Lab 9

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Dynamic Routing: RIPv2

The software that will be used is **Cisco Packet Tracer.**

Introduction

In this laboratory exercise you will configure RIPv2(max 15 routers)

1.1. Load lab 3 into packet tracer. It should be the configuration shown in figure 1 with all IP addresses assigned and all interfaces showing green arrows.

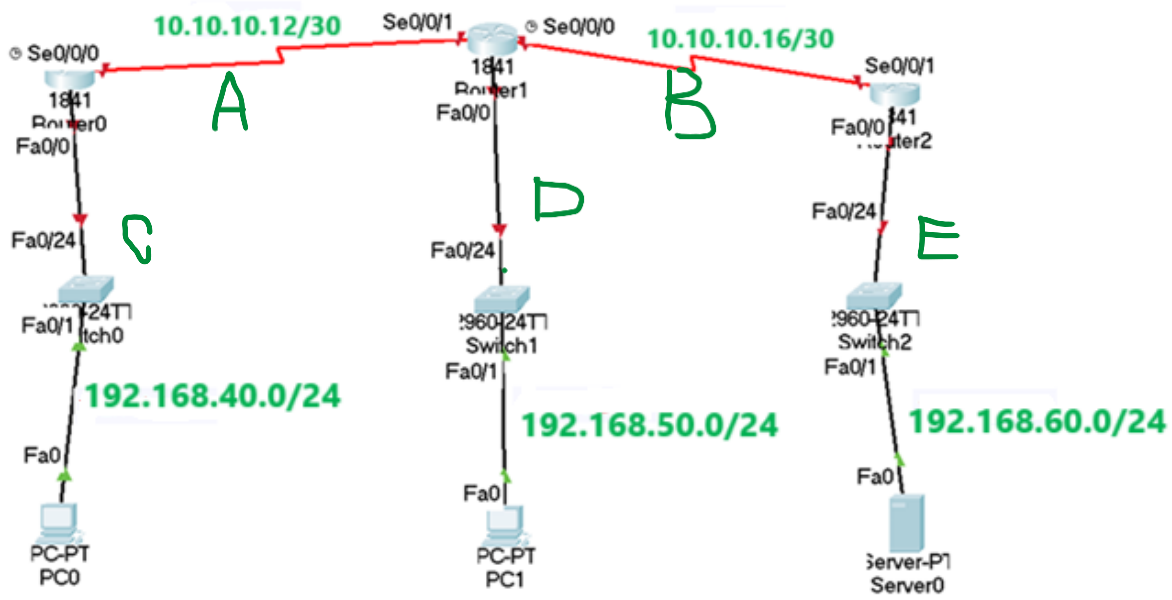


Figure 1: Network Laboratory Topology for IP Assignment

RIPv2

Routing Information Protocol (RIP) version 2 is one of the oldest distance-vector routing protocols. It employs hop count as a routing metric. Routing loops are prevented by implementing a limit on the number of hops allowed in a path from source to destination.

Configure RIPv2 on R1

1.2. R1(config)#router rip
1.3. R1(config-router)#version 2
1.4. R1(config-router)#net A_IP
1.5. R1(config-router)#net C_IP
1.6. R1(config-router)#no auto-summary
1.7. Save your configuration

Configure RIPv2 on R2

1.8. R2(config)#router rip
1.9. R2(config-router)#version 2
1.10. R2(config-router)#net A_IP

1.11. R2(config-router)#net B_IP
1.12. R2(config-router)#net D_IP
1.13. R2(config-router)#no auto-summary
1.14. Save your configuration

Configure RIPv2 on R3

1.15. R3(config)#router rip
1.16. R3(config-router)#version 2
1.17. R3(config-router)#net B_IP
1.18. R3(config-router)#net E_IP
1.19. R3(config-router)#no auto-summary
1.20. Save your configuration.

Some thoughts.

Default static routes can only be configured on the stub routers, that is R1 and R3 in Figure 1.

Currently, three routing protocols are running. Default static routes, static routes and RIPv2. Because RIPv2 has a lower administrative distance (120), it becomes the default routing protocol.

No Auto-summary – RIP (or any distance-vector protocol) will summarise the network to the class full boundary. So we see that under RIP our network is 10.0.0.0 even though when we configured the network in RIP we entered 10.x.x.x for R1 for example. The subnet mask is sent out with the network address updates when (no auto-summary) is used.

Some debug commands to explore:

- sh start
- sh ip int bri
- sh protocols
- sh controllers
- debug ip rip

How to submit

2.1. Copy your configuration file from the CLI and paste it here for R1, R2 and R3.

```
R1#show running-config
Building configuration...

Current configuration : 797 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R1
!
!
!
!
!
!
```

```
!
!
no ip cef
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface FastEthernet0/0
ip address 192.168.10.1 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/0/0
ip address 10.0.0.1 255.255.255.252
clock rate 4000000
!
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router rip
version 2
network 10.0.0.0
network 192.168.10.0
no auto-summary
!
```

```
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
End

R2#show running-config
Building configuration...

Current configuration : 787 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R2
!
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
!
```

```
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface FastEthernet0/0
ip address 192.168.2.1 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/0/0
ip address 10.0.0.2 255.255.255.252
!
interface Serial0/0/1
ip address 10.0.0.5 255.255.255.252
clock rate 4000000
!
interface Vlan1
no ip address
shutdown
!
router rip
version 2
network 10.0.0.0
network 192.168.2.0
no auto-summary
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
```

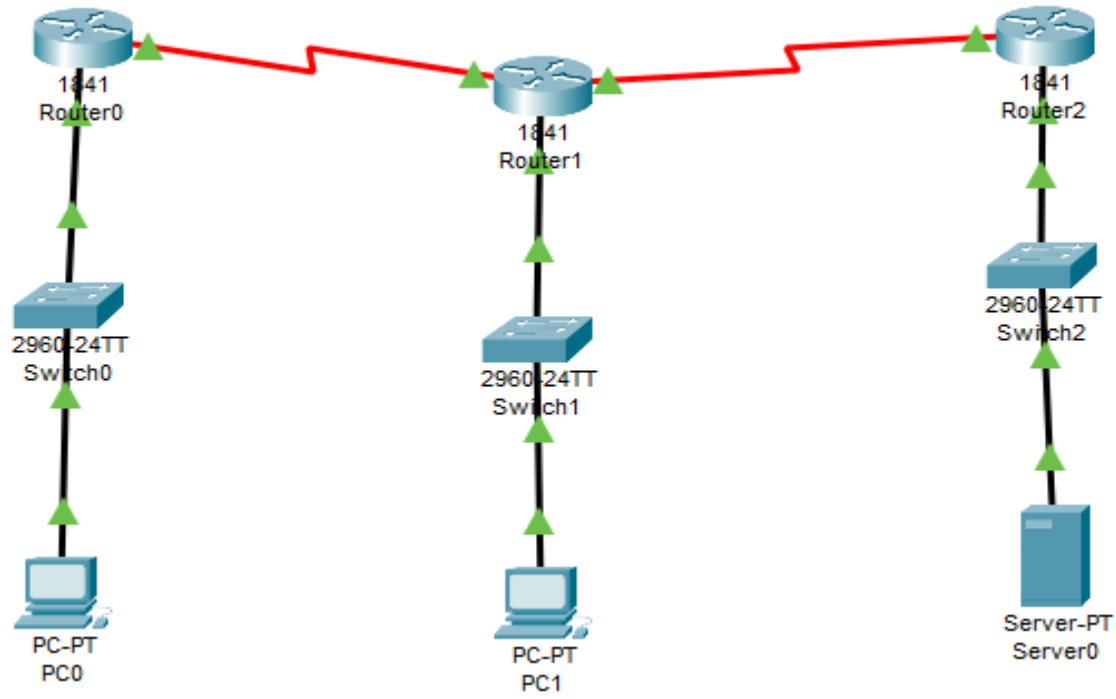
```
        login
        !
        !
        !
End

        R3#show running-config
        Building configuration...

        Current configuration : 775 bytes
        !
        version 12.4
        no service timestamps log datetime msec
        no service timestamps debug datetime msec
        no service password-encryption
        !
        hostname R3
        !
        !
        !
        !
        !
        !
        !
        !
        no ip cef
        no ipv6 cef
        !
        !
        !
        !
        !
        !
        !
        !
        !
        !
        !
        !
        spanning-tree mode pvst
        !
        !
        !
        !
        !
        !
        interface FastEthernet0/0
        ip address 192.168.1.1 255.255.255.0
        duplex auto
        speed auto
        !
        interface FastEthernet0/1
        no ip address
```

```
 duplex auto
 speed auto
 shutdown
 !
 interface Serial0/0/0
 no ip address
 clock rate 2000000
 shutdown
 !
 interface Serial0/0/1
 ip address 10.0.0.6 255.255.255.252
 !
 interface Vlan1
 no ip address
 shutdown
 !
 router rip
 version 2
 network 10.0.0.0
 network 192.168.1.0
 no auto-summary
 !
 ip classless
 !
 ip flow-export version 9
 !
 !
 !
 !
 !
 !
 !
 !
 line con 0
 !
 line aux 0
 !
 line vty 0 4
 login
 !
 !
 !
end
```

2.2. Print the logical topology to the file, then paste the image here.



2.3. For R1 show the output of (sh ip route). Paste this output here.

```
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

10.0.0.0/30 is subnetted, 2 subnets
C 10.0.0.0 is directly connected, Serial0/0/0
R 10.0.0.4 [120/1] via 10.0.0.2, 00:00:23, Serial0/0/0
R 192.168.1.0/24 [120/2] via 10.0.0.2, 00:00:23, Serial0/0/0
R 192.168.2.0/24 [120/1] via 10.0.0.2, 00:00:23, Serial0/0/0
C 192.168.10.0/24 is directly connected, FastEthernet0/0
```

2.4. For R2 show the output of (sh ip route). Paste this output here.

```
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

        10.0.0.0/30 is subnetted, 2 subnets
        C 10.0.0.0 is directly connected, Serial0/0/0
        C 10.0.0.4 is directly connected, Serial0/0/1
        R 192.168.1.0/24 [120/1] via 10.0.0.6, 00:00:08, Serial0/0/1
        C 192.168.2.0/24 is directly connected, FastEthernet0/0
R 192.168.10.0/24 [120/1] via 10.0.0.1, 00:00:02, Serial0/0/0
```

2.5. For R3 show the output of (sh ip route). Paste this output here.

```
        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

        10.0.0.0/30 is subnetted, 2 subnets
        R 10.0.0.0 [120/1] via 10.0.0.5, 00:00:02, Serial0/0/1
        C 10.0.0.4 is directly connected, Serial0/0/1
        C 192.168.1.0/24 is directly connected, FastEthernet0/0
        R 192.168.2.0/24 [120/1] via 10.0.0.5, 00:00:02, Serial0/0/1
R 192.168.10.0/24 [120/2] via 10.0.0.5, 00:00:02, Serial0/0/1
```

2.6. For R1 show the output of (sh ip int bri). Paste this output here.

```
        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

        10.0.0.0/30 is subnetted, 2 subnets
        R 10.0.0.0 [120/1] via 10.0.0.5, 00:00:02, Serial0/0/1
        C 10.0.0.4 is directly connected, Serial0/0/1
        C 192.168.1.0/24 is directly connected, FastEthernet0/0
        R 192.168.2.0/24 [120/1] via 10.0.0.5, 00:00:02, Serial0/0/1
R 192.168.10.0/24 [120/2] via 10.0.0.5, 00:00:02, Serial0/0/1
```

2.7. For R2 show the output of (sh ip int bri). Paste this output here.

Interface IP-Address OK? Method Status Protocol FastEthernet0/0 192.168.2.1 YES manual up up FastEthernet0/1 unassigned YES unset administratively down down Serial0/0/0 10.0.0.2 YES manual up up Serial0/0/1 10.0.0.5 YES manual up up Vlan1 unassigned YES unset administratively down down

2.8. For R3 show the output of (sh ip int bri). Paste this output here.

Interface IP-Address OK? Method Status Protocol FastEthernet0/0 192.168.1.1 YES manual up up FastEthernet0/1 unassigned YES unset administratively down down Serial0/0/0 unassigned YES unset administratively down down Serial0/0/1 10.0.0.6 YES manual up up Vlan1 unassigned YES unset administratively down down

END