Preliminary Implementation

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CS/EE 143 Milestone 2

Progress

- Host
- Sending and receiving flows
  - Configurable window size
- Links
- Statistics
- Static routing
  - Floyd-Warshall
- **Passed test case 0**

TODO

- Dynamic routing
  - Bellman-Ford
- Congestion Control
  - Tahoe
  - FAST

Router

env, id

links:

a dictionary {link.id: link object}

routing_table:

a dictionary {node.id: link object}

default_link

Static Routing

- Configured by environment
- Global Floyd-Warshall
- Shortest path = least number of hops
- To be removed

Sending Flow (Last time)

send_packet()

recieve_ack()

Receiving Flow

send_ack()

recieve_packet()

Flow

send_packet()

Sending Flow

run()

Receving Flow

run() - sends ack upon receiving data package

Environment (last time)

schedule periodic collect_data()

Main Function:

```
while env.peek():
    env.step()
```

Environment (now)

Main function:

```
while cur_time < duration:
    break_time = min(cur_time + interval, duration)
    env.run(until=break_time)
    collect_data()
    update_plot()
```

Link (last time)

buffers (stores)

producer()
consumer()

Link (now)

buffers (queues)

enqueue:

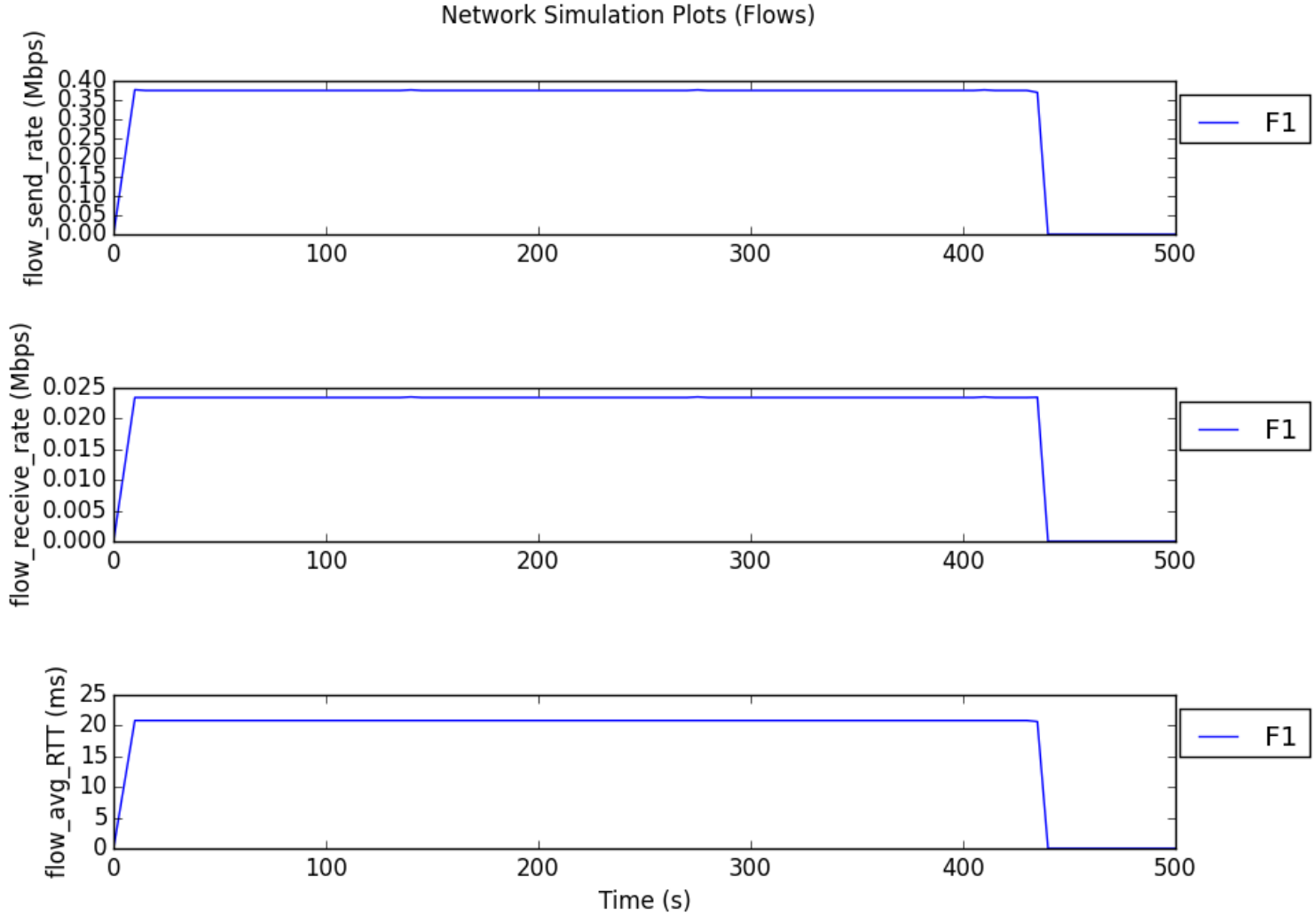
adding packets to the appropriate buffers

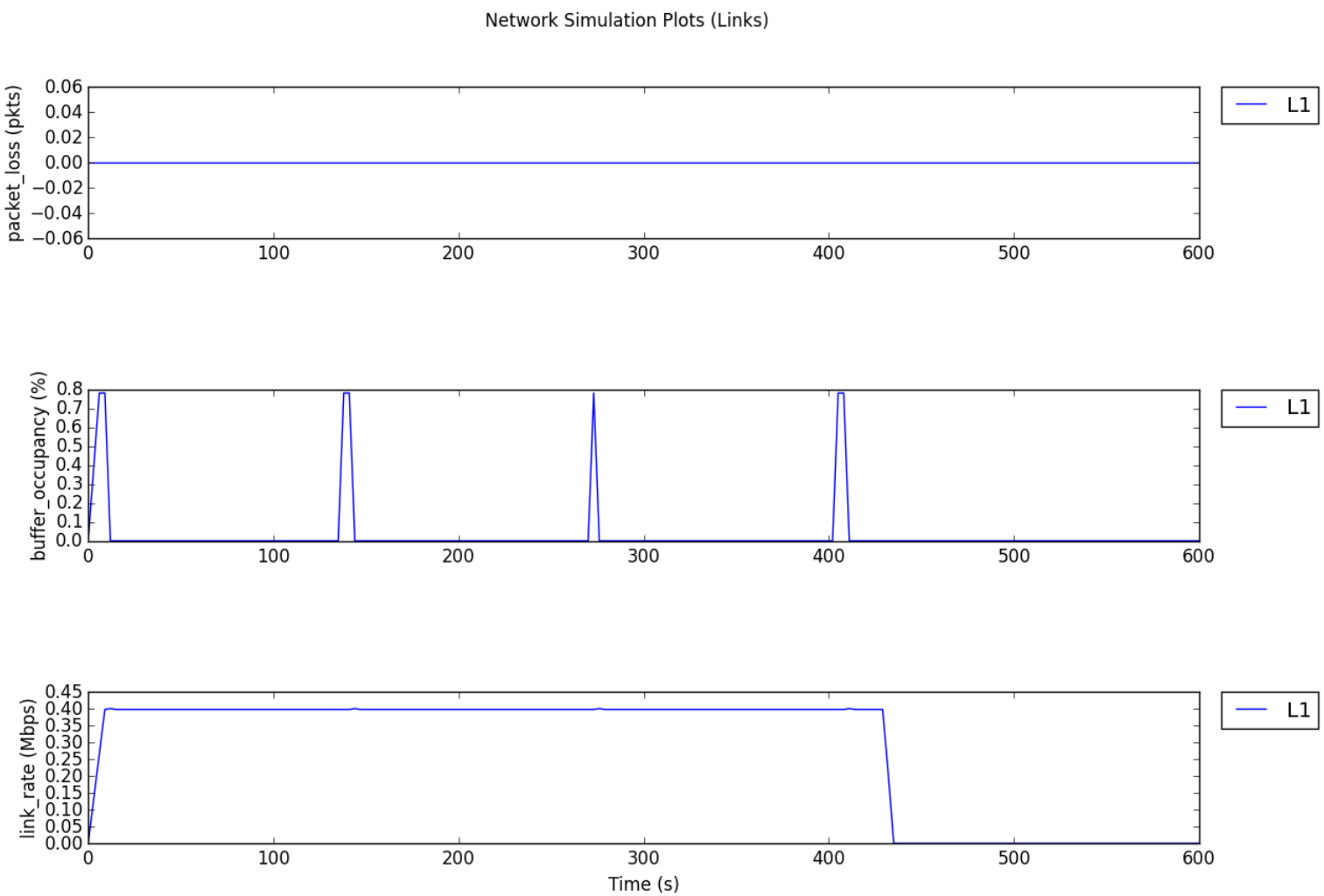
transmit:

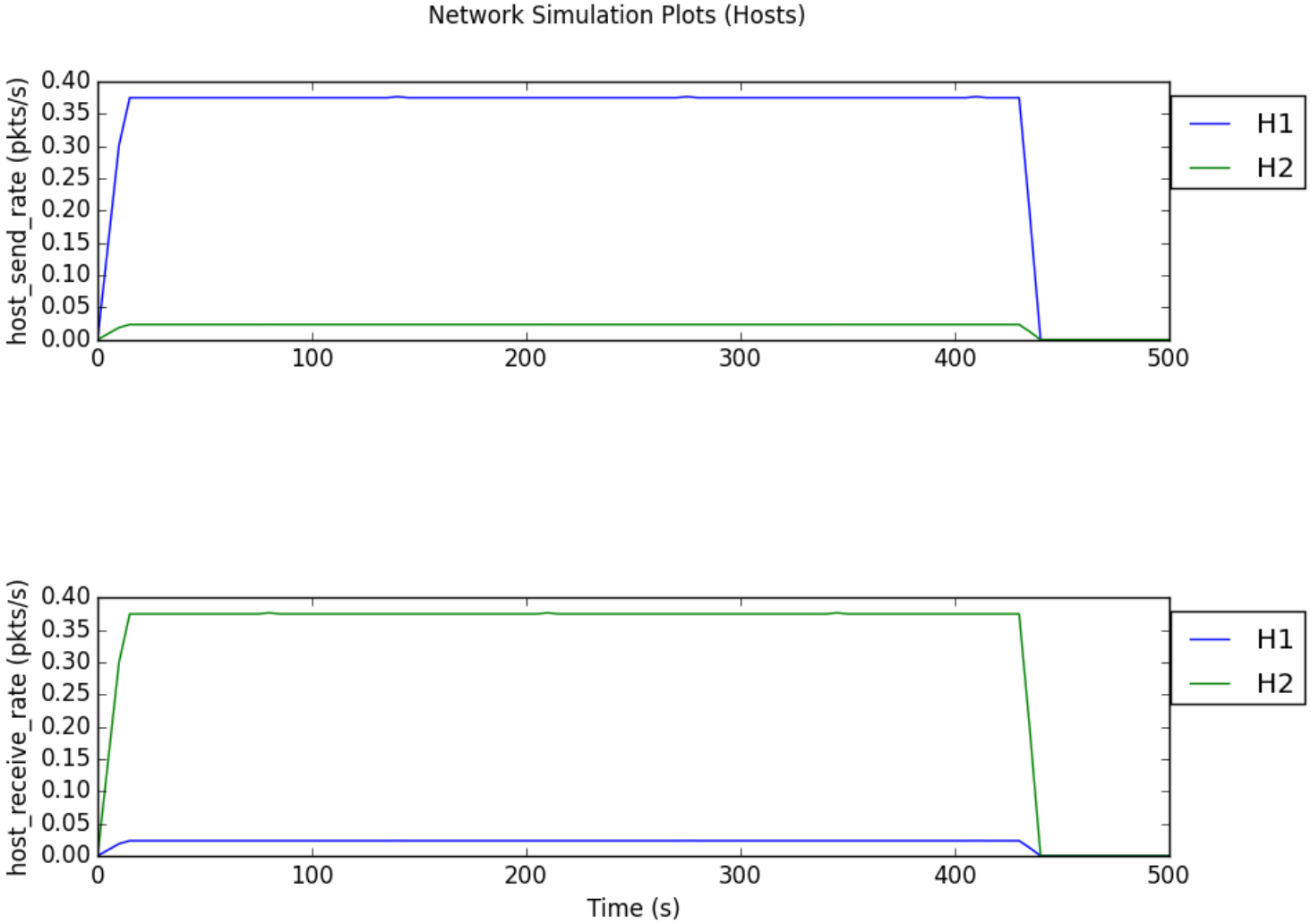
send packets that arrived first in two buffer queues

DEMO

Test Case 0


Network Simulation Plots (Flows)
flow_send_rate (Mbps)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
100
200
300
400
500
F1
flow_receive_rate (Mbps)
0.025
0.020
0.015
0.010
0.005
0.000
0
100
200
300
400
500
F1
flow_avg_RTT (ms)
25
20
15
10
5
0
0
100
200
300
400
500
Time (s)
F1


Network Simulation Plots (Links)
packet_loss (pkts)
0.06
0.04
0.02
0.00
−0.02
−0.04
−0.06
0
100
200
300
400
500
600
L1
buffer_occupancy (%)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
100
200
300
400
500
600
L1
link_rate (Mbps)
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
100
200
300
400
500
600
Time (s)
L1


Network Simulation Plots (Hosts)
host_send_rate (pkts/s)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
100
200
300
400
500
H1
H2
host_receive_rate (pkts/s)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
100
200
300
400
500
Time (s)
H1
H2

Timeline

Week 8 (Xander):

FAST, dynamic routing (test case 1)

Week 9:

Tahoe, *additional goals

Week 10 (Aditya):

final report