

Exercise Questions

CS447-003 Networks and Data Communications

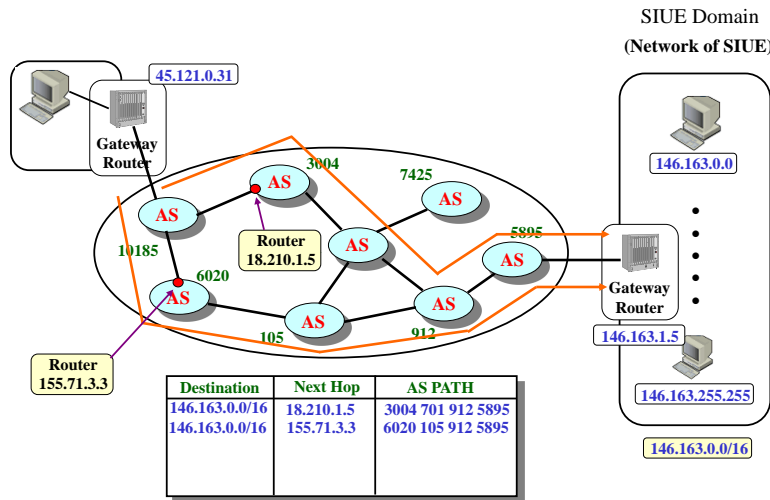
April 11, 2024

QUESTION:

Algorithms are processes or sets of rules to be followed in calculations or other problem-solving operations, especially by a computer, while network protocols are sets of rules that govern communications between two communicating computers, including routers (routers are computers that specialize in “calculating” the best path(s) to reach particular destinations in a network).

As we discussed in our classroom, the two major routing algorithms for calculating the best (shortest) paths from a source to a destination in a network are Dijkstra Shortest Path Algorithm and Bellman-Ford Shortest Path Algorithm, while BGP (Border Gateway Protocol) is the de-facto standard protocol spoken by Internet core-routers.

As a result, a routing algorithm (e.g., Dijkstra Shortest Path Algorithm and Bellman-Ford Shortest Path Algorithm) mathematically or theoretically defines a process of finding best (shortest) paths in a network, while a routing protocol (e.g., BGP) implements a given routing algorithm in a real (actual – not theoretical) network.



Question: Which routing algorithm (Dijkstra Shortest Path Algorithm or Bellman-Ford Shortest Path Algorithm) do you think the Internet uses to perform its routing (its inter-domain routing for finding the best (shortest) paths from a source domain to a destination domain using BGP)? Objectively justify your conclusion.