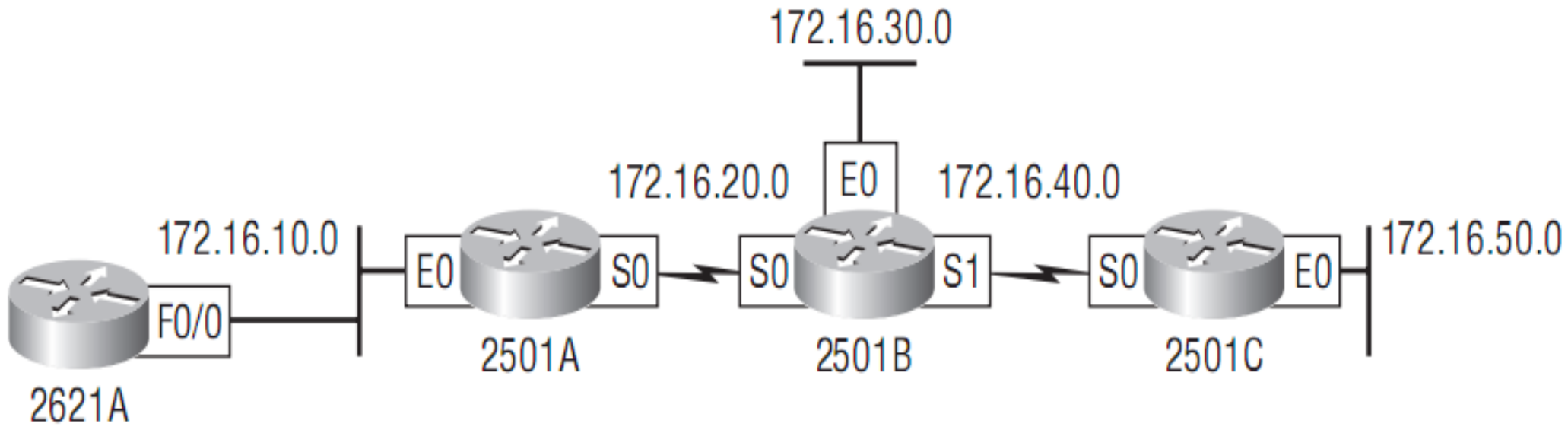
Kardan University
BCS

RIP: Routing Information Protocols

Distance Vector Protocols Review

- The algorithm of distance routing protocols send the complete routing table contents to its neighbors , which then combines with the routing info of their own routing tables, this is called routing by RUMOR, because the router receives the information from the neighbor about the remote network and believe that information without finding by itself.
- If there are multiple paths to the remote network, then the AD value is check
- Examples : RIP and IGRP

FIGURE 6.13 The internetwork with distance-vector routing



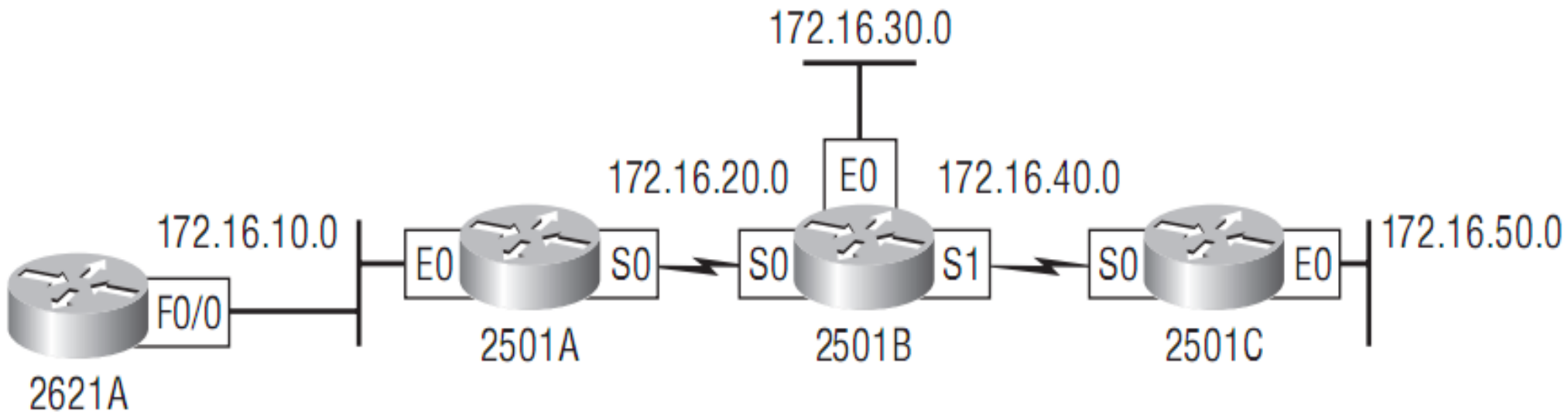
Routing Table		
172.16.10.0	F0/0	0

Routing Table		
172.16.10.0	E0	0
172.16.20.0	S0	0

Routing Table		
172.16.20.0	S0	0
172.16.30.0	E0	0
172.16.40.0	S1	0

Routing Table		
172.16.40.0	S0	0
172.16.50.0	E0	0

FIGURE 6.14 Converged routing tables



Routing Table		
172.16.10.0	F0/0	0
172.16.20.0	F0/0	1
172.16.30.0	F0/0	2
172.16.40.0	F0/0	2
172.16.50.0	F0/0	3

Routing Table		
172.16.10.0	E0	0
172.16.20.0	S0	0
172.16.30.0	S0	1
172.16.40.0	S0	1
172.16.50.0	S0	2

Routing Table		
172.16.20.0	S0	0
172.16.30.0	E0	0
172.16.40.0	S1	0
172.16.10.0	S0	1
172.16.50.0	S1	1

Routing Table		
172.16.40.0	S0	0
172.16.50.0	E0	0
172.16.10.0	S0	2
172.16.20.0	S0	1
172.16.30.0	S0	1

RIP Characteristics

- RIP: Routing Information Protocol
- A classful Distance Vector (DV) routing protocol
- It uses the Metric as hop count
- The AD of RIP is 120, RIP is used in small networks only
- RIP routing is limited to 15 hops, hop 16 indicates that the network is unreachable.
- Updates are broadcasted every 30 seconds
- RIP can perform load balancing for up 6 equal-cost links

  (4 by default)

RIP Versions

- RIP has two versions
  - RIPv1 (IPv4)
  - RIPv2 (IPv4)
  - RIPng (Next Generation) (IPv6)

  - NOTE
  - The neighbor 192.168.20.2 commands makes the routing updates unicast.

RIP Message types

- Request message
  - This is sent out on startup by each RIP enabled interface
  - Requests all RIP enabled neighbors to send routing table
- Response message
  - Message sent to requesting router containing routing table

Note:

- RIPv1 is used only in classful network, in which that all devices must use the default subnet mask.

RIPv1 Configuration Commands

- R1(config)#router rip
- R1(config-router)#network 192.168.10.0
- R1(config-router)#network 192.168.20.0
- R1(config-router)#network 192.168.30.0
- R1(config-router)#network 192.168.40.0
- R1(config-router)#do show ip route
- R1(config-router)#passive-interface serial 2/0
- R1(config-router)#neighbor 192.168.20.2

RIPv2

- This is similar to RIPv1 with little differences.
- Both versions have the AD of 120, both are distance vector protocols.

RIPv1	RIPv2
Distance Vector Classful	Distance Vector & Classless
Max hop count of 15	Max hop count of 15
No authentication	MD5/Clear text authentication
Broadcast based	Multicast Based 224.0.0.9
No Support for VLSM	Support for VLSM

RIPv2 Configuration

- R1(config)#router rip
- R1(config-router)#version 2
- R1(config-router)#no auto-summary
- R1(config-router)#network 192.168.10.0
- R1(config-router)#network 192.168.20.0
- R1(config-router)#network 192.168.30.0
- R1(config-router)#network 192.168.40.0

Advertising default route using RIP

- Router(config)# ip route 0.0.0.0 0.0.0.0 < next hop address >
- Router(config)# ip route 0.0.0.0 0.0.0.0 14.0.0.4
- Router(config)# router rip
- Router(config-router)# default-information originate

Difference between RIP & IGRP

- The main diff between RIP and IGRP is that all the Routers that share the same routing table in IGRP must have the same Autonomous System (AS) number, while in RIP such thing is not available.
- Cisco does not support IGRP anymore

Difference between RIP & IGRP

IGRP	RIP
Can be used in large internetworks	Works best in smaller networks
Uses an autonomous system number for activation	Does not use autonomous system numbers
Gives a full route table update every 90 seconds	Gives a full route table update every 30 seconds
Has an administrative distance of 100	Has an administrative distance of 120
Uses bandwidth and delay of the line as metric (lowest composite metric), with a maximum hop count of 255	Uses only hop count to determine the best path to a remote network, with 15 hops being the maximum

REFERENCES

- https://study-ccna.com/administrative-distance-metric/
- http://www.omnisecu.com/cisco-certified-network-associate-ccna/how-to-configure-rip-authentication-keychain.php
- https://www.youtube.com/watch?v=dsvWcYykakU

THANK YOU