

Part 1: Routing Algorithms

1. Summarize how DV routing algorithms function.

- a. In a DV routing algorithm, each router determines how far away it is from the destination by communicating with its neighbors. It uses this information to find the shortest path to the destination. Each router then will update its routing table and send the info to the next neighbor. This keeps going until every router has similar tables.

2. Summarize how link-state routing algorithms function.

- a. In a link-state algorithm, each router has a database called the LSDB. This holds link state information and a map of the network. The algorithm uses this information to find the best path to the destination. The routing table computed is stored locally for future use when forwarding packets.

3. Compare and contrast link-state algorithms with DV algorithms.

- a. **What are the advantages of link-state algorithms over DV algorithms?**
 - i. Link-state algorithms are more efficient than DV algorithms and they can scale better with larger networks due to how easily they can find the shortest path to the destination.
- b. **What are the disadvantages of link-state algorithms over DV algorithms?**
 - i. Despite being able to find the shortest path better, link-state algorithms have a more complex implementation compared to DV algorithms and require more memory.

Part 2: Queueing and Scheduling Algorithms

1. What is the first queueing/scheduling algorithm you researched? Summarize how it functions and compare it against the ideas behind weighted fair queuing.

- a. The first one I researched was the First-In-First-Out (FIFO) algorithm. This algorithm works by processing the packets/data in the order they are received, hence the name. WFQ distributes items differently by giving them weights. This means the first item will only have bandwidth based on its weight and not based on the order in which it came in.

2. What is the second queueing/scheduling algorithm you researched? Summarize how it functions and compare it against the ideas behind weighted fair queuing.

- a. The second one I researched was the Shortest Job Next (SJN) algorithm. This algorithm works by completing the job with the shortest completion time. It does this to optimize resources and keep job waiting times lower. This is different from WFQ, as SJN does the shortest job first and WFQ gives multiple jobs bandwidth based on weight. It does not take into consideration the time the job will take.