Computer Network

Homework #1

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텍스트, 스크린샷, 폰트이(가) 표시된 사진

자동 생성된 설명

**Answer**

1. 20 users
2. 0.1
3. The probability of 21 or more users transmitting simultaneously is equal to following equation;

Thus, the probability is estimated to 0.003

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1. The transmission delay is *L/R.* The total delay is as follows;
2. Let x = L/R.

Total delay is since I=La/R=ax.

For x = 0, the total delay is zero. If x is increased, then the result will be increased infinitely because I is less than I.

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(let a=1)

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1. Average : 6.52, 7.04, 6.54

St : 9.38, 9.30, 8.83

1. 10, 11, 11
2. 5 times. No, the largest delays occred in the same ISP
3. Inter-continent results are as follows; Average is 42.51 and standard deviation is 34.56; It shows that Inter-continent result is much slower than intra-continent results.

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1. Propagation delay(dprop) = distance/propagation speed

Distance : 20,000 kilometers = 20,000,000 meters

Propagation speed : 2.5x10^8 meters/sec

Dprop = 20,000,000 meters \* 2.5x10^8 meters/sec = 0.08 seconds

R\*dprop = 2Mbps \* 0.08 seconds = 0.16 Mb = **160,000 bits**

1. The maximum number of bits is limited by bandwidth-delay product, which is **160,000 bits**.
2. As stated in b, the maximum number of bits is limited by bandwidth-delay product. In other words, the bandwidth-delay product of a link is the maximum number of bits that can be in the link.
3. 20,000,000 meters / 160,000 bits -> 1bit = 125meters which is longer than a football field.
4. Width of a bit = (Transmission rate \* propagation speed) / the length of the link. In short, w = R\*s/m

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1. . For store-and-forward switching, the total time is 4 sec multiplied by 3 hops which is 12 sec.
2. 1st packet occurring time is . And 2nd time occurring is as twice of 1st packet time occurring which is 10m sec.
3. Time at which 1st packet is received at the destination host = 5m sec \* 3 hops = 15m sec. After this, every 5m sec one packet will be received; thus, time at which last (800th) packet is received = 15m sec + 799\*5m sec = 4.01 sec.
4. First, packets have to put in sequence at the destination. Second, Message segmentation results in many smaller packets. Since header size is usually the same for all packets, regardless of their size, with message segmentation the total amount of header bytes is more.

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The total delay time is consists of delay for first packet adds (number of packet\*delay for one packet)

So, T(total) is equal to ()(

We can get the value of S that minimizes the delay by differentiating following equation; ==0

So, after solving the equation, we can get . As a result, S=2F