

Pantheon Report

Generated at 2018-03-05 19:41:16 (UTC).

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

Repeated the test of 17 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

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

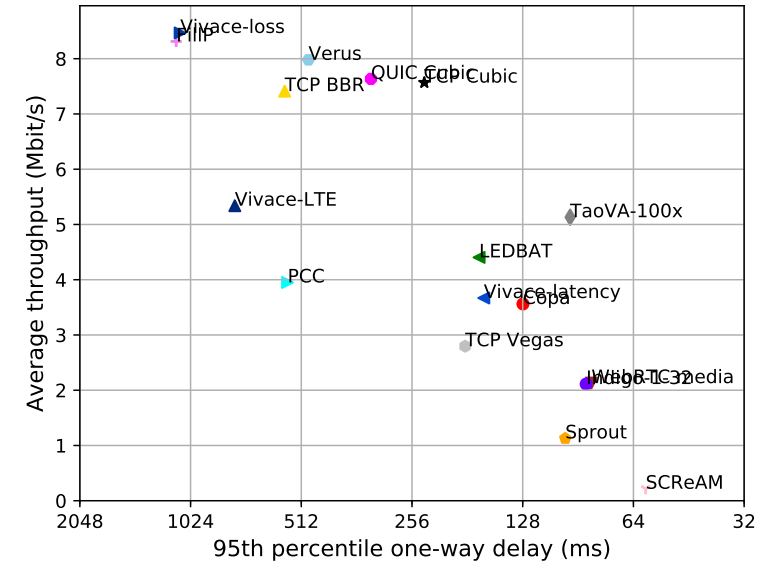
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

NTP offsets were measured against **nets.org.sg** and have been applied to correct the timestamps in logs.

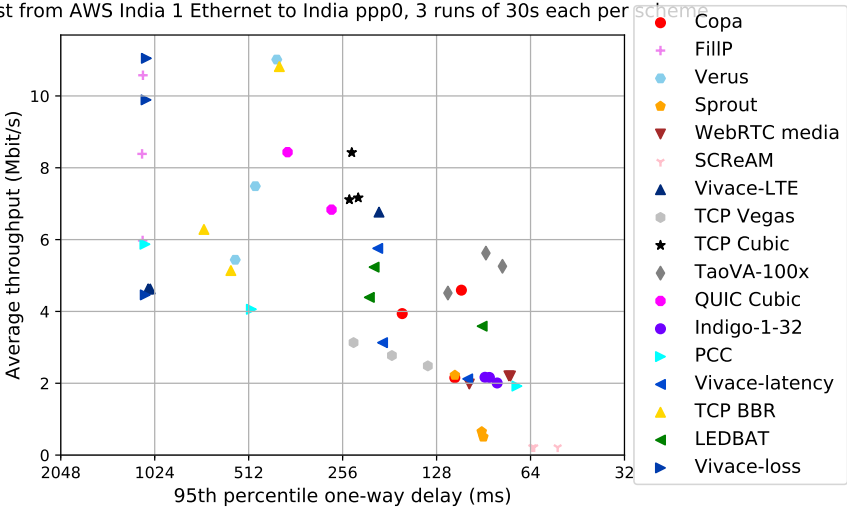
Git summary:

```
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 @ f1a14bffe749737437f61b1eaeab30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/vivace @ 7a4ba531e75b4a6f66f5c4580192120401784ce3
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

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



test from AWS India 1 Ethernet to India ppp0, 3 runs of 30s each per



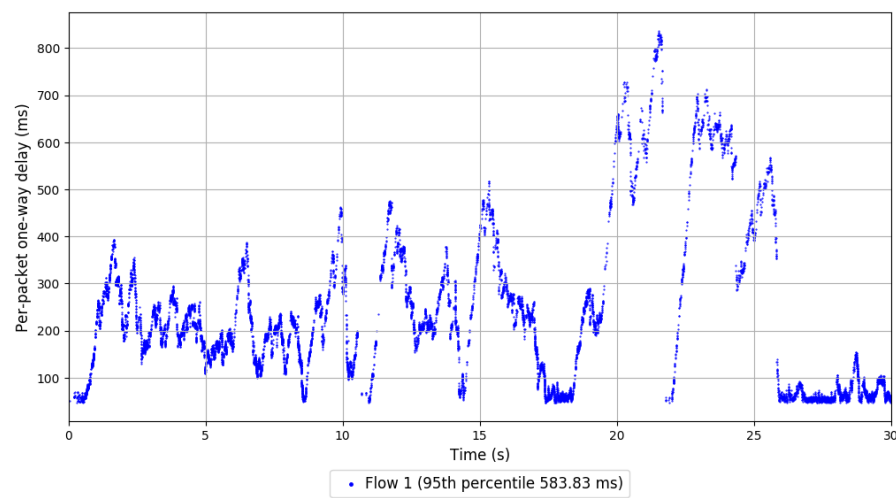
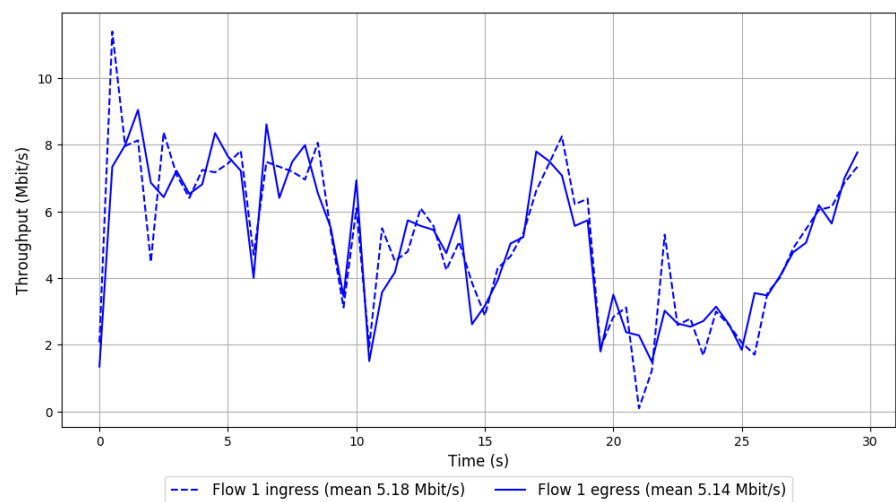
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	7.41	568.07	1.73
TCP Cubic	3	7.56	237.00	0.66
LEDBAT	3	4.40	168.22	0.56
PCC	3	3.95	557.73	15.06
QUIC Cubic	2	7.63	331.07	0.76
SCReAM	3	0.22	59.29	0.16
WebRTC media	3	2.13	83.27	0.40
Sprout	3	1.13	98.08	0.26
TaoVA-100x	3	5.13	95.14	0.33
TCP Vegas	3	2.79	183.56	0.62
Verus	3	7.98	489.63	2.42
Copa	3	3.56	127.81	0.19
FillP	3	8.32	1120.17	80.99
Indigo-1-32	3	2.11	86.03	0.17
Vivace-latency	3	3.67	163.35	0.40
Vivace-loss	3	8.47	1092.90	25.94
Vivace-LTE	3	5.34	776.26	7.15

Run 1: Statistics of TCP BBR

Start at: 2018-03-05 18:42:59
End at: 2018-03-05 18:43:29
Local clock offset: -21.902 ms
Remote clock offset: -8.675 ms

Below is generated by plot.py at 2018-03-05 19:40:17
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.14 Mbit/s
95th percentile per-packet one-way delay: 583.832 ms
Loss rate: 1.06%
-- Flow 1:
Average throughput: 5.14 Mbit/s
95th percentile per-packet one-way delay: 583.832 ms
Loss rate: 1.06%

Run 1: Report of TCP BBR — Data Link

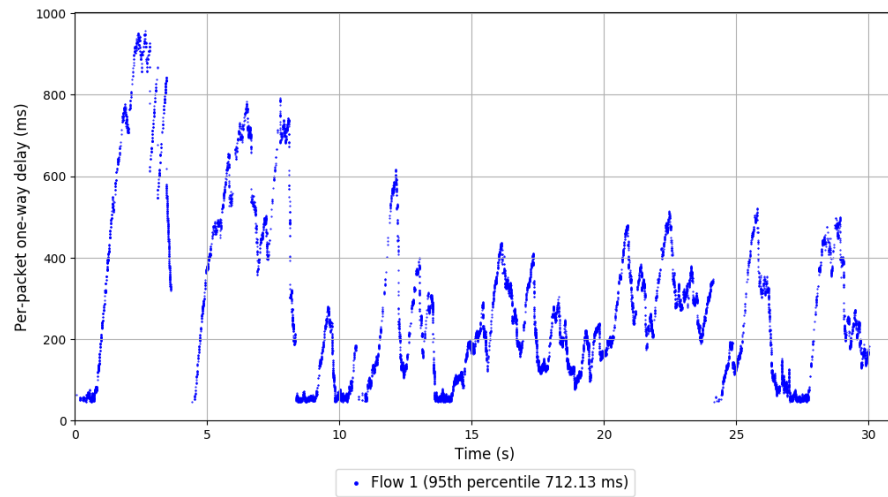
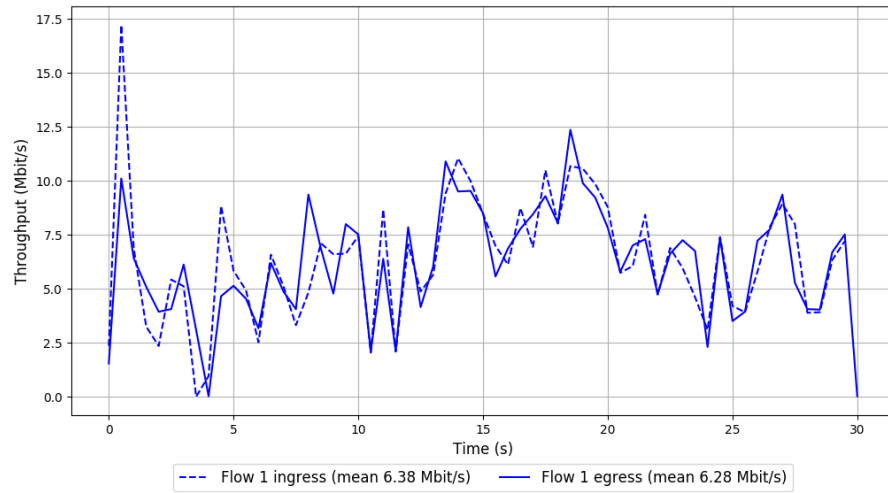


Run 2: Statistics of TCP BBR

Start at: 2018-03-05 19:02:37
End at: 2018-03-05 19:03:07
Local clock offset: -9.631 ms
Remote clock offset: -5.907 ms

Below is generated by plot.py at 2018-03-05 19:40:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.28 Mbit/s
95th percentile per-packet one-way delay: 712.133 ms
Loss rate: 1.63%
-- Flow 1:
Average throughput: 6.28 Mbit/s
95th percentile per-packet one-way delay: 712.133 ms
Loss rate: 1.63%

Run 2: Report of TCP BBR — Data Link

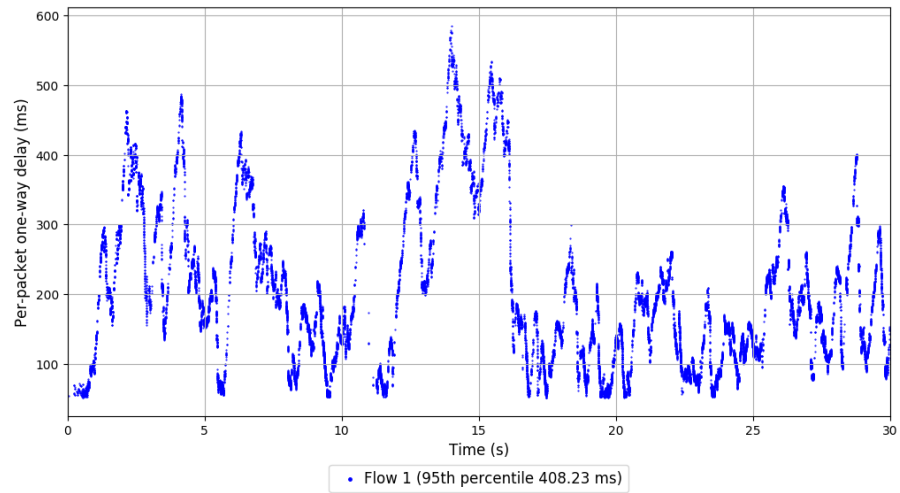
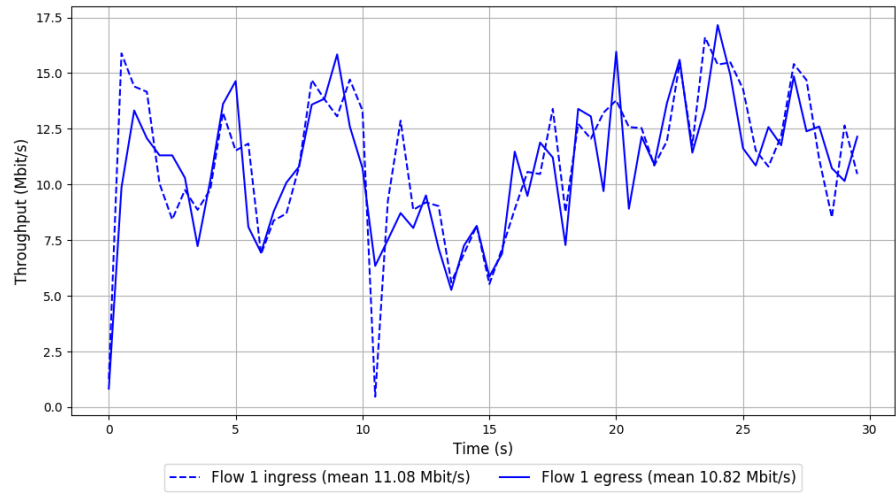


Run 3: Statistics of TCP BBR

Start at: 2018-03-05 19:22:16
End at: 2018-03-05 19:22:46
Local clock offset: -13.104 ms
Remote clock offset: -2.975 ms

Below is generated by plot.py at 2018-03-05 19:40:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.82 Mbit/s
95th percentile per-packet one-way delay: 408.234 ms
Loss rate: 2.50%
-- Flow 1:
Average throughput: 10.82 Mbit/s
95th percentile per-packet one-way delay: 408.234 ms
Loss rate: 2.50%

Run 3: Report of TCP BBR — Data Link

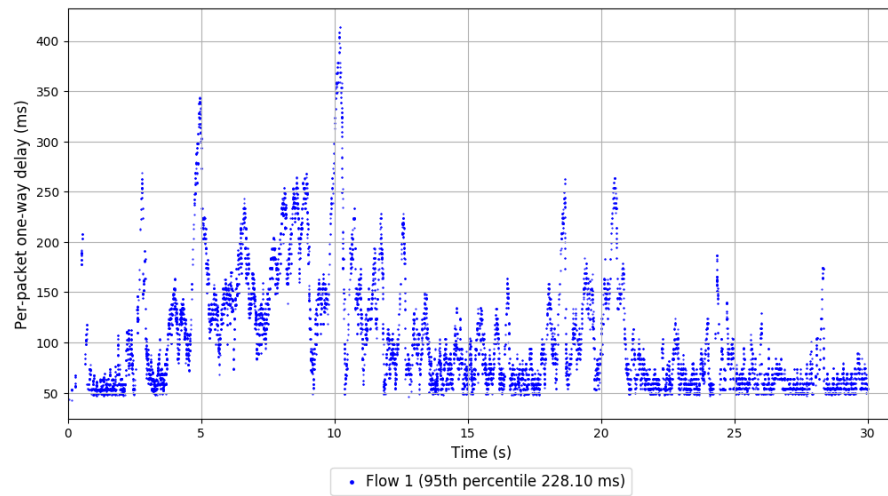
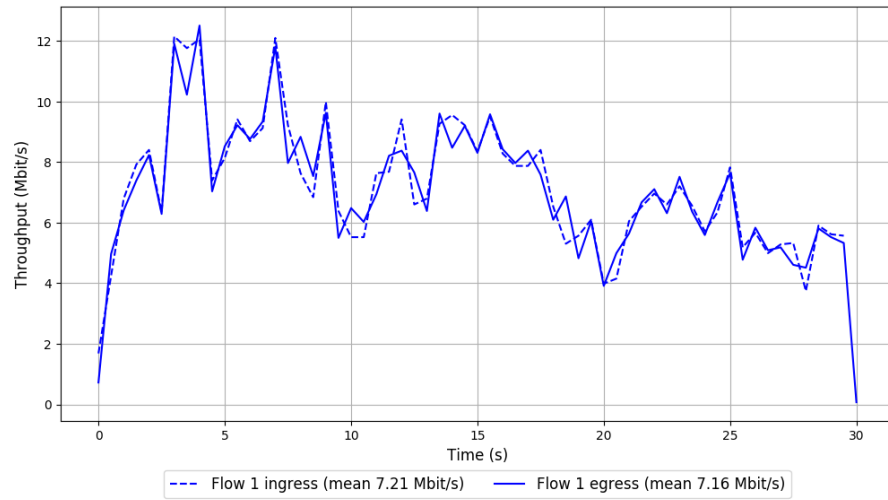


Run 1: Statistics of TCP Cubic

Start at: 2018-03-05 18:58:16
End at: 2018-03-05 18:58:46
Local clock offset: -11.83 ms
Remote clock offset: -5.478 ms

Below is generated by plot.py at 2018-03-05 19:40:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.16 Mbit/s
95th percentile per-packet one-way delay: 228.098 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 7.16 Mbit/s
95th percentile per-packet one-way delay: 228.098 ms
Loss rate: 0.71%

Run 1: Report of TCP Cubic — Data Link

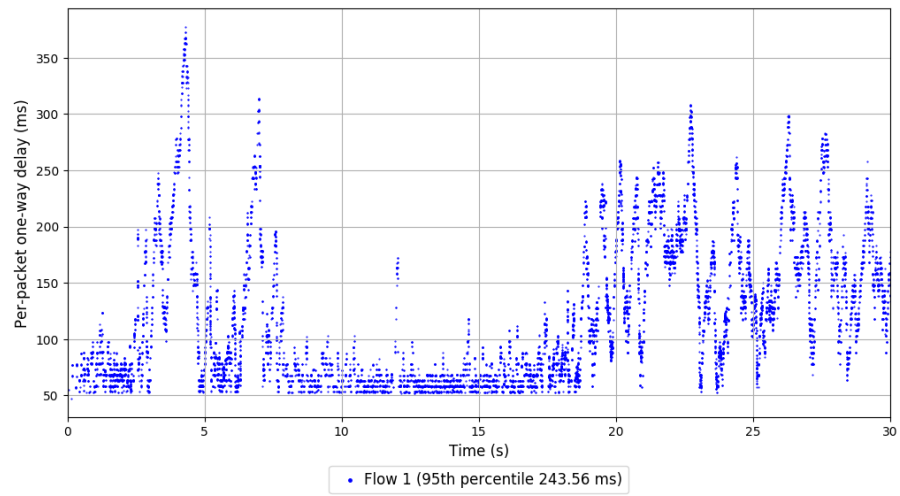
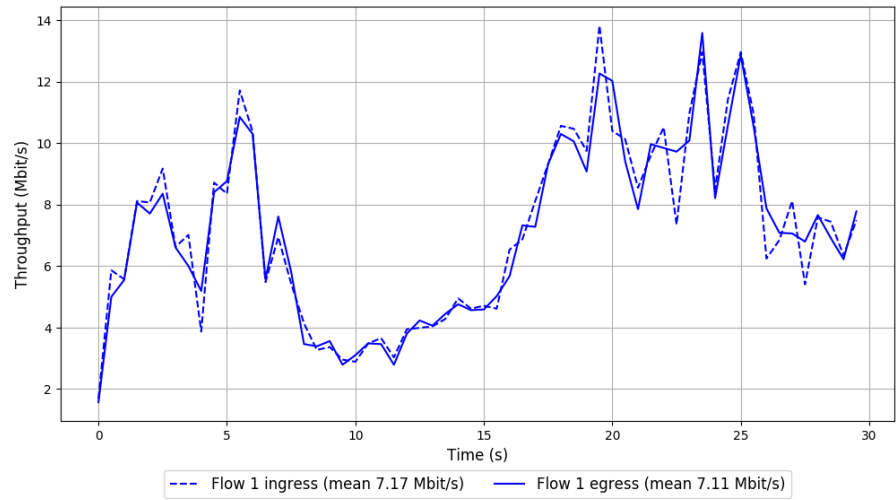


Run 2: Statistics of TCP Cubic

Start at: 2018-03-05 19:17:55
End at: 2018-03-05 19:18:25
Local clock offset: -11.906 ms
Remote clock offset: -4.8 ms

Below is generated by plot.py at 2018-03-05 19:40:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.11 Mbit/s
95th percentile per-packet one-way delay: 243.564 ms
Loss rate: 0.90%
-- Flow 1:
Average throughput: 7.11 Mbit/s
95th percentile per-packet one-way delay: 243.564 ms
Loss rate: 0.90%

Run 2: Report of TCP Cubic — Data Link

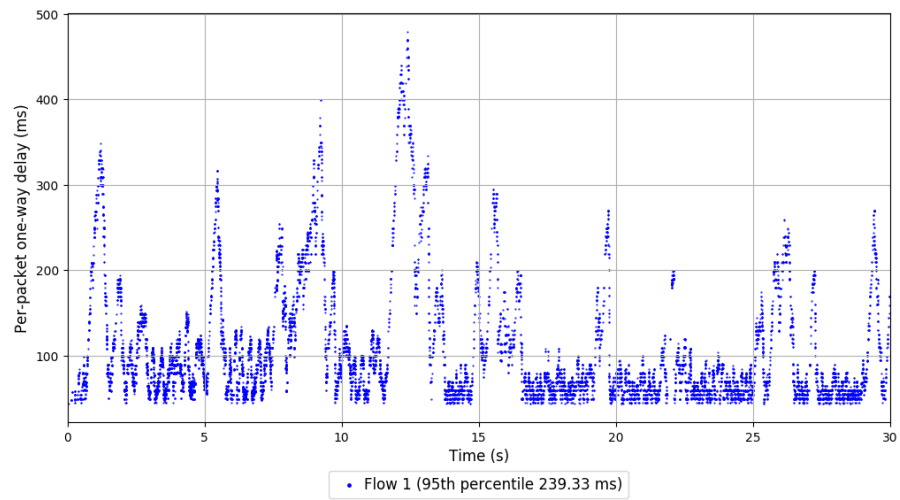
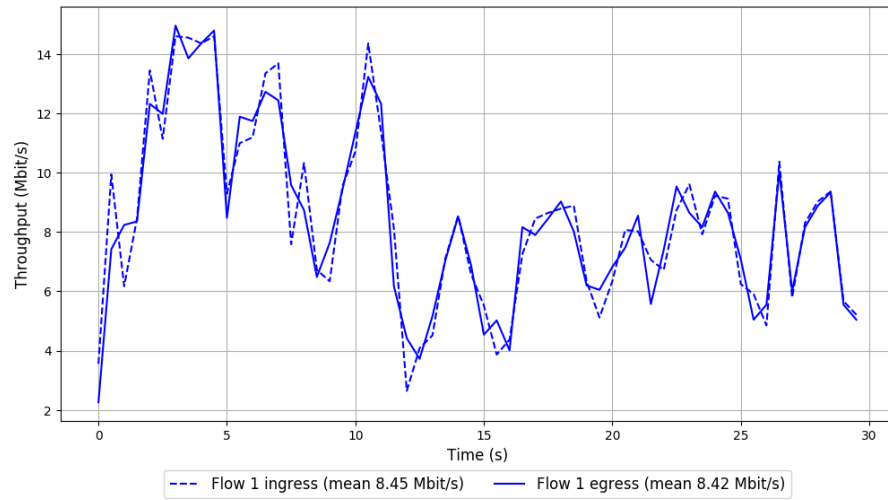


Run 3: Statistics of TCP Cubic

Start at: 2018-03-05 19:37:32
End at: 2018-03-05 19:38:02
Local clock offset: -2.41 ms
Remote clock offset: -1.607 ms

Below is generated by plot.py at 2018-03-05 19:40:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.42 Mbit/s
95th percentile per-packet one-way delay: 239.328 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 8.42 Mbit/s
95th percentile per-packet one-way delay: 239.328 ms
Loss rate: 0.38%

Run 3: Report of TCP Cubic — Data Link

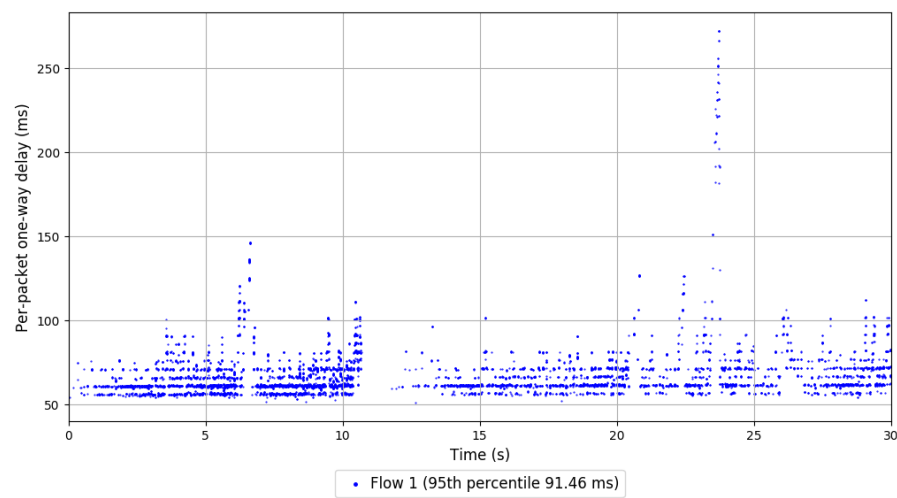
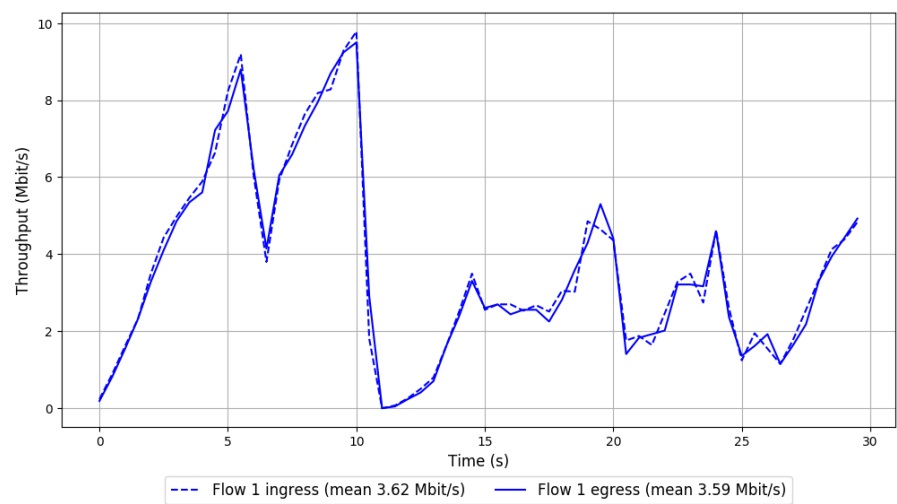


```
Run 1: Statistics of LEDBAT

Start at: 2018-03-05 18:52:49
End at: 2018-03-05 18:53:19
Local clock offset: -19.145 ms
Remote clock offset: -5.708 ms

# Below is generated by plot.py at 2018-03-05 19:40:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.59 Mbit/s
95th percentile per-packet one-way delay: 91.463 ms
Loss rate: 1.08%
-- Flow 1:
Average throughput: 3.59 Mbit/s
95th percentile per-packet one-way delay: 91.463 ms
Loss rate: 1.08%
```

Run 1: Report of LEDBAT — Data Link

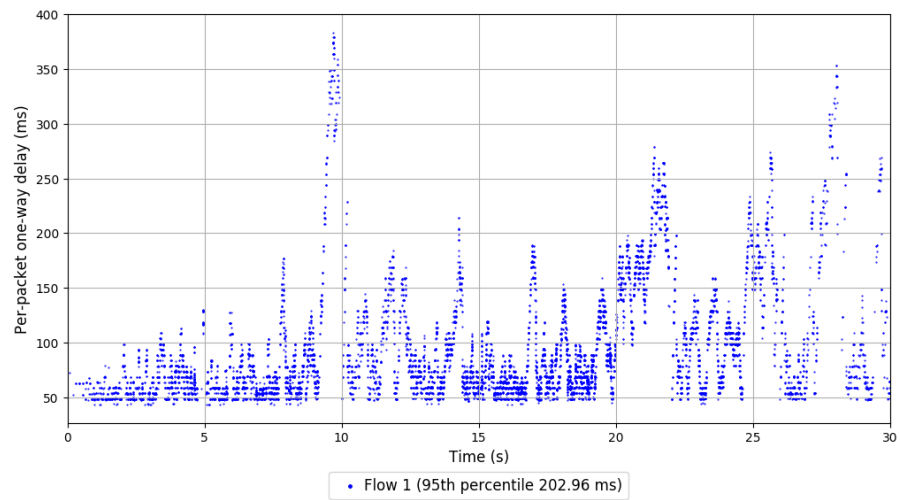
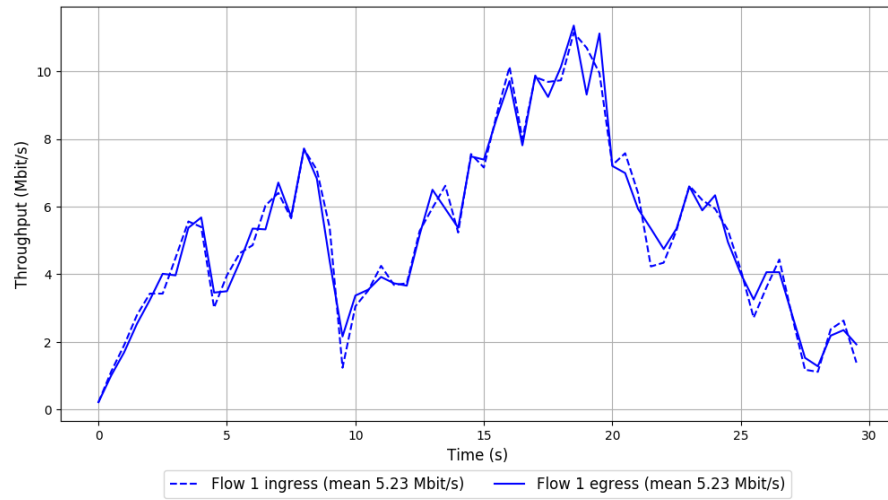


Run 2: Statistics of LEDBAT

Start at: 2018-03-05 19:12:25
End at: 2018-03-05 19:12:55
Local clock offset: -8.207 ms
Remote clock offset: -7.198 ms

Below is generated by plot.py at 2018-03-05 19:40:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.23 Mbit/s
95th percentile per-packet one-way delay: 202.964 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 5.23 Mbit/s
95th percentile per-packet one-way delay: 202.964 ms
Loss rate: 0.13%

Run 2: Report of LEDBAT — Data Link

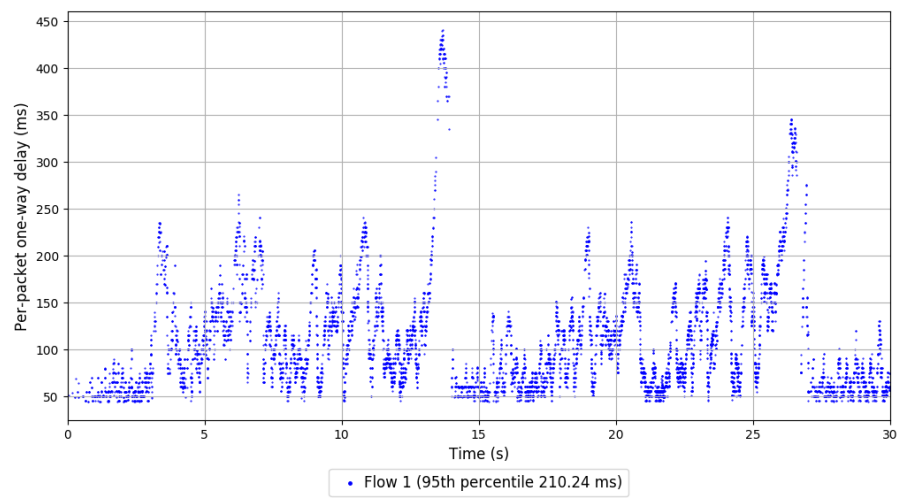
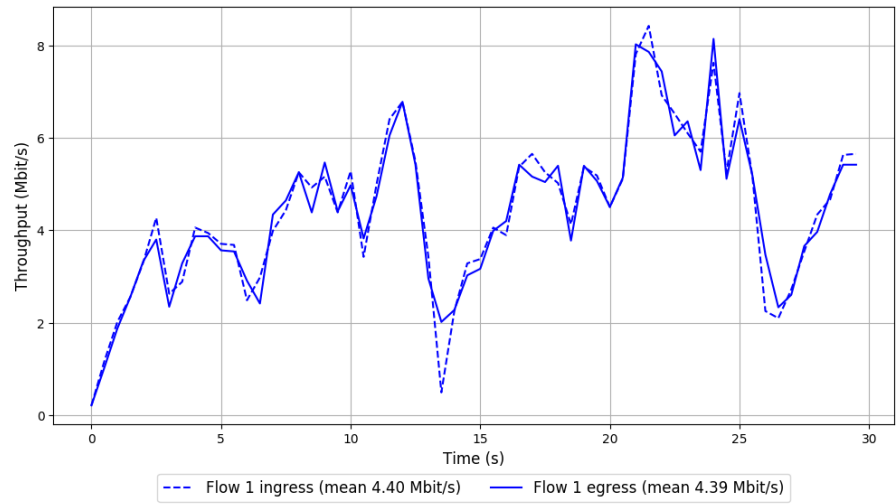


Run 3: Statistics of LEDBAT

Start at: 2018-03-05 19:32:04
End at: 2018-03-05 19:32:34
Local clock offset: -2.799 ms
Remote clock offset: -1.321 ms

Below is generated by plot.py at 2018-03-05 19:40:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.39 Mbit/s
95th percentile per-packet one-way delay: 210.240 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 4.39 Mbit/s
95th percentile per-packet one-way delay: 210.240 ms
Loss rate: 0.47%

Run 3: Report of LEDBAT — Data Link

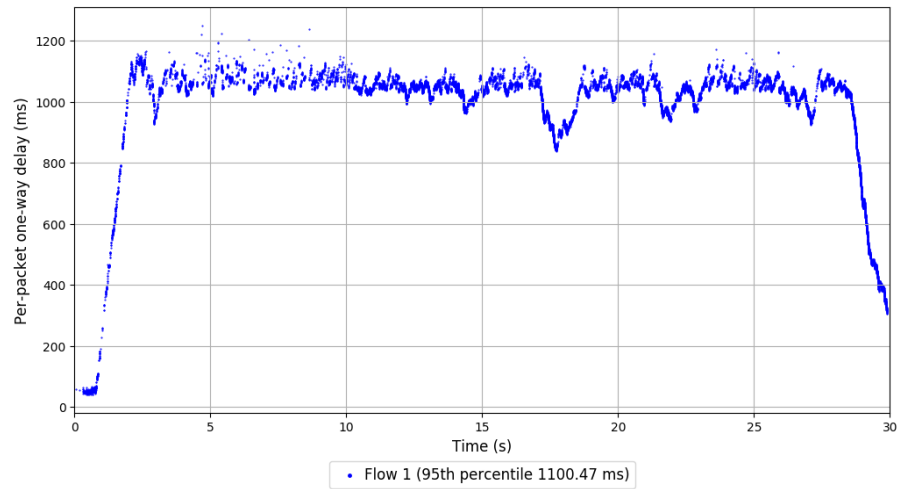
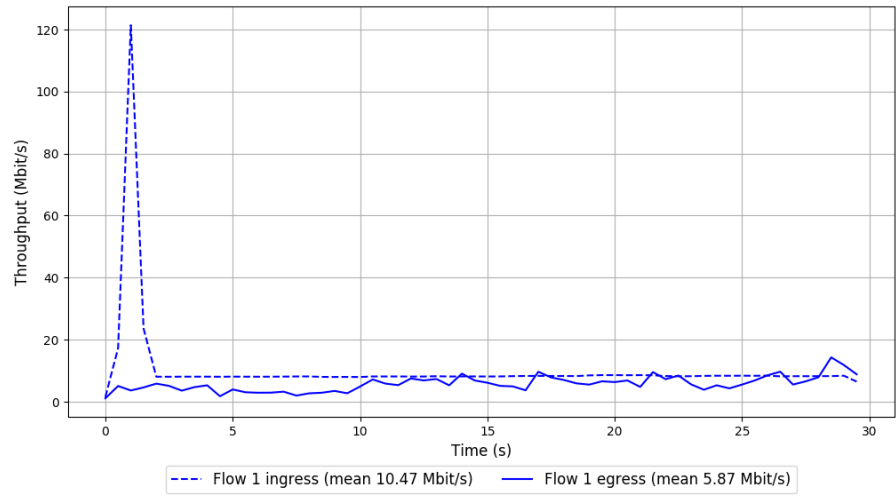


Run 1: Statistics of PCC

Start at: 2018-03-05 18:46:14
End at: 2018-03-05 18:46:44
Local clock offset: -26.867 ms
Remote clock offset: -7.677 ms

Below is generated by plot.py at 2018-03-05 19:40:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.87 Mbit/s
95th percentile per-packet one-way delay: 1100.468 ms
Loss rate: 44.01%
-- Flow 1:
Average throughput: 5.87 Mbit/s
95th percentile per-packet one-way delay: 1100.468 ms
Loss rate: 44.01%

Run 1: Report of PCC — Data Link

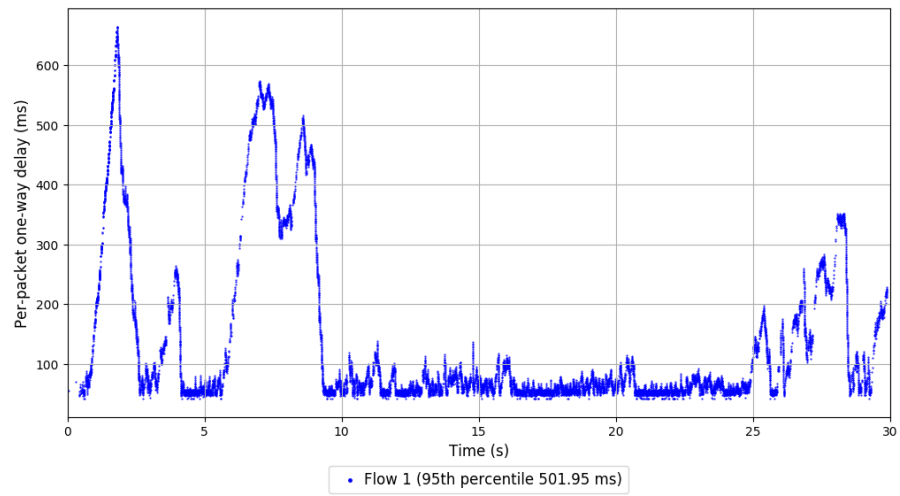
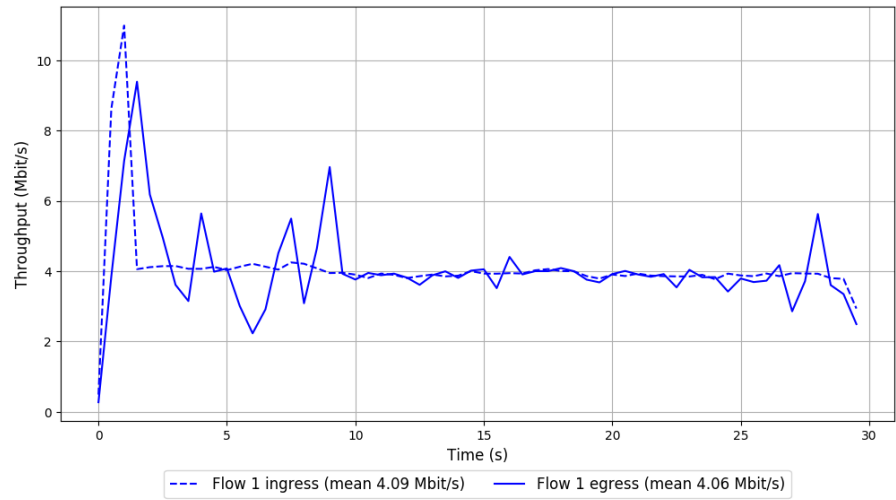


Run 2: Statistics of PCC

Start at: 2018-03-05 19:05:53
End at: 2018-03-05 19:06:23
Local clock offset: -10.315 ms
Remote clock offset: -5.565 ms

Below is generated by plot.py at 2018-03-05 19:40:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.06 Mbit/s
95th percentile per-packet one-way delay: 501.952 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 4.06 Mbit/s
95th percentile per-packet one-way delay: 501.952 ms
Loss rate: 0.94%

Run 2: Report of PCC — Data Link



Run 3: Statistics of PCC

Start at: 2018-03-05 19:25:32

End at: 2018-03-05 19:26:02

Local clock offset: -6.599 ms

Remote clock offset: -1.82 ms

Below is generated by plot.py at 2018-03-05 19:40:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.92 Mbit/s

95th percentile per-packet one-way delay: 70.759 ms

Loss rate: 0.23%

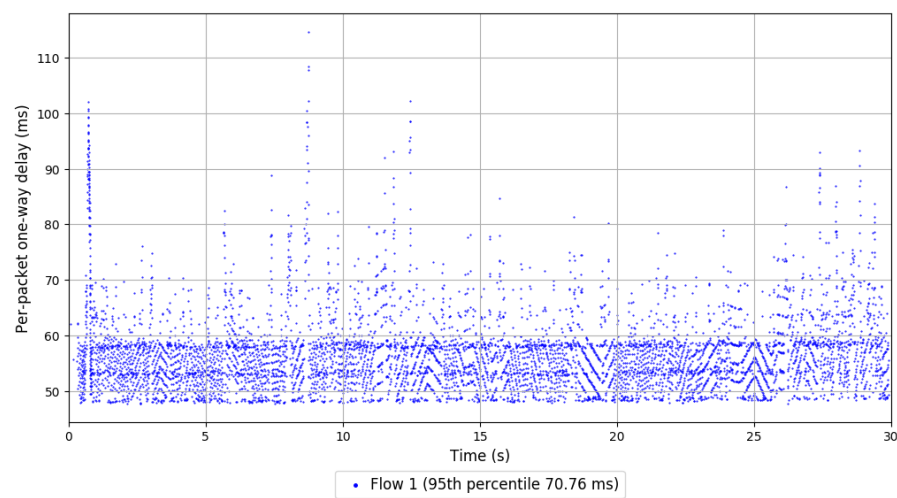
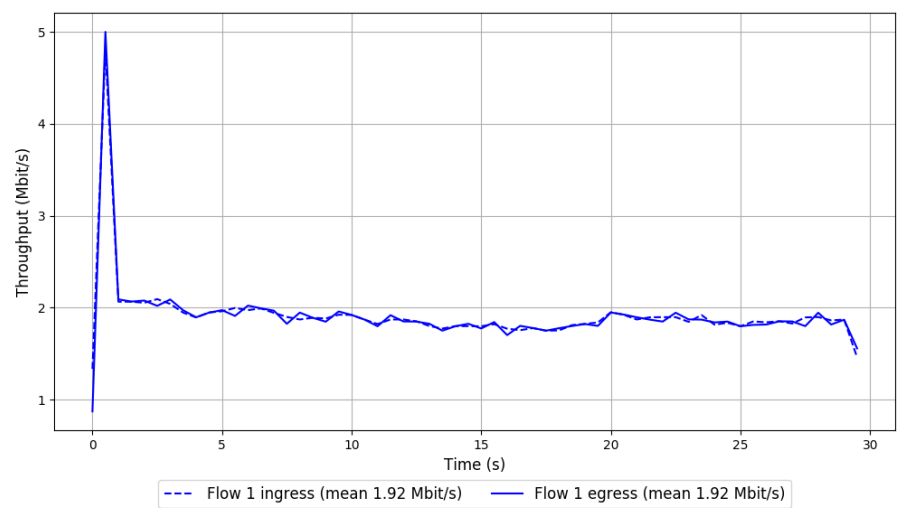
-- Flow 1:

Average throughput: 1.92 Mbit/s

95th percentile per-packet one-way delay: 70.759 ms

Loss rate: 0.23%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

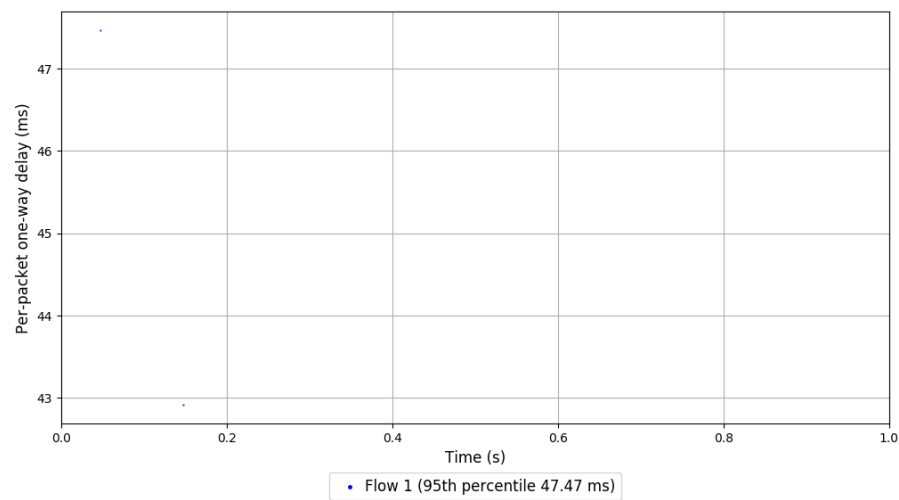
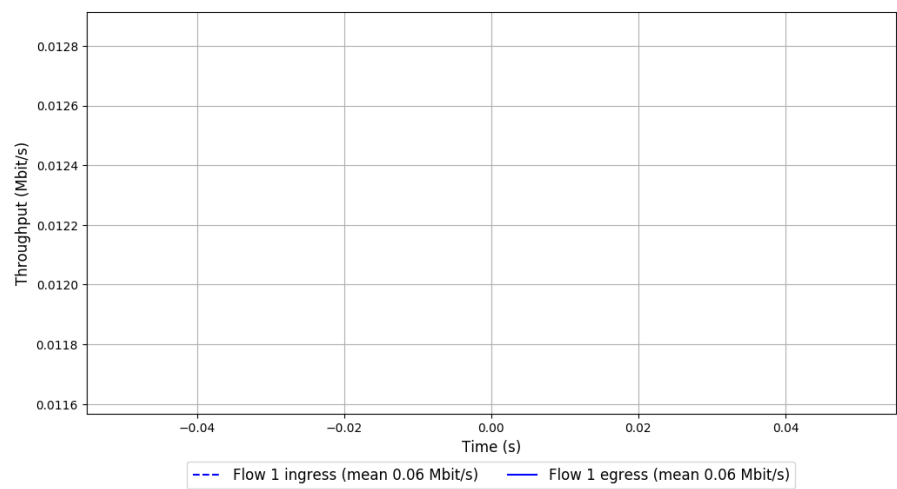
Start at: 2018-03-05 18:56:06

End at: 2018-03-05 18:56:36

Local clock offset: -12.57 ms

Remote clock offset: -6.233 ms

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-03-05 19:15:43

End at: 2018-03-05 19:16:13

Local clock offset: -7.85 ms

Remote clock offset: -5.592 ms

Below is generated by plot.py at 2018-03-05 19:40:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 6.83 Mbit/s

95th percentile per-packet one-way delay: 277.833 ms

Loss rate: 0.73%

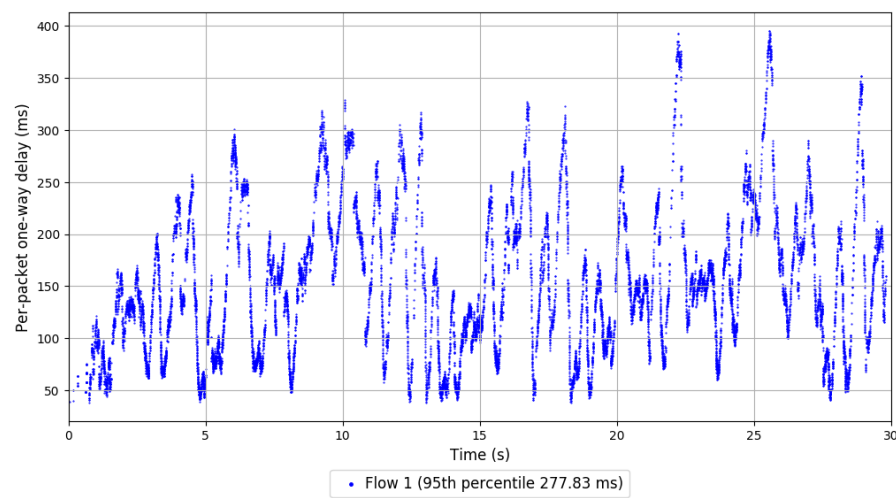
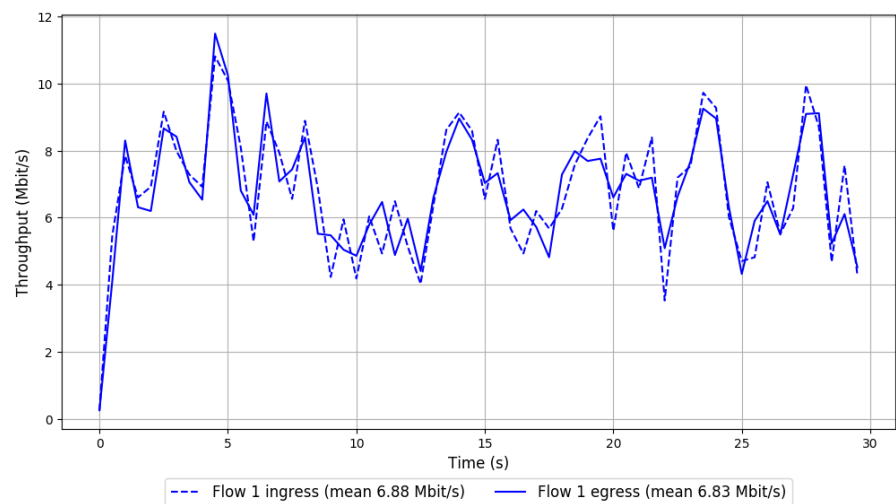
-- Flow 1:

Average throughput: 6.83 Mbit/s

95th percentile per-packet one-way delay: 277.833 ms

Loss rate: 0.73%

Run 2: Report of QUIC Cubic — Data Link

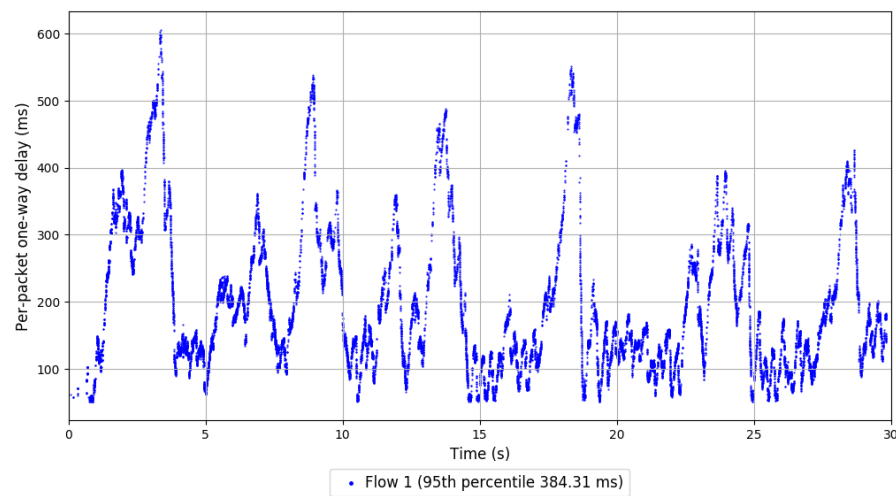
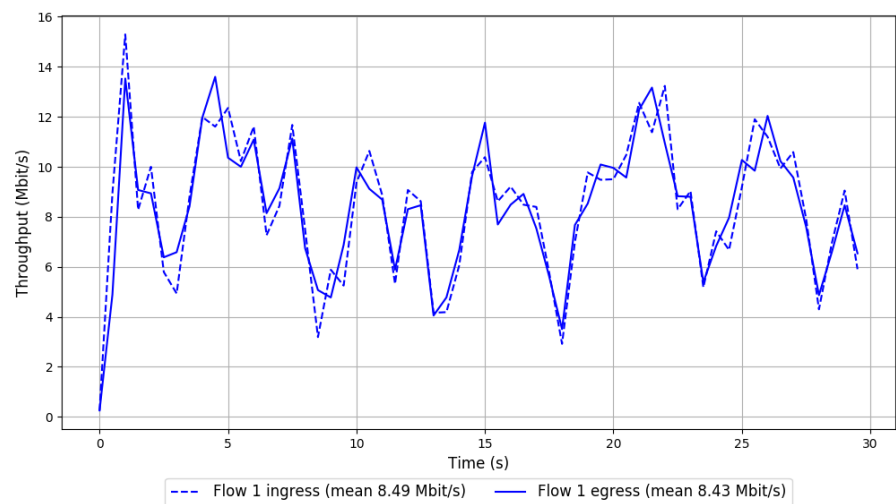


Run 3: Statistics of QUIC Cubic

Start at: 2018-03-05 19:35:21
End at: 2018-03-05 19:35:51
Local clock offset: -4.278 ms
Remote clock offset: -1.437 ms

Below is generated by plot.py at 2018-03-05 19:40:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.43 Mbit/s
95th percentile per-packet one-way delay: 384.306 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 8.43 Mbit/s
95th percentile per-packet one-way delay: 384.306 ms
Loss rate: 0.79%

Run 3: Report of QUIC Cubic — Data Link

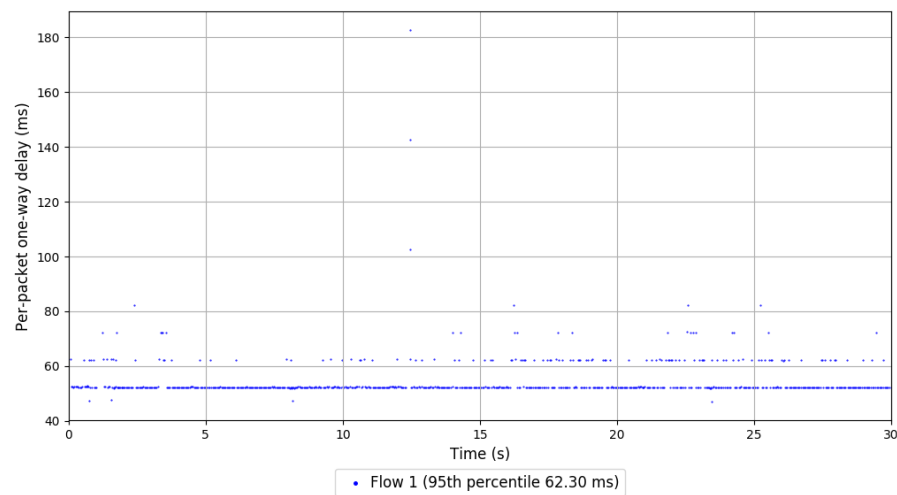
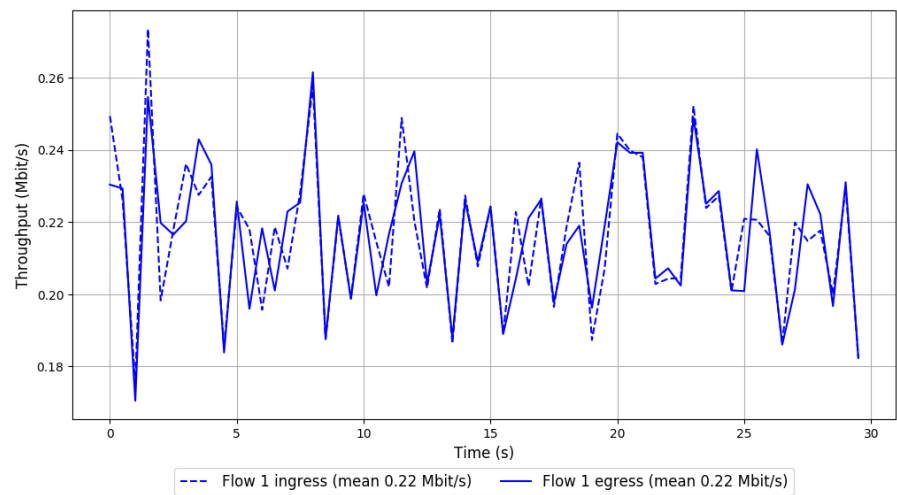


Run 1: Statistics of SCReAM

Start at: 2018-03-05 18:41:54
End at: 2018-03-05 18:42:24
Local clock offset: -24.349 ms
Remote clock offset: -7.862 ms

Below is generated by plot.py at 2018-03-05 19:40:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 62.299 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 62.299 ms
Loss rate: 0.13%

Run 1: Report of SReAM — Data Link

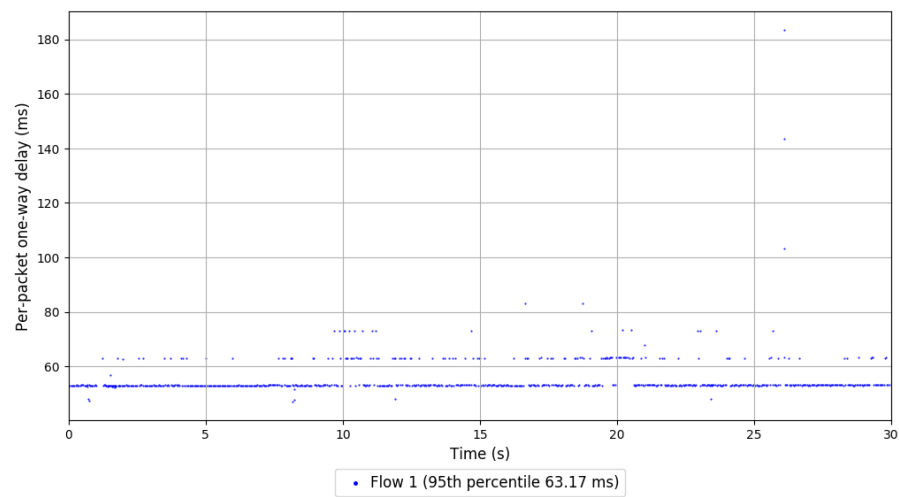
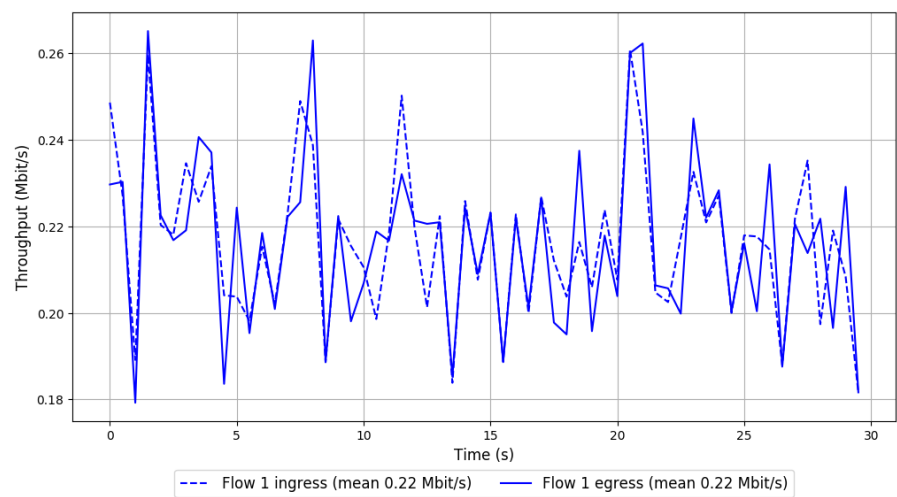


Run 2: Statistics of SCReAM

Start at: 2018-03-05 19:01:32
End at: 2018-03-05 19:02:02
Local clock offset: -10.507 ms
Remote clock offset: -5.975 ms

Below is generated by plot.py at 2018-03-05 19:40:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.172 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.172 ms
Loss rate: 0.12%

Run 2: Report of SReAM — Data Link

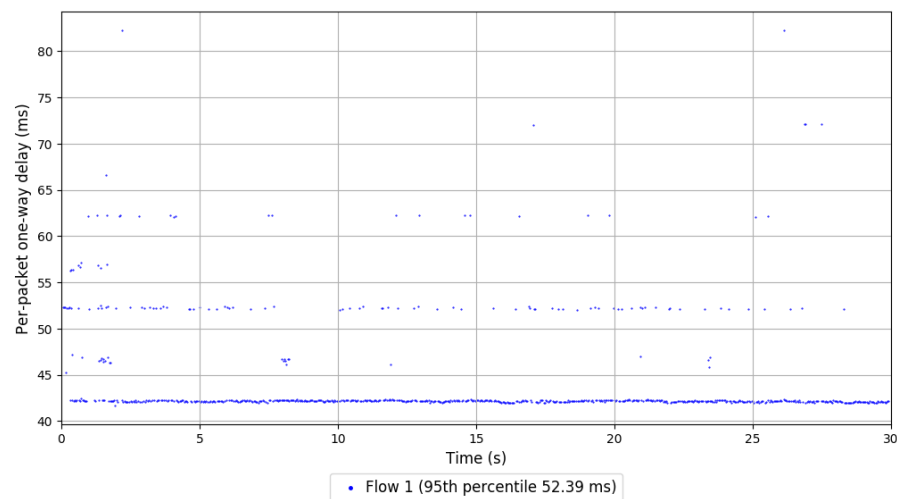
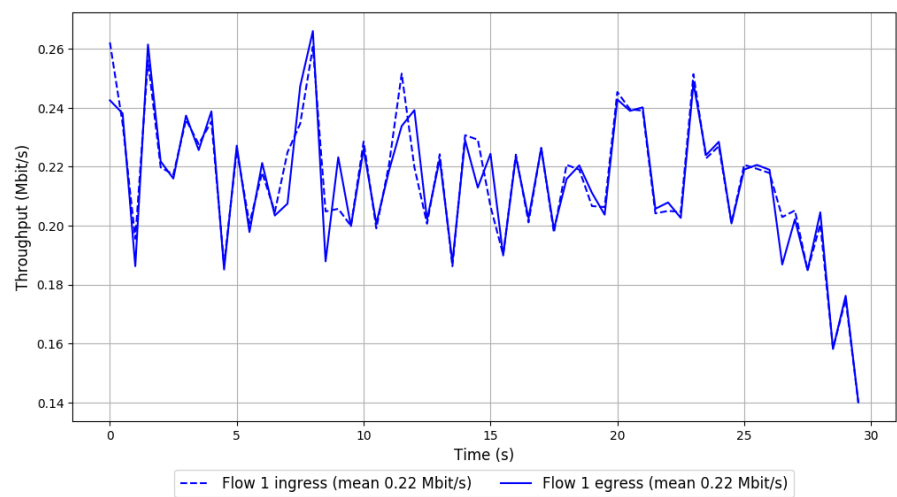


Run 3: Statistics of SCReAM

Start at: 2018-03-05 19:21:11
End at: 2018-03-05 19:21:41
Local clock offset: -10.331 ms
Remote clock offset: -2.742 ms

Below is generated by plot.py at 2018-03-05 19:40:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 52.390 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 52.390 ms
Loss rate: 0.23%

Run 3: Report of SReAM — Data Link

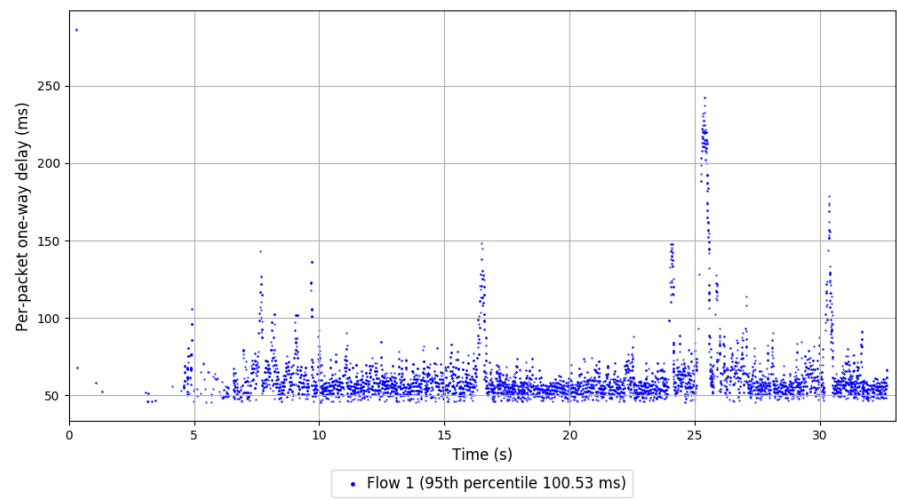
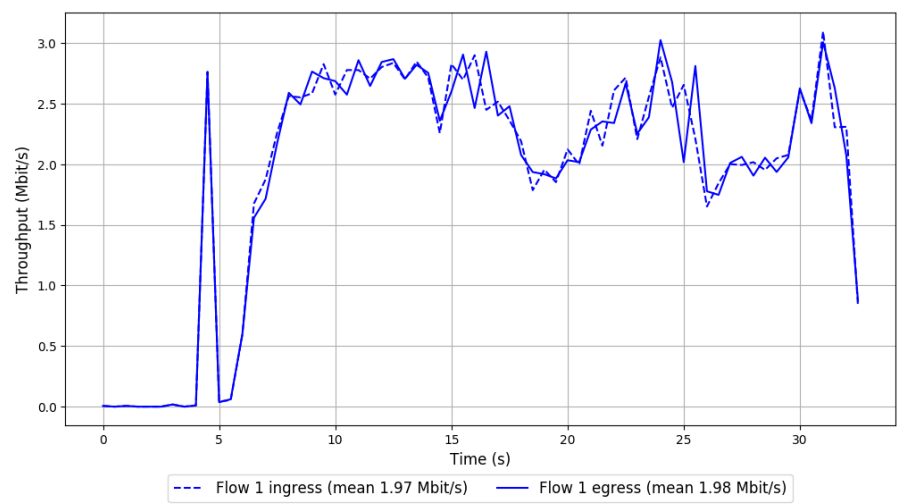


Run 1: Statistics of WebRTC media

Start at: 2018-03-05 18:59:22
End at: 2018-03-05 18:59:52
Local clock offset: -10.079 ms
Remote clock offset: -5.369 ms

Below is generated by plot.py at 2018-03-05 19:40:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.98 Mbit/s
95th percentile per-packet one-way delay: 100.526 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 1.98 Mbit/s
95th percentile per-packet one-way delay: 100.526 ms
Loss rate: 0.24%

Run 1: Report of WebRTC media — Data Link

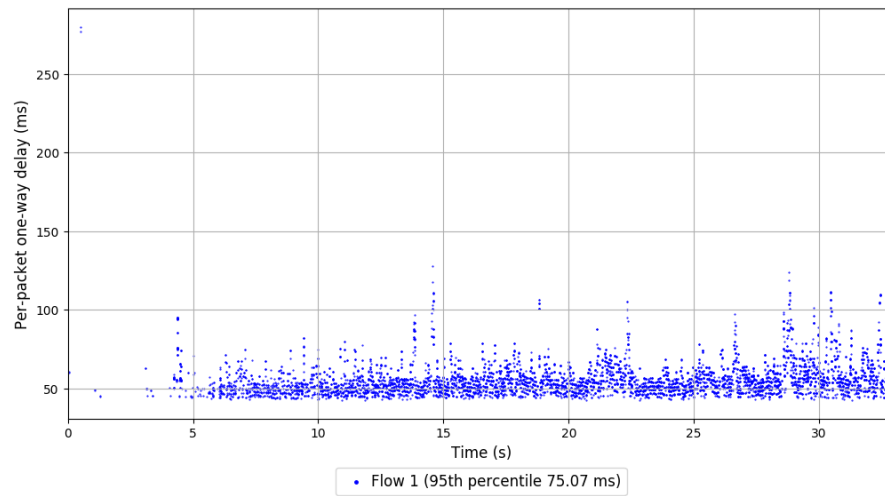
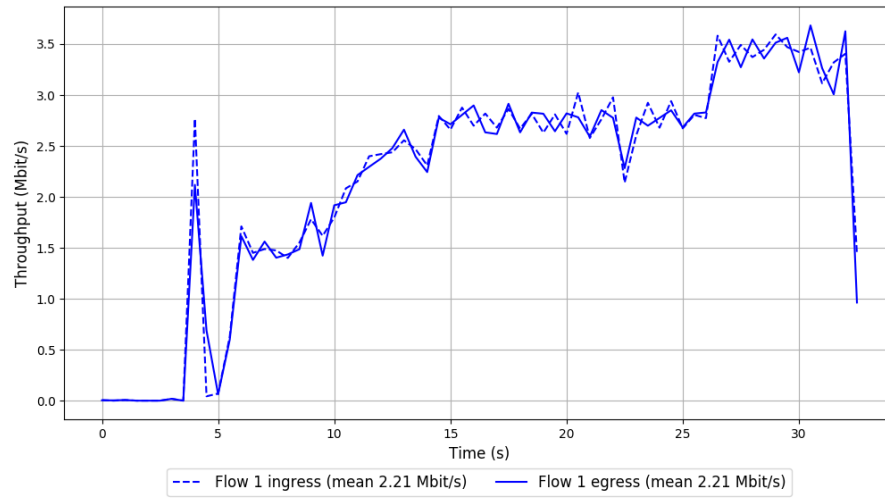


Run 2: Statistics of WebRTC media

Start at: 2018-03-05 19:19:00
End at: 2018-03-05 19:19:30
Local clock offset: -9.861 ms
Remote clock offset: -4.638 ms

Below is generated by plot.py at 2018-03-05 19:40:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.21 Mbit/s
95th percentile per-packet one-way delay: 75.073 ms
Loss rate: 0.64%
-- Flow 1:
Average throughput: 2.21 Mbit/s
95th percentile per-packet one-way delay: 75.073 ms
Loss rate: 0.64%

Run 2: Report of WebRTC media — Data Link

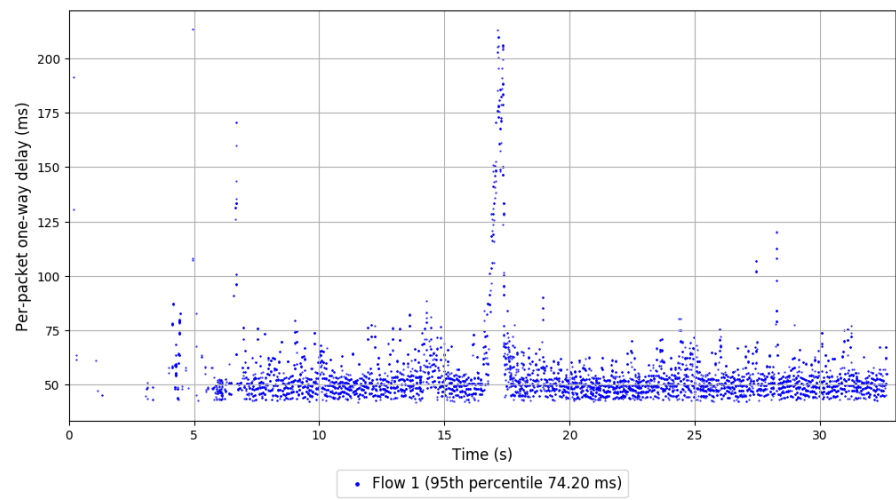
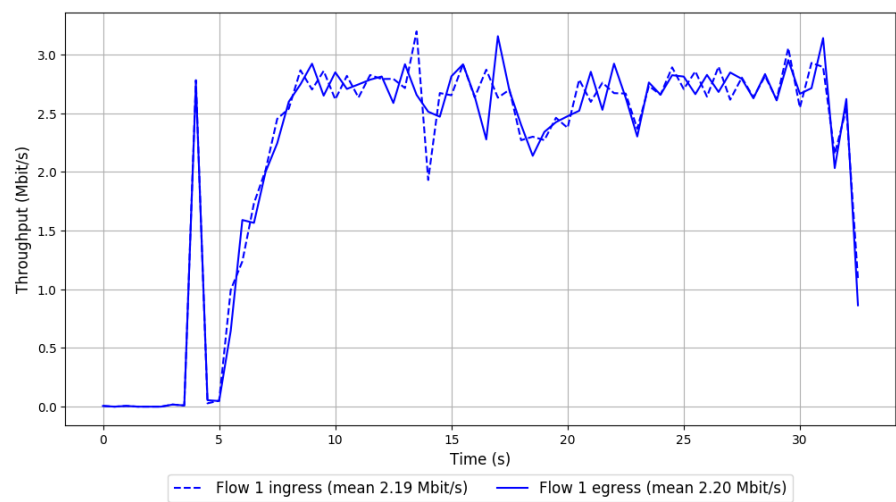


Run 3: Statistics of WebRTC media

Start at: 2018-03-05 19:38:37
End at: 2018-03-05 19:39:07
Local clock offset: -7.833 ms
Remote clock offset: -7.447 ms

Below is generated by plot.py at 2018-03-05 19:40:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.20 Mbit/s
95th percentile per-packet one-way delay: 74.201 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 2.20 Mbit/s
95th percentile per-packet one-way delay: 74.201 ms
Loss rate: 0.31%

Run 3: Report of WebRTC media — Data Link

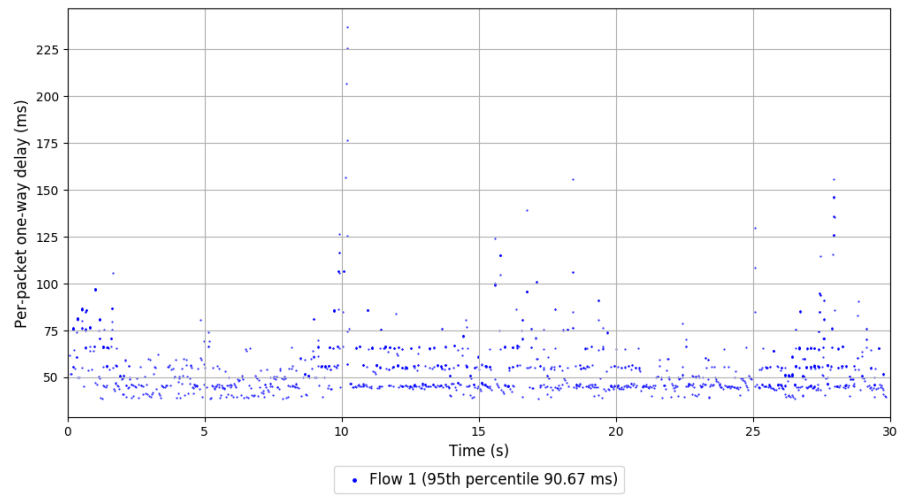
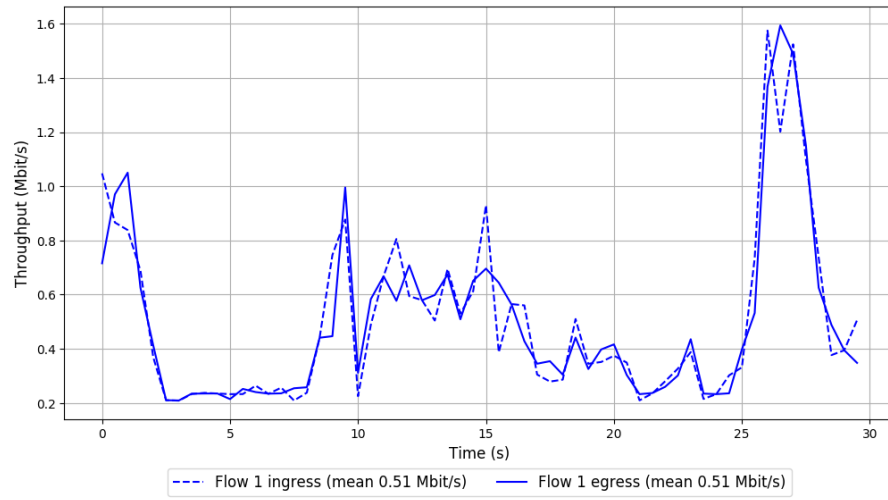


Run 1: Statistics of Sprout

Start at: 2018-03-05 18:44:04
End at: 2018-03-05 18:44:34
Local clock offset: -25.026 ms
Remote clock offset: -9.284 ms

Below is generated by plot.py at 2018-03-05 19:40:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 90.665 ms
Loss rate: 0.57%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 90.665 ms
Loss rate: 0.57%

Run 1: Report of Sprout — Data Link

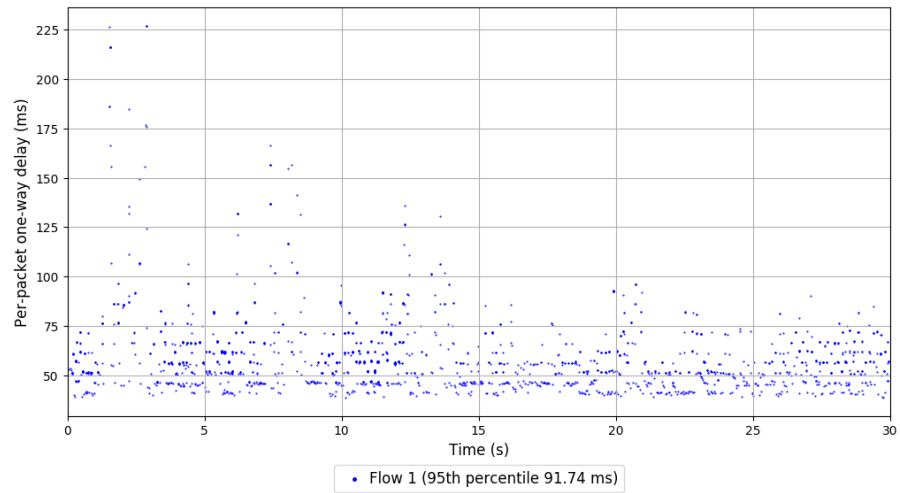
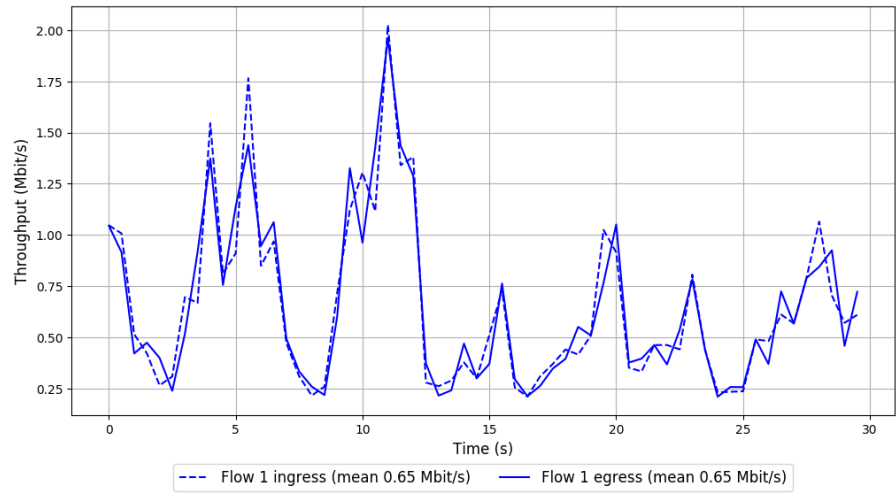


Run 2: Statistics of Sprout

Start at: 2018-03-05 19:03:42
End at: 2018-03-05 19:04:12
Local clock offset: -7.54 ms
Remote clock offset: -5.602 ms

Below is generated by plot.py at 2018-03-05 19:40:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 91.737 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 91.737 ms
Loss rate: 0.21%

Run 2: Report of Sprout — Data Link

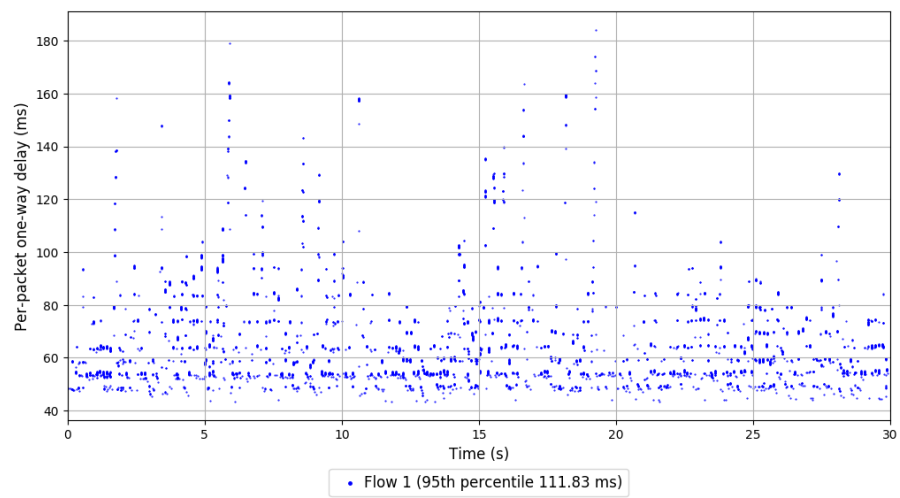
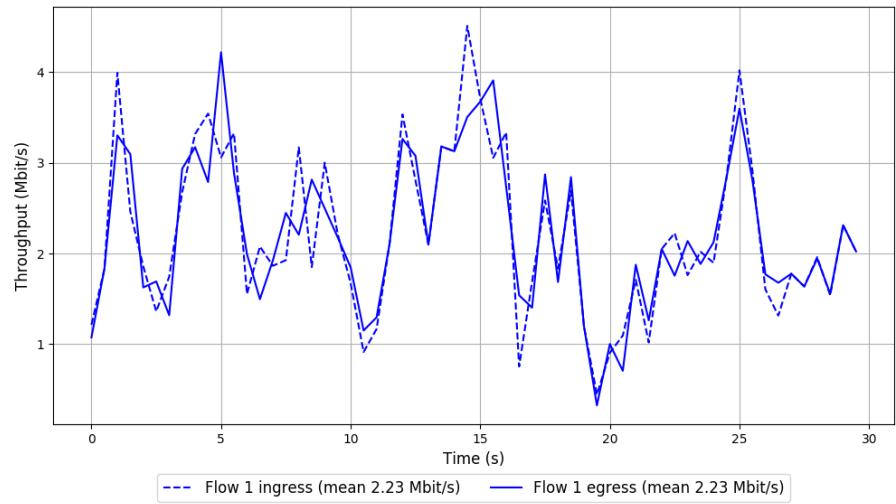


Run 3: Statistics of Sprout

Start at: 2018-03-05 19:23:22
End at: 2018-03-05 19:23:52
Local clock offset: -10.5 ms
Remote clock offset: -1.797 ms

Below is generated by plot.py at 2018-03-05 19:40:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.23 Mbit/s
95th percentile per-packet one-way delay: 111.826 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.23 Mbit/s
95th percentile per-packet one-way delay: 111.826 ms
Loss rate: 0.00%

Run 3: Report of Sprout — Data Link

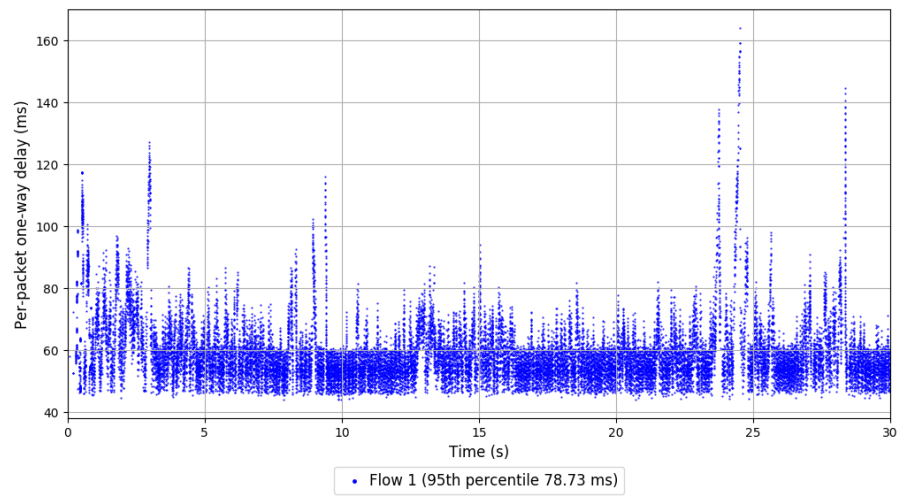
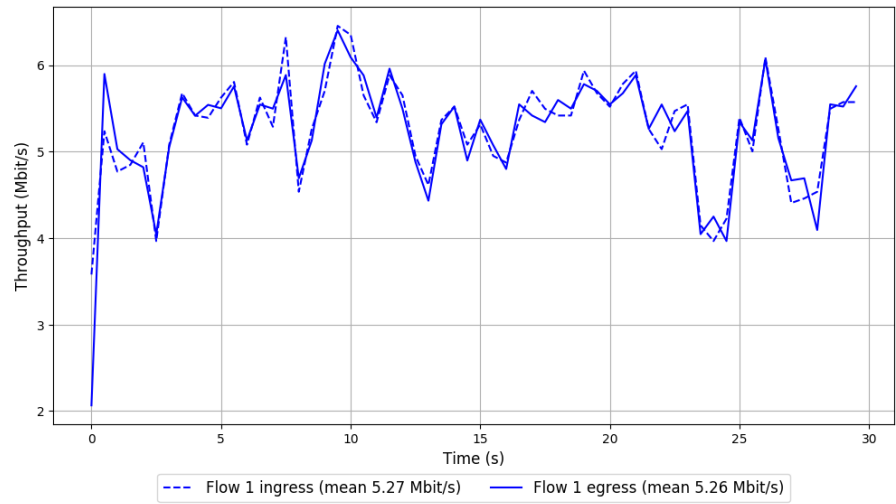


Run 1: Statistics of TaoVA-100x

Start at: 2018-03-05 18:57:11
End at: 2018-03-05 18:57:41
Local clock offset: -10.695 ms
Remote clock offset: -5.298 ms

Below is generated by plot.py at 2018-03-05 19:40:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.26 Mbit/s
95th percentile per-packet one-way delay: 78.732 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 5.26 Mbit/s
95th percentile per-packet one-way delay: 78.732 ms
Loss rate: 0.38%

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

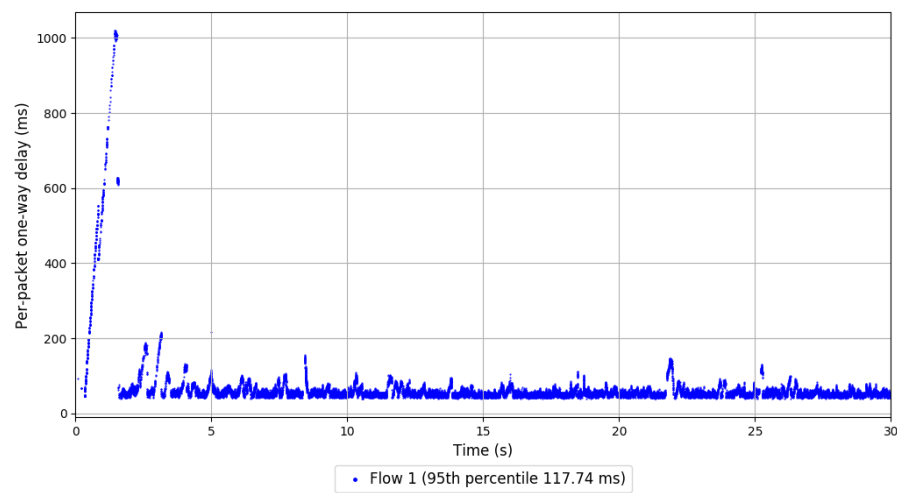
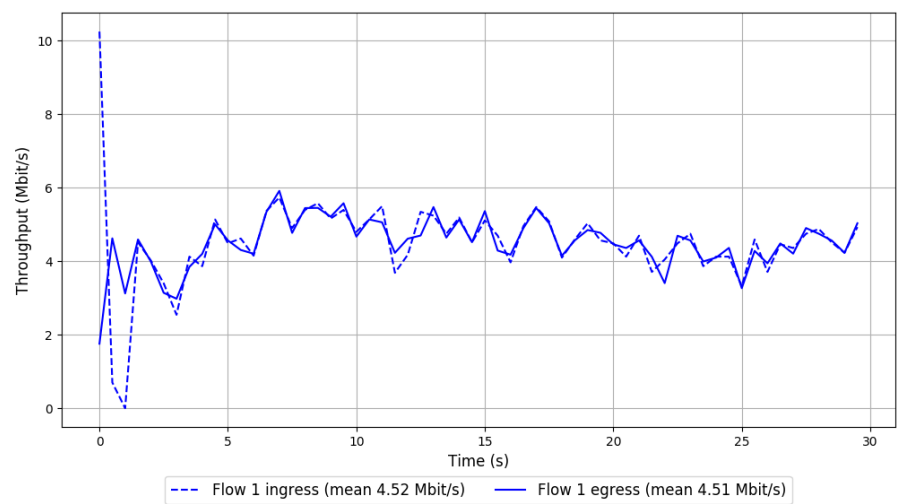


Run 2: Statistics of TaoVA-100x

Start at: 2018-03-05 19:16:49
End at: 2018-03-05 19:17:19
Local clock offset: -10.126 ms
Remote clock offset: -4.658 ms

Below is generated by plot.py at 2018-03-05 19:40:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.51 Mbit/s
95th percentile per-packet one-way delay: 117.740 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 4.51 Mbit/s
95th percentile per-packet one-way delay: 117.740 ms
Loss rate: 0.49%

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

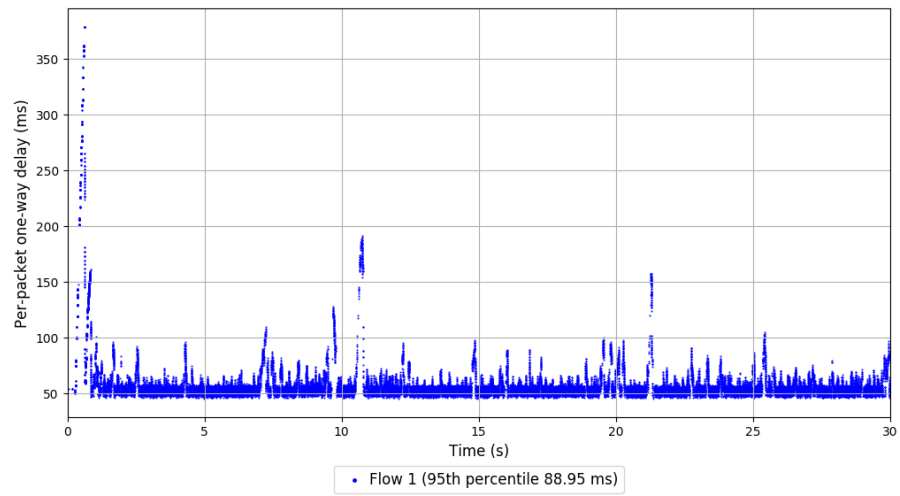
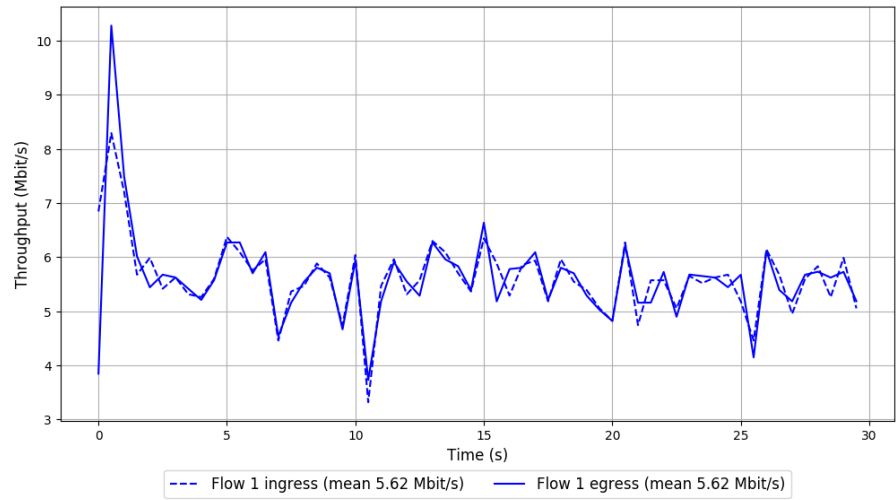


Run 3: Statistics of TaoVA-100x

Start at: 2018-03-05 19:36:26
End at: 2018-03-05 19:36:56
Local clock offset: -4.282 ms
Remote clock offset: -0.347 ms

Below is generated by plot.py at 2018-03-05 19:40:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.62 Mbit/s
95th percentile per-packet one-way delay: 88.951 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 5.62 Mbit/s
95th percentile per-packet one-way delay: 88.951 ms
Loss rate: 0.13%

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

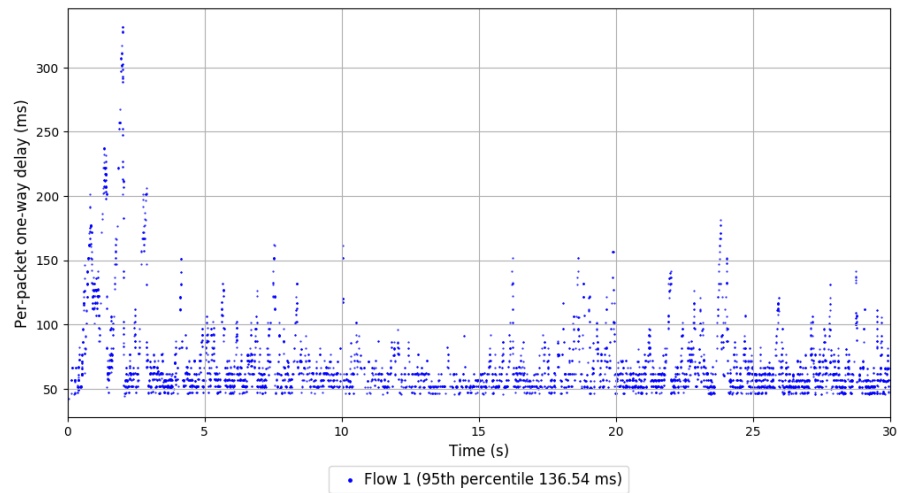
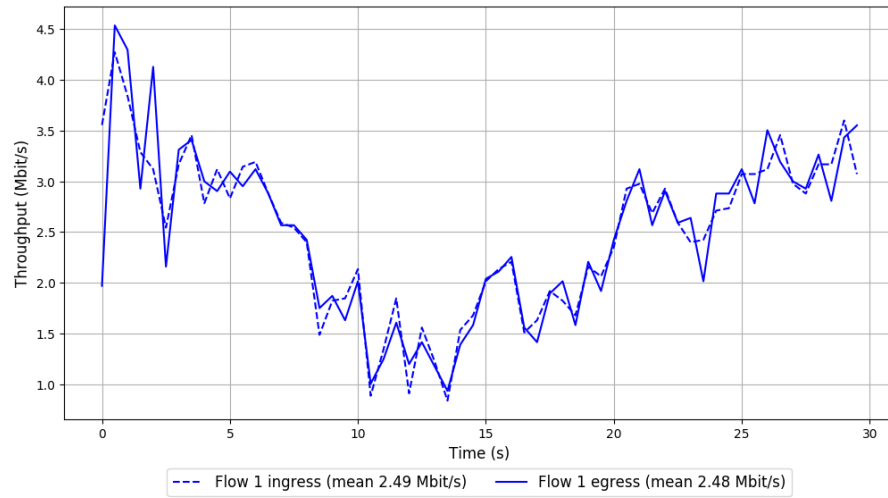


Run 1: Statistics of TCP Vegas

Start at: 2018-03-05 18:45:09
End at: 2018-03-05 18:45:39
Local clock offset: -25.711 ms
Remote clock offset: -7.174 ms

Below is generated by plot.py at 2018-03-05 19:40:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.48 Mbit/s
95th percentile per-packet one-way delay: 136.543 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 2.48 Mbit/s
95th percentile per-packet one-way delay: 136.543 ms
Loss rate: 0.55%

Run 1: Report of TCP Vegas — Data Link

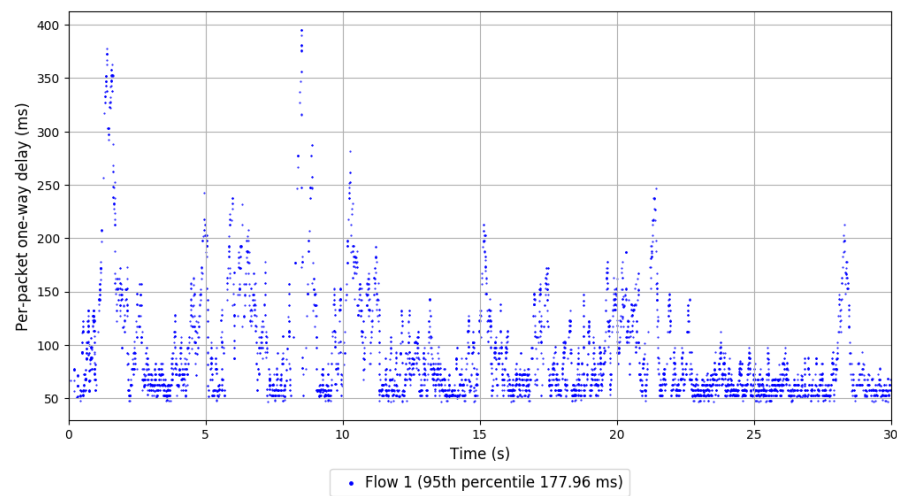
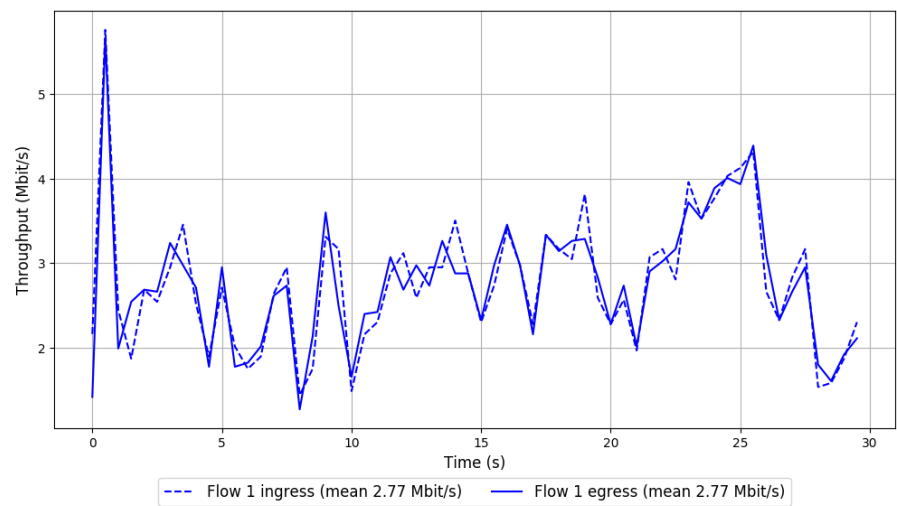


Run 2: Statistics of TCP Vegas

Start at: 2018-03-05 19:04:47
End at: 2018-03-05 19:05:17
Local clock offset: -10.469 ms
Remote clock offset: -5.029 ms

Below is generated by plot.py at 2018-03-05 19:40:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.77 Mbit/s
95th percentile per-packet one-way delay: 177.962 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 2.77 Mbit/s
95th percentile per-packet one-way delay: 177.962 ms
Loss rate: 0.25%

Run 2: Report of TCP Vegas — Data Link

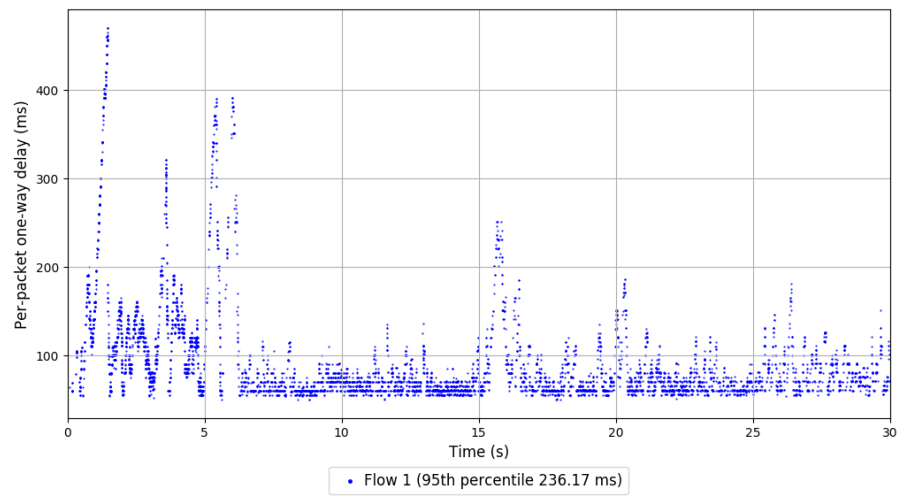
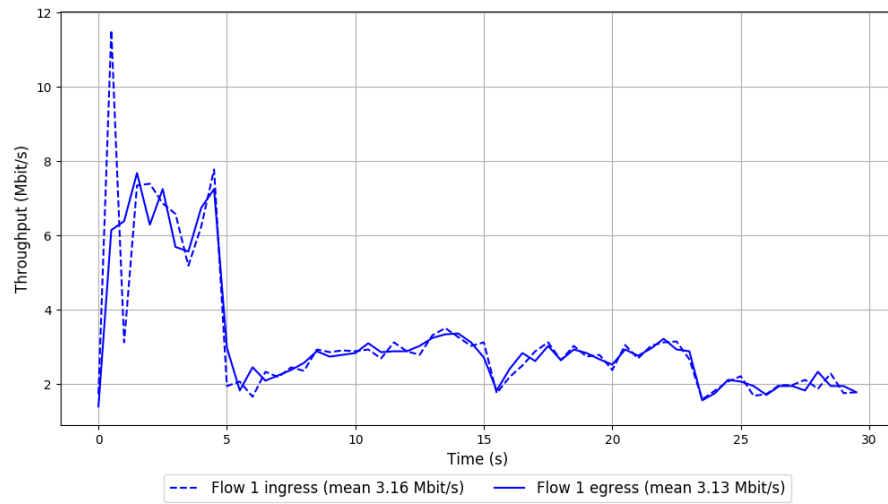


Run 3: Statistics of TCP Vegas

Start at: 2018-03-05 19:24:27
End at: 2018-03-05 19:24:57
Local clock offset: -10.967 ms
Remote clock offset: -2.418 ms

Below is generated by plot.py at 2018-03-05 19:40:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.13 Mbit/s
95th percentile per-packet one-way delay: 236.169 ms
Loss rate: 1.05%
-- Flow 1:
Average throughput: 3.13 Mbit/s
95th percentile per-packet one-way delay: 236.169 ms
Loss rate: 1.05%

Run 3: Report of TCP Vegas — Data Link

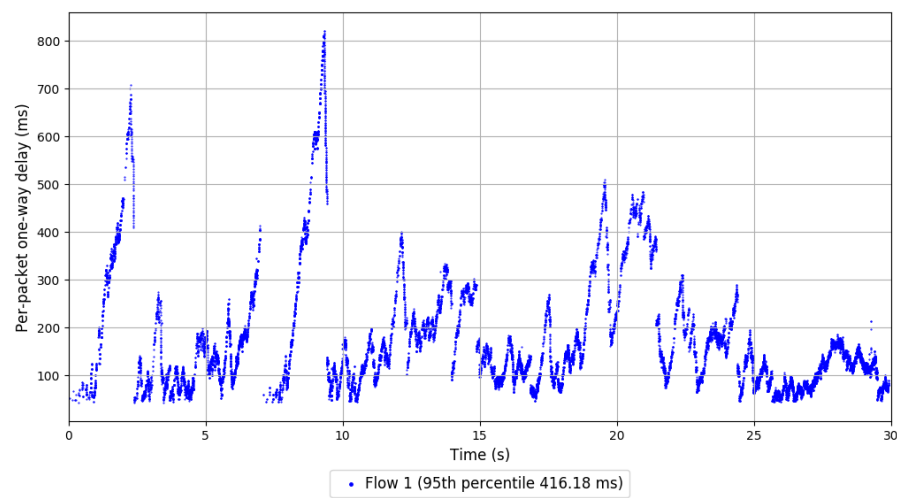
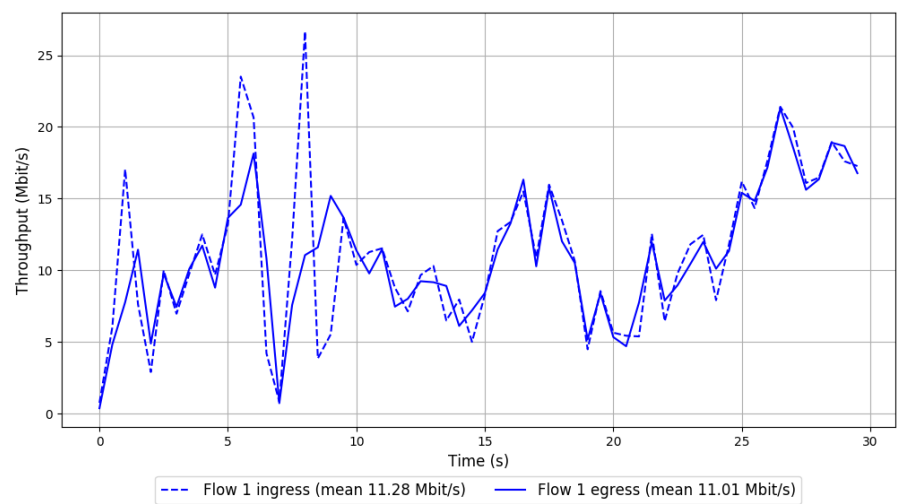


Run 1: Statistics of Verus

Start at: 2018-03-05 18:53:54
End at: 2018-03-05 18:54:24
Local clock offset: -15.929 ms
Remote clock offset: -6.989 ms

Below is generated by plot.py at 2018-03-05 19:40:53
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.01 Mbit/s
95th percentile per-packet one-way delay: 416.176 ms
Loss rate: 2.45%
-- Flow 1:
Average throughput: 11.01 Mbit/s
95th percentile per-packet one-way delay: 416.176 ms
Loss rate: 2.45%

Run 1: Report of Verus — Data Link

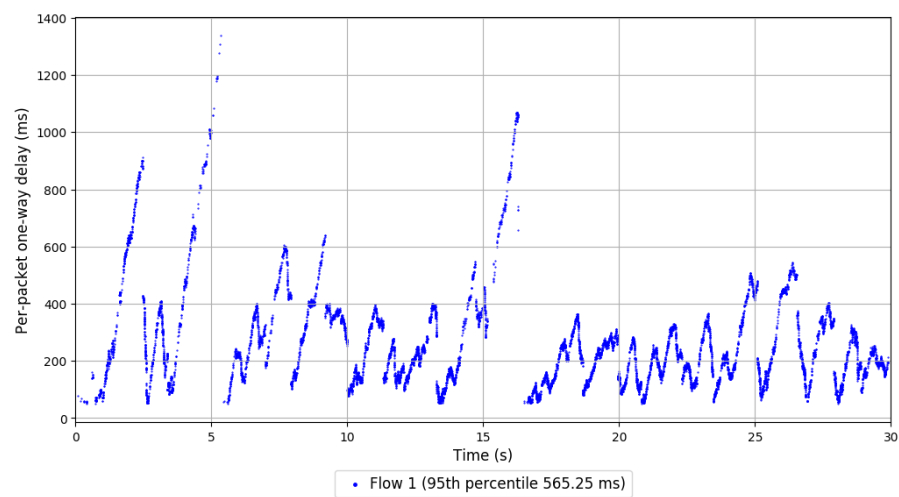
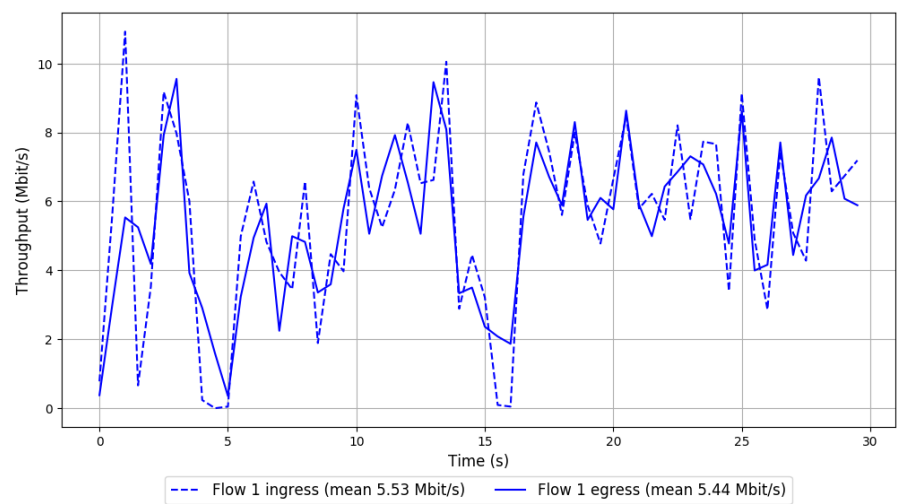


Run 2: Statistics of Verus

Start at: 2018-03-05 19:13:30
End at: 2018-03-05 19:14:00
Local clock offset: -7.324 ms
Remote clock offset: -6.065 ms

Below is generated by plot.py at 2018-03-05 19:40:53
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.44 Mbit/s
95th percentile per-packet one-way delay: 565.245 ms
Loss rate: 1.97%
-- Flow 1:
Average throughput: 5.44 Mbit/s
95th percentile per-packet one-way delay: 565.245 ms
Loss rate: 1.97%

Run 2: Report of Verus — Data Link

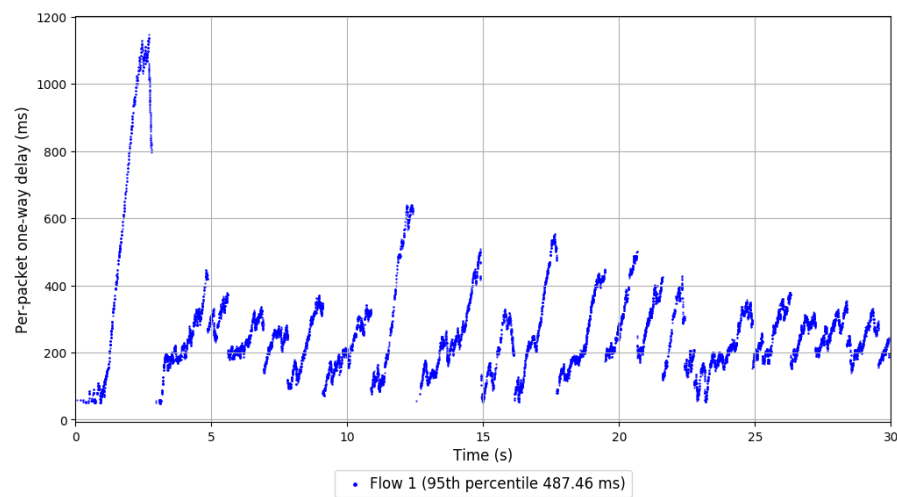
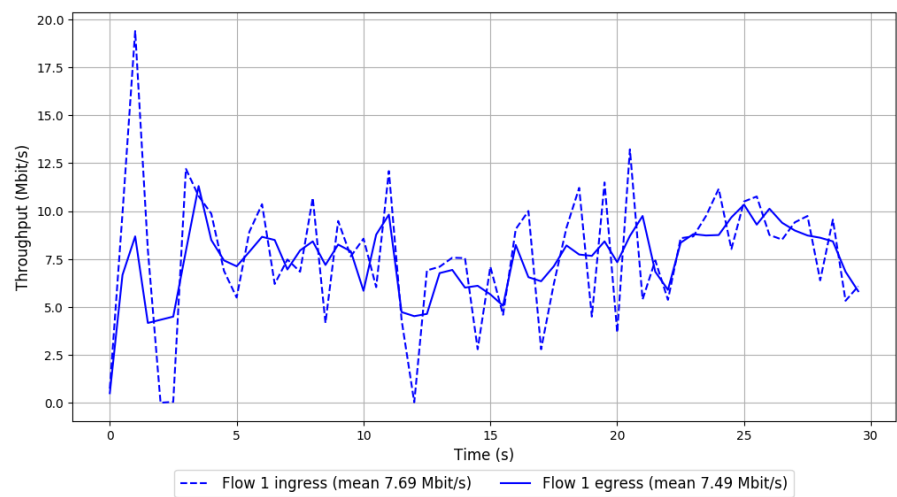


Run 3: Statistics of Verus

Start at: 2018-03-05 19:33:09
End at: 2018-03-05 19:33:39
Local clock offset: -5.106 ms
Remote clock offset: -0.486 ms

Below is generated by plot.py at 2018-03-05 19:40:53
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.49 Mbit/s
95th percentile per-packet one-way delay: 487.461 ms
Loss rate: 2.84%
-- Flow 1:
Average throughput: 7.49 Mbit/s
95th percentile per-packet one-way delay: 487.461 ms
Loss rate: 2.84%

Run 3: Report of Verus — Data Link

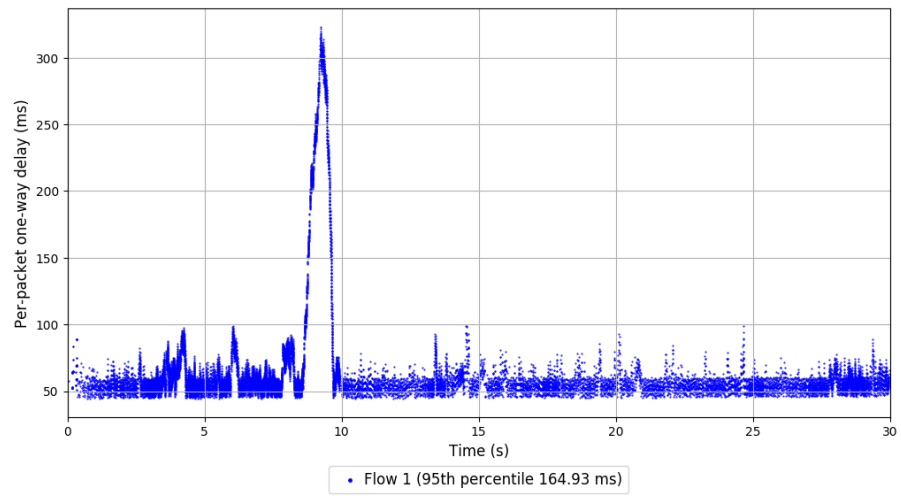
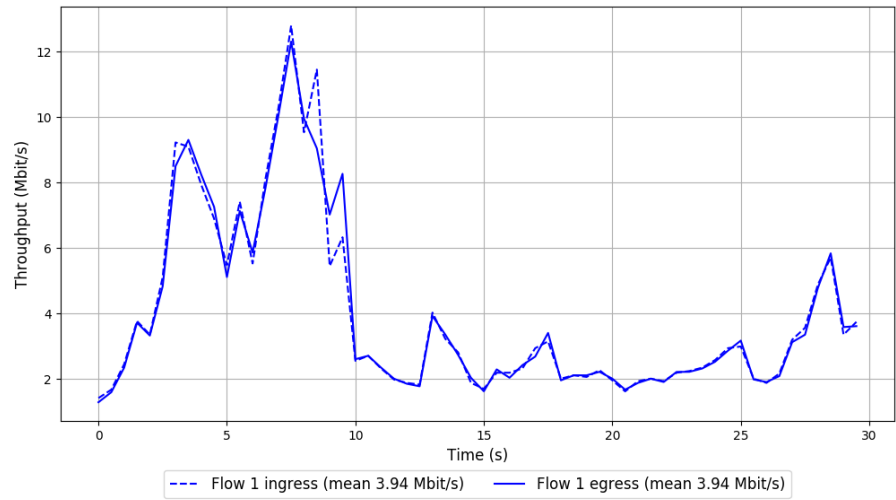


Run 1: Statistics of Copa

Start at: 2018-03-05 18:49:30
End at: 2018-03-05 18:50:00
Local clock offset: -25.217 ms
Remote clock offset: -6.939 ms

Below is generated by plot.py at 2018-03-05 19:40:53
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.94 Mbit/s
95th percentile per-packet one-way delay: 164.931 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 3.94 Mbit/s
95th percentile per-packet one-way delay: 164.931 ms
Loss rate: 0.19%

Run 1: Report of Copa — Data Link

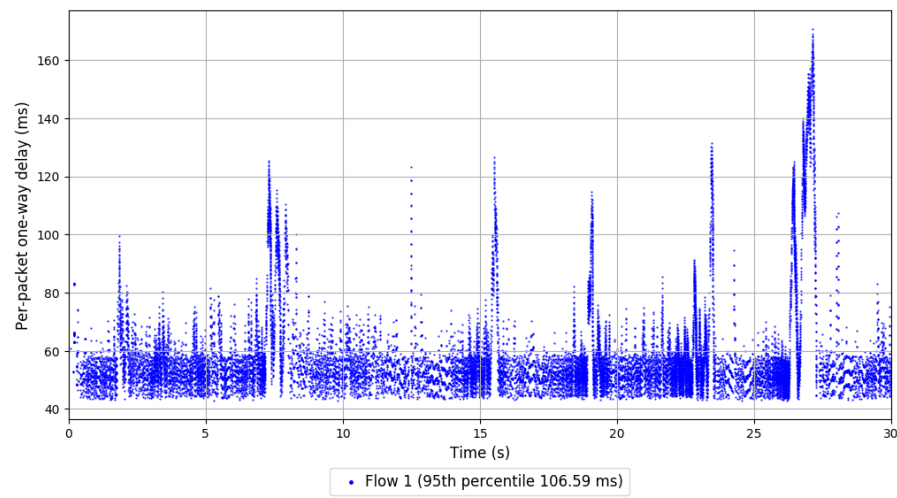
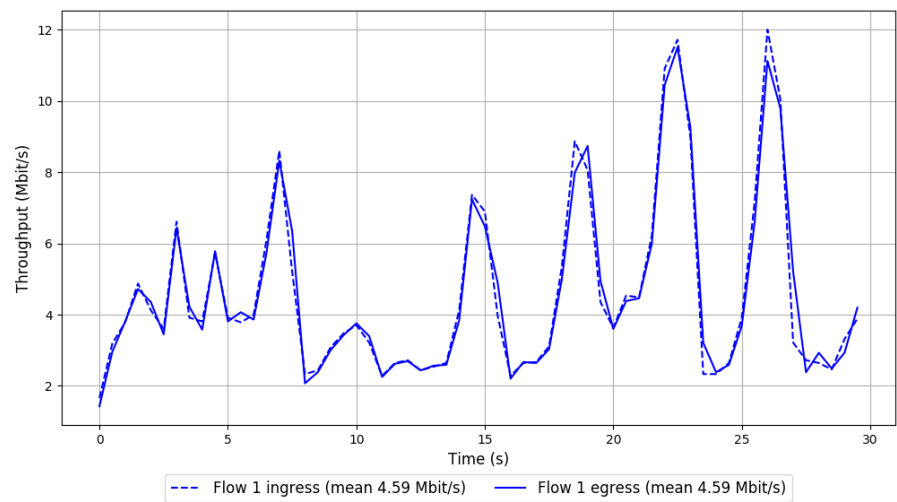


Run 2: Statistics of Copa

Start at: 2018-03-05 19:09:08
End at: 2018-03-05 19:09:39
Local clock offset: -7.039 ms
Remote clock offset: -6.234 ms

Below is generated by plot.py at 2018-03-05 19:40:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.59 Mbit/s
95th percentile per-packet one-way delay: 106.588 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 4.59 Mbit/s
95th percentile per-packet one-way delay: 106.588 ms
Loss rate: 0.13%

Run 2: Report of Copa — Data Link

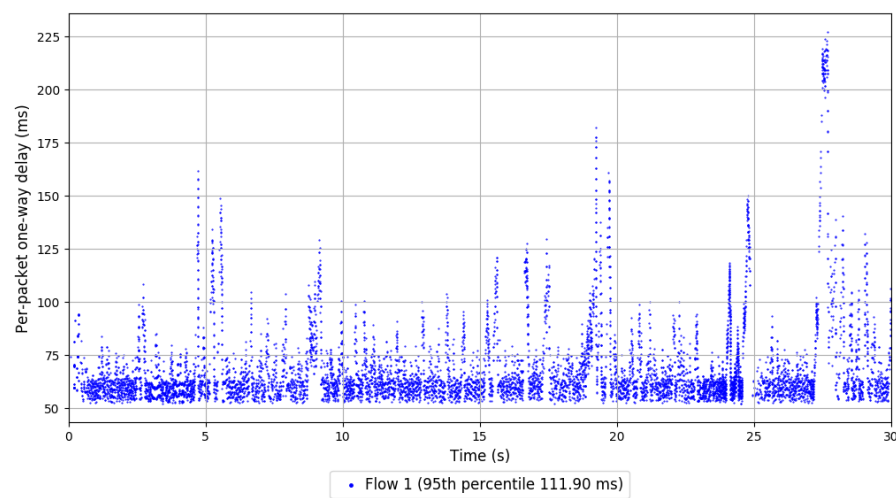
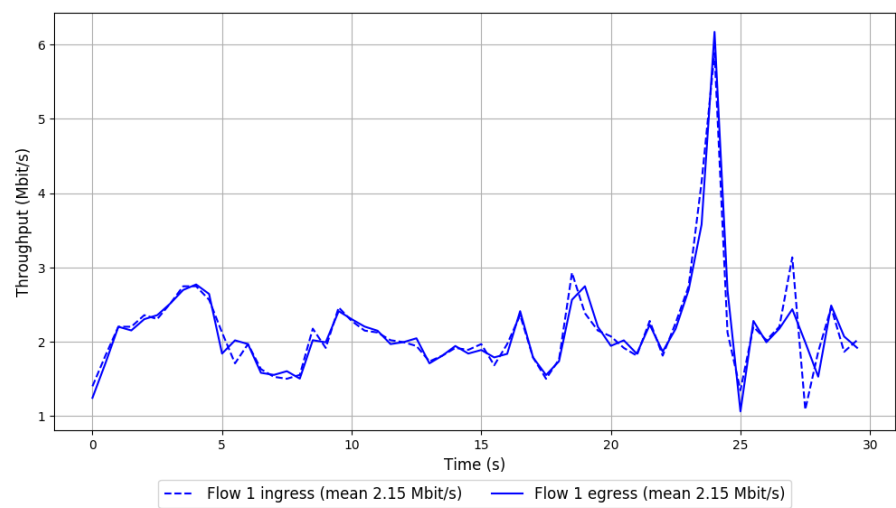


Run 3: Statistics of Copa

Start at: 2018-03-05 19:28:48
End at: 2018-03-05 19:29:18
Local clock offset: -7.716 ms
Remote clock offset: -1.597 ms

Below is generated by plot.py at 2018-03-05 19:40:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.15 Mbit/s
95th percentile per-packet one-way delay: 111.900 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 2.15 Mbit/s
95th percentile per-packet one-way delay: 111.900 ms
Loss rate: 0.24%

Run 3: Report of Copa — Data Link

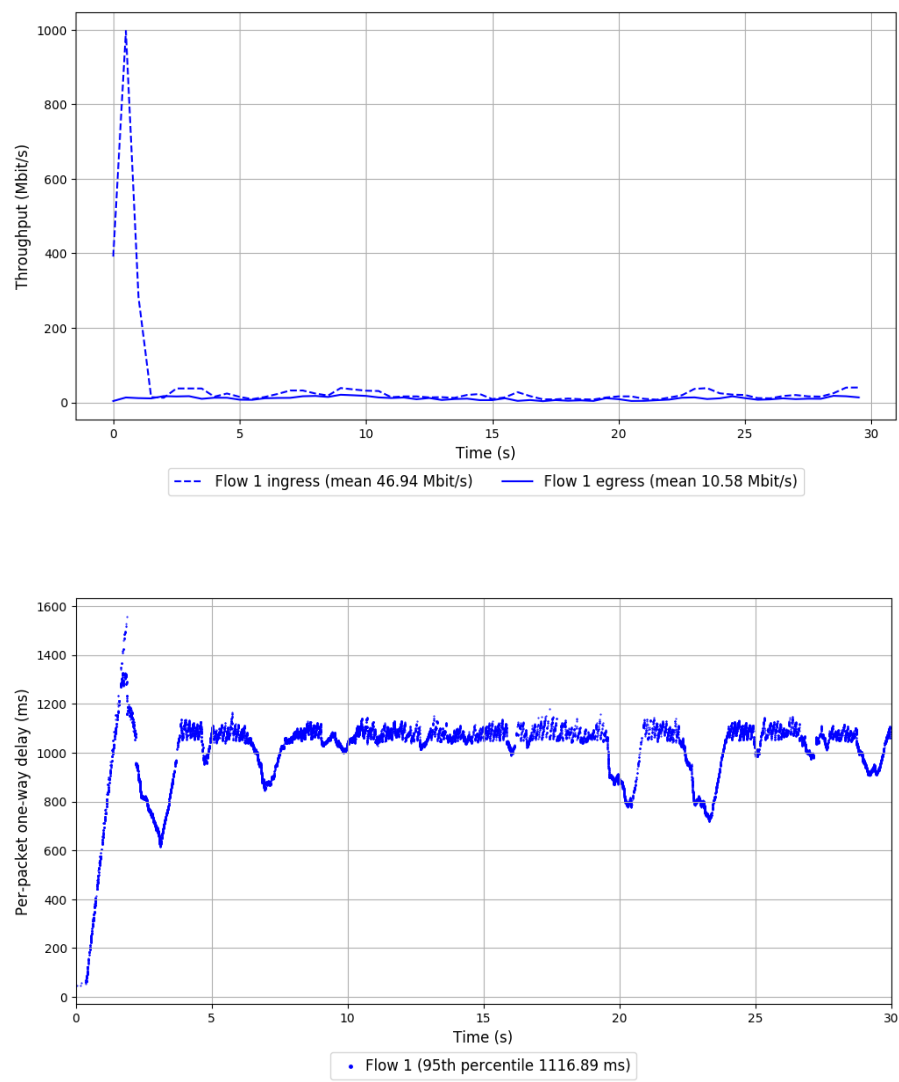


Run 1: Statistics of FillP

Start at: 2018-03-05 18:55:00
End at: 2018-03-05 18:55:30
Local clock offset: -12.944 ms
Remote clock offset: -5.665 ms

Below is generated by plot.py at 2018-03-05 19:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.58 Mbit/s
95th percentile per-packet one-way delay: 1116.893 ms
Loss rate: 77.50%
-- Flow 1:
Average throughput: 10.58 Mbit/s
95th percentile per-packet one-way delay: 1116.893 ms
Loss rate: 77.50%

Run 1: Report of FillP — Data Link

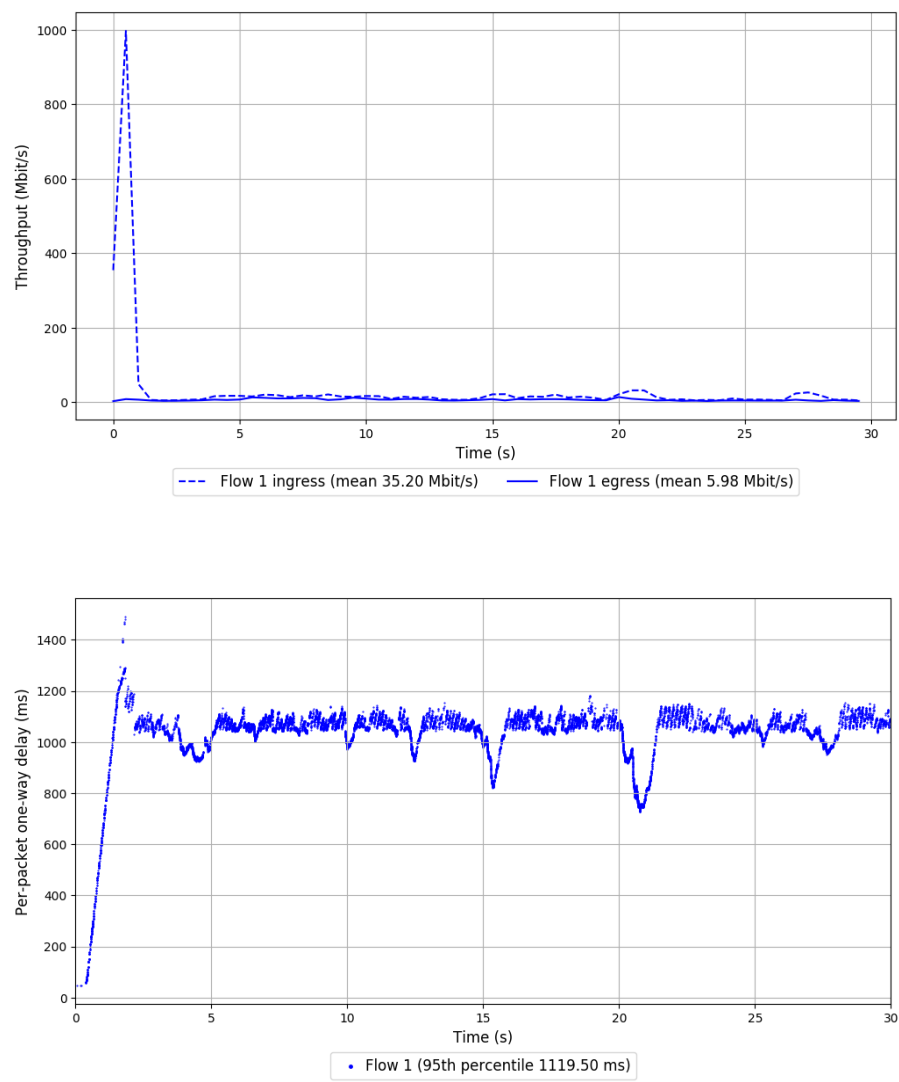


Run 2: Statistics of FillP

Start at: 2018-03-05 19:14:37
End at: 2018-03-05 19:15:07
Local clock offset: -7.768 ms
Remote clock offset: -5.794 ms

Below is generated by plot.py at 2018-03-05 19:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.98 Mbit/s
95th percentile per-packet one-way delay: 1119.500 ms
Loss rate: 83.05%
-- Flow 1:
Average throughput: 5.98 Mbit/s
95th percentile per-packet one-way delay: 1119.500 ms
Loss rate: 83.05%

Run 2: Report of FillP — Data Link

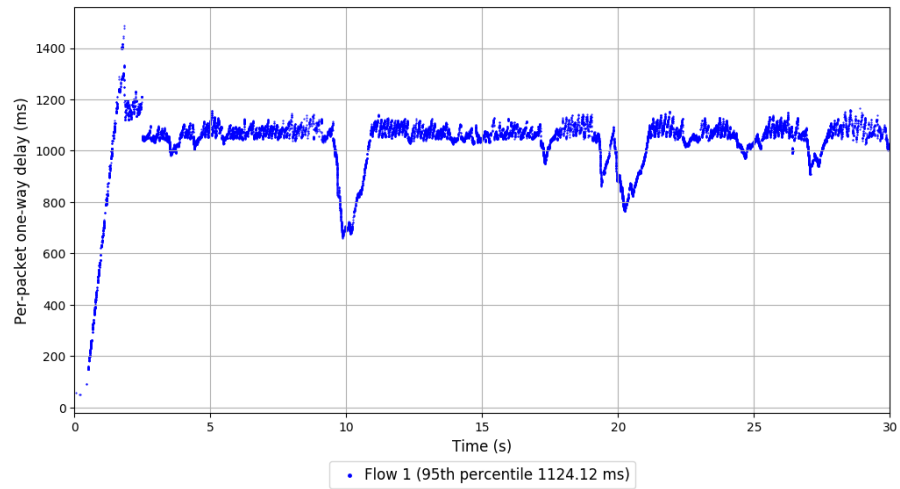
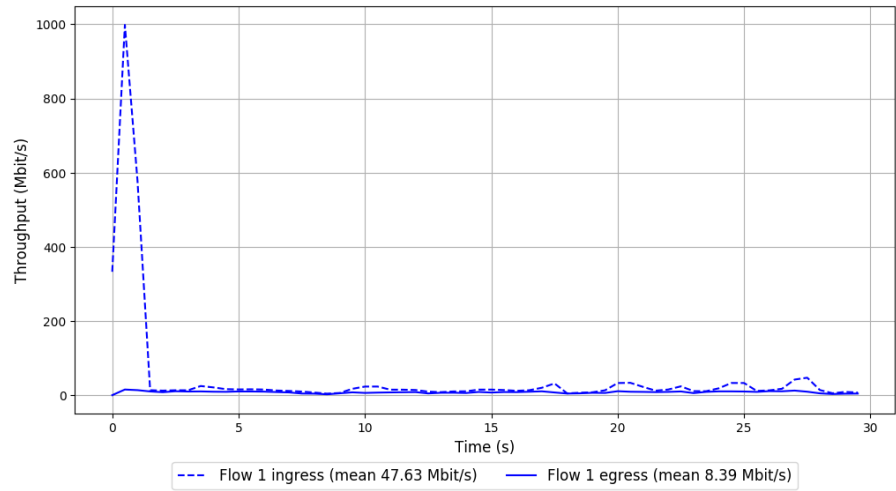


Run 3: Statistics of FillP

Start at: 2018-03-05 19:34:15
End at: 2018-03-05 19:34:45
Local clock offset: -2.729 ms
Remote clock offset: -1.644 ms

Below is generated by plot.py at 2018-03-05 19:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.39 Mbit/s
95th percentile per-packet one-way delay: 1124.123 ms
Loss rate: 82.42%
-- Flow 1:
Average throughput: 8.39 Mbit/s
95th percentile per-packet one-way delay: 1124.123 ms
Loss rate: 82.42%

Run 3: Report of FillP — Data Link

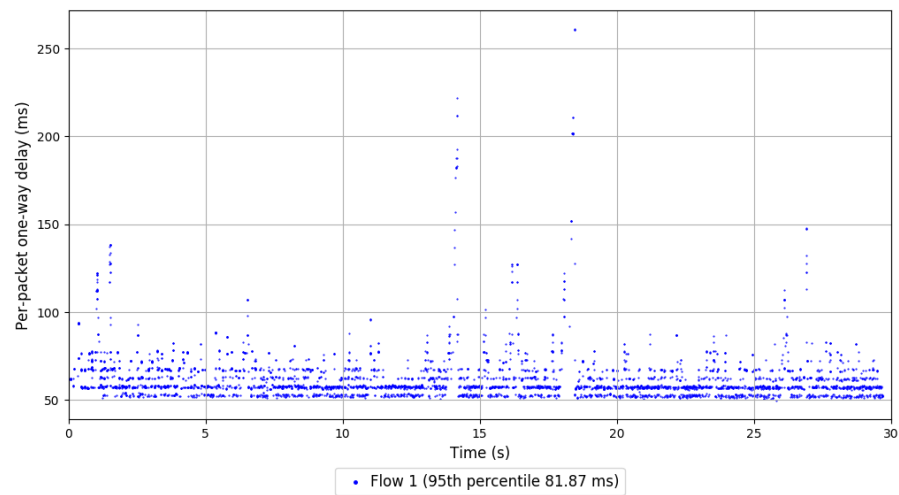
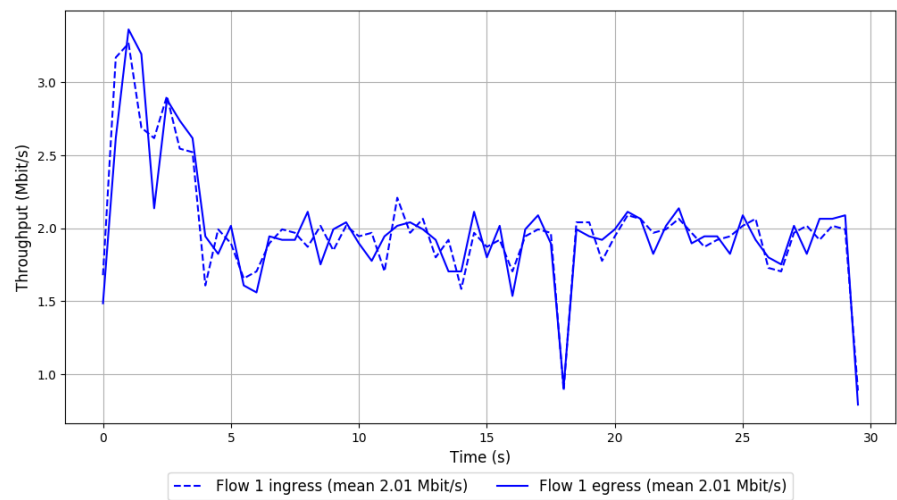


Run 1: Statistics of Indigo-1-32

Start at: 2018-03-05 18:47:19
End at: 2018-03-05 18:47:49
Local clock offset: -27.076 ms
Remote clock offset: -7.191 ms

Below is generated by plot.py at 2018-03-05 19:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.01 Mbit/s
95th percentile per-packet one-way delay: 81.871 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 2.01 Mbit/s
95th percentile per-packet one-way delay: 81.871 ms
Loss rate: 0.20%

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



Run 2: Statistics of Indigo-1-32

Start at: 2018-03-05 19:06:58

End at: 2018-03-05 19:07:28

Local clock offset: -9.229 ms

Remote clock offset: -6.763 ms

Below is generated by plot.py at 2018-03-05 19:41:13

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.17 Mbit/s

95th percentile per-packet one-way delay: 89.542 ms

Loss rate: 0.19%

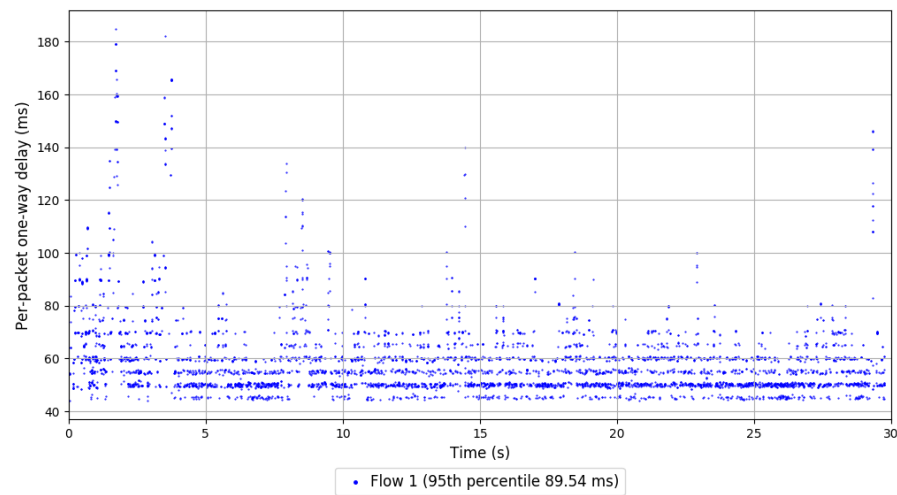
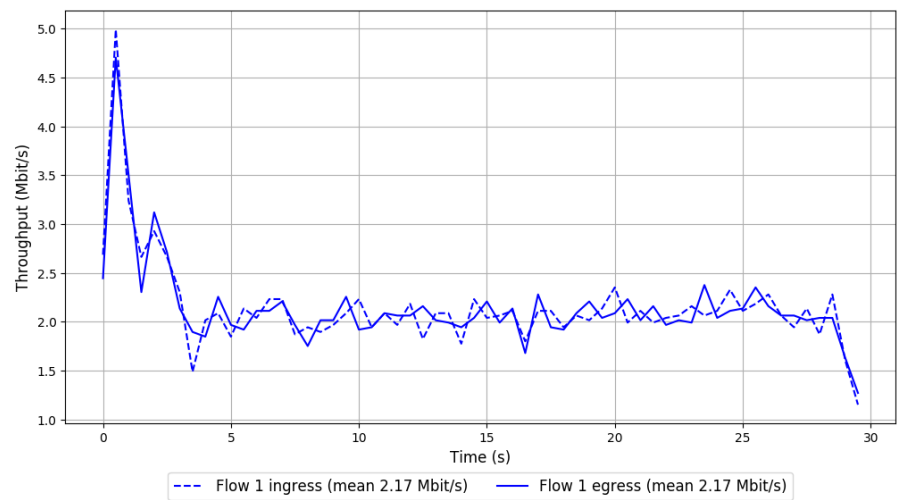
-- Flow 1:

Average throughput: 2.17 Mbit/s

95th percentile per-packet one-way delay: 89.542 ms

Loss rate: 0.19%

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

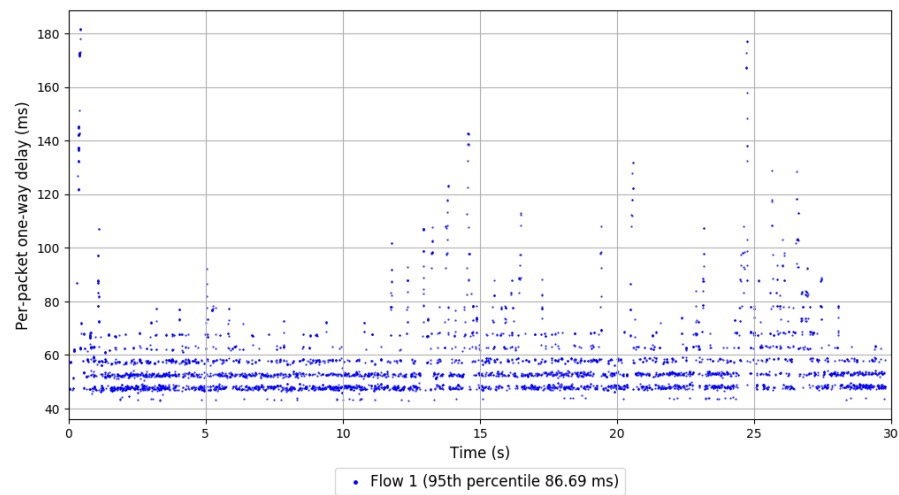
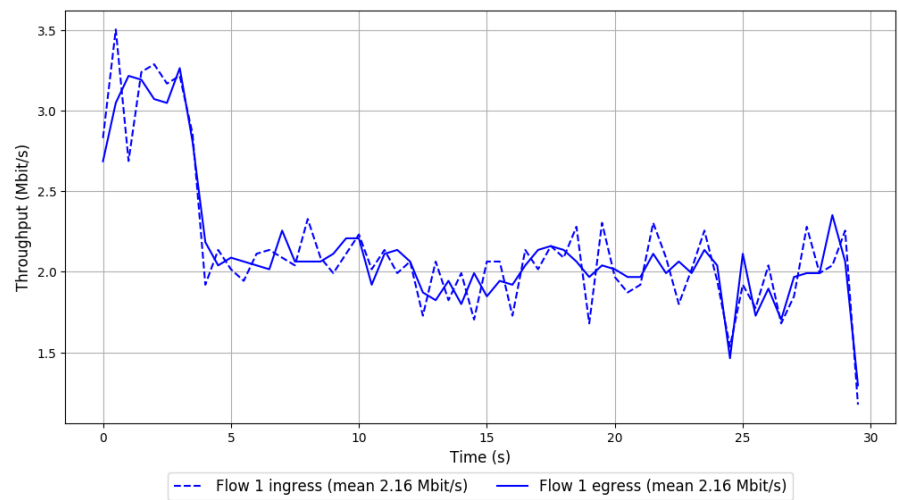


Run 3: Statistics of Indigo-1-32

Start at: 2018-03-05 19:26:37
End at: 2018-03-05 19:27:07
Local clock offset: -5.124 ms
Remote clock offset: -1.661 ms

Below is generated by plot.py at 2018-03-05 19:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 86.689 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 86.689 ms
Loss rate: 0.13%

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

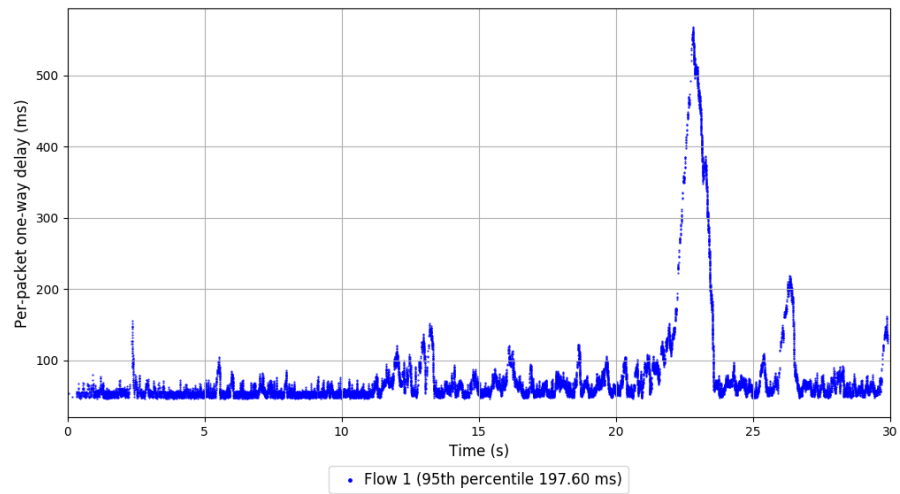
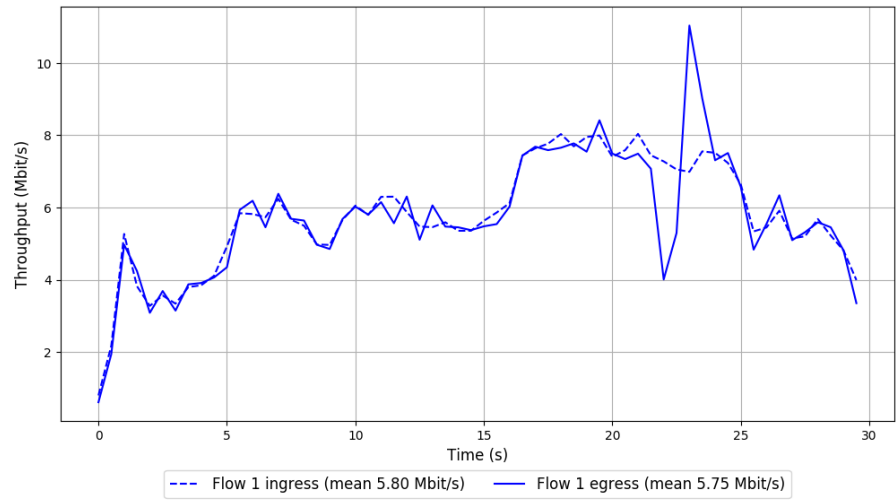


Run 1: Statistics of Vivace-latency

Start at: 2018-03-05 18:51:43
End at: 2018-03-05 18:52:13
Local clock offset: -21.014 ms
Remote clock offset: -6.688 ms

Below is generated by plot.py at 2018-03-05 19:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.75 Mbit/s
95th percentile per-packet one-way delay: 197.602 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 5.75 Mbit/s
95th percentile per-packet one-way delay: 197.602 ms
Loss rate: 0.83%

Run 1: Report of Vivace-latency — Data Link

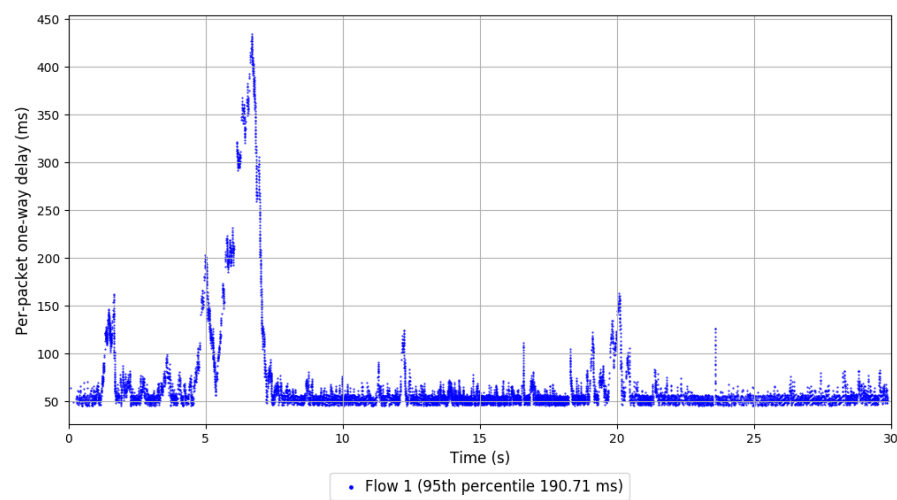
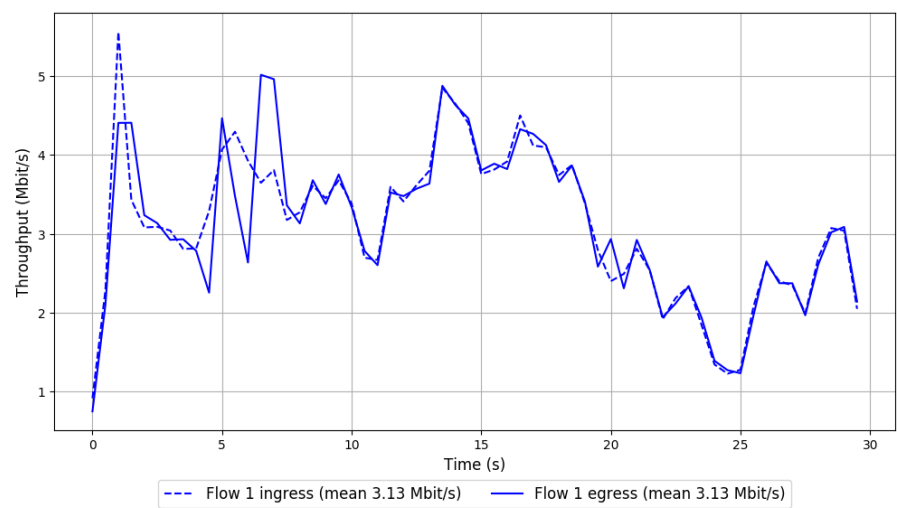


Run 2: Statistics of Vivace-latency

Start at: 2018-03-05 19:11:20
End at: 2018-03-05 19:11:50
Local clock offset: -8.344 ms
Remote clock offset: -6.733 ms

Below is generated by plot.py at 2018-03-05 19:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.13 Mbit/s
95th percentile per-packet one-way delay: 190.706 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 3.13 Mbit/s
95th percentile per-packet one-way delay: 190.706 ms
Loss rate: 0.24%

Run 2: Report of Vivace-latency — Data Link

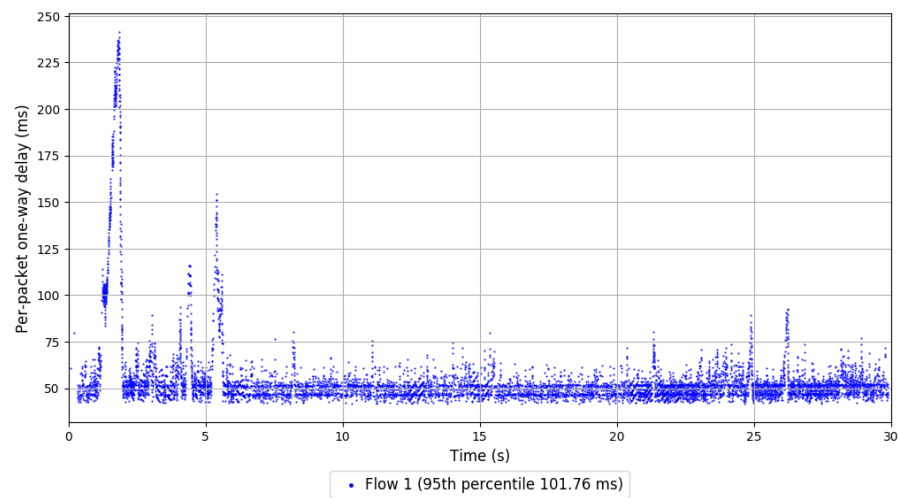
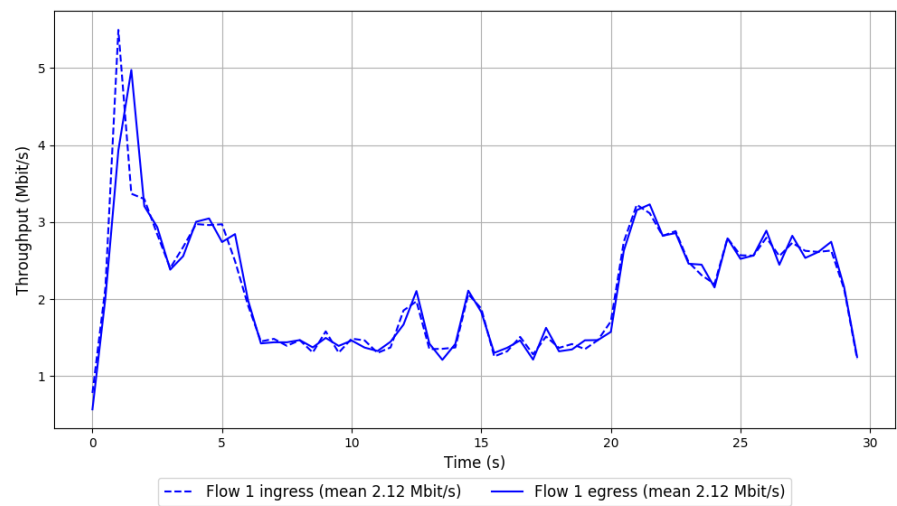


Run 3: Statistics of Vivace-latency

Start at: 2018-03-05 19:30:59
End at: 2018-03-05 19:31:29
Local clock offset: -3.888 ms
Remote clock offset: -2.126 ms

Below is generated by plot.py at 2018-03-05 19:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.12 Mbit/s
95th percentile per-packet one-way delay: 101.756 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 2.12 Mbit/s
95th percentile per-packet one-way delay: 101.756 ms
Loss rate: 0.13%

Run 3: Report of Vivace-latency — Data Link

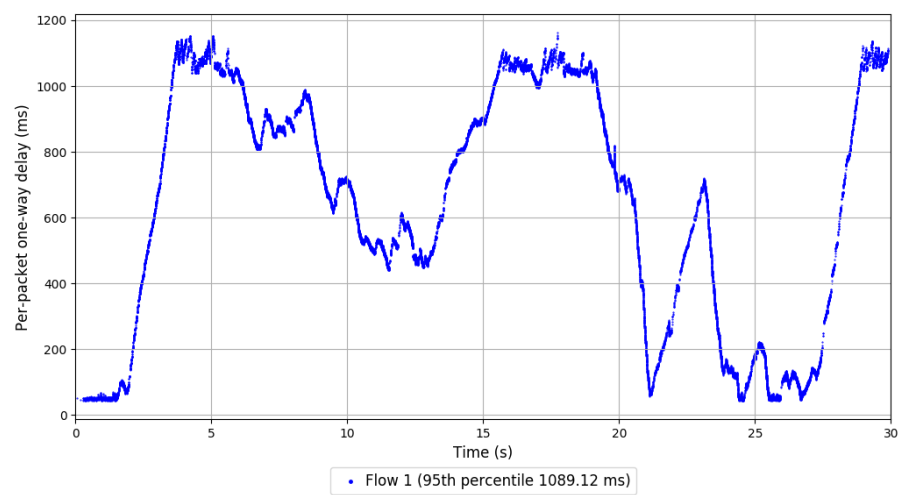
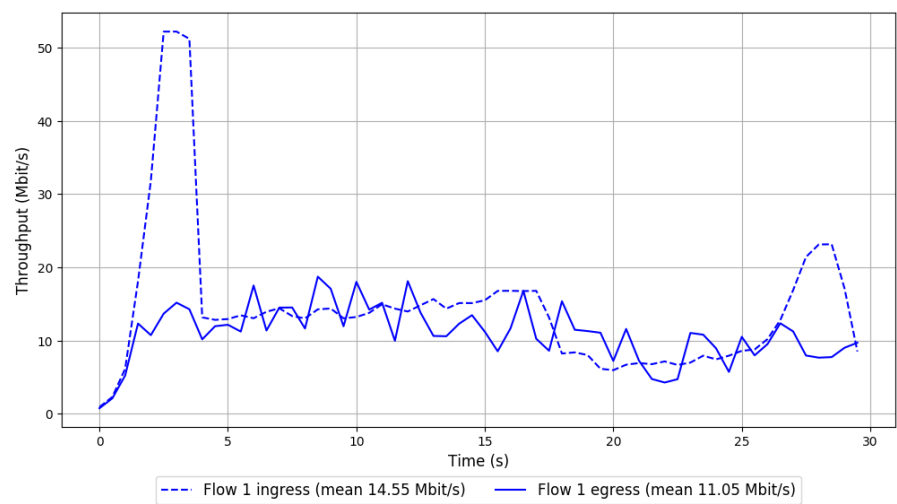


Run 1: Statistics of Vivace-loss

Start at: 2018-03-05 18:50:37
End at: 2018-03-05 18:51:07
Local clock offset: -20.374 ms
Remote clock offset: -7.05 ms

Below is generated by plot.py at 2018-03-05 19:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.05 Mbit/s
95th percentile per-packet one-way delay: 1089.115 ms
Loss rate: 24.17%
-- Flow 1:
Average throughput: 11.05 Mbit/s
95th percentile per-packet one-way delay: 1089.115 ms
Loss rate: 24.17%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-03-05 19:10:14

End at: 2018-03-05 19:10:44

Local clock offset: -9.556 ms

Remote clock offset: -6.873 ms

Below is generated by plot.py at 2018-03-05 19:41:13

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.89 Mbit/s

95th percentile per-packet one-way delay: 1091.576 ms

Loss rate: 27.27%

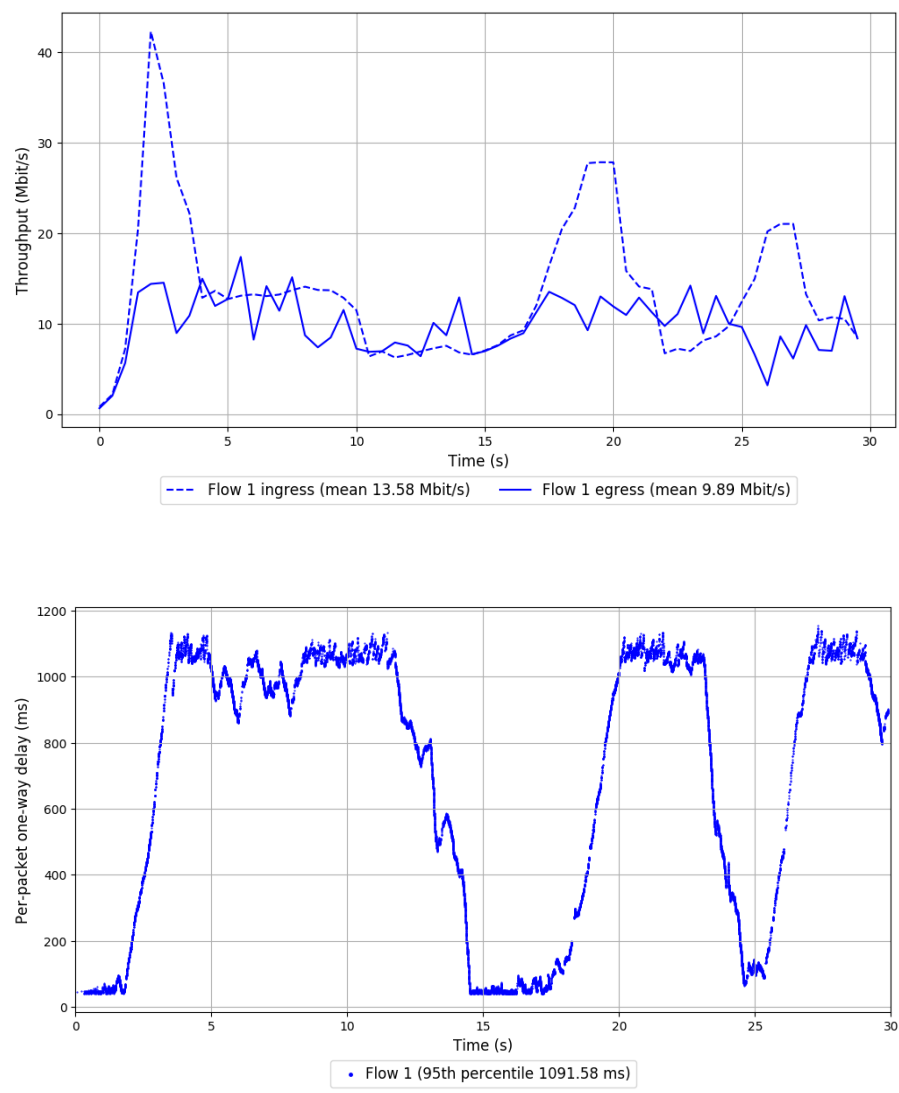
-- Flow 1:

Average throughput: 9.89 Mbit/s

95th percentile per-packet one-way delay: 1091.576 ms

Loss rate: 27.27%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-03-05 19:29:53

End at: 2018-03-05 19:30:23

Local clock offset: -7.18 ms

Remote clock offset: -2.468 ms

Below is generated by plot.py at 2018-03-05 19:41:13

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.46 Mbit/s

95th percentile per-packet one-way delay: 1098.007 ms

Loss rate: 26.38%

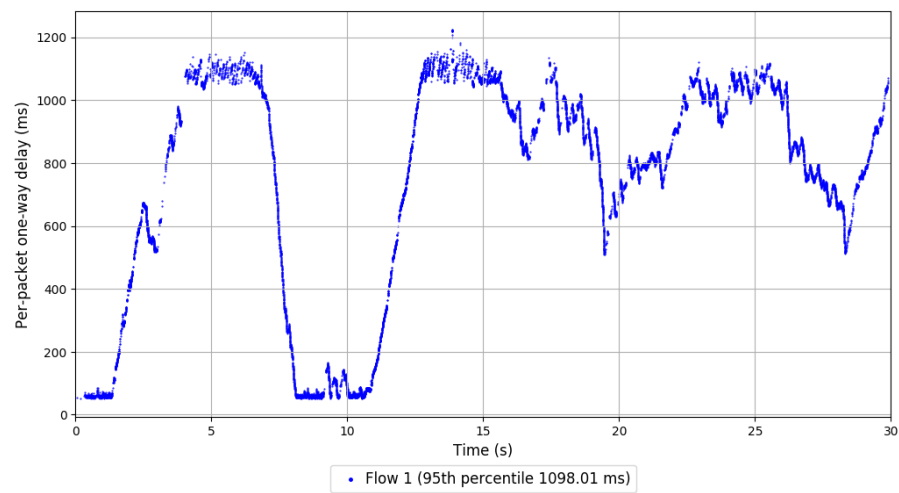
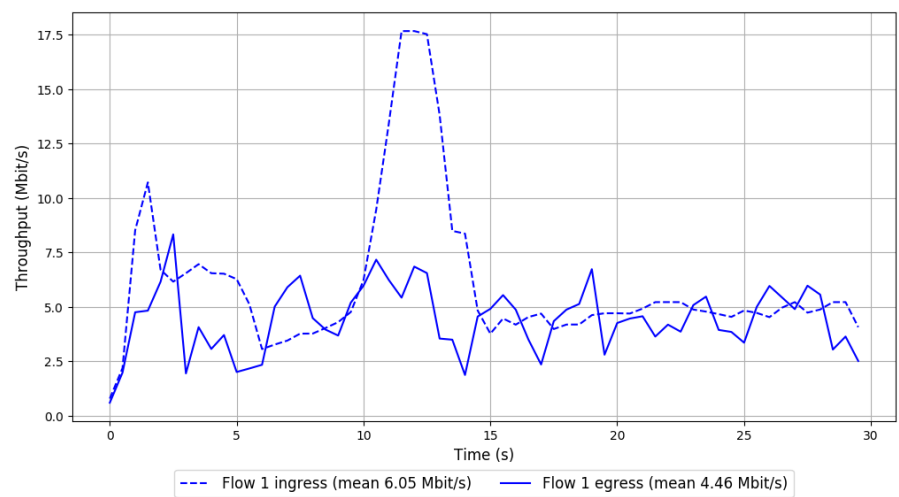
-- Flow 1:

Average throughput: 4.46 Mbit/s

95th percentile per-packet one-way delay: 1098.007 ms

Loss rate: 26.38%

Run 3: Report of Vivace-loss — Data Link

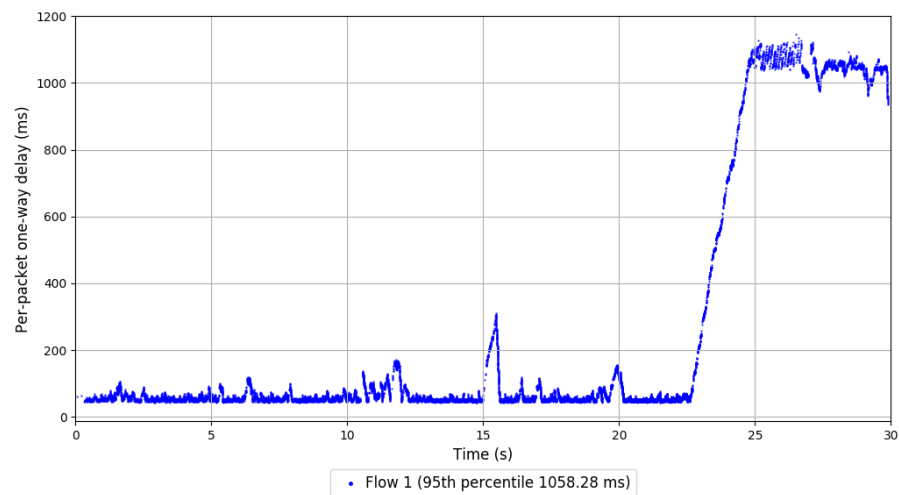
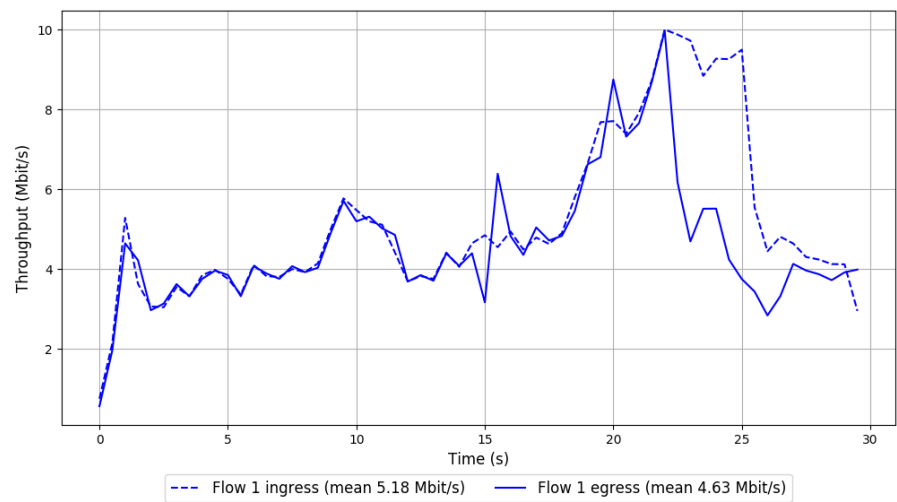


Run 1: Statistics of Vivace-LTE

Start at: 2018-03-05 18:40:48
End at: 2018-03-05 18:41:18
Local clock offset: -19.773 ms
Remote clock offset: -9.639 ms

Below is generated by plot.py at 2018-03-05 19:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.63 Mbit/s
95th percentile per-packet one-way delay: 1058.276 ms
Loss rate: 10.89%
-- Flow 1:
Average throughput: 4.63 Mbit/s
95th percentile per-packet one-way delay: 1058.276 ms
Loss rate: 10.89%

Run 1: Report of Vivace-LTE — Data Link

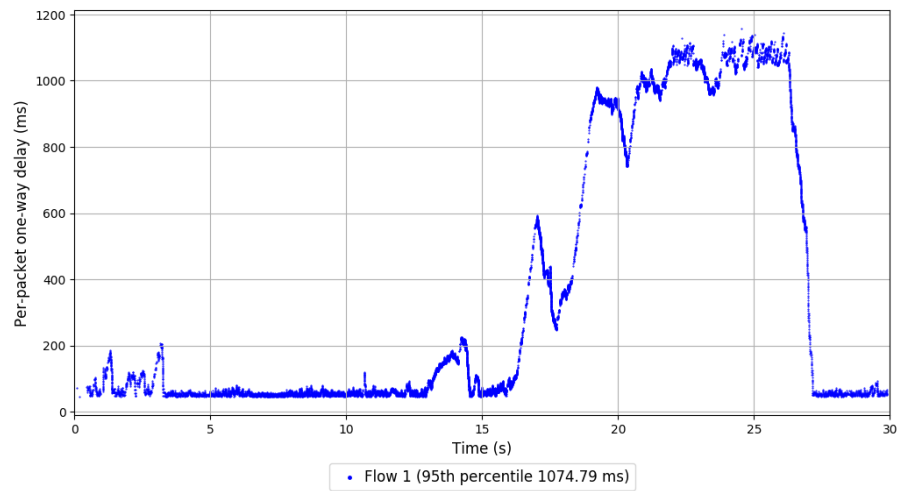
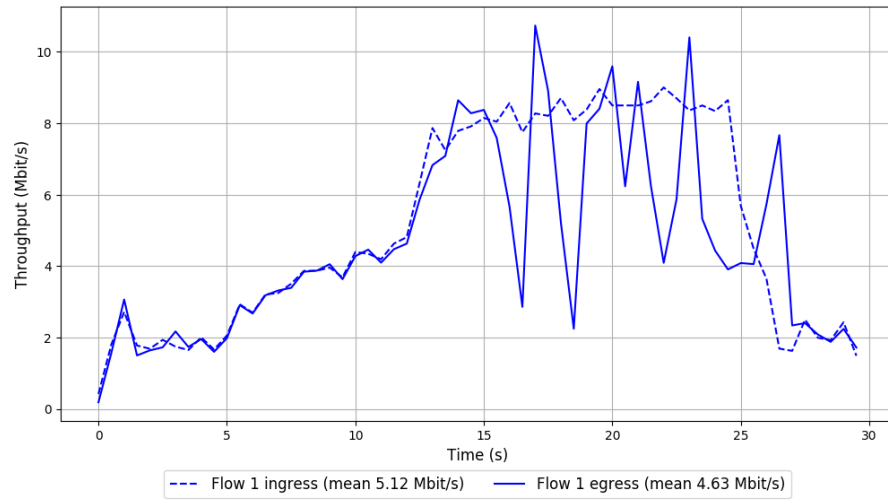


Run 2: Statistics of Vivace-LTE

Start at: 2018-03-05 19:00:27
End at: 2018-03-05 19:00:57
Local clock offset: -10.878 ms
Remote clock offset: -7.128 ms

Below is generated by plot.py at 2018-03-05 19:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.63 Mbit/s
95th percentile per-packet one-way delay: 1074.790 ms
Loss rate: 9.82%
-- Flow 1:
Average throughput: 4.63 Mbit/s
95th percentile per-packet one-way delay: 1074.790 ms
Loss rate: 9.82%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-03-05 19:20:06
End at: 2018-03-05 19:20:36
Local clock offset: -9.664 ms
Remote clock offset: -3.458 ms

Below is generated by plot.py at 2018-03-05 19:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.77 Mbit/s
95th percentile per-packet one-way delay: 195.723 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 6.77 Mbit/s
95th percentile per-packet one-way delay: 195.723 ms
Loss rate: 0.74%

Run 3: Report of Vivace-LTE — Data Link

