CS 640 LAB 1
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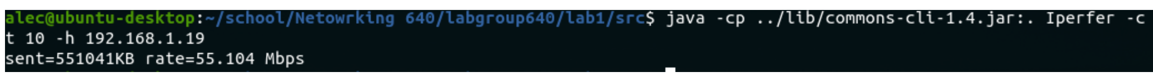
1. **Testing**
    a. Wired - Server on the left, client on the right
        i. 

        ii. Normally, after testing on a Wired environment I'd expect that the wireless environment would not only have a lower data transfer rate, but also to experience packet loss. However, this is a unique situation where the server is a low-powered RaspberryPi with a slow network interface. Additionally, there is QoS set up on my router to prioritize another machine on the network which frequently has high network demands, so the transfer rate here is quite slow. I'd expect on other devices that it may be faster, even on a wired network.
    b. Wireless
        i. Server


        ii. Client


        iii. This is what I expected given the network configuration. Oddly, both transmission methods appear to have dropped one packet. I would expect that on a configuration with no QoS and a normal device that the wired environment would have a higher throughput, however given that two normal machines were used for the wireless connection, both of which have equal priority in QoS, this result makes sense.
2. **Mininet**
    a. No submission required
3. **Mininet Questions**
    a. Q1
    b. Q2
        i. Part 3 - Q2 Predictions:
            1. Latency: 143.589
            2. Throughput: 4.7516
        ii. Part 3 - Q2 Results:
            1. Latency: 142.432
            2. Throughput: 2.754
                a. Latency was about what I expected. Throughput was off because I averaged the throughput of L1-L3 when I should

have taken the min. min(L1-L3) was around what the throughput for all three was.

c. **Q3**
   i. **Part 3 - Q3 Predictions:**
      1. **Average RTT two pairs of hosts: 143.49**
      2. **Average RTT three pairs of hosts: 185.9**
         a. I wasn't sure how to predict 3 connections so I used A methodology of adding one/third to each of the latencies to consider the added time due to collision management
      3. **Throughput two pairs of hosts: 2.688**
      4. **Throughput three pairs of hosts: 1.88**
         a. Again I know the throughput can see a dropoff due to the multitude Of connections so I decreased the number by one/third, matching My earlier consideration for methodology in predicting latency
   ii. **Part 3 - Q3 Results:**
      1. **Average RTT two pairs of hosts: 142.9**
      2. **Average RTT three pairs of hosts: 143.34**
         a. My prediction was off with latency there was no apparent slow Down in latency. Likely due to the fact that ping information is not Very content dense.
      3. **Throughput two pairs of hosts: 2.33**
      4. **Throughput three pairs of hosts: 1.424**
         a. It is not surprising that my prediction for throughput is wrong I know that throughput is measured by transfer size / transfer time And transfer time is defined as RTT + 1/bandwidth + transfer size But in terms of sharing the bandwidth it is a difficult thing to Consider as I am not away of the mechanism which determines Queueing time.

d. **Q4**
   i. **Part 3 - Q4 Predictions:**
      1. **Latency of h1->h4: 140.86**
      2. **Latency of h5->h6: 90.92**
      3. **Throughput of h1->h4: 2.79**
      4. **Throughput of h5->h6: 3.93**
   ii. **Part 3 - Q4 Results:**
      1. **Latency of h1->h4: 142.61**
      2. **Latency of h5->h6: 84.15**
         a. My predictions of the latency were wrong because I couldn't predict which transmission would be received first for the L2 link which is shared across both transmissions. It seems that the h5->h6 transmission was received first across the L2 link and the h1->h4 transmission came second, the offset latency seems consistent with that as a result.

3. **Throughput of h1->h4: 2.69**
4. **Throughput of h5->h6: 3.838**
    a. In terms of predicting the throughput of the transmissions I simply took the minimum throughput rated on the path of the links, for h1->h4 I used L1 as the lowest throughput rate and for h5->h6 I used L5 as the lowest throughput rate. Obviously when the bottleneck of L2 link is reached for this transmission we can expect a transmission rate diminishing in accordance with the scheduling and queueing of each of the transmissions.