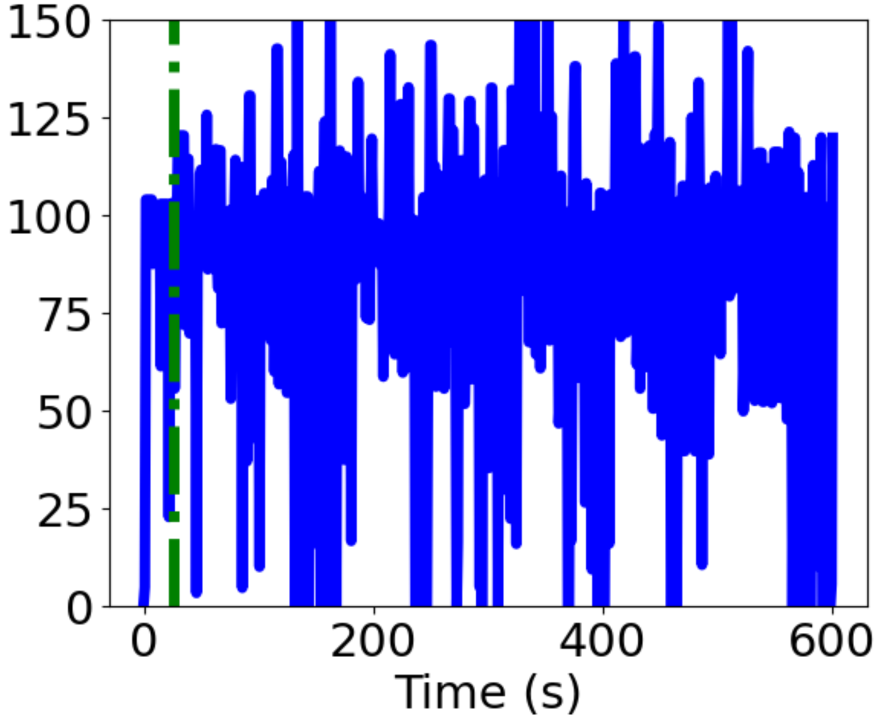
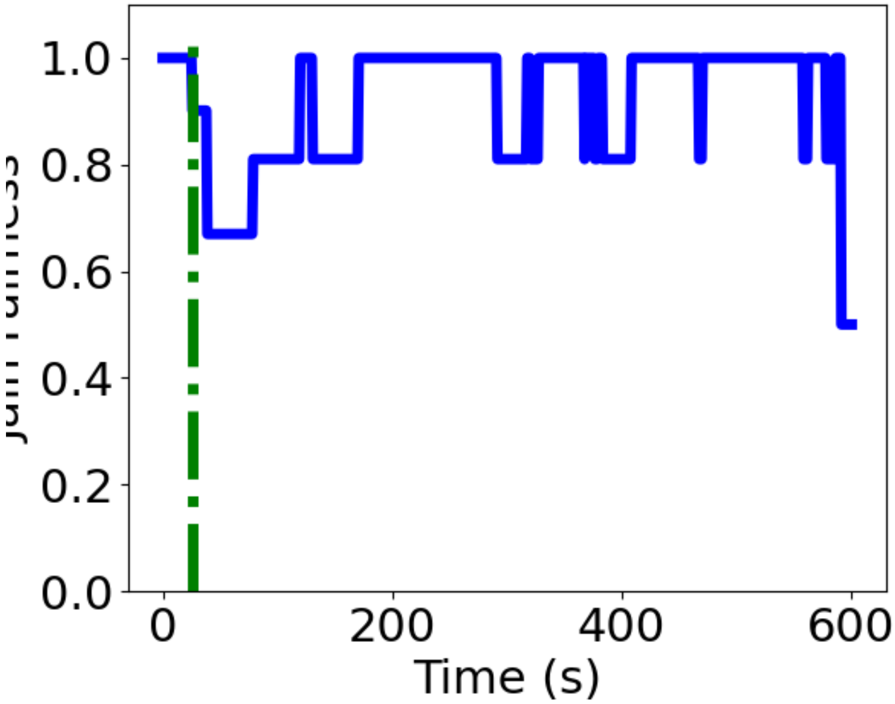
Plots of utilization, fairness, and smoothness for {0.1, 0.5, 0.9}

alpha = 0.1

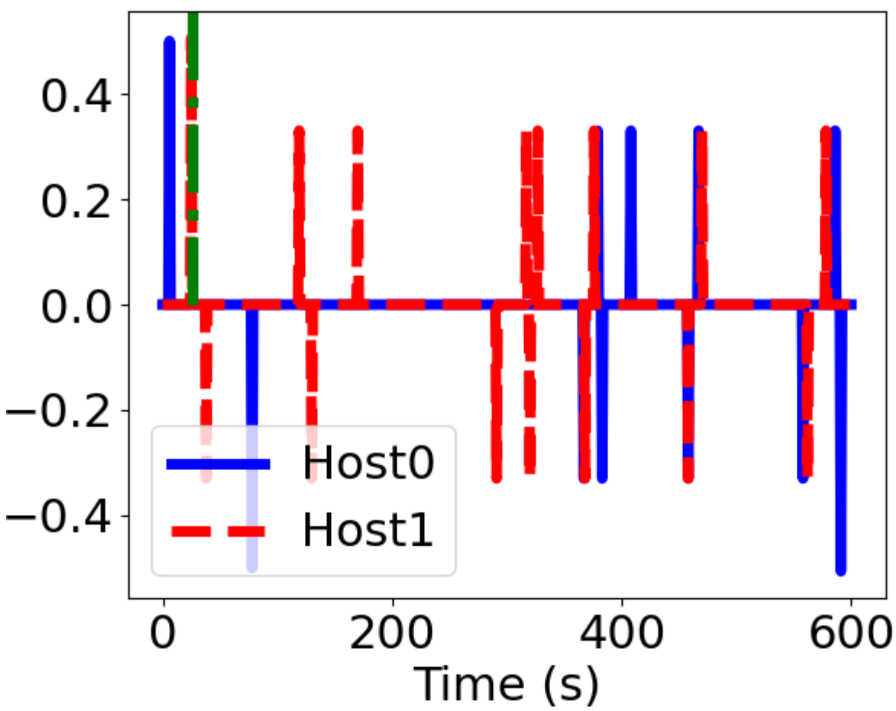
utilization:



fairness:

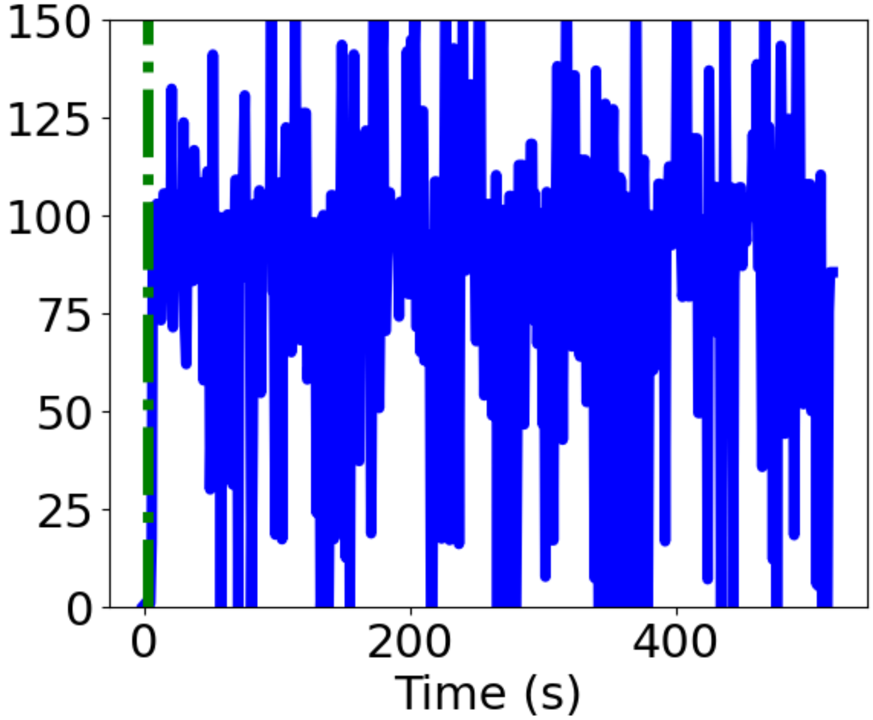

1.0
0.8
0.6
0.4
0.2
0.0
0
200
400
600
Time (s)

smoothness:

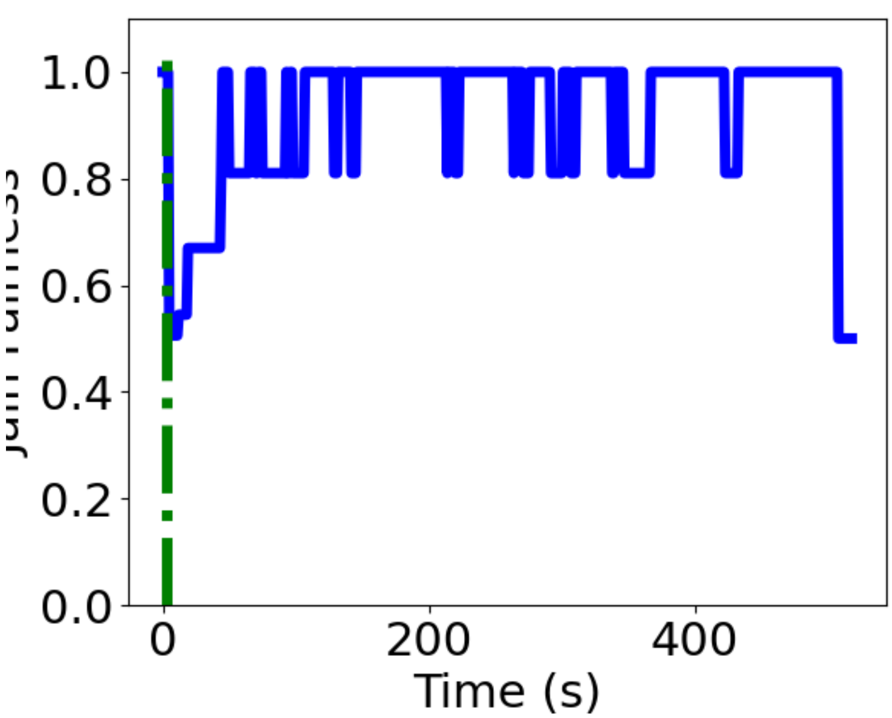

0.4
0.2
0.0
−0.2
−0.4
Host0
Host1
0
200
400
600
Time (s)

alpha = 0.5

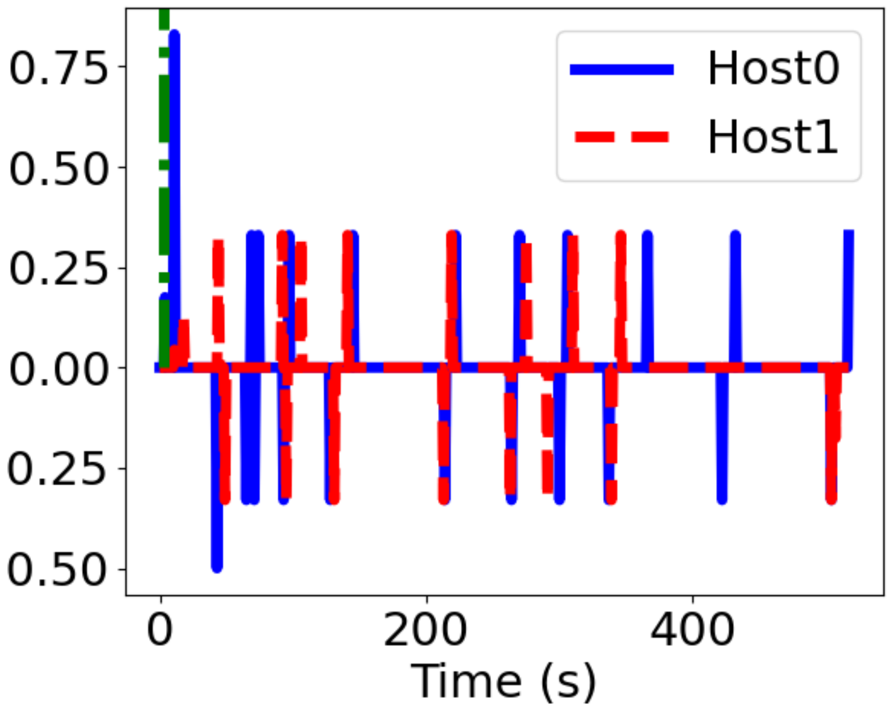
utilization:



fairness:

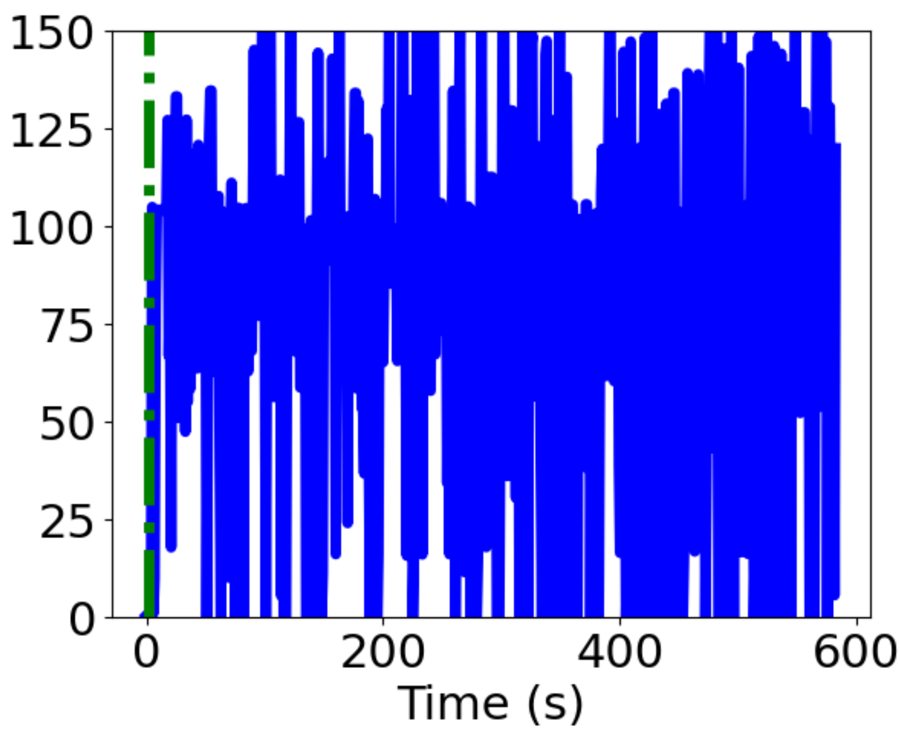


smoothness:

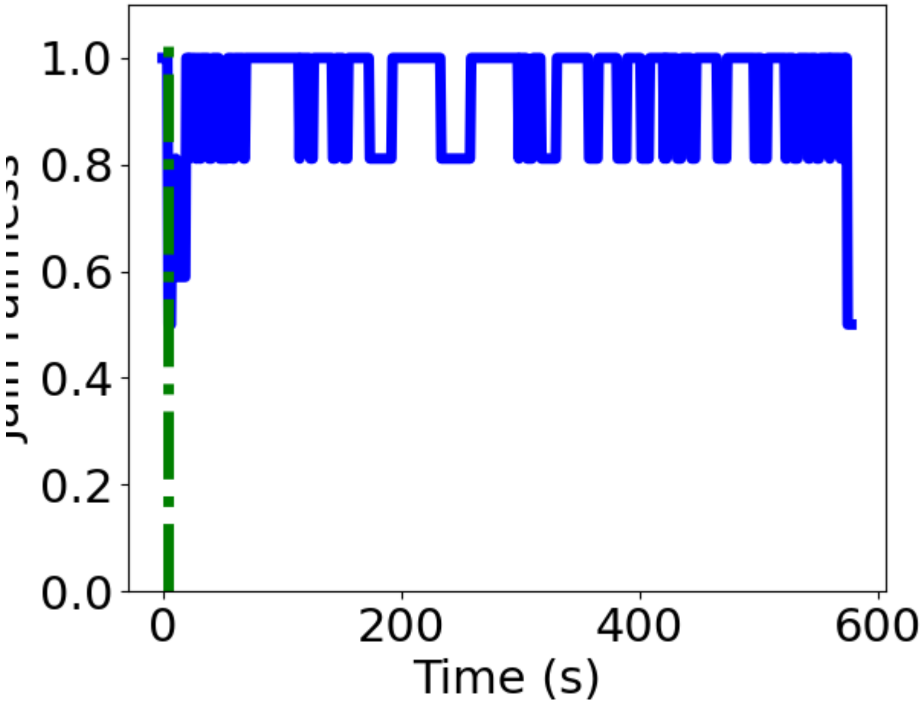


alpha = 0.9

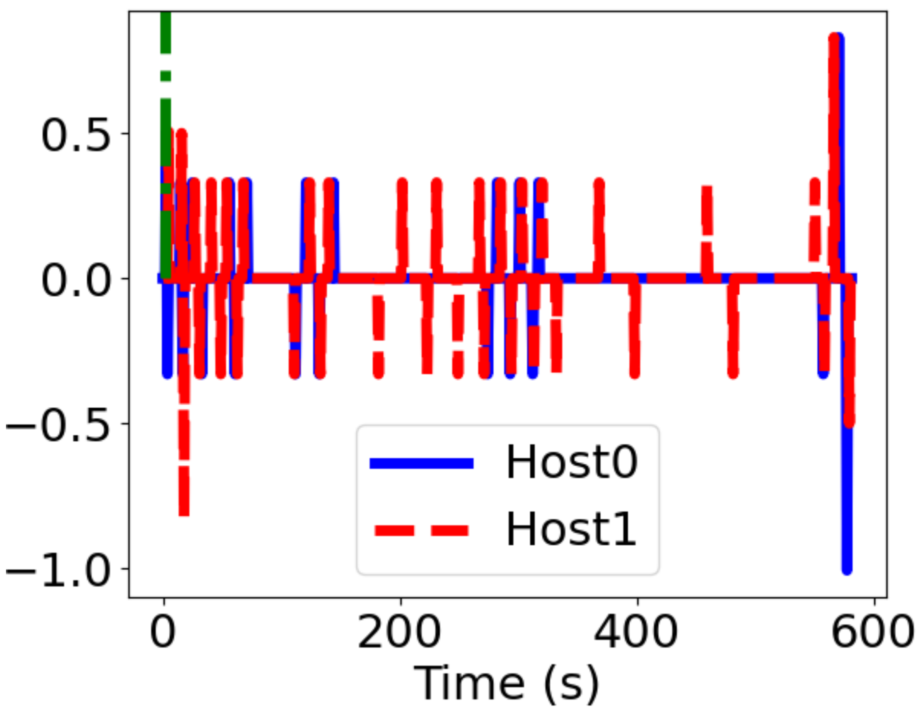
utilization:



fairness:



smoothness:



Discussion of tradeoffs for varying

In the above three types of graphs, when alpha = 0.5, the utilization is the largest, and the fairness and smoothness are also good.

When alpha = 0.1, its has better smoothness but lower utilization and fairness.

When alpha = 0.9, its has better fairness but lower utilization and smoothness.

The lower alpha has better smoothness but worse fairness, as its estimated throughput reacts slower to bandwidth change, and therefore it can not adjust the throughput according to current bandwidth in time

The higher alpha has better fairness but worse smoothness, as its estimated throughput reacts quicker to bandwidth change. The estimated throughput may reflect the actual current bandwidth, but it fluctuates too much and frequently.

The too-large or too-small alpha value can lead to low utilization. It has higher utilization when alpha is a medium value like 0.5.