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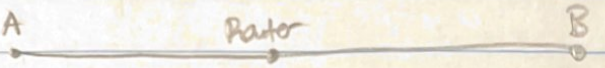
ISE 316 – HW1

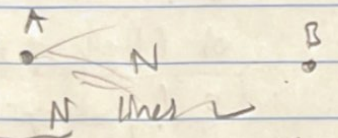
(1)



Queing delay = $I\left(\frac{L}{R}\right)(1-I) = .9\left(\frac{2\cdot10^3}{1\cdot10^9}\right)(.1) = .0000018$

$I = \frac{L\cdot a}{R} = \frac{2000\cdot(450{,}000)}{1\cdot10^9} = \frac{2\cdot10^3\cdot45\cdot10^4}{10^9} = \frac{90}{100} = .9$

(2)



B bandw N lines ✓

~~Propagation delay =~~

K packets ✓
B bits

Total size = $k \cdot B$

Total ~~transfer~~ packets / = R / B

$\frac{k\cdot B\cdot N}{V\cdot R}$

(3a) • I'd say circuit-switching because it's established, it doesn't get interrupted, the line is stable and preferable for long term periods.

(3b) • max rate depends on the smallest link; since all equal, then max rate is 10 mbps

(3c) • it'd depend on the algorithms that are being used in packet-switching that decides the routes. Best case would be to hold 10 mbps but it could go lower partially.

(4a) $\frac{400}{2\cdot10^8} = .000002$ for just propagation

(4b) → first packet NOT wait, 50th packet waits = $49\left(\frac{1000\cdot8}{10^9}\right) = 49\,\mu s \cdot 8 = 392\,\mu s$

(4c) → $300(1000\cdot8) = 24\cdot10^5 \rightarrow \frac{2.4(10^6)}{.1} = 24\ (mbps)$

(4d) → depends on slowest link. max would be 10 (mbps). If tried for more, there would be queue. And later on, potential data loss.