

Pantheon Report

Generated at 2018-03-12 22:18:20 (UTC).

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

Repeated the test of 17 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

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

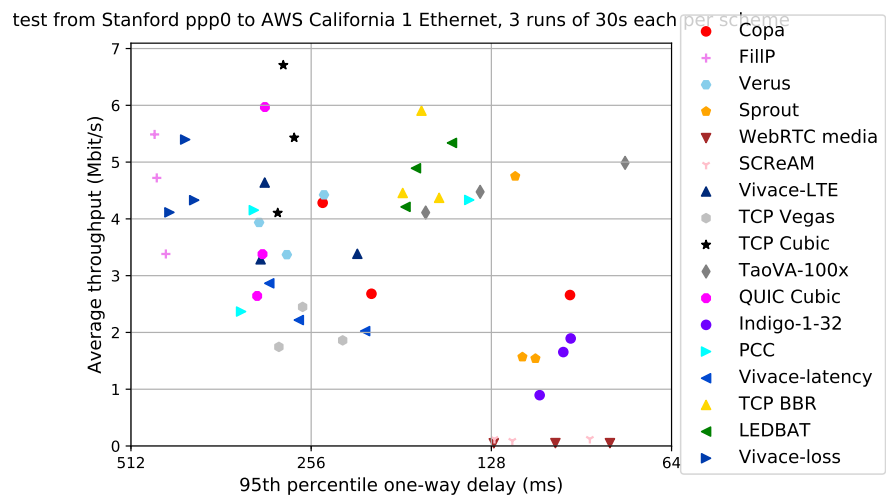
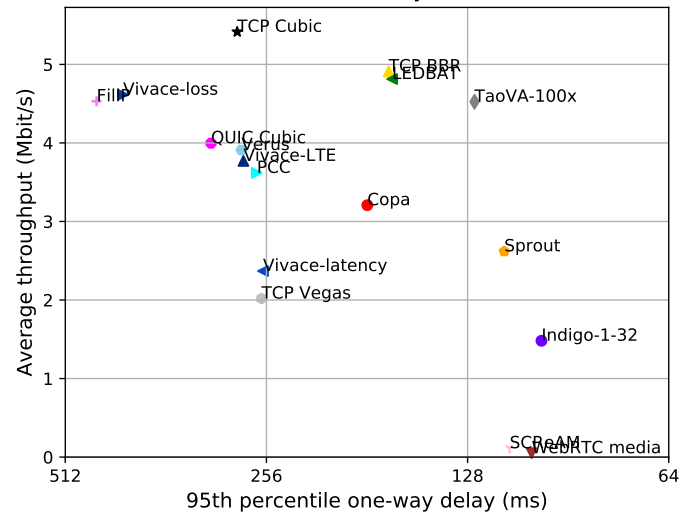
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

Git summary:

```
branch: master @ f12c42a2c63fdd9a862eefa0468859bf379b6623
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 828bbf95fd4941149b5cec90f281d1c69ae1a5c6
third_party/genericCC @ 9249eea3238475c4d8cca1443d28df70bff6c4a2
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eae30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/vivace @ 7a4ba531e75b4a6f66f5c4580192120401784ce3
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

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



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	4.91	167.99	0.38
TCP Cubic	3	5.42	283.13	1.37
LEDBAT	3	4.81	166.04	0.59
PCC	3	3.62	264.57	17.04
QUIC Cubic	3	4.00	309.87	3.21
SCReAM	3	0.11	110.73	0.90
WebRTC media	3	0.05	102.66	0.27
Sprout	3	2.62	112.80	1.19
TaoVA-100x	3	4.53	124.99	0.58
TCP Vegas	3	2.02	260.39	1.08
Verus	3	3.91	279.18	3.99
Copa	3	3.21	180.84	0.45
FillP	3	4.53	459.60	66.11
Indigo-1-32	3	1.48	99.23	0.63
Vivace-latency	3	2.37	259.08	0.62
Vivace-loss	3	4.61	419.53	22.98
Vivace-LTE	3	3.77	277.12	4.14

Run 1: Statistics of TCP BBR

Start at: 2018-03-12 20:06:58

End at: 2018-03-12 20:07:28

Local clock offset: 3.466 ms

Remote clock offset: -5.249 ms

Below is generated by plot.py at 2018-03-12 22:17:32

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.46 Mbit/s

95th percentile per-packet one-way delay: 180.017 ms

Loss rate: 0.16%

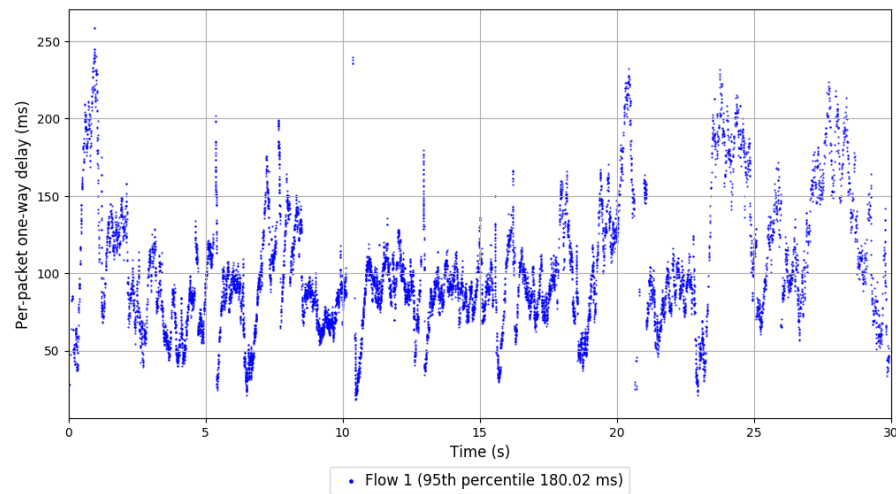
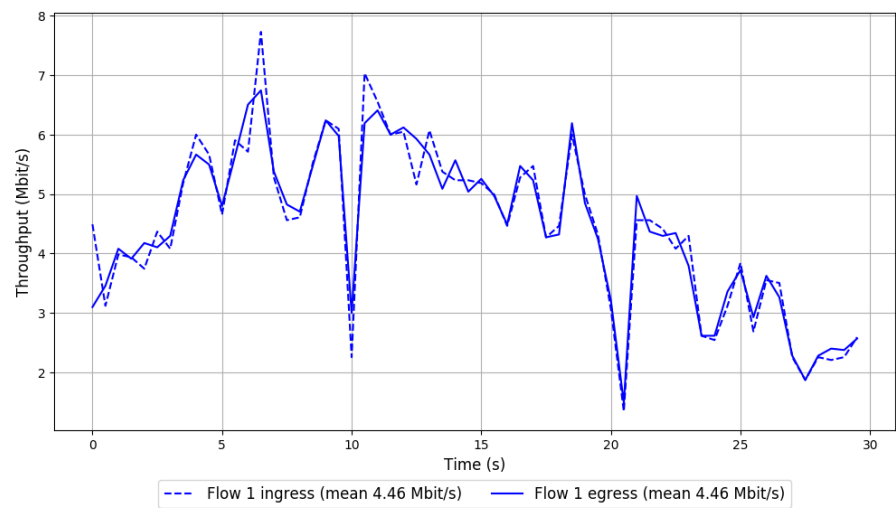
-- Flow 1:

Average throughput: 4.46 Mbit/s

95th percentile per-packet one-way delay: 180.017 ms

Loss rate: 0.16%

Run 1: Report of TCP BBR — Data Link

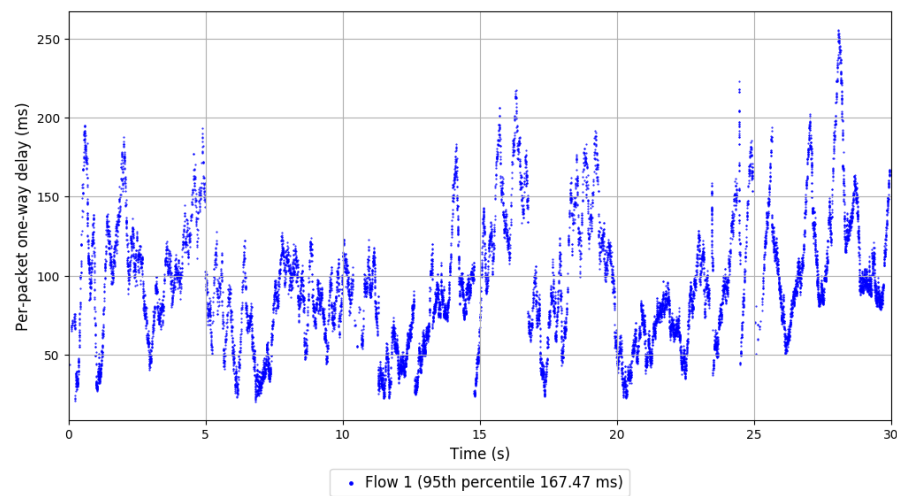
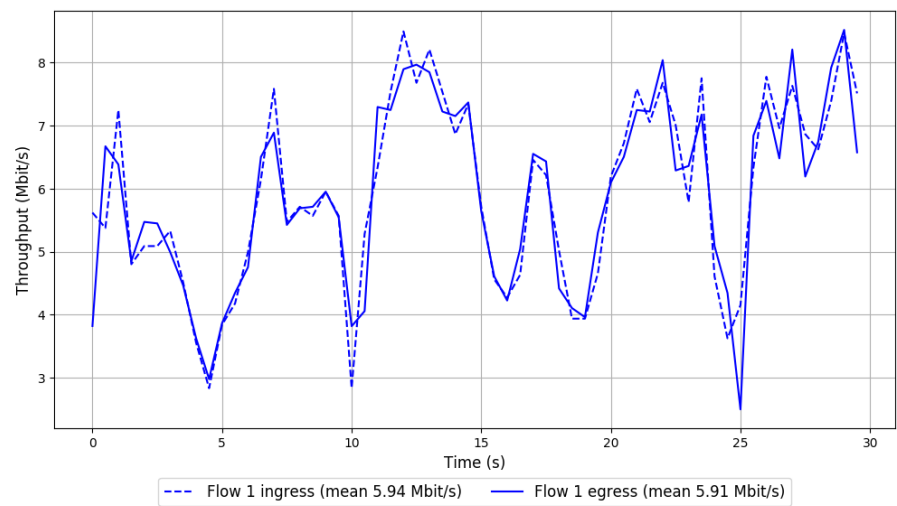


Run 2: Statistics of TCP BBR

Start at: 2018-03-12 20:30:29
End at: 2018-03-12 20:30:59
Local clock offset: 7.034 ms
Remote clock offset: -5.082 ms

Below is generated by plot.py at 2018-03-12 22:17:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.91 Mbit/s
95th percentile per-packet one-way delay: 167.468 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 5.91 Mbit/s
95th percentile per-packet one-way delay: 167.468 ms
Loss rate: 0.68%

Run 2: Report of TCP BBR — Data Link

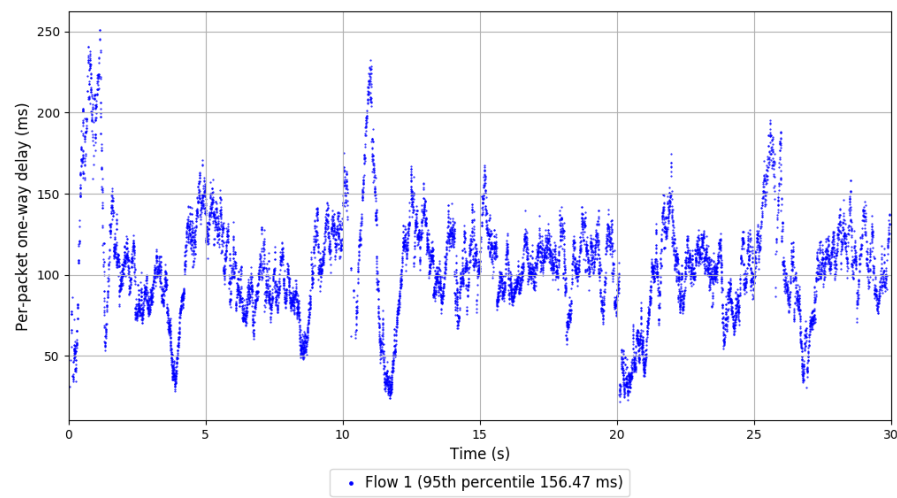
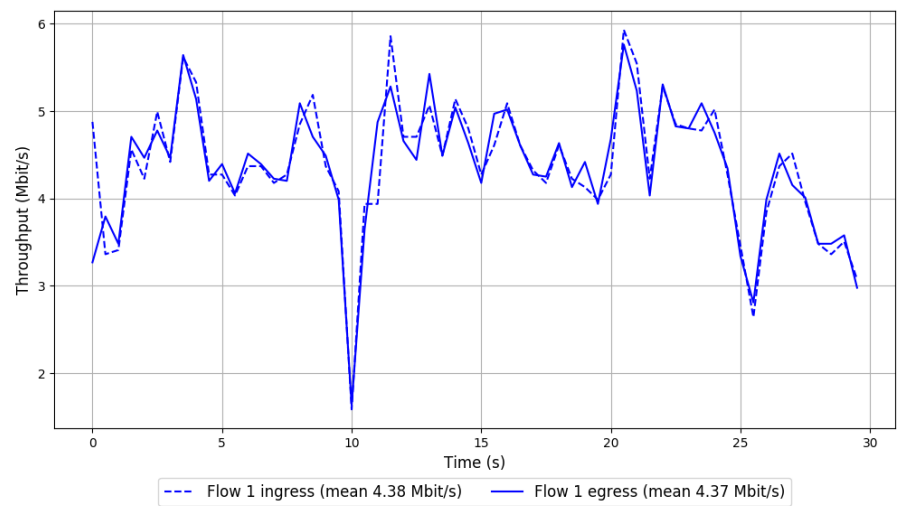


Run 3: Statistics of TCP BBR

Start at: 2018-03-12 20:54:01
End at: 2018-03-12 20:54:31
Local clock offset: 12.827 ms
Remote clock offset: -6.418 ms

Below is generated by plot.py at 2018-03-12 22:17:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.37 Mbit/s
95th percentile per-packet one-way delay: 156.473 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 4.37 Mbit/s
95th percentile per-packet one-way delay: 156.473 ms
Loss rate: 0.30%

Run 3: Report of TCP BBR — Data Link

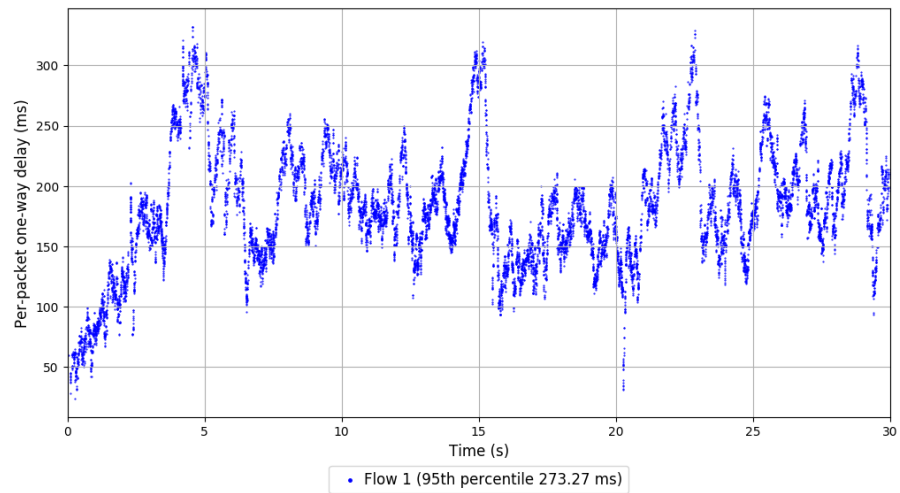
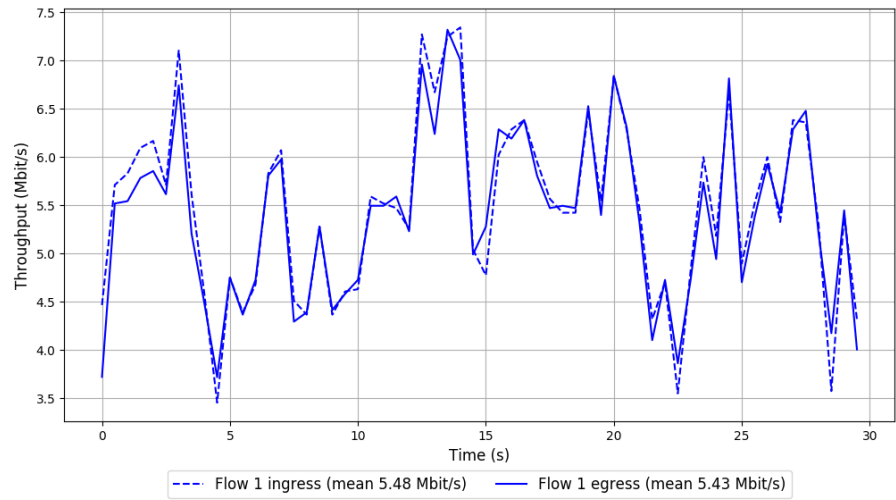


Run 1: Statistics of TCP Cubic

Start at: 2018-03-12 20:01:44
End at: 2018-03-12 20:02:14
Local clock offset: 3.333 ms
Remote clock offset: -5.197 ms

Below is generated by plot.py at 2018-03-12 22:17:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.43 Mbit/s
95th percentile per-packet one-way delay: 273.267 ms
Loss rate: 1.17%
-- Flow 1:
Average throughput: 5.43 Mbit/s
95th percentile per-packet one-way delay: 273.267 ms
Loss rate: 1.17%

Run 1: Report of TCP Cubic — Data Link

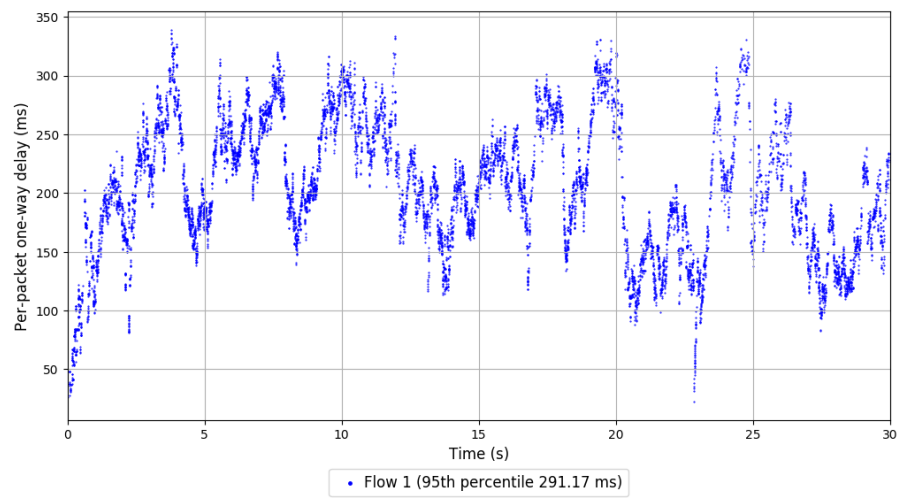
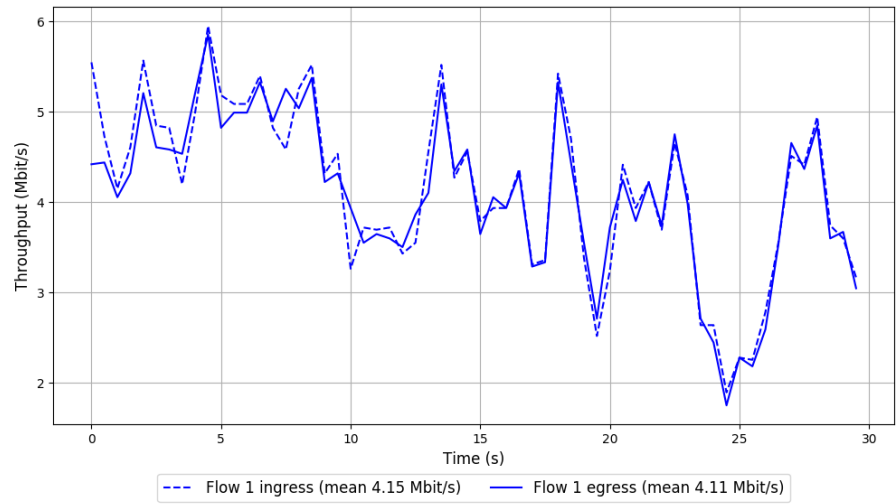


Run 2: Statistics of TCP Cubic

Start at: 2018-03-12 20:25:16
End at: 2018-03-12 20:25:46
Local clock offset: 5.878 ms
Remote clock offset: -5.027 ms

Below is generated by plot.py at 2018-03-12 22:17:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.11 Mbit/s
95th percentile per-packet one-way delay: 291.169 ms
Loss rate: 1.30%
-- Flow 1:
Average throughput: 4.11 Mbit/s
95th percentile per-packet one-way delay: 291.169 ms
Loss rate: 1.30%

Run 2: Report of TCP Cubic — Data Link

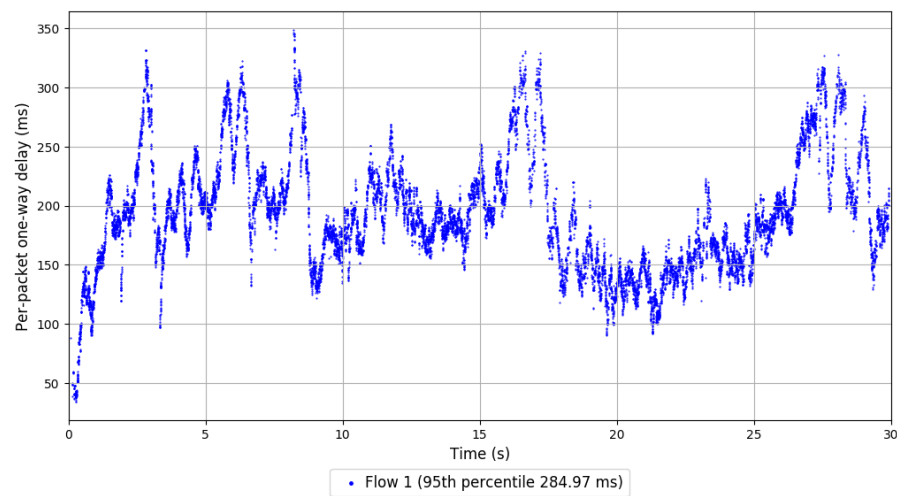
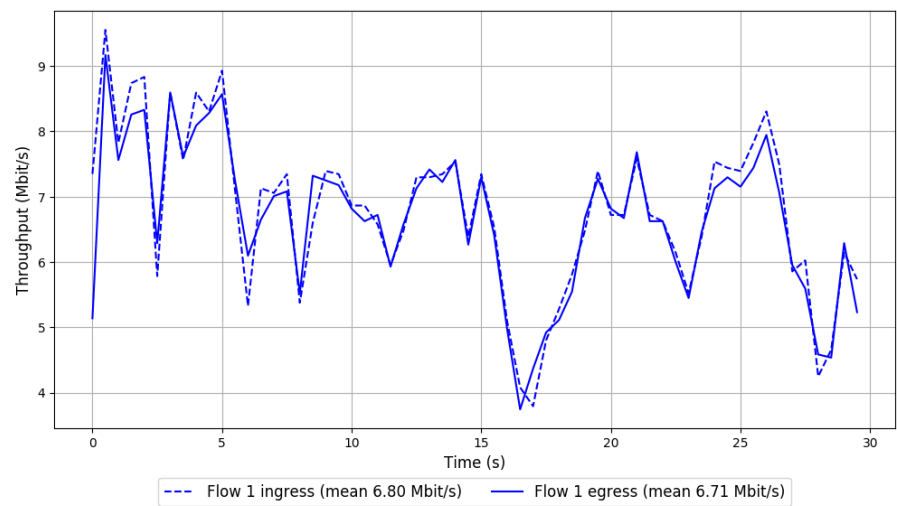


Run 3: Statistics of TCP Cubic

Start at: 2018-03-12 20:48:47
End at: 2018-03-12 20:49:17
Local clock offset: 11.325 ms
Remote clock offset: -6.196 ms

Below is generated by plot.py at 2018-03-12 22:17:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.71 Mbit/s
95th percentile per-packet one-way delay: 284.969 ms
Loss rate: 1.64%
-- Flow 1:
Average throughput: 6.71 Mbit/s
95th percentile per-packet one-way delay: 284.969 ms
Loss rate: 1.64%

Run 3: Report of TCP Cubic — Data Link

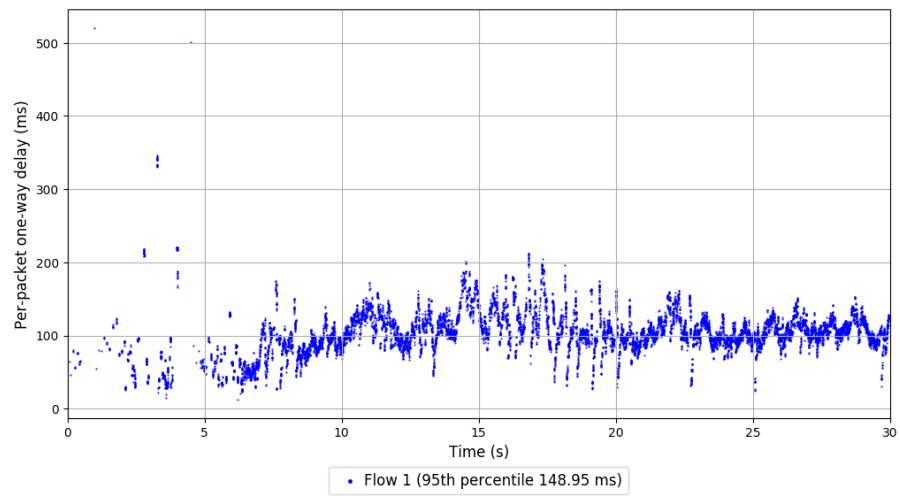
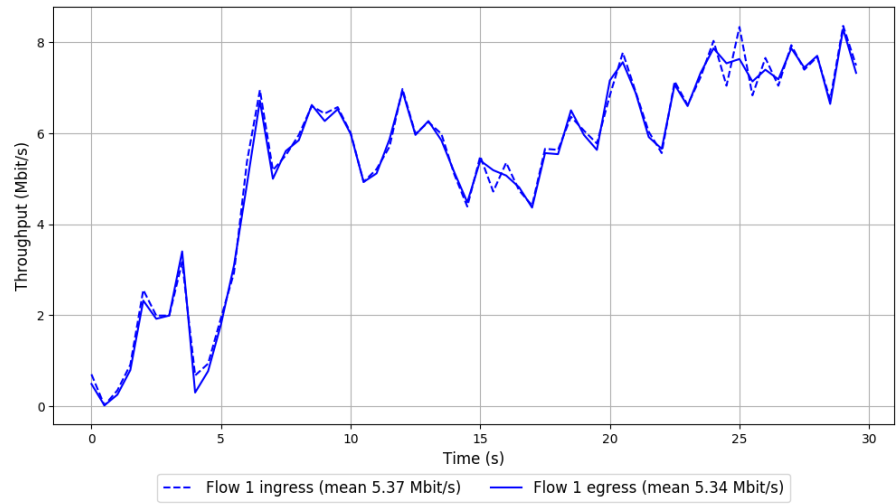


```
Run 1: Statistics of LEDBAT

Start at: 2018-03-12 20:08:17
End at: 2018-03-12 20:08:47
Local clock offset: 3.913 ms
Remote clock offset: -5.246 ms

# Below is generated by plot.py at 2018-03-12 22:17:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.34 Mbit/s
95th percentile per-packet one-way delay: 148.950 ms
Loss rate: 0.85%
-- Flow 1:
Average throughput: 5.34 Mbit/s
95th percentile per-packet one-way delay: 148.950 ms
Loss rate: 0.85%
```

Run 1: Report of LEDBAT — Data Link

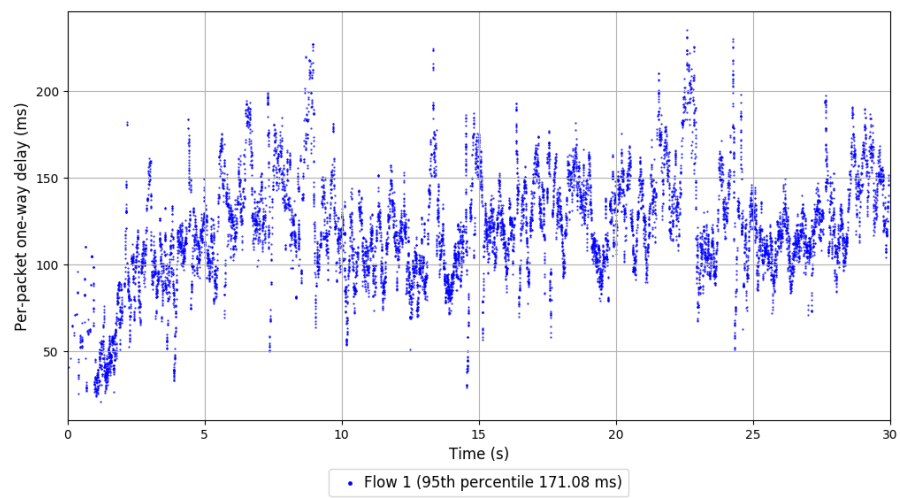
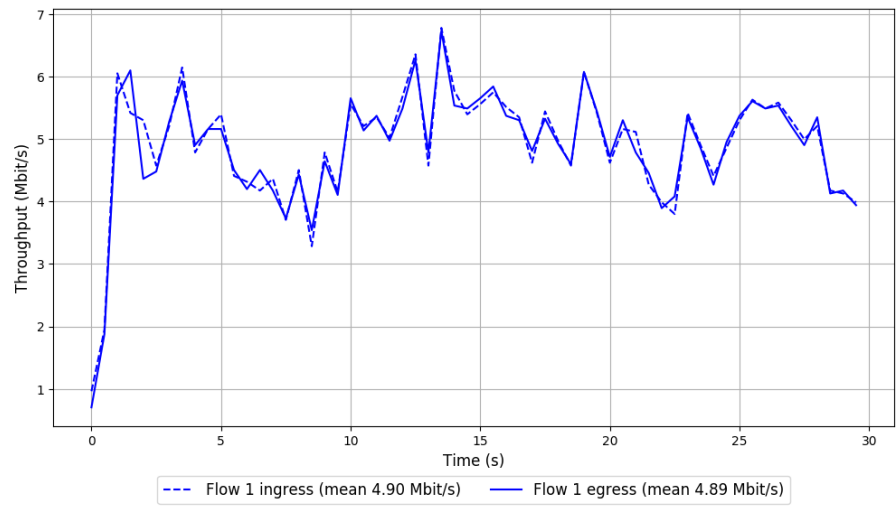


Run 2: Statistics of LEDBAT

Start at: 2018-03-12 20:31:48
End at: 2018-03-12 20:32:18
Local clock offset: 7.258 ms
Remote clock offset: -5.058 ms

Below is generated by plot.py at 2018-03-12 22:17:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.89 Mbit/s
95th percentile per-packet one-way delay: 171.083 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 4.89 Mbit/s
95th percentile per-packet one-way delay: 171.083 ms
Loss rate: 0.45%

Run 2: Report of LEDBAT — Data Link

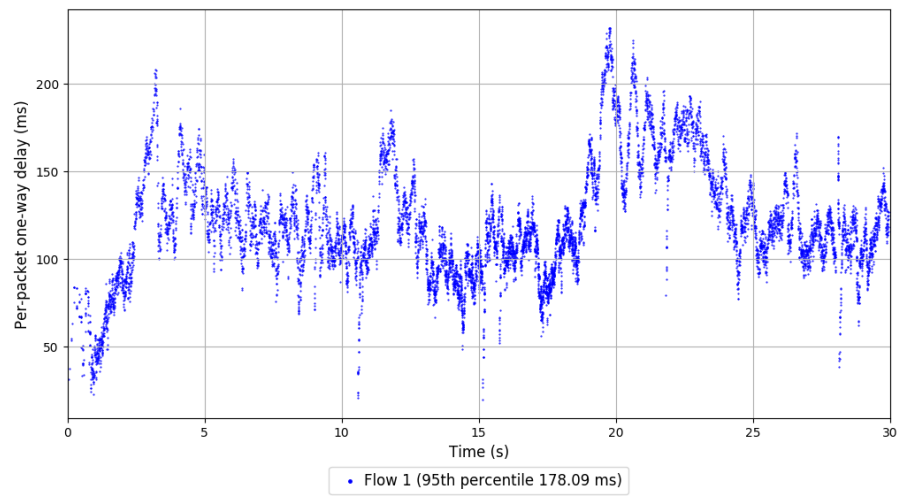
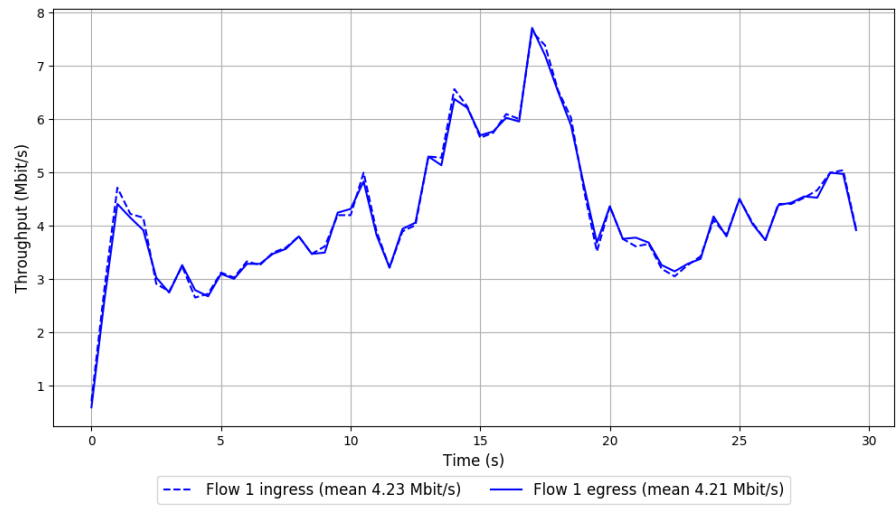


Run 3: Statistics of LEDBAT

Start at: 2018-03-12 20:55:19
End at: 2018-03-12 20:55:49
Local clock offset: 13.128 ms
Remote clock offset: -6.462 ms

Below is generated by plot.py at 2018-03-12 22:17:42
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.21 Mbit/s
95th percentile per-packet one-way delay: 178.094 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 4.21 Mbit/s
95th percentile per-packet one-way delay: 178.094 ms
Loss rate: 0.48%

Run 3: Report of LEDBAT — Data Link

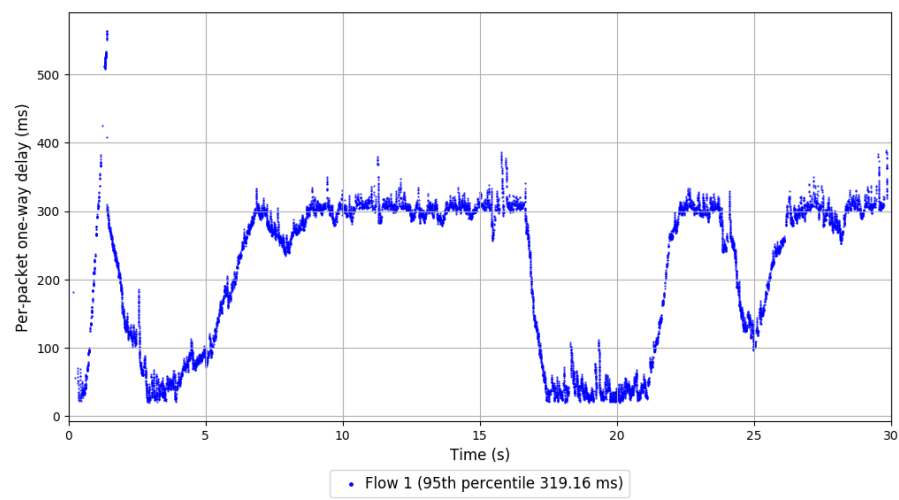
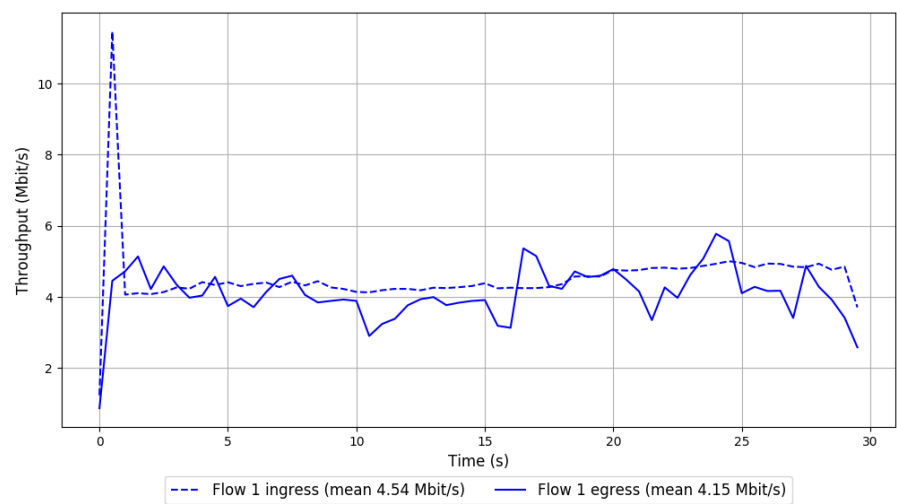


Run 1: Statistics of PCC

Start at: 2018-03-12 20:10:54
End at: 2018-03-12 20:11:24
Local clock offset: 4.567 ms
Remote clock offset: -5.286 ms

Below is generated by plot.py at 2018-03-12 22:17:44
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.15 Mbit/s
95th percentile per-packet one-way delay: 319.161 ms
Loss rate: 9.20%
-- Flow 1:
Average throughput: 4.15 Mbit/s
95th percentile per-packet one-way delay: 319.161 ms
Loss rate: 9.20%

Run 1: Report of PCC — Data Link

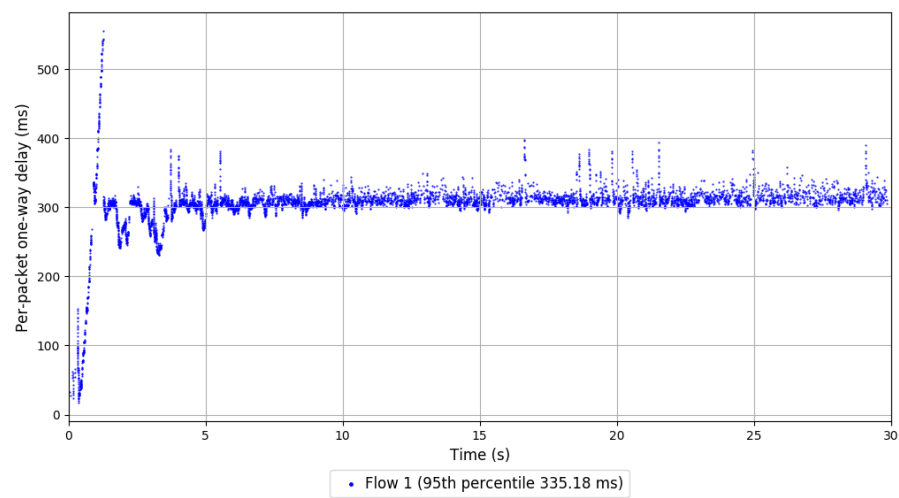
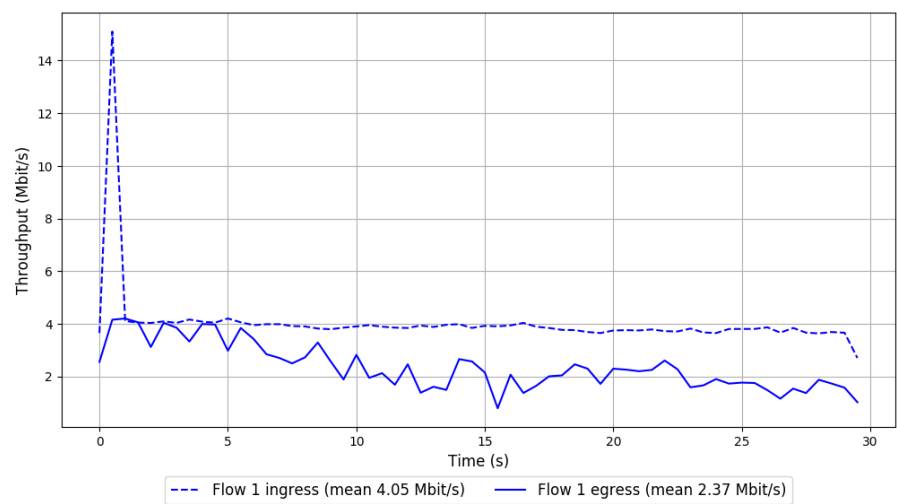


Run 2: Statistics of PCC

Start at: 2018-03-12 20:34:25
End at: 2018-03-12 20:34:55
Local clock offset: 7.656 ms
Remote clock offset: -4.964 ms

Below is generated by plot.py at 2018-03-12 22:17:44
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 335.180 ms
Loss rate: 41.63%
-- Flow 1:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 335.180 ms
Loss rate: 41.63%

Run 2: Report of PCC — Data Link

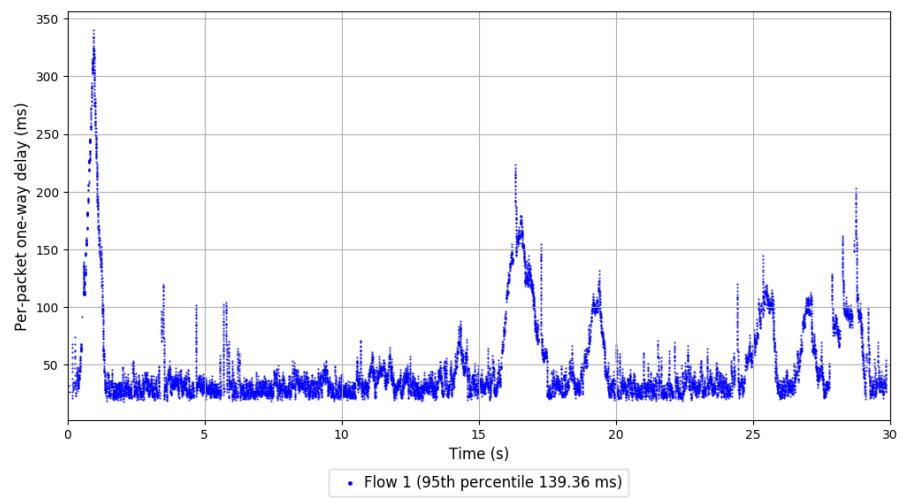
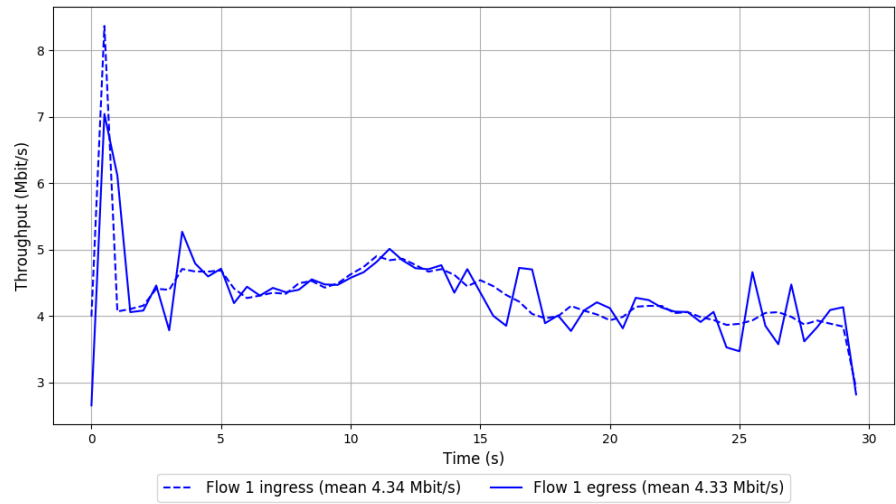


Run 3: Statistics of PCC

Start at: 2018-03-12 20:57:57
End at: 2018-03-12 20:58:27
Local clock offset: 14.015 ms
Remote clock offset: -6.519 ms

Below is generated by plot.py at 2018-03-12 22:17:45
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.33 Mbit/s
95th percentile per-packet one-way delay: 139.359 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 4.33 Mbit/s
95th percentile per-packet one-way delay: 139.359 ms
Loss rate: 0.29%

Run 3: Report of PCC — Data Link

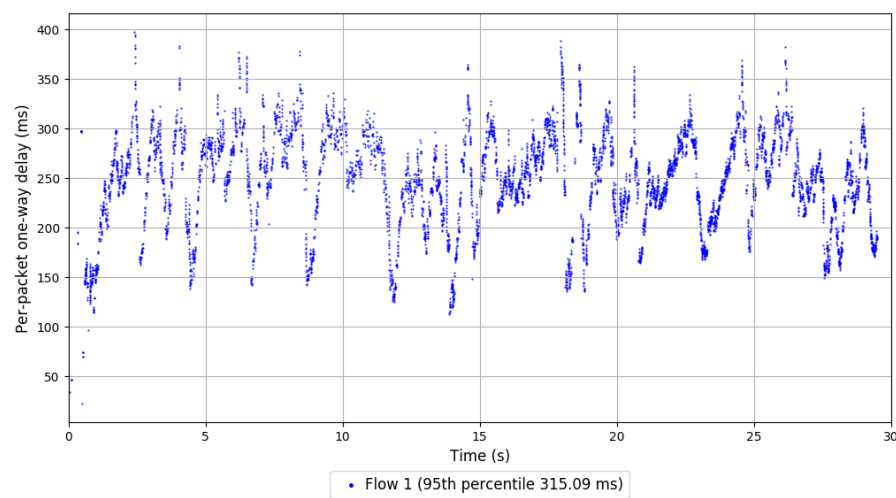
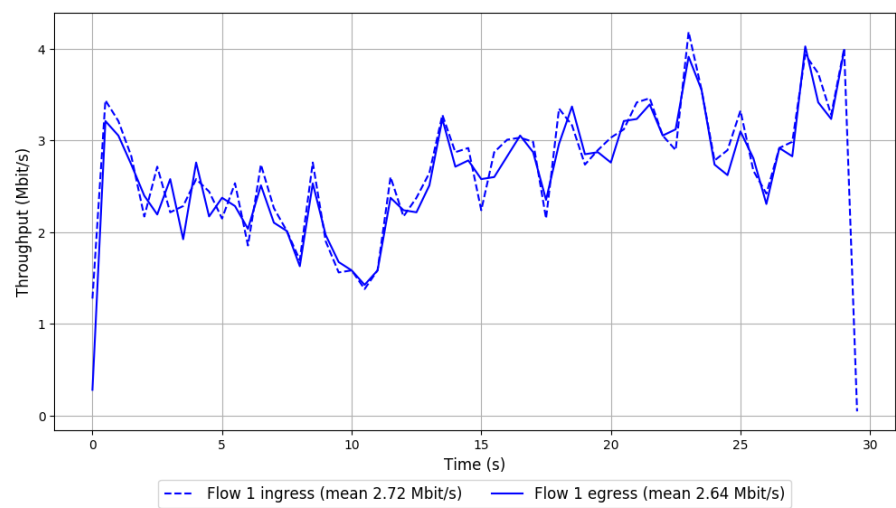


Run 1: Statistics of QUIC Cubic

Start at: 2018-03-12 20:13:30
End at: 2018-03-12 20:14:00
Local clock offset: 3.908 ms
Remote clock offset: -5.225 ms

Below is generated by plot.py at 2018-03-12 22:17:45
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.64 Mbit/s
95th percentile per-packet one-way delay: 315.093 ms
Loss rate: 2.82%
-- Flow 1:
Average throughput: 2.64 Mbit/s
95th percentile per-packet one-way delay: 315.093 ms
Loss rate: 2.82%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-03-12 20:37:02

End at: 2018-03-12 20:37:32

Local clock offset: 8.257 ms

Remote clock offset: -5.119 ms

Below is generated by plot.py at 2018-03-12 22:17:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.38 Mbit/s

95th percentile per-packet one-way delay: 308.672 ms

Loss rate: 3.93%

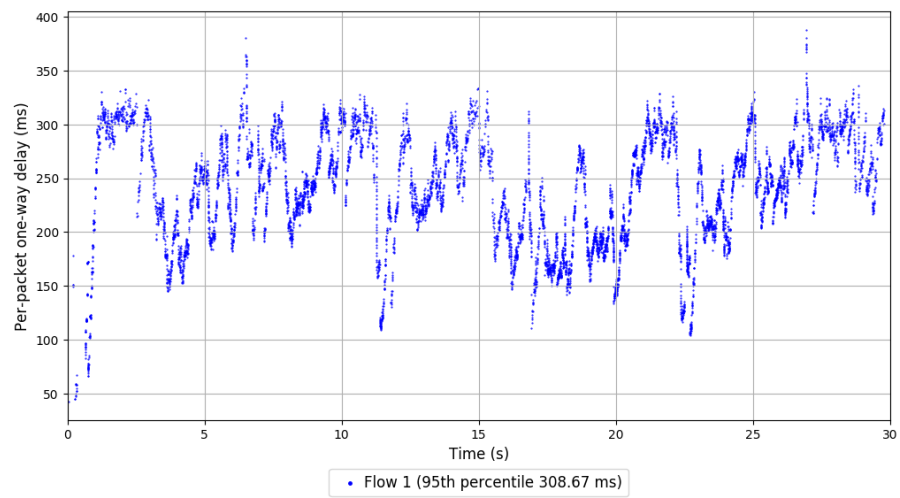
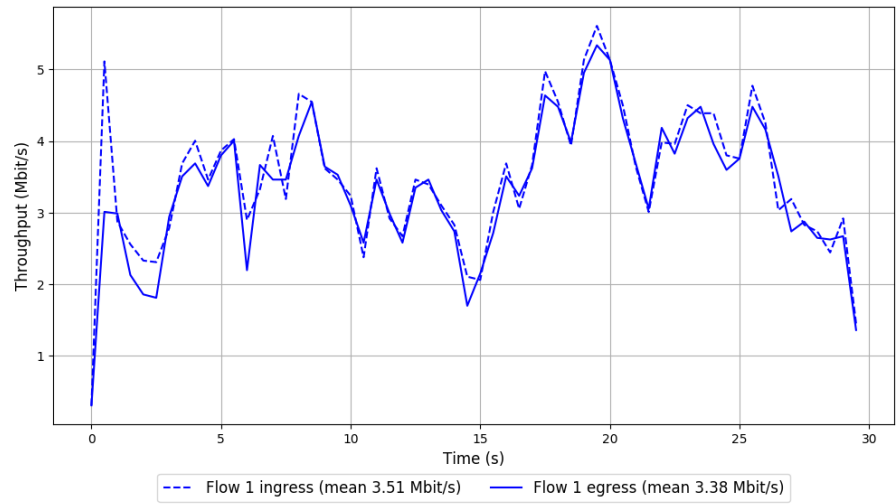
-- Flow 1:

Average throughput: 3.38 Mbit/s

95th percentile per-packet one-way delay: 308.672 ms

Loss rate: 3.93%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-03-12 21:00:34

End at: 2018-03-12 21:01:04

Local clock offset: 14.785 ms

Remote clock offset: -6.536 ms

Below is generated by plot.py at 2018-03-12 22:17:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.97 Mbit/s

95th percentile per-packet one-way delay: 305.854 ms

Loss rate: 2.88%

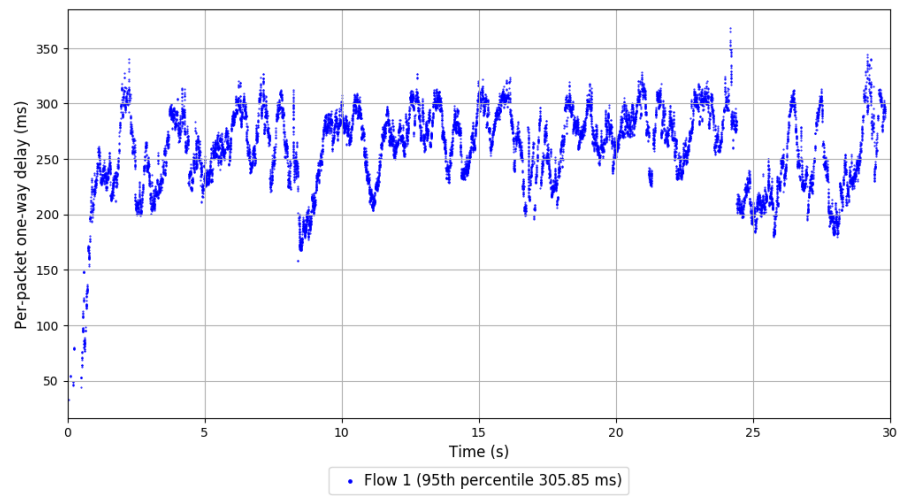
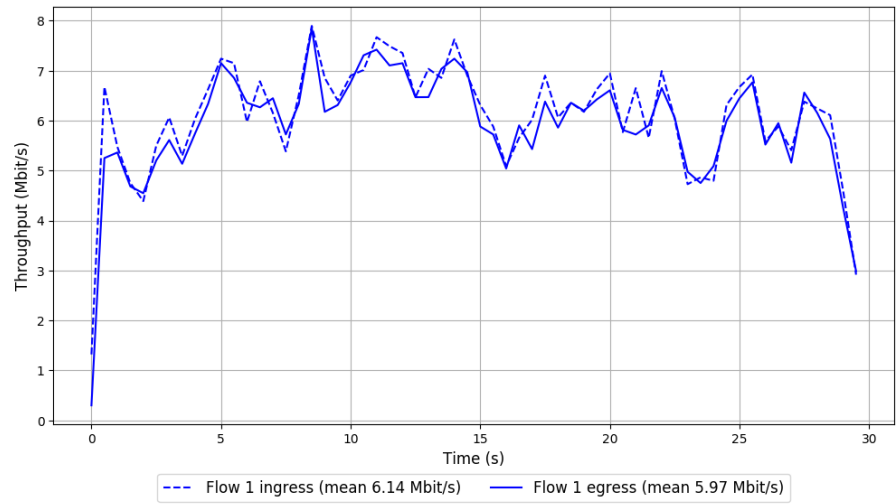
-- Flow 1:

Average throughput: 5.97 Mbit/s

95th percentile per-packet one-way delay: 305.854 ms

Loss rate: 2.88%

Run 3: Report of QUIC Cubic — Data Link



Run 1: Statistics of SCReAM

Start at: 2018-03-12 20:03:03

End at: 2018-03-12 20:03:33

Local clock offset: 2.878 ms

Remote clock offset: -5.23 ms

Below is generated by plot.py at 2018-03-12 22:17:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.09 Mbit/s

95th percentile per-packet one-way delay: 118.089 ms

Loss rate: 2.36%

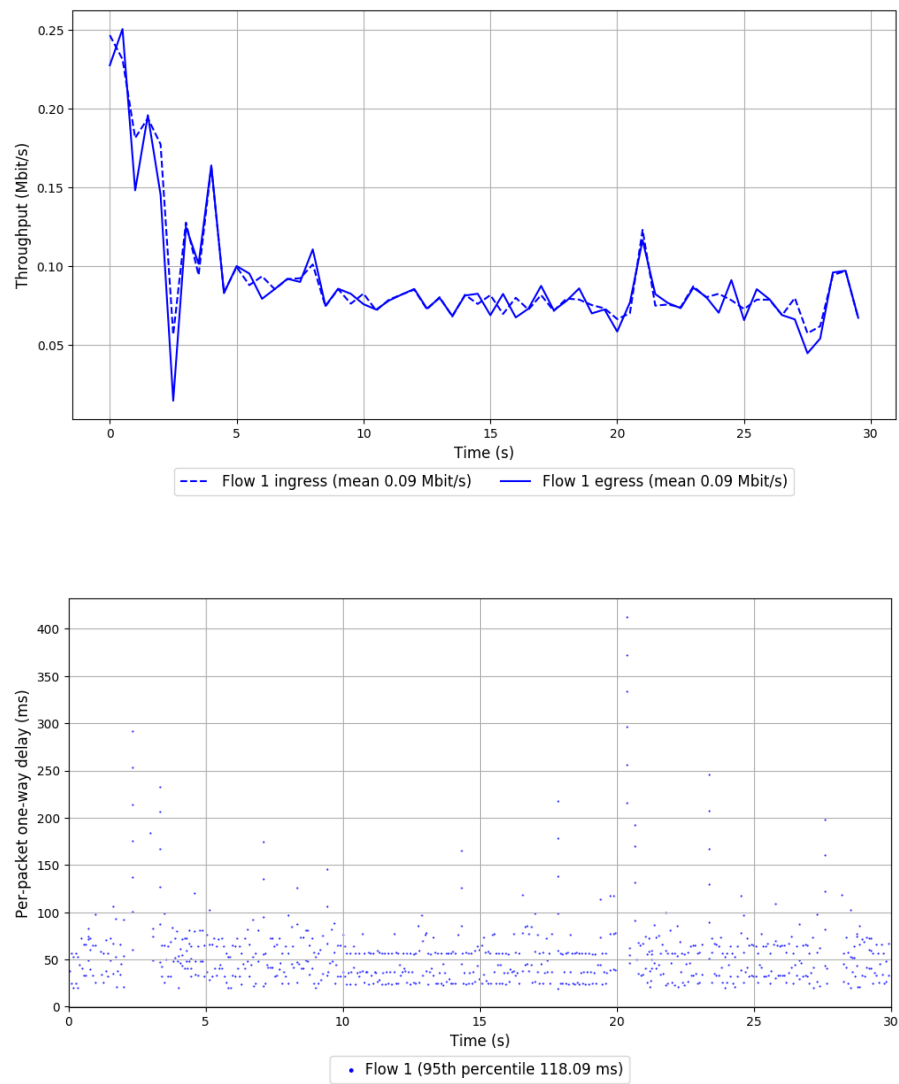
-- Flow 1:

Average throughput: 0.09 Mbit/s

95th percentile per-packet one-way delay: 118.089 ms

Loss rate: 2.36%

Run 1: Report of SReAM — Data Link

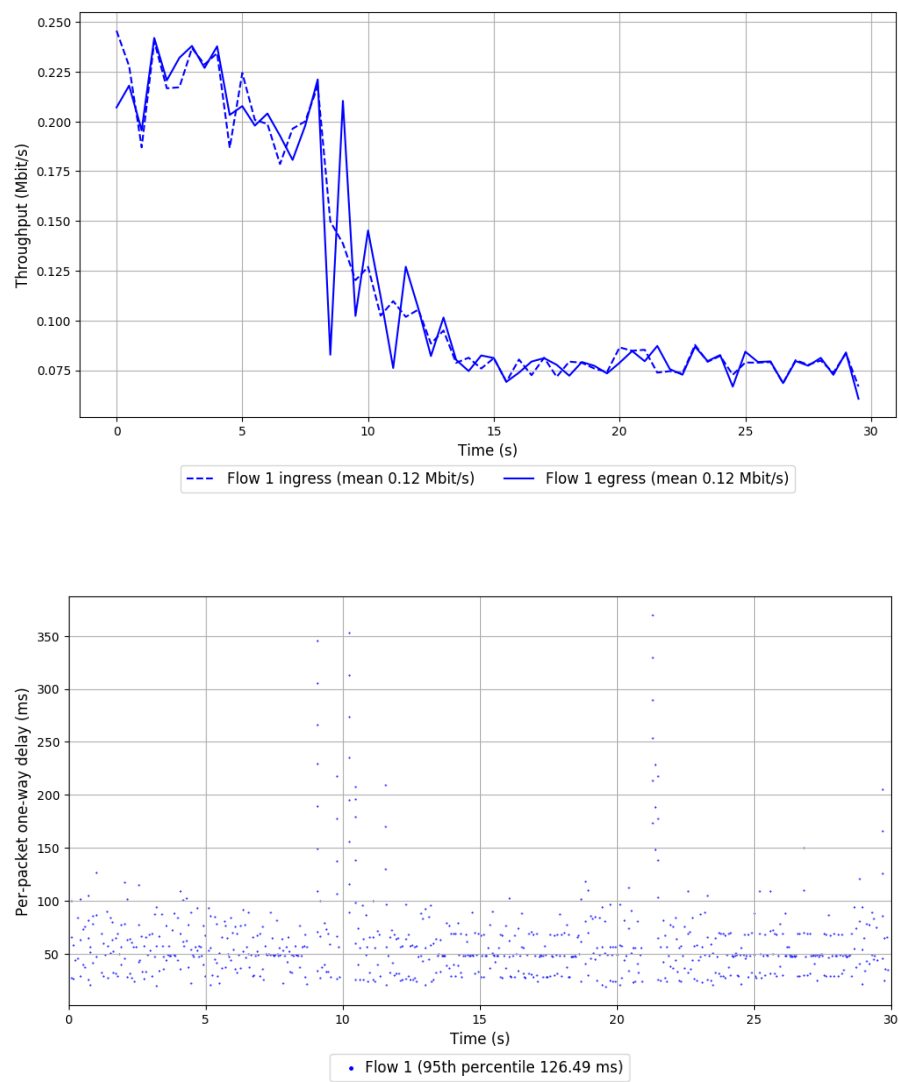


Run 2: Statistics of SCReAM

Start at: 2018-03-12 20:26:34
End at: 2018-03-12 20:27:04
Local clock offset: 6.411 ms
Remote clock offset: -5.067 ms

Below is generated by plot.py at 2018-03-12 22:17:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 126.487 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 126.487 ms
Loss rate: 0.17%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-03-12 20:50:06

End at: 2018-03-12 20:50:36

Local clock offset: 11.713 ms

Remote clock offset: -6.24 ms

Below is generated by plot.py at 2018-03-12 22:17:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.12 Mbit/s

95th percentile per-packet one-way delay: 87.626 ms

Loss rate: 0.17%

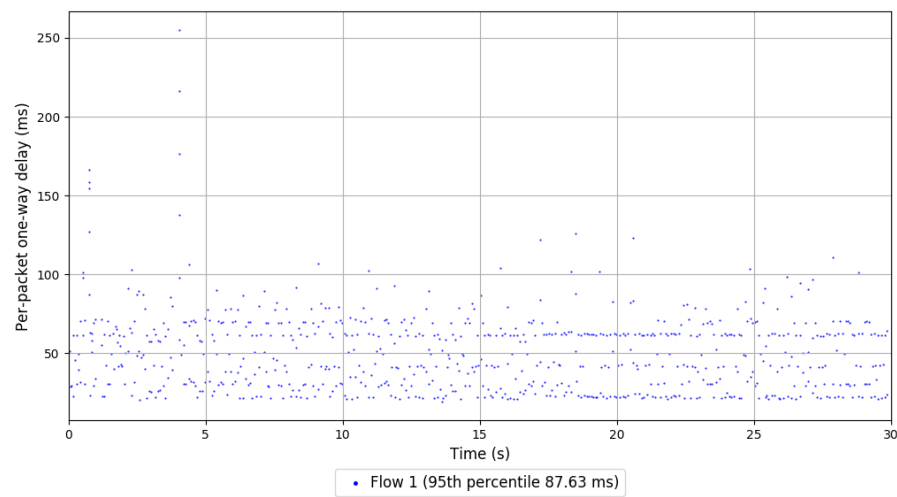
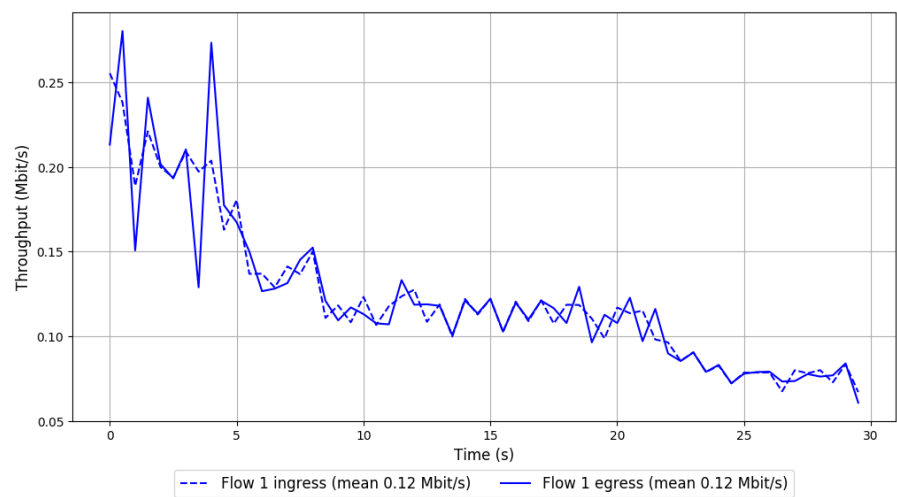
-- Flow 1:

Average throughput: 0.12 Mbit/s

95th percentile per-packet one-way delay: 87.626 ms

Loss rate: 0.17%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of WebRTC media

Start at: 2018-03-12 19:59:08

End at: 2018-03-12 19:59:38

Local clock offset: 2.095 ms

Remote clock offset: -5.24 ms

Below is generated by plot.py at 2018-03-12 22:17:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 126.802 ms

Loss rate: 0.00%

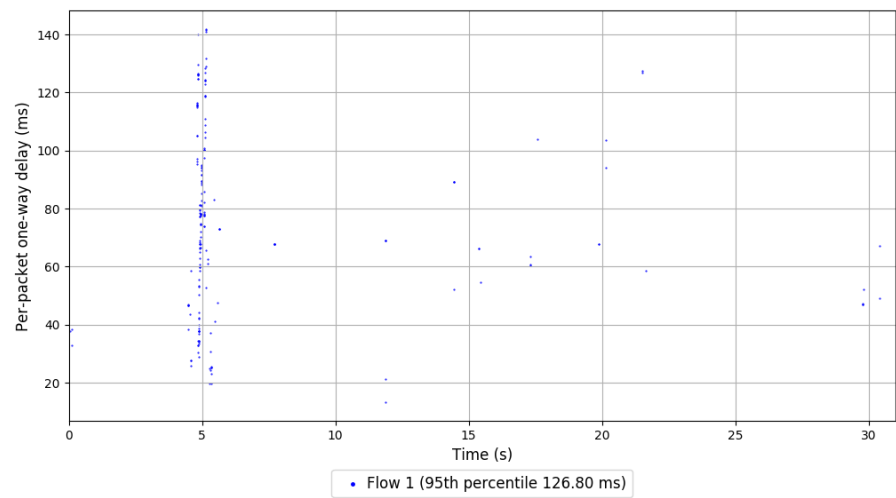
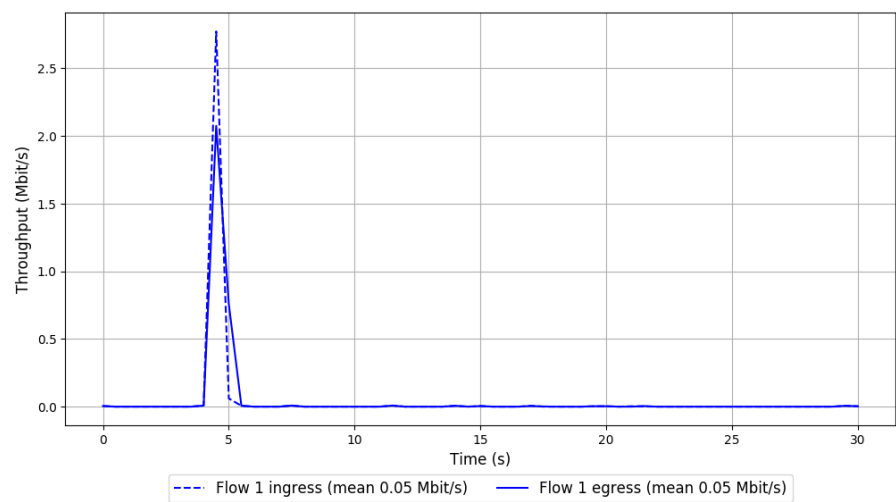
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 126.802 ms

Loss rate: 0.00%

Run 1: Report of WebRTC media — Data Link

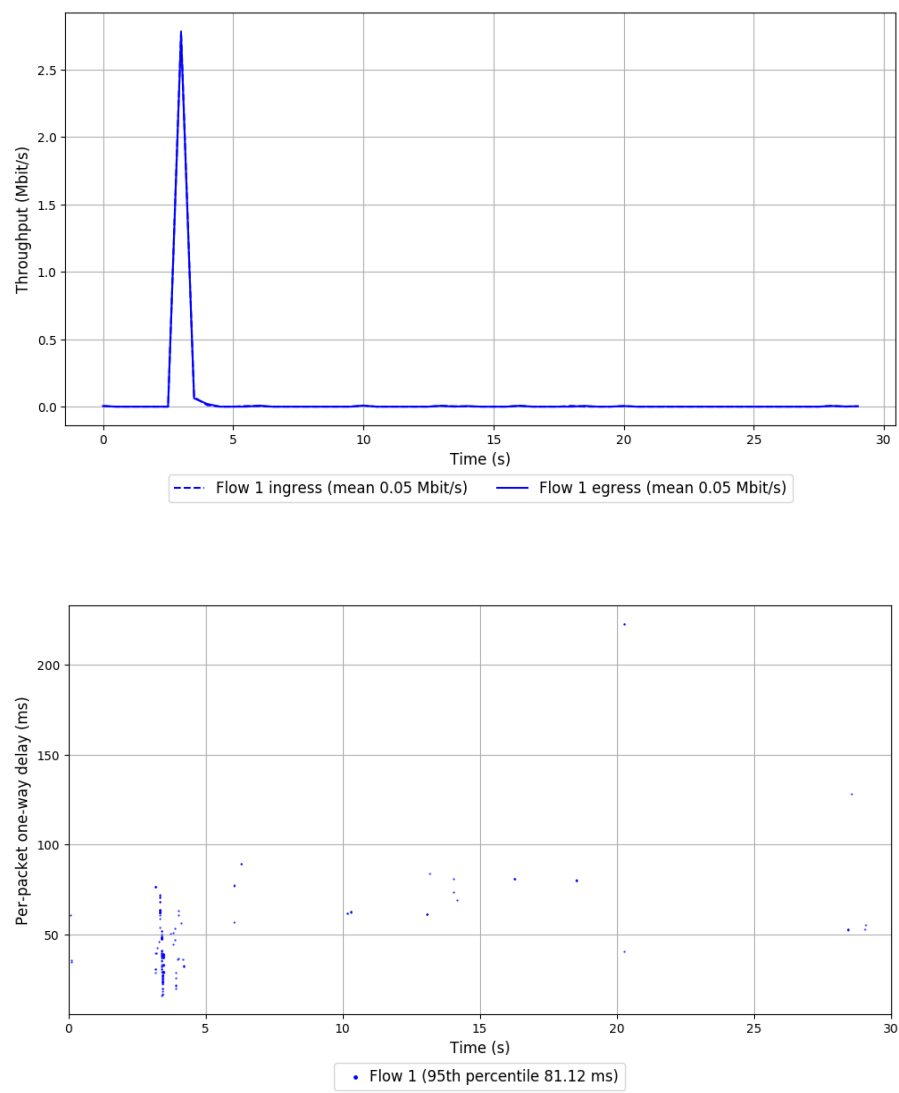


Run 2: Statistics of WebRTC media

Start at: 2018-03-12 20:22:39
End at: 2018-03-12 20:23:09
Local clock offset: 5.207 ms
Remote clock offset: -5.111 ms

Below is generated by plot.py at 2018-03-12 22:17:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 81.118 ms
Loss rate: 0.82%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 81.118 ms
Loss rate: 0.82%

Run 2: Report of WebRTC media — Data Link

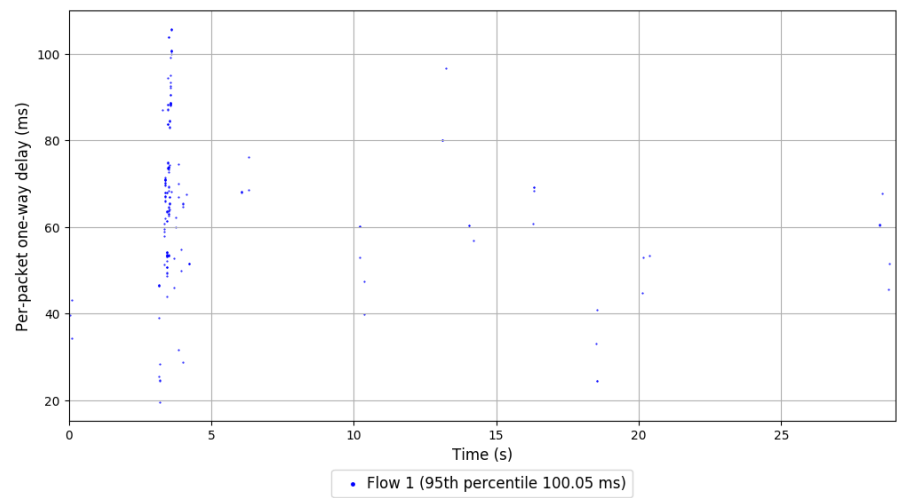
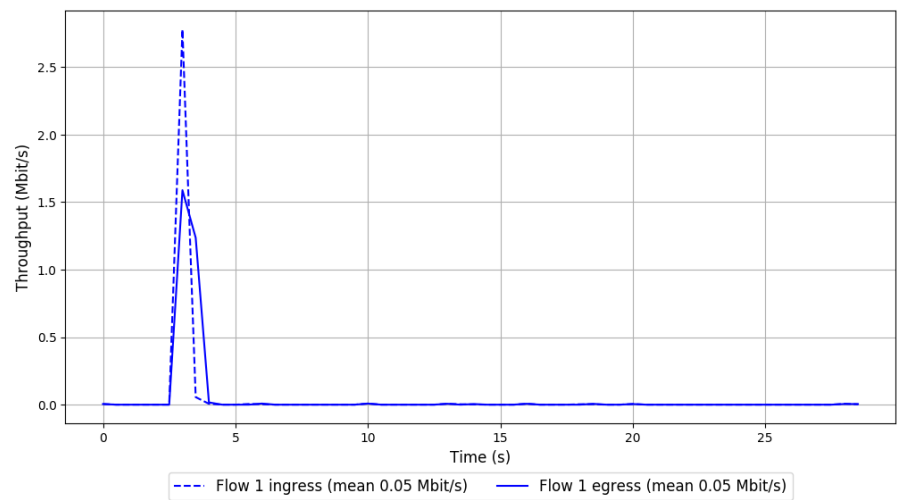


Run 3: Statistics of WebRTC media

Start at: 2018-03-12 20:46:10
End at: 2018-03-12 20:46:40
Local clock offset: 10.578 ms
Remote clock offset: -5.947 ms

Below is generated by plot.py at 2018-03-12 22:17:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 100.050 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 100.050 ms
Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

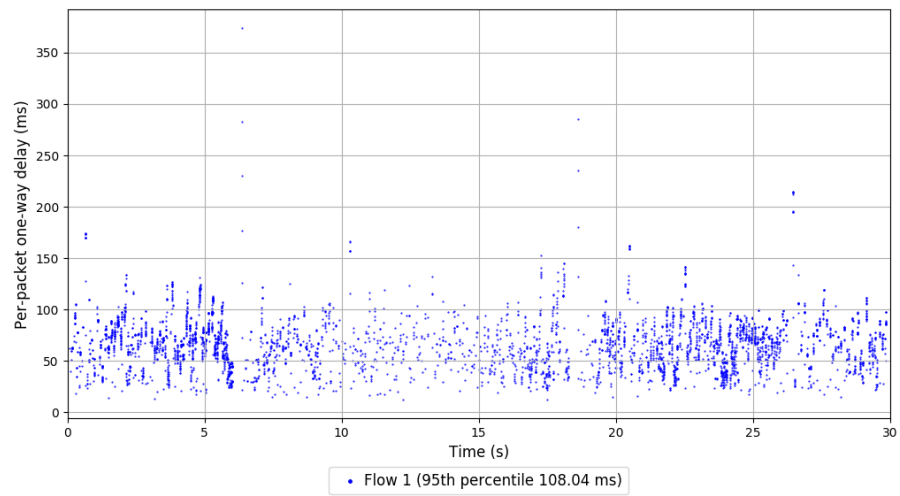
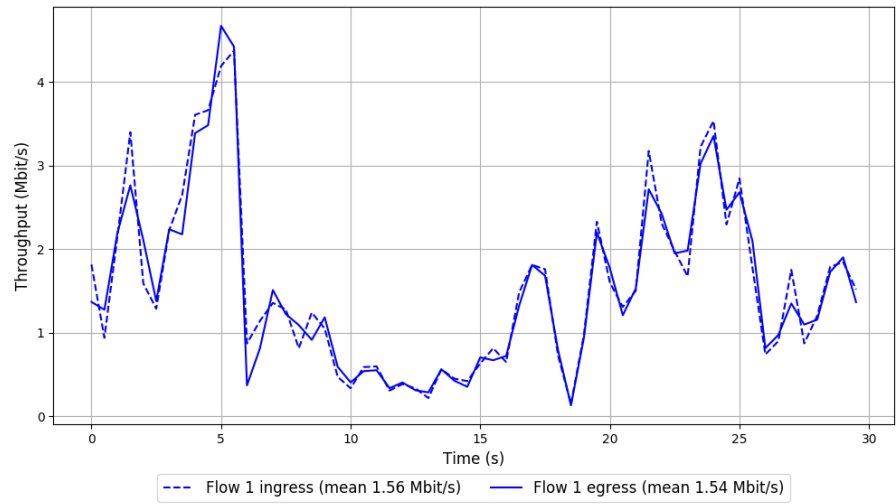


Run 1: Statistics of Sprout

Start at: 2018-03-12 20:12:12
End at: 2018-03-12 20:12:42
Local clock offset: 4.166 ms
Remote clock offset: -5.207 ms

Below is generated by plot.py at 2018-03-12 22:17:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 108.042 ms
Loss rate: 1.68%
-- Flow 1:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 108.042 ms
Loss rate: 1.68%

Run 1: Report of Sprout — Data Link

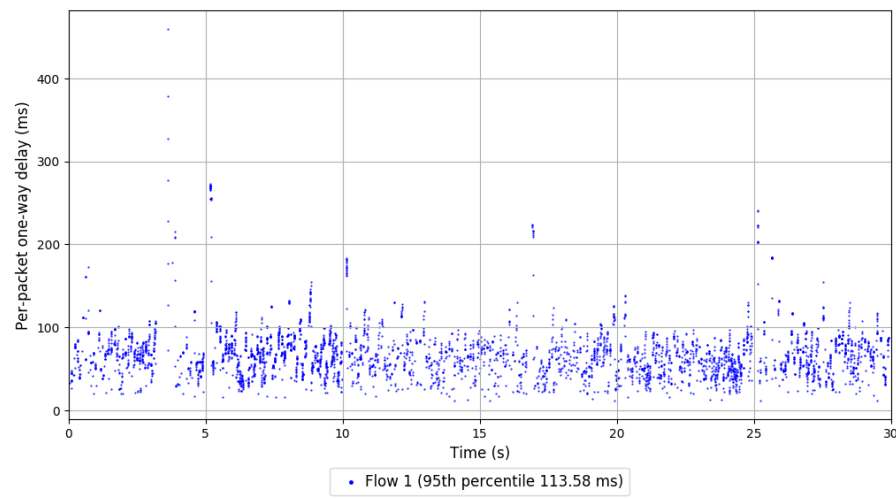
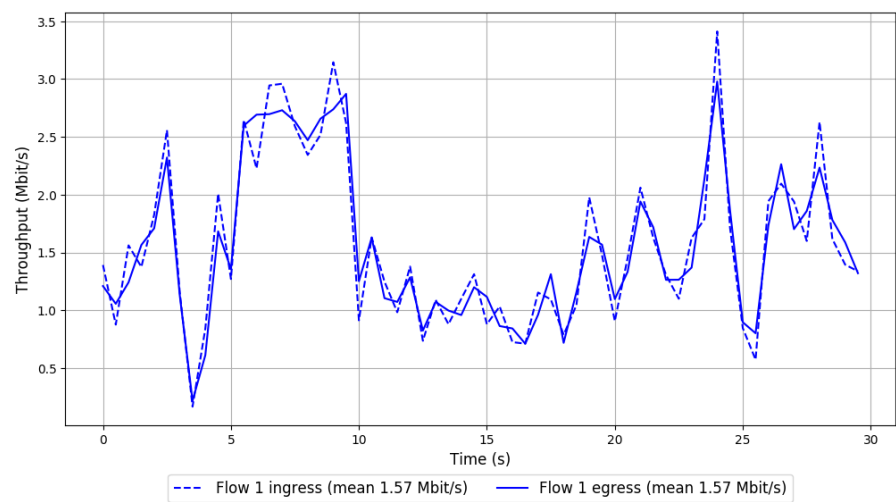


Run 2: Statistics of Sprout

Start at: 2018-03-12 20:35:44
End at: 2018-03-12 20:36:14
Local clock offset: 7.985 ms
Remote clock offset: -4.883 ms

Below is generated by plot.py at 2018-03-12 22:17:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 113.582 ms
Loss rate: 0.57%
-- Flow 1:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 113.582 ms
Loss rate: 0.57%

Run 2: Report of Sprout — Data Link

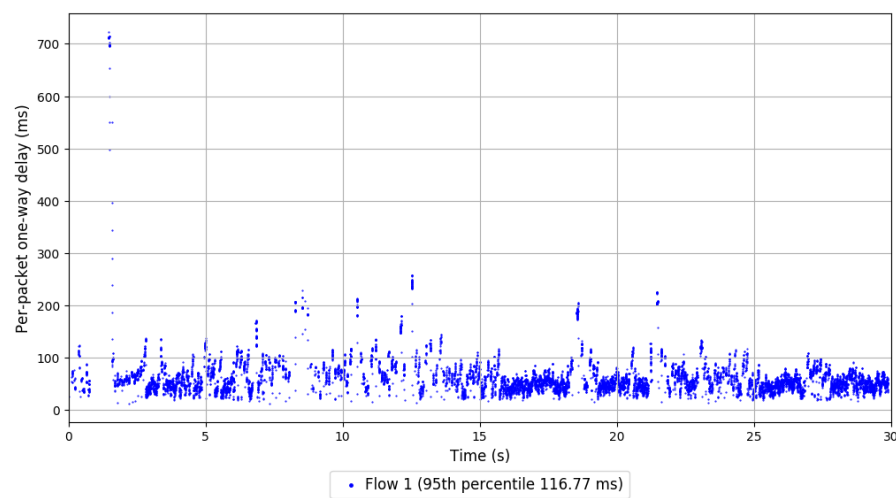
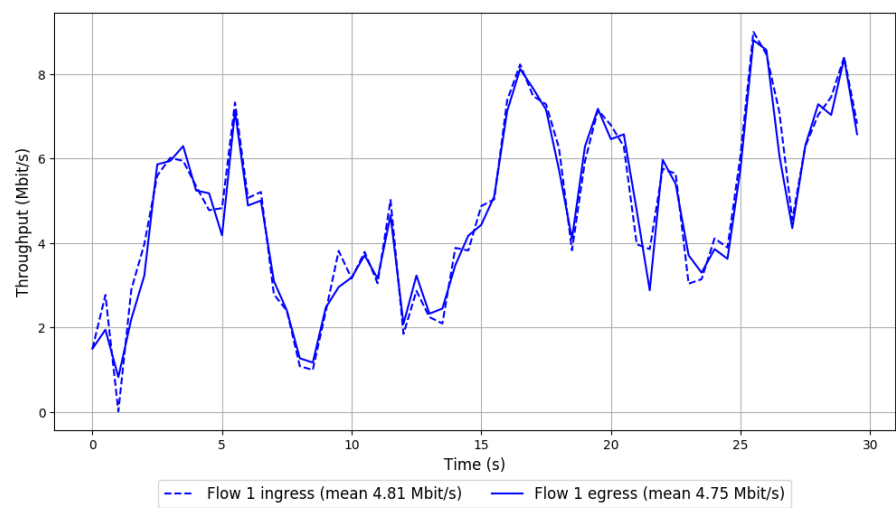


Run 3: Statistics of Sprout

Start at: 2018-03-12 20:59:15
End at: 2018-03-12 20:59:45
Local clock offset: 14.303 ms
Remote clock offset: -6.565 ms

Below is generated by plot.py at 2018-03-12 22:17:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.75 Mbit/s
95th percentile per-packet one-way delay: 116.774 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 4.75 Mbit/s
95th percentile per-packet one-way delay: 116.774 ms
Loss rate: 1.33%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-03-12 20:00:26

End at: 2018-03-12 20:00:56

Local clock offset: 2.55 ms

Remote clock offset: -5.23 ms

Below is generated by plot.py at 2018-03-12 22:18:00

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.99 Mbit/s

95th percentile per-packet one-way delay: 76.526 ms

Loss rate: 0.15%

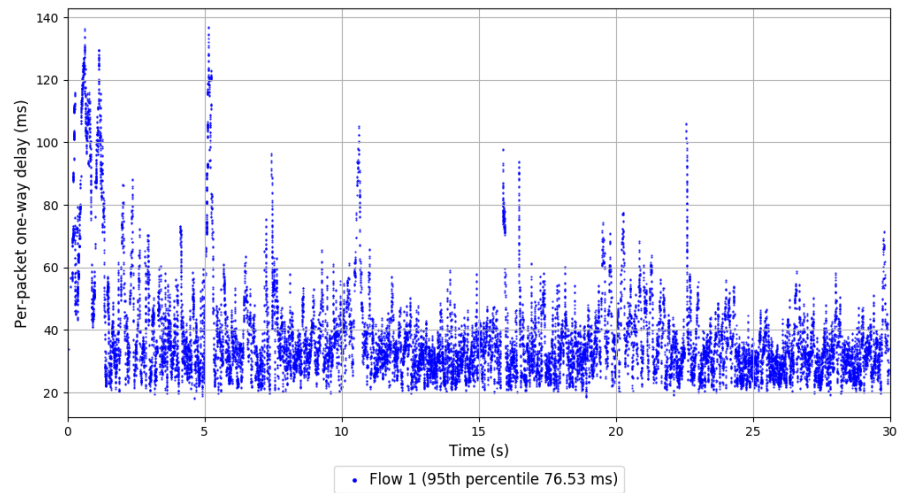
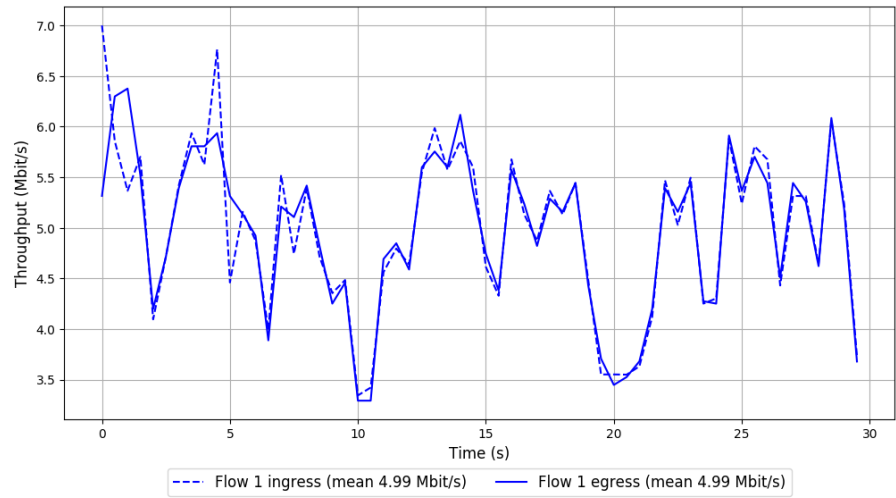
-- Flow 1:

Average throughput: 4.99 Mbit/s

95th percentile per-packet one-way delay: 76.526 ms

Loss rate: 0.15%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-03-12 20:23:57

End at: 2018-03-12 20:24:27

Local clock offset: 5.48 ms

Remote clock offset: -5.101 ms

Below is generated by plot.py at 2018-03-12 22:18:00

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.48 Mbit/s

95th percentile per-packet one-way delay: 133.643 ms

Loss rate: 1.44%

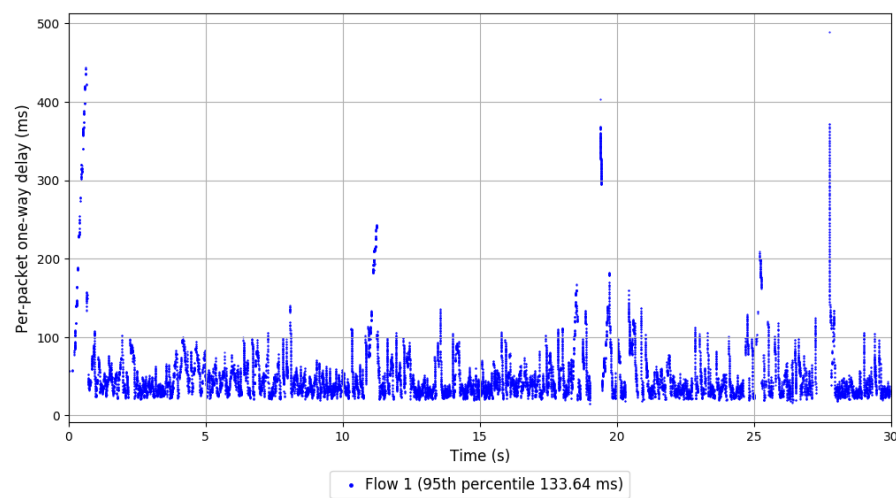
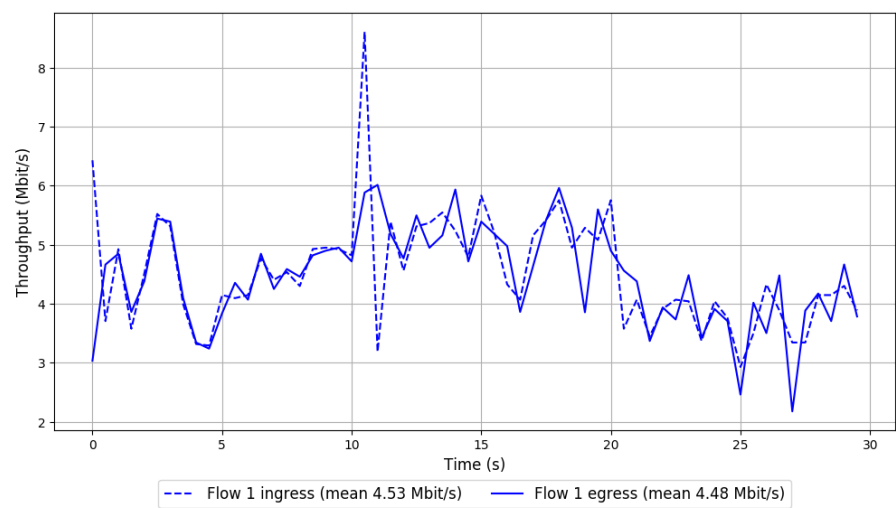
-- Flow 1:

Average throughput: 4.48 Mbit/s

95th percentile per-packet one-way delay: 133.643 ms

Loss rate: 1.44%

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

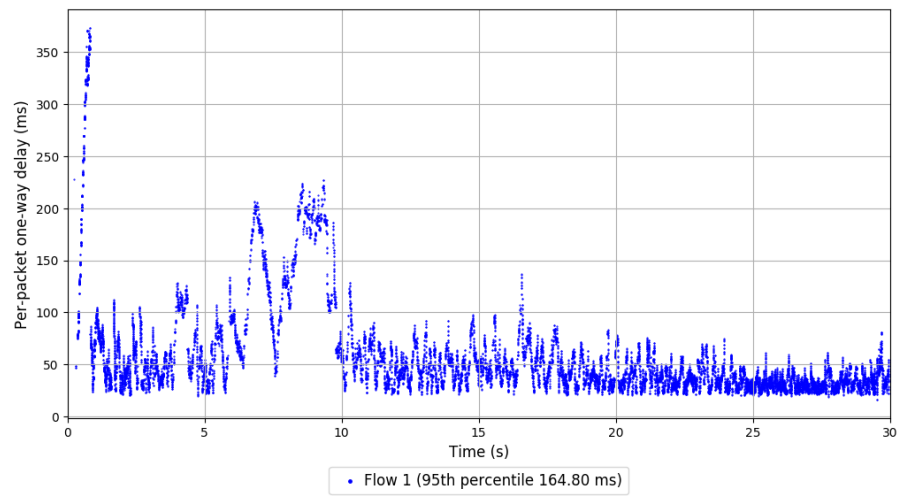
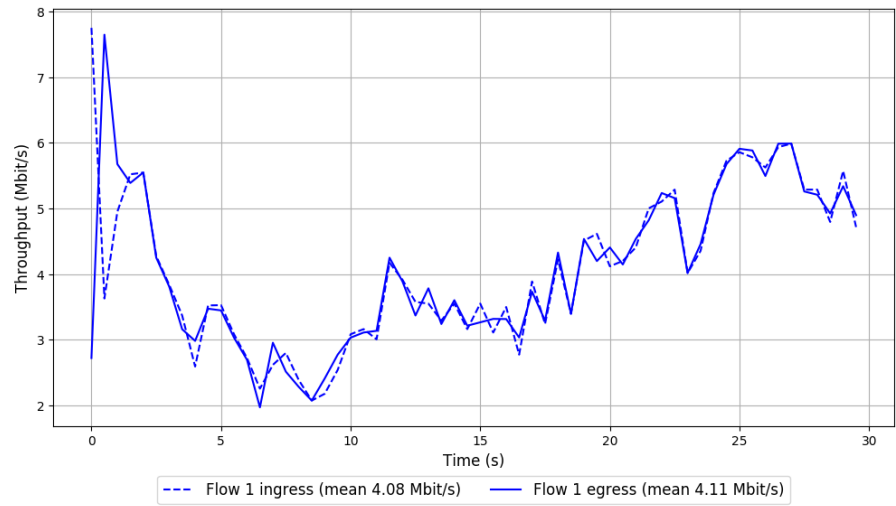


Run 3: Statistics of TaoVA-100x

Start at: 2018-03-12 20:47:29
End at: 2018-03-12 20:47:59
Local clock offset: 11.005 ms
Remote clock offset: -6.012 ms

Below is generated by plot.py at 2018-03-12 22:18:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.11 Mbit/s
95th percentile per-packet one-way delay: 164.797 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 4.11 Mbit/s
95th percentile per-packet one-way delay: 164.797 ms
Loss rate: 0.14%

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

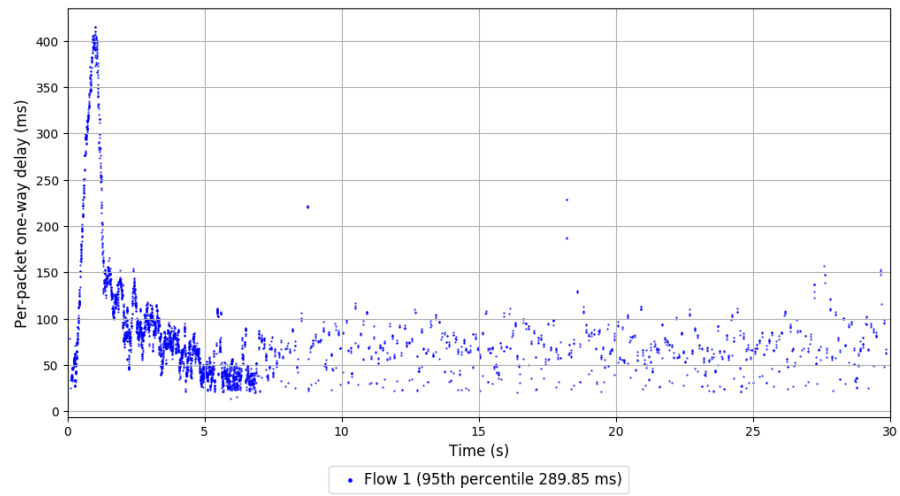
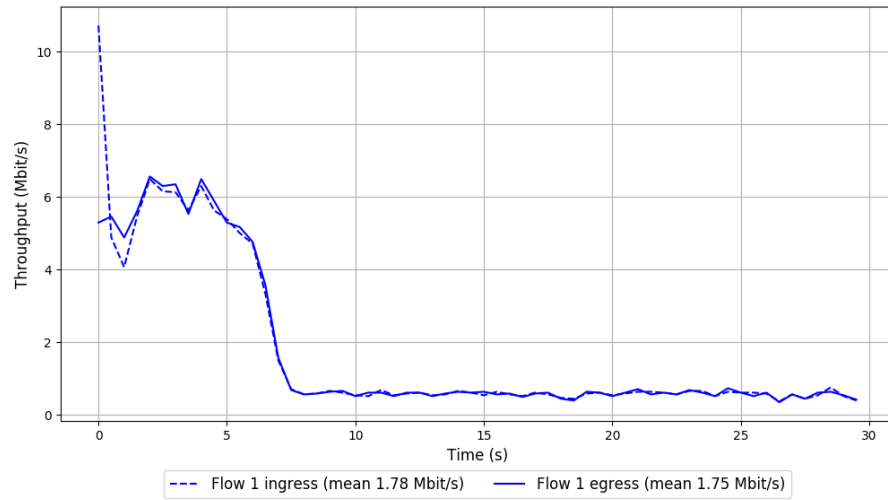


Run 1: Statistics of TCP Vegas

Start at: 2018-03-12 19:57:49
End at: 2018-03-12 19:58:19
Local clock offset: 2.546 ms
Remote clock offset: -5.249 ms

Below is generated by plot.py at 2018-03-12 22:18:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 289.845 ms
Loss rate: 2.52%
-- Flow 1:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 289.845 ms
Loss rate: 2.52%

Run 1: Report of TCP Vegas — Data Link

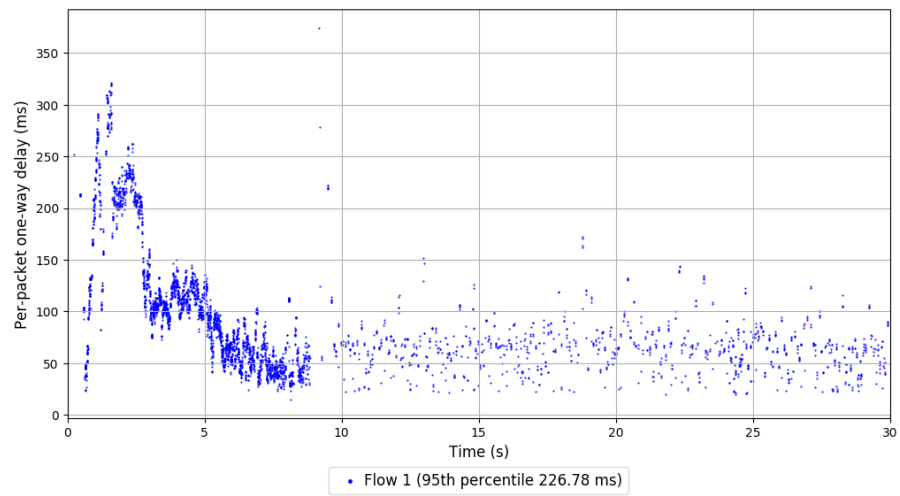
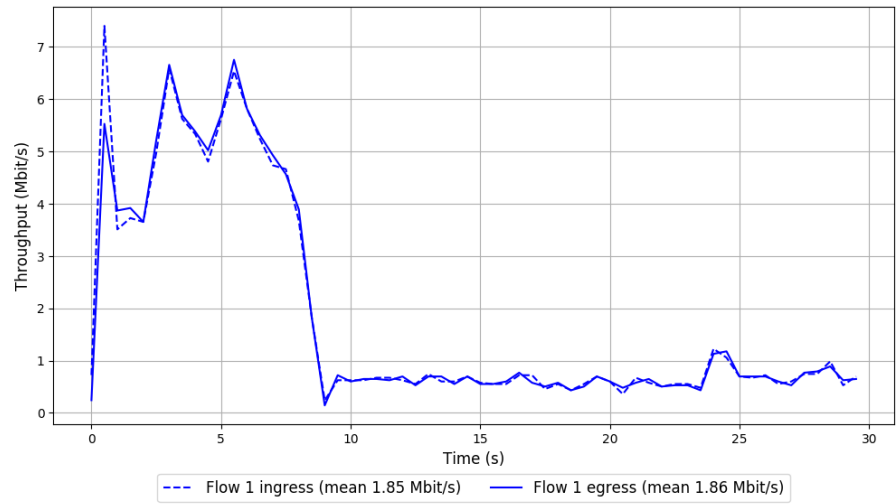


Run 2: Statistics of TCP Vegas

Start at: 2018-03-12 20:21:20
End at: 2018-03-12 20:21:50
Local clock offset: 4.79 ms
Remote clock offset: -5.125 ms

Below is generated by plot.py at 2018-03-12 22:18:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 226.778 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 226.778 ms
Loss rate: 0.48%

Run 2: Report of TCP Vegas — Data Link

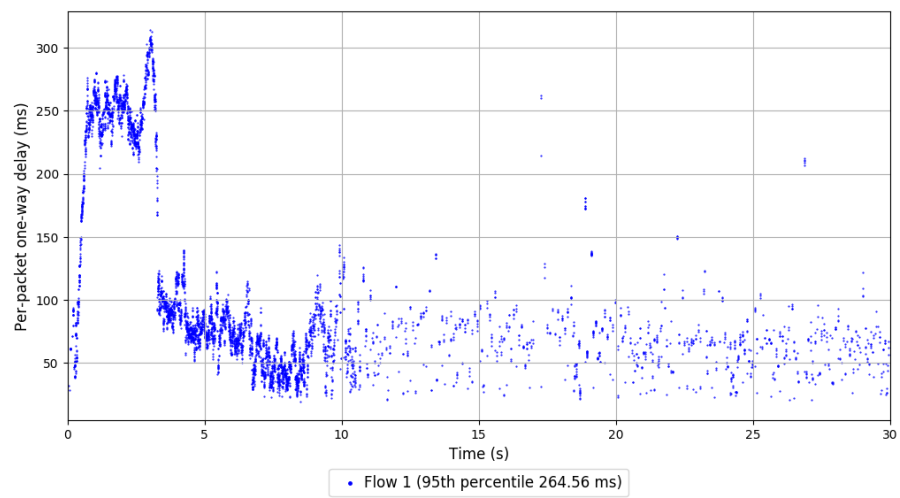
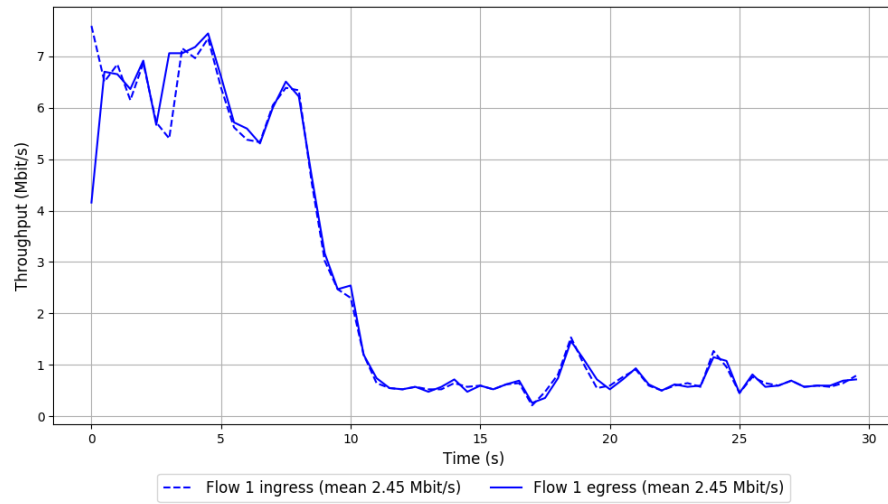


Run 3: Statistics of TCP Vegas

Start at: 2018-03-12 20:44:52
End at: 2018-03-12 20:45:22
Local clock offset: 10.283 ms
Remote clock offset: -5.956 ms

Below is generated by plot.py at 2018-03-12 22:18:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.45 Mbit/s
95th percentile per-packet one-way delay: 264.560 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 2.45 Mbit/s
95th percentile per-packet one-way delay: 264.560 ms
Loss rate: 0.23%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-03-12 20:05:40

End at: 2018-03-12 20:06:10

Local clock offset: 3.057 ms

Remote clock offset: -5.27 ms

Below is generated by plot.py at 2018-03-12 22:18:00

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.94 Mbit/s

95th percentile per-packet one-way delay: 312.787 ms

Loss rate: 9.09%

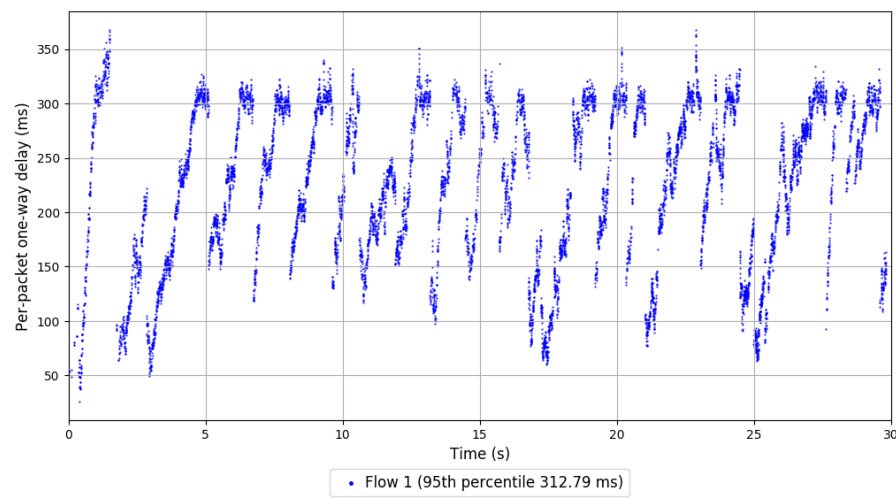
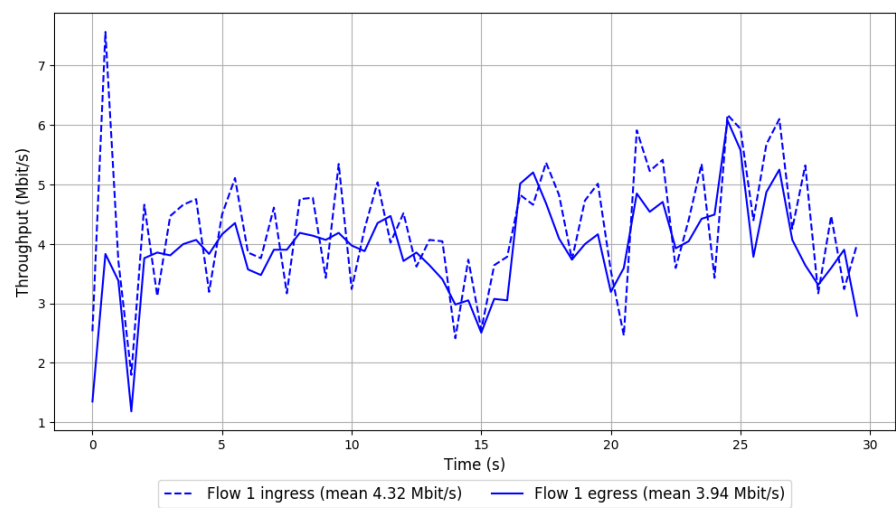
-- Flow 1:

Average throughput: 3.94 Mbit/s

95th percentile per-packet one-way delay: 312.787 ms

Loss rate: 9.09%

Run 1: Report of Verus — Data Link

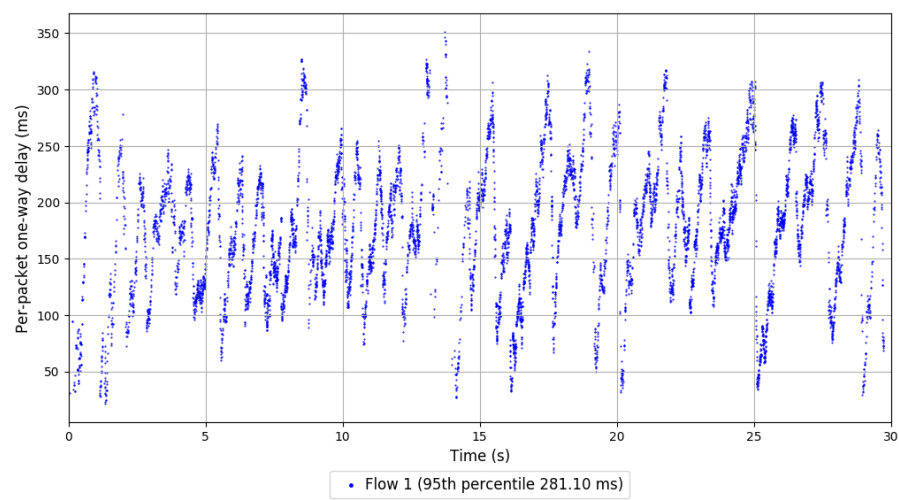
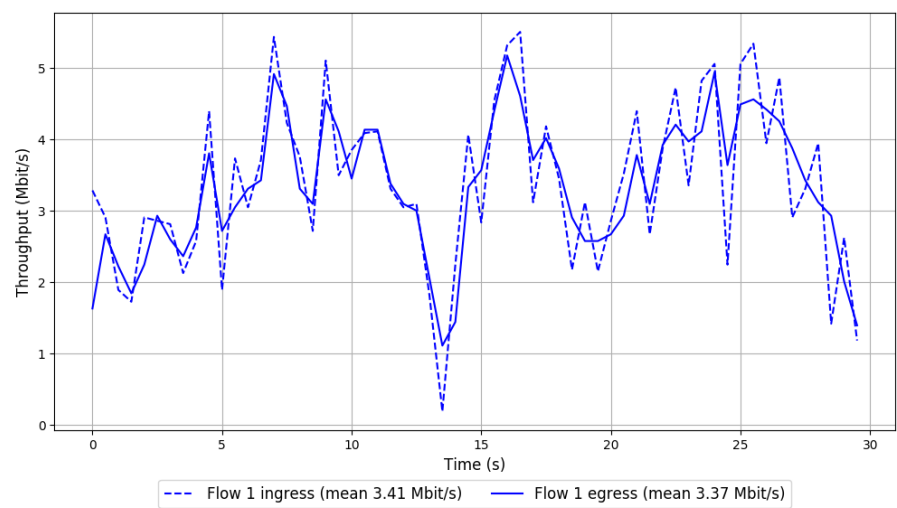


Run 2: Statistics of Verus

Start at: 2018-03-12 20:29:11
End at: 2018-03-12 20:29:41
Local clock offset: 6.88 ms
Remote clock offset: -5.091 ms

Below is generated by plot.py at 2018-03-12 22:18:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.37 Mbit/s
95th percentile per-packet one-way delay: 281.097 ms
Loss rate: 1.43%
-- Flow 1:
Average throughput: 3.37 Mbit/s
95th percentile per-packet one-way delay: 281.097 ms
Loss rate: 1.43%

Run 2: Report of Verus — Data Link

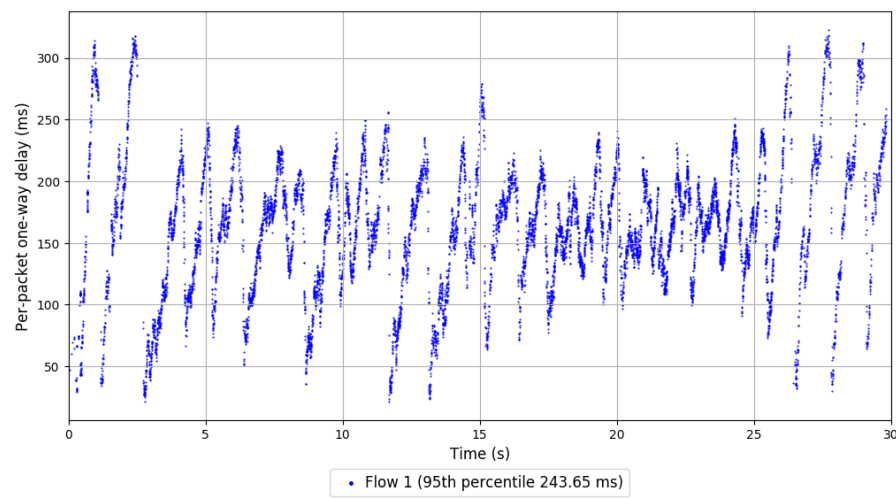
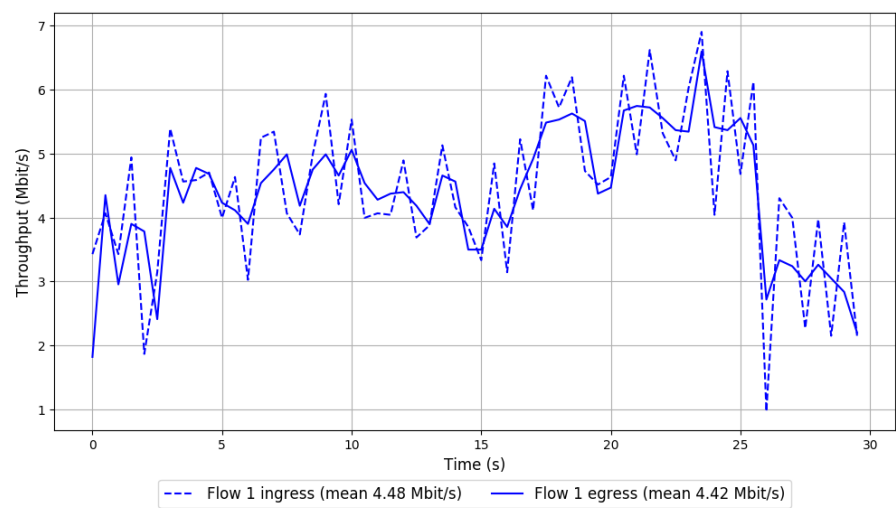


Run 3: Statistics of Verus

Start at: 2018-03-12 20:52:42
End at: 2018-03-12 20:53:12
Local clock offset: 12.514 ms
Remote clock offset: -6.361 ms

Below is generated by plot.py at 2018-03-12 22:18:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.42 Mbit/s
95th percentile per-packet one-way delay: 243.648 ms
Loss rate: 1.44%
-- Flow 1:
Average throughput: 4.42 Mbit/s
95th percentile per-packet one-way delay: 243.648 ms
Loss rate: 1.44%

Run 3: Report of Verus — Data Link



Run 1: Statistics of Copa

Start at: 2018-03-12 20:04:21

End at: 2018-03-12 20:04:51

Local clock offset: 2.86 ms

Remote clock offset: -5.23 ms

Below is generated by plot.py at 2018-03-12 22:18:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.28 Mbit/s

95th percentile per-packet one-way delay: 244.921 ms

Loss rate: 0.57%

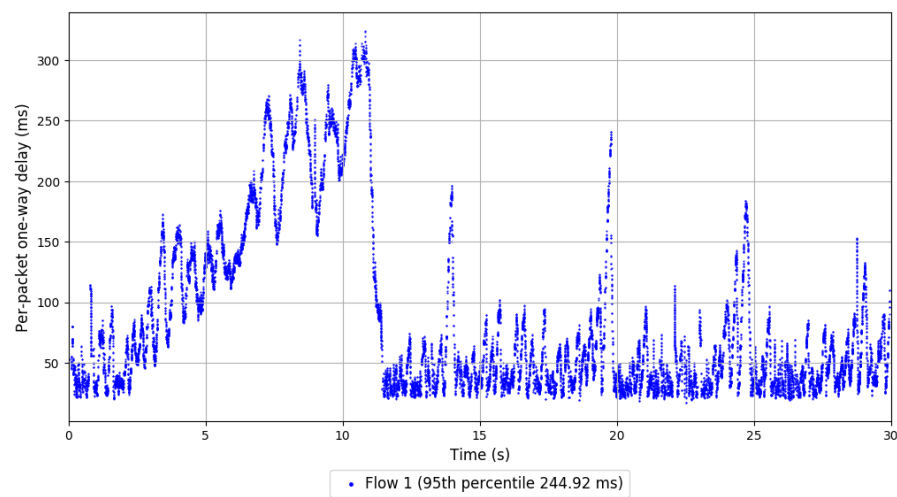
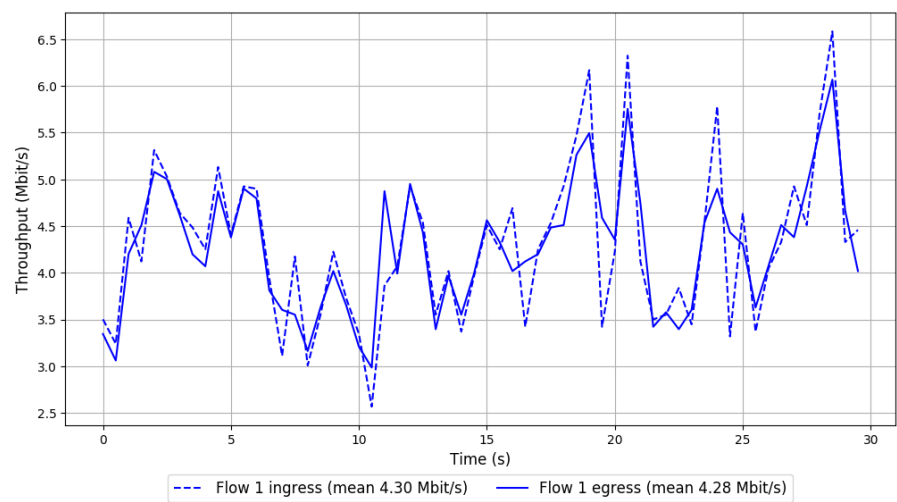
-- Flow 1:

Average throughput: 4.28 Mbit/s

95th percentile per-packet one-way delay: 244.921 ms

Loss rate: 0.57%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2018-03-12 20:27:52

End at: 2018-03-12 20:28:22

Local clock offset: 6.737 ms

Remote clock offset: -5.09 ms

Below is generated by plot.py at 2018-03-12 22:18:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.68 Mbit/s

95th percentile per-packet one-way delay: 203.005 ms

Loss rate: 0.55%

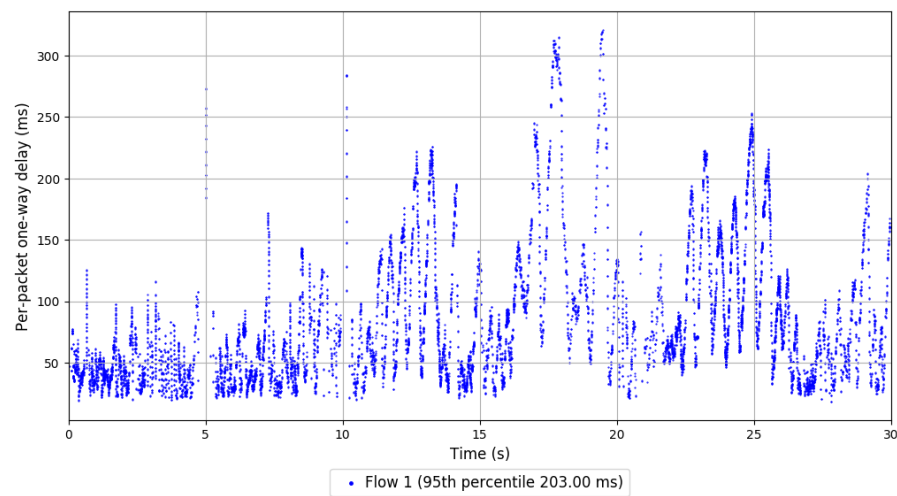
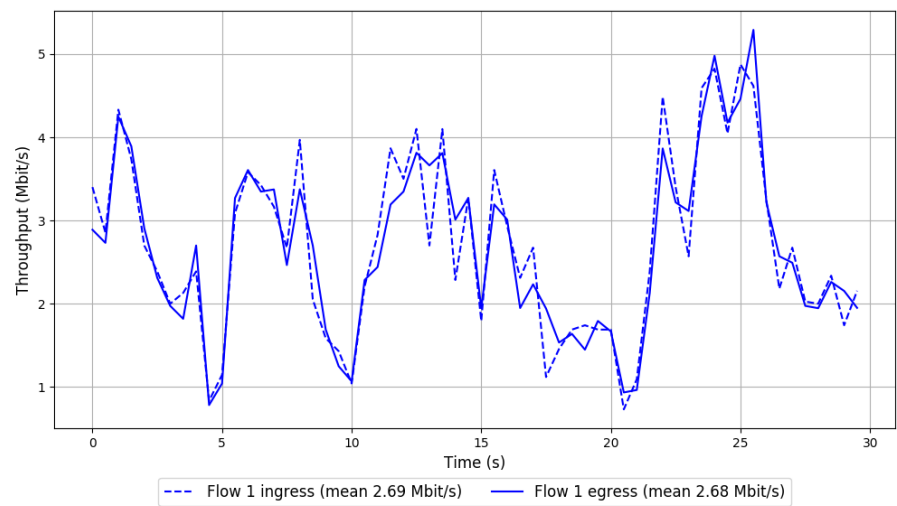
-- Flow 1:

Average throughput: 2.68 Mbit/s

95th percentile per-packet one-way delay: 203.005 ms

Loss rate: 0.55%

Run 2: Report of Copa — Data Link

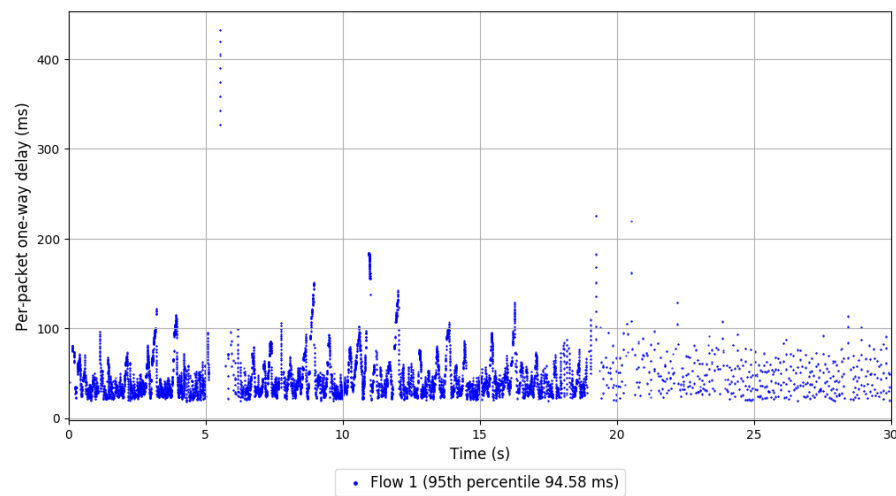
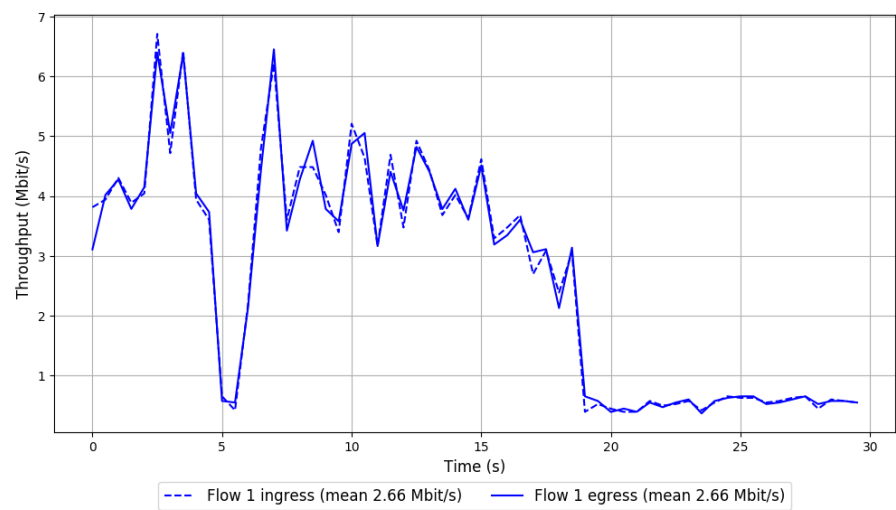


Run 3: Statistics of Copa

Start at: 2018-03-12 20:51:24
End at: 2018-03-12 20:51:54
Local clock offset: 12.118 ms
Remote clock offset: -6.238 ms

Below is generated by plot.py at 2018-03-12 22:18:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.66 Mbit/s
95th percentile per-packet one-way delay: 94.585 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 2.66 Mbit/s
95th percentile per-packet one-way delay: 94.585 ms
Loss rate: 0.23%

Run 3: Report of Copa — Data Link

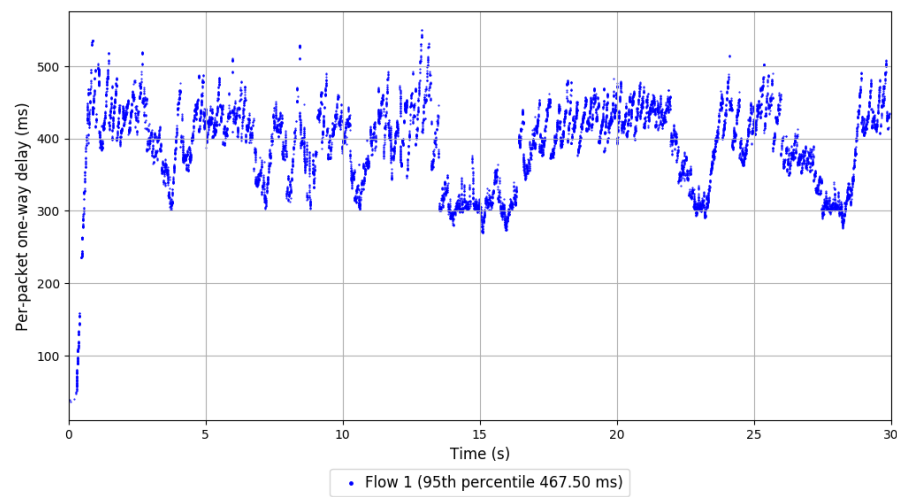
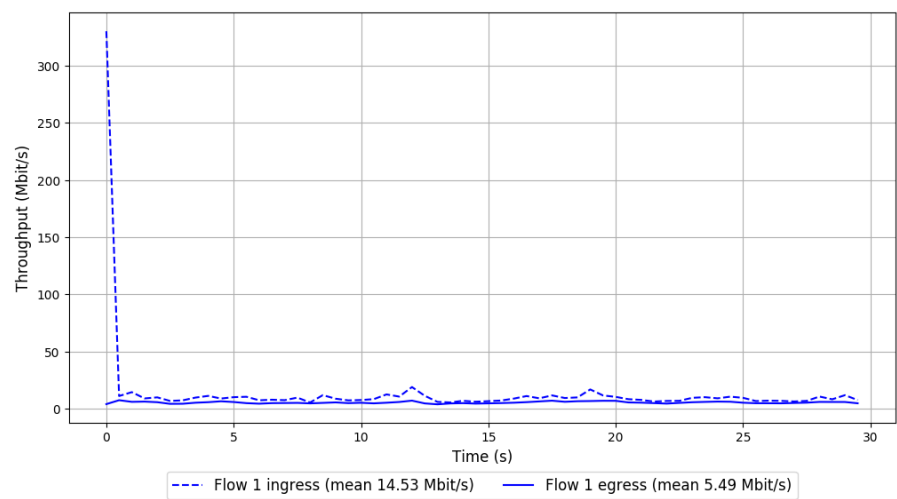


Run 1: Statistics of FillP

Start at: 2018-03-12 20:14:48
End at: 2018-03-12 20:15:18
Local clock offset: 3.719 ms
Remote clock offset: -5.173 ms

Below is generated by plot.py at 2018-03-12 22:18:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.49 Mbit/s
95th percentile per-packet one-way delay: 467.498 ms
Loss rate: 62.32%
-- Flow 1:
Average throughput: 5.49 Mbit/s
95th percentile per-packet one-way delay: 467.498 ms
Loss rate: 62.32%

Run 1: Report of FillP — Data Link

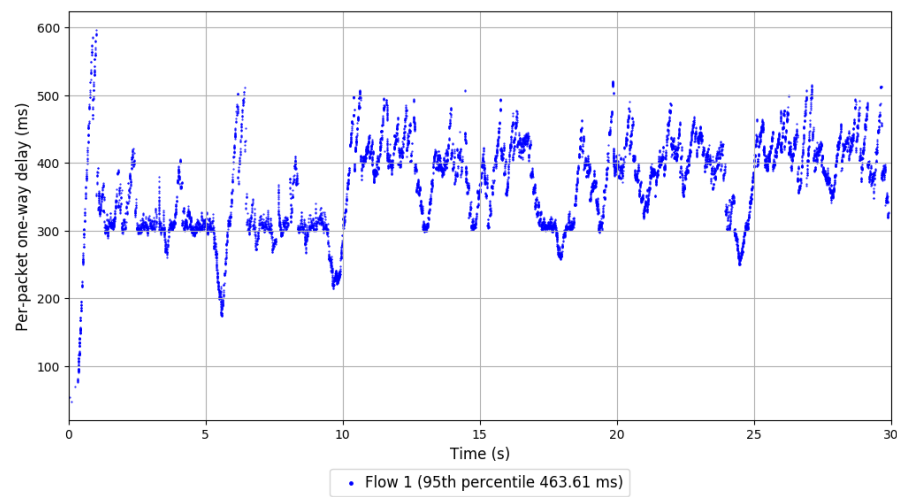
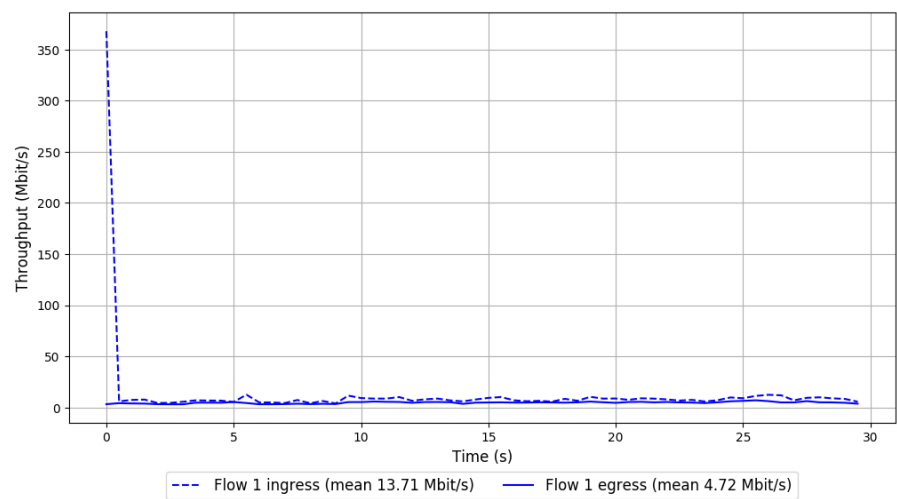


Run 2: Statistics of FillP

Start at: 2018-03-12 20:38:20
End at: 2018-03-12 20:38:50
Local clock offset: 8.573 ms
Remote clock offset: -5.294 ms

Below is generated by plot.py at 2018-03-12 22:18:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.72 Mbit/s
95th percentile per-packet one-way delay: 463.611 ms
Loss rate: 65.64%
-- Flow 1:
Average throughput: 4.72 Mbit/s
95th percentile per-packet one-way delay: 463.611 ms
Loss rate: 65.64%

Run 2: Report of FillP — Data Link

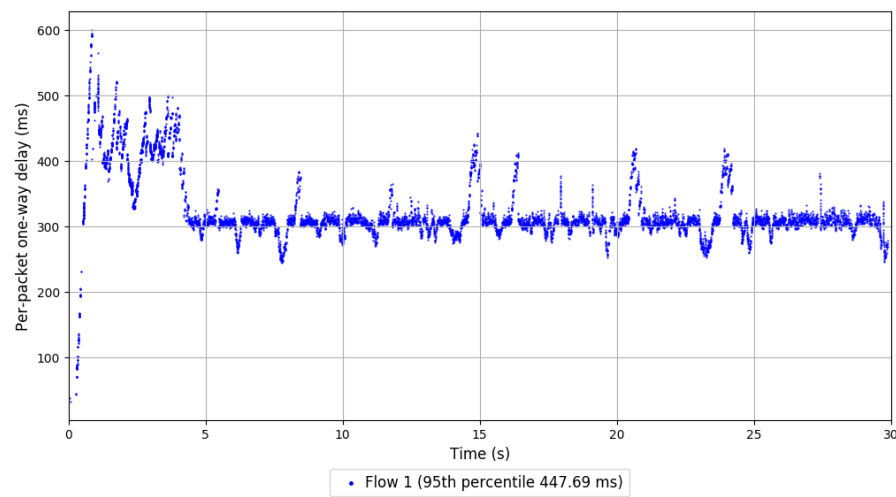
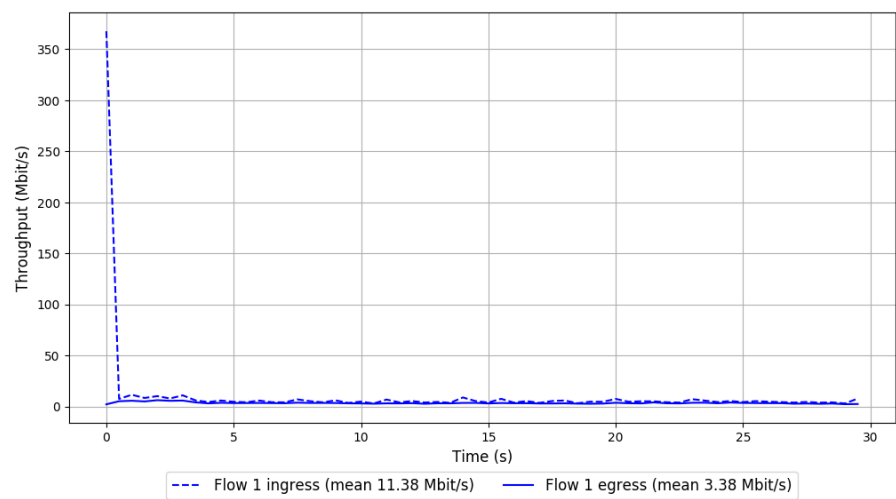


Run 3: Statistics of FillP

Start at: 2018-03-12 21:01:52
End at: 2018-03-12 21:02:22
Local clock offset: 15.144 ms
Remote clock offset: -6.616 ms

Below is generated by plot.py at 2018-03-12 22:18:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.38 Mbit/s
95th percentile per-packet one-way delay: 447.685 ms
Loss rate: 70.37%
-- Flow 1:
Average throughput: 3.38 Mbit/s
95th percentile per-packet one-way delay: 447.685 ms
Loss rate: 70.37%

Run 3: Report of FillP — Data Link



Run 1: Statistics of Indigo-1-32

Start at: 2018-03-12 20:16:07

End at: 2018-03-12 20:16:37

Local clock offset: 3.761 ms

Remote clock offset: -5.26 ms

Below is generated by plot.py at 2018-03-12 22:18:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.89 Mbit/s

95th percentile per-packet one-way delay: 94.343 ms

Loss rate: 0.40%

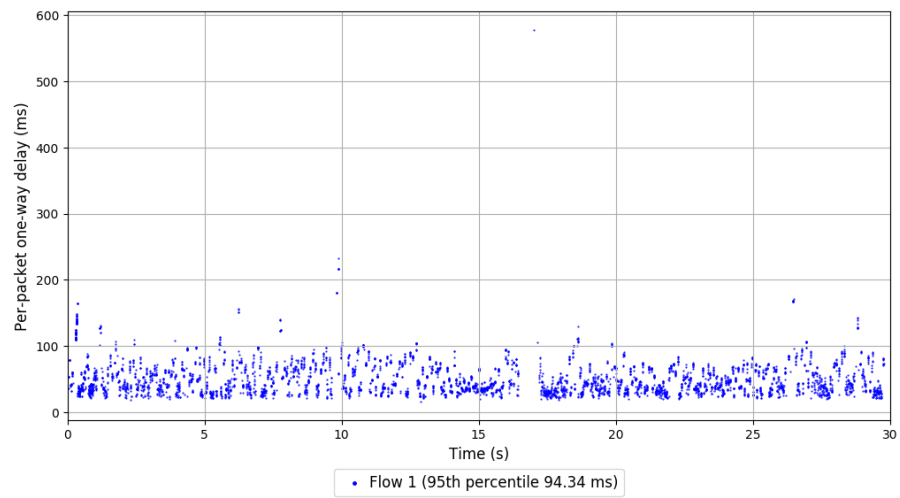
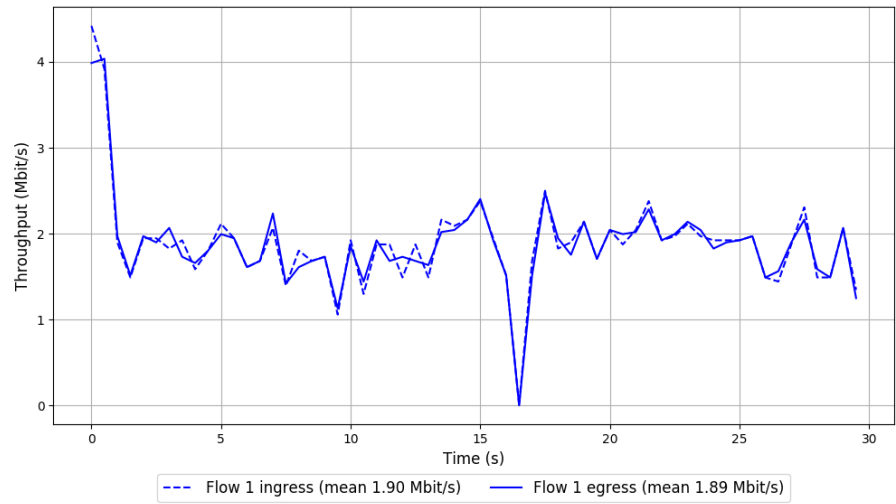
-- Flow 1:

Average throughput: 1.89 Mbit/s

95th percentile per-packet one-way delay: 94.343 ms

Loss rate: 0.40%

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

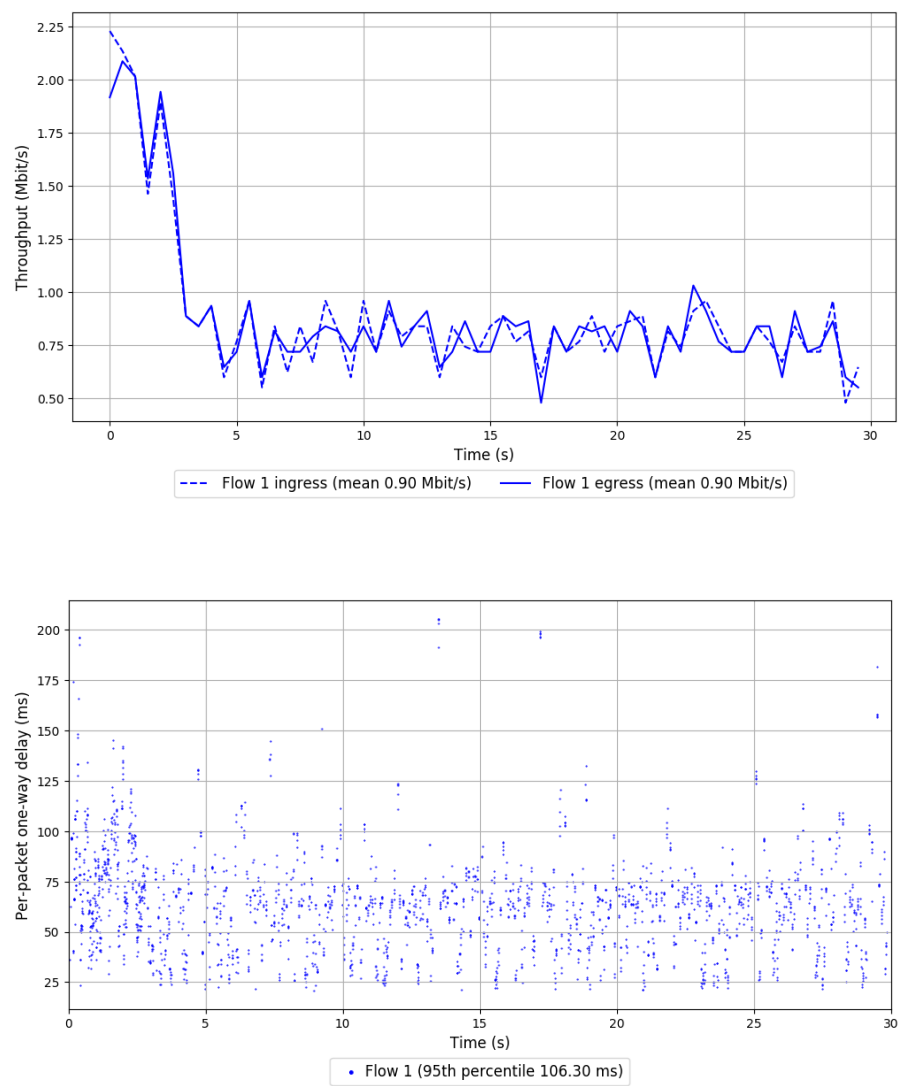


Run 2: Statistics of Indigo-1-32

Start at: 2018-03-12 20:39:39
End at: 2018-03-12 20:40:09
Local clock offset: 8.879 ms
Remote clock offset: -5.359 ms

Below is generated by plot.py at 2018-03-12 22:18:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 106.299 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 106.299 ms
Loss rate: 0.18%

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

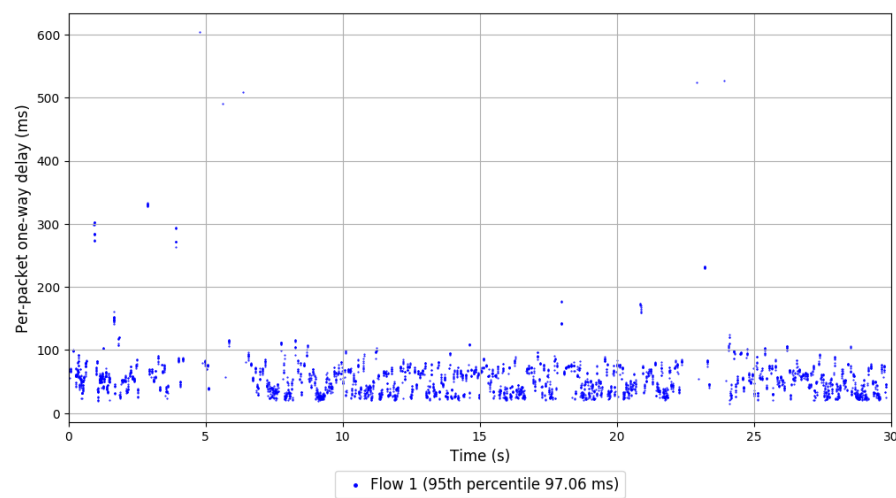
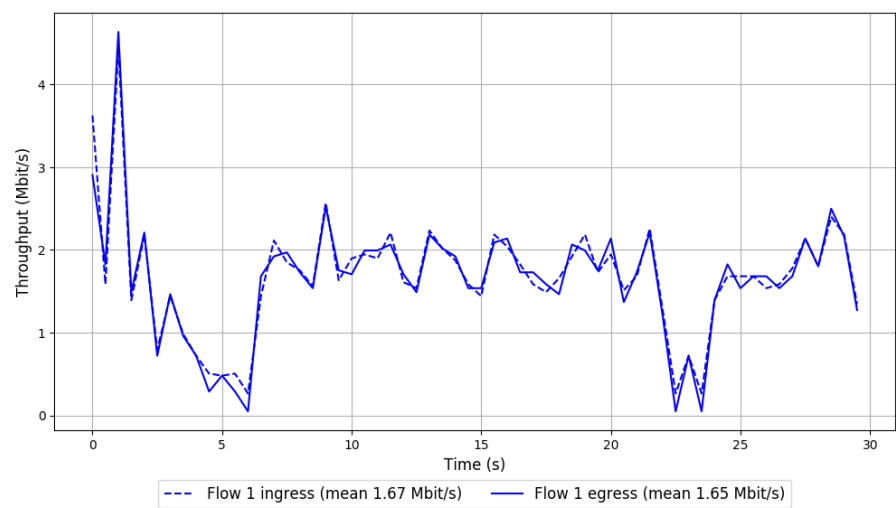


Run 3: Statistics of Indigo-1-32

Start at: 2018-03-12 21:03:10
End at: 2018-03-12 21:03:40
Local clock offset: 15.677 ms
Remote clock offset: -6.558 ms

Below is generated by plot.py at 2018-03-12 22:18:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.65 Mbit/s
95th percentile per-packet one-way delay: 97.056 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 1.65 Mbit/s
95th percentile per-packet one-way delay: 97.056 ms
Loss rate: 1.32%

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

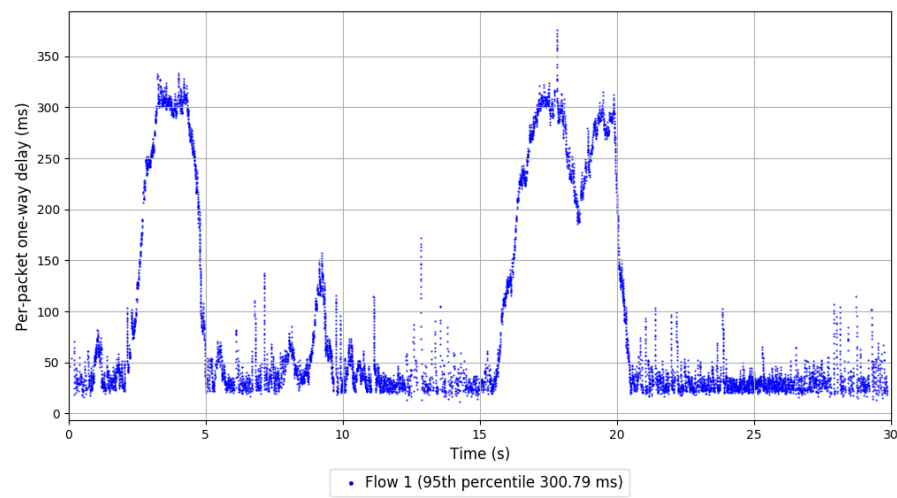
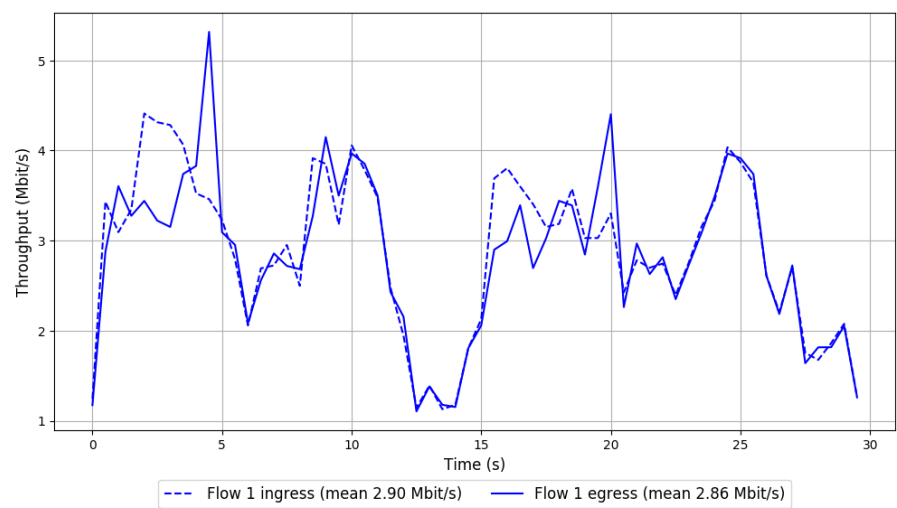


Run 1: Statistics of Vivace-latency

Start at: 2018-03-12 20:09:35
End at: 2018-03-12 20:10:05
Local clock offset: 4.484 ms
Remote clock offset: -5.291 ms

Below is generated by plot.py at 2018-03-12 22:18:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.86 Mbit/s
95th percentile per-packet one-way delay: 300.787 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 2.86 Mbit/s
95th percentile per-packet one-way delay: 300.787 ms
Loss rate: 1.52%

Run 1: Report of Vivace-latency — Data Link

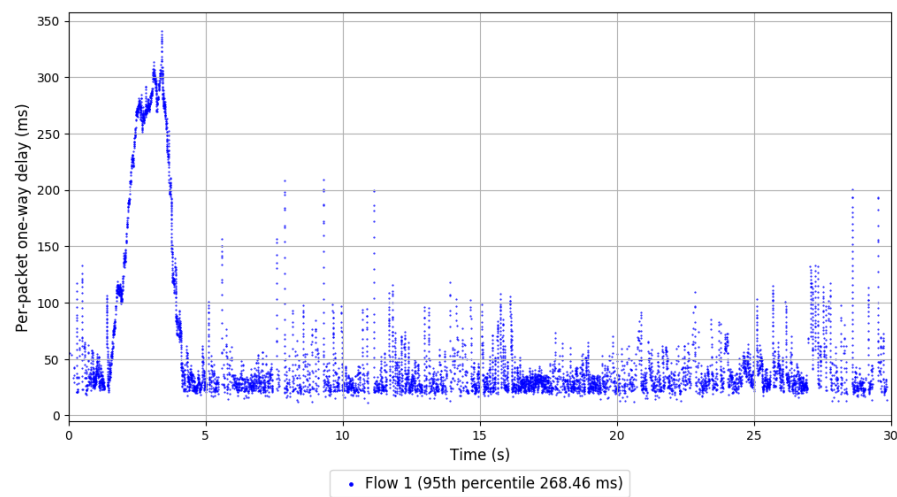
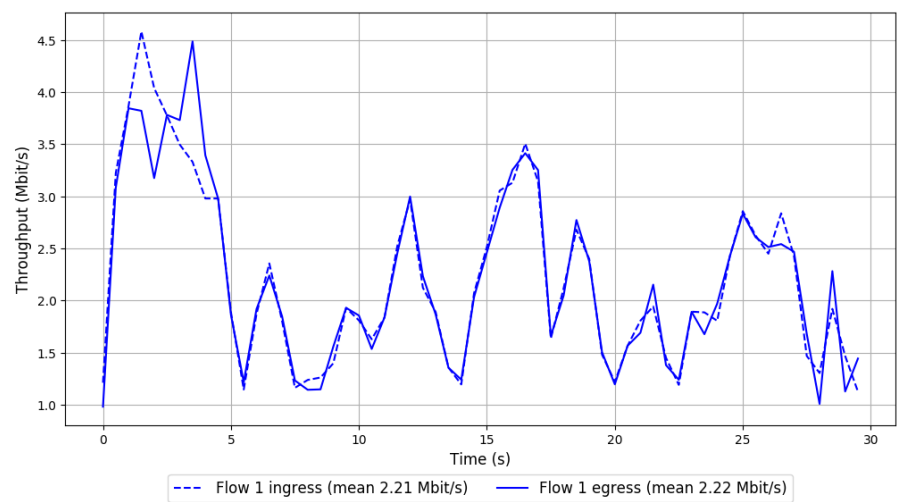


Run 2: Statistics of Vivace-latency

Start at: 2018-03-12 20:33:06
End at: 2018-03-12 20:33:36
Local clock offset: 7.471 ms
Remote clock offset: -5.038 ms

Below is generated by plot.py at 2018-03-12 22:18:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 268.456 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 268.456 ms
Loss rate: 0.12%

Run 2: Report of Vivace-latency — Data Link

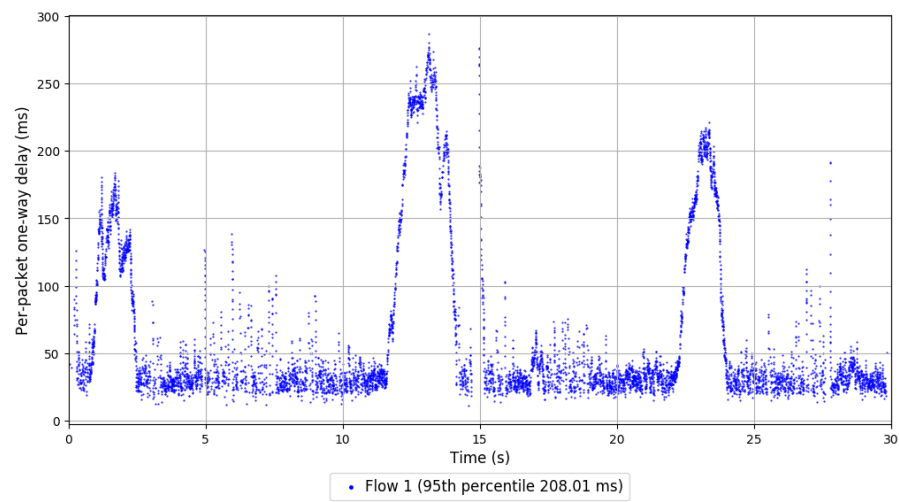
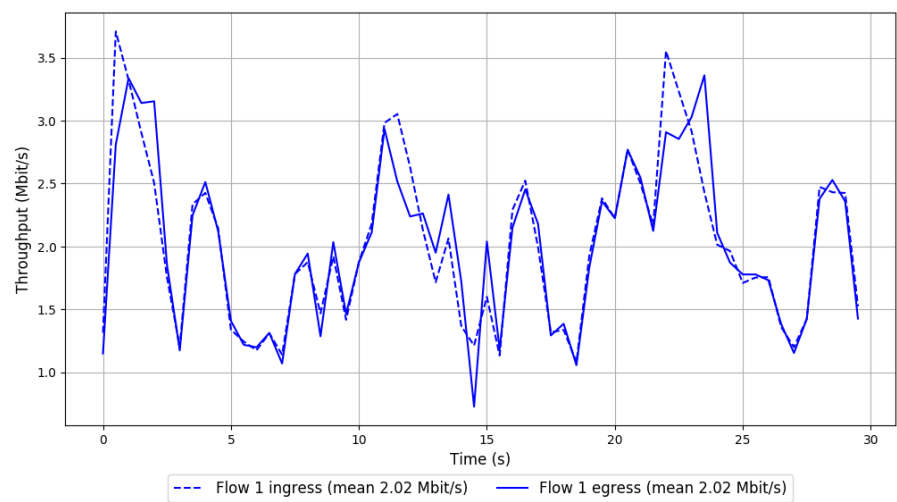


Run 3: Statistics of Vivace-latency

Start at: 2018-03-12 20:56:38
End at: 2018-03-12 20:57:08
Local clock offset: 13.686 ms
Remote clock offset: -6.402 ms

Below is generated by plot.py at 2018-03-12 22:18:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.02 Mbit/s
95th percentile per-packet one-way delay: 208.006 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 2.02 Mbit/s
95th percentile per-packet one-way delay: 208.006 ms
Loss rate: 0.23%

Run 3: Report of Vivace-latency — Data Link



Run 1: Statistics of Vivace-loss

Start at: 2018-03-12 20:18:44

End at: 2018-03-12 20:19:14

Local clock offset: 4.148 ms

Remote clock offset: -5.099 ms

Below is generated by plot.py at 2018-03-12 22:18:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.33 Mbit/s

95th percentile per-packet one-way delay: 401.450 ms

Loss rate: 21.09%

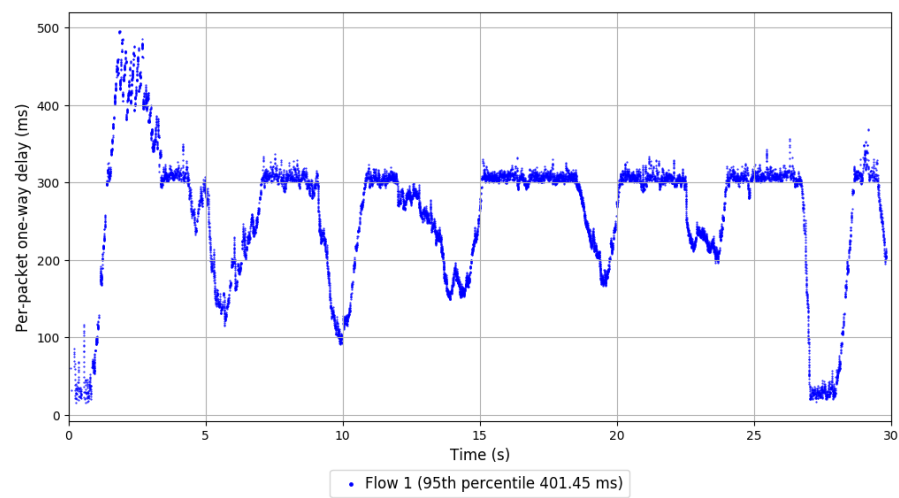
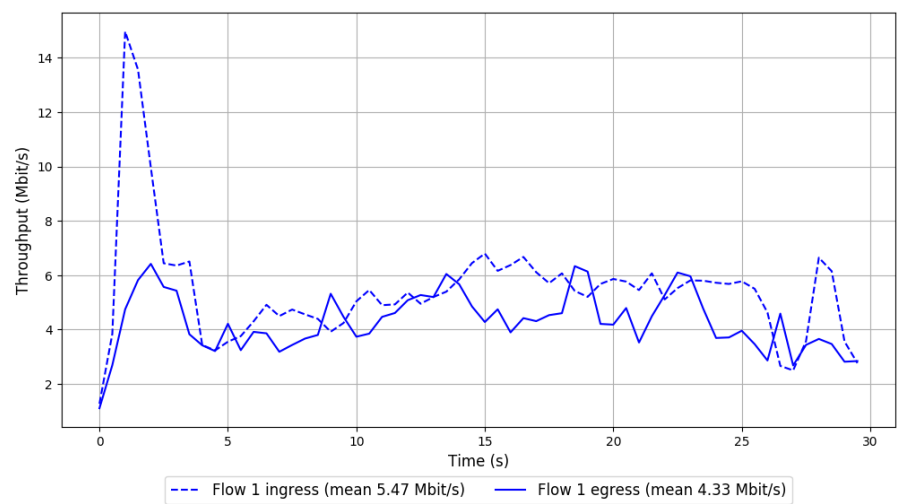
-- Flow 1:

Average throughput: 4.33 Mbit/s

95th percentile per-packet one-way delay: 401.450 ms

Loss rate: 21.09%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-03-12 20:42:16

End at: 2018-03-12 20:42:46

Local clock offset: 9.584 ms

Remote clock offset: -5.66 ms

Below is generated by plot.py at 2018-03-12 22:18:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.11 Mbit/s

95th percentile per-packet one-way delay: 441.540 ms

Loss rate: 28.10%

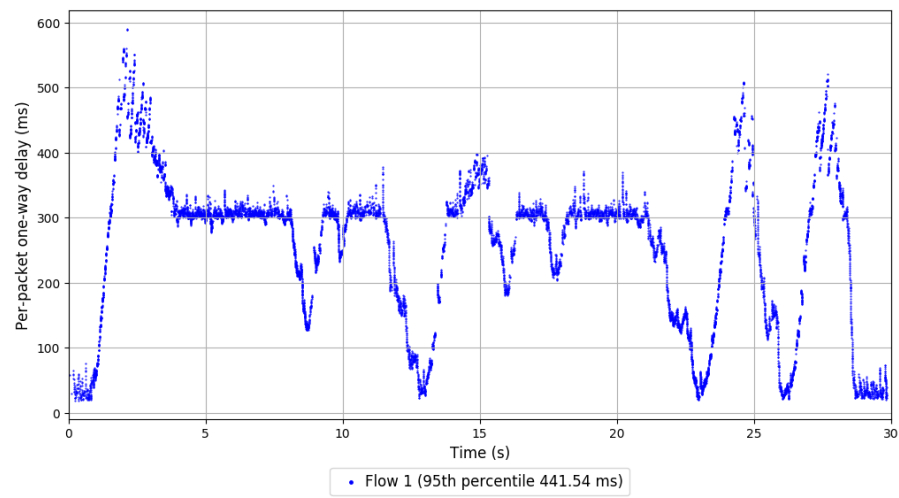
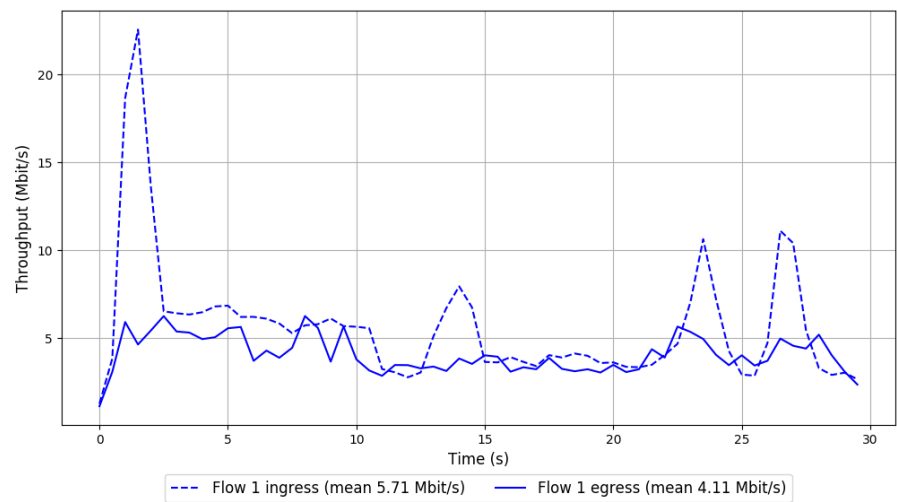
-- Flow 1:

Average throughput: 4.11 Mbit/s

95th percentile per-packet one-way delay: 441.540 ms

Loss rate: 28.10%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-03-12 21:05:48

End at: 2018-03-12 21:06:18

Local clock offset: 16.398 ms

Remote clock offset: -6.665 ms

Below is generated by plot.py at 2018-03-12 22:18:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.40 Mbit/s

95th percentile per-packet one-way delay: 415.598 ms

Loss rate: 19.75%

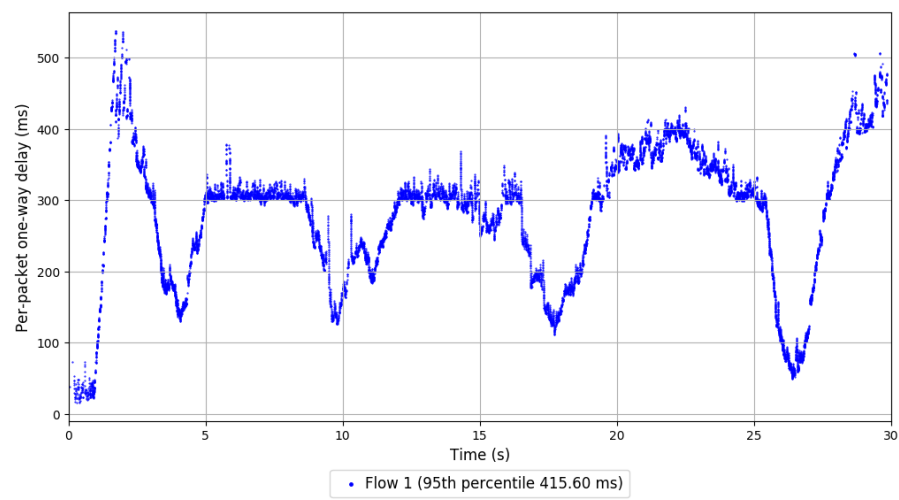
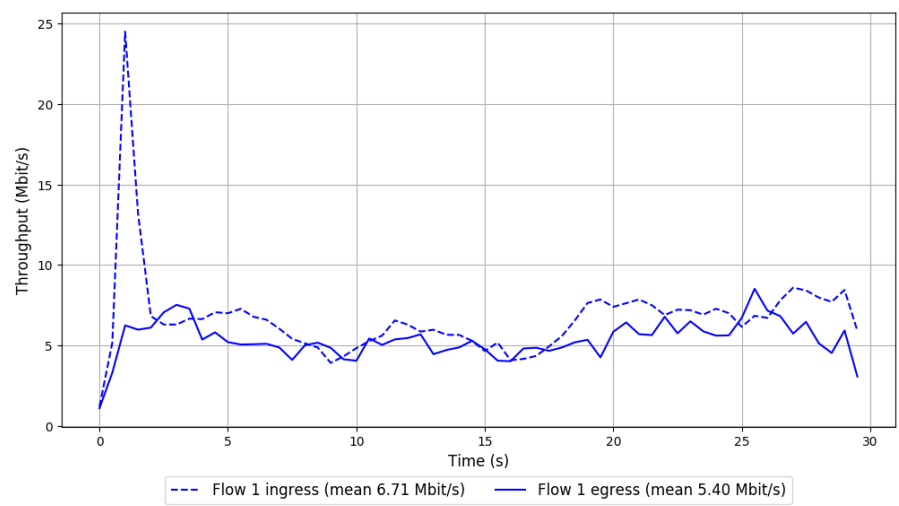
-- Flow 1:

Average throughput: 5.40 Mbit/s

95th percentile per-packet one-way delay: 415.598 ms

Loss rate: 19.75%

Run 3: Report of Vivace-loss — Data Link

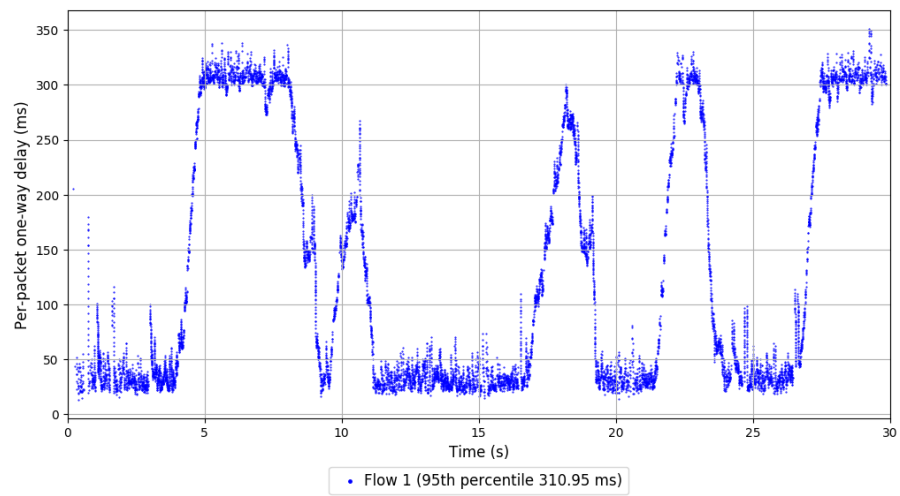
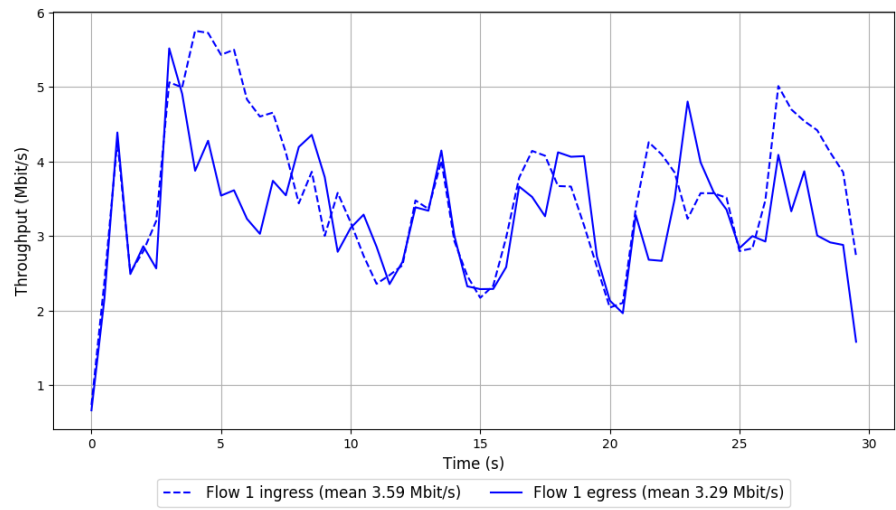


Run 1: Statistics of Vivace-LTE

Start at: 2018-03-12 20:17:25
End at: 2018-03-12 20:17:55
Local clock offset: 4.014 ms
Remote clock offset: -5.243 ms

Below is generated by plot.py at 2018-03-12 22:18:18
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.29 Mbit/s
95th percentile per-packet one-way delay: 310.955 ms
Loss rate: 9.19%
-- Flow 1:
Average throughput: 3.29 Mbit/s
95th percentile per-packet one-way delay: 310.955 ms
Loss rate: 9.19%

Run 1: Report of Vivace-LTE — Data Link

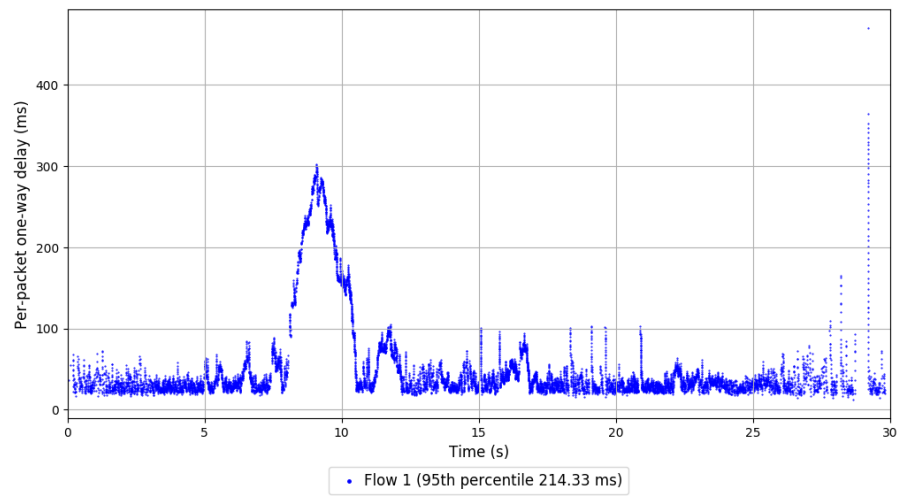
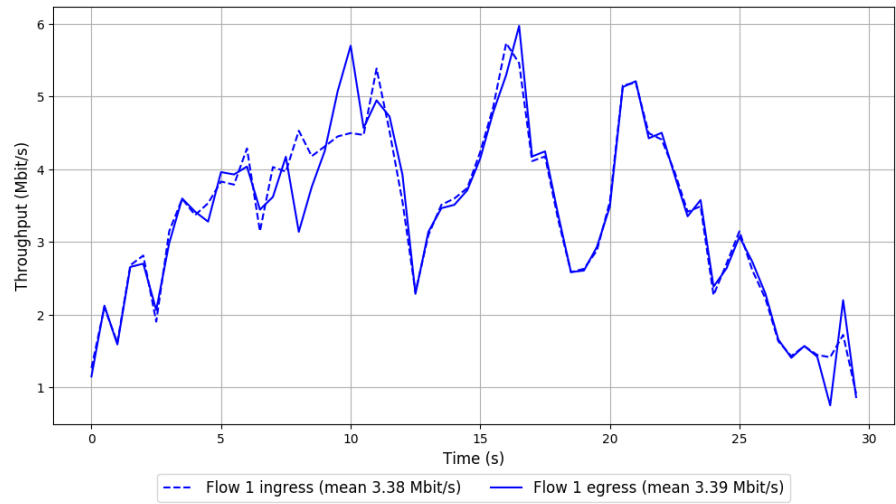


Run 2: Statistics of Vivace-LTE

Start at: 2018-03-12 20:40:57
End at: 2018-03-12 20:41:27
Local clock offset: 9.139 ms
Remote clock offset: -5.574 ms

Below is generated by plot.py at 2018-03-12 22:18:18
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.39 Mbit/s
95th percentile per-packet one-way delay: 214.330 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 3.39 Mbit/s
95th percentile per-packet one-way delay: 214.330 ms
Loss rate: 0.16%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-03-12 21:04:29

End at: 2018-03-12 21:04:59

Local clock offset: 16.006 ms

Remote clock offset: -6.68 ms

Below is generated by plot.py at 2018-03-12 22:18:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.64 Mbit/s

95th percentile per-packet one-way delay: 306.087 ms

Loss rate: 3.06%

-- Flow 1:

Average throughput: 4.64 Mbit/s

95th percentile per-packet one-way delay: 306.087 ms

Loss rate: 3.06%

Run 3: Report of Vivace-LTE — Data Link

