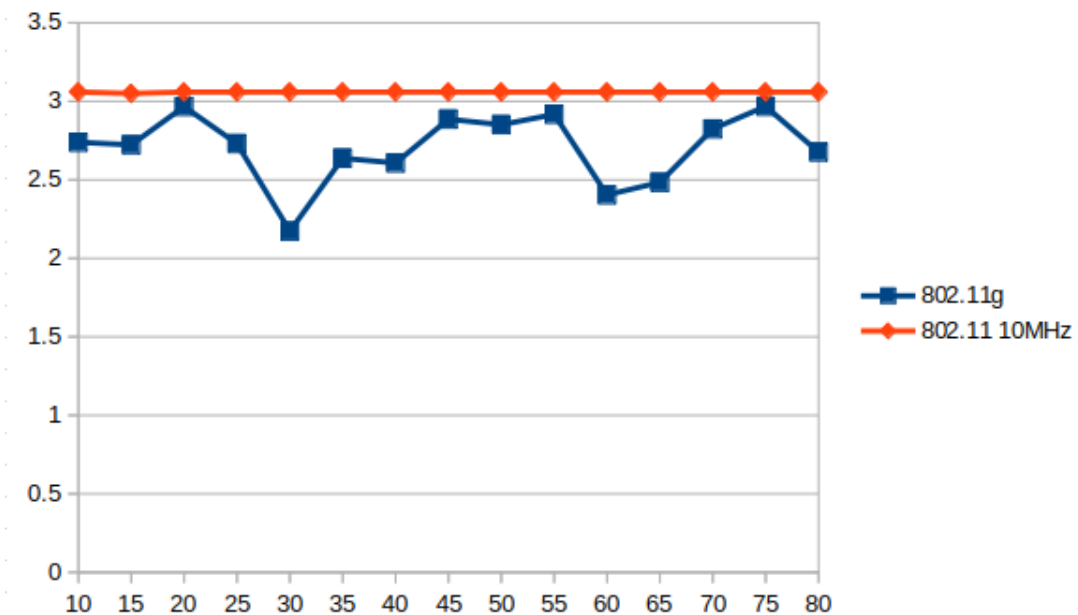


Practice #5

1. 1.1.

```
keonwoo@keonwoo-laptop:~/ns-allinone-3.31/ns-3.31$ ./waf --run scratch/task_1_skeleton
Waf: Entering directory `/home/keonwoo/ns-allinone-3.31/ns-3.31/build'
[1983/2038] Compiling scratch/task_1_skeleton.cc
[1999/2038] Linking build/scratch/task_1_skeleton
Waf: Leaving directory `/home/keonwoo/ns-allinone-3.31/ns-3.31/build'
Build commands will be stored in build/compile_commands.json
'build' finished successfully (2.339s)
Flow 2 (10.0.0.1 -> 10.0.0.2)
  Tx Packets: 2410
  Tx Bytes:   3441480
  TxOffered:  3.05909 Mbps
  Rx Packets: 1909
  Rx Bytes:   2726052
  Throughput: 2.42316 Mbps
keonwoo@keonwoo-laptop:~/ns-allinone-3.31/ns-3.31$
```

1.2. The blue line in the figure below represents the result of the simulation using WIFI_PHY_STANDARD_80211g:



Using 2.4 GHz networks, the throughput varies over the distance between A and B.

1.3.1. Using WIFI_PHY_STANDARD_80211_10MHZ, there are (almost) no decrease in the throughput, while WIFI_PHY_STANDARD_80211g shows a decrease in the throughput. Thus, 5 GHz communication is more robust to interferences.

1.3.2. WIFI_PHY_STANDARD_80211_10MHZ is for 5 GHz networking, while WIFI_PHY_STANDARD_80211g is for 2.4 GHz networking.

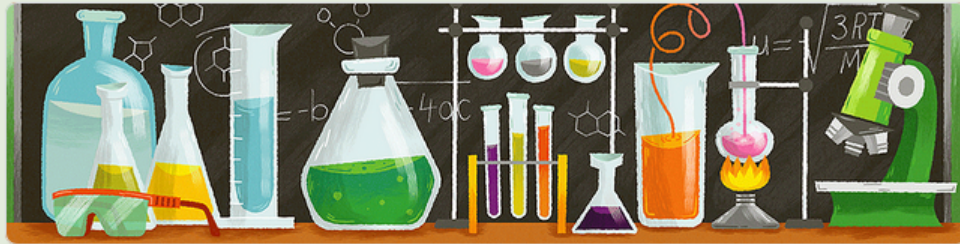
1.4. When the position of Node C is moved to $(-1000000, 0, 0)$, far enough from A and B, the throughput is close to 3.05909 Mbps, which is the maximum rate. So, we can guess that the role of Node C is to give an interference to the communication.

2. 2.5. The right one is for 2.5.1. and the left one is for 2.5.2.

<pre>keonwoo@keonwoo-laptop:~/ns-allinone-3.31/ns-3.31 \$./waf --run scratch/task_2_skeleton Waf: Entering directory `/home/keonwoo/ns-allinone-3.31/ns-3.31/build' [1991/2040] Compiling scratch/task_2_skeleton.cc [2001/2040] Linking build/scratch/task_2_skeleton Waf: Leaving directory `/home/keonwoo/ns-allinone-3.31/ns-3.31/build' Build commands will be stored in build/compile_commands.json 'build' finished successfully (4.409s) Flow ID: 1 Src Addr 10.0.0.1 Dst Addr 10.0.0.64 Tx Packets = 1999 Rx Packets = 20 Throughput: 129.045 Kbps Flow ID: 2 Src Addr 10.0.0.57 Dst Addr 10.0.0.8 Tx Packets = 19882 Rx Packets = 0 Throughput: -0 Kbps Flow ID: 3 Src Addr 10.0.0.17 Dst Addr 10.0.0.24 Tx Packets = 19764 Rx Packets = 1 Throughput: 0.298295 Kbps Flow ID: 4 Src Addr 10.0.0.41 Dst Addr 10.0.0.48 Tx Packets = 19646 Rx Packets = 7 Throughput: 1.38173 Kbps Flow ID: 5 Src Addr 10.0.0.59 Dst Addr 10.0.0.3 Tx Packets = 19528 Rx Packets = 0 Throughput: -0 Kbps Flow ID: 6 Src Addr 10.0.0.6 Dst Addr 10.0.0.62 Tx Packets = 19410 Rx Packets = 24 Throughput: 4.00241 Kbps Flow ID: 7 Src Addr 10.0.0.27 Dst Addr 10.0.0.54 Tx Packets = 19292 Rx Packets = 203 Throughput: 33.3869 Kbps Flow ID: 8 Src Addr 10.0.0.14 Dst Addr 10.0.0.52 Tx Packets = 19174 Rx Packets = 20 Throughput: 3.13827 Kbps</pre>	<pre>keonwoo@keonwoo-laptop:~/ns-allinone-3.31/ns-3.31 \$./waf --run scratch/task_2_skeleton Waf: Entering directory `/home/keonwoo/ns-allinone-3.31/ns-3.31/build' [1990/2040] Compiling scratch/task_2_skeleton.cc [2001/2040] Linking build/scratch/task_2_skeleton Waf: Leaving directory `/home/keonwoo/ns-allinone-3.31/ns-3.31/build' Build commands will be stored in build/compile_commands.json 'build' finished successfully (4.838s) Flow ID: 1 Src Addr 10.0.0.1 Dst Addr 10.0.0.64 Tx Packets = 1999 Rx Packets = 7 Throughput: 2.57459 Kbps Flow ID: 2 Src Addr 10.0.0.57 Dst Addr 10.0.0.8 Tx Packets = 19882 Rx Packets = 38 Throughput: 6.71841 Kbps Flow ID: 3 Src Addr 10.0.0.17 Dst Addr 10.0.0.24 Tx Packets = 19764 Rx Packets = 15 Throughput: 2.5509 Kbps Flow ID: 4 Src Addr 10.0.0.41 Dst Addr 10.0.0.48 Tx Packets = 19646 Rx Packets = 37 Throughput: 6.64841 Kbps Flow ID: 5 Src Addr 10.0.0.59 Dst Addr 10.0.0.3 Tx Packets = 19528 Rx Packets = 10 Throughput: 2.0477 Kbps Flow ID: 6 Src Addr 10.0.0.6 Dst Addr 10.0.0.62 Tx Packets = 19410 Rx Packets = 58 Throughput: 9.02081 Kbps Flow ID: 7 Src Addr 10.0.0.27 Dst Addr 10.0.0.54 Tx Packets = 19292 Rx Packets = 113 Throughput: 18.3022 Kbps Flow ID: 8 Src Addr 10.0.0.14 Dst Addr 10.0.0.52 Tx Packets = 19174 Rx Packets = 32 Throughput: 5.15785 Kbps</pre>
--	--

2.5.3. In general, the experiment with RTS/CTS enabled shows higher throughputs than one with RTS/CTS disabled. Since RTS/CTS is used to reduce frame collisions due to hidden node problems, it will reduce frame collisions and the throughput will increase.

3.



Practice Assignments Evaluation

Thank you for your feedback on the CS341 Practice assignments. Do not forget to include a screenshot of this to Practice #5 report!

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