**Computer Networking**

**Assignment 1**

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**1. General True/False Questions:**

**a.** True

Reason: In circuit switching network, a specified way pf switches are selected when the link was created, and it is private to other to transmit from that link. So, there won’t be any queuing delay.

**b.** True

Reason: Packet switching basically a public transmitting network where multiple clients can send packets from same link where we can get some kind of delay.

**c.** True

Reason: POP3 uses SMTP connection to send all the data it is a type of connection where we will get request and reply to messages. Therefore, POP3 is an example of request and reply.

**2. DNS:**

**a.** Basically a Domain Name System(DNS) is kind of translator which translates the Domain name to the Internet protocol address(IP address) where it is given by our internet providers company.

**b.** Advantages:

1.It can rapidly provide the cached answer to client.

2. It caches the final answer to every query it performs.

Disadvantage:

1. It is open DNS server which makes security vulnerabilities.

**c.** the recursive query DNS is vulnerable. If a server passes a wrong information and it stores wrong information in cache which can affect many users. So, it is a bad idea for a top-level domain name servers.

**3. Circuit switching vs Packet switching:**

**a.**

because the application continuously runs for long time, it requires, a circuit-switched network would be an excellent fit because the transmission rate is known and small, bandwidth can be set aside for each application session without wasting much.

Furthermore, the costs of establishing and dismantling connections are amortised throughout the course of a typical project.

**b.**

In the worst-case scenario, all of the applications send data over one or more network links at the same time. However, because each link has enough capacity to carry the total,

There will be no congestion(very minimal queuing) due to all of the applications’ data rates.

The network does not require congestion control measures due to the large link capacity.

**4. Statistical Multiplexing: Circuit switching vs Packet switching :**

**a.** Total bandwidth available: 10 Mbps =10,000 Kbps.

Each user need: 100 kbps.

Users that are supported:10,000/100=100 users.

**b.** As given the transmission rate is 10%

=Probability is 0.1

**c.** Given users are 200 users, there are 150 users:

=

**d.** Probability when there are 20 or more users transmitting:

= 1-

= 1-

**5. network delay for circuit switching vs Packet switching :**

**a.** time taken from source to first switch =no. of bits/link speed

= 8x2x

= 4 seconds

The total tome to move the message from source host to destination host = 4 seconds\*3links= 12 seconds.

**b.** First packet to switch = /2x= 5 milliseconds.

Time received = time first packet reaches

Time taken for second packet to reach first switch = 2\*5

= 10 milli seconds

**c.**

Time taken for first packet at host to destination is 5\*3 milliseconds.

So, the last packet is received in 15+ 799\*5 = 4.010 seconds

It is 0.333 times quicker than without segmentation.

**d.**

If a bit includes an error, the entire file, not just the area containing the defect, must be retransmitted. Massive packets, such as those used in movies and enormous downloads, must be pushed without segmentation, and routers must endeavour to cope with massive delays.

**e.**

Because each transmitted packet comprises a header, message segmentation results in a higher bandwidth utilisation because there are more overall bits being delivered.

**6. Name resolution, DNS, and HTTP :**

**1.**

Total time is: RTT1 +. . . + RTTn to get IP address.

After IP address is known, RTT0 to set up connection, and another RTT to request and receive the object.

Therefore, time elapses from when the client clicks on the link until the client receives the object = 2RTT0 + RTT1 +. . . + RTTn.

**2.**

**a.**

Non-persistent HTTP with no parallel TCP connections?

Time taken= IP address finding + getting that 1st object + 8 objects

= (2RTT0 + RTT1 +. . . + RTTn )+ 8\*2RTT0

= 18RTT0 + RTT1 +. . . + RTTn .

**b.** Non-persistent HTTP with browser configured for 5 parallel connections?

Time taken= IP address finding + getting that 1st object + 5objects in parallel + 3 objects in parallel

= (2RTT0 + RTT1 +. . . + RTTn )+ 2\*2RTT0

= 6RTT0 + RTT1 +. . . + RTTn .

**c.** Persistent HTTP:

Time taken= IP address finding + getting that 1st object + getting all 8 objects in one connection

= 3RTT0 + RTT1 +. . . + RTTn .

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