Section 1.4

Metrics

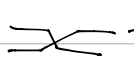
Delay → Time taken to deliver the packet

$d = 5000$ km

$s = 2 \times 10^8$ m/s

$= 200$ km/ms

$\frac{5000}{200} = 25$ ms



Round Trip

RT prop. delay ≈ 50 ms

delays

packet being transmitted

packets queueing

$d_{nodal} = d_{proc} + d_{queue} + d_{trans} + d_{prop}$

Propagation delay

$= d/s$ dependance on length and speed of light

$V = \frac{c}{\sqrt{\varepsilon}}$ → vacuum, dielectric constant

Emission (Transmission) Delay

L/R data unit → packet or file

L = size of data unit

R = rate

Pipelining bits in a packet

$d/s = \frac{1010 \text{ km}}{280 \text{ km/ms}} = 3.57$ ms

$\frac{L}{R} = \frac{800 \text{ bits}}{10 \text{ Mb/s}} = 80\mu s$

$= 0.08$ ms

~ 3.65 ms

only count prop. delay of last packet