20 = 4 too = 20
20 0.2

CS 3516 (B17) – Quiz 1 – November 3, 2017

Student Name: Adonay Reson

WPI Username: azreson

4 Grader: Yu Liu.

Please answer the following questions, which are on both sides of the paper. **This quiz is closed book/notes/cheat-sheet**. We will scan the quiz and return it electronically. To ensure it is properly scanned, please avoid wrinkling, folding, or otherwise distorting the paper.

1. Aren't Time Domain Multiplexing (TDM) and packet switching the same thing? Why or why not? (4 points)

~~Packet switching is depe~~ They are not the same thing: Packet switching depends on the number of packets while TDM user the length of time.

TDM: time slot, full bandwidth, irrespective of it's sending.

2. Consider a packet-switching scenario with N users sharing a 200 Mbps link, where each user again requires 50 Mbps when transmitting, but only needs to transmit 20% of the time. Then:

a. **How many users can be supported under circuit switching? (1 point)**
b. **If N = 4 (u1, u2, u3, and u4), what is the probability that u1, u2, and u3 are currently transmitting, while the u4 is not? (2 points)**
c. **What is the probability if instead u1, u3, and u4 are currently transmitting and u2 is not? (1 point)**

Please show the steps. Don't just write down the answers.

ps: full bandwidth for whoever needs it.

a. $a \times 0.2 = \frac{200}{50}$ $0.2a = 4$ $a = 20$

b. $(0.2)^3 \cdot 0.8$

c. Same ↑

3. Consider 1 client and 1 server with M paths between them. No two paths intersect anywhere. Each path k (k = 1, 2,..., M) consists of N links with transmission rates R_1^K, R_2^K,... R_N^K. If the server can use only one path to send data to the client, what is the maximum throughput the server can achieve? (2 points)

$\max\{\min\{R_1^1, R_2^1, \ldots R_N^1\}, \min\{R_1^2, R_2^2, \ldots, R_N^2\}, \min\{R_1^M, R_2^M, \ldots R_N^M\}\}$

4. Alice optimistically un-chokes Bob and provides file chunks to him for a 30 seconds interval. Will Bob necessarily return the favor and provide chunks to Alice in this same interval? Yes or No? Give reasons. (2 points)

No he won't. Because might have been recieving chunks from others ~~and~~ and improving their rank. Alice could not be on Bob's top 4.

5. Suppose you can access the <u>cache of your local DNS server in the CS department</u> at WPI. Can you roughly determine the web servers (outside your department) that are most popular among users in the CS department? Explain. (3 points)

Yes we can because the DNS contains the ip addresses of websites ~~that~~ accessed.

- Periodically access to the cache.
- most frequent => most popular.