

Pantheon Report

Generated at 2018-03-20 08:09:48 (UTC).

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

Repeated the test of 17 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).

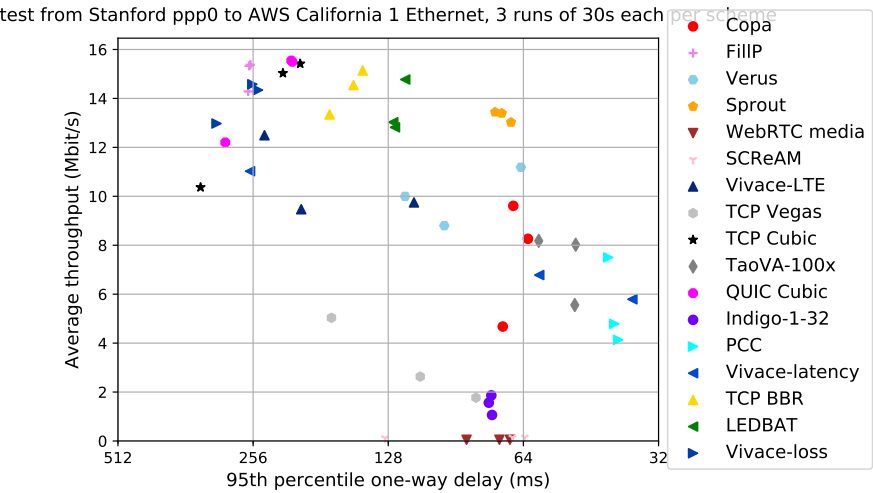
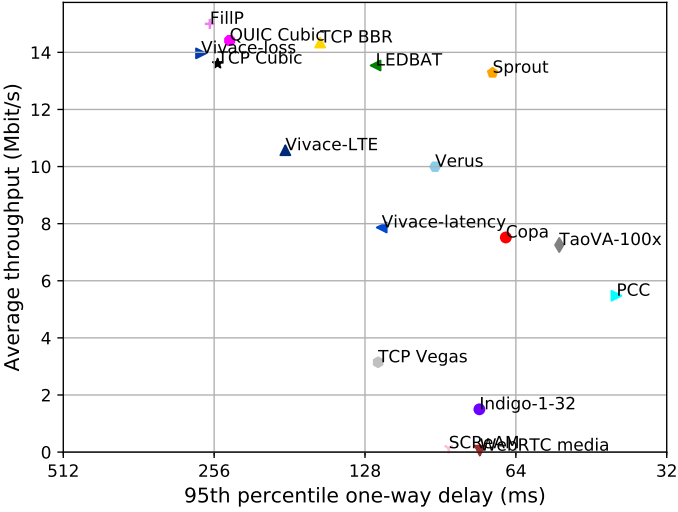
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

Git summary:

```
branch: master @ f12c42a2c63fdd9a862eefa0468859bf379b6623
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 828bbf95fd4941149b5cec90f281d1c69ae1a5c6
third_party/genericCC @ 9249eea3238475c4d8cca1443d28df70bff6c4a2
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
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-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eae30b267cde681
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/vivace @ 7a4ba531e75b4a6f66f5c4580192120401784ce3
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

test from Stanford ppp0 to AWS California 1 Ethernet, 3 runs of 30s each per scheme
(mean of all runs by 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	14.34	157.27	0.44
TCP Cubic	3	13.61	252.00	0.79
LEDBAT	3	13.54	121.93	0.45
PCC	3	5.47	40.31	0.15
QUIC Cubic	3	14.42	238.38	1.28
SCReAM	3	0.13	87.12	0.41
WebRTC media	3	0.05	75.54	0.00
Sprout	3	13.28	71.23	1.11
TaoVA-100x	3	7.25	52.43	0.49
TCP Vegas	3	3.14	120.53	0.17
Verus	3	10.00	92.76	25.84
Copa	3	7.52	67.03	0.20
FillP	3	15.00	261.08	45.82
Indigo-1-32	3	1.49	75.68	0.31
Vivace-latency	3	7.87	118.56	7.02
Vivace-loss	3	13.96	271.83	19.21
Vivace-LTE	3	10.57	184.57	2.29

Run 1: Statistics of TCP BBR

Start at: 2018-03-20 05:48:08

End at: 2018-03-20 05:48:38

Local clock offset: 4.4 ms

Remote clock offset: -5.345 ms

Below is generated by plot.py at 2018-03-20 08:08:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 13.34 Mbit/s

95th percentile per-packet one-way delay: 172.915 ms

Loss rate: 0.34%

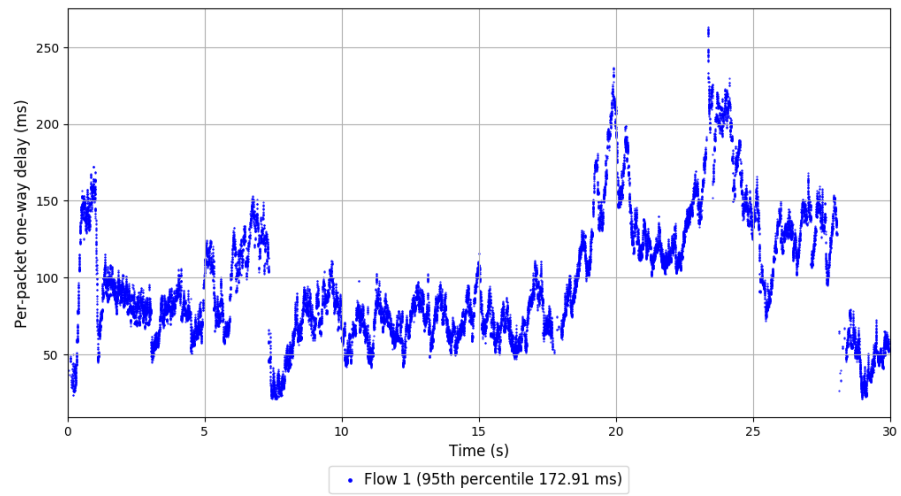
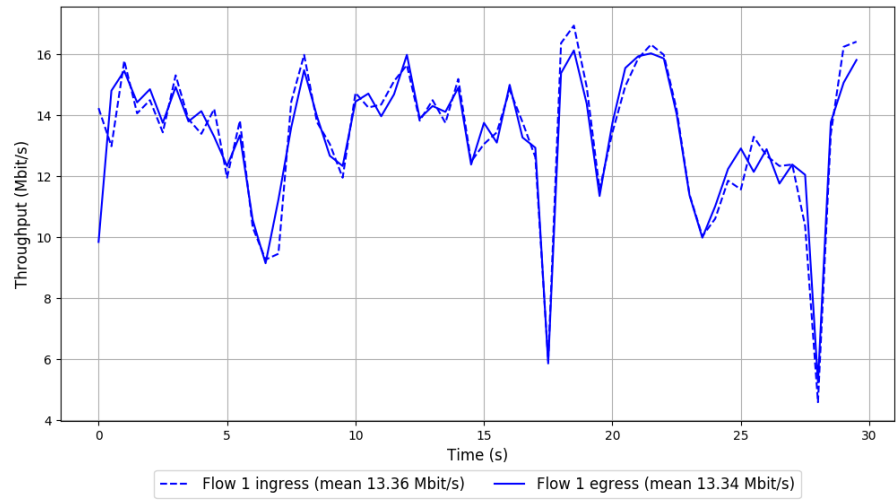
-- Flow 1:

Average throughput: 13.34 Mbit/s

95th percentile per-packet one-way delay: 172.915 ms

Loss rate: 0.34%

Run 1: Report of TCP BBR — Data Link

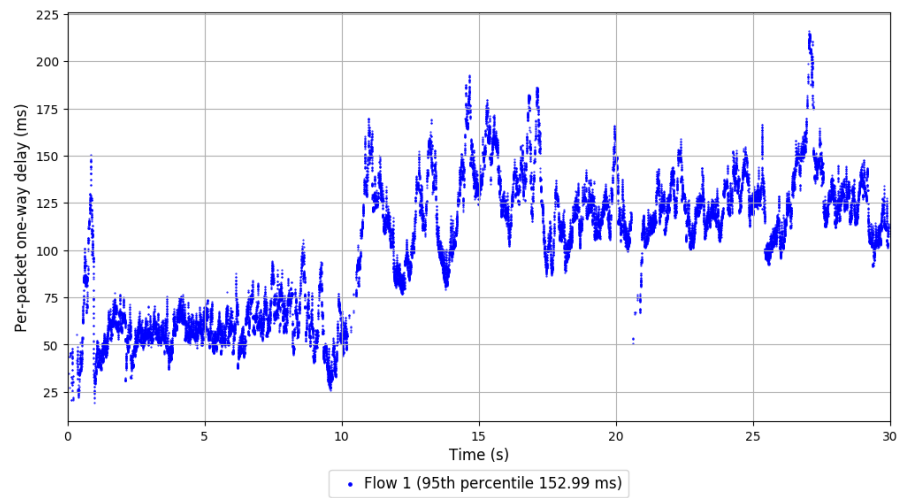
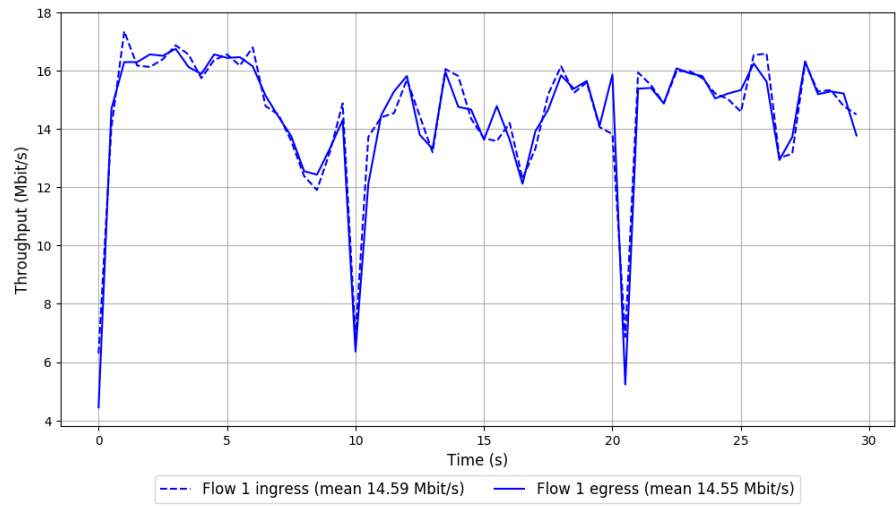


Run 2: Statistics of TCP BBR

Start at: 2018-03-20 06:11:46
End at: 2018-03-20 06:12:16
Local clock offset: 9.841 ms
Remote clock offset: -5.936 ms

Below is generated by plot.py at 2018-03-20 08:08:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 14.55 Mbit/s
95th percentile per-packet one-way delay: 152.994 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 14.55 Mbit/s
95th percentile per-packet one-way delay: 152.994 ms
Loss rate: 0.49%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-03-20 06:35:22

End at: 2018-03-20 06:35:52

Local clock offset: 4.291 ms

Remote clock offset: -4.61 ms

Below is generated by plot.py at 2018-03-20 08:08:35

Datalink statistics

-- Total of 1 flow:

Average throughput: 15.14 Mbit/s

95th percentile per-packet one-way delay: 145.906 ms

Loss rate: 0.48%

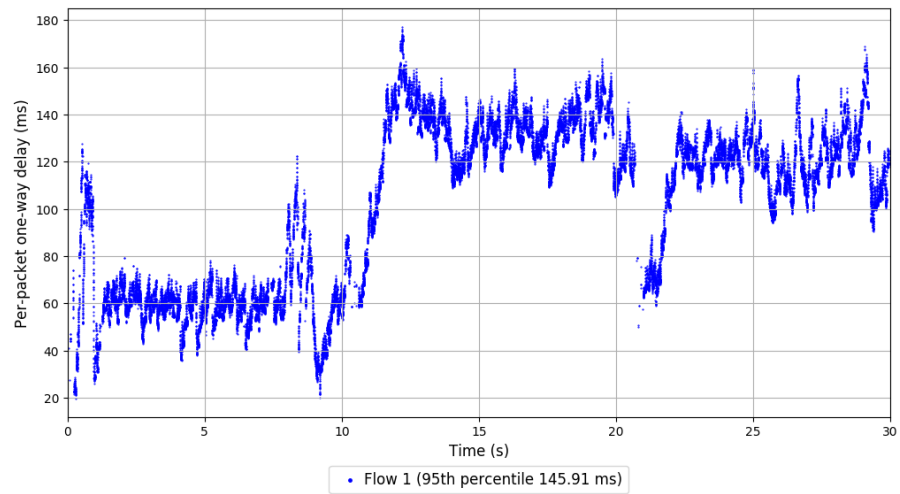
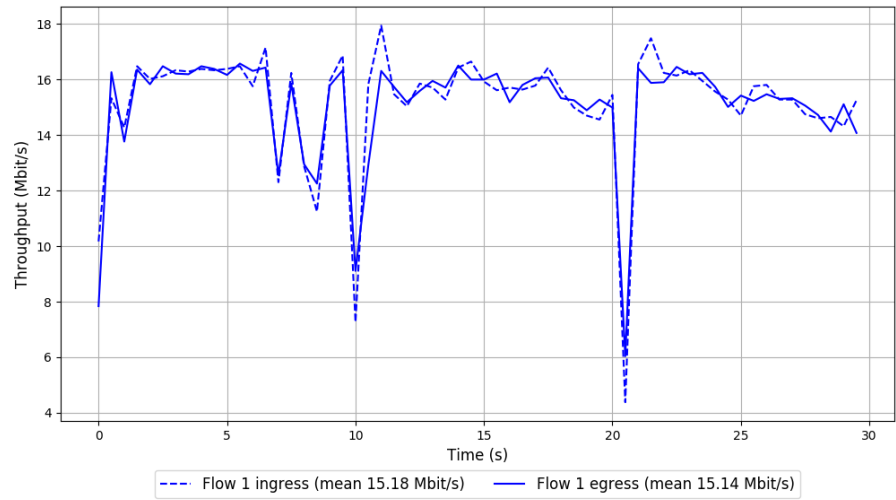
-- Flow 1:

Average throughput: 15.14 Mbit/s

95th percentile per-packet one-way delay: 145.906 ms

Loss rate: 0.48%

Run 3: Report of TCP BBR — Data Link

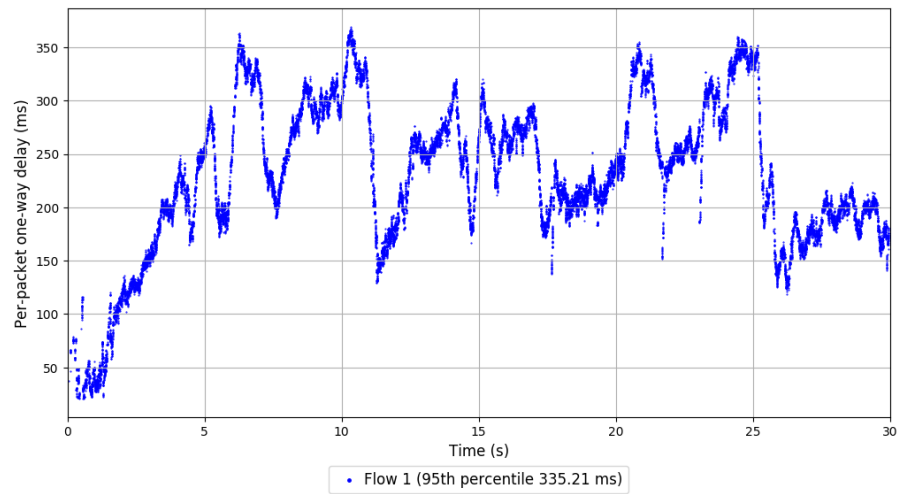
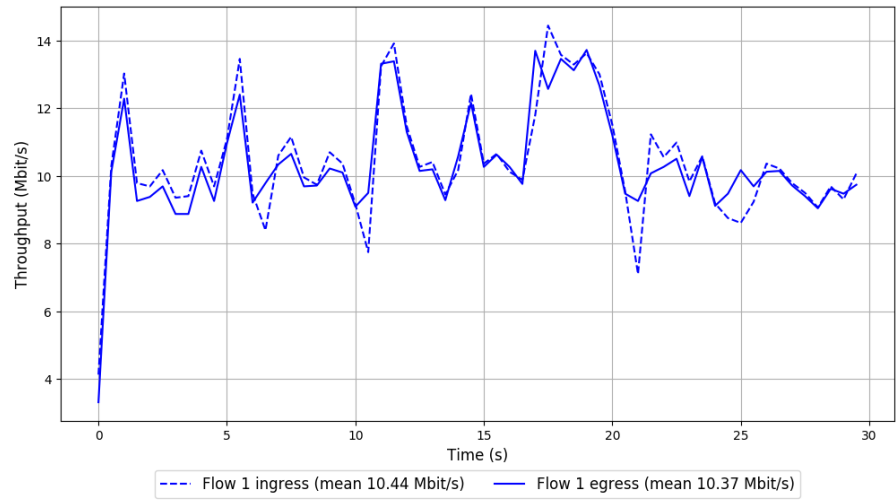


Run 1: Statistics of TCP Cubic

Start at: 2018-03-20 05:46:49
End at: 2018-03-20 05:47:19
Local clock offset: 3.46 ms
Remote clock offset: -5.309 ms

Below is generated by plot.py at 2018-03-20 08:08:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.37 Mbit/s
95th percentile per-packet one-way delay: 335.212 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 10.37 Mbit/s
95th percentile per-packet one-way delay: 335.212 ms
Loss rate: 0.86%

Run 1: Report of TCP Cubic — Data Link

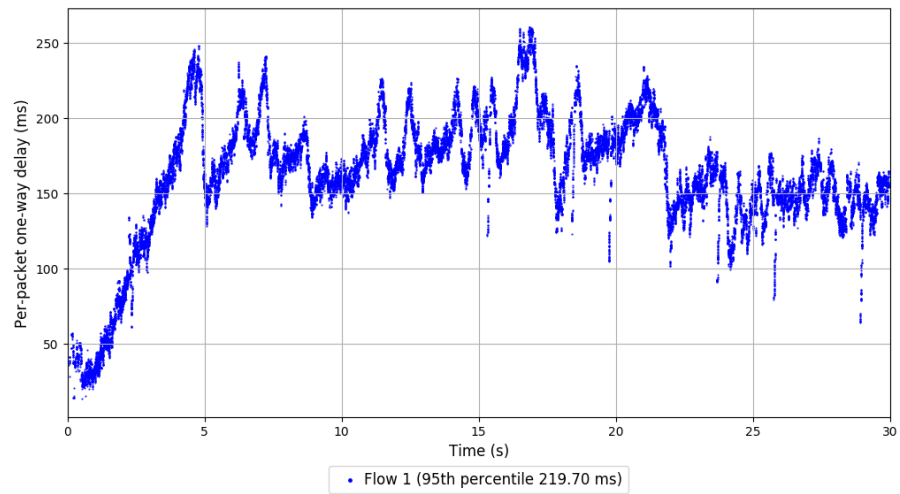
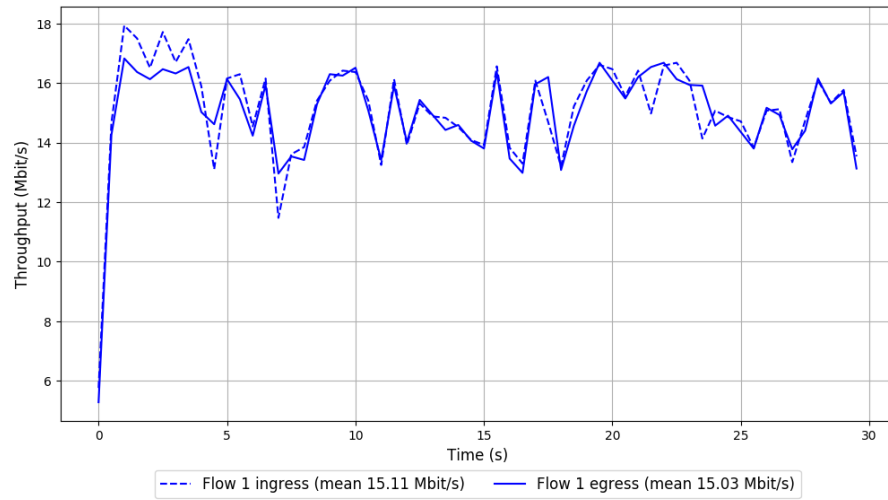


Run 2: Statistics of TCP Cubic

Start at: 2018-03-20 06:10:26
End at: 2018-03-20 06:10:57
Local clock offset: 9.609 ms
Remote clock offset: -5.934 ms

Below is generated by plot.py at 2018-03-20 08:08:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 15.03 Mbit/s
95th percentile per-packet one-way delay: 219.699 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 15.03 Mbit/s
95th percentile per-packet one-way delay: 219.699 ms
Loss rate: 0.67%

Run 2: Report of TCP Cubic — Data Link

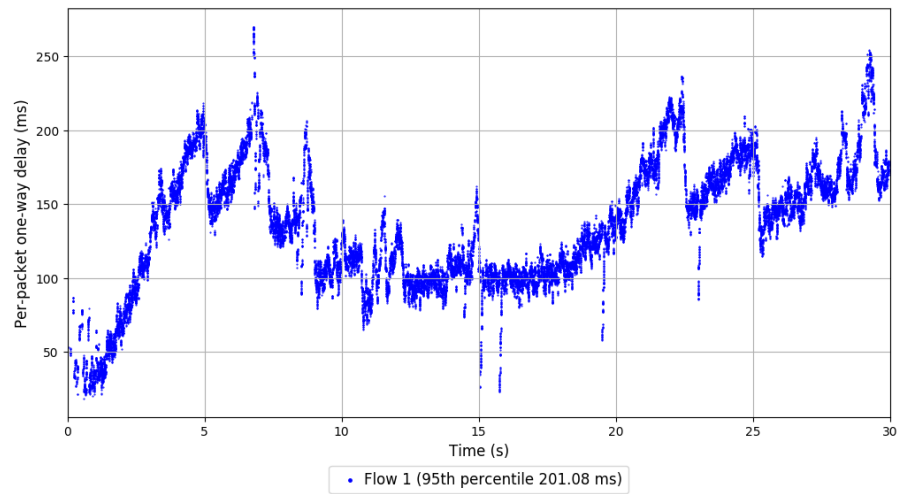
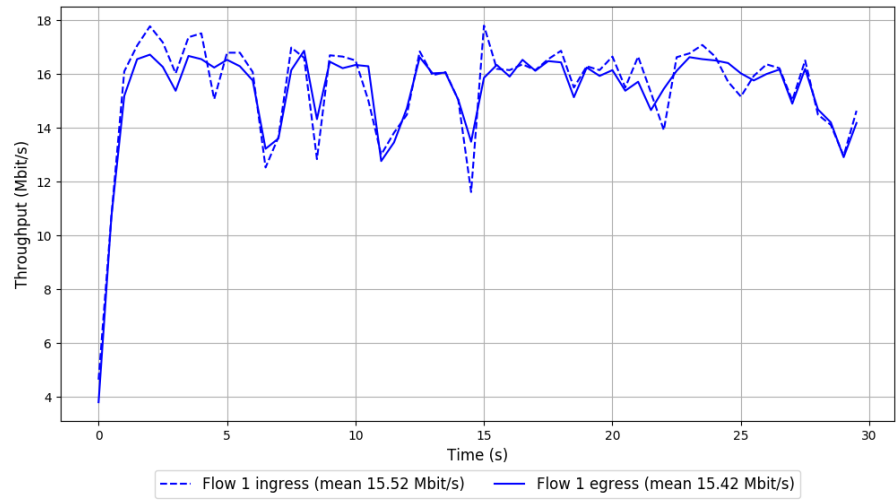


Run 3: Statistics of TCP Cubic

Start at: 2018-03-20 06:34:03
End at: 2018-03-20 06:34:33
Local clock offset: 4.421 ms
Remote clock offset: -4.767 ms

Below is generated by plot.py at 2018-03-20 08:08:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 15.42 Mbit/s
95th percentile per-packet one-way delay: 201.081 ms
Loss rate: 0.84%
-- Flow 1:
Average throughput: 15.42 Mbit/s
95th percentile per-packet one-way delay: 201.081 ms
Loss rate: 0.84%

Run 3: Report of TCP Cubic — Data Link

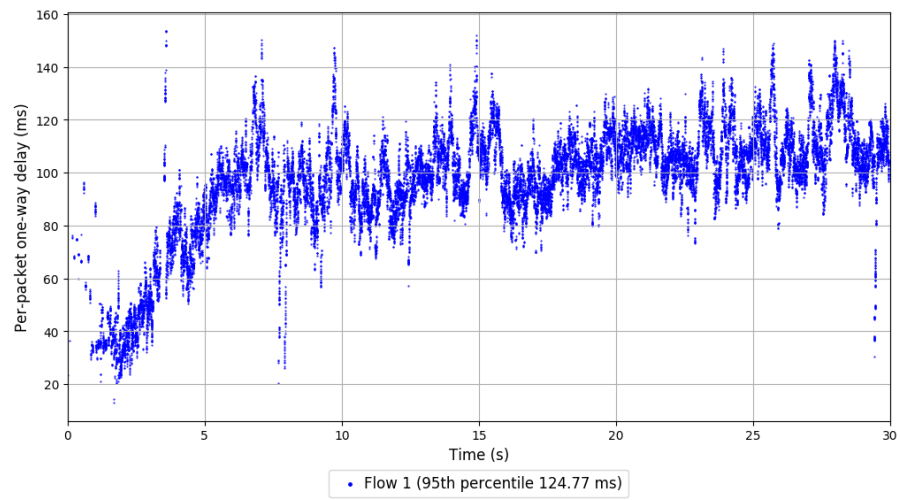
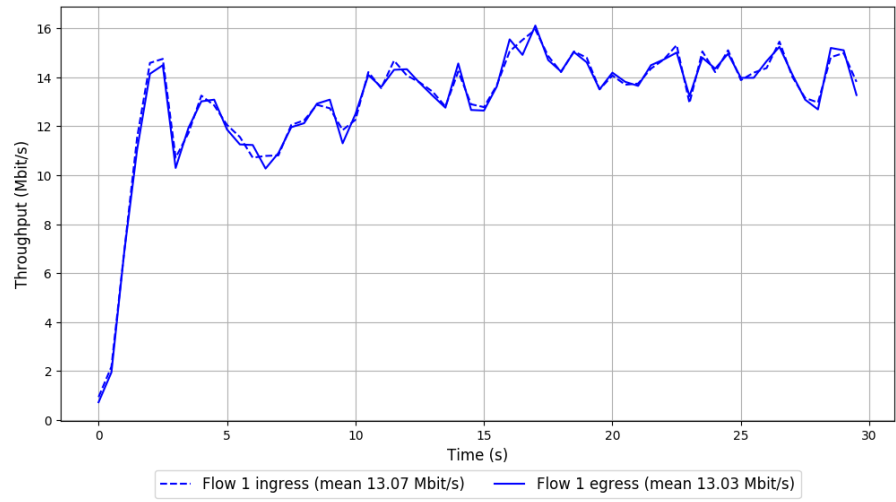


```
Run 1: Statistics of LEDBAT

Start at: 2018-03-20 06:01:15
End at: 2018-03-20 06:01:45
Local clock offset: 10.005 ms
Remote clock offset: -5.833 ms

# Below is generated by plot.py at 2018-03-20 08:08:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.03 Mbit/s
95th percentile per-packet one-way delay: 124.774 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 13.03 Mbit/s
95th percentile per-packet one-way delay: 124.774 ms
Loss rate: 0.46%
```

Run 1: Report of LEDBAT — Data Link

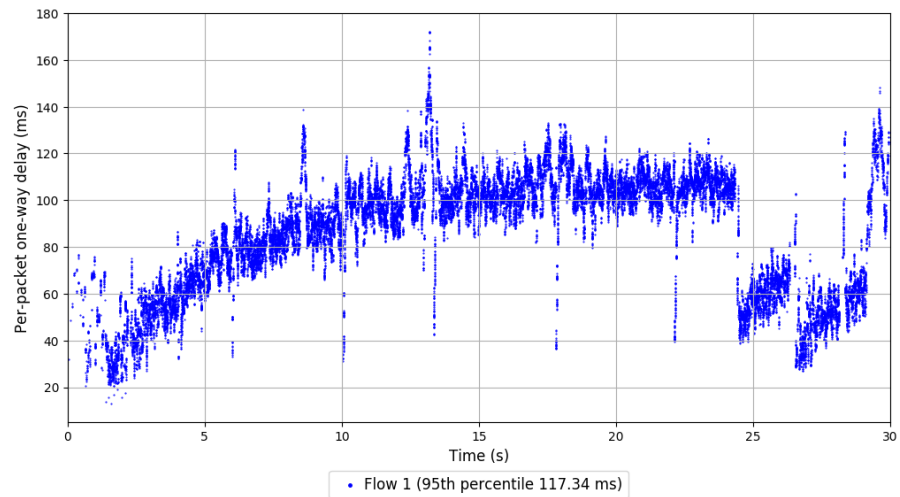
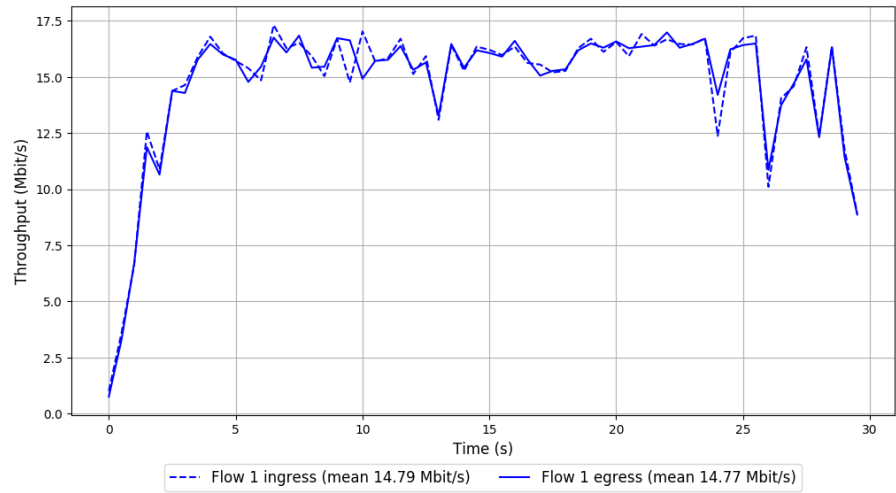


Run 2: Statistics of LEDBAT

Start at: 2018-03-20 06:24:52
End at: 2018-03-20 06:25:22
Local clock offset: 6.313 ms
Remote clock offset: -5.117 ms

Below is generated by plot.py at 2018-03-20 08:08:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 14.77 Mbit/s
95th percentile per-packet one-way delay: 117.343 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 14.77 Mbit/s
95th percentile per-packet one-way delay: 117.343 ms
Loss rate: 0.30%

Run 2: Report of LEDBAT — Data Link

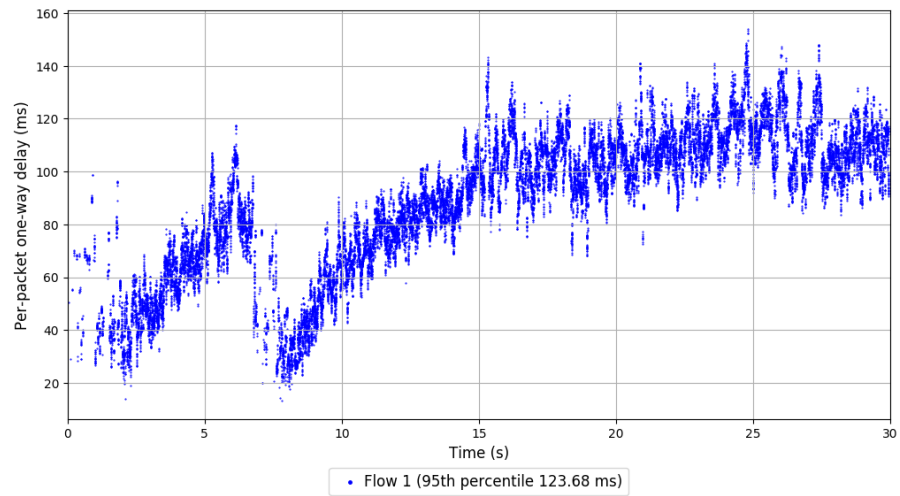
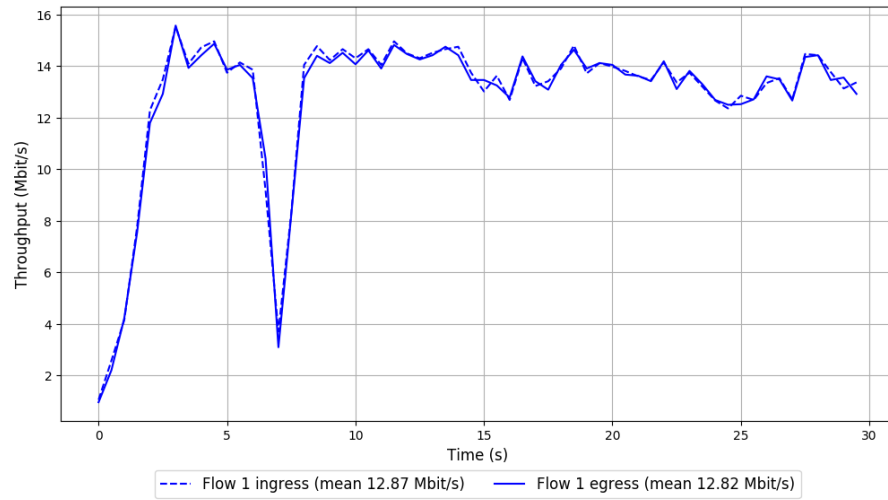


Run 3: Statistics of LEDBAT

Start at: 2018-03-20 06:48:27
End at: 2018-03-20 06:48:57
Local clock offset: 5.203 ms
Remote clock offset: -4.433 ms

Below is generated by plot.py at 2018-03-20 08:08:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.82 Mbit/s
95th percentile per-packet one-way delay: 123.677 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 12.82 Mbit/s
95th percentile per-packet one-way delay: 123.677 ms
Loss rate: 0.60%

Run 3: Report of LEDBAT — Data Link

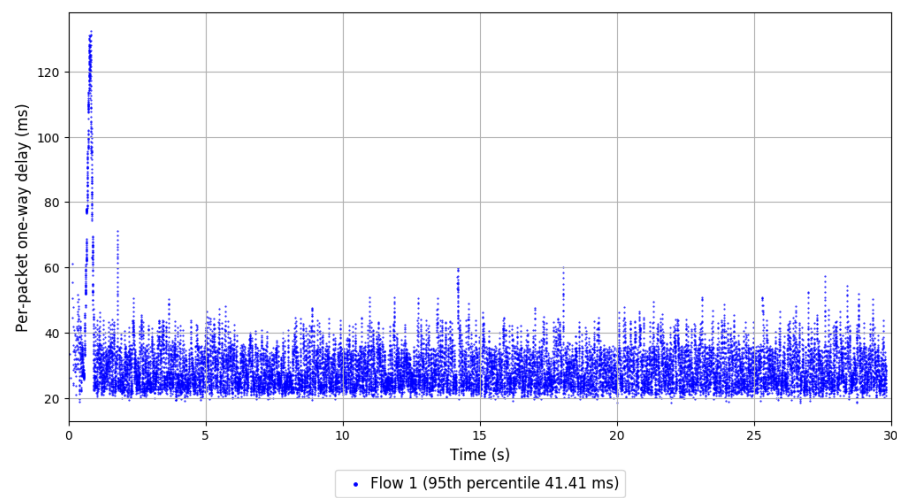
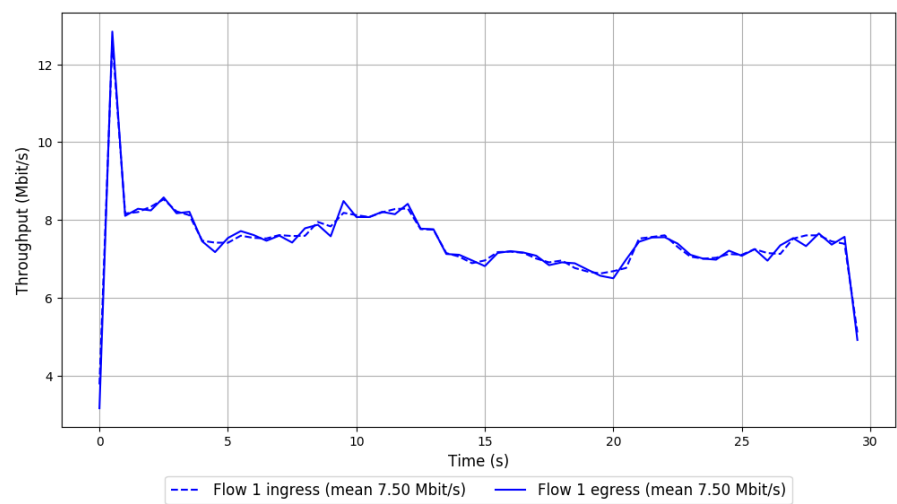


Run 1: Statistics of PCC

Start at: 2018-03-20 06:03:52
End at: 2018-03-20 06:04:22
Local clock offset: 9.191 ms
Remote clock offset: -5.871 ms

Below is generated by plot.py at 2018-03-20 08:08:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.50 Mbit/s
95th percentile per-packet one-way delay: 41.409 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 7.50 Mbit/s
95th percentile per-packet one-way delay: 41.409 ms
Loss rate: 0.15%

Run 1: Report of PCC — Data Link

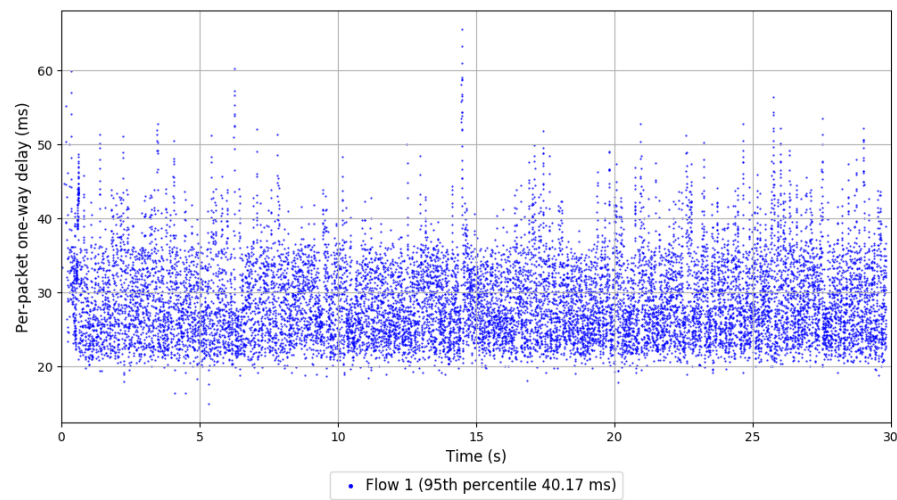
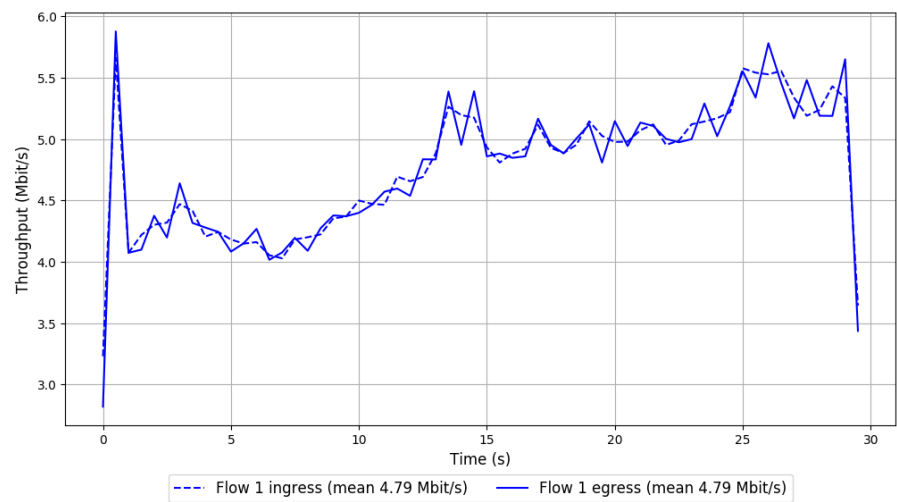


Run 2: Statistics of PCC

Start at: 2018-03-20 06:27:30
End at: 2018-03-20 06:28:00
Local clock offset: 5.387 ms
Remote clock offset: -5.066 ms

Below is generated by plot.py at 2018-03-20 08:08:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.79 Mbit/s
95th percentile per-packet one-way delay: 40.167 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 4.79 Mbit/s
95th percentile per-packet one-way delay: 40.167 ms
Loss rate: 0.16%

Run 2: Report of PCC — Data Link

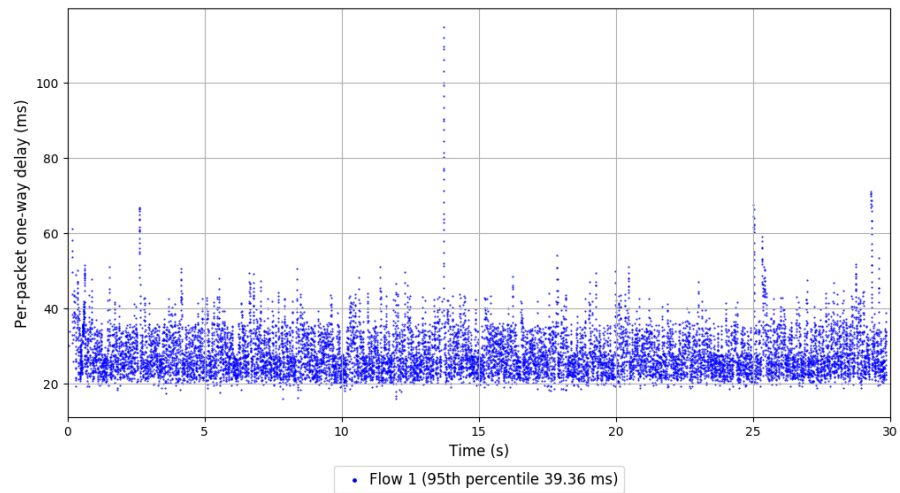
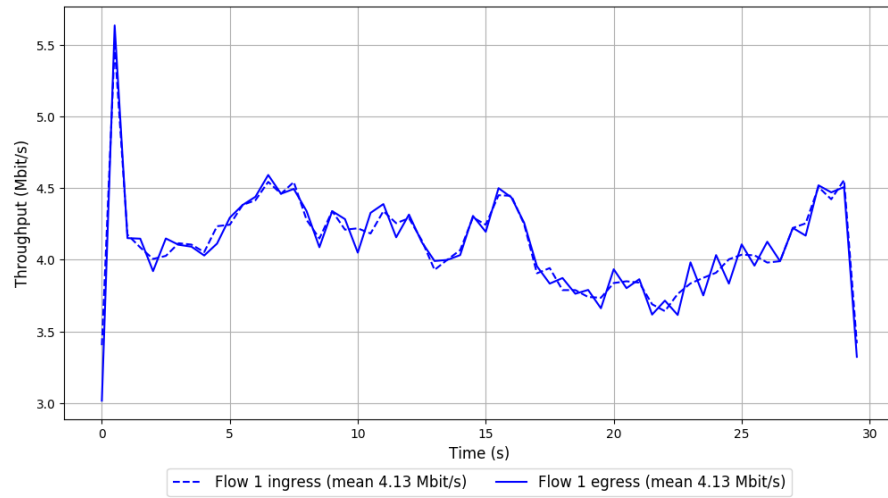


Run 3: Statistics of PCC

Start at: 2018-03-20 06:51:05
End at: 2018-03-20 06:51:35
Local clock offset: 5.495 ms
Remote clock offset: -4.365 ms

Below is generated by plot.py at 2018-03-20 08:08:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.13 Mbit/s
95th percentile per-packet one-way delay: 39.360 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 4.13 Mbit/s
95th percentile per-packet one-way delay: 39.360 ms
Loss rate: 0.15%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-03-20 06:05:11

End at: 2018-03-20 06:05:41

Local clock offset: 9.077 ms

Remote clock offset: -5.928 ms

Below is generated by plot.py at 2018-03-20 08:08:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 15.55 Mbit/s

95th percentile per-packet one-way delay: 210.499 ms

Loss rate: 1.16%

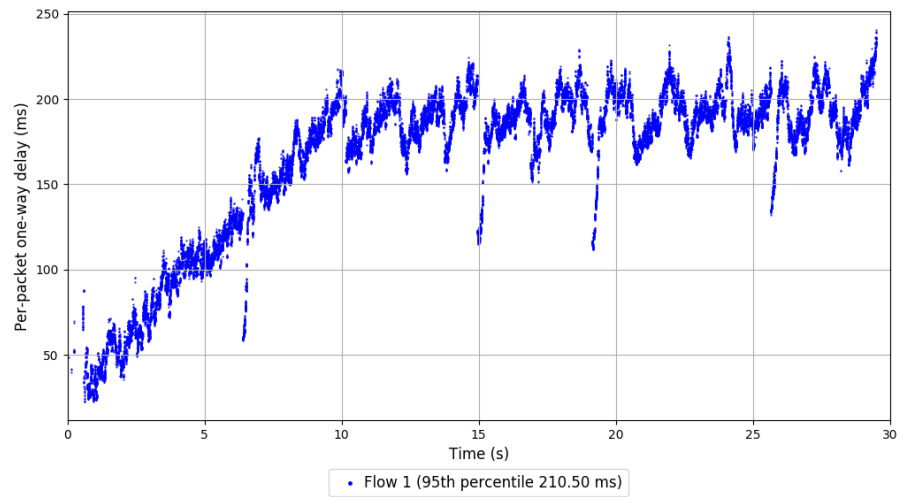
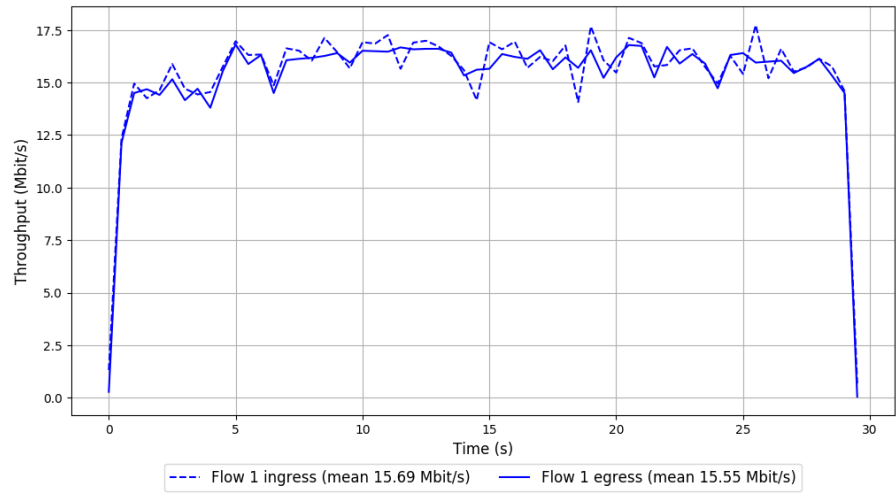
-- Flow 1:

Average throughput: 15.55 Mbit/s

95th percentile per-packet one-way delay: 210.499 ms

Loss rate: 1.16%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-03-20 06:28:48

End at: 2018-03-20 06:29:18

Local clock offset: 4.931 ms

Remote clock offset: -5.008 ms

Below is generated by plot.py at 2018-03-20 08:08:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 15.50 Mbit/s

95th percentile per-packet one-way delay: 209.363 ms

Loss rate: 1.07%

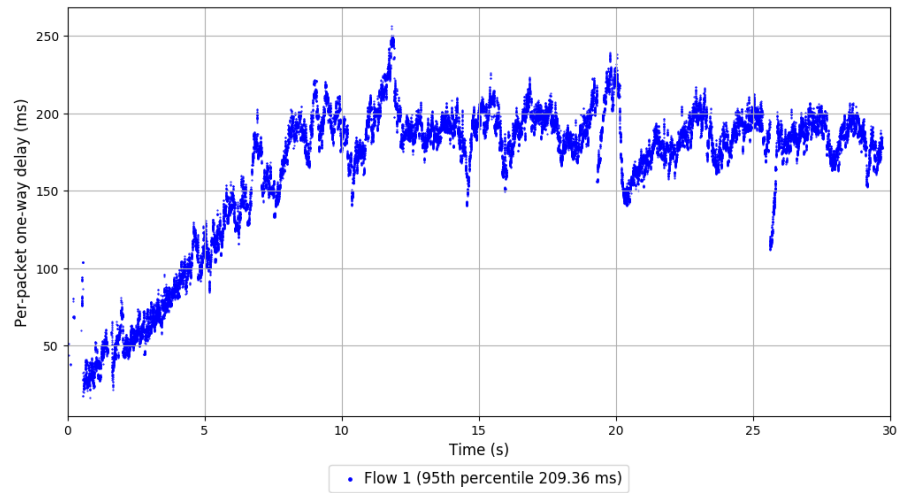
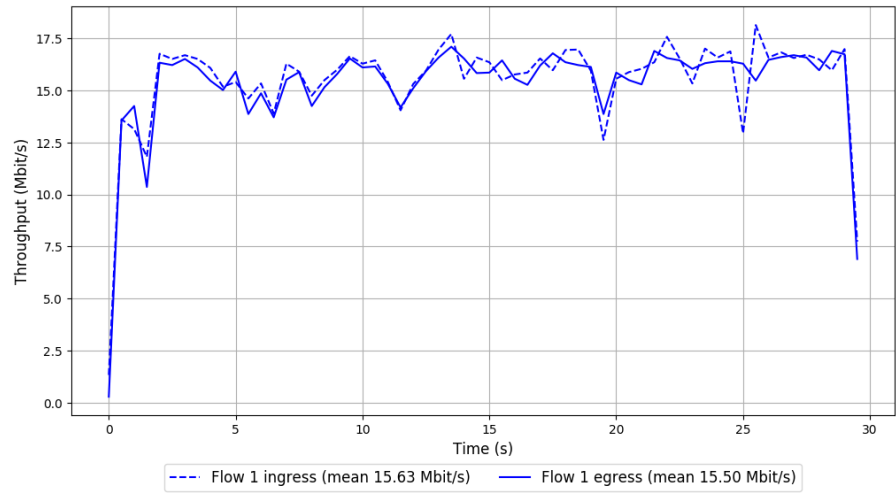
-- Flow 1:

Average throughput: 15.50 Mbit/s

95th percentile per-packet one-way delay: 209.363 ms

Loss rate: 1.07%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-03-20 06:52:23

End at: 2018-03-20 06:52:53

Local clock offset: 5.281 ms

Remote clock offset: -4.434 ms

Below is generated by plot.py at 2018-03-20 08:08:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 12.20 Mbit/s

95th percentile per-packet one-way delay: 295.290 ms

Loss rate: 1.61%

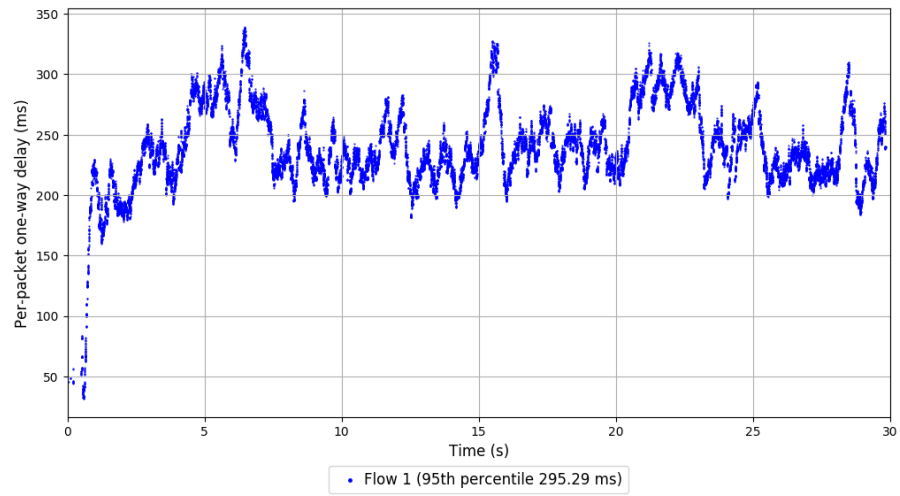
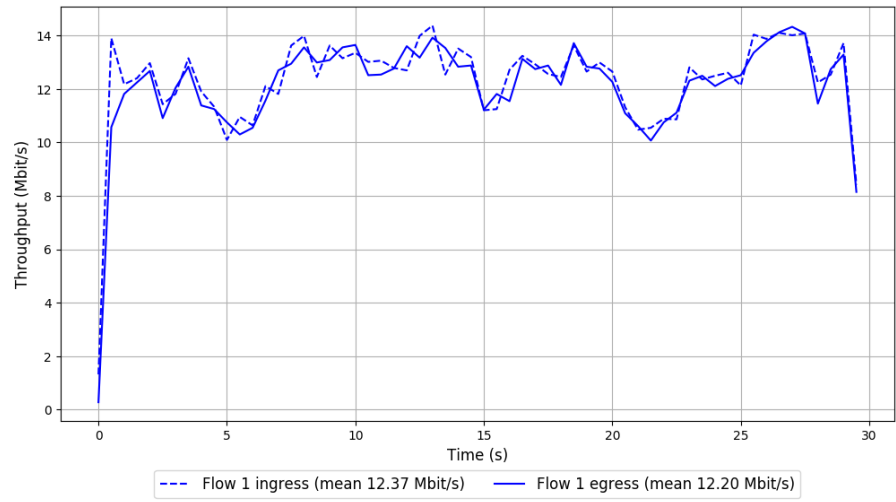
-- Flow 1:

Average throughput: 12.20 Mbit/s

95th percentile per-packet one-way delay: 295.290 ms

Loss rate: 1.61%

Run 3: Report of QUIC Cubic — Data Link

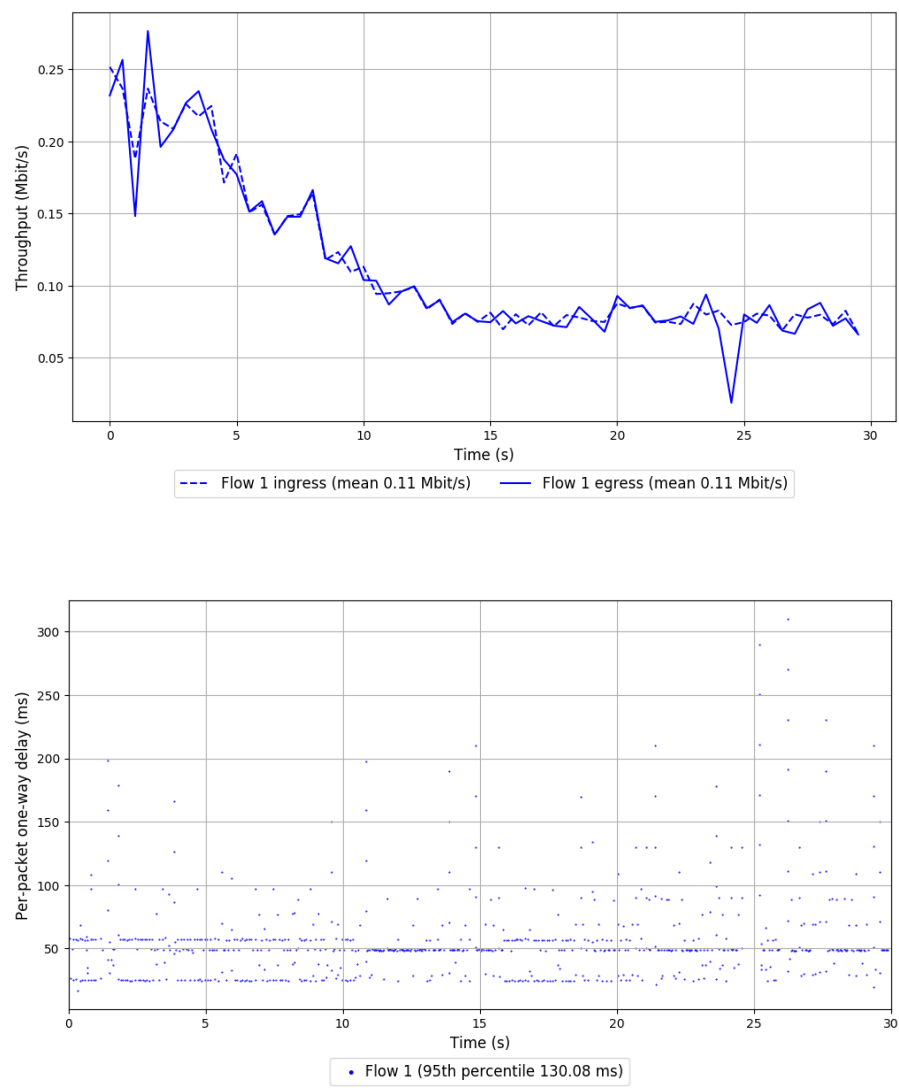


Run 1: Statistics of SCReAM

Start at: 2018-03-20 05:53:22
End at: 2018-03-20 05:53:52
Local clock offset: 6.949 ms
Remote clock offset: -5.698 ms

Below is generated by plot.py at 2018-03-20 08:08:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 130.079 ms
Loss rate: 0.97%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 130.079 ms
Loss rate: 0.97%

Run 1: Report of SReAM — Data Link

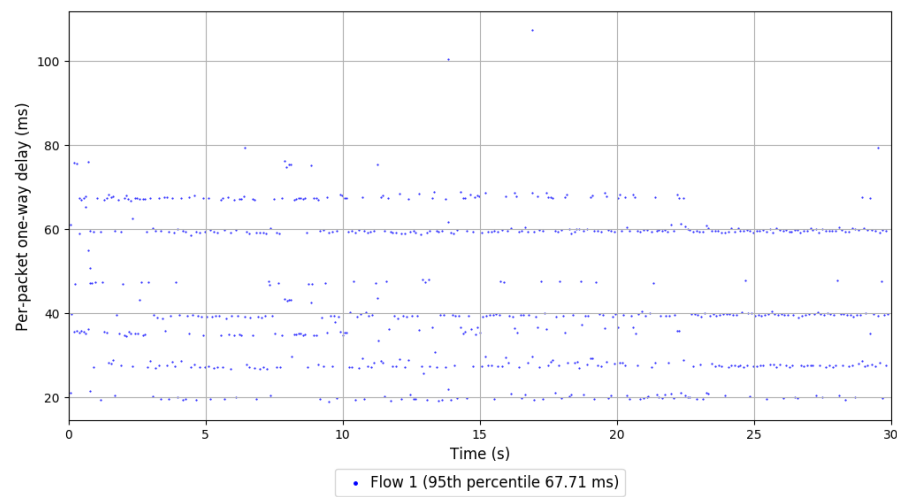
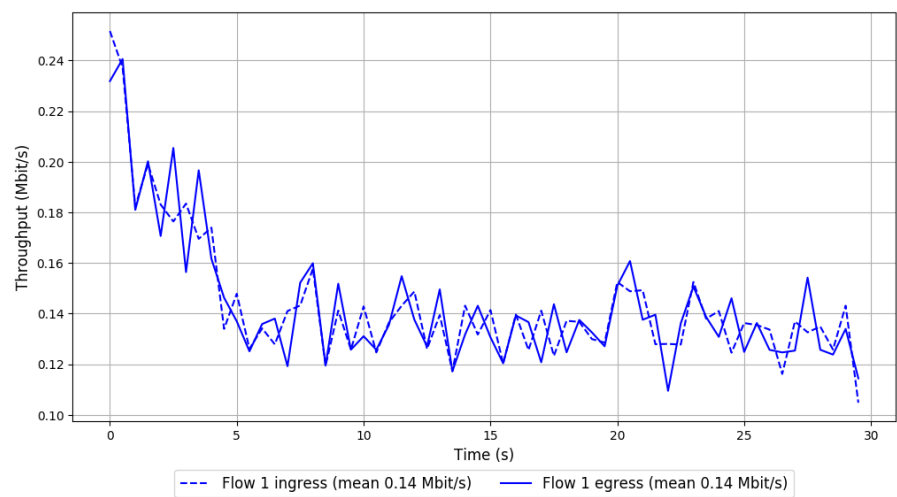


Run 2: Statistics of SCReAM

Start at: 2018-03-20 06:17:00
End at: 2018-03-20 06:17:30
Local clock offset: 11.237 ms
Remote clock offset: -5.901 ms

Below is generated by plot.py at 2018-03-20 08:08:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 67.710 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 67.710 ms
Loss rate: 0.12%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-03-20 06:40:35

End at: 2018-03-20 06:41:05

Local clock offset: 4.414 ms

Remote clock offset: -4.57 ms

Below is generated by plot.py at 2018-03-20 08:08:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 63.572 ms

Loss rate: 0.14%

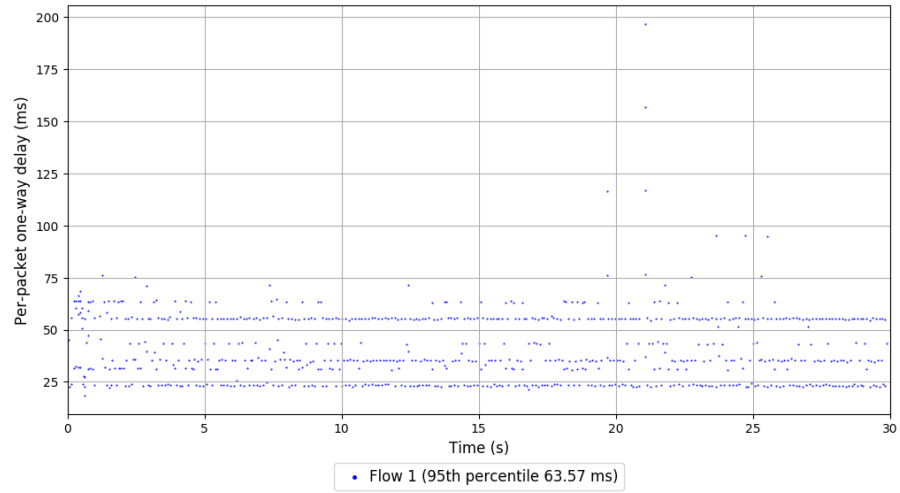
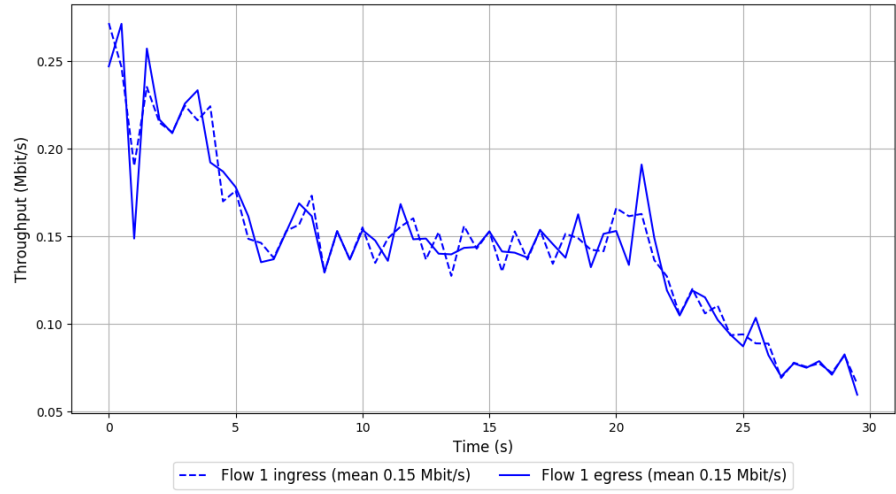
-- Flow 1:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 63.572 ms

Loss rate: 0.14%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of WebRTC media

Start at: 2018-03-20 05:50:45

End at: 2018-03-20 05:51:15

Local clock offset: 5.402 ms

Remote clock offset: -5.52 ms

Below is generated by plot.py at 2018-03-20 08:08:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 85.673 ms

Loss rate: 0.00%

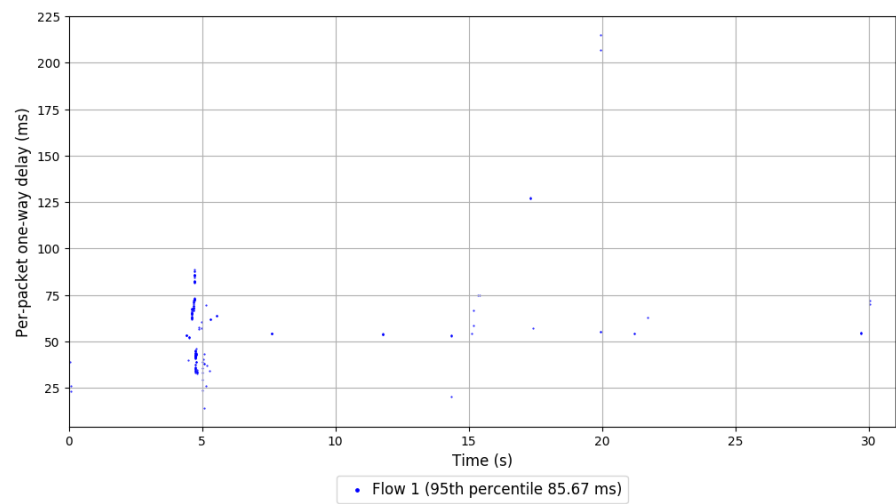
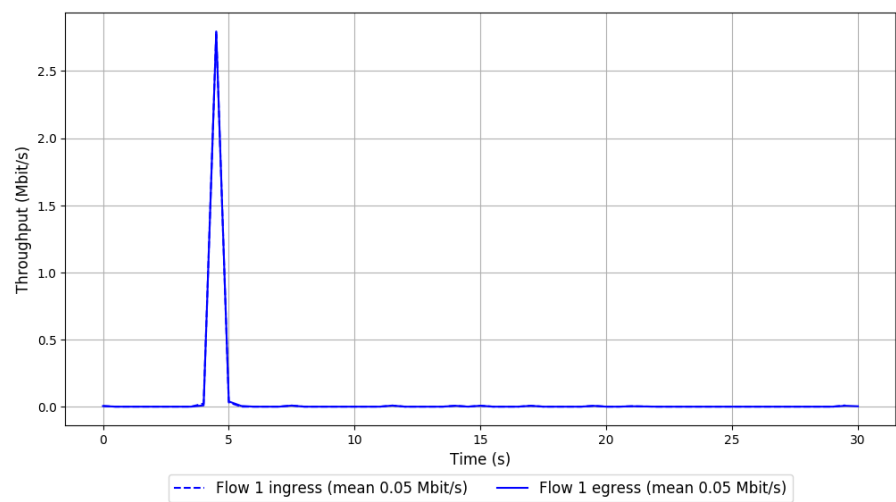
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 85.673 ms

Loss rate: 0.00%

Run 1: Report of WebRTC media — Data Link

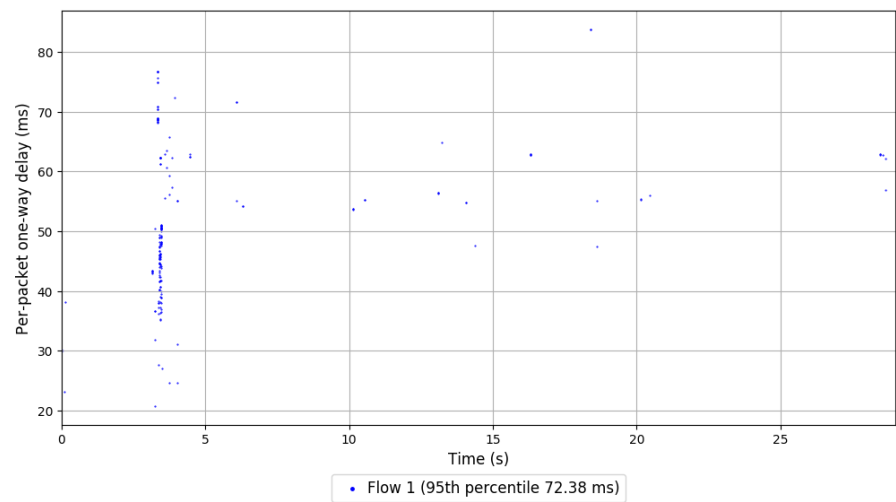
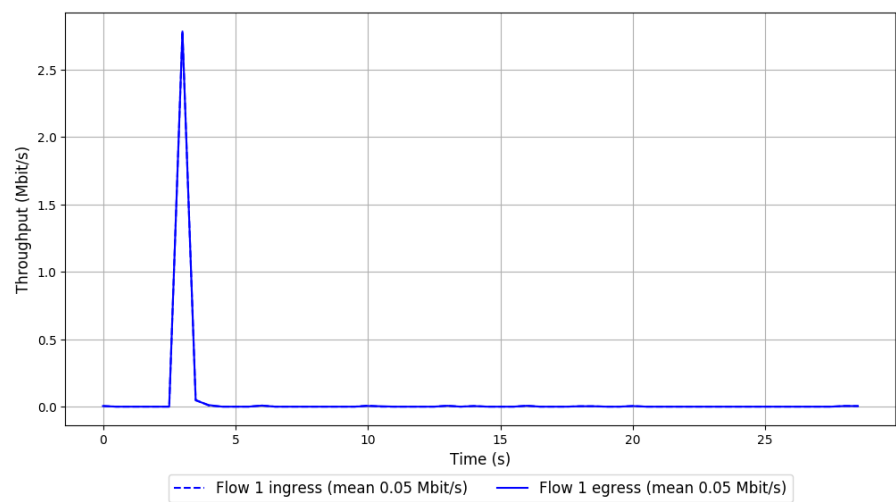


Run 2: Statistics of WebRTC media

Start at: 2018-03-20 06:14:23
End at: 2018-03-20 06:14:53
Local clock offset: 10.586 ms
Remote clock offset: -5.895 ms

Below is generated by plot.py at 2018-03-20 08:08:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 72.379 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 72.379 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link

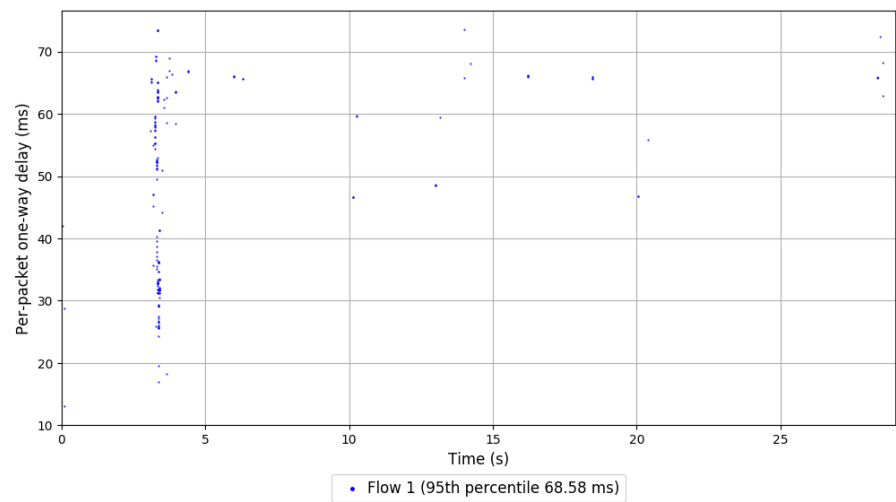
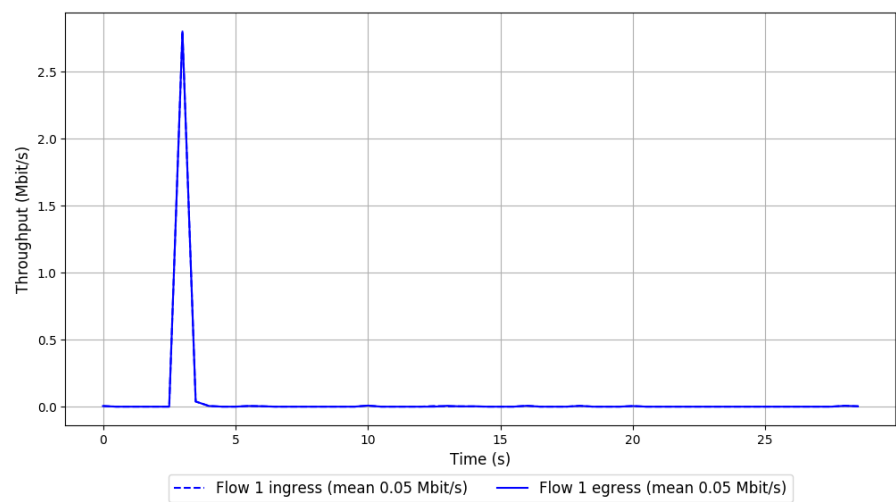


Run 3: Statistics of WebRTC media

Start at: 2018-03-20 06:37:58
End at: 2018-03-20 06:38:28
Local clock offset: 4.388 ms
Remote clock offset: -4.596 ms

Below is generated by plot.py at 2018-03-20 08:08:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 68.581 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 68.581 ms
Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

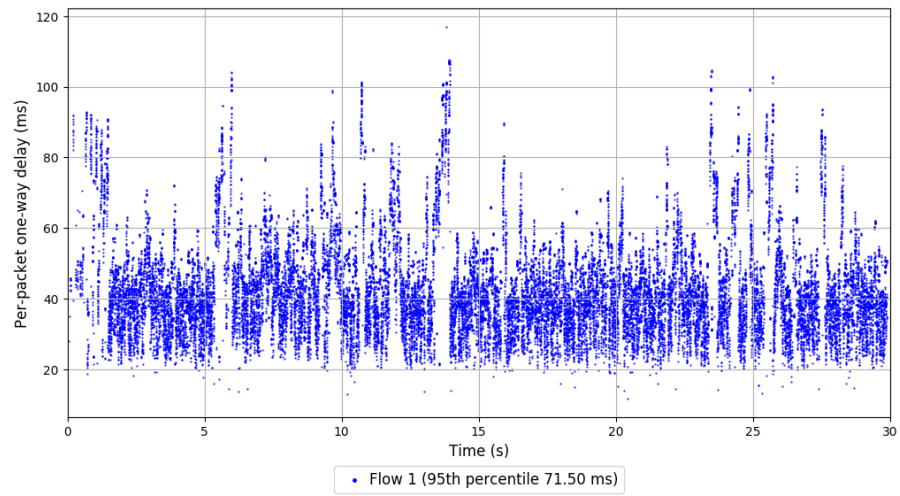
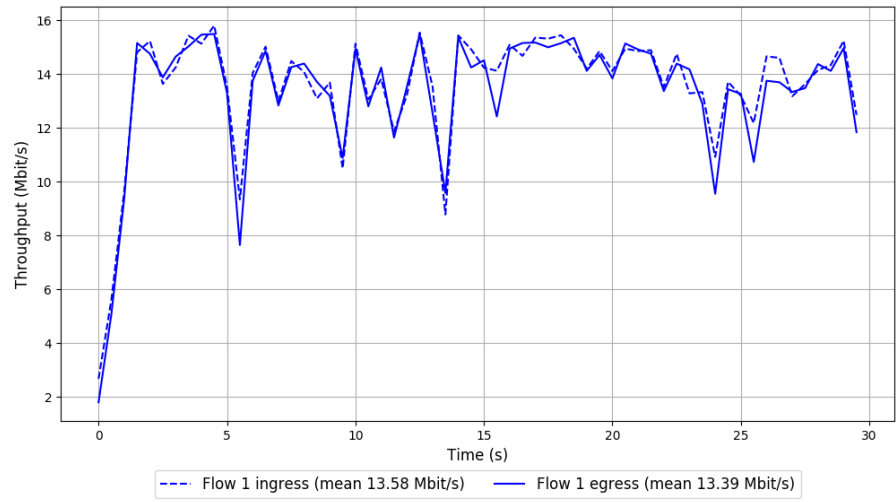


Run 1: Statistics of Sprout

Start at: 2018-03-20 06:09:08
End at: 2018-03-20 06:09:38
Local clock offset: 9.381 ms
Remote clock offset: -5.876 ms

Below is generated by plot.py at 2018-03-20 08:09:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.39 Mbit/s
95th percentile per-packet one-way delay: 71.505 ms
Loss rate: 1.49%
-- Flow 1:
Average throughput: 13.39 Mbit/s
95th percentile per-packet one-way delay: 71.505 ms
Loss rate: 1.49%

Run 1: Report of Sprout — Data Link

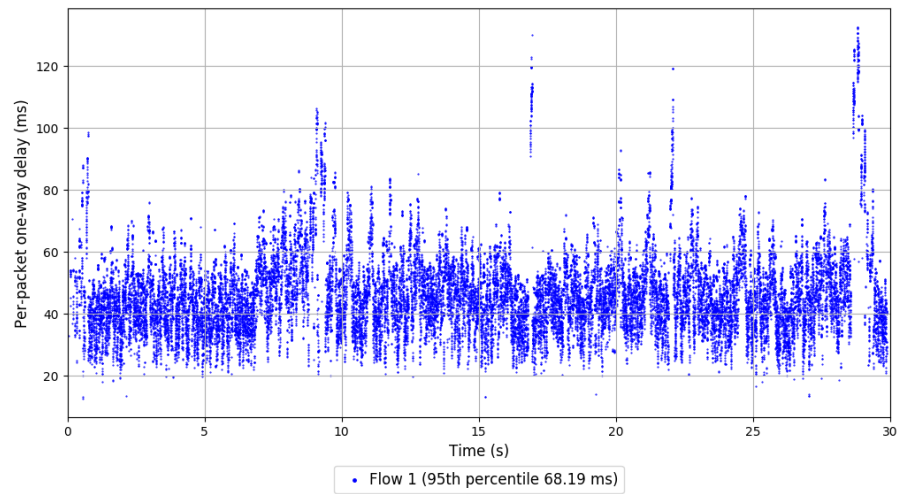
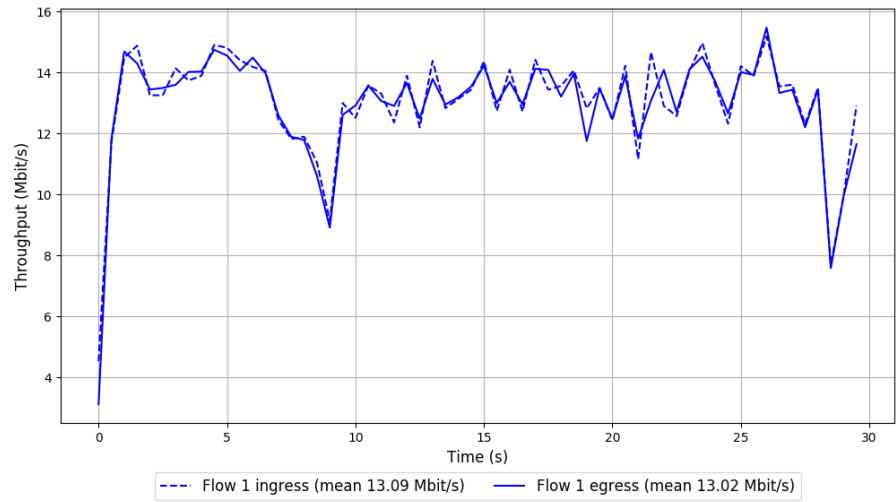


Run 2: Statistics of Sprout

Start at: 2018-03-20 06:32:44
End at: 2018-03-20 06:33:14
Local clock offset: 4.496 ms
Remote clock offset: -4.831 ms

Below is generated by plot.py at 2018-03-20 08:09:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.02 Mbit/s
95th percentile per-packet one-way delay: 68.195 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 13.02 Mbit/s
95th percentile per-packet one-way delay: 68.195 ms
Loss rate: 0.68%

Run 2: Report of Sprout — Data Link

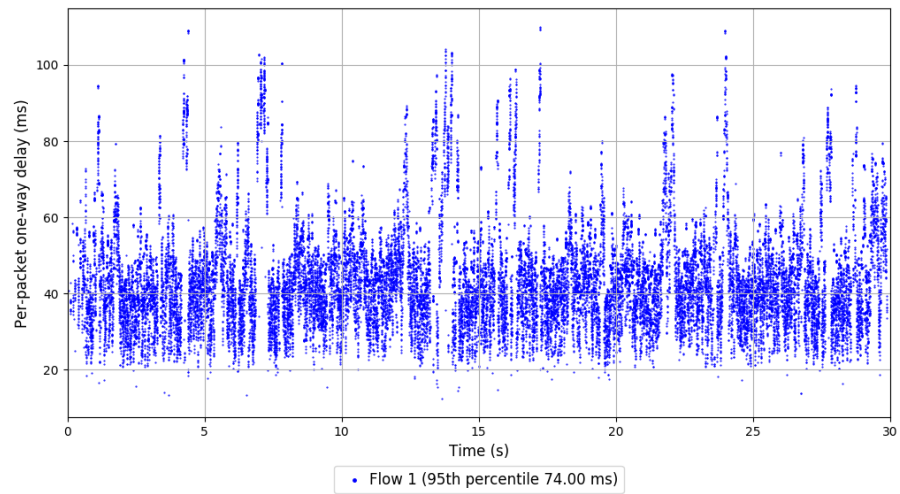
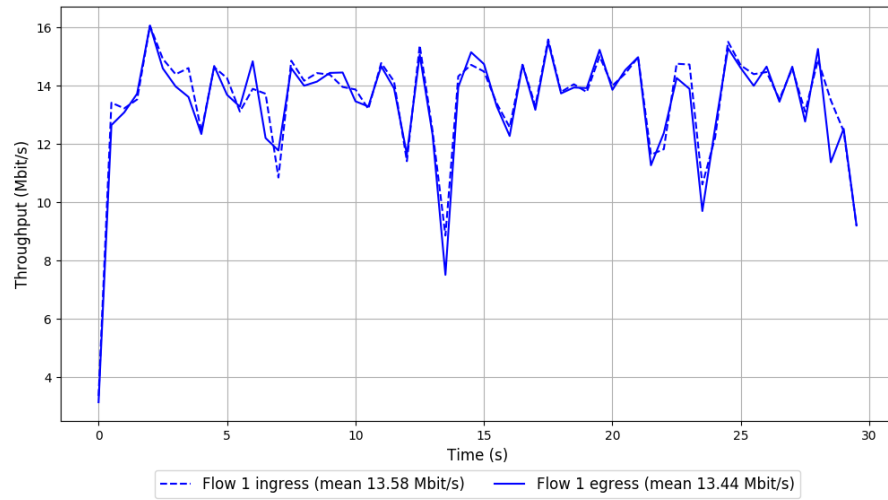


Run 3: Statistics of Sprout

Start at: 2018-03-20 06:56:19
End at: 2018-03-20 06:56:49
Local clock offset: 3.723 ms
Remote clock offset: -4.593 ms

Below is generated by plot.py at 2018-03-20 08:09:02
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.44 Mbit/s
95th percentile per-packet one-way delay: 73.995 ms
Loss rate: 1.17%
-- Flow 1:
Average throughput: 13.44 Mbit/s
95th percentile per-packet one-way delay: 73.995 ms
Loss rate: 1.17%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-03-20 05:58:37

End at: 2018-03-20 05:59:07

Local clock offset: 9.538 ms

Remote clock offset: -5.772 ms

Below is generated by plot.py at 2018-03-20 08:09:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 8.02 Mbit/s

95th percentile per-packet one-way delay: 48.954 ms

Loss rate: 0.59%

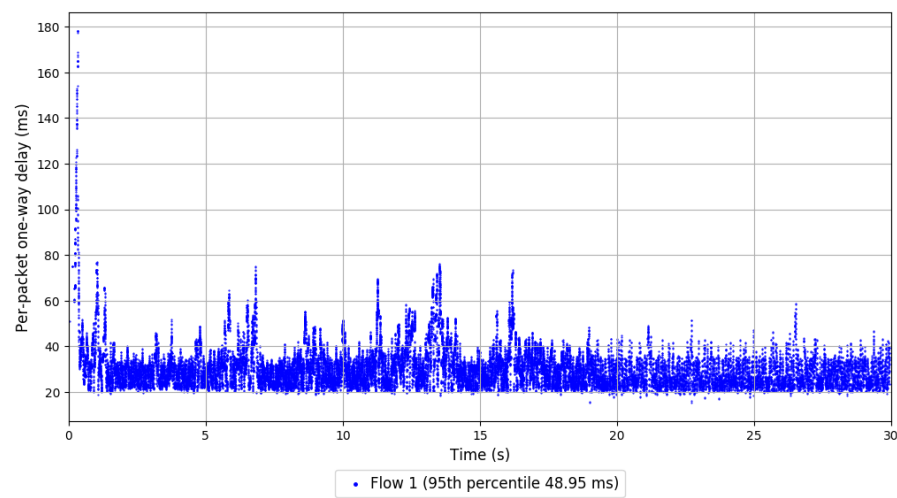
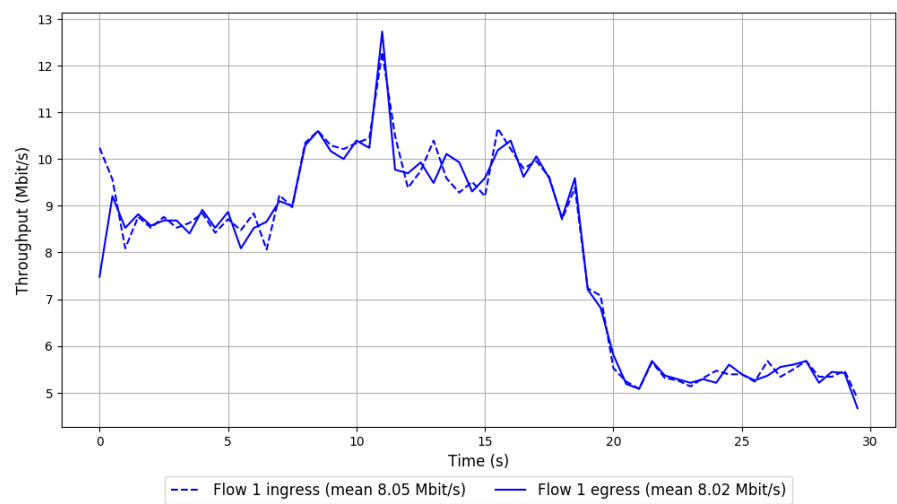
-- Flow 1:

Average throughput: 8.02 Mbit/s

95th percentile per-packet one-way delay: 48.954 ms

Loss rate: 0.59%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-03-20 06:22:14

End at: 2018-03-20 06:22:44

Local clock offset: 7.661 ms

Remote clock offset: -5.419 ms

Below is generated by plot.py at 2018-03-20 08:09:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 8.18 Mbit/s

95th percentile per-packet one-way delay: 59.162 ms

Loss rate: 0.72%

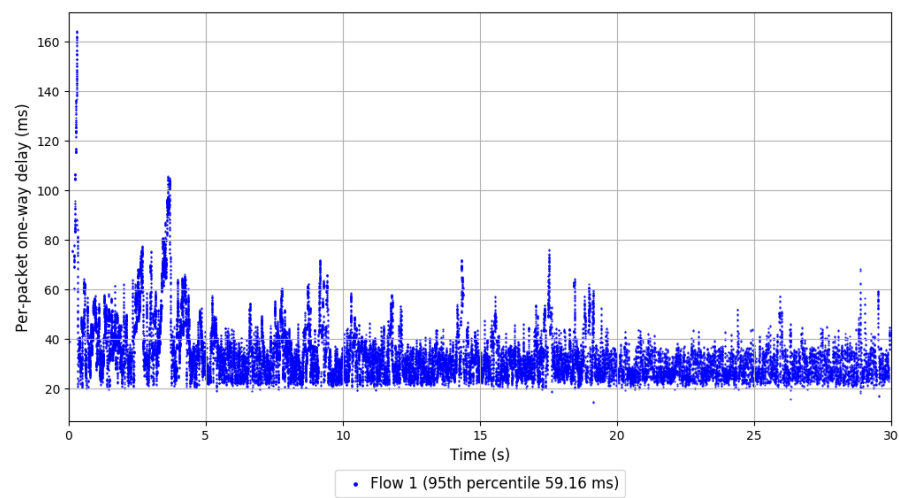
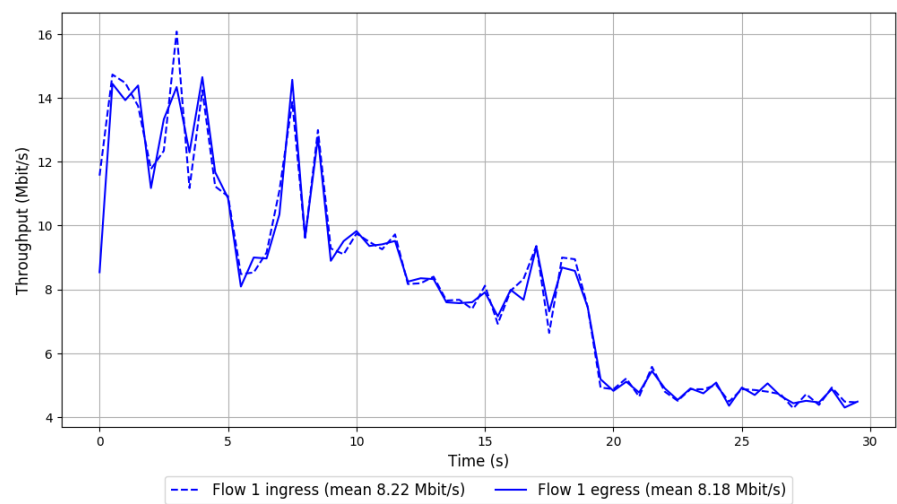
-- Flow 1:

Average throughput: 8.18 Mbit/s

95th percentile per-packet one-way delay: 59.162 ms

Loss rate: 0.72%

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

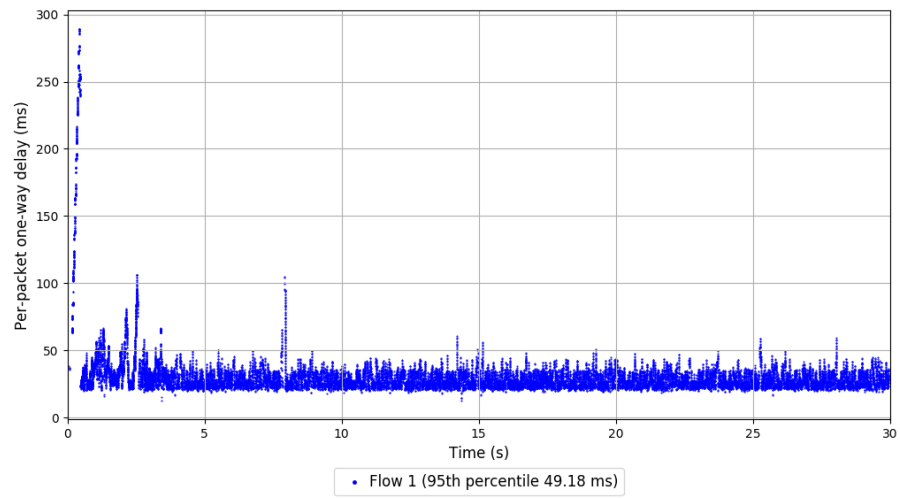
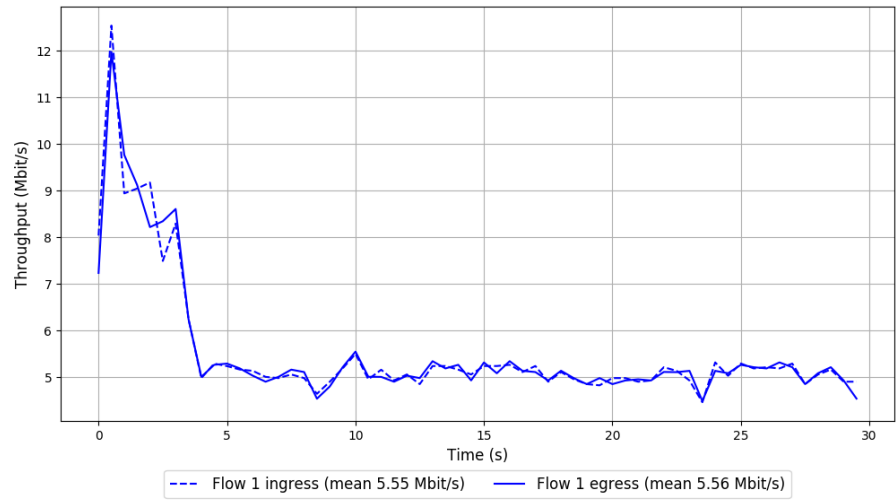


Run 3: Statistics of TaoVA-100x

Start at: 2018-03-20 06:45:50
End at: 2018-03-20 06:46:20
Local clock offset: 4.933 ms
Remote clock offset: -4.482 ms

Below is generated by plot.py at 2018-03-20 08:09:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.56 Mbit/s
95th percentile per-packet one-way delay: 49.176 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 5.56 Mbit/s
95th percentile per-packet one-way delay: 49.176 ms
Loss rate: 0.16%

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

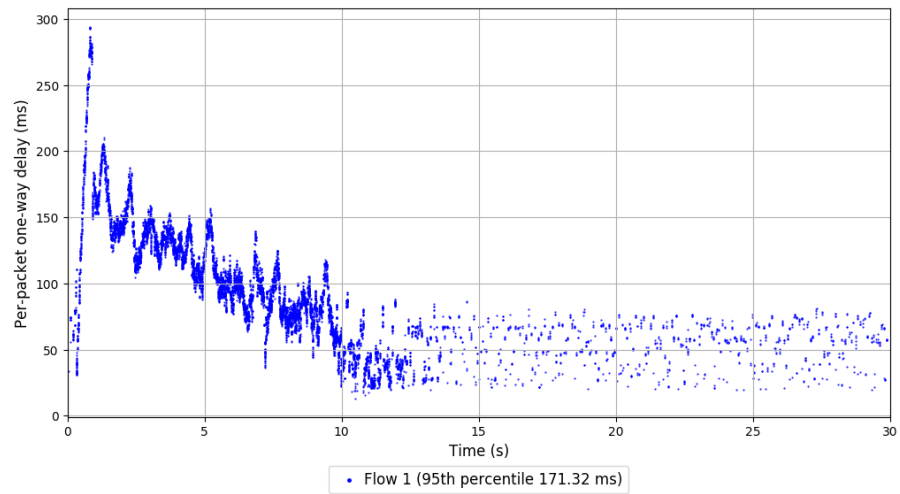
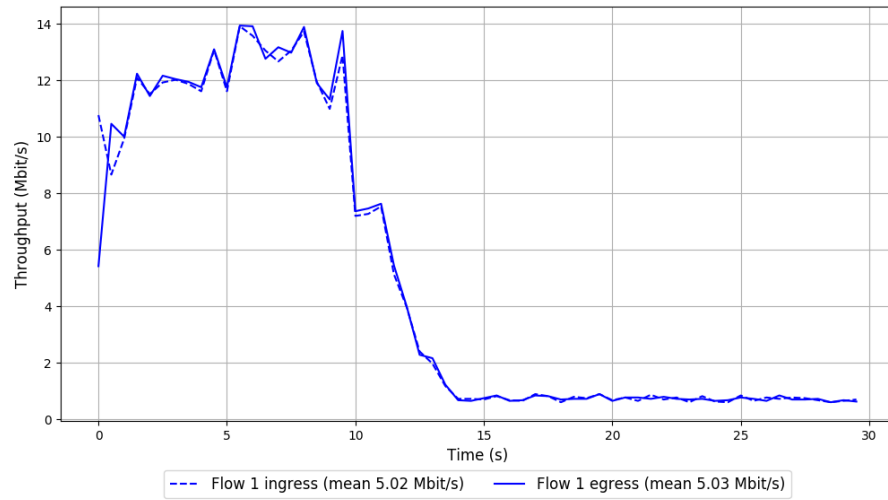


Run 1: Statistics of TCP Vegas

Start at: 2018-03-20 05:59:56
End at: 2018-03-20 06:00:26
Local clock offset: 10.146 ms
Remote clock offset: -5.875 ms

Below is generated by plot.py at 2018-03-20 08:09:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.03 Mbit/s
95th percentile per-packet one-way delay: 171.318 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 5.03 Mbit/s
95th percentile per-packet one-way delay: 171.318 ms
Loss rate: 0.05%

Run 1: Report of TCP Vegas — Data Link

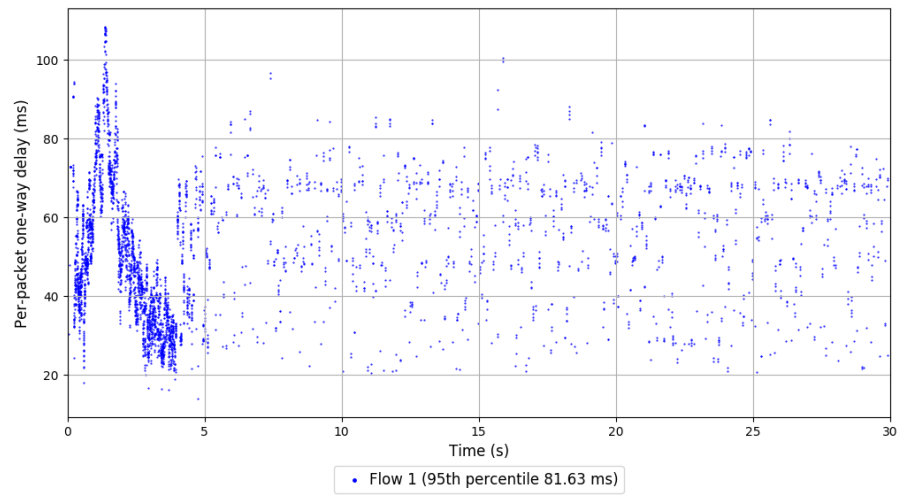
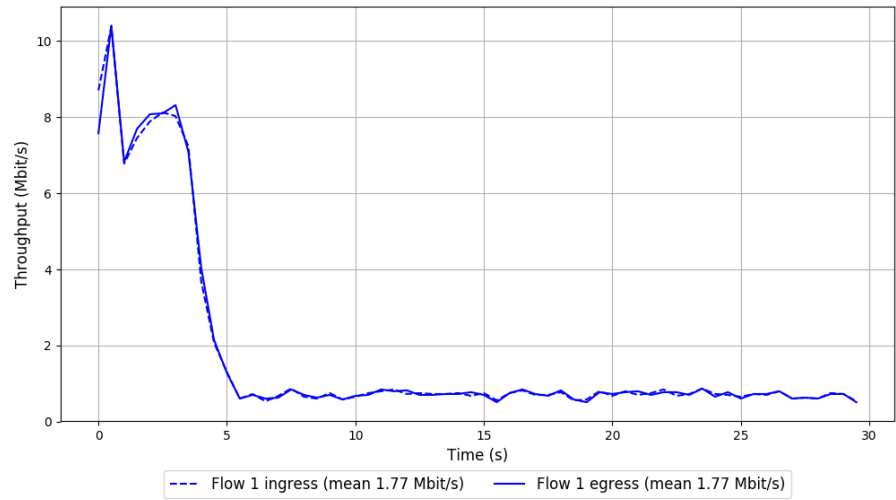


Run 2: Statistics of TCP Vegas

Start at: 2018-03-20 06:23:33
End at: 2018-03-20 06:24:03
Local clock offset: 6.891 ms
Remote clock offset: -5.303 ms

Below is generated by plot.py at 2018-03-20 08:09:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.77 Mbit/s
95th percentile per-packet one-way delay: 81.631 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 1.77 Mbit/s
95th percentile per-packet one-way delay: 81.631 ms
Loss rate: 0.11%

Run 2: Report of TCP Vegas — Data Link

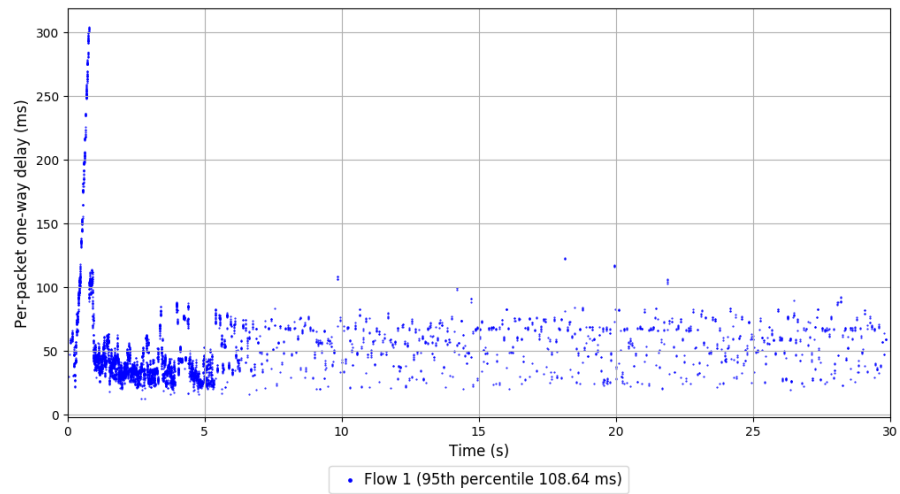
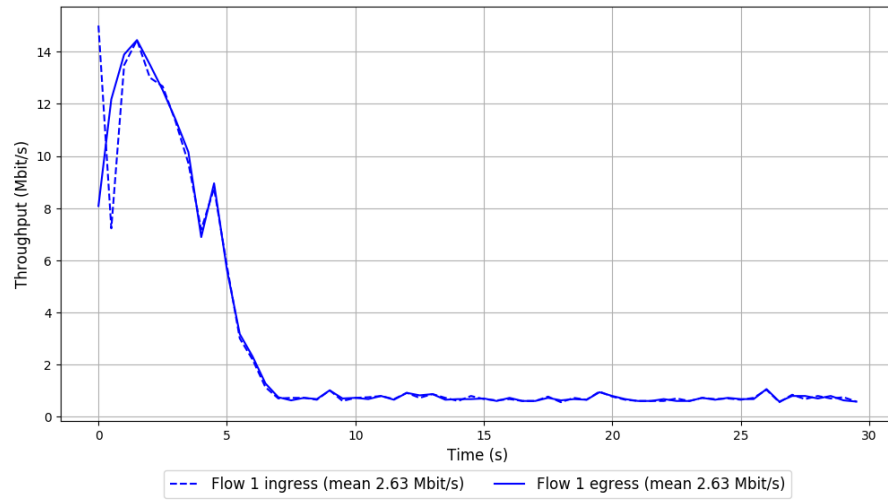


Run 3: Statistics of TCP Vegas

Start at: 2018-03-20 06:47:09
End at: 2018-03-20 06:47:39
Local clock offset: 4.984 ms
Remote clock offset: -4.459 ms

Below is generated by plot.py at 2018-03-20 08:09:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.63 Mbit/s
95th percentile per-packet one-way delay: 108.644 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 2.63 Mbit/s
95th percentile per-packet one-way delay: 108.644 ms
Loss rate: 0.35%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-03-20 06:02:33

End at: 2018-03-20 06:03:03

Local clock offset: 9.367 ms

Remote clock offset: -5.88 ms

Below is generated by plot.py at 2018-03-20 08:09:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 11.19 Mbit/s

95th percentile per-packet one-way delay: 64.829 ms

Loss rate: 5.30%

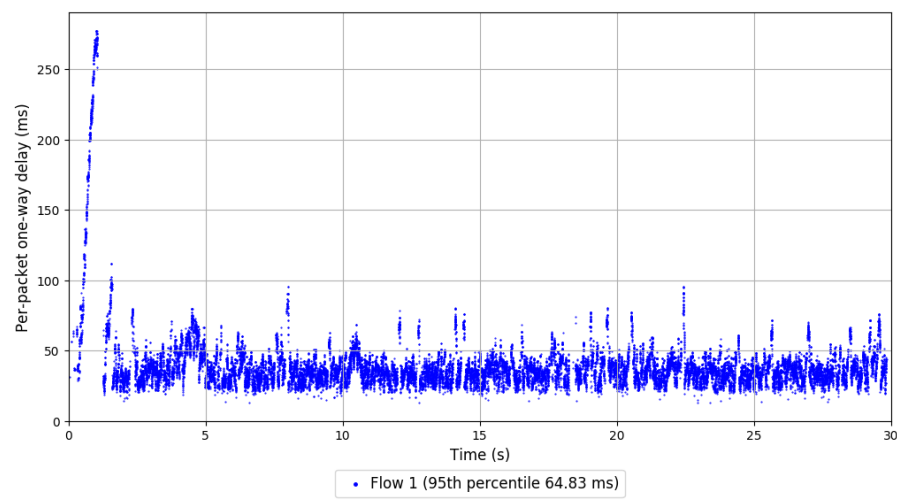
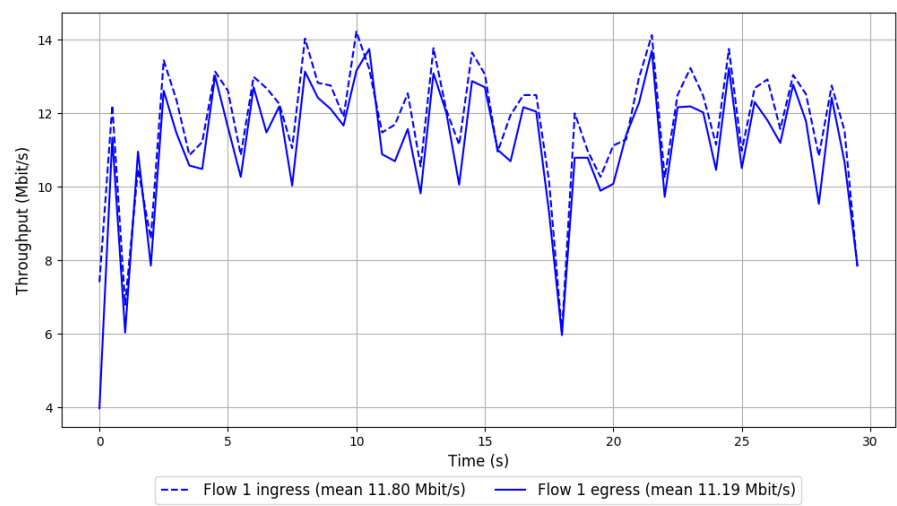
-- Flow 1:

Average throughput: 11.19 Mbit/s

95th percentile per-packet one-way delay: 64.829 ms

Loss rate: 5.30%

Run 1: Report of Verus — Data Link

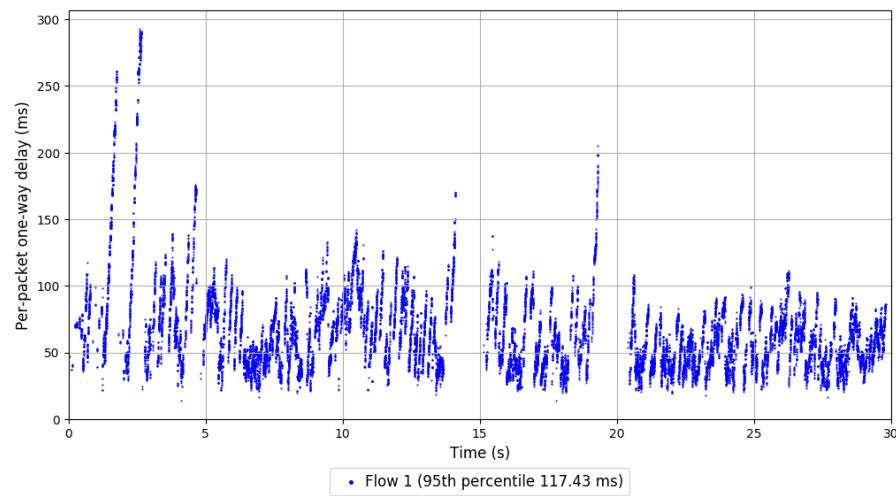
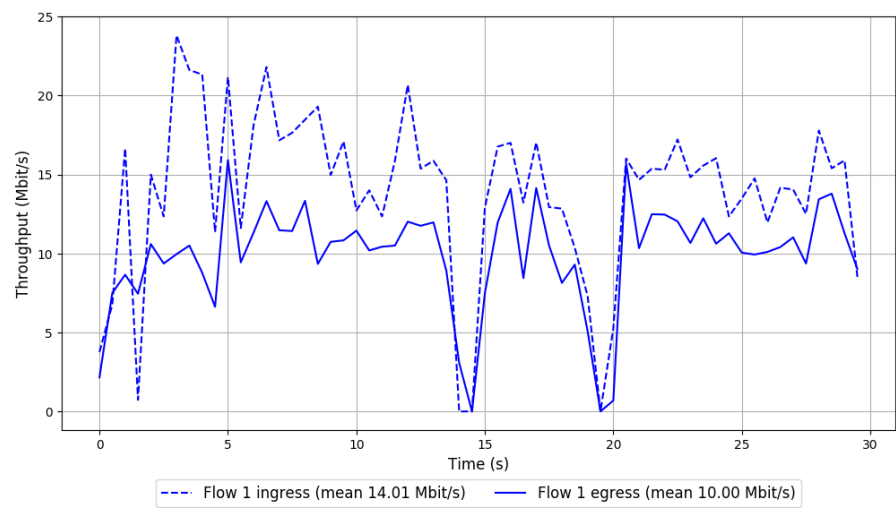


Run 2: Statistics of Verus

Start at: 2018-03-20 06:26:11
End at: 2018-03-20 06:26:41
Local clock offset: 5.779 ms
Remote clock offset: -5.151 ms

Below is generated by plot.py at 2018-03-20 08:09:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.00 Mbit/s
95th percentile per-packet one-way delay: 117.427 ms
Loss rate: 28.63%
-- Flow 1:
Average throughput: 10.00 Mbit/s
95th percentile per-packet one-way delay: 117.427 ms
Loss rate: 28.63%

Run 2: Report of Verus — Data Link

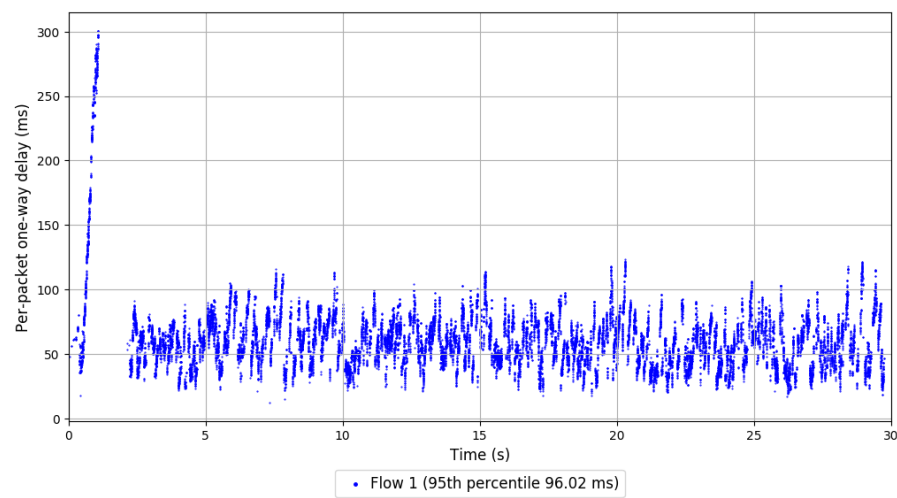
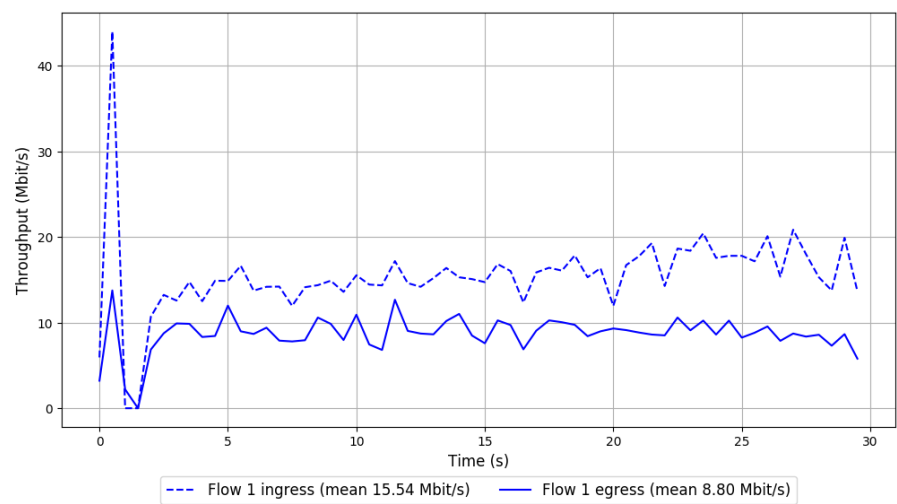


Run 3: Statistics of Verus

Start at: 2018-03-20 06:49:46
End at: 2018-03-20 06:50:16
Local clock offset: 5.337 ms
Remote clock offset: -4.314 ms

Below is generated by plot.py at 2018-03-20 08:09:17
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.80 Mbit/s
95th percentile per-packet one-way delay: 96.021 ms
Loss rate: 43.59%
-- Flow 1:
Average throughput: 8.80 Mbit/s
95th percentile per-packet one-way delay: 96.021 ms
Loss rate: 43.59%

Run 3: Report of Verus — Data Link

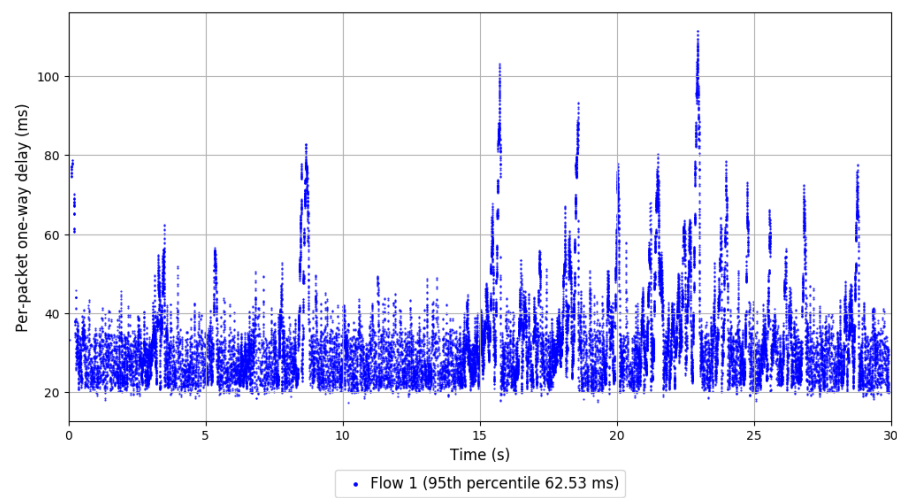
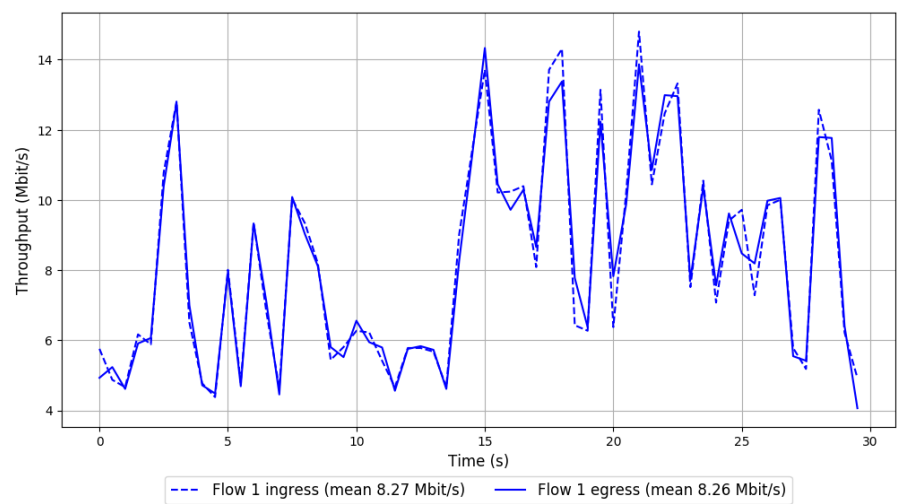


Run 1: Statistics of Copa

Start at: 2018-03-20 05:56:00
End at: 2018-03-20 05:56:30
Local clock offset: 8.31 ms
Remote clock offset: -5.719 ms

Below is generated by plot.py at 2018-03-20 08:09:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.26 Mbit/s
95th percentile per-packet one-way delay: 62.528 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 8.26 Mbit/s
95th percentile per-packet one-way delay: 62.528 ms
Loss rate: 0.28%

Run 1: Report of Copa — Data Link

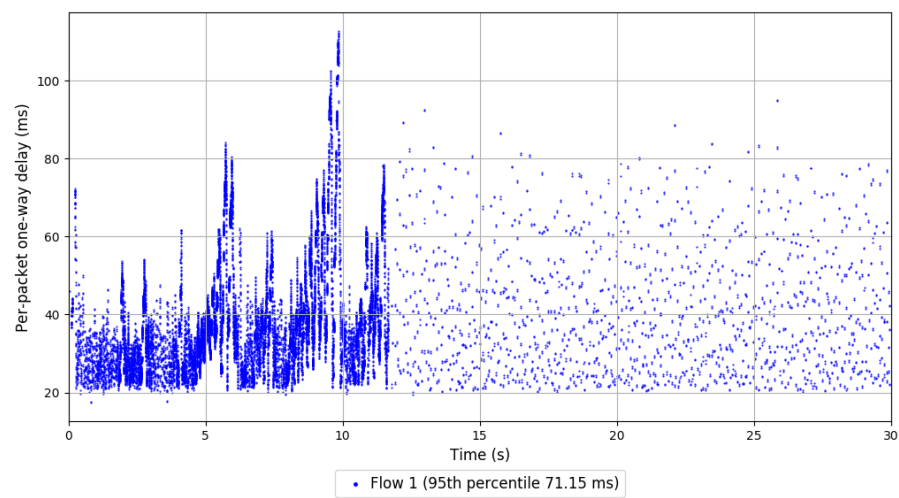
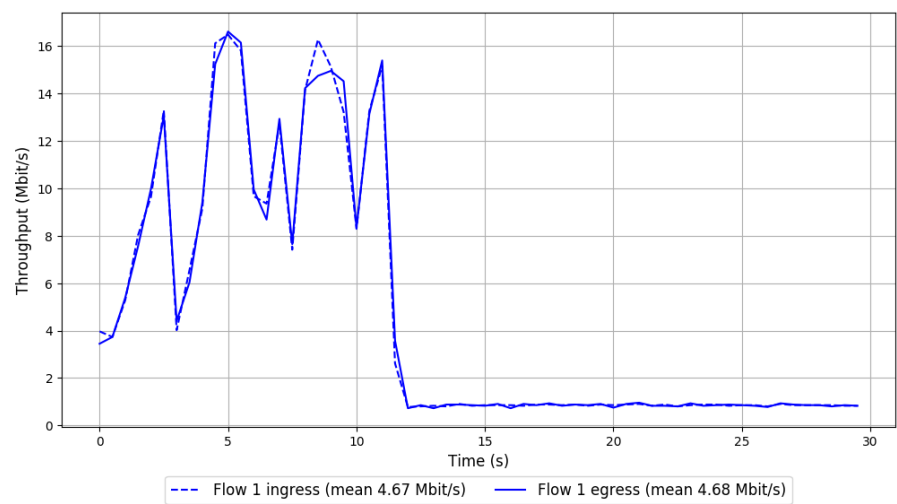


Run 2: Statistics of Copa

Start at: 2018-03-20 06:19:37
End at: 2018-03-20 06:20:07
Local clock offset: 9.431 ms
Remote clock offset: -5.542 ms

Below is generated by plot.py at 2018-03-20 08:09:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.68 Mbit/s
95th percentile per-packet one-way delay: 71.147 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 4.68 Mbit/s
95th percentile per-packet one-way delay: 71.147 ms
Loss rate: 0.10%

Run 2: Report of Copa — Data Link

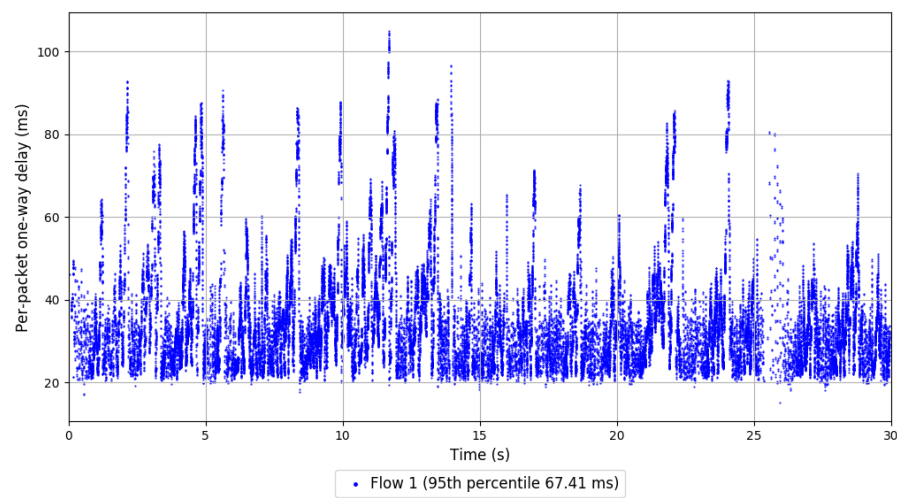
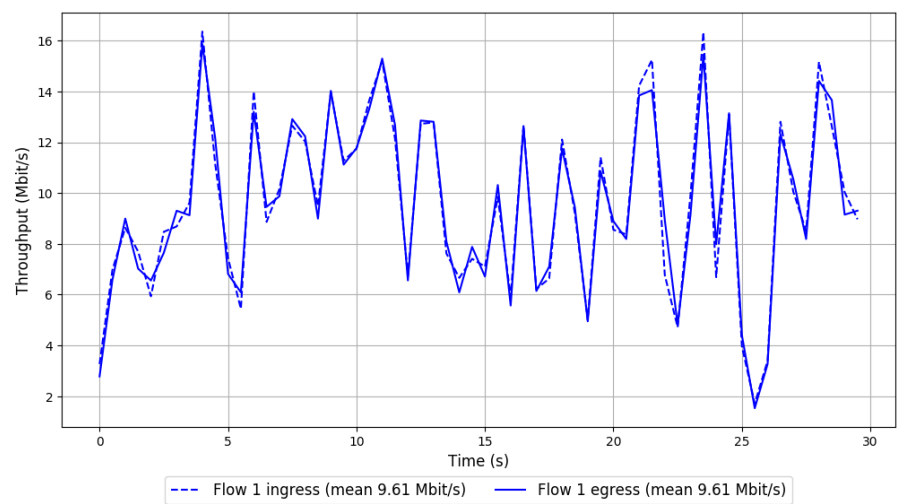


Run 3: Statistics of Copa

Start at: 2018-03-20 06:43:13
End at: 2018-03-20 06:43:43
Local clock offset: 4.604 ms
Remote clock offset: -4.533 ms

Below is generated by plot.py at 2018-03-20 08:09:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.61 Mbit/s
95th percentile per-packet one-way delay: 67.410 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 9.61 Mbit/s
95th percentile per-packet one-way delay: 67.410 ms
Loss rate: 0.21%

Run 3: Report of Copa — Data Link

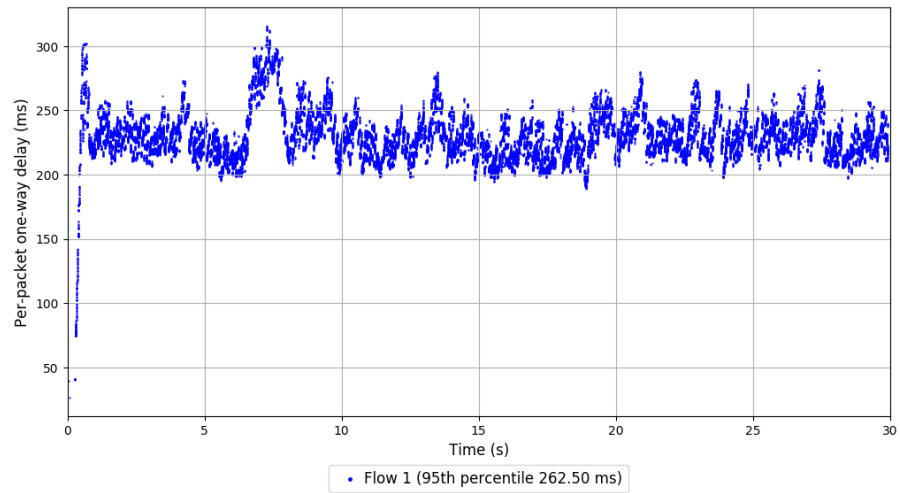
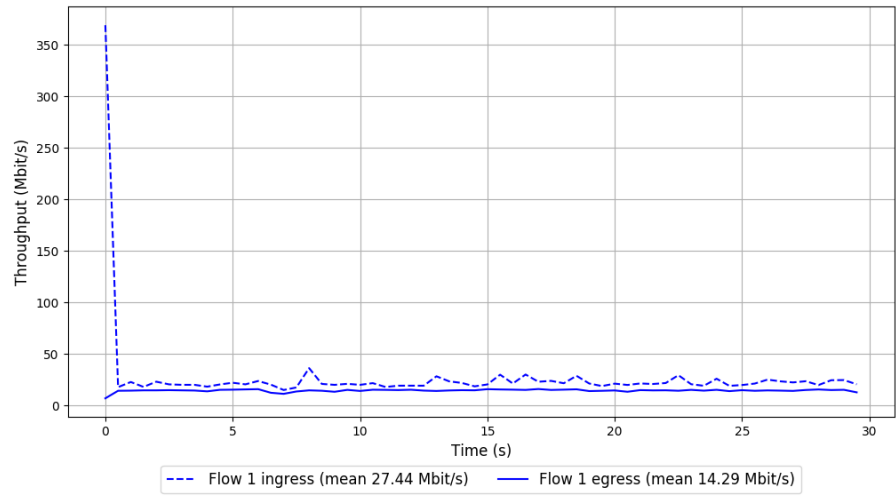


Run 1: Statistics of FillP

Start at: 2018-03-20 05:54:40
End at: 2018-03-20 05:55:11
Local clock offset: 7.588 ms
Remote clock offset: -5.657 ms

Below is generated by plot.py at 2018-03-20 08:09:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 14.29 Mbit/s
95th percentile per-packet one-way delay: 262.497 ms
Loss rate: 48.04%
-- Flow 1:
Average throughput: 14.29 Mbit/s
95th percentile per-packet one-way delay: 262.497 ms
Loss rate: 48.04%

Run 1: Report of FillP — Data Link

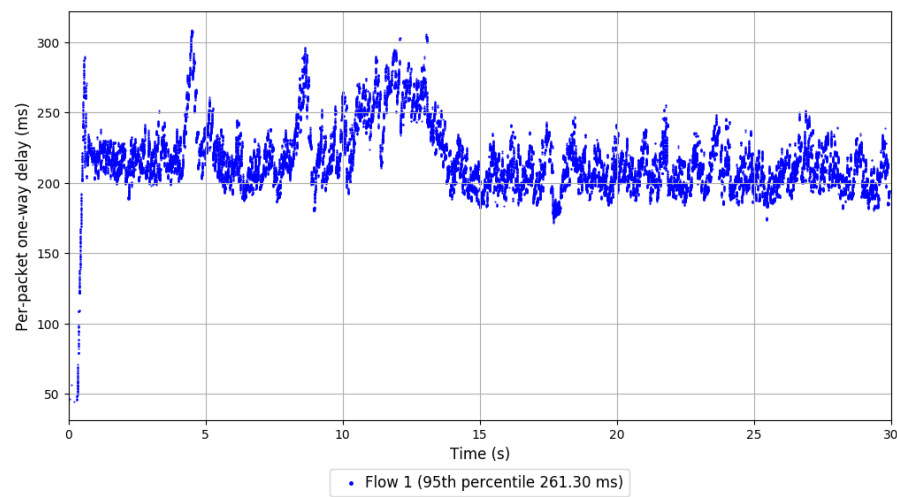
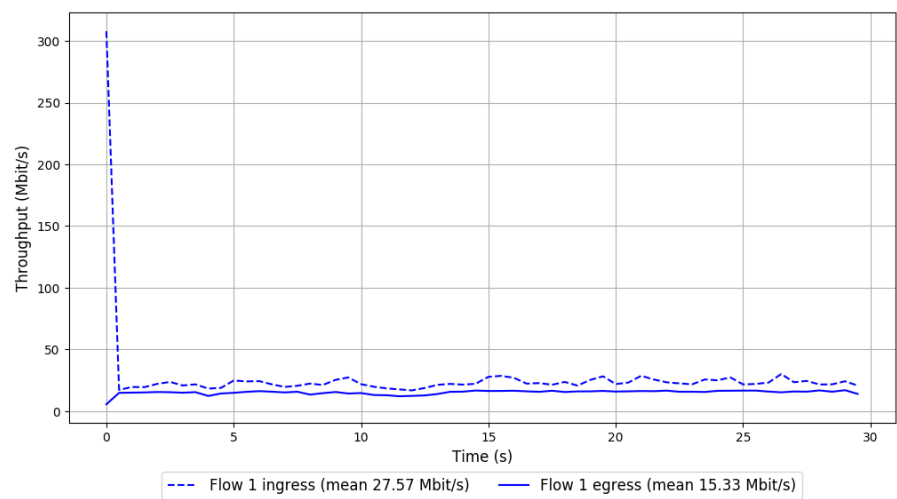


Run 2: Statistics of FillP

Start at: 2018-03-20 06:18:18
End at: 2018-03-20 06:18:48
Local clock offset: 10.797 ms
Remote clock offset: -5.726 ms

Below is generated by plot.py at 2018-03-20 08:09:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 15.33 Mbit/s
95th percentile per-packet one-way delay: 261.298 ms
Loss rate: 44.52%
-- Flow 1:
Average throughput: 15.33 Mbit/s
95th percentile per-packet one-way delay: 261.298 ms
Loss rate: 44.52%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-03-20 06:41:53

End at: 2018-03-20 06:42:23

Local clock offset: 4.575 ms

Remote clock offset: -4.49 ms

Below is generated by plot.py at 2018-03-20 08:09:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 15.38 Mbit/s

95th percentile per-packet one-way delay: 259.456 ms

Loss rate: 44.91%

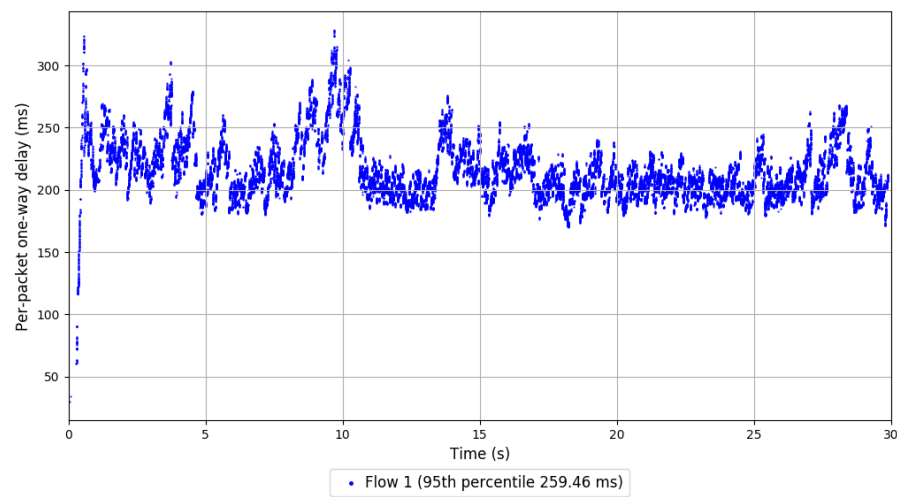
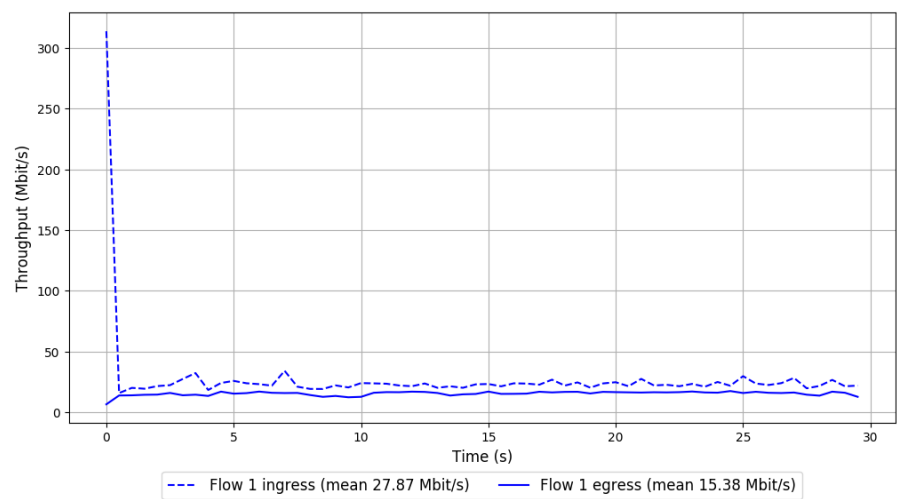
-- Flow 1:

Average throughput: 15.38 Mbit/s

95th percentile per-packet one-way delay: 259.456 ms

Loss rate: 44.91%

Run 3: Report of FillP — Data Link



Run 1: Statistics of Indigo-1-32

Start at: 2018-03-20 05:57:19

End at: 2018-03-20 05:57:49

Local clock offset: 8.948 ms

Remote clock offset: -5.818 ms

Below is generated by plot.py at 2018-03-20 08:09:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.06 Mbit/s

95th percentile per-packet one-way delay: 75.172 ms

Loss rate: 0.30%

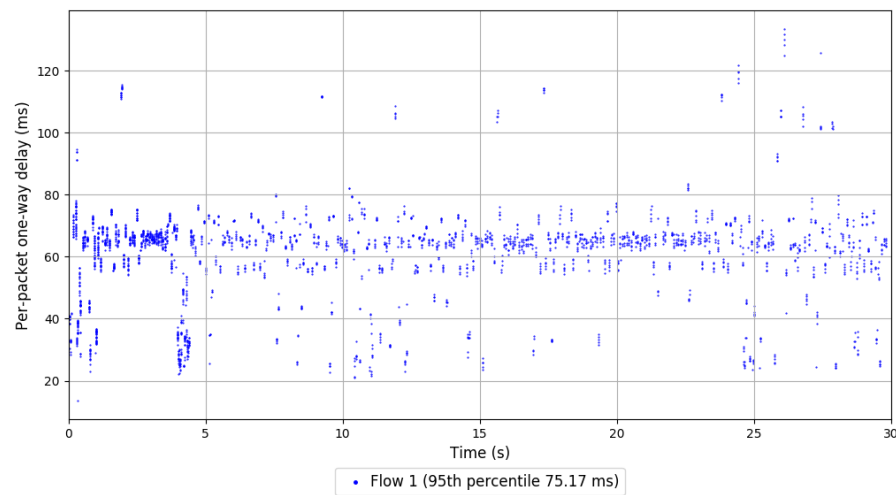
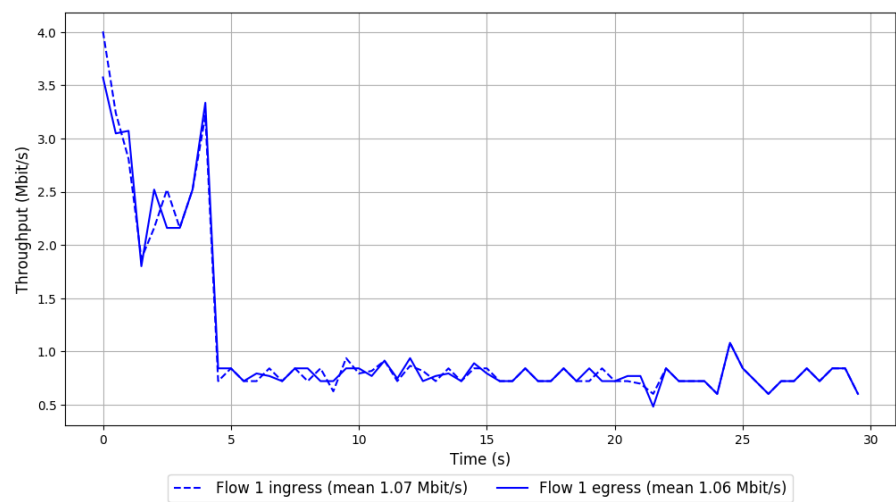
-- Flow 1:

Average throughput: 1.06 Mbit/s

95th percentile per-packet one-way delay: 75.172 ms

Loss rate: 0.30%

Run 1: Report of Indigo-1-32 — Data Link



Run 2: Statistics of Indigo-1-32

Start at: 2018-03-20 06:20:56

End at: 2018-03-20 06:21:26

Local clock offset: 8.447 ms

Remote clock offset: -5.494 ms

Below is generated by plot.py at 2018-03-20 08:09:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.56 Mbit/s

95th percentile per-packet one-way delay: 76.429 ms

Loss rate: 0.39%

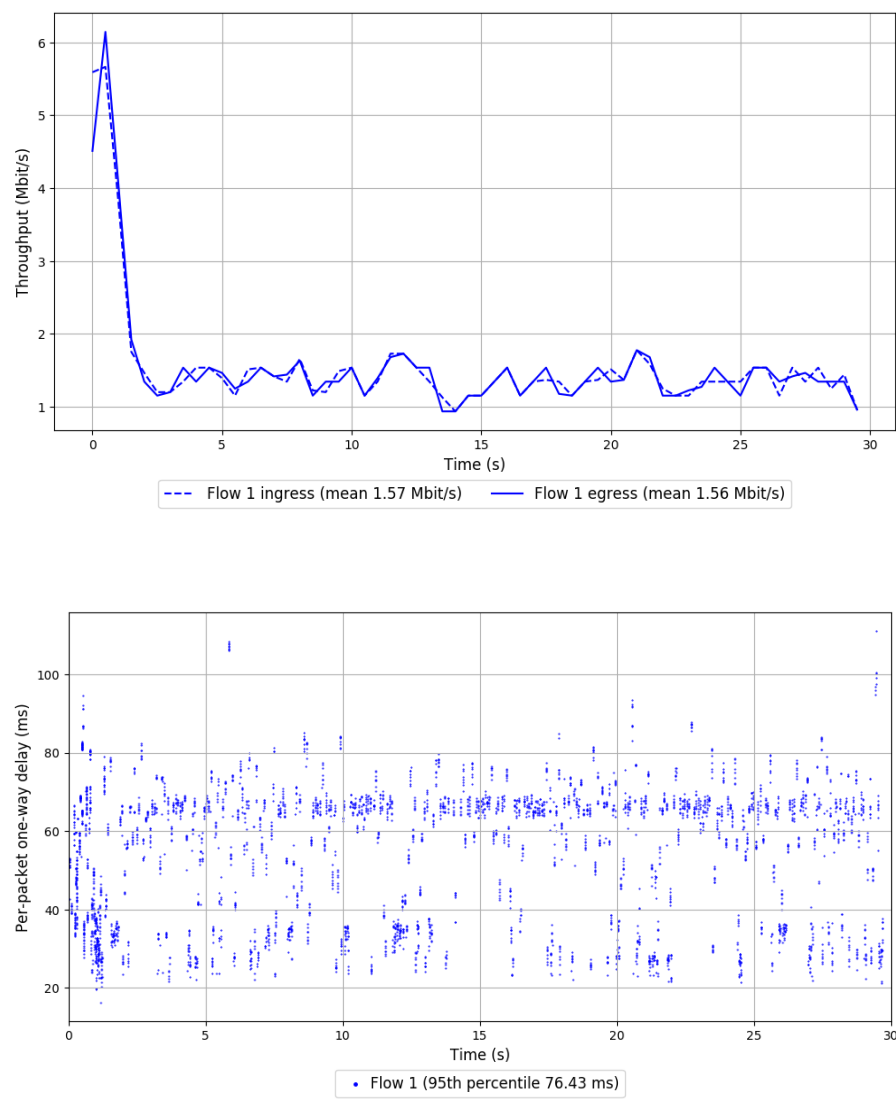
-- Flow 1:

Average throughput: 1.56 Mbit/s

95th percentile per-packet one-way delay: 76.429 ms

Loss rate: 0.39%

Run 2: Report of Indigo-1-32 — Data Link

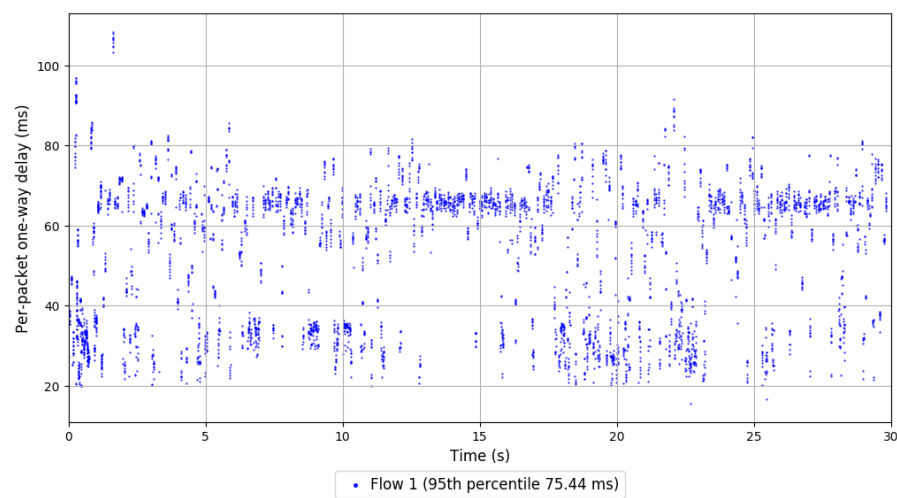
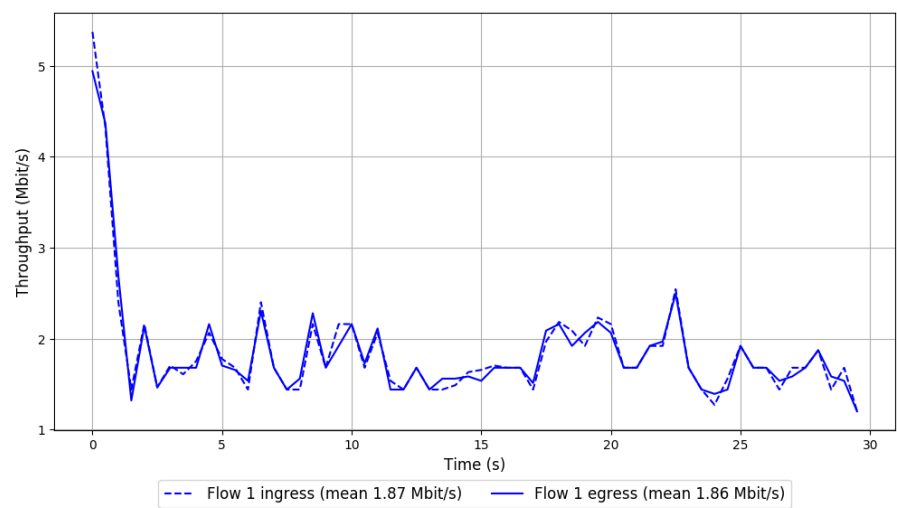


Run 3: Statistics of Indigo-1-32

Start at: 2018-03-20 06:44:31
End at: 2018-03-20 06:45:02
Local clock offset: 4.718 ms
Remote clock offset: -4.389 ms

Below is generated by plot.py at 2018-03-20 08:09:42
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 75.443 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 75.443 ms
Loss rate: 0.24%

Run 3: Report of Indigo-1-32 — Data Link



Run 1: Statistics of Vivace-latency

Start at: 2018-03-20 06:07:49

End at: 2018-03-20 06:08:19

Local clock offset: 9.129 ms

Remote clock offset: -5.95 ms

Below is generated by plot.py at 2018-03-20 08:09:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.79 Mbit/s

95th percentile per-packet one-way delay: 36.600 ms

Loss rate: 0.17%

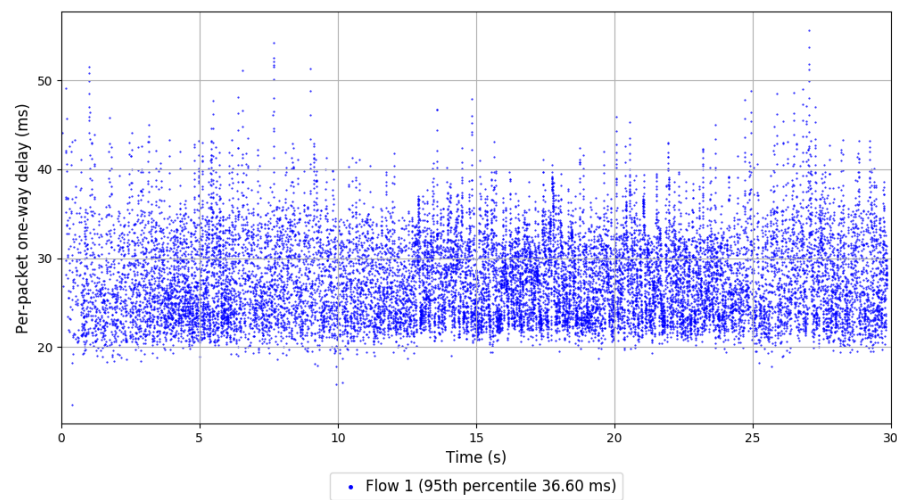
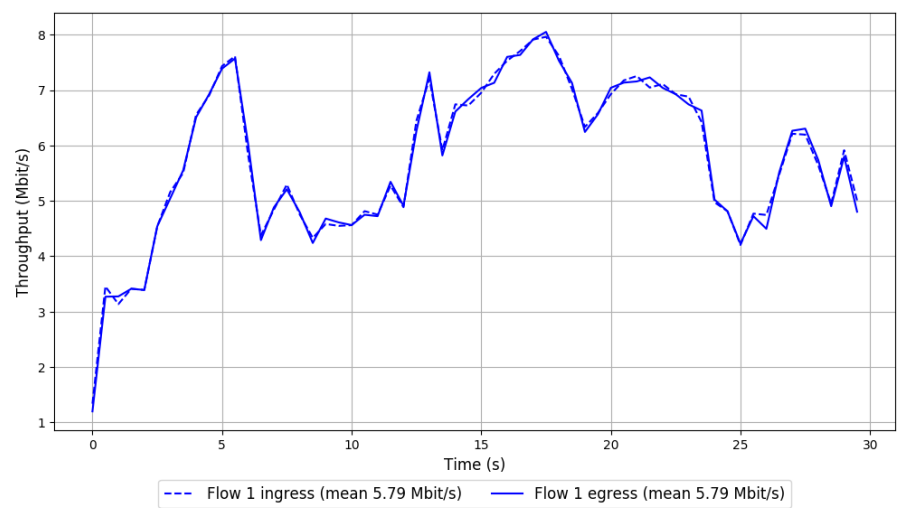
-- Flow 1:

Average throughput: 5.79 Mbit/s

95th percentile per-packet one-way delay: 36.600 ms

Loss rate: 0.17%

Run 1: Report of Vivace-latency — Data Link

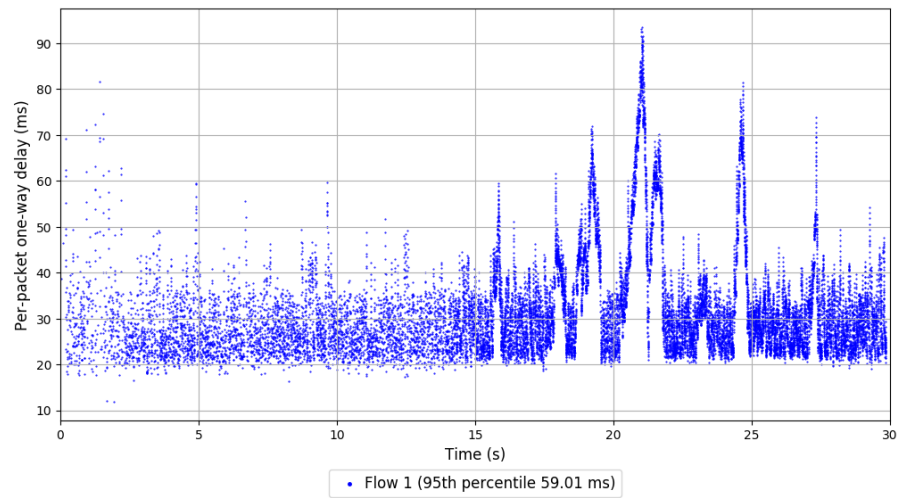
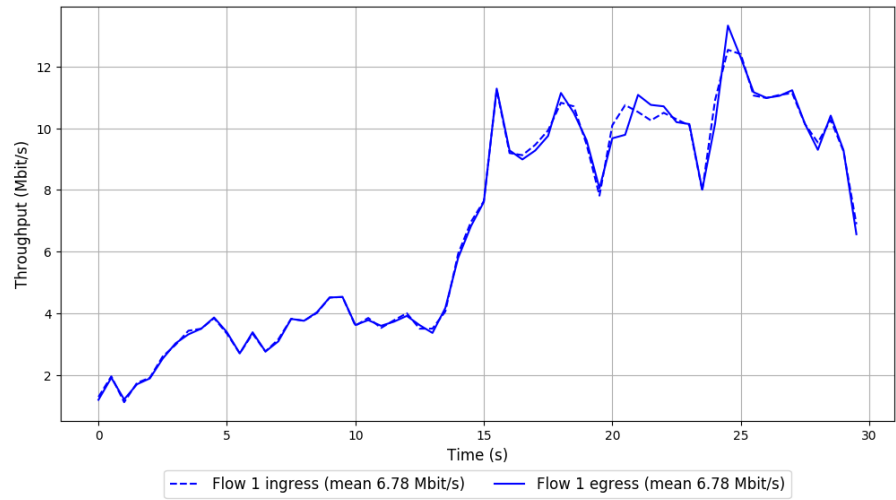


Run 2: Statistics of Vivace-latency

Start at: 2018-03-20 06:31:25
End at: 2018-03-20 06:31:56
Local clock offset: 4.53 ms
Remote clock offset: -4.869 ms

Below is generated by plot.py at 2018-03-20 08:09:42
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.78 Mbit/s
95th percentile per-packet one-way delay: 59.010 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 6.78 Mbit/s
95th percentile per-packet one-way delay: 59.010 ms
Loss rate: 0.21%

Run 2: Report of Vivace-latency — Data Link



Run 3: Statistics of Vivace-latency

Start at: 2018-03-20 06:55:01

End at: 2018-03-20 06:55:31

Local clock offset: 4.099 ms

Remote clock offset: -4.56 ms

Below is generated by plot.py at 2018-03-20 08:09:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 11.03 Mbit/s

95th percentile per-packet one-way delay: 260.057 ms

Loss rate: 20.68%

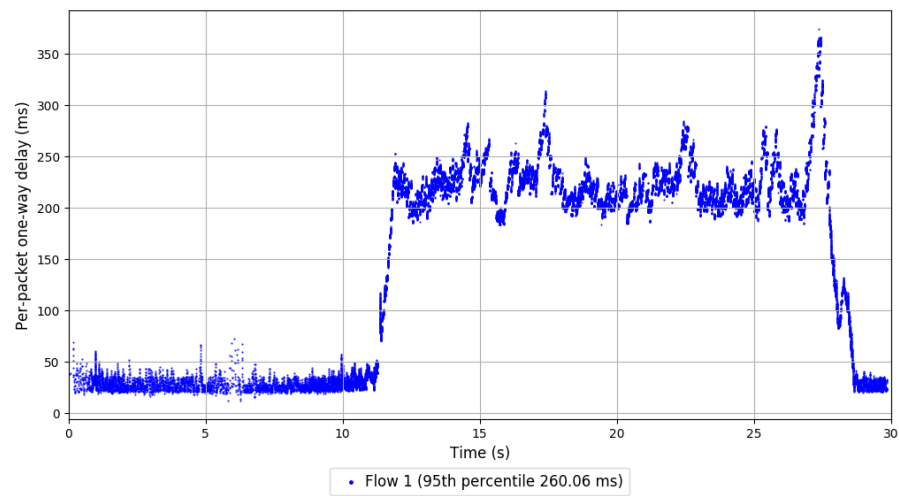
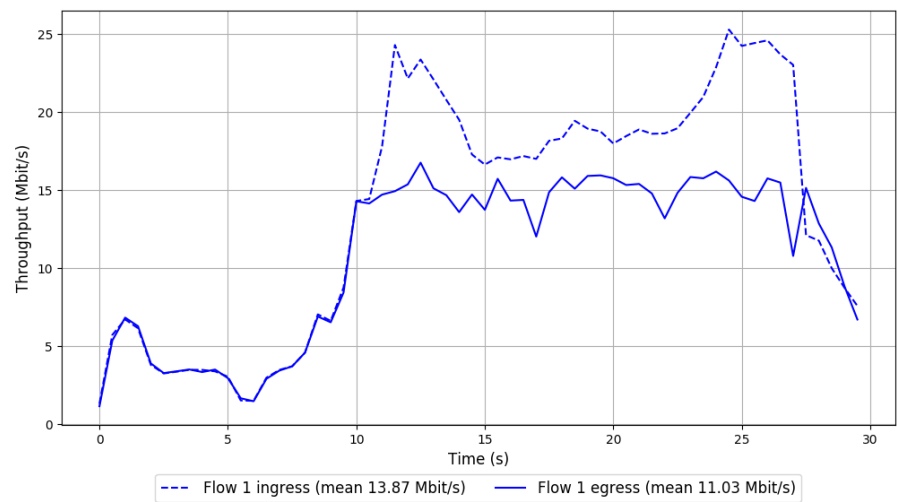
-- Flow 1:

Average throughput: 11.03 Mbit/s

95th percentile per-packet one-way delay: 260.057 ms

Loss rate: 20.68%

Run 3: Report of Vivace-latency — Data Link



Run 1: Statistics of Vivace-loss

Start at: 2018-03-20 06:06:30

End at: 2018-03-20 06:07:00

Local clock offset: 9.098 ms

Remote clock offset: -5.928 ms

Below is generated by plot.py at 2018-03-20 08:09:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 14.58 Mbit/s

95th percentile per-packet one-way delay: 256.983 ms

Loss rate: 23.27%

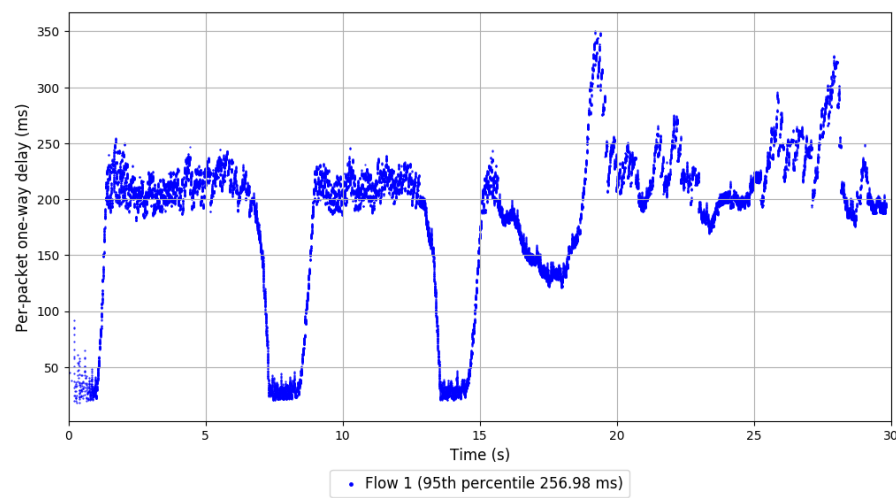
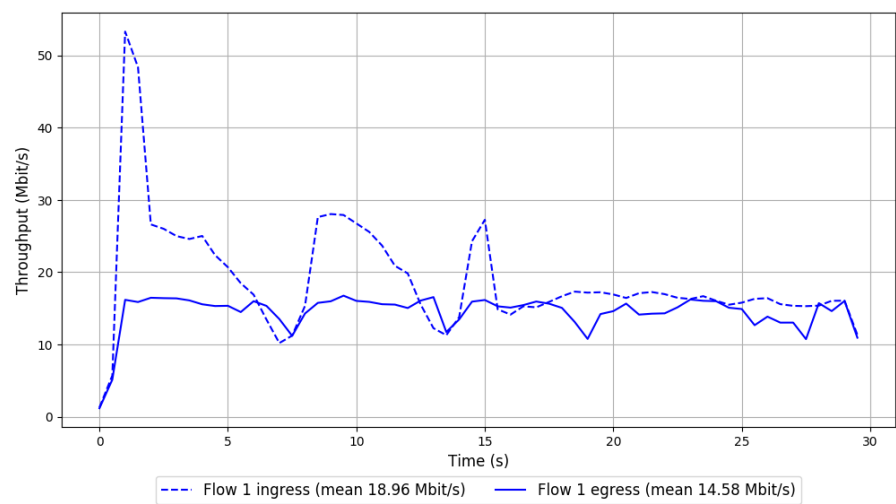
-- Flow 1:

Average throughput: 14.58 Mbit/s

95th percentile per-packet one-way delay: 256.983 ms

Loss rate: 23.27%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-03-20 06:30:07

End at: 2018-03-20 06:30:37

Local clock offset: 4.828 ms

Remote clock offset: -4.853 ms

Below is generated by plot.py at 2018-03-20 08:09:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 12.97 Mbit/s

95th percentile per-packet one-way delay: 308.834 ms

Loss rate: 21.29%

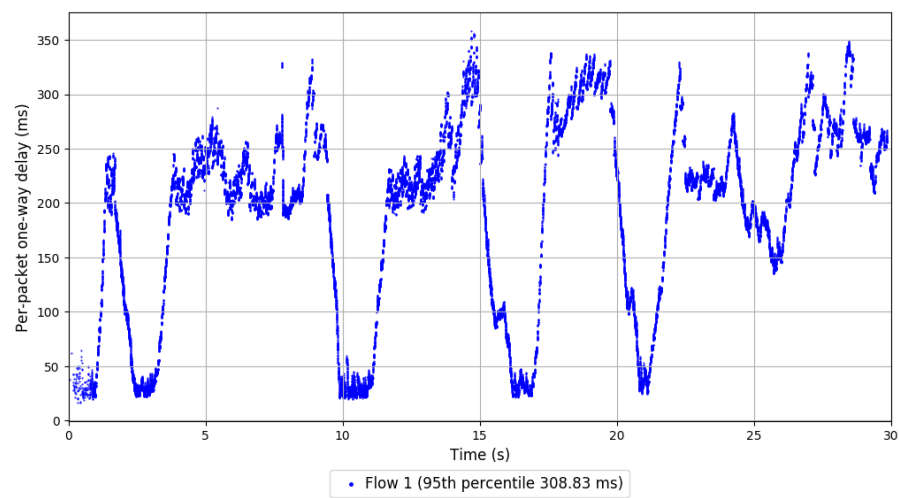
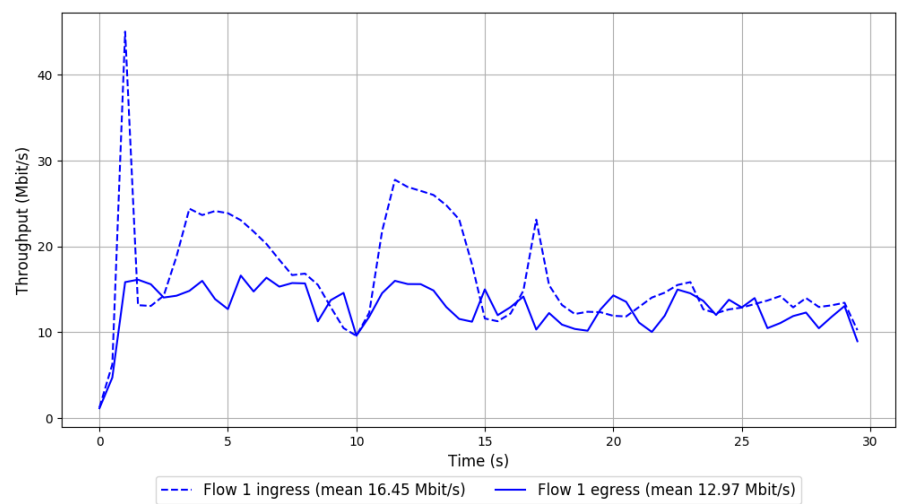
-- Flow 1:

Average throughput: 12.97 Mbit/s

95th percentile per-packet one-way delay: 308.834 ms

Loss rate: 21.29%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-03-20 06:53:42

End at: 2018-03-20 06:54:12

Local clock offset: 4.742 ms

Remote clock offset: -4.404 ms

Below is generated by plot.py at 2018-03-20 08:09:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 14.34 Mbit/s

95th percentile per-packet one-way delay: 249.663 ms

Loss rate: 13.08%

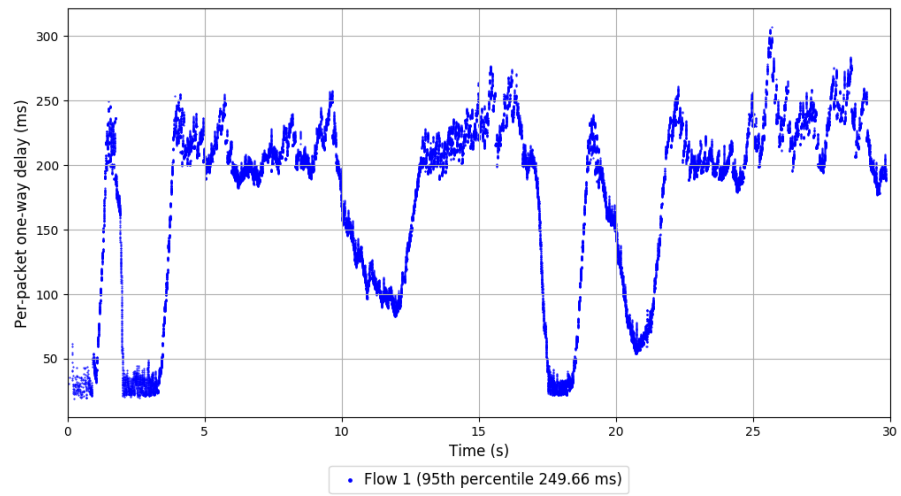
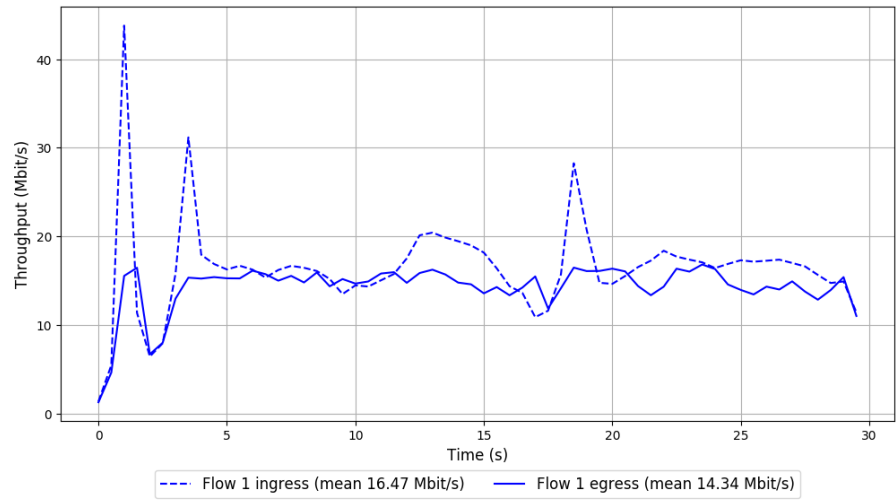
-- Flow 1:

Average throughput: 14.34 Mbit/s

95th percentile per-packet one-way delay: 249.663 ms

Loss rate: 13.08%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-03-20 05:52:03

End at: 2018-03-20 05:52:33

Local clock offset: 6.015 ms

Remote clock offset: -5.593 ms

Below is generated by plot.py at 2018-03-20 08:09:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.75 Mbit/s

95th percentile per-packet one-way delay: 112.183 ms

Loss rate: 0.10%

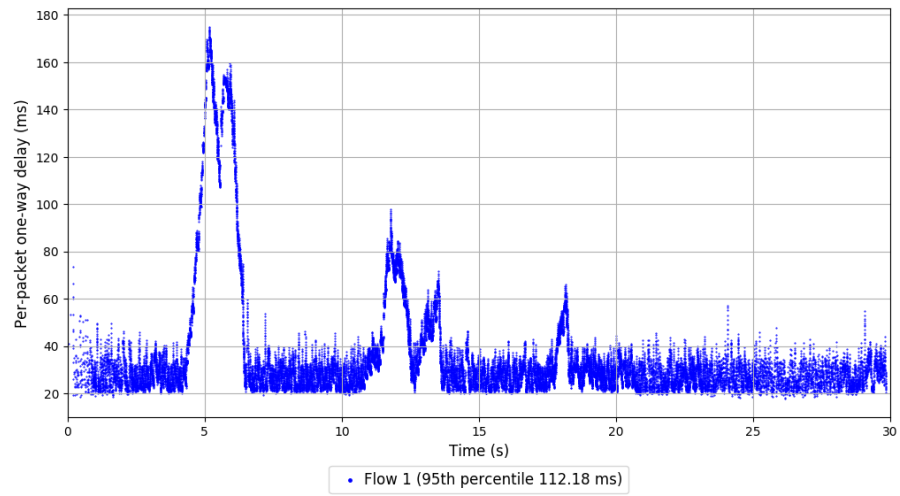
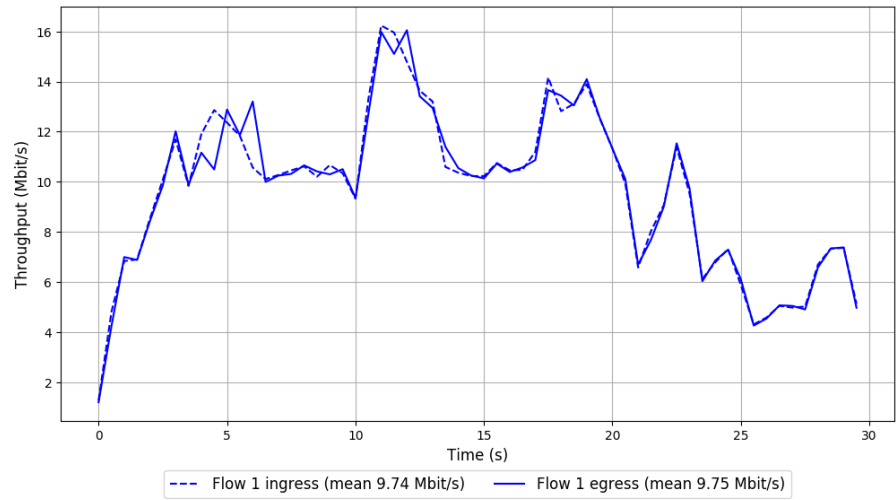
-- Flow 1:

Average throughput: 9.75 Mbit/s

95th percentile per-packet one-way delay: 112.183 ms

Loss rate: 0.10%

Run 1: Report of Vivace-LTE — Data Link

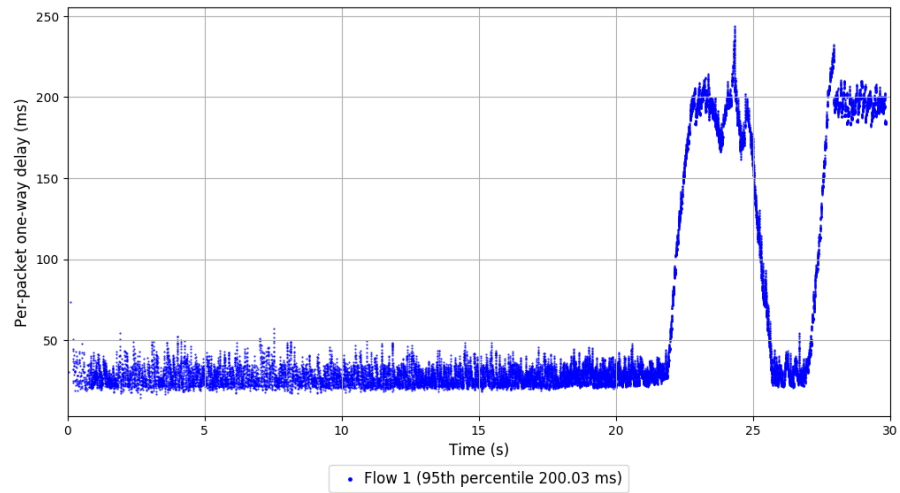
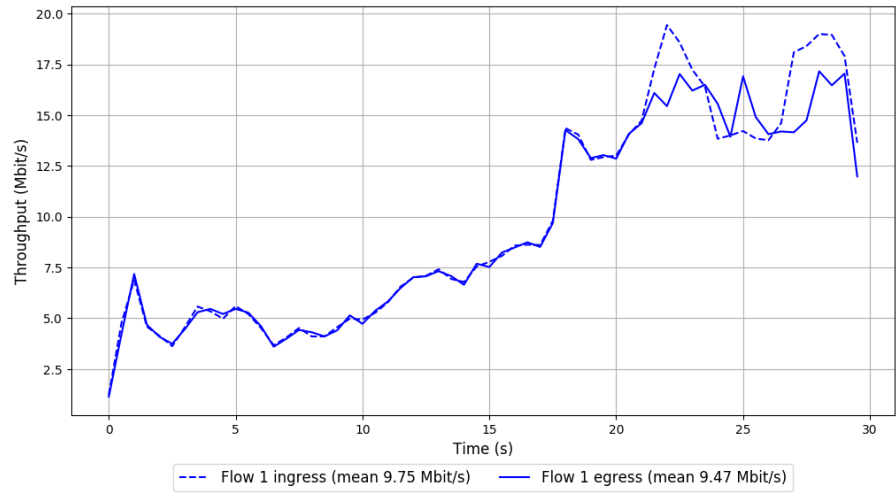


Run 2: Statistics of Vivace-LTE

Start at: 2018-03-20 06:15:41
End at: 2018-03-20 06:16:11
Local clock offset: 10.795 ms
Remote clock offset: -5.953 ms

Below is generated by plot.py at 2018-03-20 08:09:45
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.47 Mbit/s
95th percentile per-packet one-way delay: 200.026 ms
Loss rate: 3.05%
-- Flow 1:
Average throughput: 9.47 Mbit/s
95th percentile per-packet one-way delay: 200.026 ms
Loss rate: 3.05%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-03-20 06:39:16

End at: 2018-03-20 06:39:46

Local clock offset: 4.447 ms

Remote clock offset: -4.58 ms

Below is generated by plot.py at 2018-03-20 08:09:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 12.50 Mbit/s

95th percentile per-packet one-way delay: 241.512 ms

Loss rate: 3.73%

-- Flow 1:

Average throughput: 12.50 Mbit/s

95th percentile per-packet one-way delay: 241.512 ms

Loss rate: 3.73%

Run 3: Report of Vivace-LTE — Data Link

