Network Simulator: Milestone 2

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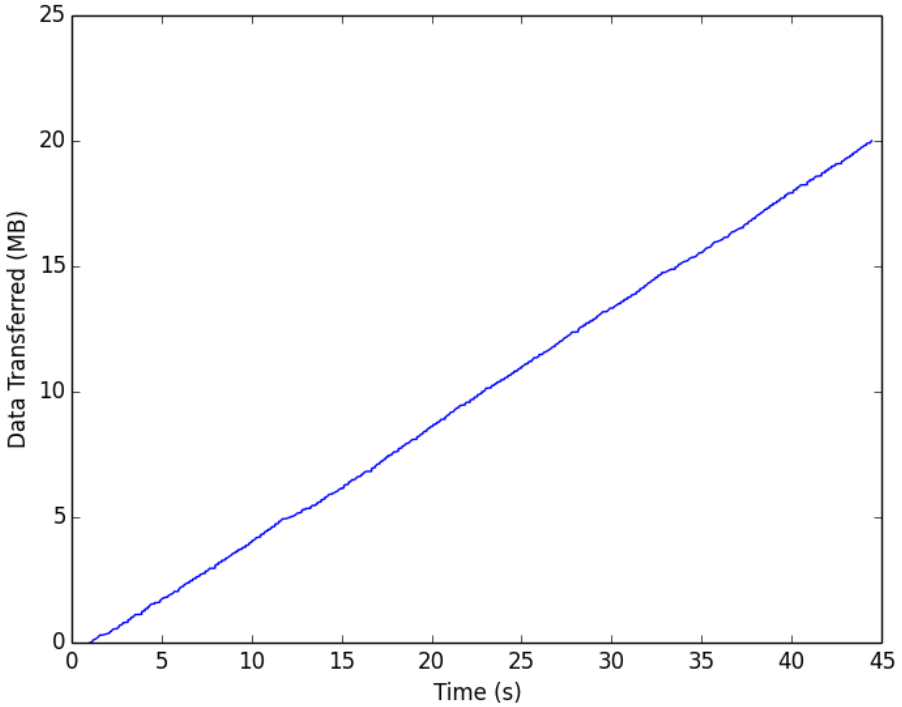
Current Progress

- Link with buffer and delay
- Setting up static routing tables for routers
- TCP Tahoe Protocol for congestion control
- Demo

One-Link Example

- 20 MB Data
- 10 Mbps Link
- TCP Tahoe

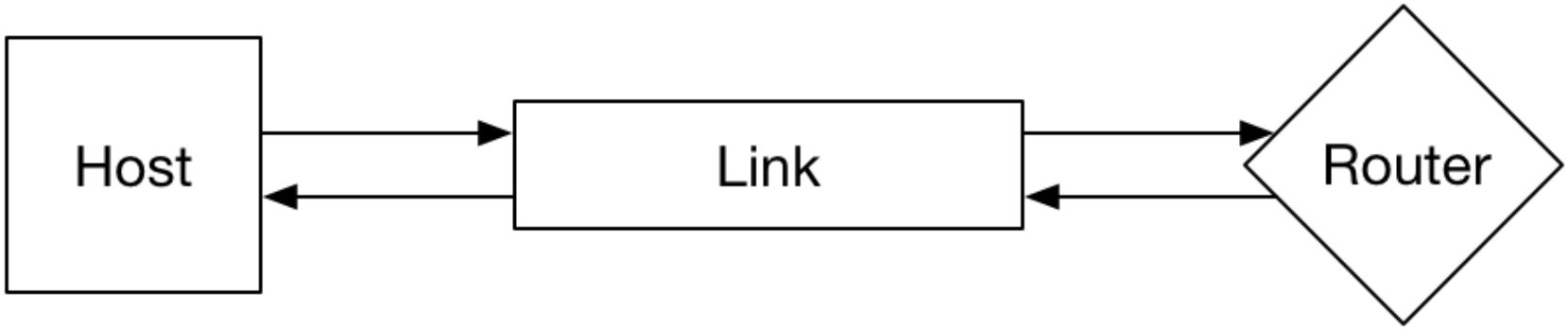


Architecture

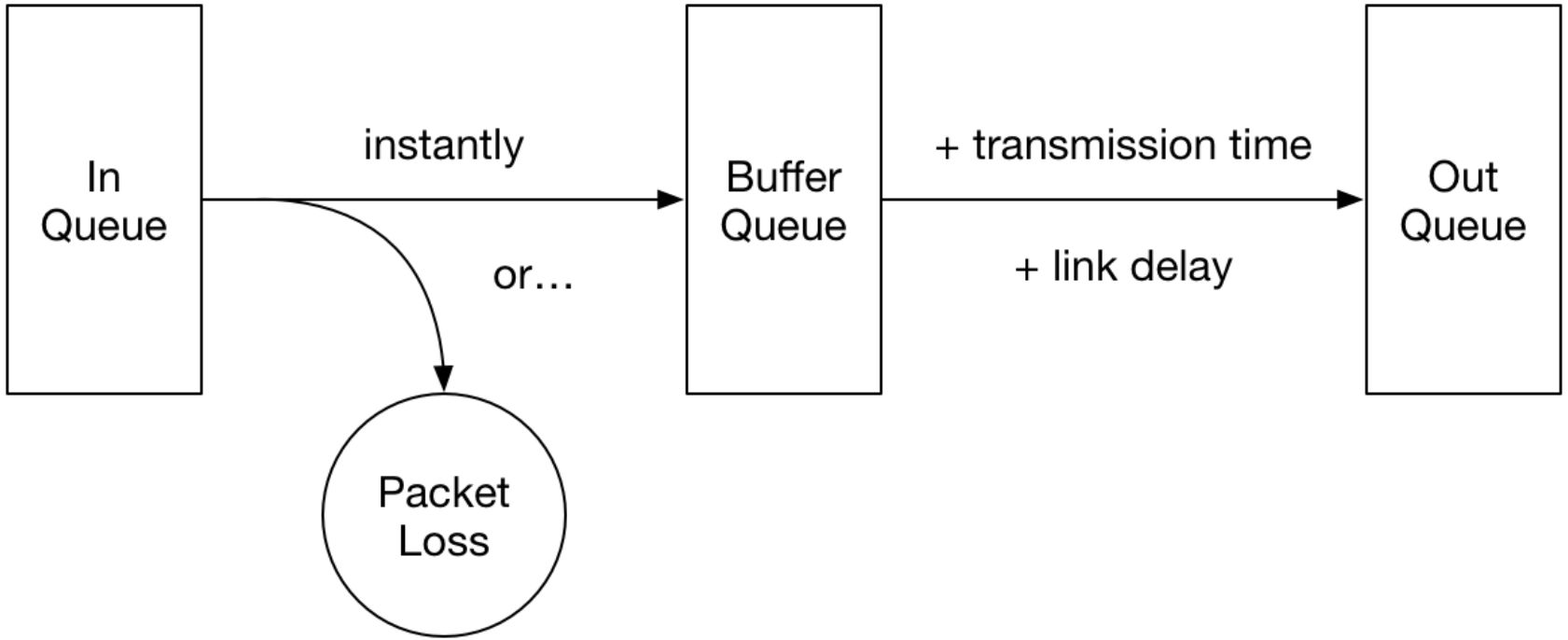
- **Device:** Host, Router, Link
- **Packet:** Data, Ack, Routing
- **Network**
- **Flow**
- **Tracker**
- Stayed the same, except...

Inter-Device Communication

- Packets are exchanged via SimPy queues
- Enable SimPy to intercept messages



Link


In Queue
instantly
or…
Packet Loss
Buffer Queue
+ transmission time
+ link delay
Out Queue

Routing Table

- Hosts initialize routing packets on startup
- Dijkstra’s algorithm for each host
- When a router discovers a host
  a. Incoming direction -> routing table
  b. Broadcast to all other directions
  c. Ignore later packets from the same host

Statistics

- Devices generate statistical messages periodically
- Standalone program for plotting
- Tied together via UNIX pipes
- Logging and plotting are decoupled :)

Difficulties

- Ever-changing architecture as we learned more about SimPy environment
- Enabling simulator with statistics

Extra Features

- TCP Vegas
- CUBIC TCP
- Real-time graphing
- Dynamic networks

Congestion Control Plans

Two different approaches:

- TCPTahoe
  - uses packet loss as signal
- FASTTCP
  - uses queuing delay as signal

Division of Remaining Labor

Ying-Yu: Statistics

Chris: Graphics

Emily: FASTTCP

Sharjeel: Dynamic Routing

Timeline

Week 8

- Implement congestion control for Flow
- Implement graphics for Tracker
- Implement dynamic routing

Week 9

- Debug code
- Prepare for presentation

Week 10

- Final presentation
- Prepare final report

Any questions?