ECE466 Computer Networks II

Lab 2b

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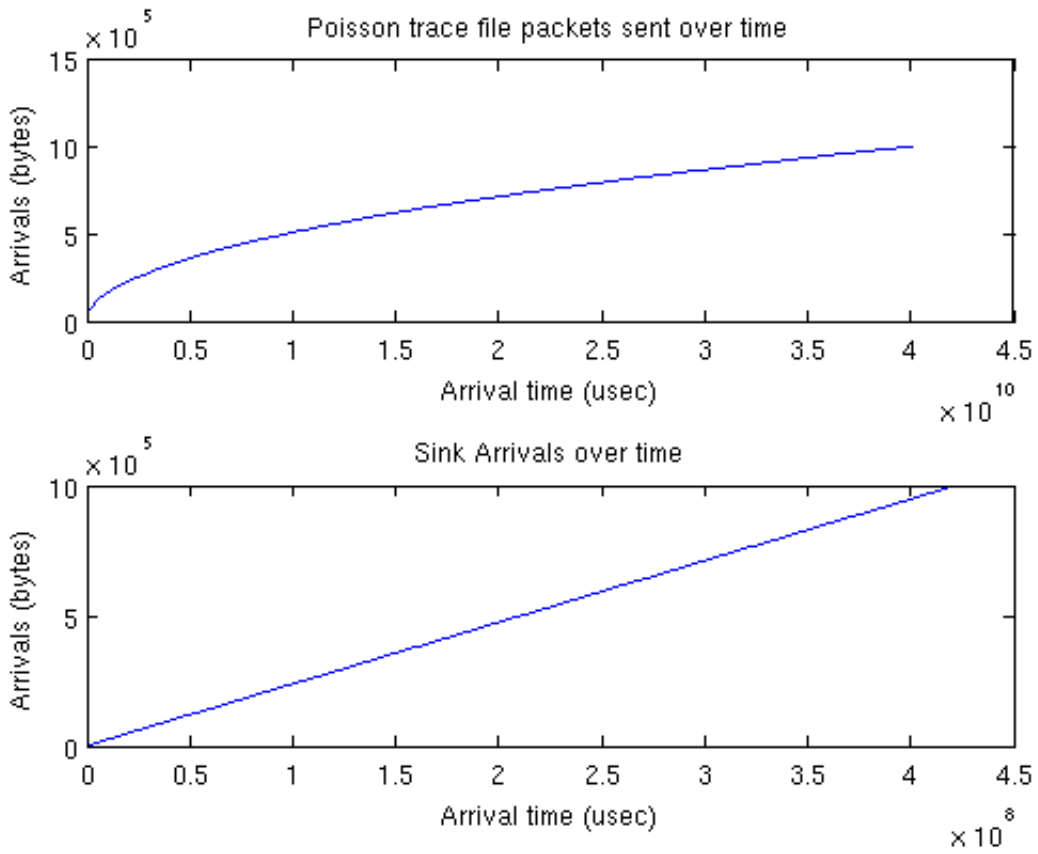
Part 1

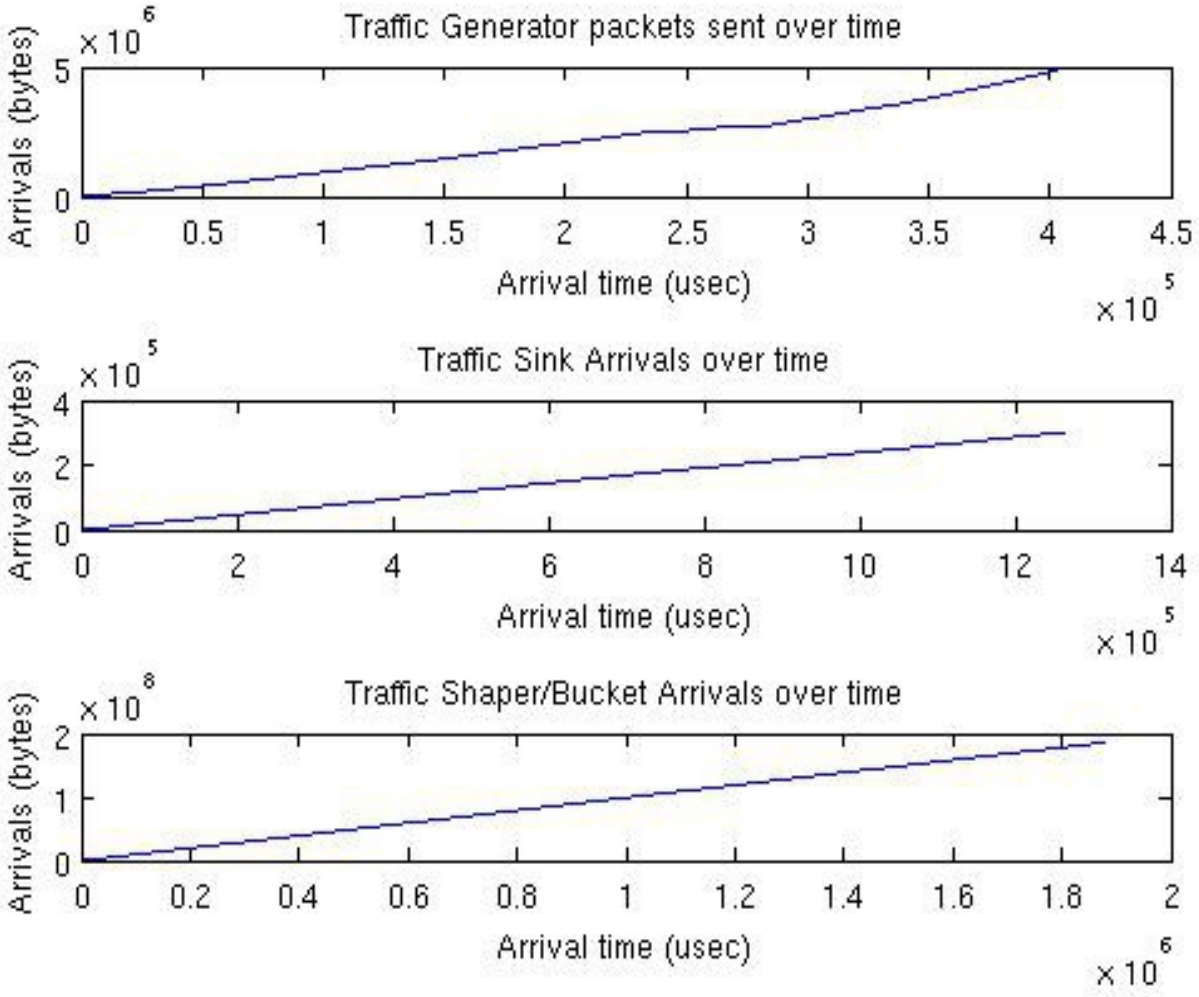


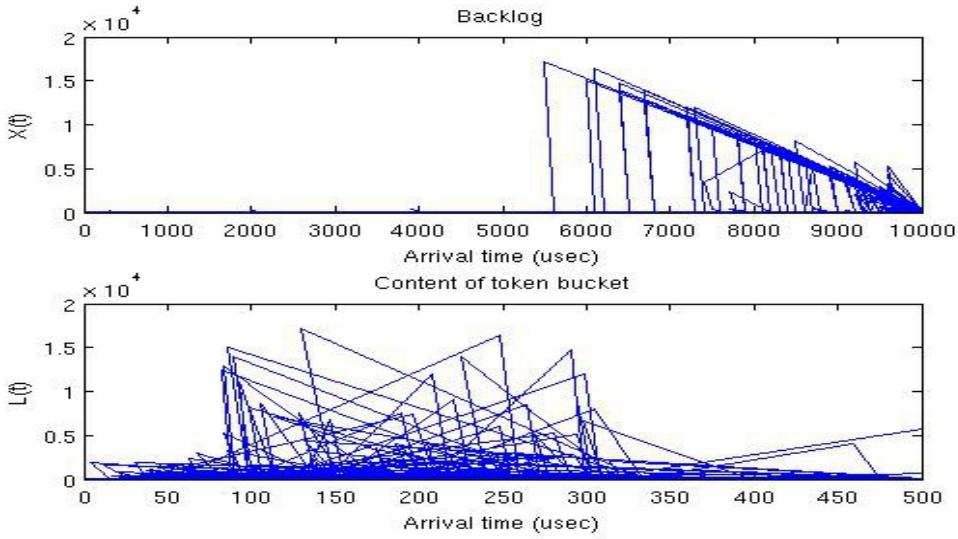
It doesn't very accurately describe the poisson trace, it just keeps sending packets following the equation given until it reaches the total size of the poisson trace. It only uses 10,000 samples it's rather limited. A more accurate version of the traffic generator was used in Part 3.

Part 2

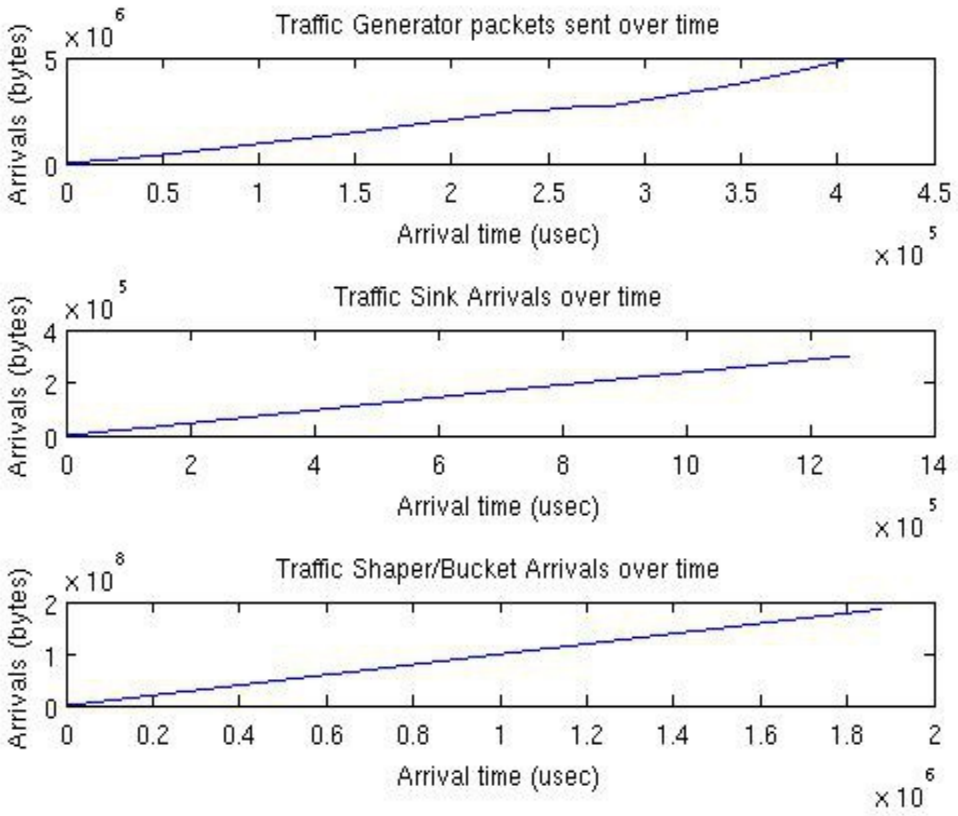
2.1 The token bucket is implemented in TokenBucket.java, with more specifics in Bucket.java. We avoid generating tokens and storing them continuosly, and only calculate them when needed.

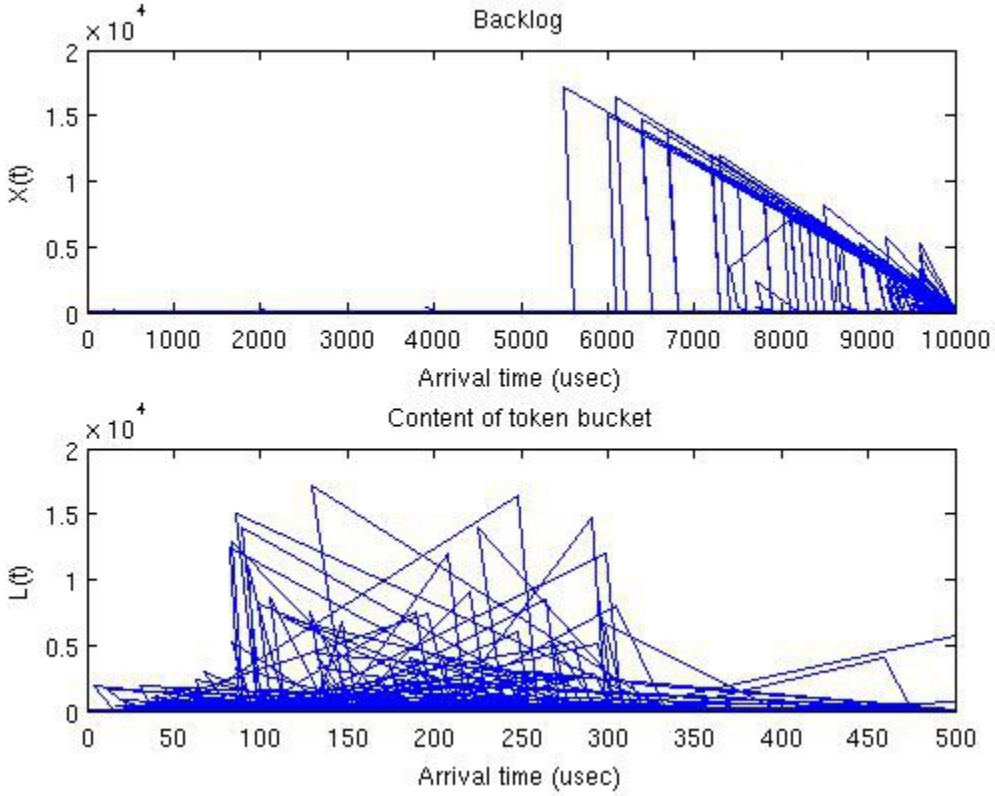
2.2 Experiment 1



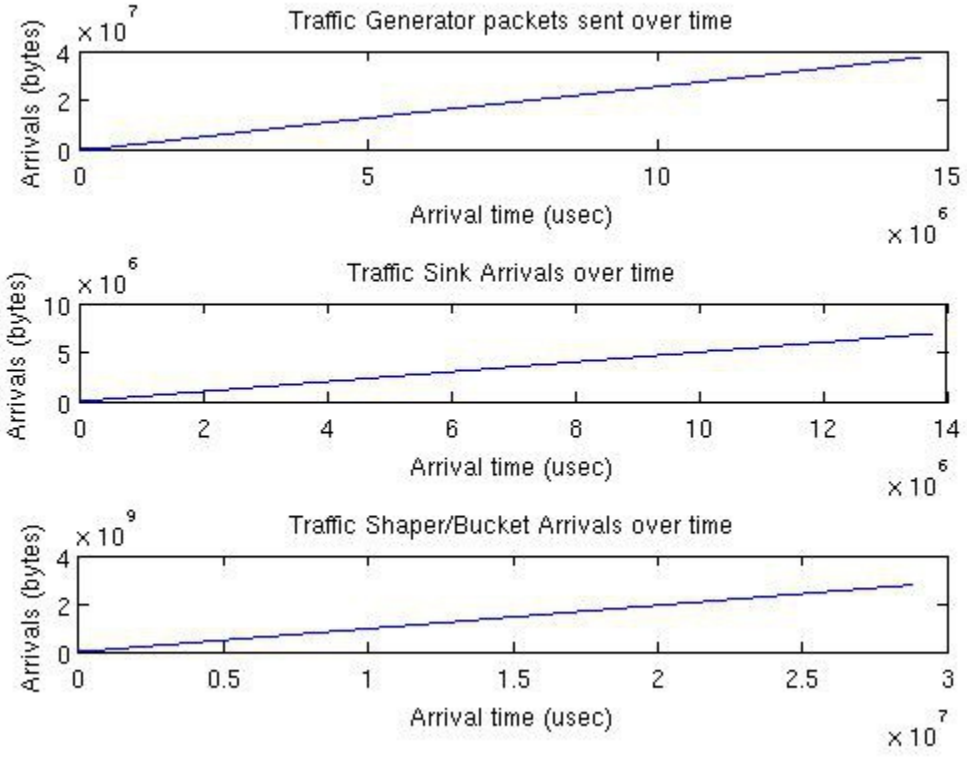


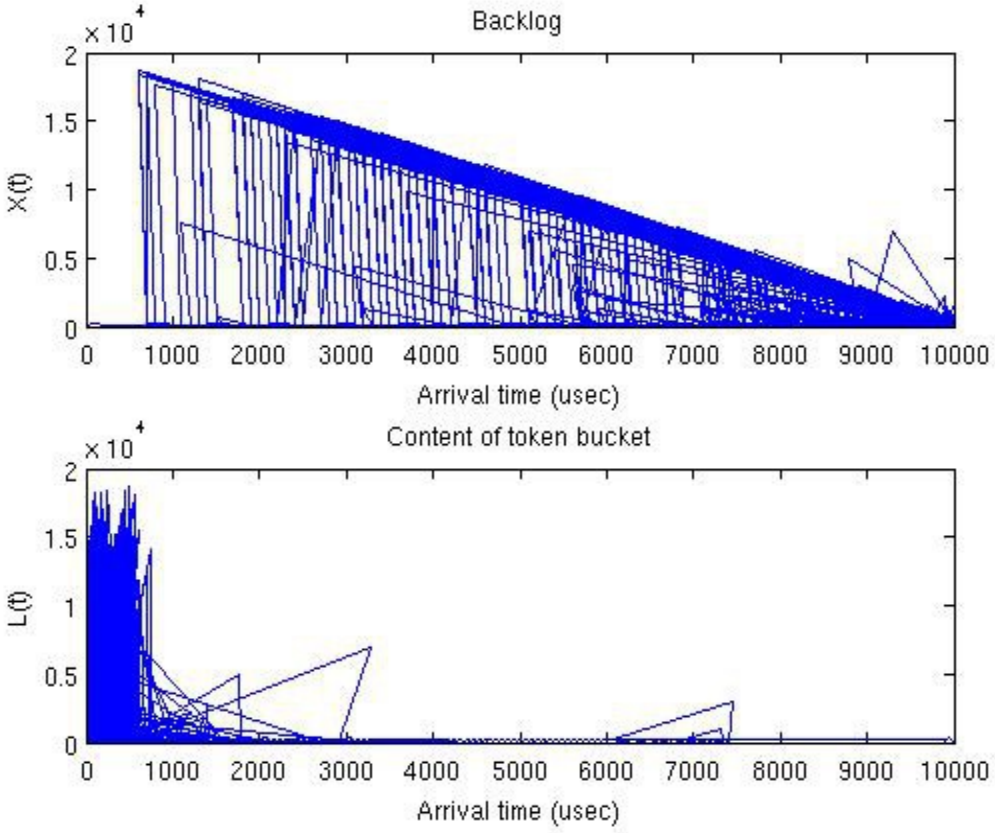
Experiment 2





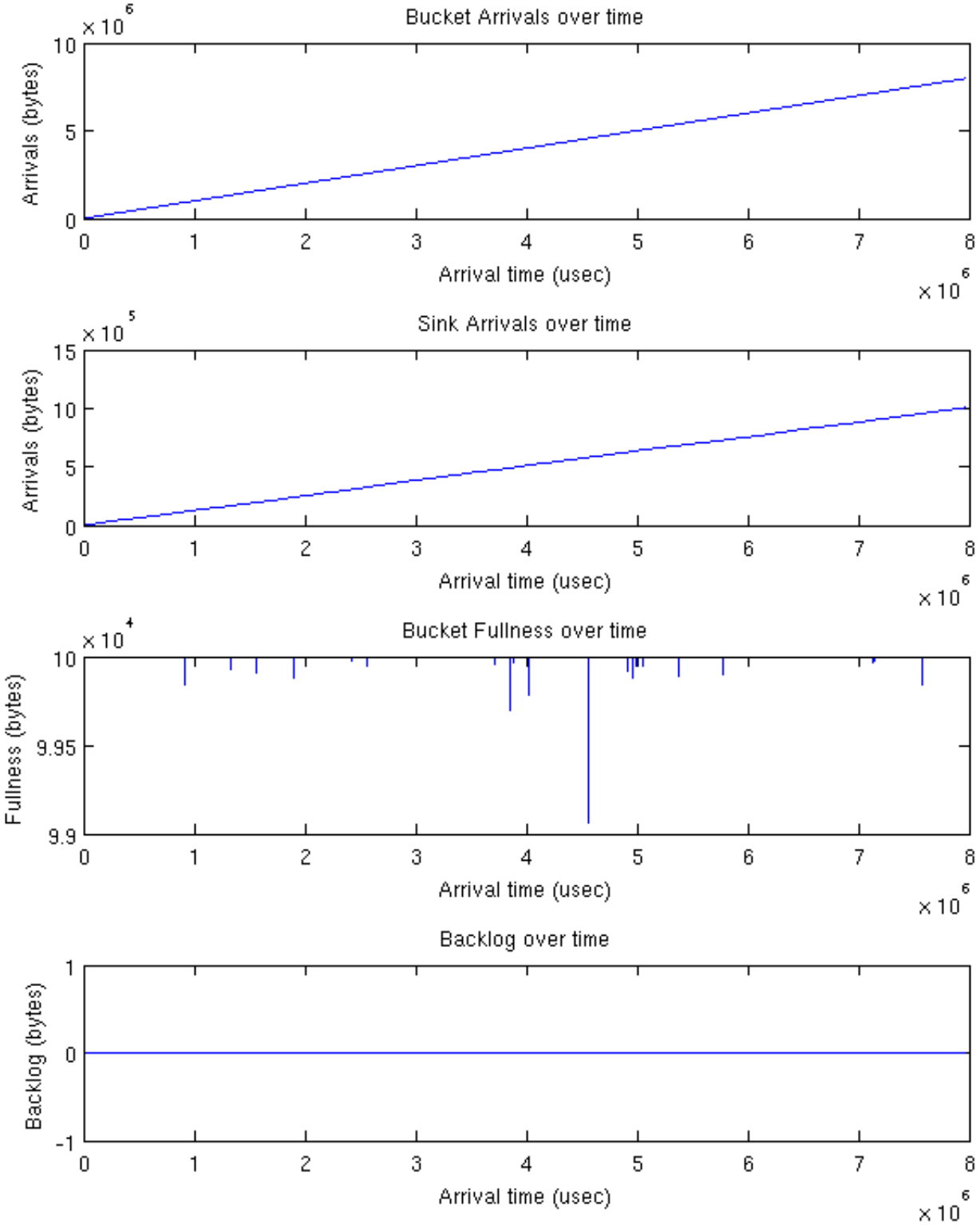
Experiment 3



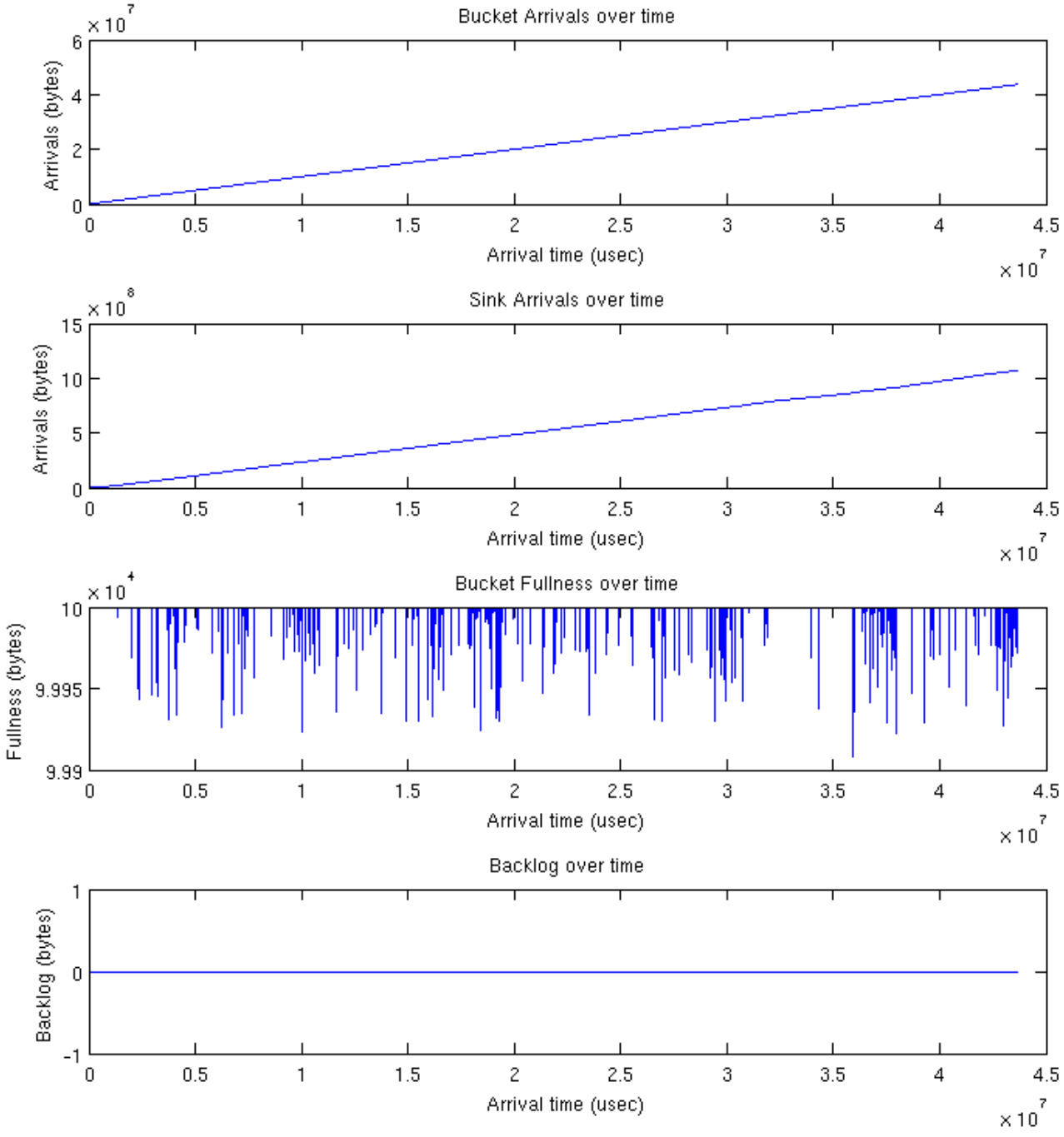


The plots for cumulative arrival functions for reference traffic generator, token bucket and traffic sink are slightly inaccurate. The plots for back and content of token bucket are also inaccurate, being based on the trace files.

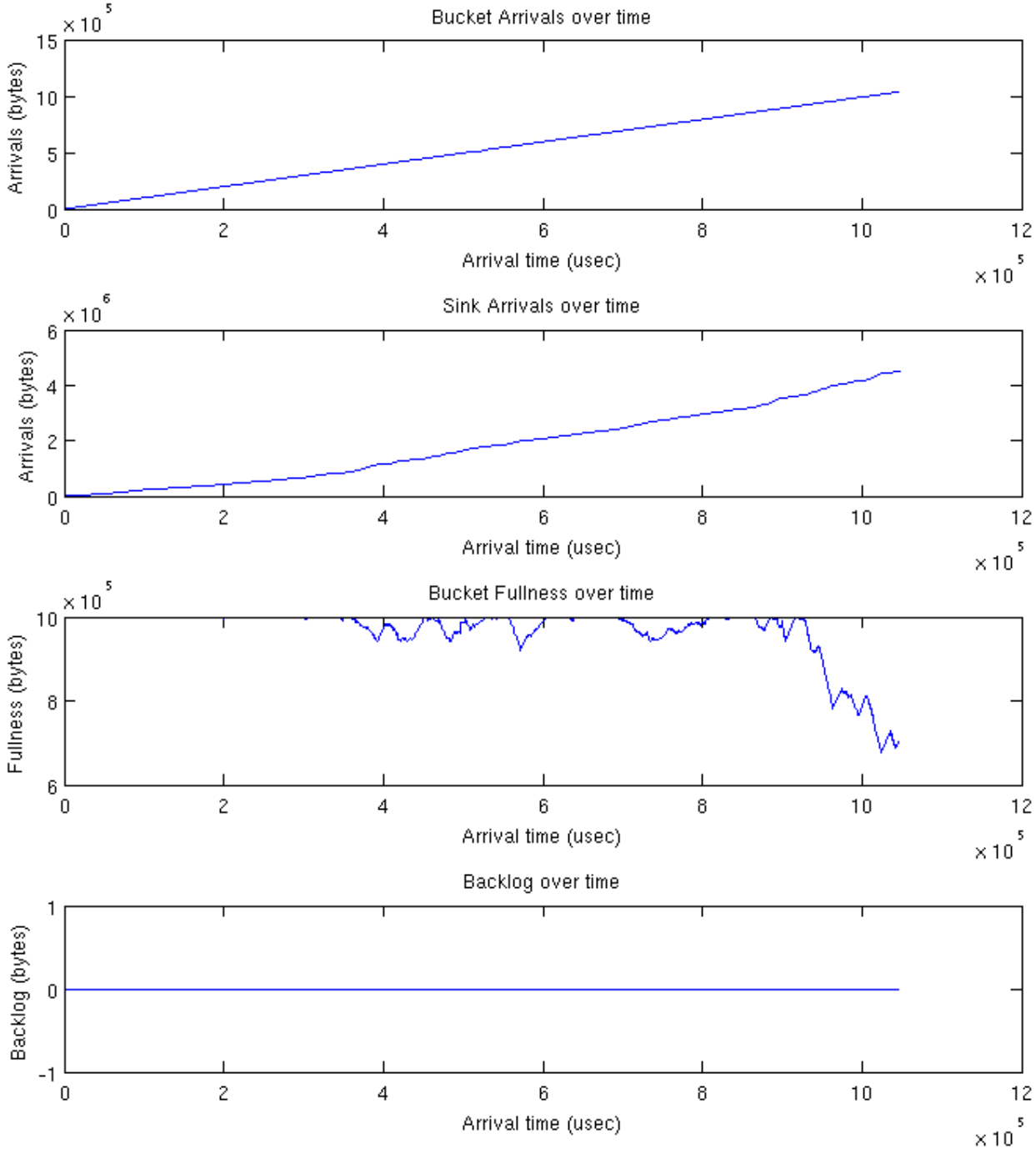
Part 3.1 Poisson Trace



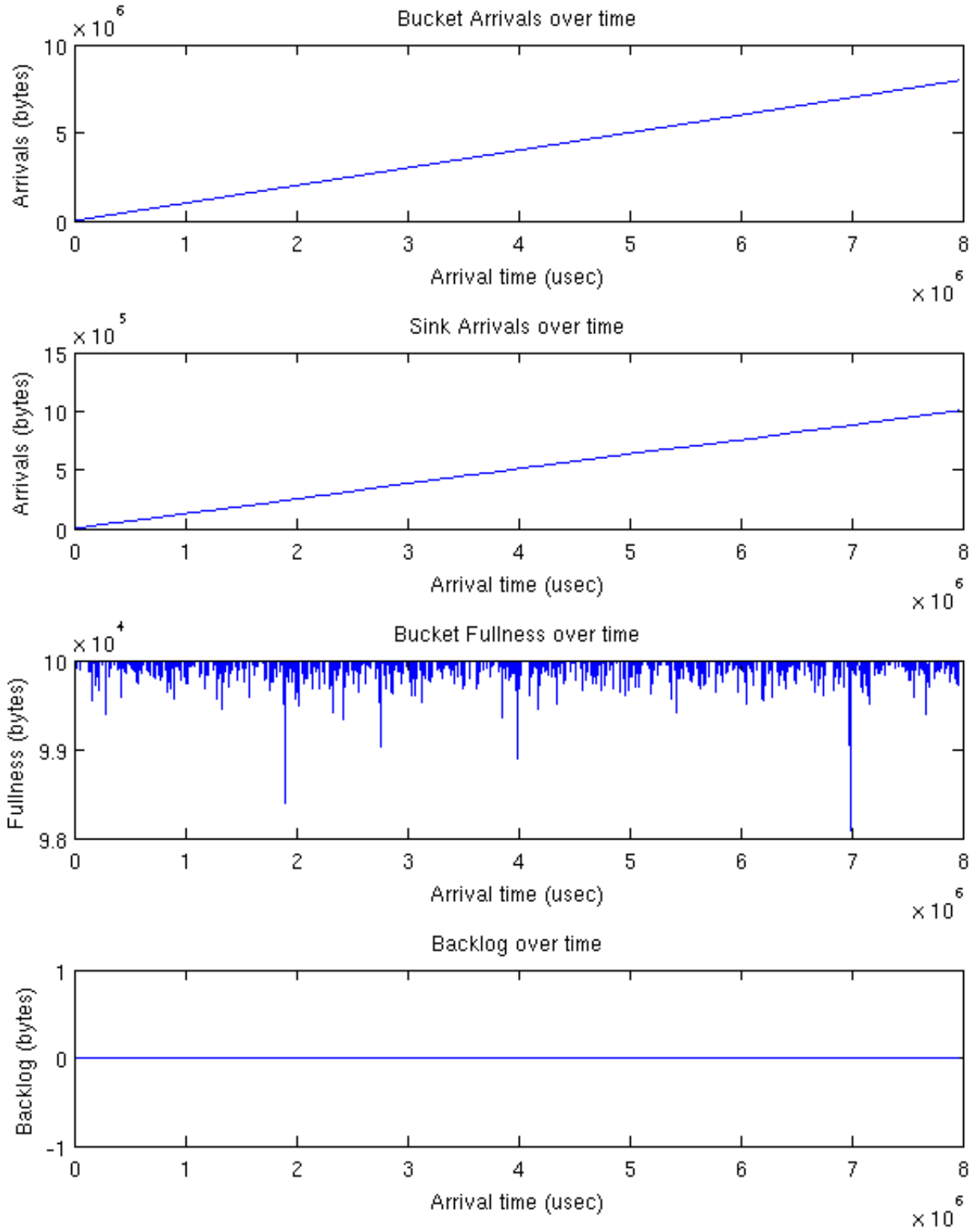
Part 3.1 Movie Trace



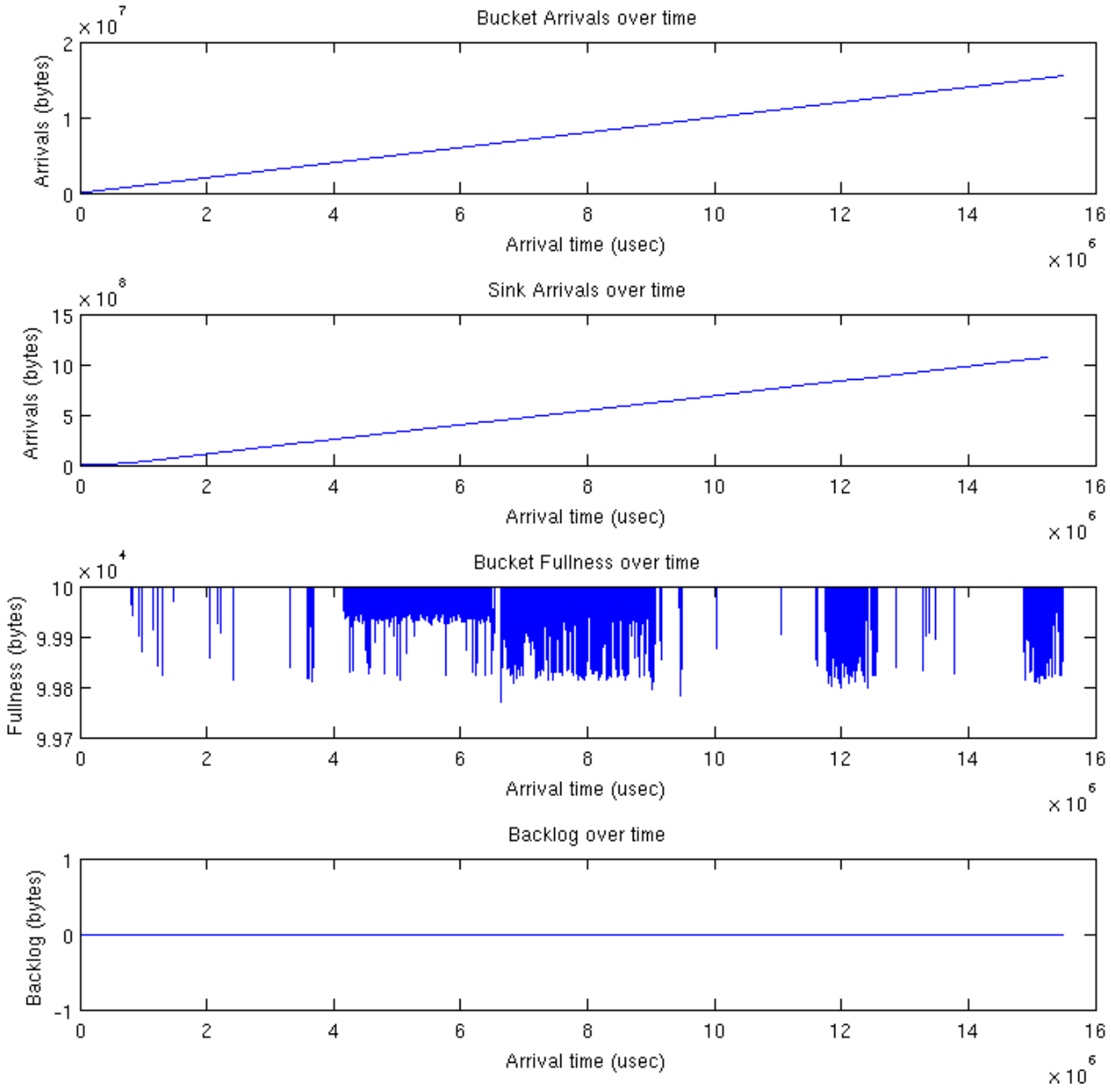
Part 3.1 Ethernet trace



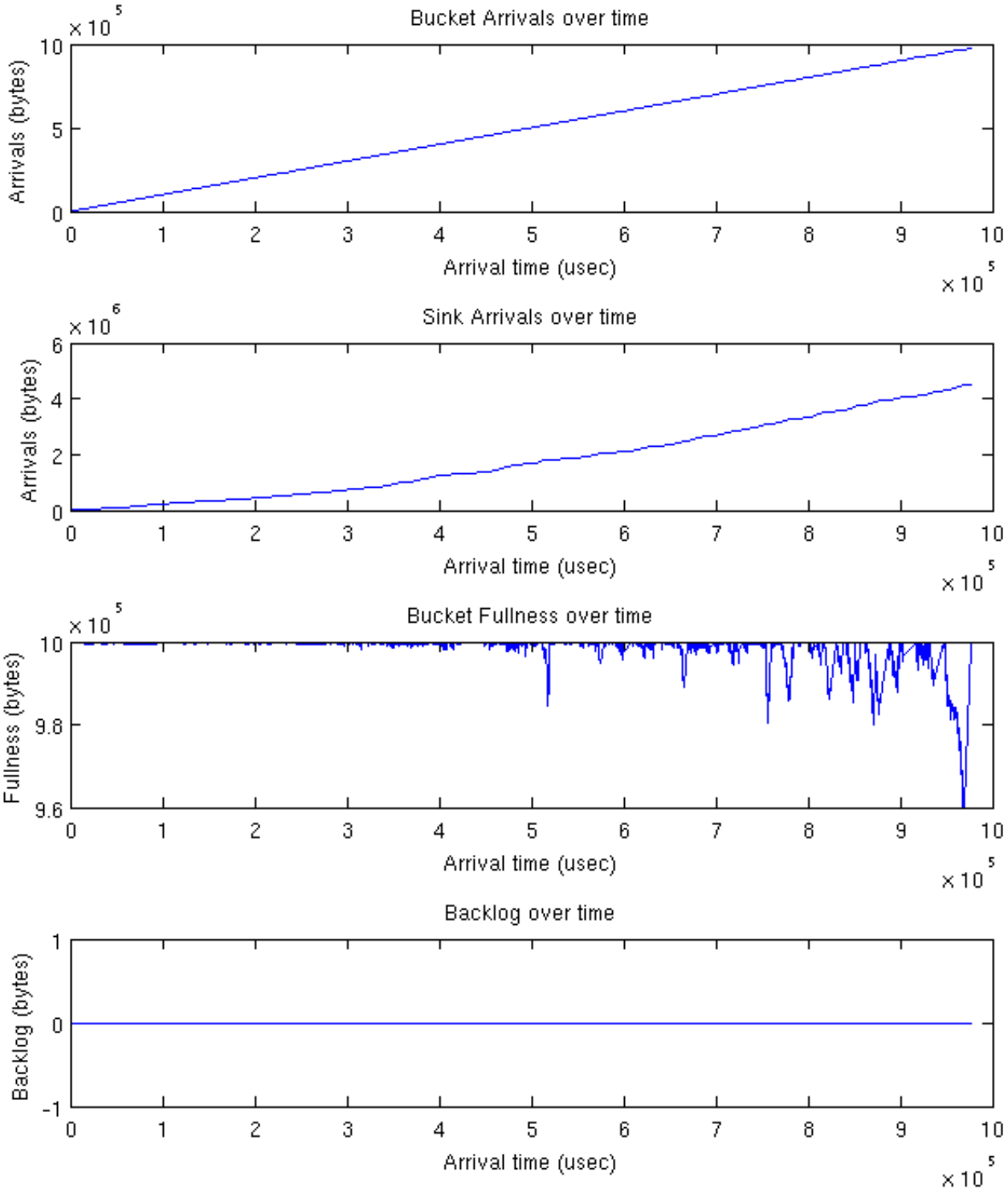
Part 3.2 Poisson Trace



Part 3.2 Movie Trace



Part 3.2 Ethernet trace



We only did the first 10,000 packets, as it was too long to do a longer simulation.

Token bucket Parameters

Section	Bitrate (B/s)	Buffer size (B)
3.1 Poisson	10000000	100000
3.1 Movie	100000000	100000
3.1 Ethernet	5000000	1000000
3.2 Poisson	1000000	100000
3.2 Movie	80000000	100000
3.2 Ethernet	10000000	1000000

To select the token bucket for the bandwidth is expensive case, we used the average bit rate from lab 1, and then slowly raised it until there were no problems. This emperical method gave us good results. If the transfer had low burstyness that would give us around the required amount of bandwidth and buffer size.

To select the token bucket parameters when the bandwidth is cheap, we just increased the bitrate which gave us a lower amount of backlog and delay.

The ethernet trace was the worst of the 3, it had very uneven amounts of burstiness and the bucket tended to go from full to empty and vice versa very quickly. This required a larger bucket size, as with a smaller size it would overflow. Towards the end of each ethernet trace you can see where it almost overfilled the bucket.