COL334 Assignment 3

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October 25, 2023

1 Algorithm

We have two implementations,

In this part, we use a round robin approach, where we maintain a set of packets which have not yet been received, and request packets by iterating over this set. In this scenario, the packets received from the server may not be in the exact order as we are requesting.

To estimate the rate at which the server can send data packets(the rate of filling tokens), we can keep track of how many requests are being skipped over a 10 packet burst. If an unusually large number of requests are being skipped, we can infer that we are getting squished and we should slow down the rate of sending requests(essentially increase the time between two consecutive bursts), otherwise we can increase the rate of sending requests.
We were able to get the entire file from Vayu server in about 14.25s, and with a penalty of about 97 using the packet burst approach.
Using a simple round robin approach, with a static send rate, we get the entire file from the server in about 11.54s with a penalty of 4.

With the simple round robin approach, we get the following graph

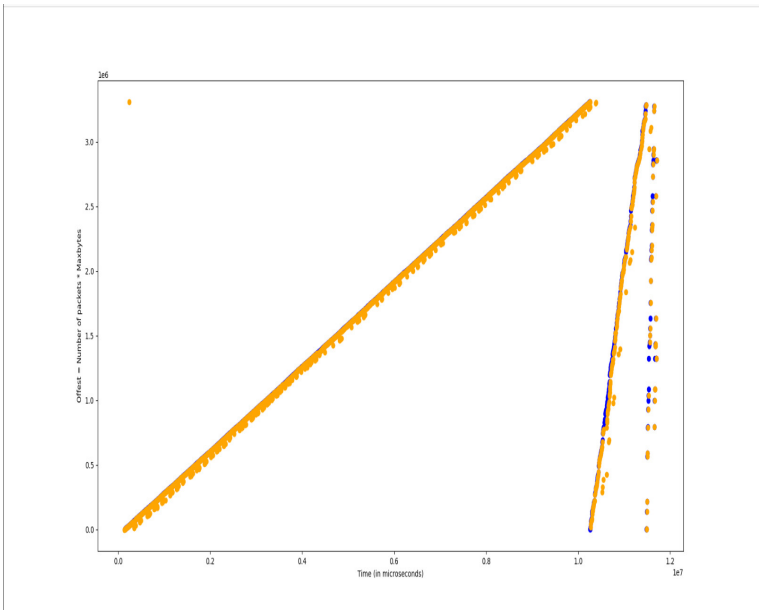

Figure 1: Round Robin Graph: Offset vs Time

We get different straight lines, because some requests are skipped by the server in the first pass, which are then received in the future passes.

When we tried to estimate the rate dynamically, we get

The send requests are blue and the receive requests are orange, since we're sending requests in bursts, but receiving in a staged manner, the blue dots are on the vertical line and the yellow ones form a straight line. This is a further zoomed in view of the same graph, again we send the requests all at once (in bursts) and receive the server replies in a staged manner.

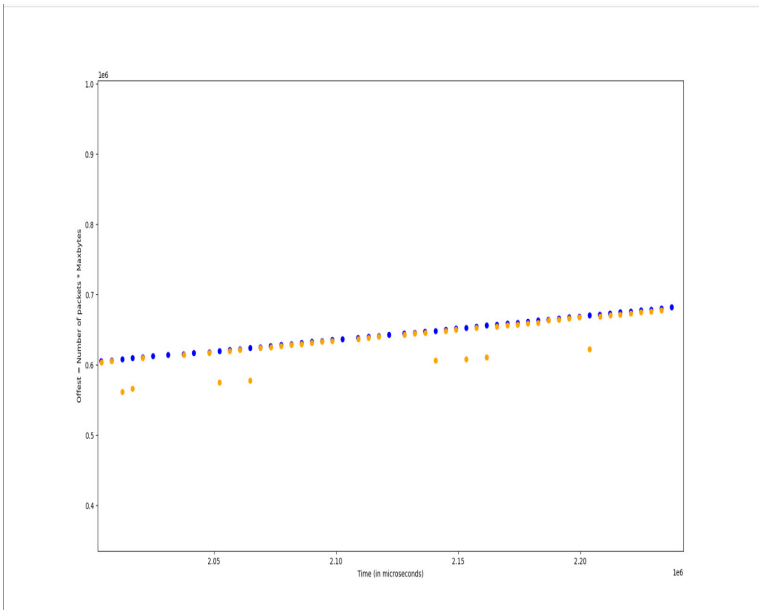

Figure 2: Round Robin Graph: Zoomed version

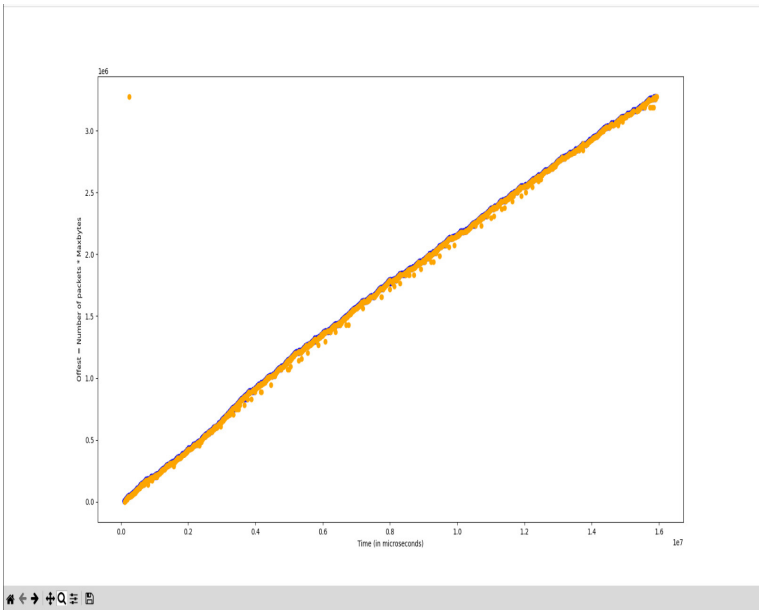

Figure 3: Dynamic Rate Estimation

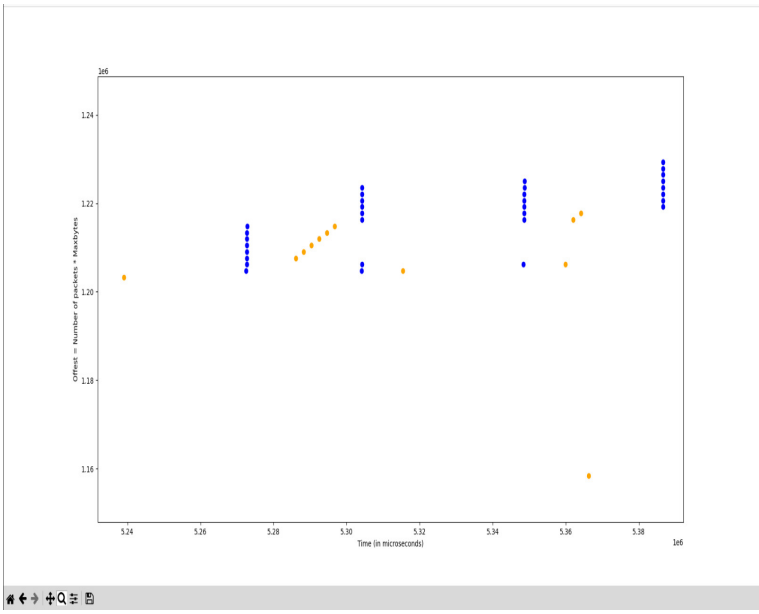

Figure 4: Dynamic Rate Estimation: Zoomed Version

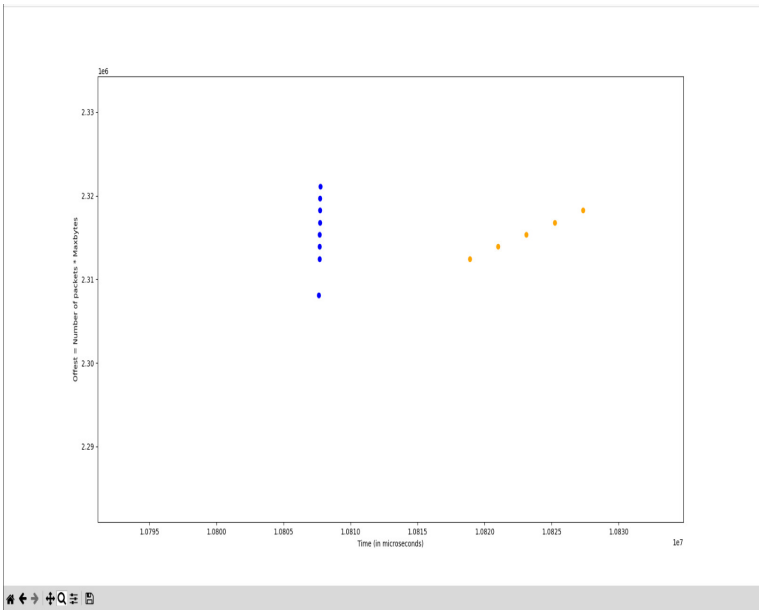

Figure 5: Dynamic Rate Estimation: More zoomed version