Latency (Delay)

1. The latency or delay defines how long it takes for an entire message to completely arrive at the destination from the time the first bit is sent out from the source.
2. Components of Latency:
   1. Transmission delay:
      1. Time it takes to place the complete data packet on the transmission medium.
      2. Transmission time = Message size / Bandwidth
   2. Propagation delay:
      1. Time it takes for a bit to go from device A to device B.
      2. Propagation Time = Distance / Propagation speed
   3. Queuing delay:
      1. The time needed for each intermediate or end device to hold the message before it can be processed.
      2. The queuing time is not a fixed factor, it changes with the load imposed on the network.
      3. When there is heavy traffic on the network, the queuing time increases.
   4. Processing delay:
      1. How much time does the node take to process the message?
3. Latency = Transmission + Propagation + Queuing + Processing