CS 168   Introduction to the Internet: Architecture and Protocols
Fall 2024   Sylvia Ratnasamy, Rob Shakir, and Peyrin Kao   Discussion 3:
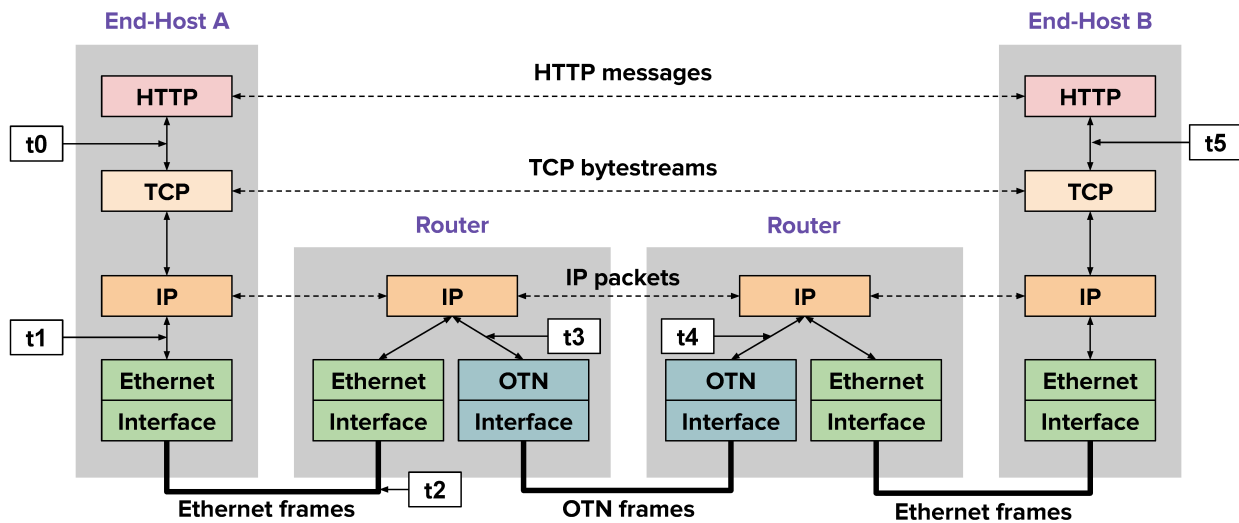Ethernet and Layers

1 True or False

1. Having a link between every pair of machines compared to a single shared wire between all machines can cause less signal collisions to occur.

2. Token passing can waste time waiting for nodes to act.

3. For ALOHA, if a node gets no acknowledgement from its recipient after sending a packet, it waits a fixed amount of time and re-sends the packet.

4. When sending out a unicast using the Ethernet, we set the destination address in our data packet to the recipient's IP address.

5. The payload in the Ethernet's data packet is the only variable-length field.
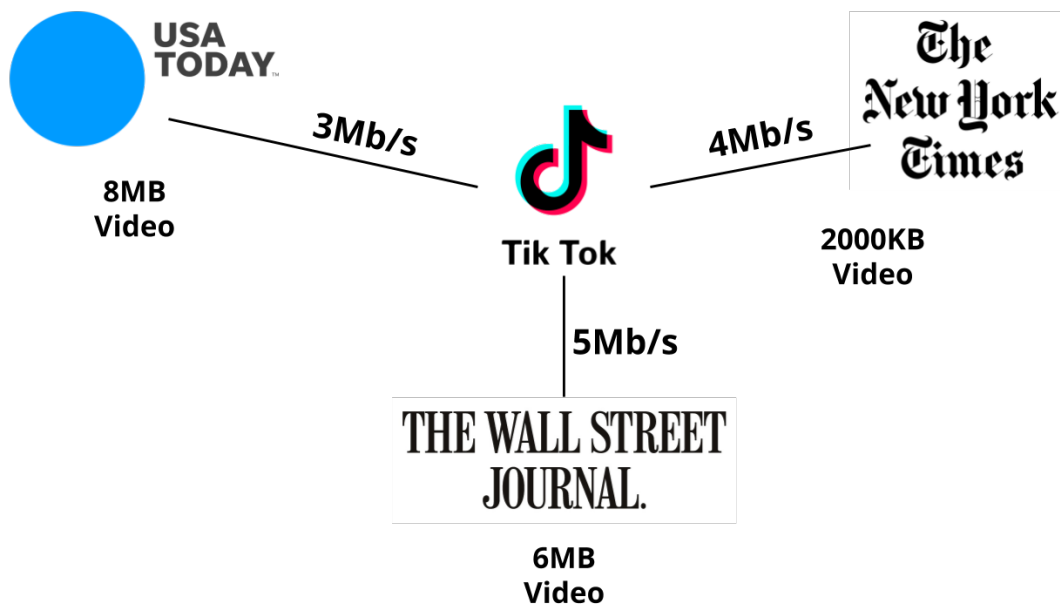
2 Protocol Diagram

Refer to the figure below, which is similar to the one from Lecture 3. In this example, Host A sends one packet to host B at time t = 0. In this question, we explore how the packet header changes as the packet traverses different layers and protocols of the network. At each time step, fill in the empty blocks to describe which headers are attached to the payload. The packet headers are provided at time t = 2 for reference.

Time	L1/L2	L3	L4	L7	Payload
Time = t0					Payload
Time = t1					Payload
Time = t2	L1/L2	L3	L4	L7	Payload
Time = t3					Payload
Time = t4					Payload
Time = t5					Payload

3   First one to TikTok wins!

As you may know, the Washington Post has a pretty spicy TikTok account. Execs at the New York Times, the Wall Street Journal, and USA Today have also noticed the Post's success and want to promote their brand on the platform. Each organization has filmed a take on the 9 to 5 challenge video to use as their first upload to TikTok. They are all waiting for the perfect moment to post.

Upon seeing the perfect opportunity, all three organizations begin uploading their video at almost the same time (within 3-seconds of each other). If we assume that propagation time is negligible, which news organization will be the first to publish their video (and ultimately become #1 trending on TikTok)?