Kanchi, Spring 2018

Quiz 1 – Week 4
CS 351 – Cloud Computing

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1. (10 points) Define the set of related terms below and state one difference between them.

a) Computer Network versus the Internet

- A computer network is any set of computers linked together so they may communicate.
- The internet is a specific computer network with a specific infrastructe.
- The internet is a computer network, but not all computer networks are the internet.

b) Packet Switching versus Circuit Switching

- Packetswitching is a type of routing where the connection path is determined "on the fly" at the time of transmission.
- Circuitswitched networks reserve route resources for a connection which guarentees those resources are available to transmit over.
- Packet switching is argued to be more efficient overall because it avoids the wasteful ness of silent periods in circuit switched networks.

c) Virus versus Worm

- A virus is malware that requires user interaction to infect the host.
- A worm is malware that automatically propogates to hosts.
- Worms take advantage of networks to quickly spread, while viruses cannot to the same extent because they require interaction to infect.

d) Routing table versus Forwarding table

- Routing tables are a map of the whole network stored in each router.
- Forwarding tables map destinations on the network to adjacent nodes of each router.
- Forwarding tables help to take the next hop, but routing tables describe the whole path.

e) TDM versus FDM

Time Division multiplexing divides a link into time slots for use by different connections.

Frequency division multiplexing divides a link into different frequency bands for use by multiple connections.

TDM is favored in circuit switching because the time slots can be weighted to provide more data to certain connections.

2) (5 points) Name the five layers of IP Stack and state two protocols used in each of the top two layers.

1. Application Layer (HTTP, SMTP)
2. Transport Layer (TCP, UDP)
3. Network Layer
4. Link Layer
5. Physical Layer

250000

3)(5 points) How long does it take a packet of length 1,000 bytes to propagate over a link of distance 2,500 km, propagation speed $2.5*10^8$ m/s and transmission rate 2 Mbps. Assume that queueing delay and processing delay is 0. (1Megabit = 125,000 bytes, 1km = 1000m) .You can use a calculator for simplification.

$$\text{Prop delay} = \frac{\text{distance}}{\text{speed}} = \frac{2.5\times10^5\ \text{m}}{2.5\times10^8\ \text{m/s}} = 1\times10^{-3}\ \text{s}$$

$$\text{trans delay} = \frac{B}{B/s} = \frac{1\times10^4\ B}{2.5\times10^5\ B/s} = 4\times10^{-2}\ \text{s}$$

X

time = prop delay + trans delay = 41 ms

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