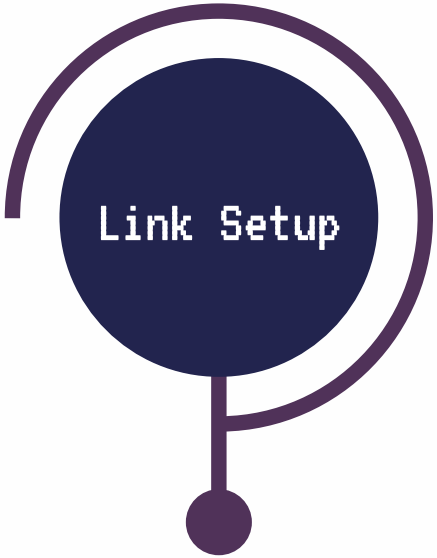
Lamar AlSubhi

Network Performance Using Different TCP Congestion Control Algorithms

Parameters



WiFi–WiFi
ETH–WiFi

BBR, Reno, CUBIC,
Vegas

None, light, heavy
Bonus: Bidirectional

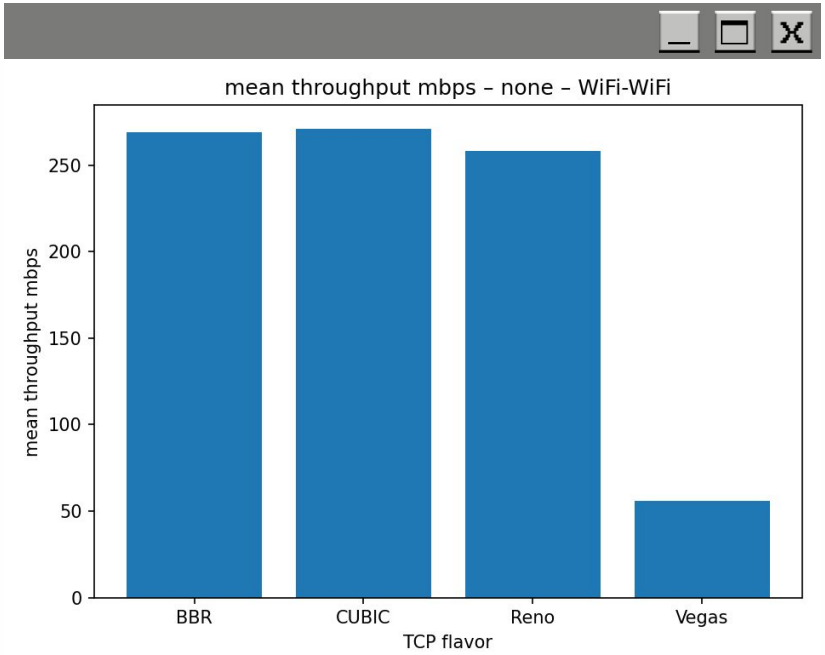
Scenario	Link setups	TCP flavors	Trials	Runs
Baseline	WiFi–WiFi, ETH–WiFi	BBR, CUBIC, Reno, Vegas	A, B	16
Light Background	WiFi–WiFi, ETH–WiFi	BBR, CUBIC, Reno, Vegas	A, B	16
Heavy Background	WiFi–WiFi, ETH–WiFi	BBR, CUBIC, Reno, Vegas	A, B	16
Bonus Bidirectional	WiFi–WiFi, ETH–WiFi	BBR, CUBIC	A, B	8
Total	—	—	—	**56**

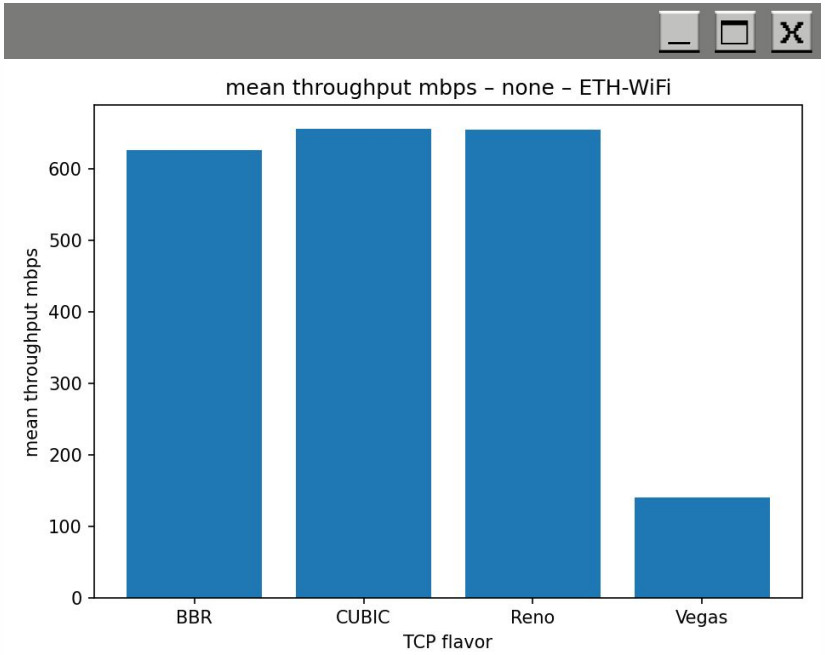
Topology

Results Pipeline

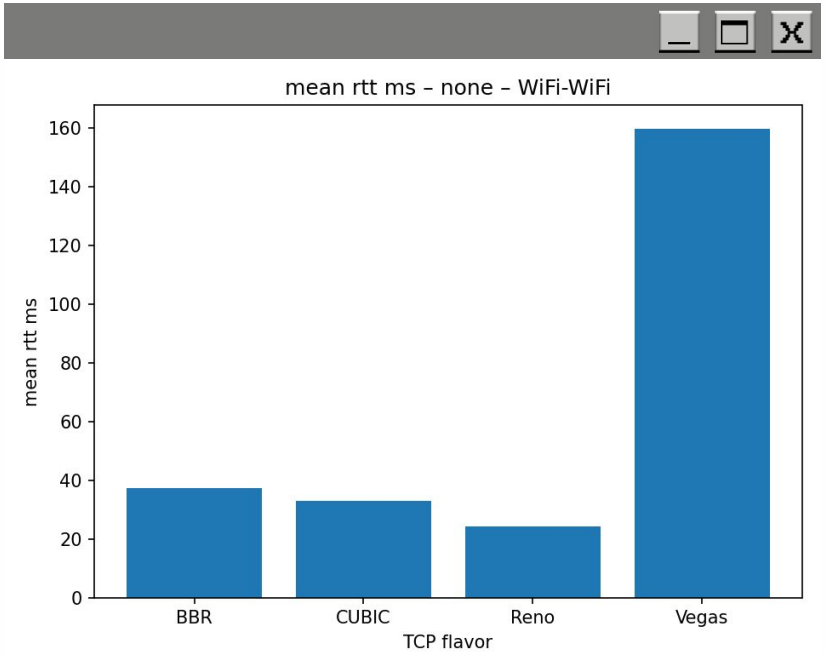
Step 1	Step 2	Step 3	Step 4	Step 5
Collect raw logs (iperf.json, rtt.txt, cwnd.txt)	Parse logs into CSVs (throughput.csv, rtt.csv, cwnd.csv)	Extract summary stats (mean, p90/p95 throughput & RTT, loss %, cwnd)	Aggregate across trials into results_agg.csv	Generate comparison plots (throughput, RTT, loss, cwnd, scatter)

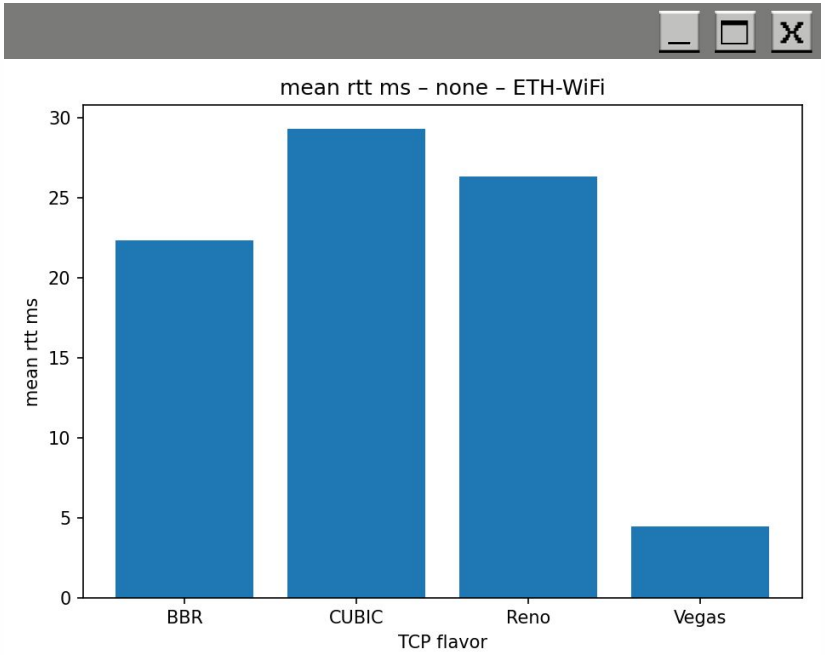
Throughput


mean throughput mbps – none – WiFi-WiFi
mean throughput mbps
0
50
100
150
200
250
BBR
CUBIC
Reno
Vegas
TCP flavor

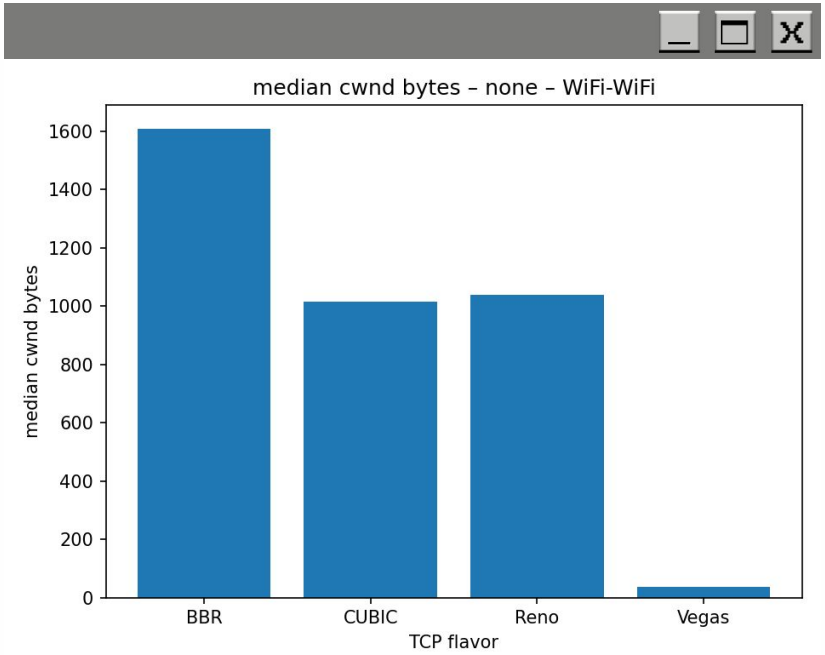

mean throughput mbps – none – ETH-WiFi
mean throughput mbps
0
100
200
300
400
500
600
BBR
CUBIC
Reno
Vegas
TCP flavor

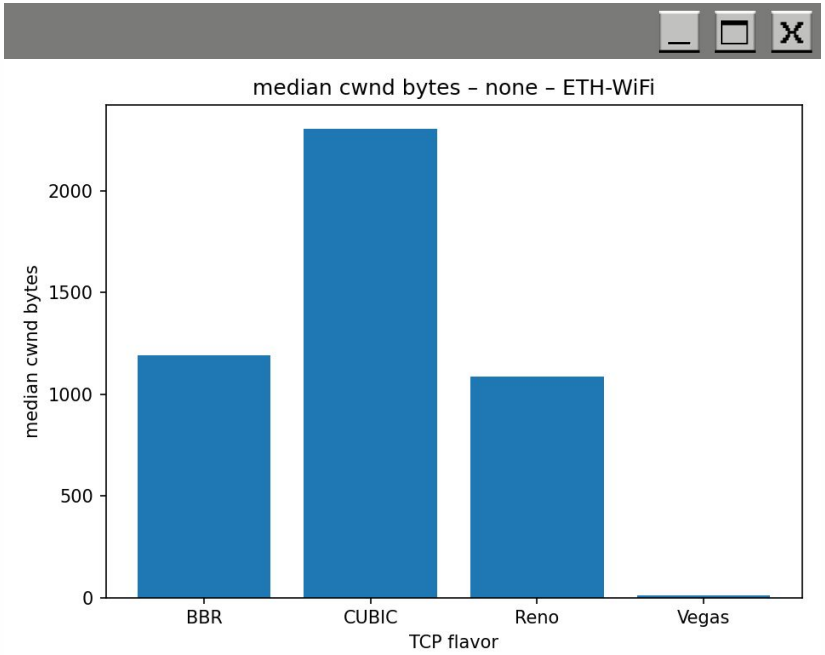
RTT


mean rtt ms – none – WiFi-WiFi
mean rtt ms
0
20
40
60
80
100
120
140
160
BBR
CUBIC
Reno
Vegas
TCP flavor

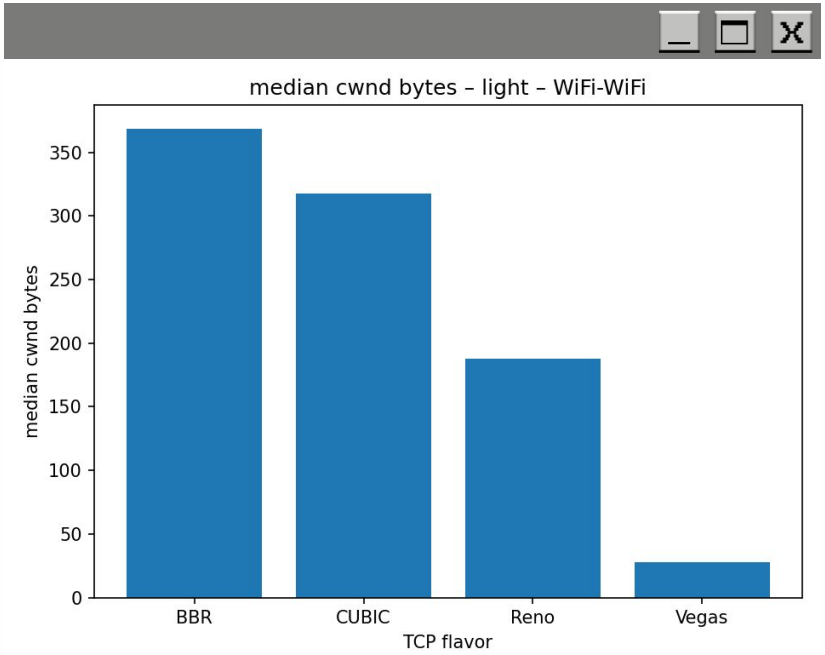

mean rtt ms – none – ETH-WiFi
mean rtt ms
0
5
10
15
20
25
30
BBR
CUBIC
Reno
Vegas
TCP flavor

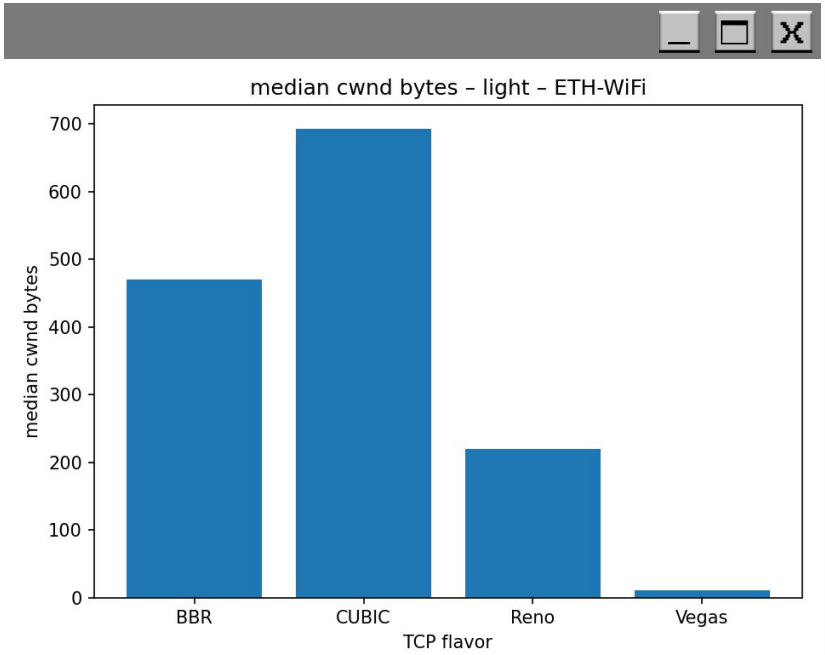
CWND (baseline)



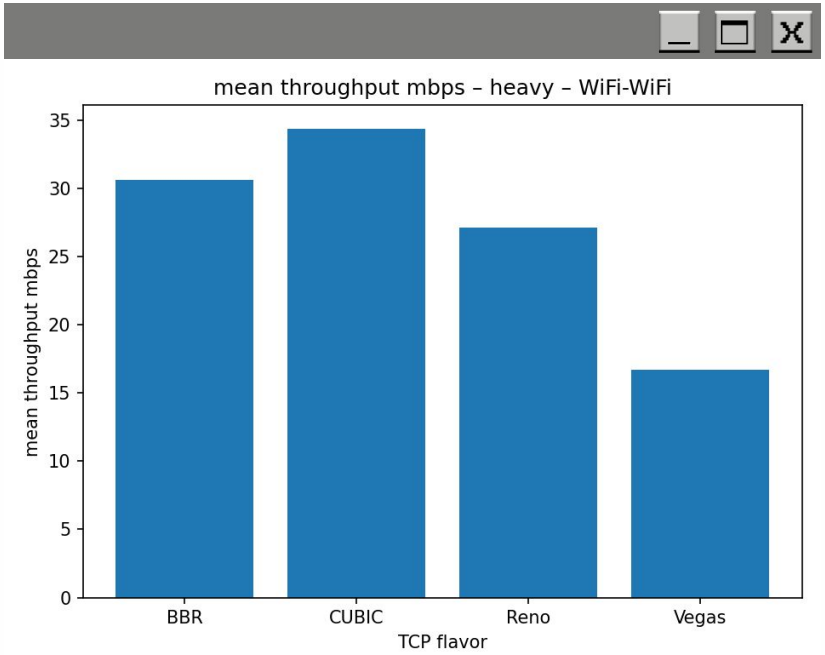


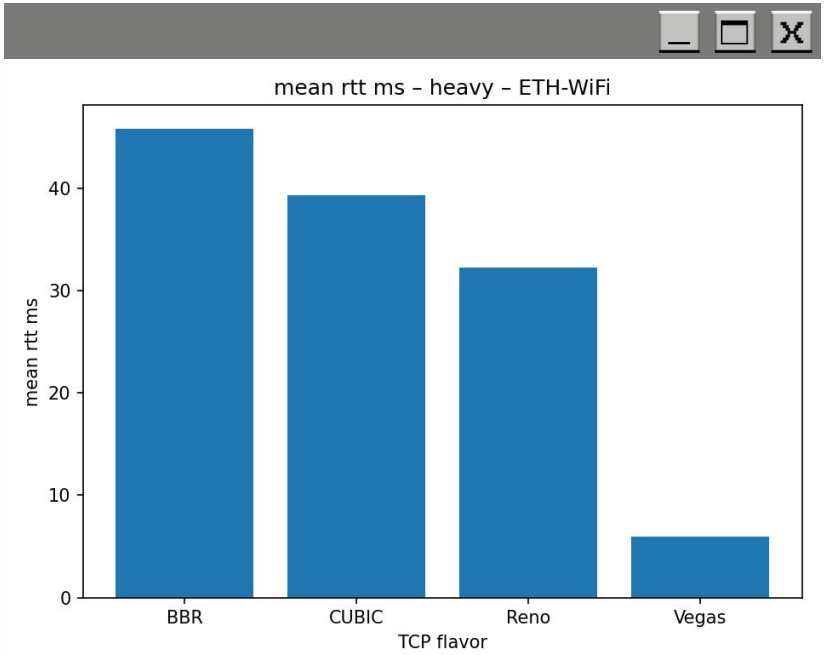
CWND (light traffic)



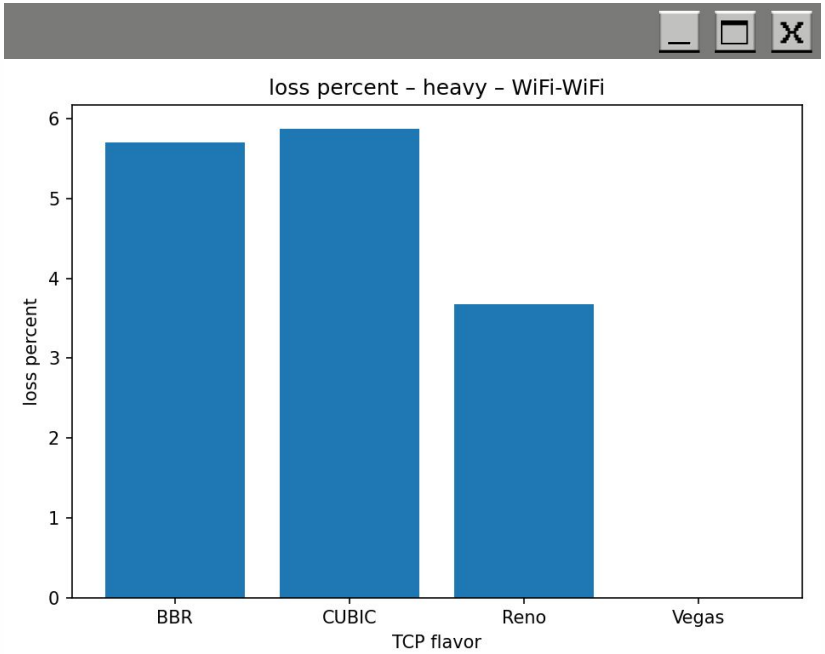


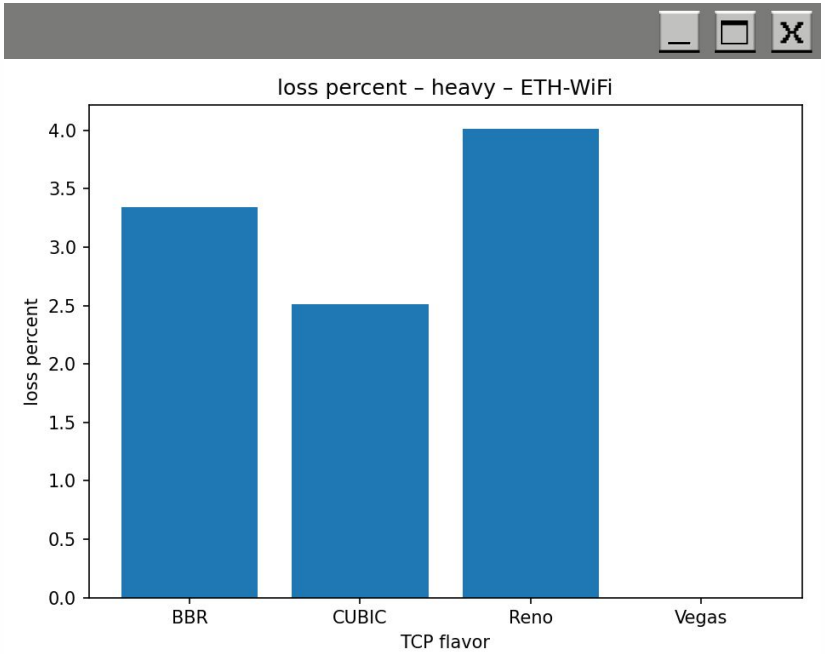
CWND (heavy traffic)





Loss %


loss percent – heavy – WiFi-WiFi
loss percent
0
1
2
3
4
5
6
BBR
CUBIC
Reno
Vegas
TCP flavor


loss percent – heavy – ETH-WiFi
loss percent
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
BBR
CUBIC
Reno
Vegas
TCP flavor

Thank you

any questions?

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