ROUTING INFORMATION PROTOCOL [RIP]

Case Study Presentation

For 21CSC302J- COMPUTER NETWORKS

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INTRODUCTION

Routing Information Protocol (RIP) is a dynamic protocol used to route data across networks by selecting paths with the fewest router hops. This simplicity makes RIP effective for smaller networks.

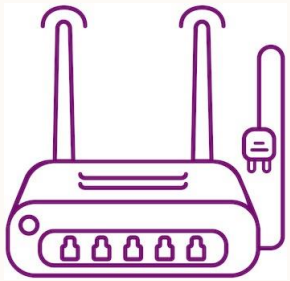
SRIP's routing table includes destination addresses, hop metrics, and next-hop details. With a 15-hop limit to prevent loops, RIP suits small networks but has limited scalability in larger setups.

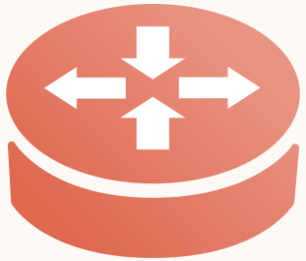
RIP is an interior routing protocol used within a single network area, operating on distance-vector principles

COMPONENTS IN A RIP

- **Components in RIP:** RIP uses a routing table, distance vector algorithm, timers (update, invalid, garbage collection), hop count metric (max 15 hops), and routing updates (every 30 seconds) to maintain optimal routes within networks.

ROUTERS

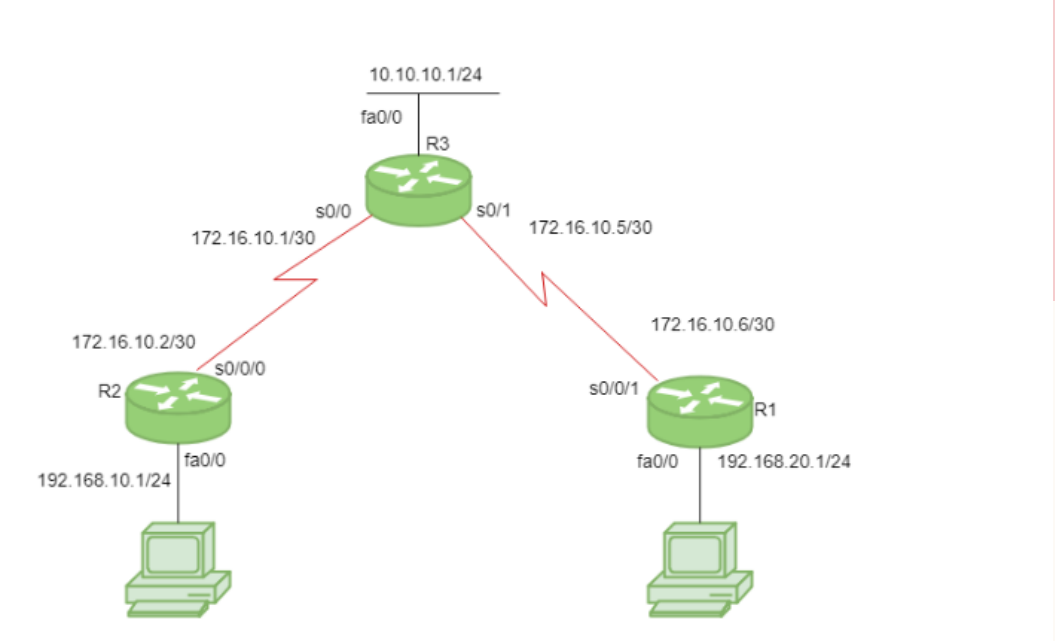




SWITCHES

FEATURES OF RIP

- RIP is a dynamic routing protocol.
- Uses hop count as a metric.
- Distance-vector protocol with AD 120.
- Works on the Network layer.
- Uses port 520.
- Hop count is the number of routers between
- source and destination.
- Lower hop count is preferred.
- Maximum hop count is 15.
- Hop count of 16 indicates unreachable network.



WORKING OF RIPV1 AND RIPV2

RIPV1
•Classful routing protocol.
•Broadcasts routing updates
• every 30 seconds.
•Uses hop count as metric.
•Maximum hop count is 15.
•Does not support VLSM.
•Less efficient due to broadcasts.
•Not scalable for large networks.

RIPV2
•Classless routing protocol.
•Multicasts routing updates
•to specific groups.
•Supports VLSM.
•More efficient than RIPv1.
•Scalable for larger networks.
•Includes authentication for security.
•Uses triggered updates for faster
•convergence.

DIFFERENCE BETWEEN RIPV1 AND RIPV2

RIP v1	RIP v2
Sends update as broadcast	Sends update as multicast
Broadcast at 255.255.255.255	Multicast at 224.0.0.9
Doesn't support authentication of updated messages	Supports authentication of RIPv2 update messages
Classful routing protocol	Classless protocol updated supports classful

ADVANTAGES OF RIP

•**Simplicity:** RIP is a relatively simple protocol to configure and manage, making it an ideal choice for small to medium-sized networks with limited resources.

•**Easy implementation:** RIP is easy to implement, as it does not require much technical expertise to set up and maintain.

•**Convergence:** RIP is known for its fast convergence time, meaning that it can quickly adapt to changes in network topology and route packets efficiently.

•**Automatic updates:** RIP automatically updates routing tables at regular intervals, ensuring that the most up-to-date information is being used to route packets.

•**Low bandwidth overhead:** RIP uses a relatively low amount of bandwidth to exchange routing information, making it an ideal choice for networks with limited bandwidth.

•**Compatibility:** RIP is compatible with many different types of routers and network devices, making it easy to integrate into existing networks.

DISADVANTAGES OF RIP

•**Limited scalability:** RIP has limited scalability, and it may not be the best choice for larger networks with complex topologies. RIP can only support up to 15 hops, which may not be sufficient for larger networks.

•**Slow convergence:** While RIP is known for its fast convergence time, it can be slower to converge than other routing protocols. This can lead to delays and inefficiencies in network performance.

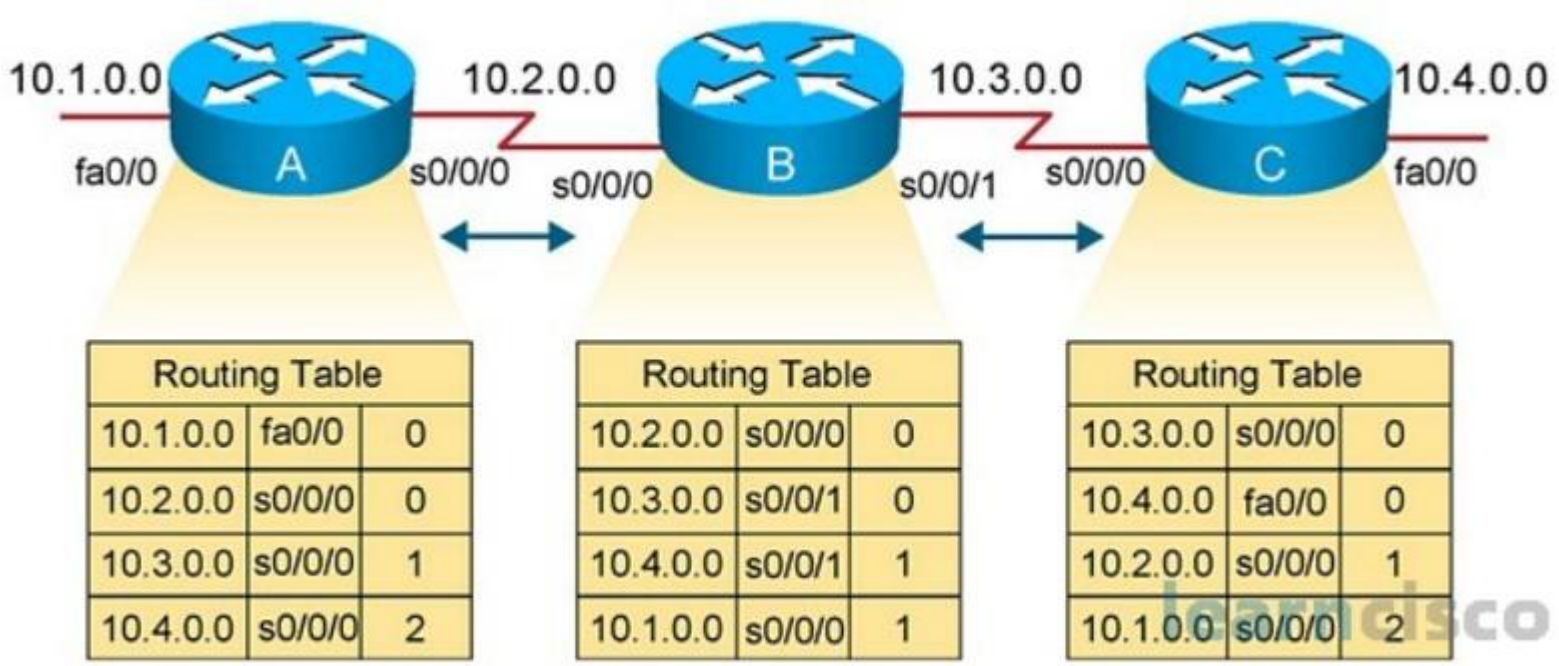
•**Routing loops:** RIP can sometimes create routing loops, which can cause network congestion and reduce overall network performance.

•**Limited support for load balancing:** RIP does not support sophisticated load balancing, which can result in suboptimal routing paths and uneven network traffic distribution.

•**Security vulnerabilities:** RIP does not provide any native security features, making it vulnerable to attacks such as spoofing and tampering.

•**Inefficient use of bandwidth:** RIP uses a lot of bandwidth for periodic updates, which can be inefficient in networks with limited bandwidth.

ROUTING CONFIGURATION TABLE



CONCLUSION

- RIPV1 and RIPV2 are distance-vector protocols suited for smaller networks. RIPV1 uses classful routing, limiting IP subnet flexibility.

RIPV2 improves on RIPV1 by supporting classless routing, subnet masks, VLSM, and multicast

- Both RIP versions have a 15-hop limit, restricting scalability and making them unsuitable for larger, complex networks.

- RIPV2 improves on RIPV1 for small networks but modern protocols offer better scalability

THANK YOU

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