Introduction to Computer Networks: Wifi Implementation Report

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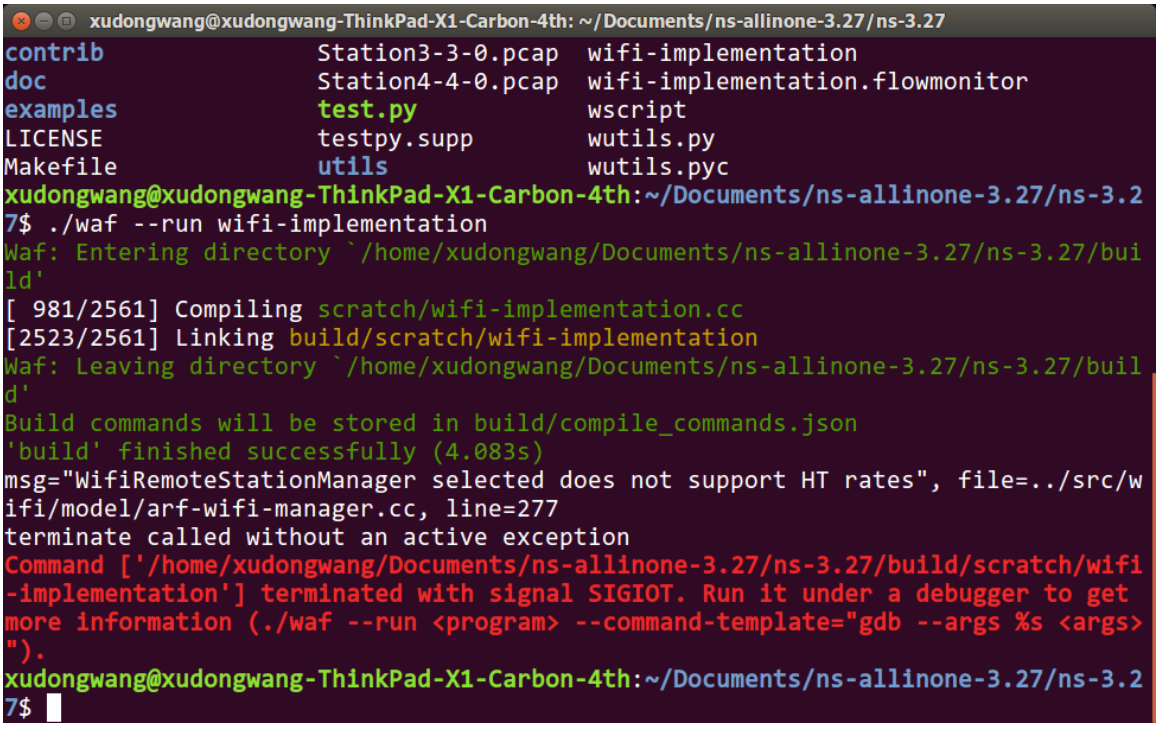
1 Set up the network simulation

With the experience of doing the first project, I am able to complete this part much faster than the first time. In fact, there is an example code wifi-tcp.cc in the folder examples/wireless. This code has nearly the same configuration as our expectation, so I just modified this code to our topology and deleted some unnecessary codes. Besides pcap, I also use flow monitor to help understand the flow situation.

2 Something about rate control algorithm

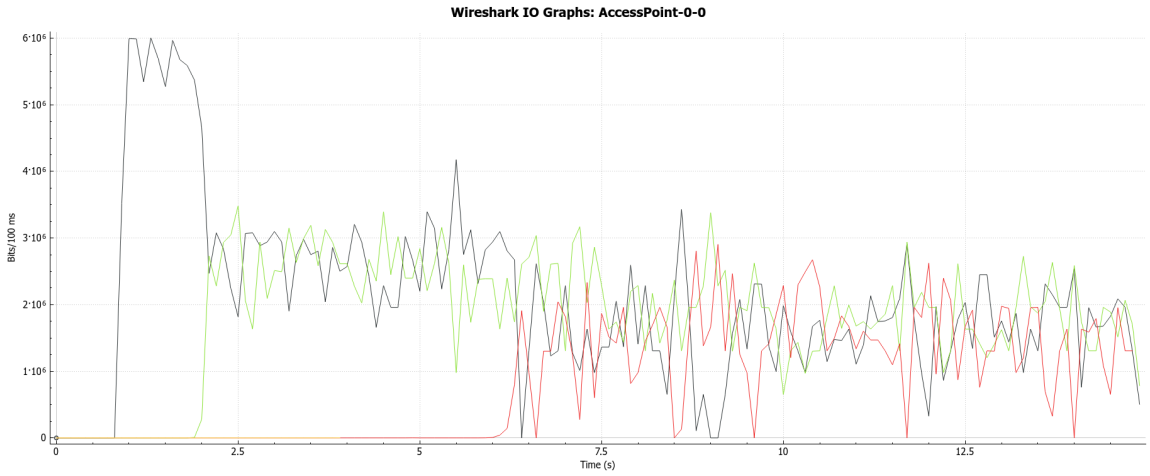
During the project, we found that ArfWifiManager cannot support 802.11n standard. More precisely, there is a message said "WifiRemoteStationManager selected does not support HT rates". I looked up the source code and found that ArfWifiManager didn't support HT rate. In fact, all rate control algorithms except ConstantRateWifiManager support standard 802.11n. Due to these problems, I didn't complete the design for an improved rate control algorithm.



3 Outcomes and Conclusion

3.1 Pcap statistics and analysis

I plot the statistics of the throughput generated during simulation as below:



In this chart, the black line refers to node 1's throughput, the green one is for node 2, the red one is for node 3, and the yellow one (lying at the bottom) for node 4. We can see that although node 3 began to send data at the 3rd second, it didn't set up a successful connection before the 6th second. Node 4 didn't have even a chance to send a byte of data(in my pcap statistics, I found that node 4 only sent 4 packets to set up the connection).

The throughput of the Access Point is stable and keeps between 40Mbps and 50Mbps except a few seconds at the beginning.

3.2 Flow statistics figure

The flow information is showed at the table below:

Node	Average Throughput (Mbps)	Packet Loss Rate (%)
AP	45.10	0.00
1	19.95	0.00
2	18.55	0.00
3	9.23	0.00
4	0.00	0.00