0

R2(config-if)#ip access-group 10 out

R2(config-if)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 7 : Verify ACL configuration and functionality.

C:\>ping 20.0.0.10

Pinging 20.0.0.10 with 32 bytes of data:

Reply from 15.0.0.2: Destination host unreachable.

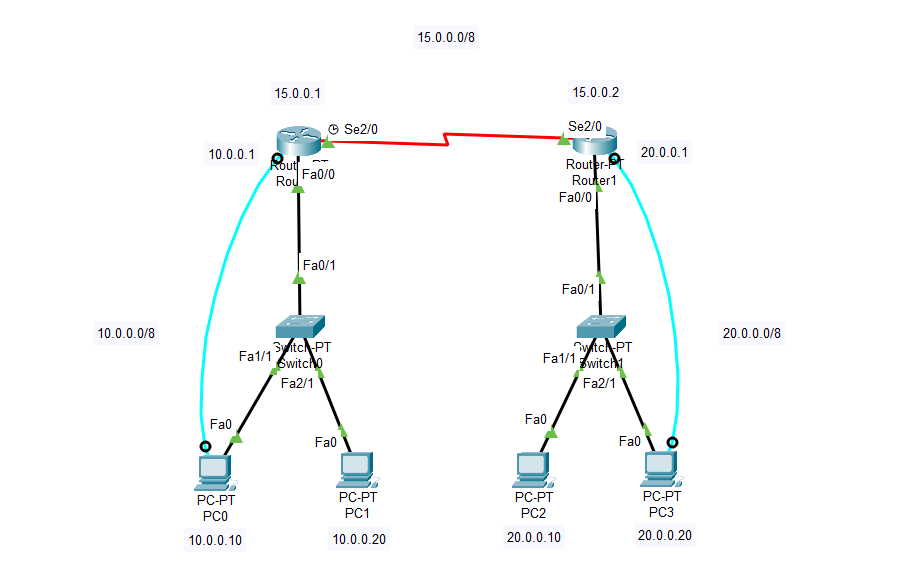
Reply from 15.0.0.2: Destination host unreachable.

Reply from 15.0.0.2: Destination host unreachable.

Reply from 15.0.0.2: Destination host unreachable.

Ping statistics for 20.0.0.10:

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



17) Extended ACL

Step 1 : Assign IP addresses to the PCs and web server.

IP Address : 10.0.0.2

Subnet Mask : 255.0.0.0

Default Gateway : 10.0.0.1

IP Address : 20.0.0.2

Subnet Mask : 255.0.0.0

Default Gateway : 20.0.0.1

IP Address : 30.0.0.2

Subnet Mask : 255.0.0.0

Default Gateway : 30.0.0.1

IP Address : 40.0.0.2 (Web Server)

Subnet Mask : 255.0.0.0

Default Gateway : 40.0.0.1

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 2 : Assign IP addresses to routers.

Router 1

--------

Router>enable

Router#conf t

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

Router(config)#interface FastEthernet0/0

Router(config-if)#ip address 10.0.0.1 255.0.0.0

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#exit

Router(config)#interface Serial2/0

Router(config-if)#ip address 15.0.0.1 255.0.0.0

Router(config-if)#no shutdown

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

Router(config-if)#exit

Router(config)#interface FastEthernet1/0

Router(config-if)#ip address 20.0.0.1 255.0.0.0

Router(config-if)#no shutdown

Router(config-if)#

%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up

Router(config-if)#exit

Router 2

--------

Router>enable

Router#conf t

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

Router(config)#interface FastEthernet0/0

Router(config-if)#ip address 30.0.0.1 255.0.0.0

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#exit

Router(config)#interface Serial2/0

Router(config-if)#ip address 15.0.0.2 255.0.0.0

Router(config-if)#no shutdown

Router(config-if)#

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

Router(config-if)#exit

Router(config)#

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

Router(config)#interface FastEthernet1/0

Router(config-if)#ip address 40.0.0.1 255.0.0.0

Router(config-if)#no shutdown

Router(config-if)#

%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up

Router(config-if)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 3 : Create extended ACL rules to router nearer to source.

(Here, Router 1.)

Router(config)#access-list 125 deny tcp host 20.0.0.2 host 40.0.0.2 eq www

Router(config)#access-list 125 permit ip any any

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 4 : Apply extended ACL to router interface nearer to source.

(Here, Router 1 interface.)

Router(config)#interface FastEthernet1/0

Router(config-if)#ip access-group 125 in

Router(config-if)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 5 : Configure RIP protocol. (OSPF or EIGRP can also be done in

place of RIP.)

Router 1

--------

Router(config)#router rip

Router(config-router)#network 10.0.0.0

Router(config-router)#network 20.0.0.0

Router(config-router)#network 15.0.0.0

Router(config-router)#exit

Router 2

--------

Router(config)#router rip

Router(config-router)#network 30.0.0.0

Router(config-router)#network 40.0.0.0

Router(config-router)#network 15.0.0.0

Router(config-router)#exit

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Step 6 : Now, HTTP service will not be possible to second PC from

the web server. That is, the HTML page at URL 40.0.0.2 will

not be accessible by the second PC. But still packets can be sent and received.

