

Pantheon Report

Generated at 2019-10-22 17:22:53 (UTC).

Tested in mahimahi: mm-delay 40 mm-link 5mbps.trace 5mbps.trace --uplink-queue=droptail
--uplink-queue-args=packets=300

Repeated the test of 4 congestion control schemes 5 times.

Each test lasted for 30 seconds running 1 flow.

System info:

Linux 4.15.0-65-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 87380 6291456
net.ipv4.tcp_wmem = 4096 16384 4194304

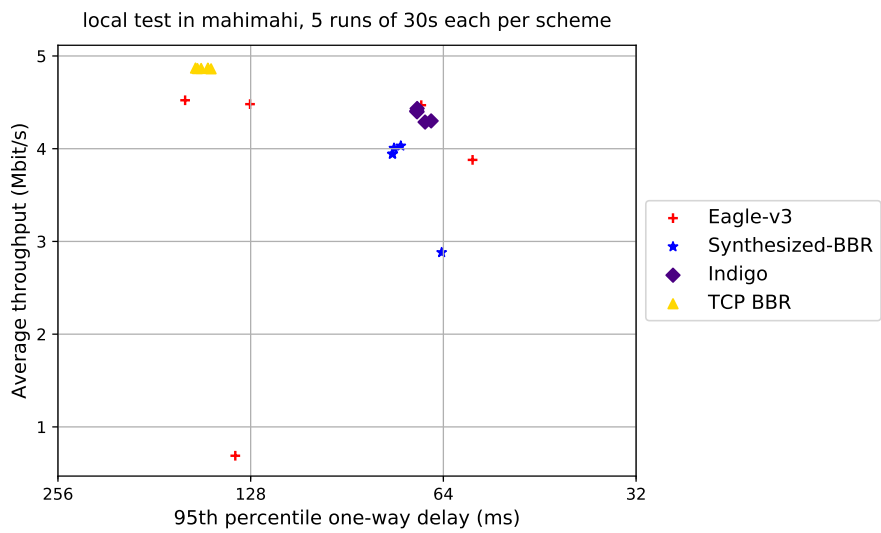
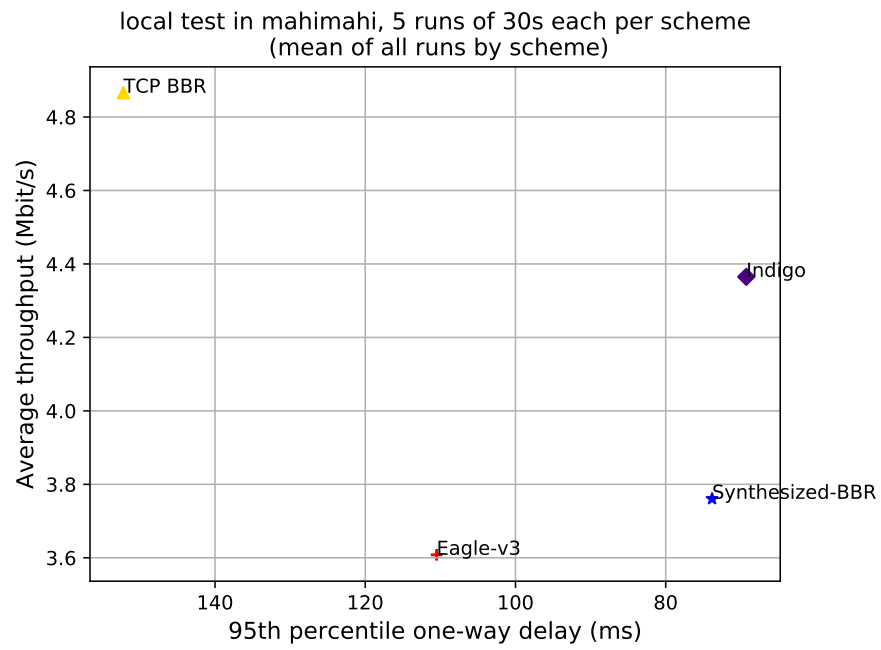
Git summary:

branch: master @ b54fc866b3140559c1fa1782d26fa636f7a43a8d
third_party/aurora @ f3e943d61015b39960854ba6391797e0c7984d74
third_party/aurora-model @ e292c316c23fb837255c4e142e40590d154bbe95
third_party/eagle-v1 @ c68d985e042be5c30704c0aee48c363861951a95
third_party/eagle-v2 @ c8a1737b3c84d7d49eada5b8785045d272a70120
third_party/eagle-v3 @ a63fea7809d9b57a6dbfc95c54181b54157c2b45
M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/datagram_pb2.cpython-36
M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/helpers.cpython-36.pyc
M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/mahimahi.cpython-36.pyc
M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/project_root.cpython-36
M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/receiver.cpython-36.pyc
M sender-receiver/sender-receiver/sender_receiver/envs/model-xentropy/model-xentropy.pt
M sender-receiver/sender-receiver/sender_receiver/logs.txt
third_party/llp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/llp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfc58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
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-quick @ 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/synthesizedBBR @ a63fea7809d9b57a6dbfc95c54181b54157c2b45
M sender-receiver/sender-receiver/sender_receiver/__pycache__/__init__.cpython-36.pyc
M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/__init__.cpython-36.pyc
M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/datagram_pb2.cpython-36.pyc
M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/helpers.cpython-36.pyc
M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/mahimahi.cpython-36.pyc
M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/project_root.cpython-36.pyc
M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/receiver.cpython-36.pyc
M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/sender_receiver_env.cpython-36.pyc
M sender-receiver/sender-receiver/sender_receiver/envs/model-xentropy/model-xentropy.py
M sender-receiver/sender-receiver/sender_receiver/envs/sender_receiver_env.py
M sender-receiver/sender-receiver/sender_receiver/logs.txt
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	4.87	152.19	0.47
Eagle-v3	5	3.61	110.50	0.16
Indigo	5	4.37	69.27	0.17
Synthesized-BBR	5	3.76	73.83	0.23

Run 1: Statistics of TCP BBR

Start at: 2019-10-22 17:04:16

End at: 2019-10-22 17:04:46

Below is generated by plot.py at 2019-10-22 17:22:29

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.87 Mbit/s (97.4% utilization)

95th percentile per-packet one-way delay: 156.079 ms

Loss rate: 0.46%

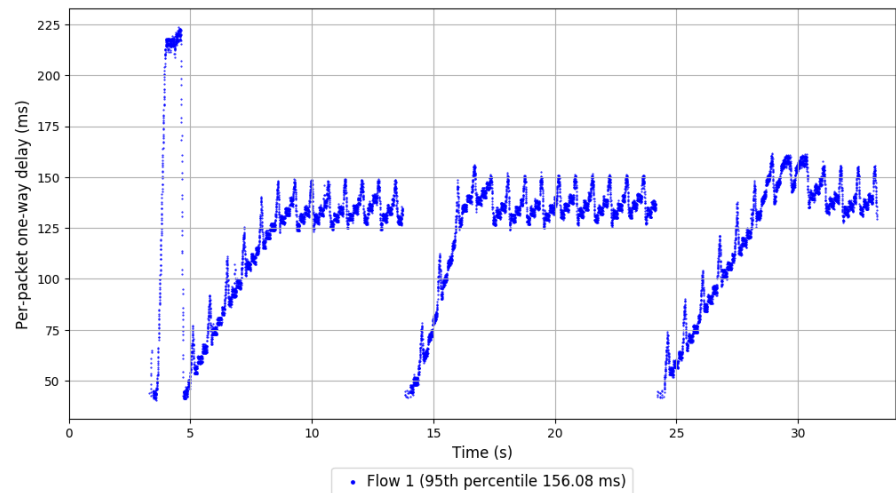
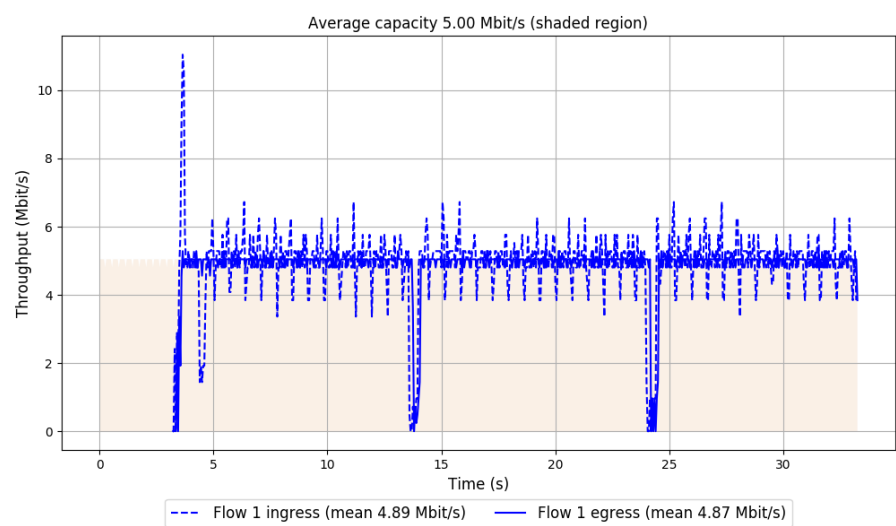
-- Flow 1:

Average throughput: 4.87 Mbit/s

95th percentile per-packet one-way delay: 156.079 ms

Loss rate: 0.46%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2019-10-22 17:06:32

End at: 2019-10-22 17:07:03

Below is generated by plot.py at 2019-10-22 17:22:30

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.87 Mbit/s (97.3% utilization)

95th percentile per-packet one-way delay: 152.964 ms

Loss rate: 0.49%

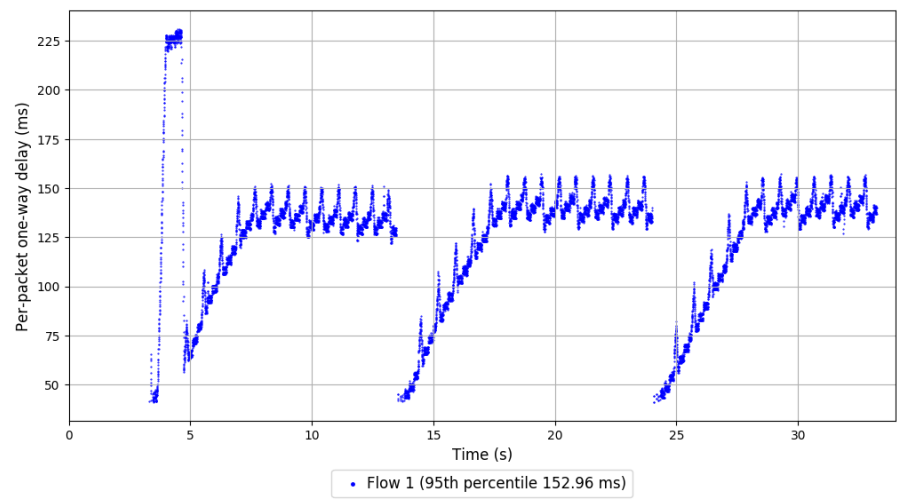
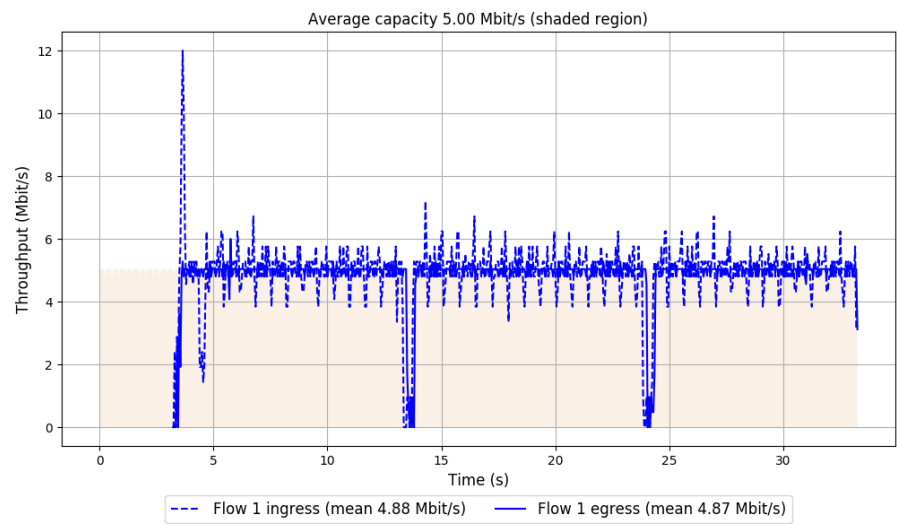
-- Flow 1:

Average throughput: 4.87 Mbit/s

95th percentile per-packet one-way delay: 152.964 ms

Loss rate: 0.49%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2019-10-22 17:08:49

End at: 2019-10-22 17:09:19

Below is generated by plot.py at 2019-10-22 17:22:30

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.87 Mbit/s (97.4% utilization)

95th percentile per-packet one-way delay: 149.297 ms

Loss rate: 0.47%

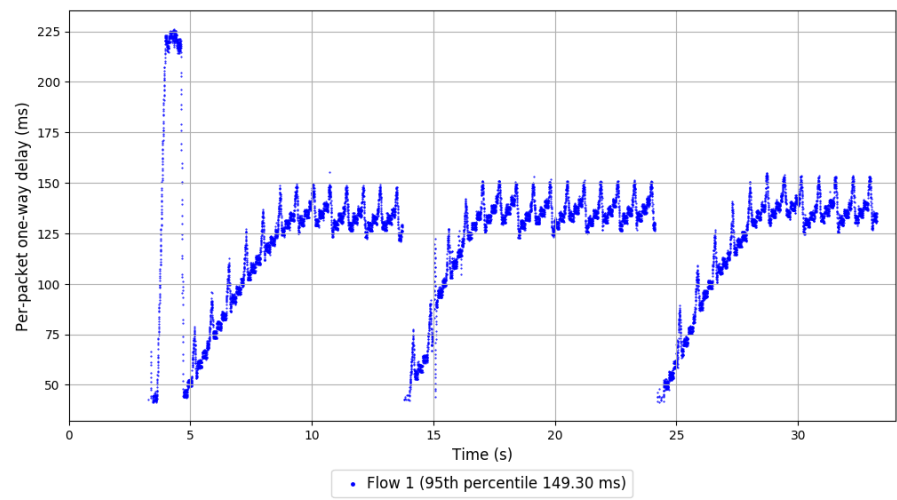
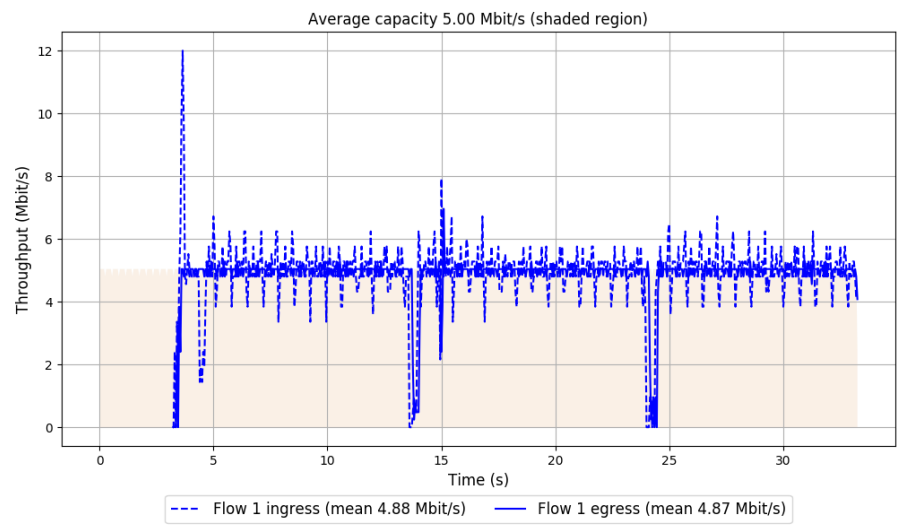
-- Flow 1:

Average throughput: 4.87 Mbit/s

95th percentile per-packet one-way delay: 149.297 ms

Loss rate: 0.47%

Run 3: Report of TCP BBR — Data Link



Run 4: Statistics of TCP BBR

Start at: 2019-10-22 17:11:05

End at: 2019-10-22 17:11:35

Below is generated by plot.py at 2019-10-22 17:22:30

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.86 Mbit/s (97.2% utilization)

95th percentile per-packet one-way delay: 147.598 ms

Loss rate: 0.43%

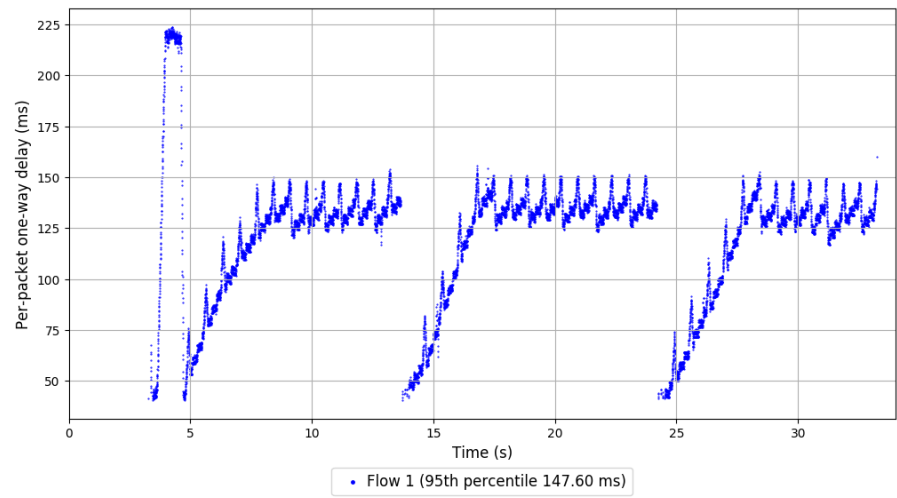
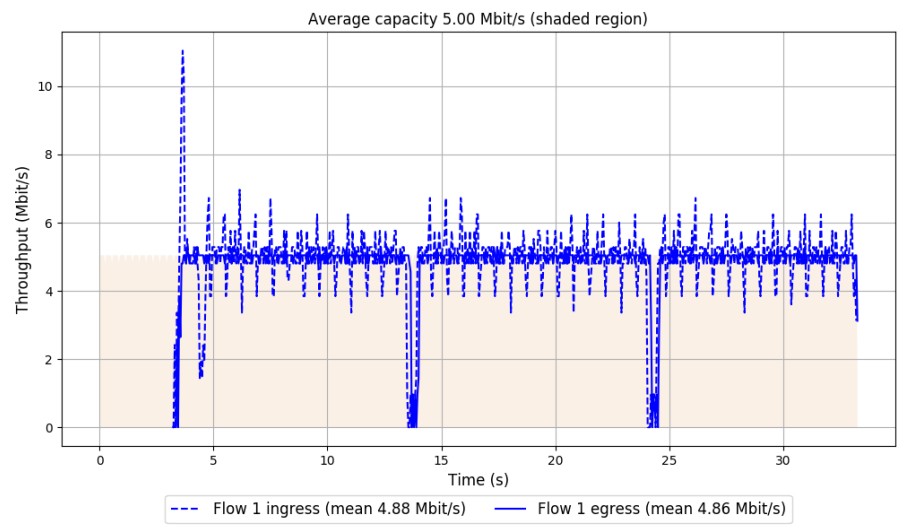
-- Flow 1:

Average throughput: 4.86 Mbit/s

95th percentile per-packet one-way delay: 147.598 ms

Loss rate: 0.43%

Run 4: Report of TCP BBR — Data Link



Run 5: Statistics of TCP BBR

Start at: 2019-10-22 17:13:21

End at: 2019-10-22 17:13:51

Below is generated by plot.py at 2019-10-22 17:22:33

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.86 Mbit/s (97.3% utilization)

95th percentile per-packet one-way delay: 155.003 ms

Loss rate: 0.52%

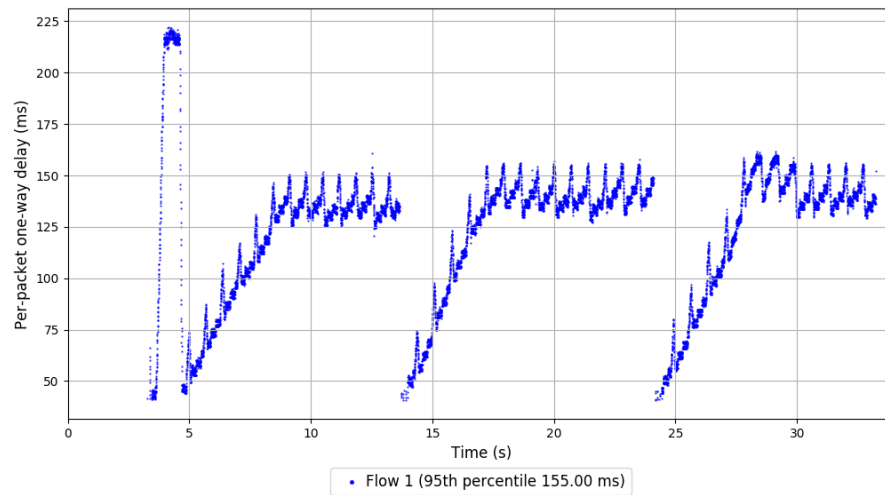
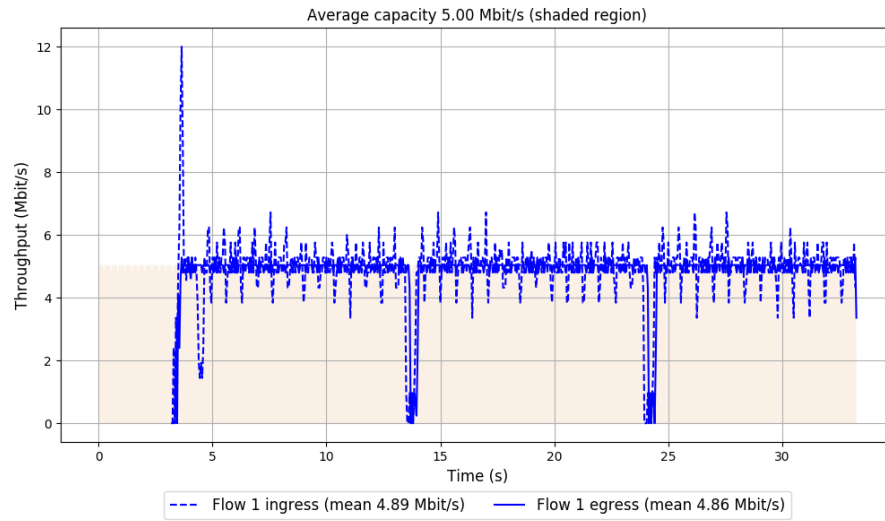
-- Flow 1:

Average throughput: 4.86 Mbit/s

95th percentile per-packet one-way delay: 155.003 ms

Loss rate: 0.52%

Run 5: Report of TCP BBR — Data Link



Run 1: Statistics of Eagle-v3

Start at: 2019-10-22 17:03:08

End at: 2019-10-22 17:03:38

Below is generated by plot.py at 2019-10-22 17:22:35

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.48 Mbit/s (89.6% utilization)

95th percentile per-packet one-way delay: 128.297 ms

Loss rate: 0.24%

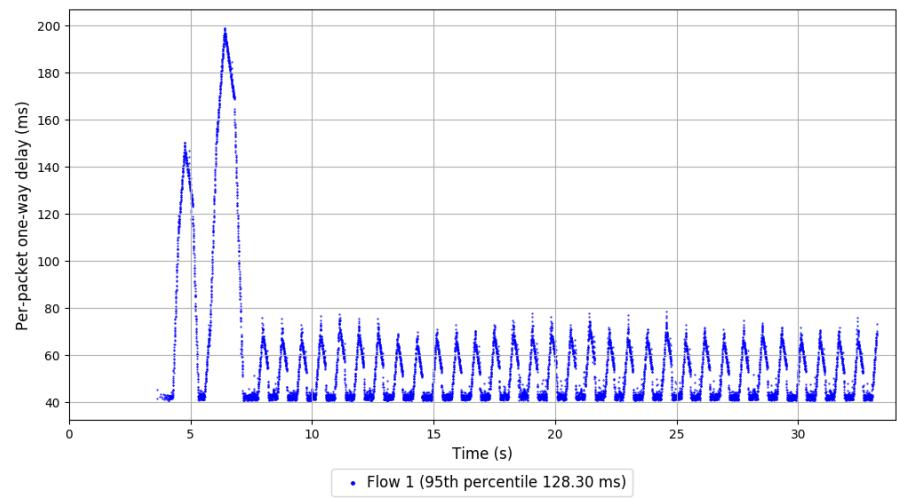
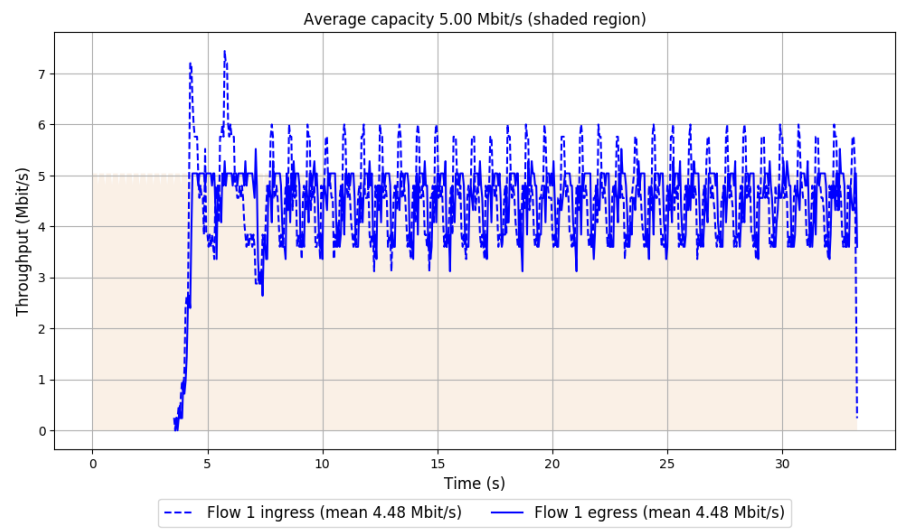
-- Flow 1:

Average throughput: 4.48 Mbit/s

95th percentile per-packet one-way delay: 128.297 ms

Loss rate: 0.24%

Run 1: Report of Eagle-v3 — Data Link



Run 2: Statistics of Eagle-v3

Start at: 2019-10-22 17:05:24

End at: 2019-10-22 17:05:54

Below is generated by plot.py at 2019-10-22 17:22:35

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.47 Mbit/s (89.4% utilization)

95th percentile per-packet one-way delay: 69.297 ms

Loss rate: 0.19%

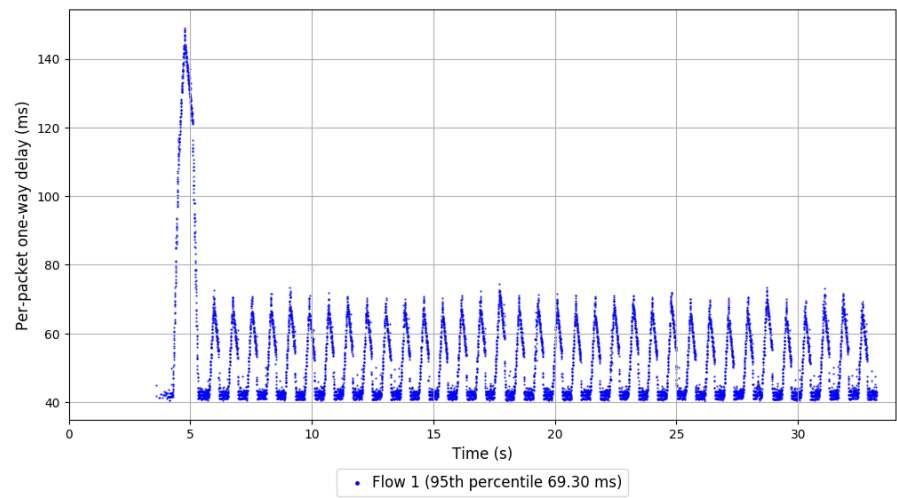
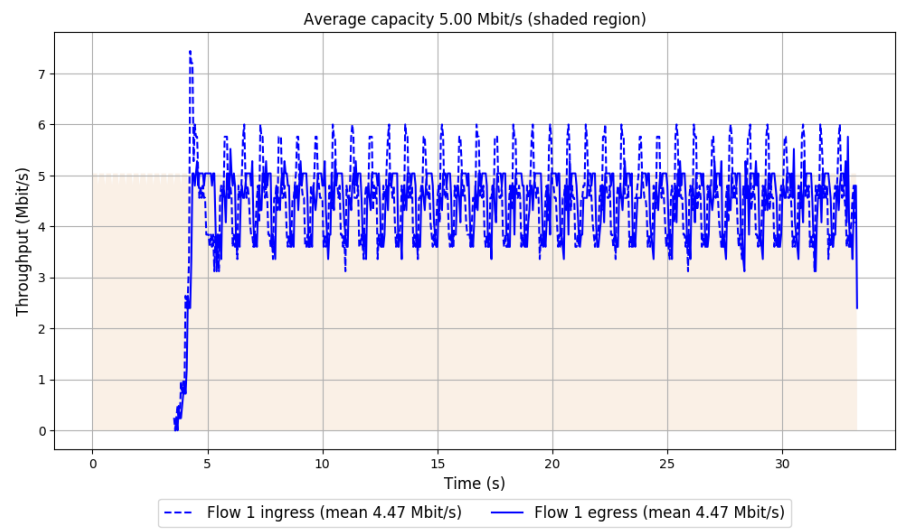
-- Flow 1:

Average throughput: 4.47 Mbit/s

95th percentile per-packet one-way delay: 69.297 ms

Loss rate: 0.19%

Run 2: Report of Eagle-v3 — Data Link



Run 3: Statistics of Eagle-v3

Start at: 2019-10-22 17:07:41

End at: 2019-10-22 17:08:11

Below is generated by plot.py at 2019-10-22 17:22:35

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 0.69 Mbit/s (13.8% utilization)

95th percentile per-packet one-way delay: 135.277 ms

Loss rate: 0.00%

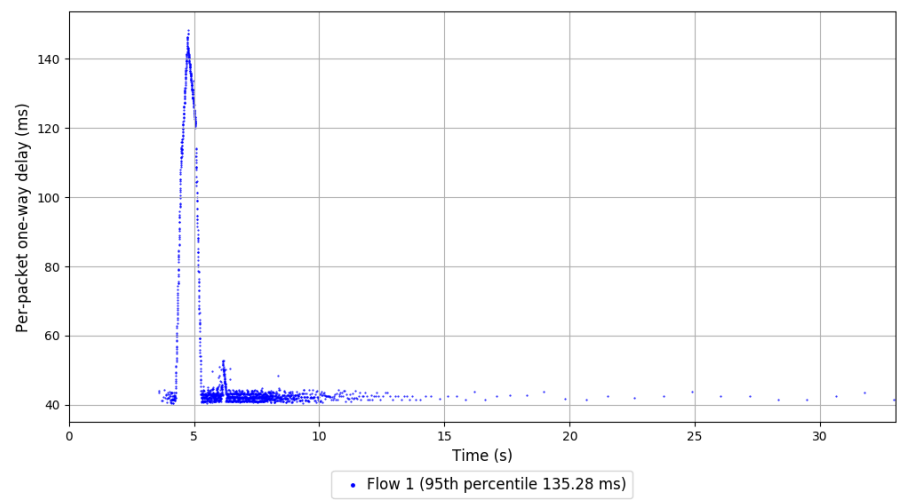
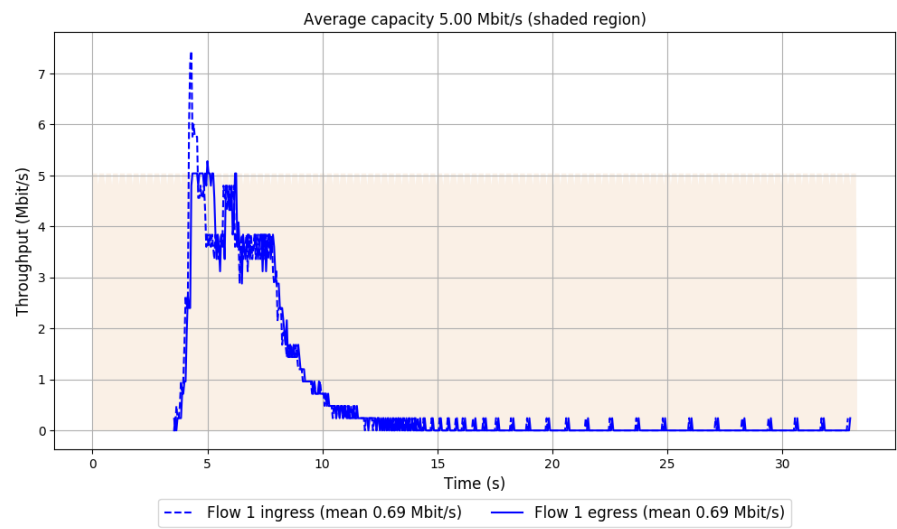
-- Flow 1:

Average throughput: 0.69 Mbit/s

95th percentile per-packet one-way delay: 135.277 ms

Loss rate: 0.00%

Run 3: Report of Eagle-v3 — Data Link



Run 4: Statistics of Eagle-v3

Start at: 2019-10-22 17:09:57

End at: 2019-10-22 17:10:27

Below is generated by plot.py at 2019-10-22 17:22:39

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 3.88 Mbit/s (77.6% utilization)

95th percentile per-packet one-way delay: 57.620 ms

Loss rate: 0.15%

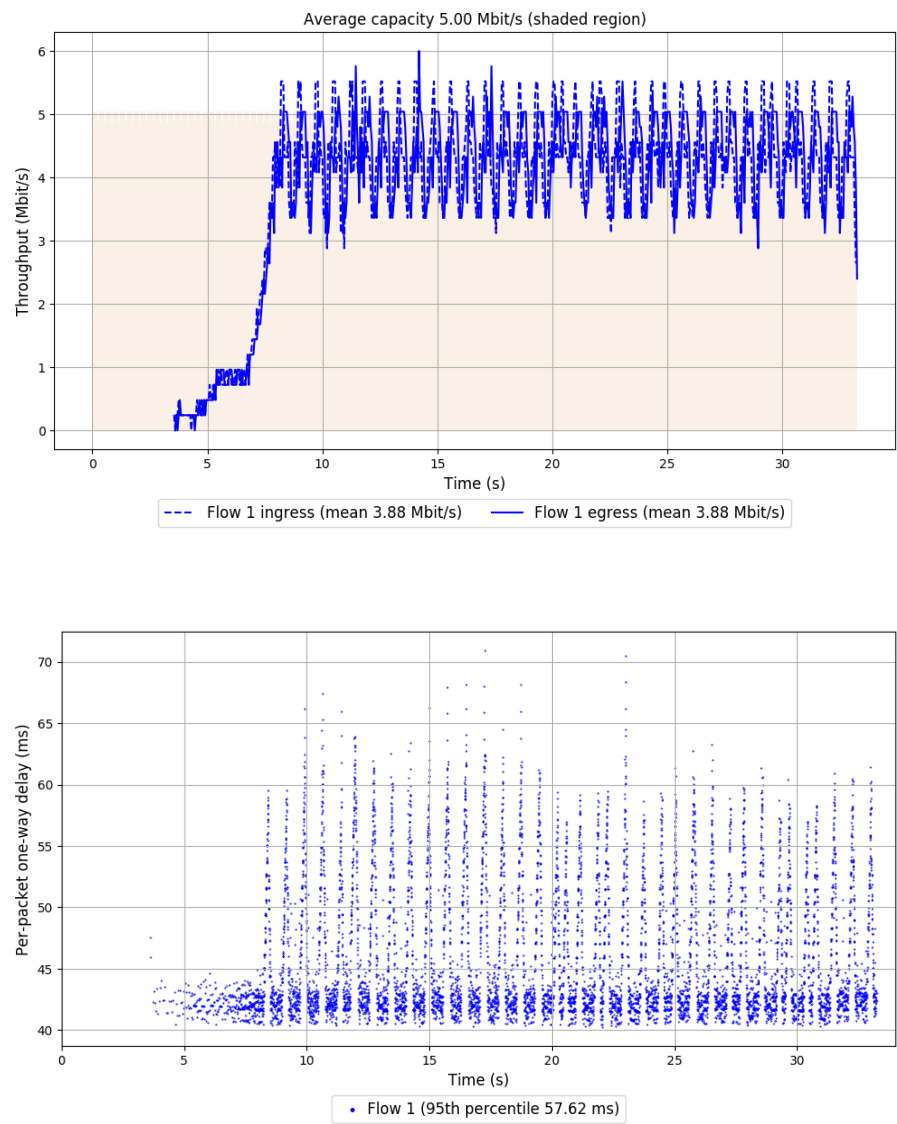
-- Flow 1:

Average throughput: 3.88 Mbit/s

95th percentile per-packet one-way delay: 57.620 ms

Loss rate: 0.15%

Run 4: Report of Eagle-v3 — Data Link



Run 5: Statistics of Eagle-v3

Start at: 2019-10-22 17:12:13

End at: 2019-10-22 17:12:43

Below is generated by plot.py at 2019-10-22 17:22:40

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.52 Mbit/s (90.4% utilization)

95th percentile per-packet one-way delay: 162.030 ms

Loss rate: 0.22%

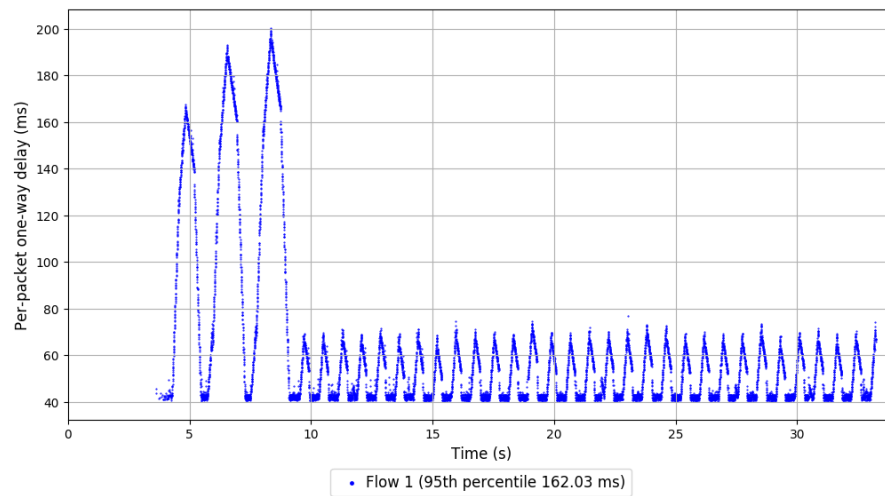
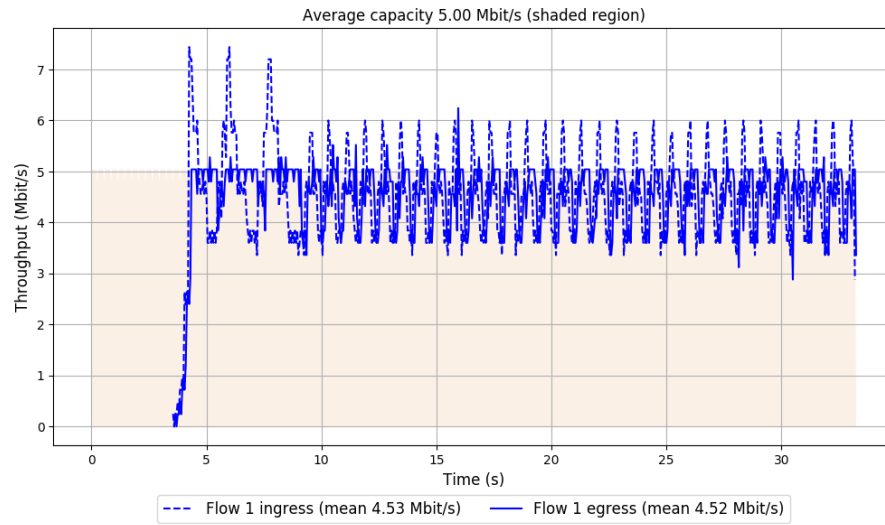
-- Flow 1:

Average throughput: 4.52 Mbit/s

95th percentile per-packet one-way delay: 162.030 ms

Loss rate: 0.22%

Run 5: Report of Eagle-v3 — Data Link



Run 1: Statistics of Indigo

Start at: 2019-10-22 17:04:50

End at: 2019-10-22 17:05:20

Below is generated by plot.py at 2019-10-22 17:22:40

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.40 Mbit/s (87.9% utilization)

95th percentile per-packet one-way delay: 70.360 ms

Loss rate: 0.15%

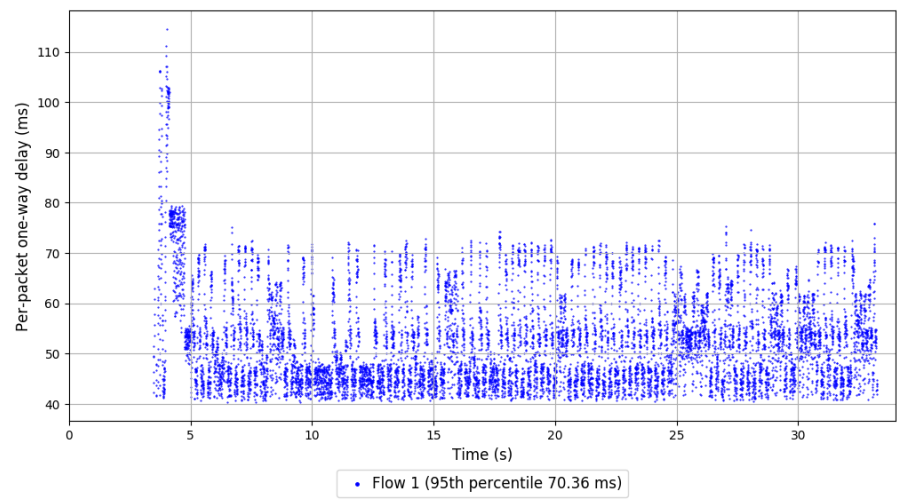
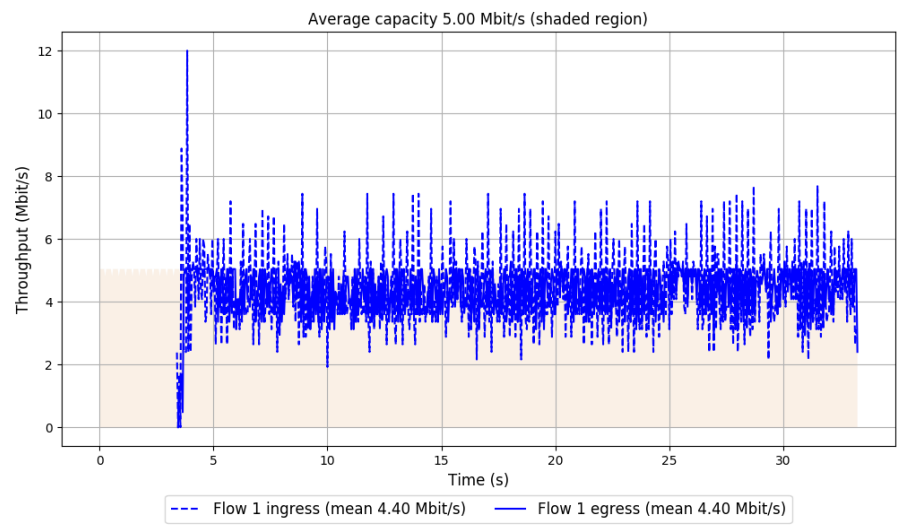
-- Flow 1:

Average throughput: 4.40 Mbit/s

95th percentile per-packet one-way delay: 70.360 ms

Loss rate: 0.15%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2019-10-22 17:07:07

End at: 2019-10-22 17:07:37

Below is generated by plot.py at 2019-10-22 17:22:42

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.41 Mbit/s (88.1% utilization)

95th percentile per-packet one-way delay: 70.447 ms

Loss rate: 0.20%

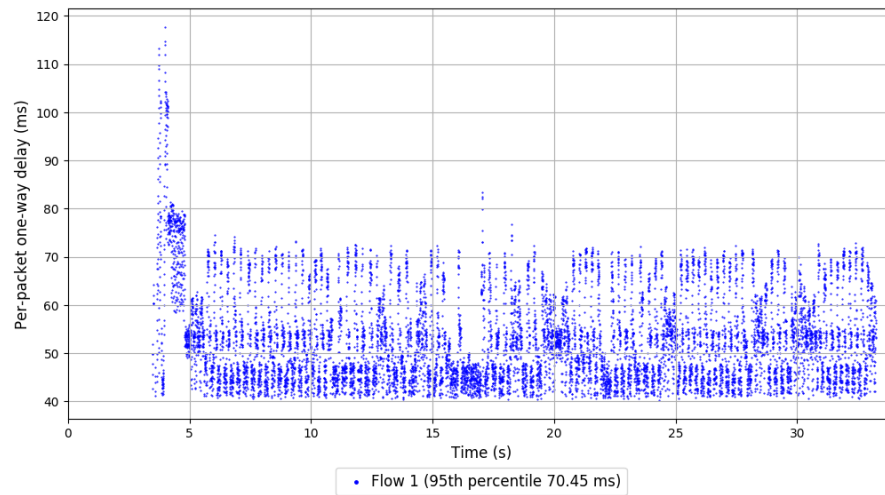
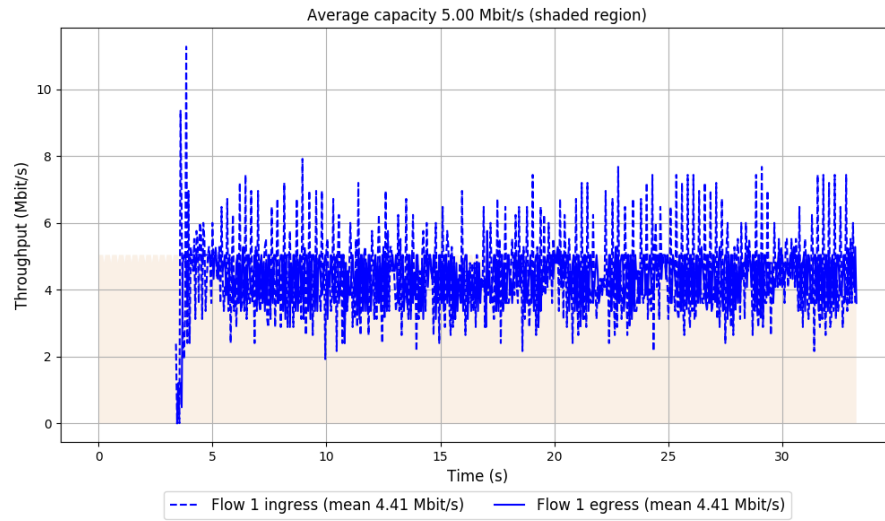
-- Flow 1:

Average throughput: 4.41 Mbit/s

95th percentile per-packet one-way delay: 70.447 ms

Loss rate: 0.20%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2019-10-22 17:09:23

End at: 2019-10-22 17:09:53

Below is generated by plot.py at 2019-10-22 17:22:43

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.29 Mbit/s (85.7% utilization)

95th percentile per-packet one-way delay: 68.352 ms

Loss rate: 0.17%

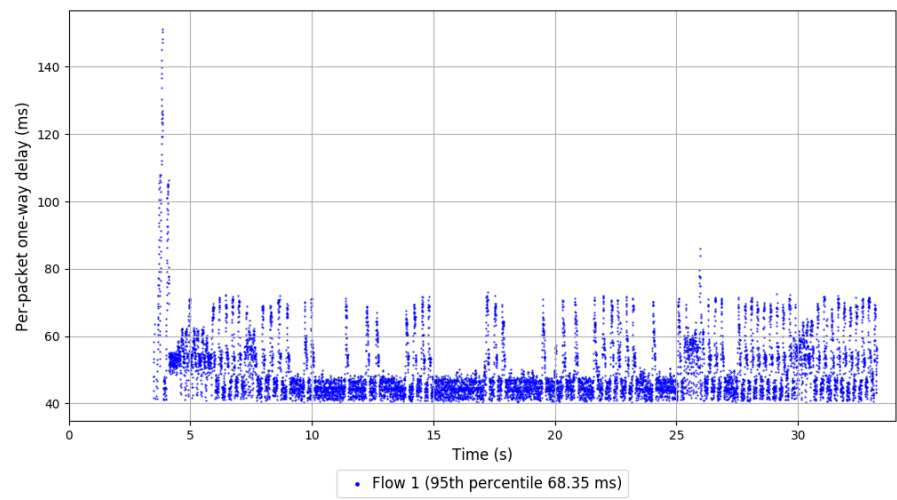
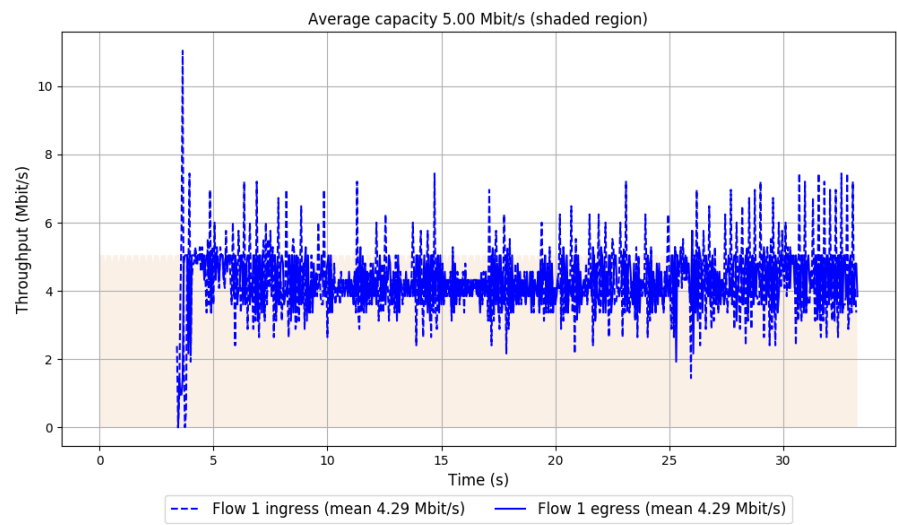
-- Flow 1:

Average throughput: 4.29 Mbit/s

95th percentile per-packet one-way delay: 68.352 ms

Loss rate: 0.17%

Run 3: Report of Indigo — Data Link



Run 4: Statistics of Indigo

Start at: 2019-10-22 17:11:39

End at: 2019-10-22 17:12:09

Below is generated by plot.py at 2019-10-22 17:22:44

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.43 Mbit/s (88.7% utilization)

95th percentile per-packet one-way delay: 70.333 ms

Loss rate: 0.18%

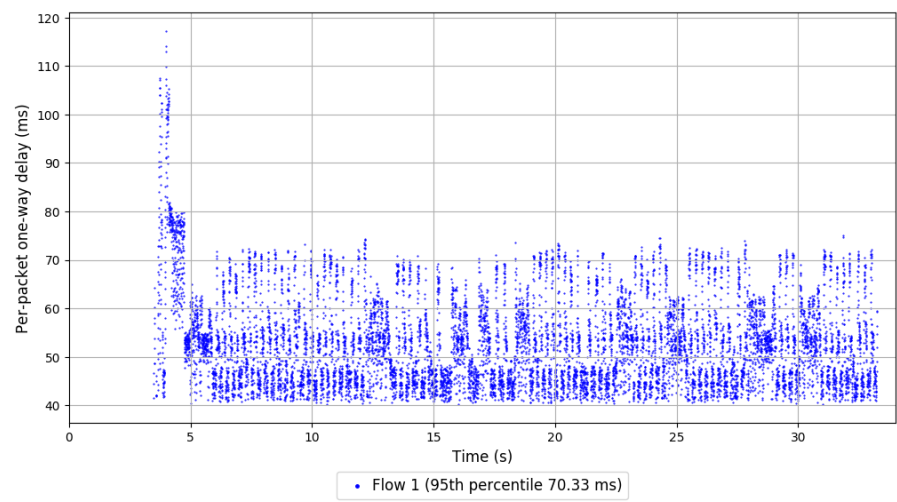
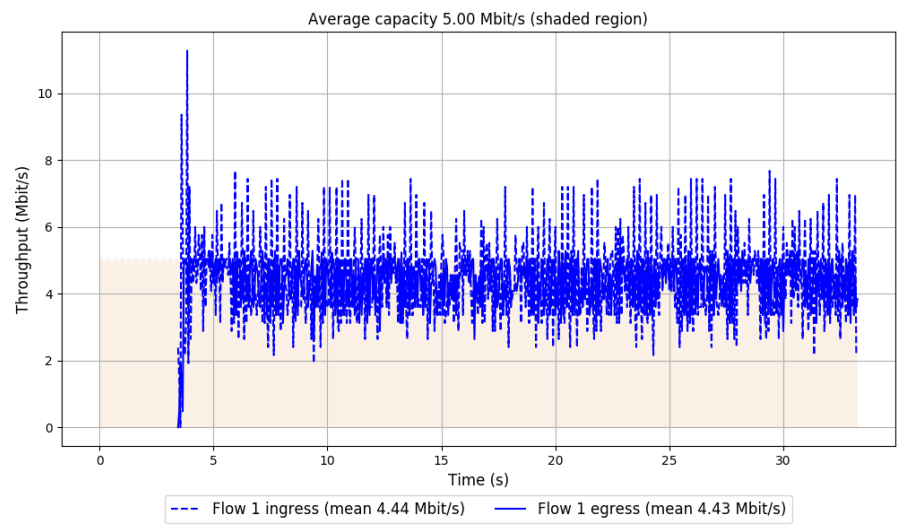
-- Flow 1:

Average throughput: 4.43 Mbit/s

95th percentile per-packet one-way delay: 70.333 ms

Loss rate: 0.18%

Run 4: Report of Indigo — Data Link



Run 5: Statistics of Indigo

Start at: 2019-10-22 17:13:55

End at: 2019-10-22 17:14:25

Below is generated by plot.py at 2019-10-22 17:22:46

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.30 Mbit/s (86.0% utilization)

95th percentile per-packet one-way delay: 66.878 ms

Loss rate: 0.17%

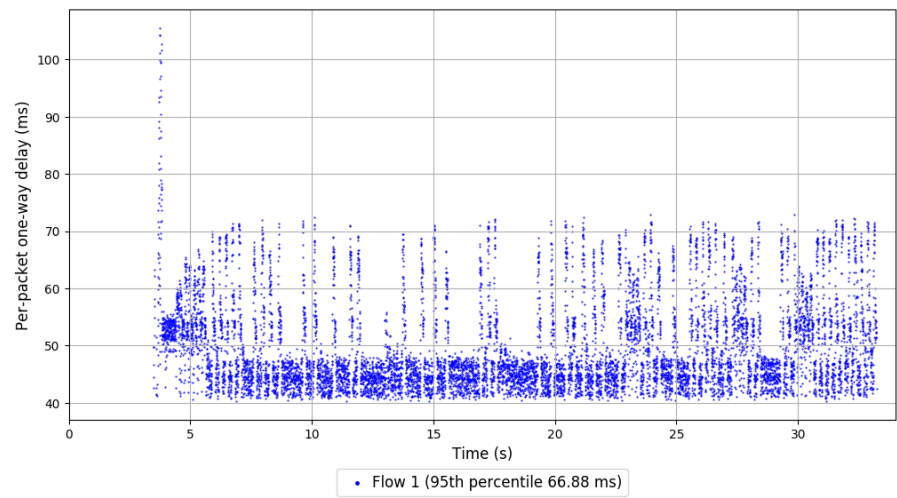
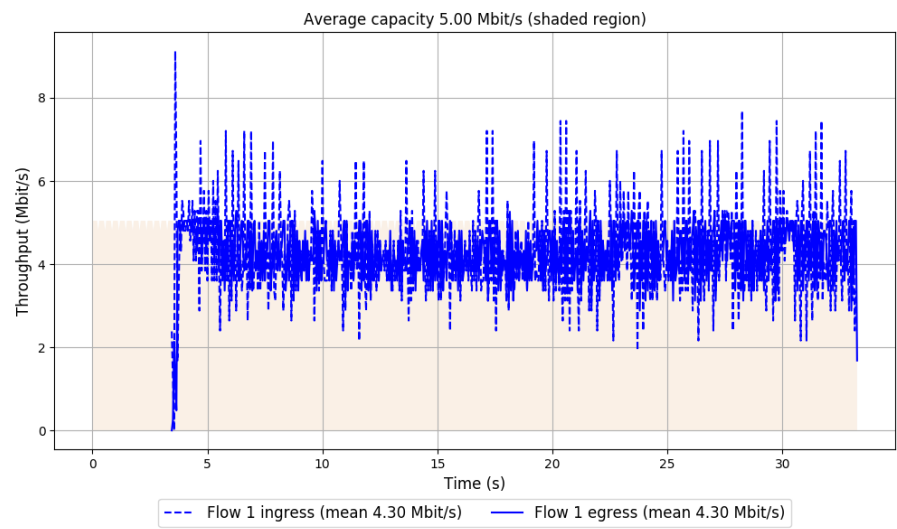
-- Flow 1:

Average throughput: 4.30 Mbit/s

95th percentile per-packet one-way delay: 66.878 ms

Loss rate: 0.17%

Run 5: Report of Indigo — Data Link



Run 1: Statistics of Synthesized-BBR

Start at: 2019-10-22 17:03:42

End at: 2019-10-22 17:04:12

Below is generated by plot.py at 2019-10-22 17:22:48

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.03 Mbit/s (80.6% utilization)

95th percentile per-packet one-way delay: 74.594 ms

Loss rate: 0.30%

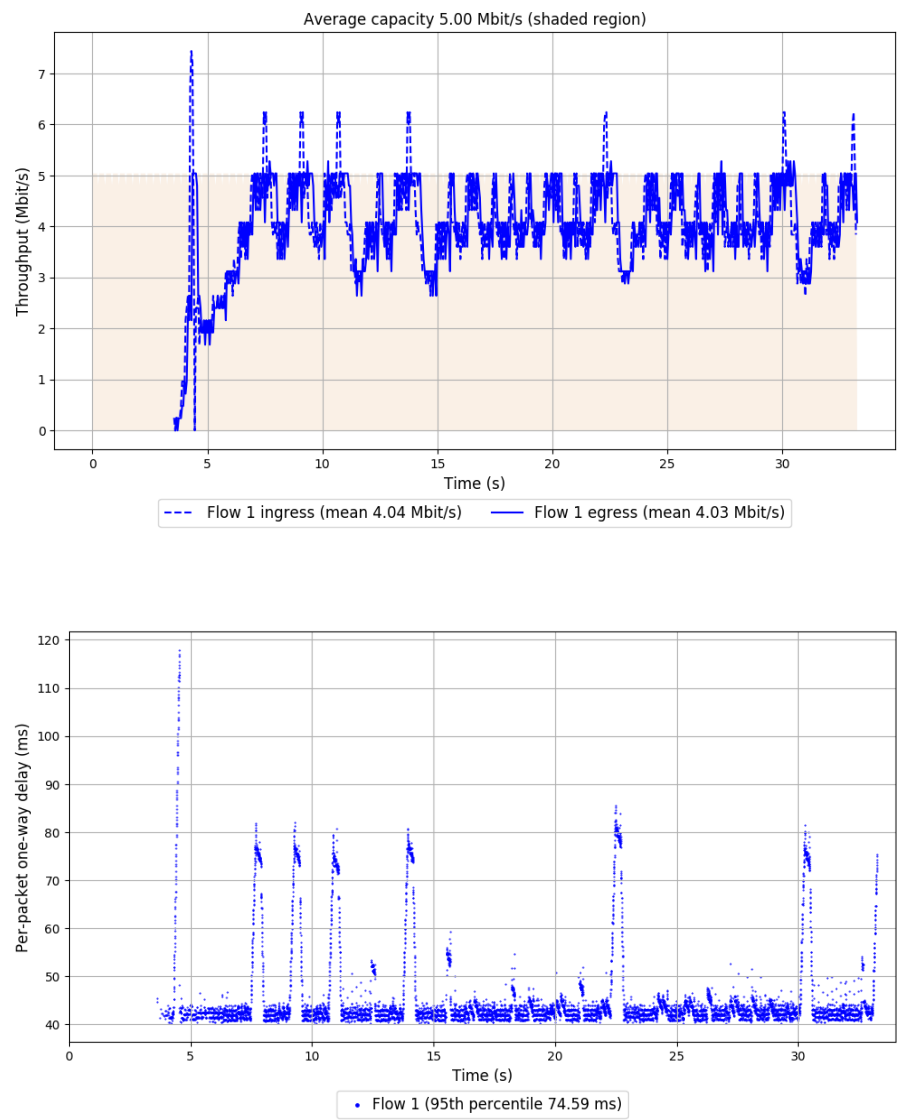
-- Flow 1:

Average throughput: 4.03 Mbit/s

95th percentile per-packet one-way delay: 74.594 ms

Loss rate: 0.30%

Run 1: Report of Synthesized-BBR — Data Link



Run 2: Statistics of Synthesized-BBR

Start at: 2019-10-22 17:05:58

End at: 2019-10-22 17:06:28

Below is generated by plot.py at 2019-10-22 17:22:49

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 3.94 Mbit/s (78.8% utilization)

95th percentile per-packet one-way delay: 76.913 ms

Loss rate: 0.16%

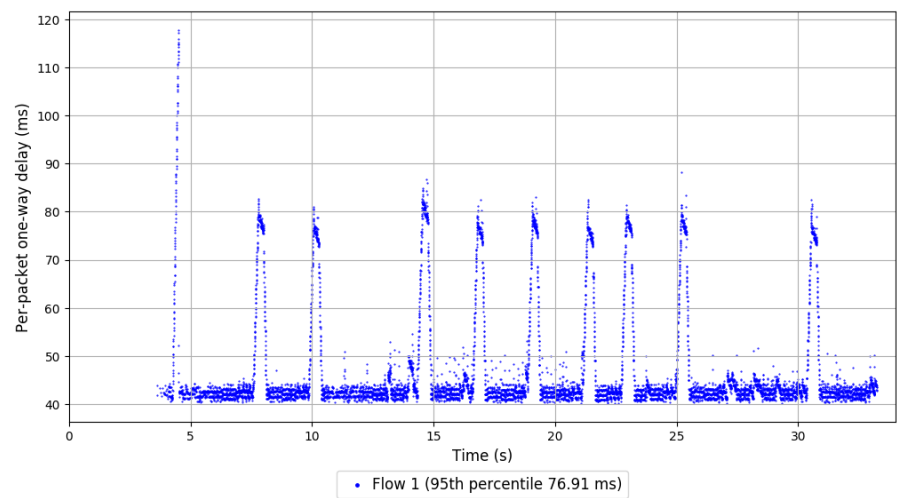
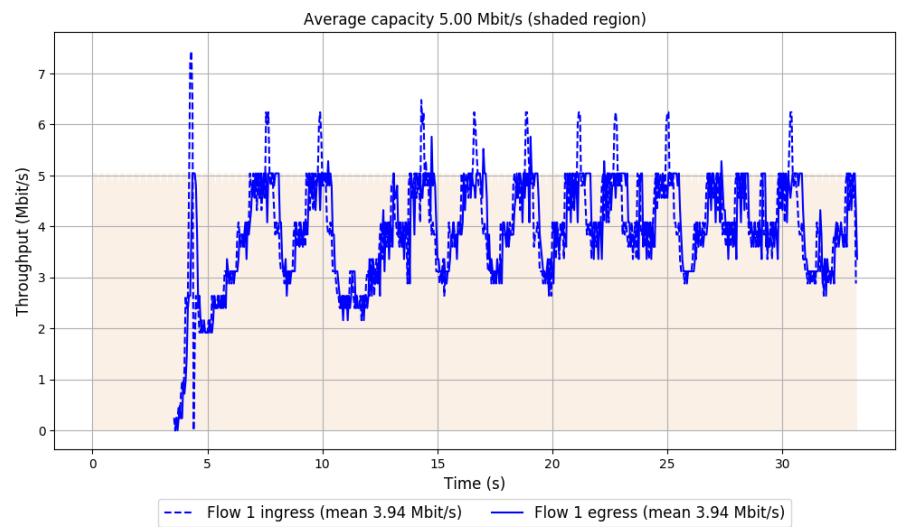
-- Flow 1:

Average throughput: 3.94 Mbit/s

95th percentile per-packet one-way delay: 76.913 ms

Loss rate: 0.16%

Run 2: Report of Synthesized-BBR — Data Link



Run 3: Statistics of Synthesized-BBR

Start at: 2019-10-22 17:08:15

End at: 2019-10-22 17:08:45

Below is generated by plot.py at 2019-10-22 17:22:49

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 2.88 Mbit/s (57.6% utilization)

95th percentile per-packet one-way delay: 64.398 ms

Loss rate: 0.24%

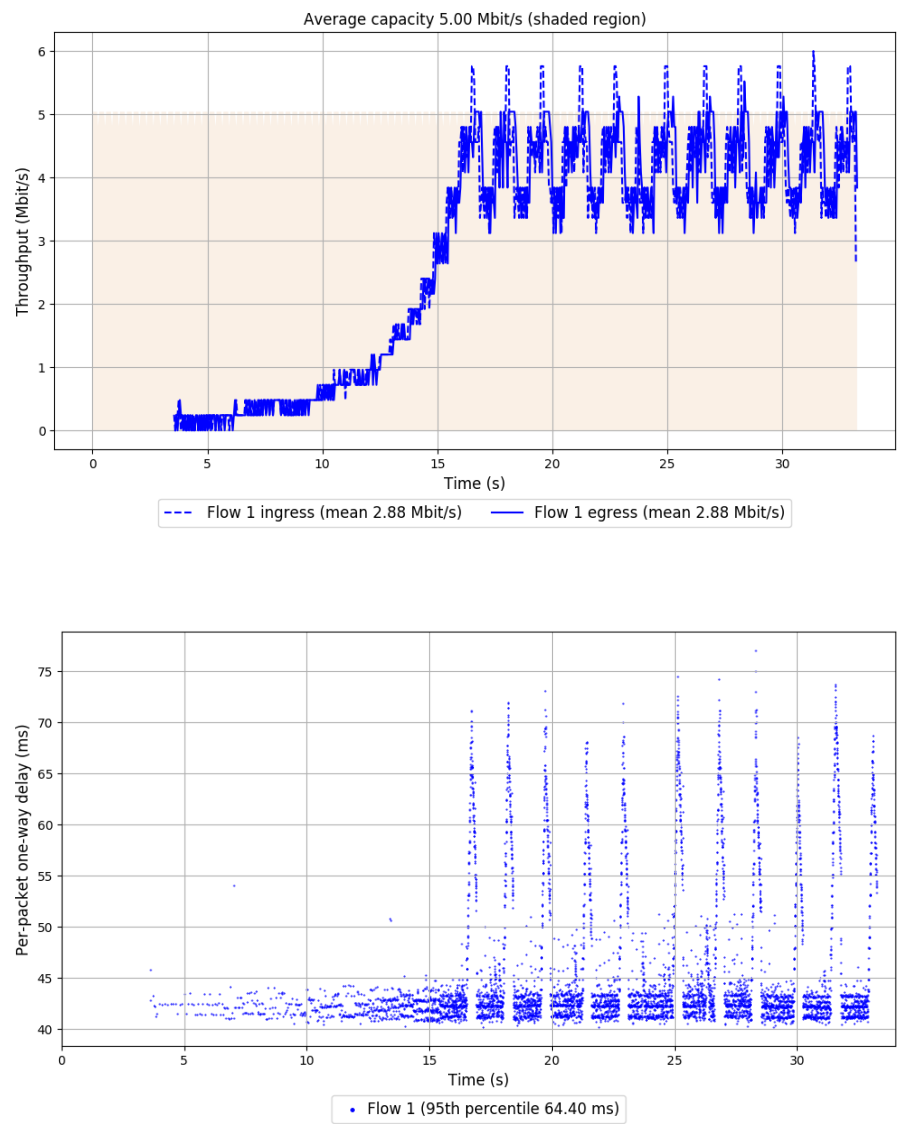
-- Flow 1:

Average throughput: 2.88 Mbit/s

95th percentile per-packet one-way delay: 64.398 ms

Loss rate: 0.24%

Run 3: Report of Synthesized-BBR — Data Link



Run 4: Statistics of Synthesized-BBR

Start at: 2019-10-22 17:10:31

End at: 2019-10-22 17:11:01

Below is generated by plot.py at 2019-10-22 17:22:51

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 3.94 Mbit/s (78.9% utilization)

95th percentile per-packet one-way delay: 76.794 ms

Loss rate: 0.26%

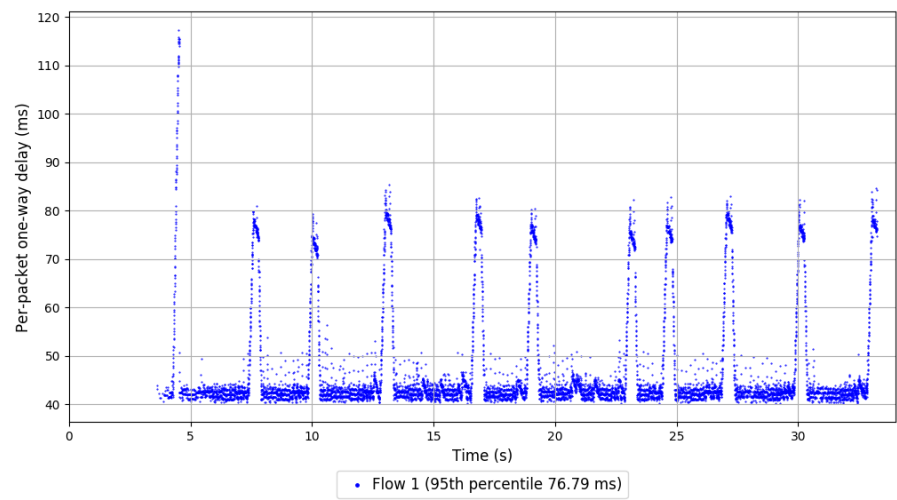
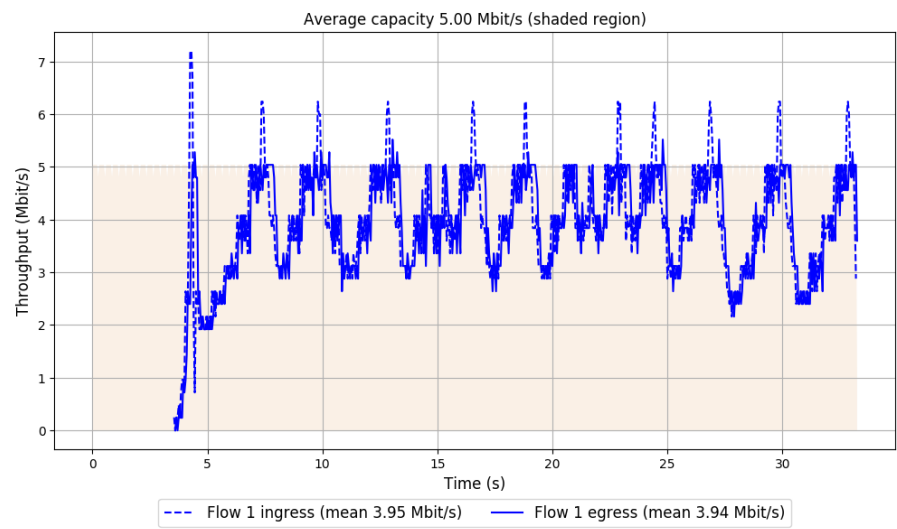
-- Flow 1:

Average throughput: 3.94 Mbit/s

95th percentile per-packet one-way delay: 76.794 ms

Loss rate: 0.26%

Run 4: Report of Synthesized-BBR — Data Link



Run 5: Statistics of Synthesized-BBR

Start at: 2019-10-22 17:12:47

End at: 2019-10-22 17:13:17

Below is generated by plot.py at 2019-10-22 17:22:52

Datalink statistics

-- Total of 1 flow:

Average capacity: 5.00 Mbit/s

Average throughput: 4.01 Mbit/s (80.1% utilization)

95th percentile per-packet one-way delay: 76.435 ms

Loss rate: 0.18%

-- Flow 1:

Average throughput: 4.01 Mbit/s

95th percentile per-packet one-way delay: 76.435 ms

Loss rate: 0.18%

Run 5: Report of Synthesized-BBR — Data Link

