

Pantheon Report

Generated at 2018-02-12 21:40:51 (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).

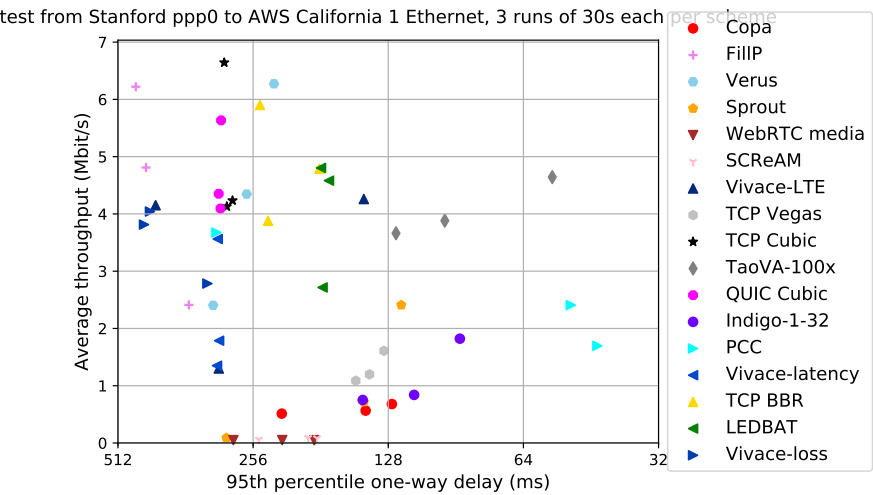
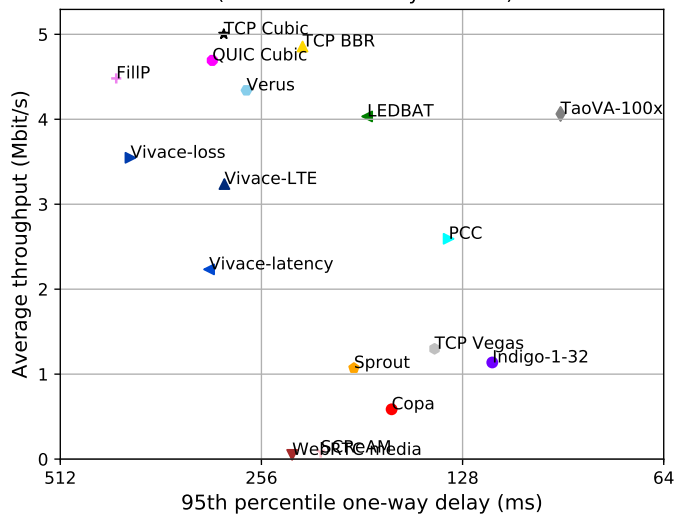
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

Git summary:

```
branch: master @ 2efdad57c2c56a9458b0d01ff33345e11732665
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 828bbf95fd4941149b5cec90f281d1c69ae1a5c6
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
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-quick @ 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	4.86	222.17	0.59
TCP Cubic	3	5.00	291.45	1.49
LEDBAT	3	4.03	177.85	0.50
PCC	3	2.60	134.30	2.35
QUIC Cubic	3	4.69	303.24	3.31
SCReAM	3	0.08	208.67	5.71
WebRTC media	3	0.05	230.31	2.15
Sprout	3	1.07	186.14	7.19
TaoVA-100x	3	4.06	91.33	1.08
TCP Vegas	3	1.30	140.99	0.88
Verus	3	4.34	269.56	7.96
Copa	3	0.59	163.46	7.05
FillP	3	4.48	422.20	67.50
Indigo-1-32	3	1.14	115.55	1.41
Vivace-latency	3	2.23	306.63	7.07
Vivace-loss	3	3.54	401.99	28.70
Vivace-LTE	3	3.24	290.81	6.29

Run 1: Statistics of TCP BBR

Start at: 2018-02-12 19:20:37

End at: 2018-02-12 19:21:07

Local clock offset: 0.272 ms

Remote clock offset: -5.344 ms

Below is generated by plot.py at 2018-02-12 21:40:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.90 Mbit/s

95th percentile per-packet one-way delay: 247.212 ms

Loss rate: 0.73%

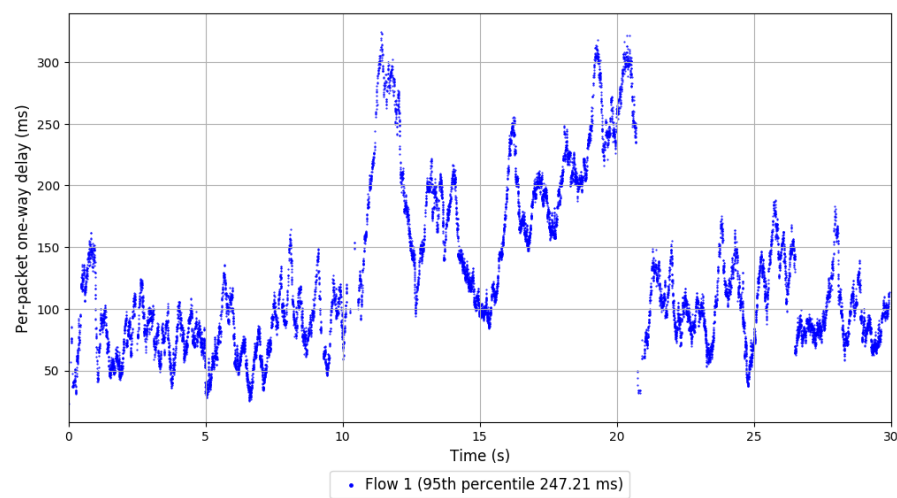
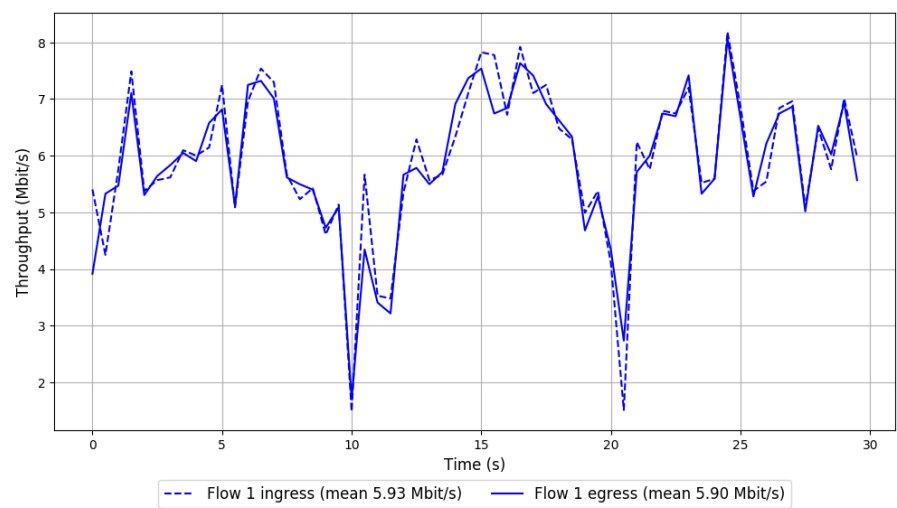
-- Flow 1:

Average throughput: 5.90 Mbit/s

95th percentile per-packet one-way delay: 247.212 ms

Loss rate: 0.73%

Run 1: Report of TCP BBR — Data Link

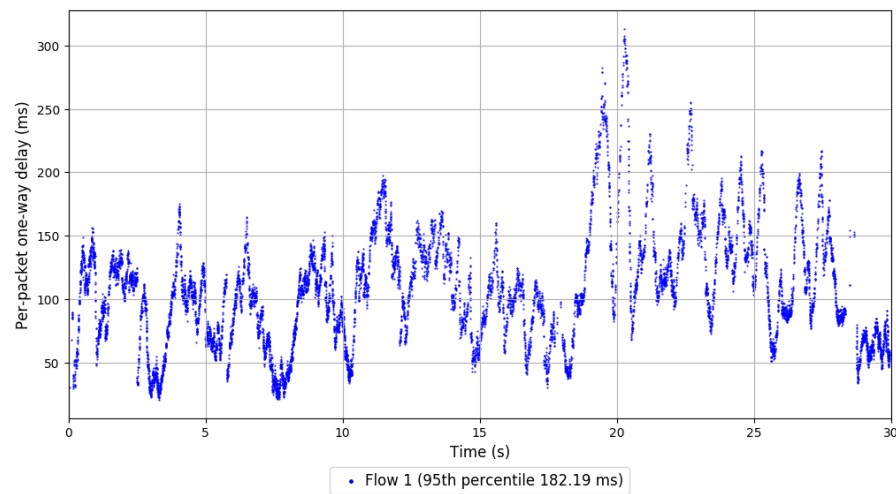
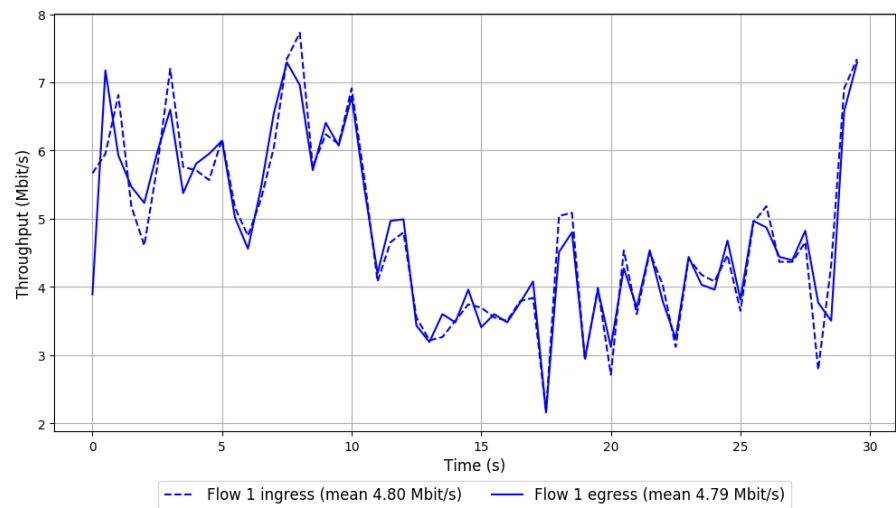


Run 2: Statistics of TCP BBR

Start at: 2018-02-12 19:44:09
End at: 2018-02-12 19:44:39
Local clock offset: 0.21 ms
Remote clock offset: -5.231 ms

Below is generated by plot.py at 2018-02-12 21:40:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.79 Mbit/s
95th percentile per-packet one-way delay: 182.186 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 4.79 Mbit/s
95th percentile per-packet one-way delay: 182.186 ms
Loss rate: 0.45%

Run 2: Report of TCP BBR — Data Link

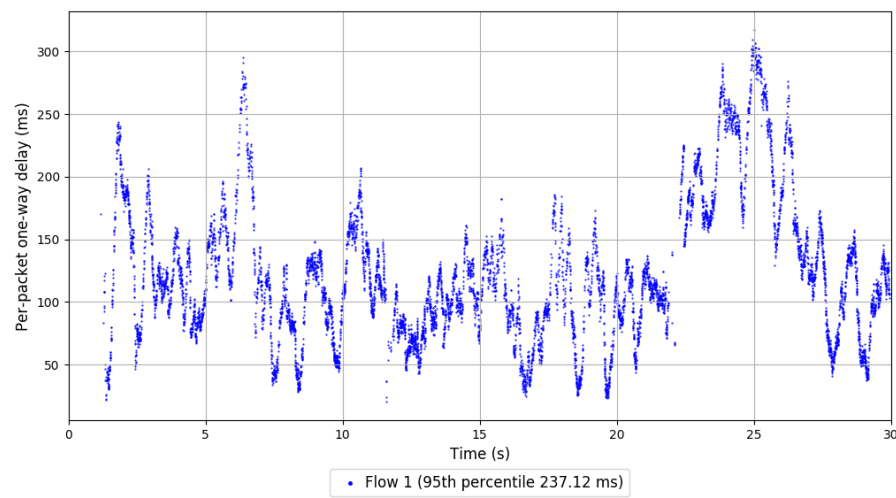
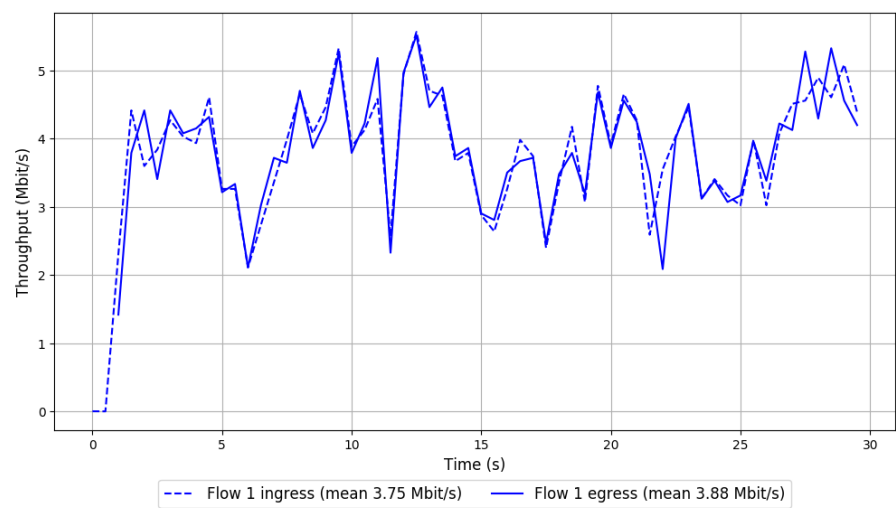


Run 3: Statistics of TCP BBR

Start at: 2018-02-12 20:07:41
End at: 2018-02-12 20:08:11
Local clock offset: 0.188 ms
Remote clock offset: -4.947 ms

Below is generated by plot.py at 2018-02-12 21:40:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.88 Mbit/s
95th percentile per-packet one-way delay: 237.118 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 3.88 Mbit/s
95th percentile per-packet one-way delay: 237.118 ms
Loss rate: 0.58%

Run 3: Report of TCP BBR — Data Link

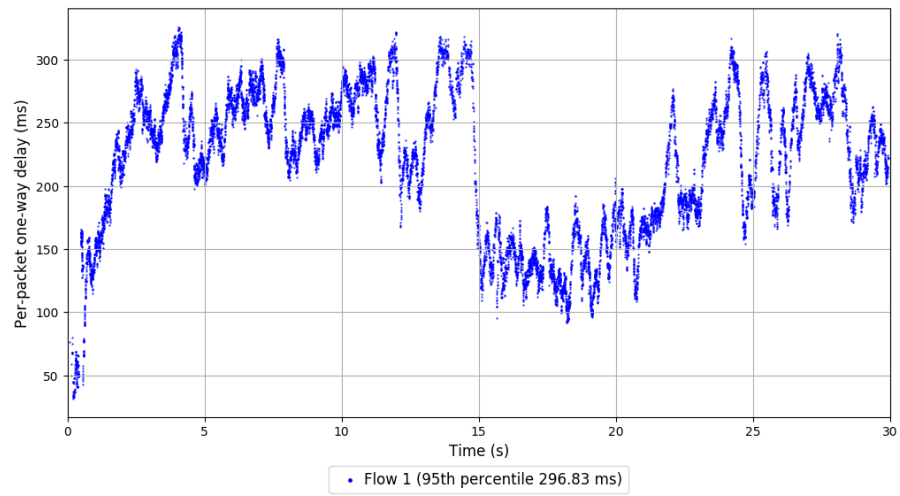
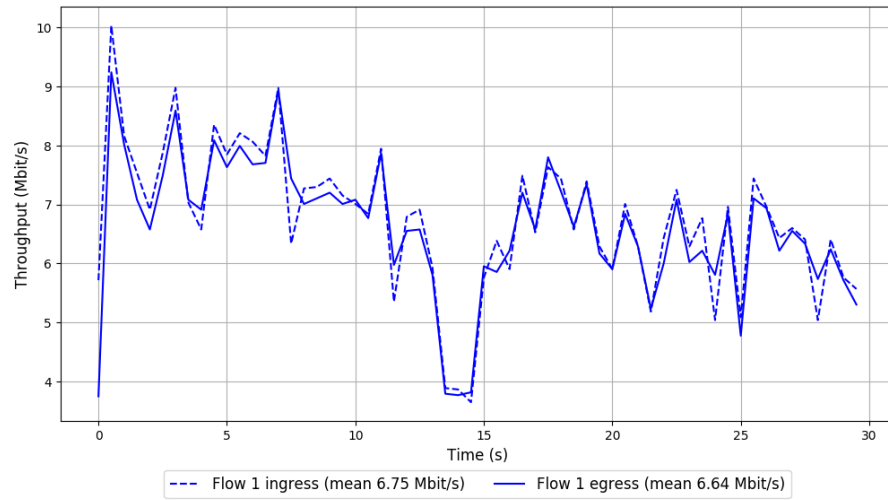


Run 1: Statistics of TCP Cubic

Start at: 2018-02-12 19:23:14
End at: 2018-02-12 19:23:44
Local clock offset: 0.162 ms
Remote clock offset: -5.327 ms

Below is generated by plot.py at 2018-02-12 21:40:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.64 Mbit/s
95th percentile per-packet one-way delay: 296.827 ms
Loss rate: 1.82%
-- Flow 1:
Average throughput: 6.64 Mbit/s
95th percentile per-packet one-way delay: 296.827 ms
Loss rate: 1.82%

Run 1: Report of TCP Cubic — Data Link

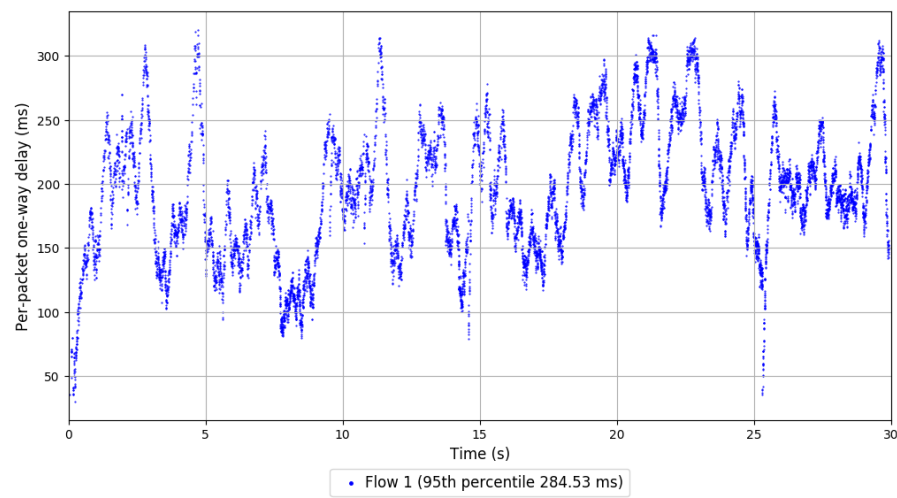
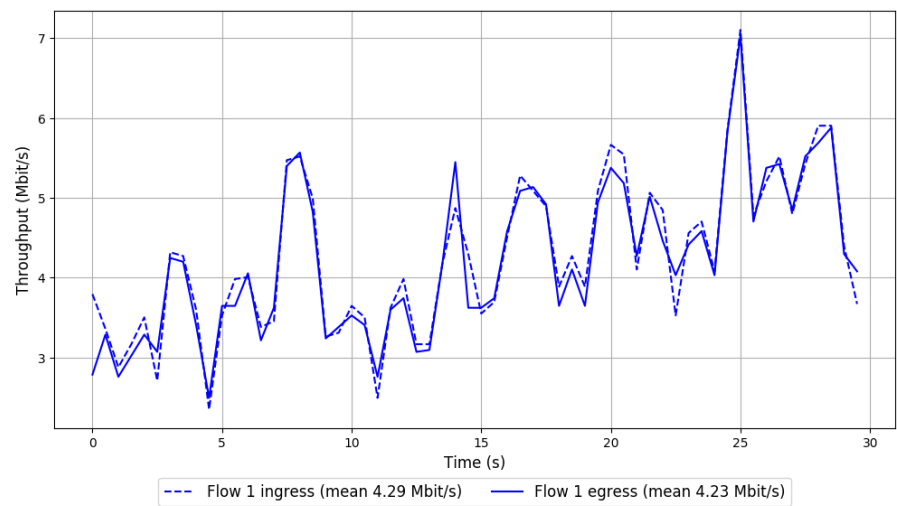


Run 2: Statistics of TCP Cubic

Start at: 2018-02-12 19:46:45
End at: 2018-02-12 19:47:16
Local clock offset: 0.224 ms
Remote clock offset: -5.133 ms

Below is generated by plot.py at 2018-02-12 21:40:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.23 Mbit/s
95th percentile per-packet one-way delay: 284.527 ms
Loss rate: 1.37%
-- Flow 1:
Average throughput: 4.23 Mbit/s
95th percentile per-packet one-way delay: 284.527 ms
Loss rate: 1.37%

Run 2: Report of TCP Cubic — Data Link

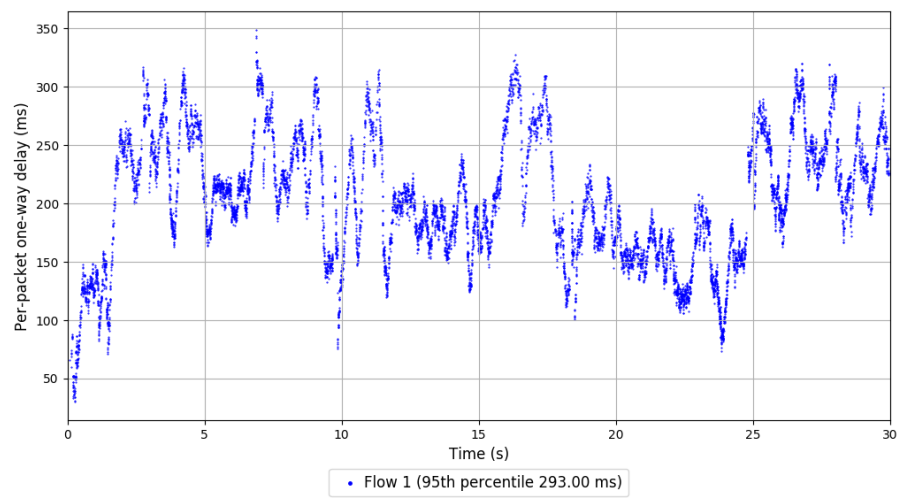
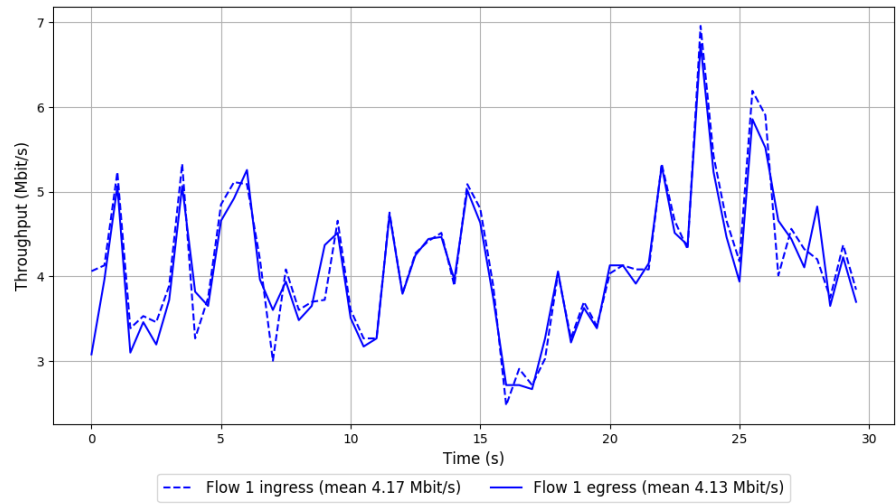


Run 3: Statistics of TCP Cubic

Start at: 2018-02-12 20:10:18
End at: 2018-02-12 20:10:48
Local clock offset: 0.202 ms
Remote clock offset: -4.707 ms

Below is generated by plot.py at 2018-02-12 21:40:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.13 Mbit/s
95th percentile per-packet one-way delay: 292.997 ms
Loss rate: 1.27%
-- Flow 1:
Average throughput: 4.13 Mbit/s
95th percentile per-packet one-way delay: 292.997 ms
Loss rate: 1.27%

Run 3: Report of TCP Cubic — Data Link

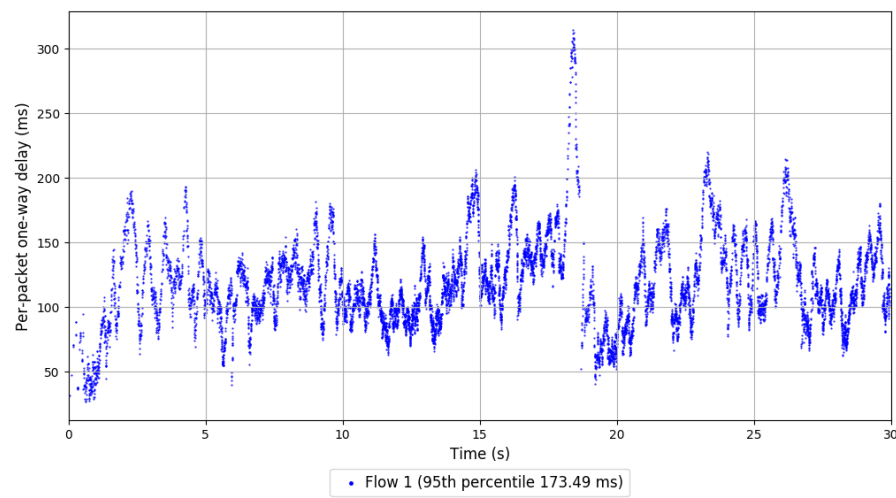
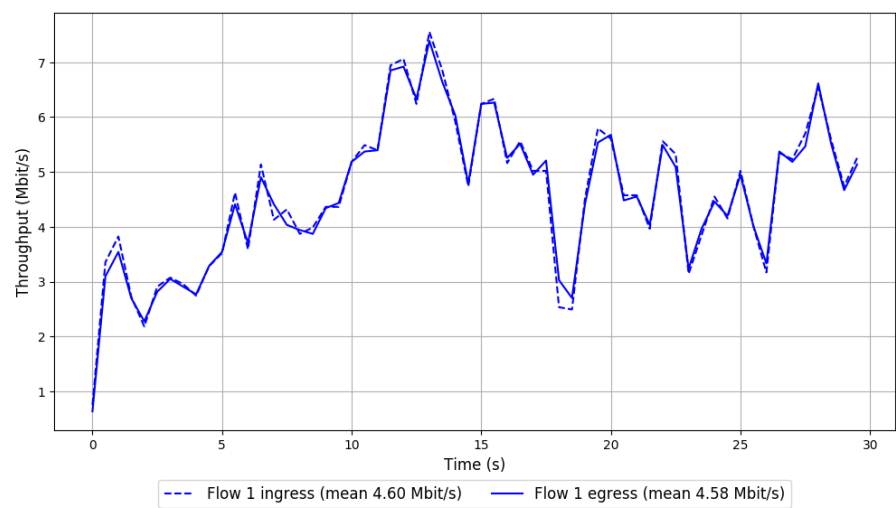


```
Run 1: Statistics of LEDBAT

Start at: 2018-02-12 19:40:13
End at: 2018-02-12 19:40:43
Local clock offset: 0.166 ms
Remote clock offset: -5.21 ms

# Below is generated by plot.py at 2018-02-12 21:40:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.58 Mbit/s
95th percentile per-packet one-way delay: 173.490 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 4.58 Mbit/s
95th percentile per-packet one-way delay: 173.490 ms
Loss rate: 0.55%
```

Run 1: Report of LEDBAT — Data Link

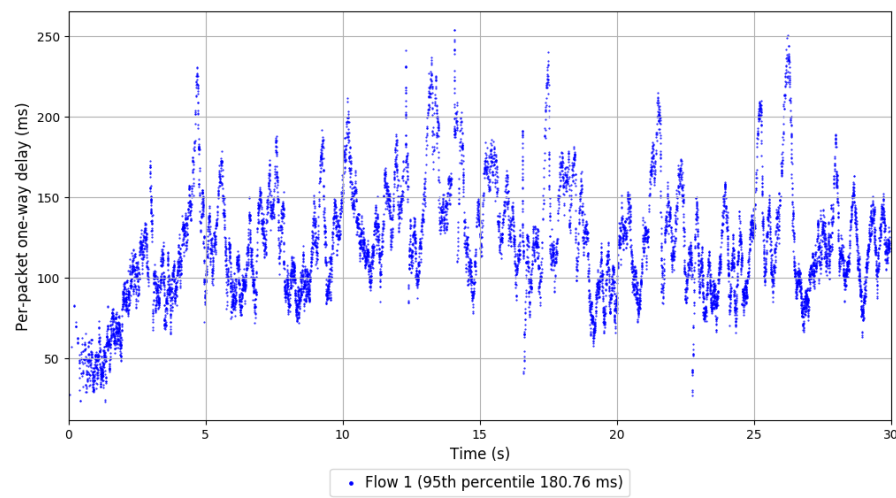
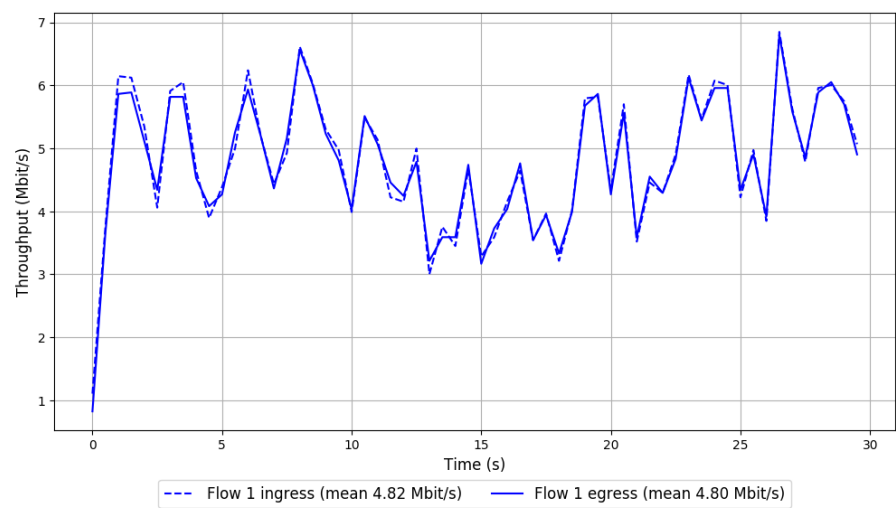


Run 2: Statistics of LEDBAT

Start at: 2018-02-12 20:03:46
End at: 2018-02-12 20:04:16
Local clock offset: 0.177 ms
Remote clock offset: -5.078 ms

Below is generated by plot.py at 2018-02-12 21:40:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.80 Mbit/s
95th percentile per-packet one-way delay: 180.756 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 4.80 Mbit/s
95th percentile per-packet one-way delay: 180.756 ms
Loss rate: 0.52%

Run 2: Report of LEDBAT — Data Link

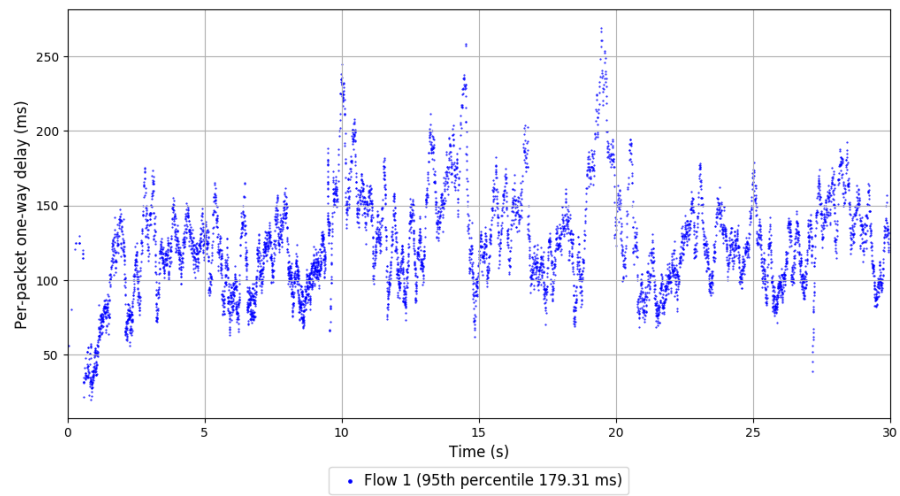
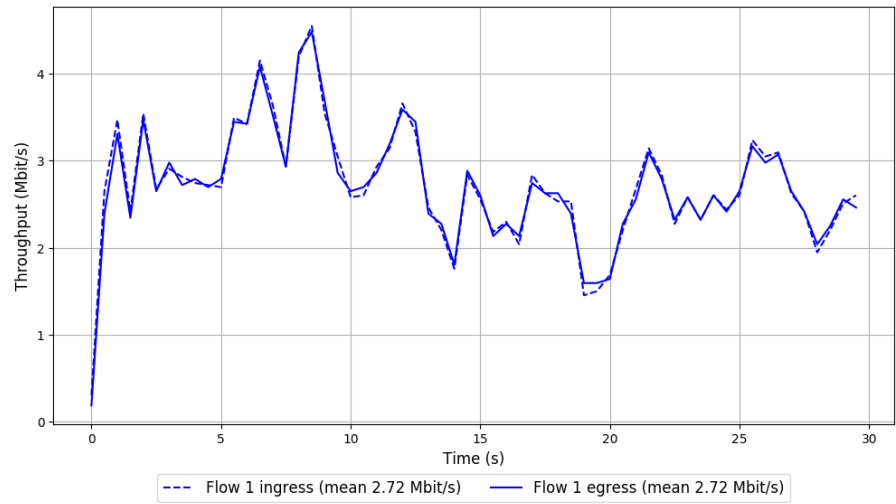


Run 3: Statistics of LEDBAT

Start at: 2018-02-12 20:27:17
End at: 2018-02-12 20:27:47
Local clock offset: 0.166 ms
Remote clock offset: -4.187 ms

Below is generated by plot.py at 2018-02-12 21:40:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.72 Mbit/s
95th percentile per-packet one-way delay: 179.311 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 2.72 Mbit/s
95th percentile per-packet one-way delay: 179.311 ms
Loss rate: 0.42%

Run 3: Report of LEDBAT — Data Link

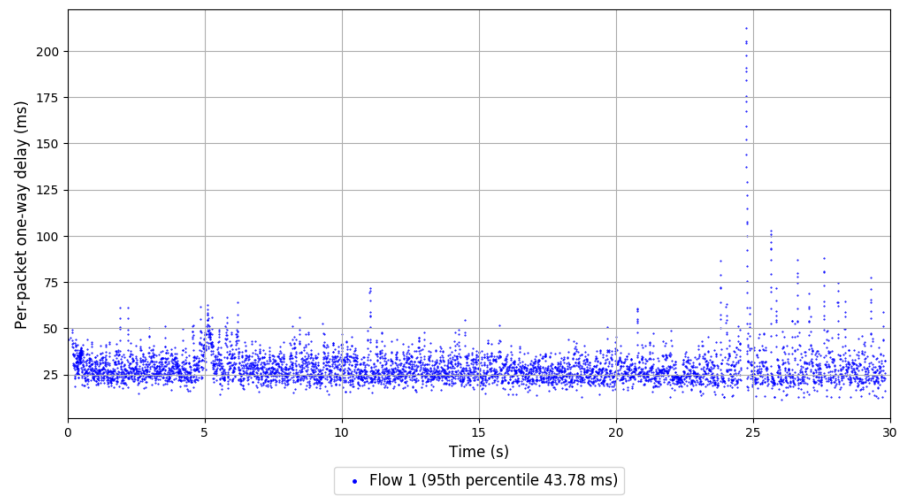
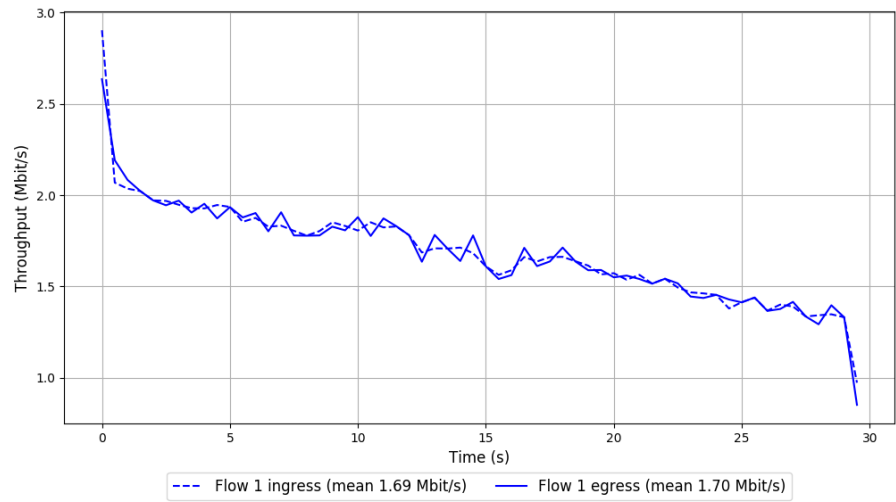


Run 1: Statistics of PCC

Start at: 2018-02-12 19:19:19
End at: 2018-02-12 19:19:49
Local clock offset: 0.166 ms
Remote clock offset: -5.356 ms

Below is generated by plot.py at 2018-02-12 21:40:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 43.784 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 43.784 ms
Loss rate: 0.19%

Run 1: Report of PCC — Data Link

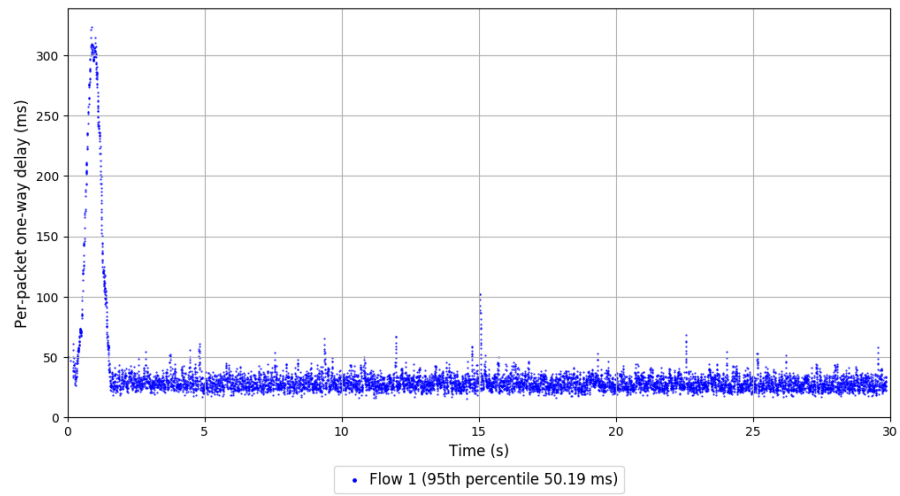
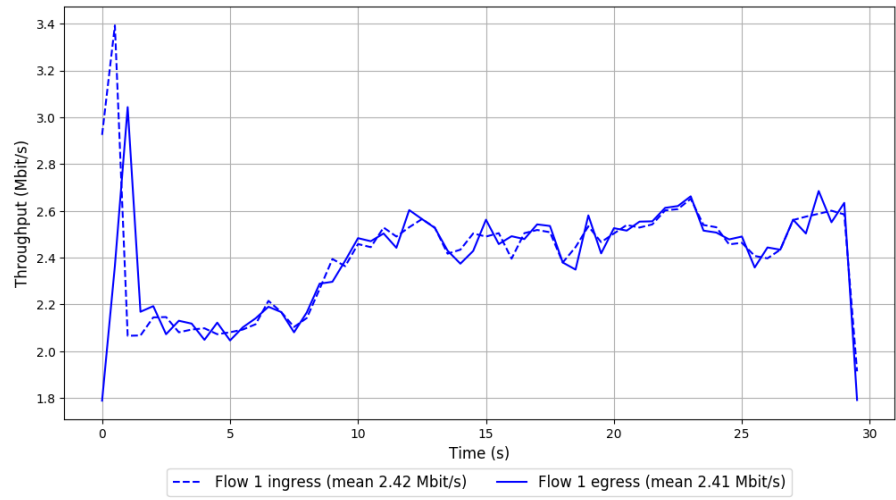


Run 2: Statistics of PCC

Start at: 2018-02-12 19:42:50
End at: 2018-02-12 19:43:20
Local clock offset: 0.22 ms
Remote clock offset: -5.265 ms

Below is generated by plot.py at 2018-02-12 21:40:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.41 Mbit/s
95th percentile per-packet one-way delay: 50.189 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 2.41 Mbit/s
95th percentile per-packet one-way delay: 50.189 ms
Loss rate: 0.80%

Run 2: Report of PCC — Data Link

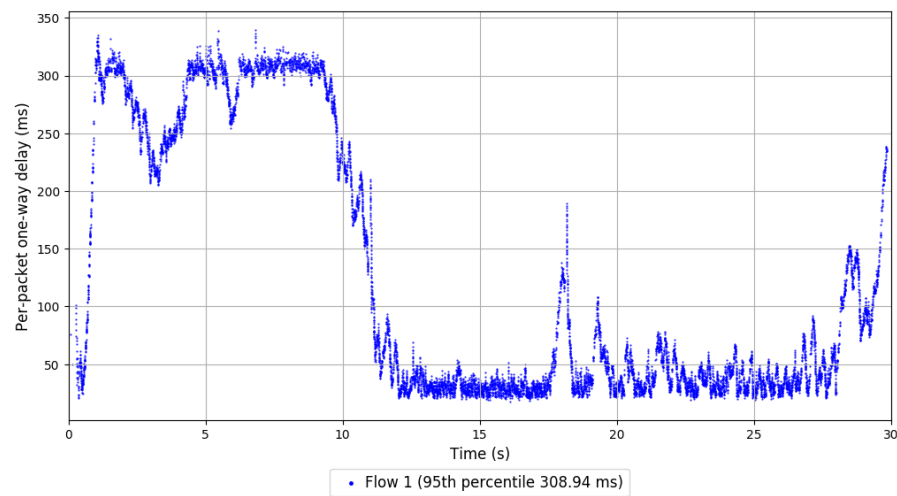
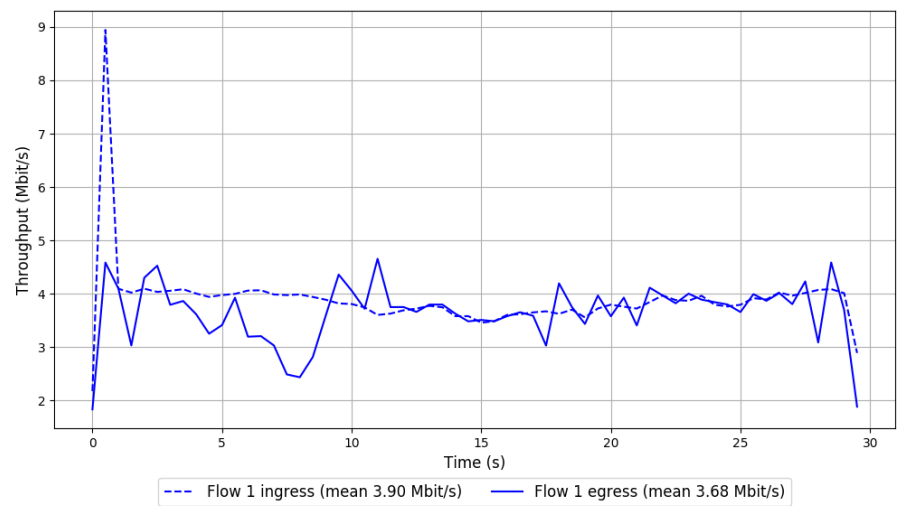


Run 3: Statistics of PCC

Start at: 2018-02-12 20:06:22
End at: 2018-02-12 20:06:52
Local clock offset: 0.173 ms
Remote clock offset: -4.988 ms

Below is generated by plot.py at 2018-02-12 21:40:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.68 Mbit/s
95th percentile per-packet one-way delay: 308.935 ms
Loss rate: 6.06%
-- Flow 1:
Average throughput: 3.68 Mbit/s
95th percentile per-packet one-way delay: 308.935 ms
Loss rate: 6.06%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-02-12 19:28:28

End at: 2018-02-12 19:28:58

Local clock offset: 0.244 ms

Remote clock offset: -5.236 ms

Below is generated by plot.py at 2018-02-12 21:40:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.35 Mbit/s

95th percentile per-packet one-way delay: 305.412 ms

Loss rate: 3.82%

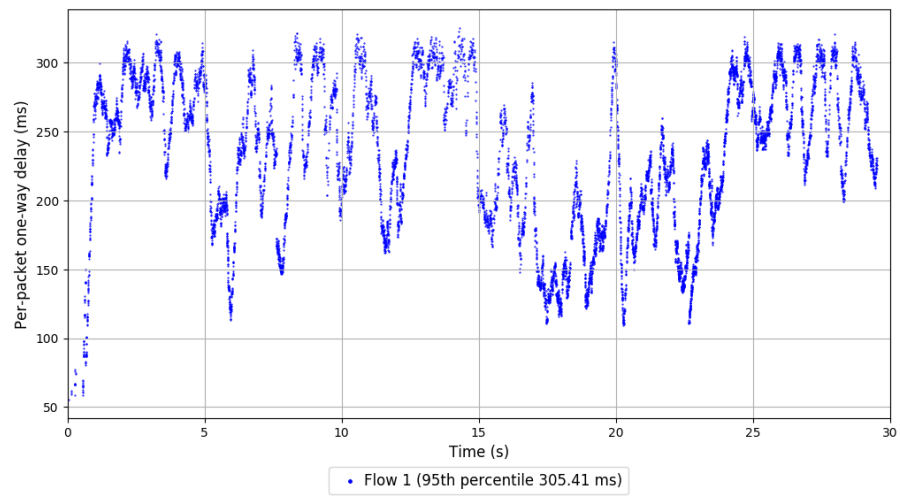
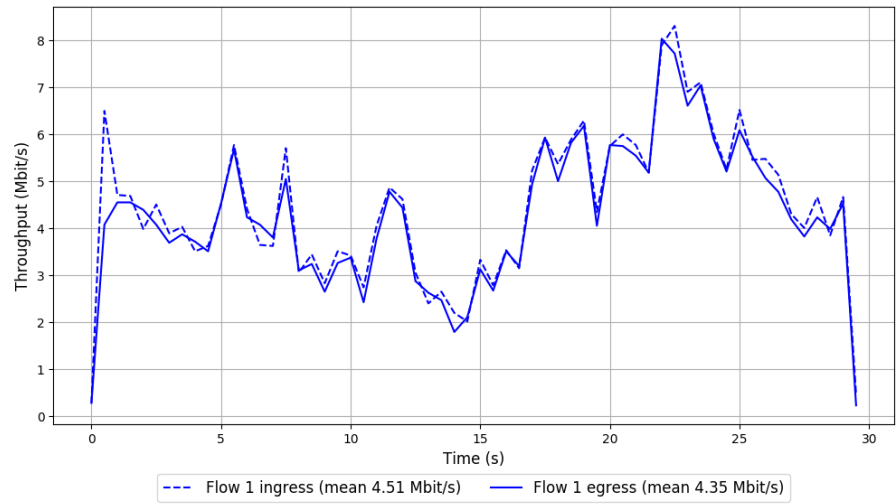
-- Flow 1:

Average throughput: 4.35 Mbit/s

95th percentile per-packet one-way delay: 305.412 ms

Loss rate: 3.82%

Run 1: Report of QUIC Cubic — Data Link

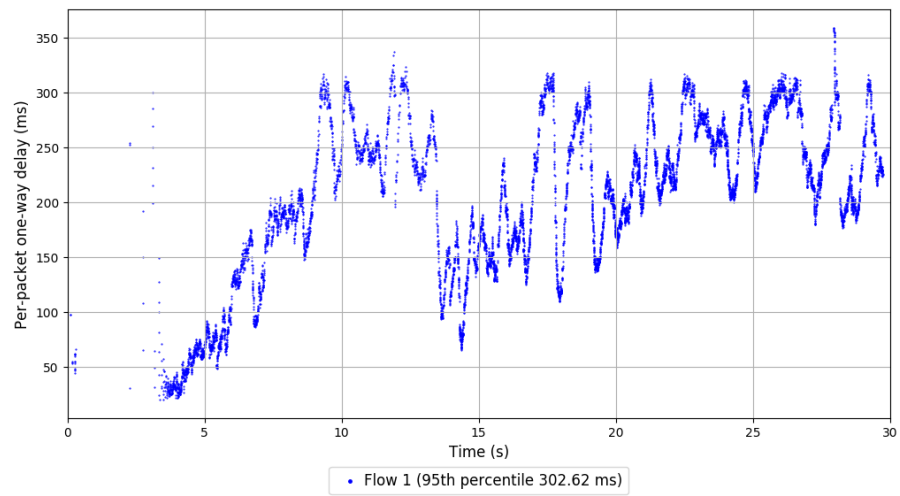
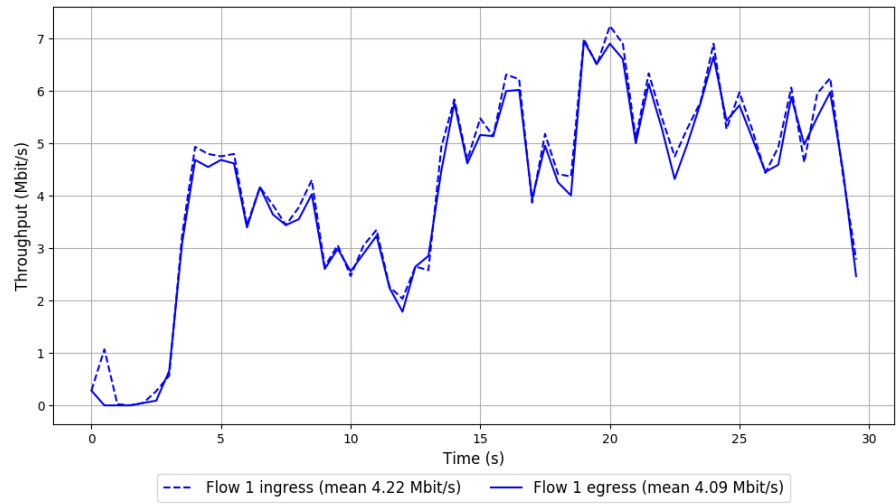


Run 2: Statistics of QUIC Cubic

Start at: 2018-02-12 19:52:00
End at: 2018-02-12 19:52:30
Local clock offset: 0.185 ms
Remote clock offset: -5.209 ms

Below is generated by plot.py at 2018-02-12 21:40:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.09 Mbit/s
95th percentile per-packet one-way delay: 302.623 ms
Loss rate: 3.47%
-- Flow 1:
Average throughput: 4.09 Mbit/s
95th percentile per-packet one-way delay: 302.623 ms
Loss rate: 3.47%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-02-12 20:15:31

End at: 2018-02-12 20:16:02

Local clock offset: 0.188 ms

Remote clock offset: -4.48 ms

Below is generated by plot.py at 2018-02-12 21:40:22

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.63 Mbit/s

95th percentile per-packet one-way delay: 301.678 ms

Loss rate: 2.65%

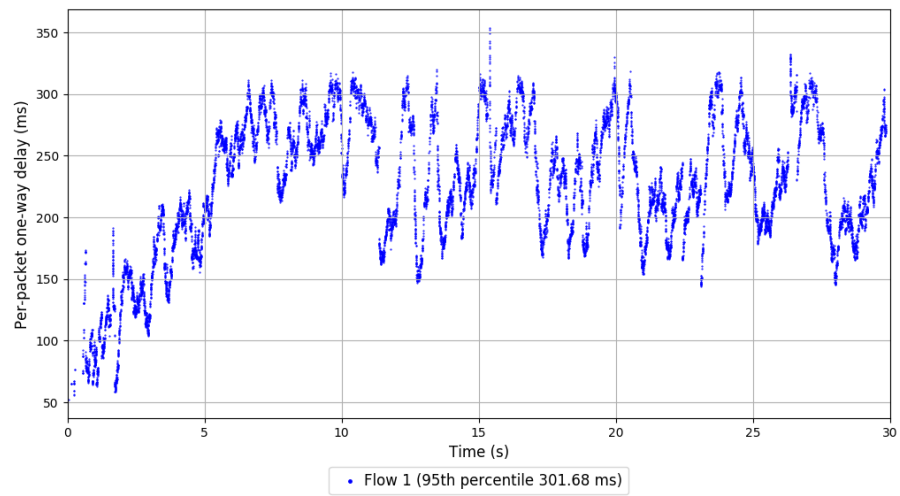
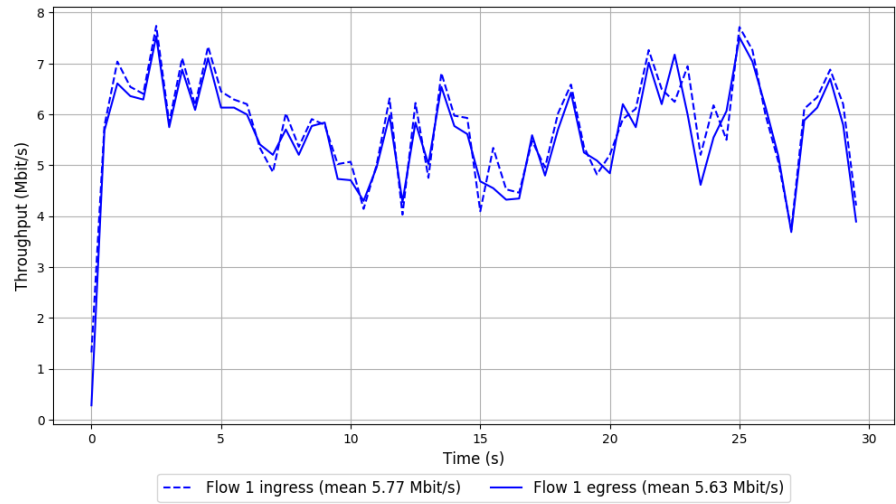
-- Flow 1:

Average throughput: 5.63 Mbit/s

95th percentile per-packet one-way delay: 301.678 ms

Loss rate: 2.65%

Run 3: Report of QUIC Cubic — Data Link

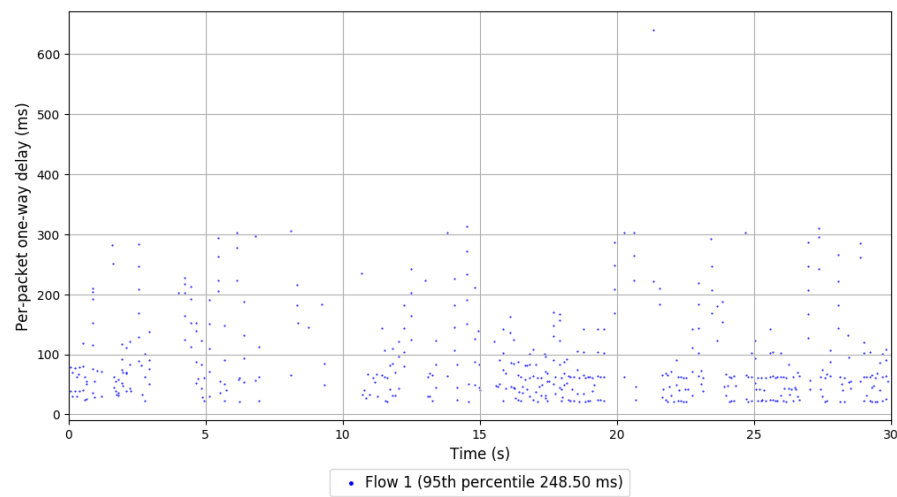
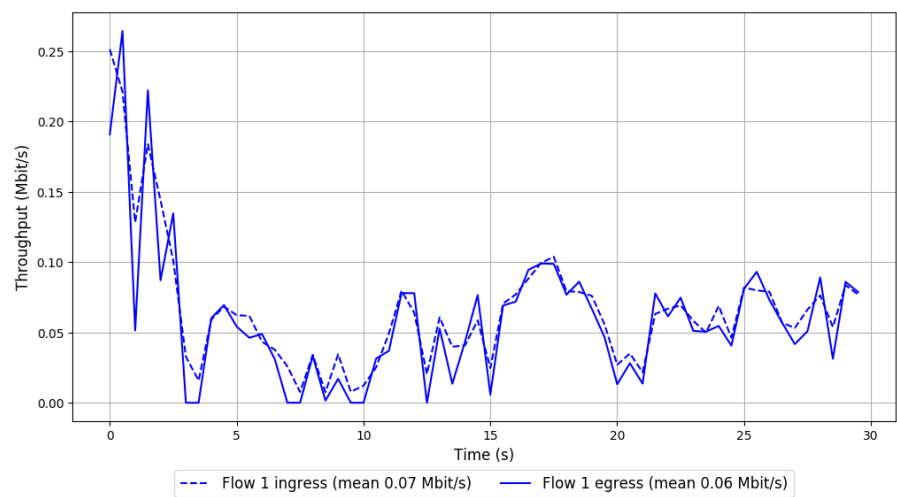


Run 1: Statistics of SCReAM

Start at: 2018-02-12 19:37:37
End at: 2018-02-12 19:38:07
Local clock offset: 0.234 ms
Remote clock offset: -5.236 ms

Below is generated by plot.py at 2018-02-12 21:40:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 248.498 ms
Loss rate: 9.15%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 248.498 ms
Loss rate: 9.15%

Run 1: Report of SReAM — Data Link

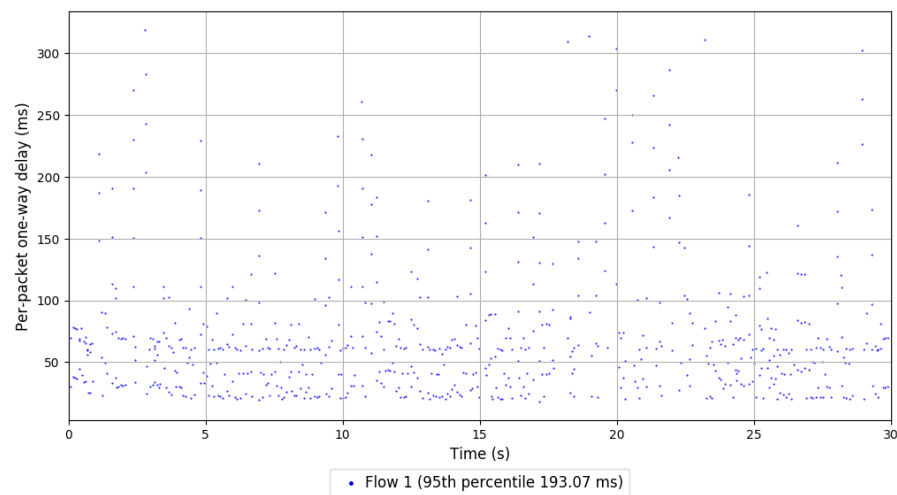
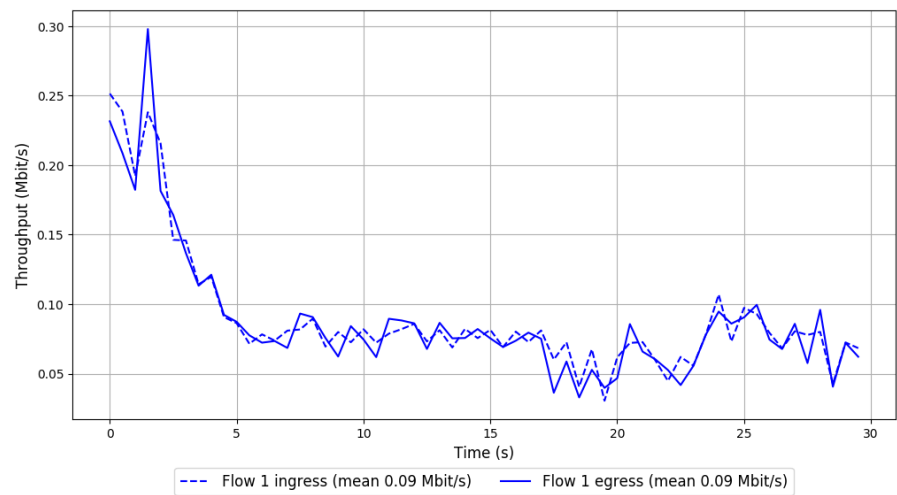


Run 2: Statistics of SCReAM

Start at: 2018-02-12 20:01:09
End at: 2018-02-12 20:01:39
Local clock offset: 0.081 ms
Remote clock offset: -5.148 ms

Below is generated by plot.py at 2018-02-12 21:40:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 193.072 ms
Loss rate: 2.06%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 193.072 ms
Loss rate: 2.06%

Run 2: Report of SReAM — Data Link

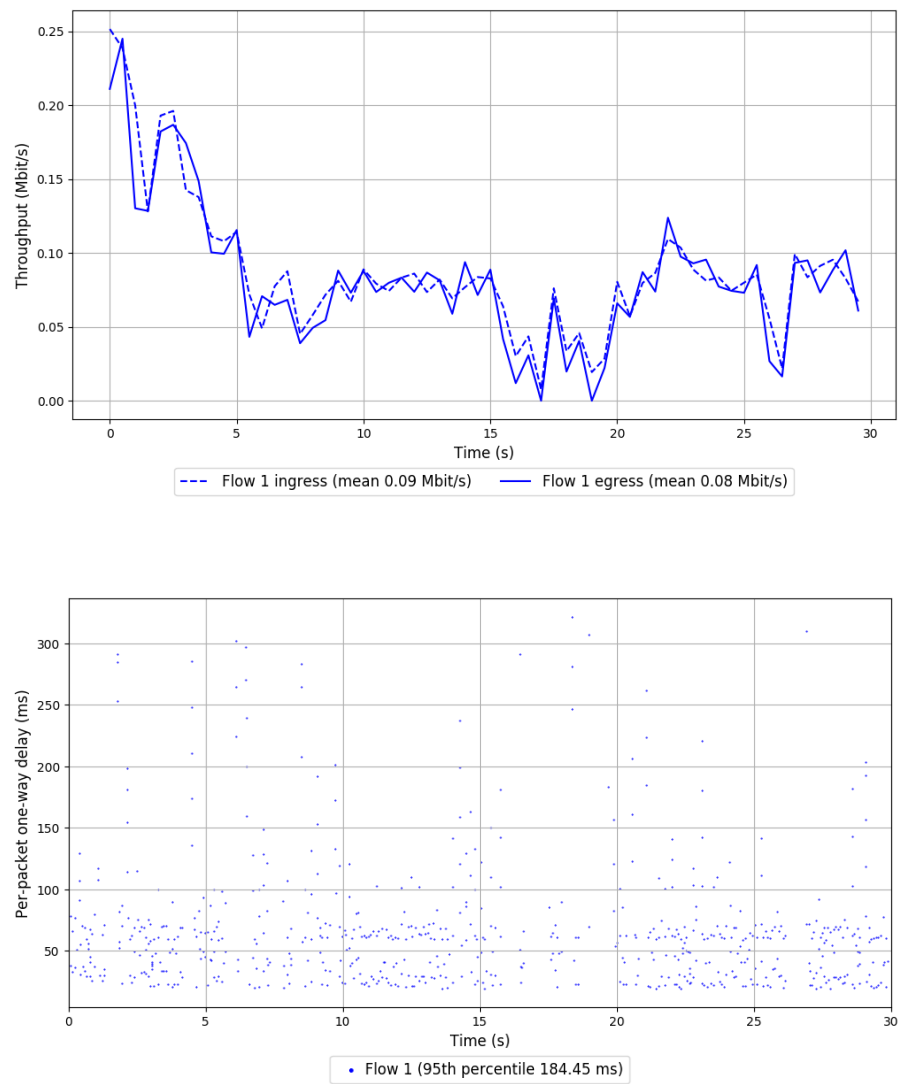


Run 3: Statistics of SCReAM

Start at: 2018-02-12 20:24:40
End at: 2018-02-12 20:25:10
Local clock offset: 0.172 ms
Remote clock offset: -4.191 ms

Below is generated by plot.py at 2018-02-12 21:40:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 184.452 ms
Loss rate: 5.91%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 184.452 ms
Loss rate: 5.91%

Run 3: Report of SReAM — Data Link

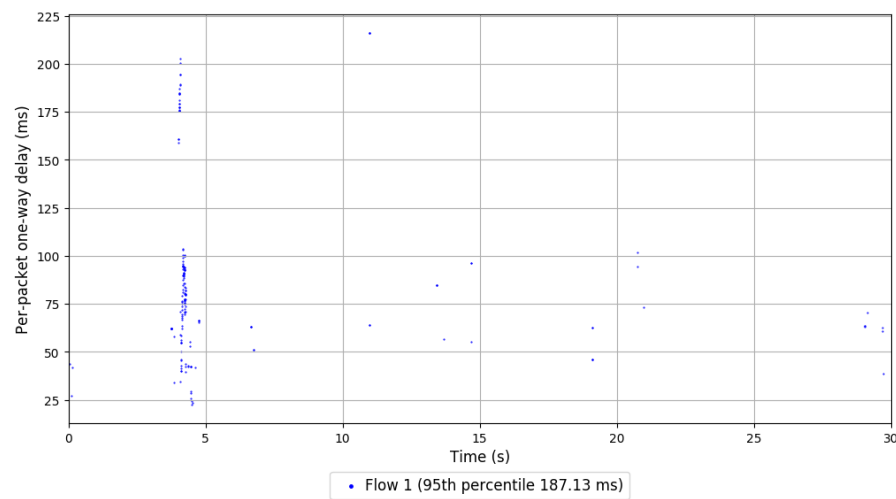
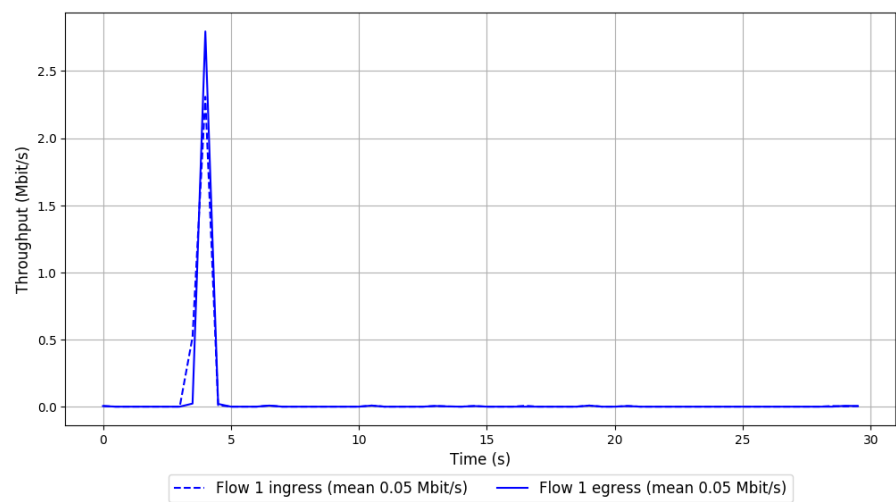


Run 1: Statistics of WebRTC media

Start at: 2018-02-12 19:38:55
End at: 2018-02-12 19:39:25
Local clock offset: 0.24 ms
Remote clock offset: -5.277 ms

Below is generated by plot.py at 2018-02-12 21:40:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 187.127 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 187.127 ms
Loss rate: 0.23%

Run 1: Report of WebRTC media — Data Link

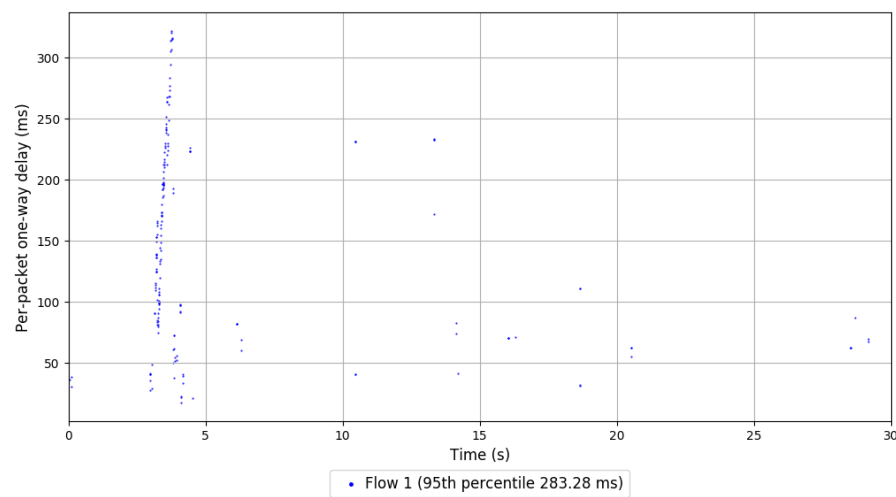
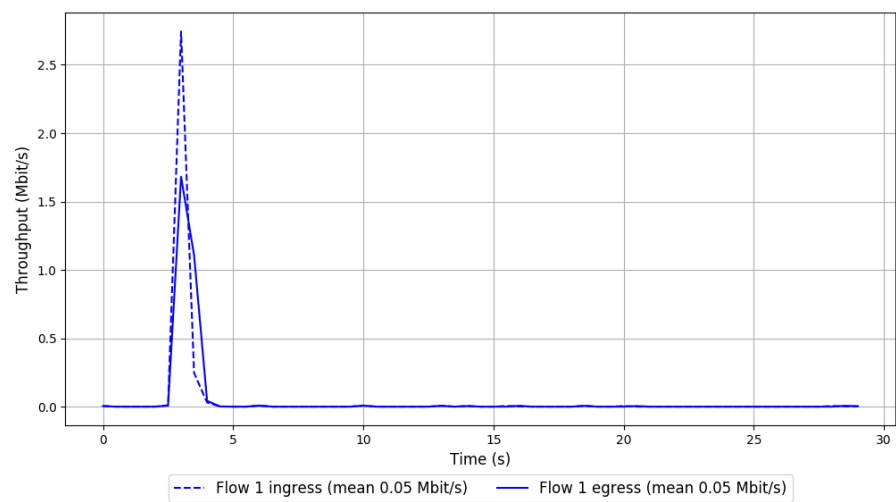


Run 2: Statistics of WebRTC media

Start at: 2018-02-12 20:02:28
End at: 2018-02-12 20:02:58
Local clock offset: 0.113 ms
Remote clock offset: -5.043 ms

Below is generated by plot.py at 2018-02-12 21:40:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 283.283 ms
Loss rate: 6.21%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 283.283 ms
Loss rate: 6.21%

Run 2: Report of WebRTC media — Data Link

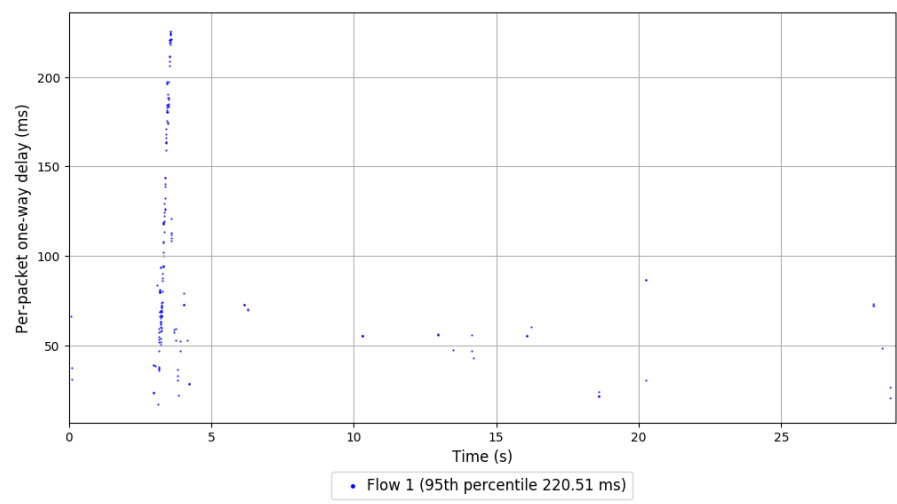
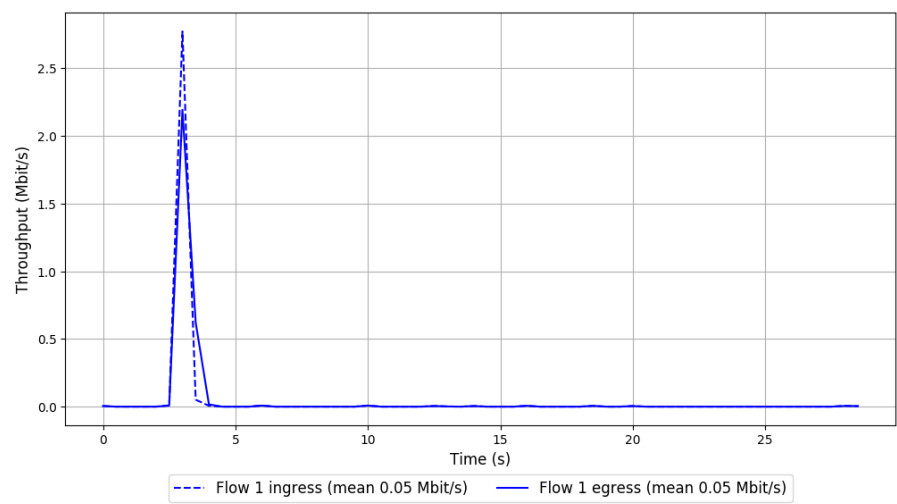


Run 3: Statistics of WebRTC media

Start at: 2018-02-12 20:25:59
End at: 2018-02-12 20:26:29
Local clock offset: 0.072 ms
Remote clock offset: -4.211 ms

Below is generated by plot.py at 2018-02-12 21:40:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 220.510 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 220.510 ms
Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

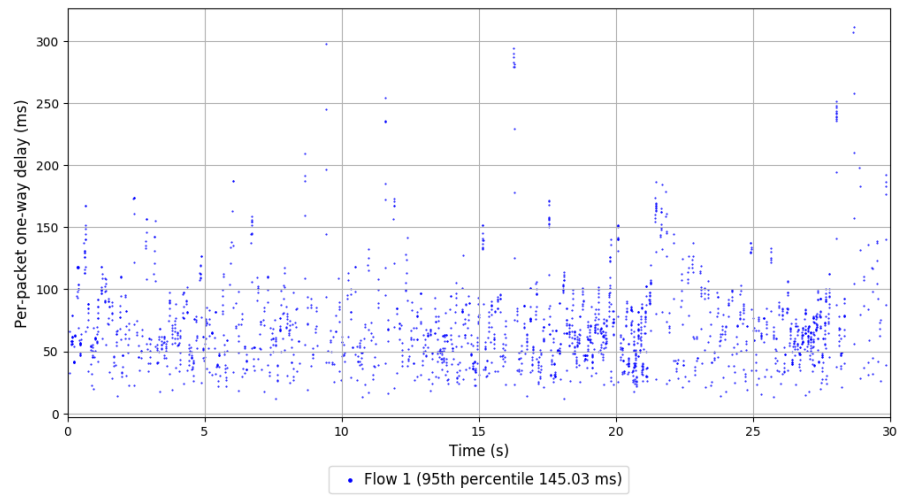
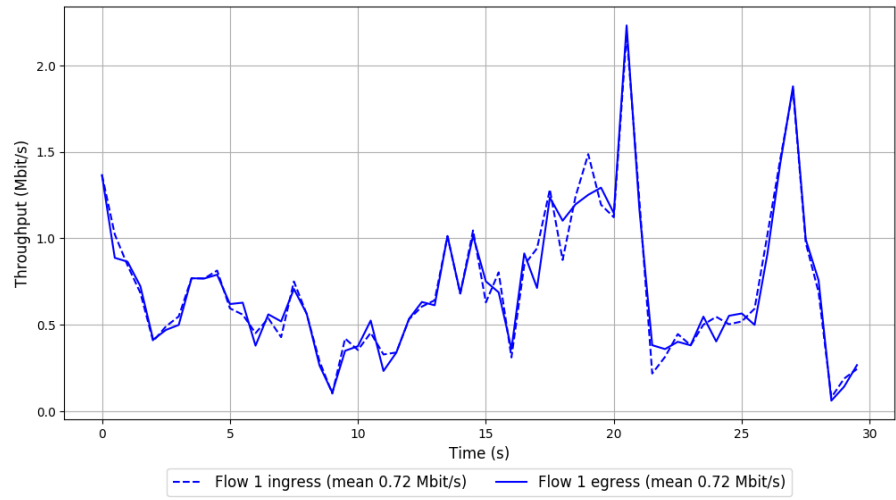


Run 1: Statistics of Sprout

Start at: 2018-02-12 19:33:42
End at: 2018-02-12 19:34:12
Local clock offset: 0.228 ms
Remote clock offset: -5.288 ms

Below is generated by plot.py at 2018-02-12 21:40:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 145.031 ms
Loss rate: 0.64%
-- Flow 1:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 145.031 ms
Loss rate: 0.64%

Run 1: Report of Sprout — Data Link

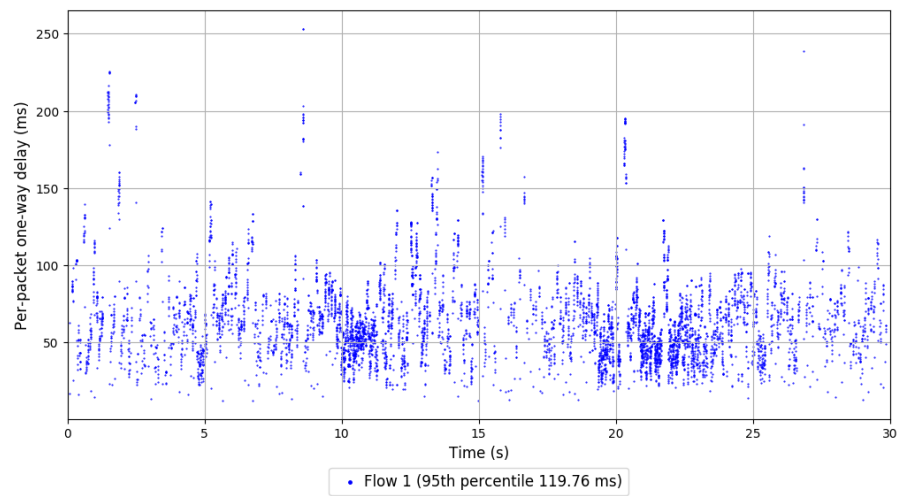
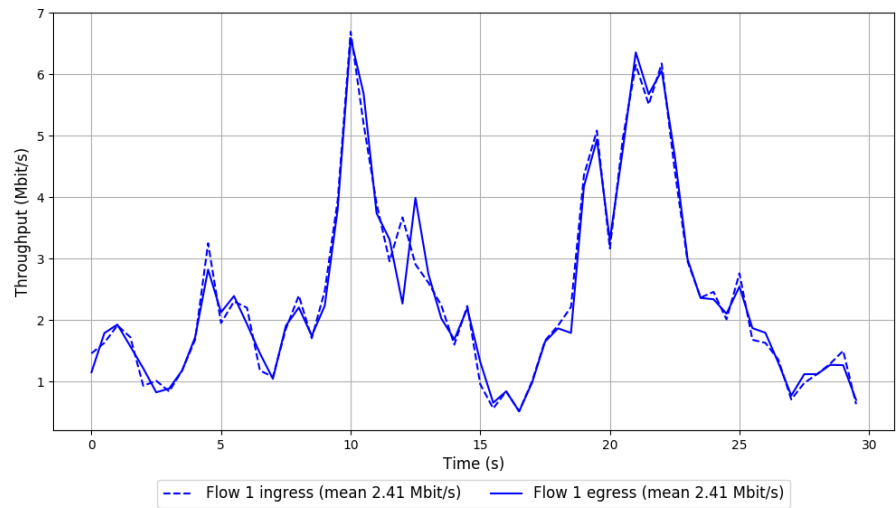


Run 2: Statistics of Sprout

Start at: 2018-02-12 19:57:14
End at: 2018-02-12 19:57:44
Local clock offset: 0.174 ms
Remote clock offset: -5.168 ms

Below is generated by plot.py at 2018-02-12 21:40:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.41 Mbit/s
95th percentile per-packet one-way delay: 119.763 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 2.41 Mbit/s
95th percentile per-packet one-way delay: 119.763 ms
Loss rate: 0.24%

Run 2: Report of Sprout — Data Link

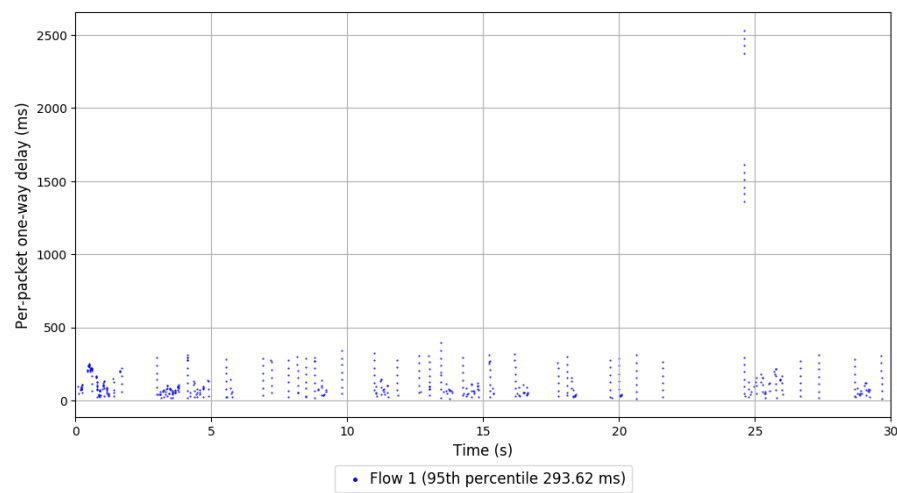
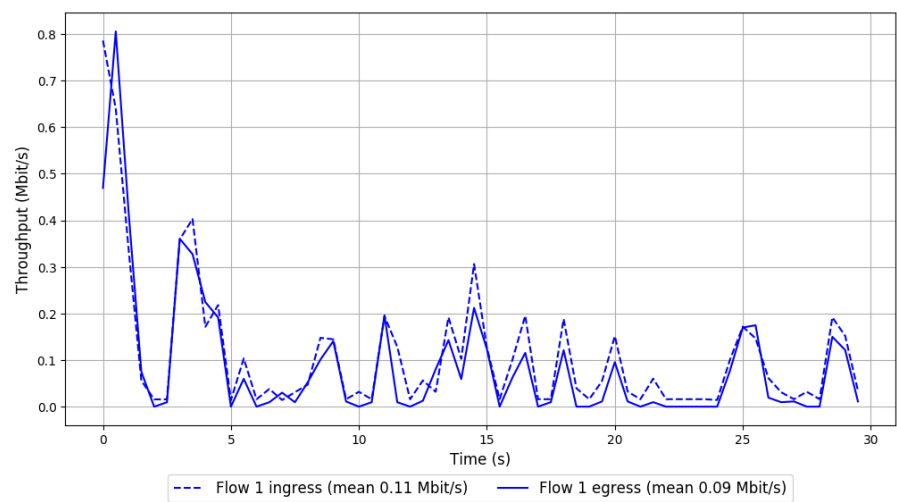


Run 3: Statistics of Sprout

Start at: 2018-02-12 20:20:46
End at: 2018-02-12 20:21:16
Local clock offset: 0.075 ms
Remote clock offset: -4.304 ms

Below is generated by plot.py at 2018-02-12 21:40:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 293.616 ms
Loss rate: 20.68%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 293.616 ms
Loss rate: 20.68%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-02-12 19:25:51

End at: 2018-02-12 19:26:21

Local clock offset: 0.14 ms

Remote clock offset: -5.213 ms

Below is generated by plot.py at 2018-02-12 21:40:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.66 Mbit/s

95th percentile per-packet one-way delay: 123.014 ms

Loss rate: 0.25%

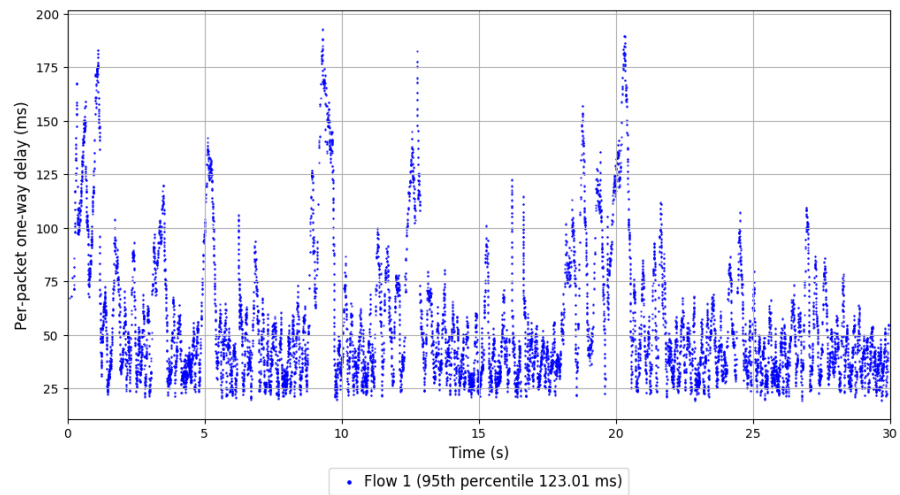
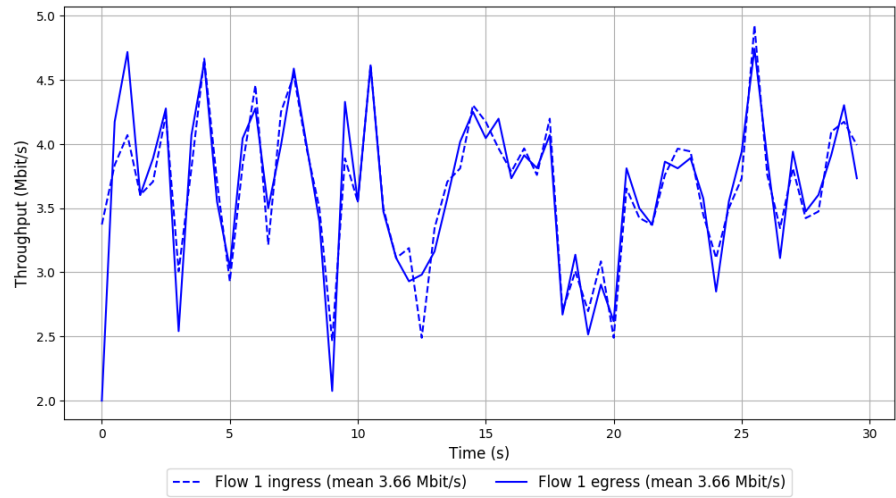
-- Flow 1:

Average throughput: 3.66 Mbit/s

95th percentile per-packet one-way delay: 123.014 ms

Loss rate: 0.25%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-02-12 19:49:23

End at: 2018-02-12 19:49:53

Local clock offset: 0.181 ms

Remote clock offset: -5.129 ms

Below is generated by plot.py at 2018-02-12 21:40:34

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.88 Mbit/s

95th percentile per-packet one-way delay: 95.776 ms

Loss rate: 1.62%

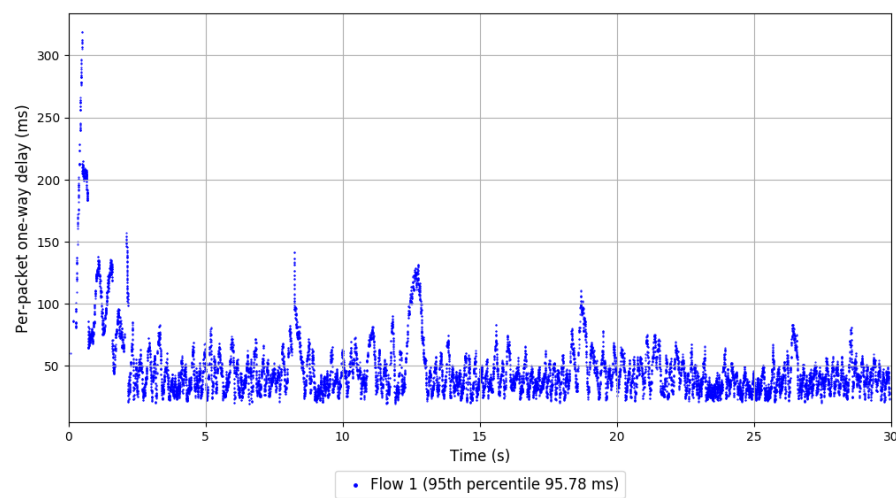
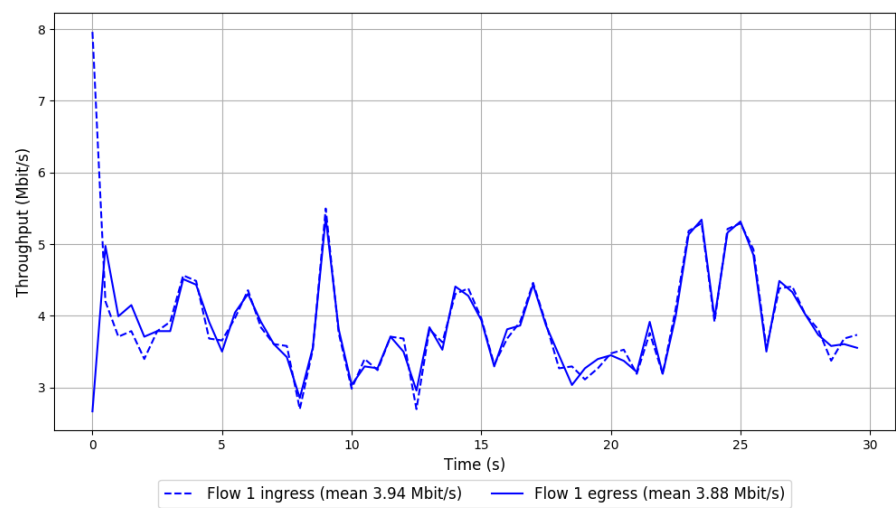
-- Flow 1:

Average throughput: 3.88 Mbit/s

95th percentile per-packet one-way delay: 95.776 ms

Loss rate: 1.62%

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



Run 3: Statistics of TaoVA-100x

Start at: 2018-02-12 20:12:55

End at: 2018-02-12 20:13:25

Local clock offset: 0.183 ms

Remote clock offset: -4.645 ms

Below is generated by plot.py at 2018-02-12 21:40:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.64 Mbit/s

95th percentile per-packet one-way delay: 55.193 ms

Loss rate: 1.36%

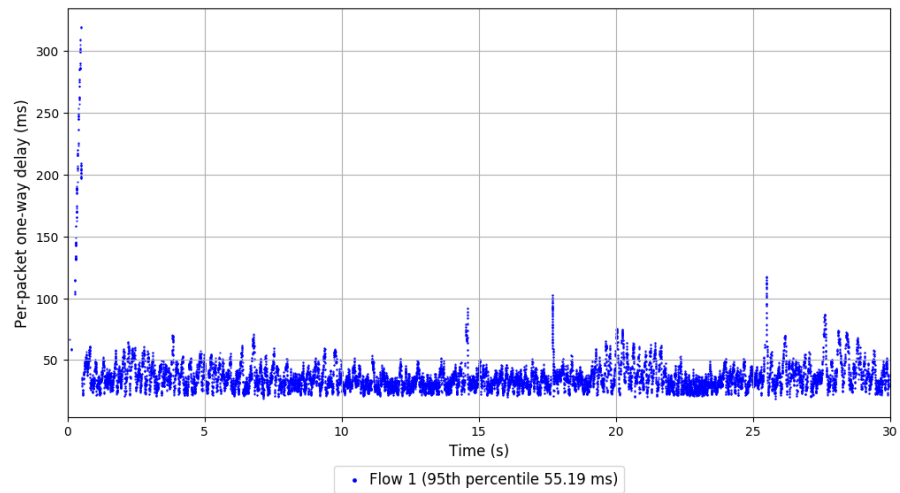
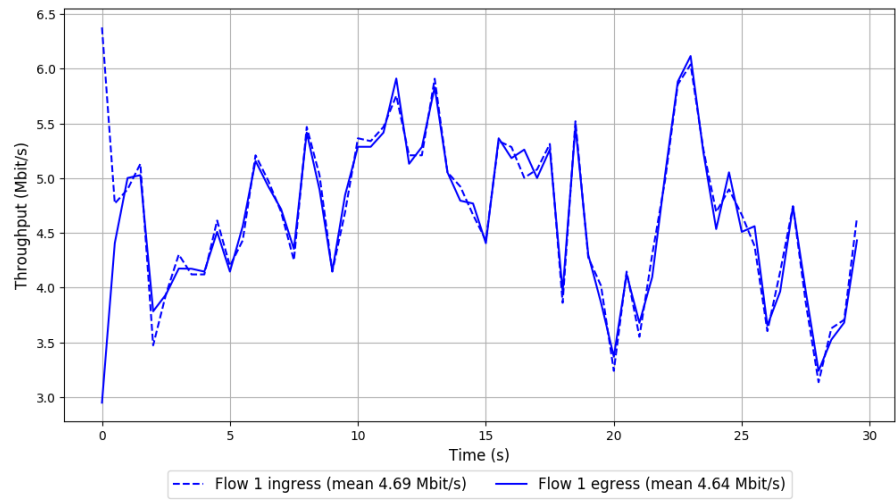
-- Flow 1:

Average throughput: 4.64 Mbit/s

95th percentile per-packet one-way delay: 55.193 ms

Loss rate: 1.36%

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

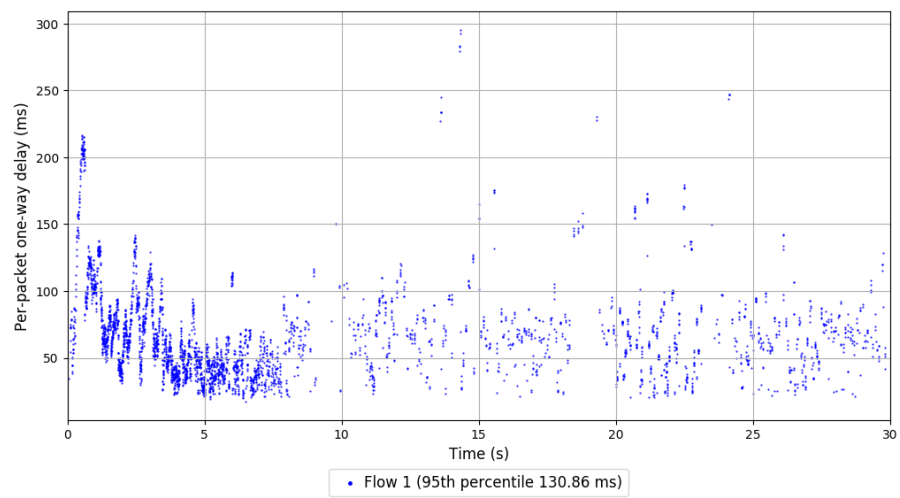
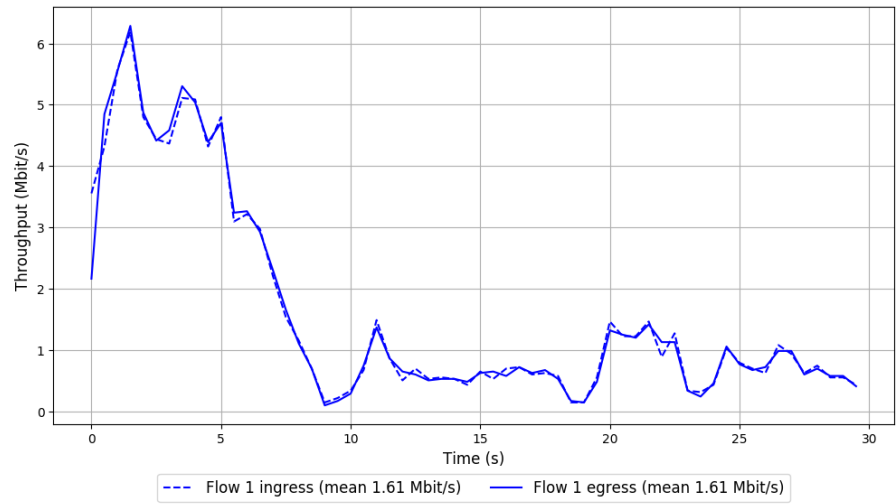


Run 1: Statistics of TCP Vegas

Start at: 2018-02-12 19:27:10
End at: 2018-02-12 19:27:40
Local clock offset: 0.166 ms
Remote clock offset: -5.317 ms

Below is generated by plot.py at 2018-02-12 21:40:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.61 Mbit/s
95th percentile per-packet one-way delay: 130.858 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 1.61 Mbit/s
95th percentile per-packet one-way delay: 130.858 ms
Loss rate: 0.47%

Run 1: Report of TCP Vegas — Data Link

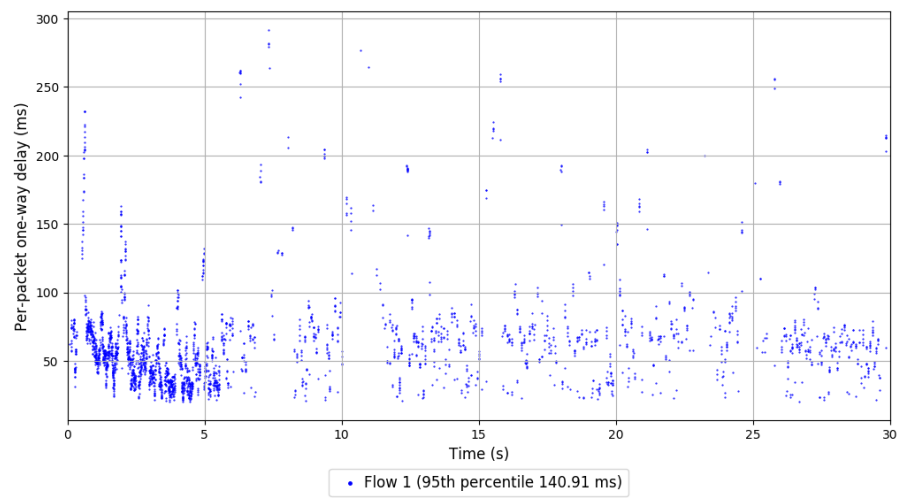
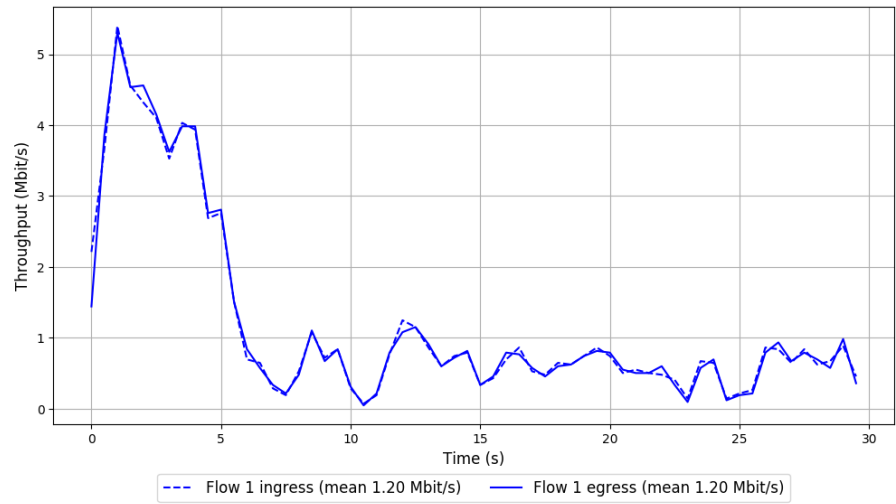


Run 2: Statistics of TCP Vegas

Start at: 2018-02-12 19:50:41
End at: 2018-02-12 19:51:11
Local clock offset: 0.168 ms
Remote clock offset: -5.101 ms

Below is generated by plot.py at 2018-02-12 21:40:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 140.910 ms
Loss rate: 0.50%
-- Flow 1:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 140.910 ms
Loss rate: 0.50%

Run 2: Report of TCP Vegas — Data Link

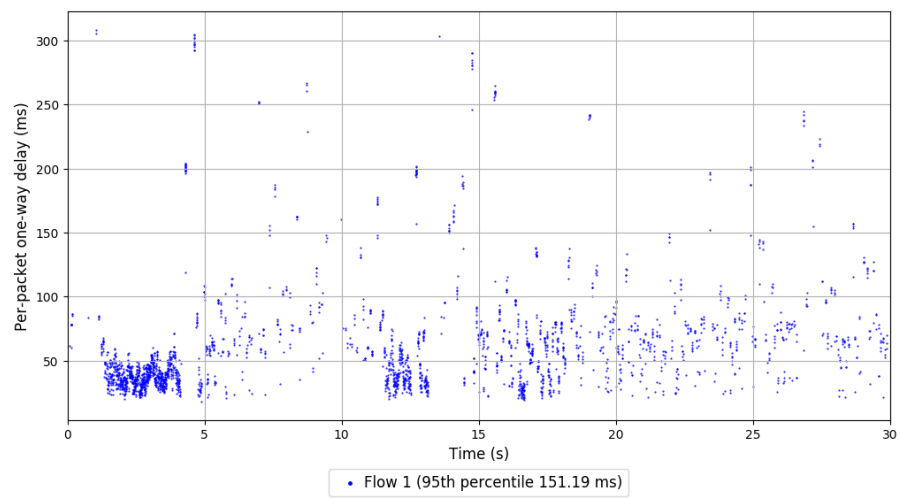
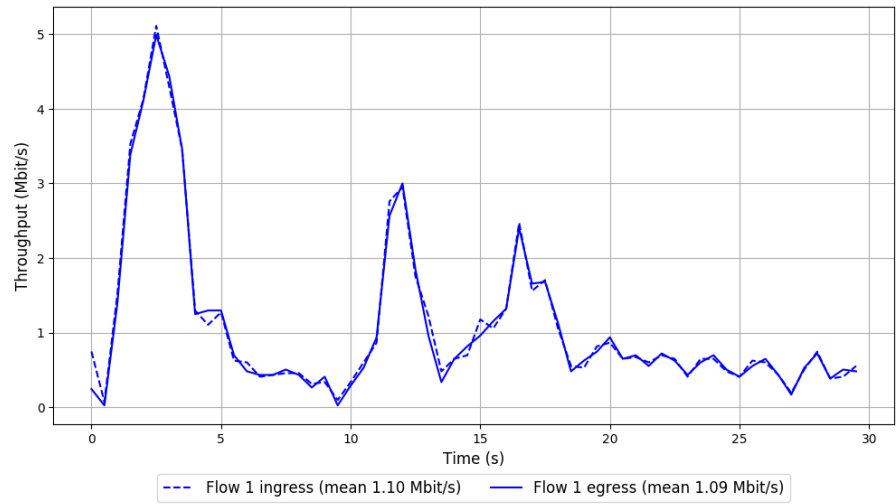


Run 3: Statistics of TCP Vegas

Start at: 2018-02-12 20:14:13
End at: 2018-02-12 20:14:43
Local clock offset: 0.113 ms
Remote clock offset: -4.577 ms

Below is generated by plot.py at 2018-02-12 21:40:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 151.190 ms
Loss rate: 1.67%
-- Flow 1:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 151.190 ms
Loss rate: 1.67%

Run 3: Report of TCP Vegas — Data Link

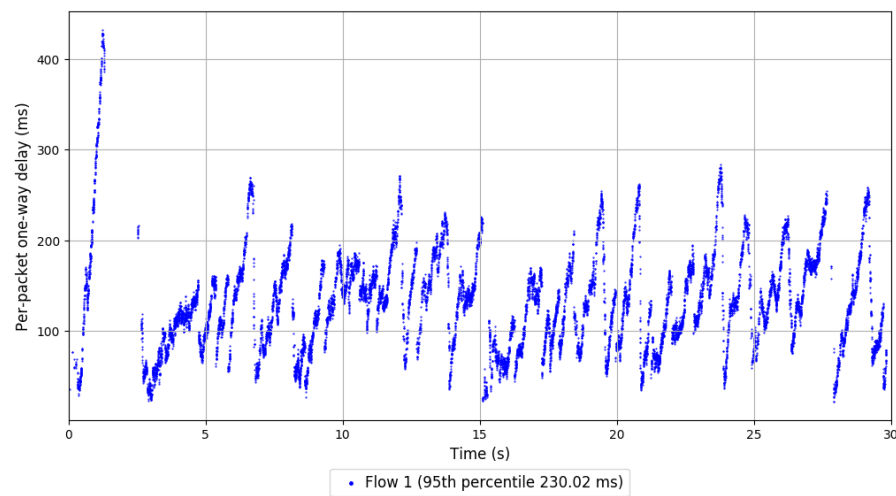
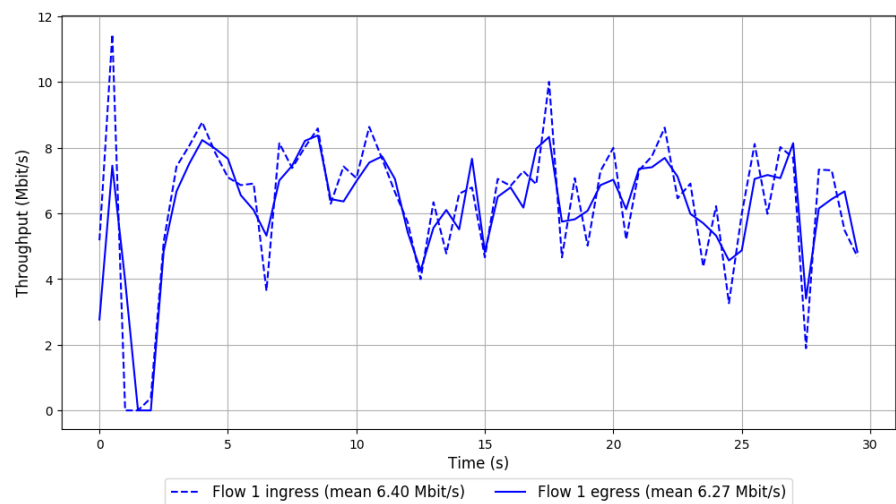


Run 1: Statistics of Verus

Start at: 2018-02-12 19:21:55
End at: 2018-02-12 19:22:26
Local clock offset: 0.261 ms
Remote clock offset: -5.278 ms

Below is generated by plot.py at 2018-02-12 21:40:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.27 Mbit/s
95th percentile per-packet one-way delay: 230.018 ms
Loss rate: 2.17%
-- Flow 1:
Average throughput: 6.27 Mbit/s
95th percentile per-packet one-way delay: 230.018 ms
Loss rate: 2.17%

Run 1: Report of Verus — Data Link

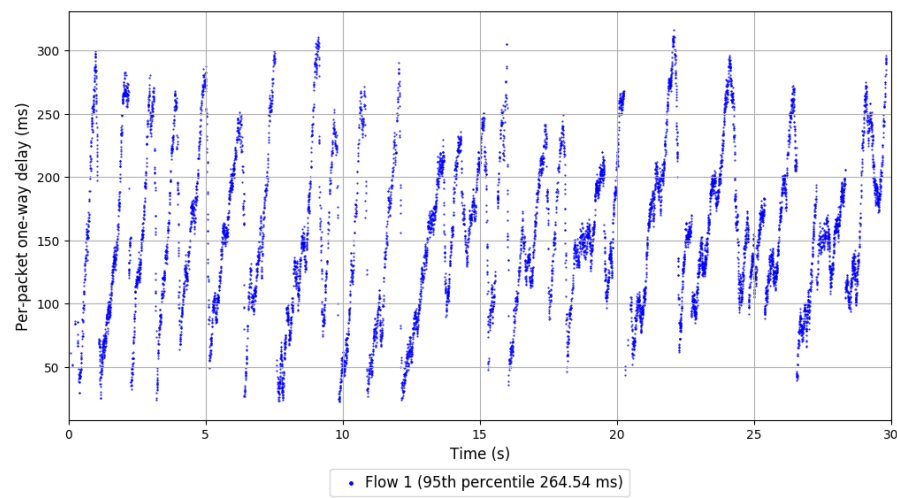
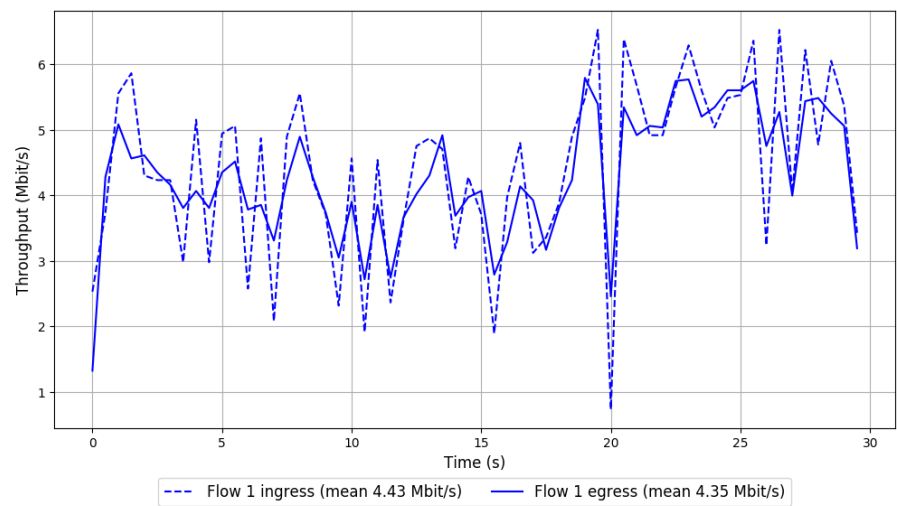


Run 2: Statistics of Verus

Start at: 2018-02-12 19:45:27
End at: 2018-02-12 19:45:57
Local clock offset: 0.204 ms
Remote clock offset: -5.213 ms

Below is generated by plot.py at 2018-02-12 21:40:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.35 Mbit/s
95th percentile per-packet one-way delay: 264.536 ms
Loss rate: 2.18%
-- Flow 1:
Average throughput: 4.35 Mbit/s
95th percentile per-packet one-way delay: 264.536 ms
Loss rate: 2.18%

Run 2: Report of Verus — Data Link

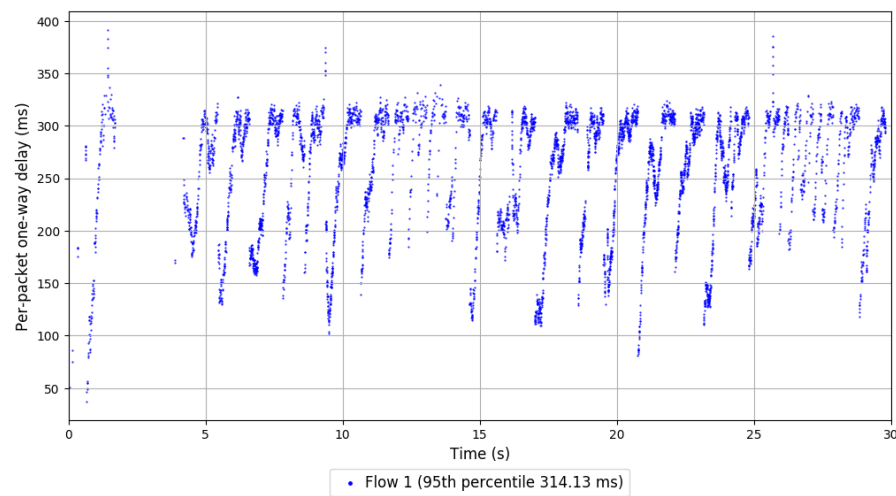
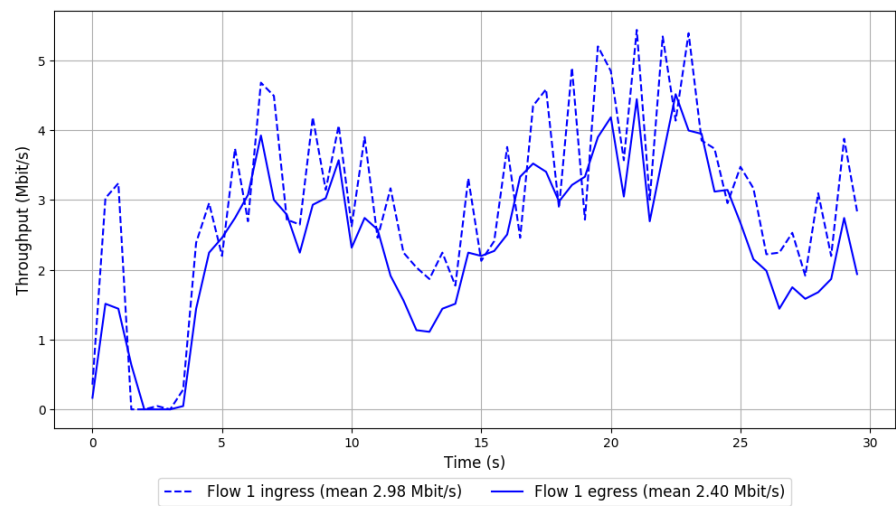


Run 3: Statistics of Verus

Start at: 2018-02-12 20:08:59
End at: 2018-02-12 20:09:29
Local clock offset: 0.19 ms
Remote clock offset: -4.864 ms

Below is generated by plot.py at 2018-02-12 21:40:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.40 Mbit/s
95th percentile per-packet one-way delay: 314.126 ms
Loss rate: 19.53%
-- Flow 1:
Average throughput: 2.40 Mbit/s
95th percentile per-packet one-way delay: 314.126 ms
Loss rate: 19.53%

Run 3: Report of Verus — Data Link

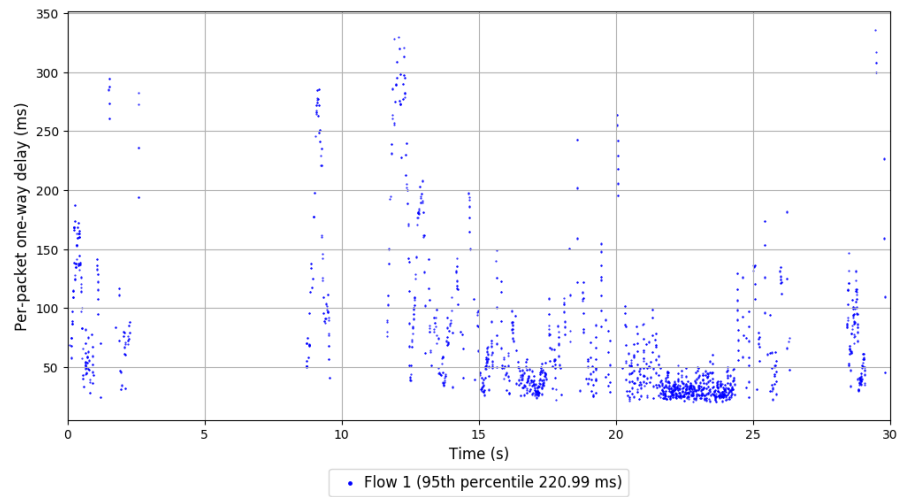
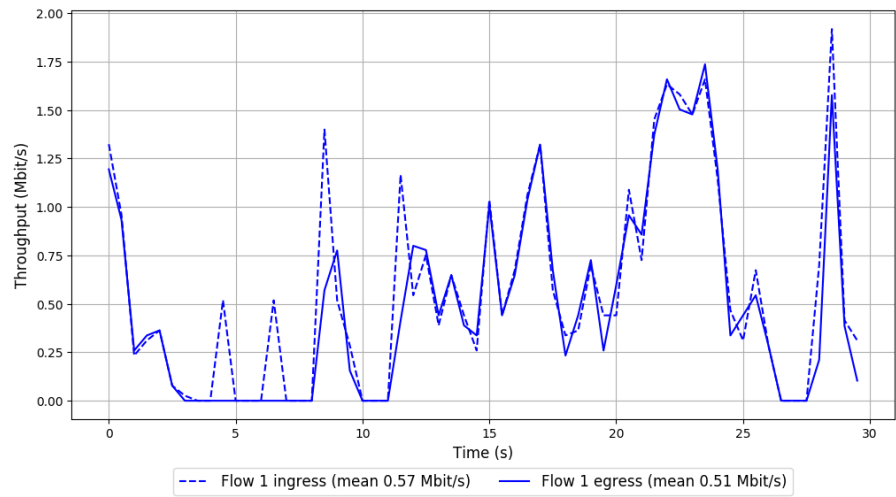


Run 1: Statistics of Copa

Start at: 2018-02-12 19:36:18
End at: 2018-02-12 19:36:48
Local clock offset: 0.248 ms
Remote clock offset: -5.286 ms

Below is generated by plot.py at 2018-02-12 21:40:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 220.985 ms
Loss rate: 10.19%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 220.985 ms
Loss rate: 10.19%

Run 1: Report of Copa — Data Link

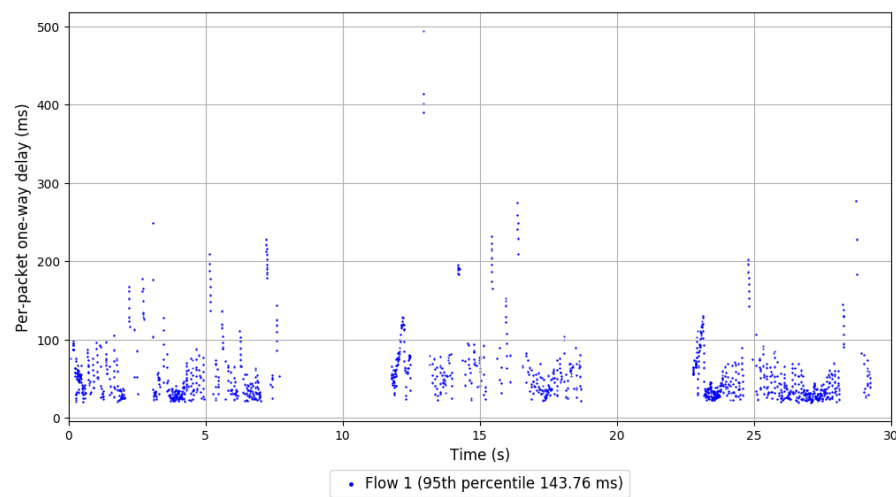
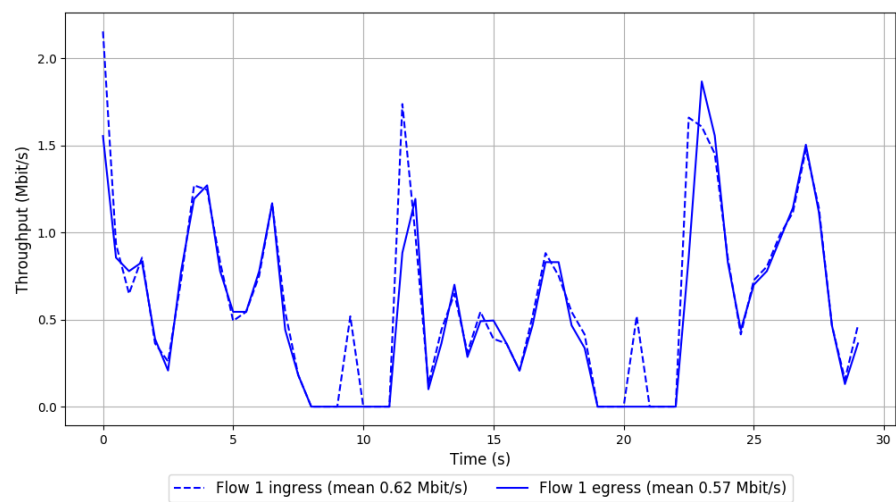


Run 2: Statistics of Copa

Start at: 2018-02-12 19:59:51
End at: 2018-02-12 20:00:21
Local clock offset: 0.171 ms
Remote clock offset: -5.052 ms

Below is generated by plot.py at 2018-02-12 21:40:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 143.757 ms
Loss rate: 8.82%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 143.757 ms
Loss rate: 8.82%

Run 2: Report of Copa — Data Link

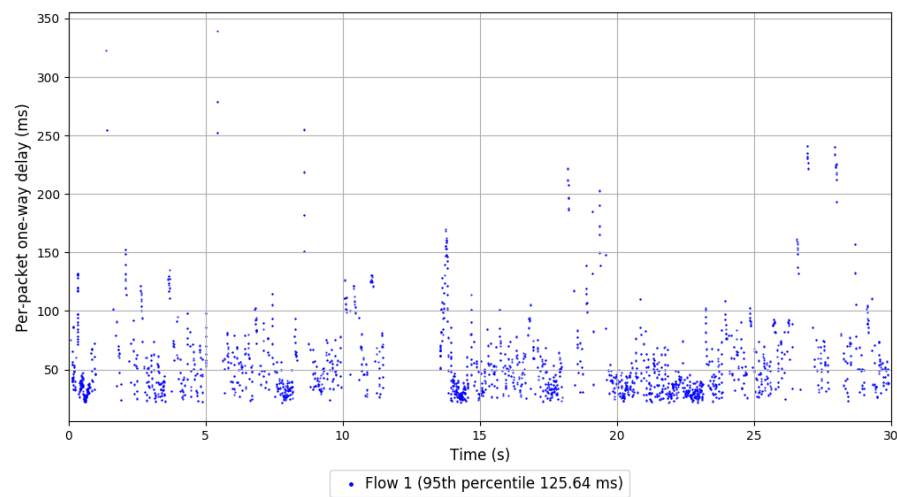
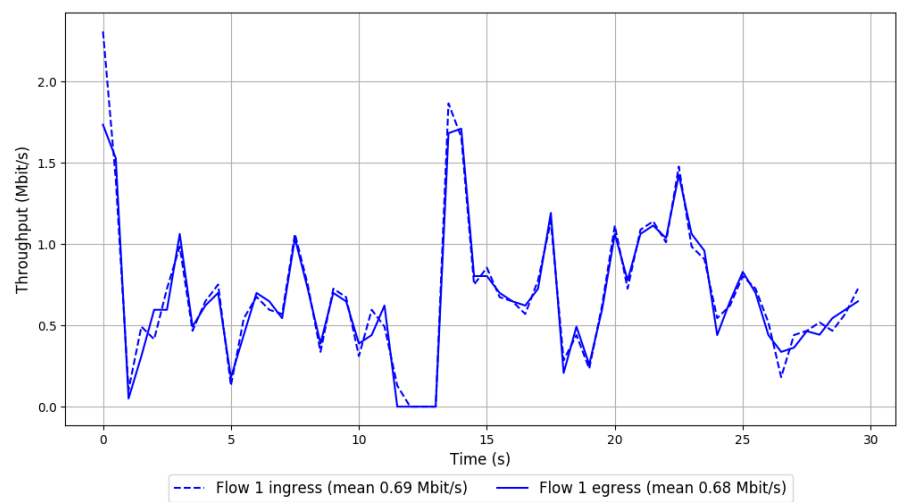


Run 3: Statistics of Copa

Start at: 2018-02-12 20:23:22
End at: 2018-02-12 20:23:52
Local clock offset: 0.084 ms
Remote clock offset: -4.191 ms

Below is generated by plot.py at 2018-02-12 21:40:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 125.644 ms
Loss rate: 2.15%
-- Flow 1:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 125.644 ms
Loss rate: 2.15%

Run 3: Report of Copa — Data Link

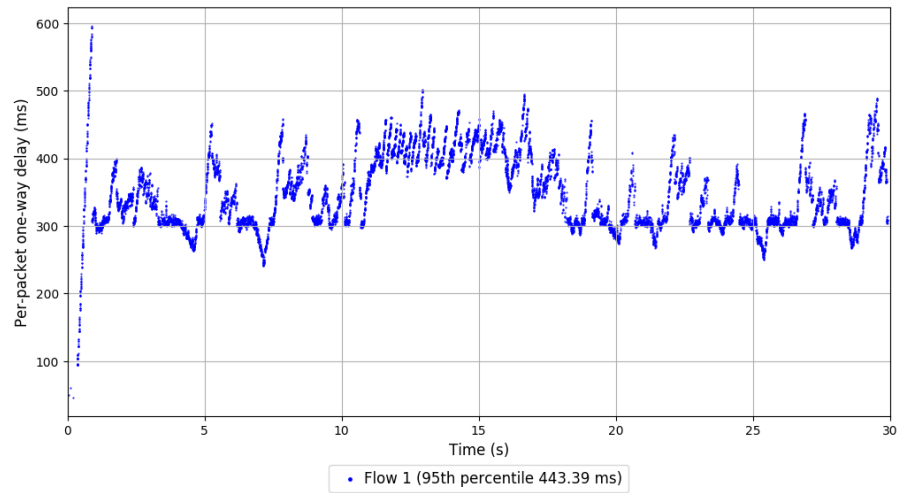
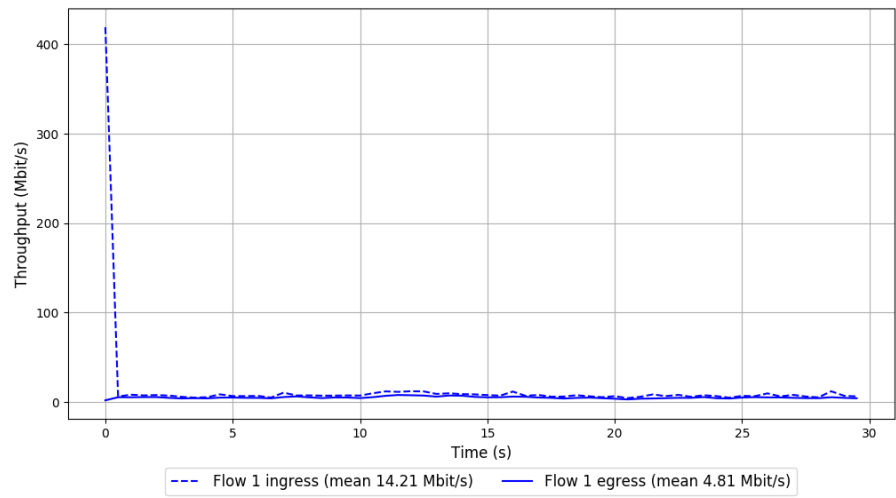


Run 1: Statistics of FillP

Start at: 2018-02-12 19:29:46
End at: 2018-02-12 19:30:16
Local clock offset: 0.239 ms
Remote clock offset: -5.199 ms

Below is generated by plot.py at 2018-02-12 21:40:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.81 Mbit/s
95th percentile per-packet one-way delay: 443.395 ms
Loss rate: 66.24%
-- Flow 1:
Average throughput: 4.81 Mbit/s
95th percentile per-packet one-way delay: 443.395 ms
Loss rate: 66.24%

Run 1: Report of FillP — Data Link

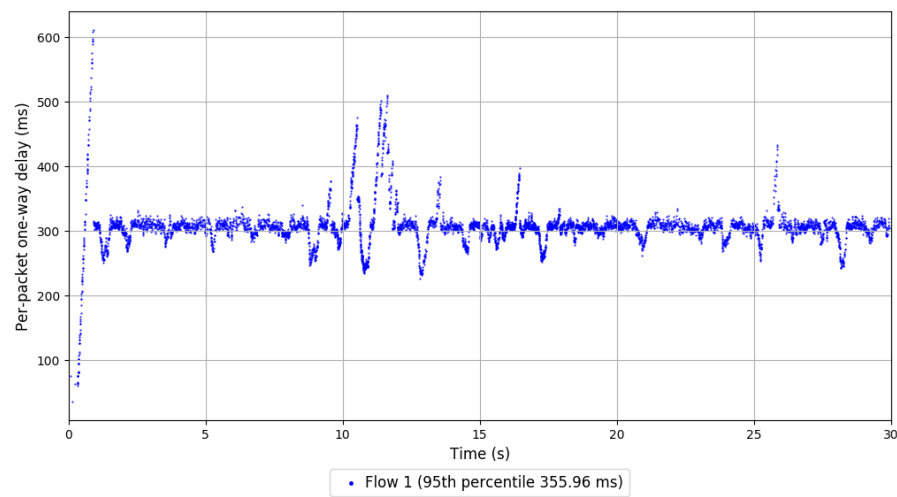
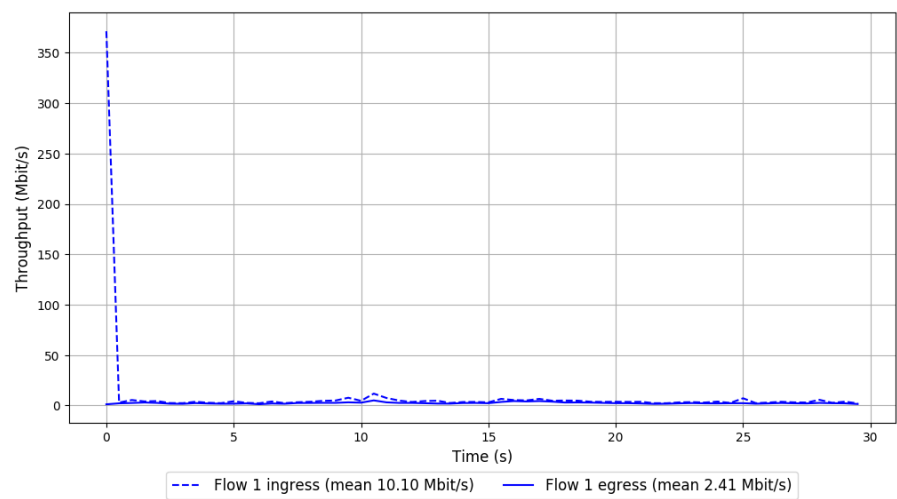


Run 2: Statistics of FillP

Start at: 2018-02-12 19:53:18
End at: 2018-02-12 19:53:48
Local clock offset: 0.161 ms
Remote clock offset: -5.194 ms

Below is generated by plot.py at 2018-02-12 21:40:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.41 Mbit/s
95th percentile per-packet one-way delay: 355.962 ms
Loss rate: 76.21%
-- Flow 1:
Average throughput: 2.41 Mbit/s
95th percentile per-packet one-way delay: 355.962 ms
Loss rate: 76.21%

Run 2: Report of FillP — Data Link

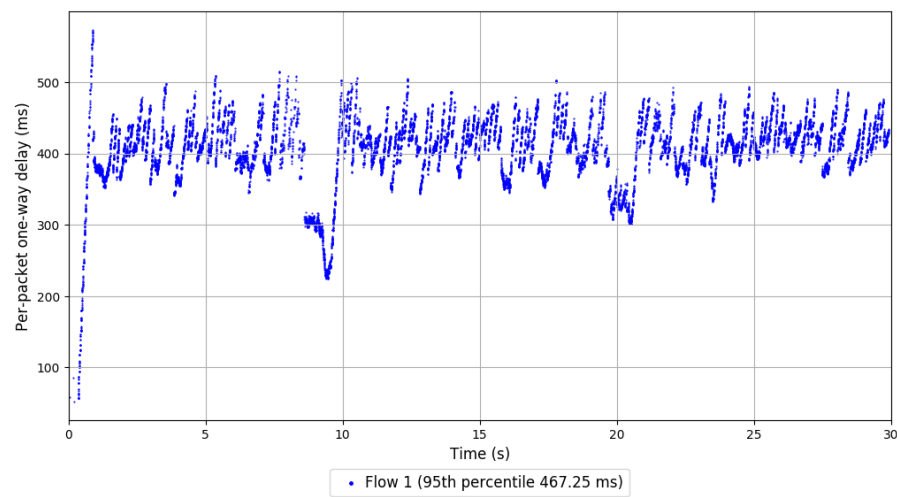
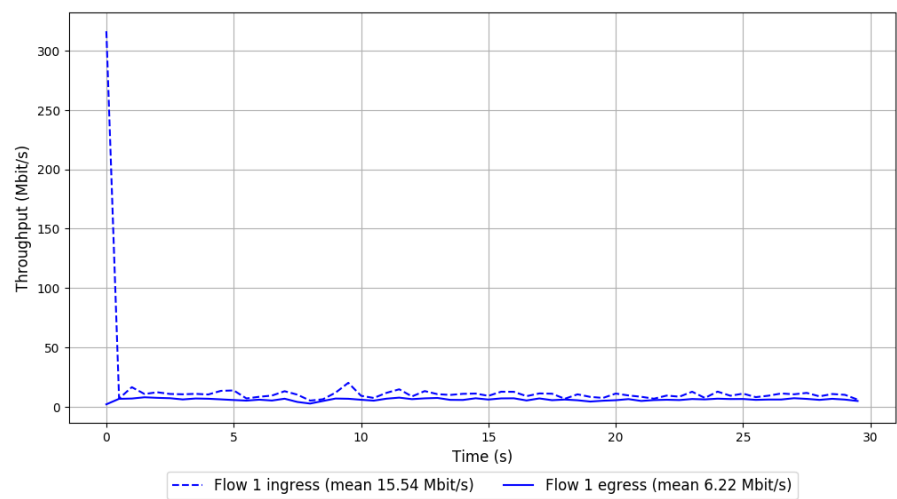


Run 3: Statistics of FillP

Start at: 2018-02-12 20:16:50
End at: 2018-02-12 20:17:20
Local clock offset: 0.192 ms
Remote clock offset: -4.417 ms

Below is generated by plot.py at 2018-02-12 21:40:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.22 Mbit/s
95th percentile per-packet one-way delay: 467.253 ms
Loss rate: 60.06%
-- Flow 1:
Average throughput: 6.22 Mbit/s
95th percentile per-packet one-way delay: 467.253 ms
Loss rate: 60.06%

Run 3: Report of FillP — Data Link

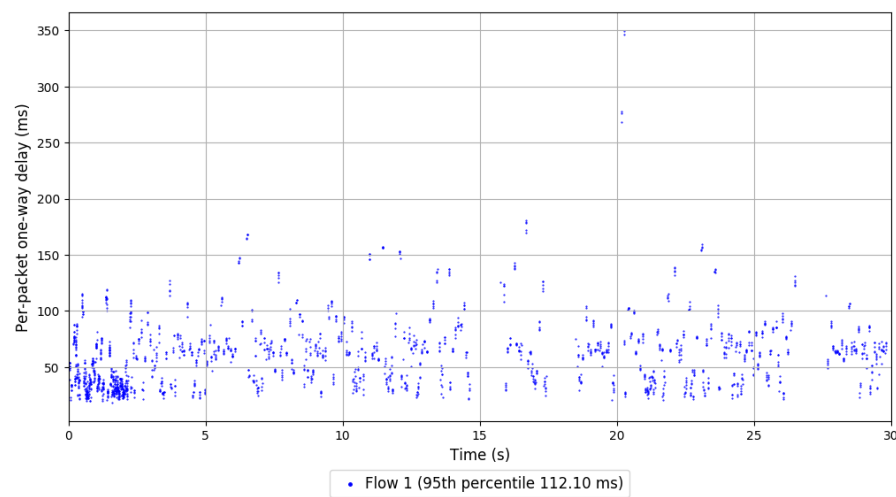
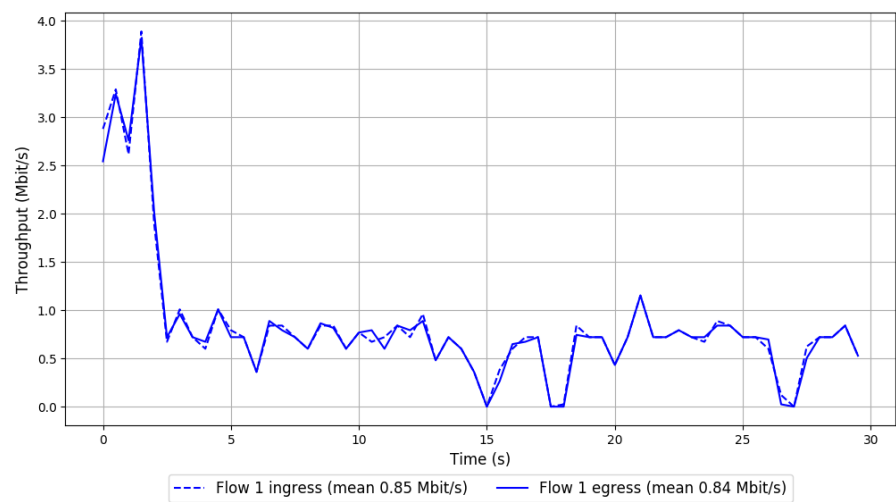


```
Run 1: Statistics of Indigo-1-32

Start at: 2018-02-12 19:41:32
End at: 2018-02-12 19:42:02
Local clock offset: 0.241 ms
Remote clock offset: -5.201 ms

# Below is generated by plot.py at 2018-02-12 21:40:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 112.103 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 112.103 ms
Loss rate: 1.09%
```

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



Run 2: Statistics of Indigo-1-32

Start at: 2018-02-12 20:05:04

End at: 2018-02-12 20:05:34

Local clock offset: 0.194 ms

Remote clock offset: -5.023 ms

Below is generated by plot.py at 2018-02-12 21:40:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.75 Mbit/s

95th percentile per-packet one-way delay: 145.892 ms

Loss rate: 2.16%

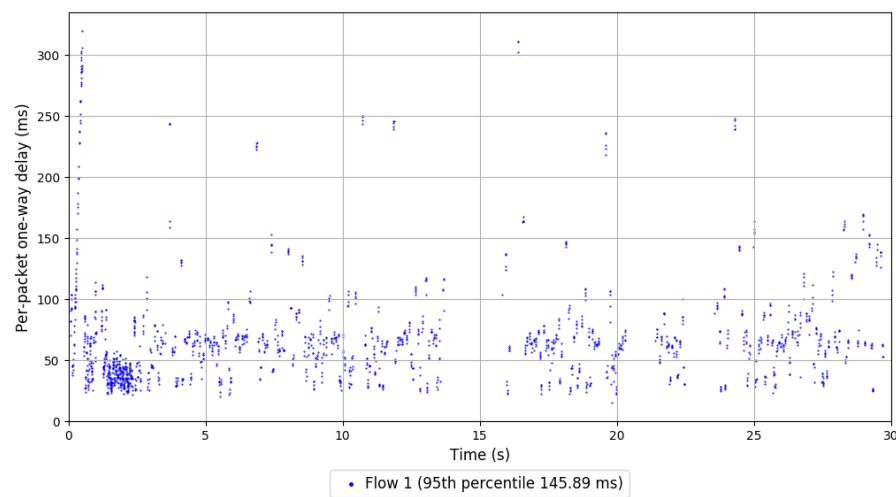
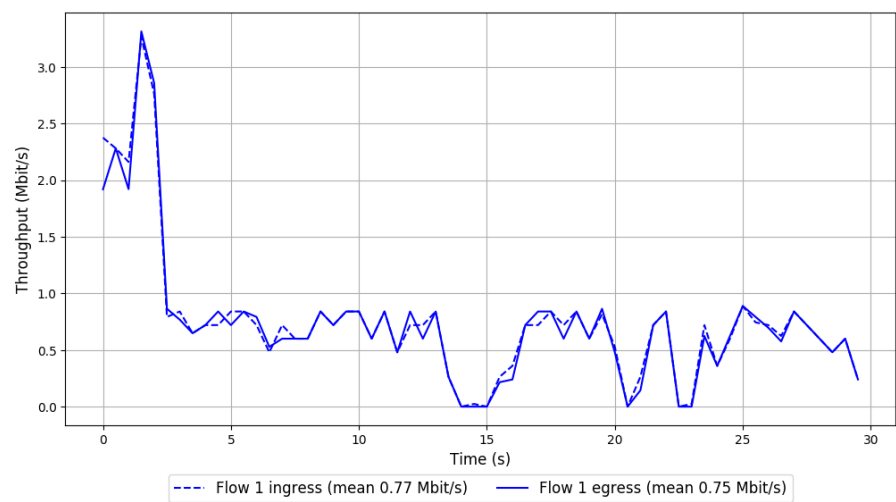
-- Flow 1:

Average throughput: 0.75 Mbit/s

95th percentile per-packet one-way delay: 145.892 ms

Loss rate: 2.16%

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



Run 3: Statistics of Indigo-1-32

Start at: 2018-02-12 20:28:36

End at: 2018-02-12 20:29:06

Local clock offset: 0.148 ms

Remote clock offset: -4.171 ms

Below is generated by plot.py at 2018-02-12 21:40:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.82 Mbit/s

95th percentile per-packet one-way delay: 88.656 ms

Loss rate: 0.97%

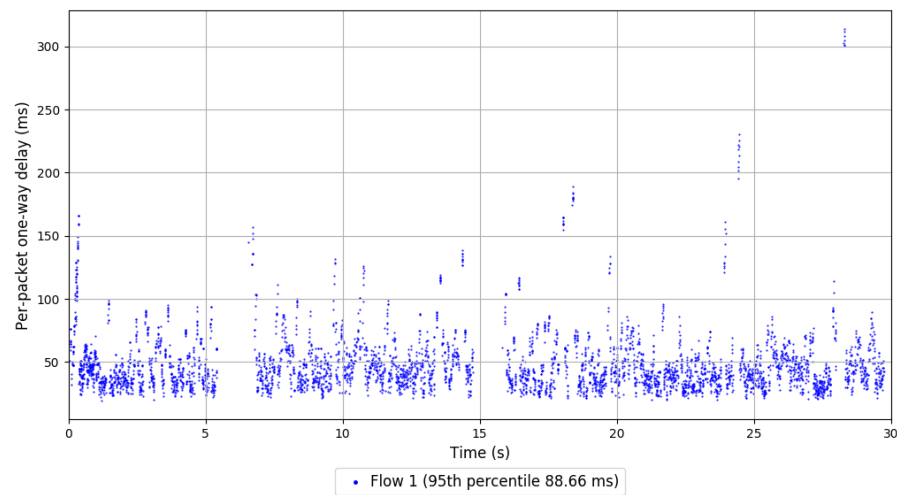
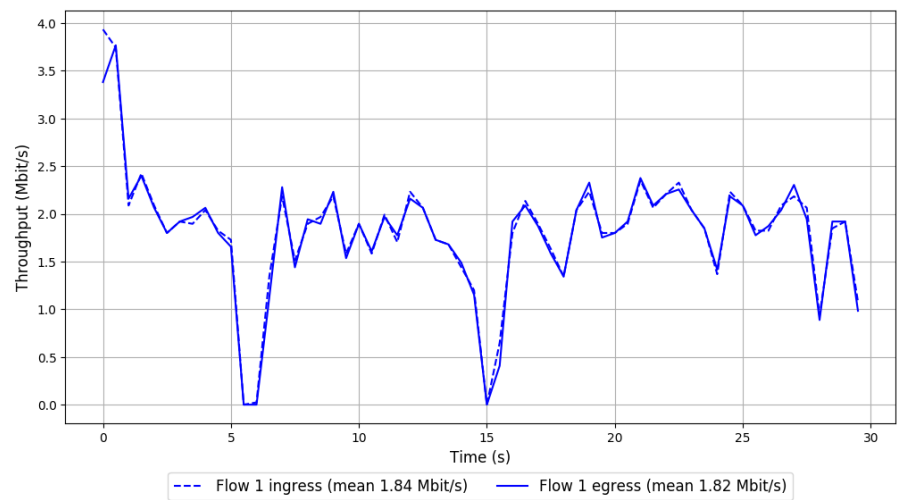
-- Flow 1:

Average throughput: 1.82 Mbit/s

95th percentile per-packet one-way delay: 88.656 ms

Loss rate: 0.97%

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

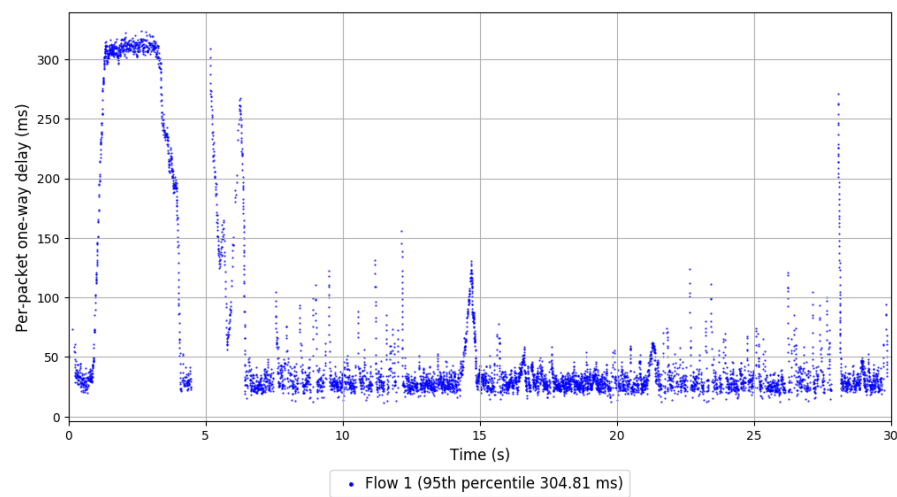
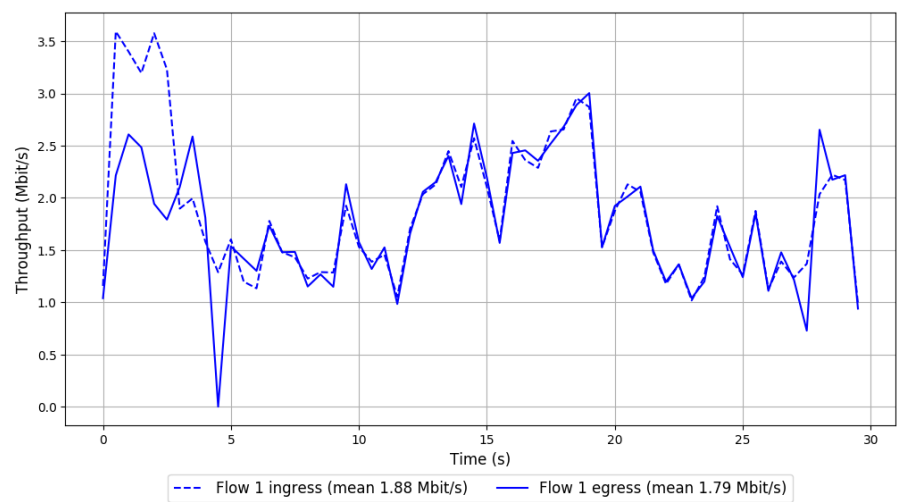


Run 1: Statistics of Vivace-latency

Start at: 2018-02-12 19:31:05
End at: 2018-02-12 19:31:35
Local clock offset: 0.224 ms
Remote clock offset: -5.295 ms

Below is generated by plot.py at 2018-02-12 21:40:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 304.814 ms
Loss rate: 5.40%
-- Flow 1:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 304.814 ms
Loss rate: 5.40%

Run 1: Report of Vivace-latency — Data Link

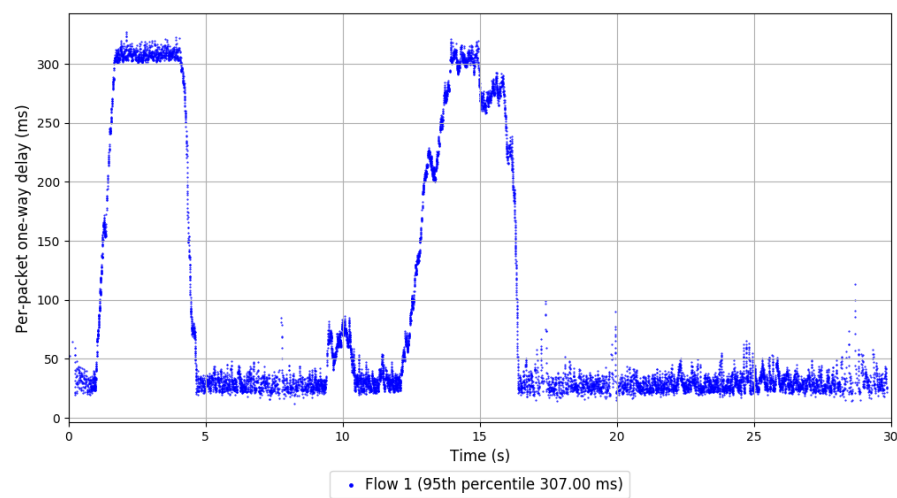
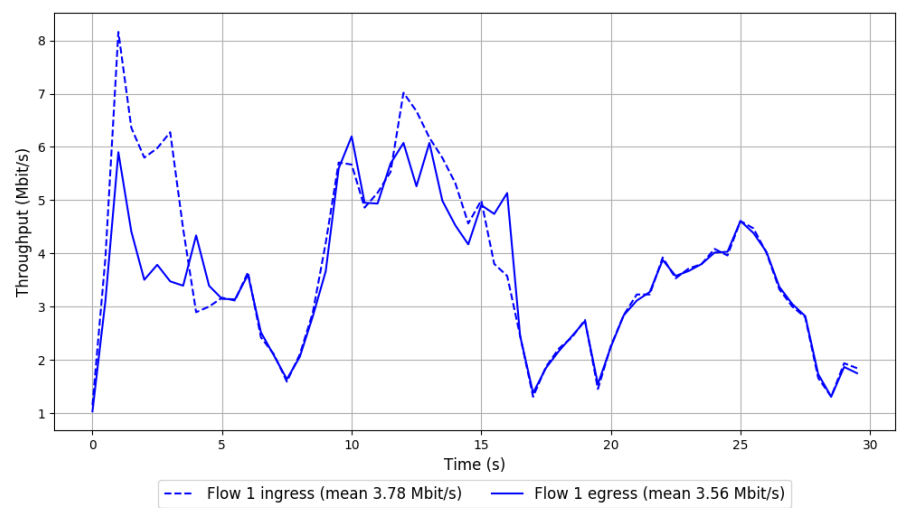


Run 2: Statistics of Vivace-latency

Start at: 2018-02-12 19:54:37
End at: 2018-02-12 19:55:07
Local clock offset: 0.1 ms
Remote clock offset: -5.201 ms

Below is generated by plot.py at 2018-02-12 21:40:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.56 Mbit/s
95th percentile per-packet one-way delay: 306.996 ms
Loss rate: 6.14%
-- Flow 1:
Average throughput: 3.56 Mbit/s
95th percentile per-packet one-way delay: 306.996 ms
Loss rate: 6.14%

Run 2: Report of Vivace-latency — Data Link

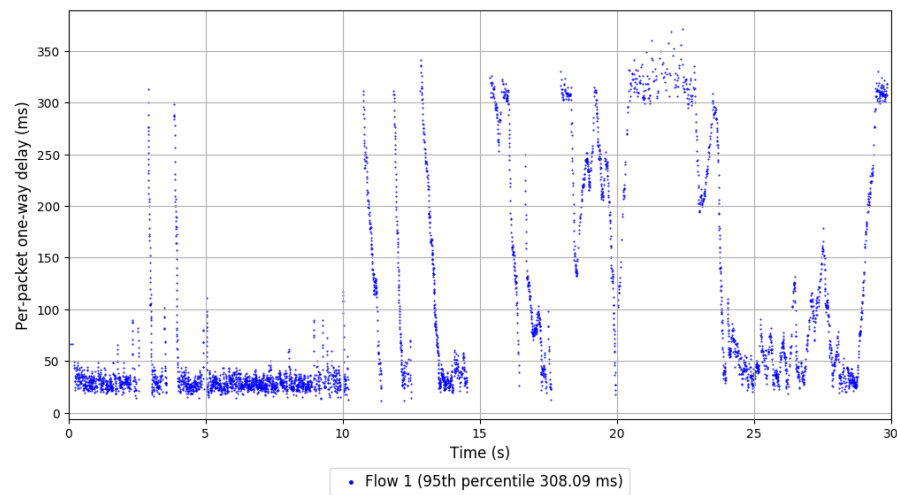
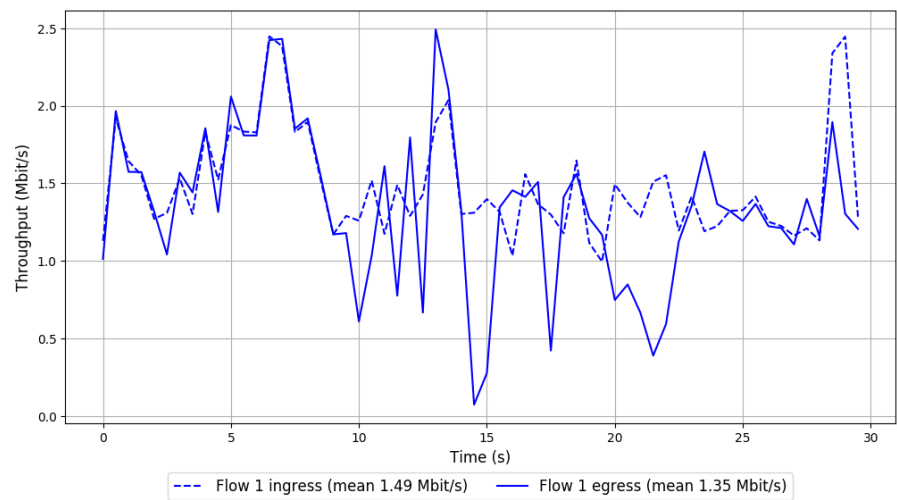


Run 3: Statistics of Vivace-latency

Start at: 2018-02-12 20:18:09
End at: 2018-02-12 20:18:39
Local clock offset: 0.093 ms
Remote clock offset: -4.438 ms

Below is generated by plot.py at 2018-02-12 21:40:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.35 Mbit/s
95th percentile per-packet one-way delay: 308.087 ms
Loss rate: 9.68%
-- Flow 1:
Average throughput: 1.35 Mbit/s
95th percentile per-packet one-way delay: 308.087 ms
Loss rate: 9.68%

Run 3: Report of Vivace-latency — Data Link



Run 1: Statistics of Vivace-loss

Start at: 2018-02-12 19:24:33

End at: 2018-02-12 19:25:03

Local clock offset: 0.247 ms

Remote clock offset: -5.259 ms

Below is generated by plot.py at 2018-02-12 21:40:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.78 Mbit/s

95th percentile per-packet one-way delay: 323.584 ms

Loss rate: 24.42%

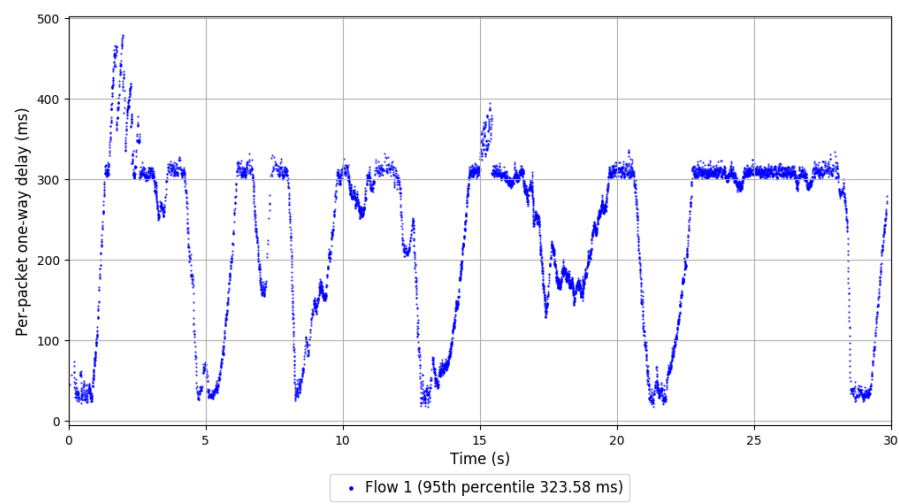
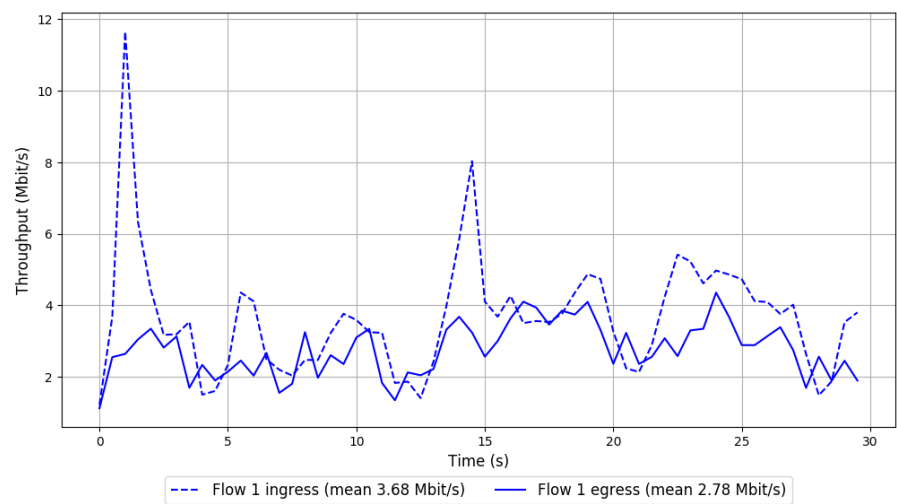
-- Flow 1:

Average throughput: 2.78 Mbit/s

95th percentile per-packet one-way delay: 323.584 ms

Loss rate: 24.42%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-02-12 19:48:04

End at: 2018-02-12 19:48:34

Local clock offset: 0.212 ms

Remote clock offset: -5.215 ms

Below is generated by plot.py at 2018-02-12 21:40:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.04 Mbit/s

95th percentile per-packet one-way delay: 434.455 ms

Loss rate: 27.69%

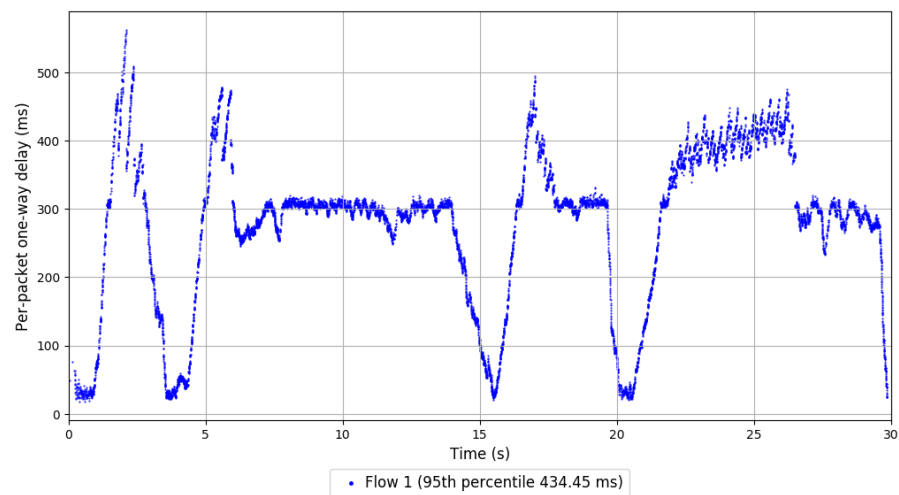
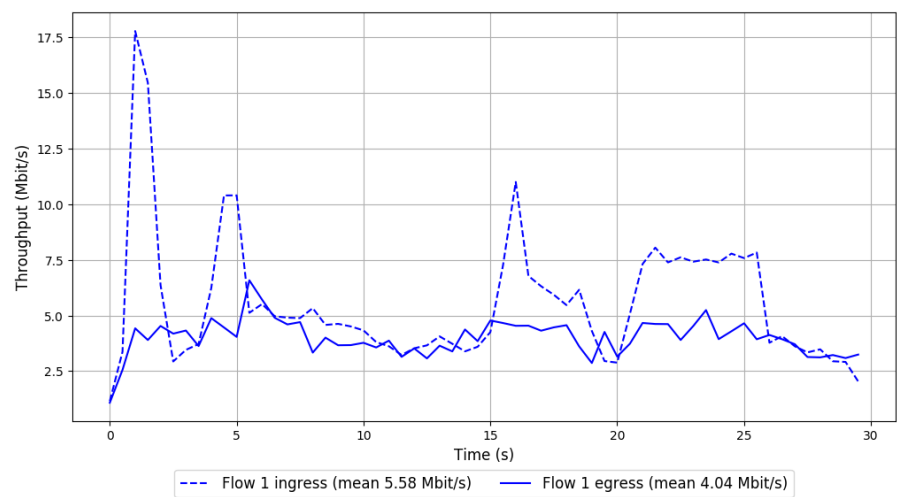
-- Flow 1:

Average throughput: 4.04 Mbit/s

95th percentile per-packet one-way delay: 434.455 ms

Loss rate: 27.69%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-02-12 20:11:36

End at: 2018-02-12 20:12:06

Local clock offset: 0.184 ms

Remote clock offset: -4.639 ms

Below is generated by plot.py at 2018-02-12 21:40:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.81 Mbit/s

95th percentile per-packet one-way delay: 447.919 ms

Loss rate: 34.00%

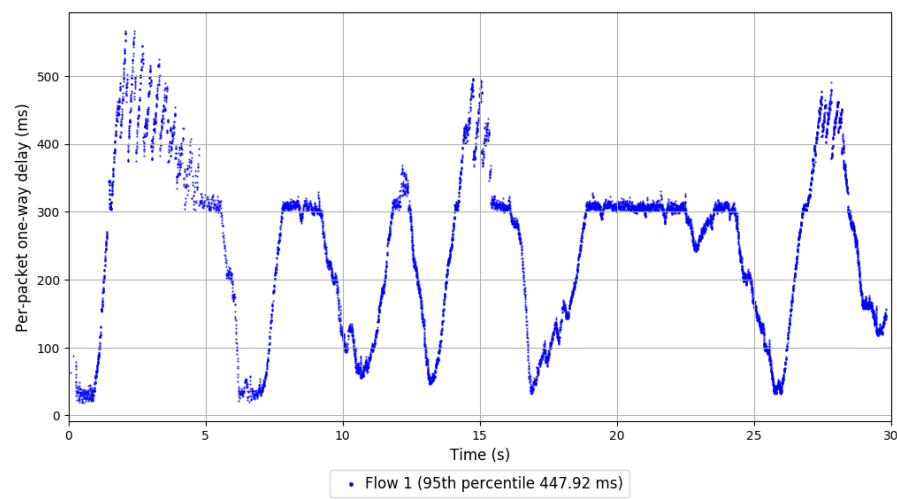
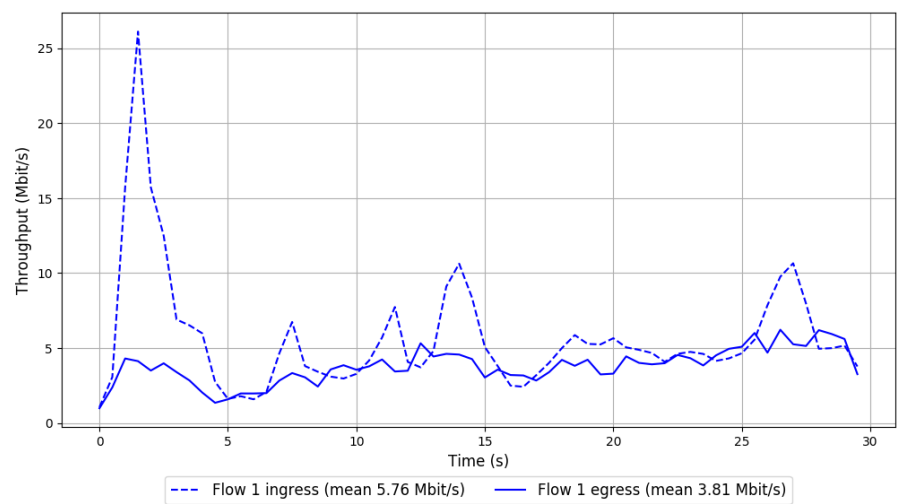
-- Flow 1:

Average throughput: 3.81 Mbit/s

95th percentile per-packet one-way delay: 447.919 ms

Loss rate: 34.00%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-02-12 19:32:23

End at: 2018-02-12 19:32:53

Local clock offset: 0.154 ms

Remote clock offset: -5.276 ms

Below is generated by plot.py at 2018-02-12 21:40:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.15 Mbit/s

95th percentile per-packet one-way delay: 422.084 ms

Loss rate: 8.48%

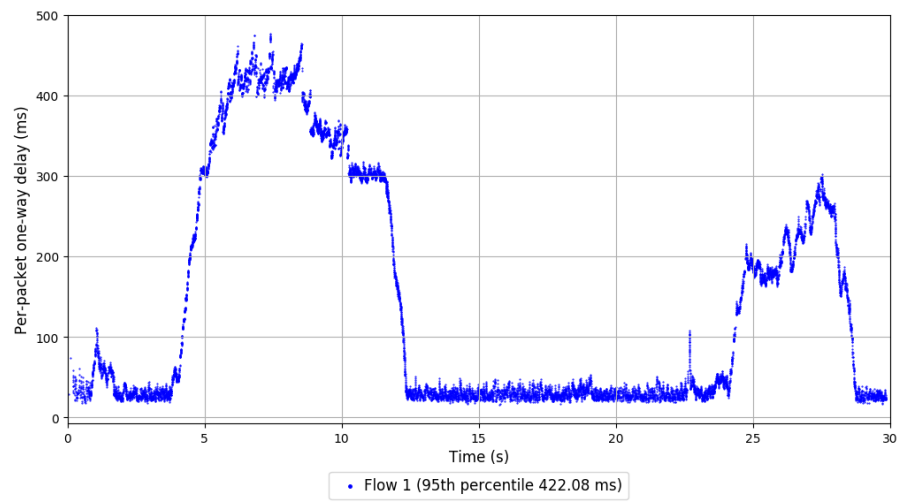
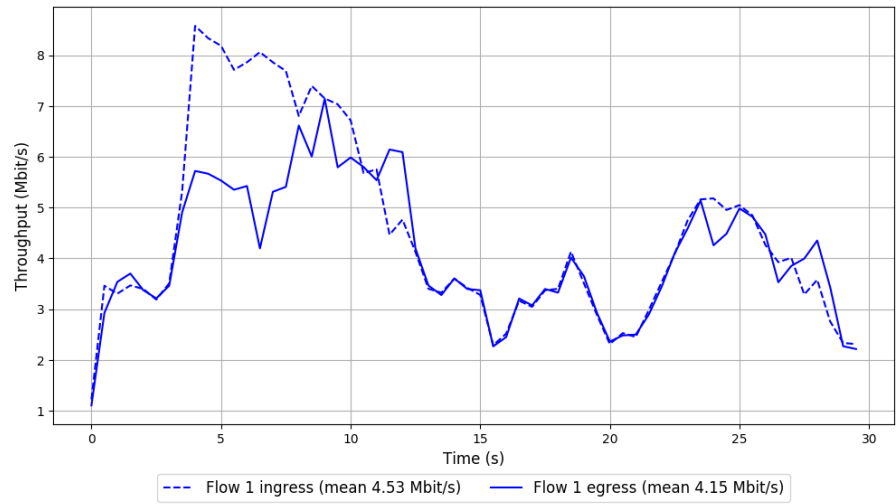
-- Flow 1:

Average throughput: 4.15 Mbit/s

95th percentile per-packet one-way delay: 422.084 ms

Loss rate: 8.48%

Run 1: Report of Vivace-LTE — Data Link

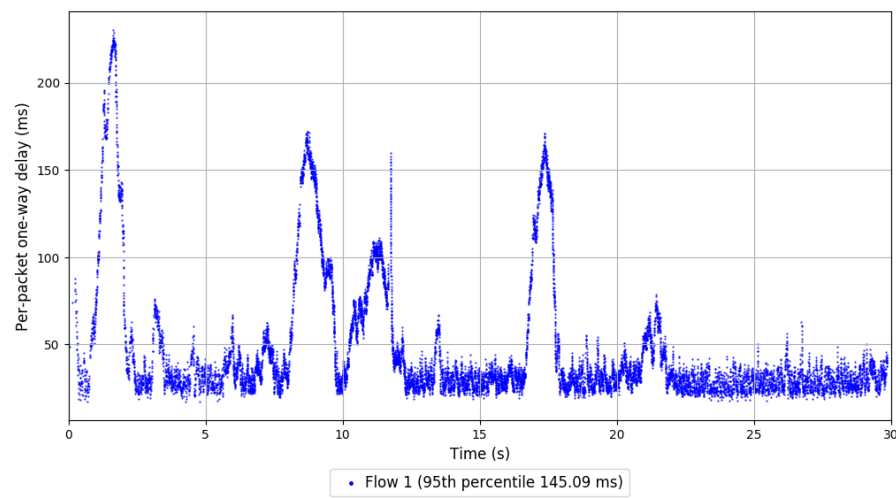
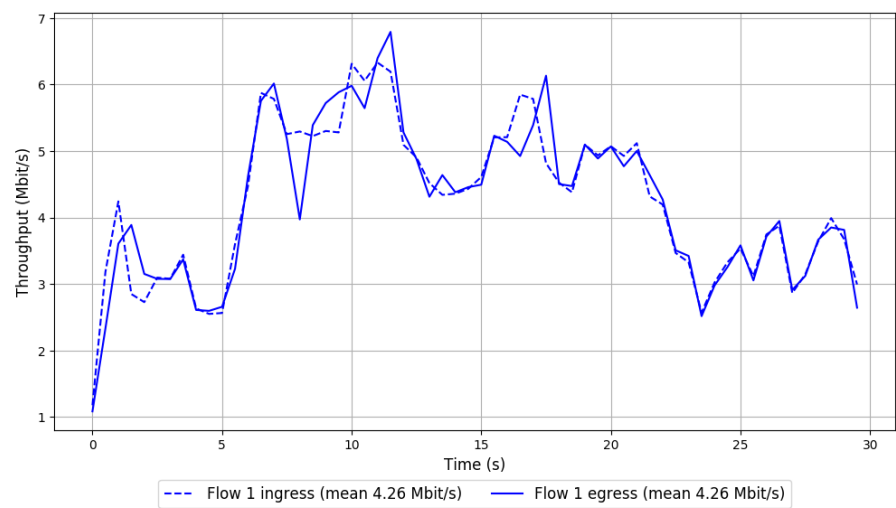


Run 2: Statistics of Vivace-LTE

Start at: 2018-02-12 19:55:56
End at: 2018-02-12 19:56:26
Local clock offset: 0.192 ms
Remote clock offset: -5.131 ms

Below is generated by plot.py at 2018-02-12 21:40:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.26 Mbit/s
95th percentile per-packet one-way delay: 145.088 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 4.26 Mbit/s
95th percentile per-packet one-way delay: 145.088 ms
Loss rate: 0.20%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-02-12 20:19:27
End at: 2018-02-12 20:19:57
Local clock offset: 0.196 ms
Remote clock offset: -4.388 ms

Below is generated by plot.py at 2018-02-12 21:40:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 305.272 ms
Loss rate: 10.19%
-- Flow 1:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 305.272 ms
Loss rate: 10.19%

Run 3: Report of Vivace-LTE — Data Link

