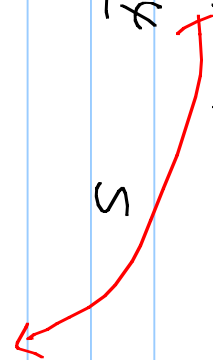


$$T = 500 \text{ ms} + \frac{640000 \text{ bit}}{1.536 \text{ Mbps} / 24}$$
$$= 0.5 + \frac{640,000 \times 24}{1.536 \times 10^6} \text{ s}$$
$$= ? \text{ sec}$$

bit/sec



$$N = 35$$

$N$  : # of active users

at the same time

$p = 0.1$  : prob. of a user being active

$$P(N=0) = (1-p)^{35} \quad P(N=1) = \binom{35}{1} p (1-p)^{34}$$

$$P(N=k) = \binom{35}{k} \cdot p^k \cdot (1-p)^{35-k}$$

$$\begin{aligned} \square \text{ (prob. of } > 10 \text{ active less)} &= P(N \leq 11) + P(N=12) + \dots + P(N=35) \\ &\approx 0.0004 \end{aligned}$$

□ 1 Mb/s link

□ each user:

❖ 100 kb/s when "active"

❖ active 10% of time

$$\text{delay} = \frac{3L}{R}$$

$$= \frac{3 \times 7.5 \times 10^3 \text{ bit}}{1.5 \times 10^6 \text{ bit/s}}$$

$$= 0.015 \text{ s}$$

- L = 7.5 Kbits
- R = 1.5 Mbps
- delay = 15 ms