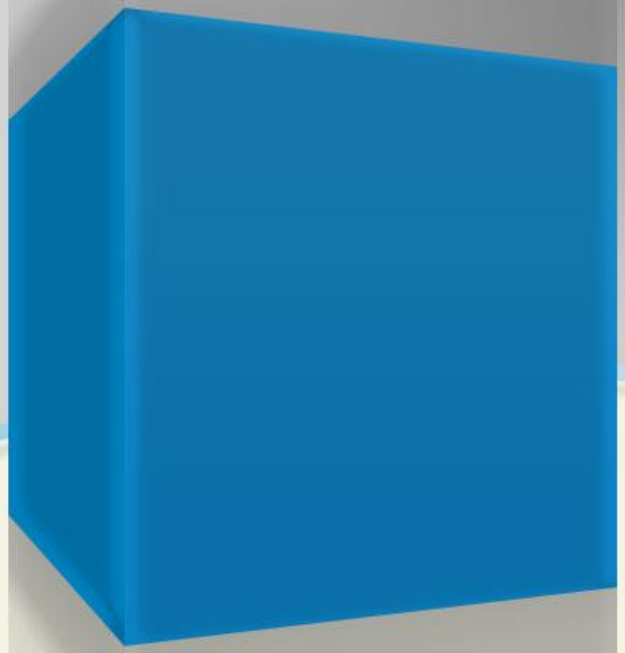
Computer Network Protocols
Network Layer (Part 1)
Lesson 5



كلية المستقبل الجامعة
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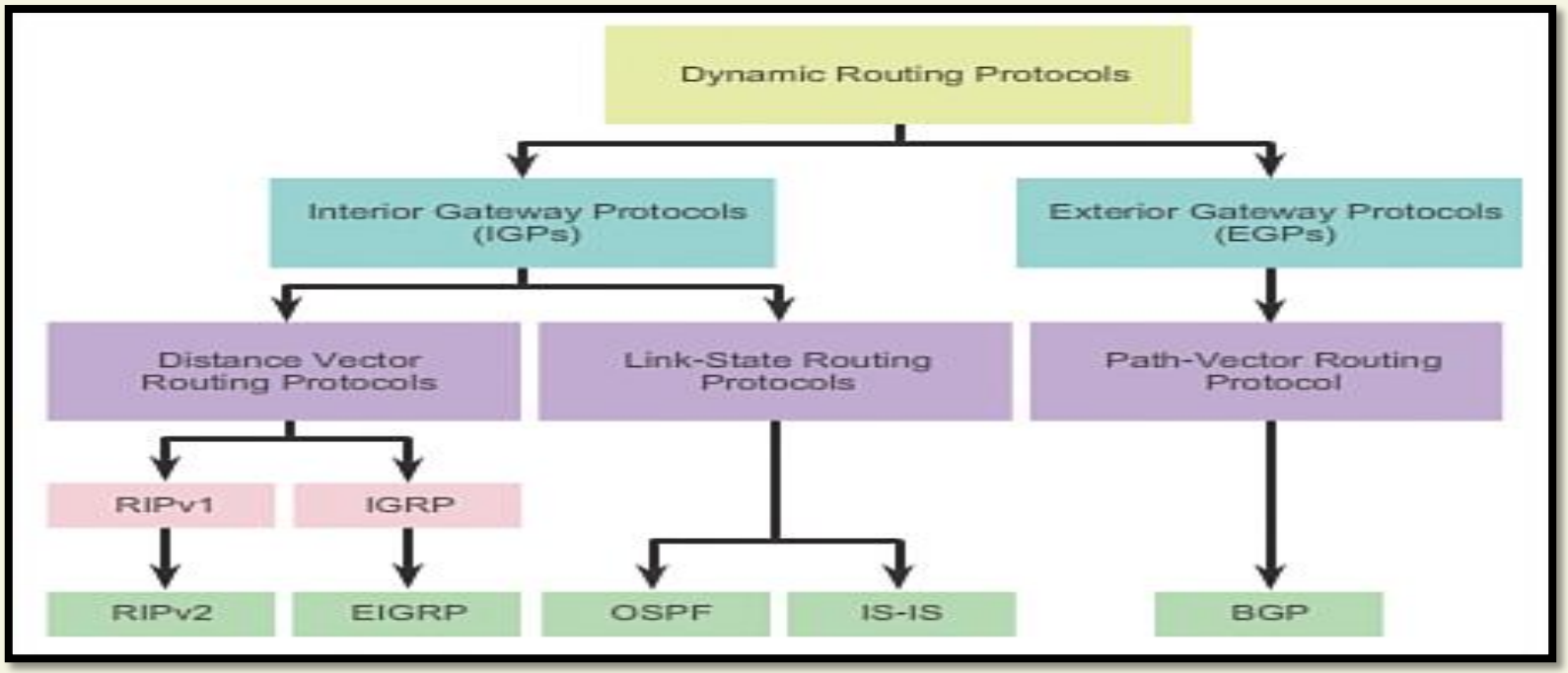
Routing Protocols

- *A routing protocol is a* ***combination of rules and a procedure*** *that* ***lets routers in the internet inform each other of changes.***

- ***Routing metric****: a* ***method*** *by which* ***routing algorithms determines that one route is better than another route****, Metric may be (****hop count, bandwidth, delay, and load****).*



Interior versus Exterior Routing Protocols

An Autonomous System (AS), *also known as a* ***domain****, is a* ***collection of routers that are under a common administration****, such as a company's internal network or an Internet service provider's (ISP's) network.* ***Because the Internet is based on the AS concept, two types of routing protocols are required:***

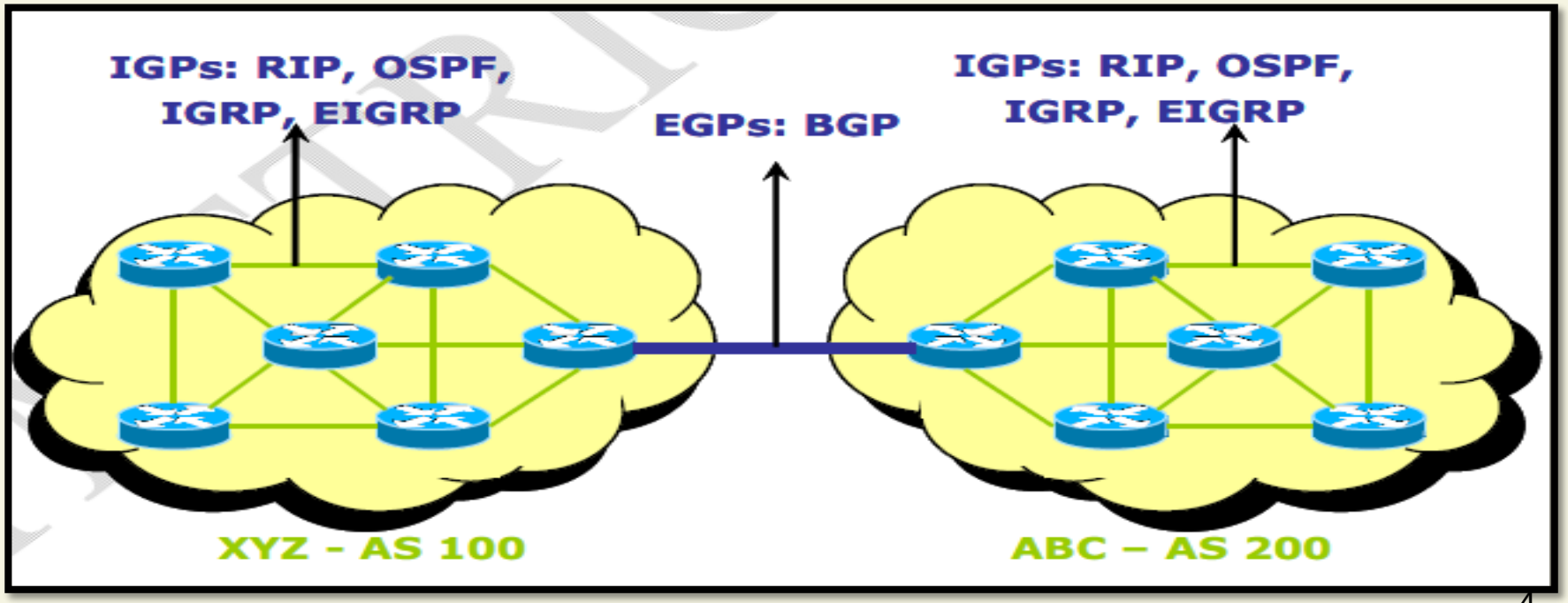
1. ***Interior Gateway Protocols (IGPs)****:* ***handle routing within an Autonomous System****. IGP's figure out how to get from place to place between the routers you own.*

2. ***Exterior Gateway Protocols (EGP): handle routing outside an Autonomous System and get you from your network, through your Internet provider's network and onto any other network.***

Interior versus Exterior Routing Protocols

1. *IGP uses **less-complicated metrics** to ease configuration and speed up the decisions about best routing paths for faster convergence.*

2. ***Slower to converge and more complex to configure.***



Routing Information Protocol (RIP)

- ***RIP*** *is a routing protocol for* ***exchanging routing table information between routers****.*
- *It is a very simple protocol based on* ***distance vector routing****.*
- *Simple* ***intra-domain*** *protocol.*
- *Uses* ***hop count as a path selection metric****. (RIP prevents routing loops by implementing a limit on the number of hops allowed in a path from the source to a destination. The* ***maximum number of hops allowed for RIP is 15****. This hop limit, however, also limits the size of networks that RIP can support, a hop count of 16 are considered an infinite distance, in other words the route is considered unreachable).*

Routing Information Protocol (RIP)

There are three types of timers in RIP routing protocol, these are:

1. ***Routing-update timer (periodic timer):*** *The periodic timer controls the advertising of regular update messages. Routers send updates every* ***30 seconds****.*

2. ***Route timeout (Expiration Timer):*** *Expiration Timer if there is a problem on an internet and no update is received within the allotted* ***180 s****, the route is considered expired and the hop count of the route is set to 16, which means the destination is unreachable.(Because 15 hop max).*

3. ***Route-flush timer (Garbage Collection Timer):*** *After the route timeout expires, the route-flush timer eventually expires, deleting the route from the table after* ***120s****.*

Drawbacks of RIP:

1. *RIP has* ***slow convergence*** *and* ***count to infinity problems***

2. *The* ***hop count cannot exceed 15, or routes will be dropped.***

EIGRP

- *EIGRP is a protocol for routing IPv4 and IPv6.*
- *EIGRP, however, is a **hybrid routing protocol**—it is a **distance vector** protocol with additional **link-state protocol** features.*
- *Uses **triggered updates** (EIGRP has no periodic updates).*
- *Provide **fast convergence** to minimize network traffic.*
- *Uses the minimum bandwidth on the path of the destination network, and calculate a route from the total **delay** metrics.*

End Of Lesson 5

Thanks For Listening