23ITT204 - COMPUTER NETWORK

UNIT 4 - ROUTING

RIP

Routing Information Protocol (RIP): The Classic Distance-Vector Routing Protocol

RIP stands as one of the oldest and most foundational routing protocols in networking history. As a distance-vector protocol, it revolutionized how routers communicate and share routing information across networks, paving the way for modern internet infrastructure.

CORE MECHANICS

How RIP Works: Hop Count and Routing Updates

01

Hop Count Metric

RIP uses hop count as its routing metric, counting the number of routers a packet passes through to reach its destination.

02

Loop Prevention

Maximum hop count is 15; anything beyond becomes 16, marking the destination as unreachable and preventing routing loops.

03

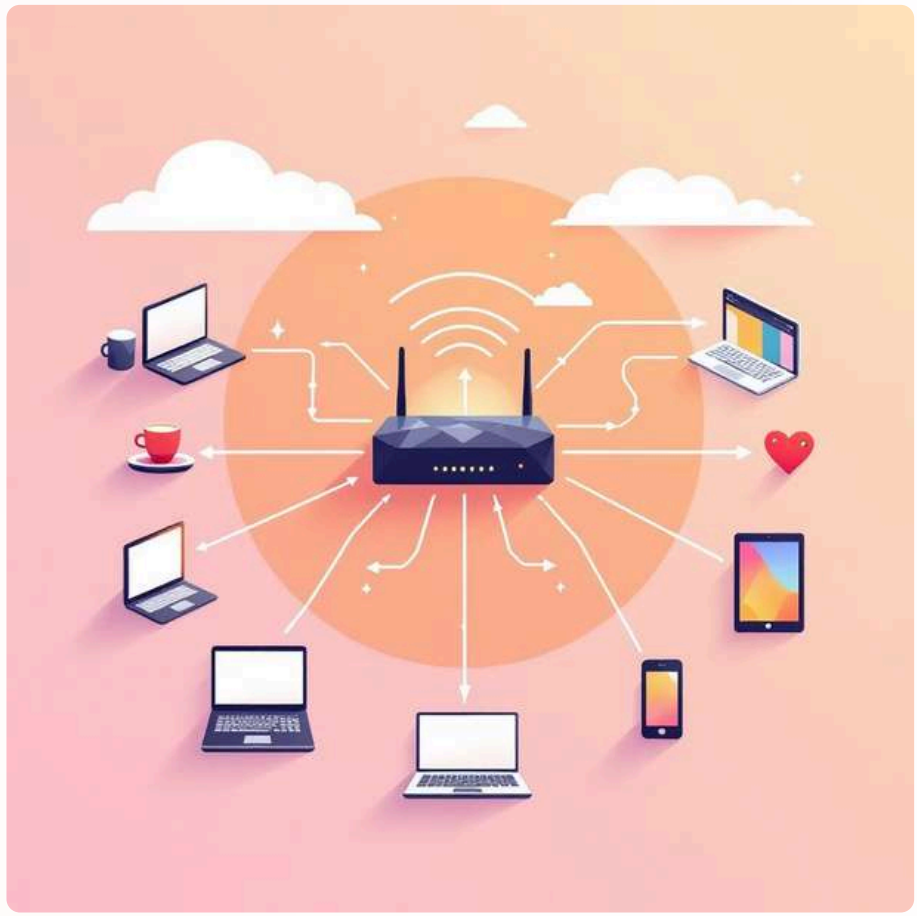
Regular Updates

Every 30 seconds, routers broadcast or multicast their entire routing tables to neighboring devices.

04

Path Selection

Routers continuously update their tables, selecting the shortest path based on the lowest hop count metric.



This straightforward approach makes RIP easy to understand and implement, though it comes with performance trade-offs in larger networks.

EVOLUTION

Key Features and Versions of RIP

RIPv1 (1988)

First version: classful routing only, no subnet mask support, broadcasts updates to all devices.

RIPng (1997)

Modern extension: designed specifically for IPv6 networks, maintaining RIP's simplicity for next-gen addressing.

1 2 3

RIPv2 (1993)

Major upgrade: supports classless routing (CIDR), uses multicast for efficient updates, adds authentication security.

Loop Prevention Mechanisms

Split Horizon

Prevents routing information from being advertised back to the source it came from.

Route Poisoning

Marks failed routes withinfinite metric (16 hops) to quickly propagate unreachable status.

Hold-Down Timers

Temporarily ignores updates about routes that have recently failed, preventing instability.

Despite these sophisticated features, RIP faces limitations in scalability and convergence speed compared to modern protocols like OSPF and EIGRP.

RIP Today: Where and Why It's Still Used

Perfect for Specific Scenarios

Small Networks

Ideal for small to medium-sized networks where simplicity outweighs the need for advanced features and rapid convergence.

Legacy Systems

Continues support in older network infrastructure where device compatibility and established configurations are critical.

Educational Use

Frequently used in networking courses and certifications to teach fundamental routing concepts and distance-vector algorithms.

Legacy and Impact: While modern enterprise networks prefer OSPF or EIGRP for their scalability and performance, RIP remains a foundational protocol in networking history. Its simplicity and widespread support ensure it continues serving specific use cases, and its concepts underpin understanding of all routing protocols.