(1.1)

RTS/CTS increases the throughput. But in some cases when we compare throughput decreased. This could be due to overhead.

```
Swaroops-MacBook-Air:ns-3.30 swaroop$ ./waf --run scratch/wifi-hidden-terminal
Waf: Entering directory `/Users/swaroop/Desktop/ns-allinone-3.30/ns-3.30/build'
[1815/1879] Compiling scratch/wifi-cw-expt.cc
[1816/1879] Compiling scratch/myfirst-hw1.cc
[1817/1879] Compiling scratch/scratch-simulator.cc
[1818/1879] Compiling scratch/subdir/scratch-simulator-subdir.cc
[1827/1879] Compiling scratch/mythird-hw1.cc
[1828/1879] Compiling scratch/mysecond-hw1.cc
[1829/1879] Linking build/scratch/subdir/subdir
[1830/1879] Linking build/scratch/scratch-simulator
[1831/1879] Linking build/scratch/wifi-cw-expt
[1832/1879] Compiling scratch/wifi-hidden-terminal.cc
[1833/1879] Compiling scratch/wifi.cc
[1834/1879] Compiling scratch/lognormal-propagation-loss-distance-expt.cc
[1835/1879] Linking build/scratch/myfirst-hw1
[1836/1879] Linking build/scratch/mysecond-hw1
[1837/1879] Linking build/scratch/mythird-hw1
[1838/1879] Linking build/scratch/wifi-hidden-terminal
[1839/1879] Linking build/scratch/lognormal-propagation-loss-distance-expt
[1840/1879] Linking build/scratch/wifi
Waf: Leaving directory `/Users/swaroop/Desktop/ns-allinone-3.30/ns-3.30/build'
Build commands will be stored in build/compile_commands.json
'build' finished successfully (10.804s)
Hidden station experiment with RTS/CTS disabled:
Flow 1 (10.0.0.1 -> 10.0.0.2)
  Tx Packets: 2410
  Tx Bytes:   3441480
  TxOffered:  3.05909 Mbps
  Rx Packets: 1767
  Rx Bytes:   2523276
  Throughput: 2.24291 Mbps
Flow 2 (10.0.0.3 -> 10.0.0.2)
  Tx Packets: 2411
  Tx Bytes:   3442908
  TxOffered:  3.06036 Mbps
  Rx Packets: 1837
  Rx Bytes:   2623236
```

```
  Throughput: 2.33177 Mbps
-----------------------------------------------
Hidden station experiment with RTS/CTS enabled:
Flow 1 (10.0.0.1 -> 10.0.0.2)
  Tx Packets: 2410
  Tx Bytes:   3441480
  TxOffered:  3.05909 Mbps
  Rx Packets: 1557
  Rx Bytes:   2223396
  Throughput: 1.97635 Mbps
Flow 2 (10.0.0.3 -> 10.0.0.2)
  Tx Packets: 2411
  Tx Bytes:   3442908
  TxOffered:  3.06036 Mbps
  Rx Packets: 1617
  Rx Bytes:   2309076
  Throughput: 2.05251 Mbps
```

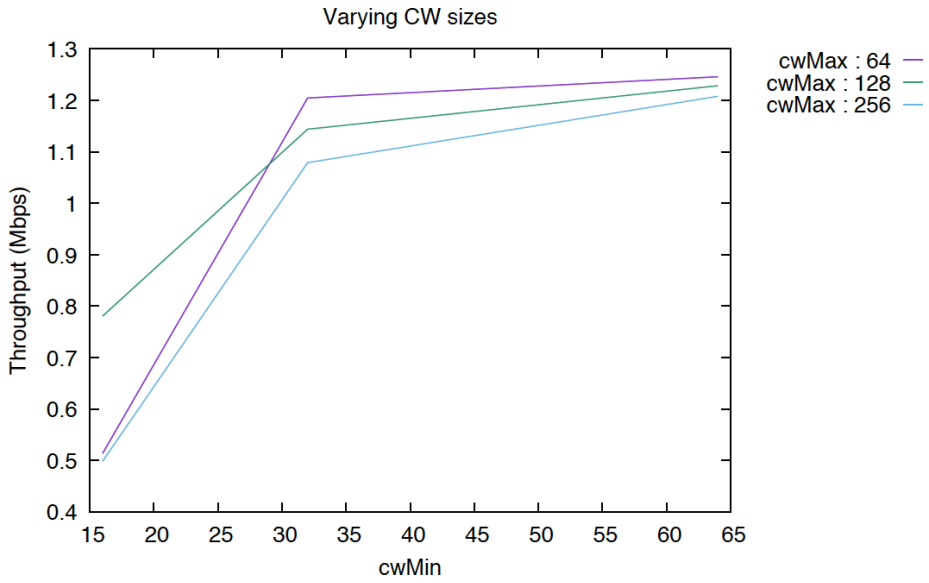
(1.2)

Throuput has increased with the decrease in default propagation loss. More transmission and less loss.

```
'build' finished successfully (2.668s)
Hidden station experiment with RTS/CTS disabled:
Flow 1 (10.0.0.1 -> 10.0.0.2)
  Tx Packets: 2410
  Tx Bytes:   3441480
  TxOffered:  3.05909 Mbps
  Rx Packets: 1767
  Rx Bytes:   2523276
  Throughput: 2.24291 Mbps
Flow 2 (10.0.0.3 -> 10.0.0.2)
  Tx Packets: 2411
  Tx Bytes:   3442908
  TxOffered:  3.06036 Mbps
  Rx Packets: 1837
  Rx Bytes:   2623236
  Throughput: 2.33177 Mbps
-----------------------------------------------
Hidden station experiment with RTS/CTS enabled:
Flow 1 (10.0.0.1 -> 10.0.0.2)
  Tx Packets: 2410
  Tx Bytes:   3441480
  TxOffered:  3.05909 Mbps
  Rx Packets: 1557
  Rx Bytes:   2223396
```

```
  Throughput: 1.97635 Mbps
Flow 2 (10.0.0.3 -> 10.0.0.2)
  Tx Packets: 2411
  Tx Bytes:   3442908
  TxOffered:  3.06036 Mbps
  Rx Packets: 1617
  Rx Bytes:   2309076
  Throughput: 2.05251 Mbps
```

(2)
PLOT



Plot description
Maximum throughput is achieved at cmin = 32 and cmax =64
Throughput is directly proportional to cmin

References:

https://www.sciencedirect.com/topics/computer-science/contention-window
http://www.revolutionwifi.net/revolutionwifi/2010/08/wireless-qos-part-5-contention-window.html