

What is RIP?

RIP (Routing Information Protocol) is a **distance-vector routing protocol** used to dynamically exchange routing information between routers.

- It uses **hop count** as the metric to choose the best route.
- Simple to configure, but has **limitations**.

Key Characteristics of RIP

Feature	Details
Type	Distance-vector
Metric	Hop count (1 hop = 1 router)
Max Hop Count	15 (16 = unreachable)
Routing Updates	Sent every 30 seconds
Protocol Number	UDP port 520
Administrative Distance	120
Supports	Classful (RIP v1), Classless (RIP v2)

Versions of RIP

Version Description

RIP v1 Classful, doesn't support subnet masks, no authentication

RIP v2 Classless, supports VLSM, subnet masks, multicast updates, authentication

How RIP Works (Step-by-Step)

1. Routers send **updates every 30 seconds** containing their routing table.
2. Each router **adds 1 hop** to each route it receives.
3. Router updates its routing table **only if**:
 - The new path has **fewer hops**, OR
 - The path is new
4. RIP chooses the route with the **least number of hops** to reach the destination.

5. Routes that are **unreachable (16 hops)** are dropped.

6. Uses timers:

- **Route Update Timer** (30 sec)
- **Invalid Timer** (180 sec)
- **Hold-down Timer** (180 sec)
- **Flush Timer** (240 sec)

RIP Example

Router A → Router B → Router C → Router D

- A wants to reach D.
- A receives info from B: “D is 2 hops away.”
- A adds 1 hop (now 3 hops) and stores that in its routing table.
- If a better (shorter) route appears, A updates it.

Limitations of RIP

- **Slow convergence** (can take time to detect changes)
- **Max 15 hops** — not suitable for large networks
- **Wastes bandwidth** due to periodic updates
- **No knowledge of bandwidth, delay, etc.** — only hop count

RIP Configuration Example (Cisco IOS)

```
Router(config)# router rip
```

```
Router(config-router)# version 2
```

```
Router(config-router)# network 192.168.1.0
```

```
Router(config-router)# network 10.0.0.0
```

Enable RIP and advertise the directly connected networks.

RIP Timers Summary

Timer	Purpose
Update Timer	Sends routing updates every 30 seconds
Invalid Timer	Route is marked invalid after 180 sec
Hold-down Timer	Router waits before accepting bad info

Flush Timer

Route is removed from table after 240 sec

📌 Summary Table

Feature	RIP v1	RIP v2
Classful/Classless	Classful	Classless (supports VLSM)
Subnet Mask Support	✗ No	✓ Yes
Authentication	✗ No	✓ Yes
Update Type	Broadcast	Multicast (224.0.0.9)
Max Hops	15	15