

Review Questions 21

Your Name:

Please print out this form (two-sided, if you can) and write your answers *legibly* in the spaces provided. If you can't write legibly, type.

1. The parameter α used by the exponential weighted moving average method for computing average packet delay essentially controls the “averaging interval”. That is, when α is large, the most recent samples count heavily, while if α is small, older samples contribute a larger share, increasing the time period over which the sampling is done. Given that queuing delays in the internet are heavily influenced by the dynamics of TCP traffic how long an averaging interval do you think is appropriate? Justify your answer.

2. Consider a VoIP system that uses Forward Error correction to recover from lost packets. Suppose we send one redundant voice packet for every five voice packets, and that voice packets are sent every 20 ms. How does this affect the required playout delay at the receiver?

3. Consider 3 flows sharing a 10 Mb/s link that uses weighted-fair queueing. Suppose that the flows have been assigned weights of .1, .3 and .6 but are sending at rates of 5 Mb/s, 2 Mb/s and 5 Mb/s respectively. How much of the 10 Mb/s link bandwidth is used to forward packets for each of these three flows? How much would they each get if there were a single FIFO queue instead?