

Pantheon Report

Generated at 2025-04-18 00:29:56 (UTC).

Tested in mahimahi: mm-delay 5 mm-link 50mbps_10ms.trace 50mbps_10ms.trace
--uplink-queue=droptail --uplink-queue-args=bytes=6250000

Repeated the test of 3 congestion control schemes 5 times.

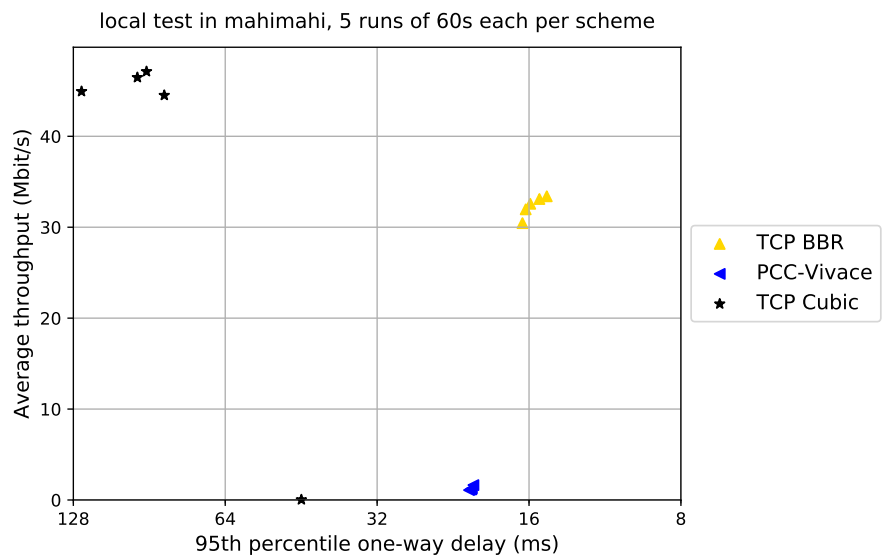
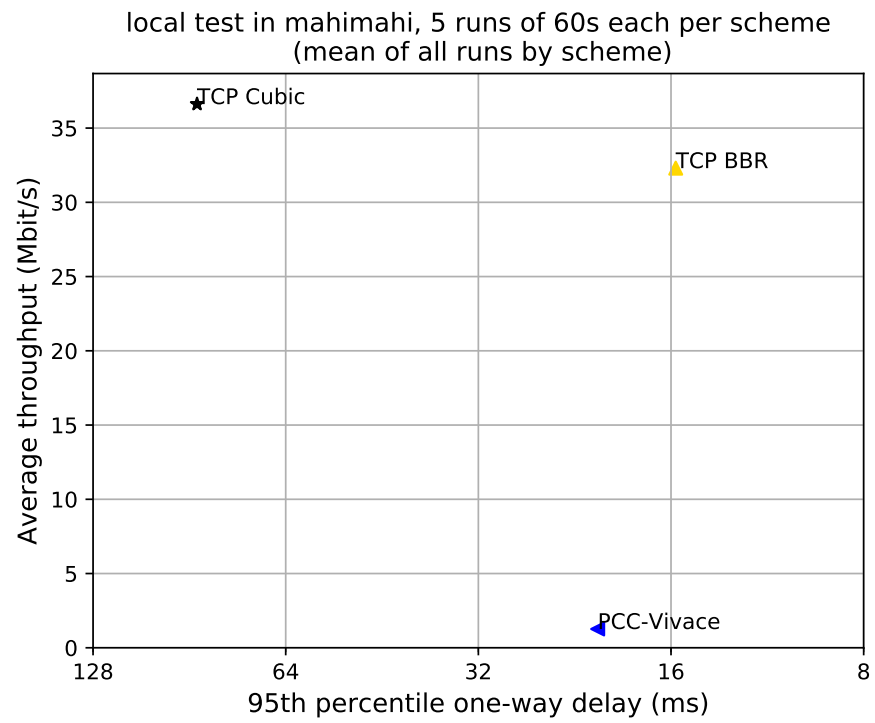
Each test lasted for 60 seconds running 1 flow.

System info:

Linux 5.4.0-150-generic
net.core.default_qdisc = fq
net.core.rmem_default = 212992
net.core.rmem_max = 212992
net.core.wmem_default = 212992
net.core.wmem_max = 212992
net.ipv4.tcp_rmem = 4096 131072 6291456
net.ipv4.tcp_wmem = 4096 16384 4194304

Git summary:

branch: main @ 40bd711d6c1132f2400100db42dd4a7b7d5f514a
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
third_party/indigo @ 463d89b09699a57bfdfbae351646df6a60040b90
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
M src/examples/cellsim.cc
M src/examples/sproutbt2.cc
M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	5	32.30	15.73	0.02
TCP Cubic	5	36.61	88.05	0.38
PCC-Vivace	5	1.27	20.83	0.02

Run 1: Statistics of TCP BBR

Start at: 2025-04-18 00:11:21

End at: 2025-04-18 00:12:21

Below is generated by plot.py at 2025-04-18 00:27:52

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 32.58 Mbit/s (65.2% utilization)

95th percentile per-packet one-way delay: 15.911 ms

Loss rate: 0.02%

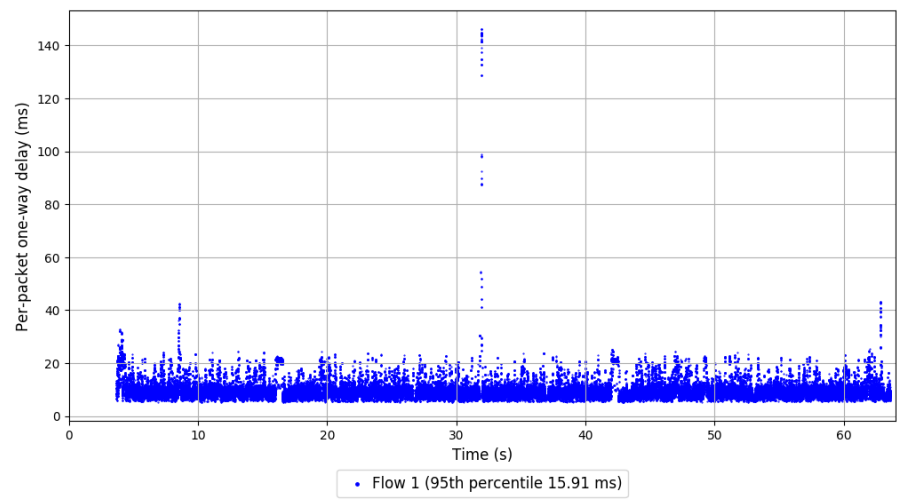
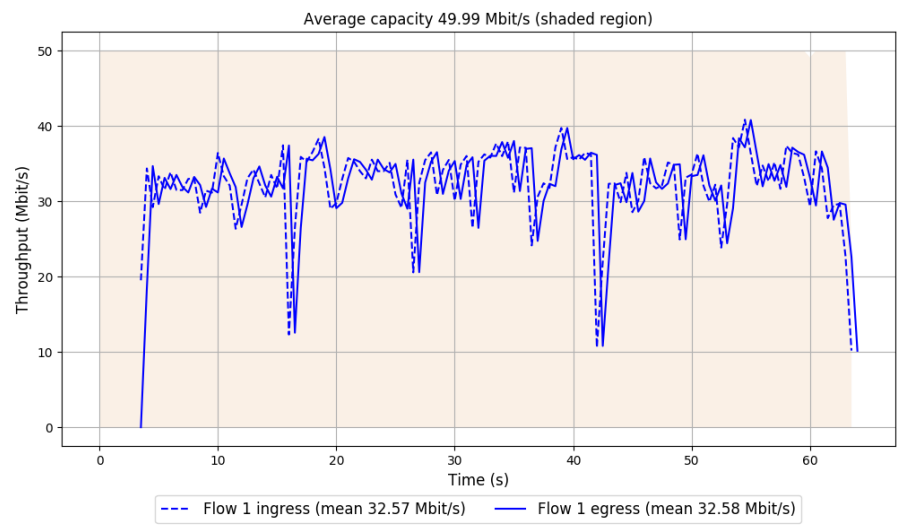
-- Flow 1:

Average throughput: 32.58 Mbit/s

95th percentile per-packet one-way delay: 15.911 ms

Loss rate: 0.02%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2025-04-18 00:14:51

End at: 2025-04-18 00:15:51

Below is generated by plot.py at 2025-04-18 00:27:57

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 31.97 Mbit/s (63.9% utilization)

95th percentile per-packet one-way delay: 16.245 ms

Loss rate: 0.02%

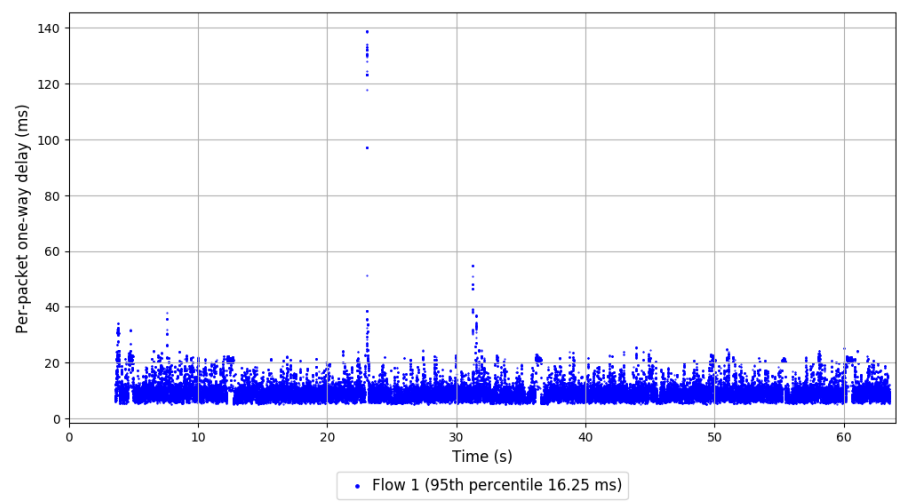
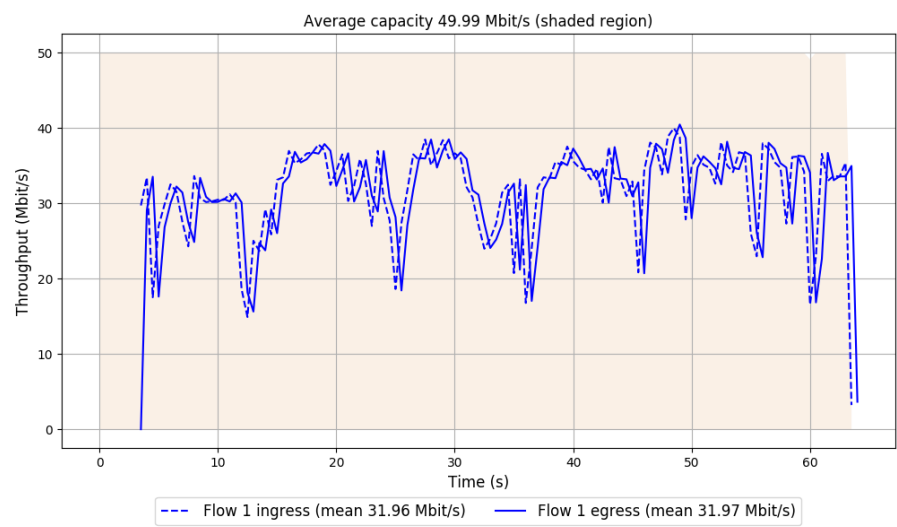
-- Flow 1:

Average throughput: 31.97 Mbit/s

95th percentile per-packet one-way delay: 16.245 ms

Loss rate: 0.02%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2025-04-18 00:18:20

End at: 2025-04-18 00:19:20

Below is generated by plot.py at 2025-04-18 00:28:01

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 33.11 Mbit/s (66.2% utilization)

95th percentile per-packet one-way delay: 15.259 ms

Loss rate: 0.02%

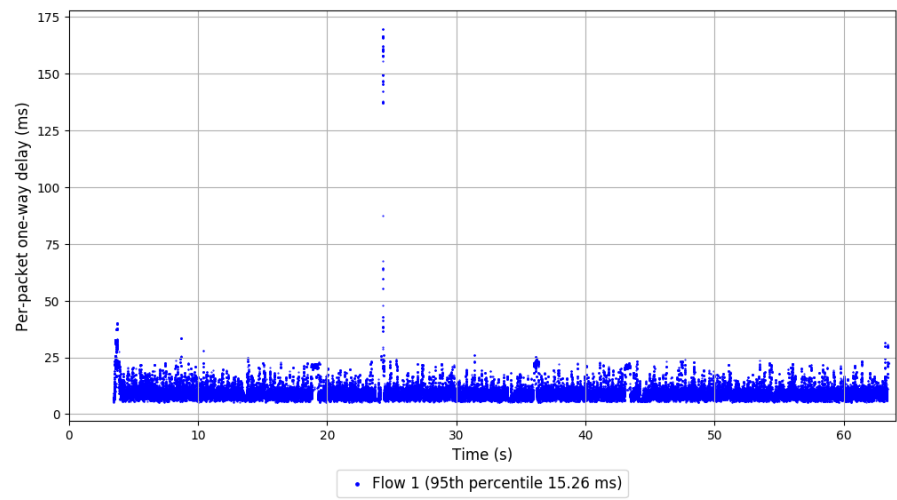
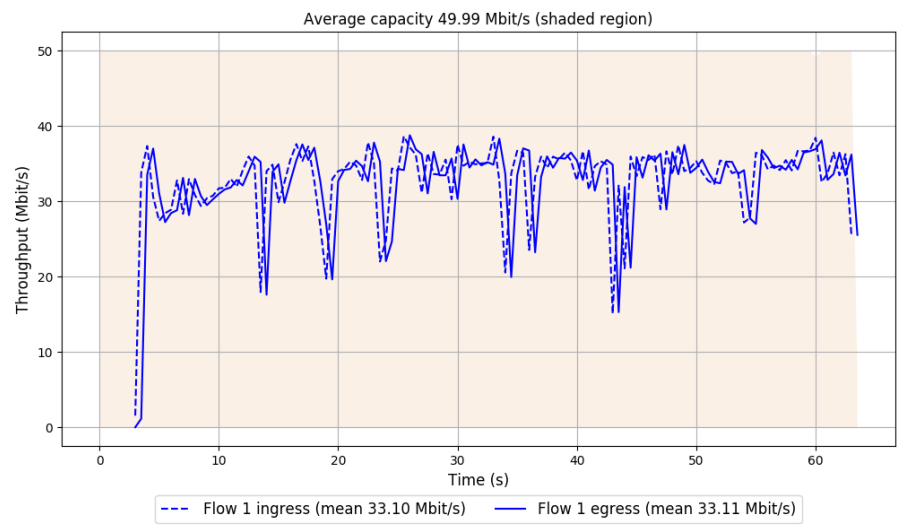
-- Flow 1:

Average throughput: 33.11 Mbit/s

95th percentile per-packet one-way delay: 15.259 ms

Loss rate: 0.02%

Run 3: Report of TCP BBR — Data Link



Run 4: Statistics of TCP BBR

Start at: 2025-04-18 00:21:54

End at: 2025-04-18 00:22:54

Below is generated by plot.py at 2025-04-18 00:28:05

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 30.45 Mbit/s (60.9% utilization)

95th percentile per-packet one-way delay: 16.486 ms

Loss rate: 0.02%

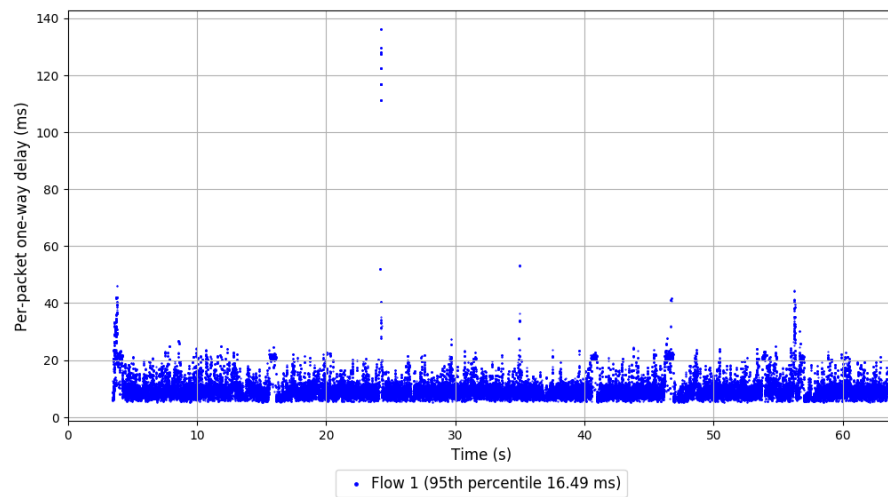
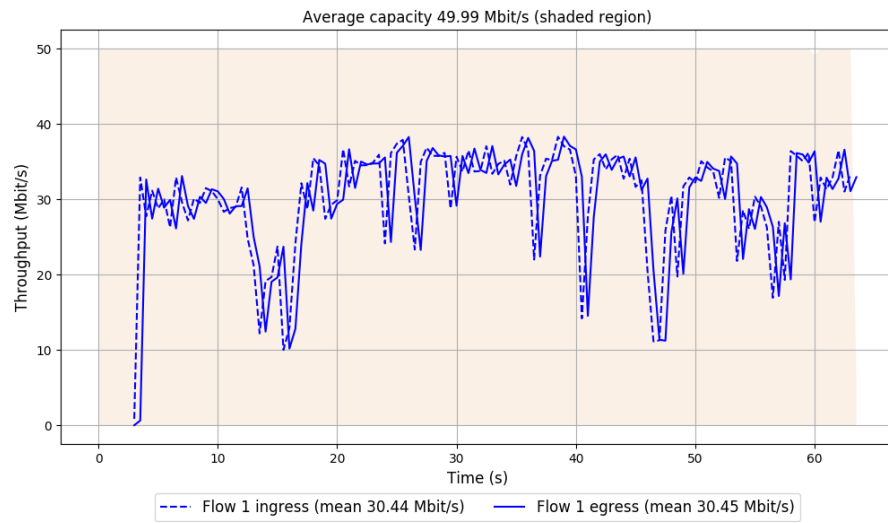
-- Flow 1:

Average throughput: 30.45 Mbit/s

95th percentile per-packet one-way delay: 16.486 ms

Loss rate: 0.02%

Run 4: Report of TCP BBR — Data Link



Run 5: Statistics of TCP BBR

Start at: 2025-04-18 00:25:23

End at: 2025-04-18 00:26:23

Below is generated by plot.py at 2025-04-18 00:28:10

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 33.40 Mbit/s (66.8% utilization)

95th percentile per-packet one-way delay: 14.756 ms

Loss rate: 0.02%

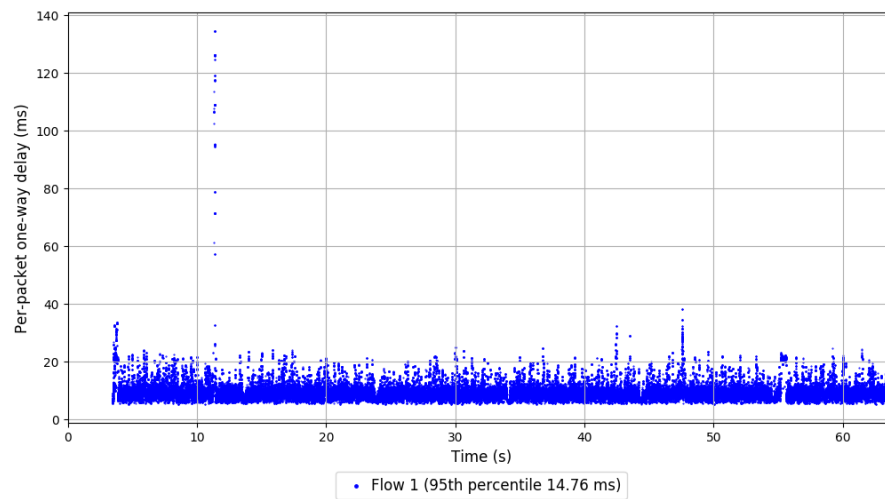
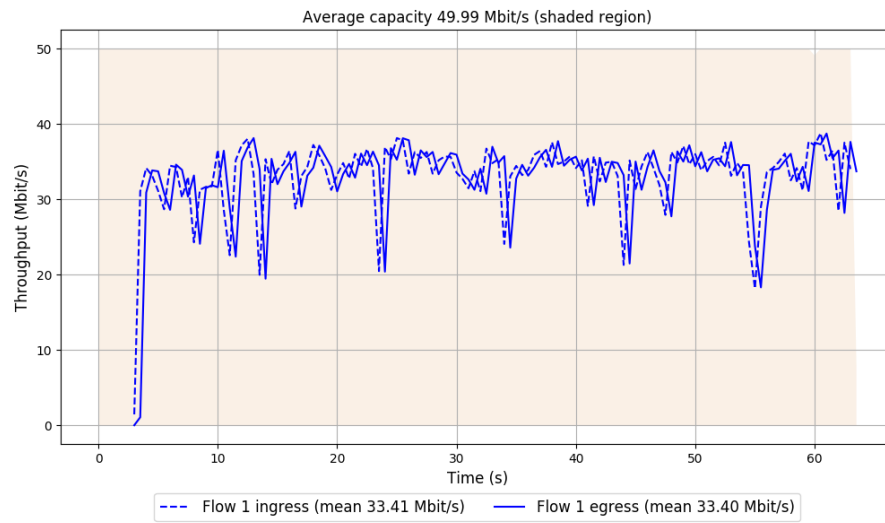
-- Flow 1:

Average throughput: 33.40 Mbit/s

95th percentile per-packet one-way delay: 14.756 ms

Loss rate: 0.02%

Run 5: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2025-04-17 21:43:09

End at: 2025-04-18 00:04:58

Below is generated by plot.py at 2025-04-18 00:29:23

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 0.03 Mbit/s (0.1% utilization)

95th percentile per-packet one-way delay: 45.214 ms

Loss rate: 1.28%

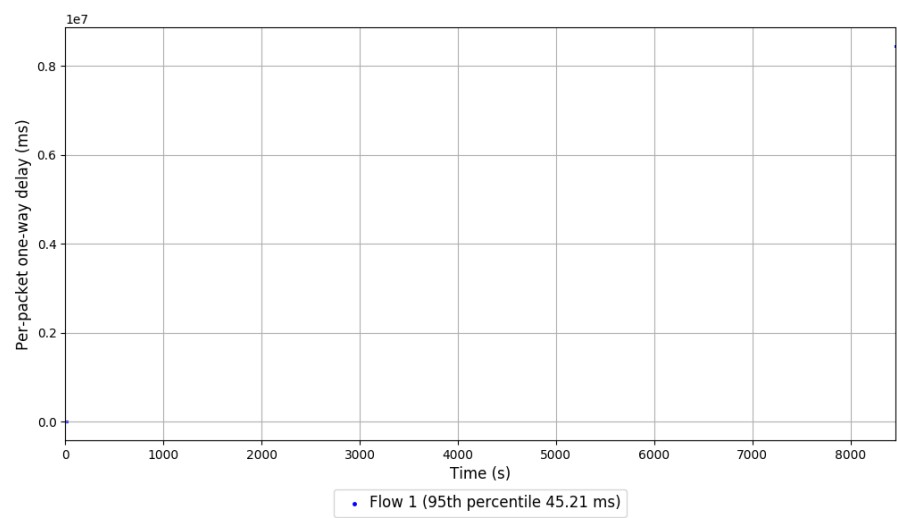
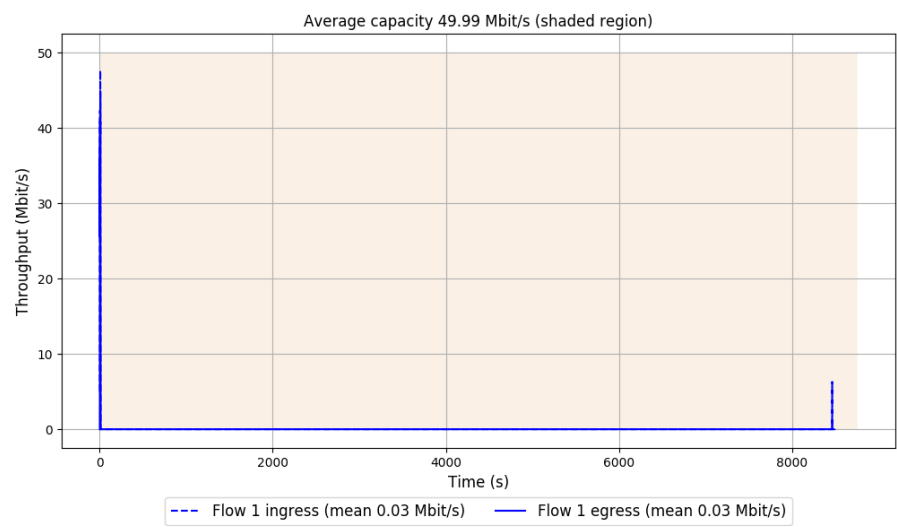
-- Flow 1:

Average throughput: 0.03 Mbit/s

95th percentile per-packet one-way delay: 45.214 ms

Loss rate: 1.28%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2025-04-18 00:13:38

End at: 2025-04-18 00:14:38

Below is generated by plot.py at 2025-04-18 00:29:29

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 44.51 Mbit/s (89.0% utilization)

95th percentile per-packet one-way delay: 84.517 ms

Loss rate: 0.12%

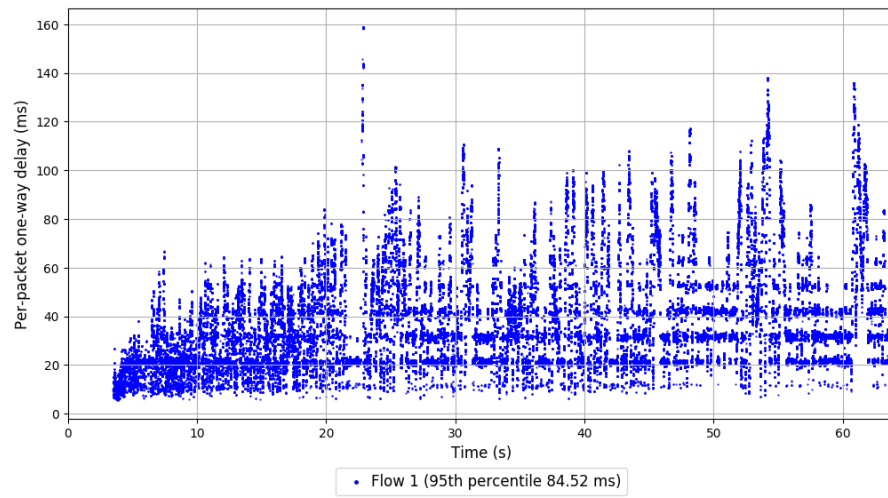
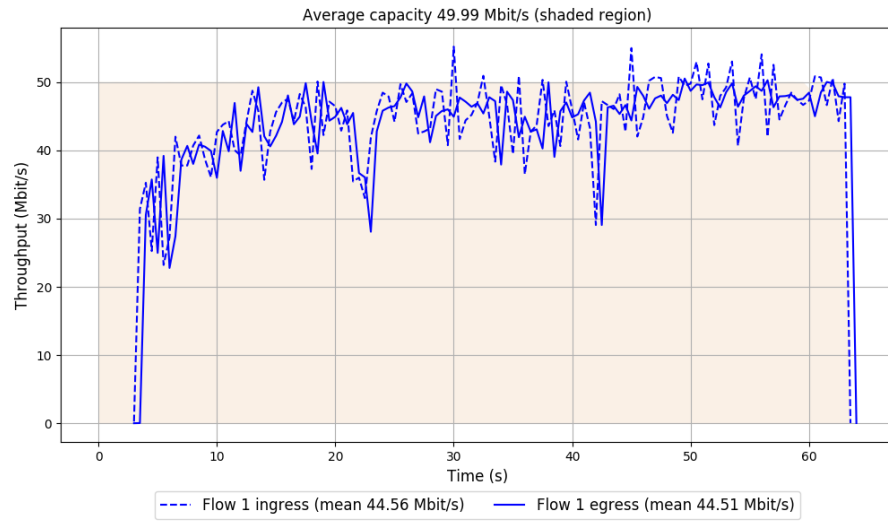
-- Flow 1:

Average throughput: 44.51 Mbit/s

95th percentile per-packet one-way delay: 84.517 ms

Loss rate: 0.12%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2025-04-18 00:17:08

End at: 2025-04-18 00:18:08

Below is generated by plot.py at 2025-04-18 00:29:34

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 44.93 Mbit/s (89.9% utilization)

95th percentile per-packet one-way delay: 123.303 ms

Loss rate: 0.12%

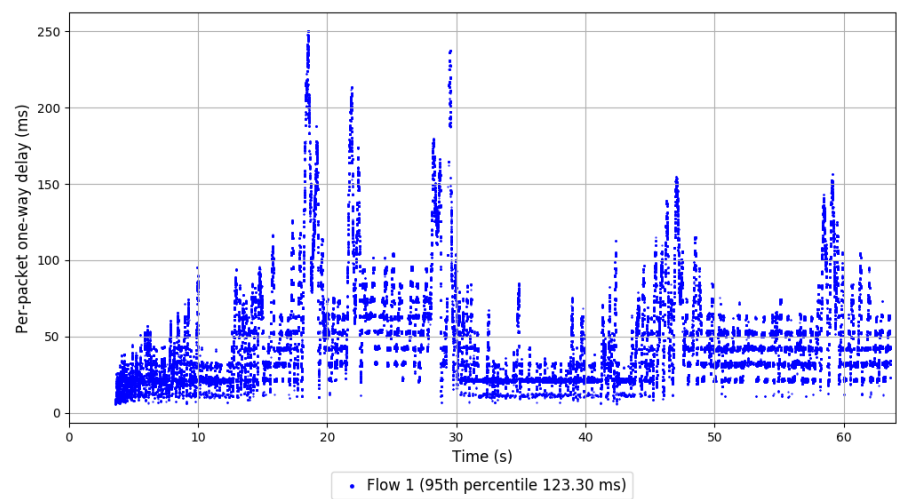
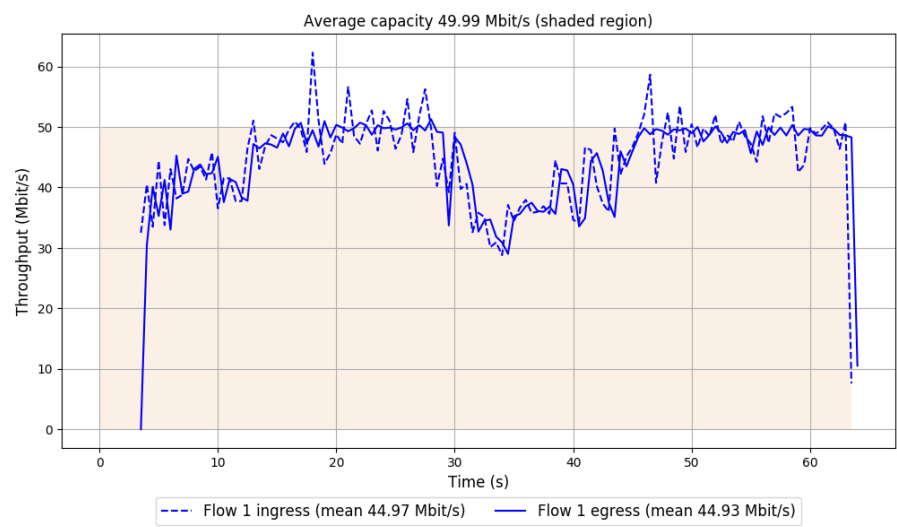
-- Flow 1:

Average throughput: 44.93 Mbit/s

95th percentile per-packet one-way delay: 123.303 ms

Loss rate: 0.12%

Run 3: Report of TCP Cubic — Data Link



Run 4: Statistics of TCP Cubic

Start at: 2025-04-18 00:20:42

End at: 2025-04-18 00:21:42

Below is generated by plot.py at 2025-04-18 00:29:40

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 47.13 Mbit/s (94.3% utilization)

95th percentile per-packet one-way delay: 91.663 ms

Loss rate: 0.11%

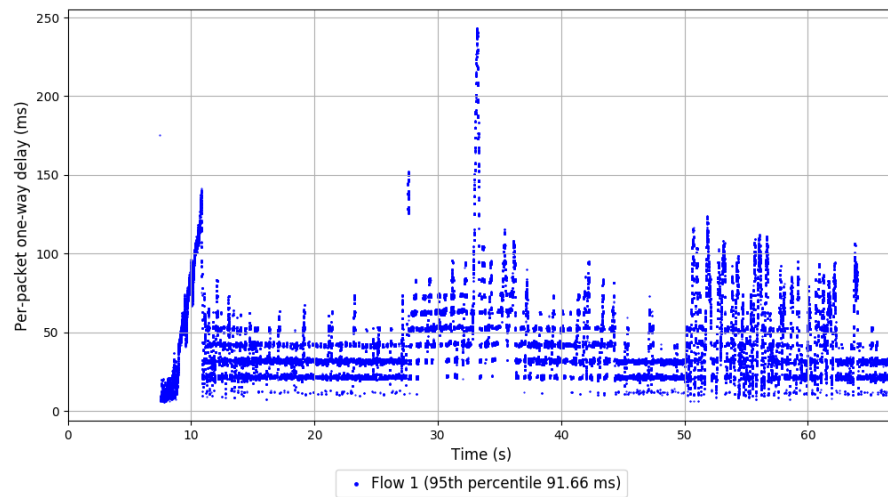
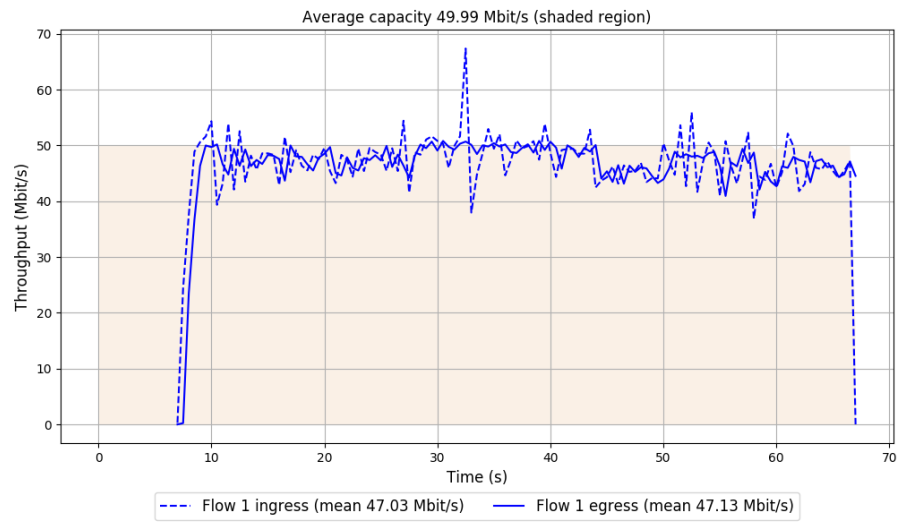
-- Flow 1:

Average throughput: 47.13 Mbit/s

95th percentile per-packet one-way delay: 91.663 ms

Loss rate: 0.11%

Run 4: Report of TCP Cubic — Data Link



Run 5: Statistics of TCP Cubic

Start at: 2025-04-18 00:24:11

End at: 2025-04-18 00:25:11

Below is generated by plot.py at 2025-04-18 00:29:46

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 46.47 Mbit/s (93.0% utilization)

95th percentile per-packet one-way delay: 95.556 ms

Loss rate: 0.27%

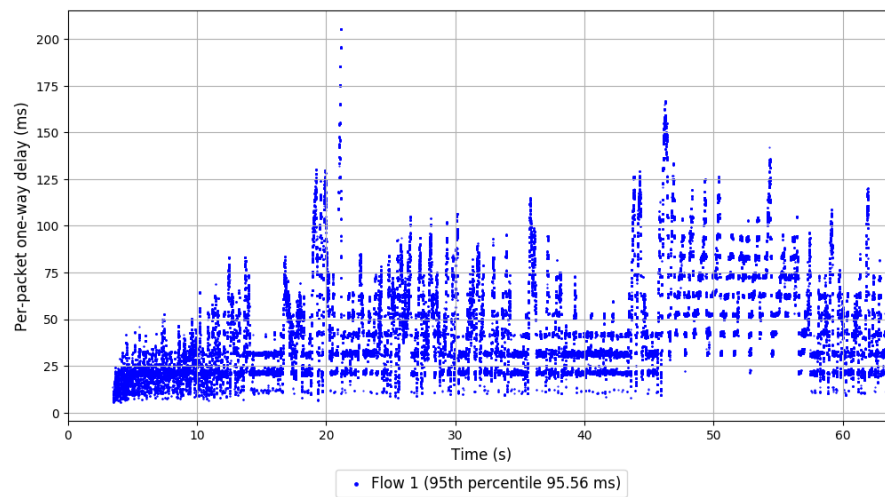
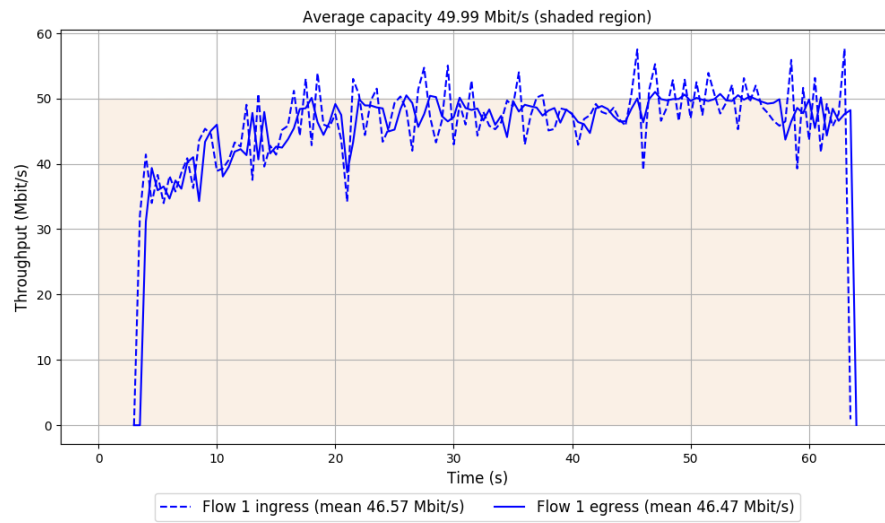
-- Flow 1:

Average throughput: 46.47 Mbit/s

95th percentile per-packet one-way delay: 95.556 ms

Loss rate: 0.27%

Run 5: Report of TCP Cubic — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2025-04-18 00:12:32

End at: 2025-04-18 00:13:32

Below is generated by plot.py at 2025-04-18 00:29:47

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 1.09 Mbit/s (2.2% utilization)

95th percentile per-packet one-way delay: 21.043 ms

Loss rate: 0.04%

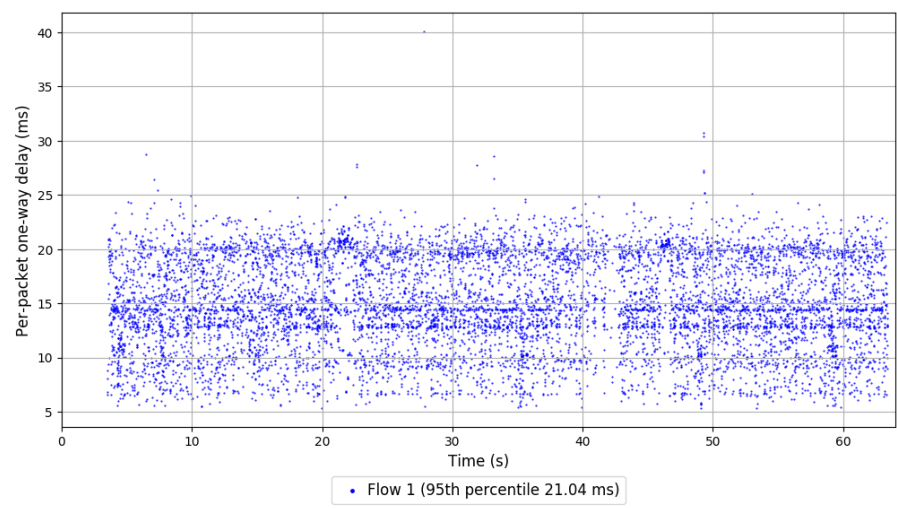
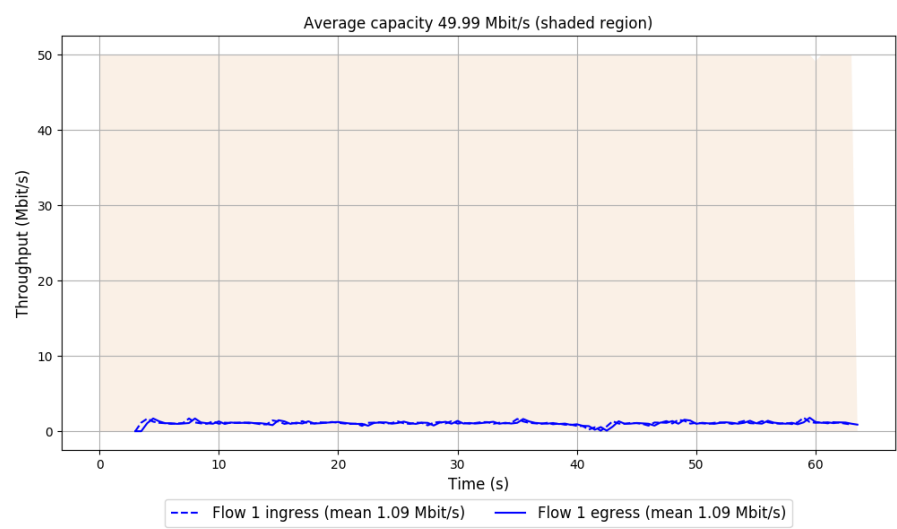
-- Flow 1:

Average throughput: 1.09 Mbit/s

95th percentile per-packet one-way delay: 21.043 ms

Loss rate: 0.04%

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2025-04-18 00:16:01

End at: 2025-04-18 00:17:01

Below is generated by plot.py at 2025-04-18 00:29:49

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 1.27 Mbit/s (2.5% utilization)

95th percentile per-packet one-way delay: 20.777 ms

Loss rate: 0.02%

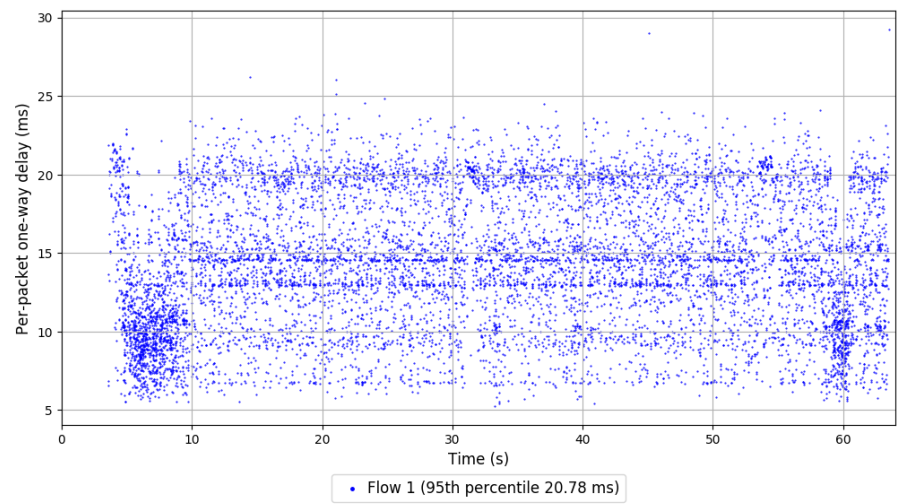
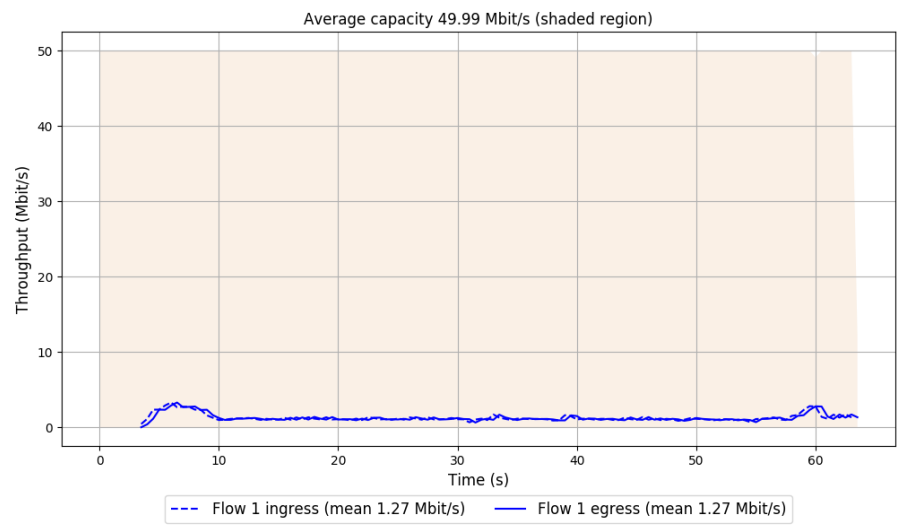
-- Flow 1:

Average throughput: 1.27 Mbit/s

95th percentile per-packet one-way delay: 20.777 ms

Loss rate: 0.02%

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2025-04-18 00:19:31

End at: 2025-04-18 00:20:31

Below is generated by plot.py at 2025-04-18 00:29:50

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 1.16 Mbit/s (2.3% utilization)

95th percentile per-packet one-way delay: 20.892 ms

Loss rate: 0.00%

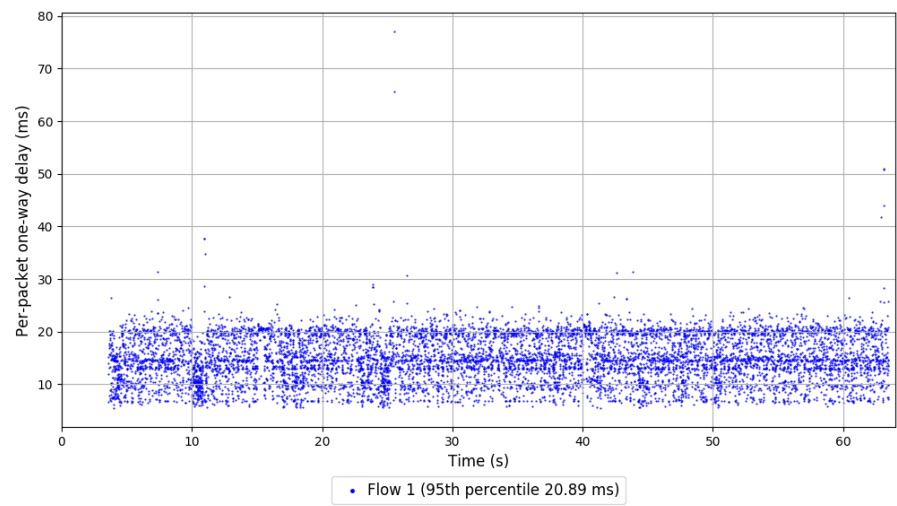
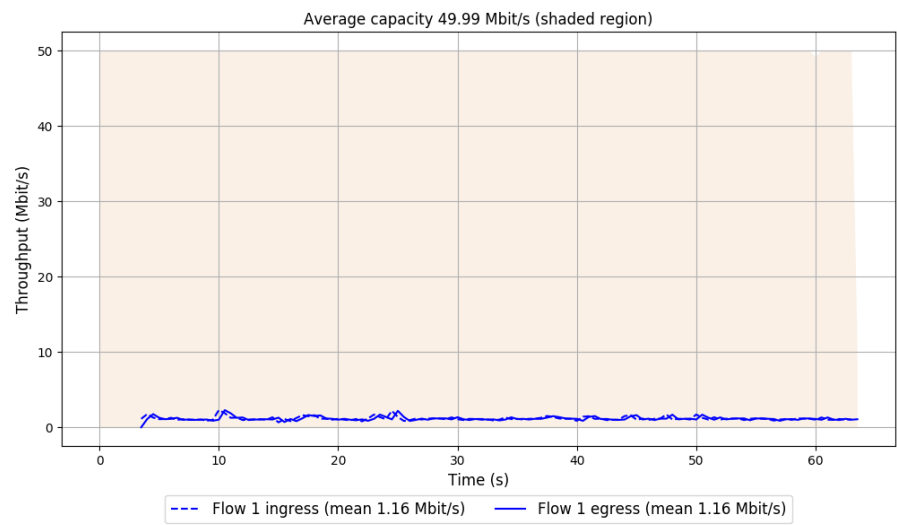
-- Flow 1:

Average throughput: 1.16 Mbit/s

95th percentile per-packet one-way delay: 20.892 ms

Loss rate: 0.00%

Run 3: Report of PCC-Vivace — Data Link



Run 4: Statistics of PCC-Vivace

Start at: 2025-04-18 00:23:04

End at: 2025-04-18 00:24:04

Below is generated by plot.py at 2025-04-18 00:29:52

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 1.64 Mbit/s (3.3% utilization)

95th percentile per-packet one-way delay: 20.626 ms

Loss rate: 0.01%

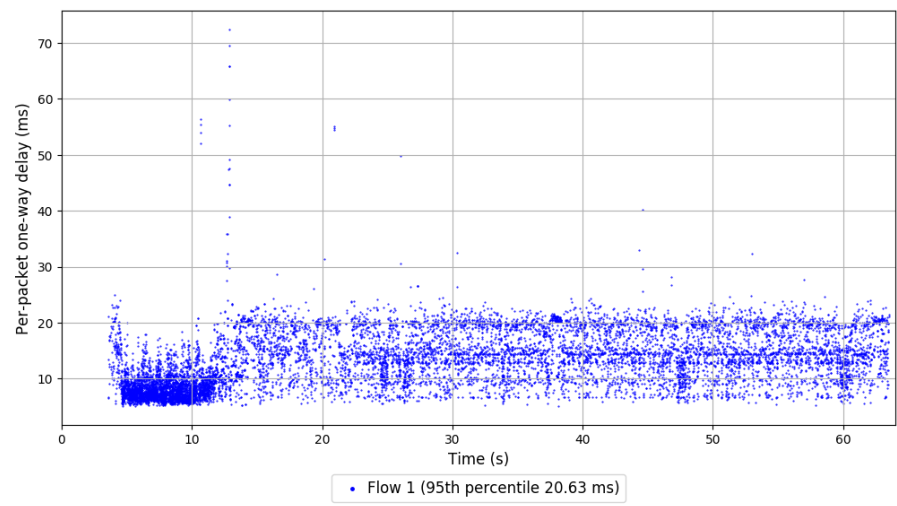
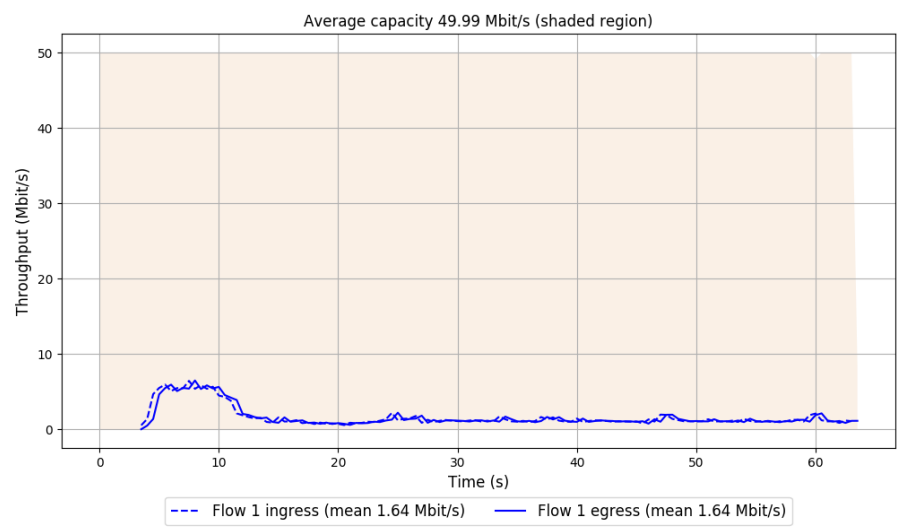
-- Flow 1:

Average throughput: 1.64 Mbit/s

95th percentile per-packet one-way delay: 20.626 ms

Loss rate: 0.01%

Run 4: Report of PCC-Vivace — Data Link



Run 5: Statistics of PCC-Vivace

Start at: 2025-04-18 00:26:33

End at: 2025-04-18 00:27:34

Below is generated by plot.py at 2025-04-18 00:29:53

Datalink statistics

-- Total of 1 flow:

Average capacity: 49.99 Mbit/s

Average throughput: 1.18 Mbit/s (2.4% utilization)

95th percentile per-packet one-way delay: 20.828 ms

Loss rate: 0.02%

-- Flow 1:

Average throughput: 1.18 Mbit/s

95th percentile per-packet one-way delay: 20.828 ms

Loss rate: 0.02%

Run 5: Report of PCC-Vivace — Data Link

