

RIP version 1

Routing Protocols and Concepts

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Objectives

- Describe the functions, characteristics, and operation of the RIPv1 protocol.
- Configure a device for using RIPv1.
- Verify proper RIPv1 operation.
- Describe how RIPv1 performs automatic summarization.
- Configure, verify, and troubleshoot default routes propagated in a routed network implementing RIPv1.
- Use recommended techniques to solve problems related to RIPv1



RIPv1

- RIP Characteristics
 - A classful, Distance Vector (DV) routing protocol
 - Metric = hop count
 - Routes with a hop count > 15 are unreachable
 - Updates are broadcast every 30 seconds

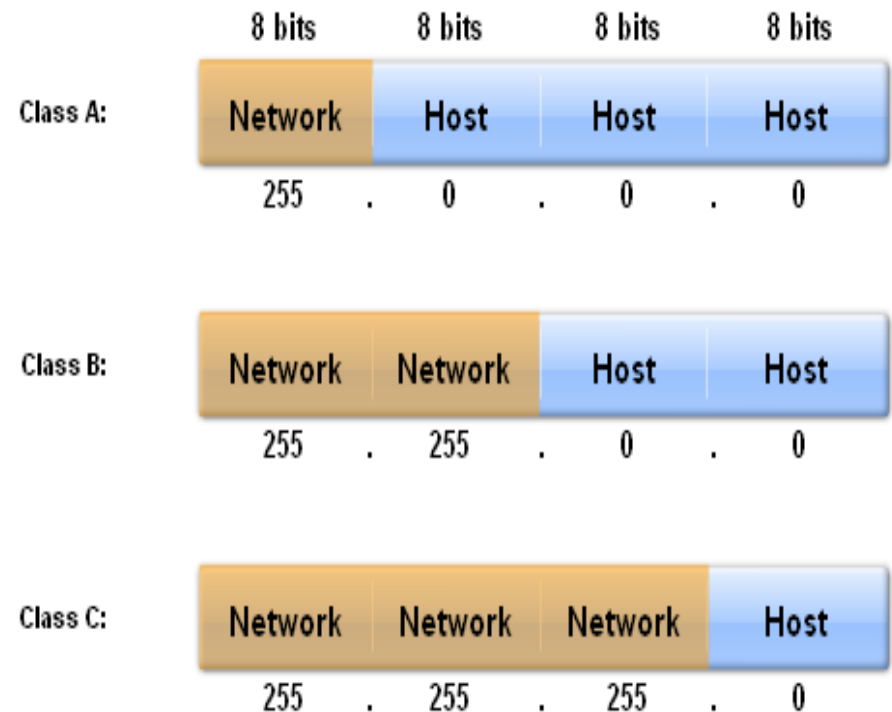


RIPv1



- IP addresses initially divided into classes
 - Class A
 - Class B
 - Class C
- RIP is a classful routing protocol
 - Does not send subnet masks in routing updates

Default Subnet Masks for Address Classes



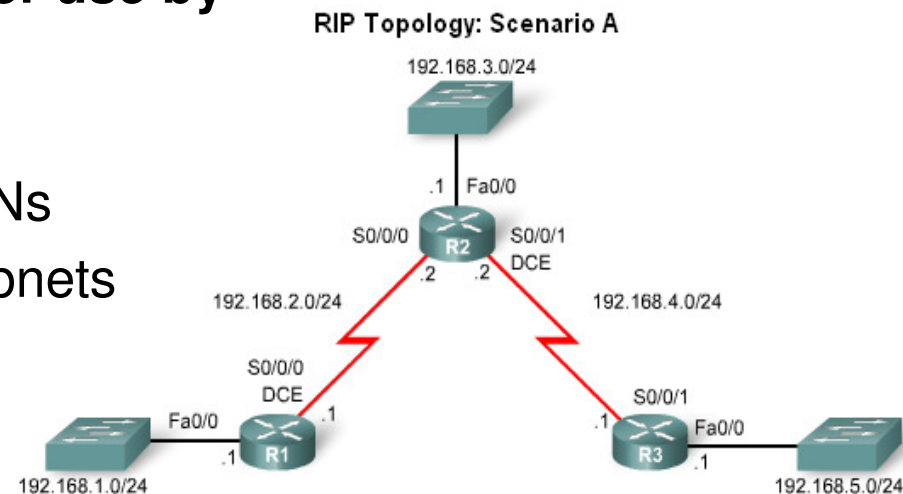
Class A Address Range: 1.0.0.0 to 126.255.255.255
Class B Address Range: 128.0.0.0 to 191.255.255.255
Class C Address Range: 192.0.0.0 to 223.255.255.255



Basic RIPv1 Configuration

- A typical topology suitable for use by RIPv1 includes:

- Three router set up
- No PCs attached to LANs
- Use of 5 different IP subnets



Addressing Table: Scenario A

Device	Interface	IP Address	Subnet Mask
R1	Fa0/0	192.168.1.1	255.255.255.0
	S0/0/0	192.168.2.1	255.255.255.0
R2	Fa0/0	192.168.3.1	255.255.255.0
	S0/0/0	192.168.2.2	255.255.255.0
R3	S0/0/1	192.168.4.2	255.255.255.0
	Fa0/0	192.168.5.1	255.255.255.0
R3	S0/0/1	192.168.4.1	255.255.255.0



Basic RIPv1 Configuration

- Router RIP Command
 - To enable RIP enter:
 - *Router rip* at the global configuration prompt
 - Prompt will look like ***R1(config-router)#***

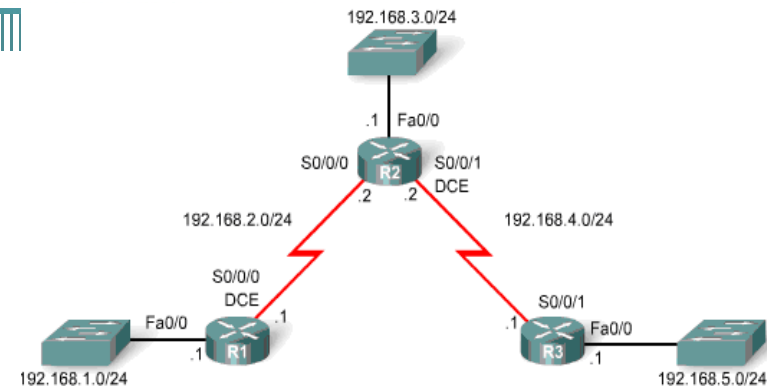
```
R1#conf t
Enter configuration commands, one per line. End with CTRL/Z.
R1(config)#router ?
  bgp      Border Gateway Protocol (BGP)
  egp      Exterior Gateway Protocol (EGP)
  eigrp    Enhanced Interior Gateway Protocol (EIRGP)
  igrp     Interior Gateway Routing Protocol (IGRP)
  isis     ISO IS-IS
  iso-igrp IGRP for OSI networks
  mobile   Mobile routes
  odr      On Demand stub Routes
  ospf     Open Shortest Path First (OSPF)
  rip      Routing Information Protocol (RIP)

R1(config)#router rip
R1(config-router)#
```



Basic RIPv1 Configuration

- Specifying Networks
 - Use the **network** command to:
 - Enable RIP on all interfaces that belong to this network
 - Advertise this network in RIP updates sent to other routers every 30 seconds



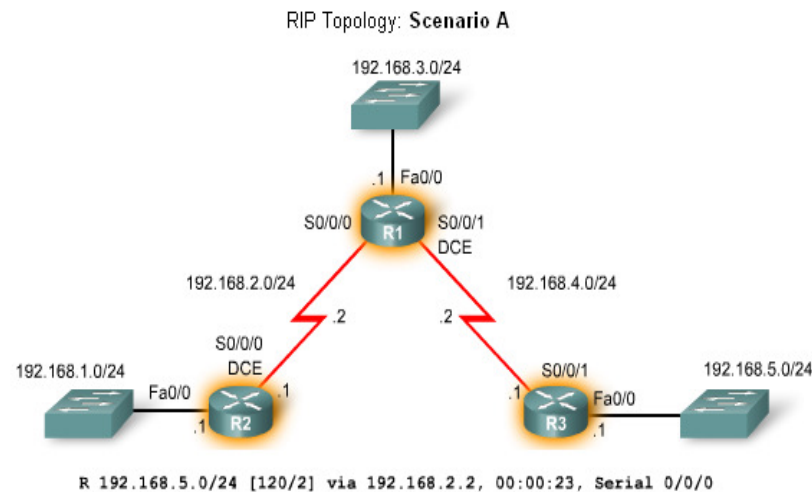
```
R1(config)#router rip
R1(config-router)#network 192.168.1.0
R1(config-router)#network 192.168.2.0
```

```
R2(config)#router rip
R2(config-router)#network 192.168.2.0
R2(config-router)#network 192.168.3.0
R2(config-router)#network 192.168.4.0
```

```
R3(config)#router rip
R3(config-router)#network 192.168.4.0
R3(config-router)#network 192.168.5.0
```

Verification and Troubleshooting

- Show ip Route
- To verify and troubleshoot routing
 - Use the following commands:
 - show ip route
 - show ip protocols
 - debug ip rip



Interpreting a RIP Route in the Routing Table

R	Identifies the source of the route as RIP.
192.168.5.0	Indicates the address of the remote network.
/24	The subnet mask used for this network
[120/2]	The administrative distance (120) and the metric (2 hops)
via 192.168.2.2	Specifies the address of the next-hop router (R2) to send traffic to for the remote network.
00:00:23	Specifies the amount of time since the route was updated (here, 23 seconds). Another update is due in 7 seconds.
Serial0/0/0	192.168.4.2

Summary

- RIP characteristics include:
 - Classful, distance vector routing protocol
 - Metric is Hop Count
 - Does not support VLSM or discontinuous subnets
 - Updates every 30 seconds
- Rip messages are encapsulated in a UDP segment with source and destination ports of 520



Summary: Commands used by RIP

Command	Command's purpose
Rtr(config)#router rip	Enables RIP routing process
Rtr(config-router)#network	Associates a network with a RIP routing process
Rtr#debug ip rip	used to view real time RIP routing updates
Rtr(config-router)#passive-interface fa0/0	Prevent RIP updates from going out an interface
Rtr(config-router)#default-information originate	Used by RIP to propagate default routes
Rtr#show ip protocols	Used to display timers used by RIP

