

Pantheon Report

Generated at 2017-12-20 17:49:37 (UTC).

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

Repeated the test of 14 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).

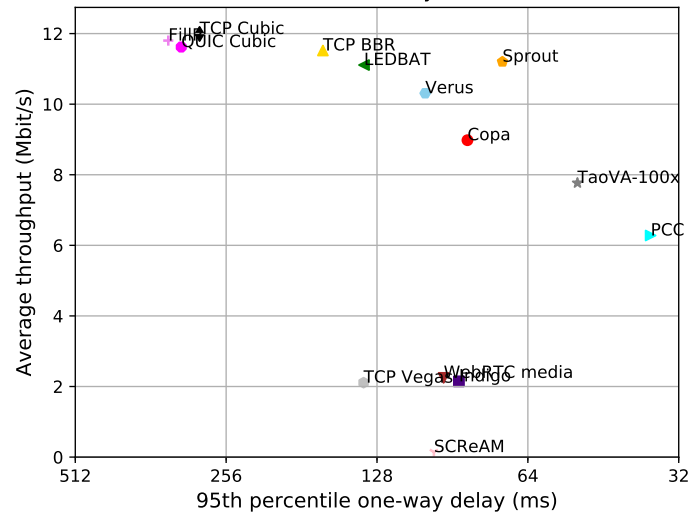
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

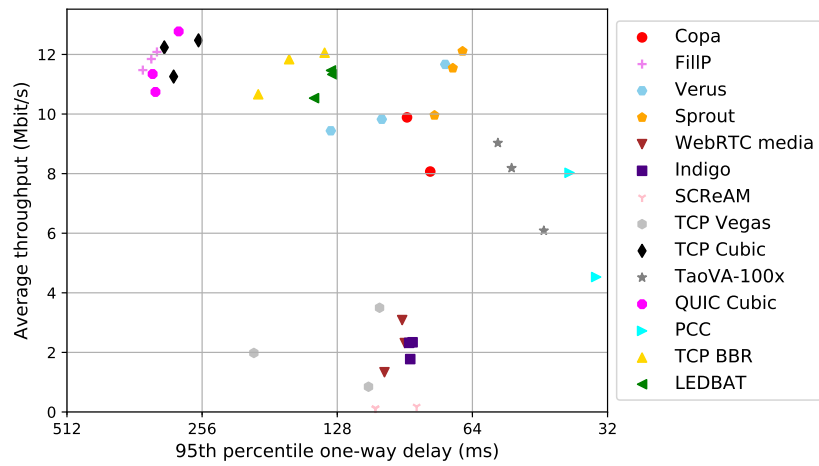
Git summary:

```
branch: master @ 904a5750834816b1e46a2c86405d707788d27c16
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fixlisp @ dcaef6b00654e660f73f7ed679d2eab61ce08639
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
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-quick @ 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/webRTC @ a488197ddd041ace68a42849b2540ad834825f42
```

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



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



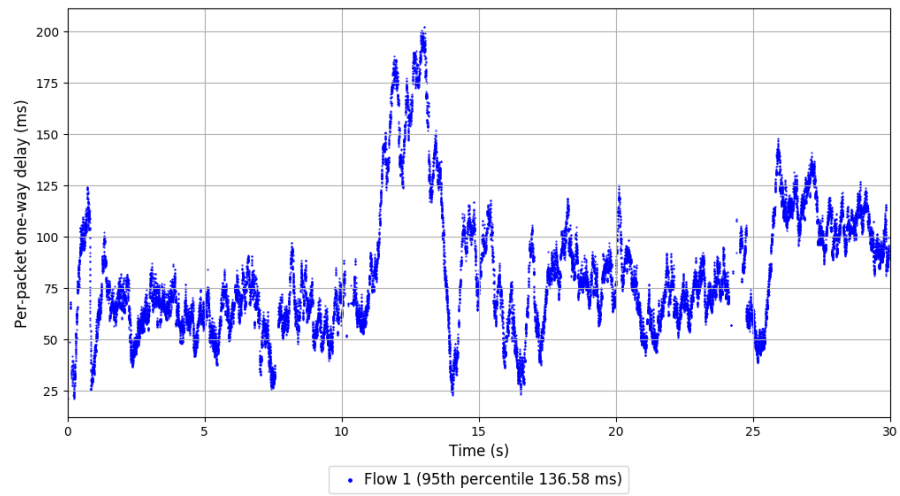
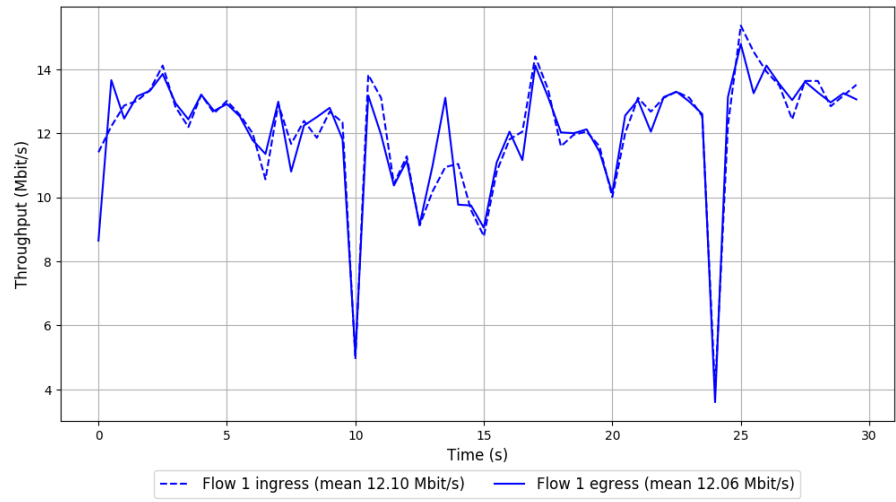
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	11.52	164.12	0.47
TCP Cubic	3	11.99	289.25	1.00
LEDBAT	3	11.11	135.90	0.44
PCC	2	6.28	36.41	0.14
QUIC Cubic	3	11.62	314.63	1.53
SCReAM	3	0.14	98.56	0.34
WebRTC media	3	2.24	94.25	0.71
Sprout	3	11.20	71.94	1.27
TaoVA-100x	3	7.77	50.96	0.64
TCP Vegas	3	2.11	136.14	0.29
Verus	3	10.31	102.58	10.56
Copa	2	8.98	84.48	0.38
FillP	3	11.80	333.97	51.79
Indigo	3	2.15	87.85	0.22

Run 1: Statistics of TCP BBR

Start at: 2017-12-20 16:05:11
End at: 2017-12-20 16:05:41
Local clock offset: -0.149 ms
Remote clock offset: -2.873 ms

Below is generated by plot.py at 2017-12-20 17:48:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.06 Mbit/s
95th percentile per-packet one-way delay: 136.584 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 12.06 Mbit/s
95th percentile per-packet one-way delay: 136.584 ms
Loss rate: 0.44%

Run 1: Report of TCP BBR — Data Link

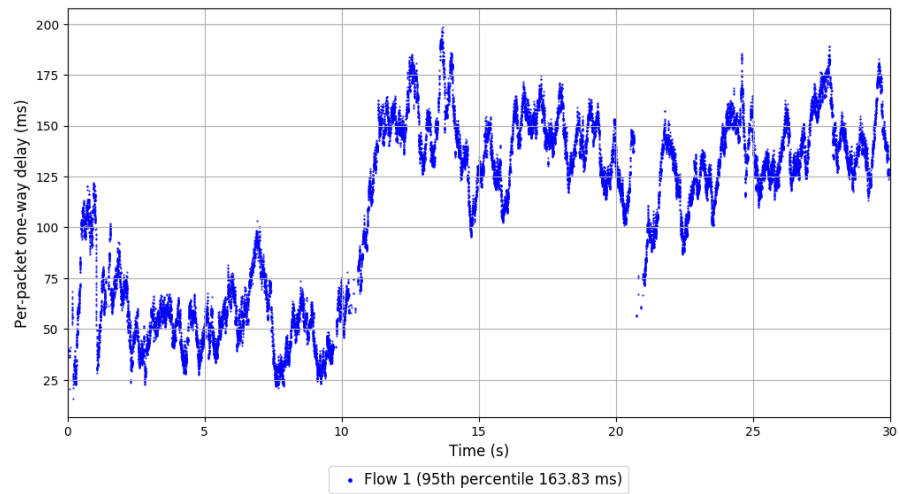
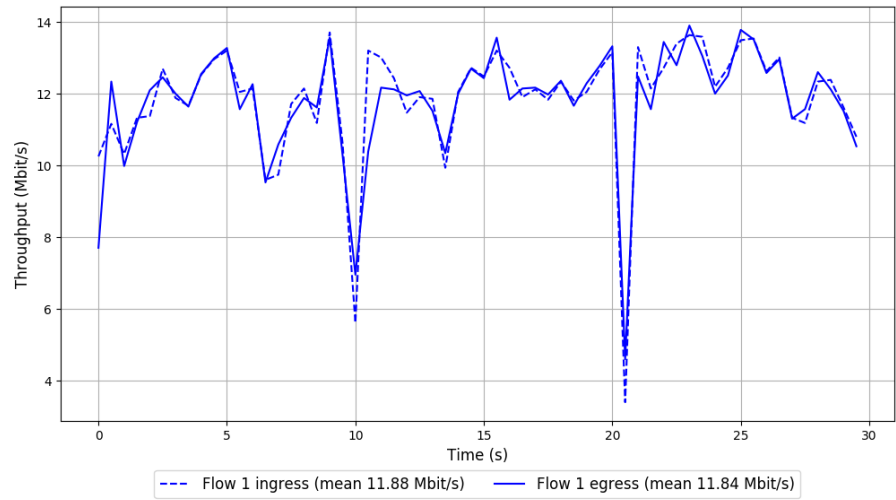


Run 2: Statistics of TCP BBR

Start at: 2017-12-20 16:22:51
End at: 2017-12-20 16:23:21
Local clock offset: 0.018 ms
Remote clock offset: -2.825 ms

Below is generated by plot.py at 2017-12-20 17:48:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.84 Mbit/s
95th percentile per-packet one-way delay: 163.828 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 11.84 Mbit/s
95th percentile per-packet one-way delay: 163.828 ms
Loss rate: 0.52%

Run 2: Report of TCP BBR — Data Link

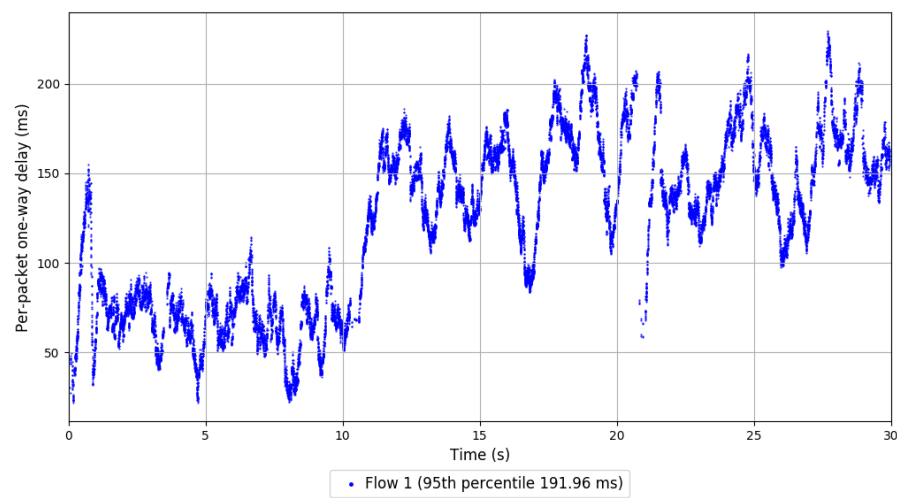
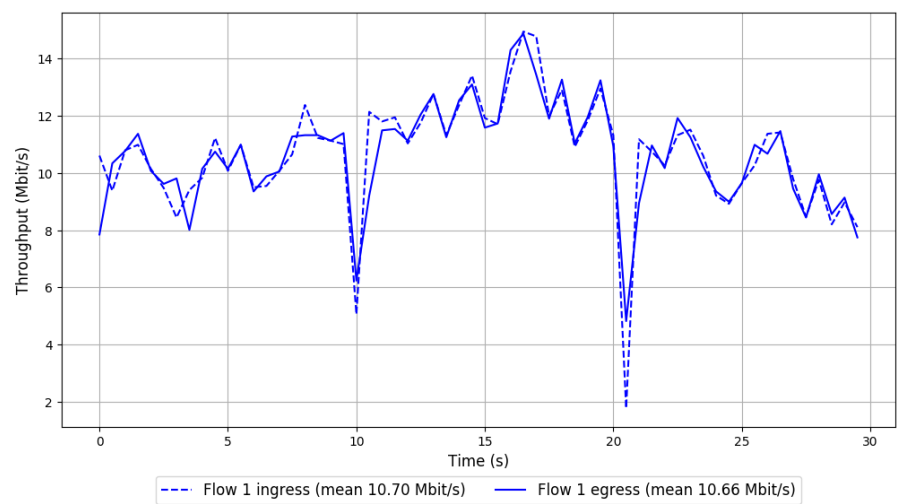


Run 3: Statistics of TCP BBR

Start at: 2017-12-20 16:40:30
End at: 2017-12-20 16:41:00
Local clock offset: 0.211 ms
Remote clock offset: -2.711 ms

Below is generated by plot.py at 2017-12-20 17:48:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.66 Mbit/s
95th percentile per-packet one-way delay: 191.955 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 10.66 Mbit/s
95th percentile per-packet one-way delay: 191.955 ms
Loss rate: 0.46%

Run 3: Report of TCP BBR — Data Link

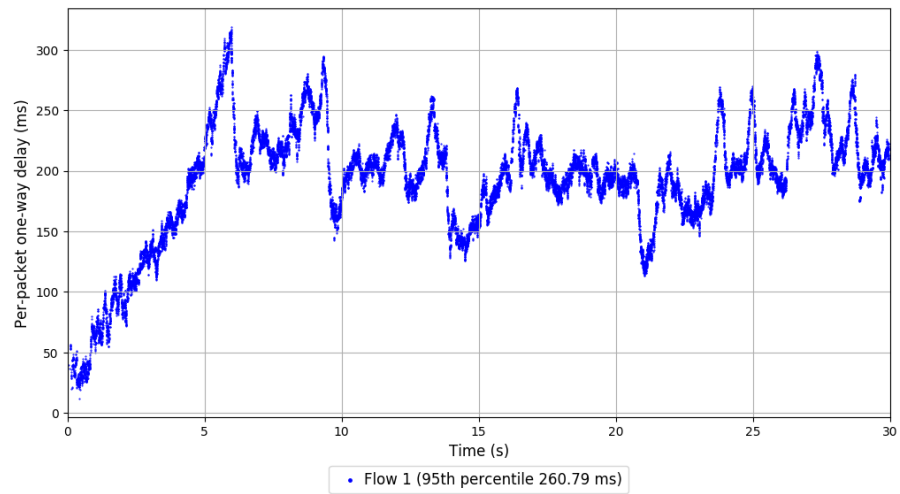
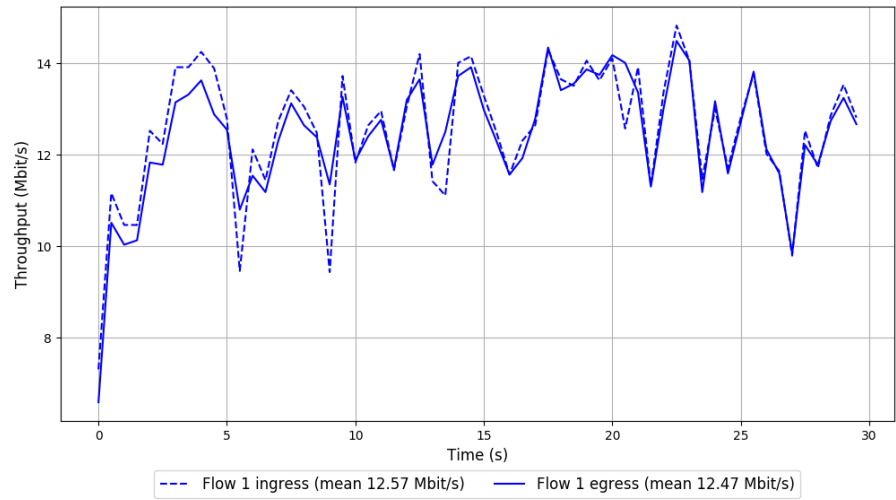


Run 1: Statistics of TCP Cubic

Start at: 2017-12-20 16:18:07
End at: 2017-12-20 16:18:38
Local clock offset: -0.042 ms
Remote clock offset: -2.928 ms

Below is generated by plot.py at 2017-12-20 17:48:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.47 Mbit/s
95th percentile per-packet one-way delay: 260.786 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 12.47 Mbit/s
95th percentile per-packet one-way delay: 260.786 ms
Loss rate: 0.93%

Run 1: Report of TCP Cubic — Data Link

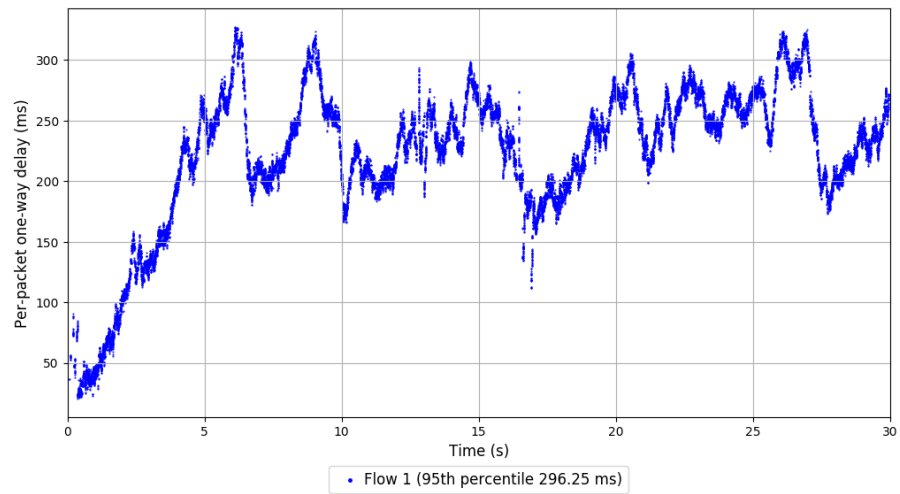
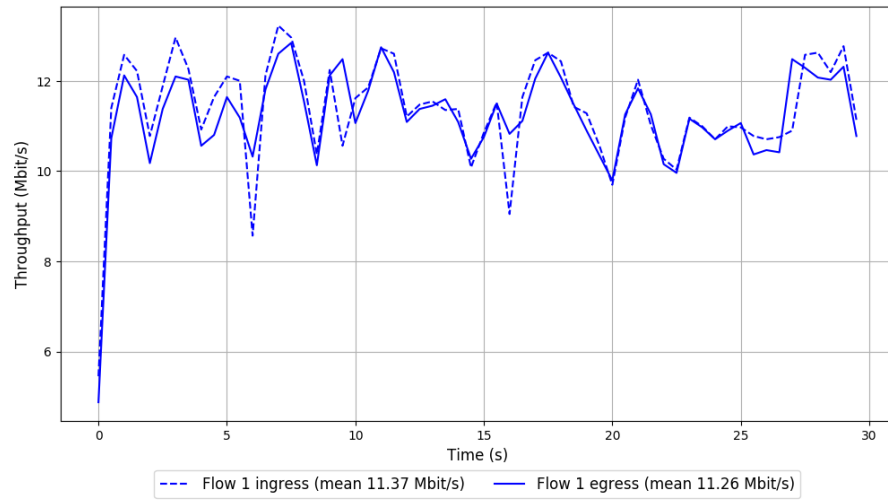


Run 2: Statistics of TCP Cubic

Start at: 2017-12-20 16:35:47
End at: 2017-12-20 16:36:17
Local clock offset: 0.09 ms
Remote clock offset: -2.773 ms

Below is generated by plot.py at 2017-12-20 17:48:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.26 Mbit/s
95th percentile per-packet one-way delay: 296.253 ms
Loss rate: 1.14%
-- Flow 1:
Average throughput: 11.26 Mbit/s
95th percentile per-packet one-way delay: 296.253 ms
Loss rate: 1.14%

Run 2: Report of TCP Cubic — Data Link

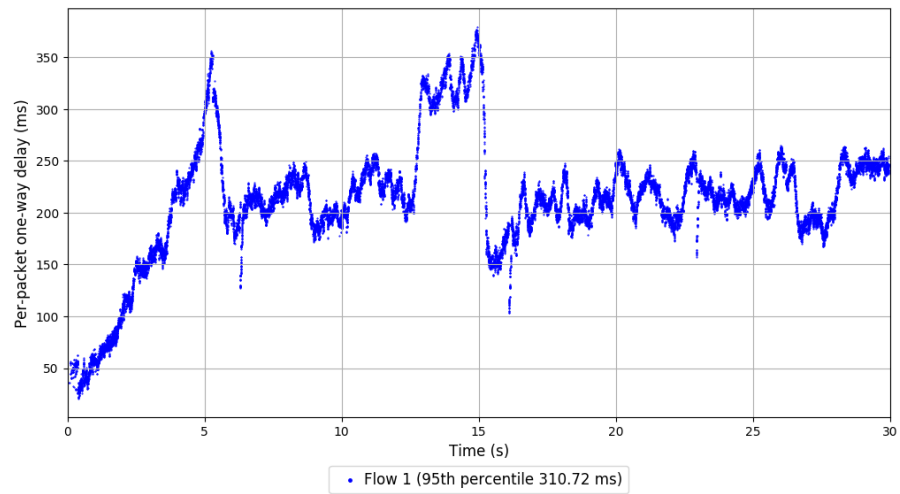
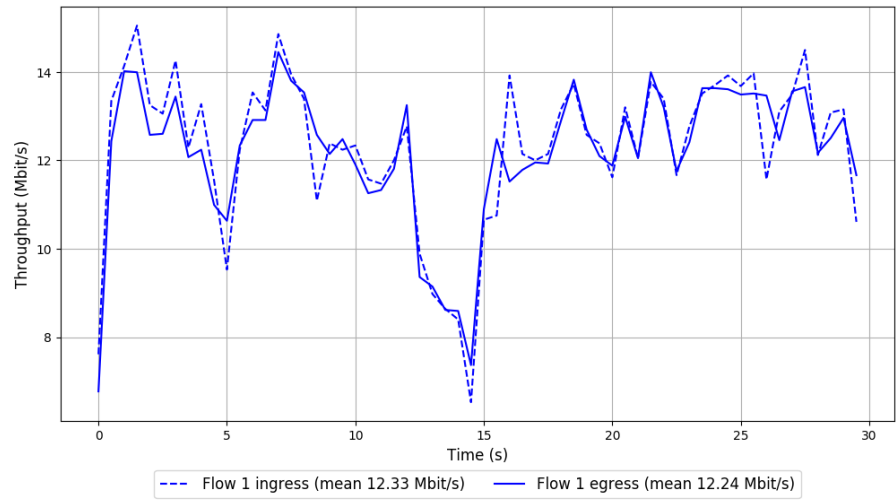


Run 3: Statistics of TCP Cubic

Start at: 2017-12-20 16:53:27
End at: 2017-12-20 16:53:57
Local clock offset: 0.232 ms
Remote clock offset: -2.749 ms

Below is generated by plot.py at 2017-12-20 17:48:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.24 Mbit/s
95th percentile per-packet one-way delay: 310.716 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 12.24 Mbit/s
95th percentile per-packet one-way delay: 310.716 ms
Loss rate: 0.93%

Run 3: Report of TCP Cubic — Data Link

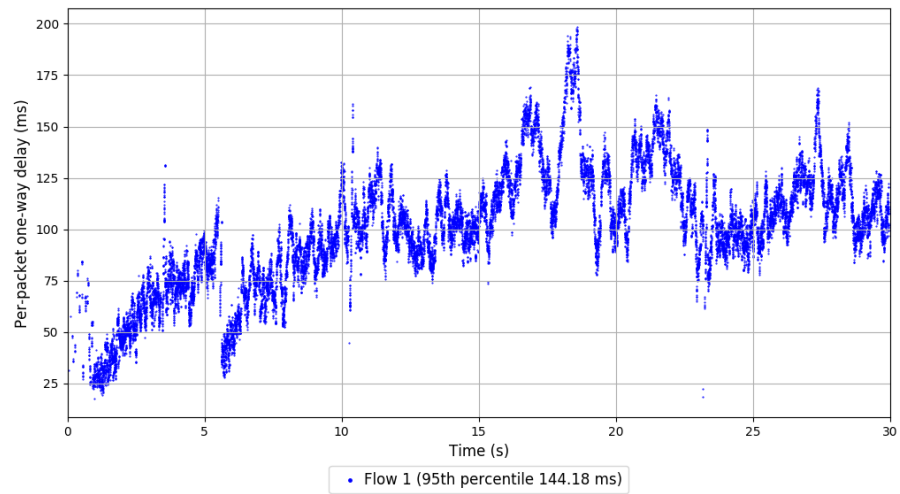
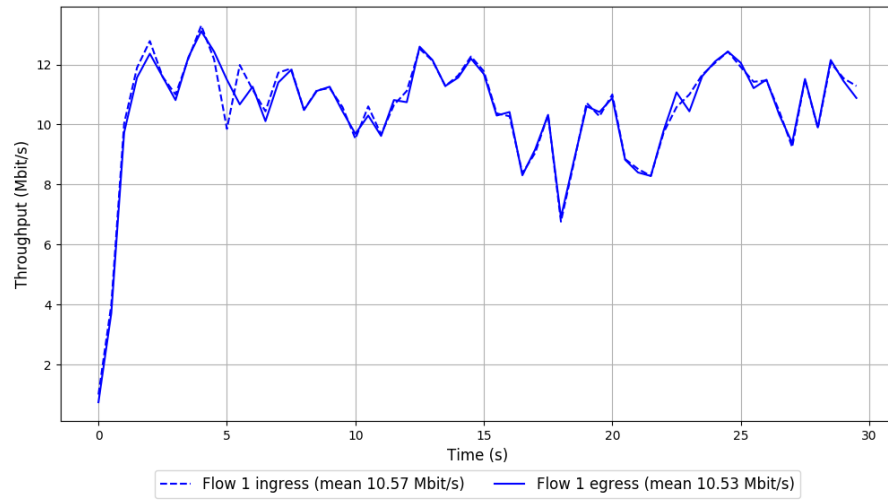


Run 1: Statistics of LEDBAT

Start at: 2017-12-20 16:19:19
End at: 2017-12-20 16:19:49
Local clock offset: 0.065 ms
Remote clock offset: -2.874 ms

Below is generated by plot.py at 2017-12-20 17:48:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.53 Mbit/s
95th percentile per-packet one-way delay: 144.178 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 10.53 Mbit/s
95th percentile per-packet one-way delay: 144.178 ms
Loss rate: 0.46%

Run 1: Report of LEDBAT — Data Link

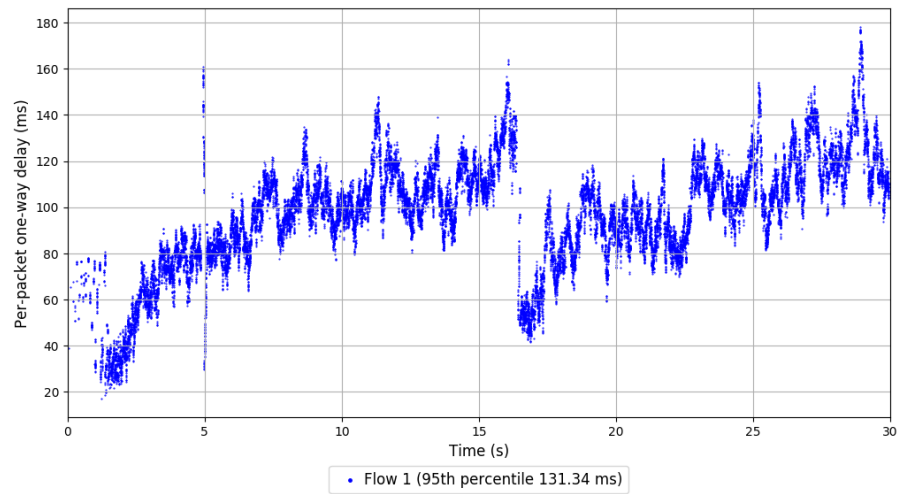
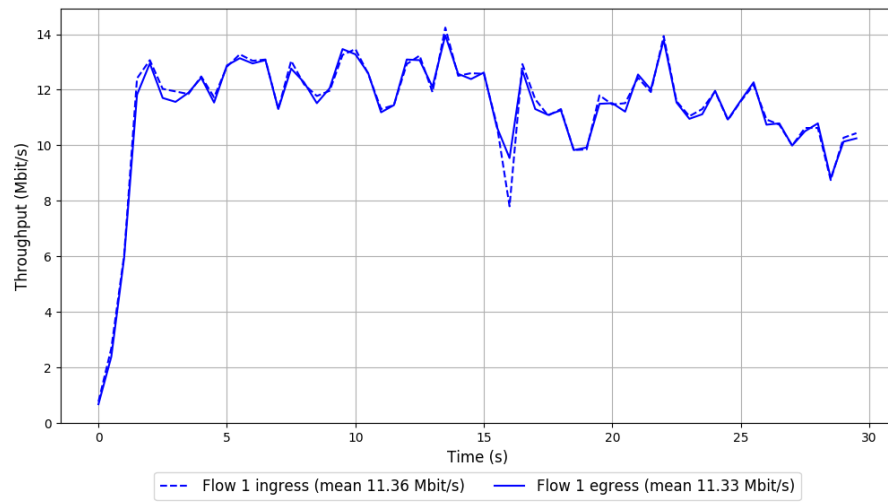


Run 2: Statistics of LEDBAT

Start at: 2017-12-20 16:36:58
End at: 2017-12-20 16:37:28
Local clock offset: 0.09 ms
Remote clock offset: -2.787 ms

Below is generated by plot.py at 2017-12-20 17:48:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.33 Mbit/s
95th percentile per-packet one-way delay: 131.344 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 11.33 Mbit/s
95th percentile per-packet one-way delay: 131.344 ms
Loss rate: 0.42%

Run 2: Report of LEDBAT — Data Link

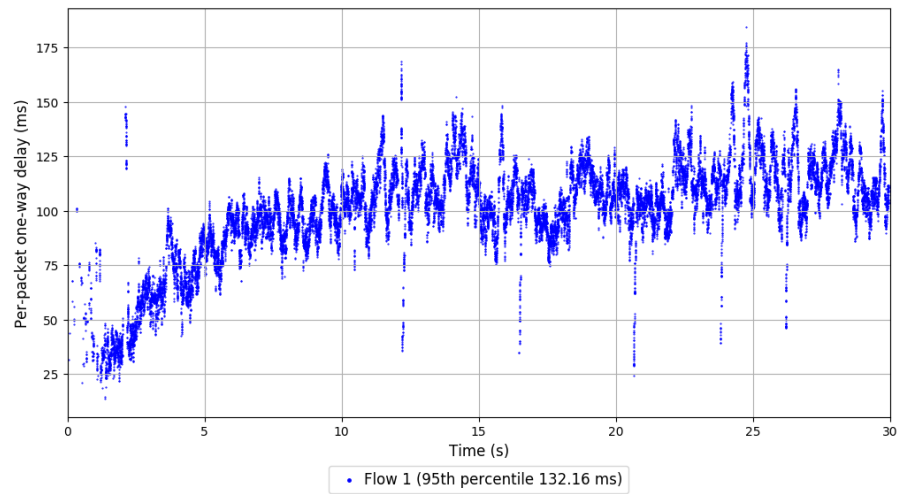
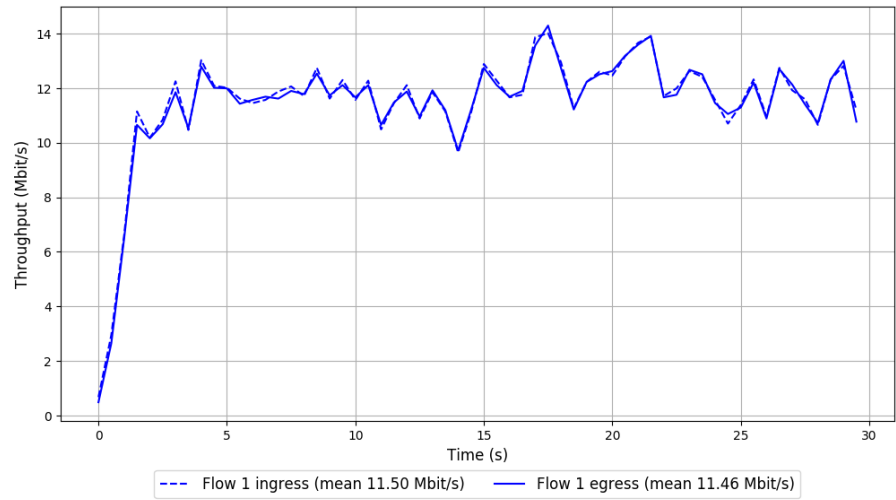


Run 3: Statistics of LEDBAT

Start at: 2017-12-20 16:54:38
End at: 2017-12-20 16:55:08
Local clock offset: 0.199 ms
Remote clock offset: -2.606 ms

Below is generated by plot.py at 2017-12-20 17:49:02
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.46 Mbit/s
95th percentile per-packet one-way delay: 132.165 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 11.46 Mbit/s
95th percentile per-packet one-way delay: 132.165 ms
Loss rate: 0.44%

Run 3: Report of LEDBAT — Data Link

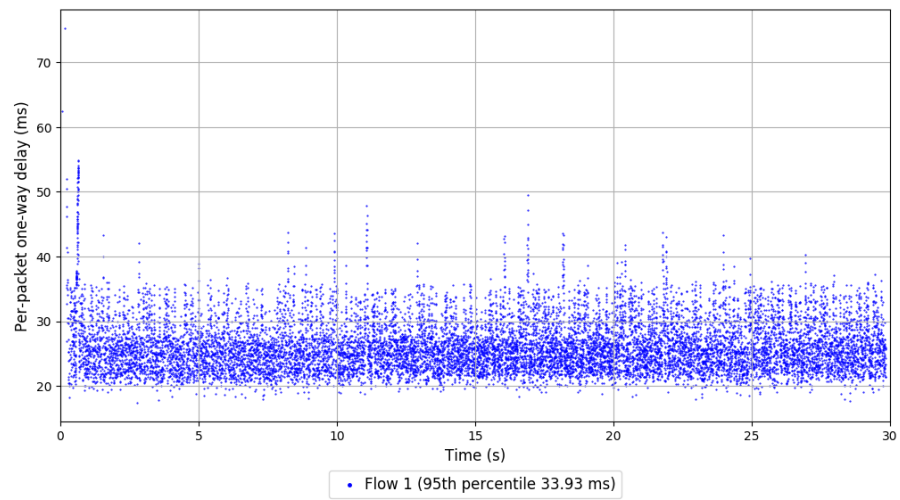
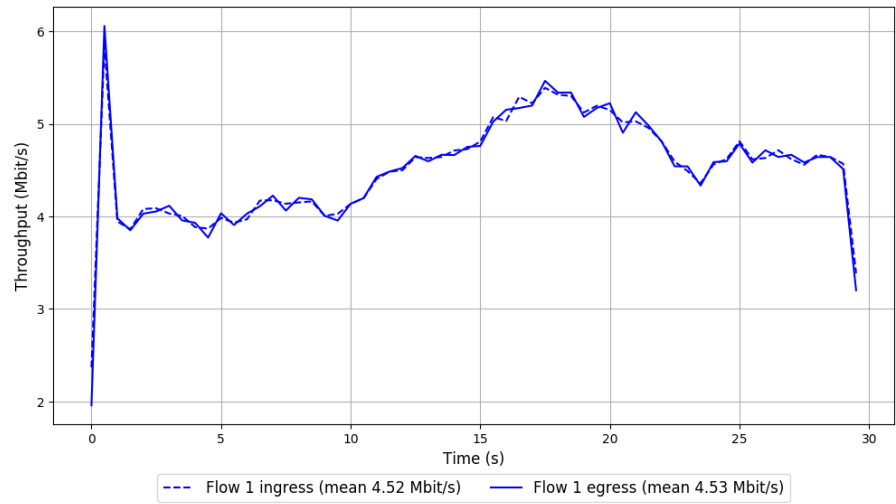


Run 1: Statistics of PCC

Start at: 2017-12-20 16:09:52
End at: 2017-12-20 16:10:22
Local clock offset: -0.061 ms
Remote clock offset: -2.828 ms

Below is generated by plot.py at 2017-12-20 17:49:02
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.53 Mbit/s
95th percentile per-packet one-way delay: 33.928 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 4.53 Mbit/s
95th percentile per-packet one-way delay: 33.928 ms
Loss rate: 0.18%

Run 1: Report of PCC — Data Link



Run 2: Statistics of PCC

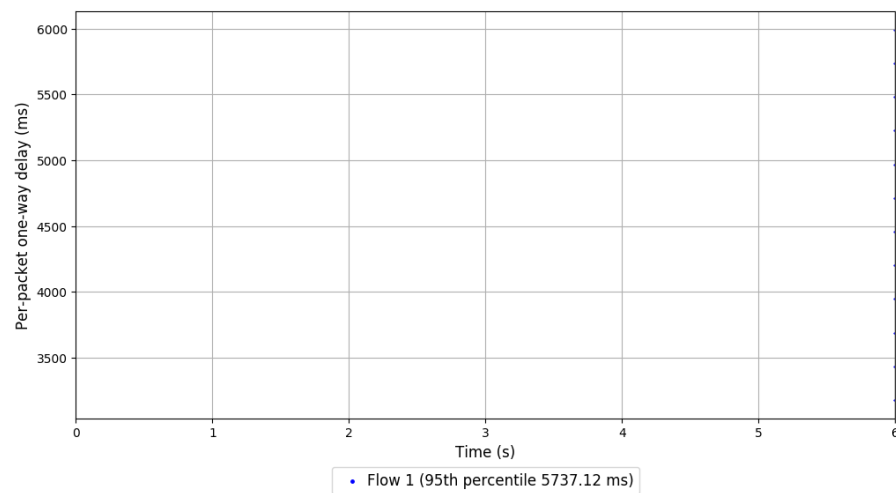
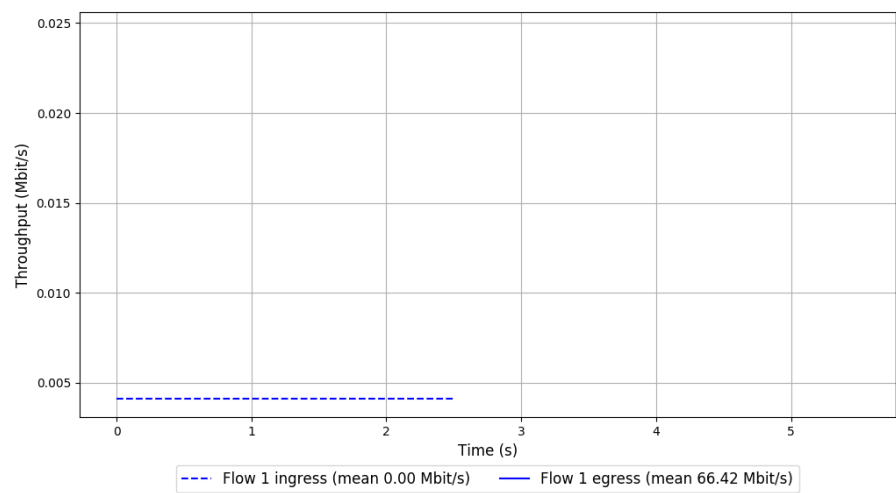
Start at: 2017-12-20 16:27:33

End at: 2017-12-20 16:28:03

Local clock offset: 0.062 ms

Remote clock offset: -2.894 ms

Run 2: Report of PCC — Data Link

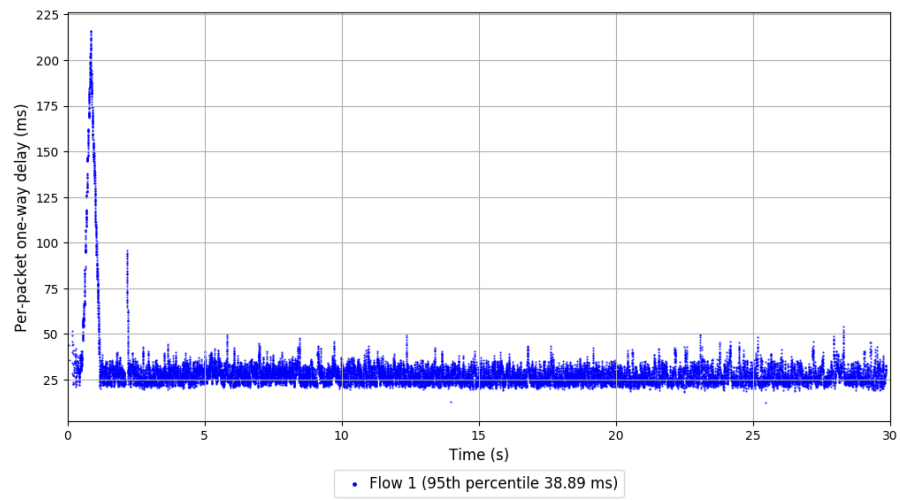
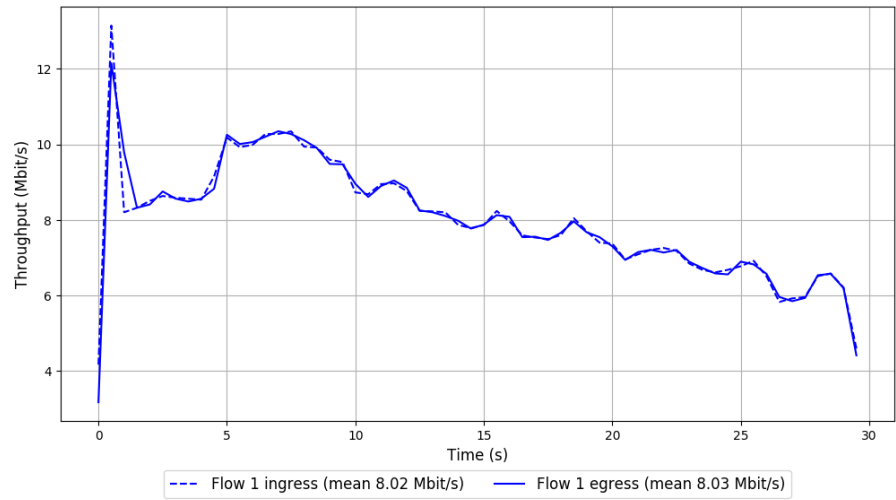


Run 3: Statistics of PCC

Start at: 2017-12-20 16:45:12
End at: 2017-12-20 16:45:42
Local clock offset: 0.235 ms
Remote clock offset: -2.632 ms

Below is generated by plot.py at 2017-12-20 17:49:02
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.03 Mbit/s
95th percentile per-packet one-way delay: 38.886 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 8.03 Mbit/s
95th percentile per-packet one-way delay: 38.886 ms
Loss rate: 0.11%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2017-12-20 16:14:36

End at: 2017-12-20 16:15:06

Local clock offset: -0.004 ms

Remote clock offset: -2.867 ms

Below is generated by plot.py at 2017-12-20 17:49:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 12.77 Mbit/s

95th percentile per-packet one-way delay: 288.720 ms

Loss rate: 1.46%

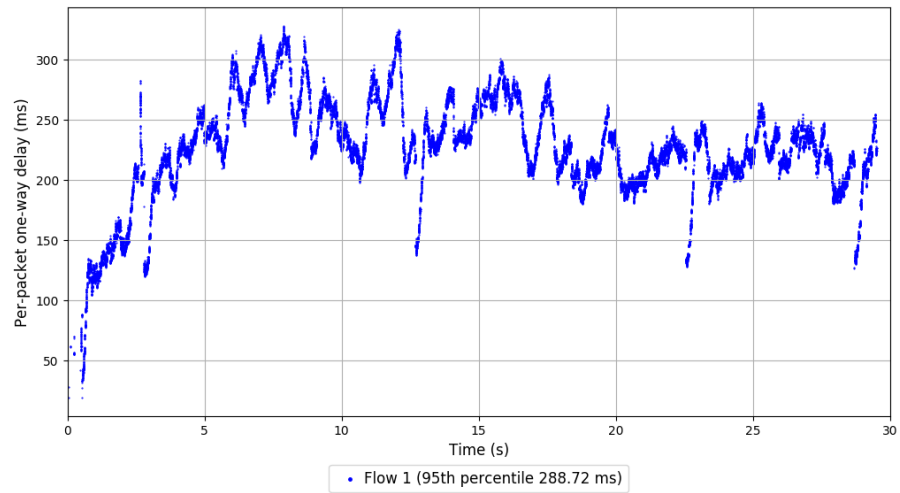
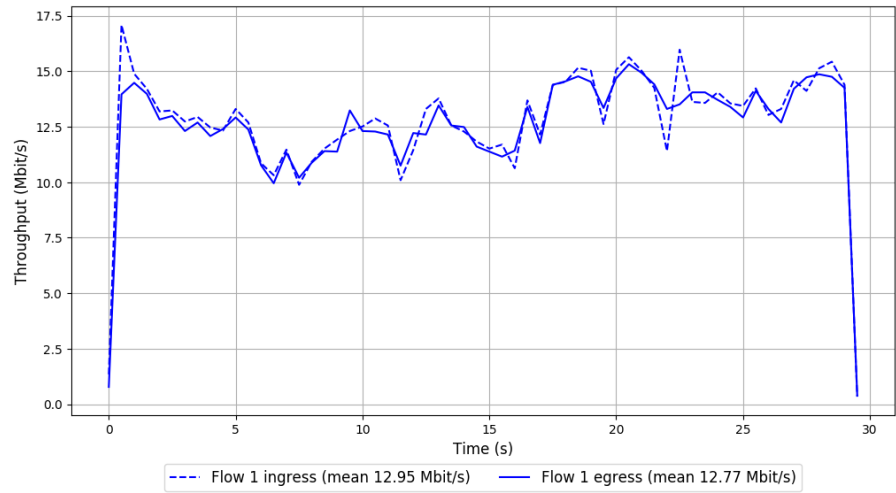
-- Flow 1:

Average throughput: 12.77 Mbit/s

95th percentile per-packet one-way delay: 288.720 ms

Loss rate: 1.46%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2017-12-20 16:32:15

End at: 2017-12-20 16:32:45

Local clock offset: 0.084 ms

Remote clock offset: -2.851 ms

Below is generated by plot.py at 2017-12-20 17:49:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 11.34 Mbit/s

95th percentile per-packet one-way delay: 329.958 ms

Loss rate: 1.58%

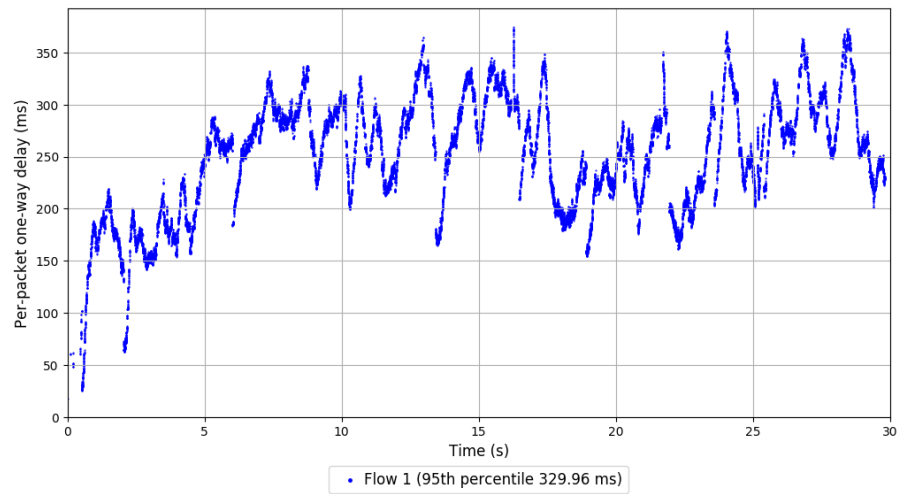
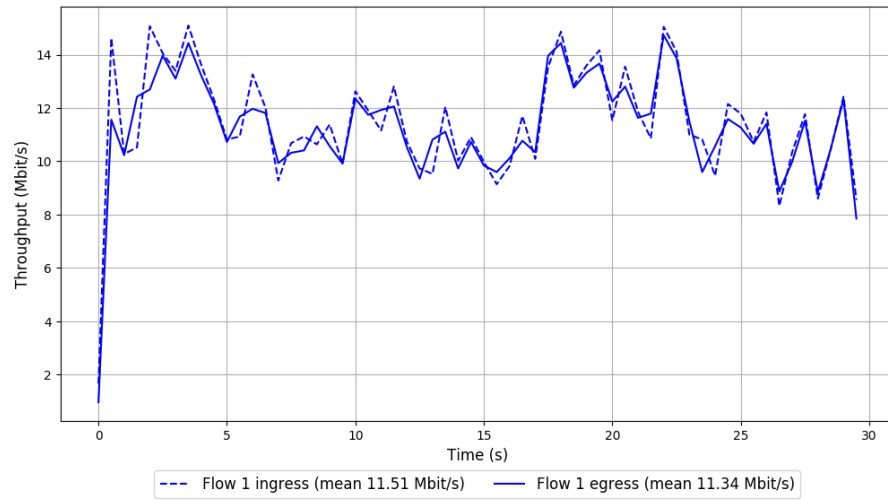
-- Flow 1:

Average throughput: 11.34 Mbit/s

95th percentile per-packet one-way delay: 329.958 ms

Loss rate: 1.58%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2017-12-20 16:49:55

End at: 2017-12-20 16:50:25

Local clock offset: 0.24 ms

Remote clock offset: -2.741 ms

Below is generated by plot.py at 2017-12-20 17:49:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 10.74 Mbit/s

95th percentile per-packet one-way delay: 325.198 ms

Loss rate: 1.54%

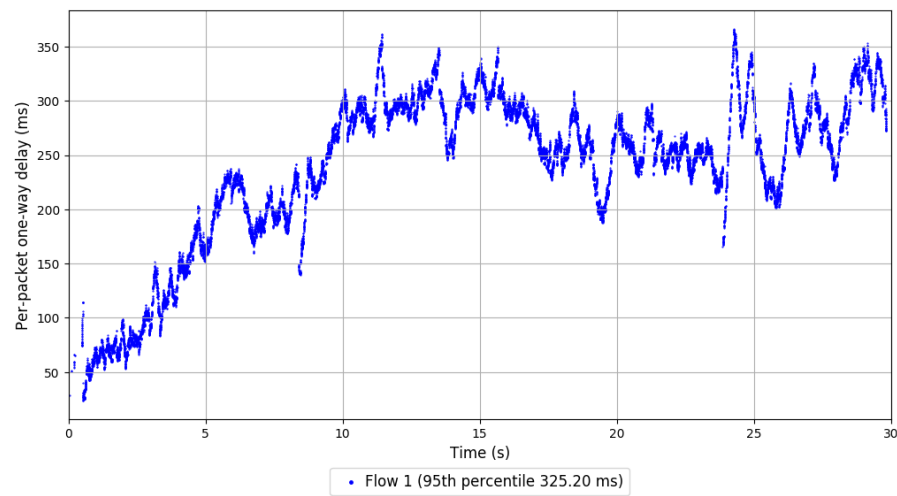
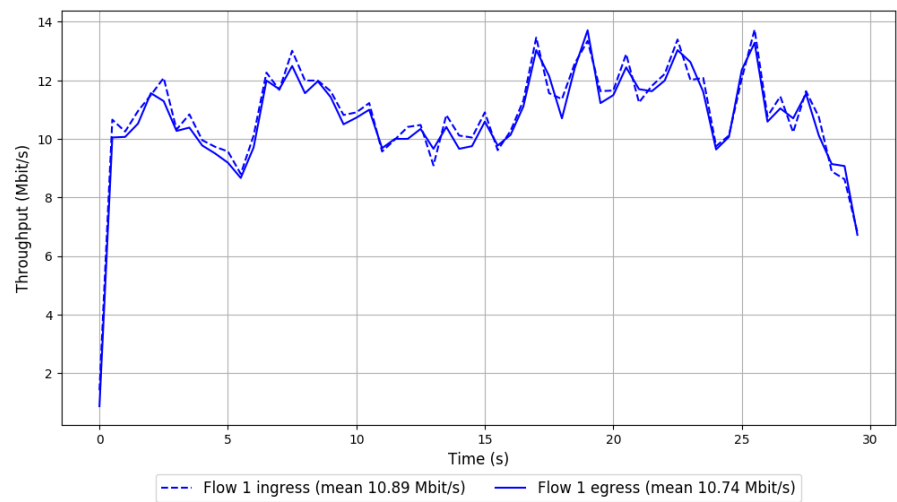
-- Flow 1:

Average throughput: 10.74 Mbit/s

95th percentile per-packet one-way delay: 325.198 ms

Loss rate: 1.54%

Run 3: Report of QUIC Cubic — Data Link

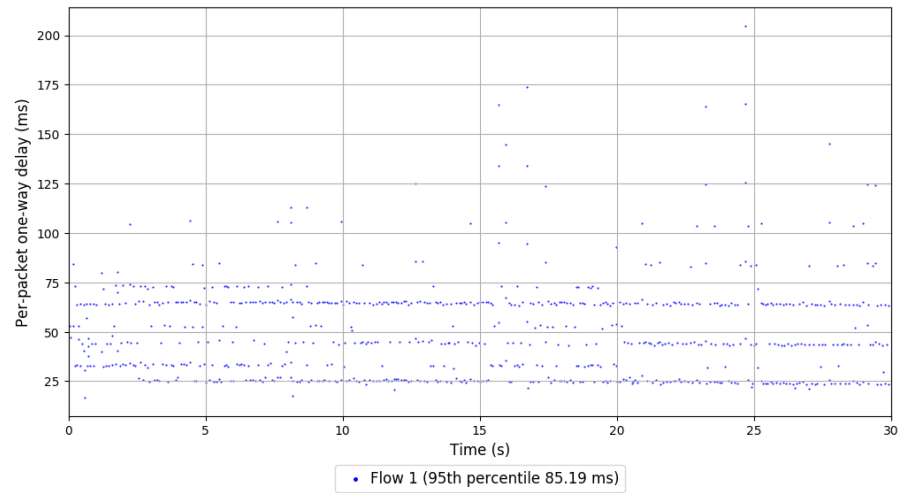
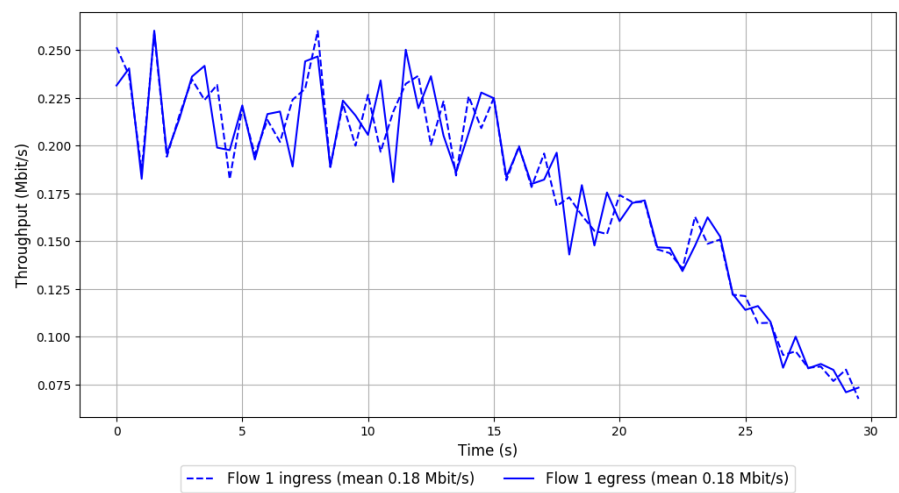


Run 1: Statistics of SCReAM

Start at: 2017-12-20 16:06:21
End at: 2017-12-20 16:06:51
Local clock offset: -0.237 ms
Remote clock offset: -2.913 ms

Below is generated by plot.py at 2017-12-20 17:49:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 85.189 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 85.189 ms
Loss rate: 0.06%

Run 1: Report of SReAM — Data Link

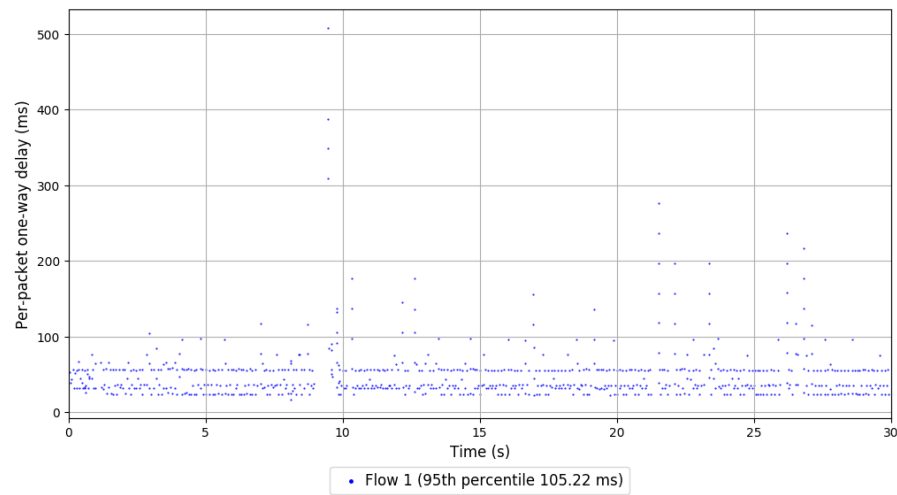
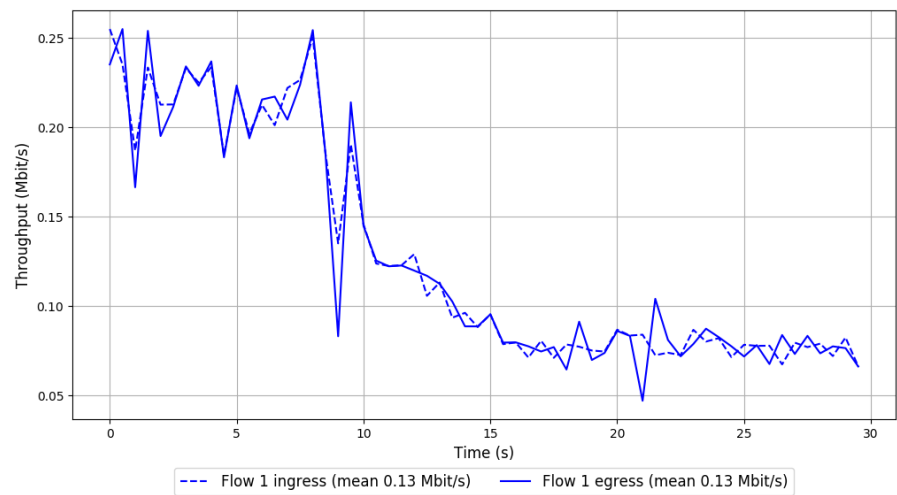


Run 2: Statistics of SCReAM

Start at: 2017-12-20 16:24:01
End at: 2017-12-20 16:24:31
Local clock offset: 0.125 ms
Remote clock offset: -2.828 ms

Below is generated by plot.py at 2017-12-20 17:49:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 105.221 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 105.221 ms
Loss rate: 0.52%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2017-12-20 16:41:41

End at: 2017-12-20 16:42:11

Local clock offset: 0.144 ms

Remote clock offset: -2.67 ms

Below is generated by plot.py at 2017-12-20 17:49:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.11 Mbit/s

95th percentile per-packet one-way delay: 105.261 ms

Loss rate: 0.45%

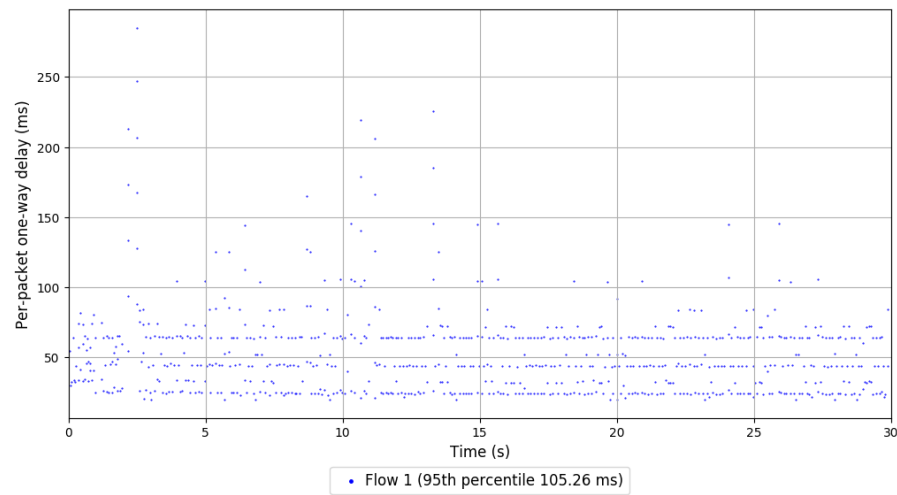
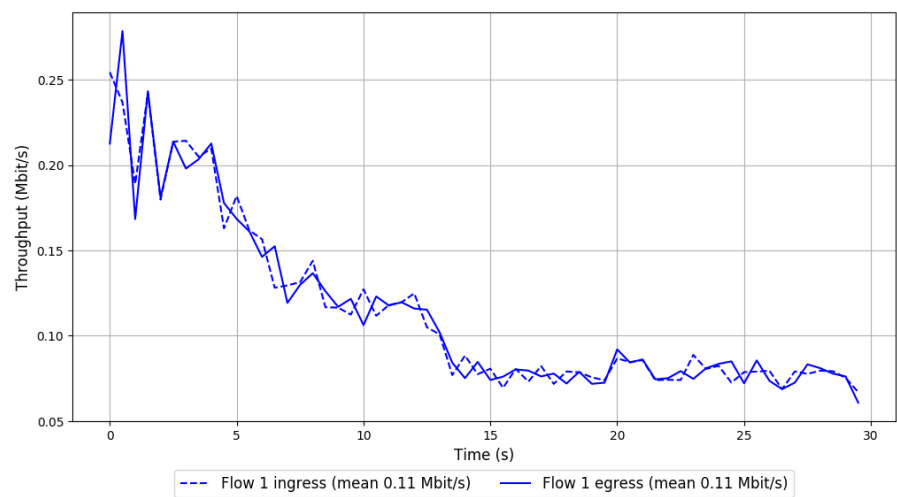
-- Flow 1:

Average throughput: 0.11 Mbit/s

95th percentile per-packet one-way delay: 105.261 ms

Loss rate: 0.45%

Run 3: Report of SReAM — Data Link

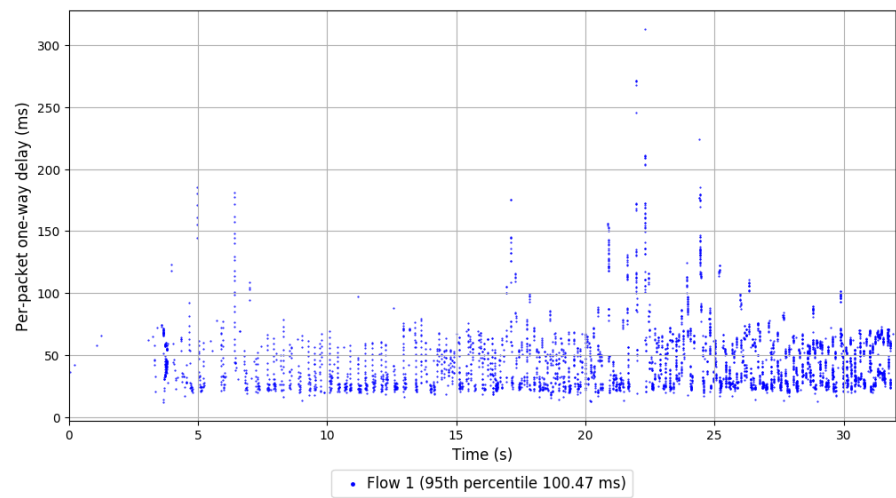
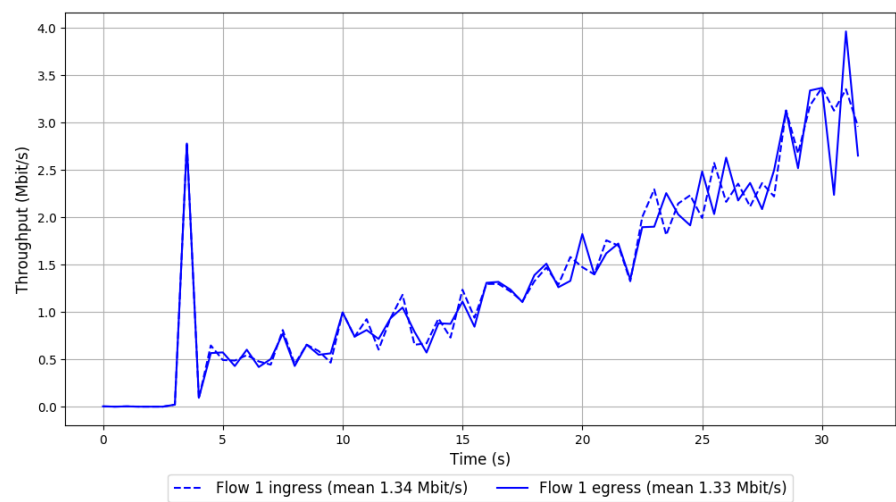


Run 1: Statistics of WebRTC media

Start at: 2017-12-20 16:07:31
End at: 2017-12-20 16:08:01
Local clock offset: -0.145 ms
Remote clock offset: -2.892 ms

Below is generated by plot.py at 2017-12-20 17:49:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.33 Mbit/s
95th percentile per-packet one-way delay: 100.472 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 1.33 Mbit/s
95th percentile per-packet one-way delay: 100.472 ms
Loss rate: 0.80%

Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2017-12-20 16:25:12

End at: 2017-12-20 16:25:42

Local clock offset: 0.123 ms

Remote clock offset: -2.84 ms

Below is generated by plot.py at 2017-12-20 17:49:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.08 Mbit/s

95th percentile per-packet one-way delay: 91.748 ms

Loss rate: 1.02%

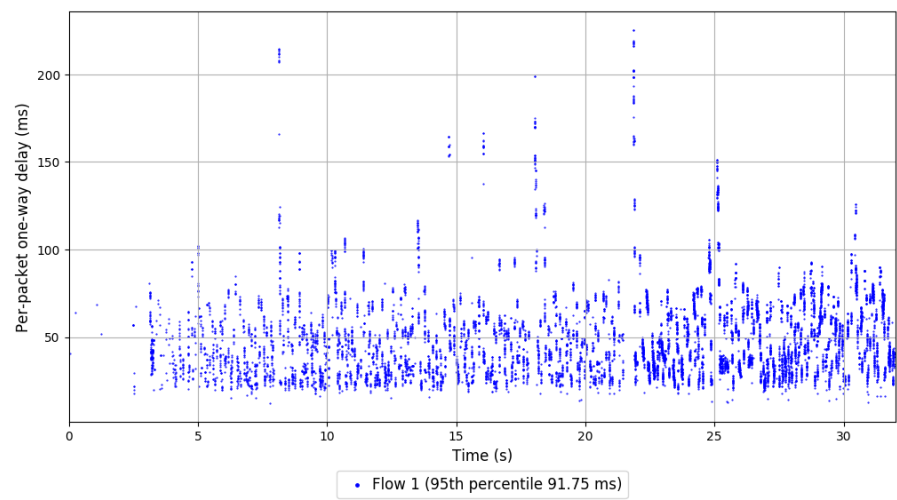
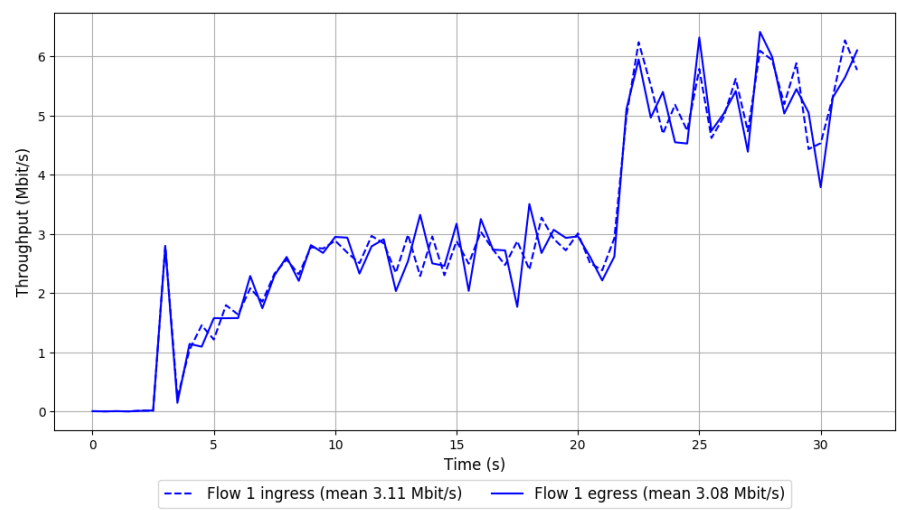
-- Flow 1:

Average throughput: 3.08 Mbit/s

95th percentile per-packet one-way delay: 91.748 ms

Loss rate: 1.02%

Run 2: Report of WebRTC media — Data Link

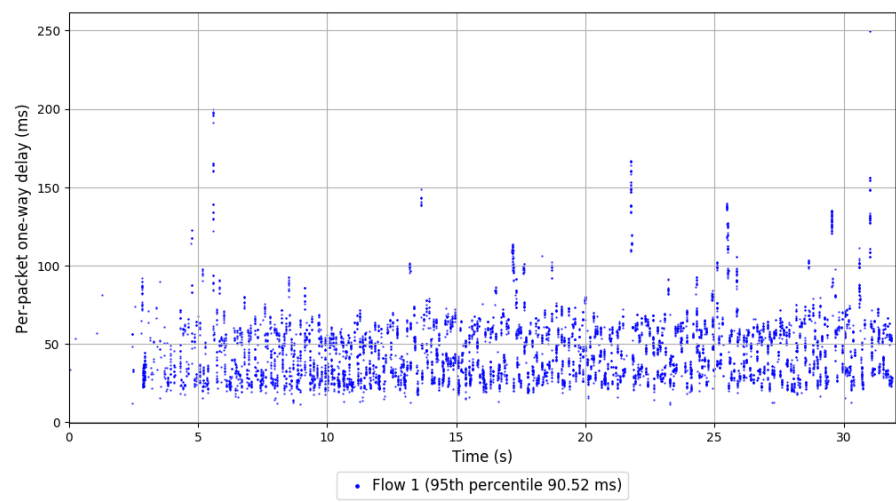
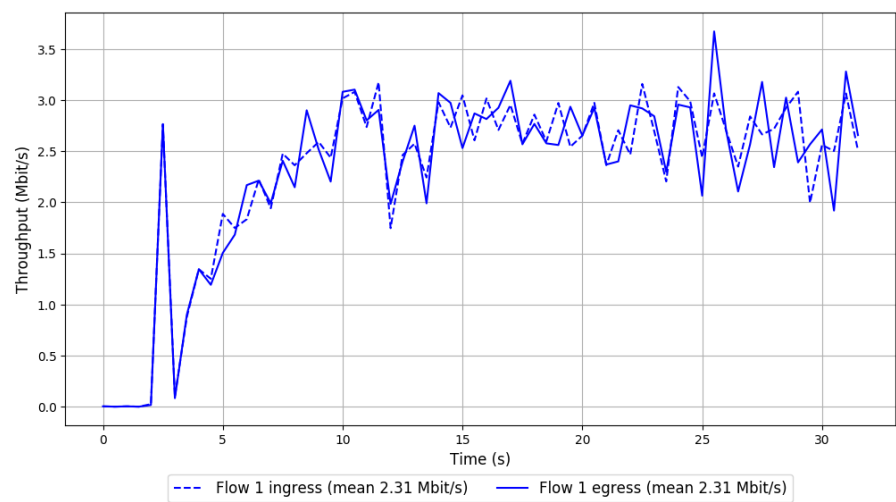


Run 3: Statistics of WebRTC media

Start at: 2017-12-20 16:42:51
End at: 2017-12-20 16:43:21
Local clock offset: 0.1 ms
Remote clock offset: -2.639 ms

Below is generated by plot.py at 2017-12-20 17:49:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 90.522 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 90.522 ms
Loss rate: 0.31%

Run 3: Report of WebRTC media — Data Link

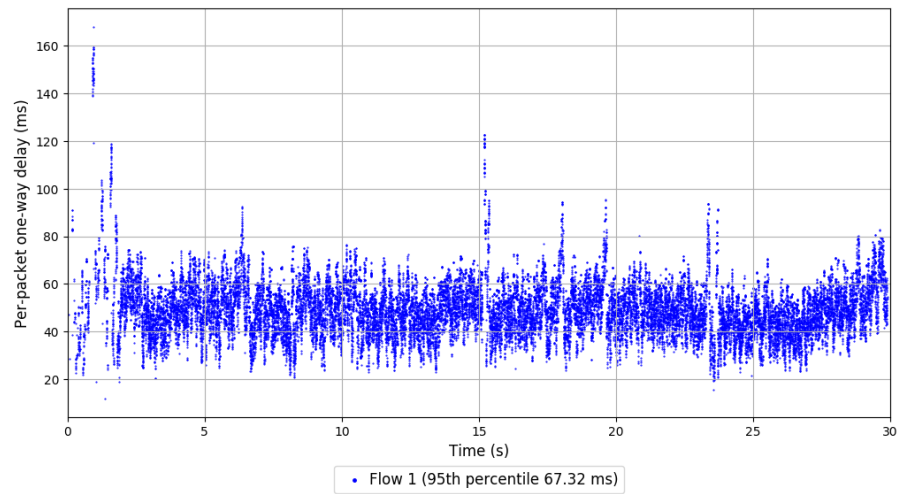
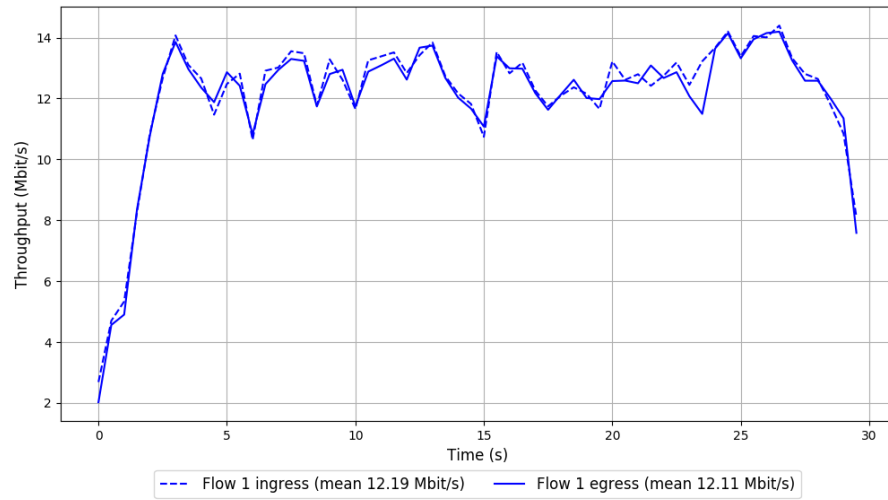


Run 1: Statistics of Sprout

Start at: 2017-12-20 16:15:47
End at: 2017-12-20 16:16:17
Local clock offset: -0.099 ms
Remote clock offset: -2.837 ms

Below is generated by plot.py at 2017-12-20 17:49:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.11 Mbit/s
95th percentile per-packet one-way delay: 67.318 ms
Loss rate: 0.88%
-- Flow 1:
Average throughput: 12.11 Mbit/s
95th percentile per-packet one-way delay: 67.318 ms
Loss rate: 0.88%

Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

Start at: 2017-12-20 16:33:26

End at: 2017-12-20 16:33:56

Local clock offset: 0.092 ms

Remote clock offset: -2.89 ms

Below is generated by plot.py at 2017-12-20 17:49:13

Datalink statistics

-- Total of 1 flow:

Average throughput: 11.54 Mbit/s

95th percentile per-packet one-way delay: 70.765 ms

Loss rate: 1.48%

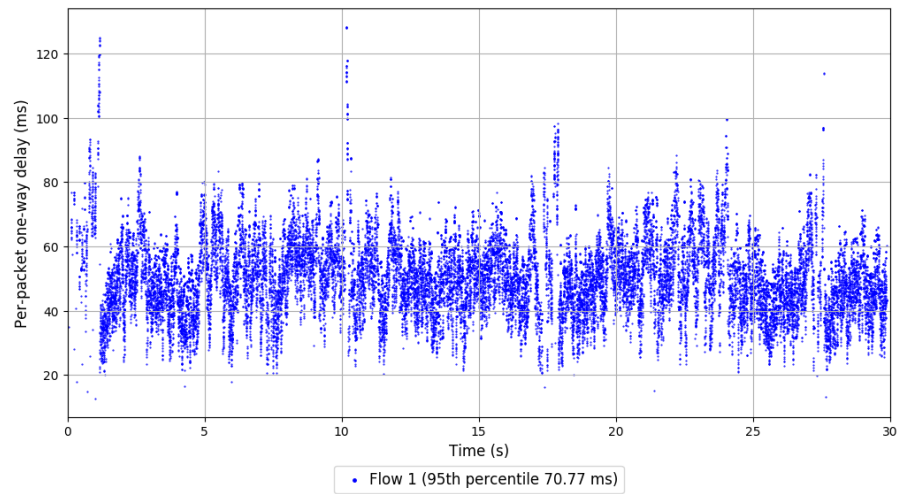
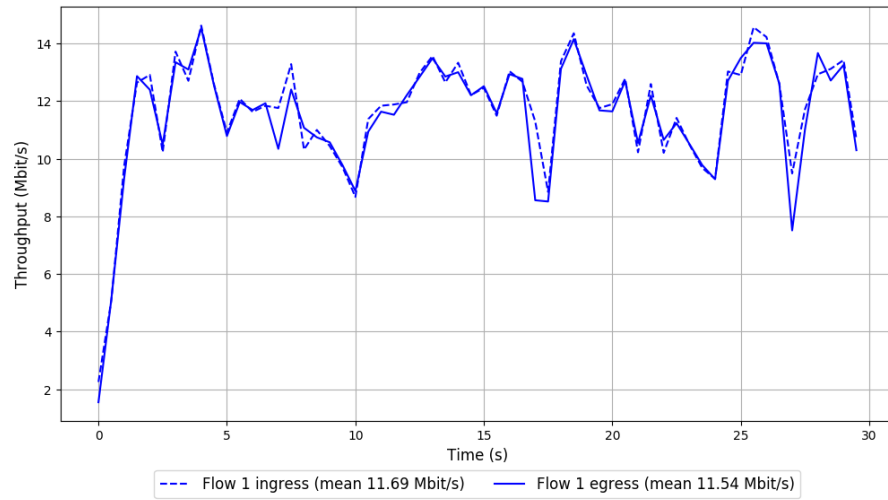
-- Flow 1:

Average throughput: 11.54 Mbit/s

95th percentile per-packet one-way delay: 70.765 ms

Loss rate: 1.48%

Run 2: Report of Sprout — Data Link

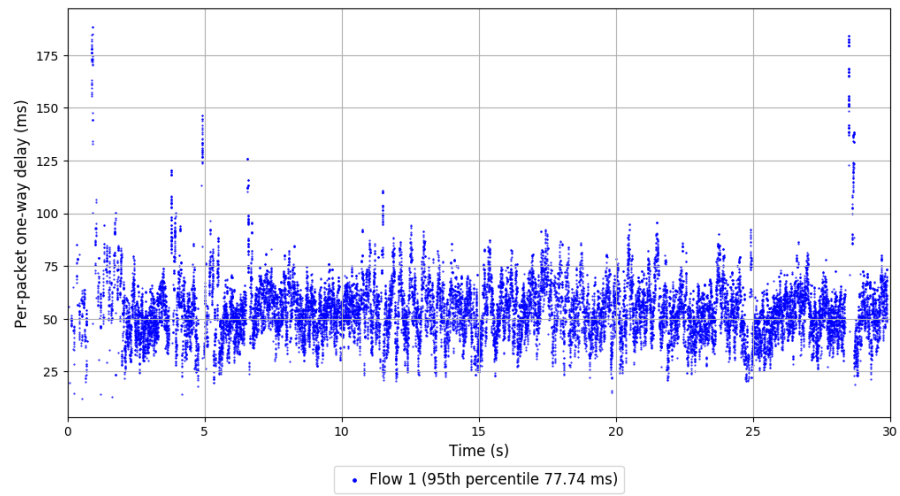
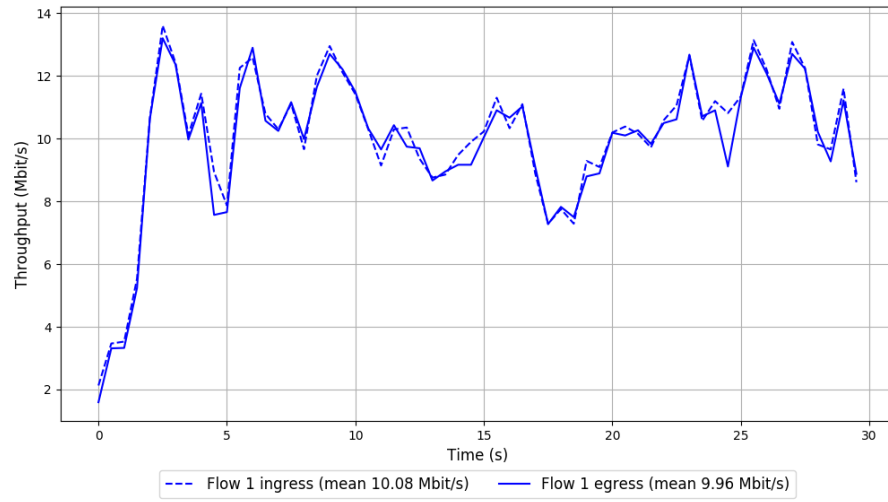


Run 3: Statistics of Sprout

Start at: 2017-12-20 16:51:06
End at: 2017-12-20 16:51:36
Local clock offset: 0.154 ms
Remote clock offset: -2.718 ms

Below is generated by plot.py at 2017-12-20 17:49:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.96 Mbit/s
95th percentile per-packet one-way delay: 77.737 ms
Loss rate: 1.44%
-- Flow 1:
Average throughput: 9.96 Mbit/s
95th percentile per-packet one-way delay: 77.737 ms
Loss rate: 1.44%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2017-12-20 16:02:50

End at: 2017-12-20 16:03:20

Local clock offset: -0.285 ms

Remote clock offset: -2.9 ms

Below is generated by plot.py at 2017-12-20 17:49:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.03 Mbit/s

95th percentile per-packet one-way delay: 56.167 ms

Loss rate: 0.52%

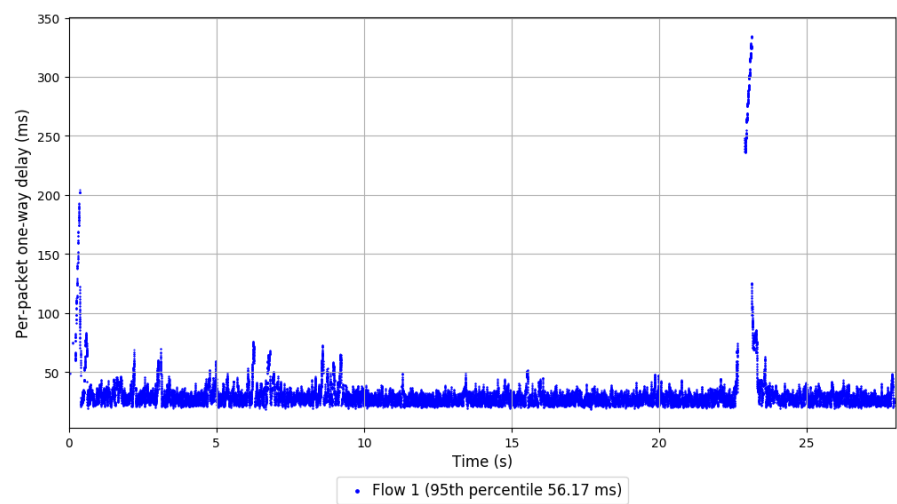
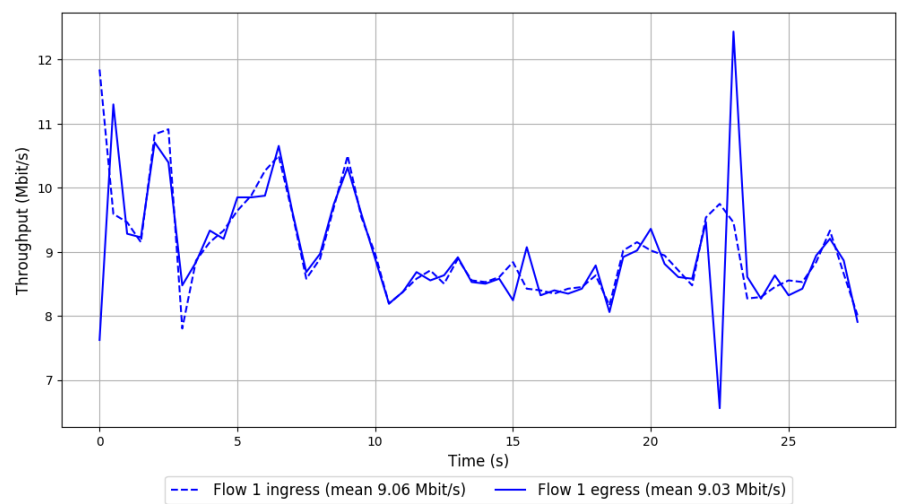
-- Flow 1:

Average throughput: 9.03 Mbit/s

95th percentile per-packet one-way delay: 56.167 ms

Loss rate: 0.52%

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



Run 2: Statistics of TaoVA-100x

Start at: 2017-12-20 16:20:29

End at: 2017-12-20 16:20:59

Local clock offset: 0.065 ms

Remote clock offset: -2.842 ms

Below is generated by plot.py at 2017-12-20 17:49:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 8.19 Mbit/s

95th percentile per-packet one-way delay: 52.346 ms

Loss rate: 0.62%

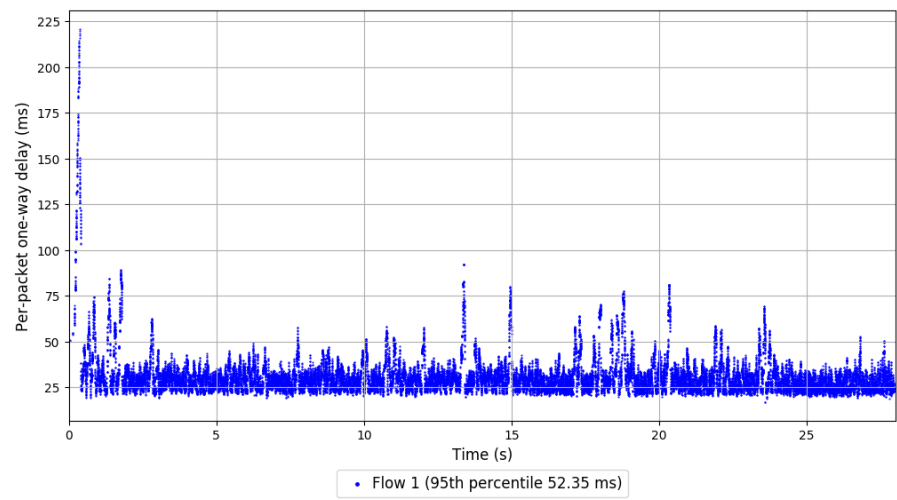
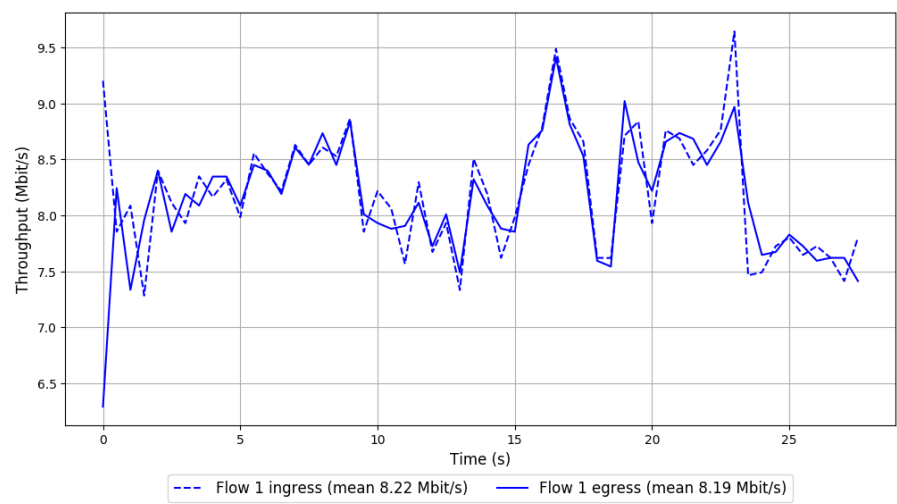
-- Flow 1:

Average throughput: 8.19 Mbit/s

95th percentile per-packet one-way delay: 52.346 ms

Loss rate: 0.62%

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



Run 3: Statistics of TaoVA-100x

Start at: 2017-12-20 16:38:09

End at: 2017-12-20 16:38:39

Local clock offset: 0.093 ms

Remote clock offset: -2.78 ms

Below is generated by plot.py at 2017-12-20 17:49:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 6.09 Mbit/s

95th percentile per-packet one-way delay: 44.374 ms

Loss rate: 0.78%

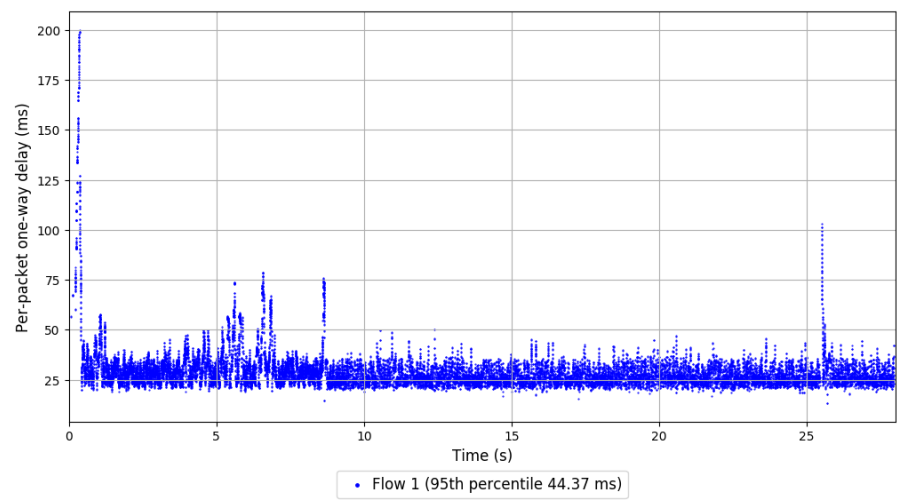
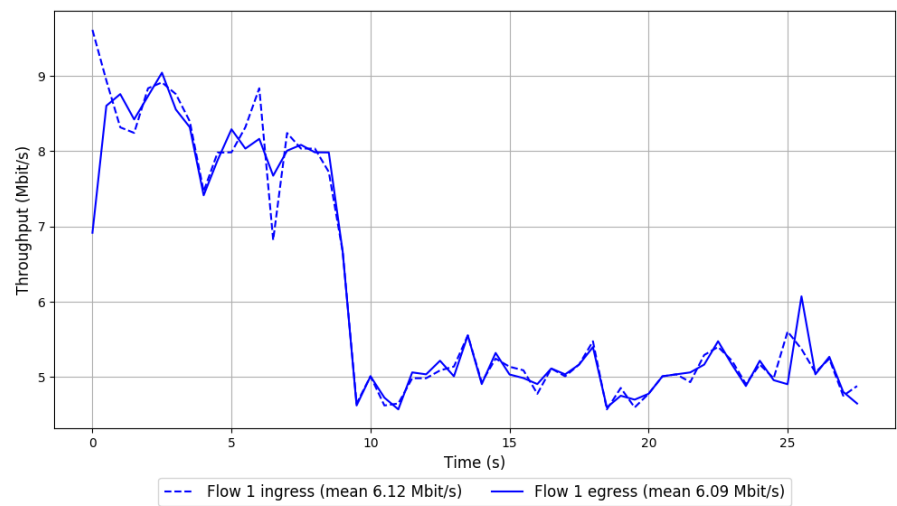
-- Flow 1:

Average throughput: 6.09 Mbit/s

95th percentile per-packet one-way delay: 44.374 ms

Loss rate: 0.78%

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

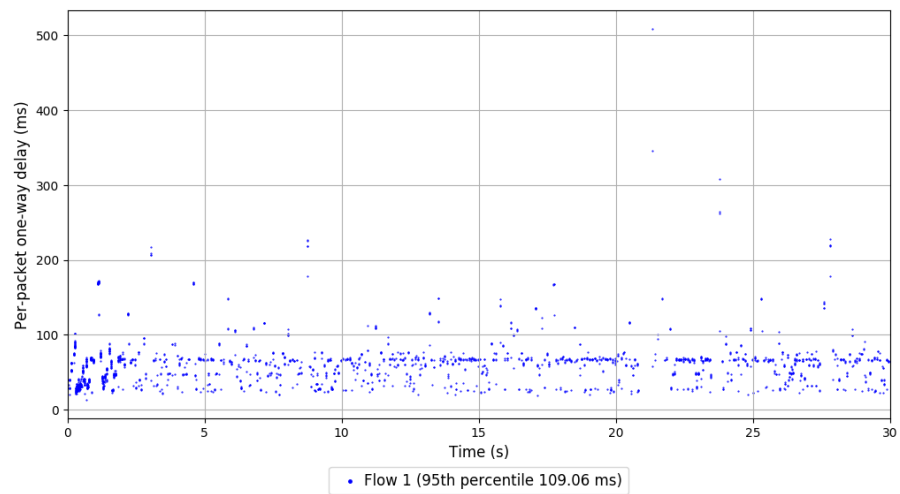
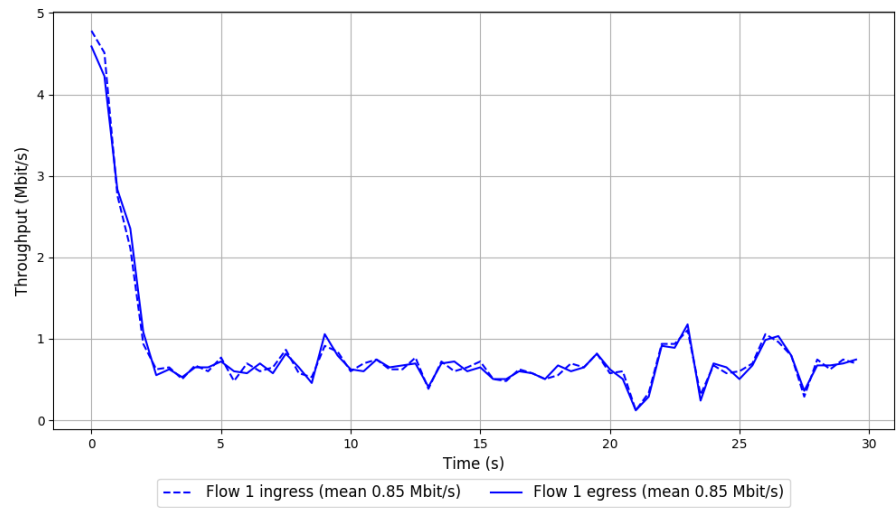


Run 1: Statistics of TCP Vegas

Start at: 2017-12-20 16:04:00
End at: 2017-12-20 16:04:30
Local clock offset: -0.25 ms
Remote clock offset: -2.897 ms

Below is generated by plot.py at 2017-12-20 17:49:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 109.060 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 109.060 ms
Loss rate: 0.47%

Run 1: Report of TCP Vegas — Data Link

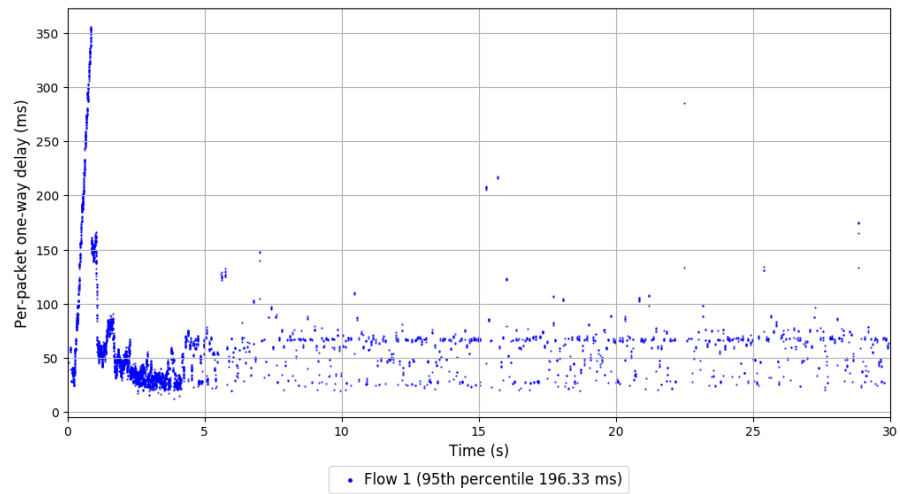
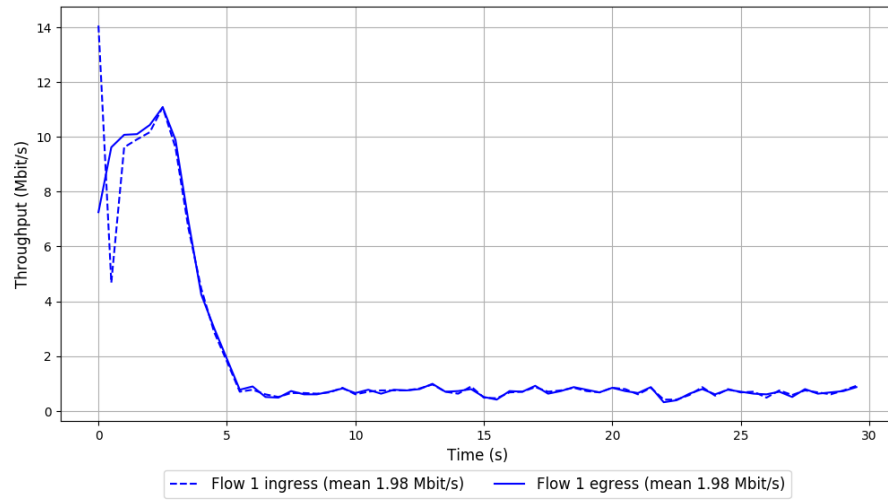


Run 2: Statistics of TCP Vegas

Start at: 2017-12-20 16:21:40
End at: 2017-12-20 16:22:10
Local clock offset: 0.029 ms
Remote clock offset: -2.861 ms

Below is generated by plot.py at 2017-12-20 17:49:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.98 Mbit/s
95th percentile per-packet one-way delay: 196.326 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 1.98 Mbit/s
95th percentile per-packet one-way delay: 196.326 ms
Loss rate: 0.34%

Run 2: Report of TCP Vegas — Data Link

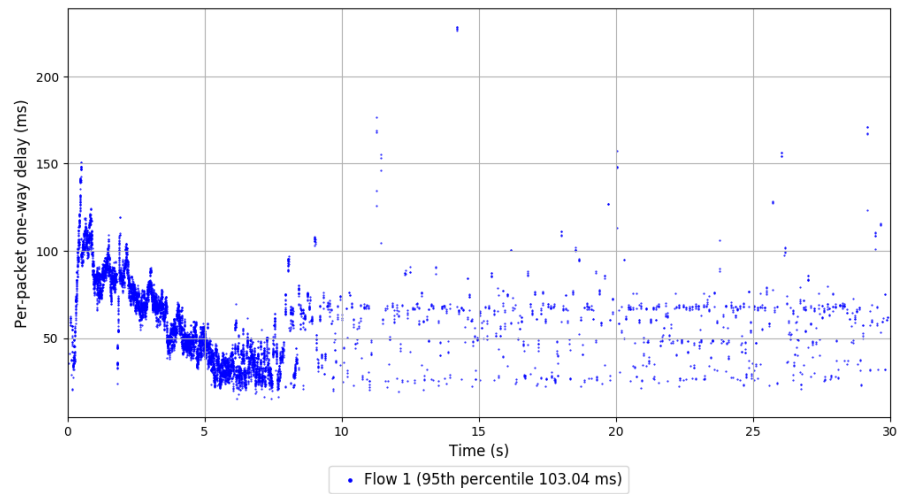
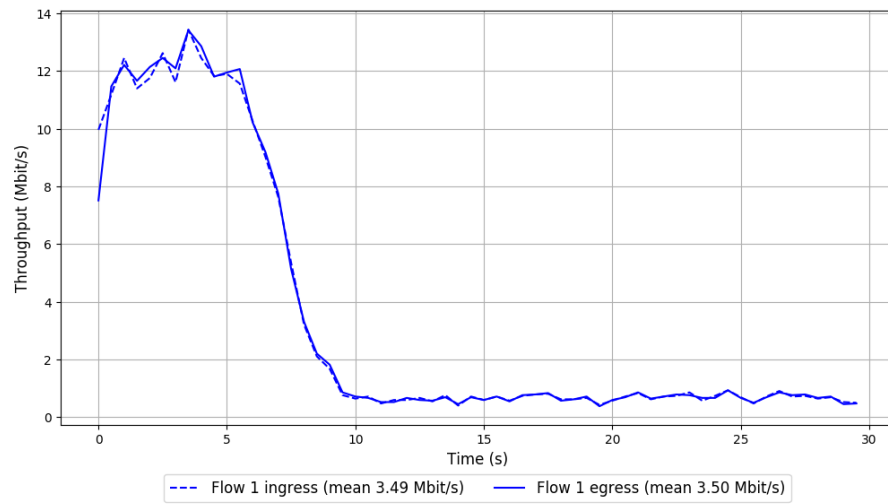


Run 3: Statistics of TCP Vegas

Start at: 2017-12-20 16:39:20
End at: 2017-12-20 16:39:50
Local clock offset: 0.081 ms
Remote clock offset: -2.754 ms

Below is generated by plot.py at 2017-12-20 17:49:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.50 Mbit/s
95th percentile per-packet one-way delay: 103.044 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 3.50 Mbit/s
95th percentile per-packet one-way delay: 103.044 ms
Loss rate: 0.06%

Run 3: Report of TCP Vegas — Data Link

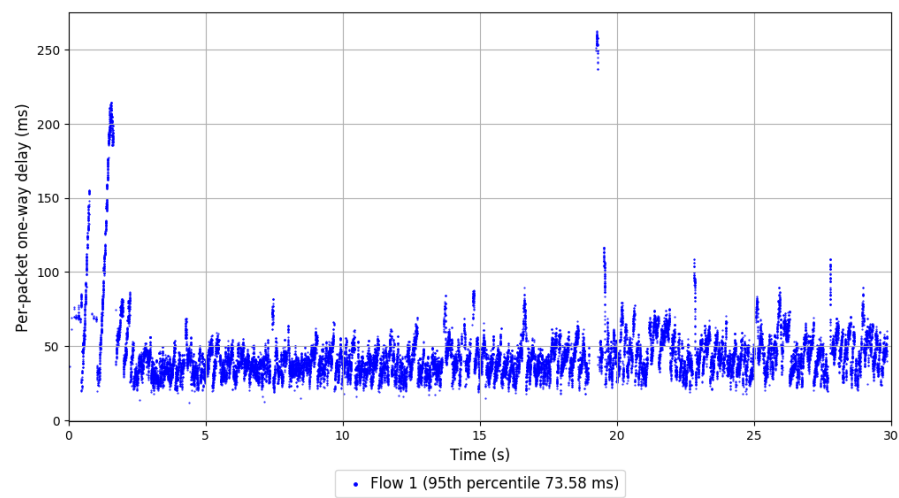
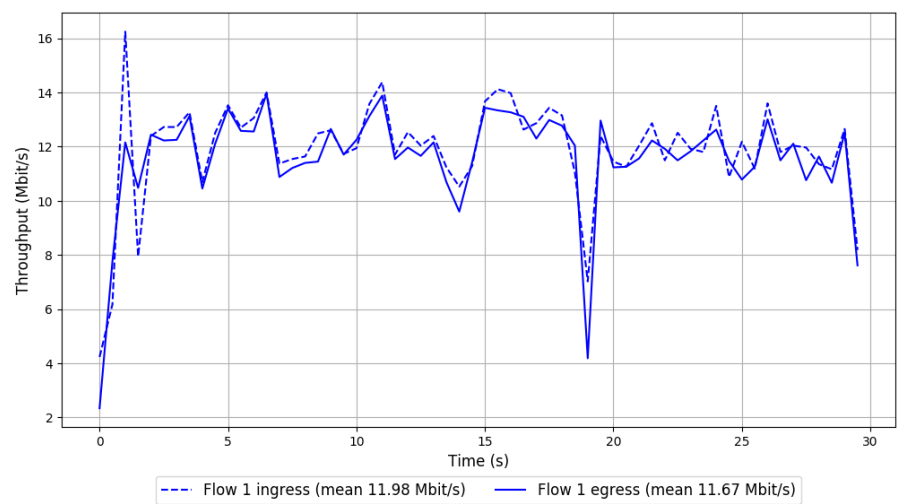


Run 1: Statistics of Verus

Start at: 2017-12-20 16:11:03
End at: 2017-12-20 16:11:33
Local clock offset: -0.075 ms
Remote clock offset: -2.893 ms

Below is generated by plot.py at 2017-12-20 17:49:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.67 Mbit/s
95th percentile per-packet one-way delay: 73.578 ms
Loss rate: 2.77%
-- Flow 1:
Average throughput: 11.67 Mbit/s
95th percentile per-packet one-way delay: 73.578 ms
Loss rate: 2.77%

Run 1: Report of Verus — Data Link

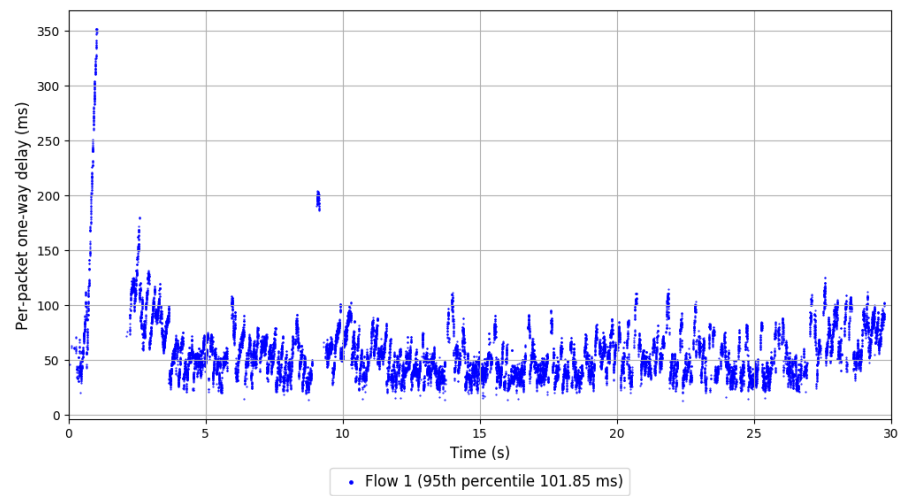
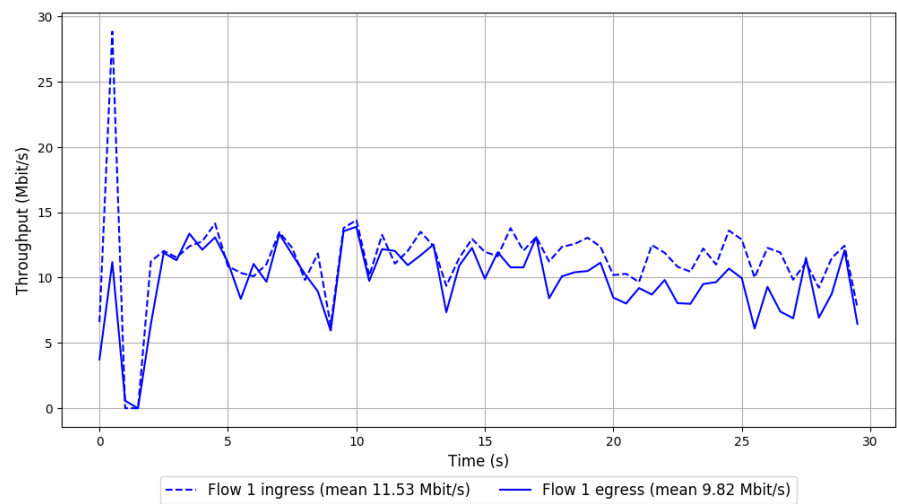


Run 2: Statistics of Verus

Start at: 2017-12-20 16:28:43
End at: 2017-12-20 16:29:13
Local clock offset: 0.13 ms
Remote clock offset: -2.891 ms

Below is generated by plot.py at 2017-12-20 17:49:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.82 Mbit/s
95th percentile per-packet one-way delay: 101.851 ms
Loss rate: 14.86%
-- Flow 1:
Average throughput: 9.82 Mbit/s
95th percentile per-packet one-way delay: 101.851 ms
Loss rate: 14.86%

Run 2: Report of Verus — Data Link

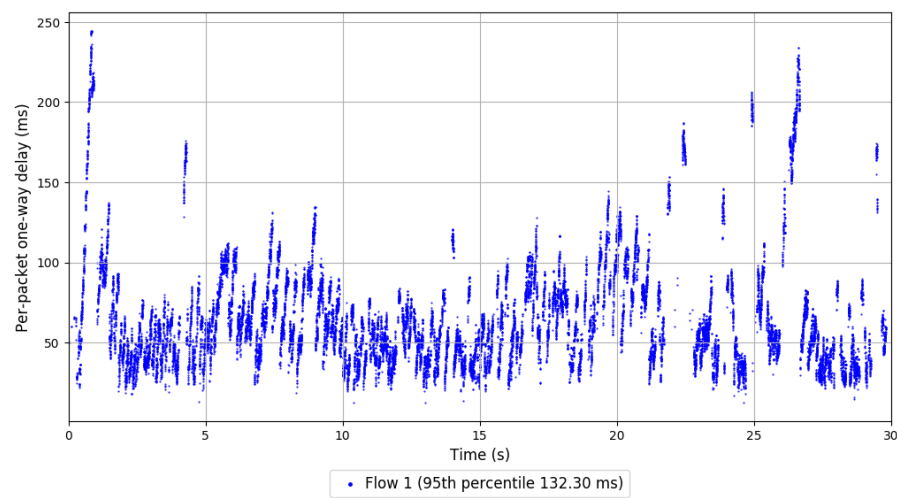
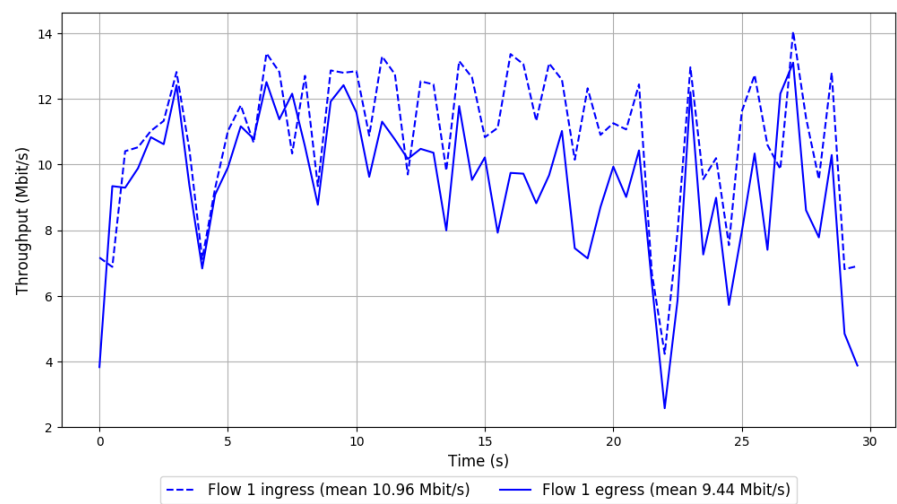


Run 3: Statistics of Verus

Start at: 2017-12-20 16:46:22
End at: 2017-12-20 16:46:52
Local clock offset: 0.238 ms
Remote clock offset: -2.739 ms

Below is generated by plot.py at 2017-12-20 17:49:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.44 Mbit/s
95th percentile per-packet one-way delay: 132.303 ms
Loss rate: 14.06%
-- Flow 1:
Average throughput: 9.44 Mbit/s
95th percentile per-packet one-way delay: 132.303 ms
Loss rate: 14.06%

Run 3: Report of Verus — Data Link

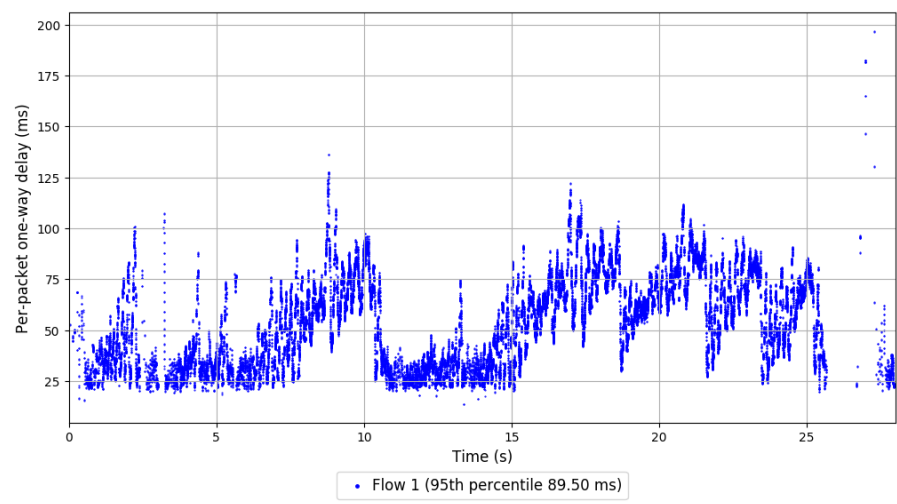
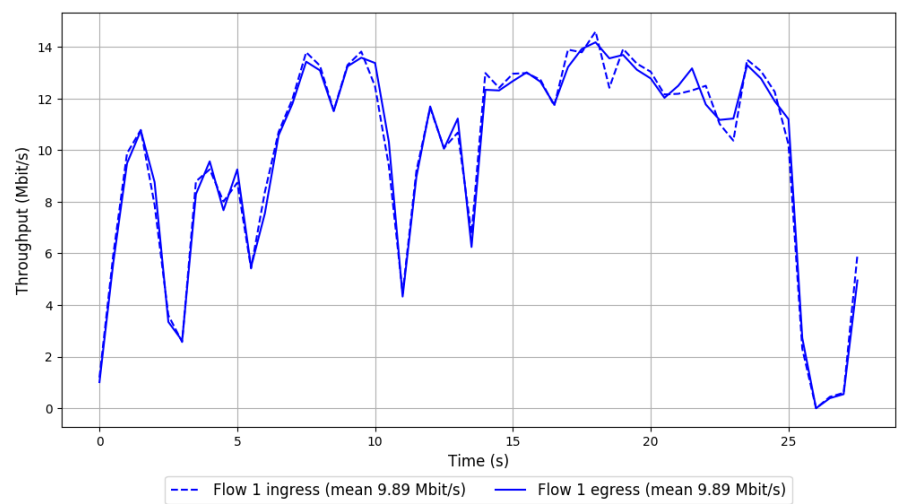


Run 1: Statistics of Copa

Start at: 2017-12-20 16:13:25
End at: 2017-12-20 16:13:55
Local clock offset: -0.114 ms
Remote clock offset: -2.978 ms

Below is generated by plot.py at 2017-12-20 17:49:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.89 Mbit/s
95th percentile per-packet one-way delay: 89.505 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 9.89 Mbit/s
95th percentile per-packet one-way delay: 89.505 ms
Loss rate: 0.26%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

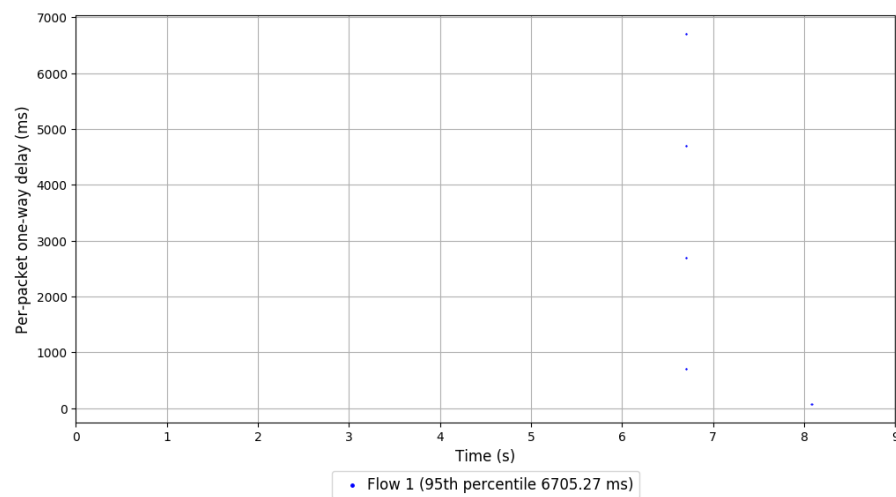
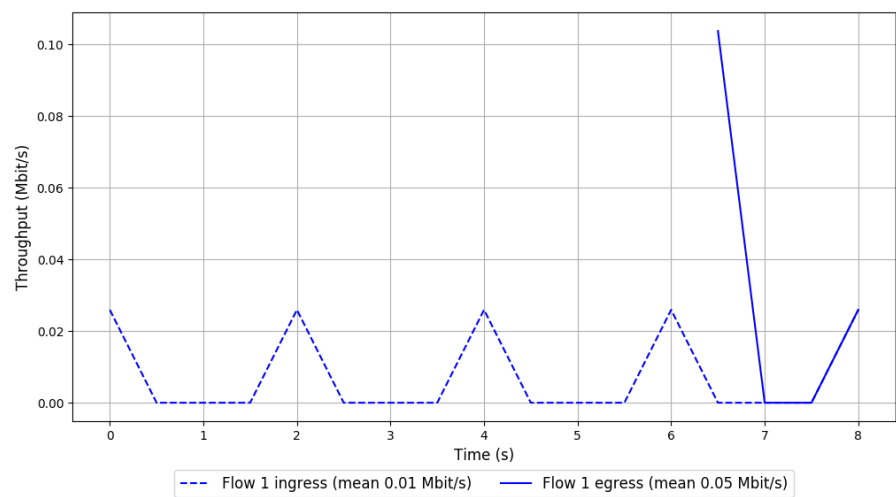
Start at: 2017-12-20 16:31:05

End at: 2017-12-20 16:31:35

Local clock offset: 0.149 ms

Remote clock offset: -2.837 ms

Run 2: Report of Copa — Data Link

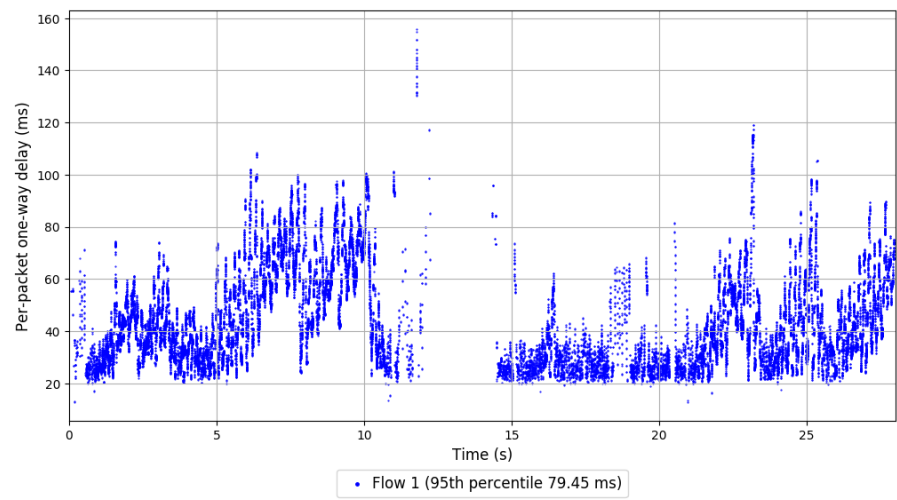
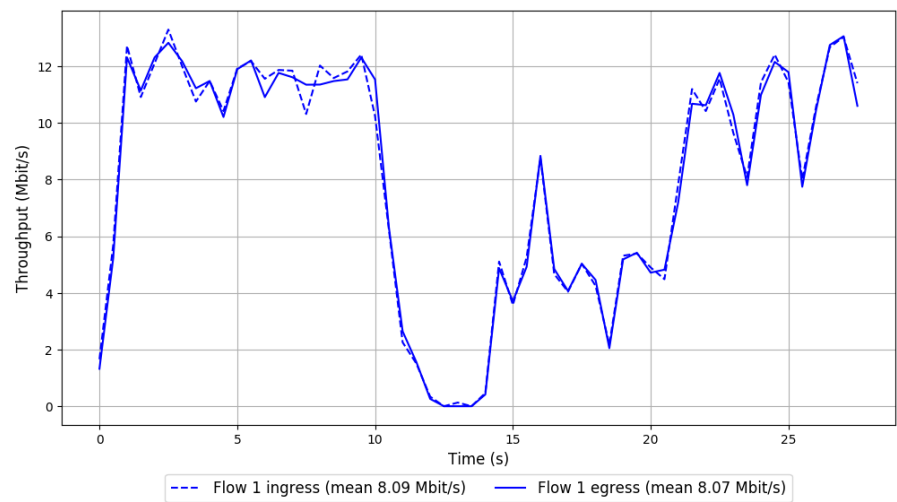


Run 3: Statistics of Copa

Start at: 2017-12-20 16:48:44
End at: 2017-12-20 16:49:14
Local clock offset: 0.114 ms
Remote clock offset: -2.765 ms

Below is generated by plot.py at 2017-12-20 17:49:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.07 Mbit/s
95th percentile per-packet one-way delay: 79.450 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 8.07 Mbit/s
95th percentile per-packet one-way delay: 79.450 ms
Loss rate: 0.49%

Run 3: Report of Copa — Data Link

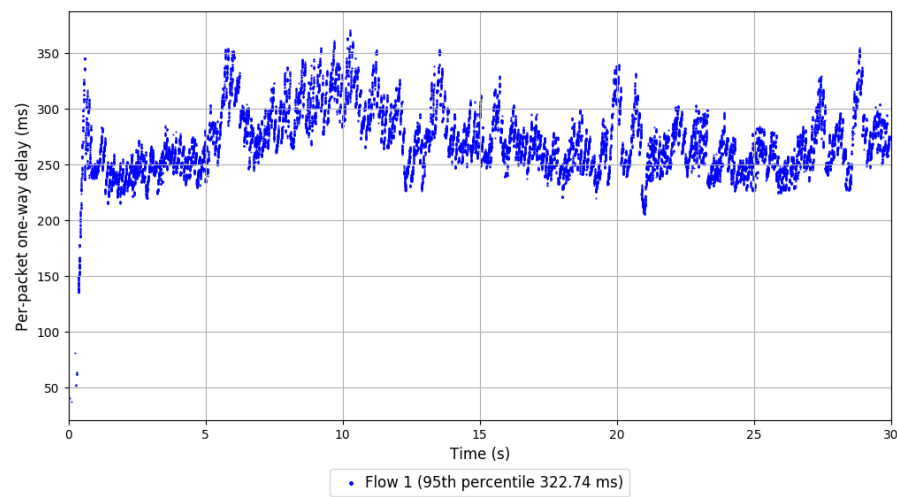
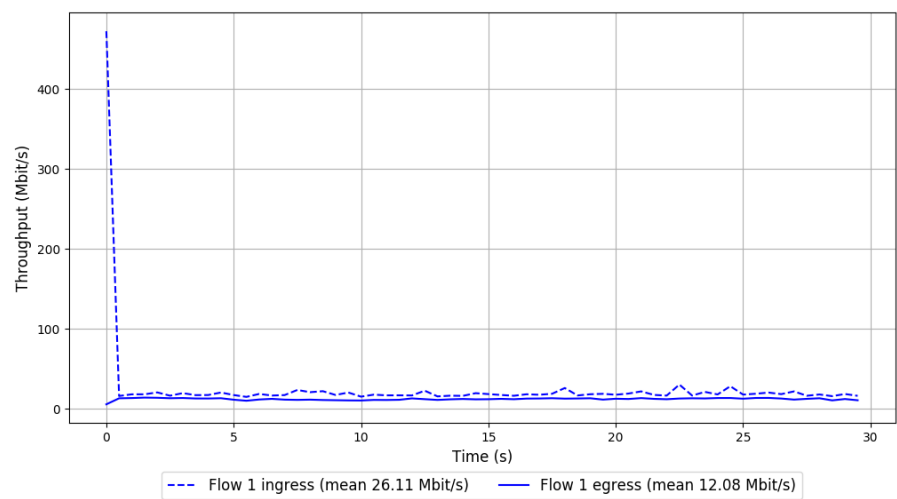


Run 1: Statistics of FillP

Start at: 2017-12-20 16:12:14
End at: 2017-12-20 16:12:44
Local clock offset: -0.133 ms
Remote clock offset: -2.904 ms

Below is generated by plot.py at 2017-12-20 17:49:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.08 Mbit/s
95th percentile per-packet one-way delay: 322.743 ms
Loss rate: 53.82%
-- Flow 1:
Average throughput: 12.08 Mbit/s
95th percentile per-packet one-way delay: 322.743 ms
Loss rate: 53.82%

Run 1: Report of FillP — Data Link

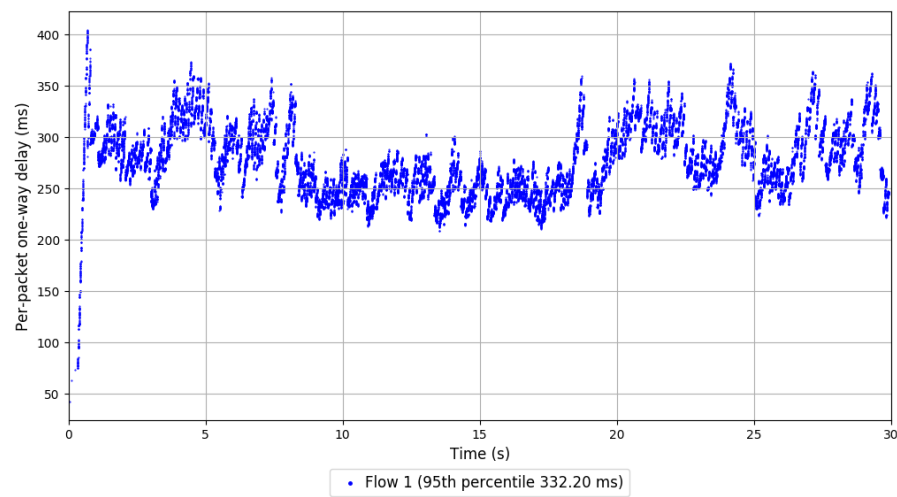
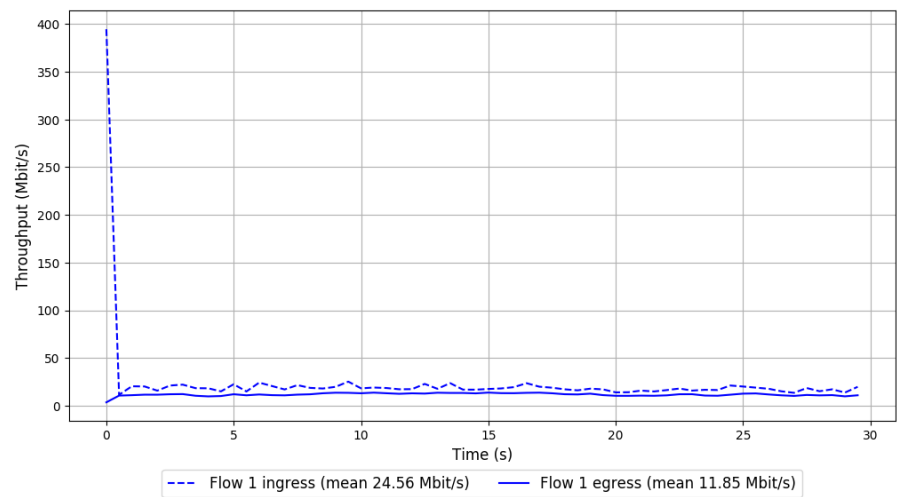


Run 2: Statistics of FillP

Start at: 2017-12-20 16:29:54
End at: 2017-12-20 16:30:24
Local clock offset: 0.063 ms
Remote clock offset: -2.886 ms

Below is generated by plot.py at 2017-12-20 17:49:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.85 Mbit/s
95th percentile per-packet one-way delay: 332.198 ms
Loss rate: 51.86%
-- Flow 1:
Average throughput: 11.85 Mbit/s
95th percentile per-packet one-way delay: 332.198 ms
Loss rate: 51.86%

Run 2: Report of FillP — Data Link

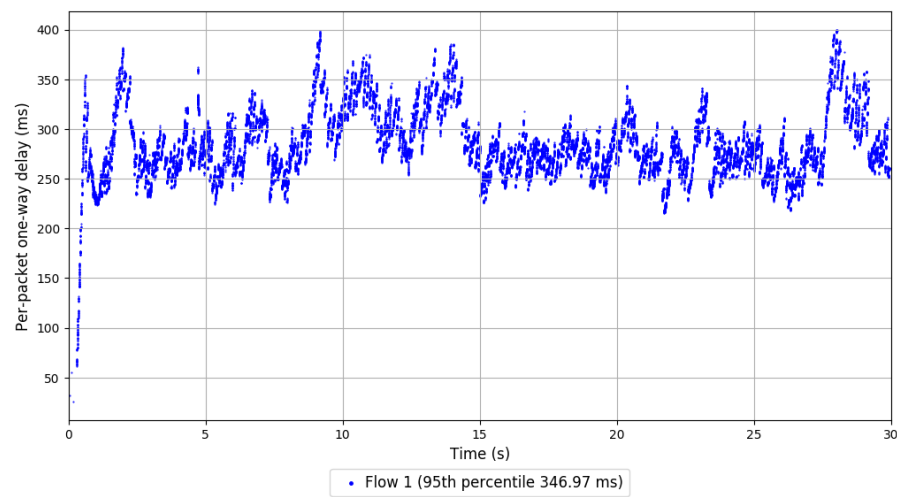
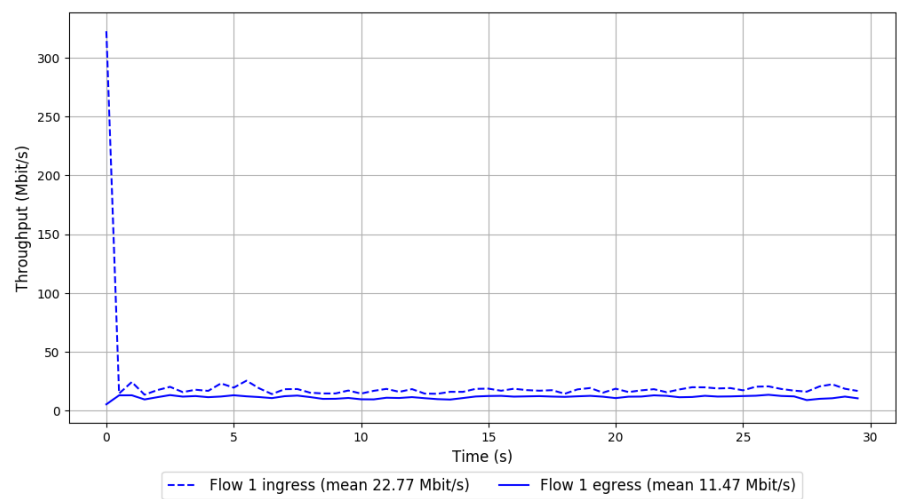


Run 3: Statistics of FillP

Start at: 2017-12-20 16:47:33
End at: 2017-12-20 16:48:03
Local clock offset: 0.157 ms
Remote clock offset: -2.767 ms

Below is generated by plot.py at 2017-12-20 17:49:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.47 Mbit/s
95th percentile per-packet one-way delay: 346.969 ms
Loss rate: 49.70%
-- Flow 1:
Average throughput: 11.47 Mbit/s
95th percentile per-packet one-way delay: 346.969 ms
Loss rate: 49.70%

Run 3: Report of FillP — Data Link

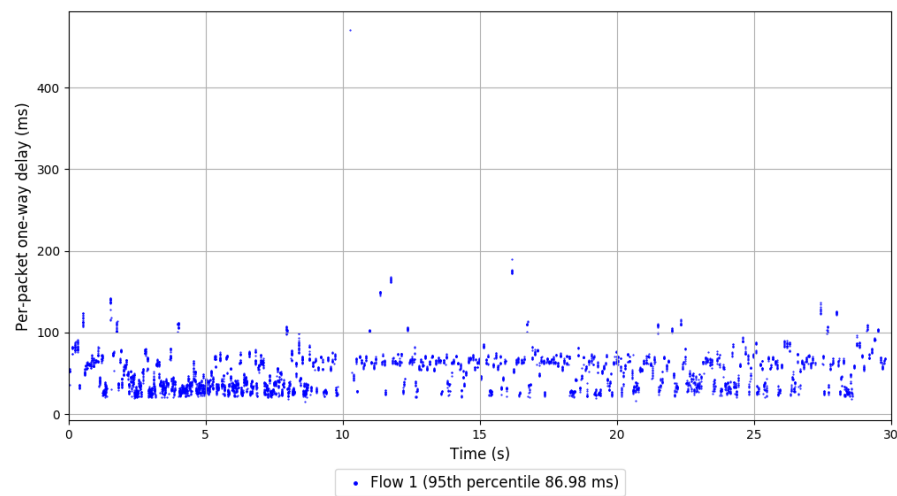
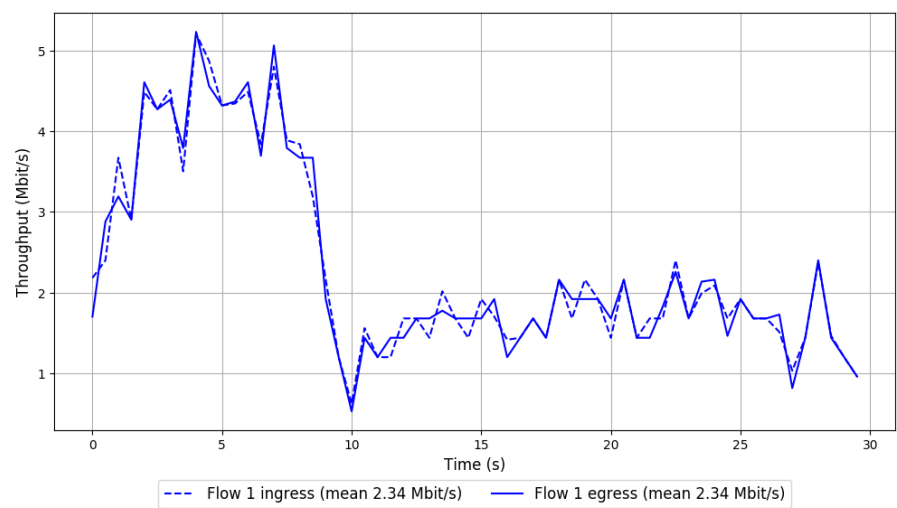


```
Run 1: Statistics of Indigo

Start at: 2017-12-20 16:16:57
End at: 2017-12-20 16:17:27
Local clock offset: -0.004 ms
Remote clock offset: -2.929 ms

# Below is generated by plot.py at 2017-12-20 17:49:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 86.985 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 86.985 ms
Loss rate: 0.33%
```

Run 1: Report of Indigo — Data Link

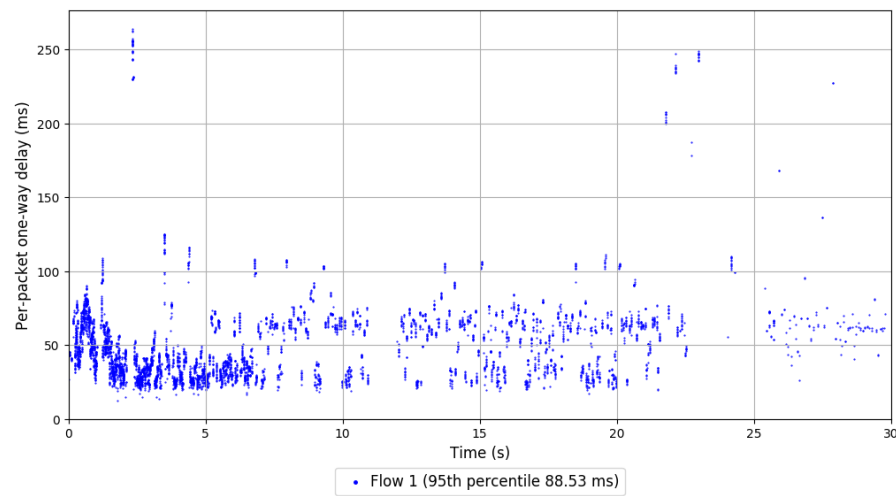
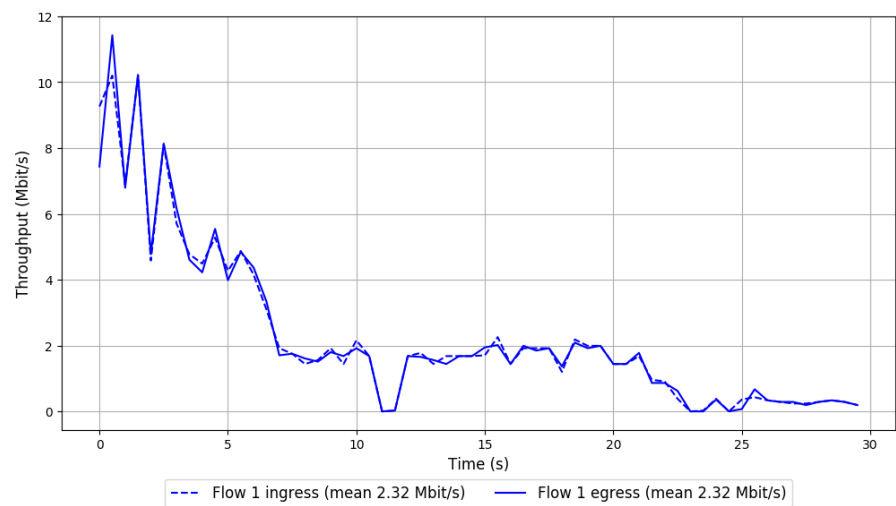


Run 2: Statistics of Indigo

Start at: 2017-12-20 16:34:37
End at: 2017-12-20 16:35:07
Local clock offset: 0.078 ms
Remote clock offset: -2.741 ms

Below is generated by plot.py at 2017-12-20 17:49:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 88.527 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 88.527 ms
Loss rate: 0.28%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2017-12-20 16:52:16
End at: 2017-12-20 16:52:46
Local clock offset: 0.137 ms
Remote clock offset: -2.764 ms

Below is generated by plot.py at 2017-12-20 17:49:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 88.043 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 88.043 ms
Loss rate: 0.05%

Run 3: Report of Indigo — Data Link

