

Pantheon Report

Generated at 2018-03-26 21:54:36 (UTC).

Data path: AWS Brazil 2 Ethernet (*local*) → Colombia ppp0 (*remote*).

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).

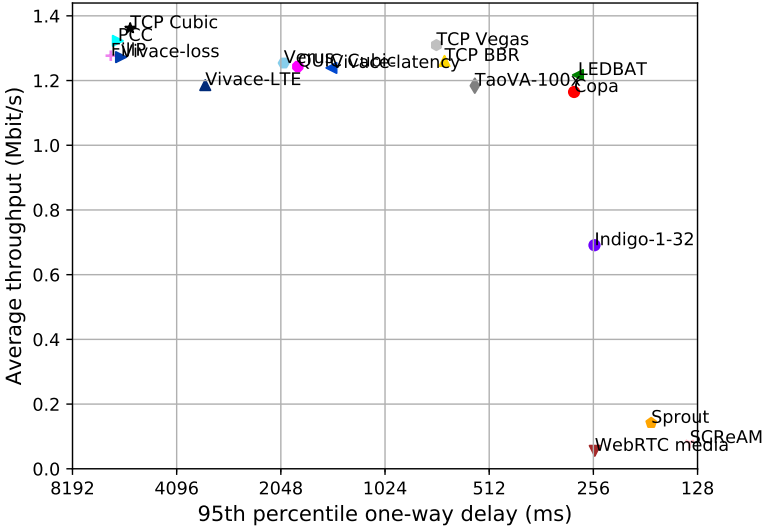
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

NTP offsets were measured against **gps.ntp.br** and have been applied to correct the timestamps in logs.

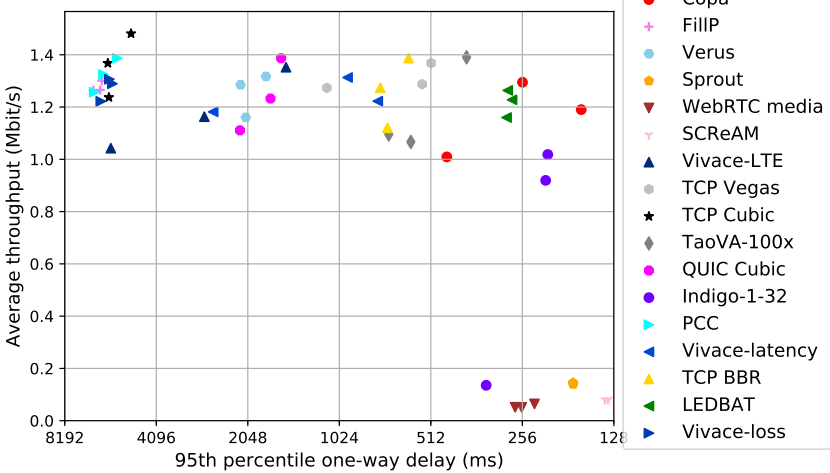
Git summary:

```
branch: master @ 503f51fe03f703a4c0a826a0792a4fead3e7d1b0
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 @ f1a14bffe749737437f61b1eaeab30b267cde681
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 @ f271183af822eee5d0031620f4bebf38aedc5581
```

test from AWS Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme



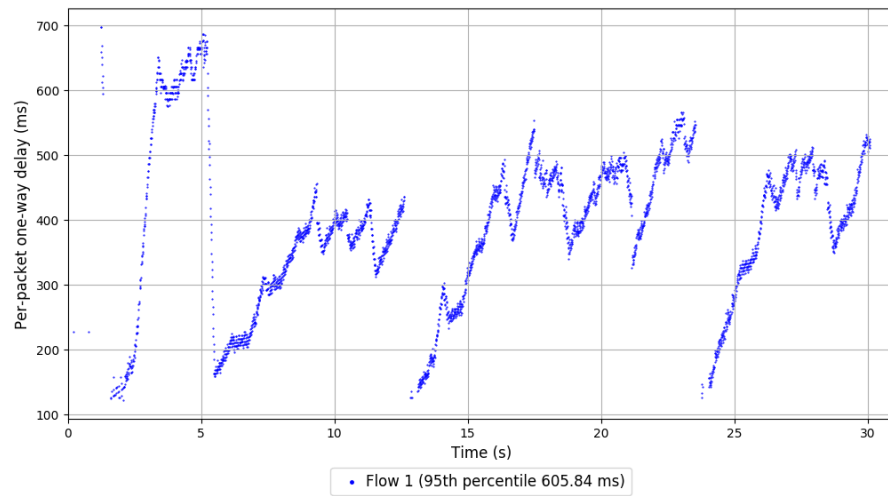
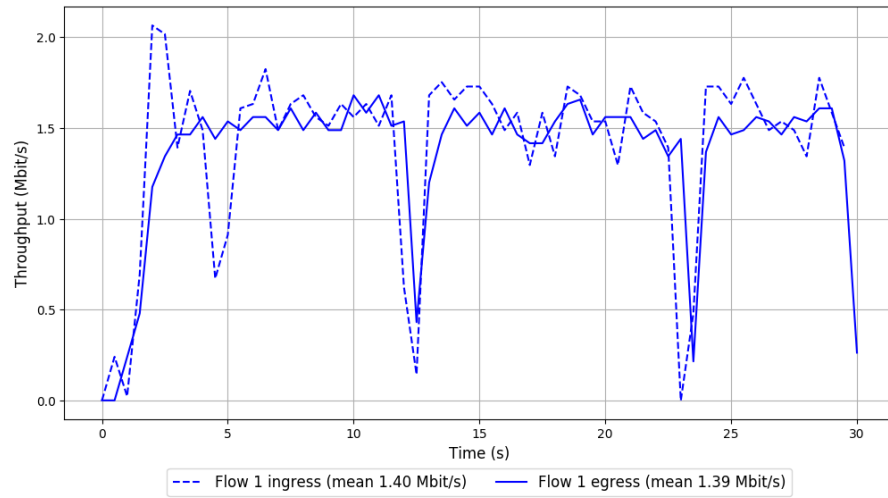
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	1.26	689.29	1.46
TCP Cubic	3	1.36	5579.48	20.77
LEDBAT	3	1.22	283.73	0.36
PCC	3	1.32	6056.48	75.54
QUIC Cubic	3	1.24	1829.32	6.20
SCReAM	3	0.08	134.84	0.09
WebRTC media	3	0.05	253.66	0.00
Sprout	3	0.14	174.26	0.18
TaoVA-100x	3	1.19	563.44	0.85
TCP Vegas	3	1.31	727.40	0.90
Verus	3	1.26	2008.75	3.87
Copa	3	1.16	291.04	0.12
FillP	3	1.28	6348.99	96.42
Indigo-1-32	3	0.69	254.13	0.10
Vivace-latency	3	1.24	1463.17	3.67
Vivace-loss	3	1.27	5929.04	35.62
Vivace-LTE	3	1.18	3386.41	13.63

Run 1: Statistics of TCP BBR

Start at: 2018-03-26 20:51:01
End at: 2018-03-26 20:51:31
Local clock offset: -11.689 ms
Remote clock offset: 6.566 ms

Below is generated by plot.py at 2018-03-26 21:54:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 605.841 ms
Loss rate: 1.37%
-- Flow 1:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 605.841 ms
Loss rate: 1.37%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-03-26 21:12:18

End at: 2018-03-26 21:12:48

Local clock offset: -5.5 ms

Remote clock offset: 2.143 ms

Below is generated by plot.py at 2018-03-26 21:54:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.12 Mbit/s

95th percentile per-packet one-way delay: 711.314 ms

Loss rate: 1.56%

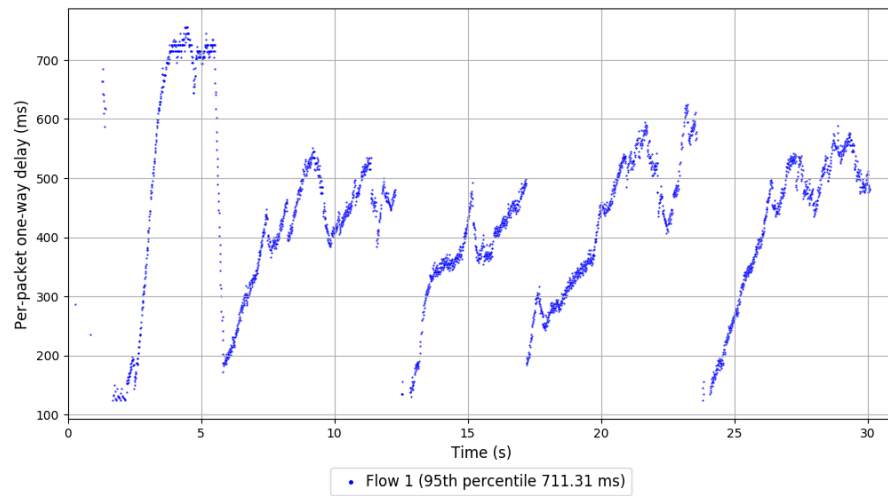
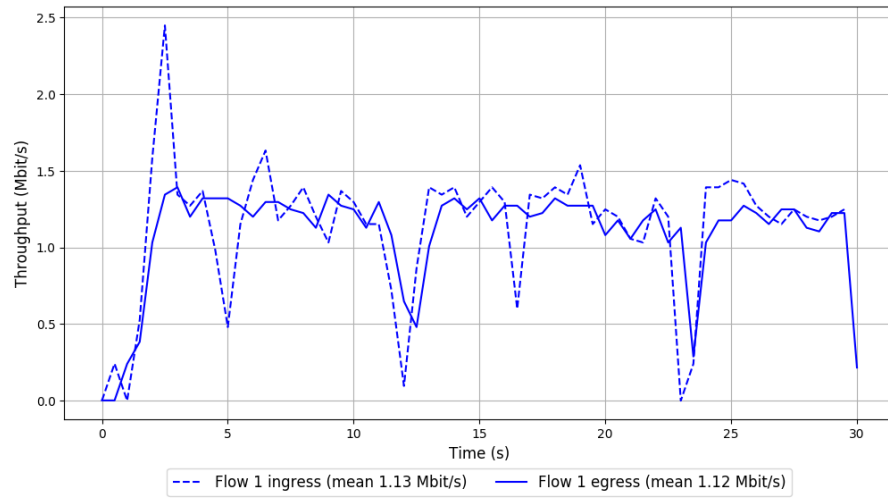
-- Flow 1:

Average throughput: 1.12 Mbit/s

95th percentile per-packet one-way delay: 711.314 ms

Loss rate: 1.56%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-03-26 21:33:34

End at: 2018-03-26 21:34:04

Local clock offset: -5.943 ms

Remote clock offset: 7.746 ms

Below is generated by plot.py at 2018-03-26 21:54:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.27 Mbit/s

95th percentile per-packet one-way delay: 750.717 ms

Loss rate: 1.46%

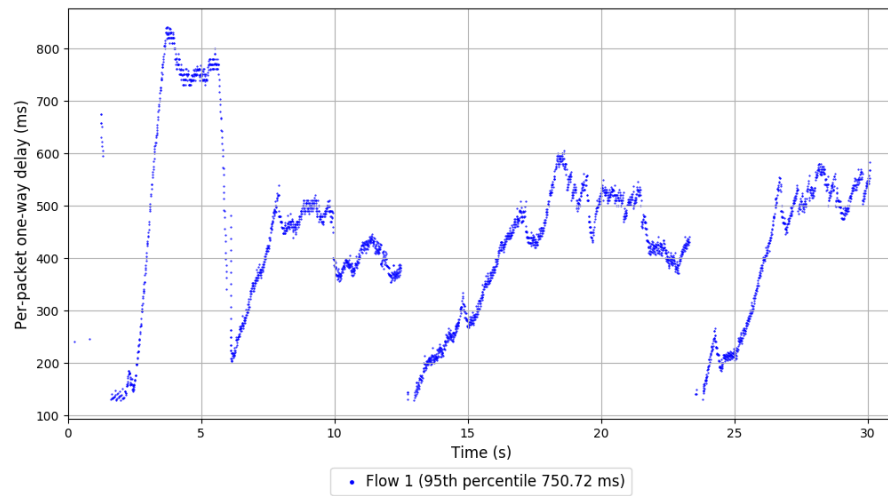
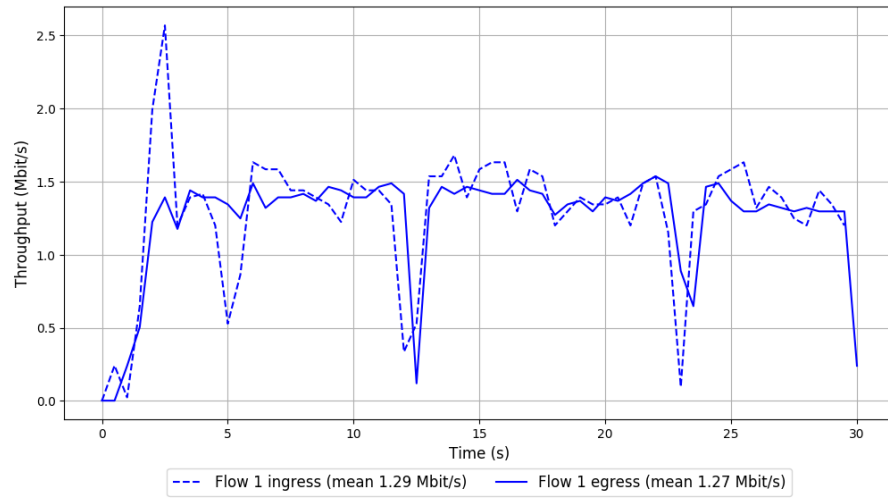
-- Flow 1:

Average throughput: 1.27 Mbit/s

95th percentile per-packet one-way delay: 750.717 ms

Loss rate: 1.46%

Run 3: Report of TCP BBR — Data Link

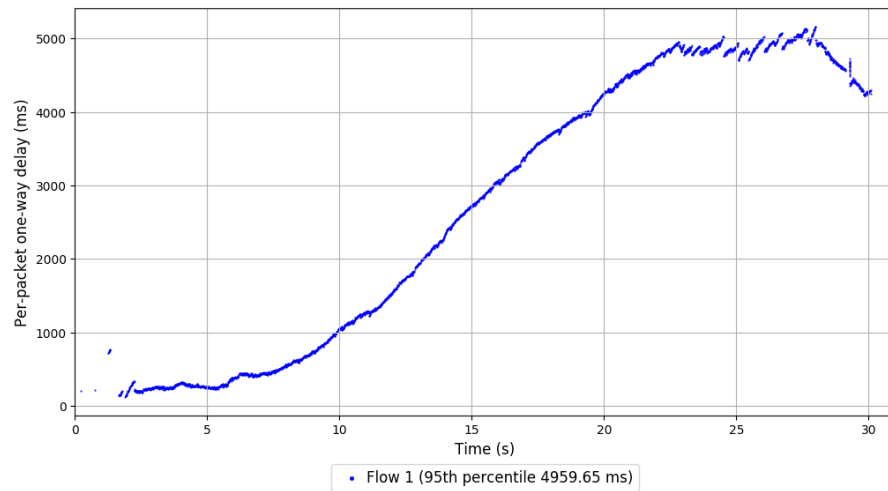
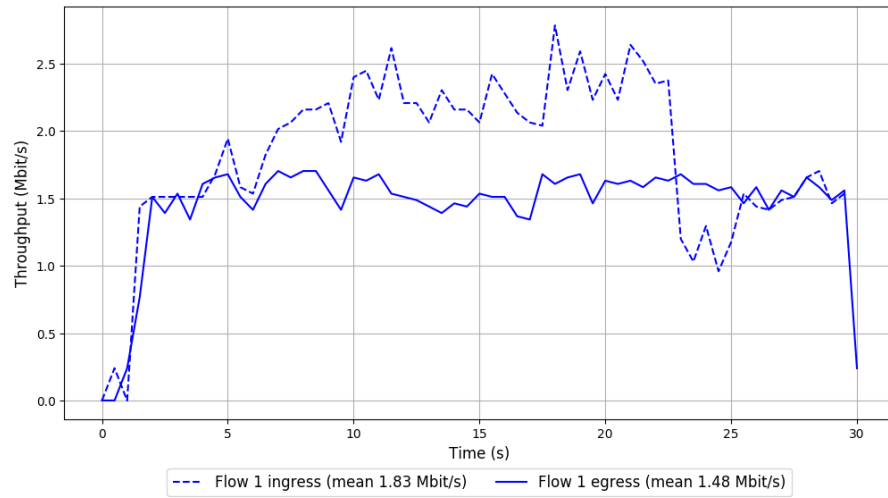


Run 1: Statistics of TCP Cubic

Start at: 2018-03-26 20:52:12
End at: 2018-03-26 20:52:42
Local clock offset: -10.655 ms
Remote clock offset: 2.195 ms

Below is generated by plot.py at 2018-03-26 21:54:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 4959.651 ms
Loss rate: 19.59%
-- Flow 1:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 4959.651 ms
Loss rate: 19.59%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-03-26 21:13:28

End at: 2018-03-26 21:13:58

Local clock offset: -5.474 ms

Remote clock offset: 2.245 ms

Below is generated by plot.py at 2018-03-26 21:54:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.24 Mbit/s

95th percentile per-packet one-way delay: 5865.722 ms

Loss rate: 22.36%

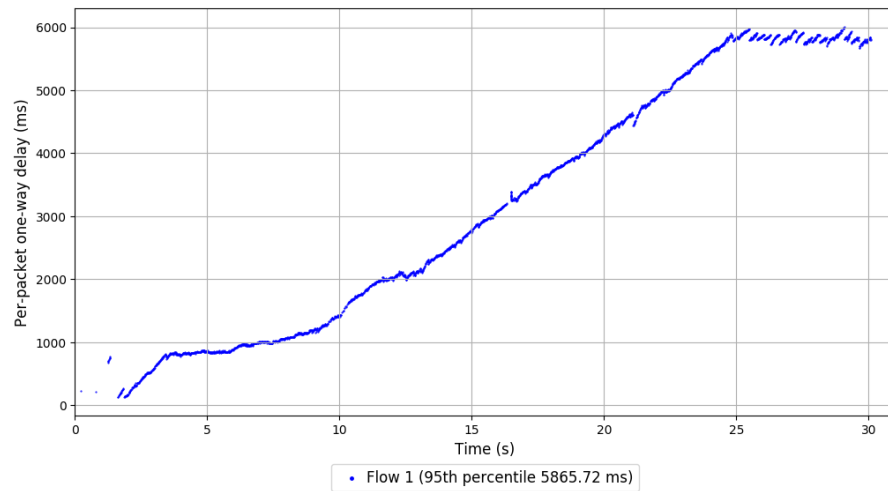
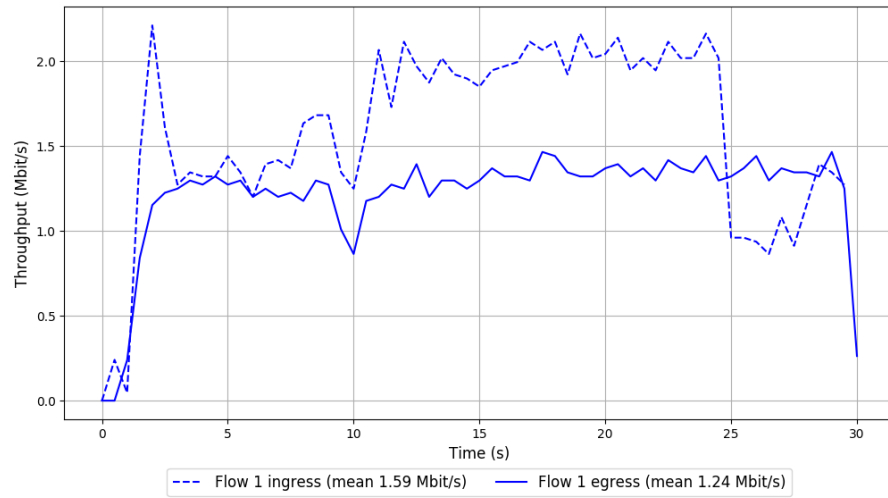
-- Flow 1:

Average throughput: 1.24 Mbit/s

95th percentile per-packet one-way delay: 5865.722 ms

Loss rate: 22.36%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-03-26 21:34:45

End at: 2018-03-26 21:35:15

Local clock offset: -5.834 ms

Remote clock offset: 7.746 ms

Below is generated by plot.py at 2018-03-26 21:54:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.37 Mbit/s

95th percentile per-packet one-way delay: 5913.065 ms

Loss rate: 20.36%

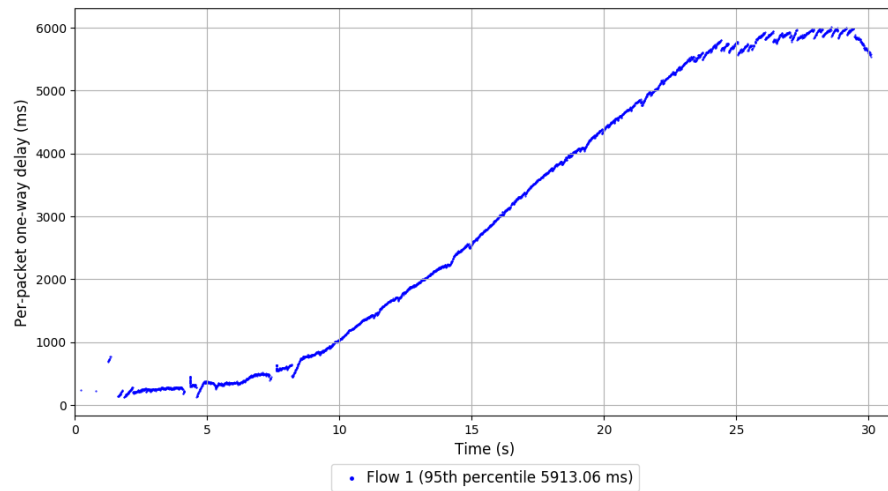
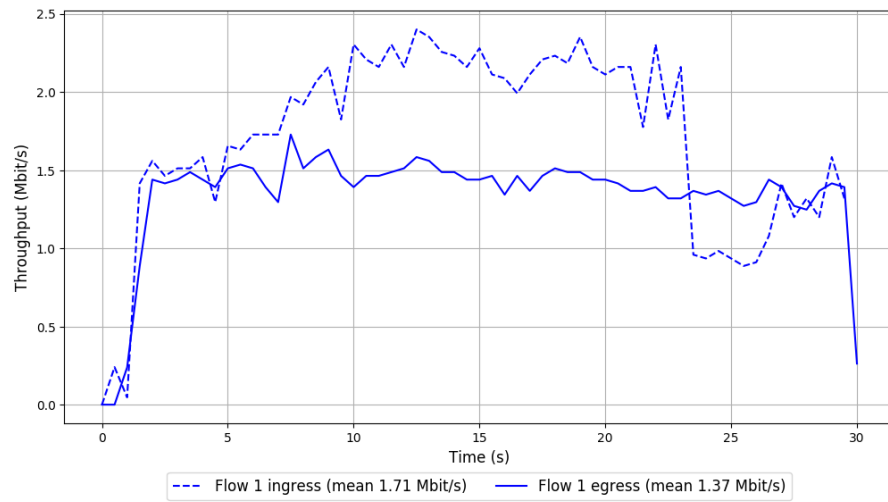
-- Flow 1:

Average throughput: 1.37 Mbit/s

95th percentile per-packet one-way delay: 5913.065 ms

Loss rate: 20.36%

Run 3: Report of TCP Cubic — Data Link

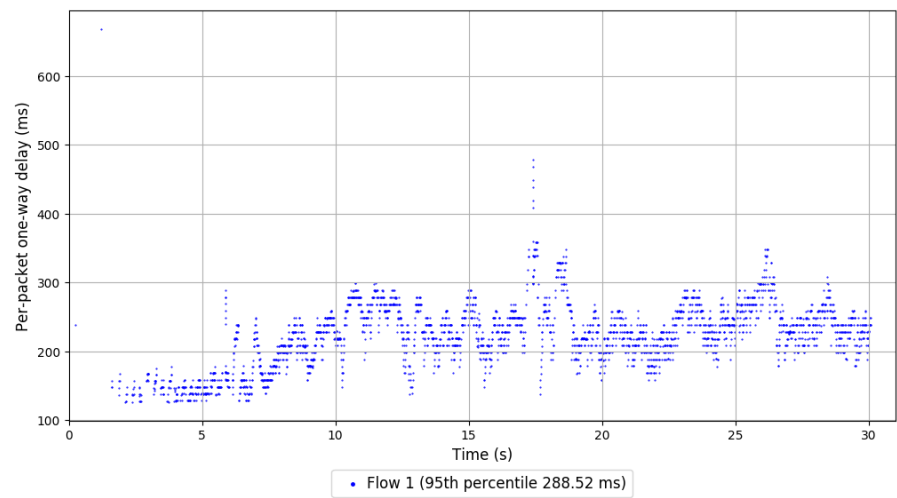
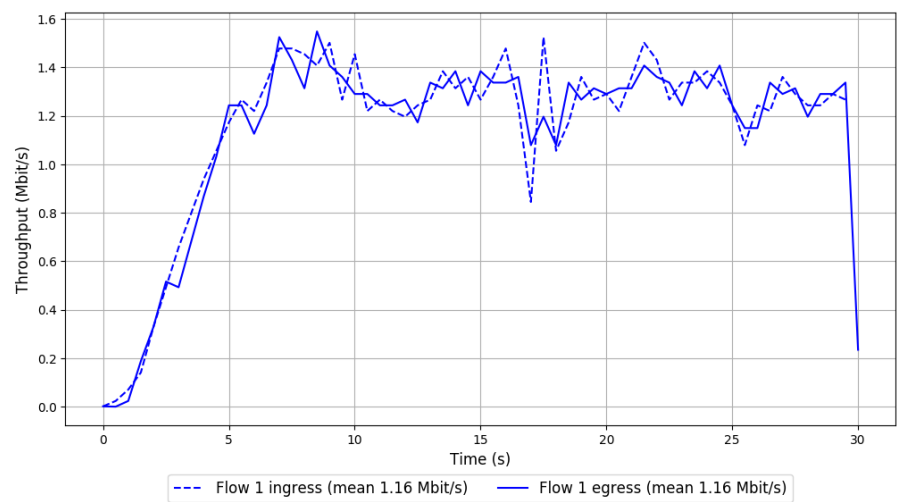


```
Run 1: Statistics of LEDBAT

Start at: 2018-03-26 21:00:29
End at: 2018-03-26 21:00:59
Local clock offset: -6.805 ms
Remote clock offset: 6.531 ms

# Below is generated by plot.py at 2018-03-26 21:54:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 288.523 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 288.523 ms
Loss rate: 0.40%
```

Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2018-03-26 21:21:45

End at: 2018-03-26 21:22:15

Local clock offset: -5.597 ms

Remote clock offset: 7.387 ms

Below is generated by plot.py at 2018-03-26 21:54:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.23 Mbit/s

95th percentile per-packet one-way delay: 276.780 ms

Loss rate: 0.35%

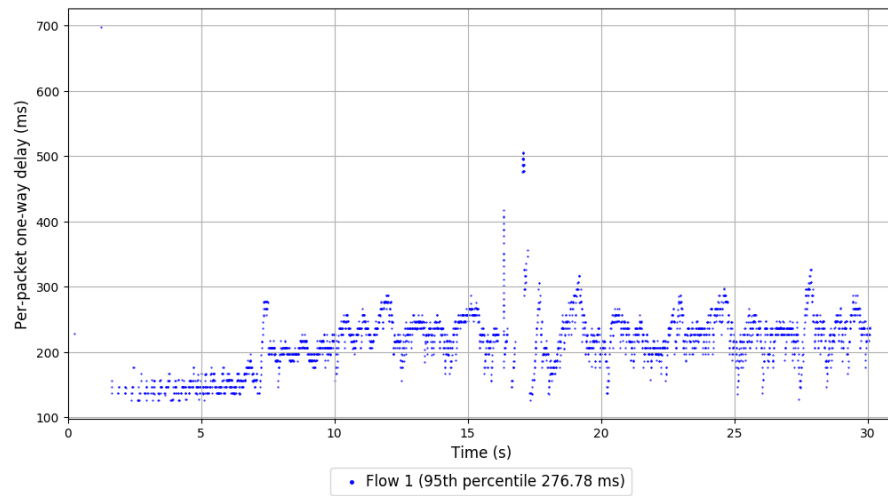
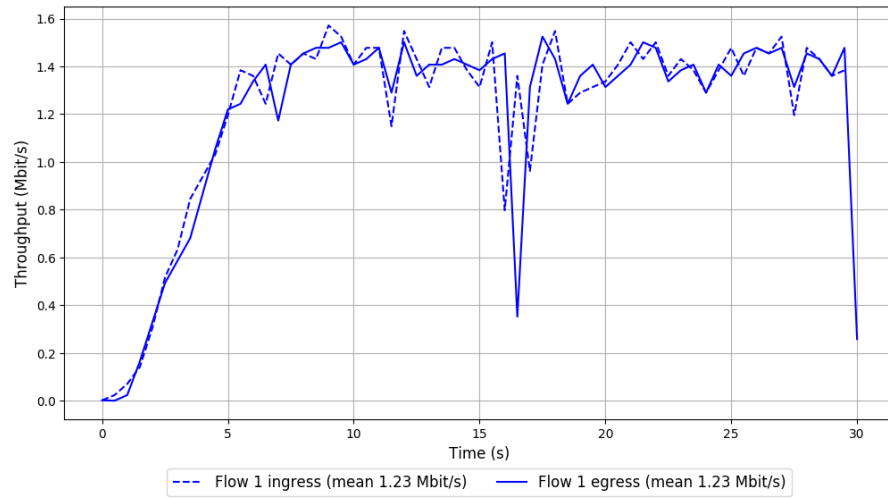
-- Flow 1:

Average throughput: 1.23 Mbit/s

95th percentile per-packet one-way delay: 276.780 ms

Loss rate: 0.35%

Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

Start at: 2018-03-26 21:43:00

End at: 2018-03-26 21:43:30

Local clock offset: -6.241 ms

Remote clock offset: 7.807 ms

Below is generated by plot.py at 2018-03-26 21:54:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.26 Mbit/s

95th percentile per-packet one-way delay: 285.874 ms

Loss rate: 0.34%

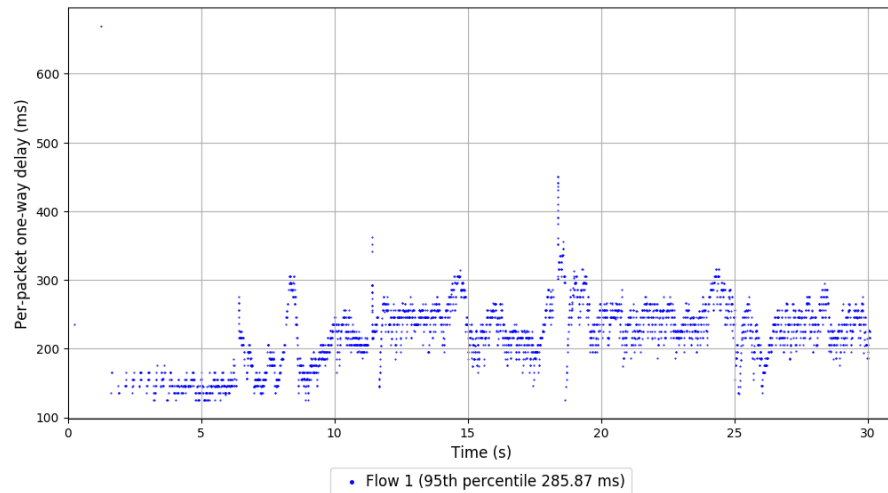
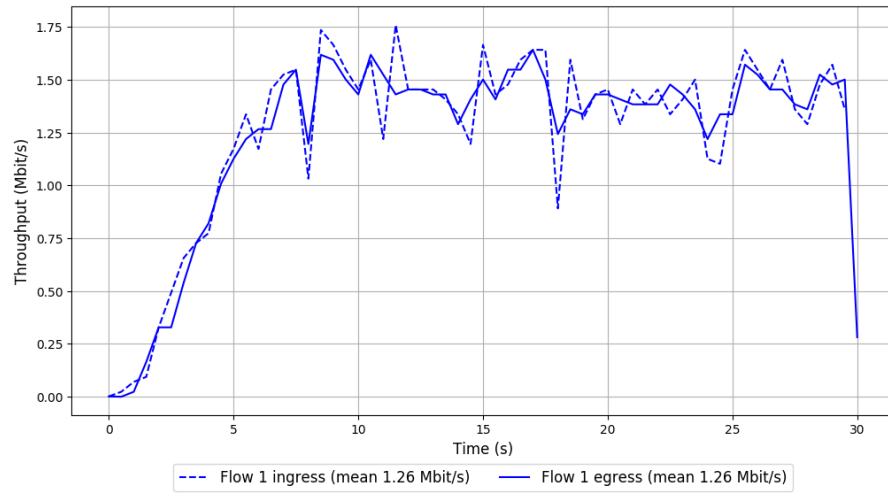
-- Flow 1:

Average throughput: 1.26 Mbit/s

95th percentile per-packet one-way delay: 285.874 ms

Loss rate: 0.34%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC

Start at: 2018-03-26 20:59:18

End at: 2018-03-26 20:59:48

Local clock offset: -7.159 ms

Remote clock offset: 6.597 ms

Below is generated by plot.py at 2018-03-26 21:54:08

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.26 Mbit/s

95th percentile per-packet one-way delay: 6553.098 ms

Loss rate: 81.69%

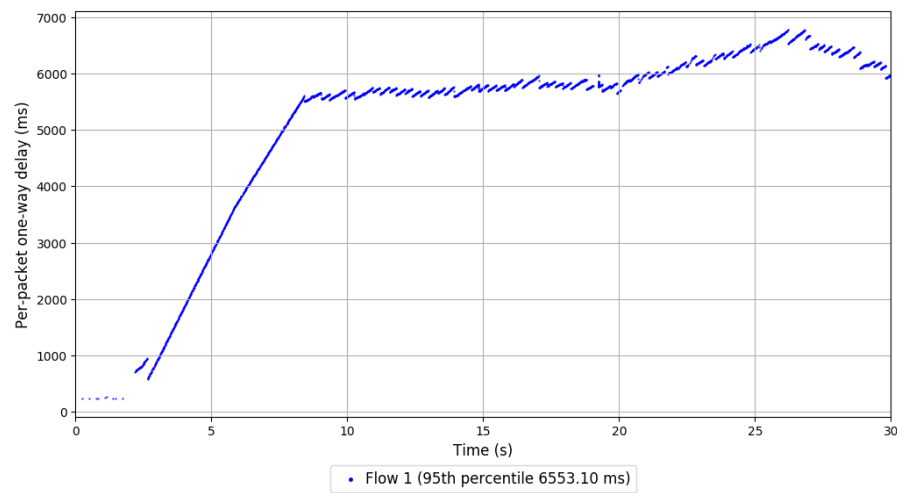
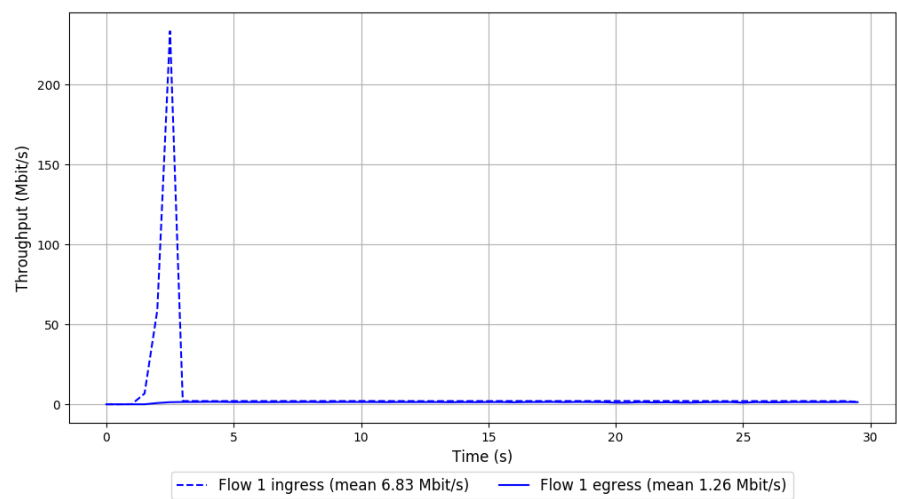
-- Flow 1:

Average throughput: 1.26 Mbit/s

95th percentile per-packet one-way delay: 6553.098 ms

Loss rate: 81.69%

Run 1: Report of PCC — Data Link



Run 2: Statistics of PCC

Start at: 2018-03-26 21:20:33

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

Local clock offset: -5.596 ms

Remote clock offset: 2.642 ms

Below is generated by plot.py at 2018-03-26 21:54:08

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.32 Mbit/s

95th percentile per-packet one-way delay: 6107.156 ms

Loss rate: 71.50%

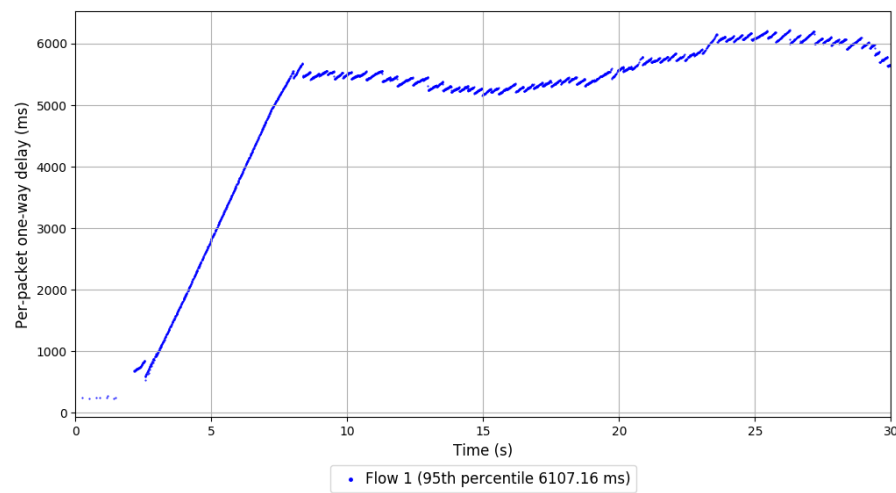
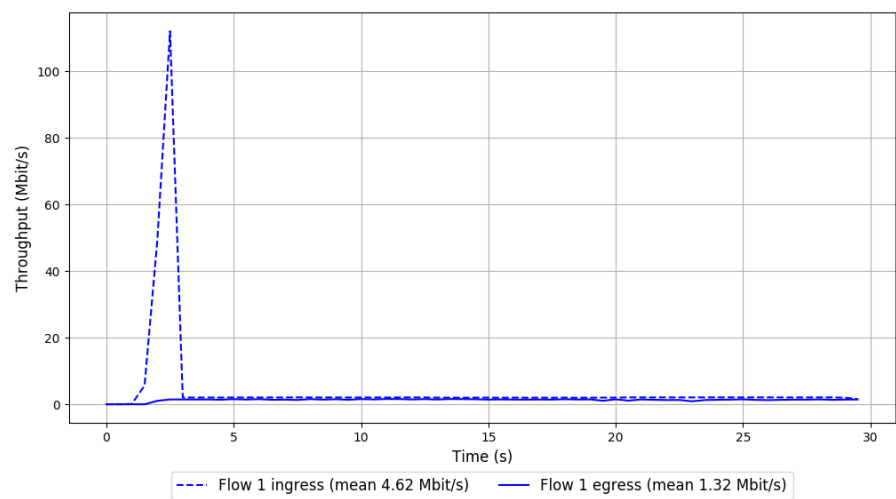
-- Flow 1:

Average throughput: 1.32 Mbit/s

95th percentile per-packet one-way delay: 6107.156 ms

Loss rate: 71.50%

Run 2: Report of PCC — Data Link



Run 3: Statistics of PCC

Start at: 2018-03-26 21:41:50

End at: 2018-03-26 21:42:20

Local clock offset: -6.185 ms

Remote clock offset: 7.816 ms

Below is generated by plot.py at 2018-03-26 21:54:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.39 Mbit/s

95th percentile per-packet one-way delay: 5509.189 ms

Loss rate: 73.42%

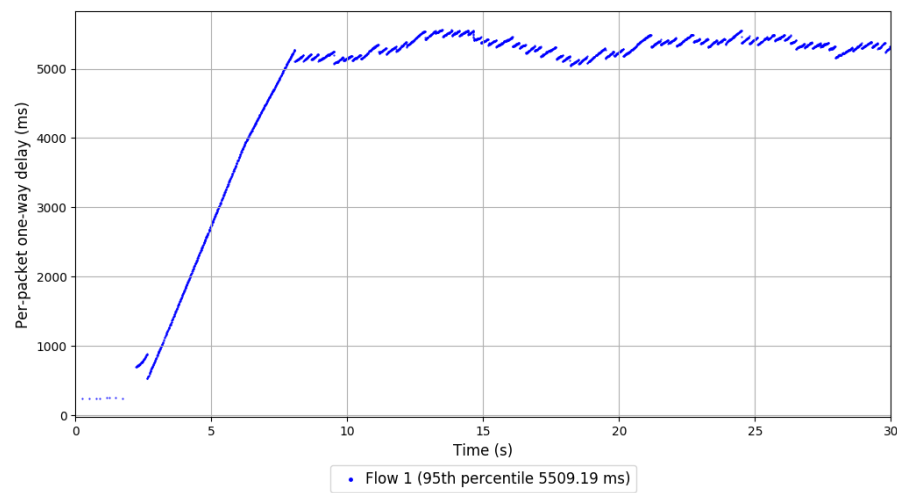
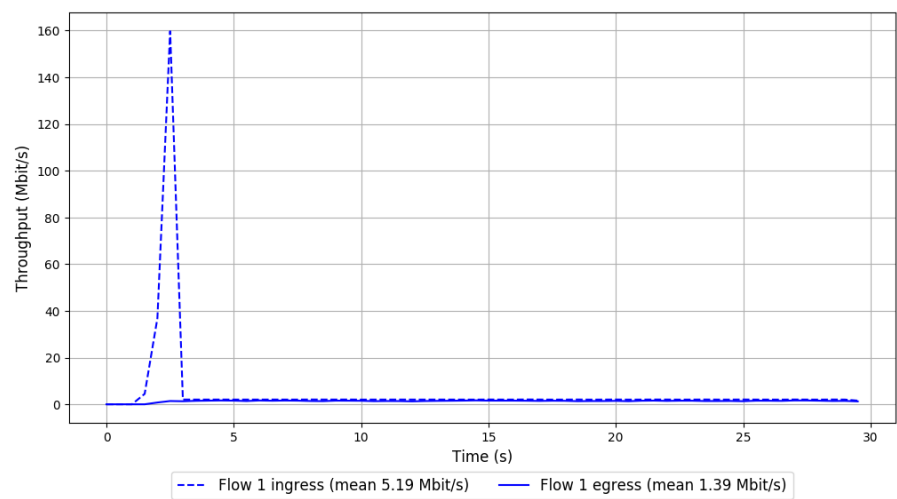
-- Flow 1:

Average throughput: 1.39 Mbit/s

95th percentile per-packet one-way delay: 5509.189 ms

Loss rate: 73.42%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-03-26 20:55:44

End at: 2018-03-26 20:56:14

Local clock offset: -8.487 ms

Remote clock offset: 2.613 ms

Below is generated by plot.py at 2018-03-26 21:54:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.39 Mbit/s

95th percentile per-packet one-way delay: 1590.546 ms

Loss rate: 5.96%

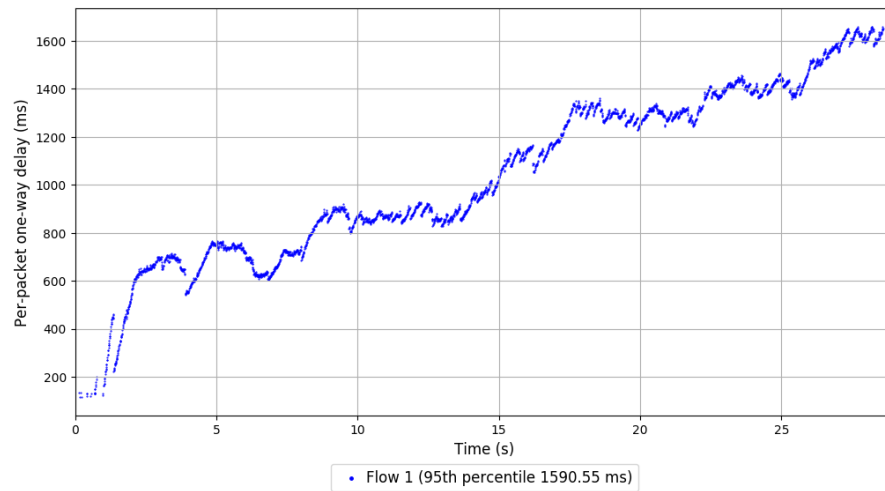
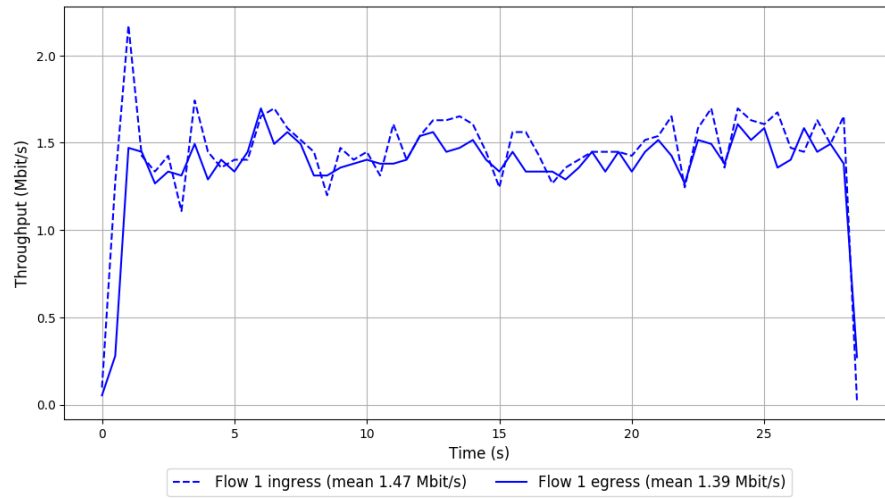
-- Flow 1:

Average throughput: 1.39 Mbit/s

95th percentile per-packet one-way delay: 1590.546 ms

Loss rate: 5.96%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-03-26 21:17:01

End at: 2018-03-26 21:17:31

Local clock offset: -5.447 ms

Remote clock offset: 2.451 ms

Below is generated by plot.py at 2018-03-26 21:54:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.23 Mbit/s

95th percentile per-packet one-way delay: 1724.296 ms

Loss rate: 5.81%

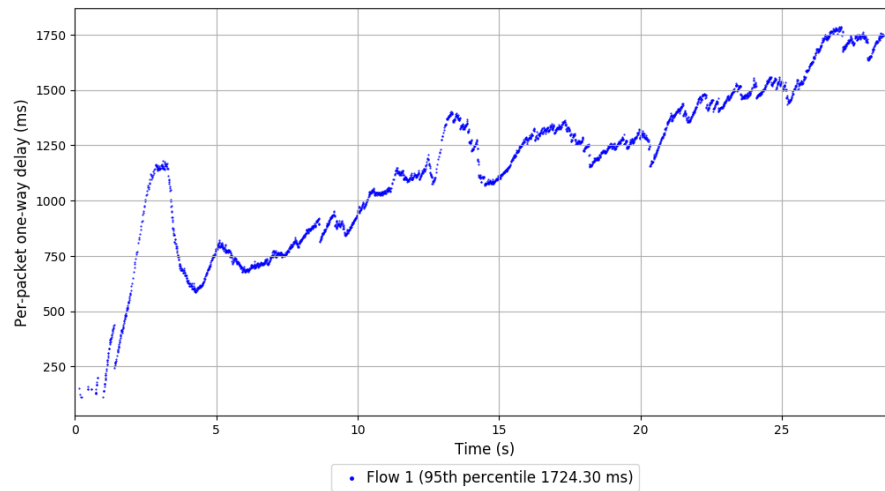
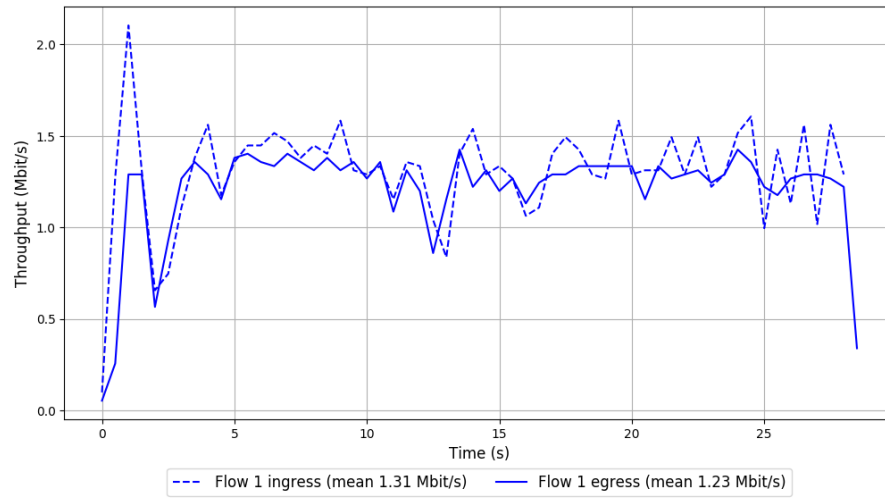
-- Flow 1:

Average throughput: 1.23 Mbit/s

95th percentile per-packet one-way delay: 1724.296 ms

Loss rate: 5.81%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-03-26 21:38:17

End at: 2018-03-26 21:38:47

Local clock offset: -6.1 ms

Remote clock offset: 2.992 ms

Below is generated by plot.py at 2018-03-26 21:54:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.11 Mbit/s

95th percentile per-packet one-way delay: 2173.107 ms

Loss rate: 6.82%

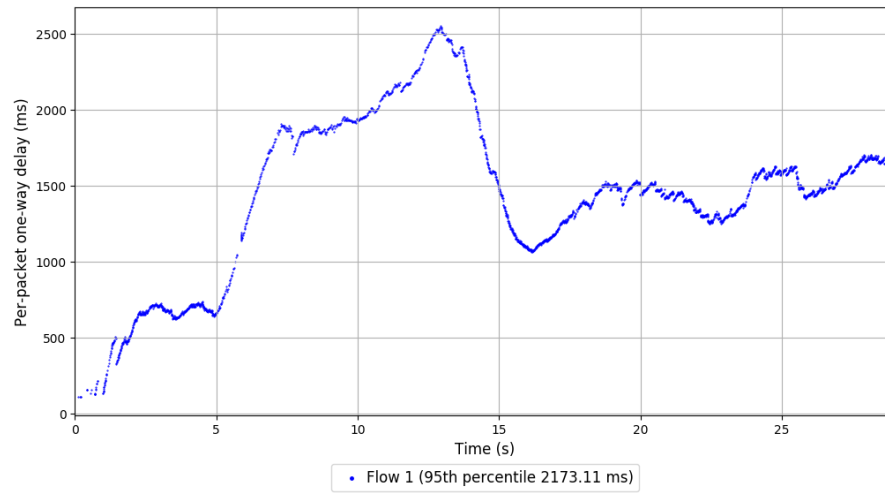
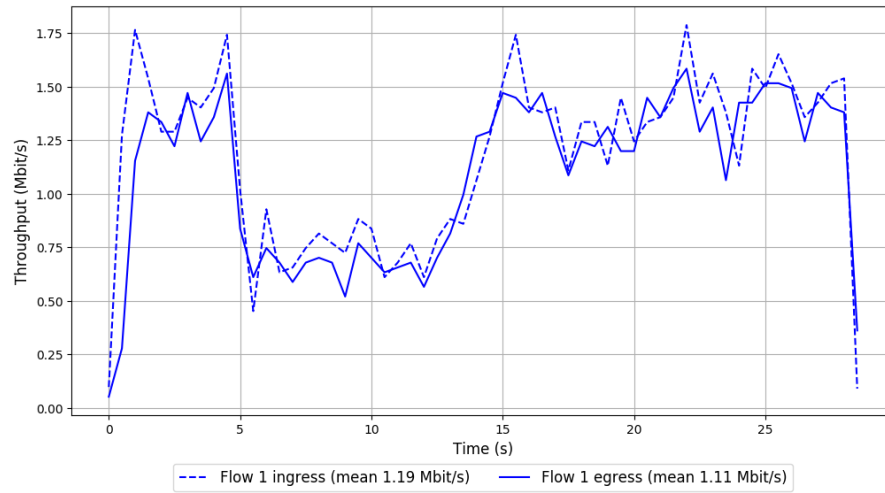
-- Flow 1:

Average throughput: 1.11 Mbit/s

95th percentile per-packet one-way delay: 2173.107 ms

Loss rate: 6.82%

Run 3: Report of QUIC Cubic — Data Link

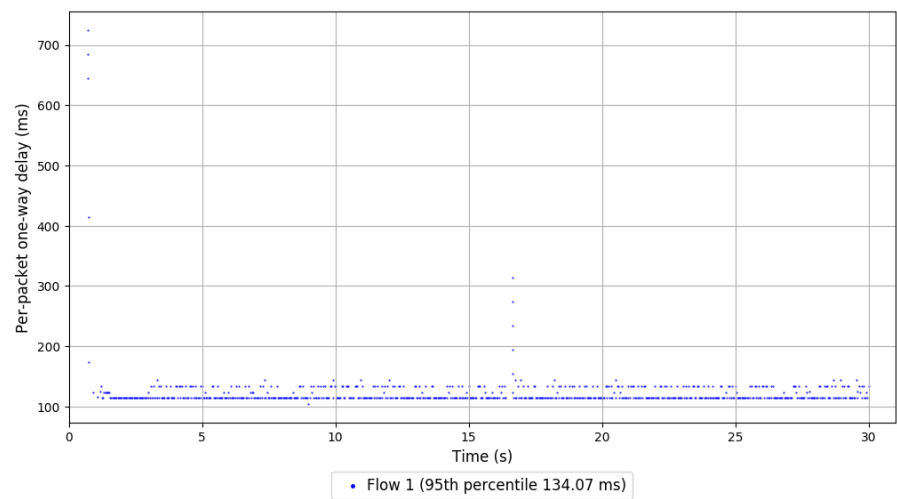
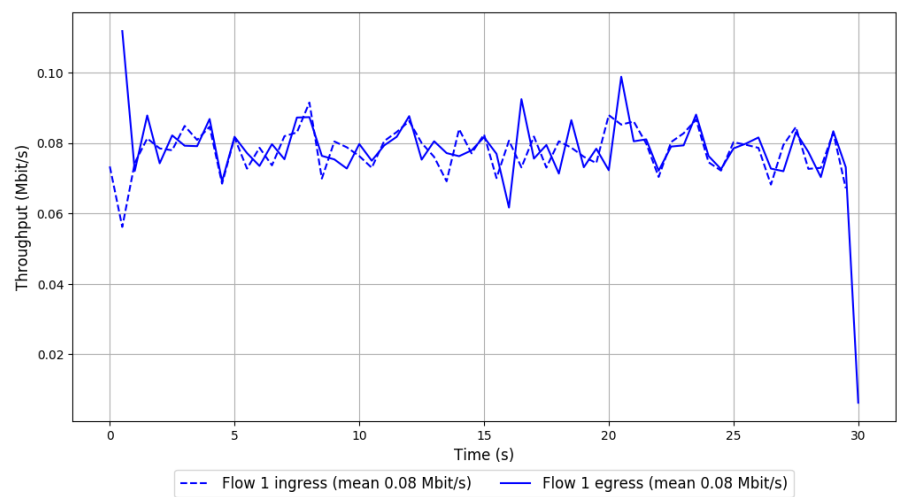


```
Run 1: Statistics of SCReAM

Start at: 2018-03-26 21:06:23
End at: 2018-03-26 21:06:53
Local clock offset: -5.813 ms
Remote clock offset: 0.146 ms

# Below is generated by plot.py at 2018-03-26 21:54:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 134.075 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 134.075 ms
Loss rate: 0.13%
```

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2018-03-26 21:27:39

End at: 2018-03-26 21:28:09

Local clock offset: -5.663 ms

Remote clock offset: 7.596 ms

Below is generated by plot.py at 2018-03-26 21:54:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 137.120 ms

Loss rate: 0.00%

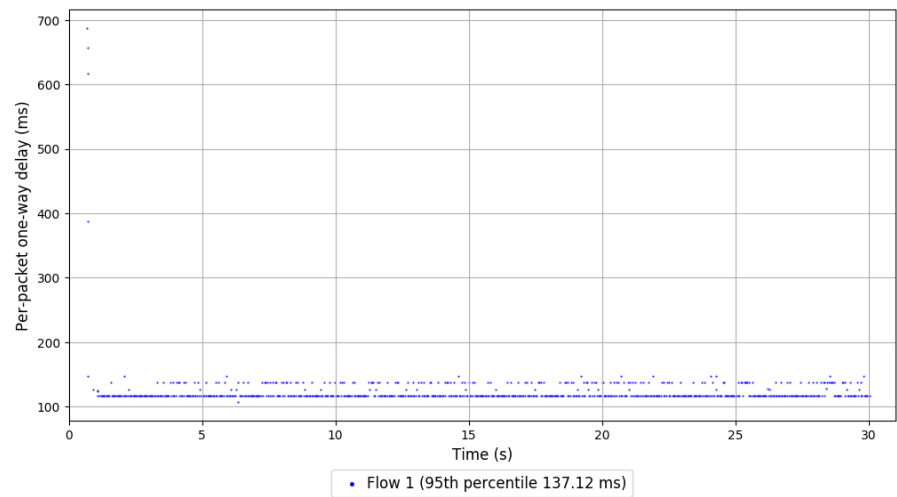
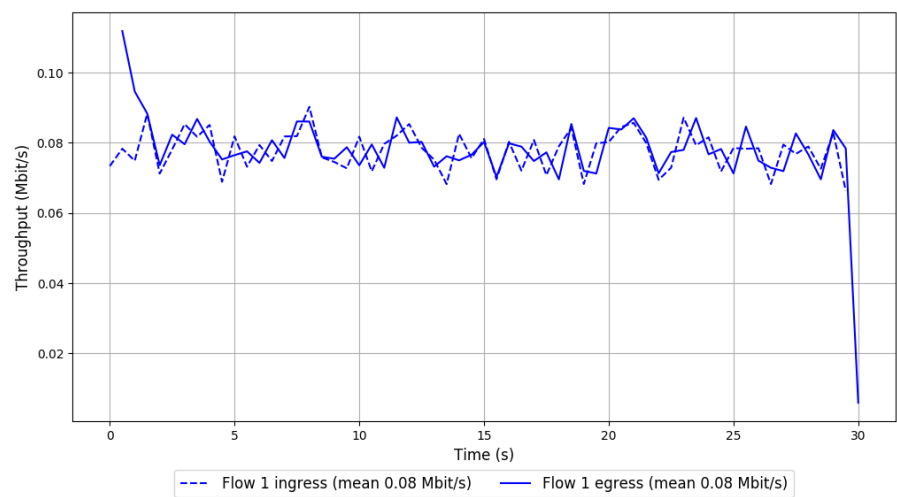
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 137.120 ms

Loss rate: 0.00%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-03-26 21:48:55

End at: 2018-03-26 21:49:25

Local clock offset: -6.476 ms

Remote clock offset: 7.553 ms

Below is generated by plot.py at 2018-03-26 21:54:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 133.316 ms

Loss rate: 0.13%

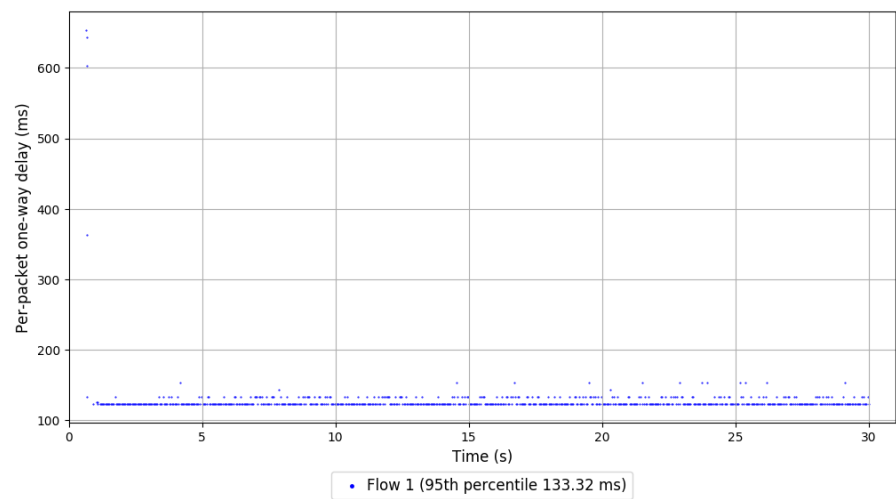
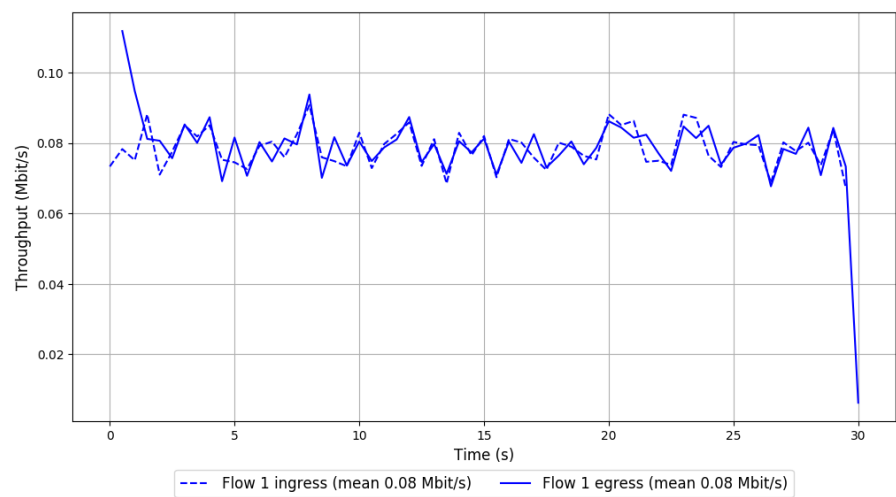
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 133.316 ms

Loss rate: 0.13%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of WebRTC media

Start at: 2018-03-26 20:53:23

End at: 2018-03-26 20:53:53

Local clock offset: -9.863 ms

Remote clock offset: 2.628 ms

Below is generated by plot.py at 2018-03-26 21:54:10

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 270.301 ms

Loss rate: 0.00%

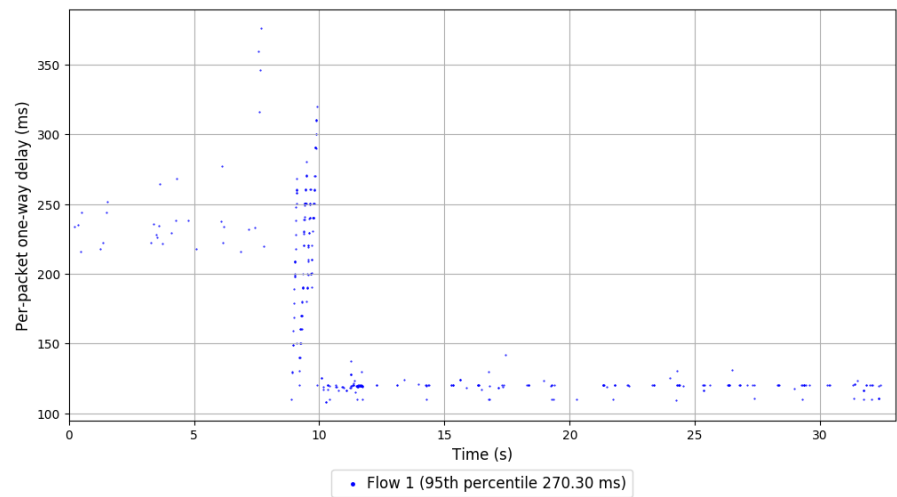
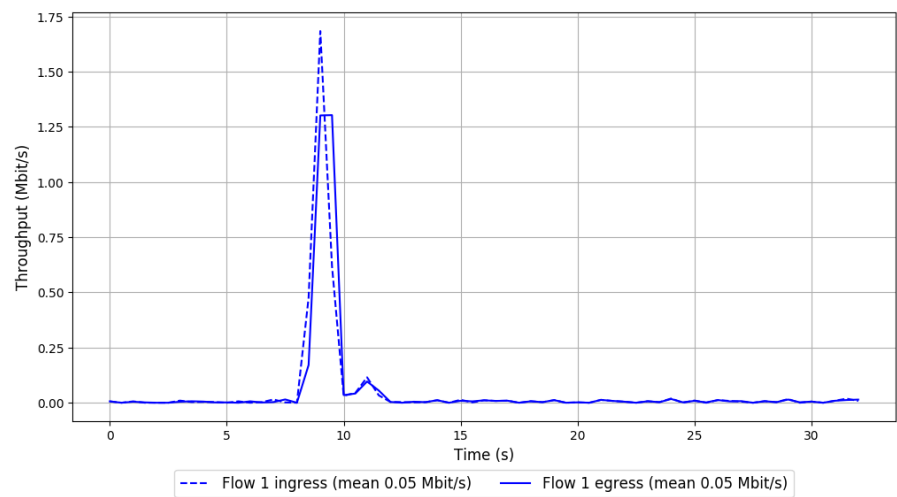
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 270.301 ms

Loss rate: 0.00%

Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2018-03-26 21:14:39

End at: 2018-03-26 21:15:09

Local clock offset: -5.448 ms

Remote clock offset: 2.331 ms

Below is generated by plot.py at 2018-03-26 21:54:11

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 257.209 ms

Loss rate: 0.00%

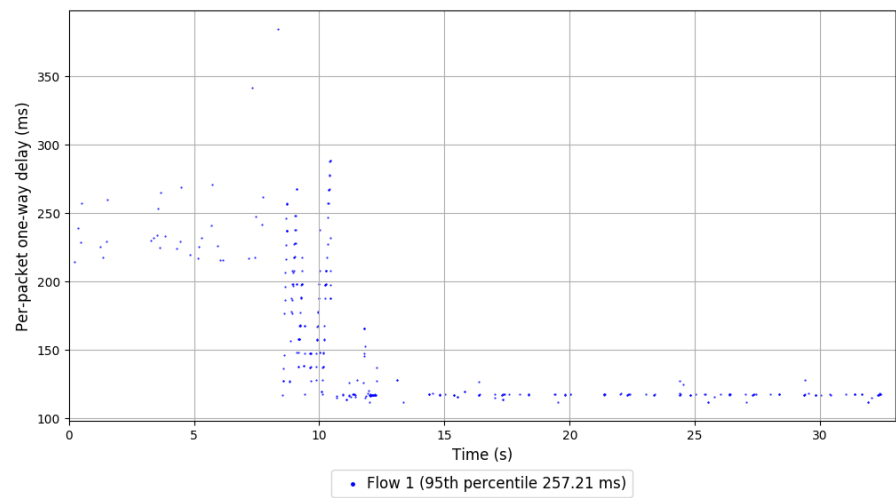
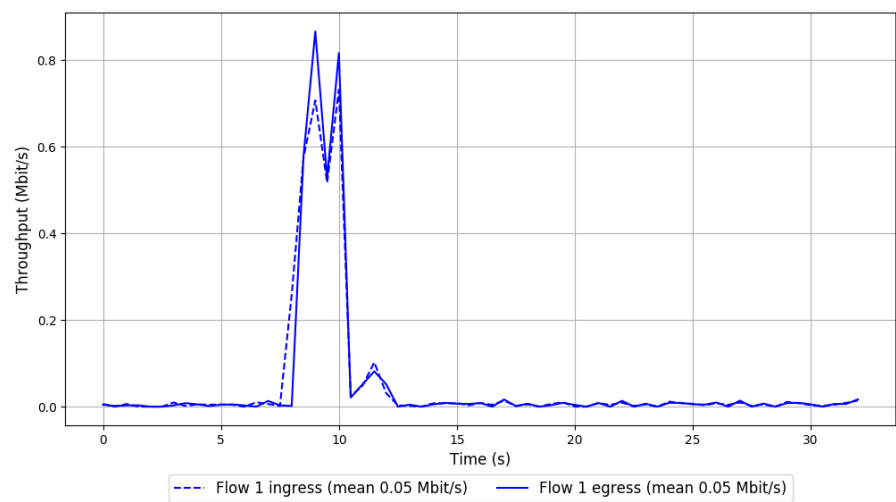
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 257.209 ms

Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-03-26 21:35:56

End at: 2018-03-26 21:36:26

Local clock offset: -6.02 ms

Remote clock offset: 7.768 ms

Below is generated by plot.py at 2018-03-26 21:54:11

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.06 Mbit/s

95th percentile per-packet one-way delay: 233.479 ms

Loss rate: 0.00%

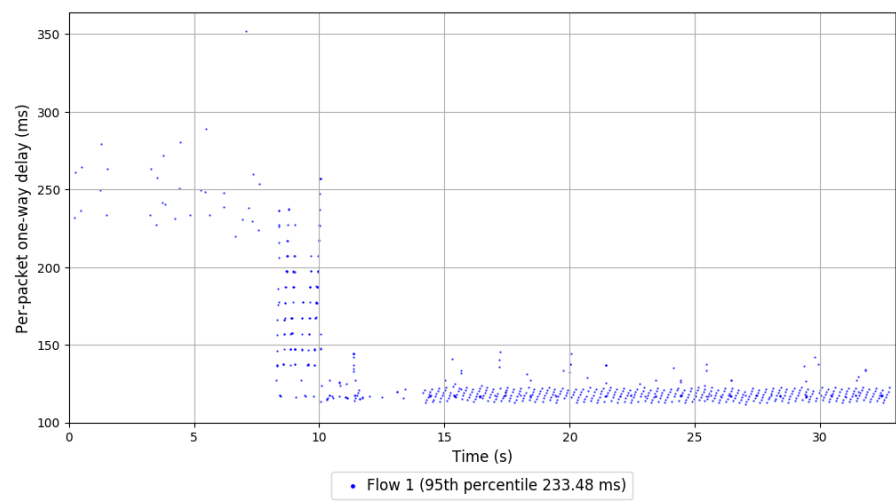
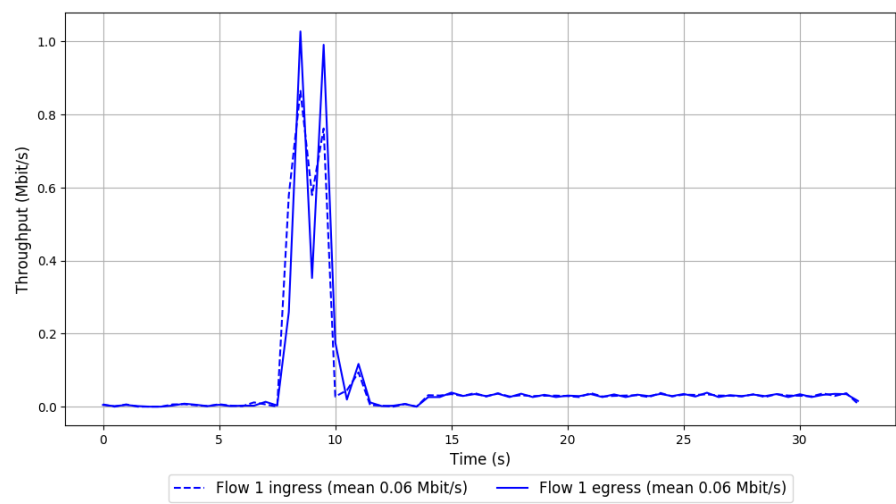
-- Flow 1:

Average throughput: 0.06 Mbit/s

95th percentile per-packet one-way delay: 233.479 ms

Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

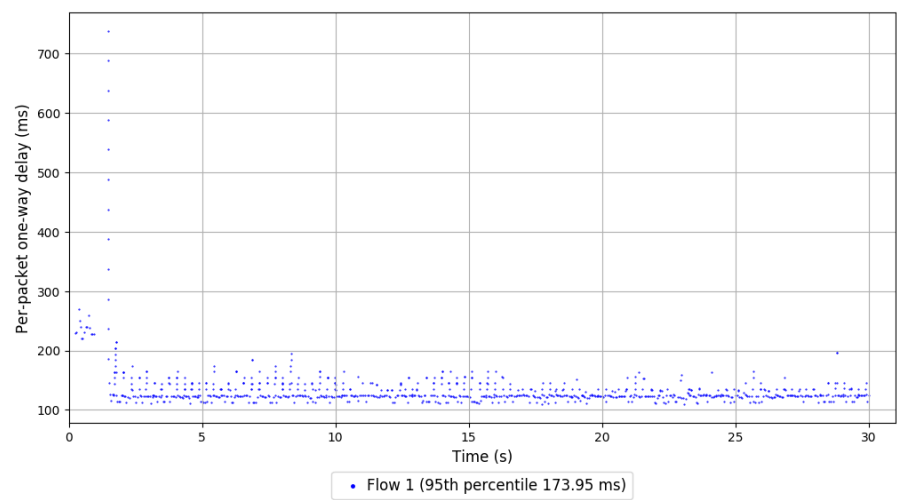
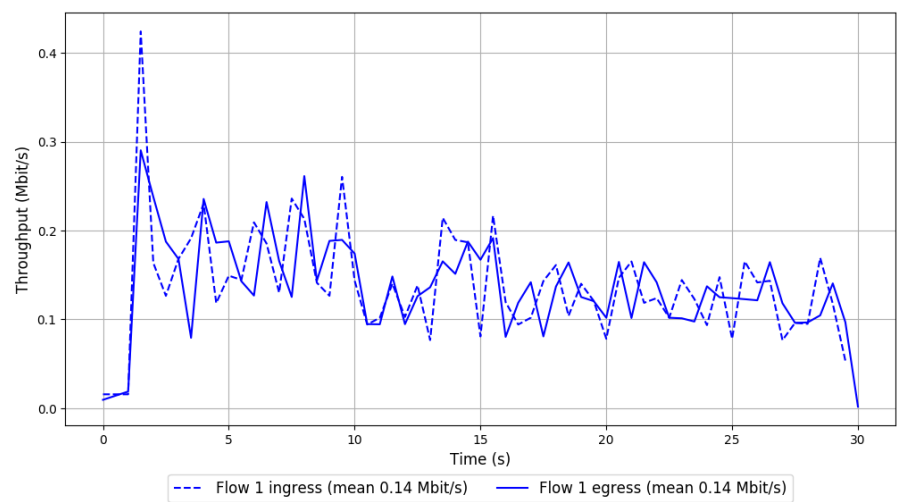


Run 1: Statistics of Sprout

Start at: 2018-03-26 20:49:50
End at: 2018-03-26 20:50:20
Local clock offset: -12.713 ms
Remote clock offset: 6.674 ms

Below is generated by plot.py at 2018-03-26 21:54:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 173.947 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 173.947 ms
Loss rate: 0.00%

Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

Start at: 2018-03-26 21:11:07

End at: 2018-03-26 21:11:37

Local clock offset: -5.517 ms

Remote clock offset: 6.804 ms

Below is generated by plot.py at 2018-03-26 21:54:11

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 174.276 ms

Loss rate: 0.27%

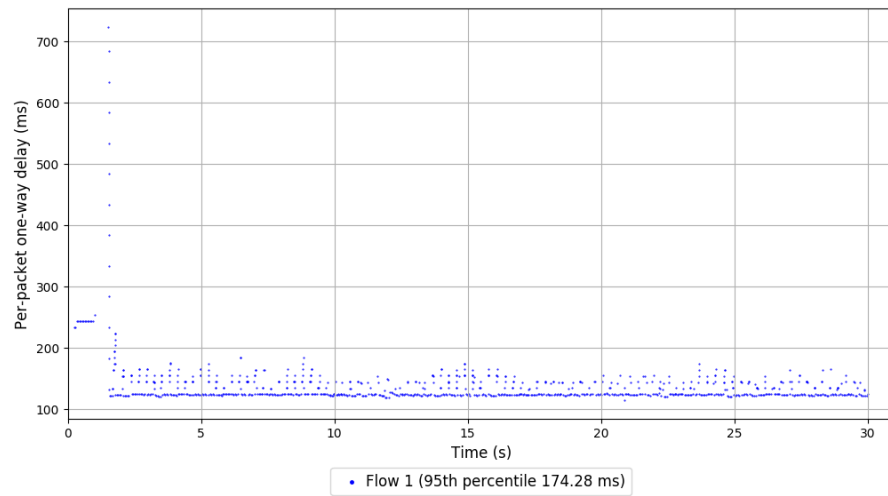
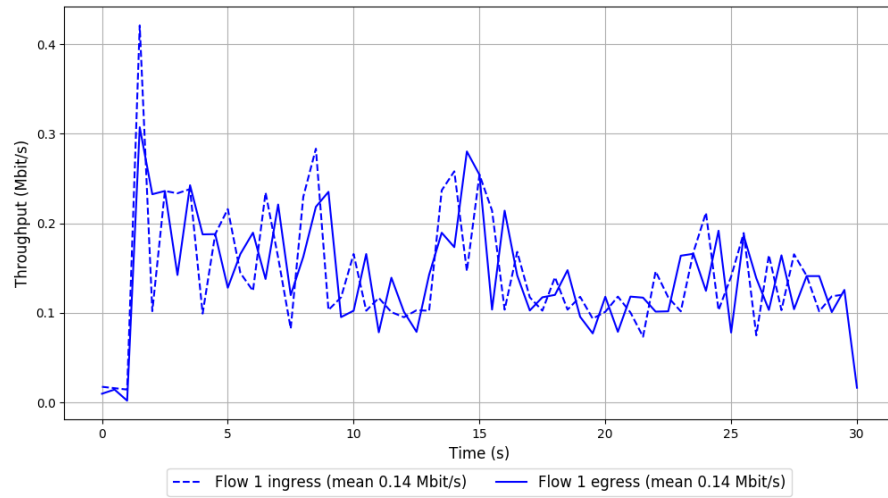
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 174.276 ms

Loss rate: 0.27%

Run 2: Report of Sprout — Data Link



Run 3: Statistics of Sprout

Start at: 2018-03-26 21:32:23

End at: 2018-03-26 21:32:53

Local clock offset: -5.815 ms

Remote clock offset: 2.935 ms

Below is generated by plot.py at 2018-03-26 21:54:12

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 174.565 ms

Loss rate: 0.28%

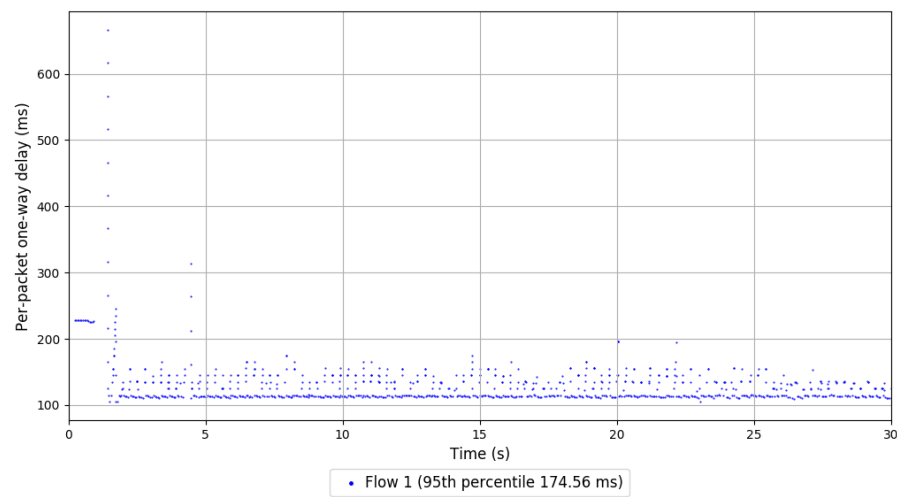
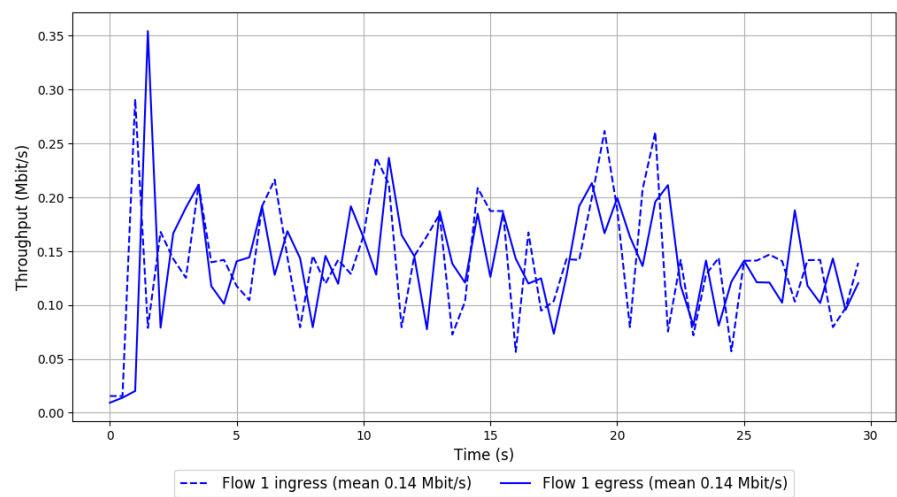
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 174.565 ms

Loss rate: 0.28%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-03-26 20:56:56

End at: 2018-03-26 20:57:26

Local clock offset: -8.078 ms

Remote clock offset: 6.641 ms

Below is generated by plot.py at 2018-03-26 21:54:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.10 Mbit/s

95th percentile per-packet one-way delay: 704.161 ms

Loss rate: 0.47%

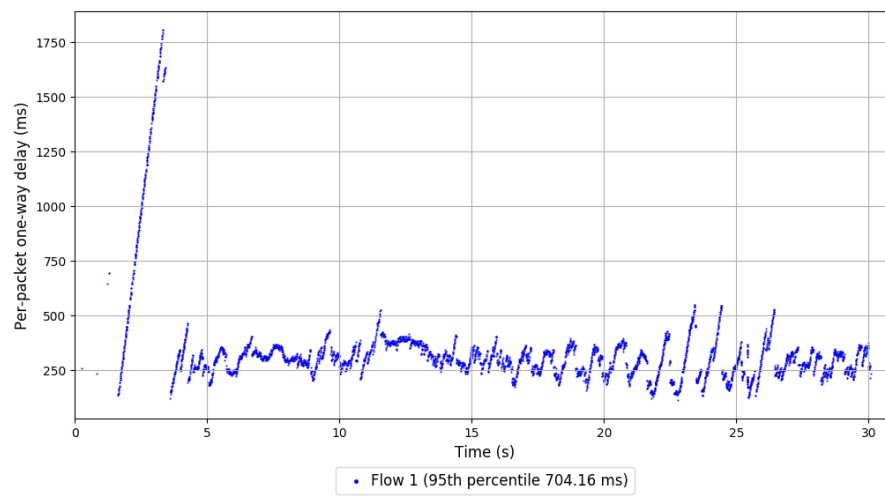
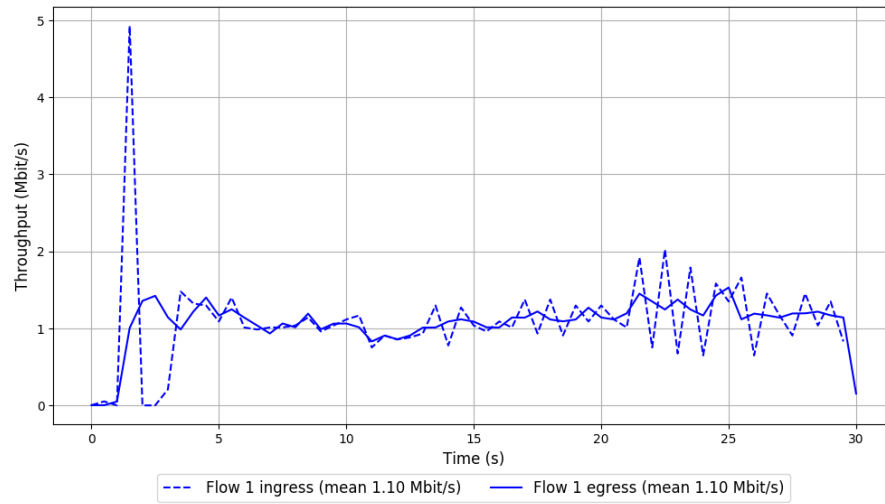
-- Flow 1:

Average throughput: 1.10 Mbit/s

95th percentile per-packet one-way delay: 704.161 ms

Loss rate: 0.47%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-03-26 21:18:11

End at: 2018-03-26 21:18:41

Local clock offset: -5.531 ms

Remote clock offset: 7.262 ms

Below is generated by plot.py at 2018-03-26 21:54:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.07 Mbit/s

95th percentile per-packet one-way delay: 595.619 ms

Loss rate: 1.36%

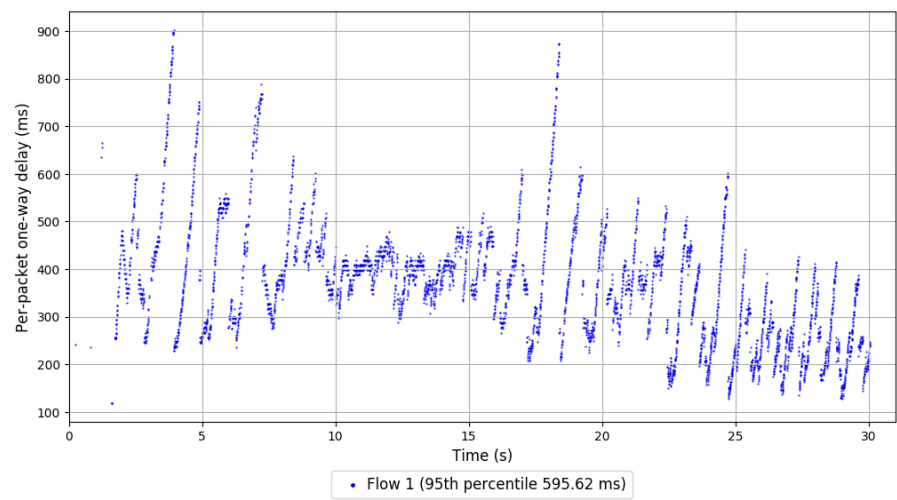
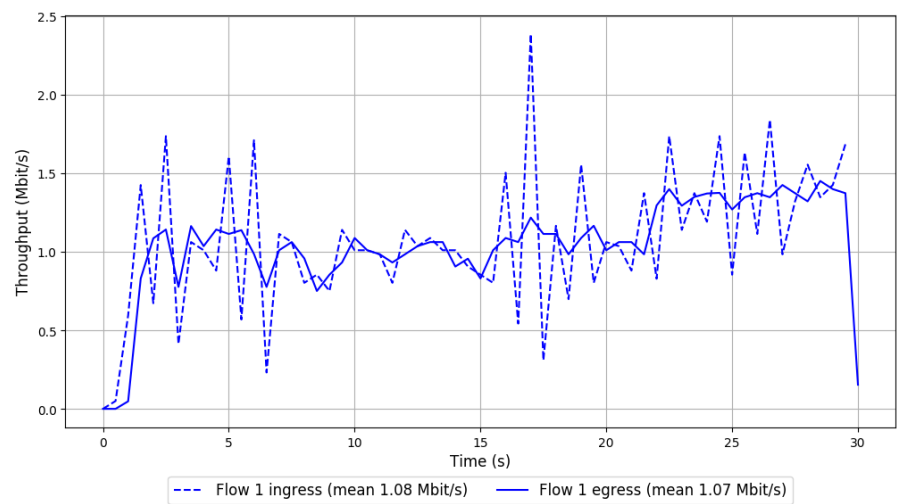
-- Flow 1:

Average throughput: 1.07 Mbit/s

95th percentile per-packet one-way delay: 595.619 ms

Loss rate: 1.36%

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



Run 3: Statistics of TaoVA-100x

Start at: 2018-03-26 21:39:28

End at: 2018-03-26 21:39:58

Local clock offset: -6.104 ms

Remote clock offset: 7.858 ms

Below is generated by plot.py at 2018-03-26 21:54:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.39 Mbit/s

95th percentile per-packet one-way delay: 390.547 ms

Loss rate: 0.71%

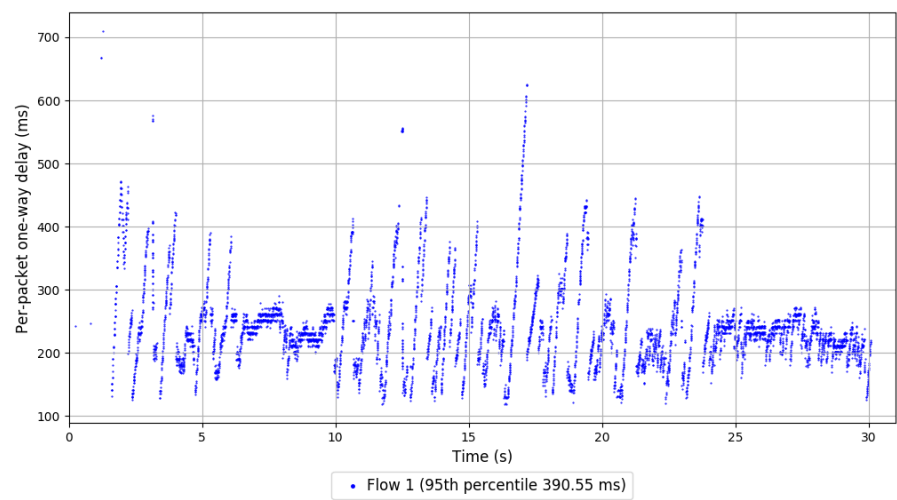
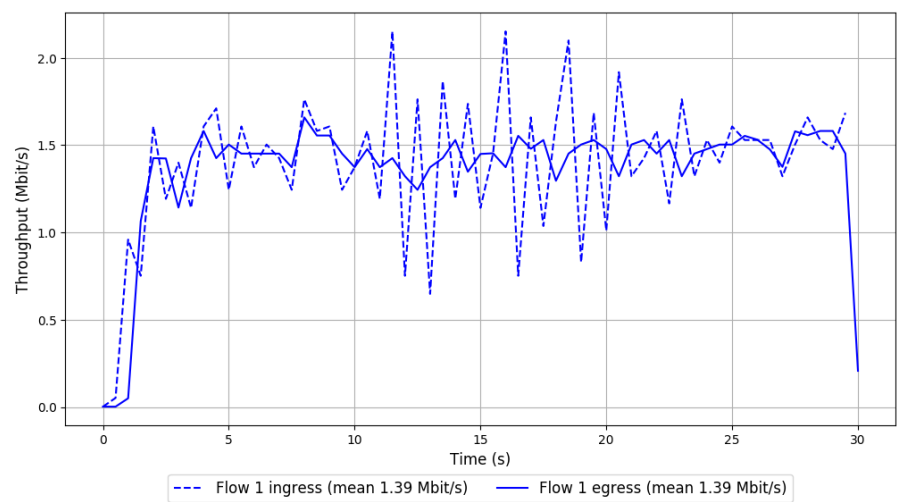
-- Flow 1:

Average throughput: 1.39 Mbit/s

95th percentile per-packet one-way delay: 390.547 ms

Loss rate: 0.71%

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



Run 1: Statistics of TCP Vegas

Start at: 2018-03-26 21:04:01

End at: 2018-03-26 21:04:31

Local clock offset: -6.102 ms

Remote clock offset: 0.185 ms

Below is generated by plot.py at 2018-03-26 21:54:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.27 Mbit/s

95th percentile per-packet one-way delay: 1124.810 ms

Loss rate: 2.22%

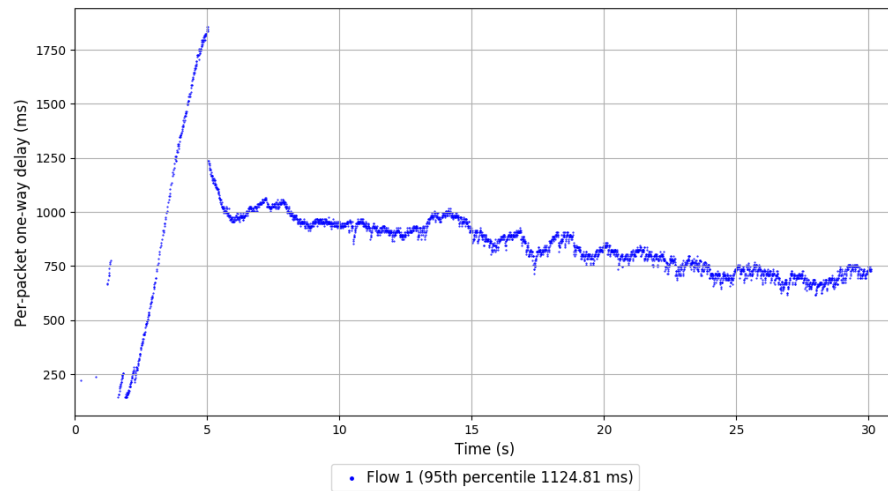
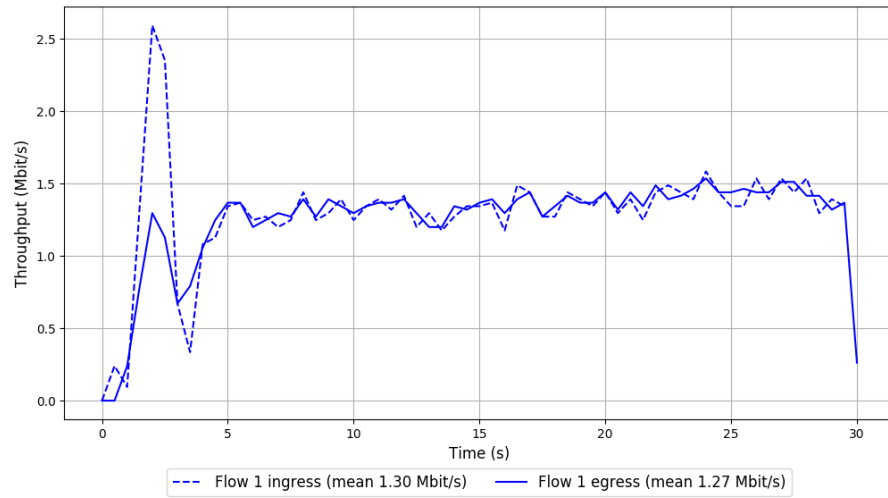
-- Flow 1:

Average throughput: 1.27 Mbit/s

95th percentile per-packet one-way delay: 1124.810 ms

Loss rate: 2.22%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2018-03-26 21:25:17

End at: 2018-03-26 21:25:47

Local clock offset: -5.617 ms

Remote clock offset: 2.782 ms

Below is generated by plot.py at 2018-03-26 21:54:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.37 Mbit/s

95th percentile per-packet one-way delay: 510.968 ms

Loss rate: 0.23%

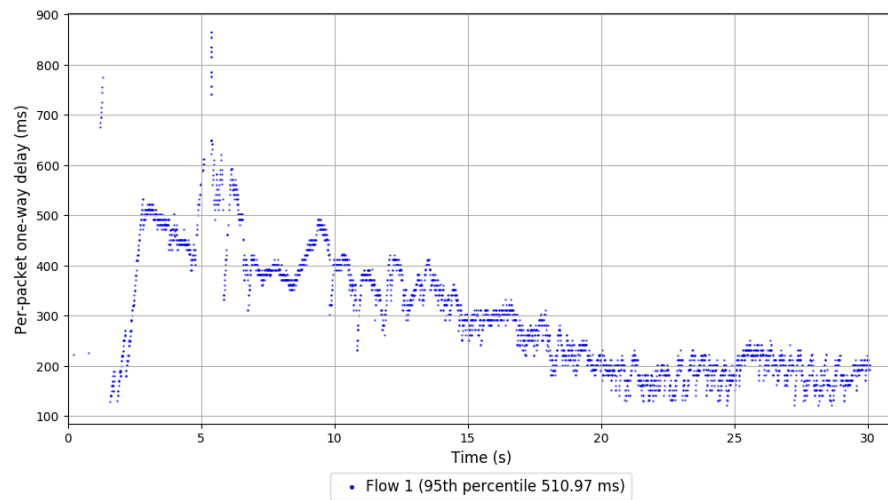
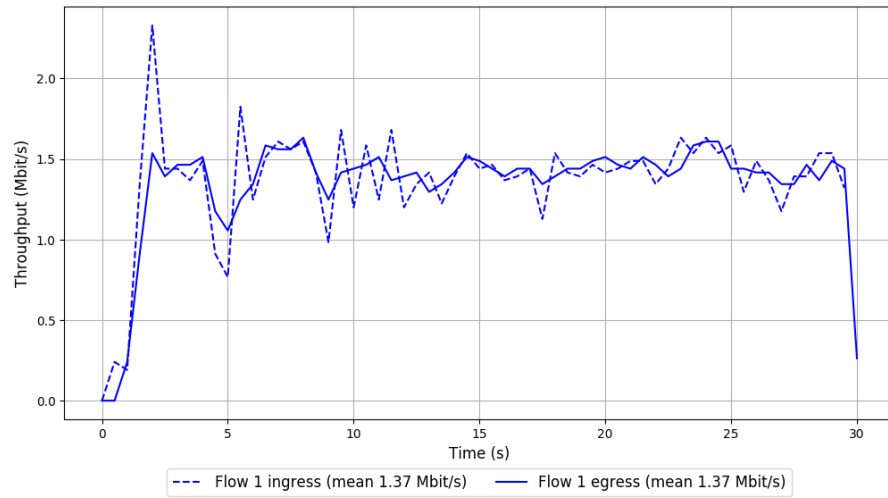
-- Flow 1:

Average throughput: 1.37 Mbit/s

95th percentile per-packet one-way delay: 510.968 ms

Loss rate: 0.23%

Run 2: Report of TCP Vegas — Data Link



Run 3: Statistics of TCP Vegas

Start at: 2018-03-26 21:46:33

End at: 2018-03-26 21:47:03

Local clock offset: -6.4 ms

Remote clock offset: 7.583 ms

Below is generated by plot.py at 2018-03-26 21:54:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.29 Mbit/s

95th percentile per-packet one-way delay: 546.426 ms

Loss rate: 0.25%

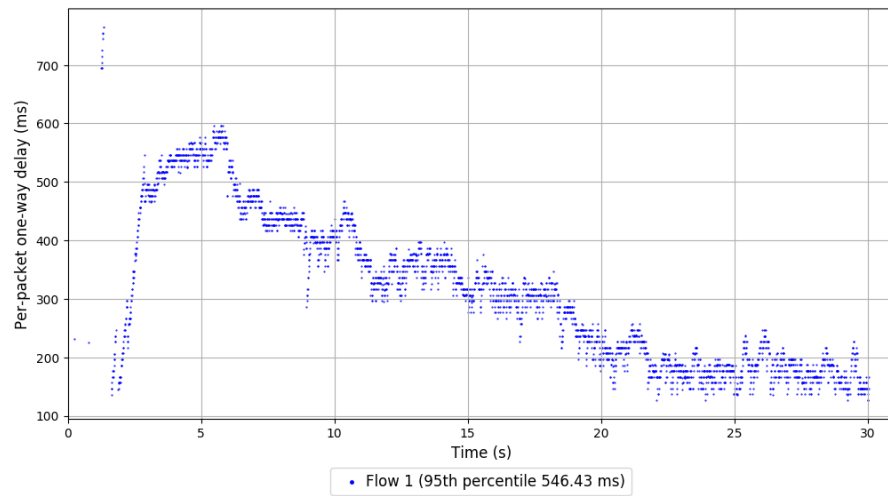
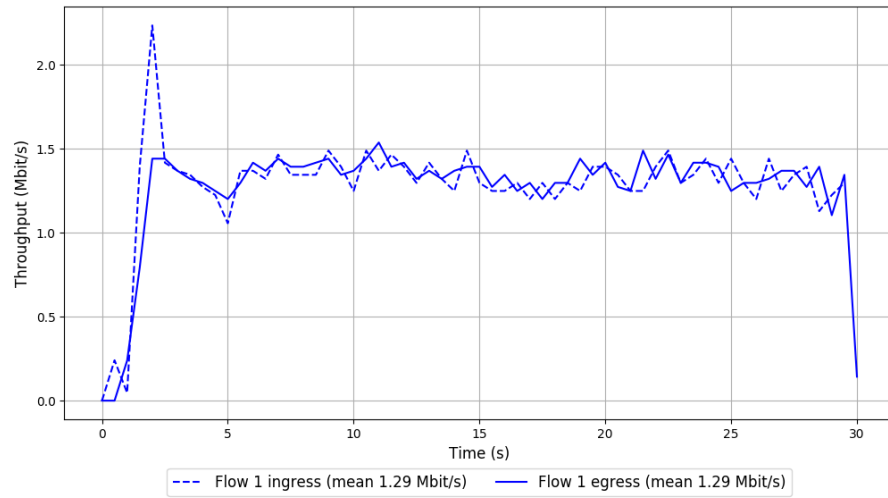
-- Flow 1:

Average throughput: 1.29 Mbit/s

95th percentile per-packet one-way delay: 546.426 ms

Loss rate: 0.25%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-03-26 21:09:55

End at: 2018-03-26 21:10:26

Local clock offset: -5.567 ms

Remote clock offset: 6.619 ms

Below is generated by plot.py at 2018-03-26 21:54:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.29 Mbit/s

95th percentile per-packet one-way delay: 2163.558 ms

Loss rate: 5.75%

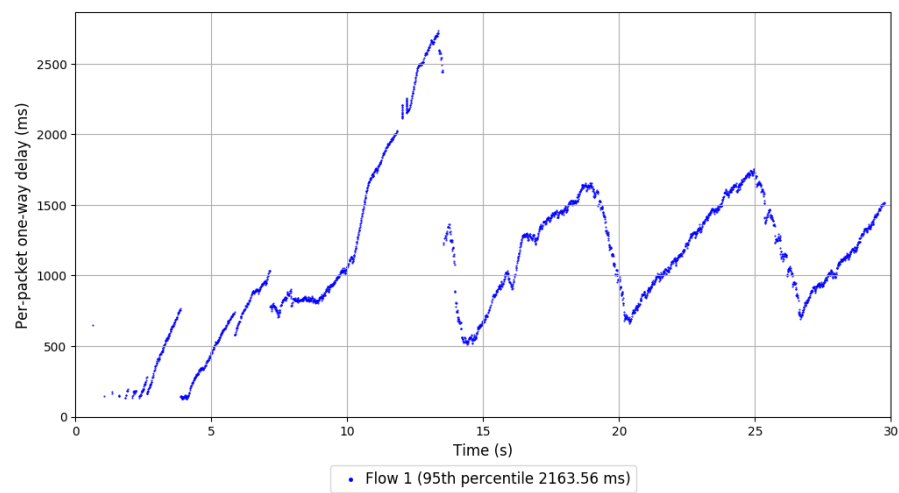
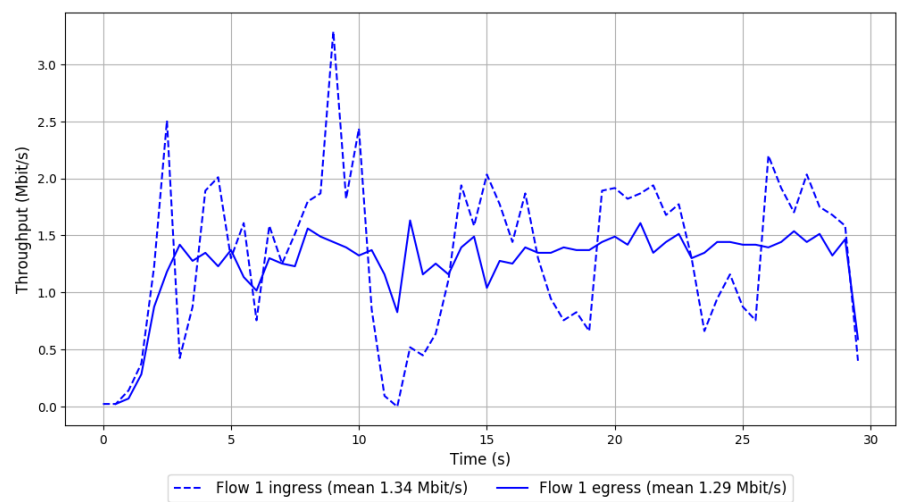
-- Flow 1:

Average throughput: 1.29 Mbit/s

95th percentile per-packet one-way delay: 2163.558 ms

Loss rate: 5.75%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2018-03-26 21:31:12

End at: 2018-03-26 21:31:42

Local clock offset: -5.783 ms

Remote clock offset: 2.965 ms

Below is generated by plot.py at 2018-03-26 21:54:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.32 Mbit/s

95th percentile per-packet one-way delay: 1783.891 ms

Loss rate: 3.05%

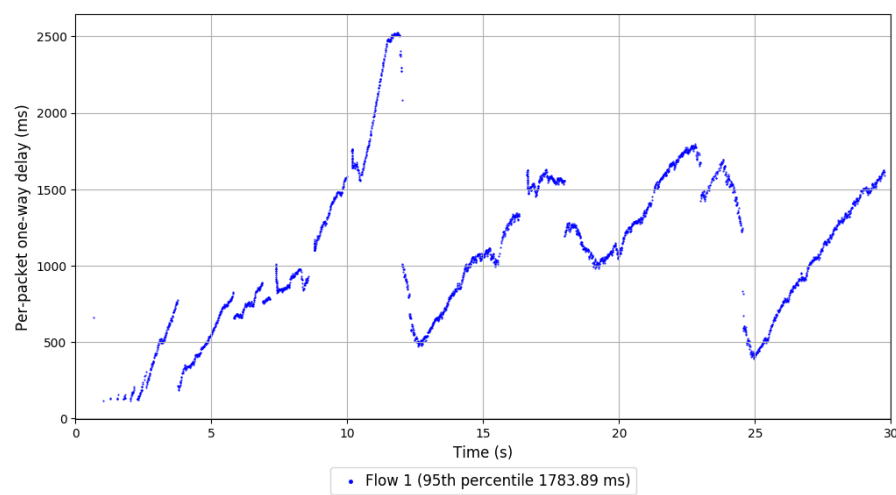
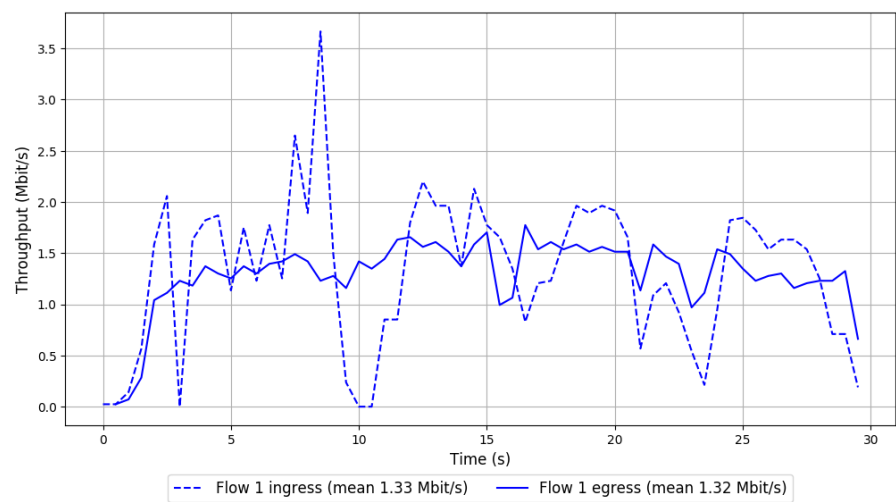
-- Flow 1:

Average throughput: 1.32 Mbit/s

95th percentile per-packet one-way delay: 1783.891 ms

Loss rate: 3.05%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2018-03-26 21:52:28

End at: 2018-03-26 21:52:58

Local clock offset: -6.644 ms

Remote clock offset: 2.493 ms

Below is generated by plot.py at 2018-03-26 21:54:19

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.16 Mbit/s

95th percentile per-packet one-way delay: 2078.793 ms

Loss rate: 2.81%

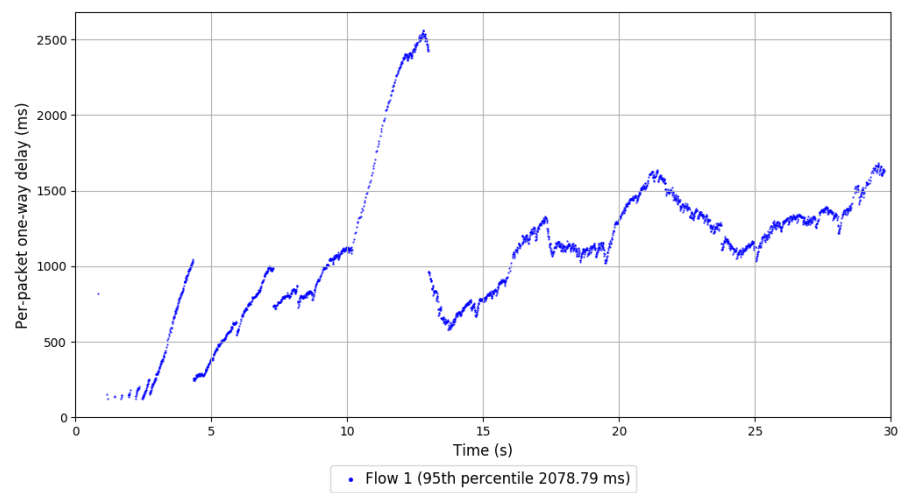
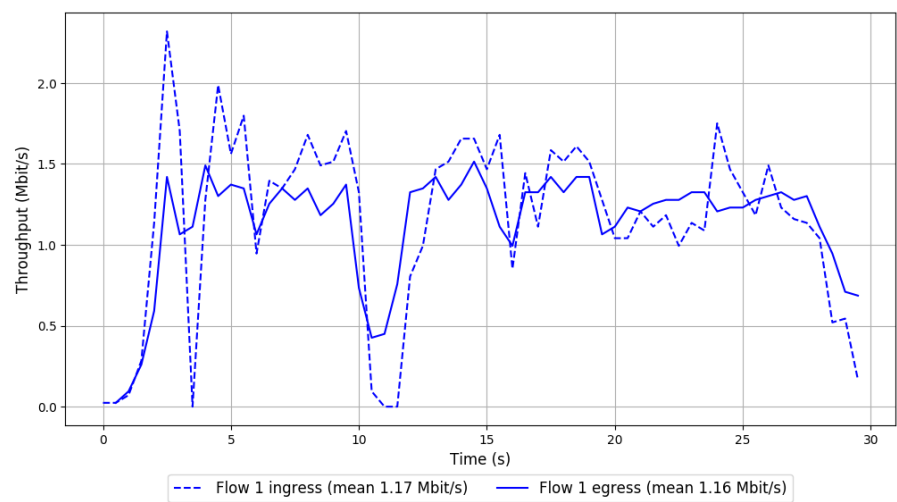
-- Flow 1:

Average throughput: 1.16 Mbit/s

95th percentile per-packet one-way delay: 2078.793 ms

Loss rate: 2.81%

Run 3: Report of Verus — Data Link



Run 1: Statistics of Copa

Start at: 2018-03-26 21:02:50

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

Local clock offset: -6.264 ms

Remote clock offset: 6.52 ms

Below is generated by plot.py at 2018-03-26 21:54:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.01 Mbit/s

95th percentile per-packet one-way delay: 453.571 ms

Loss rate: 0.13%

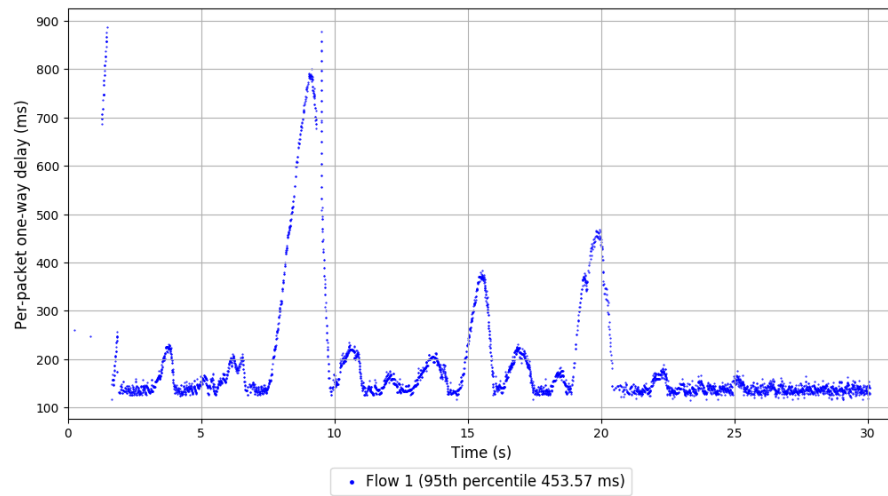
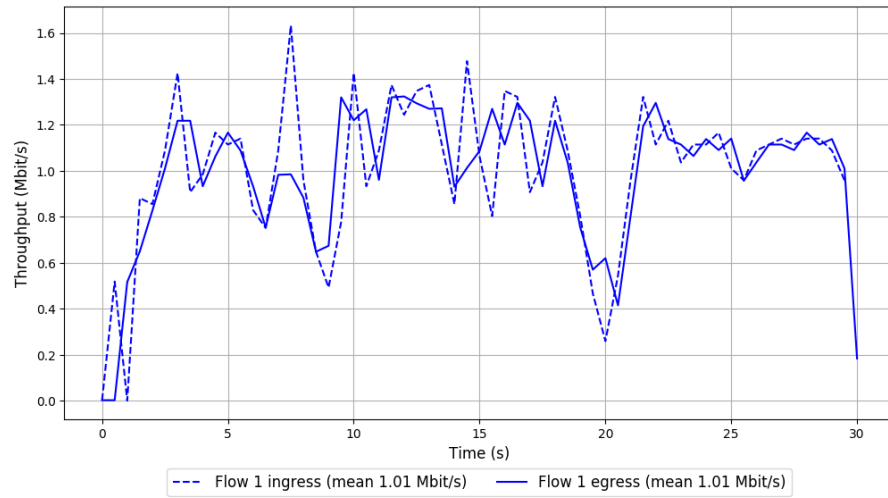
-- Flow 1:

Average throughput: 1.01 Mbit/s

95th percentile per-packet one-way delay: 453.571 ms

Loss rate: 0.13%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2018-03-26 21:24:06

End at: 2018-03-26 21:24:36

Local clock offset: -5.558 ms

Remote clock offset: 7.543 ms

Below is generated by plot.py at 2018-03-26 21:54:22

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.19 Mbit/s

95th percentile per-packet one-way delay: 163.903 ms

Loss rate: 0.11%

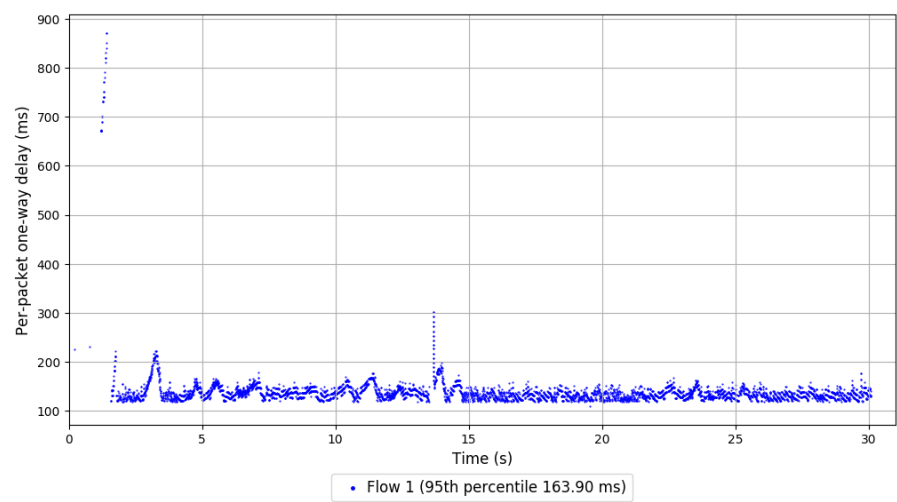
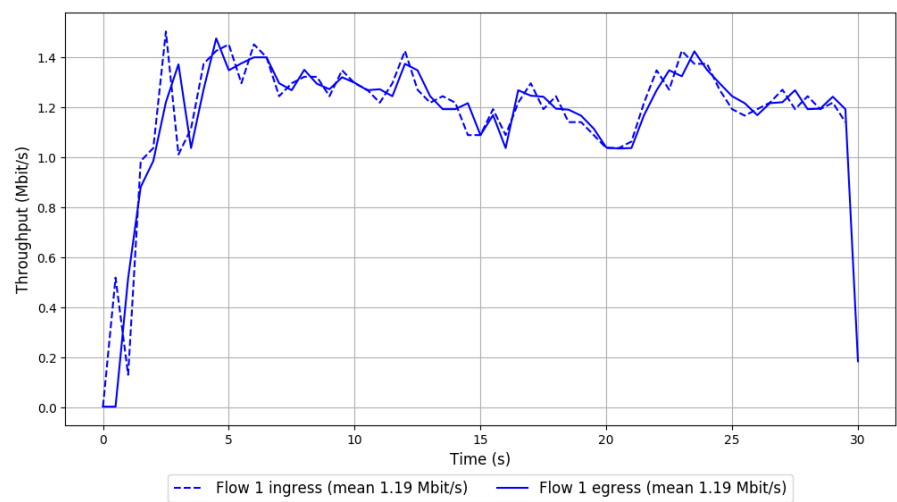
-- Flow 1:

Average throughput: 1.19 Mbit/s

95th percentile per-packet one-way delay: 163.903 ms

Loss rate: 0.11%

Run 2: Report of Copa — Data Link

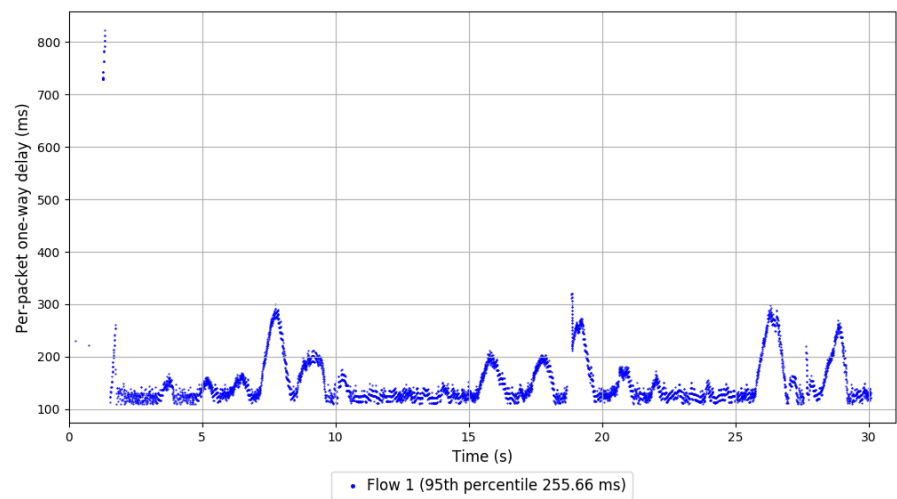
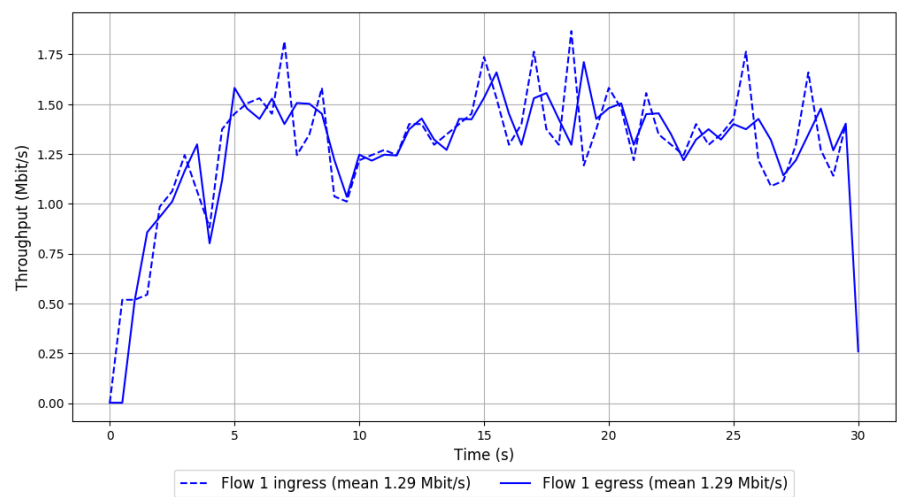


Run 3: Statistics of Copa

Start at: 2018-03-26 21:45:22
End at: 2018-03-26 21:45:52
Local clock offset: -6.433 ms
Remote clock offset: 2.922 ms

Below is generated by plot.py at 2018-03-26 21:54:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 255.660 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 255.660 ms
Loss rate: 0.13%

Run 3: Report of Copa — Data Link



Run 1: Statistics of FillP

Start at: 2018-03-26 21:07:33

End at: 2018-03-26 21:08:03

Local clock offset: -5.784 ms

Remote clock offset: 6.504 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.27 Mbit/s

95th percentile per-packet one-way delay: 6266.211 ms

Loss rate: 96.50%

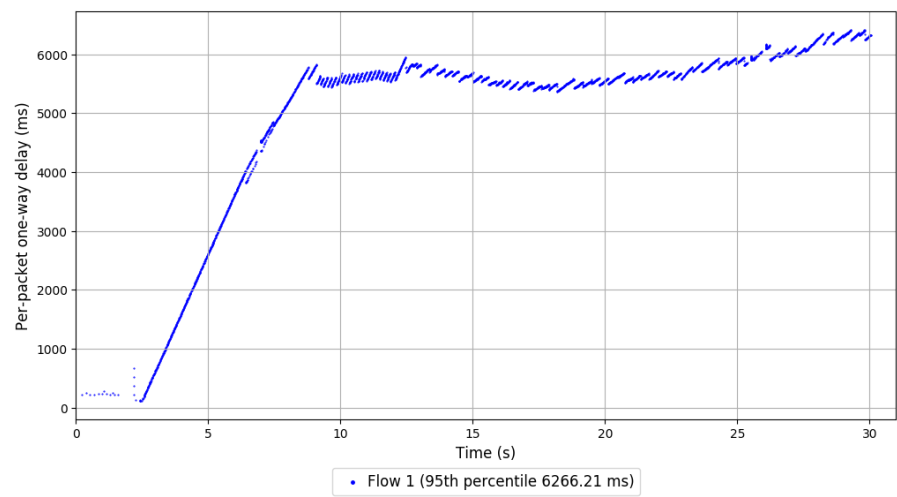
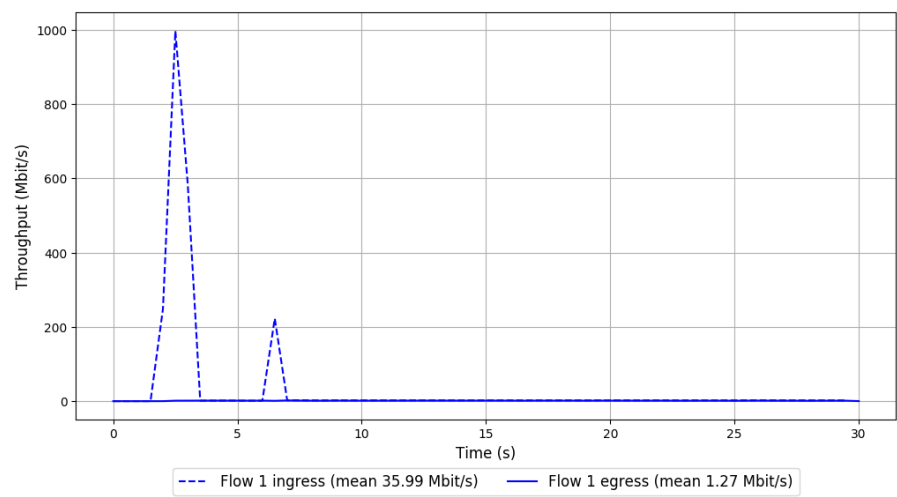
-- Flow 1:

Average throughput: 1.27 Mbit/s

95th percentile per-packet one-way delay: 6266.211 ms

Loss rate: 96.50%

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2018-03-26 21:28:50

End at: 2018-03-26 21:29:20

Local clock offset: -5.695 ms

Remote clock offset: 2.869 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.26 Mbit/s

95th percentile per-packet one-way delay: 6596.585 ms

Loss rate: 96.32%

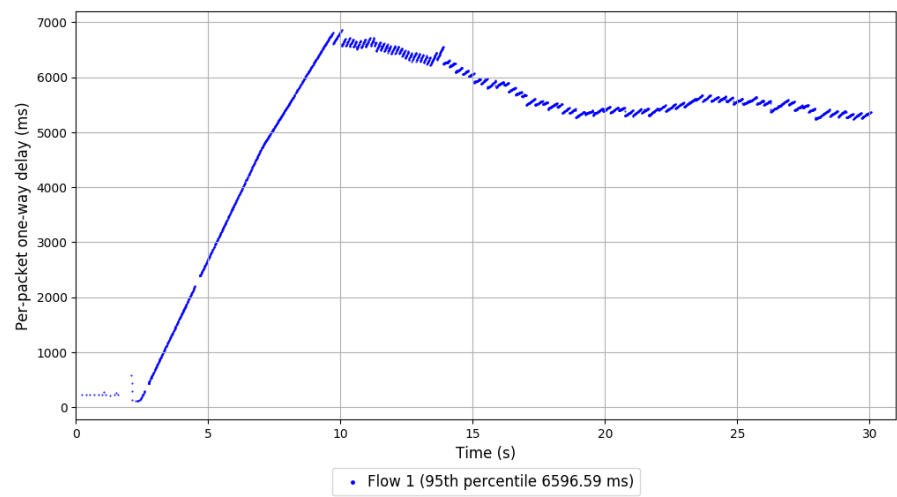
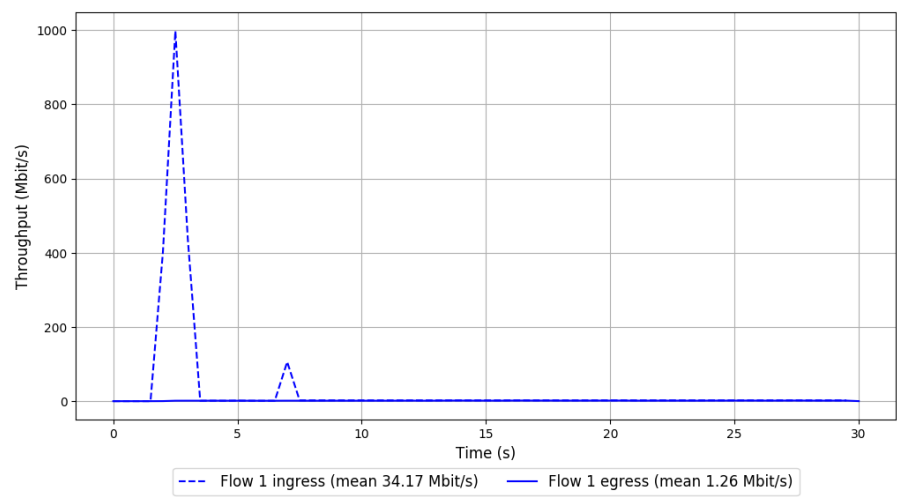
-- Flow 1:

Average throughput: 1.26 Mbit/s

95th percentile per-packet one-way delay: 6596.585 ms

Loss rate: 96.32%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-03-26 21:50:05

End at: 2018-03-26 21:50:35

Local clock offset: -6.61 ms

Remote clock offset: 7.463 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.30 Mbit/s

95th percentile per-packet one-way delay: 6184.188 ms

Loss rate: 96.43%

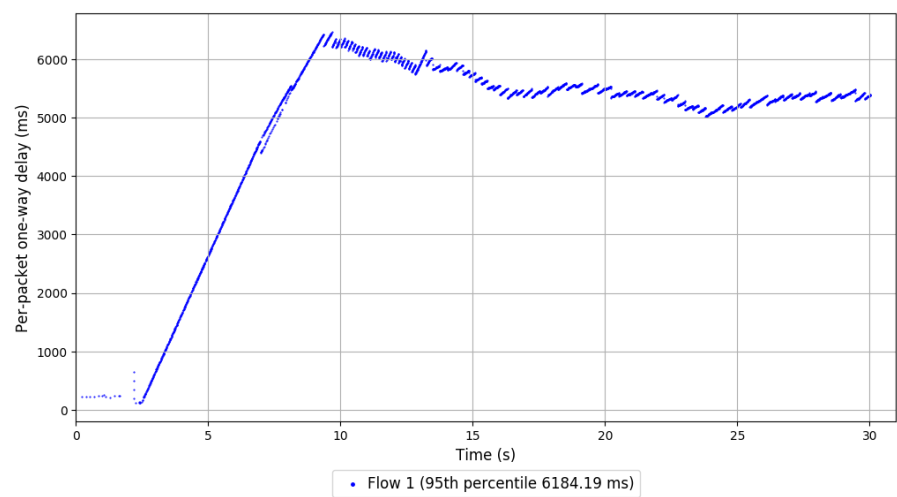
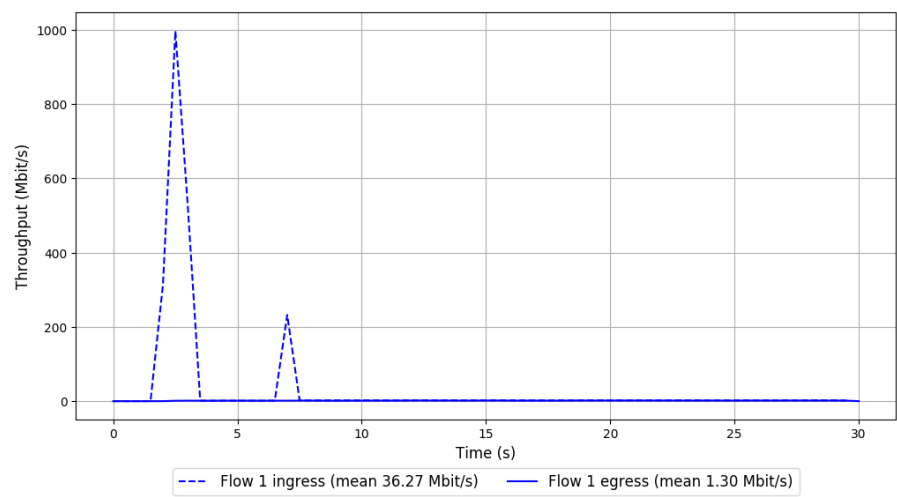
-- Flow 1:

Average throughput: 1.30 Mbit/s

95th percentile per-packet one-way delay: 6184.188 ms

Loss rate: 96.43%

Run 3: Report of FillP — Data Link



Run 1: Statistics of Indigo-1-32

Start at: 2018-03-26 21:01:39

End at: 2018-03-26 21:02:09

Local clock offset: -6.549 ms

Remote clock offset: 0.243 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 336.698 ms

Loss rate: 0.00%

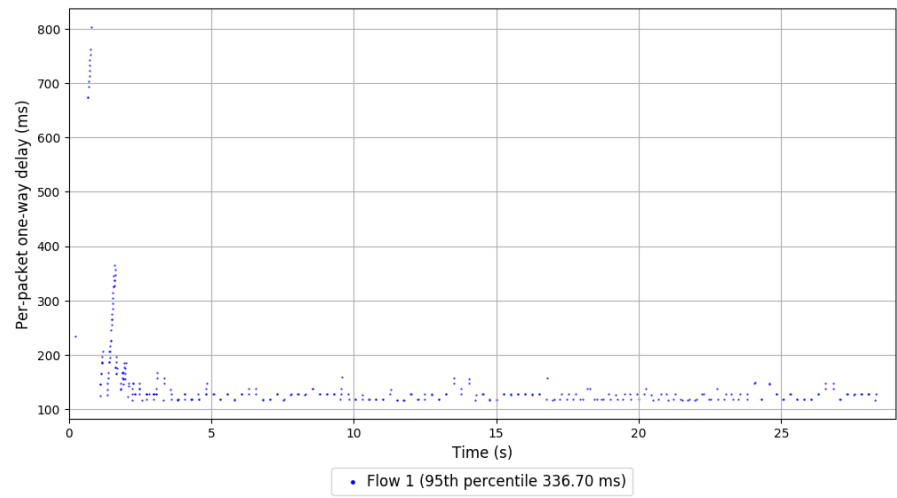
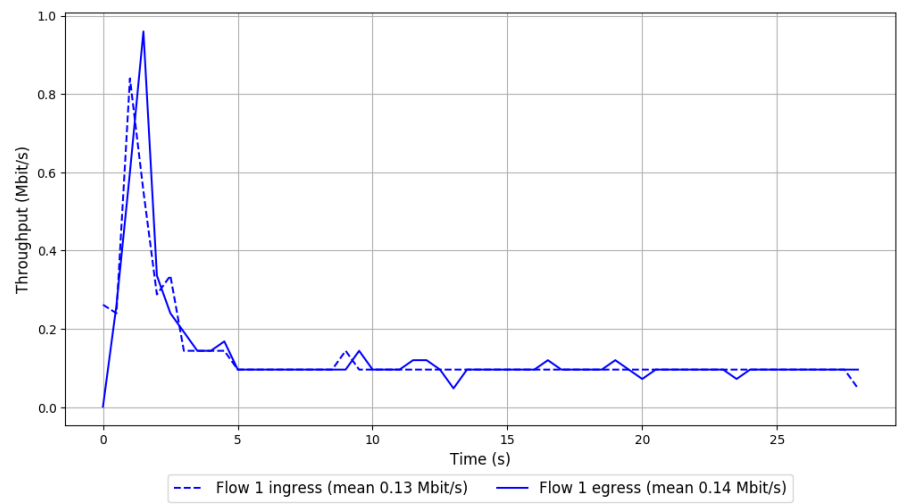
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 336.698 ms

Loss rate: 0.00%

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



Run 2: Statistics of Indigo-1-32

Start at: 2018-03-26 21:22:56

End at: 2018-03-26 21:23:26

Local clock offset: -5.557 ms

Remote clock offset: 7.459 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.92 Mbit/s

95th percentile per-packet one-way delay: 214.546 ms

Loss rate: 0.31%

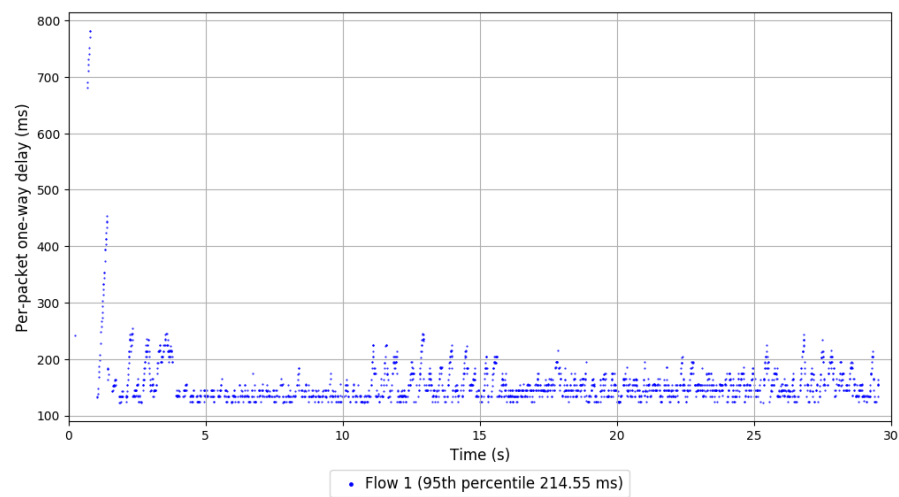
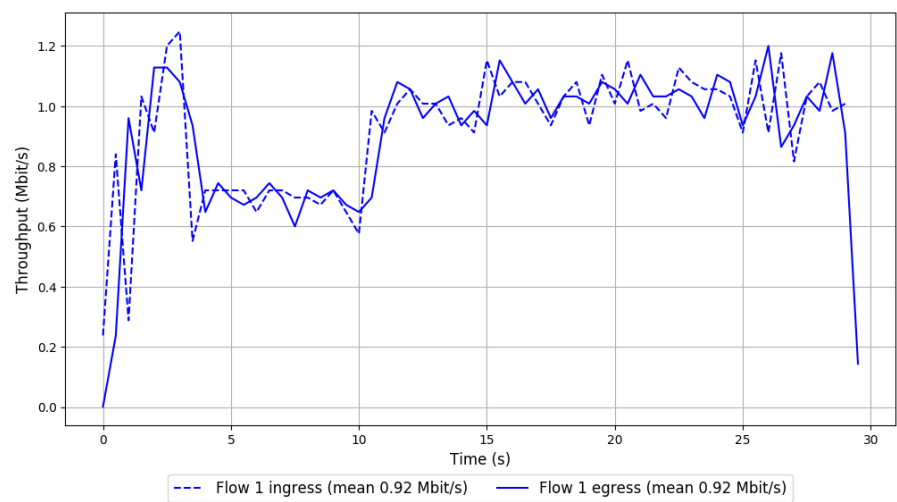
-- Flow 1:

Average throughput: 0.92 Mbit/s

95th percentile per-packet one-way delay: 214.546 ms

Loss rate: 0.31%

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



Run 3: Statistics of Indigo-1-32

Start at: 2018-03-26 21:44:11

End at: 2018-03-26 21:44:41

Local clock offset: -6.303 ms

Remote clock offset: 7.743 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.02 Mbit/s

95th percentile per-packet one-way delay: 211.153 ms

Loss rate: 0.00%

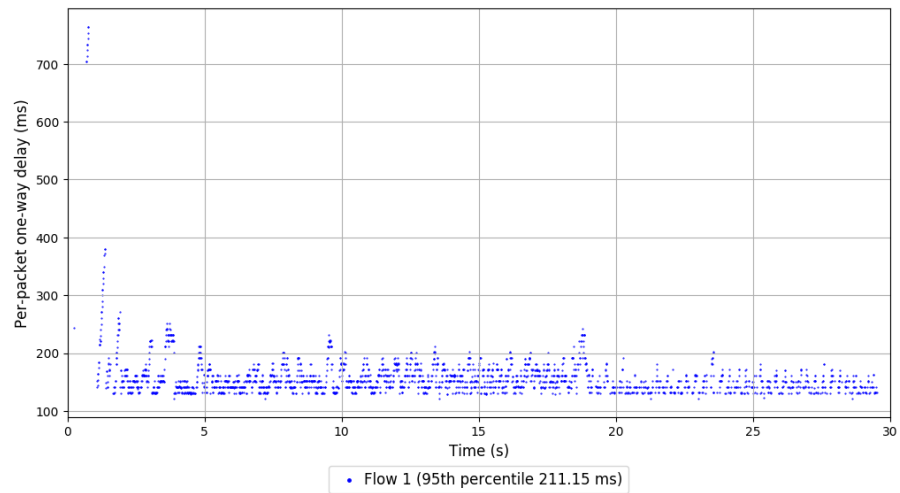
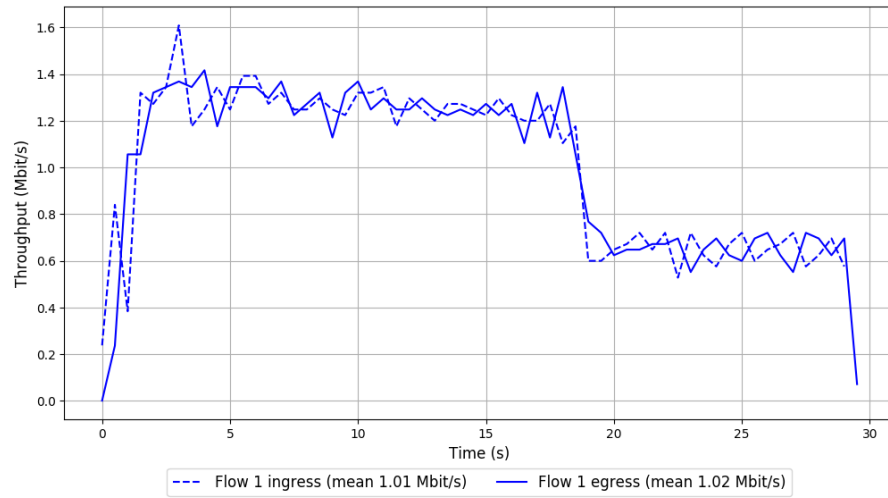
-- Flow 1:

Average throughput: 1.02 Mbit/s

95th percentile per-packet one-way delay: 211.153 ms

Loss rate: 0.00%

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



Run 1: Statistics of Vivace-latency

Start at: 2018-03-26 21:05:12

End at: 2018-03-26 21:05:42

Local clock offset: -6.035 ms

Remote clock offset: 0.128 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.18 Mbit/s

95th percentile per-packet one-way delay: 2662.298 ms

Loss rate: 8.30%

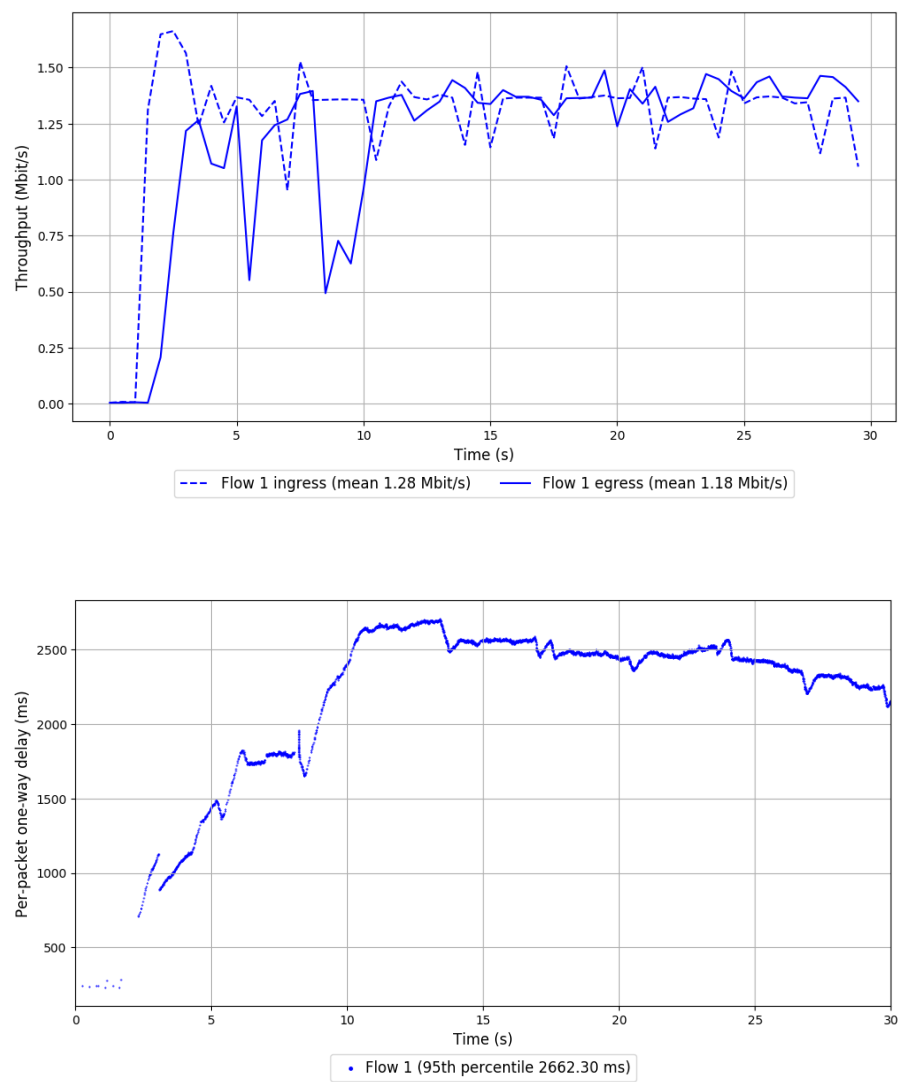
-- Flow 1:

Average throughput: 1.18 Mbit/s

95th percentile per-packet one-way delay: 2662.298 ms

Loss rate: 8.30%

Run 1: Report of Vivace-latency — Data Link



Run 2: Statistics of Vivace-latency

Start at: 2018-03-26 21:26:28

End at: 2018-03-26 21:26:58

Local clock offset: -5.624 ms

Remote clock offset: 7.551 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.22 Mbit/s

95th percentile per-packet one-way delay: 765.210 ms

Loss rate: 1.52%

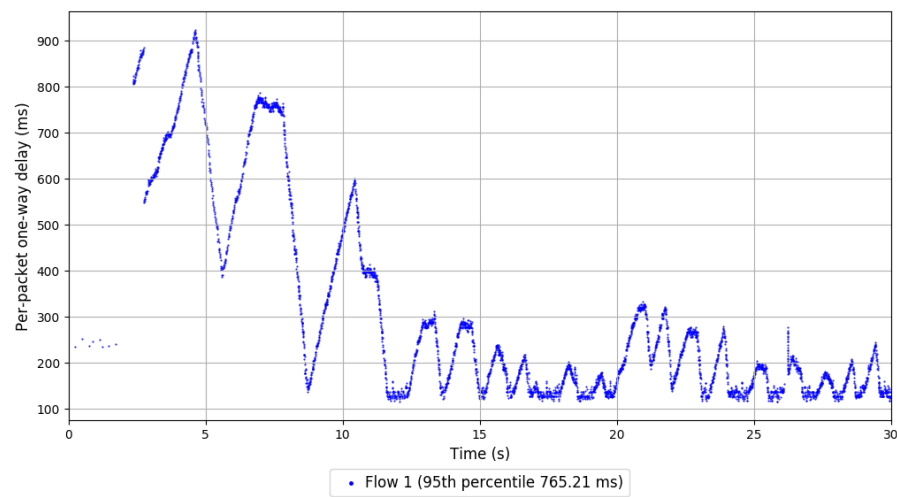
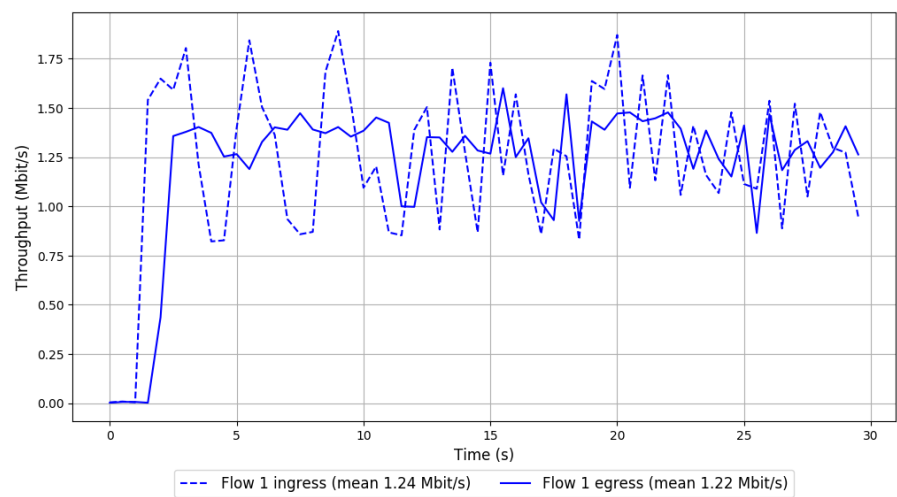
-- Flow 1:

Average throughput: 1.22 Mbit/s

95th percentile per-packet one-way delay: 765.210 ms

Loss rate: 1.52%

Run 2: Report of Vivace-latency — Data Link

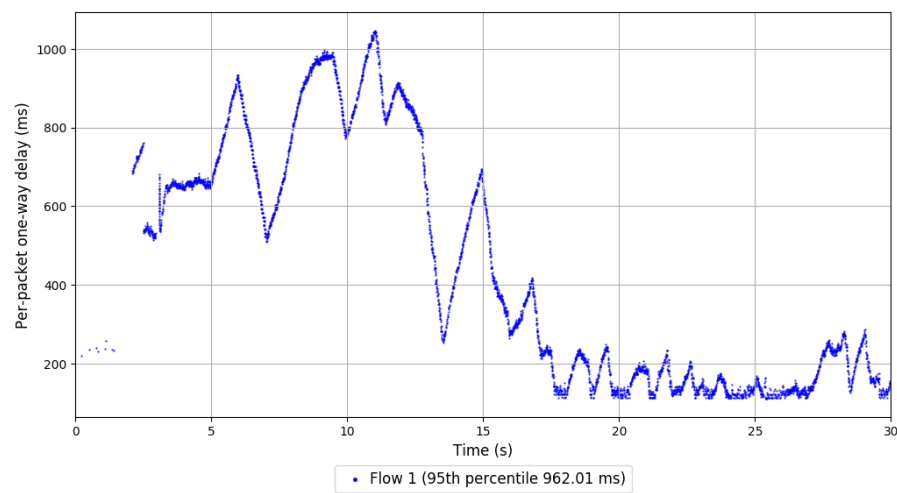
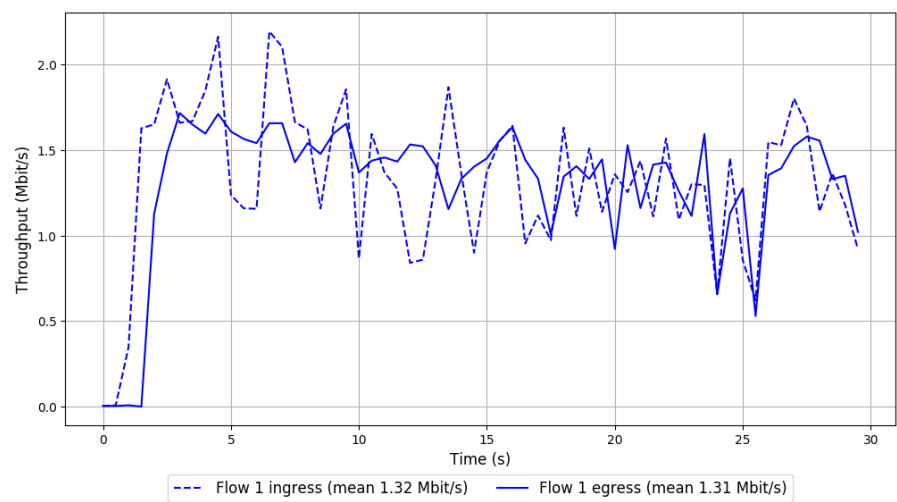


Run 3: Statistics of Vivace-latency

Start at: 2018-03-26 21:47:44
End at: 2018-03-26 21:48:14
Local clock offset: -6.446 ms
Remote clock offset: 2.872 ms

Below is generated by plot.py at 2018-03-26 21:54:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 962.008 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 962.008 ms
Loss rate: 1.18%

Run 3: Report of Vivace-latency — Data Link



Run 1: Statistics of Vivace-loss

Start at: 2018-03-26 20:54:33

End at: 2018-03-26 20:55:03

Local clock offset: -9.106 ms

Remote clock offset: 6.562 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.29 Mbit/s

95th percentile per-packet one-way delay: 5708.983 ms

Loss rate: 33.62%

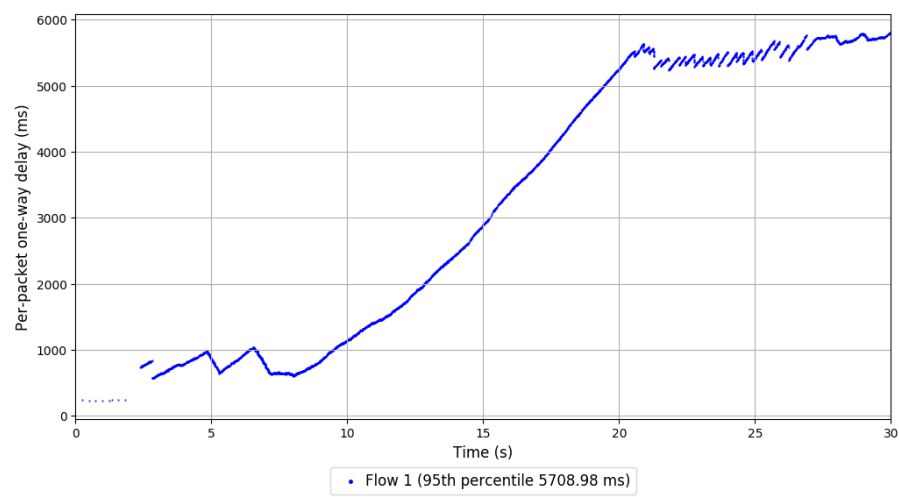
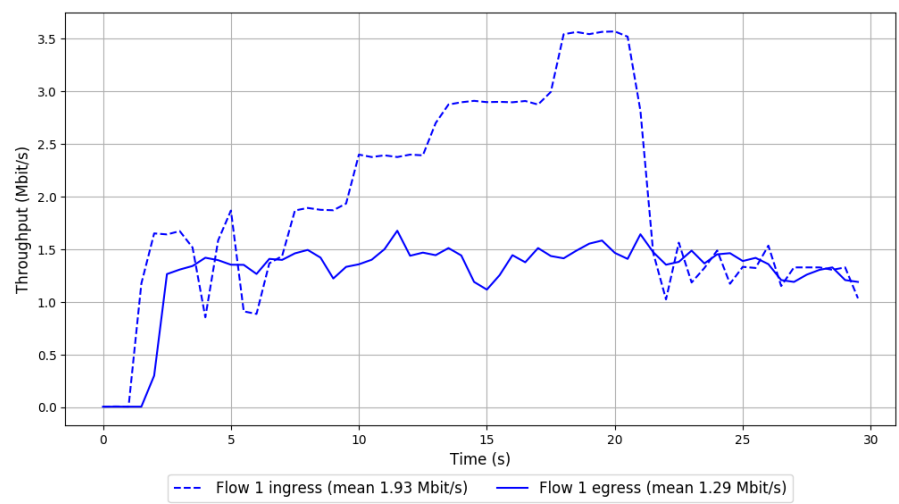
-- Flow 1:

Average throughput: 1.29 Mbit/s

95th percentile per-packet one-way delay: 5708.983 ms

Loss rate: 33.62%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-03-26 21:15:50

End at: 2018-03-26 21:16:20

Local clock offset: -5.527 ms

Remote clock offset: 7.139 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.22 Mbit/s

95th percentile per-packet one-way delay: 6235.174 ms

Loss rate: 37.97%

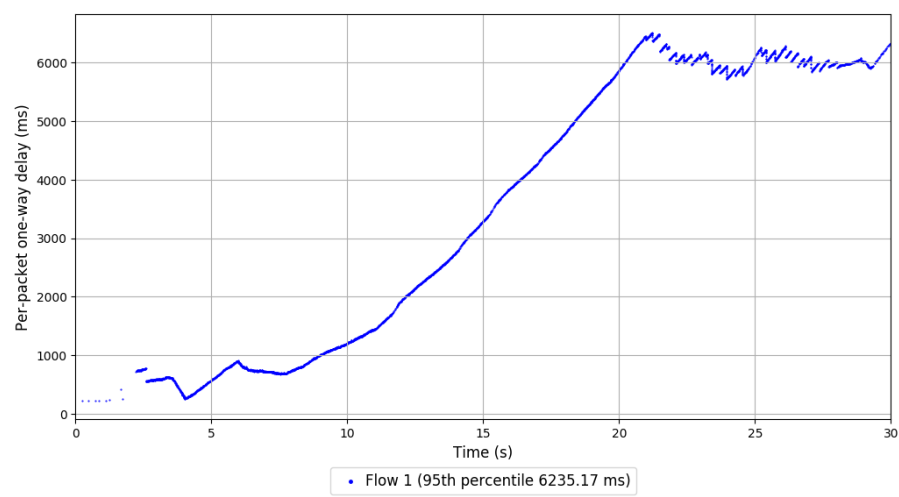
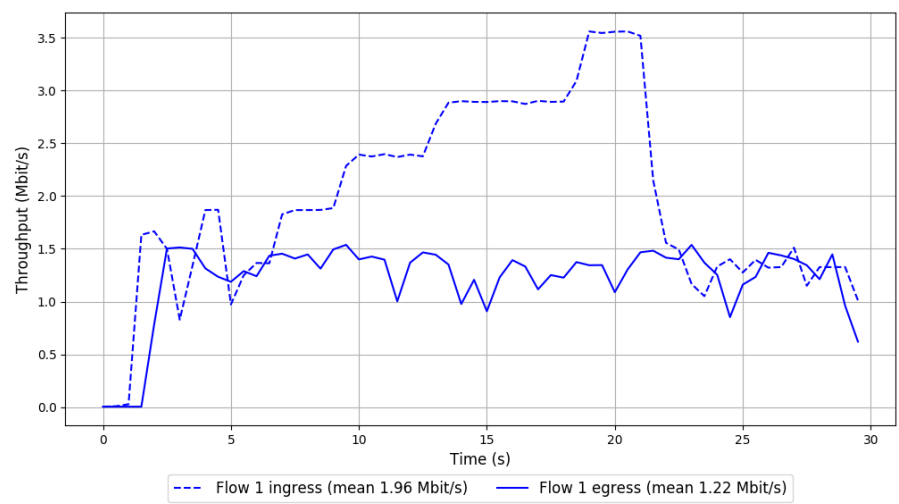
-- Flow 1:

Average throughput: 1.22 Mbit/s

95th percentile per-packet one-way delay: 6235.174 ms

Loss rate: 37.97%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-03-26 21:37:06

End at: 2018-03-26 21:37:36

Local clock offset: -6.009 ms

Remote clock offset: 3.047 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.31 Mbit/s

95th percentile per-packet one-way delay: 5842.969 ms

Loss rate: 35.26%

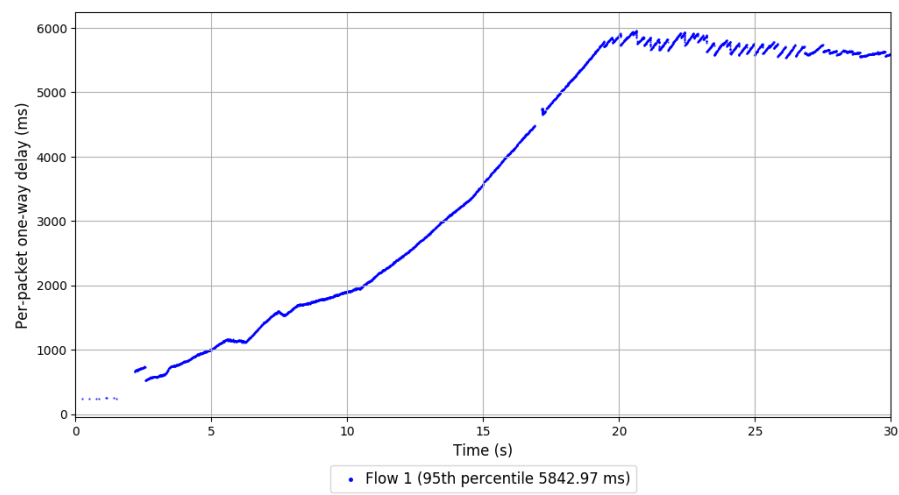
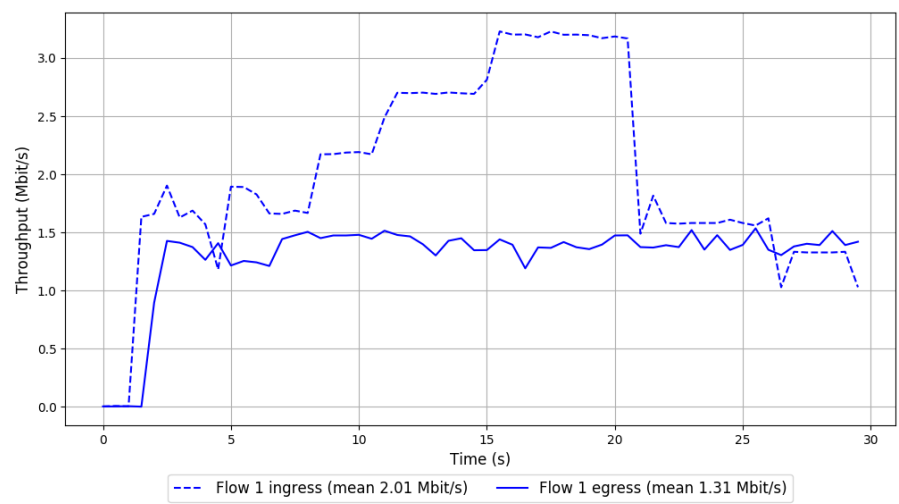
-- Flow 1:

Average throughput: 1.31 Mbit/s

95th percentile per-packet one-way delay: 5842.969 ms

Loss rate: 35.26%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-03-26 21:08:45

End at: 2018-03-26 21:09:15

Local clock offset: -5.623 ms

Remote clock offset: 6.509 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.04 Mbit/s

95th percentile per-packet one-way delay: 5779.852 ms

Loss rate: 23.36%

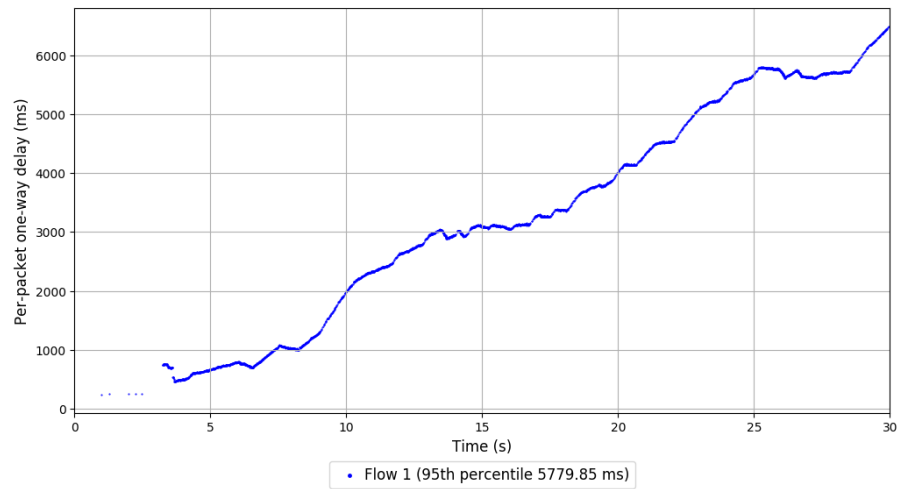
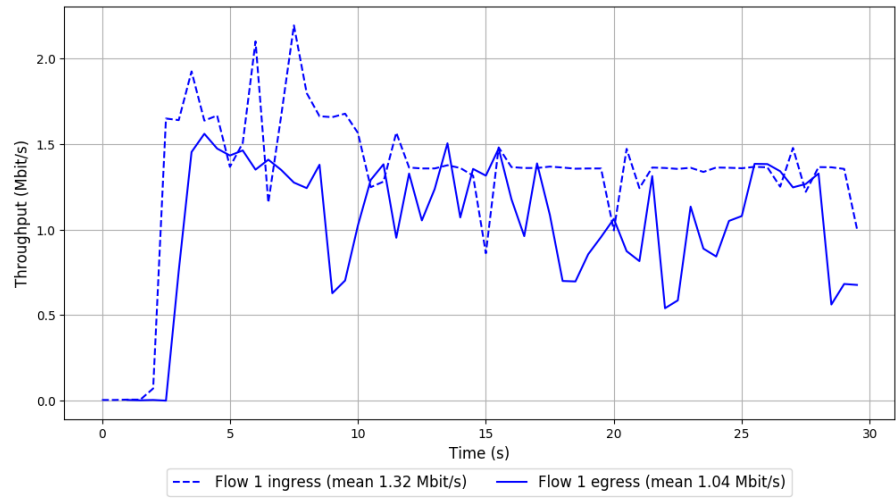
-- Flow 1:

Average throughput: 1.04 Mbit/s

95th percentile per-packet one-way delay: 5779.852 ms

Loss rate: 23.36%

Run 1: Report of Vivace-LTE — Data Link



Run 2: Statistics of Vivace-LTE

Start at: 2018-03-26 21:30:01

End at: 2018-03-26 21:30:31

Local clock offset: -5.733 ms

Remote clock offset: 3.007 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.16 Mbit/s

95th percentile per-packet one-way delay: 2845.944 ms

Loss rate: 10.62%

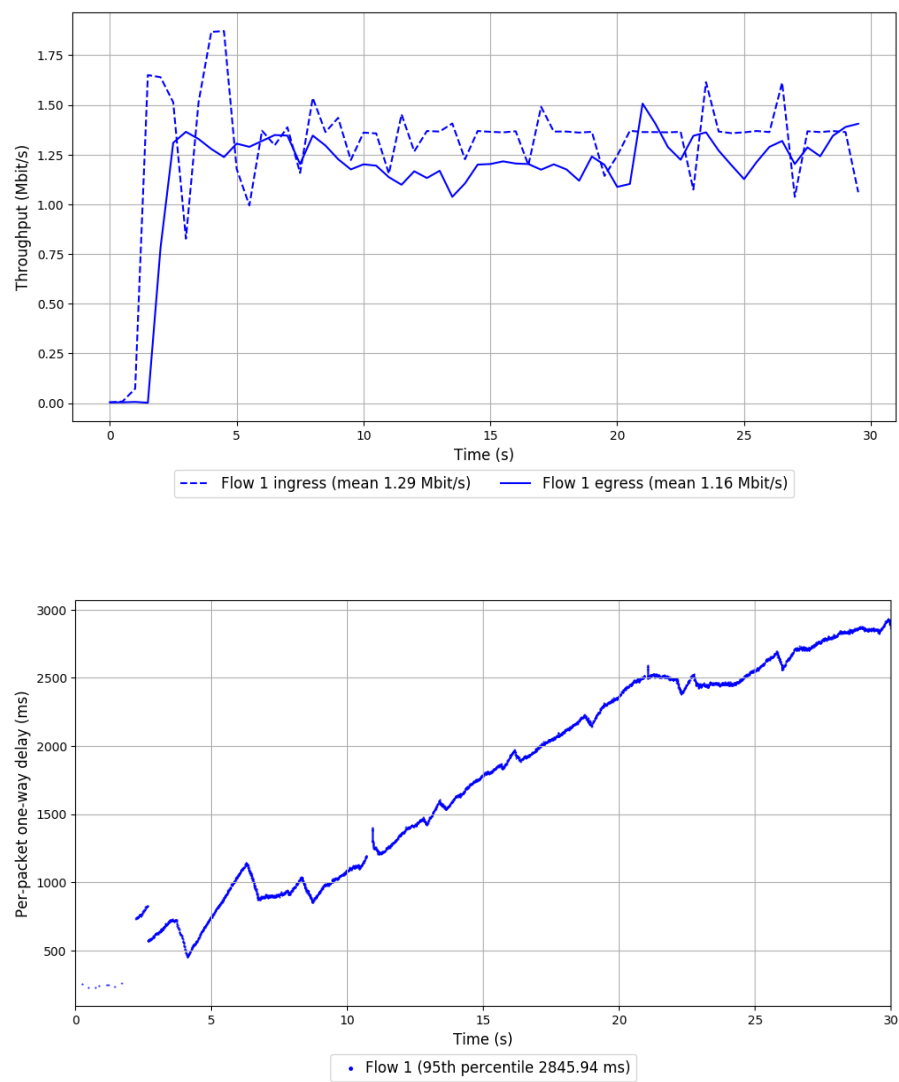
-- Flow 1:

Average throughput: 1.16 Mbit/s

95th percentile per-packet one-way delay: 2845.944 ms

Loss rate: 10.62%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-03-26 21:51:17

End at: 2018-03-26 21:51:47

Local clock offset: -6.594 ms

Remote clock offset: 2.451 ms

Below is generated by plot.py at 2018-03-26 21:54:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.35 Mbit/s

95th percentile per-packet one-way delay: 1533.425 ms

Loss rate: 6.90%

-- Flow 1:

Average throughput: 1.35 Mbit/s

95th percentile per-packet one-way delay: 1533.425 ms

Loss rate: 6.90%

Run 3: Report of Vivace-LTE — Data Link

