COMP9332 Network Routing and Switching
Solution of Self-assessed Tutorial for BGP

Q1. When using compression, how many bytes are required to code the mask-address pair if the network address has a prefix length of

(a) 10 bits
(b) 16 bits
(c) 17 bits
(d) 24 bits

A1.

(a) 3
(b) 3
(c) 4
(d) 4

Q2. Examine the lecture slide 45 (confederation). How many IBGP and EBGP connections are there? How many BGP connections would have been there if neither *confederation*, nor *route reflector* was chosen?

A2. Confederation has 3 EBGP and 7 IBGP connections (a total of 10 BGP connections). If neither *confederation*, nor *route reflector* was chosen, fully mesh BGP connectivity would have been used. With 8 routers, a full mesh results in 28 BGP connections.

Q3. ISP A and ISP B have separate autonomous systems assuming the numbers 100 and 200, respectively. ISP A advertises the route [N1, (100), Community2] to ISP B. What would be a possible route advertisement if ISP B wants to advertise the route to another neighbour?

A3. Because of the parameter Community2, ISP B is required to inflate the path. A possible advertisement would be [N1, (200,200,100), Community2] where ISP B also requests its neighbour to inflate the path (the path gets inflated at every hop).

Q4 What is BGP Synchronization problem? Name two methods that address this problem without requiring all routers to run BGP. Compare the advantages and disadvantages of these two methods.

A4. BGP Sync refers to the problem when a transit AS advertises a route to its neighbour while some of its internal routers do not know about this route. Two methods, which do not require all internal routers to run BGP, are: (1) to distribute any such route to all routers using intra-domain routing protocol, or (2) use IP-in-IP tunneling.

Q5 Consider the network in Slide 56 of BGP lecture notes. Show how AS1 can enforce that all traffic from ISP1 and ISP2 arrive via Link 1 and traffic from ISP 3 via Link2.

A5. It is not possible. If path inflation is used, traffic from all three ISPs will either arrive on Link 1, or on Link 2, depending on which link was chosen for the inflation.