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Assignment 1

1.

(a)

Circuit switching requires two nodes to have a communication circuit before communication.

Packet switching does not an establishment of dedicated path between two nodes.

Let d\_{end - end}: end to end delay

d\_{proc}: processing delay

d\_{queue}: queuing delay

d\_{trans}: transmission delay

d\_{prop}: propagation delay

N: number of routers

L: packet size (bits)

R: transmission rate of link between two routers (bits / second)

D: distance between nodes (meters)

S: propagation speed (meters / second)

d\_{end - end} = N (d\_{proc} + d\_{queue} + d\_{trans} + d\_{prop})

d\_{trans} = L / R

d\_{prop} = D / S

circuit switching:

delay = N (d\_{proc} + D / S) + L / R

packet switching:

delay = N (d\_{proc} + d\_{queue} + L / R + D / S)