

1. In this situation, the correct way to transfer 40 terabytes of data across the country would be to do it through a courier service such as FedEx. With a given transfer rate of 2 Gbps (2×10^9 bits per second), transferring 40 TB (3.2×10^{14} bits) would take 160,000 seconds, or more than 44 hours of time. This is much more time than the 24 hours necessitated for this urgent transmission, and so sending the physical storage media through a courier service would be the only possible way to get the data to its destination on time.
2. The formula for calculating the delay on a network is $d = d_{processing} + d_{queue} + d_{transmission} + d_{propagation}$. In order to calculate the delay of transmitting a file of size F from host A to B through two switches, let us define a few constants first.
 - d_1 is the distance from host A to switch 1 (d_2 : from switch 1 to switch 2, d_3 : from switch 2 to host B)
 - s_1 is the propagation speed of the link of d_1 (s_2 corresponding to d_2 and s_3 corresponding to d_3 in the same ways.)
 - $\sum d_i / s_i$ is the sum of d_n / s_n from 1 to 3.
 - t is the amount of time for the hosts to process a packet

Using this information, we can calculate the time it takes a packet to travel from host A to host B as $d = t + 0 + L/R + \sum d_i / s_i$. Therefore, the time for the entire file to be transferred between hosts would be the time for a packet to transfer multiplied by the number of packets, or $(F / S) * (t + L/R + \sum d_i / s_i)$