

CCNA (200-301) Cisco Certified Network Associate

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Lecture 5

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تسعى لتكون الكيان الأول الذي يتبنى مبدأ المجتمع التعليمي
التعاوني ويقدم العلم مقابل العمل لتنمية وبناء المجتمعات.

مزيد من التفاصيل

Dynamic Routing

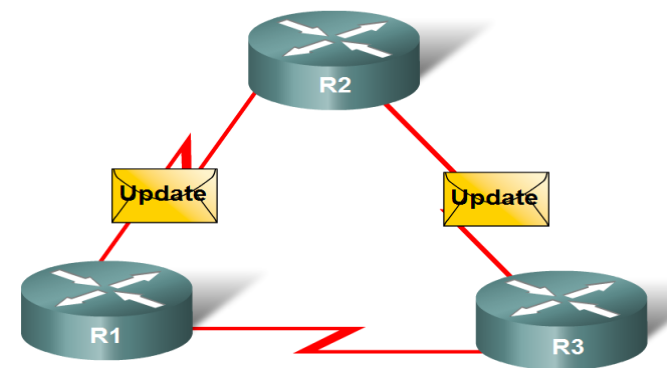


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Dynamic Routing Protocols

- Function(s) of Dynamic Routing Protocols:
 - -Dynamically share information between routers.
 - -Automatically update routing table when topology changes.
 - -Determine best path to a destination.

Routers Dynamically Pass Updates

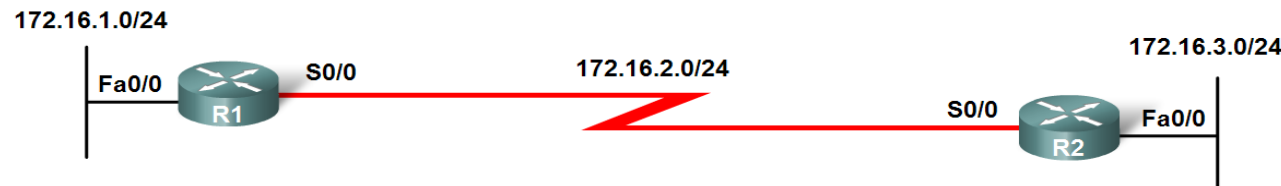


Dynamic Routing Protocols

- The **purpose of a dynamic routing protocol** is to:
 - -Discover remote networks
 - -Maintaining up-to-date routing information
 - -Choosing the best path to destination networks
 - -Ability to find a new best path if the current path is no longer available

Routing Protocol Operation

Routing protocols are used to exchange routing information between the routers.



Dynamic Routing Protocols

- **Components of a routing protocol**

- **Algorithm**

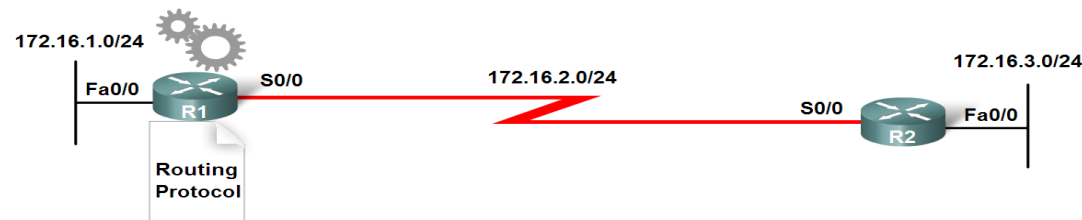
- In the case of a routing protocol algorithms are used for facilitating routing information and best path determination

- **Routing protocol messages**

- These are messages for discovering neighbors and exchange of routing information

Routing Protocol Operation

Routing protocols are used to exchange routing information between the routers.



Dynamic Routing Protocols

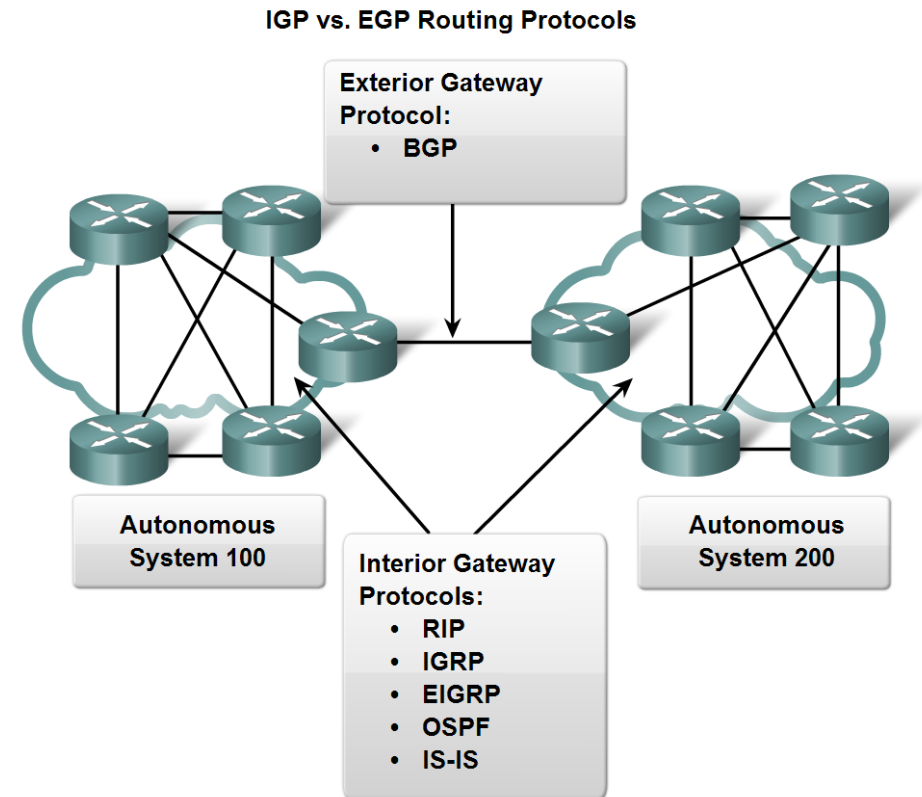
- **Advantages of static routing**
 - -It can backup multiple interfaces/networks on a router
 - -Easy to configure
 - -No extra resources are needed
 - -More secure
- **Disadvantages of static routing**
 - -Network changes require manual reconfiguration
 - -Does not scale well in large topologies

Classifying Routing Protocols

- **Dynamic routing protocols** are *grouped according to characteristics*. Examples include:
 - -RIP
 - -IGRP
 - -EIGRP
 - -OSPF
 - -IS-IS
 - -BGP
- **Autonomous System** is a group of routers under the control of a single authority.

Classifying Routing Protocols

- **Types of routing protocols:**
 - - **Interior Gateway Protocols (IGP)**
 - - **Exterior Gateway Protocols (EGP)**



Classifying Routing Protocols

- **Interior Gateway Routing Protocols (IGP)**
 - -Used for routing inside an autonomous system & used to route within the individual networks themselves.
 - -Examples: RIP, EIGRP, OSPF
- **Exterior Routing Protocols (EGP)**
 - -Used for routing between autonomous systems
 - -Example: BGPv4

Classifying Routing Protocols

- IGP: **Comparison of Distance Vector & Link State** Routing Protocols

- ❖ **Distance vector**

- routes are advertised as vectors
 - of distance & direction.
 - incomplete view of network
 - topology.
 - Generally, periodic
 - updates.

- ❖ **Link state**

- complete view of network
 - topology is created.
 - updates are not
 - periodic

- Points of difference between IGP protocols:

1. IGP Category:

- A. 1.Distance vector (RIP V 1, RIP V2 , IGRP)
- B. 2. Link State (OSPF , IS-IS)
- C. 3.Hybrid Balanced (EIGRP)

2. Updated Types :

Routing protocols send updates in two ways

❖ **Full update** :send full routing table in regular intervals regardless of changes
Consuming B.W and making delay in update exchange (distance vector)

❖ **Partial Update** :Send a part of routing table changed when the changes are occurred

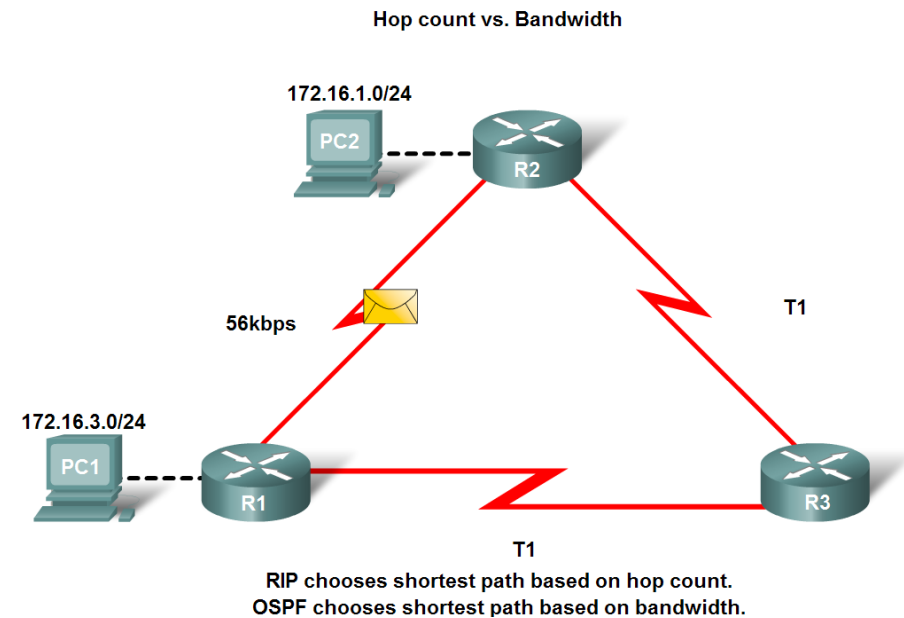
This maintains B.W and reduces delay (link state & Hybrid Balanced)

3. Convergence Time

- ❖ is the time required by routing protocols to send updates in routing table to the other routers.
- ❖ Routing protocols used **full updates** have a slow time while Routing protocols used **partial updates** have faster time

4. Metric

- A value used by a routing protocol to determine which routes are better than others.
- **Metrics used in IP routing protocols**
 - -Bandwidth
 - -Cost
 - -Delay
 - -Hop count
 - -Load
 - -Reliability
- **Best Route = Lowest Metric**



5. Industry Standard or Vendor Specific

- IGRP & EIGRP are vendor specific (worked only in cisco devices)
- (RIP V1, RIP V2 , OSPF) are industry standard protocols

6. Classless or Classful Protocols

- Classful Protocols :Send updates without subnet mask
- Classless Protocols Send updates with subnet mask

7. Multicast or Broadcast update

Routing Protocols	Destination IP	Type
RIP V1	255.255.255.255	broadcast
IGRP	255.255.255.255	broadcast
EIGRP	224.0.0.10	Multicast
OSPF	224.0.0.5 & 224.0.0.6	Multicast
RIP V2	224.0.0.9	Multicast



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