

Pantheon Report

Generated at 2018-03-05 20:02:50 (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).

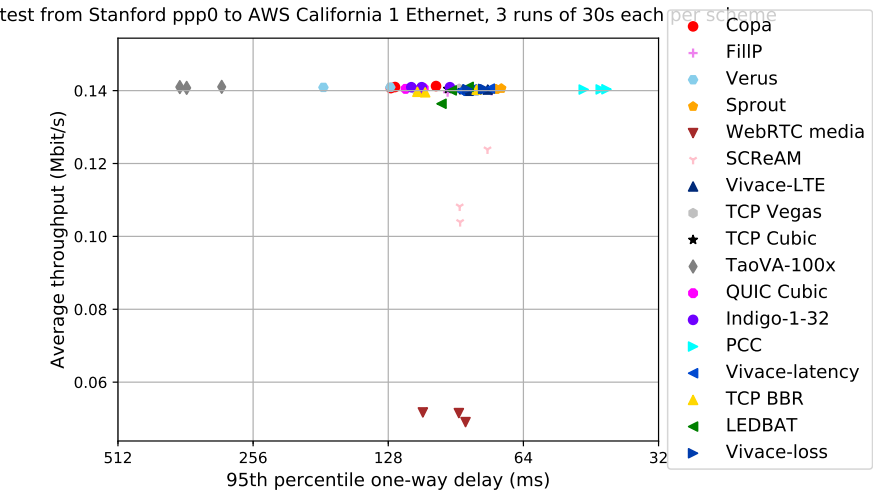
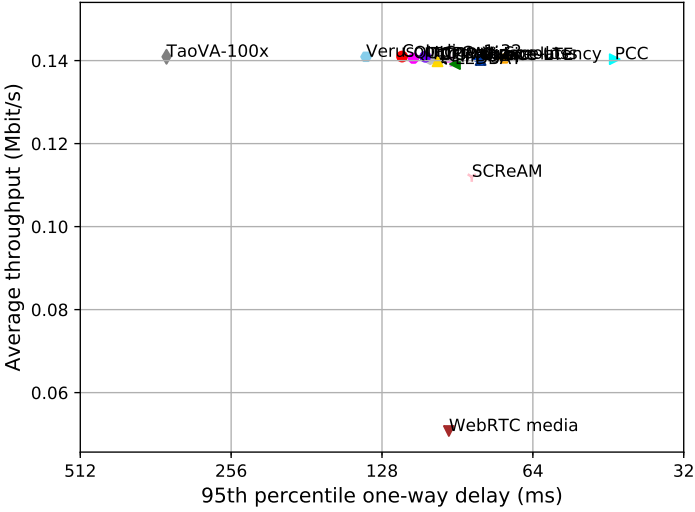
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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 @ 828bbf95fd4941149b5ce90f281d1c69ae1a5c6
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	0.14	99.17	22.70
TCP Cubic	3	0.14	96.59	32.77
LEDBAT	3	0.14	91.55	30.93
PCC	3	0.14	43.94	95.52
QUIC Cubic	3	0.14	110.79	64.36
SCReAM	3	0.11	84.74	0.61
WebRTC media	3	0.05	94.14	45.41
Sprout	3	0.14	73.01	45.81
TaoVA-100x	3	0.14	344.52	93.55
TCP Vegas	3	0.14	102.55	33.13
Verus	3	0.14	137.75	86.79
Copa	3	0.14	116.72	52.51
FillP	3	0.14	93.29	98.37
Indigo-1-32	3	0.14	104.95	80.03
Vivace-latency	3	0.14	82.60	88.44
Vivace-loss	3	0.14	80.63	88.27
Vivace-LTE	3	0.14	81.37	88.37

Run 1: Statistics of TCP BBR

Start at: 2018-03-05 17:47:16

End at: 2018-03-05 17:47:46

Local clock offset: -4.951 ms

Remote clock offset: 1.368 ms

Below is generated by plot.py at 2018-03-05 20:02:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 81.357 ms

Loss rate: 20.31%

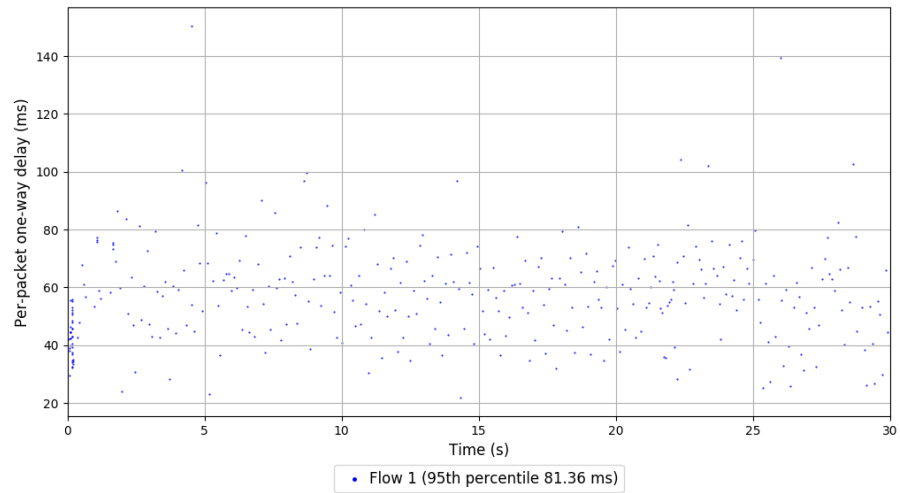
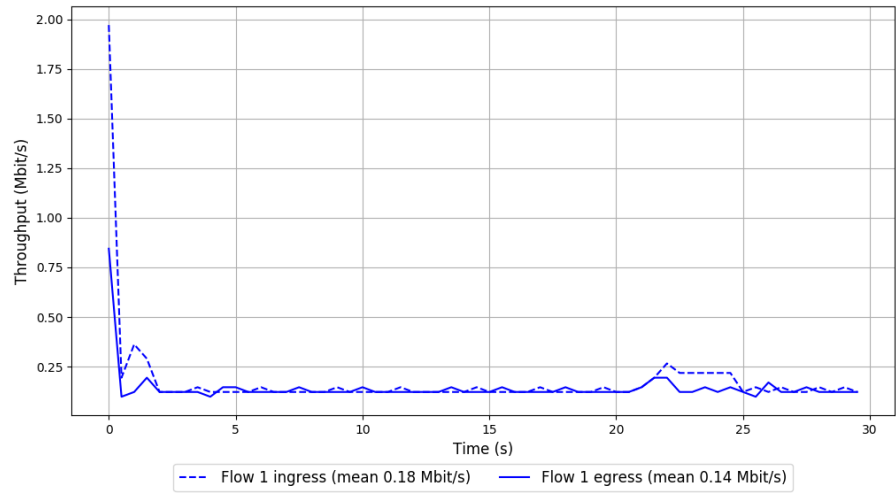
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 81.357 ms

Loss rate: 20.31%

Run 1: Report of TCP BBR — Data Link

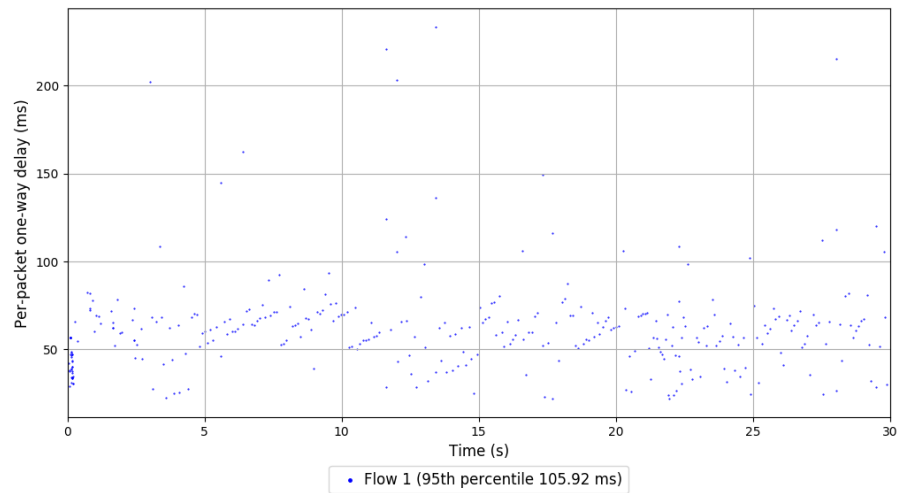
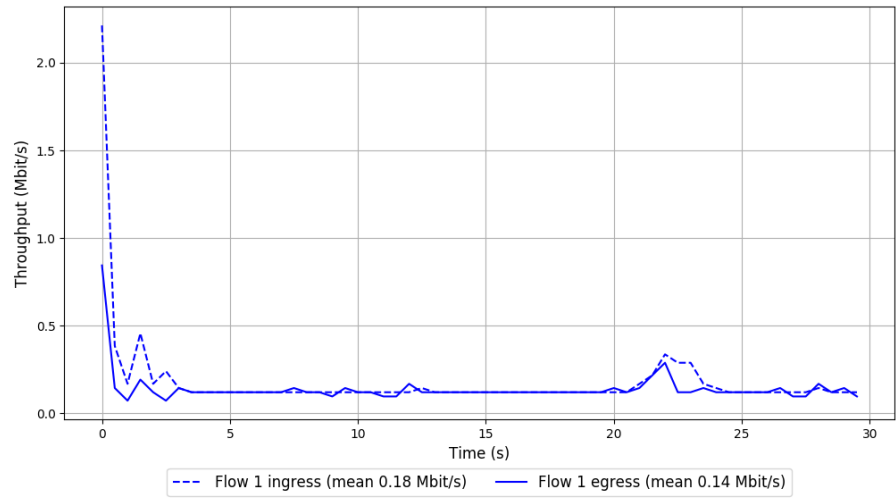


Run 2: Statistics of TCP BBR

Start at: 2018-03-05 18:10:47
End at: 2018-03-05 18:11:17
Local clock offset: -12.705 ms
Remote clock offset: 1.545 ms

Below is generated by plot.py at 2018-03-05 20:02:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 105.916 ms
Loss rate: 23.90%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 105.916 ms
Loss rate: 23.90%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-03-05 18:34:16

End at: 2018-03-05 18:34:46

Local clock offset: -15.19 ms

Remote clock offset: 1.412 ms

Below is generated by plot.py at 2018-03-05 20:02:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 110.238 ms

Loss rate: 23.90%

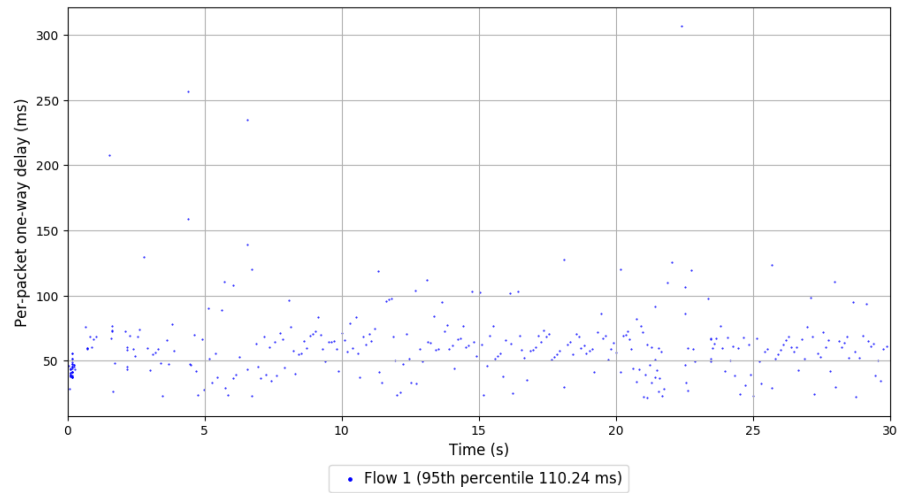
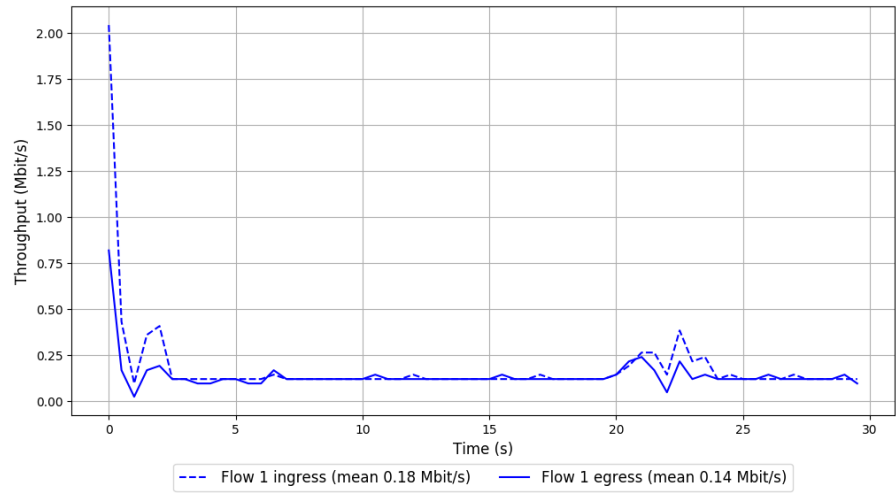
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 110.238 ms

Loss rate: 23.90%

Run 3: Report of TCP BBR — Data Link

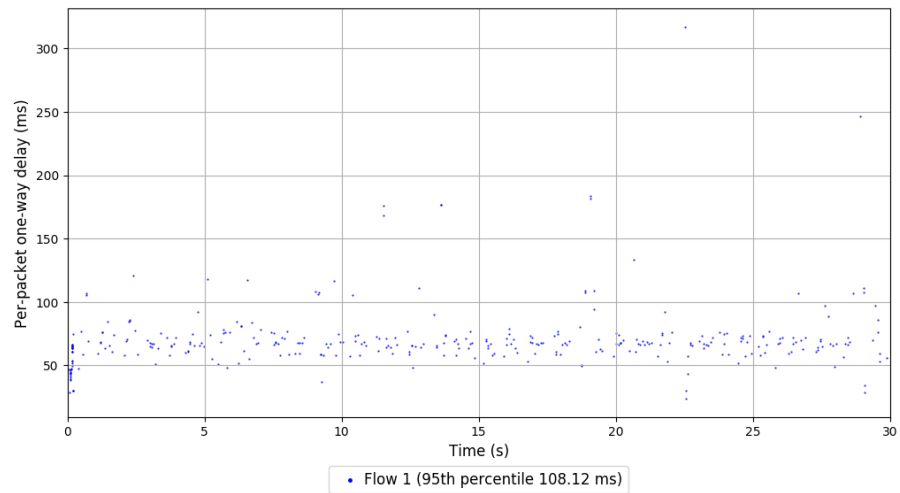
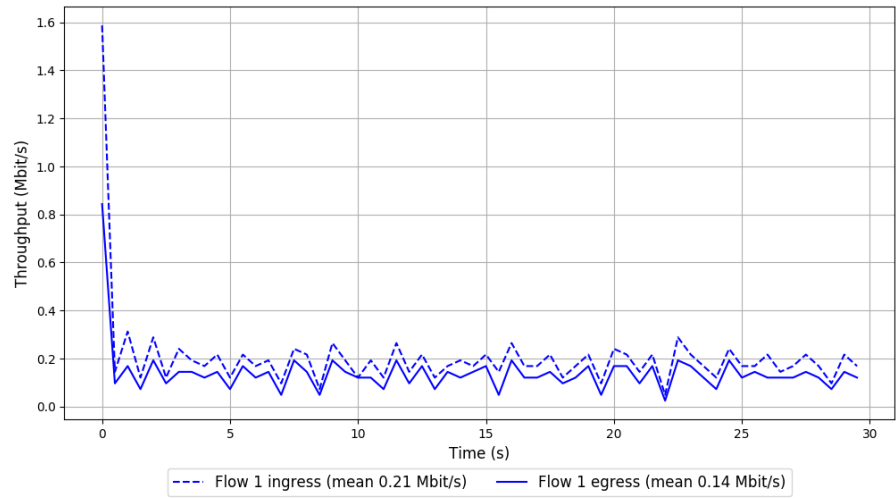


Run 1: Statistics of TCP Cubic

Start at: 2018-03-05 17:59:02
End at: 2018-03-05 17:59:32
Local clock offset: -10.179 ms
Remote clock offset: 1.408 ms

Below is generated by plot.py at 2018-03-05 20:02:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 108.121 ms
Loss rate: 31.89%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 108.121 ms
Loss rate: 31.89%

Run 1: Report of TCP Cubic — Data Link

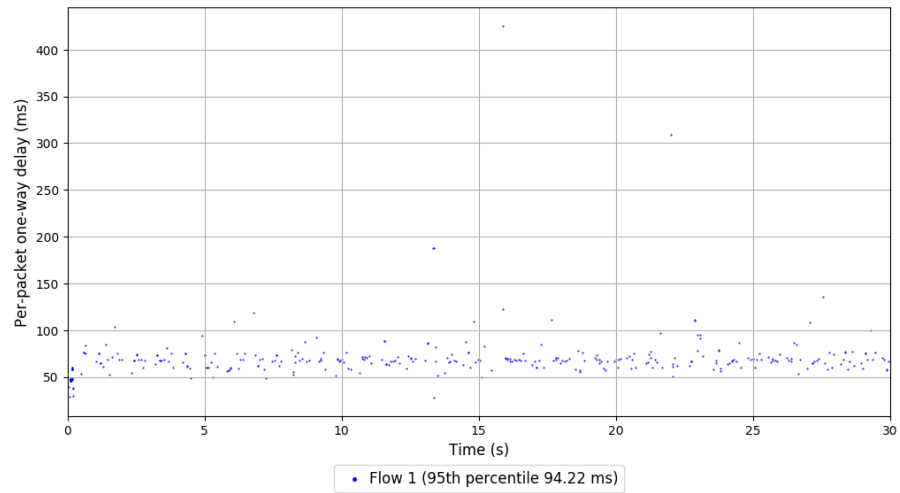
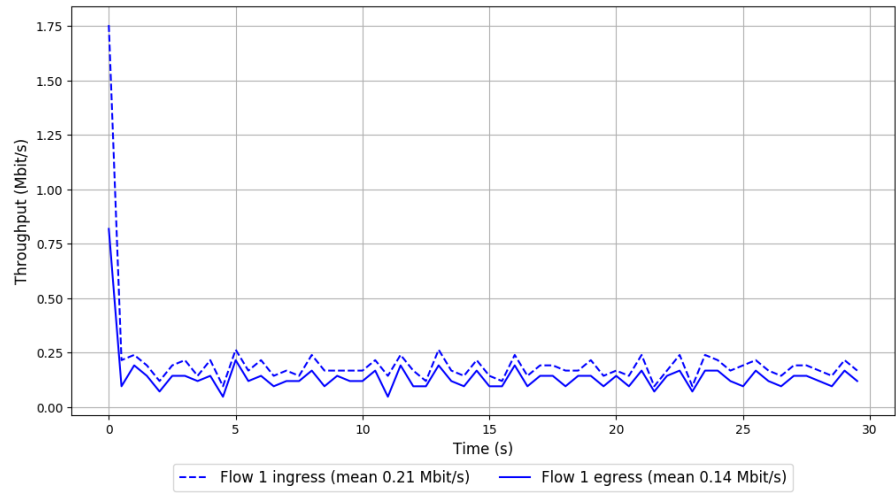


Run 2: Statistics of TCP Cubic

Start at: 2018-03-05 18:22:32
End at: 2018-03-05 18:23:02
Local clock offset: -12.097 ms
Remote clock offset: 1.569 ms

Below is generated by plot.py at 2018-03-05 20:02:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 94.215 ms
Loss rate: 32.16%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 94.215 ms
Loss rate: 32.16%

Run 2: Report of TCP Cubic — Data Link

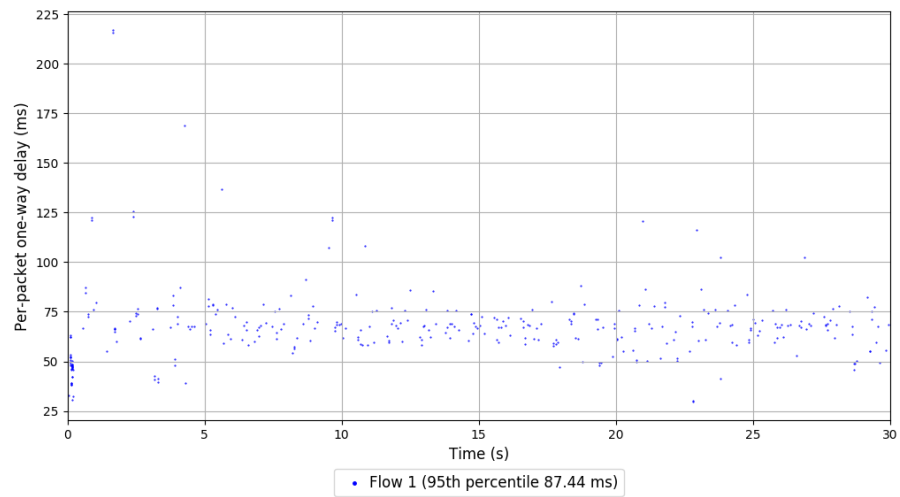
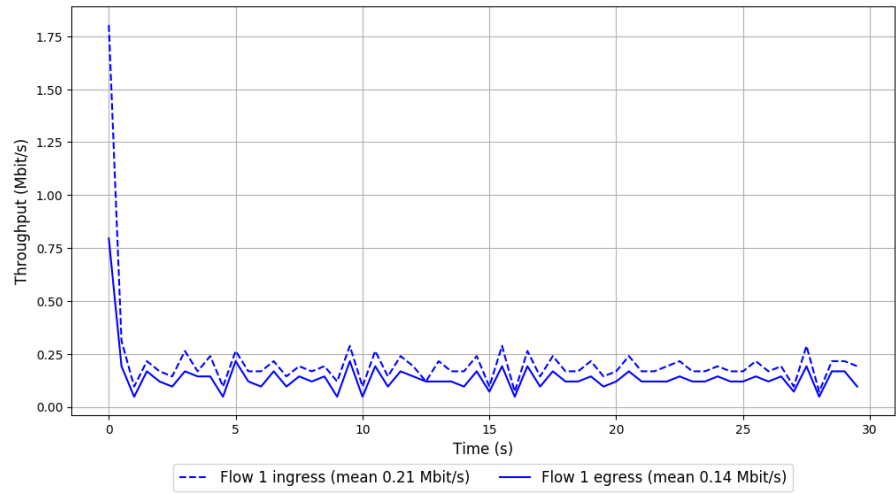


Run 3: Statistics of TCP Cubic

Start at: 2018-03-05 18:46:00
End at: 2018-03-05 18:46:30
Local clock offset: -21.742 ms
Remote clock offset: 1.276 ms

Below is generated by plot.py at 2018-03-05 20:02:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 87.439 ms
Loss rate: 34.27%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 87.439 ms
Loss rate: 34.27%

Run 3: Report of TCP Cubic — Data Link

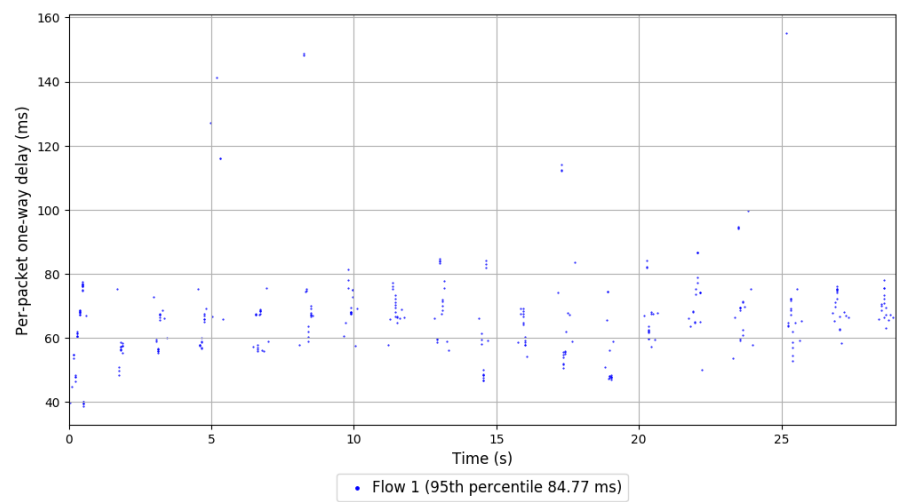
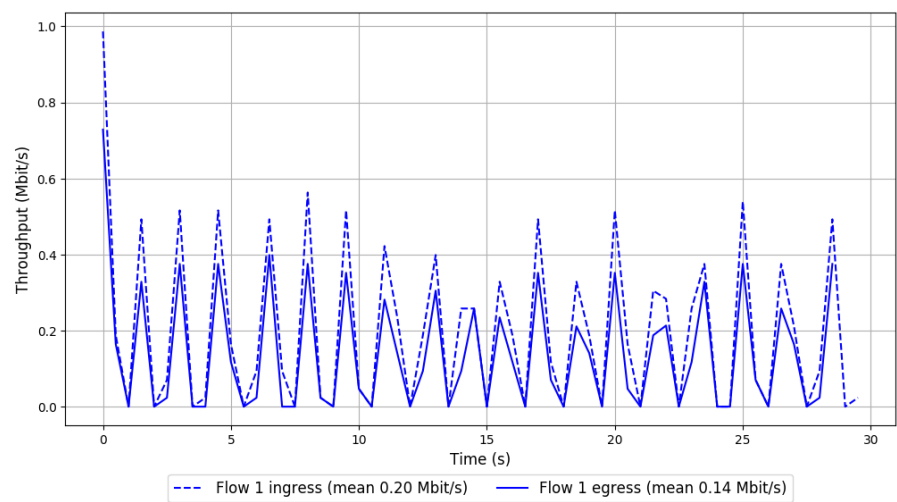


```
Run 1: Statistics of LEDBAT

Start at: 2018-03-05 17:44:39
End at: 2018-03-05 17:45:09
Local clock offset: -5.396 ms
Remote clock offset: 1.315 ms

# Below is generated by plot.py at 2018-03-05 20:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 84.772 ms
Loss rate: 31.55%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 84.772 ms
Loss rate: 31.55%
```

Run 1: Report of LEDBAT — Data Link

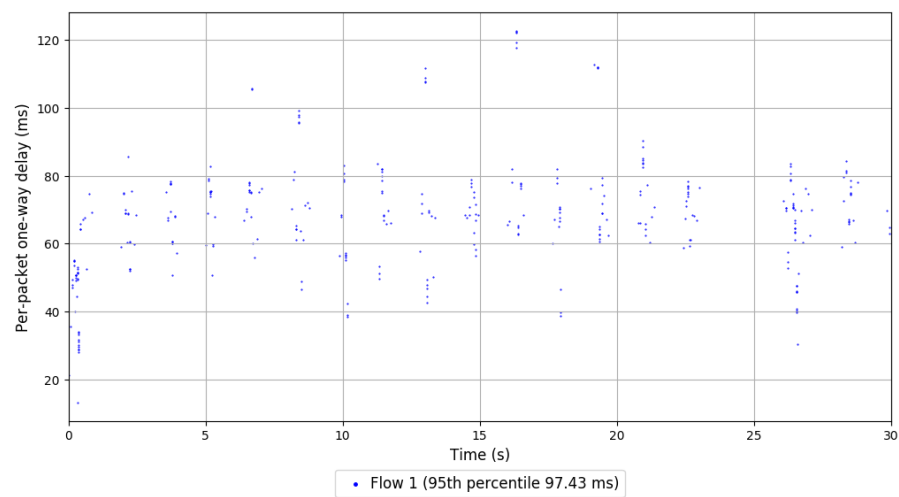
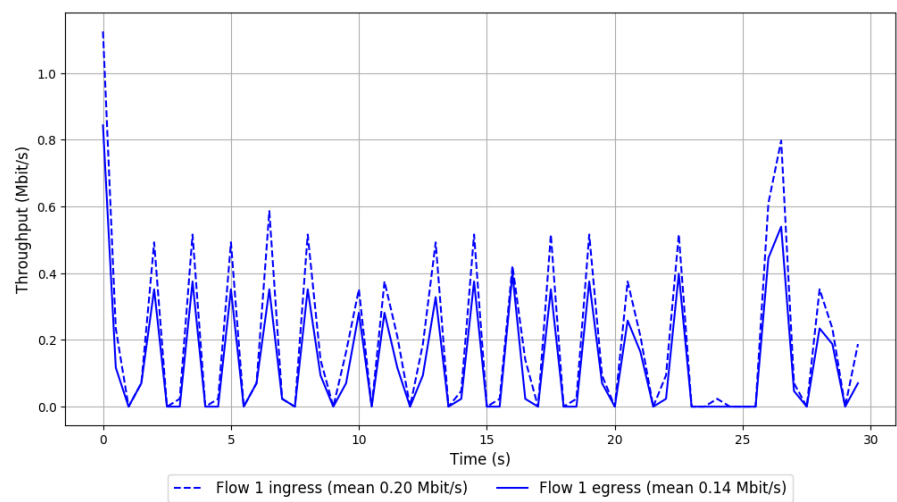


Run 2: Statistics of LEDBAT

Start at: 2018-03-05 18:08:10
End at: 2018-03-05 18:08:40
Local clock offset: -10.959 ms
Remote clock offset: 1.444 ms

Below is generated by plot.py at 2018-03-05 20:02:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 97.428 ms
Loss rate: 31.23%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 97.428 ms
Loss rate: 31.23%

Run 2: Report of LEDBAT — Data Link

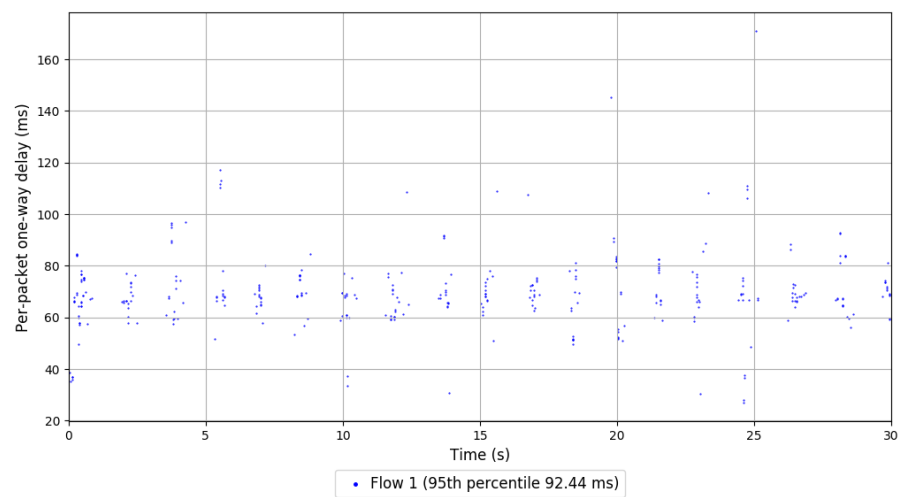
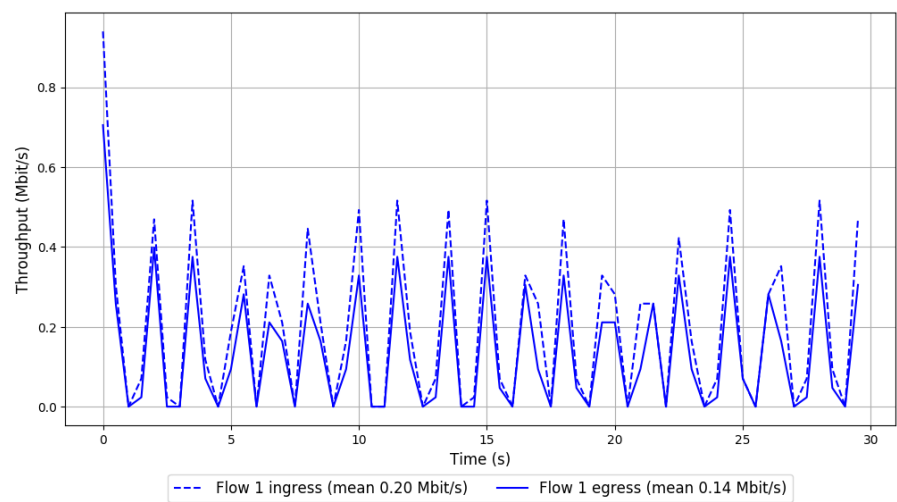


Run 3: Statistics of LEDBAT

Start at: 2018-03-05 18:31:39
End at: 2018-03-05 18:32:09
Local clock offset: -13.999 ms
Remote clock offset: 1.383 ms

Below is generated by plot.py at 2018-03-05 20:02:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 92.442 ms
Loss rate: 30.00%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 92.442 ms
Loss rate: 30.00%

Run 3: Report of LEDBAT — Data Link

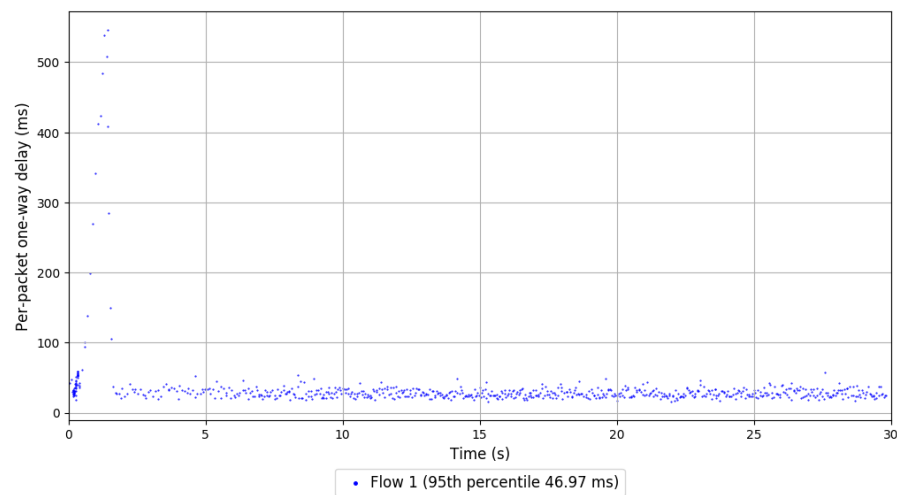
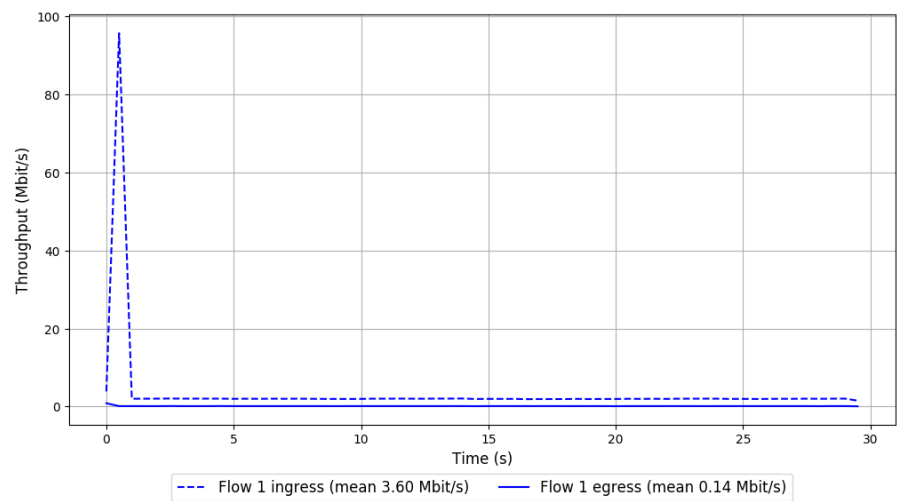


```
Run 1: Statistics of PCC

Start at: 2018-03-05 17:52:29
End at: 2018-03-05 17:52:59
Local clock offset: -6.603 ms
Remote clock offset: 1.294 ms

# Below is generated by plot.py at 2018-03-05 20:02:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 46.968 ms
Loss rate: 96.12%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 46.968 ms
Loss rate: 96.12%
```

Run 1: Report of PCC — Data Link

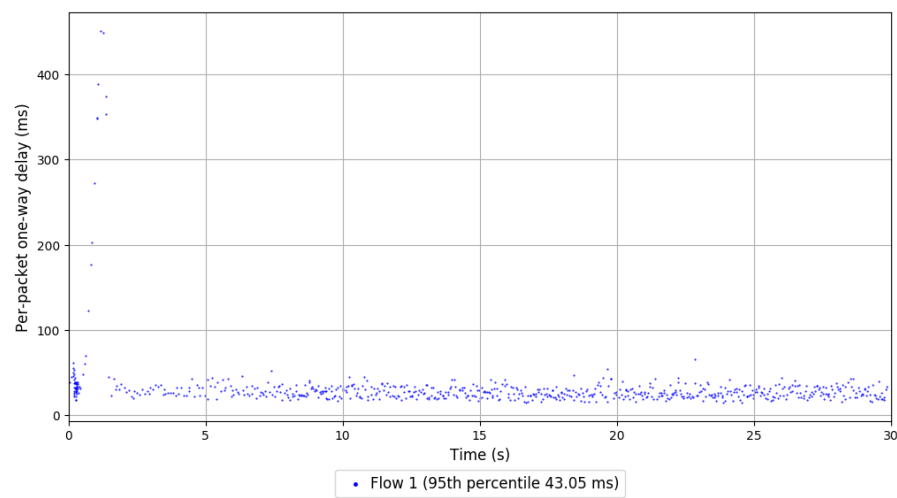
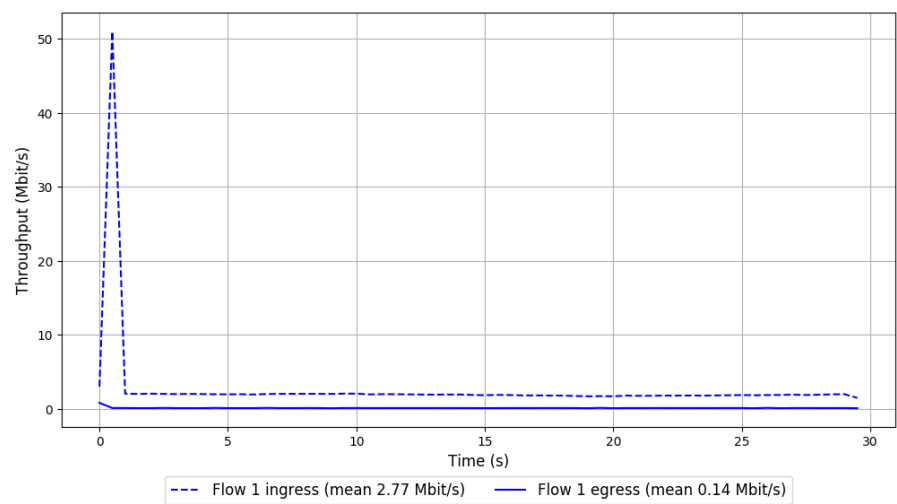


Run 2: Statistics of PCC

Start at: 2018-03-05 18:16:00
End at: 2018-03-05 18:16:30
Local clock offset: -15.039 ms
Remote clock offset: 1.498 ms

Below is generated by plot.py at 2018-03-05 20:02:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 43.048 ms
Loss rate: 94.94%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 43.048 ms
Loss rate: 94.94%

Run 2: Report of PCC — Data Link

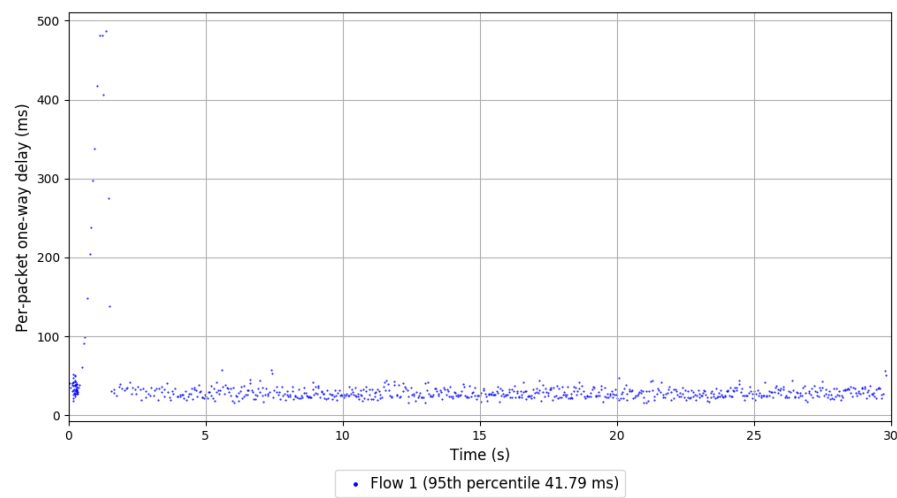
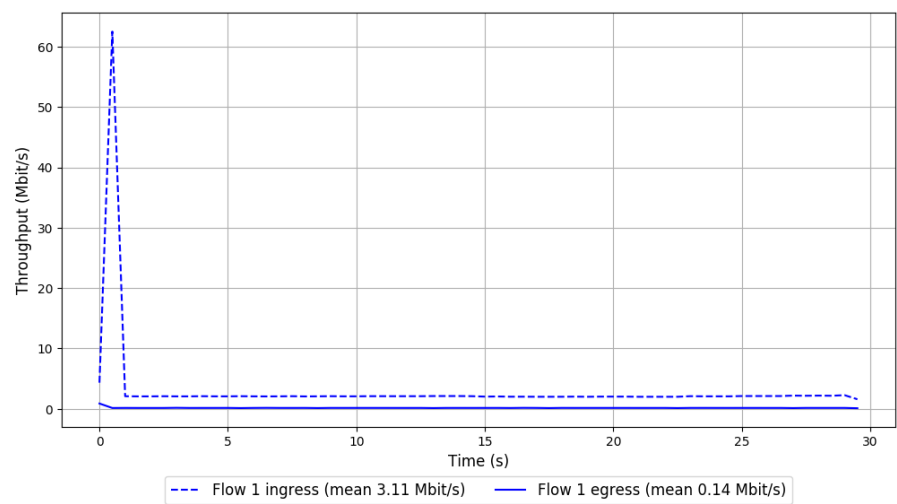


Run 3: Statistics of PCC

Start at: 2018-03-05 18:39:29
End at: 2018-03-05 18:39:59
Local clock offset: -17.957 ms
Remote clock offset: 1.408 ms

Below is generated by plot.py at 2018-03-05 20:02:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 41.790 ms
Loss rate: 95.50%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 41.790 ms
Loss rate: 95.50%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-03-05 17:43:21

End at: 2018-03-05 17:43:51

Local clock offset: -3.985 ms

Remote clock offset: 1.432 ms

Below is generated by plot.py at 2018-03-05 20:02:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 108.533 ms

Loss rate: 67.42%

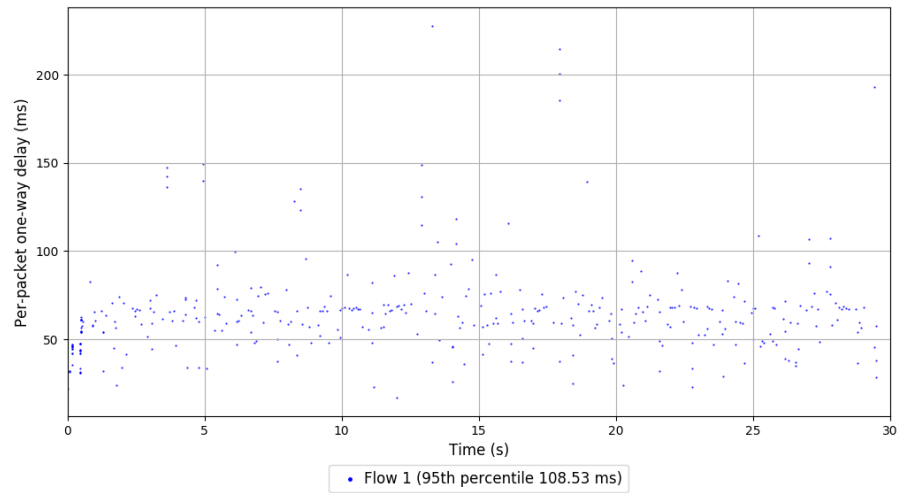
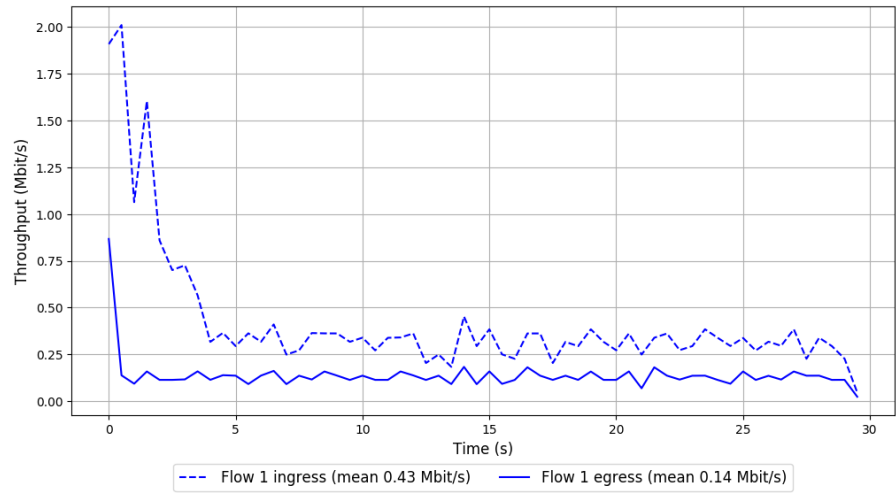
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 108.533 ms

Loss rate: 67.42%

Run 1: Report of QUIC Cubic — Data Link

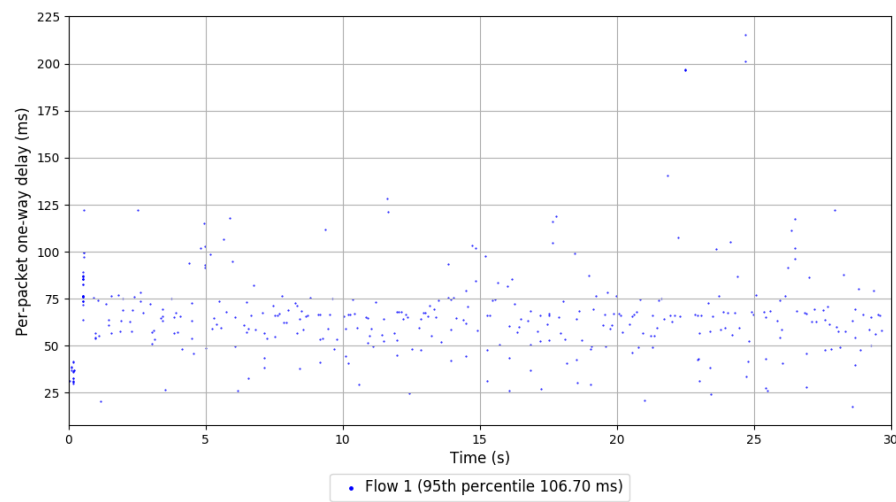
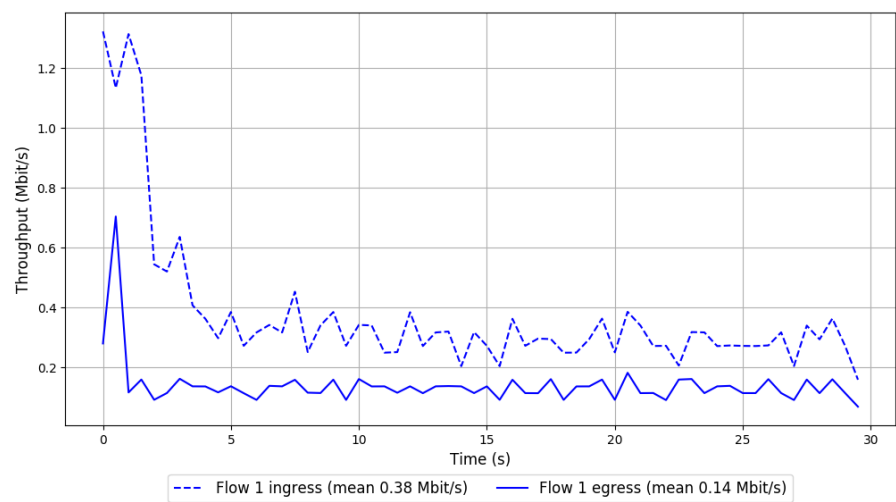


Run 2: Statistics of QUIC Cubic

Start at: 2018-03-05 18:06:51
End at: 2018-03-05 18:07:21
Local clock offset: -10.087 ms
Remote clock offset: 1.495 ms

Below is generated by plot.py at 2018-03-05 20:02:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 106.703 ms
Loss rate: 62.94%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 106.703 ms
Loss rate: 62.94%

Run 2: Report of QUIC Cubic — Data Link

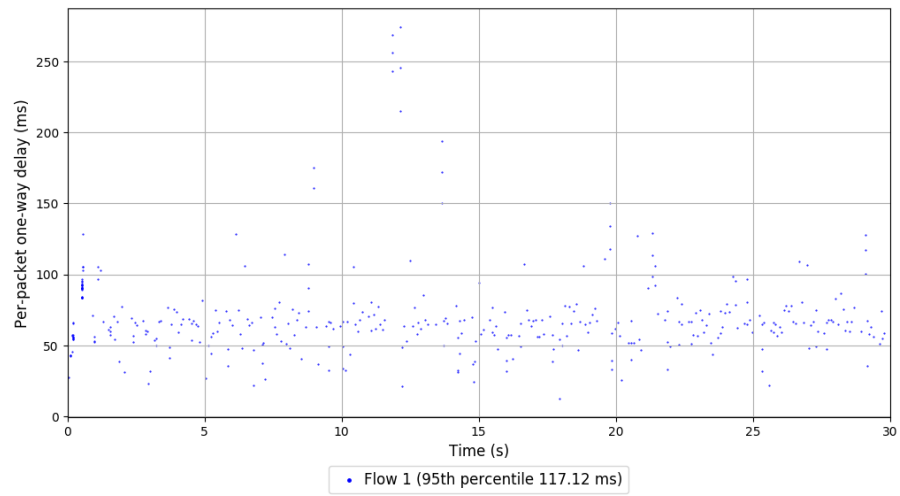
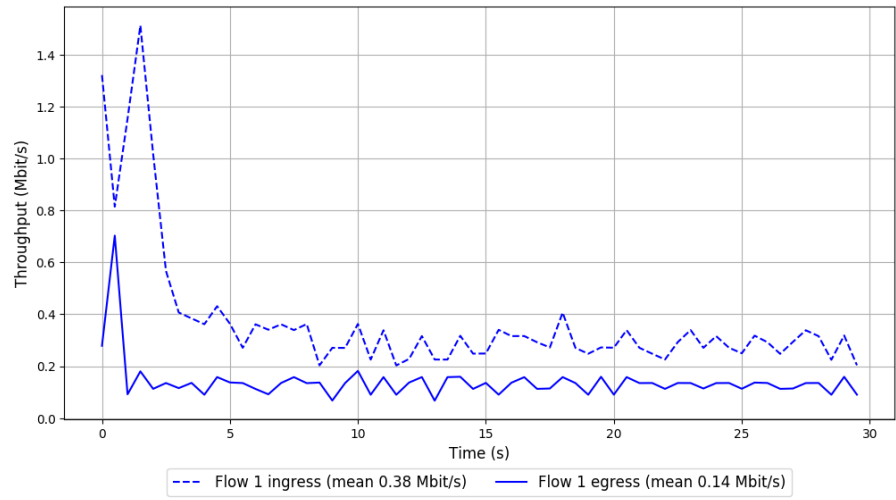


Run 3: Statistics of QUIC Cubic

Start at: 2018-03-05 18:30:21
End at: 2018-03-05 18:30:51
Local clock offset: -13.604 ms
Remote clock offset: 1.485 ms

Below is generated by plot.py at 2018-03-05 20:02:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 117.124 ms
Loss rate: 62.73%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 117.124 ms
Loss rate: 62.73%

Run 3: Report of QUIC Cubic — Data Link

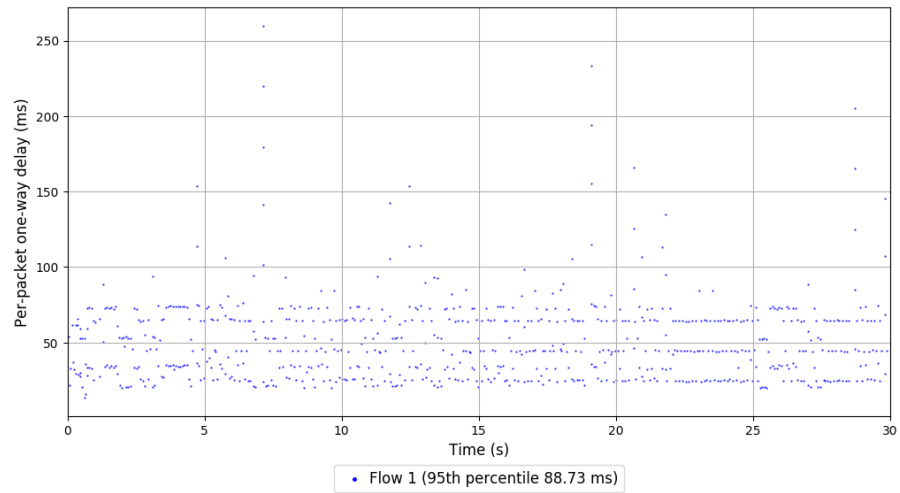
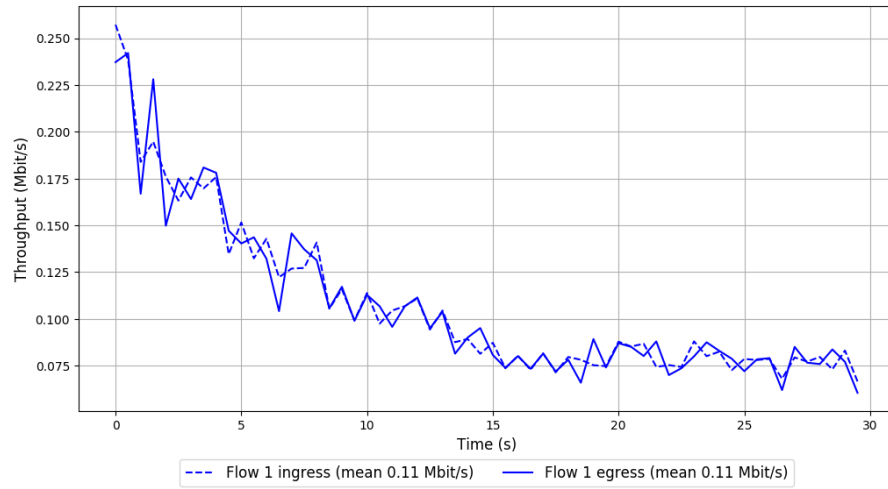


```
Run 1: Statistics of SCReAM

Start at: 2018-03-05 18:01:38
End at: 2018-03-05 18:02:08
Local clock offset: -8.659 ms
Remote clock offset: 1.403 ms

# Below is generated by plot.py at 2018-03-05 20:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 88.735 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 88.735 ms
Loss rate: 0.19%
```

Run 1: Report of SReAM — Data Link

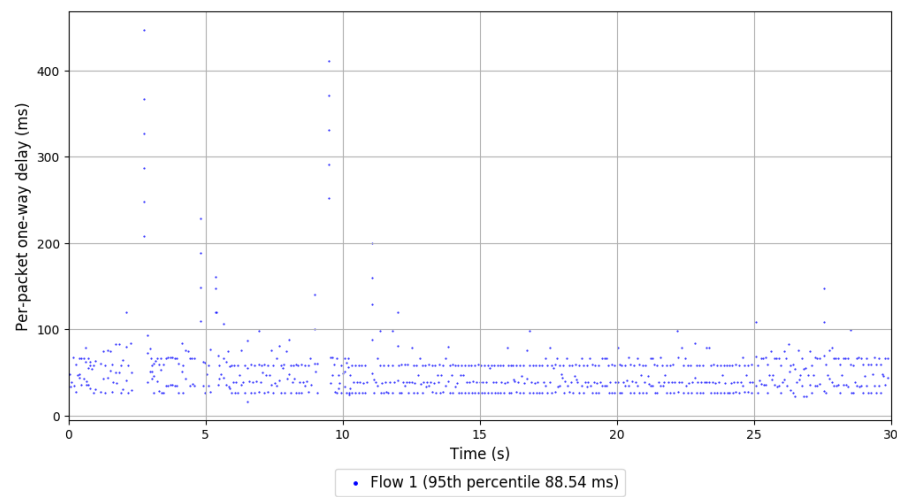
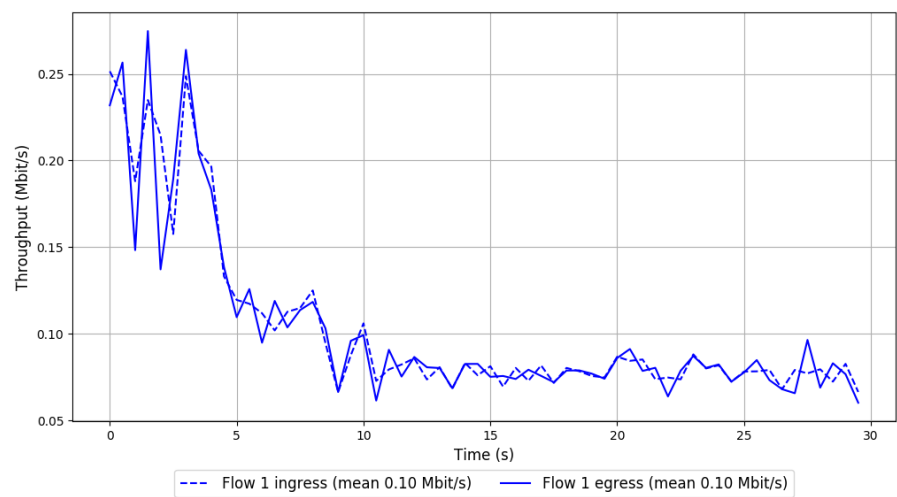


Run 2: Statistics of SCReAM

Start at: 2018-03-05 18:25:08
End at: 2018-03-05 18:25:38
Local clock offset: -12.196 ms
Remote clock offset: 1.538 ms

Below is generated by plot.py at 2018-03-05 20:02:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 88.542 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 88.542 ms
Loss rate: 0.86%

Run 2: Report of SReAM — Data Link

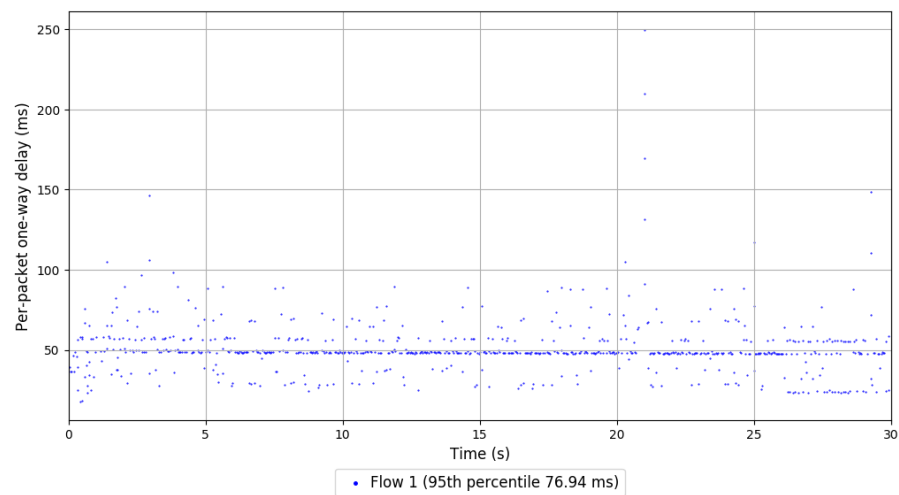
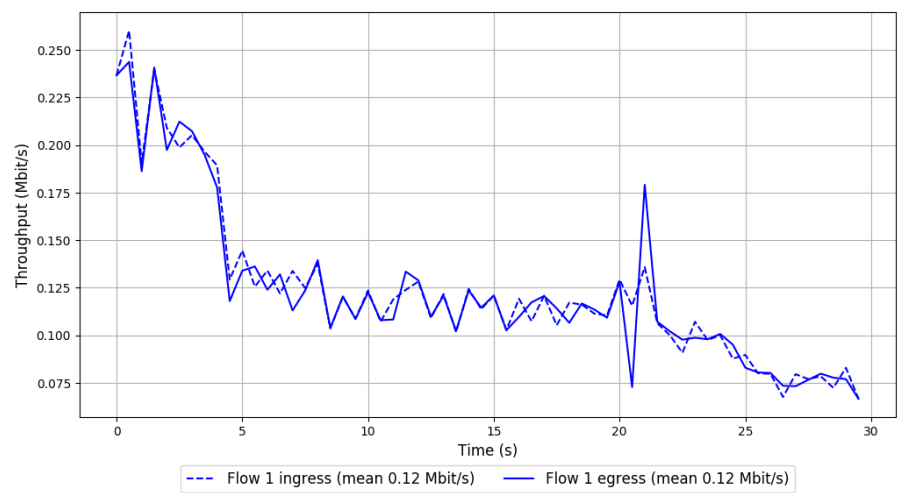


Run 3: Statistics of SCReAM

Start at: 2018-03-05 18:48:37
End at: 2018-03-05 18:49:07
Local clock offset: -23.395 ms
Remote clock offset: 1.25 ms

Below is generated by plot.py at 2018-03-05 20:02:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 76.943 ms
Loss rate: 0.77%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 76.943 ms
Loss rate: 0.77%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of WebRTC media

Start at: 2018-03-05 18:02:56

End at: 2018-03-05 18:03:26

Local clock offset: -8.774 ms

Remote clock offset: 1.487 ms

Below is generated by plot.py at 2018-03-05 20:02:29

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 86.118 ms

Loss rate: 44.54%

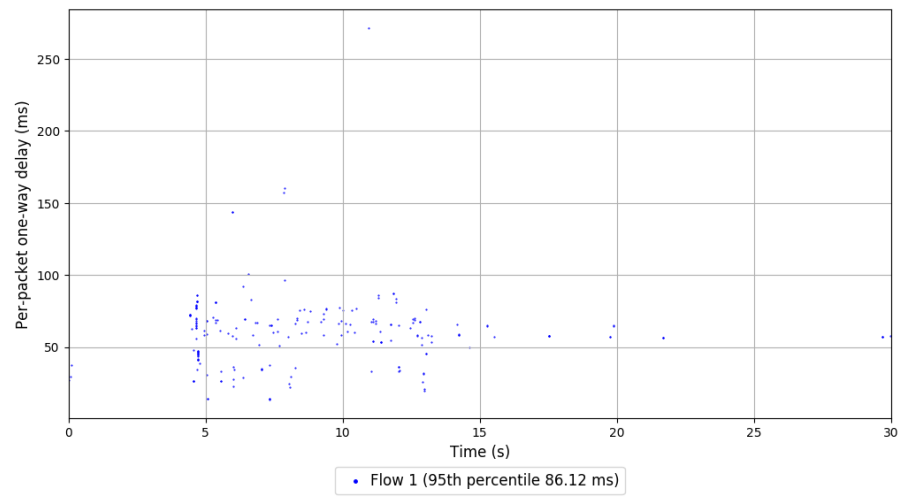
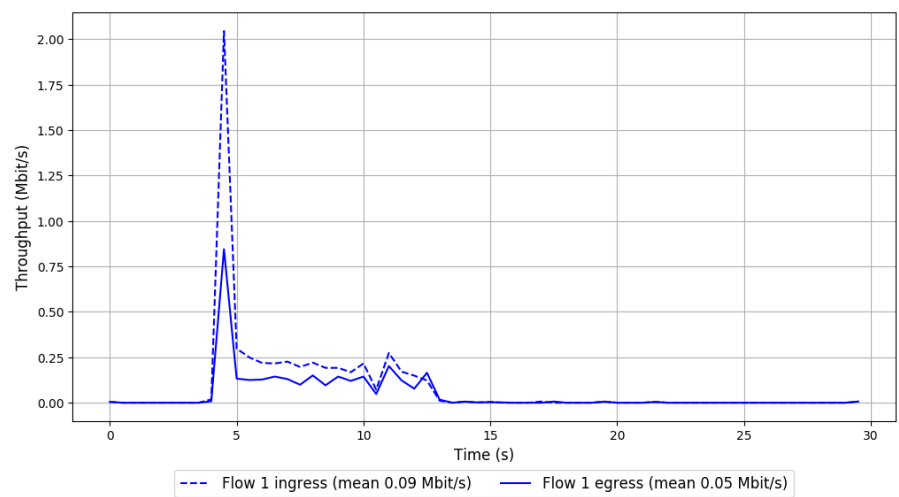
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 86.118 ms

Loss rate: 44.54%

Run 1: Report of WebRTC media — Data Link

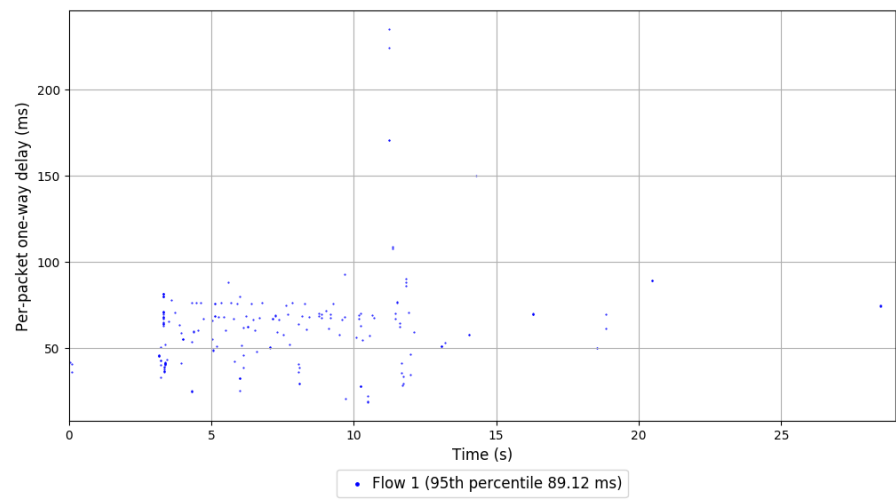
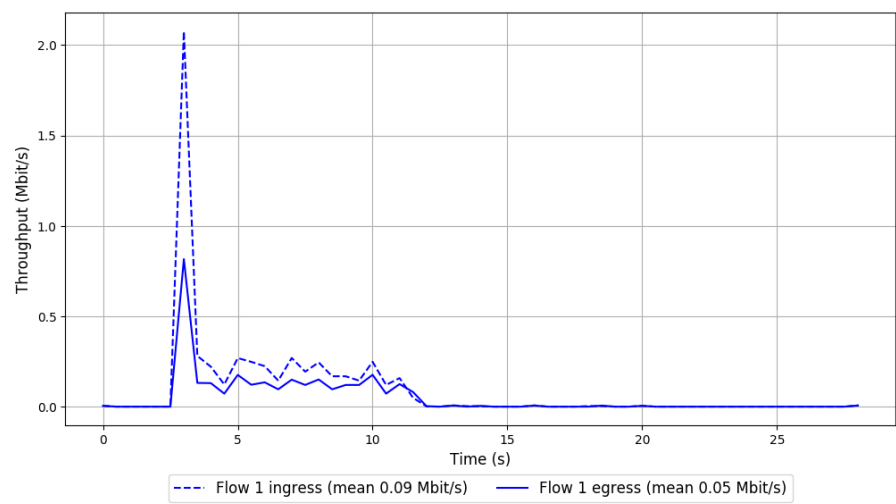


Run 2: Statistics of WebRTC media

Start at: 2018-03-05 18:26:26
End at: 2018-03-05 18:26:56
Local clock offset: -12.411 ms
Remote clock offset: 1.61 ms

Below is generated by plot.py at 2018-03-05 20:02:29
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 89.119 ms
Loss rate: 45.65%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 89.119 ms
Loss rate: 45.65%

Run 2: Report of WebRTC media — Data Link

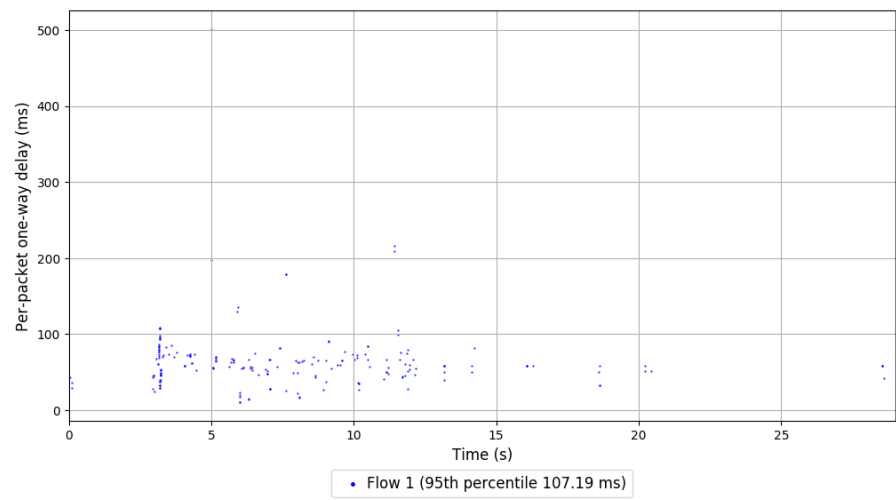
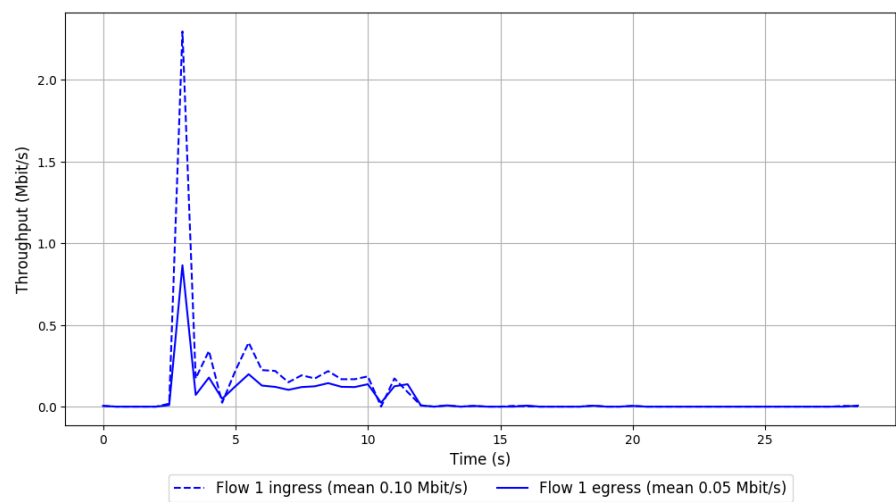


Run 3: Statistics of WebRTC media

Start at: 2018-03-05 18:49:55
End at: 2018-03-05 18:50:25
Local clock offset: -21.848 ms
Remote clock offset: 1.228 ms

Below is generated by plot.py at 2018-03-05 20:02:29
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 107.190 ms
Loss rate: 46.05%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 107.190 ms
Loss rate: 46.05%

Run 3: Report of WebRTC media — Data Link



Run 1: Statistics of Sprout

Start at: 2018-03-05 17:51:11

End at: 2018-03-05 17:51:41

Local clock offset: -6.266 ms

Remote clock offset: 1.298 ms

Below is generated by plot.py at 2018-03-05 20:02:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 73.794 ms

Loss rate: 46.17%

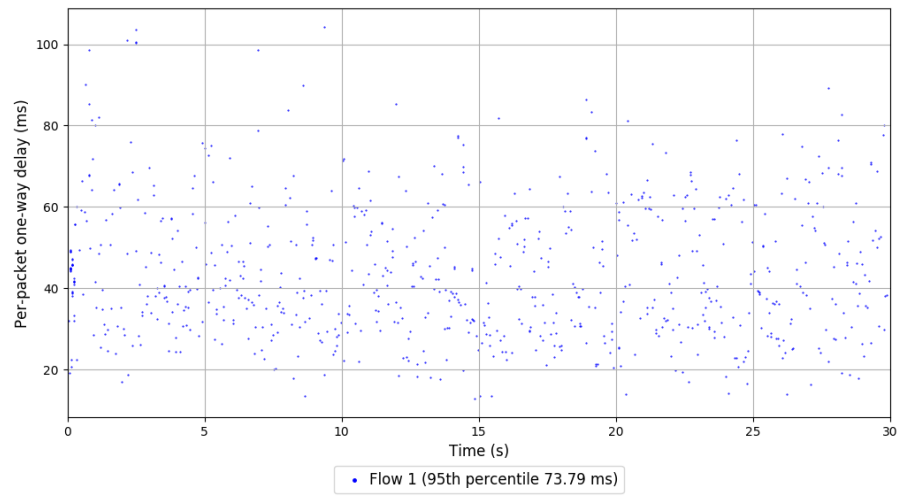
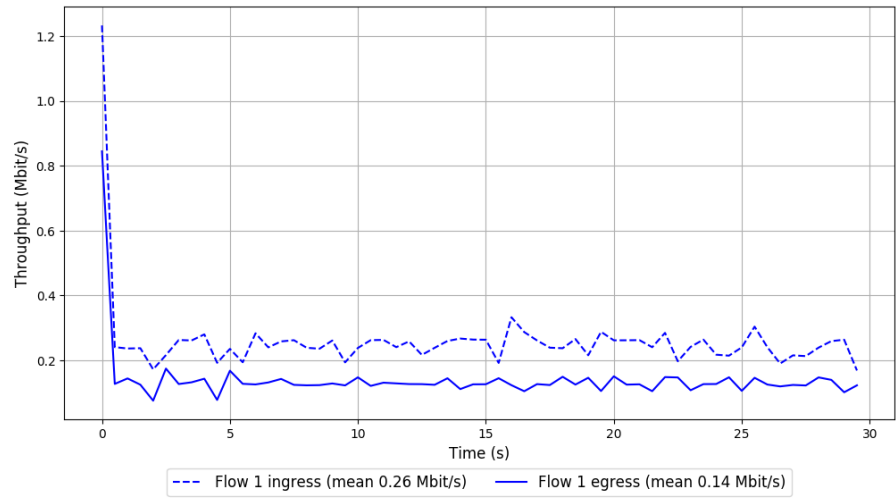
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 73.794 ms

Loss rate: 46.17%

Run 1: Report of Sprout — Data Link

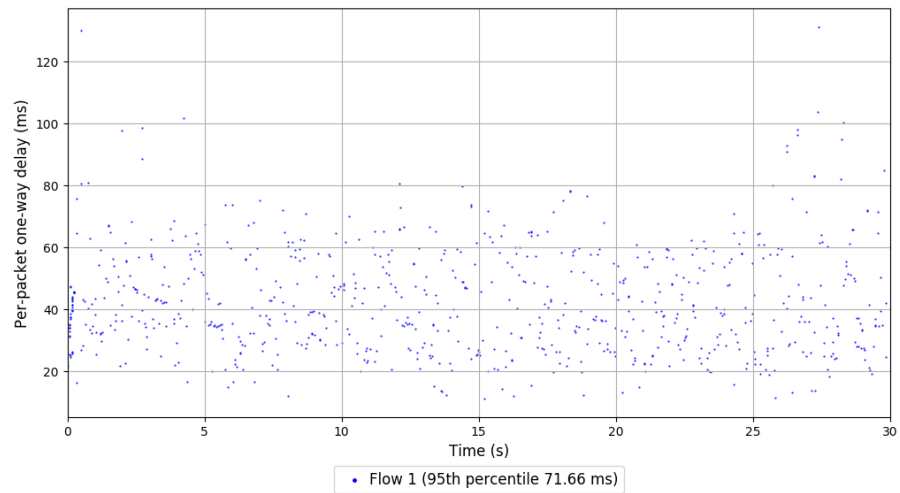
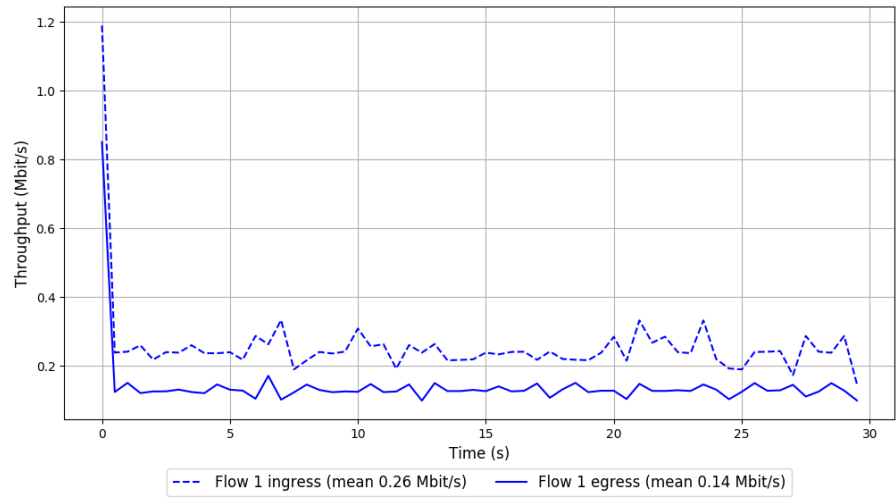


Run 2: Statistics of Sprout

Start at: 2018-03-05 18:14:42
End at: 2018-03-05 18:15:12
Local clock offset: -15.954 ms
Remote clock offset: 1.568 ms

Below is generated by plot.py at 2018-03-05 20:02:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 71.663 ms
Loss rate: 45.48%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 71.663 ms
Loss rate: 45.48%

Run 2: Report of Sprout — Data Link

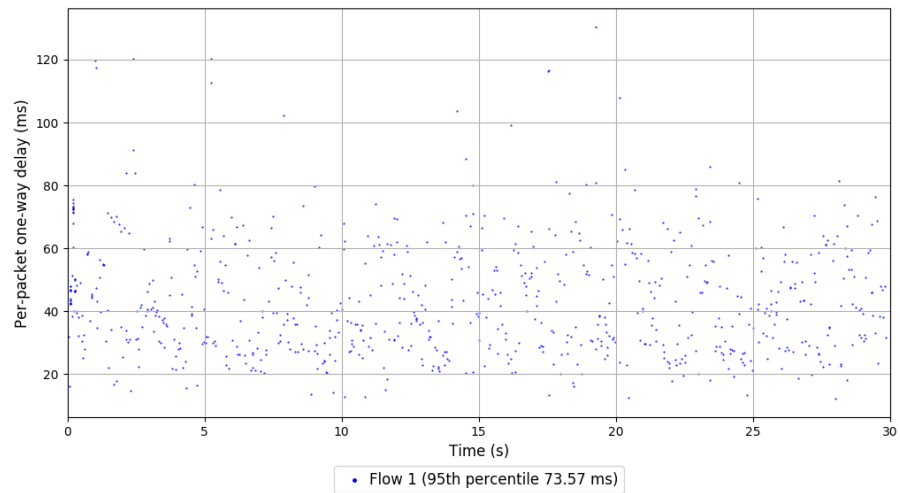
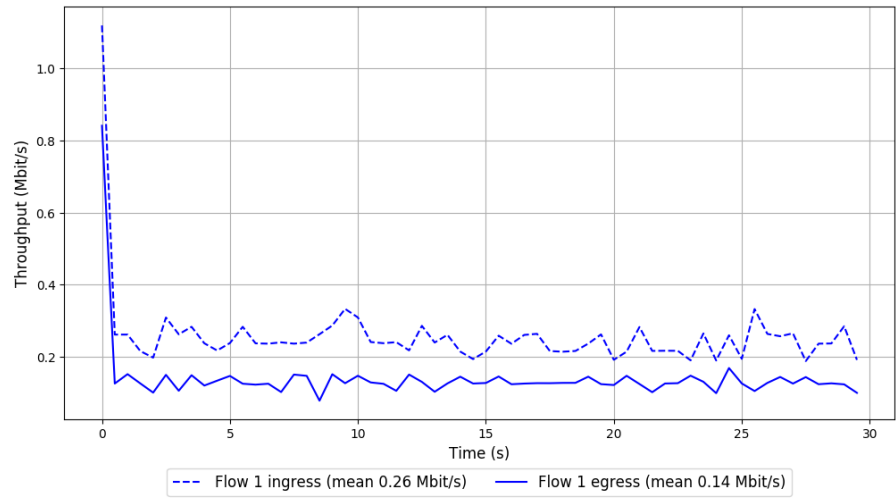


Run 3: Statistics of Sprout

Start at: 2018-03-05 18:38:10
End at: 2018-03-05 18:38:40
Local clock offset: -17.216 ms
Remote clock offset: 1.315 ms

Below is generated by plot.py at 2018-03-05 20:02:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 73.568 ms
Loss rate: 45.78%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 73.568 ms
Loss rate: 45.78%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-03-05 18:04:14

End at: 2018-03-05 18:04:44

Local clock offset: -8.987 ms

Remote clock offset: 1.539 ms

Below is generated by plot.py at 2018-03-05 20:02:34

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 300.759 ms

Loss rate: 93.38%

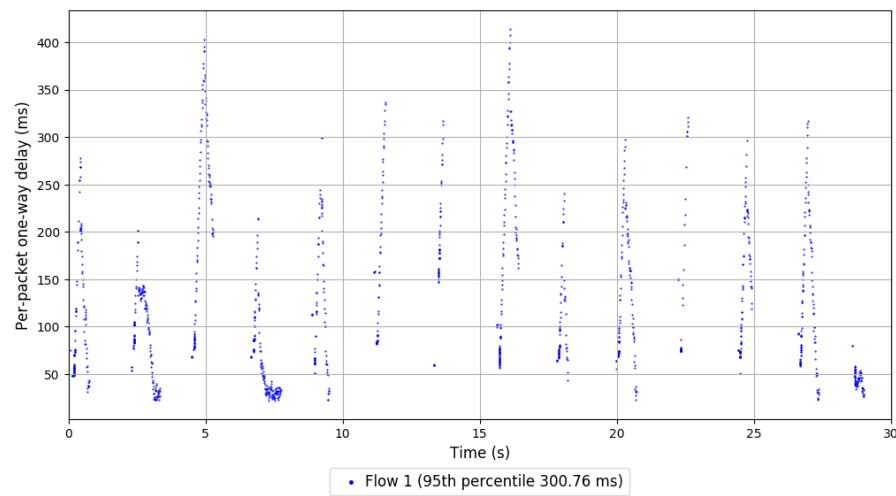
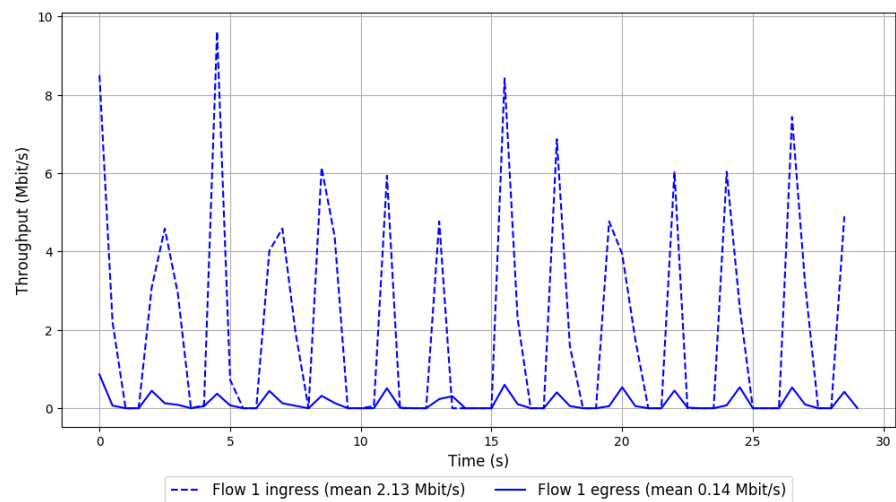
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 300.759 ms

Loss rate: 93.38%

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

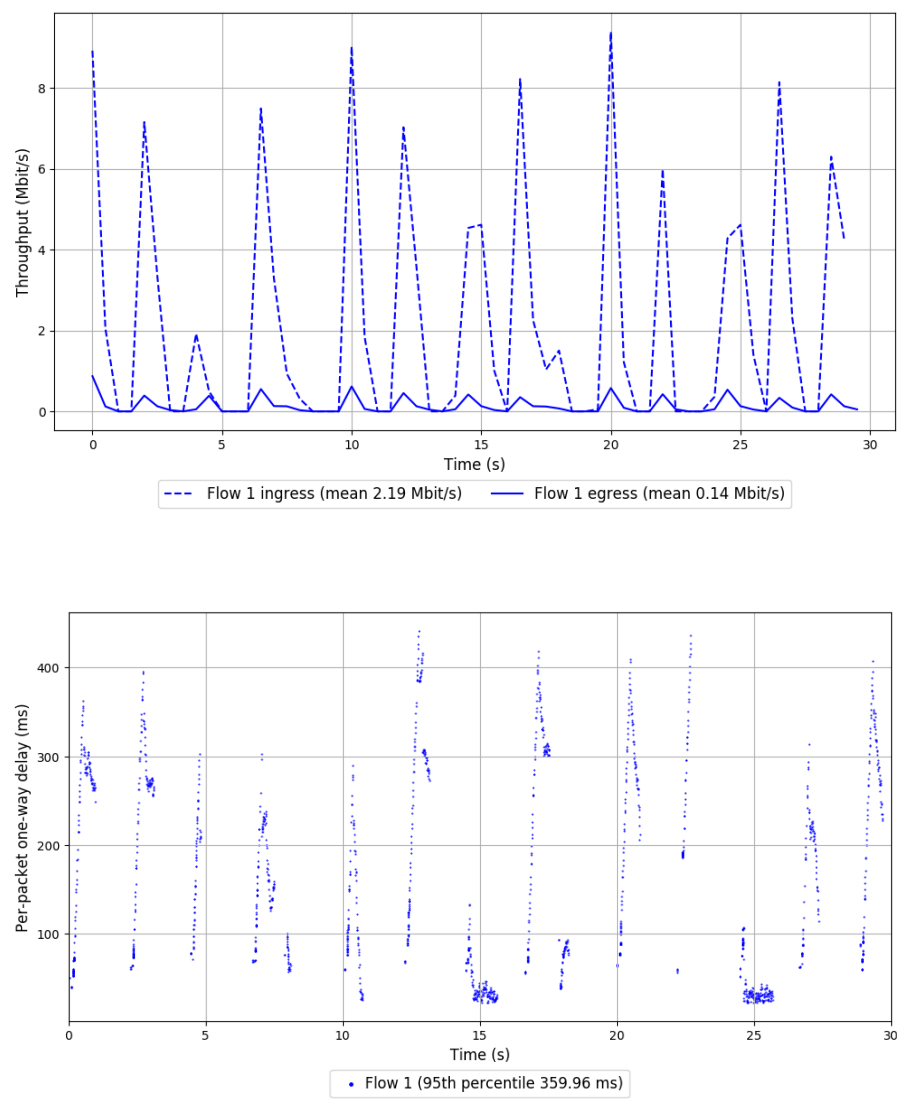


Run 2: Statistics of TaoVA-100x

Start at: 2018-03-05 18:27:45
End at: 2018-03-05 18:28:15
Local clock offset: -12.688 ms
Remote clock offset: 1.459 ms

Below is generated by plot.py at 2018-03-05 20:02:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 359.964 ms
Loss rate: 93.54%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 359.964 ms
Loss rate: 93.54%

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

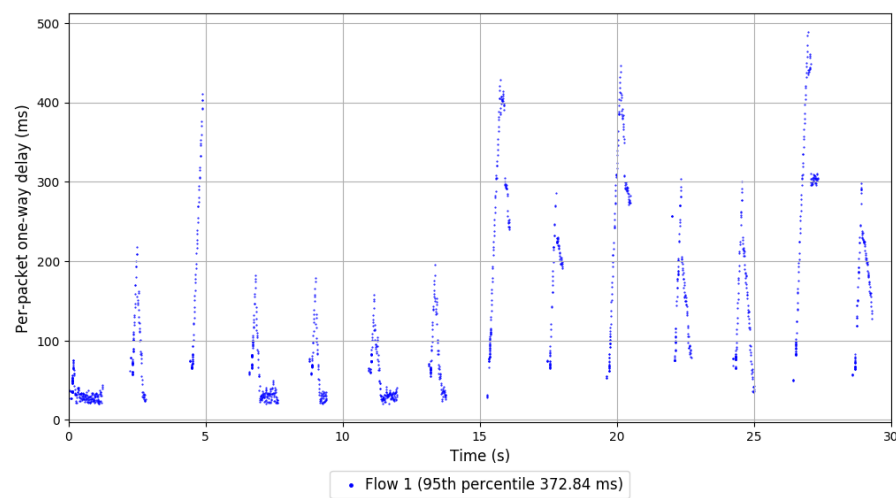
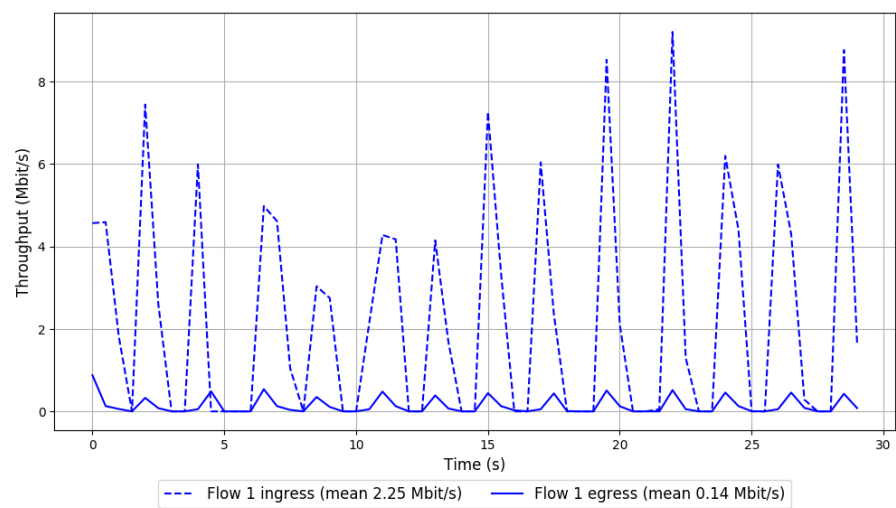


Run 3: Statistics of TaoVA-100x

Start at: 2018-03-05 18:51:13
End at: 2018-03-05 18:51:43
Local clock offset: -19.319 ms
Remote clock offset: 1.276 ms

Below is generated by plot.py at 2018-03-05 20:02:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 372.842 ms
Loss rate: 93.73%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 372.842 ms
Loss rate: 93.73%

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



Run 1: Statistics of TCP Vegas

Start at: 2018-03-05 17:48:34

End at: 2018-03-05 17:49:04

Local clock offset: -6.75 ms

Remote clock offset: 1.316 ms

Below is generated by plot.py at 2018-03-05 20:02:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 111.020 ms

Loss rate: 33.64%

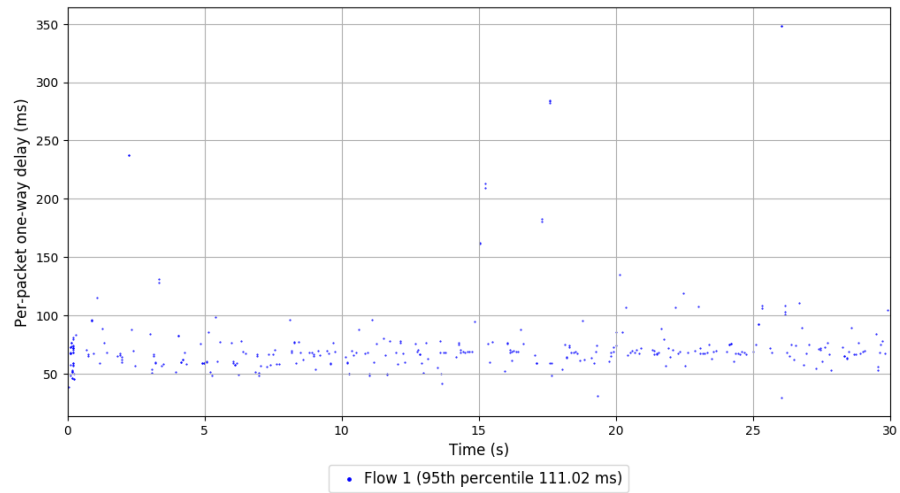
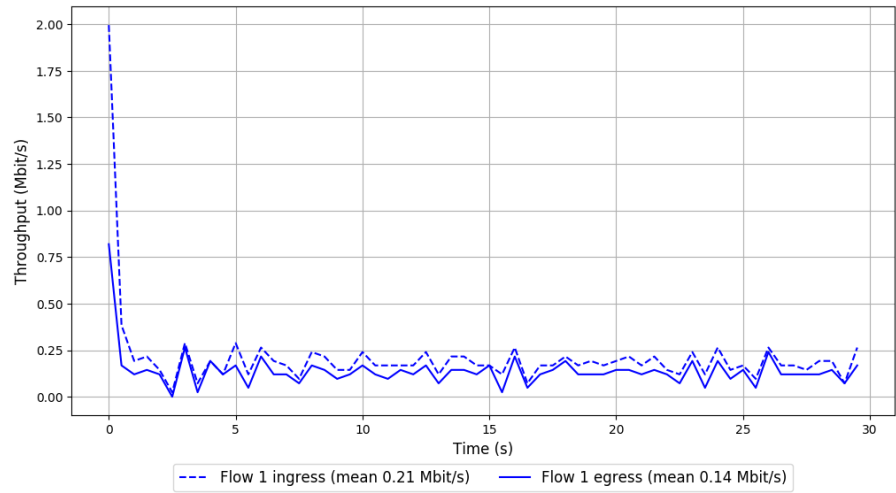
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 111.020 ms

Loss rate: 33.64%

Run 1: Report of TCP Vegas — Data Link

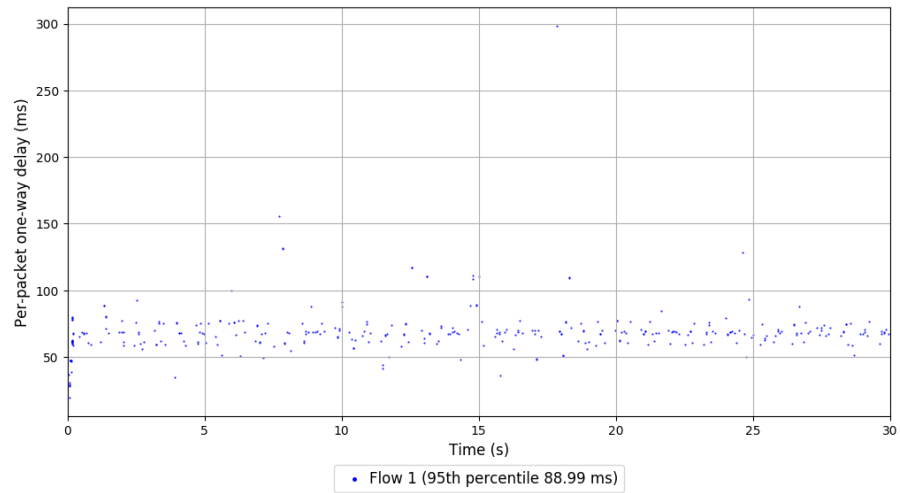
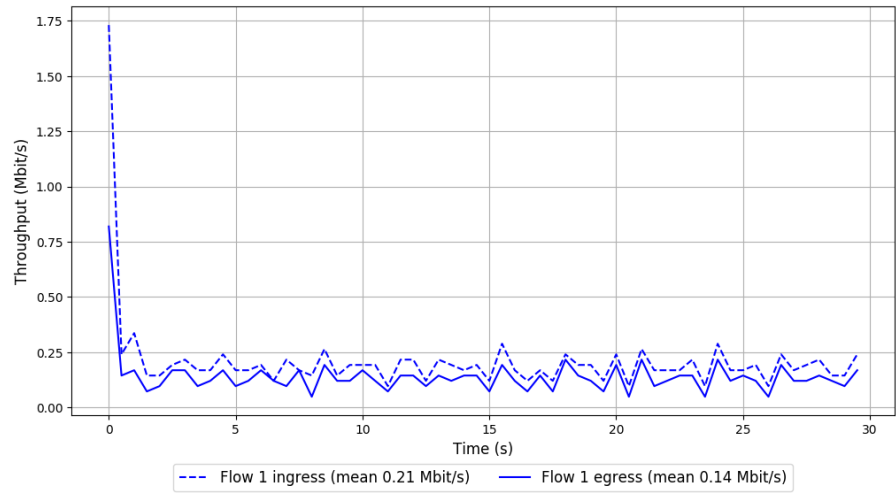


Run 2: Statistics of TCP Vegas

Start at: 2018-03-05 18:12:05
End at: 2018-03-05 18:12:35
Local clock offset: -13.927 ms
Remote clock offset: 1.471 ms

Below is generated by plot.py at 2018-03-05 20:02:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 88.994 ms
Loss rate: 33.07%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 88.994 ms
Loss rate: 33.07%

Run 2: Report of TCP Vegas — Data Link

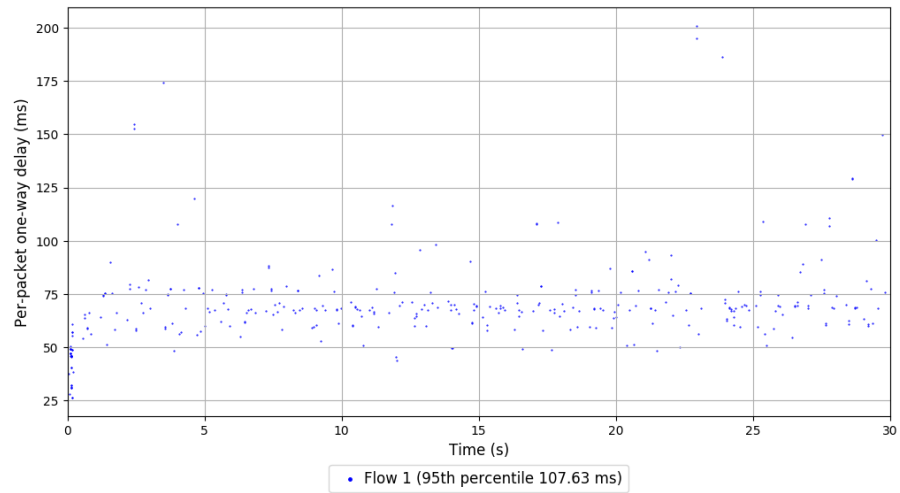
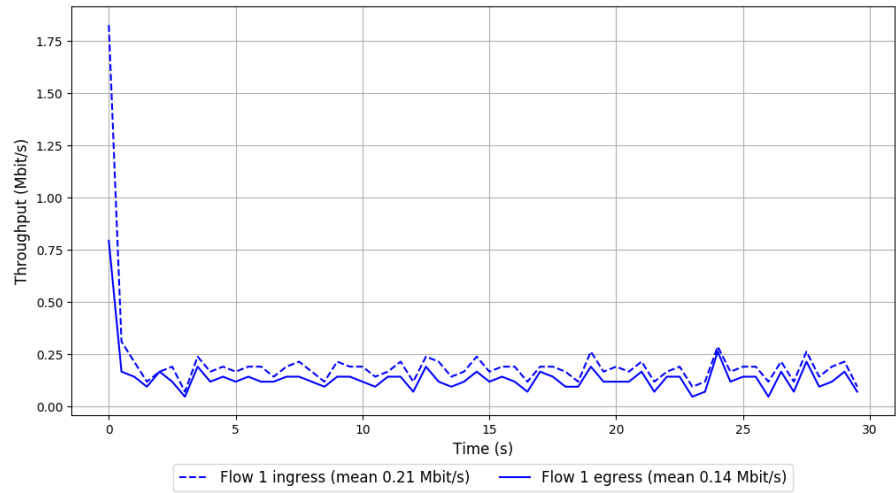


Run 3: Statistics of TCP Vegas

Start at: 2018-03-05 18:35:34
End at: 2018-03-05 18:36:04
Local clock offset: -15.918 ms
Remote clock offset: 1.343 ms

Below is generated by plot.py at 2018-03-05 20:02:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 107.633 ms
Loss rate: 32.68%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 107.633 ms
Loss rate: 32.68%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-03-05 17:42:03

End at: 2018-03-05 17:42:33

Local clock offset: -1.735 ms

Remote clock offset: 1.326 ms

Below is generated by plot.py at 2018-03-05 20:02:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 126.631 ms

Loss rate: 96.28%

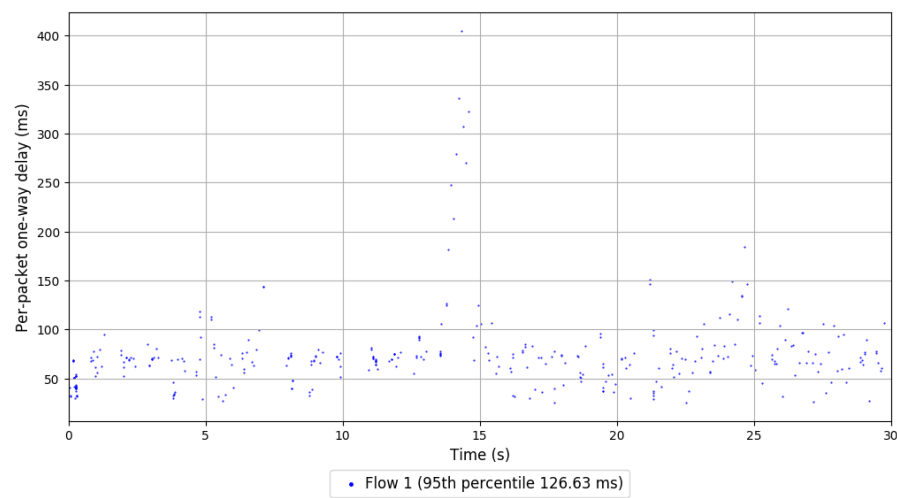
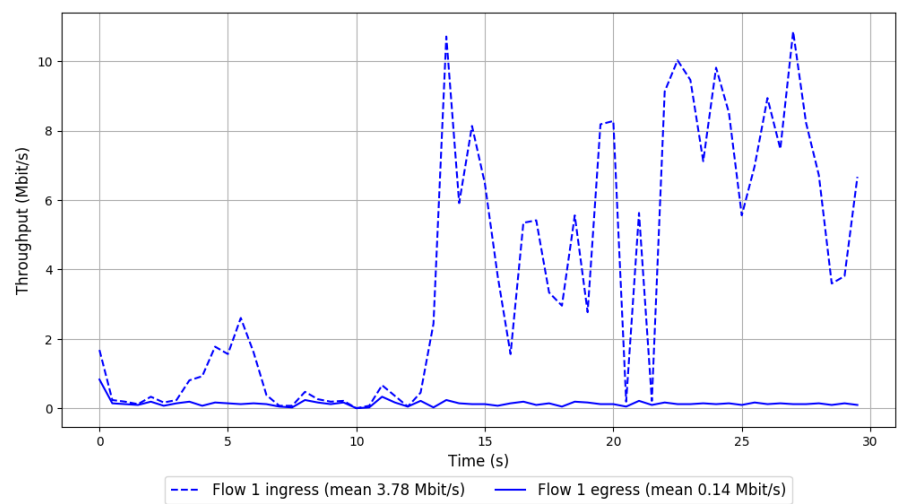
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 126.631 ms

Loss rate: 96.28%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2018-03-05 18:05:33

End at: 2018-03-05 18:06:03

Local clock offset: -9.389 ms

Remote clock offset: 1.427 ms

Below is generated by plot.py at 2018-03-05 20:02:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 178.496 ms

Loss rate: 90.87%

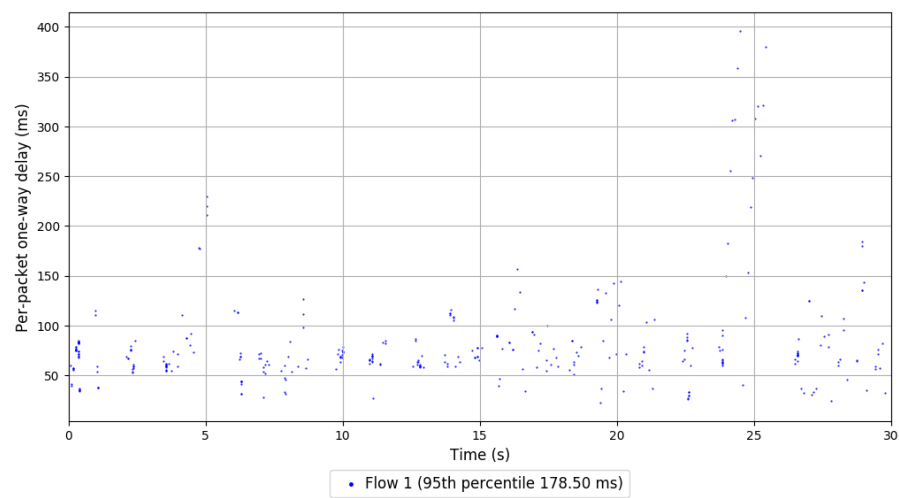
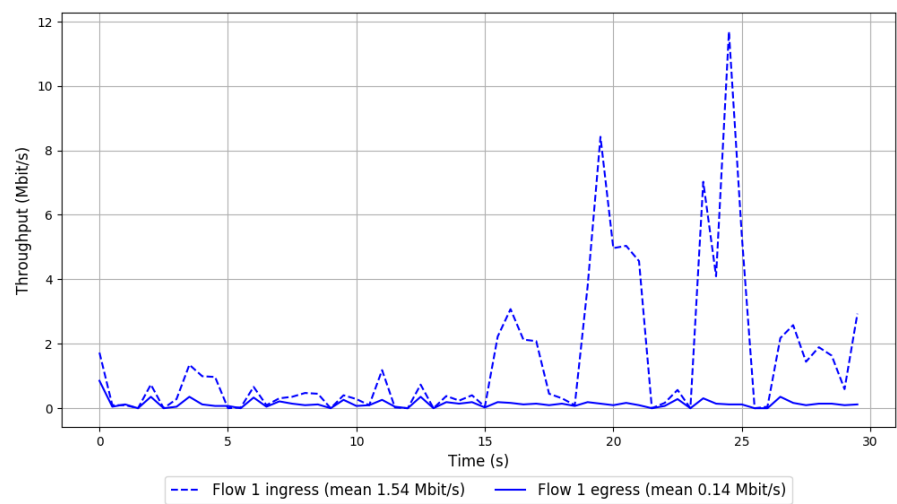
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 178.496 ms

Loss rate: 90.87%

Run 2: Report of Verus — Data Link

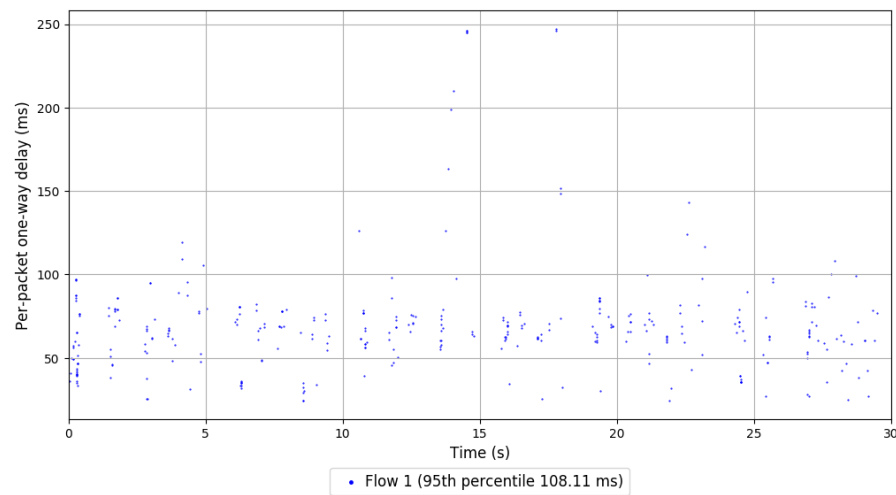
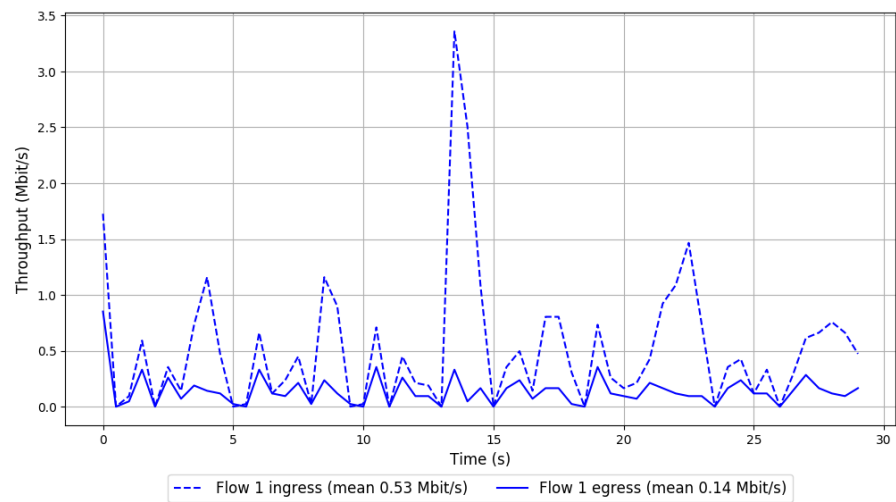


Run 3: Statistics of Verus

Start at: 2018-03-05 18:29:03
End at: 2018-03-05 18:29:33
Local clock offset: -13.065 ms
Remote clock offset: 1.424 ms

Below is generated by plot.py at 2018-03-05 20:02:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 108.108 ms
Loss rate: 73.21%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 108.108 ms
Loss rate: 73.21%

Run 3: Report of Verus — Data Link



Run 1: Statistics of Copa

Start at: 2018-03-05 18:00:20

End at: 2018-03-05 18:00:50

Local clock offset: -9.147 ms

Remote clock offset: 1.468 ms

Below is generated by plot.py at 2018-03-05 20:02:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 100.190 ms

Loss rate: 53.78%

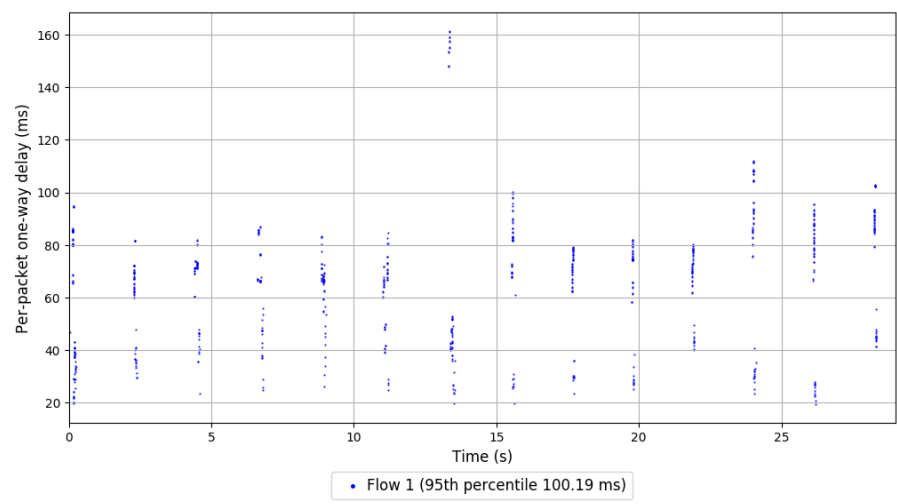
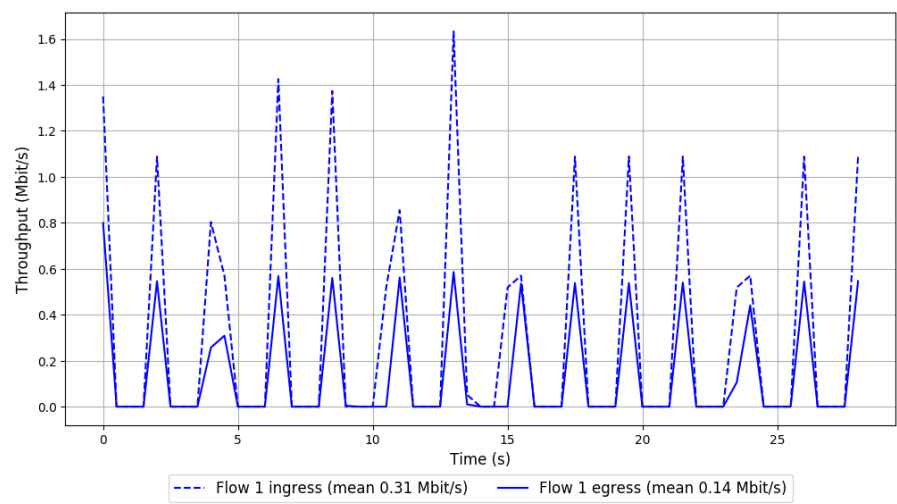
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 100.190 ms

Loss rate: 53.78%

Run 1: Report of Copa — Data Link

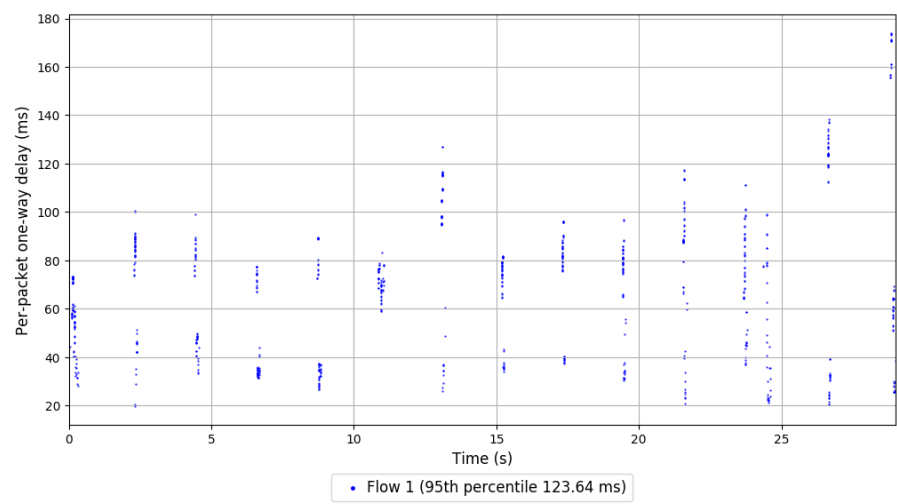
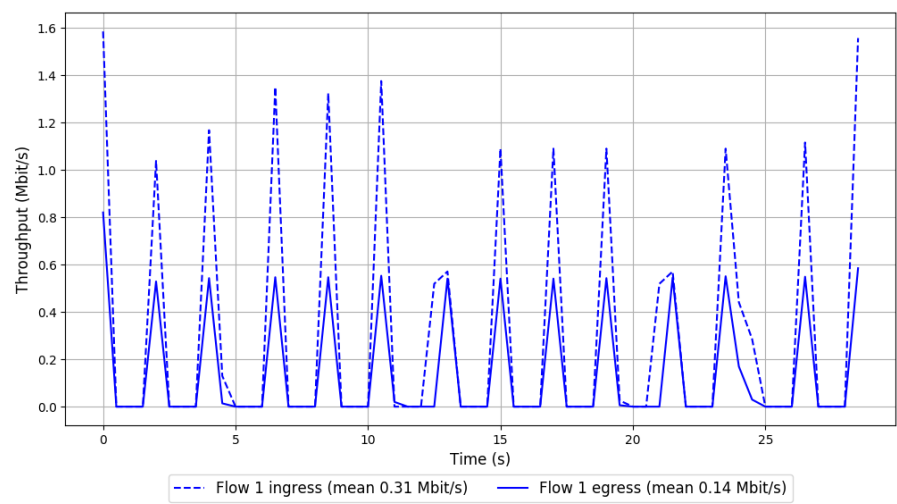


Run 2: Statistics of Copa

Start at: 2018-03-05 18:23:50
End at: 2018-03-05 18:24:20
Local clock offset: -12.151 ms
Remote clock offset: 1.533 ms

Below is generated by plot.py at 2018-03-05 20:02:38
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 123.637 ms
Loss rate: 54.43%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 123.637 ms
Loss rate: 54.43%

Run 2: Report of Copa — Data Link

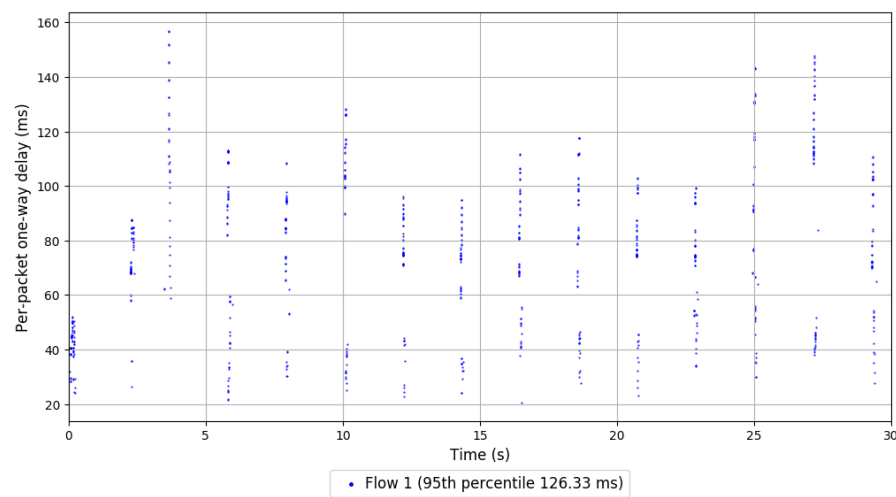
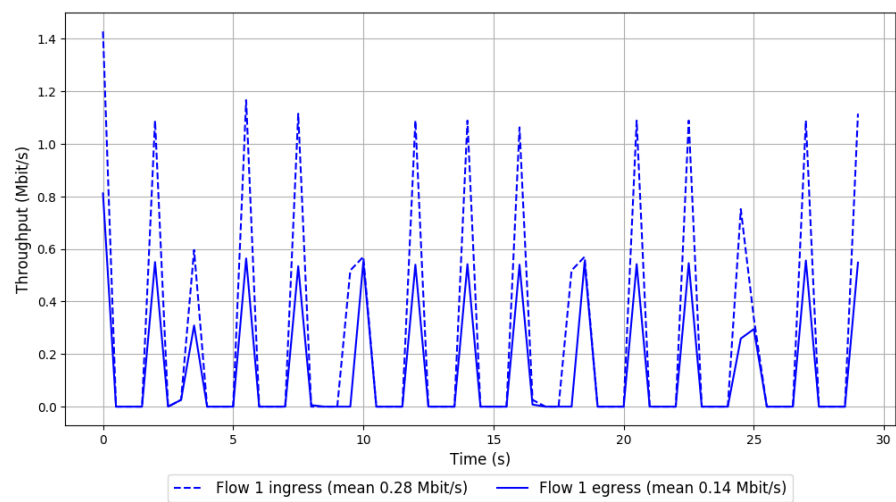


Run 3: Statistics of Copa

Start at: 2018-03-05 18:47:18
End at: 2018-03-05 18:47:48
Local clock offset: -22.553 ms
Remote clock offset: 1.242 ms

Below is generated by plot.py at 2018-03-05 20:02:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 126.328 ms
Loss rate: 49.31%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 126.328 ms
Loss rate: 49.31%

Run 3: Report of Copa — Data Link



Run 1: Statistics of FillP

Start at: 2018-03-05 17:55:06

End at: 2018-03-05 17:55:36

Local clock offset: -8.821 ms

Remote clock offset: 1.329 ms

Below is generated by plot.py at 2018-03-05 20:02:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 94.412 ms

Loss rate: 98.20%

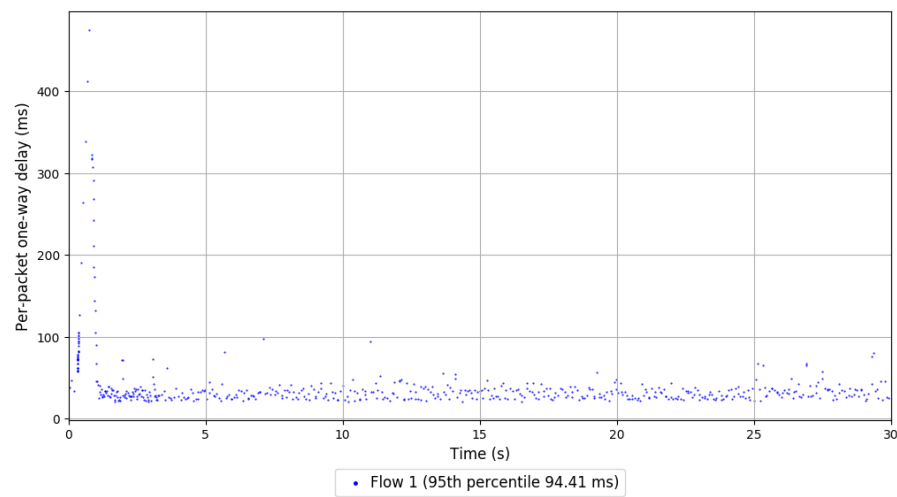
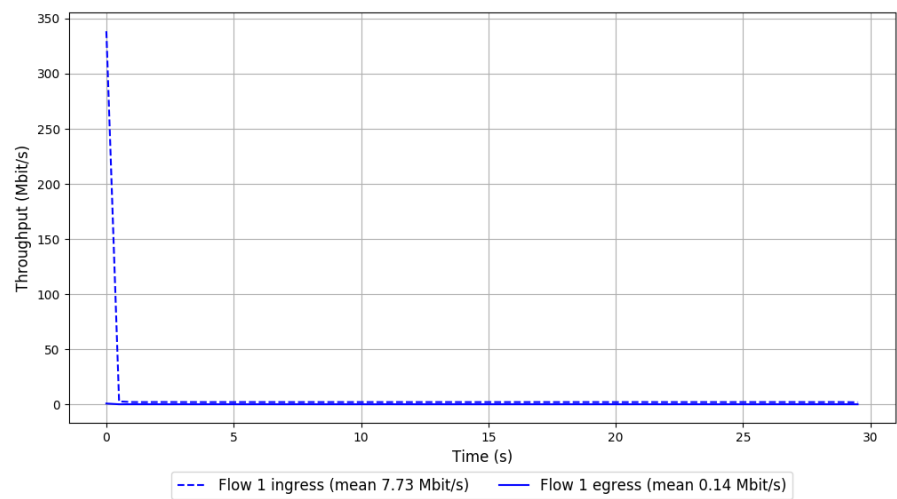
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 94.412 ms

Loss rate: 98.20%

Run 1: Report of FillP — Data Link

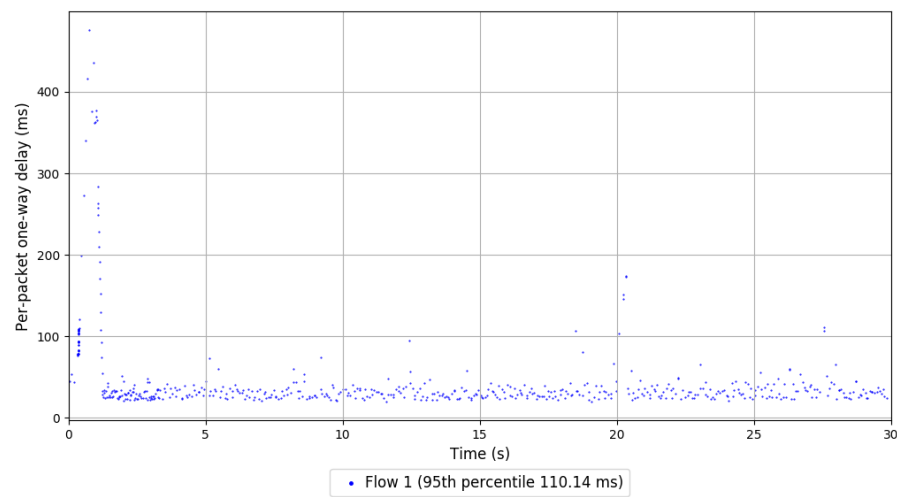
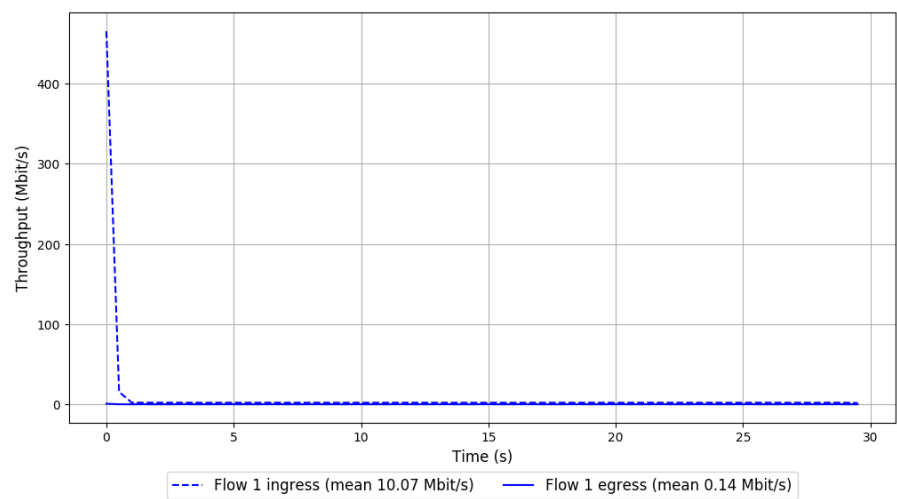


Run 2: Statistics of FillP

Start at: 2018-03-05 18:18:36
End at: 2018-03-05 18:19:06
Local clock offset: -13.143 ms
Remote clock offset: 1.606 ms

Below is generated by plot.py at 2018-03-05 20:02:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 110.142 ms
Loss rate: 98.62%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 110.142 ms
Loss rate: 98.62%

Run 2: Report of FillP — Data Link

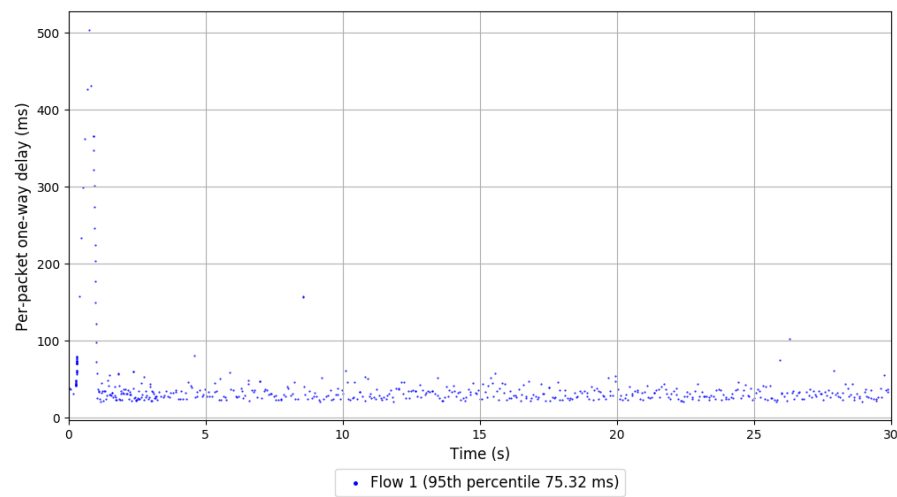
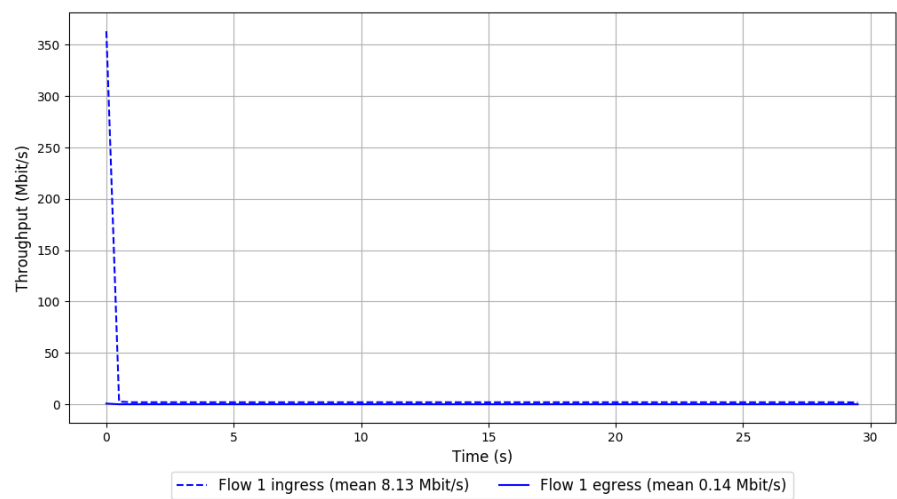


Run 3: Statistics of FillP

Start at: 2018-03-05 18:42:05
End at: 2018-03-05 18:42:35
Local clock offset: -19.422 ms
Remote clock offset: 1.288 ms

Below is generated by plot.py at 2018-03-05 20:02:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 75.322 ms
Loss rate: 98.29%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 75.322 ms
Loss rate: 98.29%

Run 3: Report of FillP — Data Link

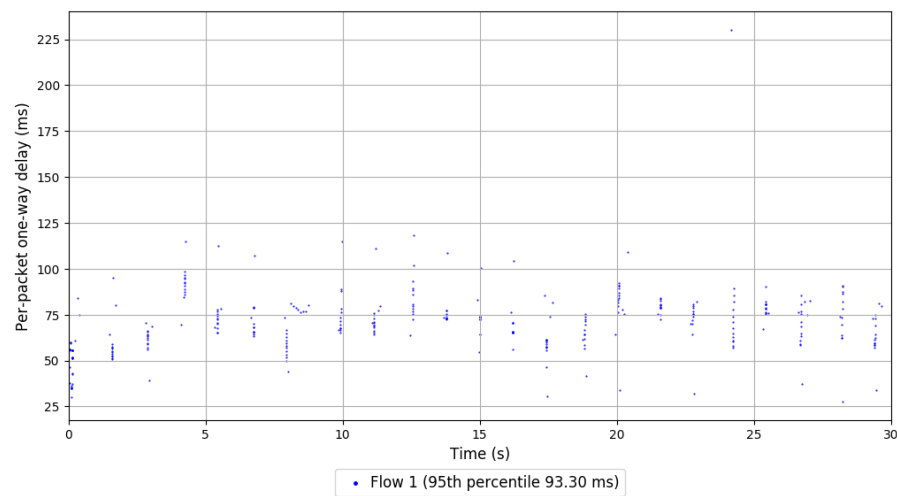
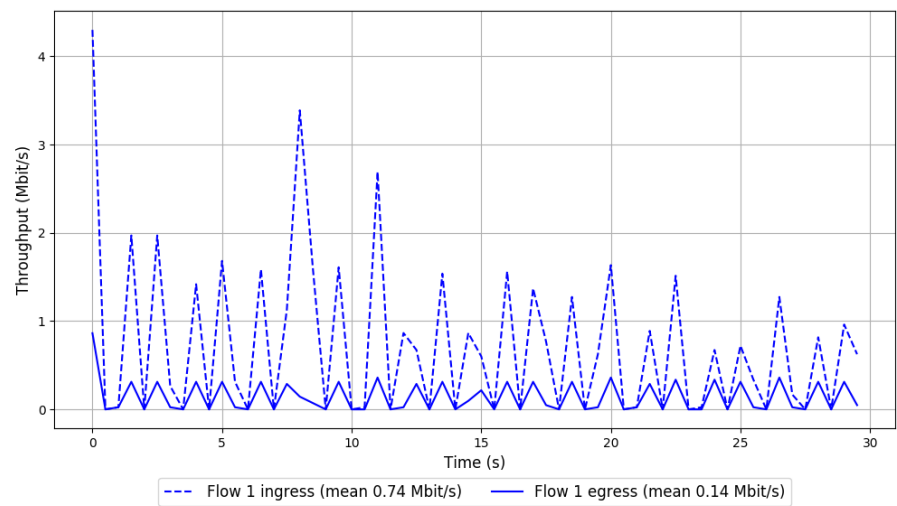


```
Run 1: Statistics of Indigo-1-32

Start at: 2018-03-05 17:56:25
End at: 2018-03-05 17:56:55
Local clock offset: -10.128 ms
Remote clock offset: 1.354 ms

# Below is generated by plot.py at 2018-03-05 20:02:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 93.298 ms
Loss rate: 80.90%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 93.298 ms
Loss rate: 80.90%
```

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

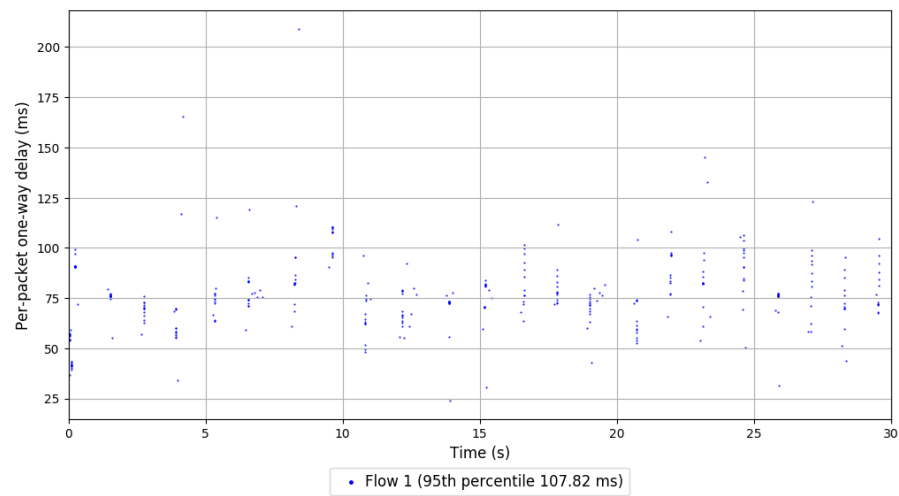
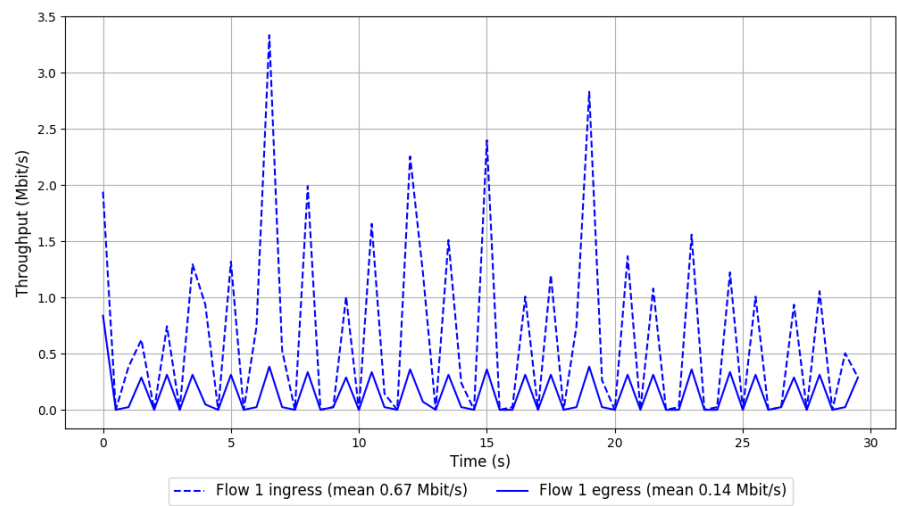


Run 2: Statistics of Indigo-1-32

Start at: 2018-03-05 18:19:55
End at: 2018-03-05 18:20:25
Local clock offset: -12.613 ms
Remote clock offset: 1.6 ms

Below is generated by plot.py at 2018-03-05 20:02:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 107.823 ms
Loss rate: 78.91%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 107.823 ms
Loss rate: 78.91%

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

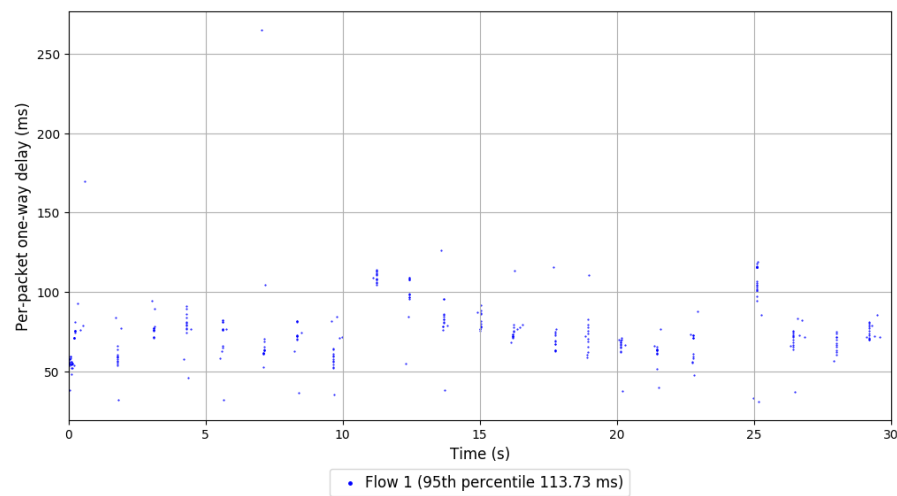
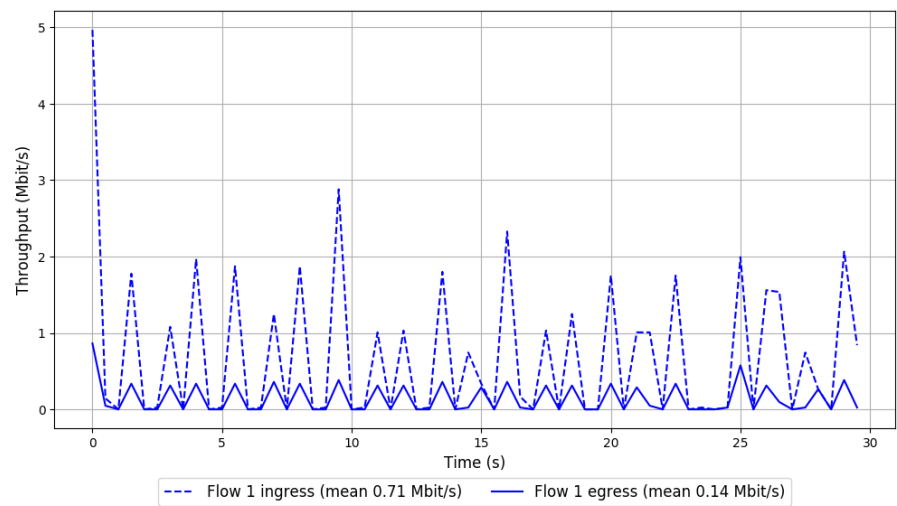


Run 3: Statistics of Indigo-1-32

Start at: 2018-03-05 18:43:23
End at: 2018-03-05 18:43:53
Local clock offset: -20.147 ms
Remote clock offset: 1.268 ms

Below is generated by plot.py at 2018-03-05 20:02:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 113.730 ms
Loss rate: 80.28%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 113.730 ms
Loss rate: 80.28%

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

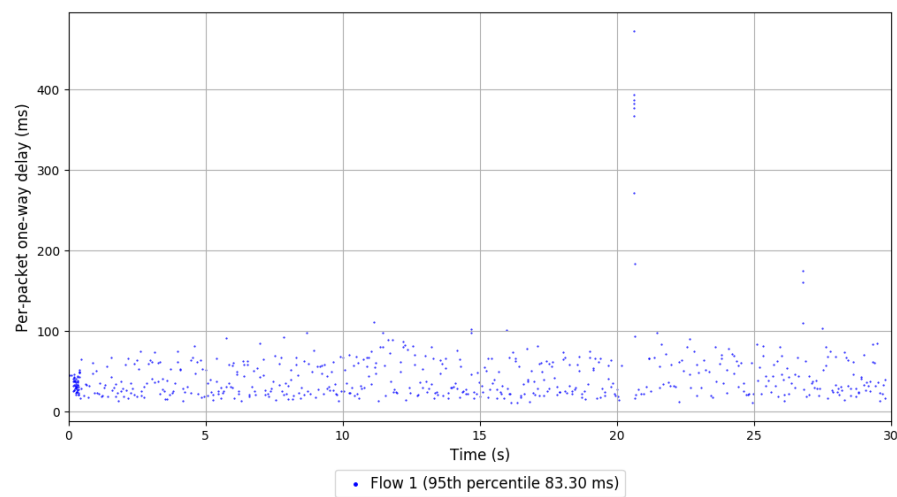
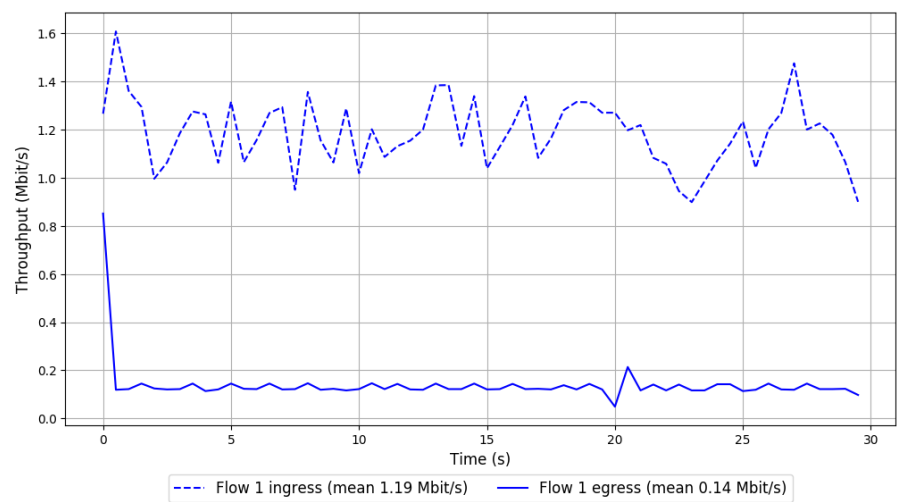


Run 1: Statistics of Vivace-latency

Start at: 2018-03-05 17:57:43
End at: 2018-03-05 17:58:13
Local clock offset: -11.632 ms
Remote clock offset: 1.382 ms

Below is generated by plot.py at 2018-03-05 20:02:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 83.296 ms
Loss rate: 88.26%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 83.296 ms
Loss rate: 88.26%

Run 1: Report of Vivace-latency — Data Link

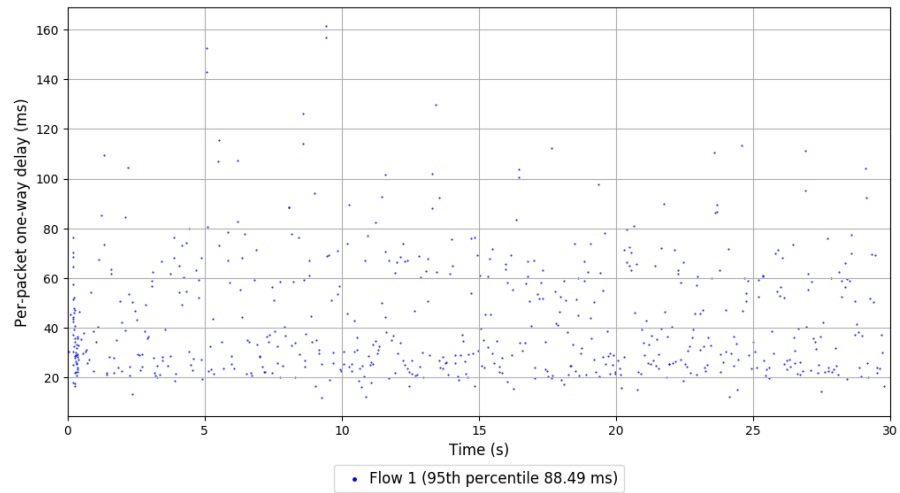
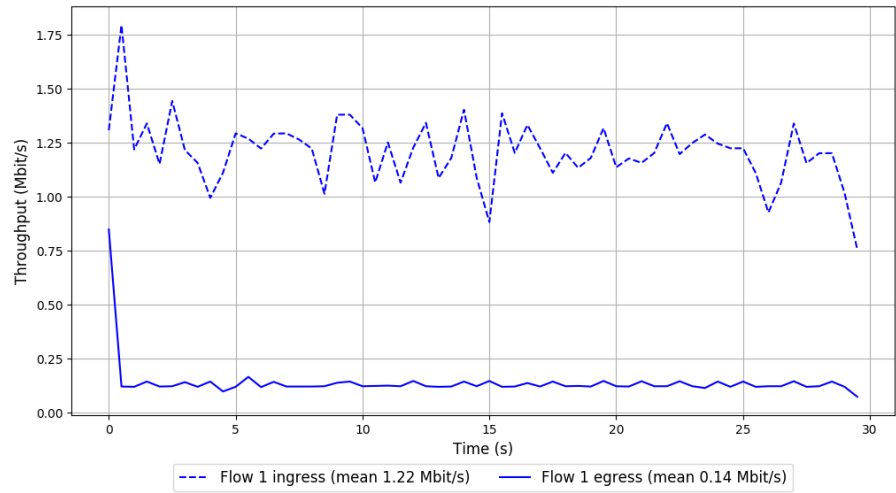


Run 2: Statistics of Vivace-latency

Start at: 2018-03-05 18:21:13
End at: 2018-03-05 18:21:43
Local clock offset: -12.237 ms
Remote clock offset: 1.501 ms

Below is generated by plot.py at 2018-03-05 20:02:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 88.490 ms
Loss rate: 88.51%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 88.490 ms
Loss rate: 88.51%

Run 2: Report of Vivace-latency — Data Link

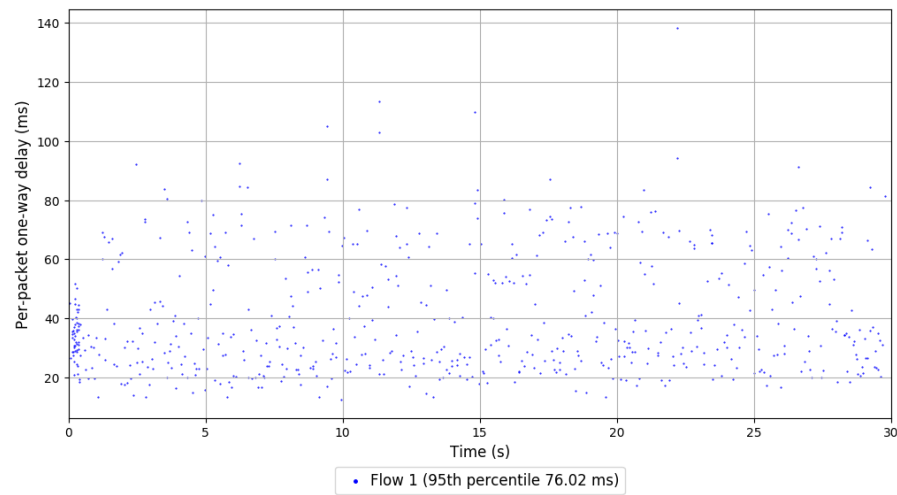
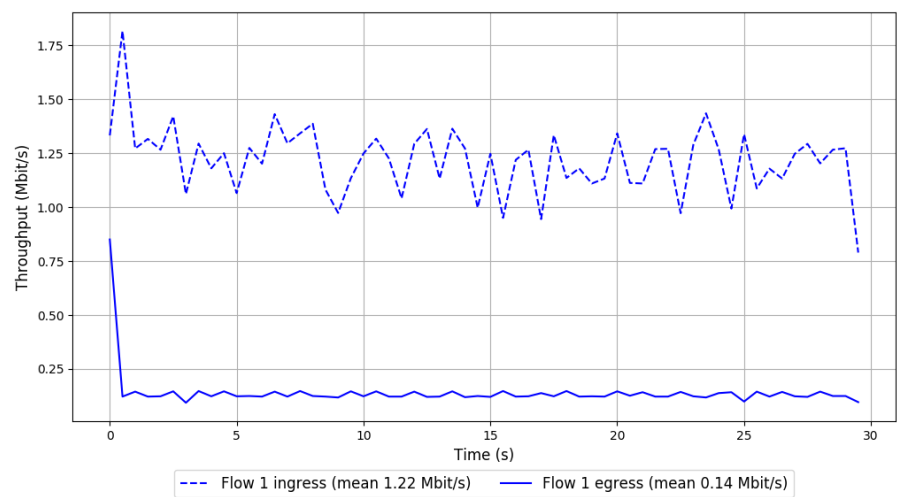


Run 3: Statistics of Vivace-latency

Start at: 2018-03-05 18:44:42
End at: 2018-03-05 18:45:12
Local clock offset: -20.944 ms
Remote clock offset: 1.261 ms

Below is generated by plot.py at 2018-03-05 20:02:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 76.016 ms
Loss rate: 88.54%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 76.016 ms
Loss rate: 88.54%

Run 3: Report of Vivace-latency — Data Link



Run 1: Statistics of Vivace-loss

Start at: 2018-03-05 17:45:57

End at: 2018-03-05 17:46:27

Local clock offset: -4.482 ms

Remote clock offset: 1.374 ms

Below is generated by plot.py at 2018-03-05 20:02:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 78.680 ms

Loss rate: 88.13%

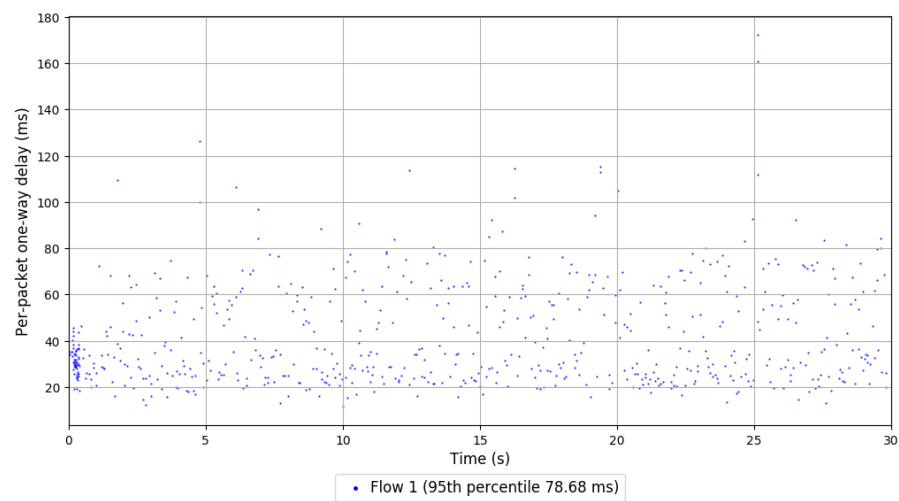
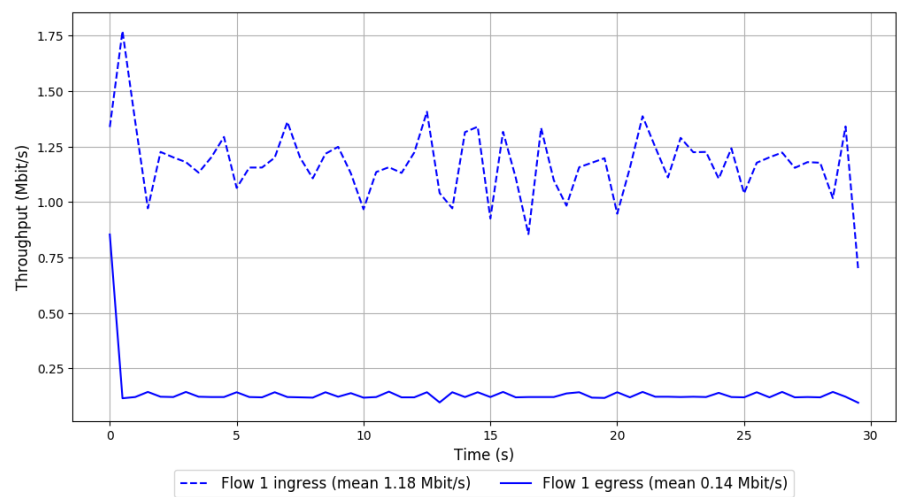
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 78.680 ms

Loss rate: 88.13%

Run 1: Report of Vivace-loss — Data Link

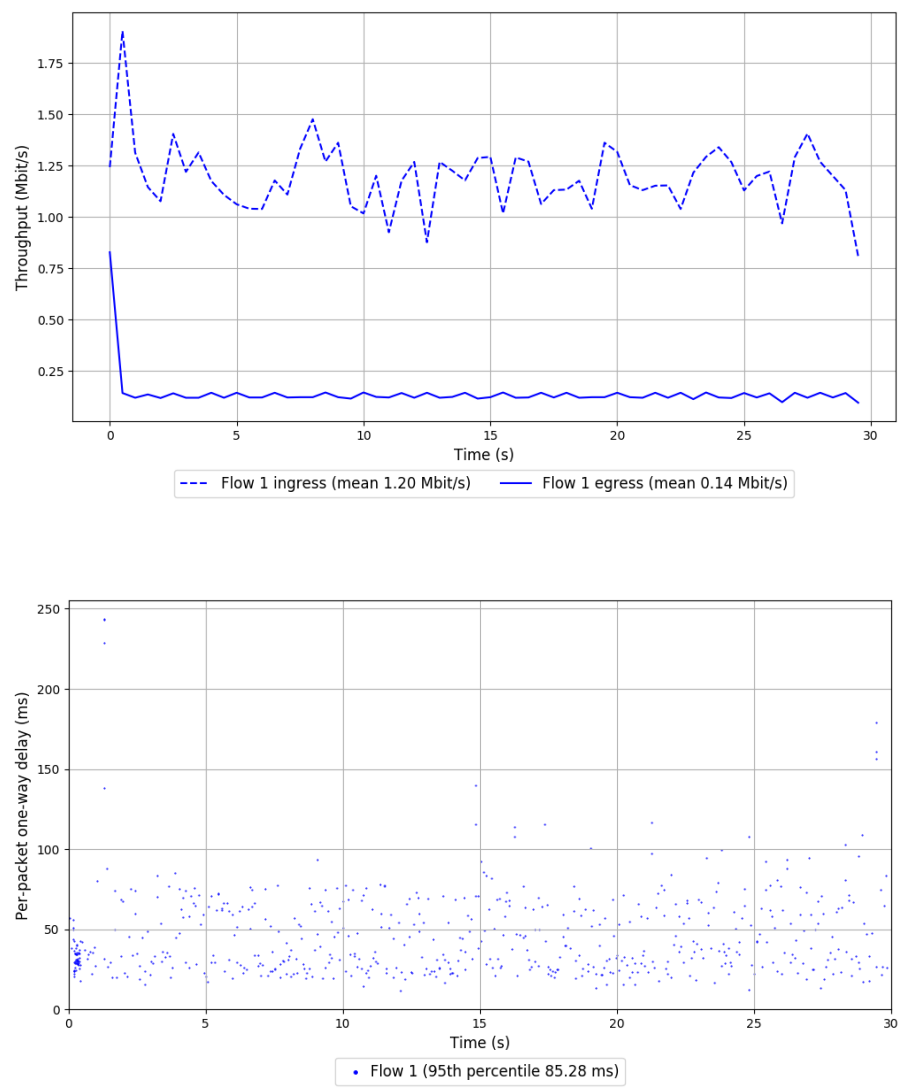


Run 2: Statistics of Vivace-loss

Start at: 2018-03-05 18:09:28
End at: 2018-03-05 18:09:58
Local clock offset: -11.884 ms
Remote clock offset: 1.458 ms

Below is generated by plot.py at 2018-03-05 20:02:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 85.278 ms
Loss rate: 88.34%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 85.278 ms
Loss rate: 88.34%

Run 2: Report of Vivace-loss — Data Link

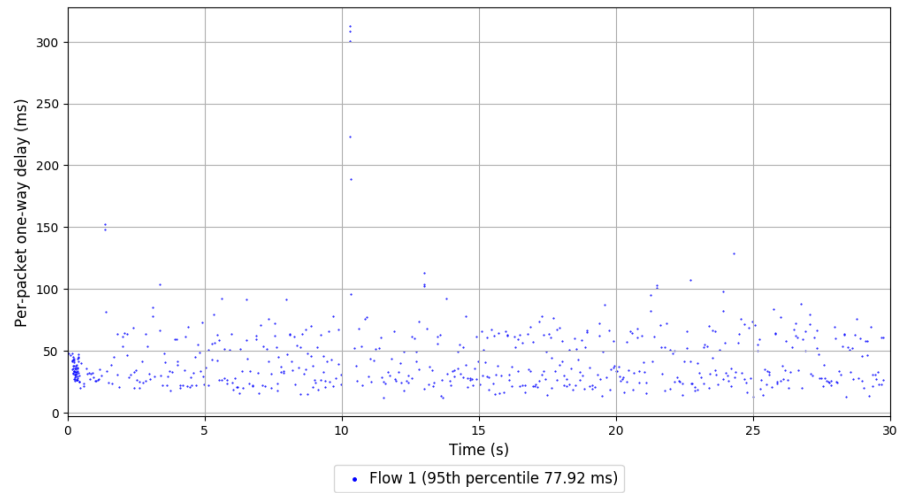
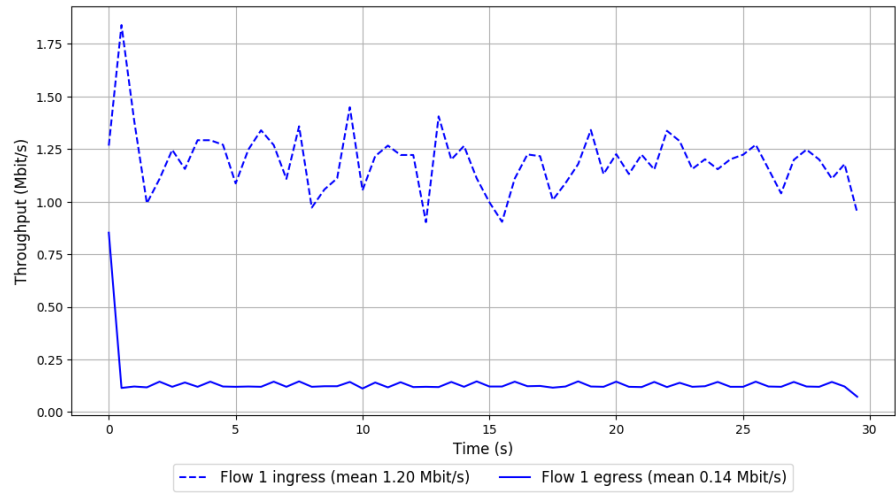


Run 3: Statistics of Vivace-loss

Start at: 2018-03-05 18:32:58
End at: 2018-03-05 18:33:28
Local clock offset: -14.642 ms
Remote clock offset: 1.362 ms

Below is generated by plot.py at 2018-03-05 20:02:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 77.925 ms
Loss rate: 88.34%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 77.925 ms
Loss rate: 88.34%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-03-05 17:49:52

End at: 2018-03-05 17:50:22

Local clock offset: -6.854 ms

Remote clock offset: 1.363 ms

Below is generated by plot.py at 2018-03-05 20:02:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 82.491 ms

Loss rate: 88.49%

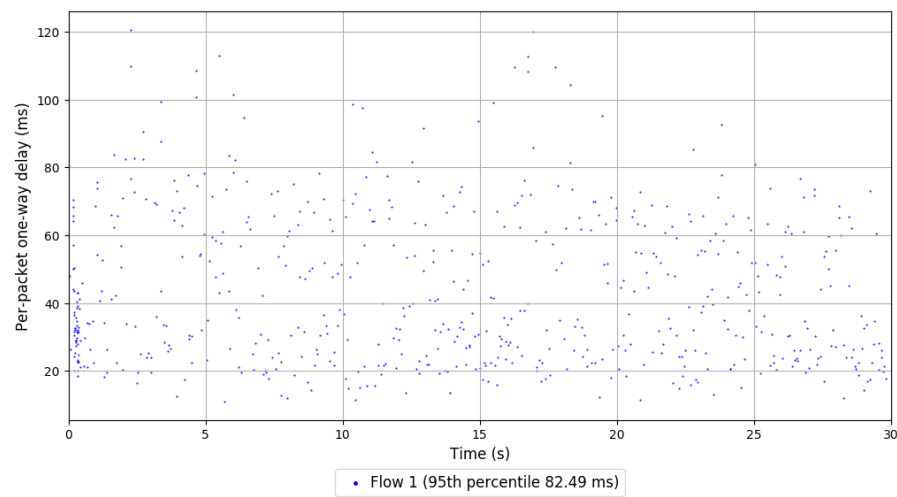
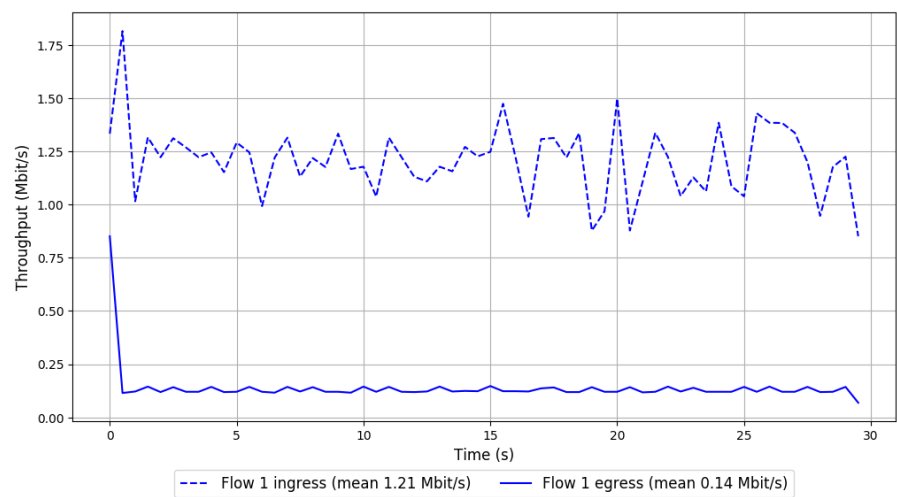
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 82.491 ms

Loss rate: 88.49%

Run 1: Report of Vivace-LTE — Data Link

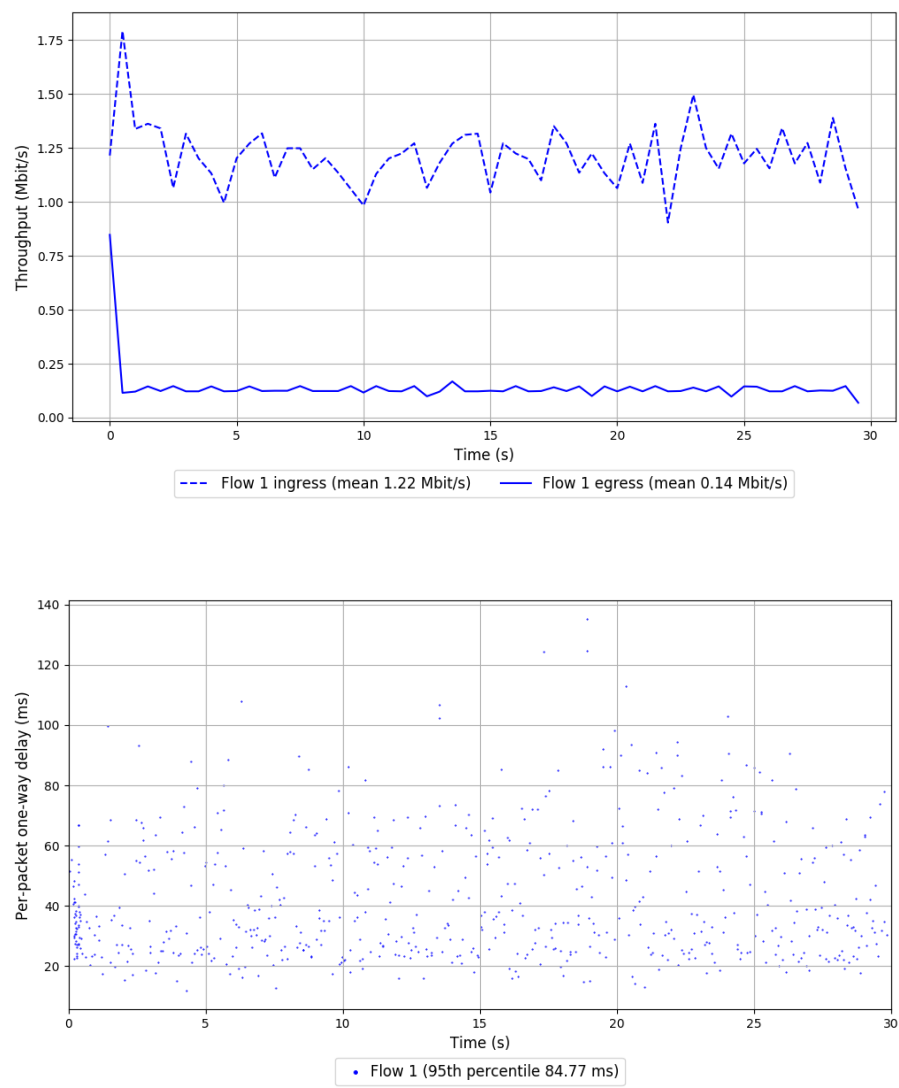


Run 2: Statistics of Vivace-LTE

Start at: 2018-03-05 18:13:23
End at: 2018-03-05 18:13:53
Local clock offset: -14.869 ms
Remote clock offset: 1.534 ms

Below is generated by plot.py at 2018-03-05 20:02:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 84.769 ms
Loss rate: 88.53%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 84.769 ms
Loss rate: 88.53%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-03-05 18:36:52
End at: 2018-03-05 18:37:22
Local clock offset: -16.539 ms
Remote clock offset: 1.391 ms

Below is generated by plot.py at 2018-03-05 20:02:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 76.849 ms
Loss rate: 88.08%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 76.849 ms
Loss rate: 88.08%

Run 3: Report of Vivace-LTE — Data Link

