L11-Introduction to Computer Networking
Homework 3 Answers
Due Date: Dec.20, 2016 by 23:59PM on Google Drive

Name: Yuta Nemoto

Students ID: s1240234

Problem1 (30pts):

Regarding transmission delay and propagation delay

Suppose there is a direct link of 1000 km between two hosts, the propagation speed on the link is 2.5×10^8 m/sec, and transmission rate is 2 Mbps. How long does it take to transfer a packet of length 1 Kbytes from one host to the other host?

In general, how long does it take to move a packet of length L over a link of distance d, propagation speed s, and transmission rate R bps (Only English answer is acceptable for this problem)

Length between 2 hosts (d): 1000 km = 1.0×10^6 m

Propagation speed (s): 2.5×10^8 m/sec

Transmission rate (R): 2Mbps = 2.0×10^6 bps

Packet length (L): 1Kbytes = 8.0×10^3 bits

Time it take to transfer a packet of length 1Kbytes:

$(1.0 \times 10^6)/(2.5 \times 10^8) + (8.0 \times 10^3)/(2.0 \times 10^6)$

$= 8.0 \times 10^3$

$\therefore 8.0 \times 10^3$ second

Generally Time to move a packet:

$d / s + L / R$

Problem2 (50pts/ 10pts per question):

Regarding protocol layers

① **What are the five protocol layers, from top to bottom, in the Internet?**

Application Layer

Transport Layer

Network Layer

Data Link Layer

Physical Layer

② **For each of the five layers, what is the name of the packets processed at the layer?**

Application: Message
Transport: Segment
Network: Packet
Data Link: Frame
Physical: Electric signal, Bit string

③ **An end-system processes up to which layer?**

Application layer

④ **A router processes up to which layer?**

Network layer

⑤ **A link-layer switch processes up to which layer?**

Physical layer

問題３：日本一番北側の **IX,** 一番南側の **IX** がそれぞれどの都市に設置されていますか**. (20pts)**

北側: 秋田県秋田市
南側: 沖縄県浦添市