Computer Networks
Jacobs University Bremen
Dr. Jürgen Schönwälder, Vaibhav Bajpai, Nikolay Melnikov

Course: 320301
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Time: 10 min.

Quiz Sheet #3

Problem 3.1: *Internet Routing* (1+1+1+1 = 4 points)

true	false	
□	□	A distance vector routing protocol uses Dijkstra's algorithm to calculate shortest paths.
□	□	A node in a link-state routing protocol exchanges path vectors with its neighbors.
□	□	BGP uses the split horizon technique to resolve the count to infinity problem.
□	□	BGP can be used between Autonomous Systems (eBGP) as well as within an Autonomous System (iBGP).

Solution:

true	false	
□	☑	A distance vector routing protocol uses Dijkstra's algorithm to calculate shortest paths.
□	☑	A node in a link-state routing protocol exchanges path vectors with its neighbors.
□	☑	BGP uses the split horizon technique to resolve the count to infinity problem.
☑	□	BGP can be used between Autonomous Systems (eBGP) as well as within an Autonomous System (iBGP).

Problem 3.2: *Autonomous Systems* (1+1 = 2 points)

What are Multihomed Autonomous System and Transit Autonomous System? What is the difference between them?

Solution:

A Multihomed AS has a peering relationship with more than one AS, however it refuses to carry transit traffic. A Transit AS is a Multihomed AS that is designed to carry transit and local traffic.

Problem 3.3: *BGP policies and* `cbgp` (1+1 = 2 points)

a) What is a `local-pref` attribute used for?

b) What is a `MED (or metric)` attribute used for?

Solution:

a) A `local-pref` attribute is used by an Autonomous System to control outgoing traffic by setting relatively higher attribute values for preferable links.

b) A `MED` attribute is used by an Autonomous System to control incoming traffic by setting relatively lower attribute values for preferable links. The attribute is subject to negotiation with other Autonomous Systems.

Problem 3.4: *subnet masks and prefixes (lab session)* (1+1 = 2 points)

a) What are the equivalents of subnet masks 255.255.128.0 and 255.255.255.192 in prefix notation?

b) What is the longest IPv4 prefix that can used for a subnet that has two interfaces (hosts) attached?

Solution:

a) 255.255.128.0 $\Longrightarrow$ /17
255.255.255.192 $\Longrightarrow$ /26

b) The longest prefix that can be used is a /30, since it leaves 4 IPv4 addresses for the subnet. Two addresses can be assigned to the two interfaces, leaving the *all* zeroes and *all* ones addresses in the subnetwork reserved for broadcasts.