RIP

ROUTING INFORMATION PROTOCOL

SAINITECHKING
Sumeet Saini

ROUTING INFORMATION PROTOCOL

Routing Information Protocol (RIP) is a dynamic routing protocol which uses hop count as a routing metric to find the best path between the source and the destination over a network by using a routing metric/hop count algorithm. This algorithm is used to determine the shortest path from the source to destination, which allows the data to be delivered at high speed in the shortest time. It is a distance vector routing protocol which has AD value 120.

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Hop count :

Hop count is the number of routers occurring in between the source and destination network. The path with the lowest hop count is considered as the best route to reach a network and therefore placed in the routing table. RIP prevents routing loops by limiting the number of hopes allowed in a path from source and destination. The maximum hop count allowed for RIP is 15 and hop count of 16 is considered as network unreachable.

Features of RIP

1. **Classfull routing–** RIP is a classfull routing protocol, it does not send or receive subnet masks, it assumes classfull subnet masks

2. **Periodic updates–** RIP broadcasts routing updates every 30 seconds. It broadcasts the entire routing table in the update.

3. **Metric–** RIP's metric is hop count. RIP's maximum distance is 15 hops. 16 hops is infinity and is used to mark a route as dead.

4. **Administrative Distance–** RIP's administrative distance is 120. AD ranks the trustworthiness, or reliability of the route, the lower the administrative distance the better the route.

5. **Hold Down Timer–** RIP uses a hold down timer of 180 seconds so that it does not propagate bad routes and does not have a count-to-infinity routing loop. Route is flushed at 240 seconds.

6. Full routing tables are sent in updates.

RIP versions :

There are three vesions of routing information protocol – **RIP Version1**, **RIP Version2** and **RIPng**.

RIP v1	RIP v2	RIPng
Sends update as broadcast	Sends update as multicast	Sends update as multicast
Broadcast at 255.255.255.255	Multicast at 224.0.0.9	Multicast at FF02::9 (RIPng can only run on IPv6 networks)
Classful routing protocol	Classless protocol, supports classful	Classless updates are sent

Features of RIP

RIP v1 is known as *Classfull* Routing Protocol because it doesn't send information of subnet mask in its routing update.

RIP v2 is known as *Classless* Routing Protocol because it sends information of subnet mask in its routing update.

RIPng can only run on IPv6 networks.

RIP timers :

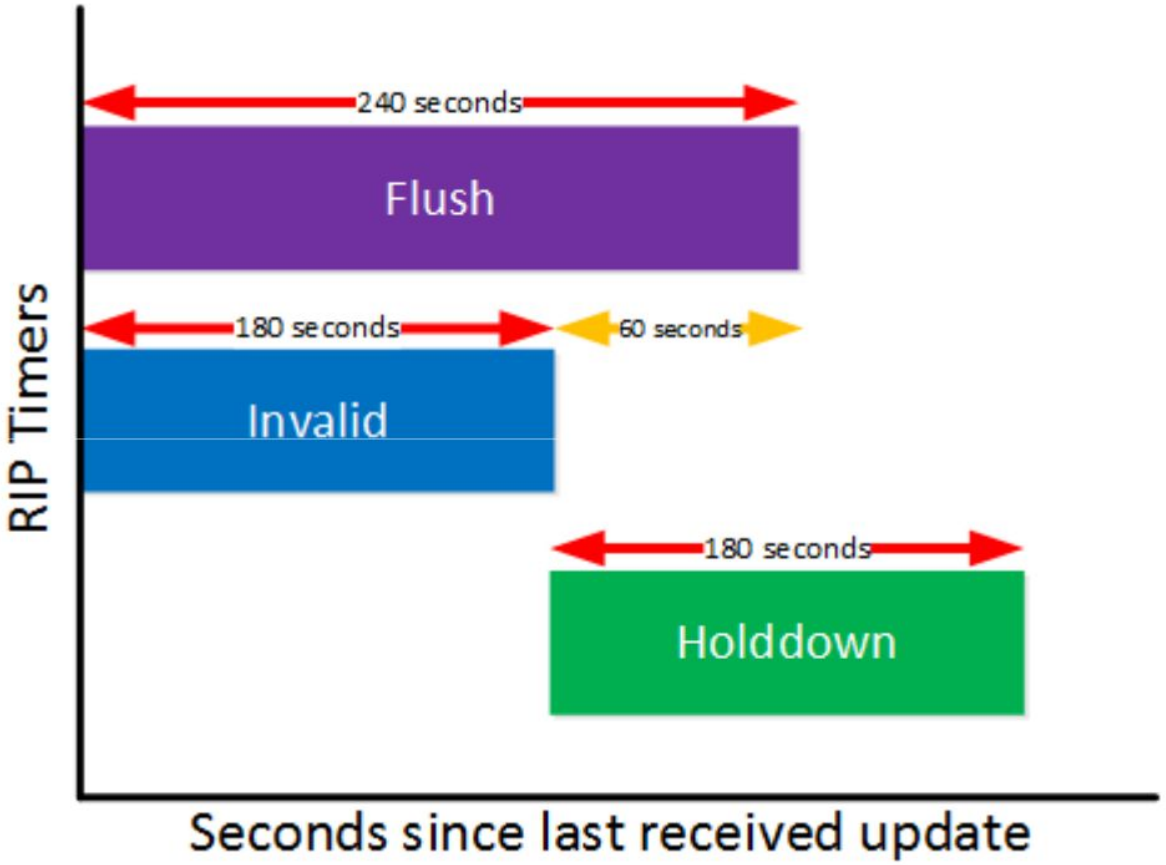
Update timer : The default timing for routing information being exchanged by the routers operating RIP is 30 seconds. Using Update timer, the routers exchange their routing table periodically.

Invalid timer: If no update comes until 180 seconds, then the destination router consider it as invalid. In this scenario, the destination router mark hop count as 16 for that router.

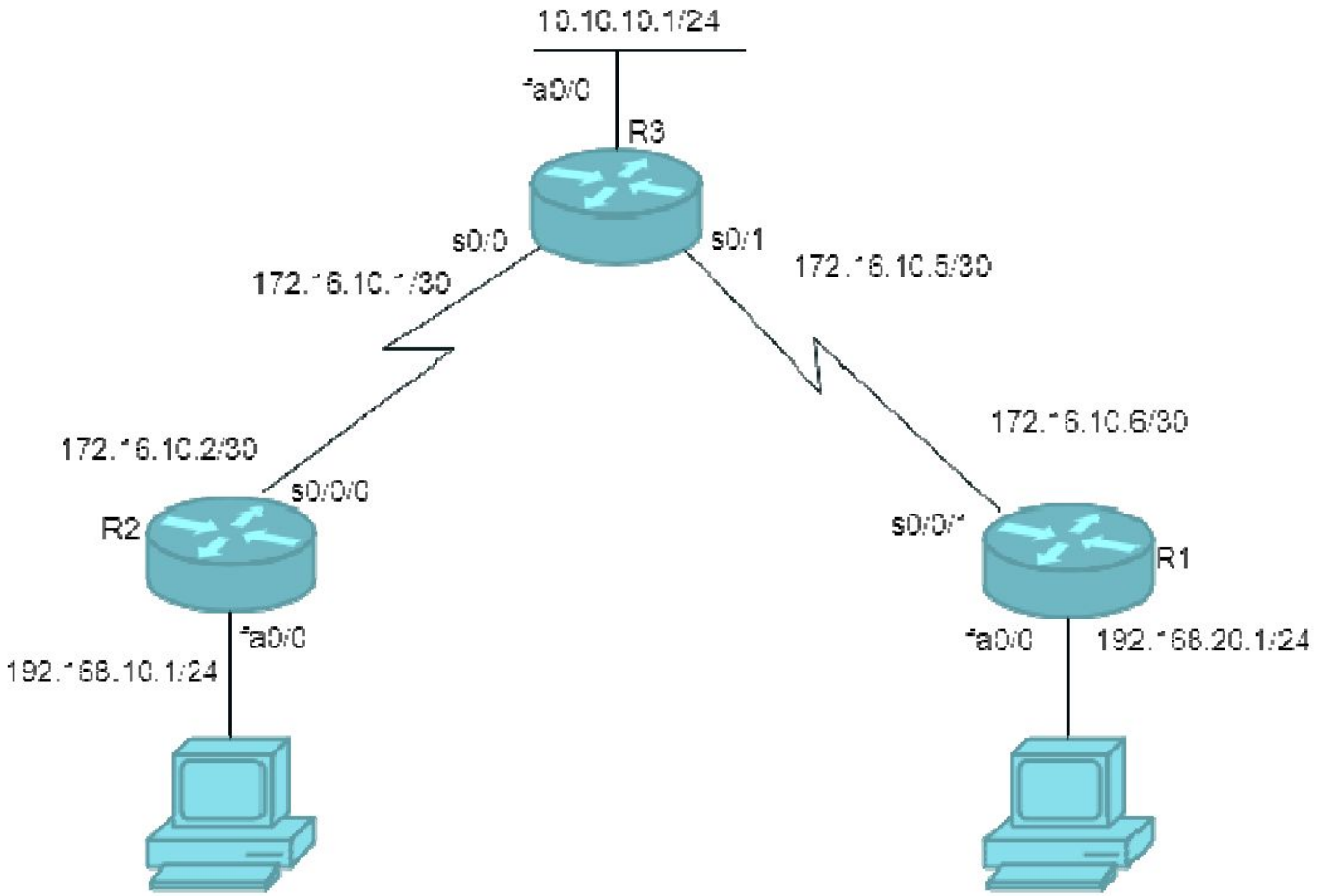
Hold down timer : This is the time for which the router waits for neighbor router to respond. If the router isn't able to respond within a given time then it is declared dead. It is 180 seconds by default.

Flush time : It is the time after which the entry of the route will be flushed if it doesn't respond within the flush time. It is 60 seconds by default. This timer starts after the route has been declared invalid and after 60 seconds i.e time will be 180 + 60 = 240 seconds.

RIP timers :



RIP Senario :



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Configure RIP for R1 :

R1(config)# router rip
R1(config-router)# network 192.168.20.0
R1(config-router)# network 172.16.10.4
R1(config-router)# version 2

Configure RIP for R2 :

R2(config)# router rip
R2(config-router)# network 192.168.10.0
R2(config-router)# network 172.16.10.0
R2(config-router)# version 2

Configure RIP for R3 :

R3(config)# router rip
R3(config-router)# network 10.10.10.0
R3(config-router)# network 172.16.10.4
R3(config-router)# network 172.16.10.0
R3(config-router)# version 2

For verification commands :

➢ **Show RIP configuration on R1**

```
R1#show running-config | section rip
router rip
version 2
network 192.168.20.0
network 172.16.10.4
```

➢ **Show the default RIP times with the show ip protocols command:**

```
R2#show ip protocols | include seconds
Sending updates every 30 seconds, next due in 21 seconds
 Invalid after 180 seconds, hold down 180, flushed after 240
```

➢ **Show ip route | include RIP**