Arpan Srivastava

COMP – 4320

7/14/2022

Assignment 1

1.

1. Packet switching will be more appropriate. Because the application program has data transmission at different rates, and the independent physical channels established by circuit switching on both sides of communication are not compatible with the transmission at different rates. Three physical channels need to be established to complete the transmission which is not feasible. Packet switching does not occupy a fixed communication line but occupies different physical paths in different time sections to improve channel utilization.
2. Congestion control is needed. In the 0.3 second of each second, the transmission speed of data is faster than 1.8Mbps, thus causing congestion during that time.

2.

a．15000kbps/500kbps=30, thus 30 users can be supported

b．p = 0.15

c．(p=0.15)

d． = 0.9979.

3.

4.

=min

。

5.

1. transmission delay equals P/R, the total delay =
2. total delay = , let

Chart, line chart

Description automatically generated

1. ，

6.

a．，total time=0.4s\*3 = 1.2s

b．500bits/10Mbps=0.05msec, second packet needs 0.05msec to move to the first switch. Therefore, the first switch needs 0.1msec to fully accept the second packet.

c．0.05msec \* 3 + (16000-1) \* 0.05msec = 800.1msec = 0.8001sec. Compared with the 1.2sec in part a, there is a decrease of 0.4sec, and the delay reduces by 33%.

d．Disadvantage of message segmentation: The packets must arrive at their destination in the correct order thus the total length of all packets is greater.