

Pantheon Report

Generated at 2017-08-31 14:06:18 (UTC).

Data path: AWS California 1 Ethernet (*local*) → Stanford ppp0 (*remote*).

Repeated the test of 15 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

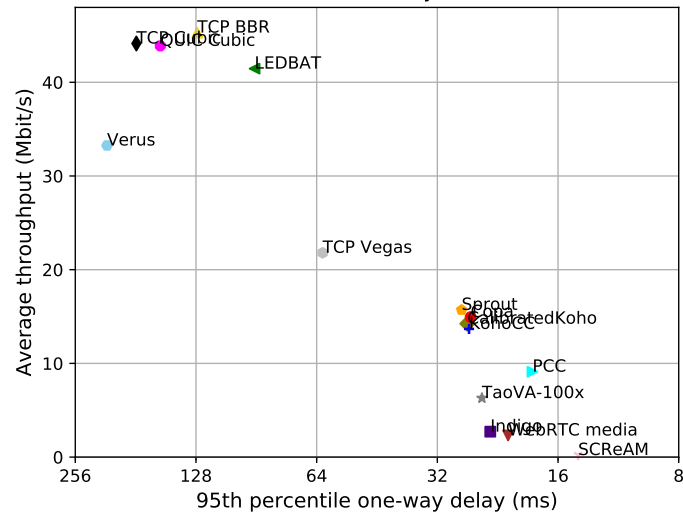
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

NTP offsets were measured against `time.stanford.edu` and have been applied to correct the timestamps in logs.

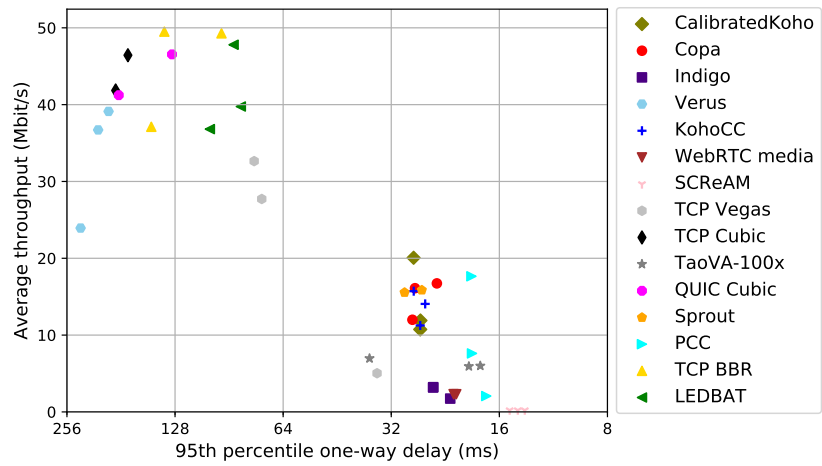
Git summary:

```
branch: master @ 5ea146acdebe79f5b9acfb2d9044554a7d2582ea
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/genericCC @ f7ca42f251bf49b432bb71de6d13fa903515c366
third_party/indigo @ 7ddb4adf480966042c0438984cb22a298bfa635f
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ baf443516dea3eeddeccaf9b916cc313273ca4f4
  M scripts/merge-tunnel-logs
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/proto-quick @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaaeb30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  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/webRTC @ a488197ddd041ace68a42849b2540ad834825f42
```

test from AWS California 1 Ethernet to Stanford ppp0, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS California 1 Ethernet to Stanford ppp0, 3 runs of 30s each per scheme



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	45.30	127.05	0.48
CalibratedKoho	3	14.24	26.95	0.00
Copa	3	14.94	26.43	0.00
TCP Cubic	2	44.14	180.26	0.39
Indigo	3	2.71	23.61	0.00
KohoCC	3	13.68	26.67	0.00
LEDBAT	3	41.46	91.44	0.26
PCC	3	9.11	18.53	0.00
QUIC Cubic	2	43.88	157.08	0.35
SCReAM	3	0.22	14.26	0.00
Sprout	2	15.71	27.84	0.01
TaoVA-100x	3	6.30	24.77	0.00
TCP Vegas	3	21.80	61.84	0.14
Verus	3	33.25	213.37	23.09
WebRTC media	3	2.31	21.31	0.00

Run 1: Statistics of TCP BBR

Start at: 2017-08-31 13:26:07

End at: 2017-08-31 13:26:37

Local clock offset: 0.985 ms

Remote clock offset: -2.387 ms

Below is generated by plot.py at 2017-08-31 14:05:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 49.51 Mbit/s

95th percentile per-packet one-way delay: 137.088 ms

Loss rate: 0.96%

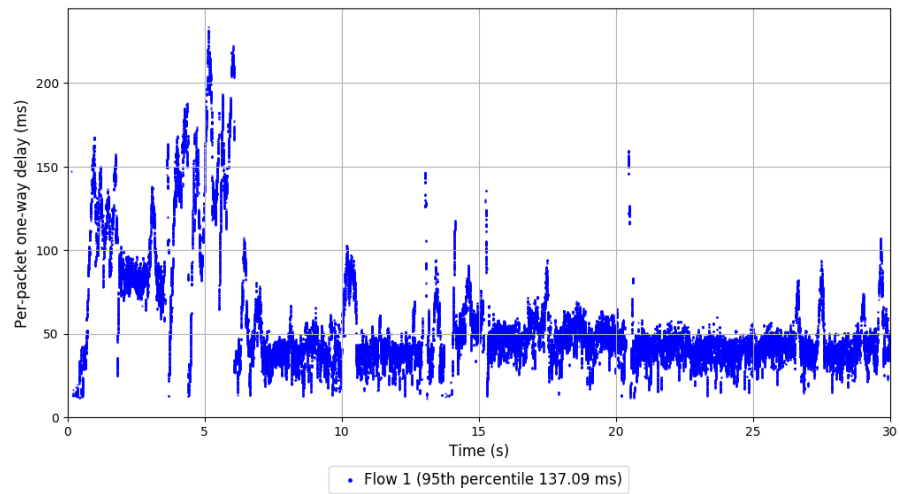
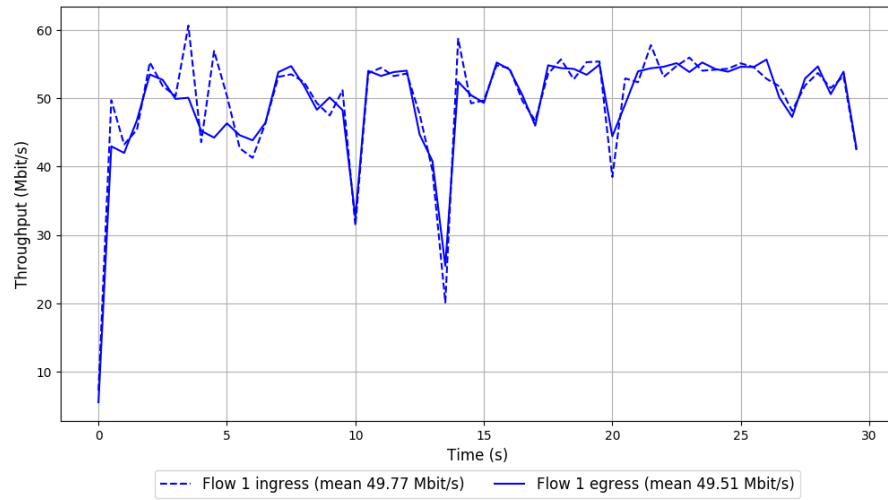
-- Flow 1:

Average throughput: 49.51 Mbit/s

95th percentile per-packet one-way delay: 137.088 ms

Loss rate: 0.96%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2017-08-31 13:43:58

End at: 2017-08-31 13:44:28

Local clock offset: 1.038 ms

Remote clock offset: -2.545 ms

Below is generated by plot.py at 2017-08-31 14:05:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 49.28 Mbit/s

95th percentile per-packet one-way delay: 95.034 ms

Loss rate: 0.14%

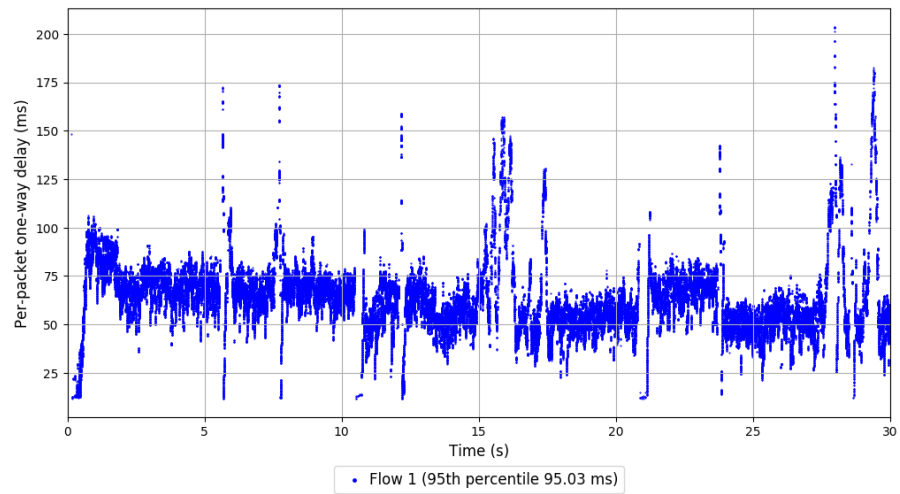
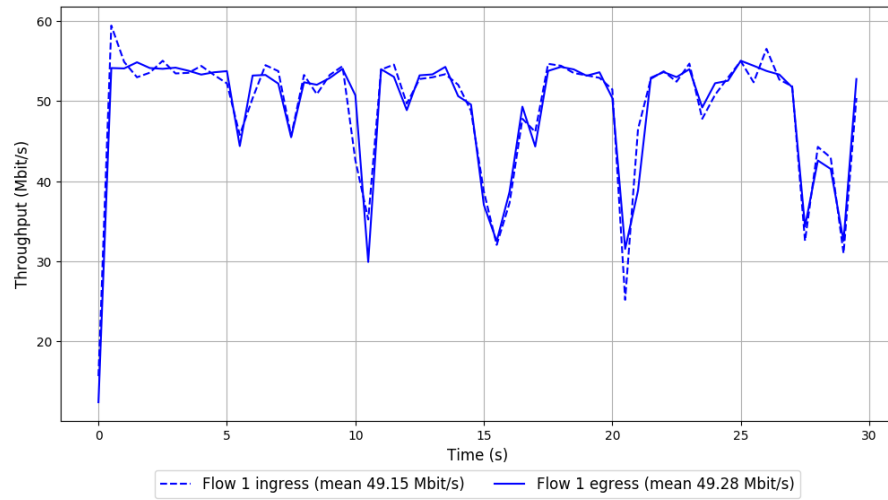
-- Flow 1:

Average throughput: 49.28 Mbit/s

95th percentile per-packet one-way delay: 95.034 ms

Loss rate: 0.14%

Run 2: Report of TCP BBR — Data Link

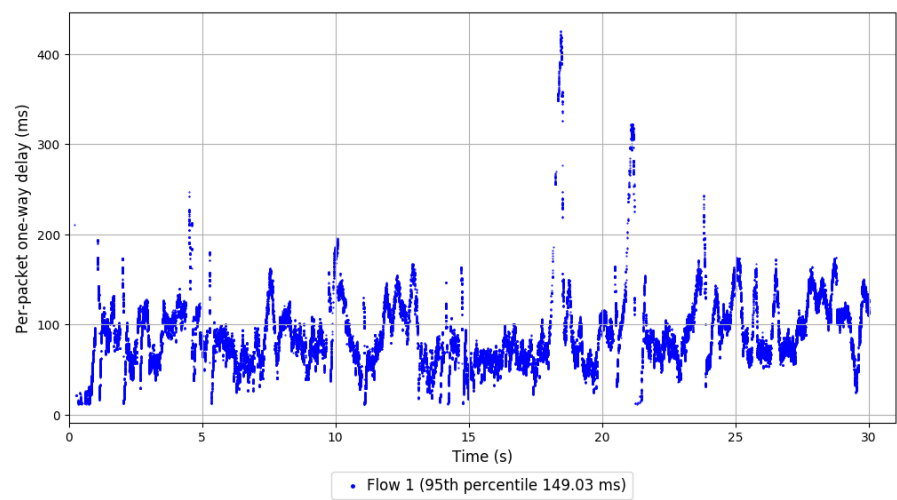
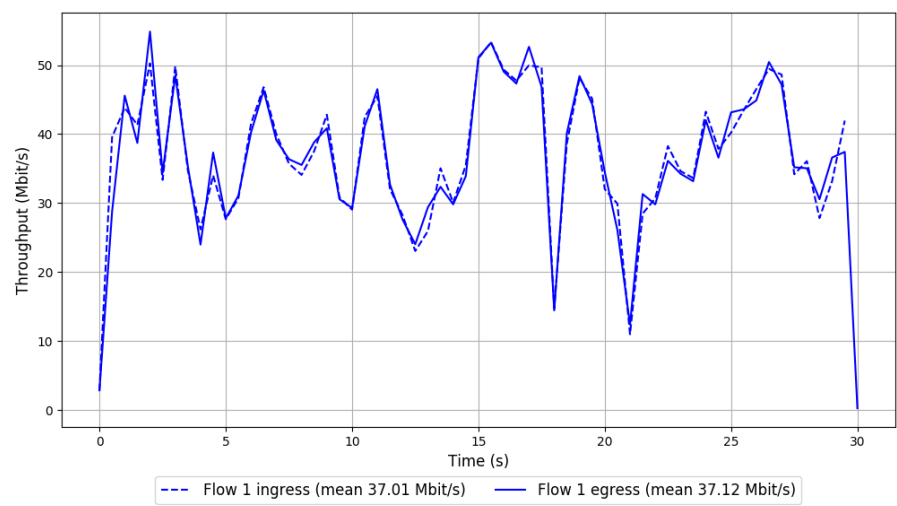


Run 3: Statistics of TCP BBR

Start at: 2017-08-31 14:01:49
End at: 2017-08-31 14:02:19
Local clock offset: 1.141 ms
Remote clock offset: -2.754 ms

Below is generated by plot.py at 2017-08-31 14:05:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 37.12 Mbit/s
95th percentile per-packet one-way delay: 149.035 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 37.12 Mbit/s
95th percentile per-packet one-way delay: 149.035 ms
Loss rate: 0.34%

Run 3: Report of TCP BBR — Data Link

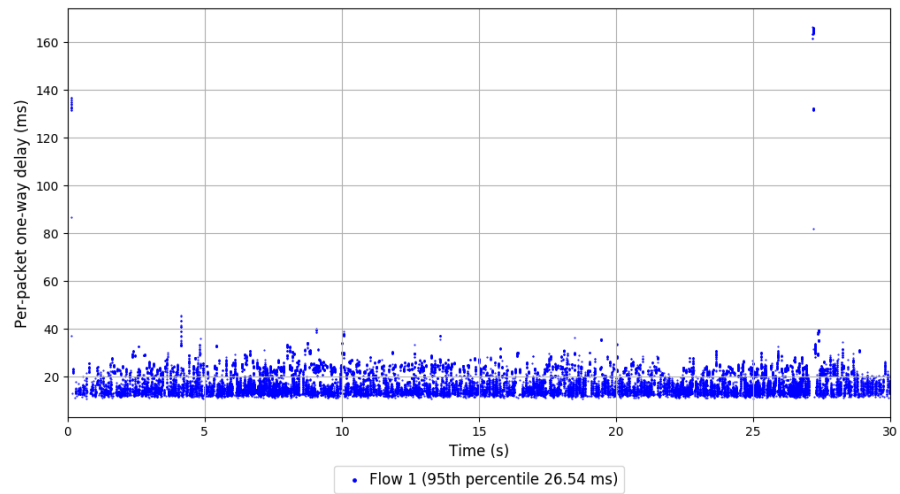
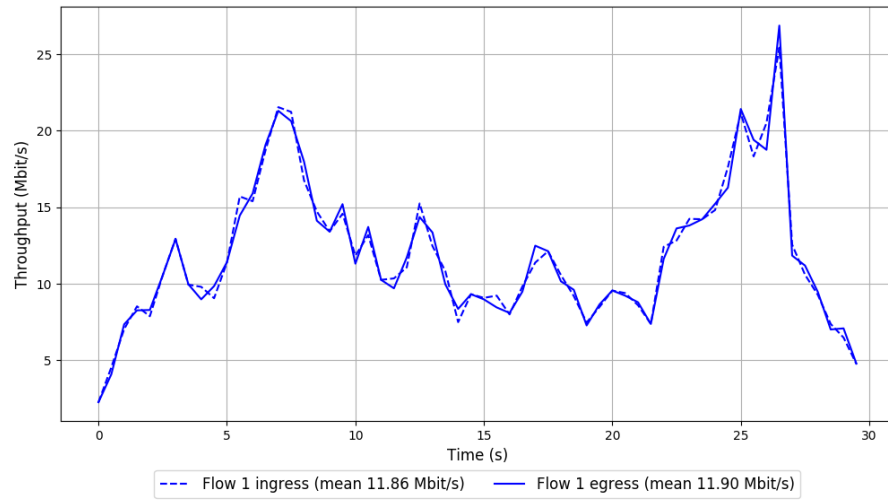


Run 1: Statistics of CalibratedKoho

Start at: 2017-08-31 13:17:50
End at: 2017-08-31 13:18:20
Local clock offset: 1.034 ms
Remote clock offset: -2.253 ms

Below is generated by plot.py at 2017-08-31 14:05:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.90 Mbit/s
95th percentile per-packet one-way delay: 26.538 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 11.90 Mbit/s
95th percentile per-packet one-way delay: 26.538 ms
Loss rate: 0.00%

Run 1: Report of CalibratedKoho — Data Link

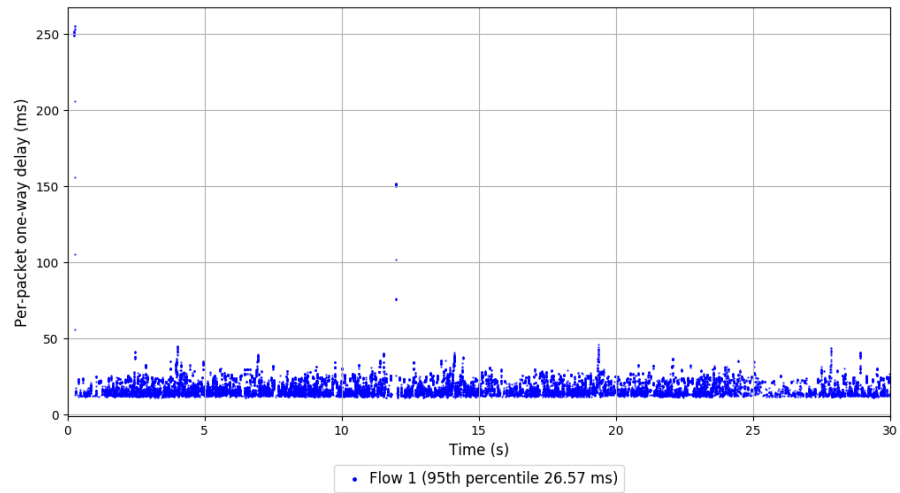
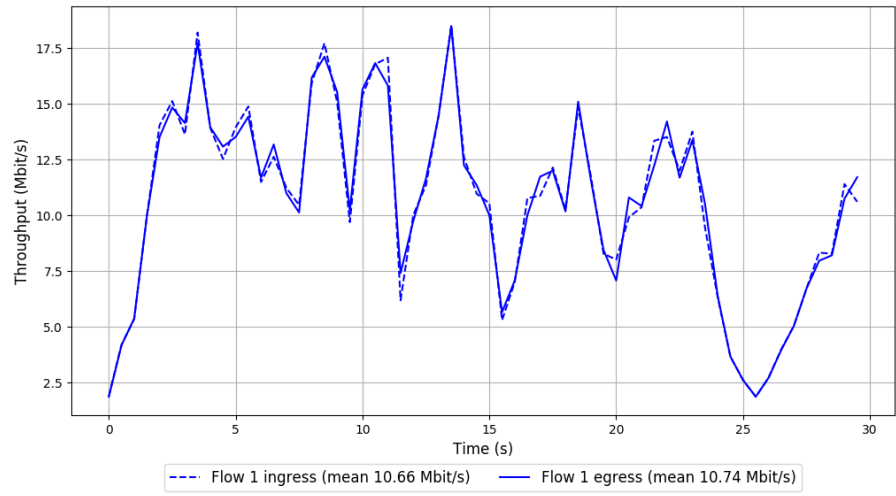


Run 2: Statistics of CalibratedKoho

Start at: 2017-08-31 13:35:39
End at: 2017-08-31 13:36:10
Local clock offset: 1.097 ms
Remote clock offset: -2.366 ms

Below is generated by plot.py at 2017-08-31 14:05:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.74 Mbit/s
95th percentile per-packet one-way delay: 26.575 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 10.74 Mbit/s
95th percentile per-packet one-way delay: 26.575 ms
Loss rate: 0.00%

Run 2: Report of CalibratedKoho — Data Link

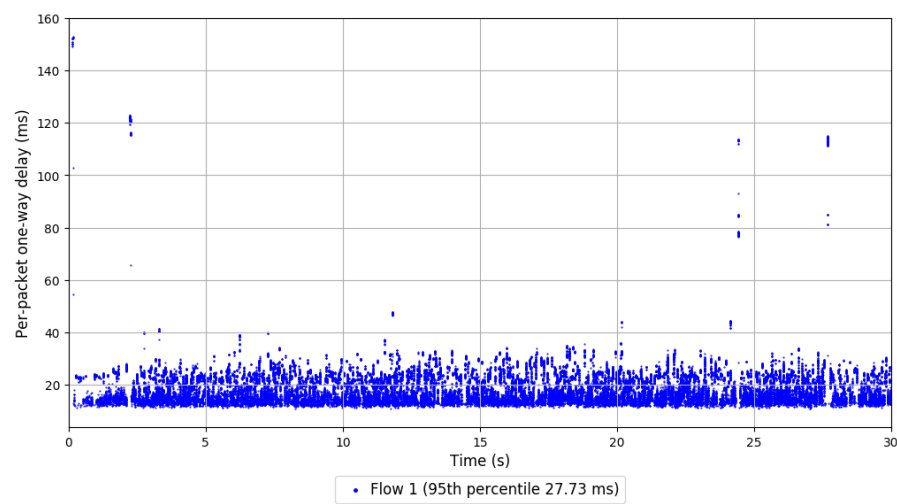
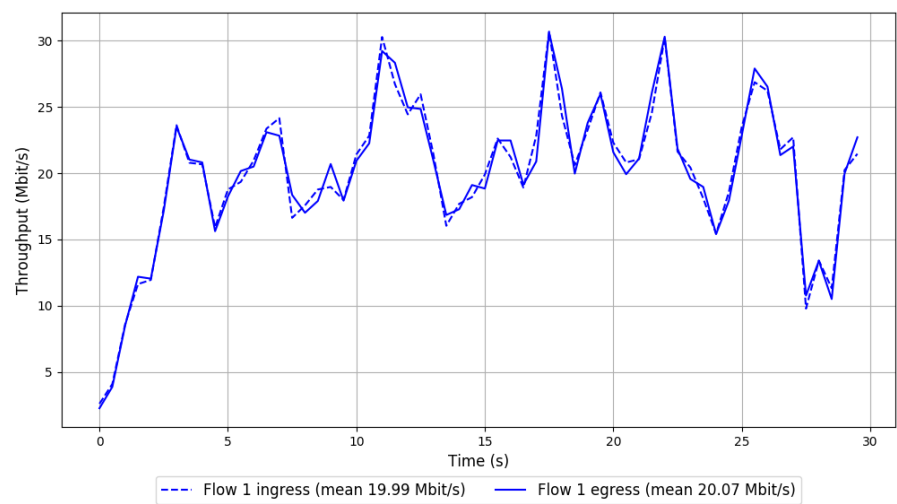


Run 3: Statistics of CalibratedKoho

Start at: 2017-08-31 13:53:29
End at: 2017-08-31 13:53:59
Local clock offset: 1.037 ms
Remote clock offset: -2.726 ms

Below is generated by plot.py at 2017-08-31 14:05:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 20.07 Mbit/s
95th percentile per-packet one-way delay: 27.727 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 20.07 Mbit/s
95th percentile per-packet one-way delay: 27.727 ms
Loss rate: 0.00%

Run 3: Report of CalibratedKoho — Data Link

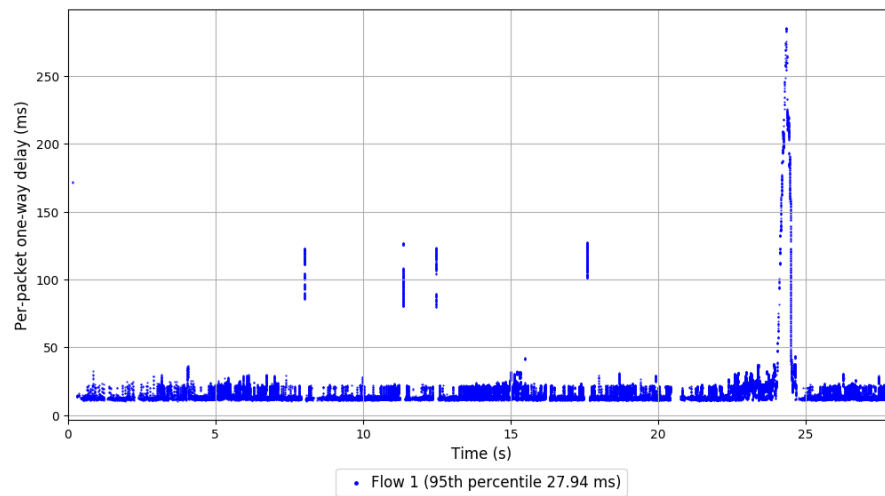
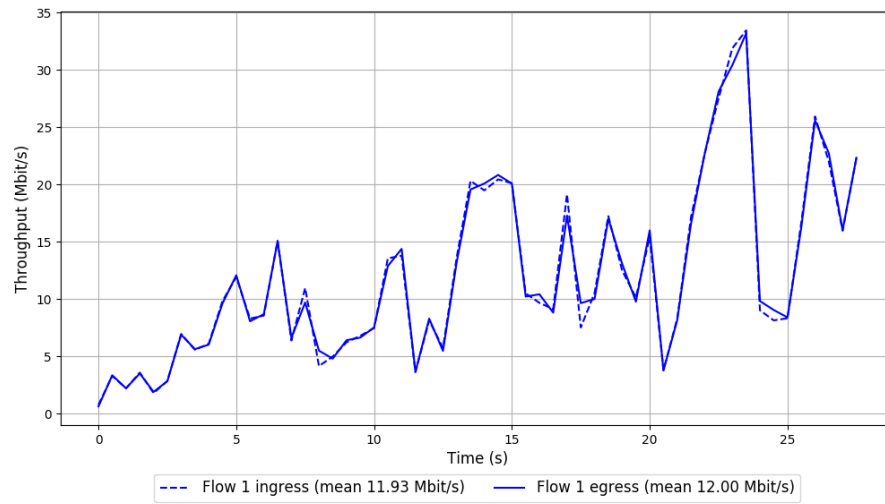


Run 1: Statistics of Copa

Start at: 2017-08-31 13:14:18
End at: 2017-08-31 13:14:48
Local clock offset: 0.917 ms
Remote clock offset: -2.163 ms

Below is generated by plot.py at 2017-08-31 14:05:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.00 Mbit/s
95th percentile per-packet one-way delay: 27.937 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 12.00 Mbit/s
95th percentile per-packet one-way delay: 27.937 ms
Loss rate: 0.00%

Run 1: Report of Copa — Data Link

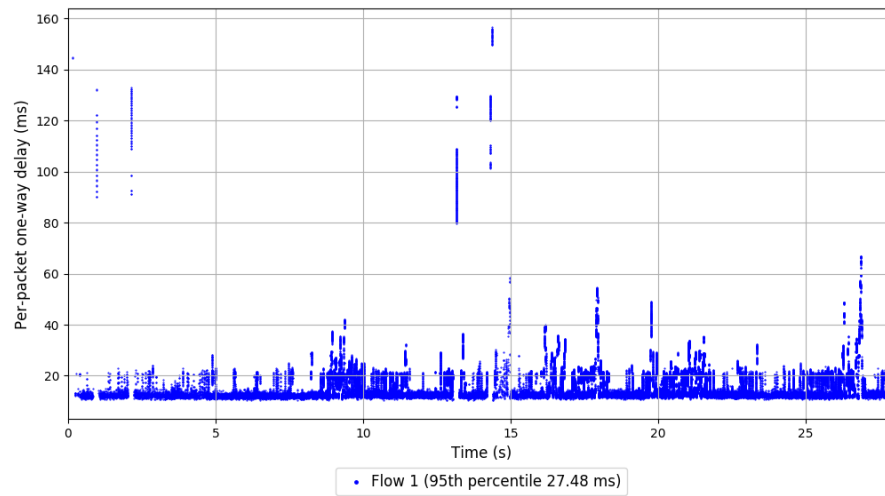
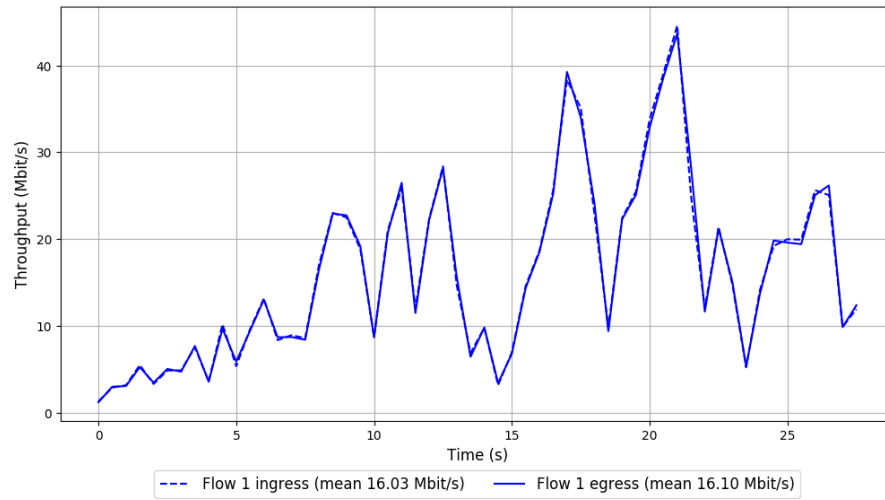


Run 2: Statistics of Copa

Start at: 2017-08-31 13:32:07
End at: 2017-08-31 13:32:37
Local clock offset: 1.091 ms
Remote clock offset: -2.283 ms

Below is generated by plot.py at 2017-08-31 14:05:17
Datalink statistics
-- Total of 1 flow:
Average throughput: 16.10 Mbit/s
95th percentile per-packet one-way delay: 27.479 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 16.10 Mbit/s
95th percentile per-packet one-way delay: 27.479 ms
Loss rate: 0.00%

Run 2: Report of Copa — Data Link

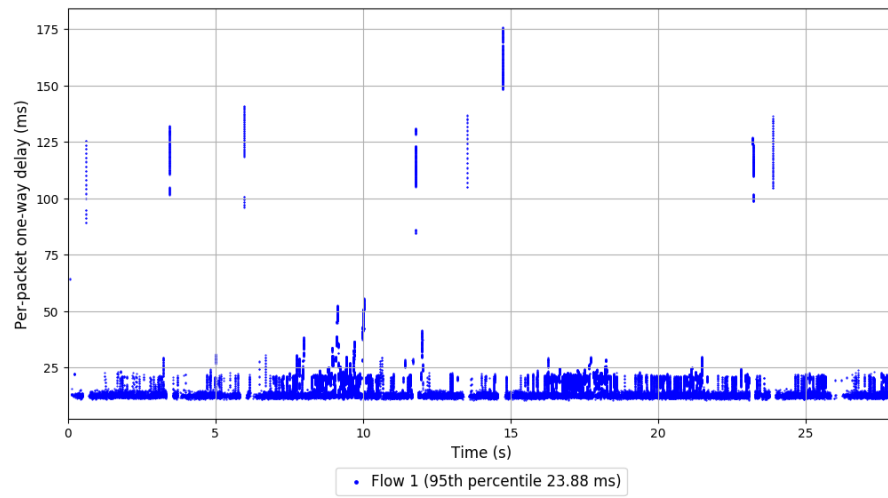
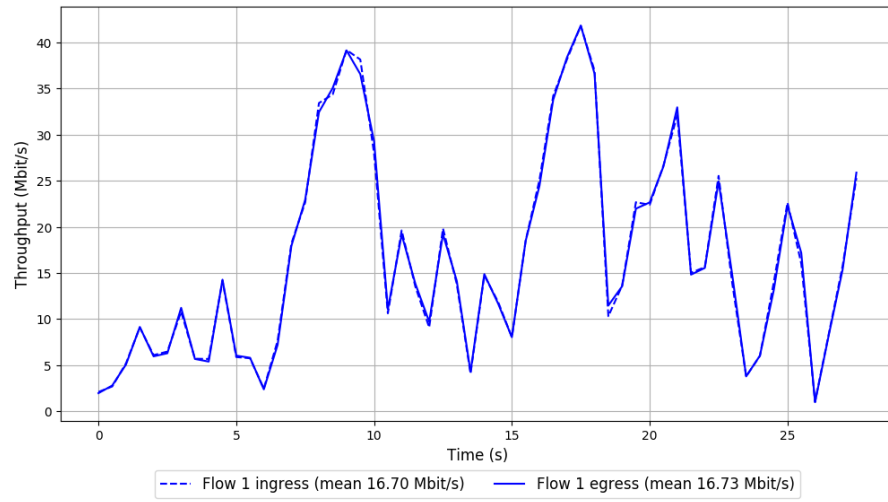


Run 3: Statistics of Copa

Start at: 2017-08-31 13:49:57
End at: 2017-08-31 13:50:27
Local clock offset: 1.033 ms
Remote clock offset: -2.602 ms

Below is generated by plot.py at 2017-08-31 14:05:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 16.73 Mbit/s
95th percentile per-packet one-way delay: 23.883 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 16.73 Mbit/s
95th percentile per-packet one-way delay: 23.883 ms
Loss rate: 0.00%

Run 3: Report of Copa — Data Link

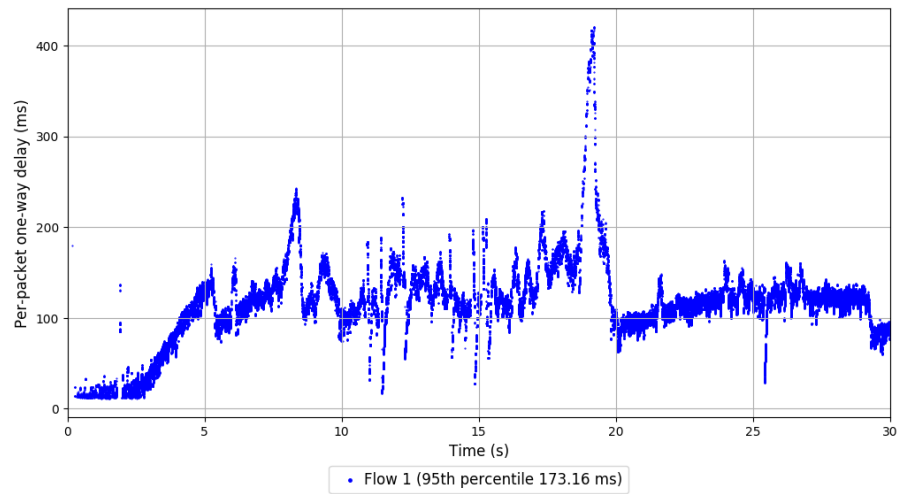
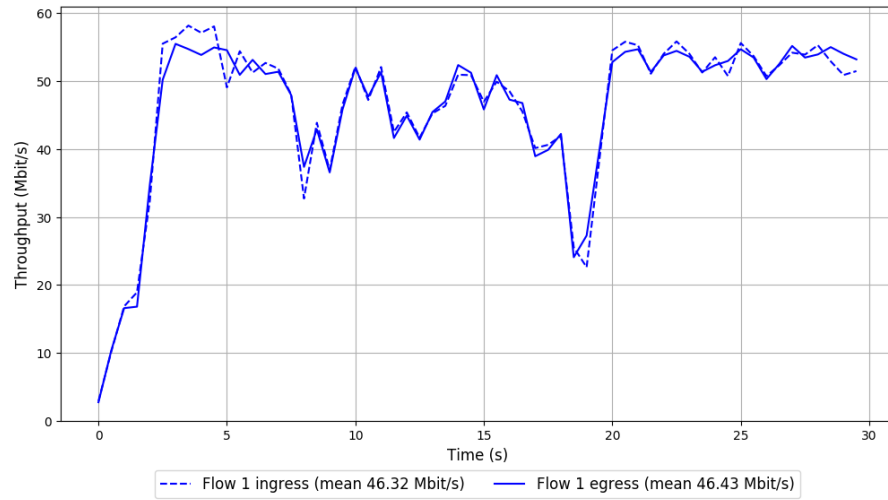


Run 1: Statistics of TCP Cubic

Start at: 2017-08-31 13:13:05
End at: 2017-08-31 13:13:35
Local clock offset: 1.034 ms
Remote clock offset: -2.137 ms

Below is generated by plot.py at 2017-08-31 14:05:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 46.43 Mbit/s
95th percentile per-packet one-way delay: 173.160 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 46.43 Mbit/s
95th percentile per-packet one-way delay: 173.160 ms
Loss rate: 0.29%

Run 1: Report of TCP Cubic — Data Link

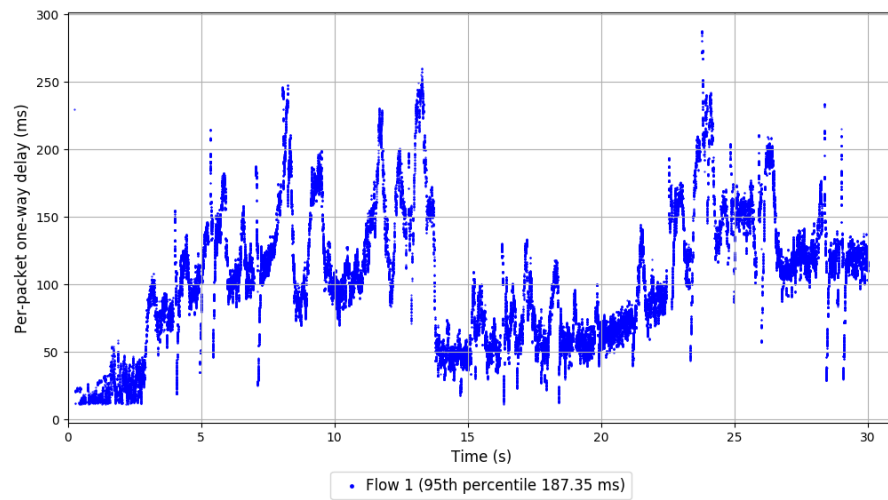
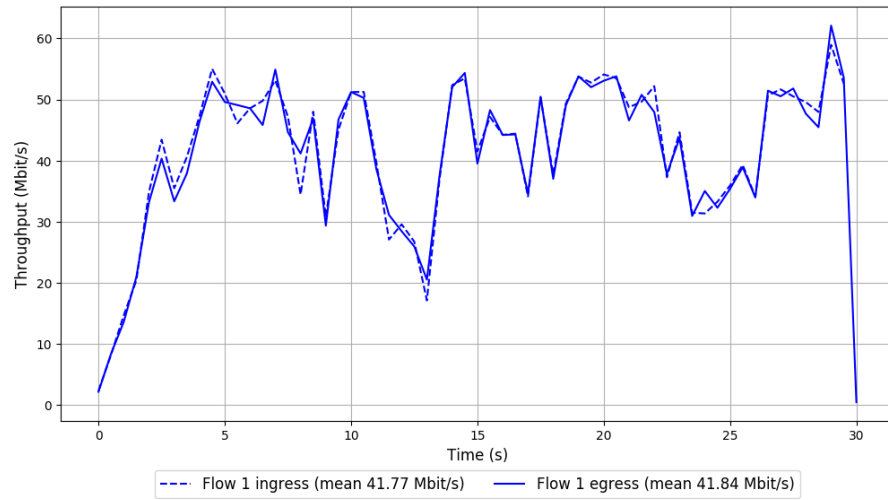


Run 2: Statistics of TCP Cubic

Start at: 2017-08-31 13:30:54
End at: 2017-08-31 13:31:24
Local clock offset: 0.983 ms
Remote clock offset: -2.366 ms

Below is generated by plot.py at 2017-08-31 14:05:26
Datalink statistics
-- Total of 1 flow:
Average throughput: 41.84 Mbit/s
95th percentile per-packet one-way delay: 187.355 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 41.84 Mbit/s
95th percentile per-packet one-way delay: 187.355 ms
Loss rate: 0.49%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

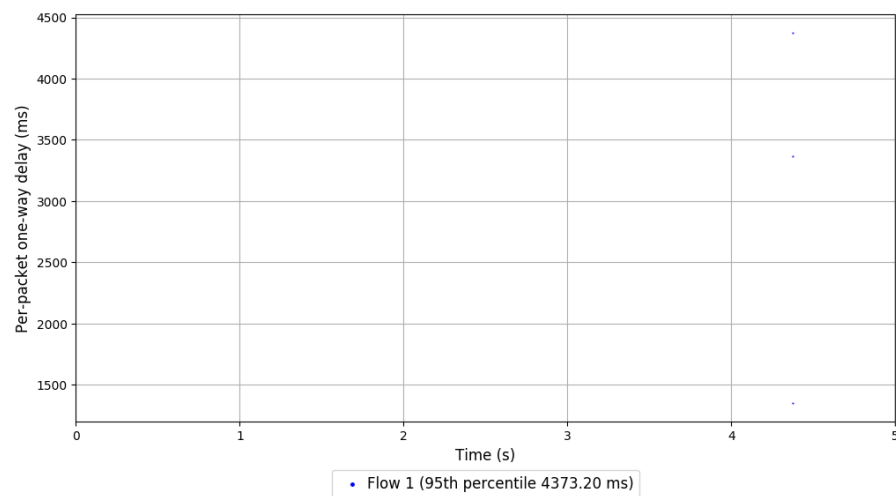
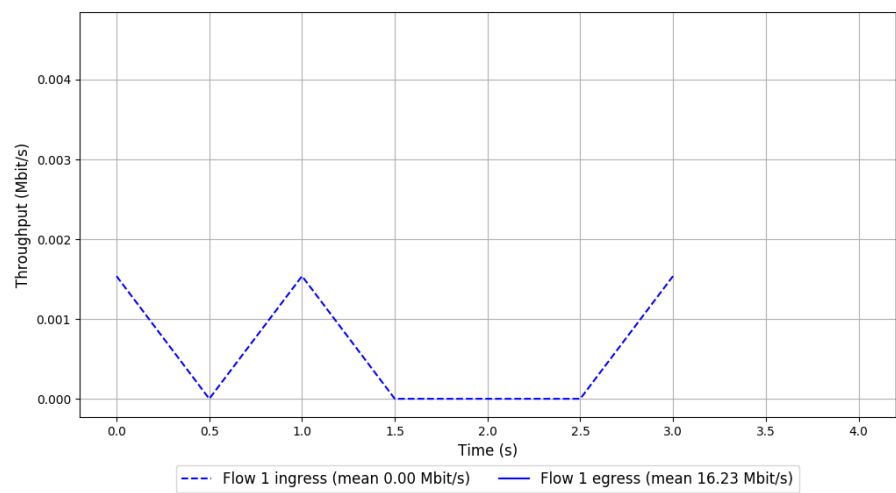
Start at: 2017-08-31 13:48:46

End at: 2017-08-31 13:49:16

Local clock offset: 1.116 ms

Remote clock offset: -2.571 ms

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2017-08-31 13:11:54

End at: 2017-08-31 13:12:24

Local clock offset: 0.937 ms

Remote clock offset: -2.112 ms

Below is generated by plot.py at 2017-08-31 14:05:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.18 Mbit/s

95th percentile per-packet one-way delay: 24.470 ms

Loss rate: 0.00%

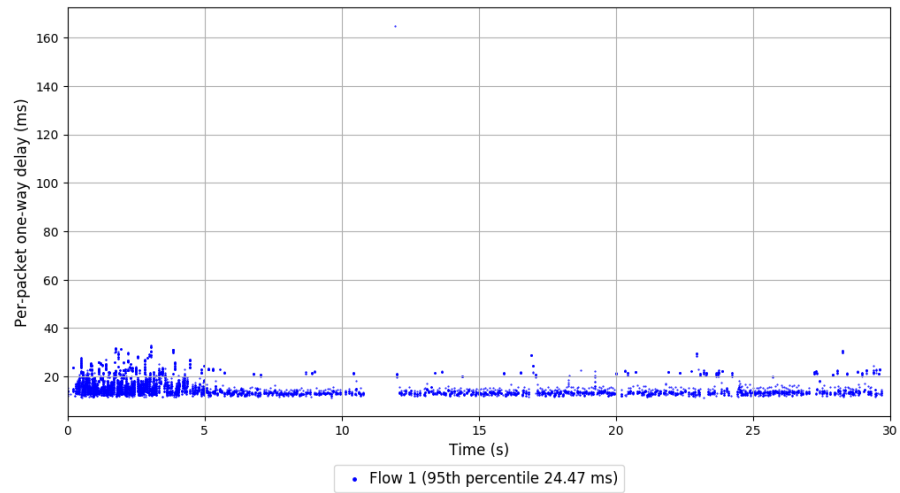
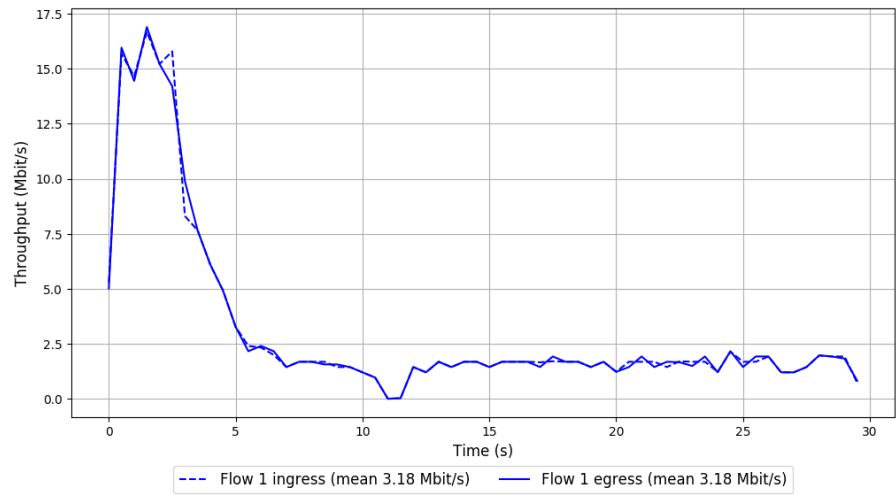
-- Flow 1:

Average throughput: 3.18 Mbit/s

95th percentile per-packet one-way delay: 24.470 ms

Loss rate: 0.00%

Run 1: Report of Indigo — Data Link

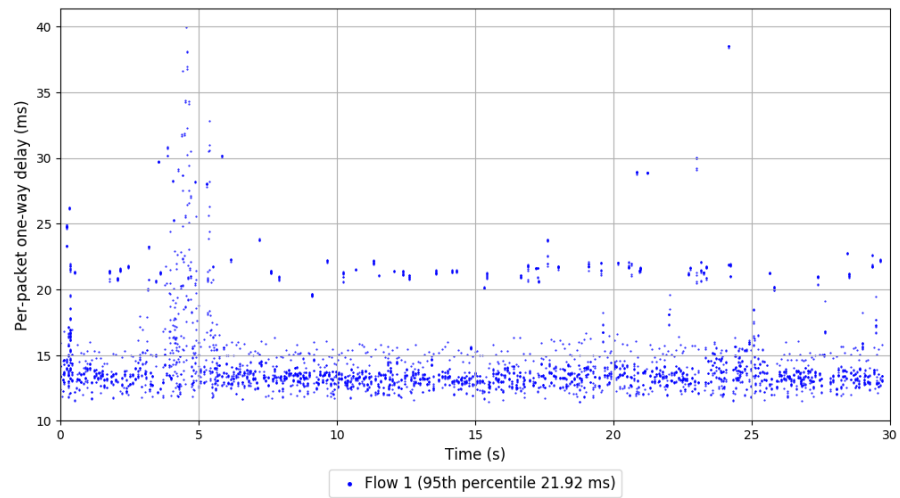
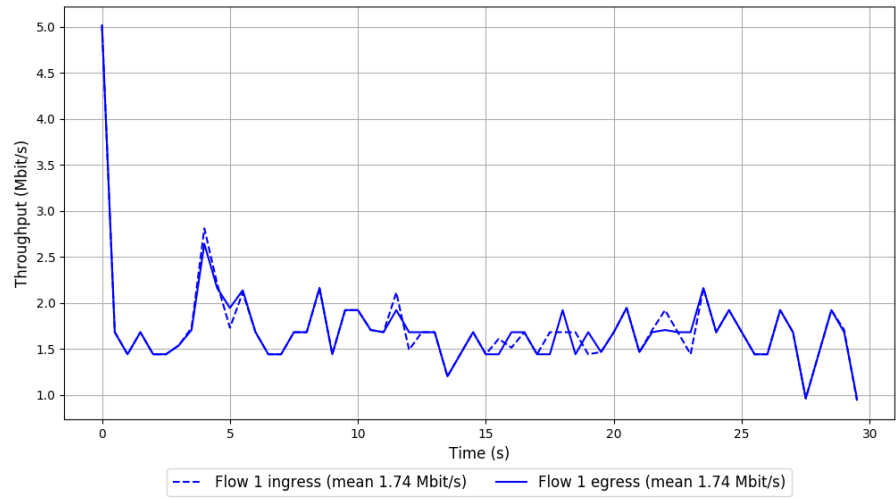


Run 2: Statistics of Indigo

Start at: 2017-08-31 13:29:43
End at: 2017-08-31 13:30:13
Local clock offset: 0.961 ms
Remote clock offset: -2.301 ms

Below is generated by plot.py at 2017-08-31 14:05:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 21.923 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 21.923 ms
Loss rate: 0.00%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2017-08-31 13:47:36

End at: 2017-08-31 13:48:06

Local clock offset: 1.05 ms

Remote clock offset: -2.477 ms

Below is generated by plot.py at 2017-08-31 14:05:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.22 Mbit/s

95th percentile per-packet one-way delay: 24.445 ms

Loss rate: 0.00%

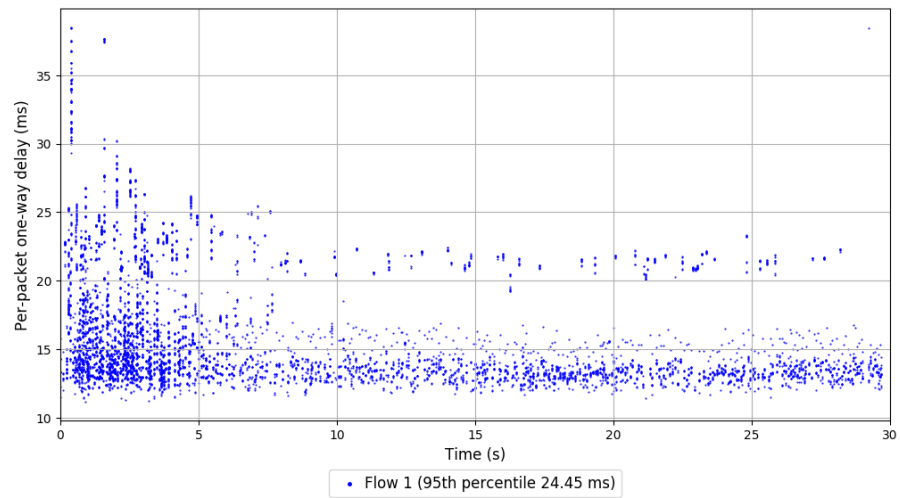
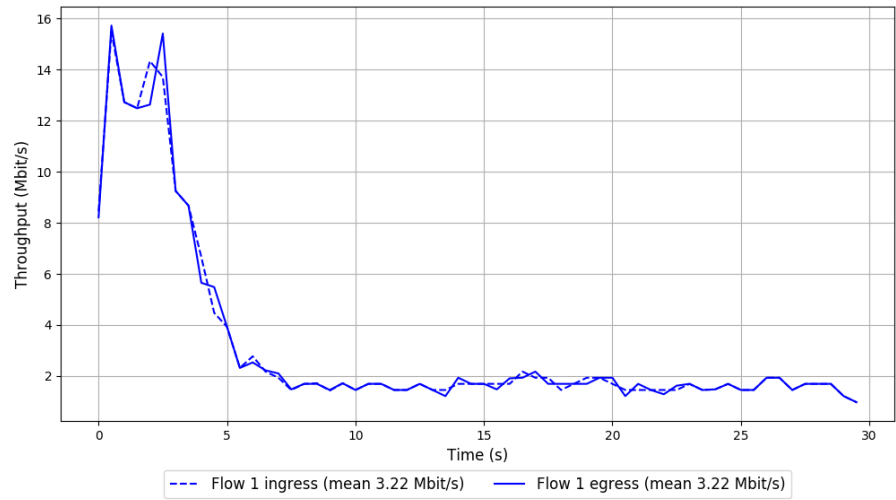
-- Flow 1:

Average throughput: 3.22 Mbit/s

95th percentile per-packet one-way delay: 24.445 ms

Loss rate: 0.00%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of KohoCC

Start at: 2017-08-31 13:24:56

End at: 2017-08-31 13:25:26

Local clock offset: 0.977 ms

Remote clock offset: -2.378 ms

Below is generated by plot.py at 2017-08-31 14:05:29

Datalink statistics

-- Total of 1 flow:

Average throughput: 14.06 Mbit/s

95th percentile per-packet one-way delay: 25.743 ms

Loss rate: 0.00%

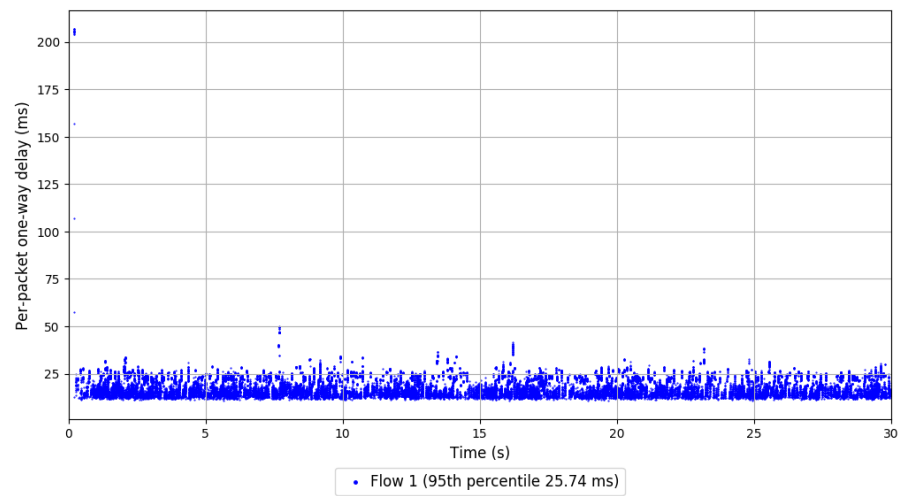
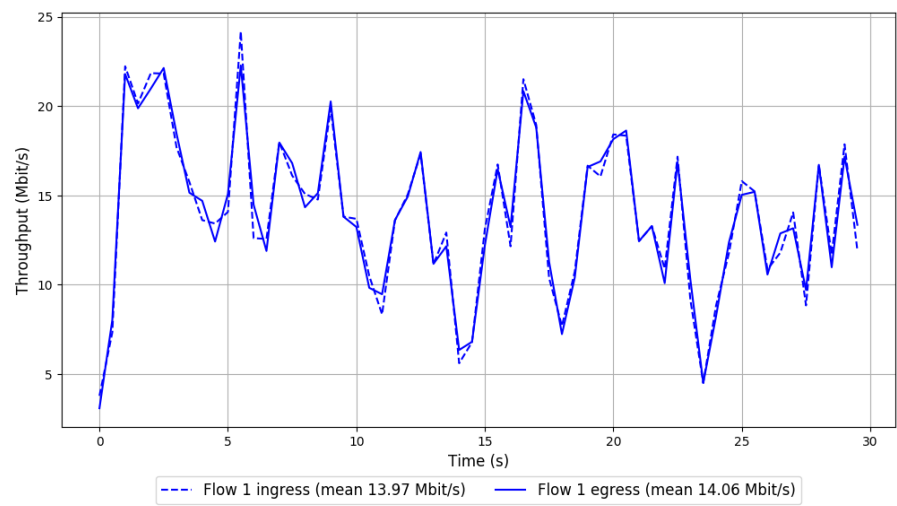
-- Flow 1:

Average throughput: 14.06 Mbit/s

95th percentile per-packet one-way delay: 25.743 ms

Loss rate: 0.00%

Run 1: Report of KohoCC — Data Link

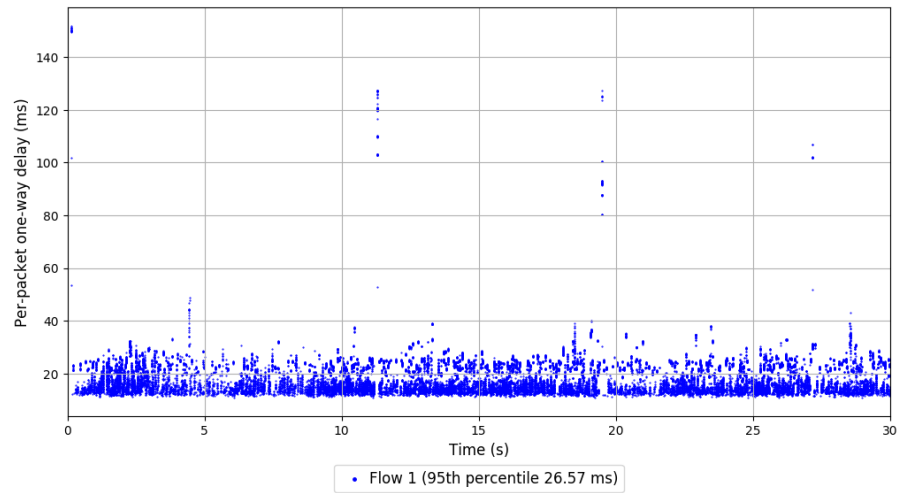
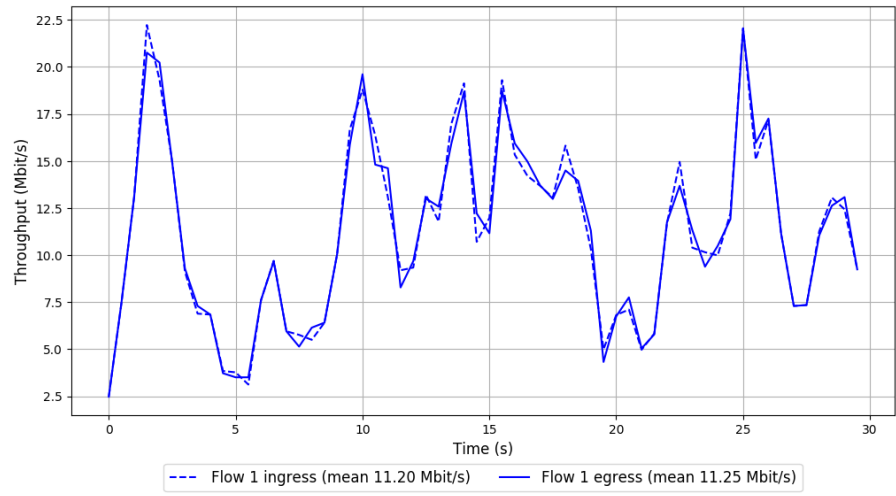


Run 2: Statistics of KohoCC

Start at: 2017-08-31 13:42:47
End at: 2017-08-31 13:43:17
Local clock offset: 1.113 ms
Remote clock offset: -2.508 ms

Below is generated by plot.py at 2017-08-31 14:05:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.25 Mbit/s
95th percentile per-packet one-way delay: 26.574 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 11.25 Mbit/s
95th percentile per-packet one-way delay: 26.574 ms
Loss rate: 0.00%

Run 2: Report of KohoCC — Data Link

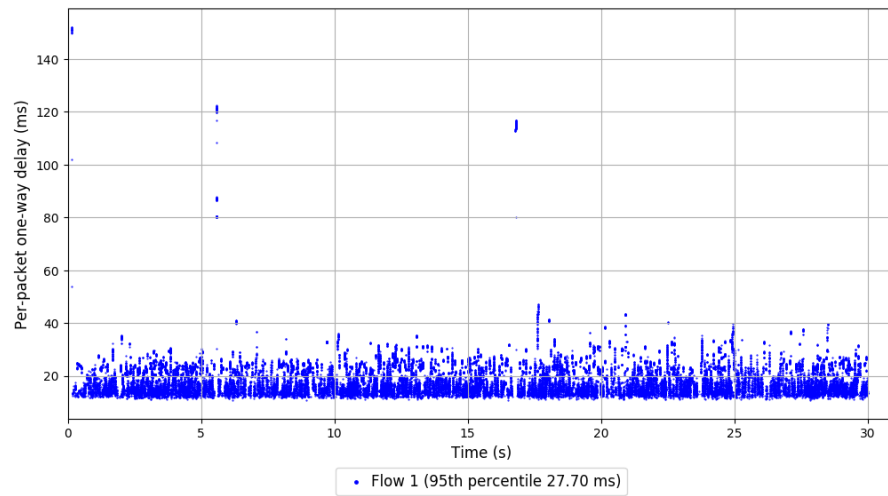
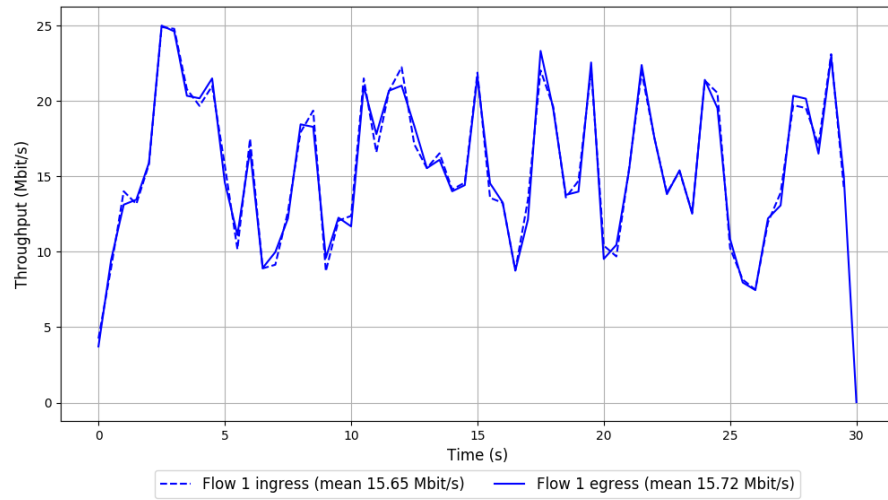


Run 3: Statistics of KohoCC

Start at: 2017-08-31 14:00:38
End at: 2017-08-31 14:01:08
Local clock offset: 1.043 ms
Remote clock offset: -2.808 ms

Below is generated by plot.py at 2017-08-31 14:05:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 15.72 Mbit/s
95th percentile per-packet one-way delay: 27.704 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 15.72 Mbit/s
95th percentile per-packet one-way delay: 27.704 ms
Loss rate: 0.00%

Run 3: Report of KohoCC — Data Link

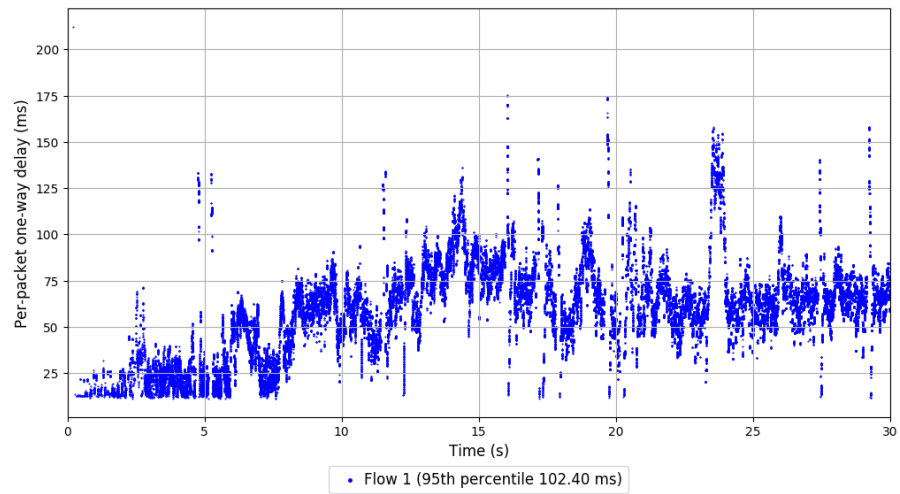
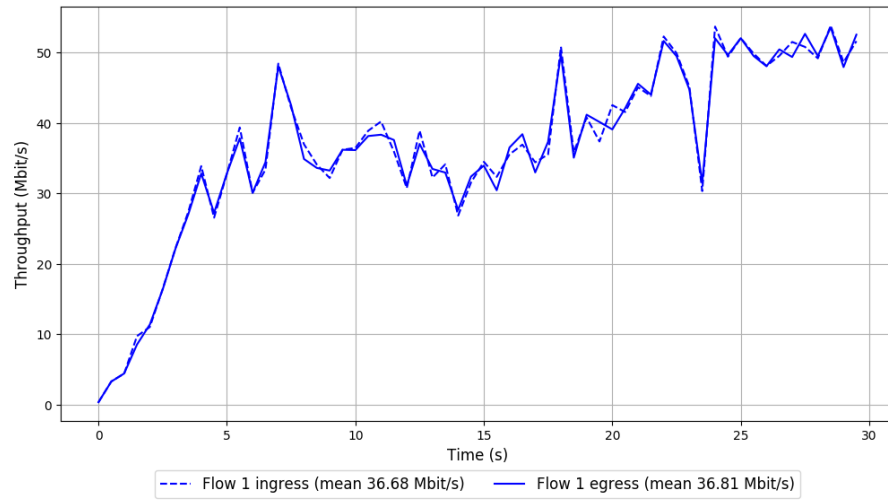


```
Run 1: Statistics of LEDBAT

Start at: 2017-08-31 13:09:30
End at: 2017-08-31 13:10:00
Local clock offset: 0.903 ms
Remote clock offset: -2.122 ms

# Below is generated by plot.py at 2017-08-31 14:05:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 36.81 Mbit/s
95th percentile per-packet one-way delay: 102.403 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 36.81 Mbit/s
95th percentile per-packet one-way delay: 102.403 ms
Loss rate: 0.30%
```

Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2017-08-31 13:27:20

End at: 2017-08-31 13:27:50

Local clock offset: 1.053 ms

Remote clock offset: -2.36 ms

Below is generated by plot.py at 2017-08-31 14:05:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 39.76 Mbit/s

95th percentile per-packet one-way delay: 83.966 ms

Loss rate: 0.26%

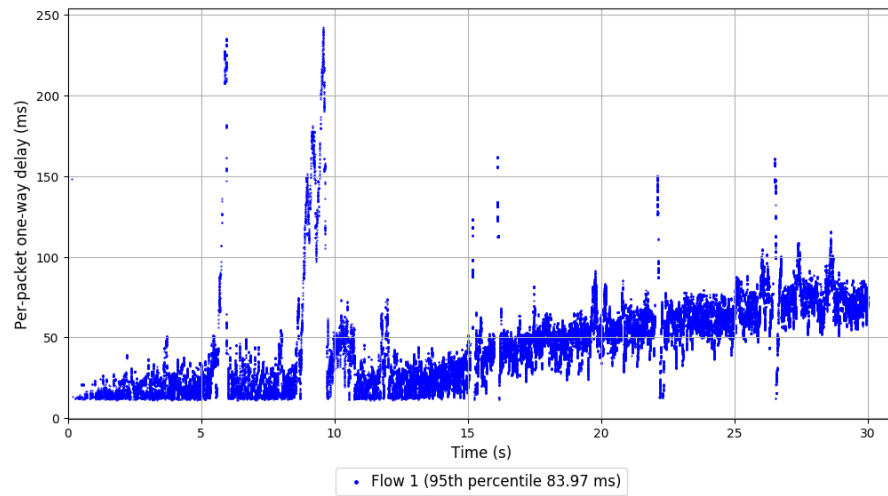
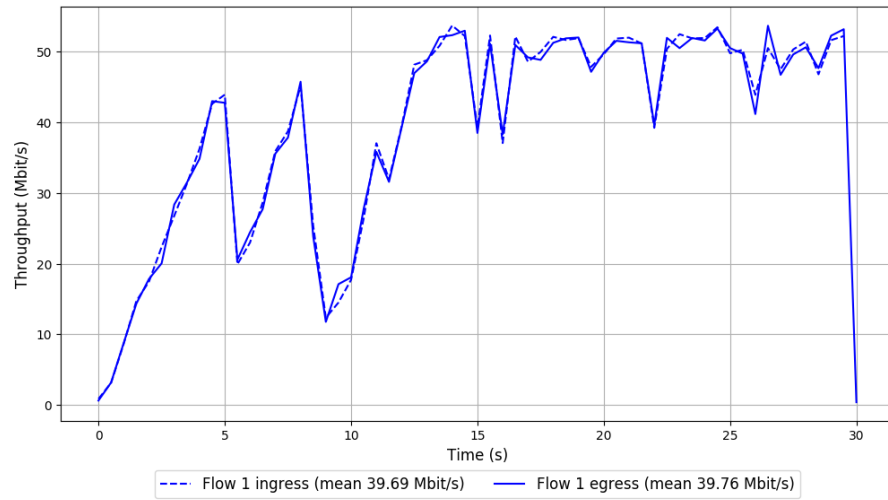
-- Flow 1:

Average throughput: 39.76 Mbit/s

95th percentile per-packet one-way delay: 83.966 ms

Loss rate: 0.26%

Run 2: Report of LEDBAT — Data Link

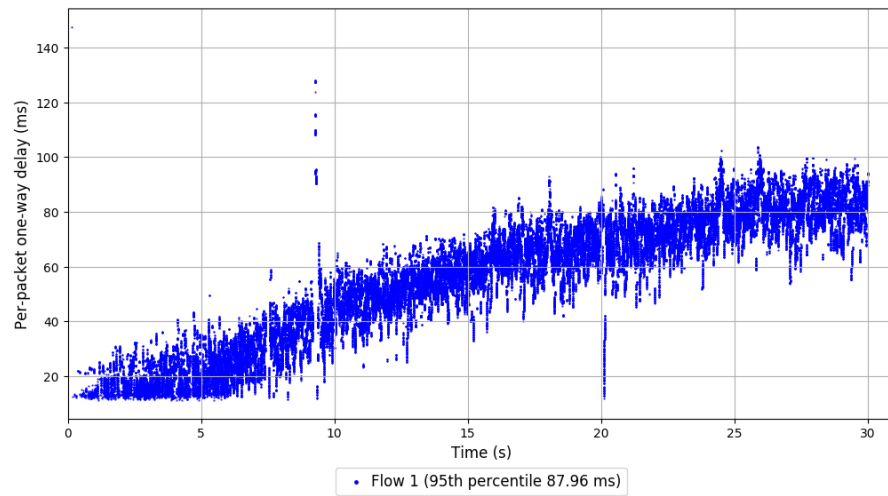
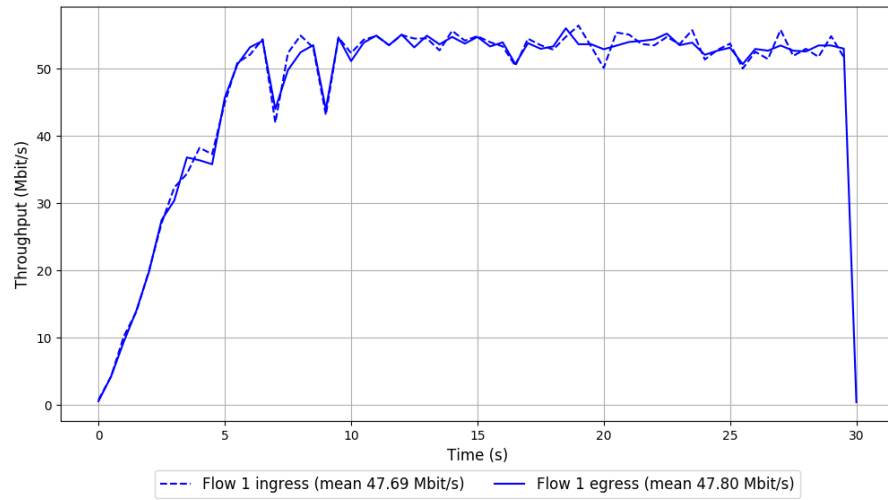


Run 3: Statistics of LEDBAT

Start at: 2017-08-31 13:45:11
End at: 2017-08-31 13:45:41
Local clock offset: 1.029 ms
Remote clock offset: -2.507 ms

Below is generated by plot.py at 2017-08-31 14:05:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 47.80 Mbit/s
95th percentile per-packet one-way delay: 87.956 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 47.80 Mbit/s
95th percentile per-packet one-way delay: 87.956 ms
Loss rate: 0.23%

Run 3: Report of LEDBAT — Data Link

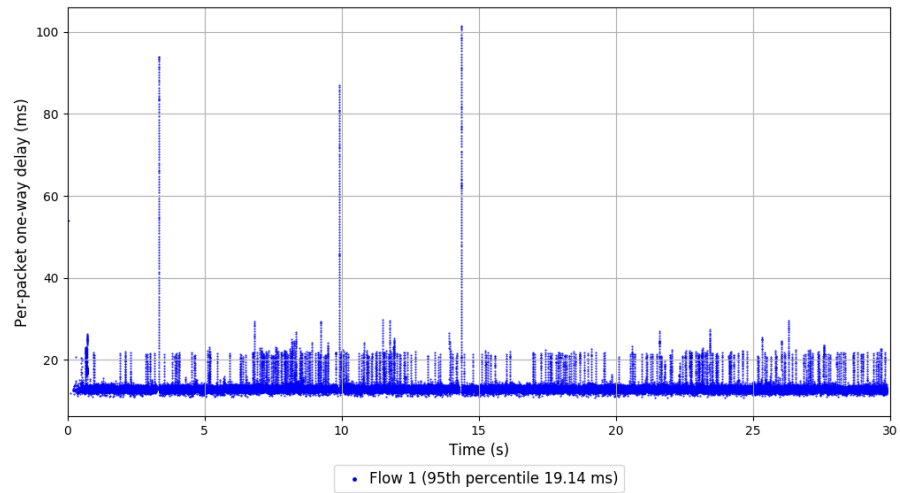
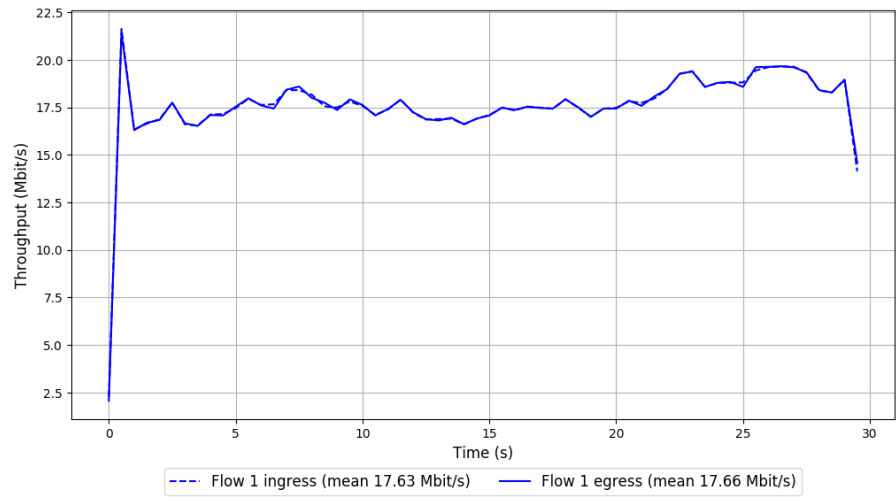


Run 1: Statistics of PCC

Start at: 2017-08-31 13:23:45
End at: 2017-08-31 13:24:15
Local clock offset: 1.05 ms
Remote clock offset: -2.372 ms

Below is generated by plot.py at 2017-08-31 14:05:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 17.66 Mbit/s
95th percentile per-packet one-way delay: 19.135 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 17.66 Mbit/s
95th percentile per-packet one-way delay: 19.135 ms
Loss rate: 0.00%

Run 1: Report of PCC — Data Link

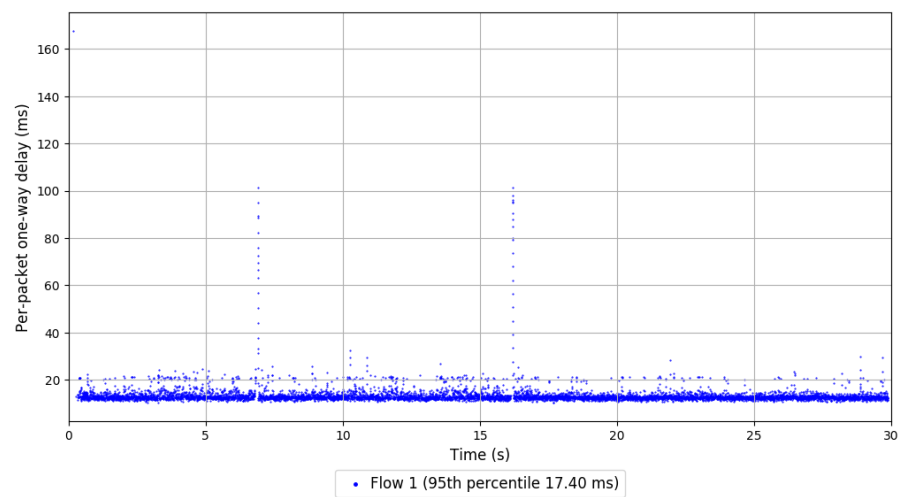
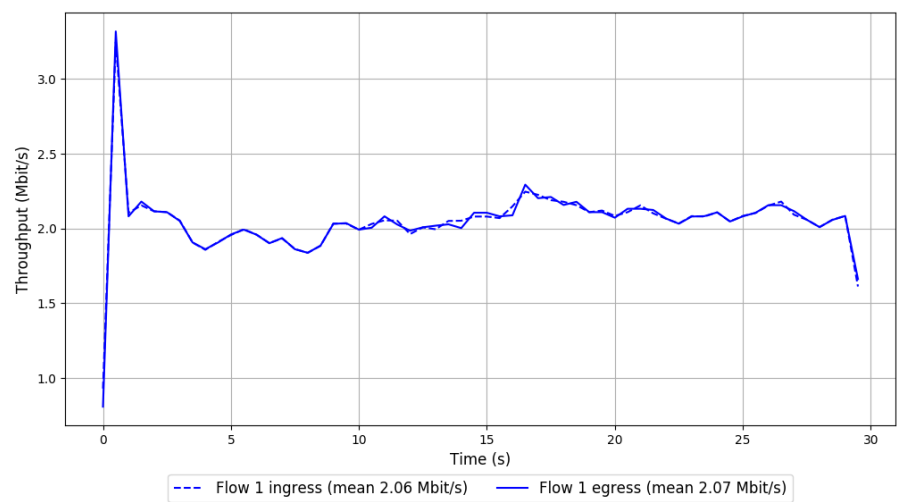


Run 2: Statistics of PCC

Start at: 2017-08-31 13:41:36
End at: 2017-08-31 13:42:06
Local clock offset: 1.12 ms
Remote clock offset: -2.406 ms

Below is generated by plot.py at 2017-08-31 14:05:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.07 Mbit/s
95th percentile per-packet one-way delay: 17.400 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.07 Mbit/s
95th percentile per-packet one-way delay: 17.400 ms
Loss rate: 0.00%

Run 2: Report of PCC — Data Link

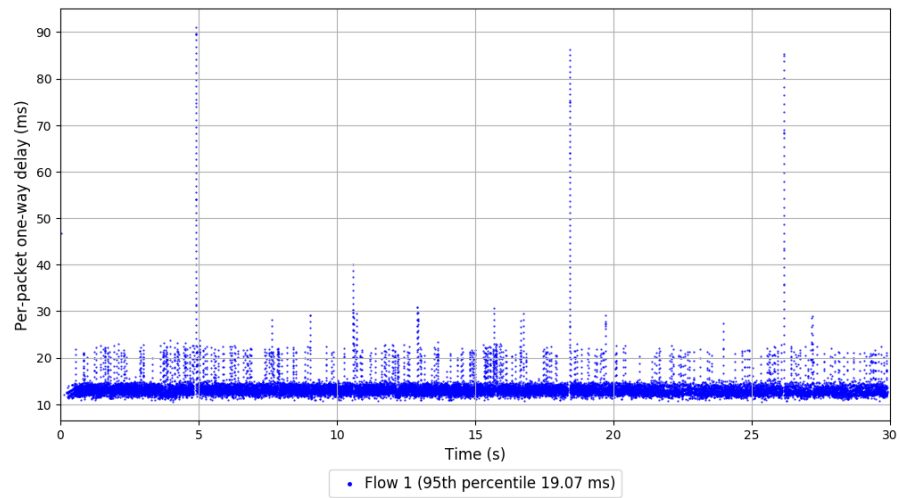
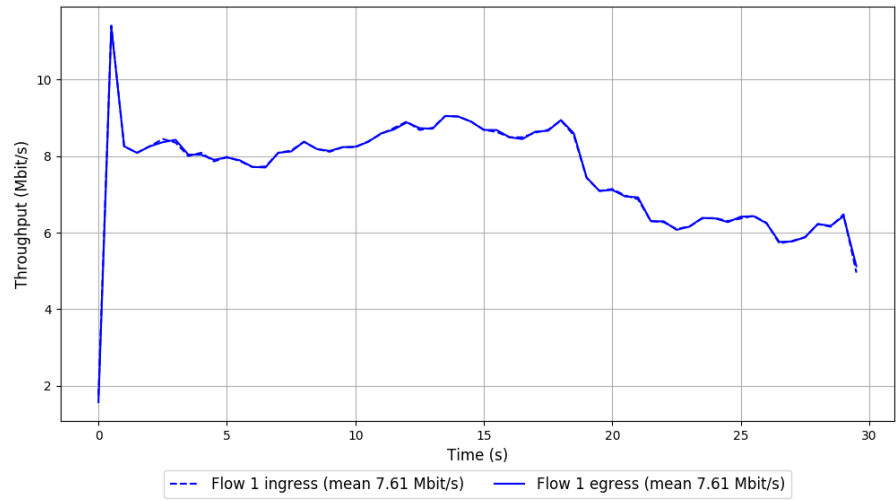


Run 3: Statistics of PCC

Start at: 2017-08-31 13:59:27
End at: 2017-08-31 13:59:57
Local clock offset: 1.134 ms
Remote clock offset: -2.808 ms

Below is generated by plot.py at 2017-08-31 14:05:45
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.61 Mbit/s
95th percentile per-packet one-way delay: 19.065 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 7.61 Mbit/s
95th percentile per-packet one-way delay: 19.065 ms
Loss rate: 0.00%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

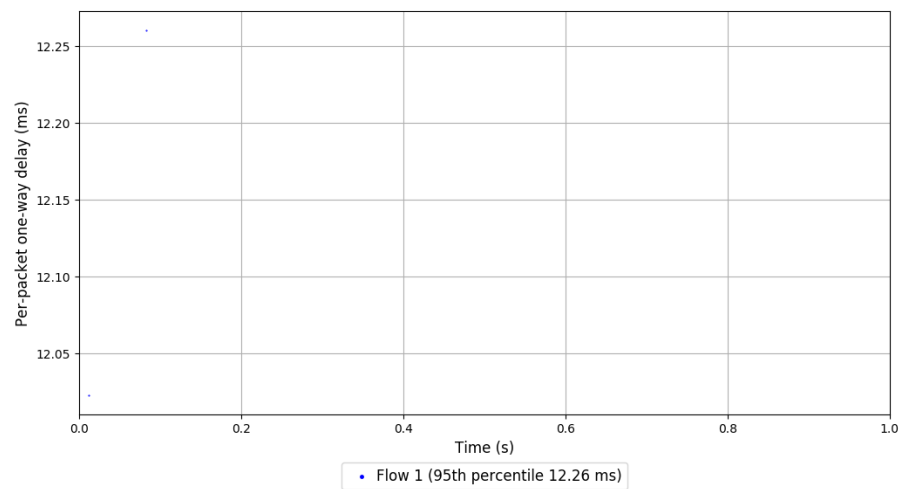
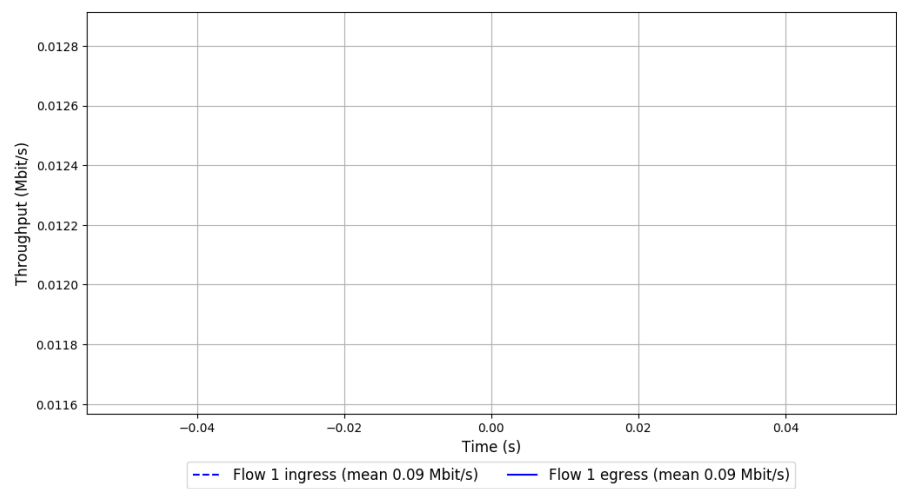
Start at: 2017-08-31 13:20:12

End at: 2017-08-31 13:20:42

Local clock offset: 0.945 ms

Remote clock offset: -2.299 ms

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2017-08-31 13:38:00

End at: 2017-08-31 13:38:30

Local clock offset: 1.022 ms

Remote clock offset: -2.409 ms

Below is generated by plot.py at 2017-08-31 14:05:51

Datalink statistics

-- Total of 1 flow:

Average throughput: 41.23 Mbit/s

95th percentile per-packet one-way delay: 183.616 ms

Loss rate: 0.38%

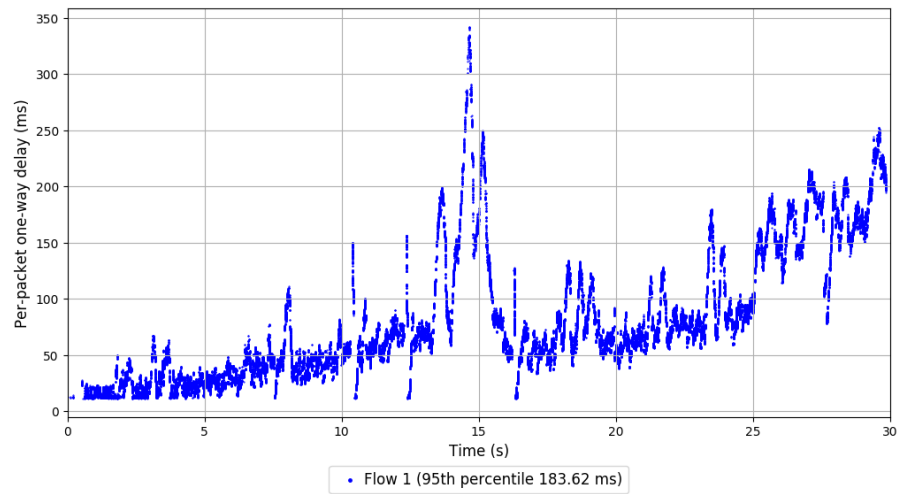
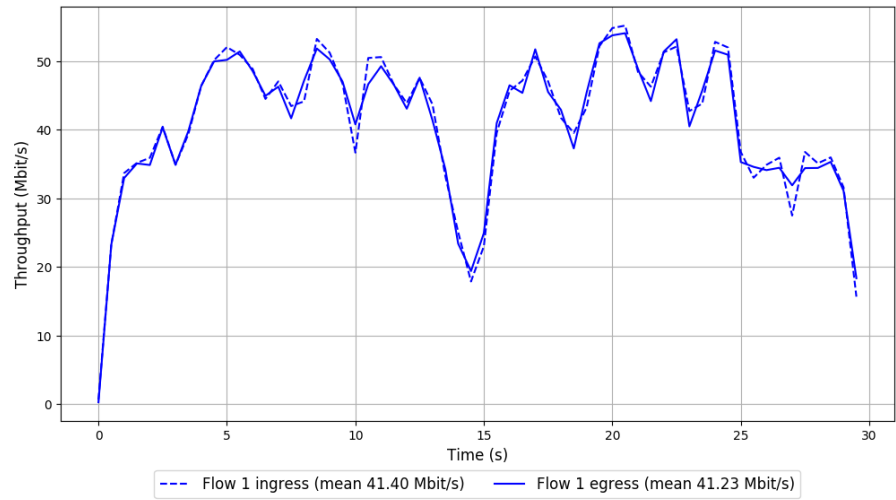
-- Flow 1:

Average throughput: 41.23 Mbit/s

95th percentile per-packet one-way delay: 183.616 ms

Loss rate: 0.38%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2017-08-31 13:55:51

End at: 2017-08-31 13:56:21

Local clock offset: 1.147 ms

Remote clock offset: -2.782 ms

Below is generated by plot.py at 2017-08-31 14:05:52

Datalink statistics

-- Total of 1 flow:

Average throughput: 46.54 Mbit/s

95th percentile per-packet one-way delay: 130.540 ms

Loss rate: 0.32%

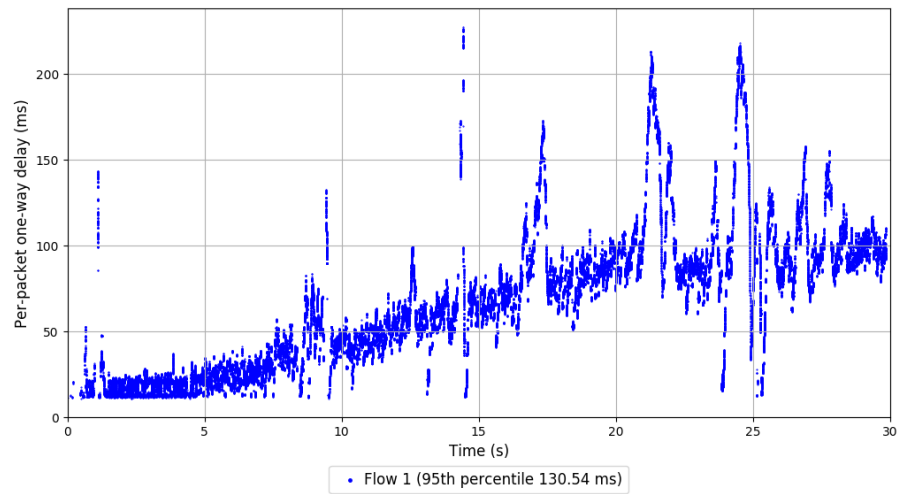
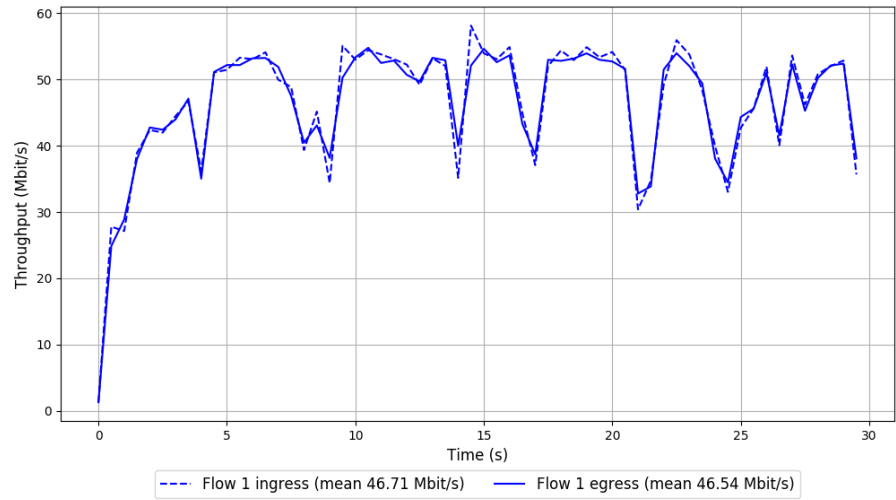
-- Flow 1:

Average throughput: 46.54 Mbit/s

95th percentile per-packet one-way delay: 130.540 ms

Loss rate: 0.32%

Run 3: Report of QUIC Cubic — Data Link

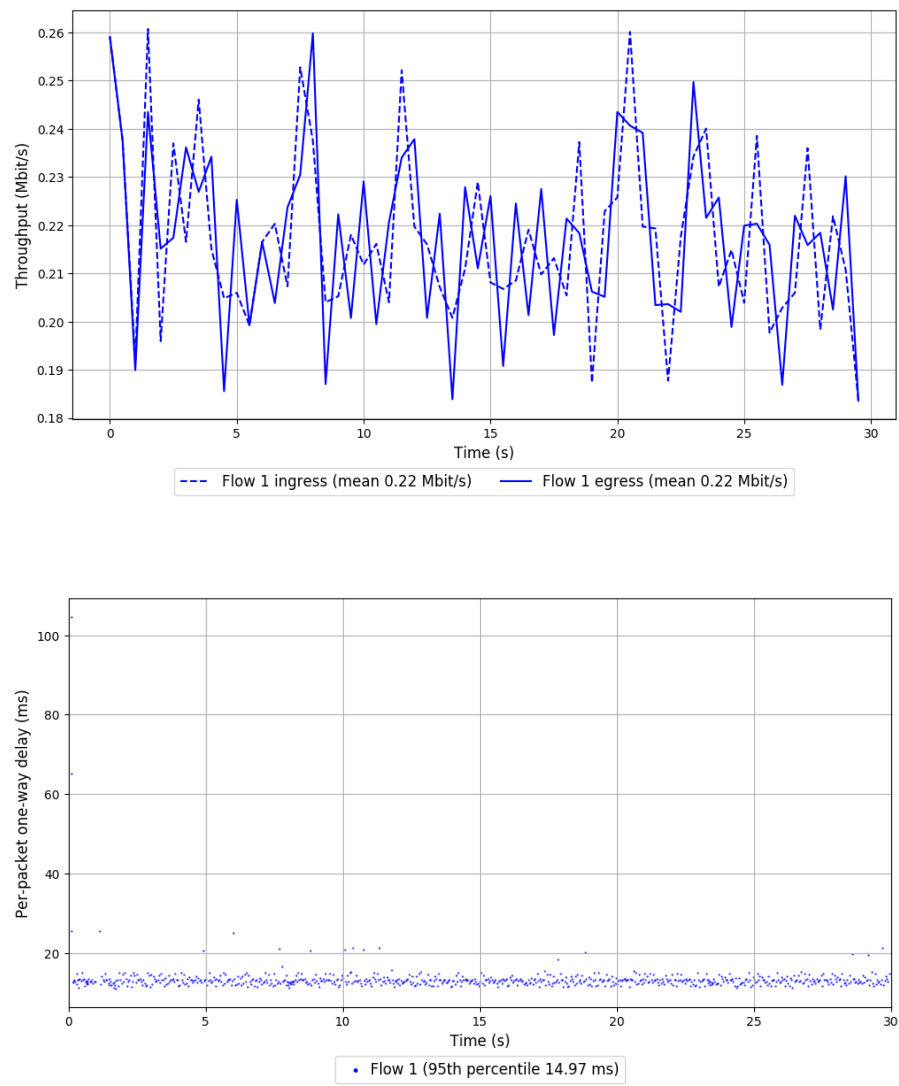


Run 1: Statistics of SCReAM

Start at: 2017-08-31 13:15:29
End at: 2017-08-31 13:15:59
Local clock offset: 1.025 ms
Remote clock offset: -2.067 ms

Below is generated by plot.py at 2017-08-31 14:05:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 14.974 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 14.974 ms
Loss rate: 0.00%

Run 1: Report of SReAM — Data Link

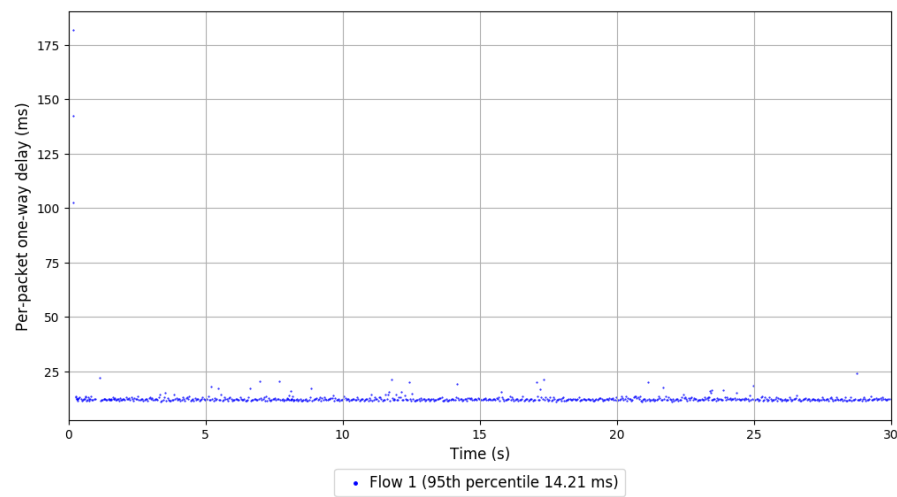
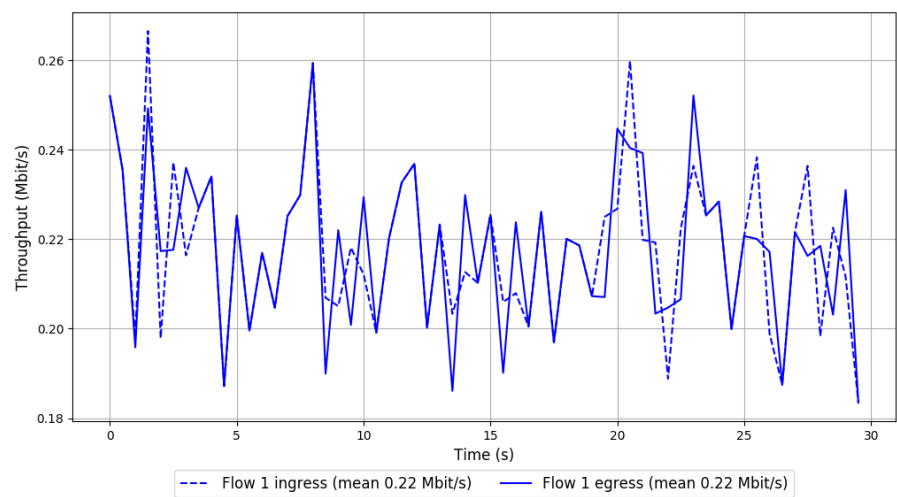


Run 2: Statistics of SCReAM

Start at: 2017-08-31 13:33:19
End at: 2017-08-31 13:33:49
Local clock offset: 0.987 ms
Remote clock offset: -2.377 ms

Below is generated by plot.py at 2017-08-31 14:05:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 14.213 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 14.213 ms
Loss rate: 0.00%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2017-08-31 13:51:08

End at: 2017-08-31 13:51:38

Local clock offset: 1.118 ms

Remote clock offset: -2.58 ms

Below is generated by plot.py at 2017-08-31 14:05:53

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 13.591 ms

Loss rate: 0.00%

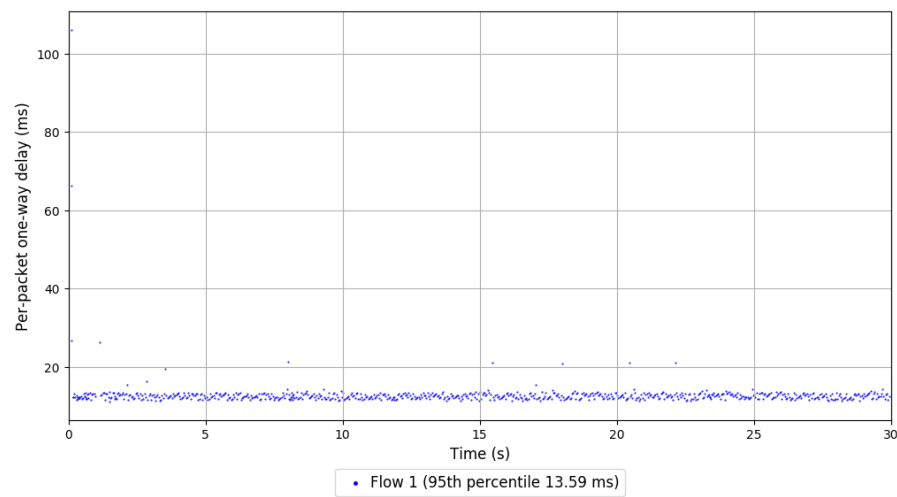
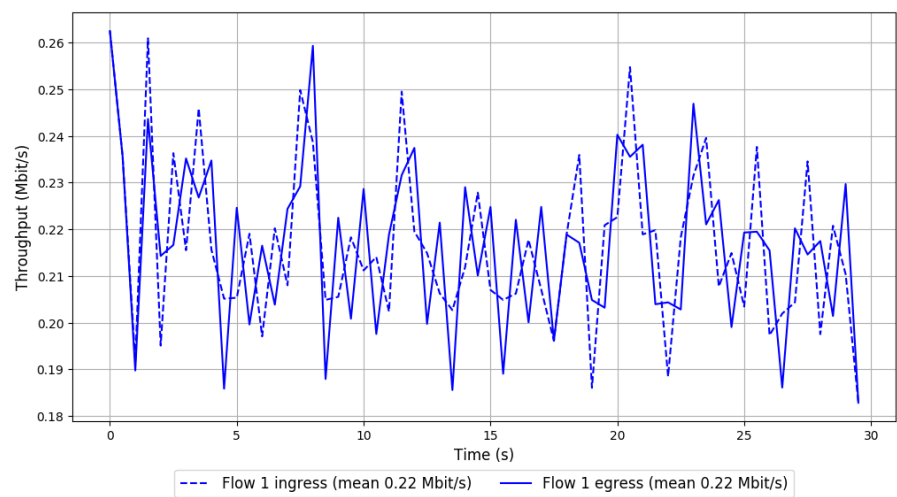
-- Flow 1:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 13.591 ms

Loss rate: 0.00%

Run 3: Report of SReAM — Data Link

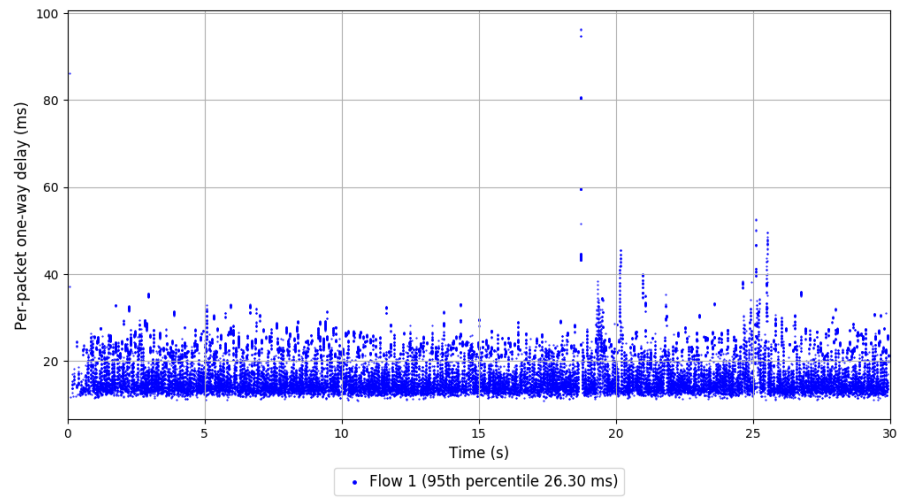
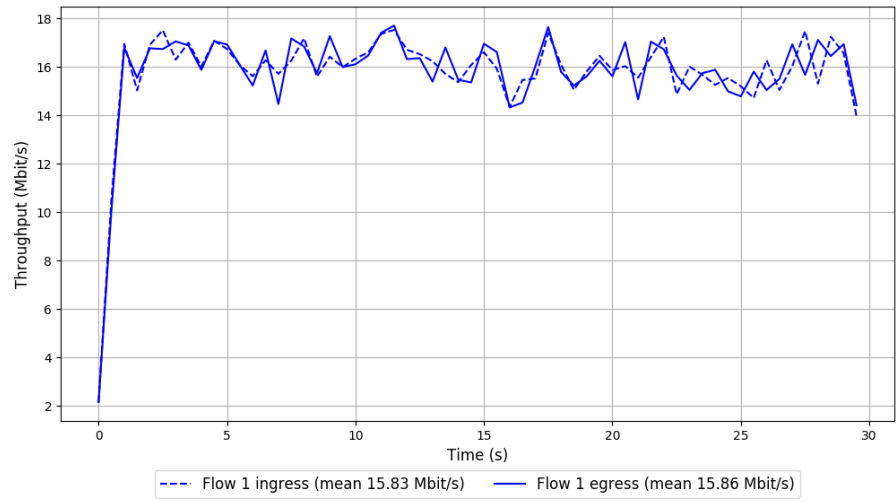


Run 1: Statistics of Sprout

Start at: 2017-08-31 13:16:40
End at: 2017-08-31 13:17:10
Local clock offset: 0.936 ms
Remote clock offset: -2.225 ms

Below is generated by plot.py at 2017-08-31 14:05:55
Datalink statistics
-- Total of 1 flow:
Average throughput: 15.86 Mbit/s
95th percentile per-packet one-way delay: 26.304 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 15.86 Mbit/s
95th percentile per-packet one-way delay: 26.304 ms
Loss rate: 0.00%

Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

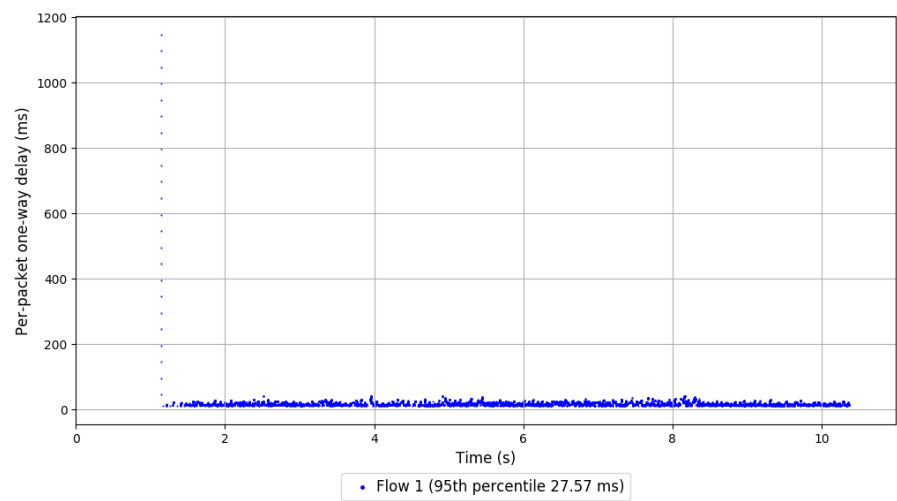
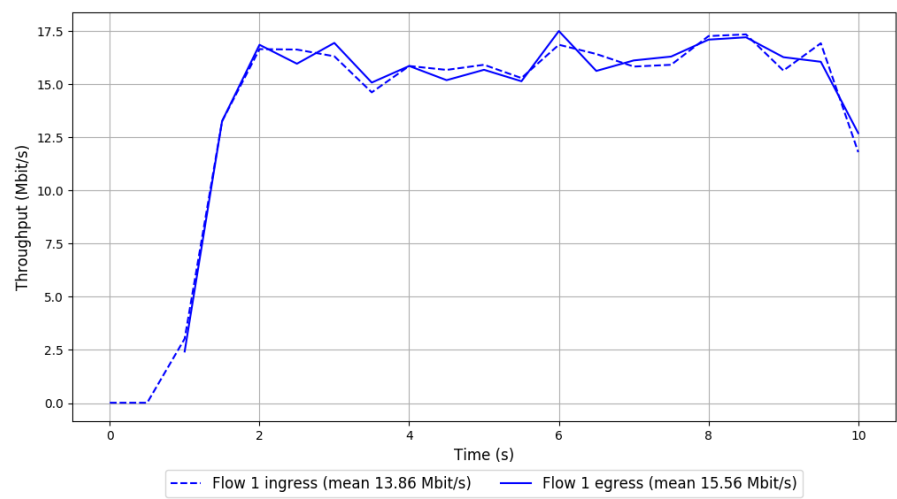
Start at: 2017-08-31 13:34:29

End at: 2017-08-31 13:34:59

Local clock offset: 0.996 ms

Remote clock offset: -2.352 ms

Run 2: Report of Sprout — Data Link

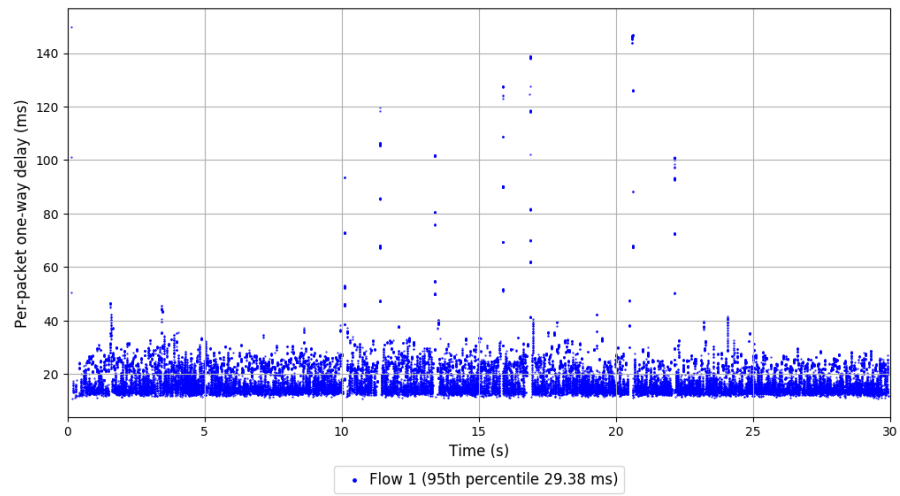
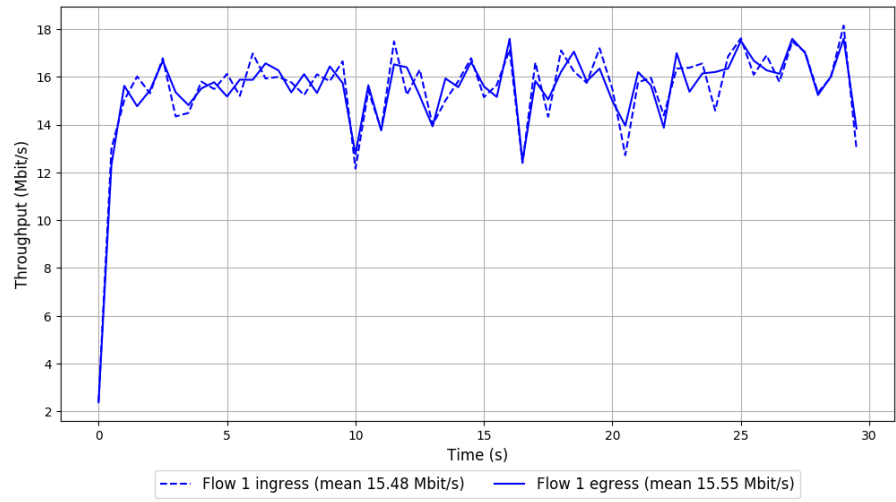


Run 3: Statistics of Sprout

Start at: 2017-08-31 13:52:18
End at: 2017-08-31 13:52:49
Local clock offset: 1.049 ms
Remote clock offset: -2.694 ms

Below is generated by plot.py at 2017-08-31 14:05:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 15.55 Mbit/s
95th percentile per-packet one-way delay: 29.379 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 15.55 Mbit/s
95th percentile per-packet one-way delay: 29.379 ms
Loss rate: 0.01%

Run 3: Report of Sprout — Data Link

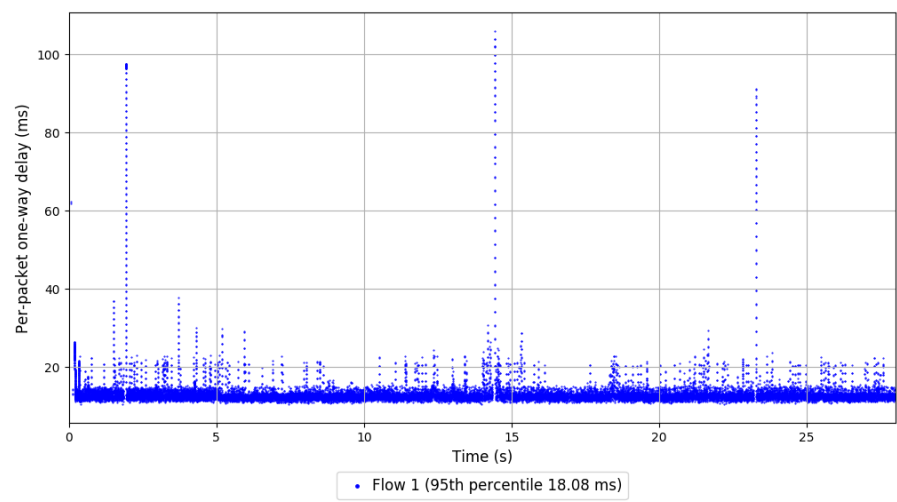
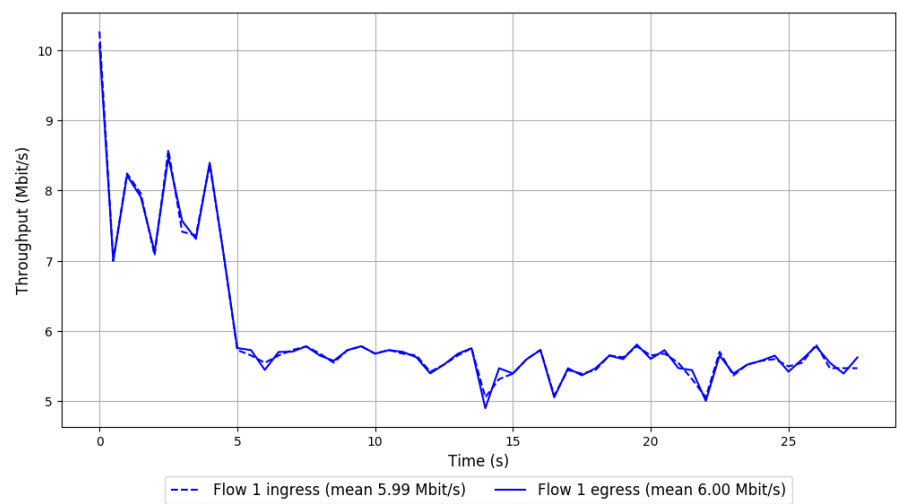


```
Run 1: Statistics of TaoVA-100x

Start at: 2017-08-31 13:22:34
End at: 2017-08-31 13:23:04
Local clock offset: 1.025 ms
Remote clock offset: -2.245 ms

# Below is generated by plot.py at 2017-08-31 14:05:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.00 Mbit/s
95th percentile per-packet one-way delay: 18.078 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 6.00 Mbit/s
95th percentile per-packet one-way delay: 18.078 ms
Loss rate: 0.01%
```

Run 1: Report of TaoVA-100x — Data Link



Run 2: Statistics of TaoVA-100x

Start at: 2017-08-31 13:40:25

End at: 2017-08-31 13:40:55

Local clock offset: 1.112 ms

Remote clock offset: -2.467 ms

Below is generated by plot.py at 2017-08-31 14:05:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.93 Mbit/s

95th percentile per-packet one-way delay: 19.455 ms

Loss rate: 0.00%

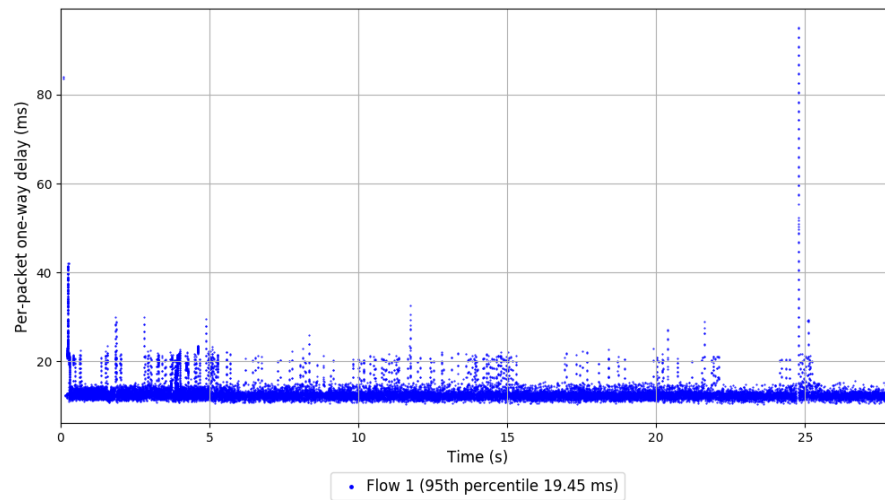
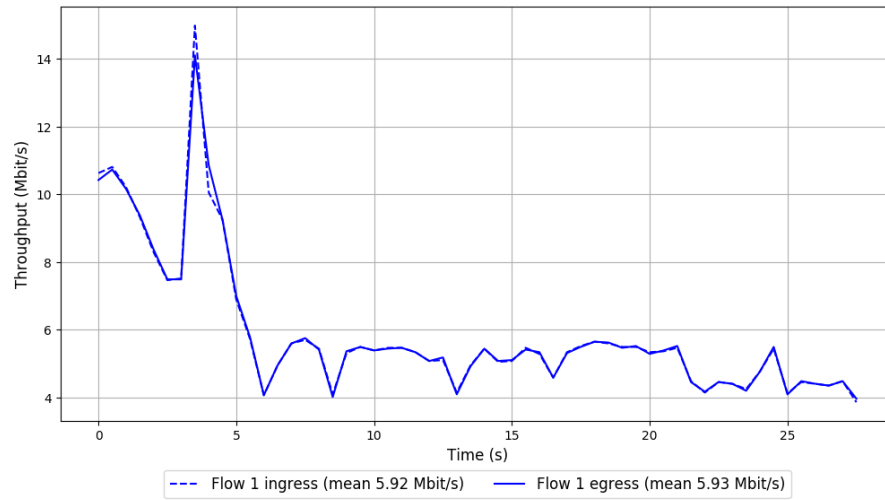
-- Flow 1:

Average throughput: 5.93 Mbit/s

95th percentile per-packet one-way delay: 19.455 ms

Loss rate: 0.00%

Run 2: Report of TaoVA-100x — Data Link



Run 3: Statistics of TaoVA-100x

Start at: 2017-08-31 13:58:16

End at: 2017-08-31 13:58:46

Local clock offset: 1.039 ms

Remote clock offset: -2.798 ms

Below is generated by plot.py at 2017-08-31 14:06:00

Datalink statistics

-- Total of 1 flow:

Average throughput: 6.96 Mbit/s

95th percentile per-packet one-way delay: 36.784 ms

Loss rate: 0.00%

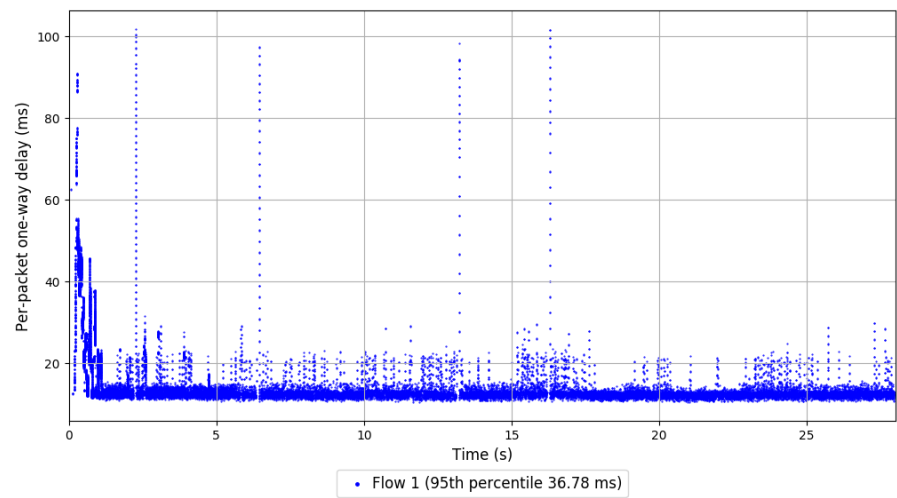
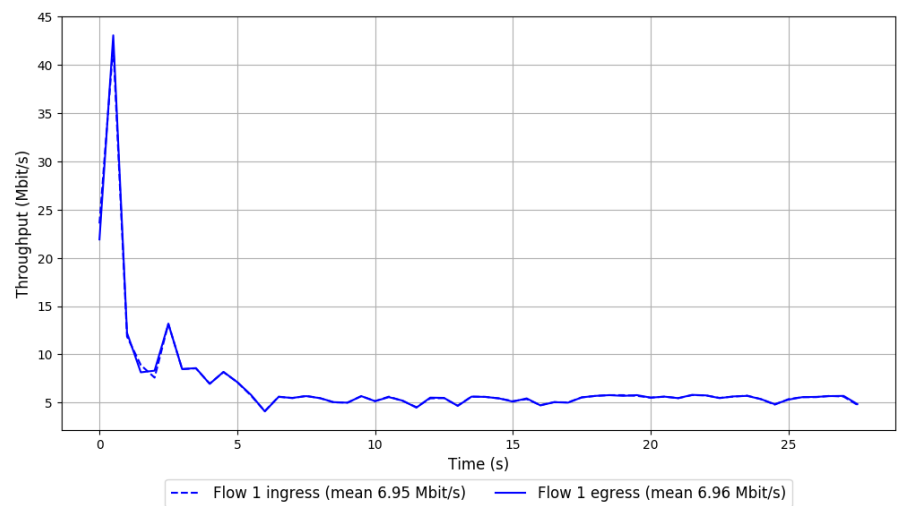
-- Flow 1:

Average throughput: 6.96 Mbit/s

95th percentile per-packet one-way delay: 36.784 ms

Loss rate: 0.00%

Run 3: Report of TaoVA-100x — Data Link



Run 1: Statistics of TCP Vegas

Start at: 2017-08-31 13:10:43

End at: 2017-08-31 13:11:13

Local clock offset: 0.937 ms

Remote clock offset: -2.024 ms

Below is generated by plot.py at 2017-08-31 14:06:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 27.72 Mbit/s

95th percentile per-packet one-way delay: 73.413 ms

Loss rate: 0.00%

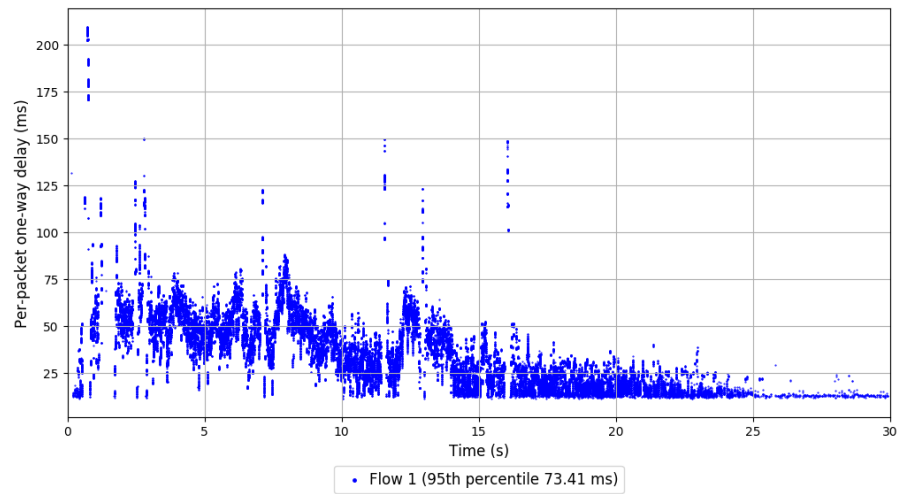
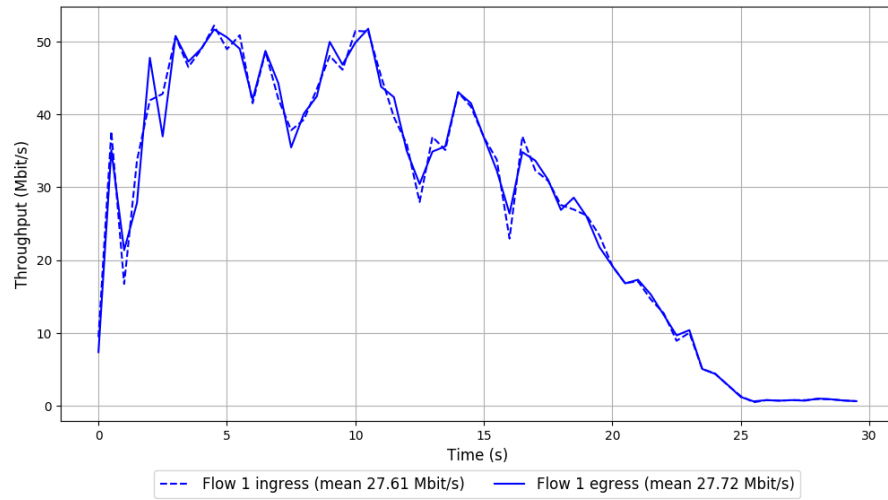
-- Flow 1:

Average throughput: 27.72 Mbit/s

95th percentile per-packet one-way delay: 73.413 ms

Loss rate: 0.00%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2017-08-31 13:28:33

End at: 2017-08-31 13:29:03

Local clock offset: 1.061 ms

Remote clock offset: -2.312 ms

Below is generated by plot.py at 2017-08-31 14:06:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.04 Mbit/s

95th percentile per-packet one-way delay: 35.050 ms

Loss rate: 0.00%

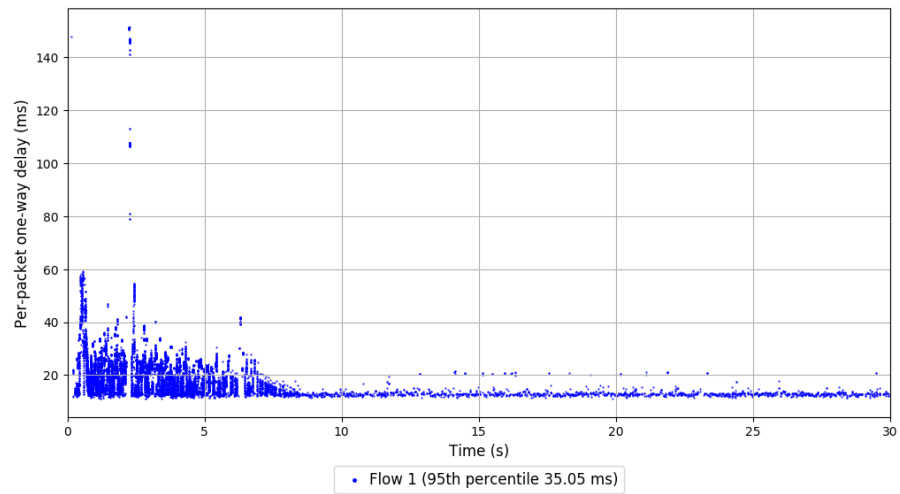
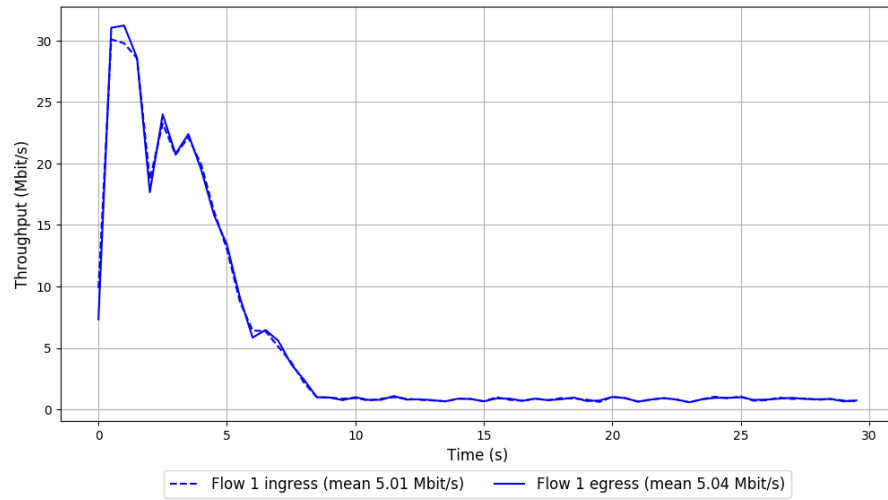
-- Flow 1:

Average throughput: 5.04 Mbit/s

95th percentile per-packet one-way delay: 35.050 ms

Loss rate: 0.00%

Run 2: Report of TCP Vegas — Data Link

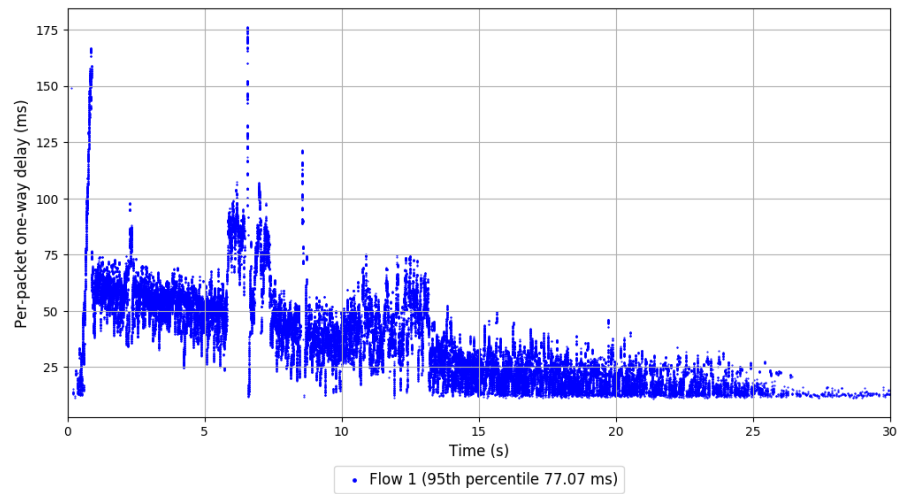
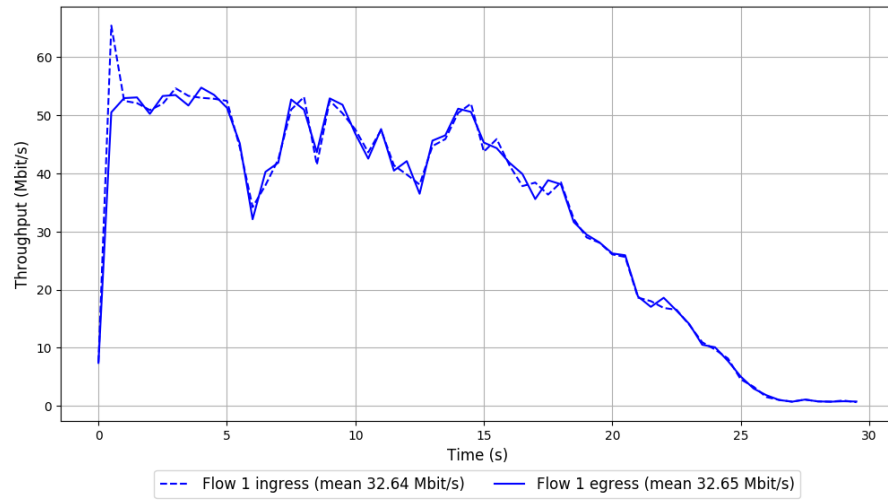


Run 3: Statistics of TCP Vegas

Start at: 2017-08-31 13:46:24
End at: 2017-08-31 13:46:54
Local clock offset: 1.133 ms
Remote clock offset: -2.499 ms

Below is generated by plot.py at 2017-08-31 14:06:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 32.65 Mbit/s
95th percentile per-packet one-way delay: 77.071 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 32.65 Mbit/s
95th percentile per-packet one-way delay: 77.071 ms
Loss rate: 0.42%

Run 3: Report of TCP Vegas — Data Link

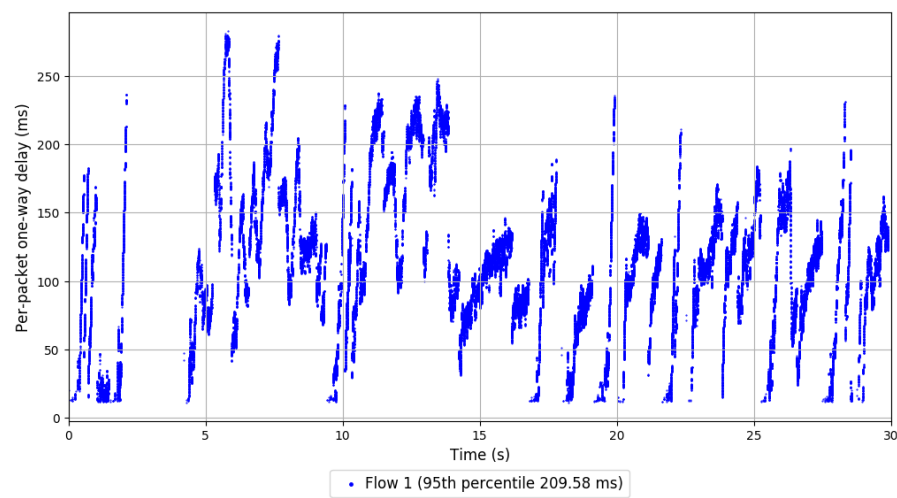
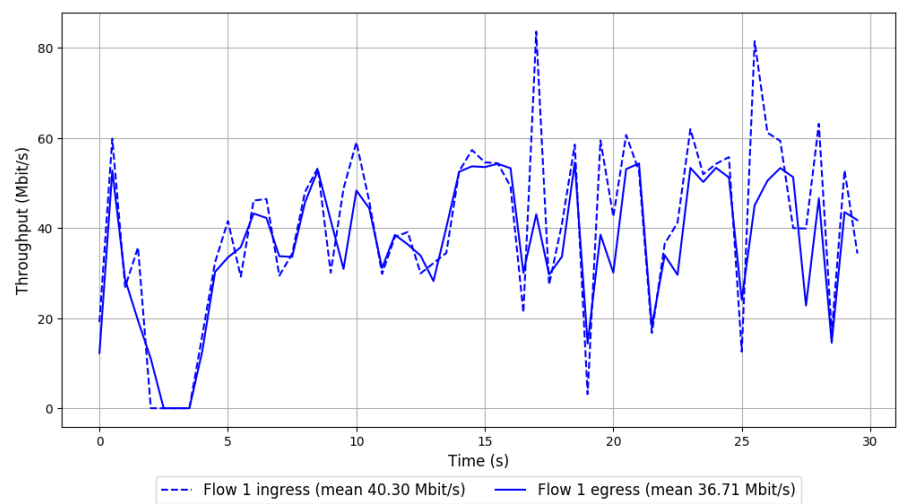


Run 1: Statistics of Verus

Start at: 2017-08-31 13:21:22
End at: 2017-08-31 13:21:52
Local clock offset: 0.928 ms
Remote clock offset: -2.277 ms

Below is generated by plot.py at 2017-08-31 14:06:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 36.71 Mbit/s
95th percentile per-packet one-way delay: 209.576 ms
Loss rate: 8.77%
-- Flow 1:
Average throughput: 36.71 Mbit/s
95th percentile per-packet one-way delay: 209.576 ms
Loss rate: 8.77%

Run 1: Report of Verus — Data Link

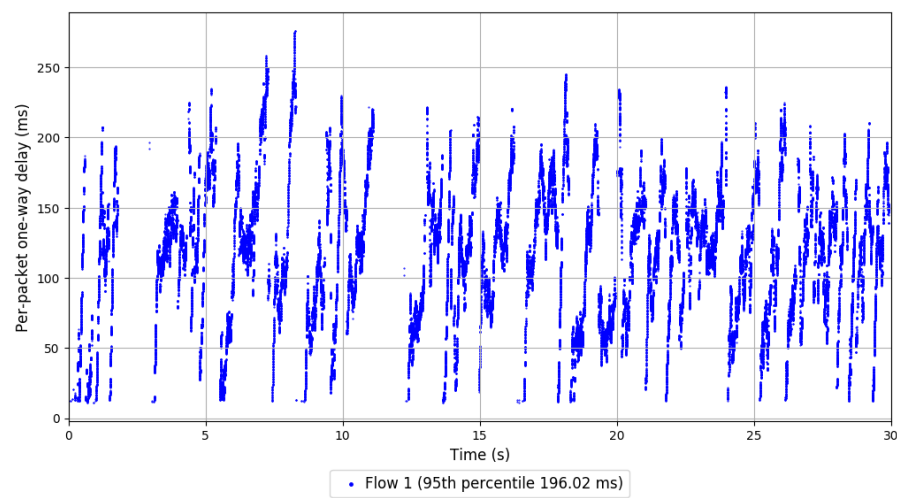
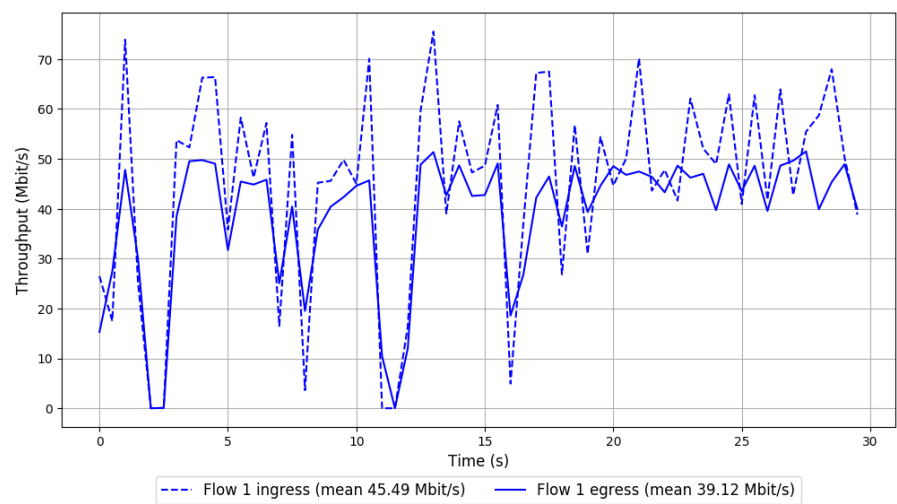


Run 2: Statistics of Verus

Start at: 2017-08-31 13:39:13
End at: 2017-08-31 13:39:43
Local clock offset: 1.119 ms
Remote clock offset: -2.428 ms

Below is generated by plot.py at 2017-08-31 14:06:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 39.12 Mbit/s
95th percentile per-packet one-way delay: 196.023 ms
Loss rate: 13.62%
-- Flow 1:
Average throughput: 39.12 Mbit/s
95th percentile per-packet one-way delay: 196.023 ms
Loss rate: 13.62%

Run 2: Report of Verus — Data Link

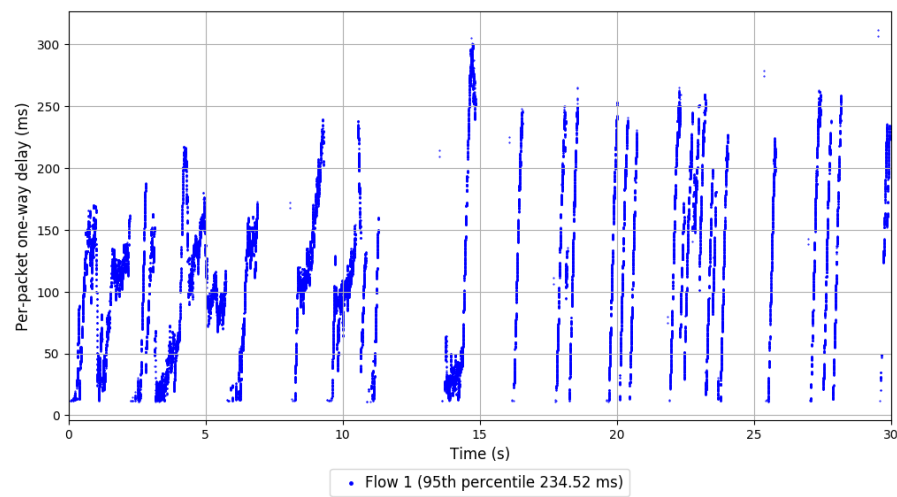
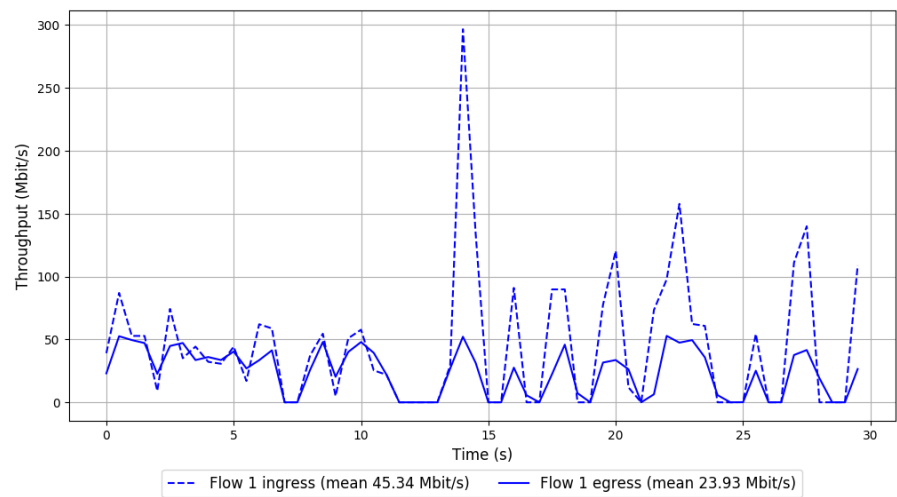


Run 3: Statistics of Verus

Start at: 2017-08-31 13:57:04
End at: 2017-08-31 13:57:34
Local clock offset: 1.134 ms
Remote clock offset: -2.791 ms

Below is generated by plot.py at 2017-08-31 14:06:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 23.93 Mbit/s
95th percentile per-packet one-way delay: 234.521 ms
Loss rate: 46.89%
-- Flow 1:
Average throughput: 23.93 Mbit/s
95th percentile per-packet one-way delay: 234.521 ms
Loss rate: 46.89%

Run 3: Report of Verus — Data Link



Run 1: Statistics of WebRTC media

Start at: 2017-08-31 13:19:02

End at: 2017-08-31 13:19:32

Local clock offset: 0.948 ms

Remote clock offset: -2.171 ms

Below is generated by plot.py at 2017-08-31 14:06:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.30 Mbit/s

95th percentile per-packet one-way delay: 21.092 ms

Loss rate: 0.00%

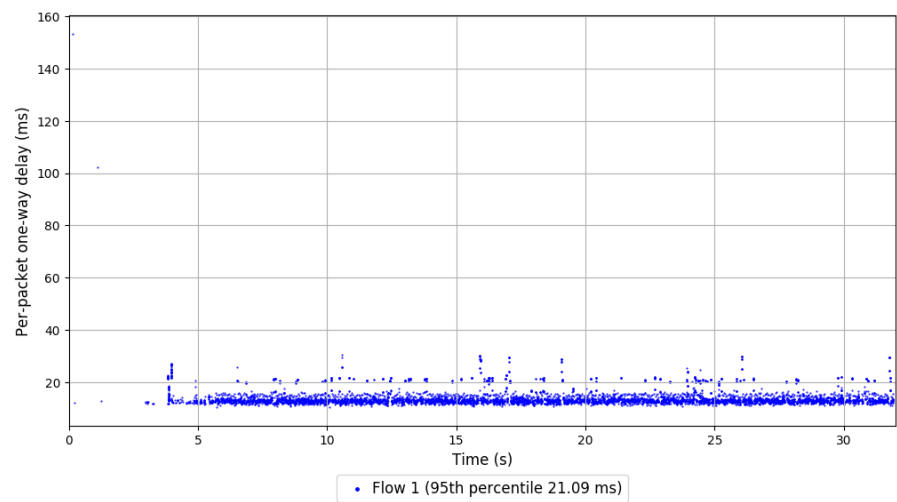
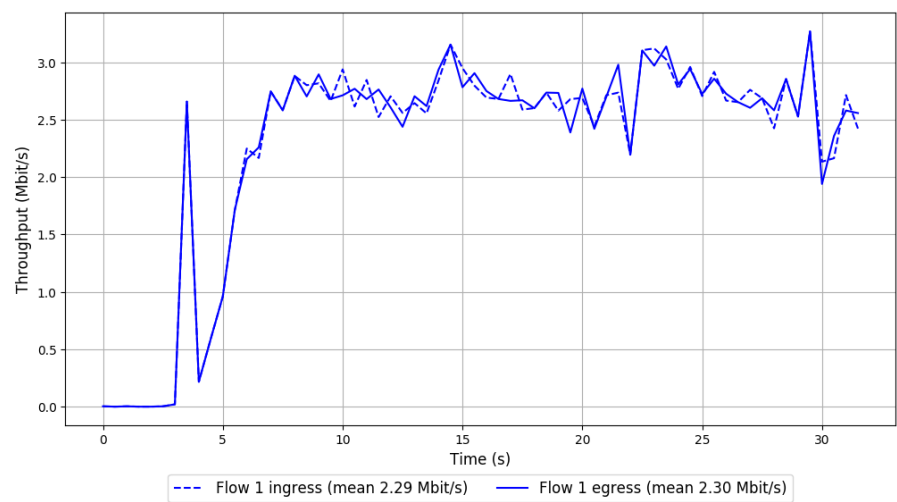
-- Flow 1:

Average throughput: 2.30 Mbit/s

95th percentile per-packet one-way delay: 21.092 ms

Loss rate: 0.00%

Run 1: Report of WebRTC media — Data Link

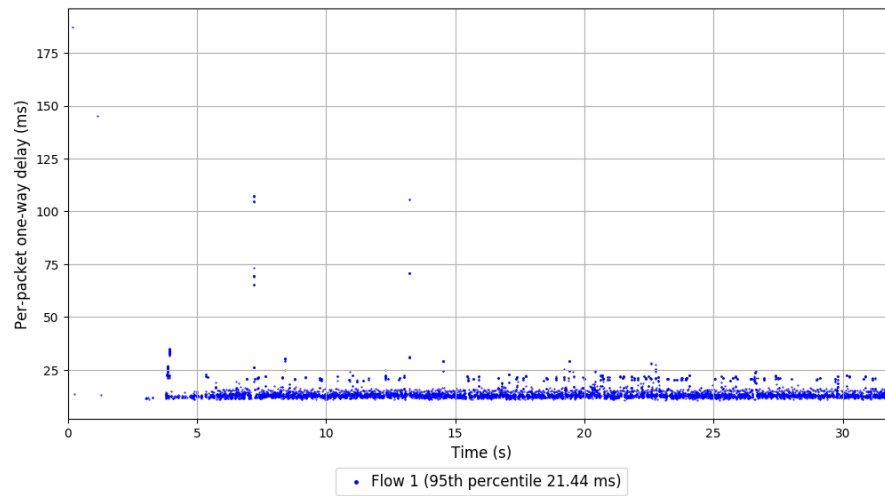
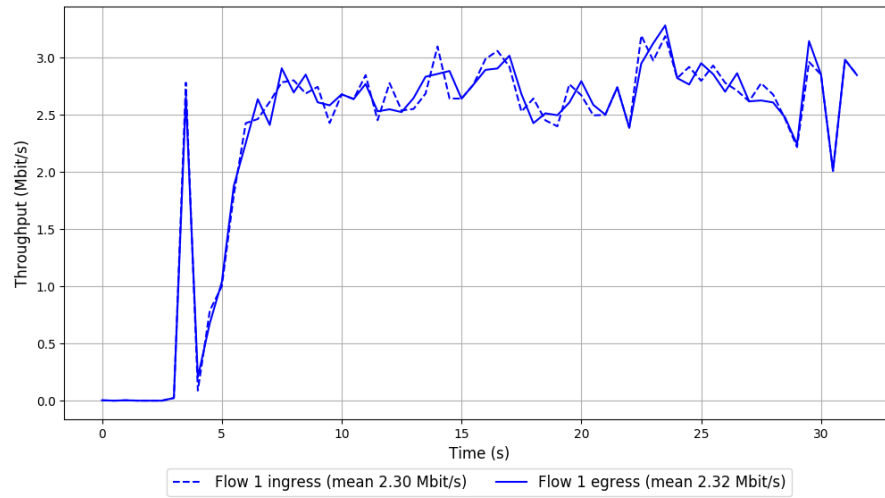


Run 2: Statistics of WebRTC media

Start at: 2017-08-31 13:36:50
End at: 2017-08-31 13:37:20
Local clock offset: 1.097 ms
Remote clock offset: -2.284 ms

Below is generated by plot.py at 2017-08-31 14:06:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 21.444 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 21.444 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2017-08-31 13:54:40
End at: 2017-08-31 13:55:11
Local clock offset: 1.056 ms
Remote clock offset: -2.677 ms

Below is generated by plot.py at 2017-08-31 14:06:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 21.401 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 21.401 ms
Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

