COMP3331 18s2

Home
Course Outline
Course Work
Lectures
Echo 360 Lecture Recordings
Labs
Assignment
Mid-session Exam
Final Exam
Homework Questions
Forums
Timetable
Groups
Staff
Activities

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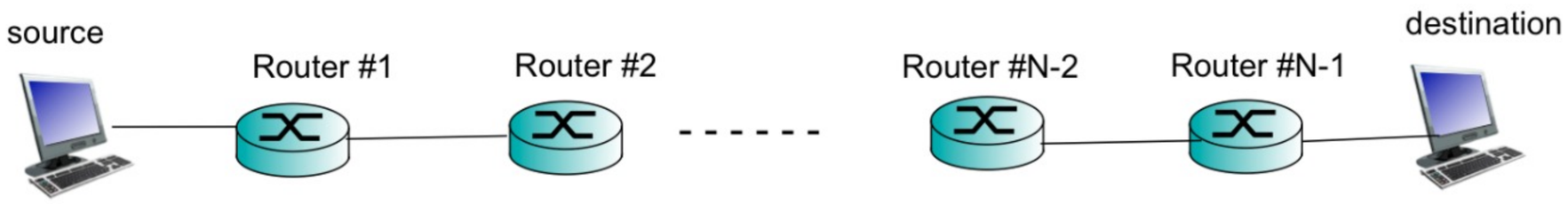
Sample Question: Message Switching vs Packet Switching (Please discuss)

This was a past exam question. Students are strongly encouraged to discuss the solution in the comments below. It may help to visualise the delays using the timing diagrams used in the lectures.

Consider an *N* -hop path (i.e. *N-1* intermediate routers) between a source and destination as depicted in the figure below. The source wants to transmit a file of size *kP* bits to the destination. There are two options: (i) Transmit the entire file as one large chunk (i.e. packet) of data. This is what we refer to as *message switching* or (ii) Break up the file into *k* packets, each of size *P* bits and transmit these packets back-to-back. As you may recall, this is *packet switching* .



All links (i.e. hops) have the same transmission delay and propagation delay. Assume that the propagation delay of a link is *d* sec. Assume that the transmission delay for transmitting P bits on a link is *T* sec. Thus, transmitting the entire file (as is the case in message switching) on a link takes *kT* sec.

Assume that there is no other traffic on the network. Ignore the time taken by each router to process each packet (or message). Assume that packet headers are negligible.

Compare the end-to-end delay incurred in transmitting the file for the two options outlined above, i.e. message switching vs packet switching. Which incurs lower delay and under what conditions?

Resource created 8 days ago, last modified about 21 hours ago.

Comments

Add a comment

Abanob Tawfik 27 minutes from now

would message switching cause a delay of N(d + kt) seconds as each router must wait for the signal to be received before transmitting it to the next "hop", whereas there is continous transmission with packet switching as the message is broken up into chunks and sent out. please correct me if i'm wrong but would packet switching cause a delay of N(d+t) + (k)*d (constant data transmission kd) seconds? this would mean in most cases where n is very large, packet switching will incur a lower delay, as it is continously transmitting data, whereas in cases where N is smaller or in the case n = 2, message switching be better? not certain if my answer is accurate.

Reply

Nadeem Ahmed about 2 hours from now

The question assumes that for both message switching and packet switching each router employ "store and forward" (we will study this in the next lecture). What this essentially means that the router will wait for arrival of complete (message or packet as the case may be) before forwarding it to the next hop. Lets see what other students come up with.

Reply

Wenxin Wang about 4 hours ago

packet switching is better solution.

Reply