

Pantheon Report

Generated at 2018-03-20 07:46:08 (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).

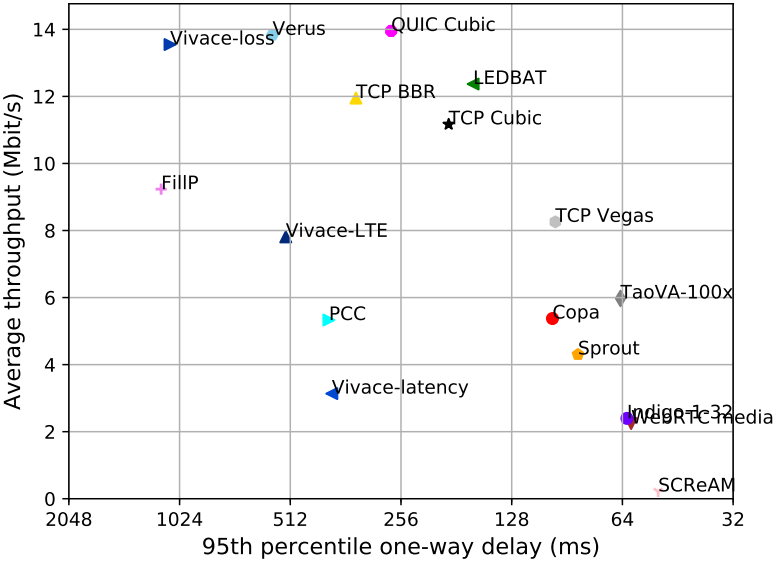
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

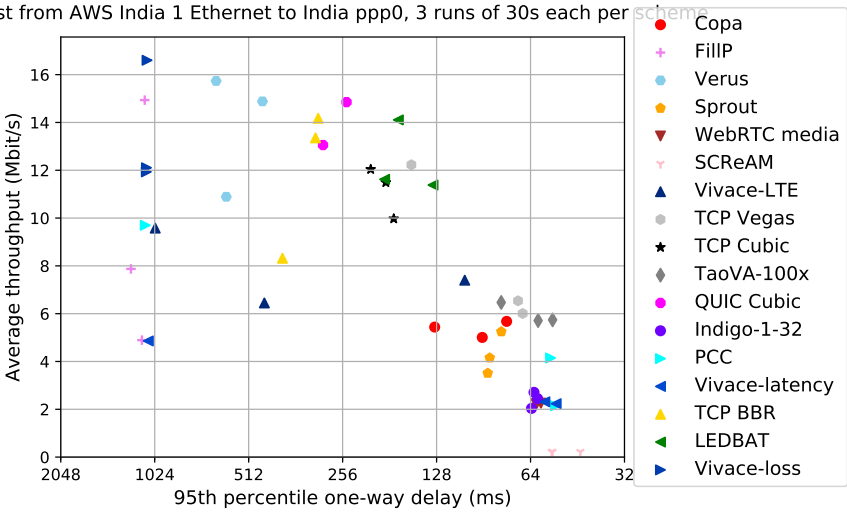
Git summary:

```
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



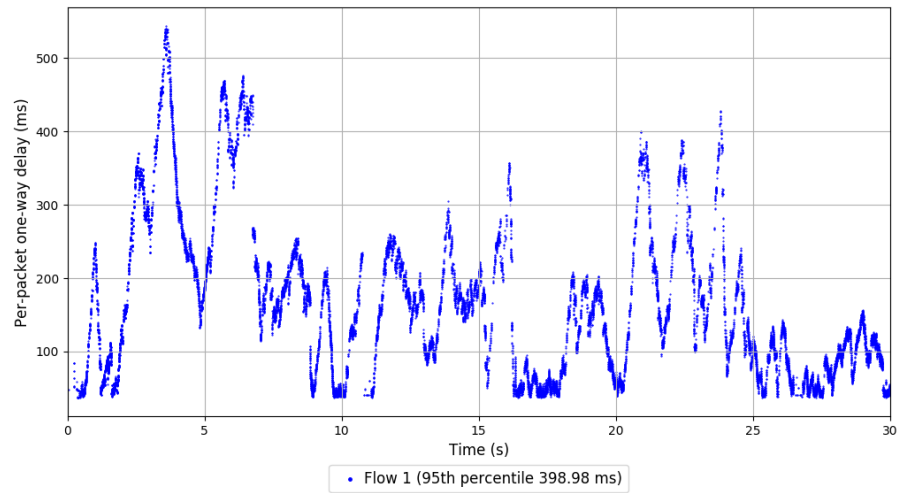
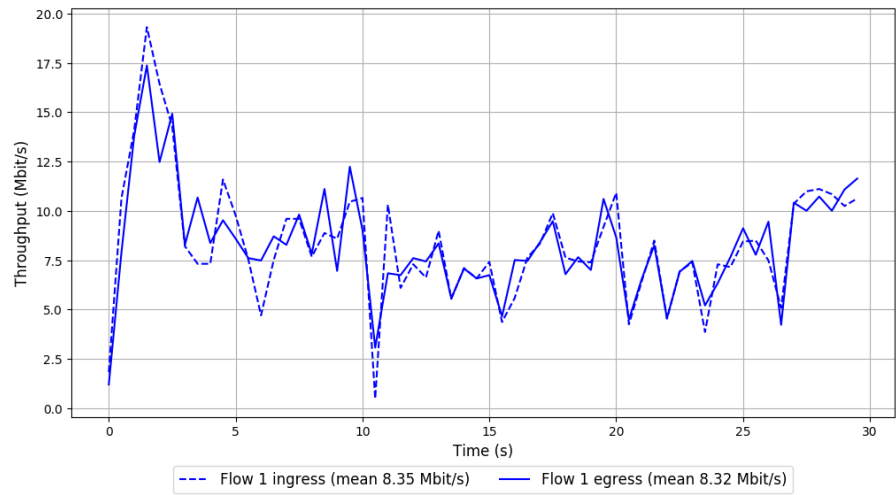
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	11.95	339.44	0.49
TCP Cubic	3	11.17	189.95	0.39
LEDBAT	3	12.37	163.01	0.15
PCC	3	5.33	402.00	14.54
QUIC Cubic	2	13.95	272.28	0.43
SCReAM	3	0.22	51.16	0.13
WebRTC media	3	2.24	60.60	0.12
Sprout	3	4.30	84.55	0.00
TaoVA-100x	3	5.97	64.78	0.12
TCP Vegas	3	8.26	97.39	0.09
Verus	3	13.84	572.43	1.22
Copa	3	5.38	99.18	0.17
FillP	3	9.23	1149.24	81.40
Indigo-1-32	3	2.40	62.22	0.15
Vivace-latency	3	3.14	394.80	5.77
Vivace-loss	3	13.55	1086.95	34.83
Vivace-LTE	3	7.81	526.70	1.33

Run 1: Statistics of TCP BBR

Start at: 2018-03-20 07:01:48
End at: 2018-03-20 07:02:18
Local clock offset: -16.759 ms
Remote clock offset: -0.644 ms

Below is generated by plot.py at 2018-03-20 07:44:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.32 Mbit/s
95th percentile per-packet one-way delay: 398.975 ms
Loss rate: 0.51%
-- Flow 1:
Average throughput: 8.32 Mbit/s
95th percentile per-packet one-way delay: 398.975 ms
Loss rate: 0.51%

Run 1: Report of TCP BBR — Data Link

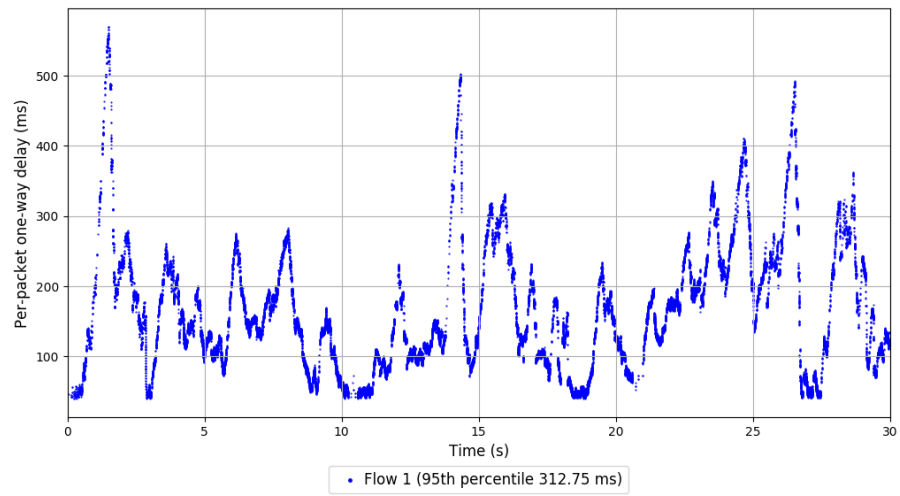
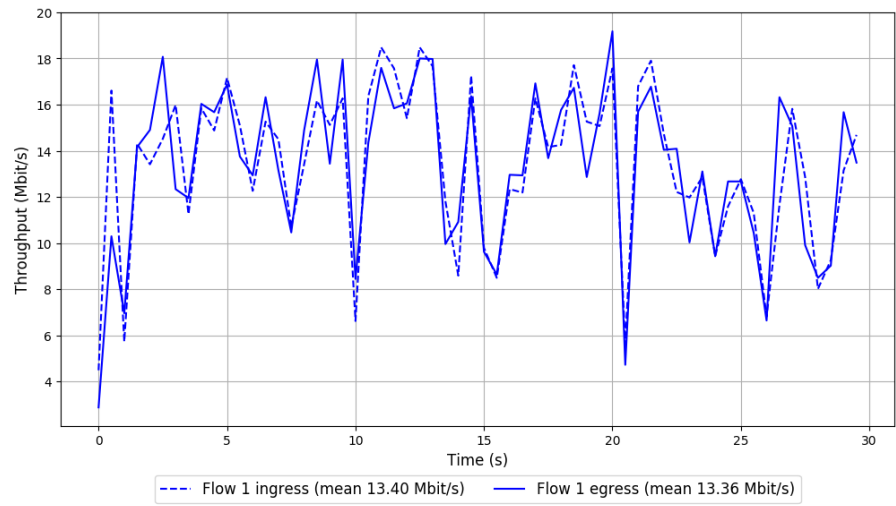


Run 2: Statistics of TCP BBR

Start at: 2018-03-20 07:21:29
End at: 2018-03-20 07:21:59
Local clock offset: -17.893 ms
Remote clock offset: -4.586 ms

Below is generated by plot.py at 2018-03-20 07:45:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.36 Mbit/s
95th percentile per-packet one-way delay: 312.747 ms
Loss rate: 0.51%
-- Flow 1:
Average throughput: 13.36 Mbit/s
95th percentile per-packet one-way delay: 312.747 ms
Loss rate: 0.51%

Run 2: Report of TCP BBR — Data Link

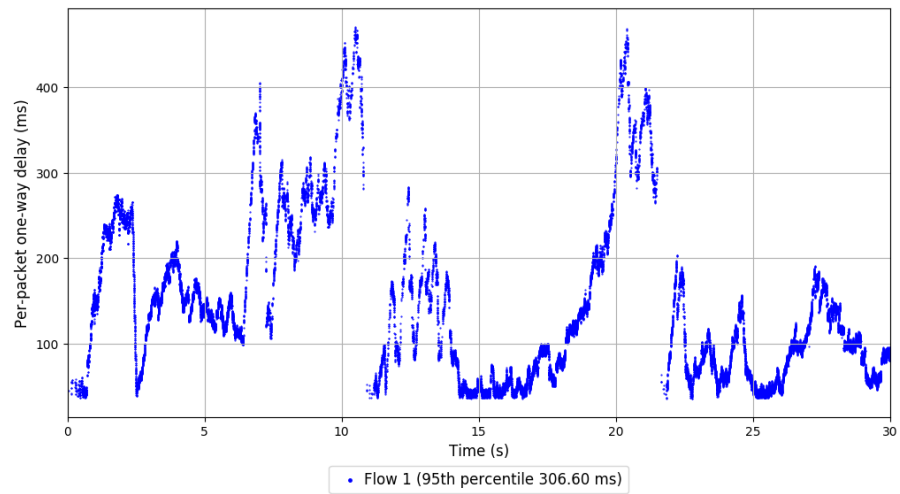
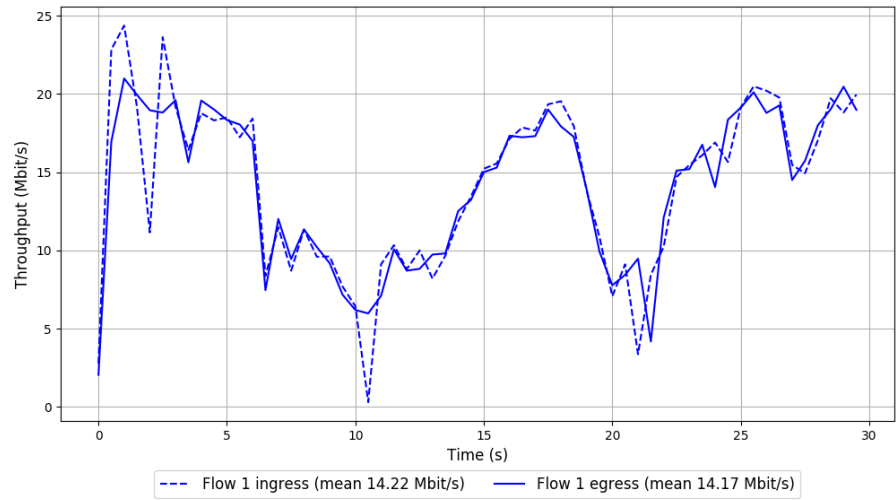


Run 3: Statistics of TCP BBR

Start at: 2018-03-20 07:41:06
End at: 2018-03-20 07:41:36
Local clock offset: -4.001 ms
Remote clock offset: -2.974 ms

Below is generated by plot.py at 2018-03-20 07:45:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 14.17 Mbit/s
95th percentile per-packet one-way delay: 306.602 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 14.17 Mbit/s
95th percentile per-packet one-way delay: 306.602 ms
Loss rate: 0.44%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-03-20 06:45:20

End at: 2018-03-20 06:45:50

Local clock offset: -24.4 ms

Remote clock offset: 1.963 ms

Below is generated by plot.py at 2018-03-20 07:45:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.97 Mbit/s

95th percentile per-packet one-way delay: 175.596 ms

Loss rate: 0.38%

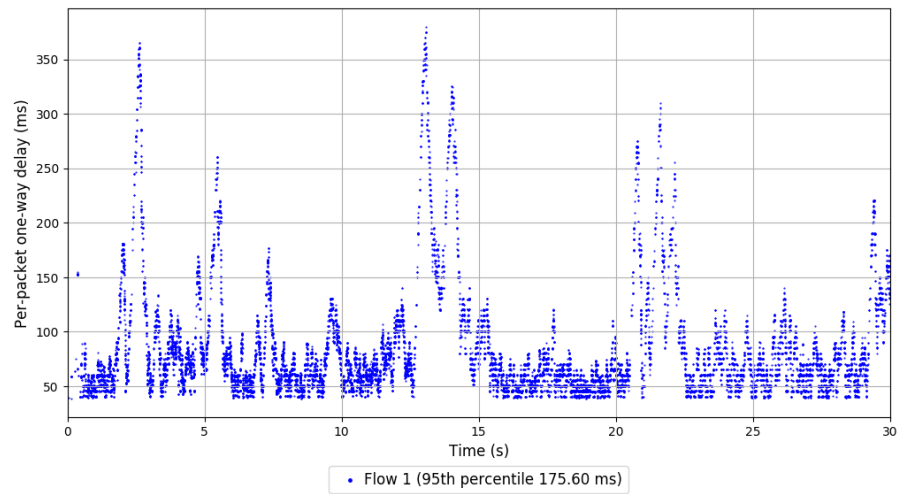
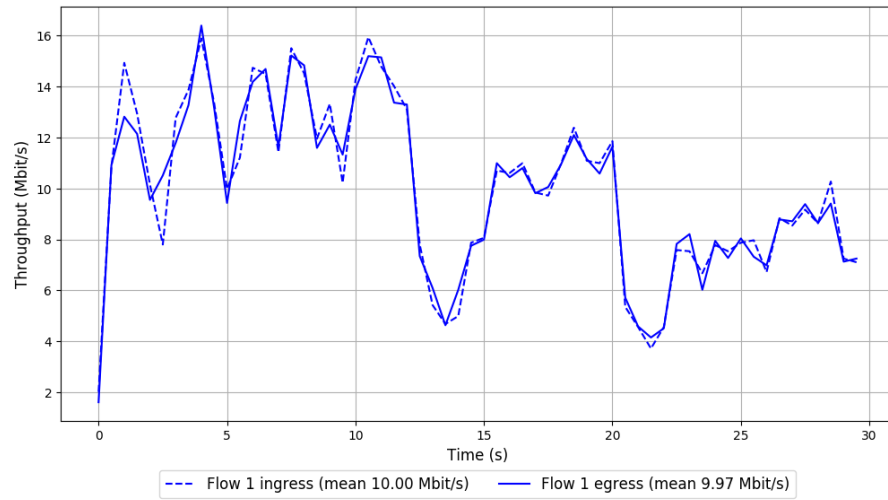
-- Flow 1:

Average throughput: 9.97 Mbit/s

95th percentile per-packet one-way delay: 175.596 ms

Loss rate: 0.38%

Run 1: Report of TCP Cubic — Data Link

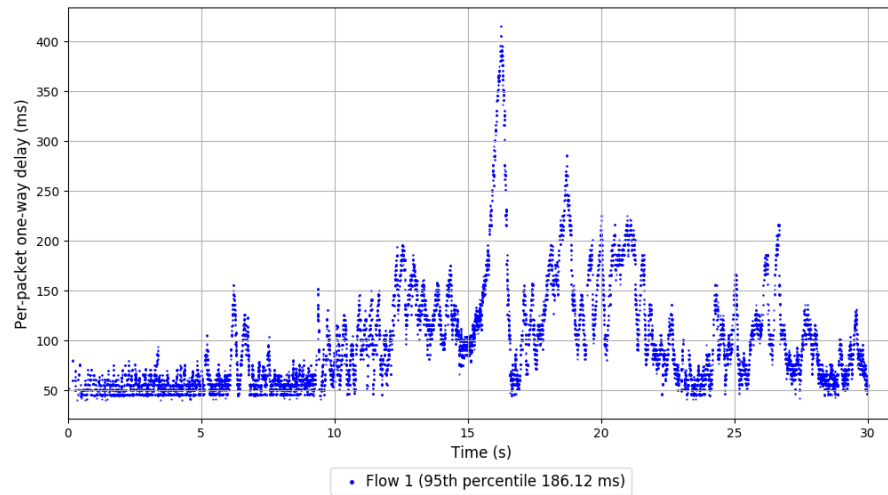
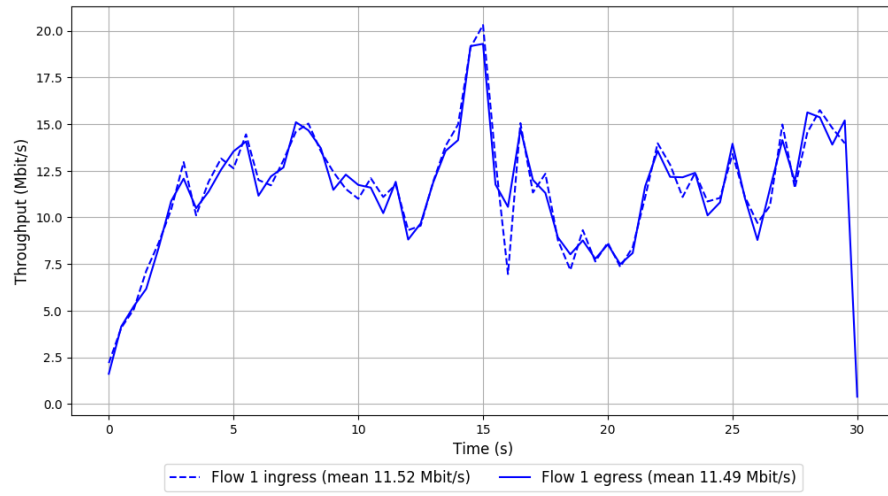


Run 2: Statistics of TCP Cubic

Start at: 2018-03-20 07:05:08
End at: 2018-03-20 07:05:38
Local clock offset: -19.11 ms
Remote clock offset: -0.656 ms

Below is generated by plot.py at 2018-03-20 07:45:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.49 Mbit/s
95th percentile per-packet one-way delay: 186.118 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 11.49 Mbit/s
95th percentile per-packet one-way delay: 186.118 ms
Loss rate: 0.41%

Run 2: Report of TCP Cubic — Data Link

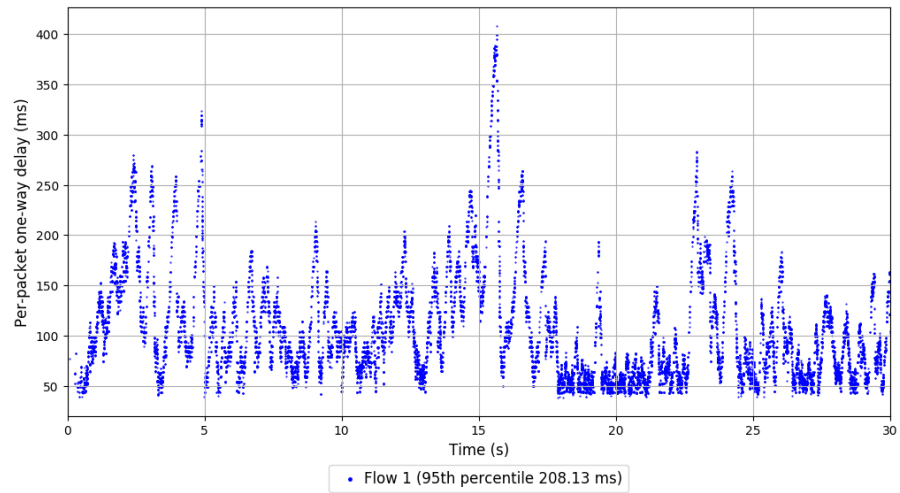
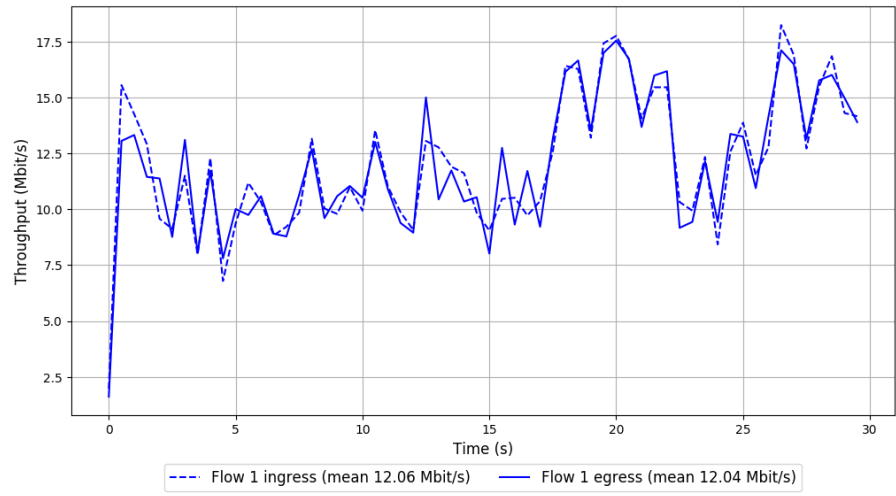


Run 3: Statistics of TCP Cubic

Start at: 2018-03-20 07:24:44
End at: 2018-03-20 07:25:14
Local clock offset: -18.832 ms
Remote clock offset: -4.901 ms

Below is generated by plot.py at 2018-03-20 07:45:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.04 Mbit/s
95th percentile per-packet one-way delay: 208.126 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 12.04 Mbit/s
95th percentile per-packet one-way delay: 208.126 ms
Loss rate: 0.37%

Run 3: Report of TCP Cubic — Data Link

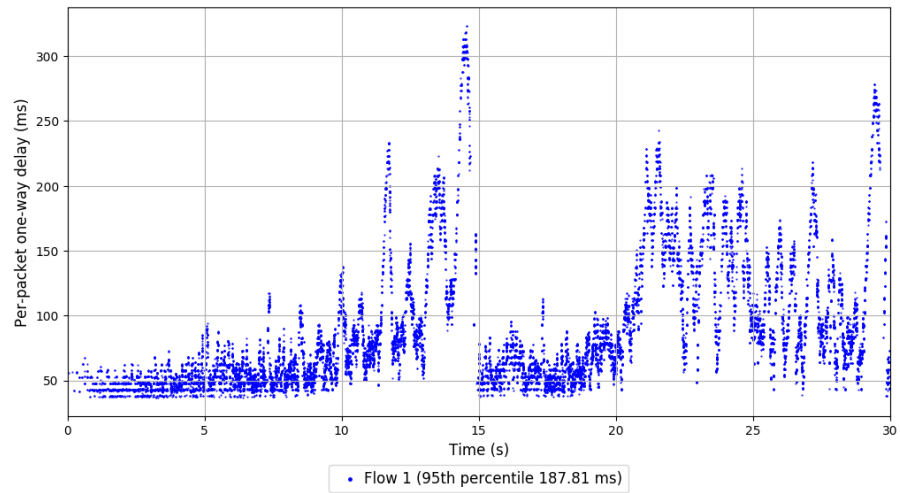
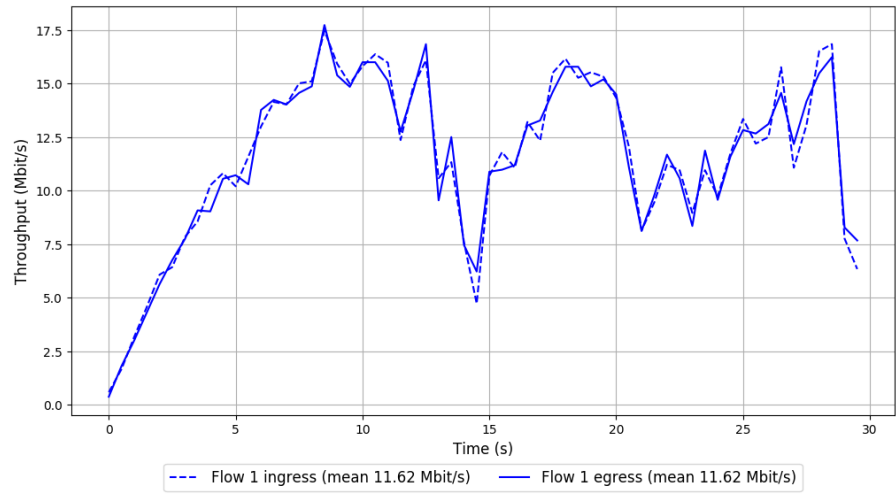


```
Run 1: Statistics of LEDBAT

Start at: 2018-03-20 06:54:09
End at: 2018-03-20 06:54:39
Local clock offset: -22.637 ms
Remote clock offset: 3.125 ms

# Below is generated by plot.py at 2018-03-20 07:45:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.62 Mbit/s
95th percentile per-packet one-way delay: 187.813 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 11.62 Mbit/s
95th percentile per-packet one-way delay: 187.813 ms
Loss rate: 0.16%
```

Run 1: Report of LEDBAT — Data Link

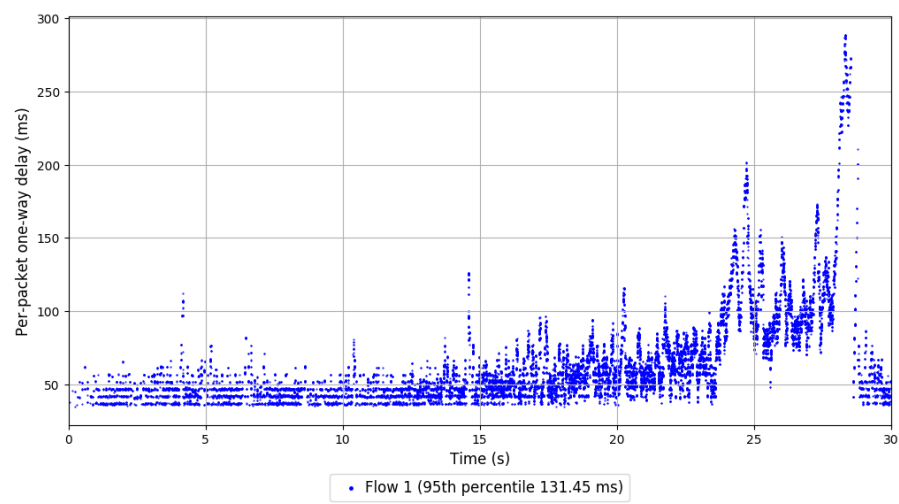
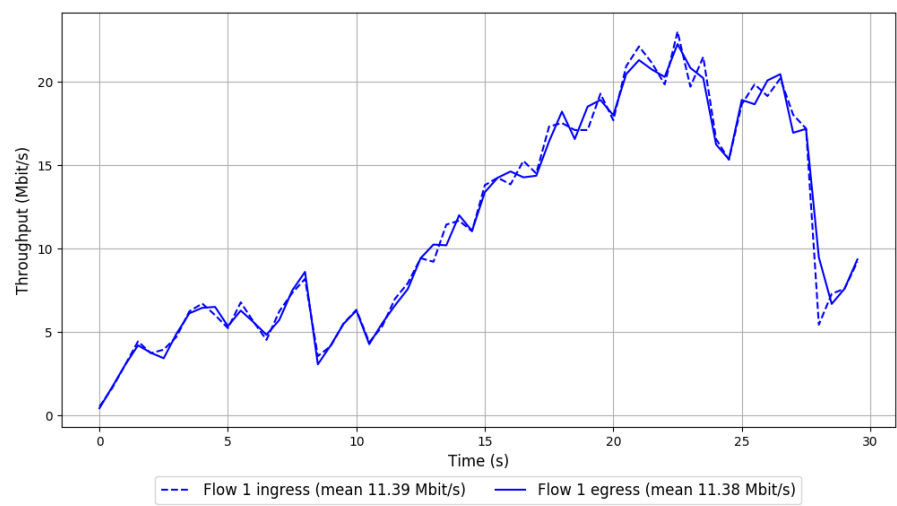


Run 2: Statistics of LEDBAT

Start at: 2018-03-20 07:13:52
End at: 2018-03-20 07:14:22
Local clock offset: -14.267 ms
Remote clock offset: -3.937 ms

Below is generated by plot.py at 2018-03-20 07:45:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.38 Mbit/s
95th percentile per-packet one-way delay: 131.454 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 11.38 Mbit/s
95th percentile per-packet one-way delay: 131.454 ms
Loss rate: 0.21%

Run 2: Report of LEDBAT — Data Link

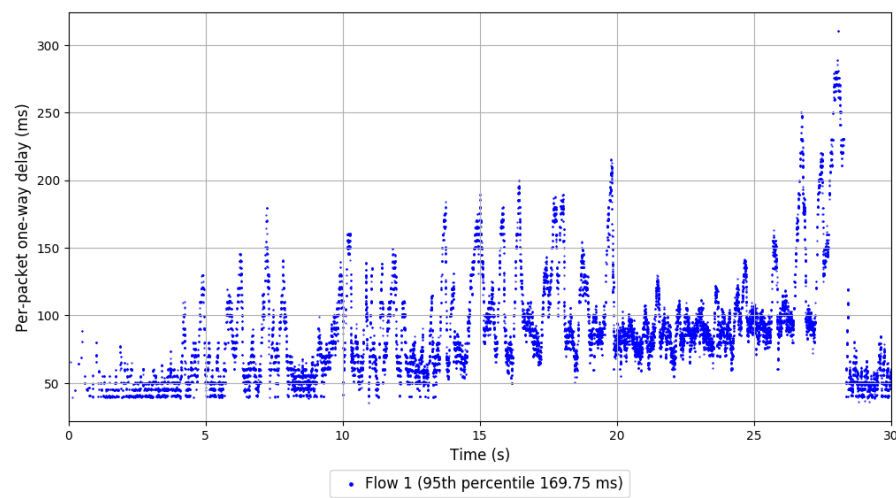
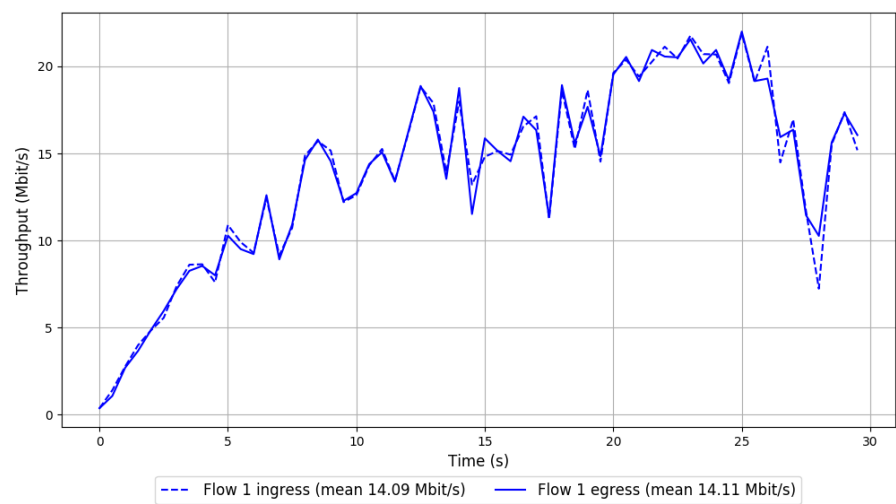


Run 3: Statistics of LEDBAT

Start at: 2018-03-20 07:33:28
End at: 2018-03-20 07:33:58
Local clock offset: -7.608 ms
Remote clock offset: -3.753 ms

Below is generated by plot.py at 2018-03-20 07:45:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 14.11 Mbit/s
95th percentile per-packet one-way delay: 169.754 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 14.11 Mbit/s
95th percentile per-packet one-way delay: 169.754 ms
Loss rate: 0.09%

Run 3: Report of LEDBAT — Data Link

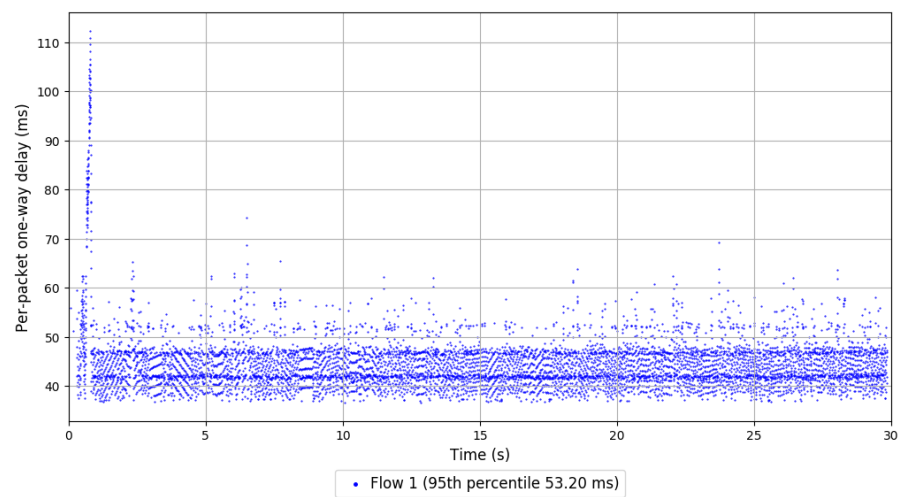
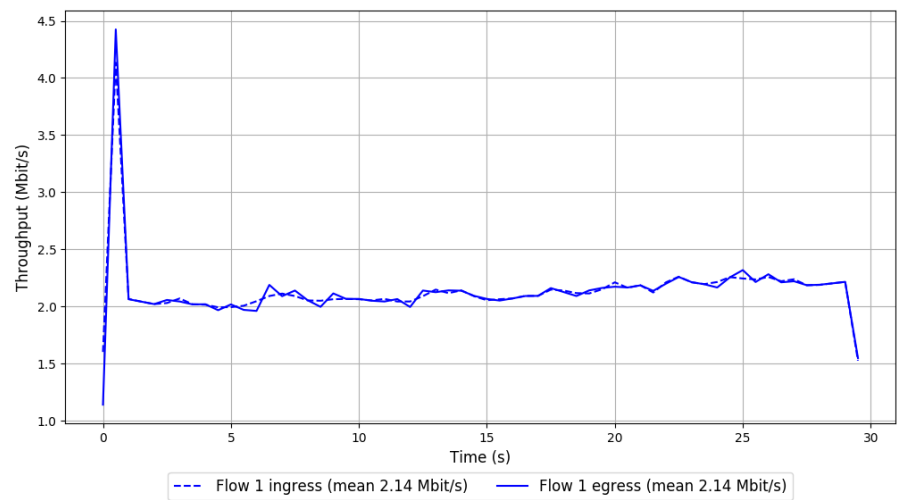


Run 1: Statistics of PCC

Start at: 2018-03-20 06:50:53
End at: 2018-03-20 06:51:23
Local clock offset: -27.289 ms
Remote clock offset: 3.069 ms

Below is generated by plot.py at 2018-03-20 07:45:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.14 Mbit/s
95th percentile per-packet one-way delay: 53.196 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 2.14 Mbit/s
95th percentile per-packet one-way delay: 53.196 ms
Loss rate: 0.14%

Run 1: Report of PCC — Data Link

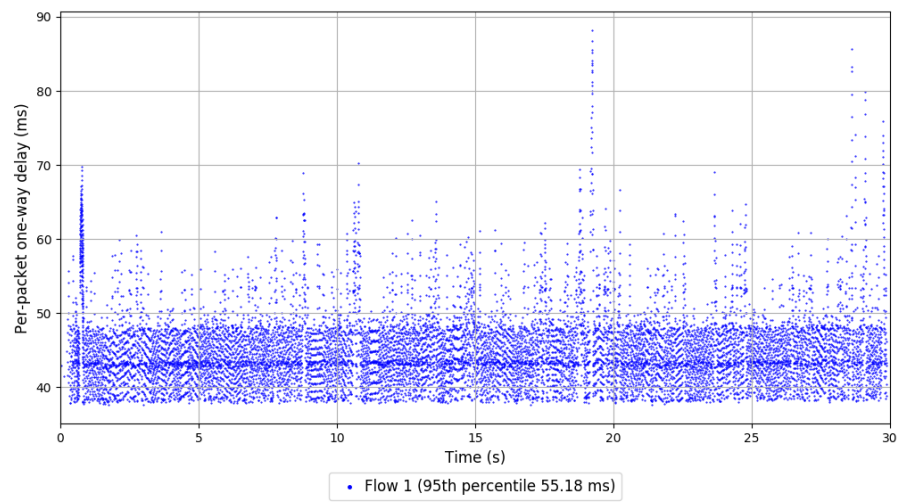
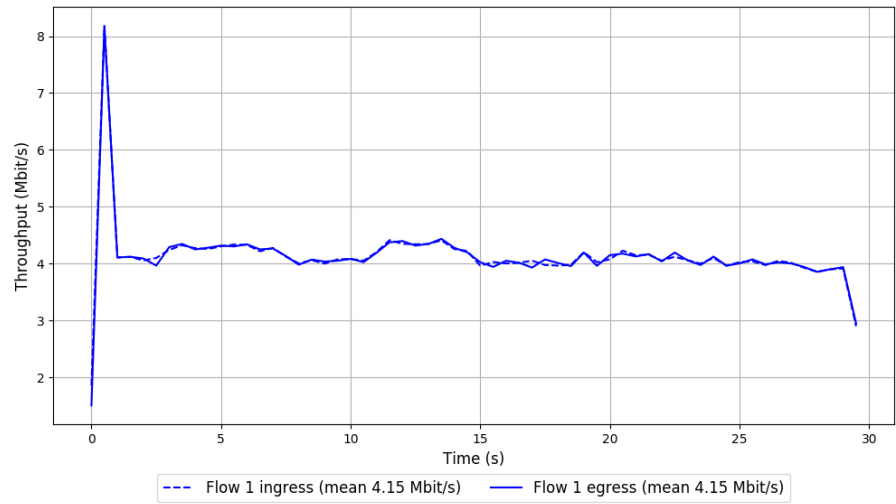


Run 2: Statistics of PCC

Start at: 2018-03-20 07:10:36
End at: 2018-03-20 07:11:06
Local clock offset: -15.488 ms
Remote clock offset: -3.026 ms

Below is generated by plot.py at 2018-03-20 07:45:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.15 Mbit/s
95th percentile per-packet one-way delay: 55.181 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 4.15 Mbit/s
95th percentile per-packet one-way delay: 55.181 ms
Loss rate: 0.12%

Run 2: Report of PCC — Data Link

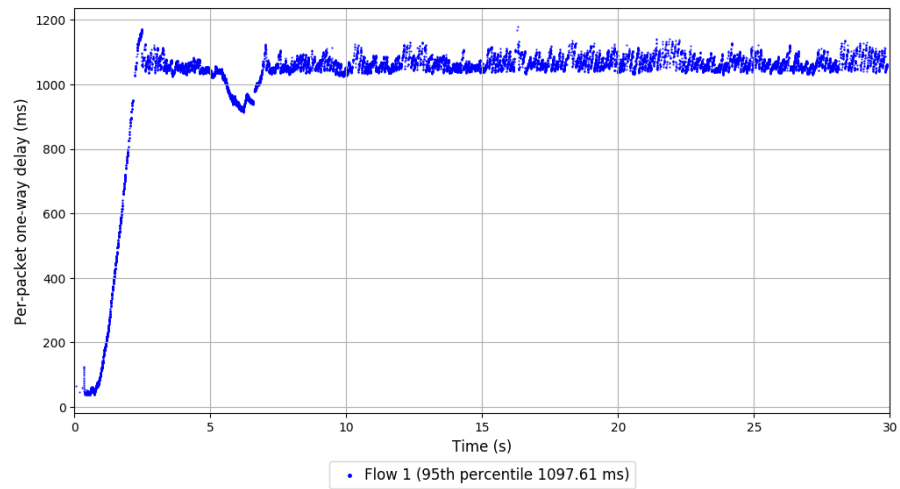
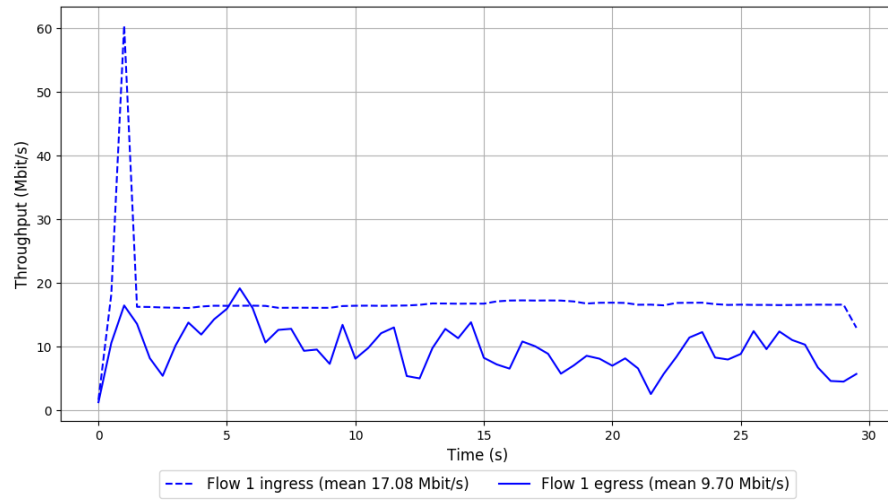


Run 3: Statistics of PCC

Start at: 2018-03-20 07:30:11
End at: 2018-03-20 07:30:41
Local clock offset: -11.246 ms
Remote clock offset: -6.426 ms

Below is generated by plot.py at 2018-03-20 07:45:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.70 Mbit/s
95th percentile per-packet one-way delay: 1097.612 ms
Loss rate: 43.35%
-- Flow 1:
Average throughput: 9.70 Mbit/s
95th percentile per-packet one-way delay: 1097.612 ms
Loss rate: 43.35%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

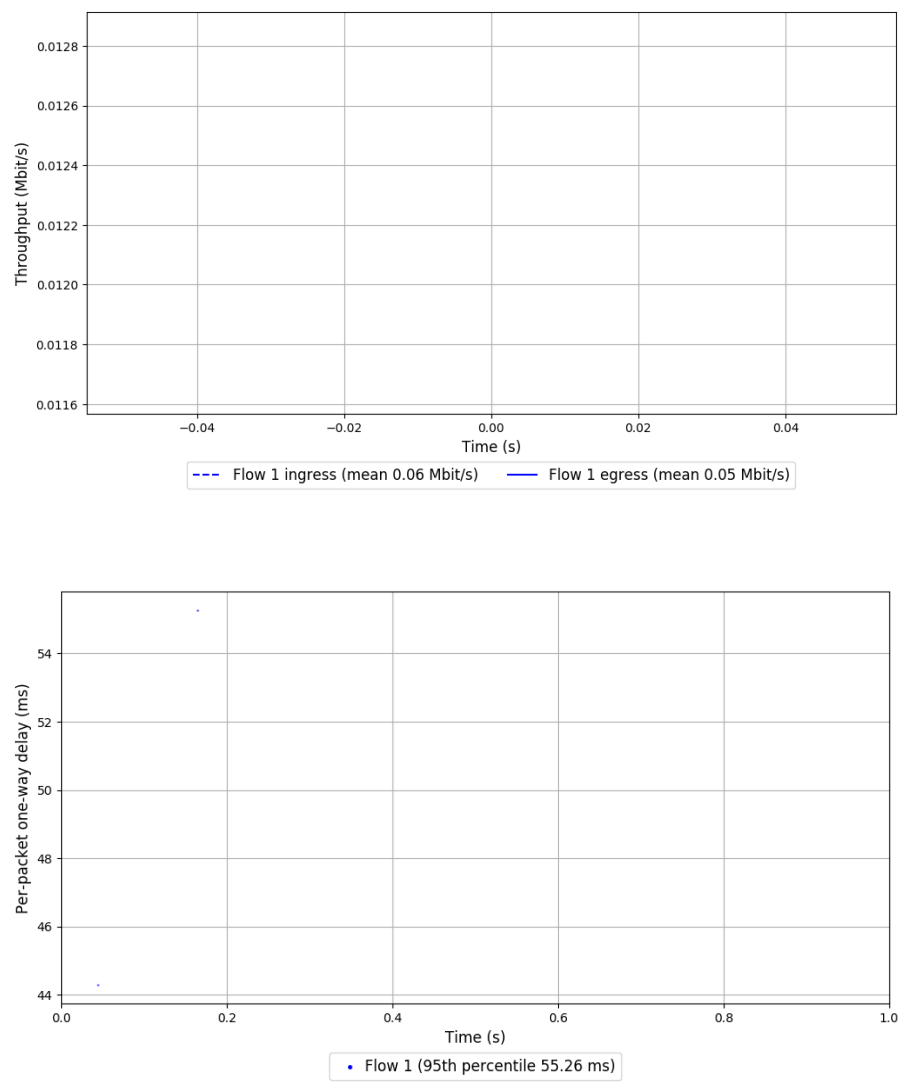
Start at: 2018-03-20 07:00:43

End at: 2018-03-20 07:01:13

Local clock offset: -18.197 ms

Remote clock offset: 0.252 ms

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-03-20 07:20:23

End at: 2018-03-20 07:20:54

Local clock offset: -18.351 ms

Remote clock offset: -7.219 ms

Below is generated by plot.py at 2018-03-20 07:45:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 13.05 Mbit/s

95th percentile per-packet one-way delay: 295.830 ms

Loss rate: 0.35%

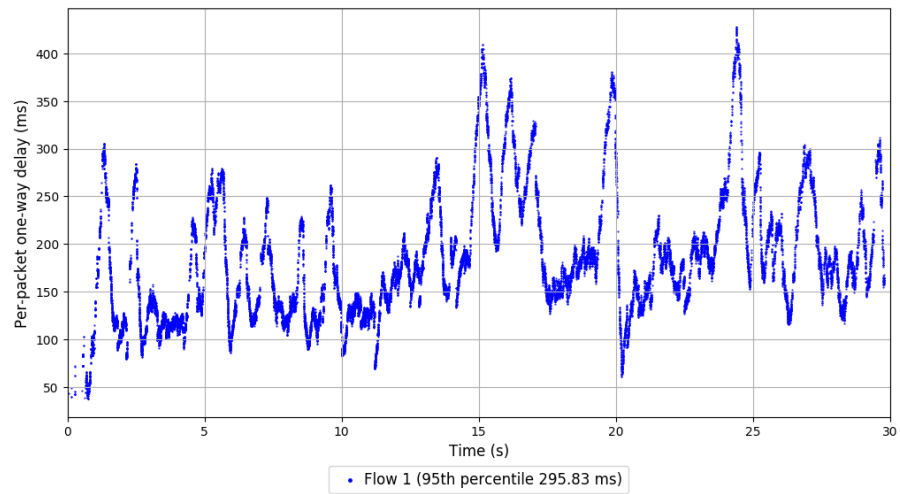
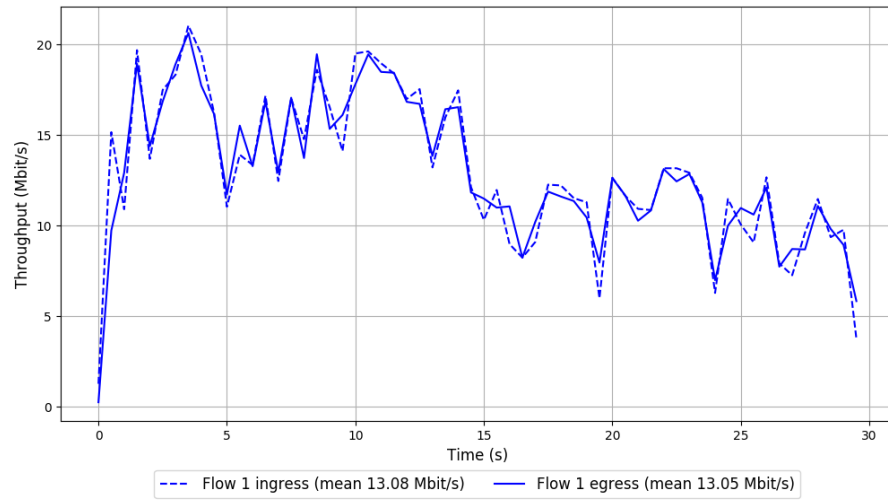
-- Flow 1:

Average throughput: 13.05 Mbit/s

95th percentile per-packet one-way delay: 295.830 ms

Loss rate: 0.35%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-03-20 07:40:00

End at: 2018-03-20 07:40:30

Local clock offset: -6.226 ms

Remote clock offset: -2.911 ms

Below is generated by plot.py at 2018-03-20 07:45:25

Datalink statistics

-- Total of 1 flow:

Average throughput: 14.85 Mbit/s

95th percentile per-packet one-way delay: 248.723 ms

Loss rate: 0.51%

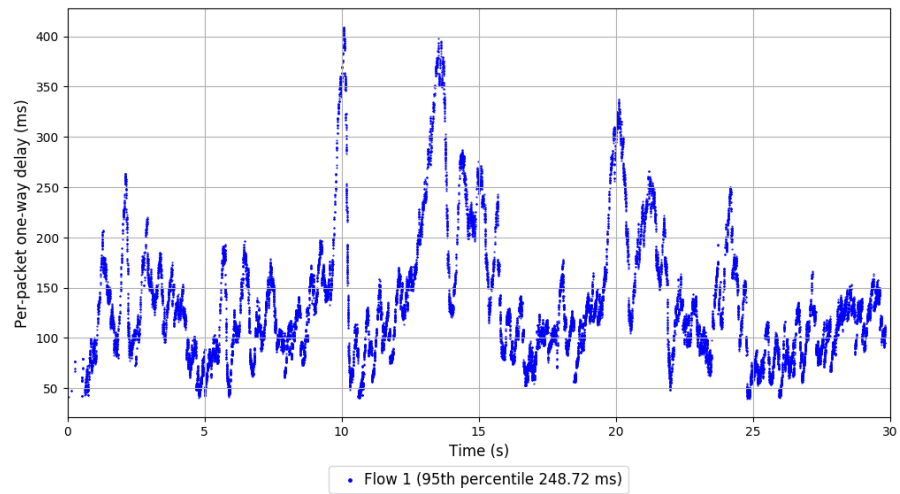
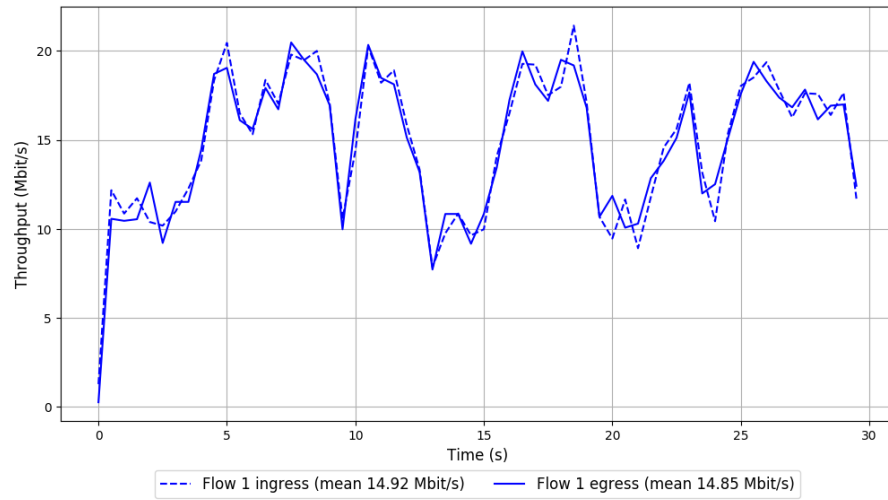
-- Flow 1:

Average throughput: 14.85 Mbit/s

95th percentile per-packet one-way delay: 248.723 ms

Loss rate: 0.51%

Run 3: Report of QUIC Cubic — Data Link

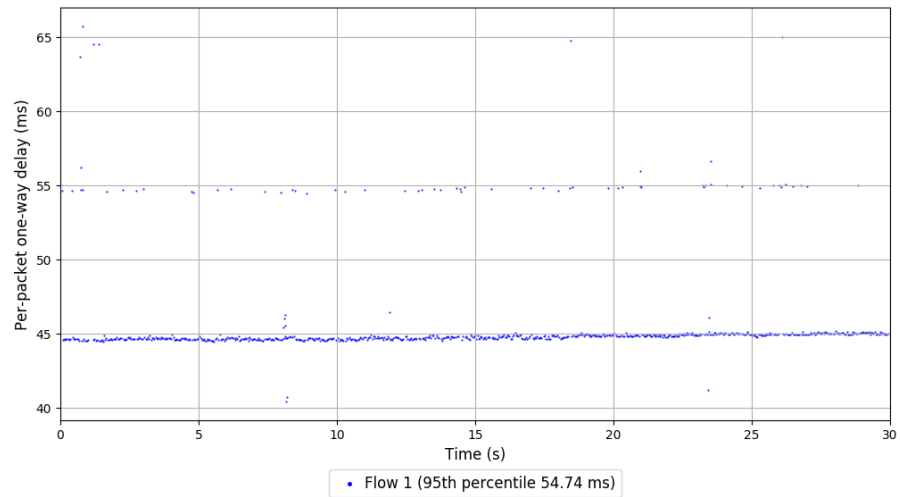
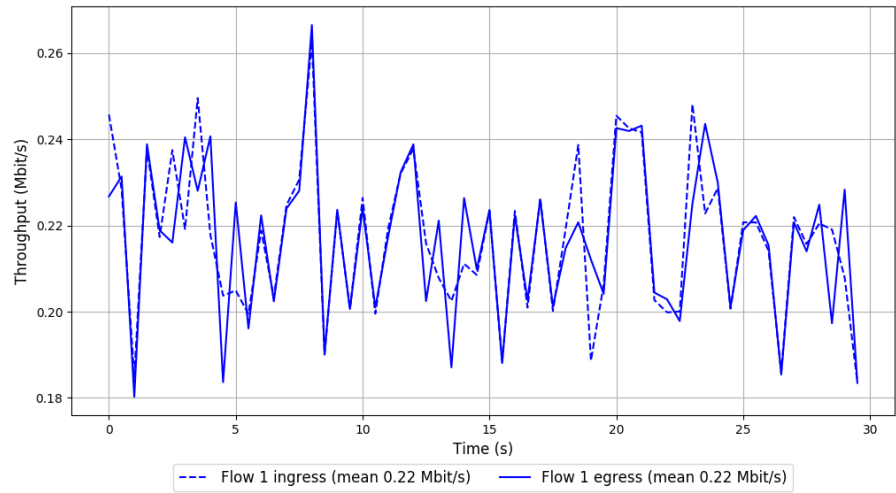


```
Run 1: Statistics of SCReAM

Start at: 2018-03-20 06:57:25
End at: 2018-03-20 06:57:55
Local clock offset: -21.398 ms
Remote clock offset: 1.914 ms

# Below is generated by plot.py at 2018-03-20 07:45:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 54.738 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 54.738 ms
Loss rate: 0.13%
```

Run 1: Report of SReAM — Data Link

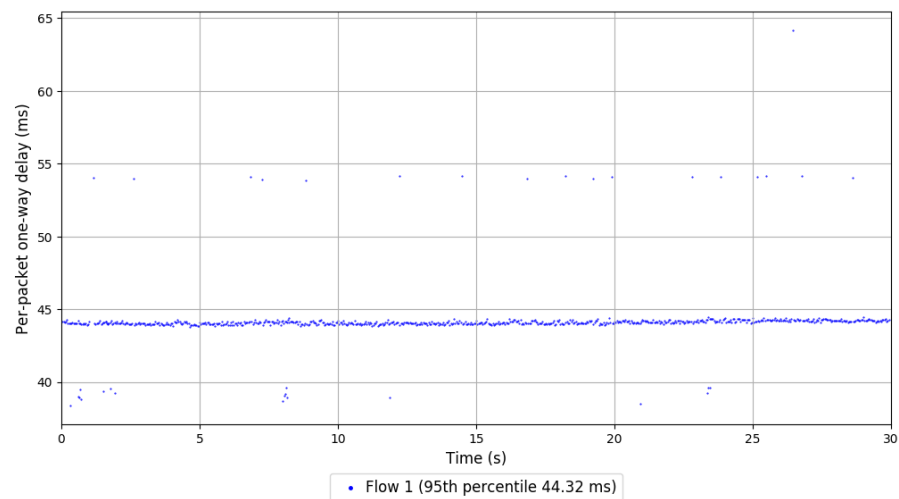
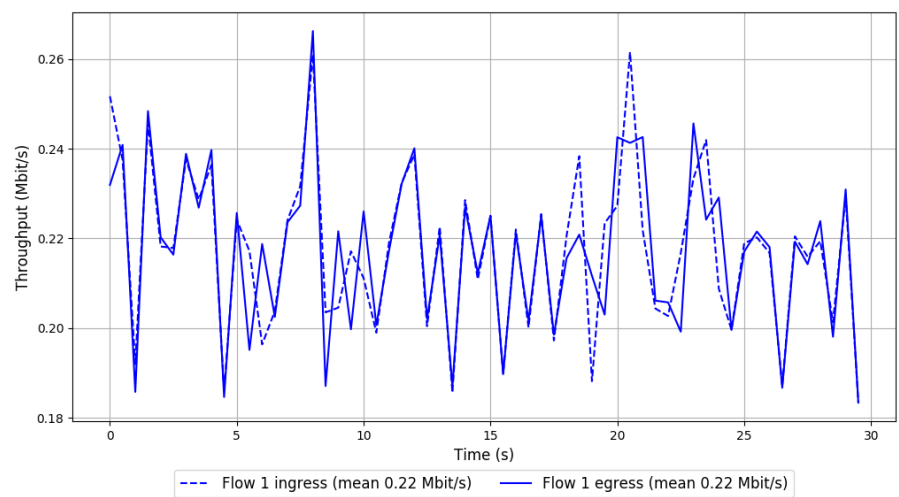


Run 2: Statistics of SCReAM

Start at: 2018-03-20 07:17:08
End at: 2018-03-20 07:17:38
Local clock offset: -15.879 ms
Remote clock offset: -3.988 ms

Below is generated by plot.py at 2018-03-20 07:45:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 44.323 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 44.323 ms
Loss rate: 0.13%

Run 2: Report of SReAM — Data Link

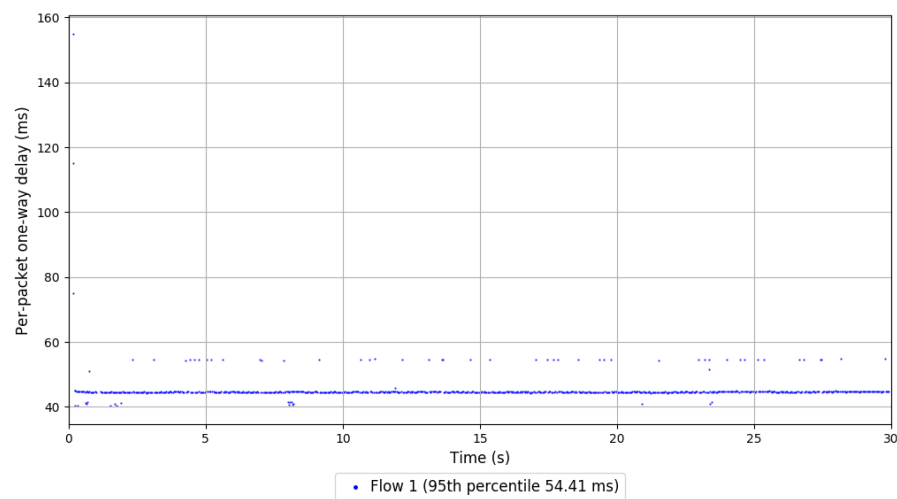
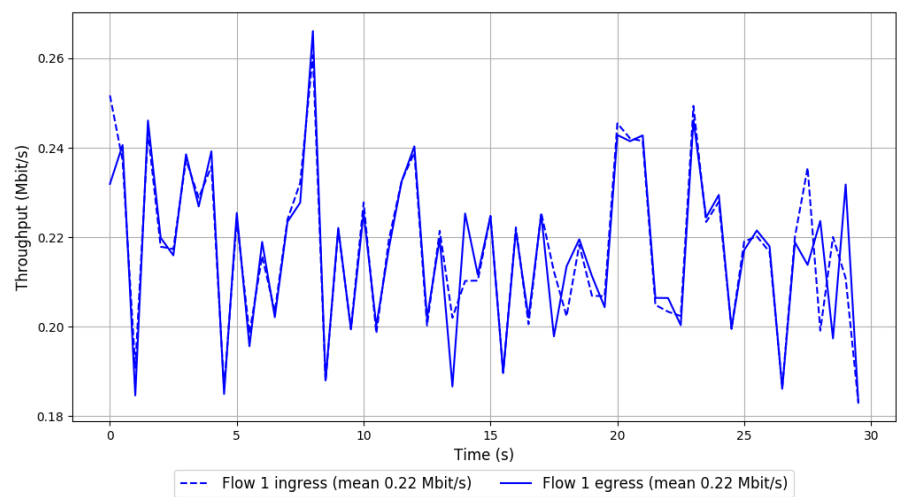


Run 3: Statistics of SCReAM

Start at: 2018-03-20 07:36:43
End at: 2018-03-20 07:37:13
Local clock offset: -6.374 ms
Remote clock offset: -3.783 ms

Below is generated by plot.py at 2018-03-20 07:45:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 54.413 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 54.413 ms
Loss rate: 0.13%

Run 3: Report of SReAM — Data Link

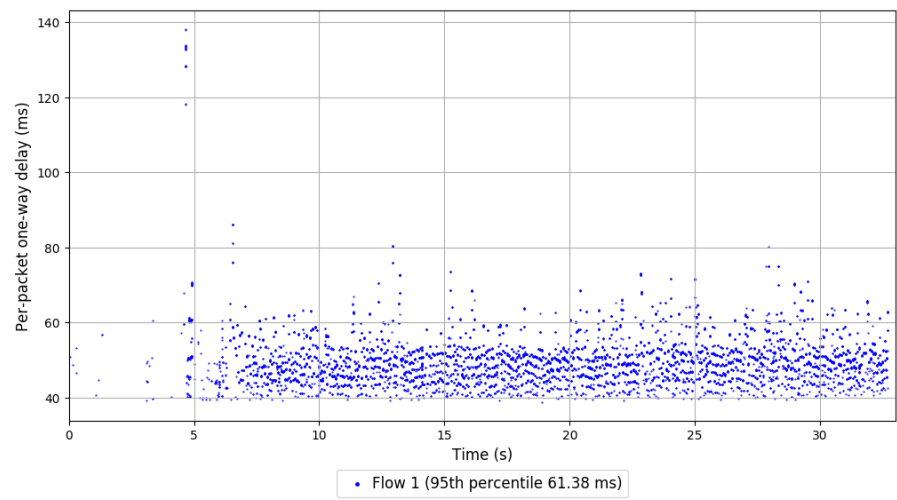
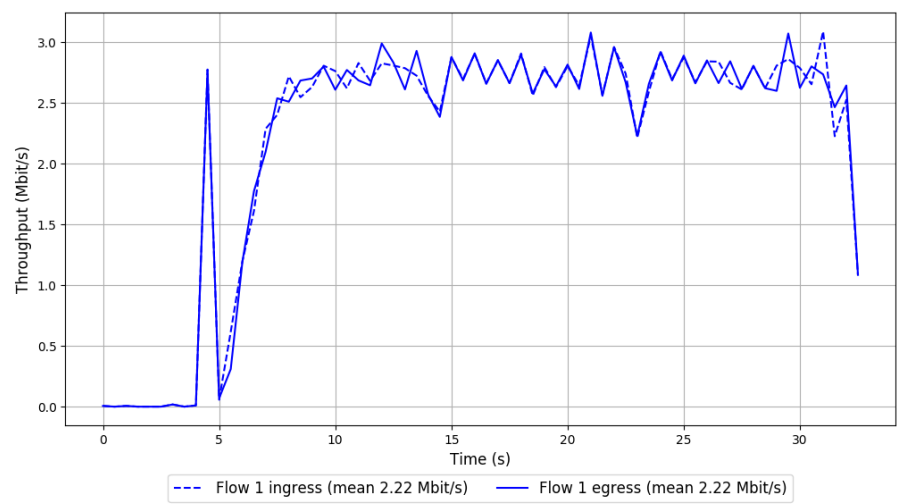


Run 1: Statistics of WebRTC media

Start at: 2018-03-20 06:56:20
End at: 2018-03-20 06:56:50
Local clock offset: -21.748 ms
Remote clock offset: 2.95 ms

Below is generated by plot.py at 2018-03-20 07:45:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 61.384 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 61.384 ms
Loss rate: 0.15%

Run 1: Report of WebRTC media — Data Link

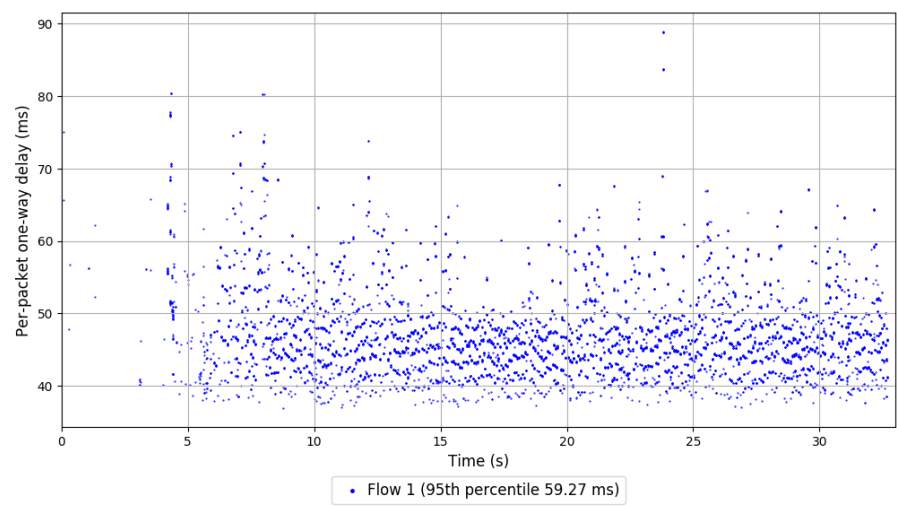
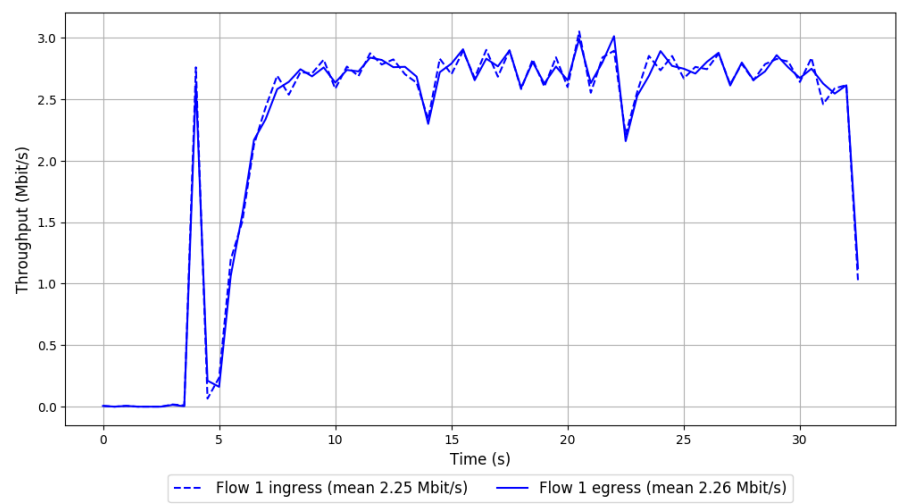


Run 2: Statistics of WebRTC media

Start at: 2018-03-20 07:16:03
End at: 2018-03-20 07:16:33
Local clock offset: -18.116 ms
Remote clock offset: -4.519 ms

Below is generated by plot.py at 2018-03-20 07:45:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.26 Mbit/s
95th percentile per-packet one-way delay: 59.271 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 2.26 Mbit/s
95th percentile per-packet one-way delay: 59.271 ms
Loss rate: 0.08%

Run 2: Report of WebRTC media — Data Link

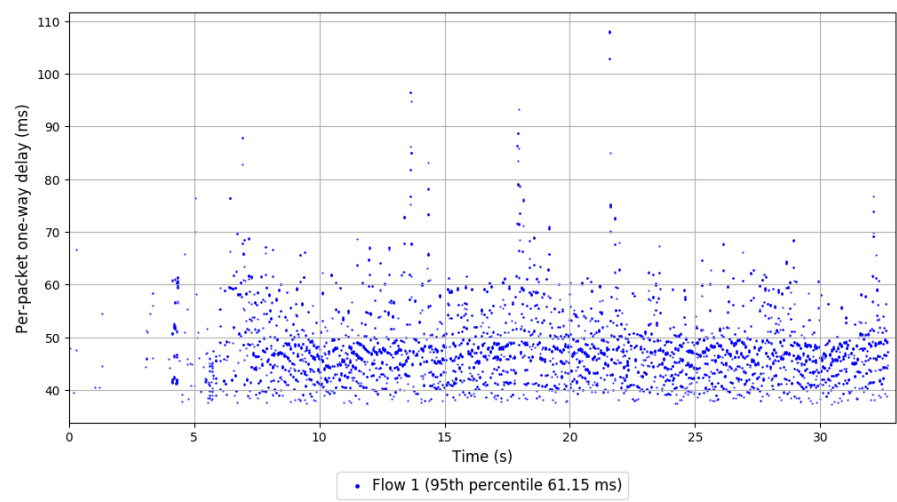
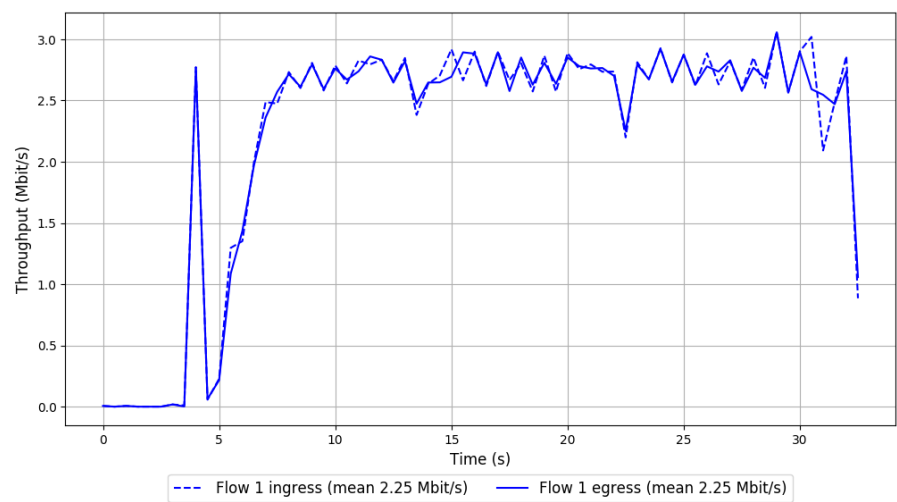


Run 3: Statistics of WebRTC media

Start at: 2018-03-20 07:35:38
End at: 2018-03-20 07:36:08
Local clock offset: -7.578 ms
Remote clock offset: -3.509 ms

Below is generated by plot.py at 2018-03-20 07:45:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 61.147 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 61.147 ms
Loss rate: 0.12%

Run 3: Report of WebRTC media — Data Link

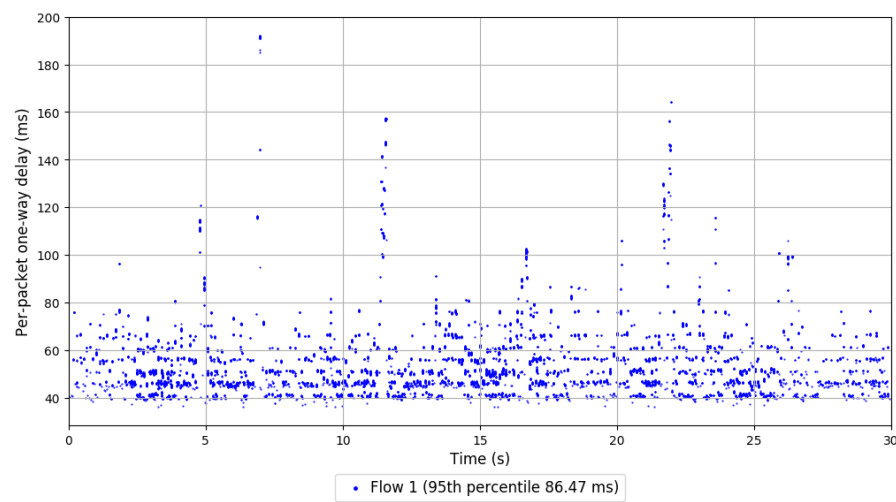
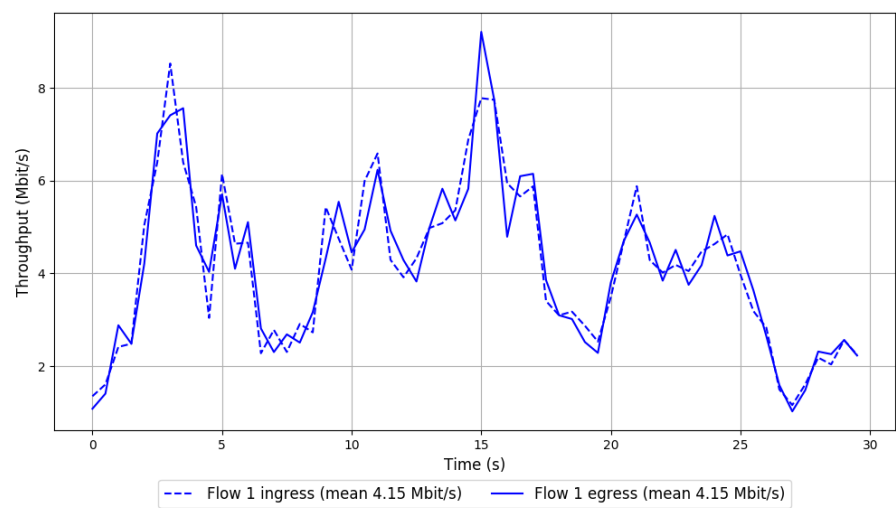


Run 1: Statistics of Sprout

Start at: 2018-03-20 07:04:02
End at: 2018-03-20 07:04:32
Local clock offset: -15.467 ms
Remote clock offset: -0.222 ms

Below is generated by plot.py at 2018-03-20 07:45:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.15 Mbit/s
95th percentile per-packet one-way delay: 86.467 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 4.15 Mbit/s
95th percentile per-packet one-way delay: 86.467 ms
Loss rate: 0.01%

Run 1: Report of Sprout — Data Link

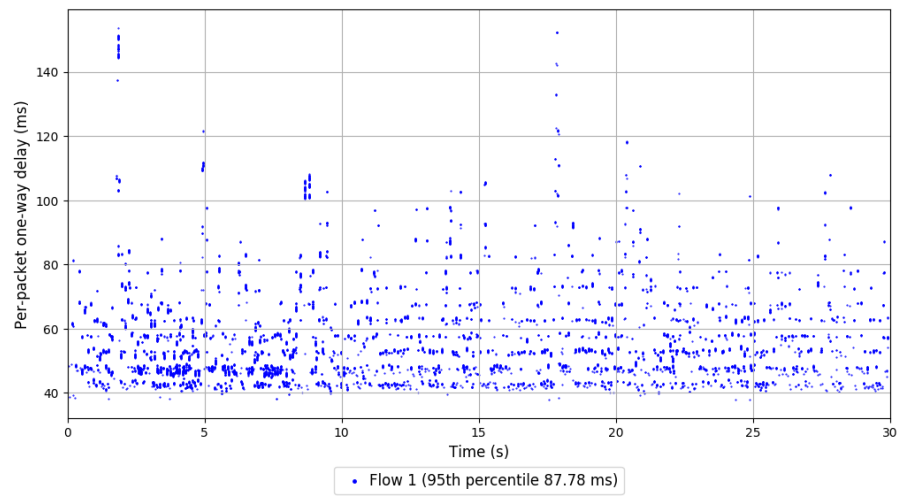
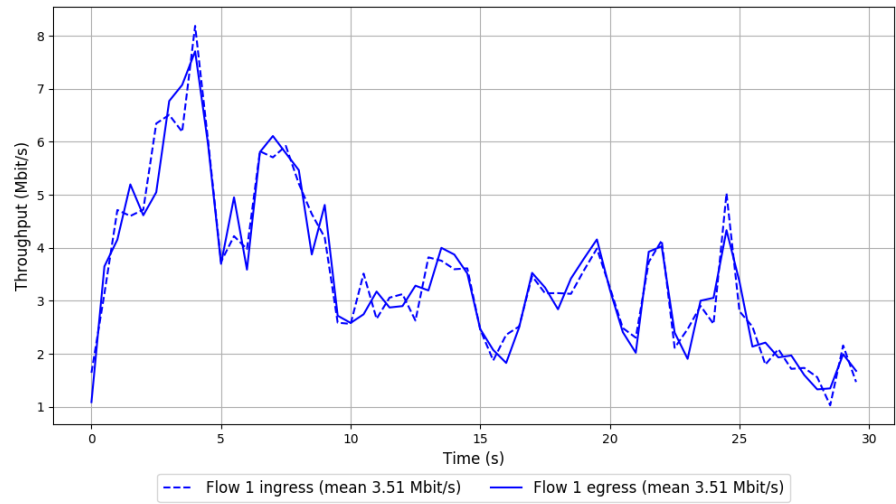


Run 2: Statistics of Sprout

Start at: 2018-03-20 07:23:39
End at: 2018-03-20 07:24:09
Local clock offset: -18.389 ms
Remote clock offset: -4.849 ms

Below is generated by plot.py at 2018-03-20 07:45:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.51 Mbit/s
95th percentile per-packet one-way delay: 87.778 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 3.51 Mbit/s
95th percentile per-packet one-way delay: 87.778 ms
Loss rate: 0.00%

Run 2: Report of Sprout — Data Link

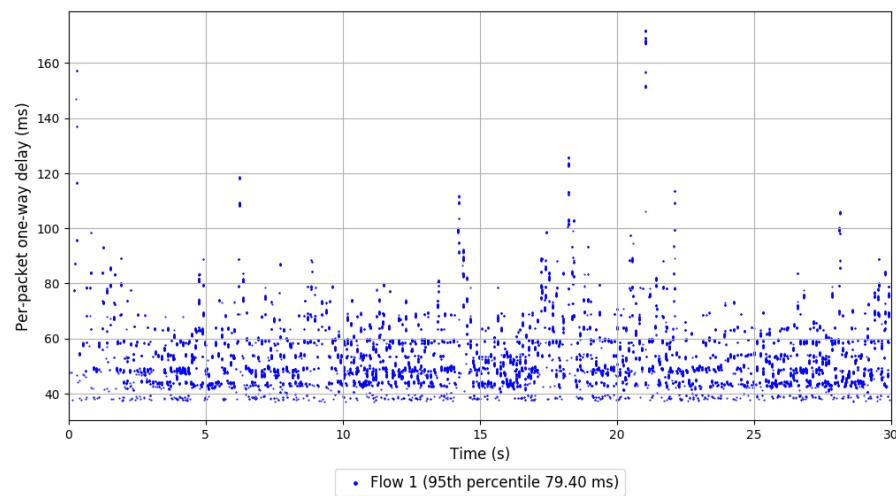
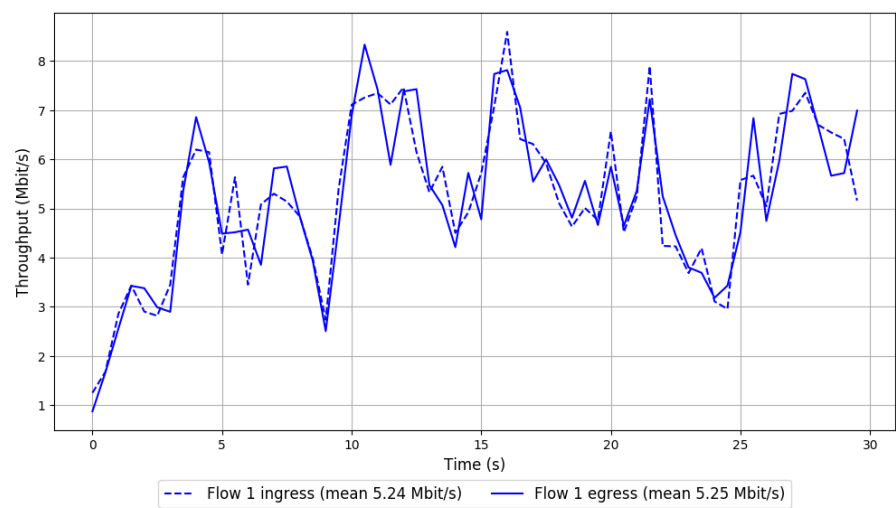


Run 3: Statistics of Sprout

Start at: 2018-03-20 07:43:16
End at: 2018-03-20 07:43:46
Local clock offset: -4.777 ms
Remote clock offset: -2.745 ms

Below is generated by plot.py at 2018-03-20 07:45:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.25 Mbit/s
95th percentile per-packet one-way delay: 79.398 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 5.25 Mbit/s
95th percentile per-packet one-way delay: 79.398 ms
Loss rate: 0.00%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-03-20 06:46:26

End at: 2018-03-20 06:46:56

Local clock offset: -23.8 ms

Remote clock offset: 2.067 ms

Below is generated by plot.py at 2018-03-20 07:45:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.74 Mbit/s

95th percentile per-packet one-way delay: 54.389 ms

Loss rate: 0.14%

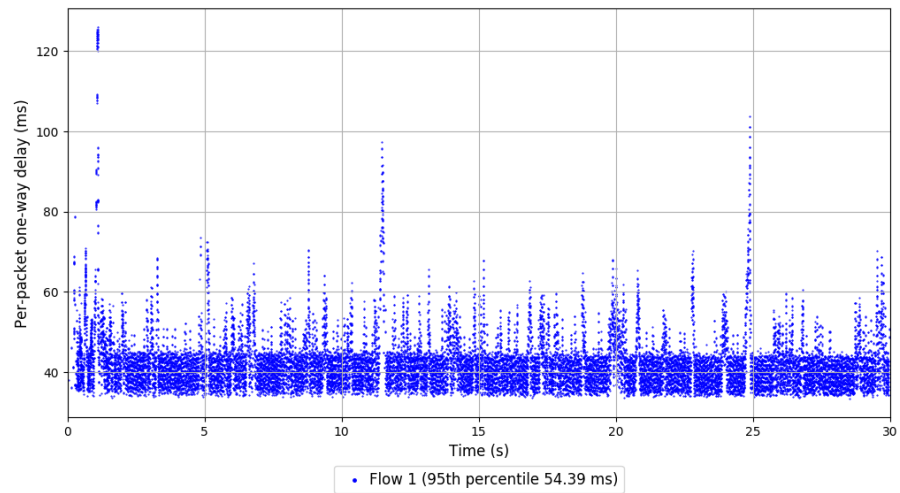
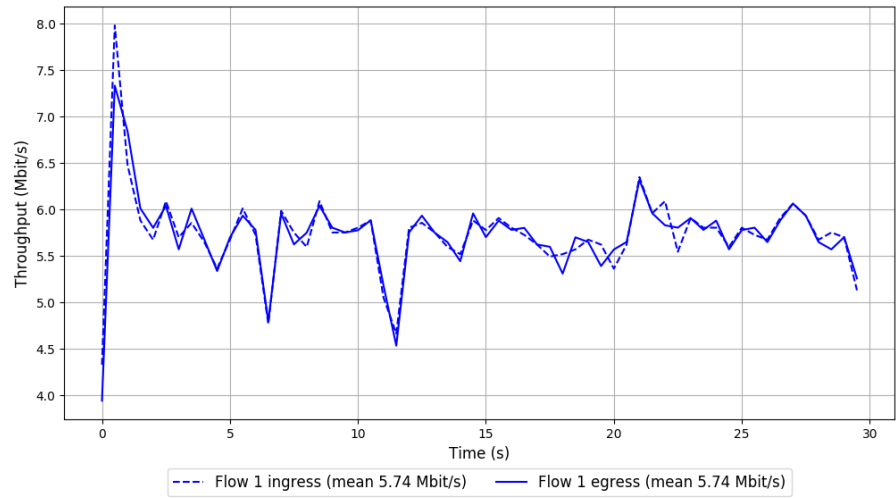
-- Flow 1:

Average throughput: 5.74 Mbit/s

95th percentile per-packet one-way delay: 54.389 ms

Loss rate: 0.14%

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

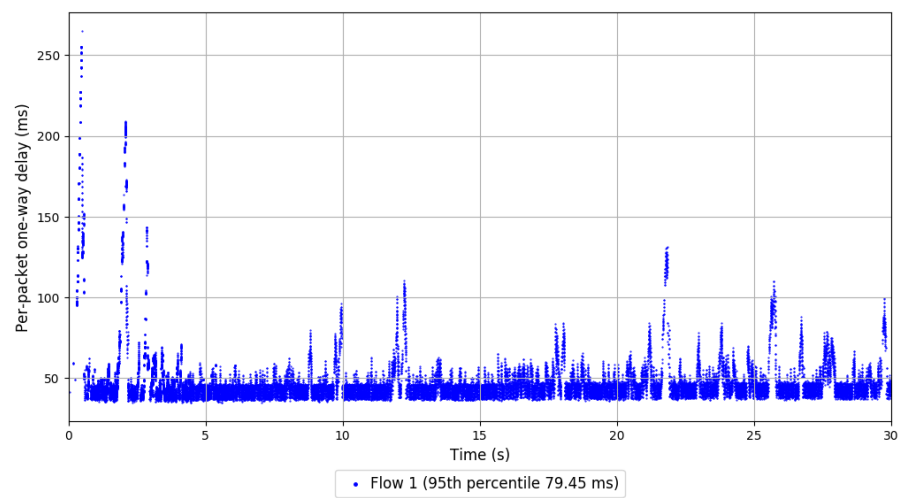
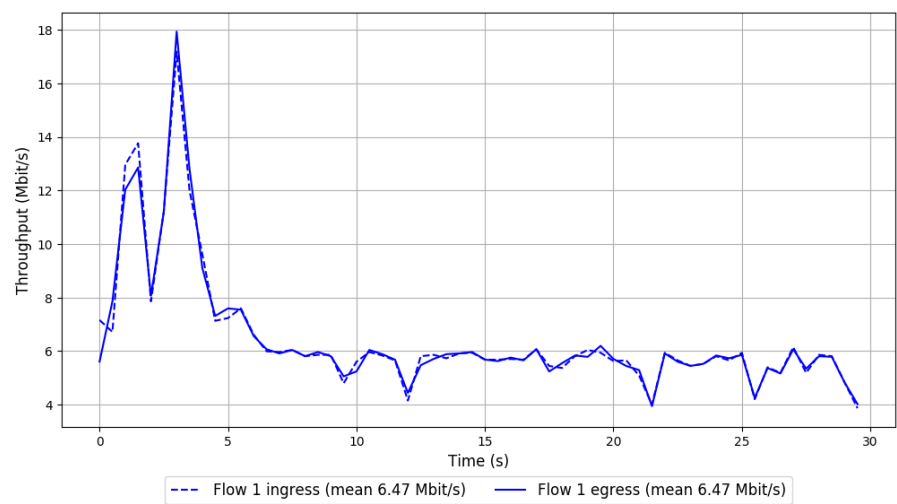


Run 2: Statistics of TaoVA-100x

Start at: 2018-03-20 07:06:14
End at: 2018-03-20 07:06:44
Local clock offset: -15.412 ms
Remote clock offset: -2.782 ms

Below is generated by plot.py at 2018-03-20 07:45:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.47 Mbit/s
95th percentile per-packet one-way delay: 79.451 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 6.47 Mbit/s
95th percentile per-packet one-way delay: 79.451 ms
Loss rate: 0.10%

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

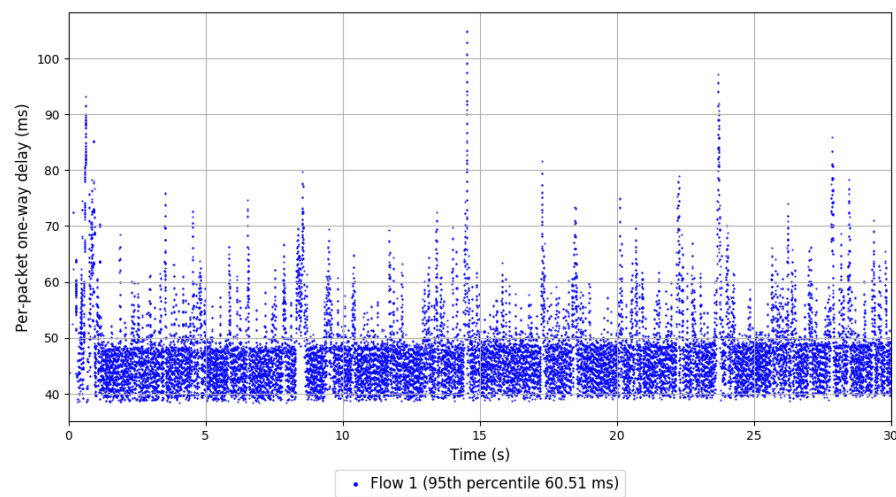
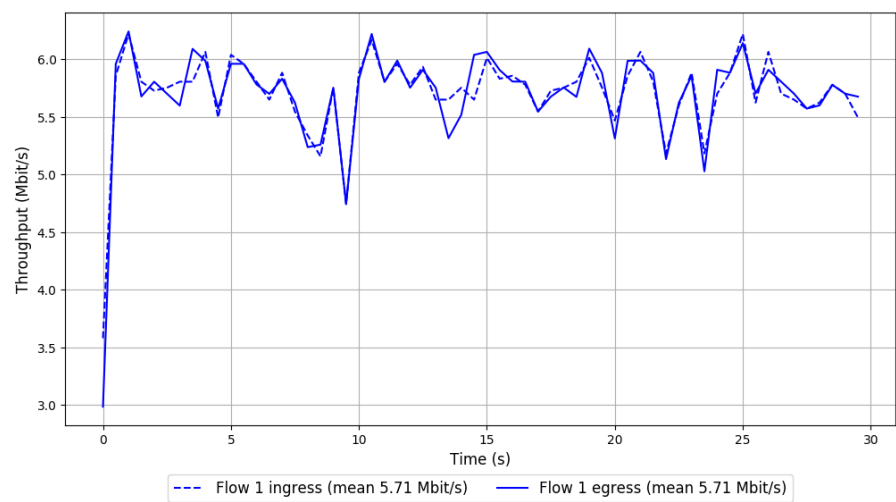


Run 3: Statistics of TaoVA-100x

Start at: 2018-03-20 07:25:50
End at: 2018-03-20 07:26:20
Local clock offset: -18.394 ms
Remote clock offset: -4.882 ms

Below is generated by plot.py at 2018-03-20 07:45:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.71 Mbit/s
95th percentile per-packet one-way delay: 60.514 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 5.71 Mbit/s
95th percentile per-packet one-way delay: 60.514 ms
Loss rate: 0.11%

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

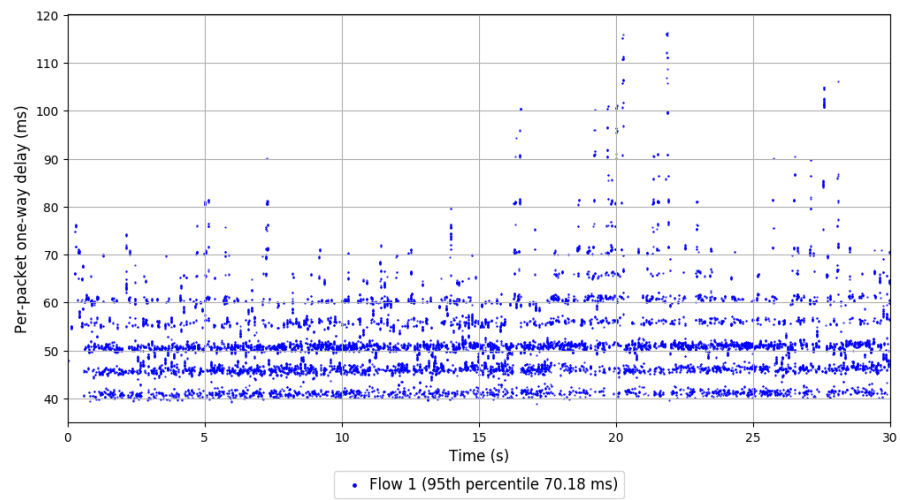
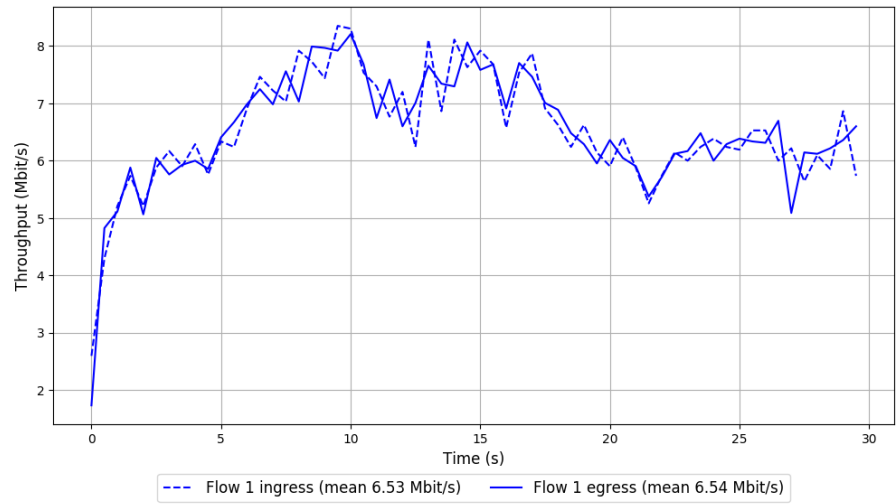


Run 1: Statistics of TCP Vegas

Start at: 2018-03-20 06:59:36
End at: 2018-03-20 07:00:06
Local clock offset: -19.859 ms
Remote clock offset: 1.071 ms

Below is generated by plot.py at 2018-03-20 07:45:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.54 Mbit/s
95th percentile per-packet one-way delay: 70.179 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 6.54 Mbit/s
95th percentile per-packet one-way delay: 70.179 ms
Loss rate: 0.02%

Run 1: Report of TCP Vegas — Data Link

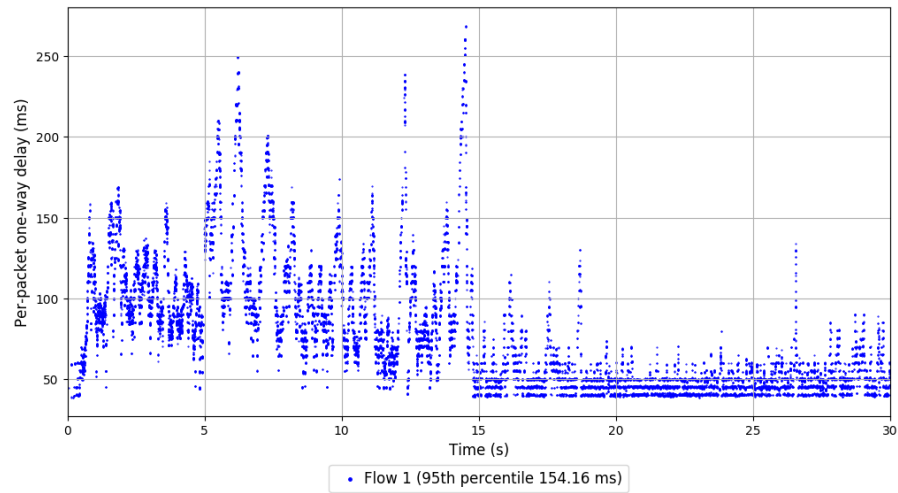
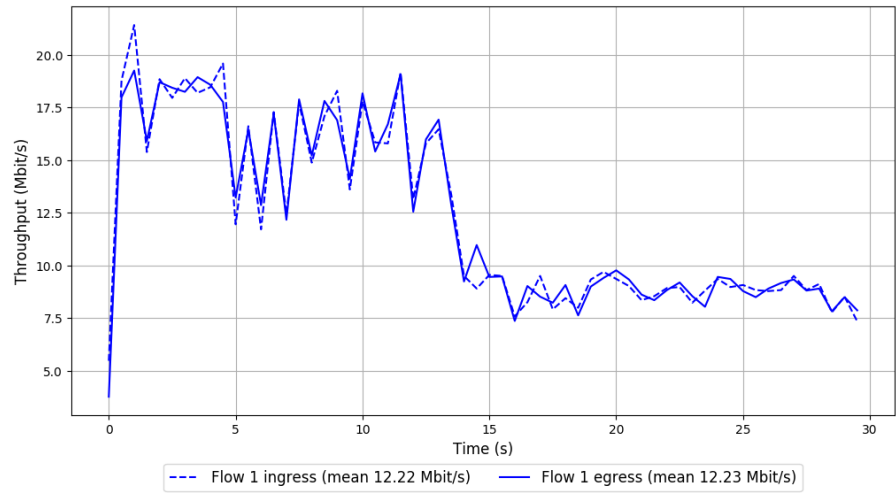


Run 2: Statistics of TCP Vegas

Start at: 2018-03-20 07:19:18
End at: 2018-03-20 07:19:48
Local clock offset: -14.936 ms
Remote clock offset: -3.347 ms

Below is generated by plot.py at 2018-03-20 07:45:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.23 Mbit/s
95th percentile per-packet one-way delay: 154.162 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 12.23 Mbit/s
95th percentile per-packet one-way delay: 154.162 ms
Loss rate: 0.09%

Run 2: Report of TCP Vegas — Data Link

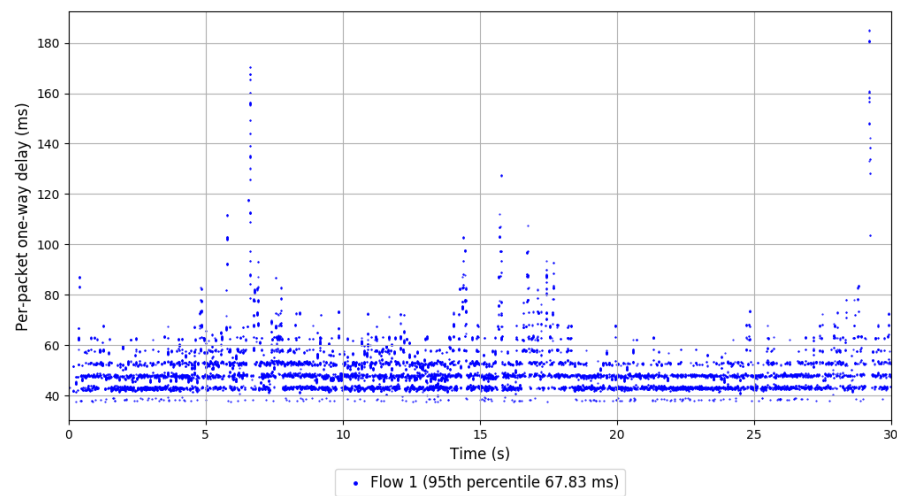
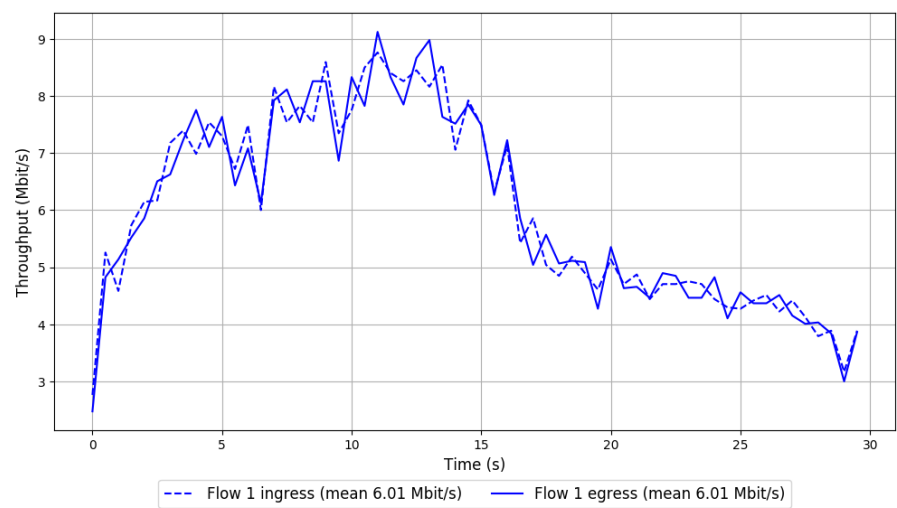


Run 3: Statistics of TCP Vegas

Start at: 2018-03-20 07:38:54
End at: 2018-03-20 07:39:24
Local clock offset: -6.309 ms
Remote clock offset: -3.328 ms

Below is generated by plot.py at 2018-03-20 07:45:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.01 Mbit/s
95th percentile per-packet one-way delay: 67.831 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 6.01 Mbit/s
95th percentile per-packet one-way delay: 67.831 ms
Loss rate: 0.16%

Run 3: Report of TCP Vegas — Data Link

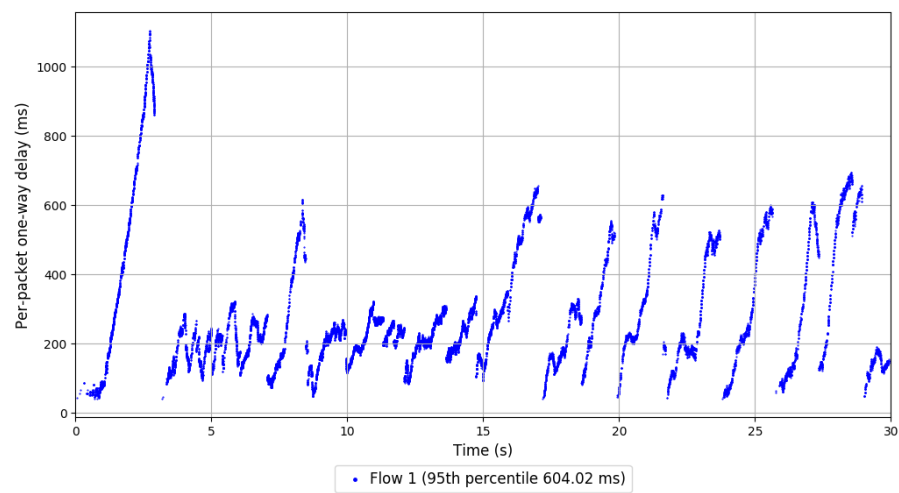
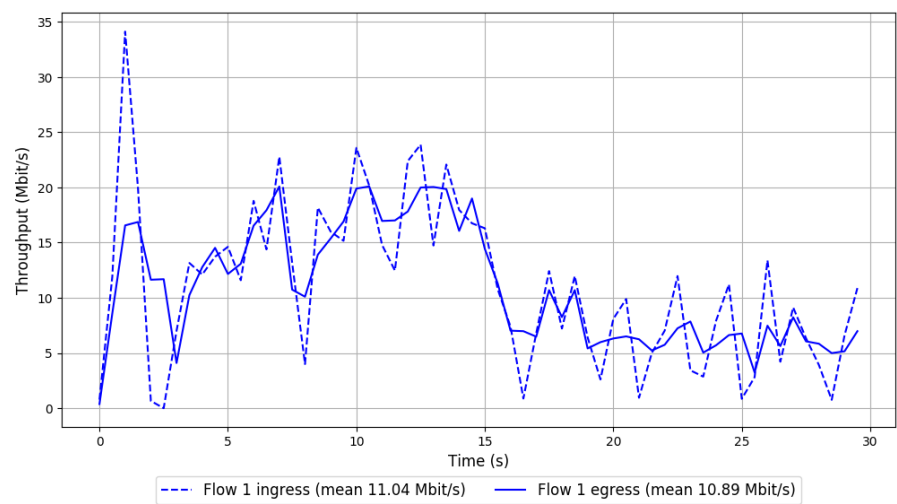


Run 1: Statistics of Verus

Start at: 2018-03-20 06:48:42
End at: 2018-03-20 06:49:12
Local clock offset: -27.428 ms
Remote clock offset: 3.205 ms

Below is generated by plot.py at 2018-03-20 07:45:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.89 Mbit/s
95th percentile per-packet one-way delay: 604.022 ms
Loss rate: 1.48%
-- Flow 1:
Average throughput: 10.89 Mbit/s
95th percentile per-packet one-way delay: 604.022 ms
Loss rate: 1.48%

Run 1: Report of Verus — Data Link

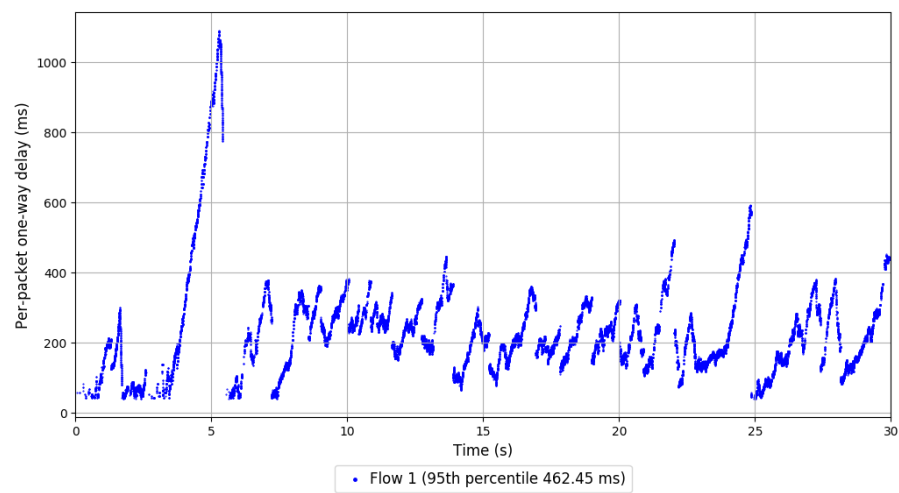
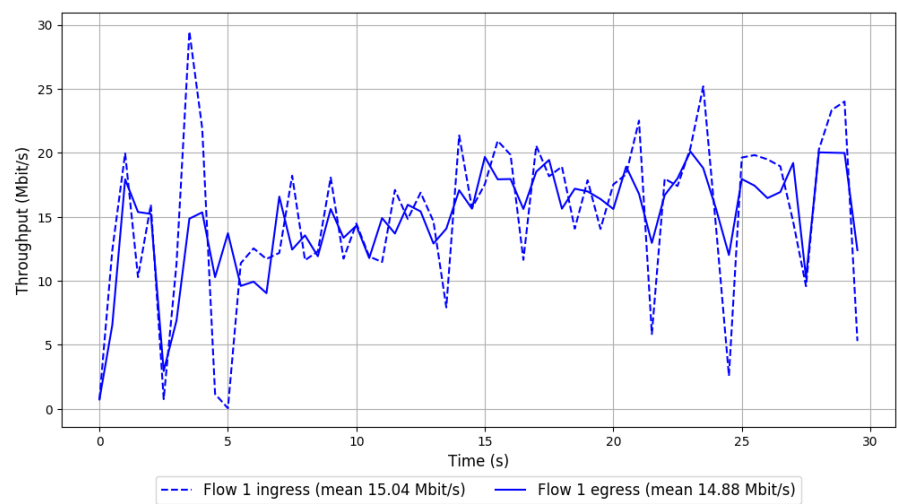


Run 2: Statistics of Verus

Start at: 2018-03-20 07:08:25
End at: 2018-03-20 07:08:55
Local clock offset: -17.388 ms
Remote clock offset: -2.842 ms

Below is generated by plot.py at 2018-03-20 07:45:44
Datalink statistics
-- Total of 1 flow:
Average throughput: 14.88 Mbit/s
95th percentile per-packet one-way delay: 462.449 ms
Loss rate: 1.25%
-- Flow 1:
Average throughput: 14.88 Mbit/s
95th percentile per-packet one-way delay: 462.449 ms
Loss rate: 1.25%

Run 2: Report of Verus — Data Link

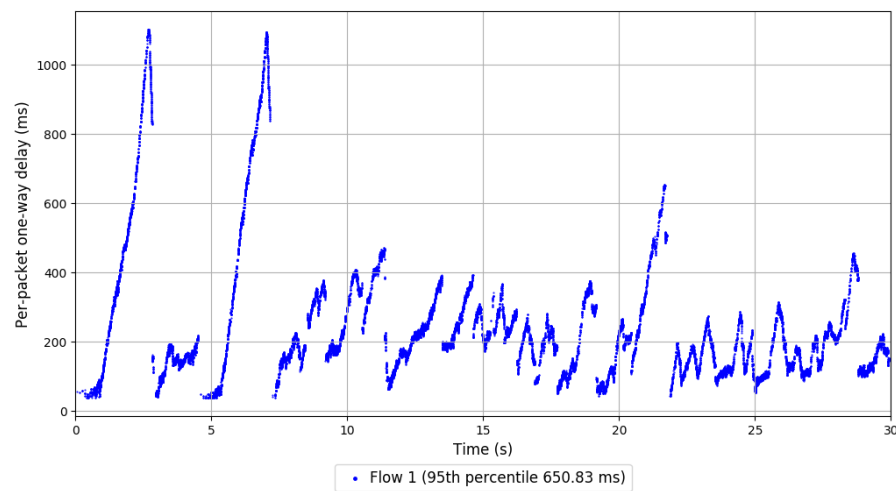
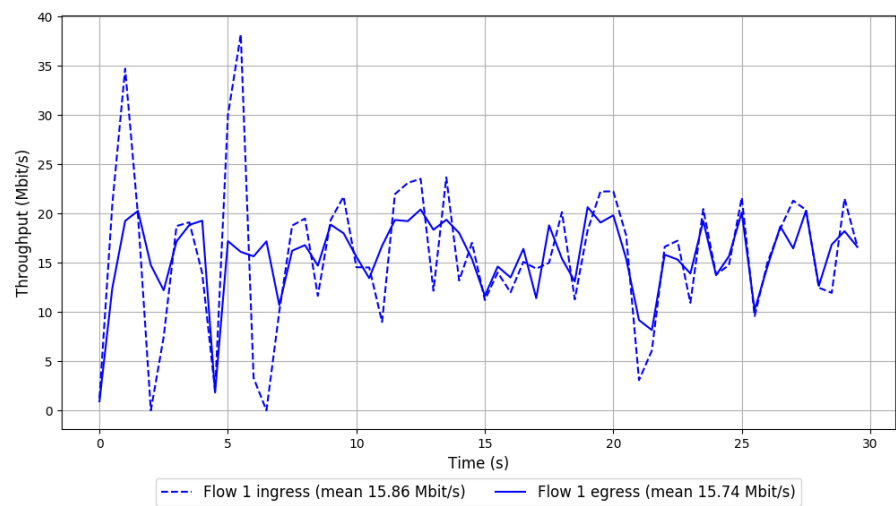


Run 3: Statistics of Verus

Start at: 2018-03-20 07:28:00
End at: 2018-03-20 07:28:30
Local clock offset: -13.314 ms
Remote clock offset: -5.029 ms

Below is generated by plot.py at 2018-03-20 07:45:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 15.74 Mbit/s
95th percentile per-packet one-way delay: 650.827 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 15.74 Mbit/s
95th percentile per-packet one-way delay: 650.827 ms
Loss rate: 0.94%

Run 3: Report of Verus — Data Link

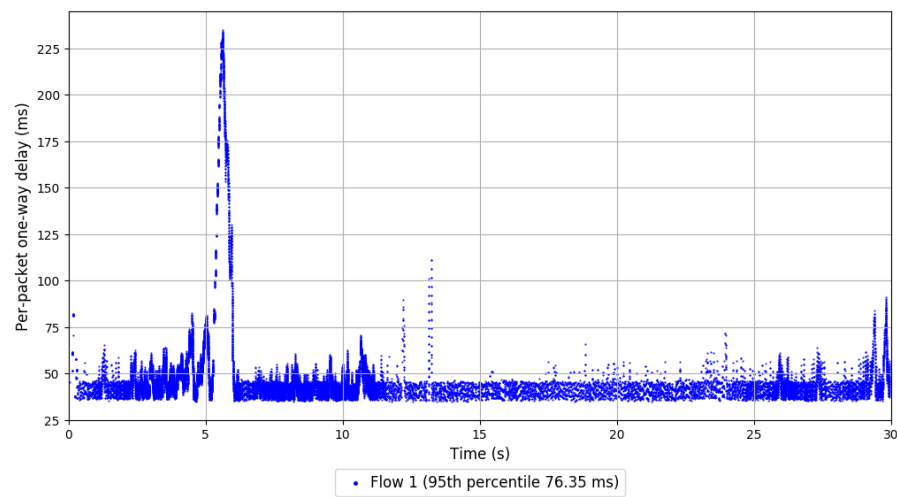
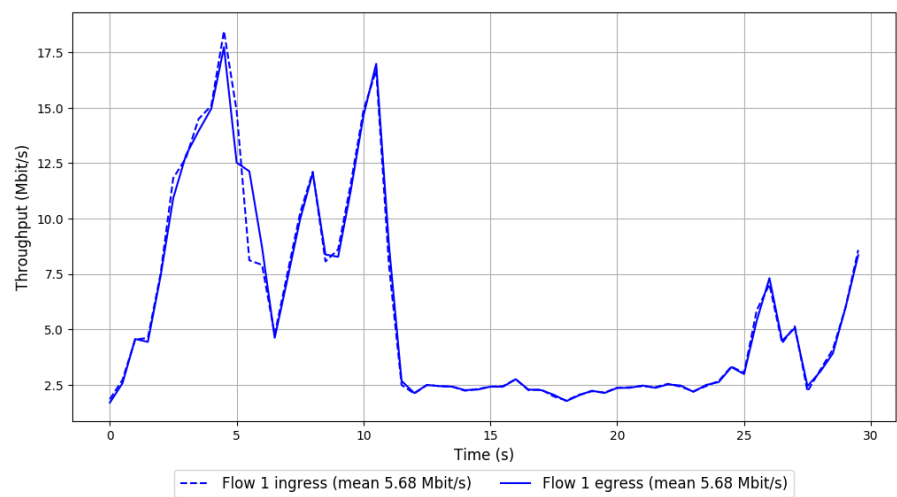


Run 1: Statistics of Copa

Start at: 2018-03-20 06:47:36
End at: 2018-03-20 06:48:06
Local clock offset: -24.129 ms
Remote clock offset: 2.152 ms

Below is generated by plot.py at 2018-03-20 07:45:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.68 Mbit/s
95th percentile per-packet one-way delay: 76.346 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 5.68 Mbit/s
95th percentile per-packet one-way delay: 76.346 ms
Loss rate: 0.21%

Run 1: Report of Copa — Data Link

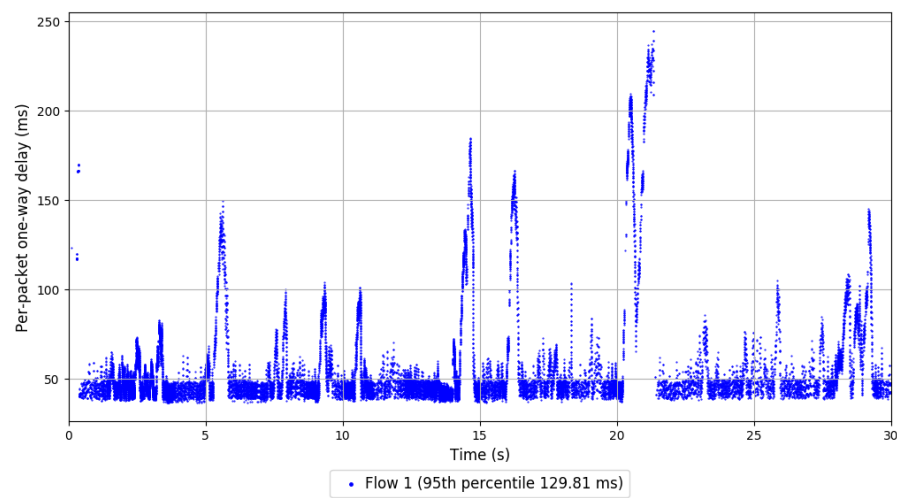
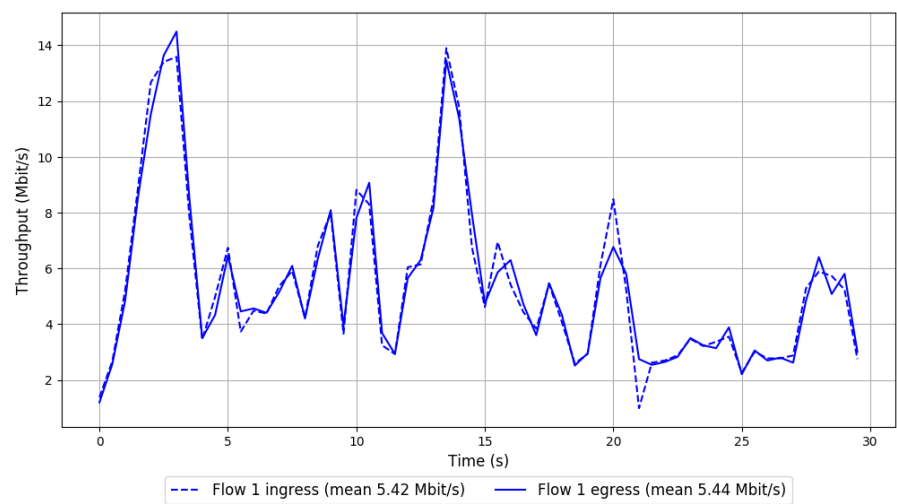


Run 2: Statistics of Copa

Start at: 2018-03-20 07:07:19
End at: 2018-03-20 07:07:49
Local clock offset: -15.326 ms
Remote clock offset: -2.615 ms

Below is generated by plot.py at 2018-03-20 07:45:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.44 Mbit/s
95th percentile per-packet one-way delay: 129.809 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 5.44 Mbit/s
95th percentile per-packet one-way delay: 129.809 ms
Loss rate: 0.07%

Run 2: Report of Copa — Data Link

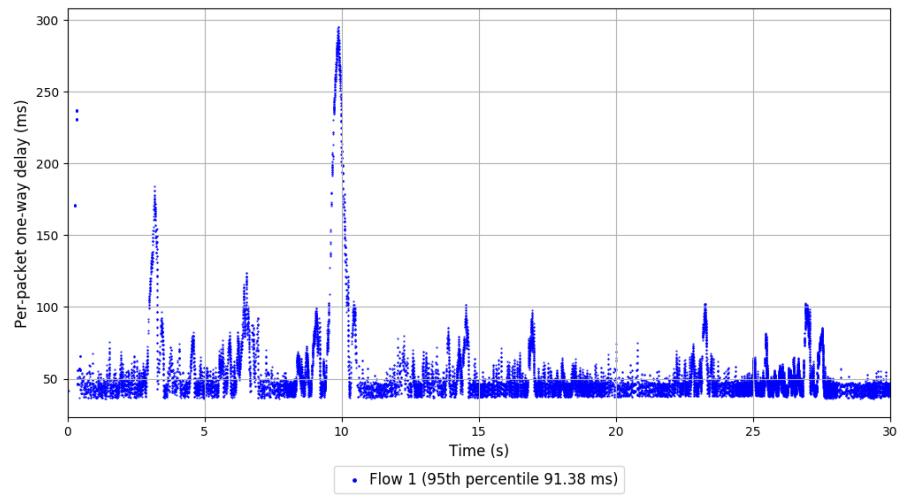
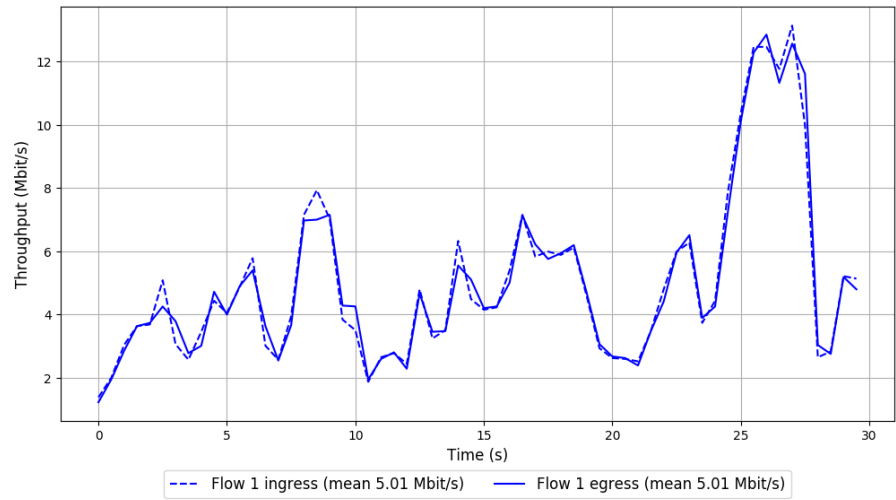


Run 3: Statistics of Copa

Start at: 2018-03-20 07:26:55
End at: 2018-03-20 07:27:25
Local clock offset: -14.743 ms
Remote clock offset: -6.372 ms

Below is generated by plot.py at 2018-03-20 07:45:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.01 Mbit/s
95th percentile per-packet one-way delay: 91.376 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 5.01 Mbit/s
95th percentile per-packet one-way delay: 91.376 ms
Loss rate: 0.22%

Run 3: Report of Copa — Data Link

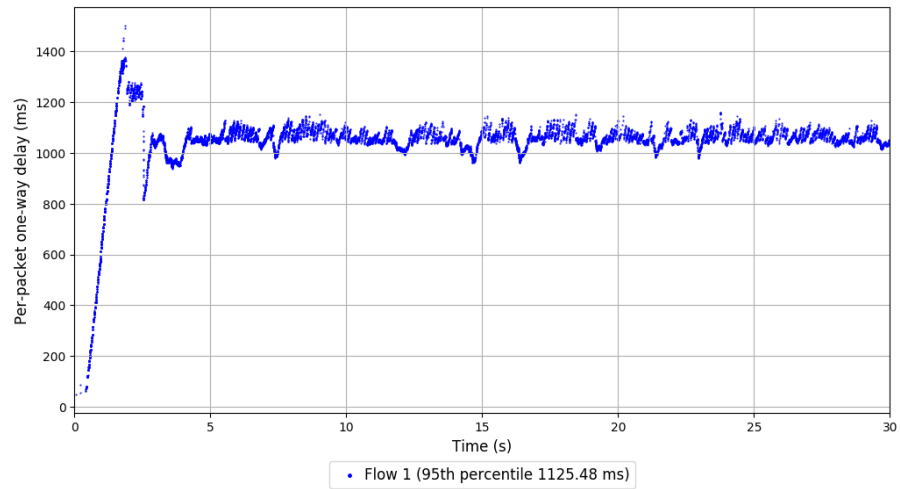
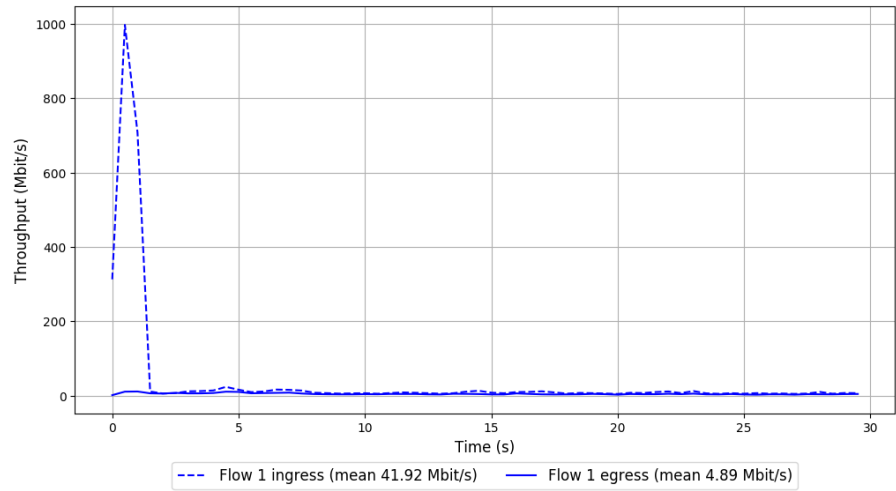


Run 1: Statistics of FillP

Start at: 2018-03-20 06:53:03
End at: 2018-03-20 06:53:33
Local clock offset: -25.978 ms
Remote clock offset: 3.09 ms

Below is generated by plot.py at 2018-03-20 07:45:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.89 Mbit/s
95th percentile per-packet one-way delay: 1125.481 ms
Loss rate: 88.35%
-- Flow 1:
Average throughput: 4.89 Mbit/s
95th percentile per-packet one-way delay: 1125.481 ms
Loss rate: 88.35%

Run 1: Report of FillP — Data Link

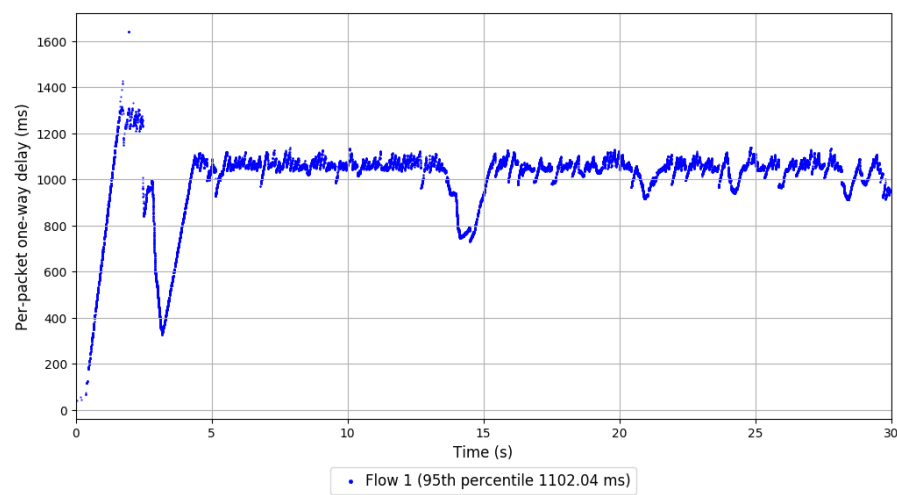
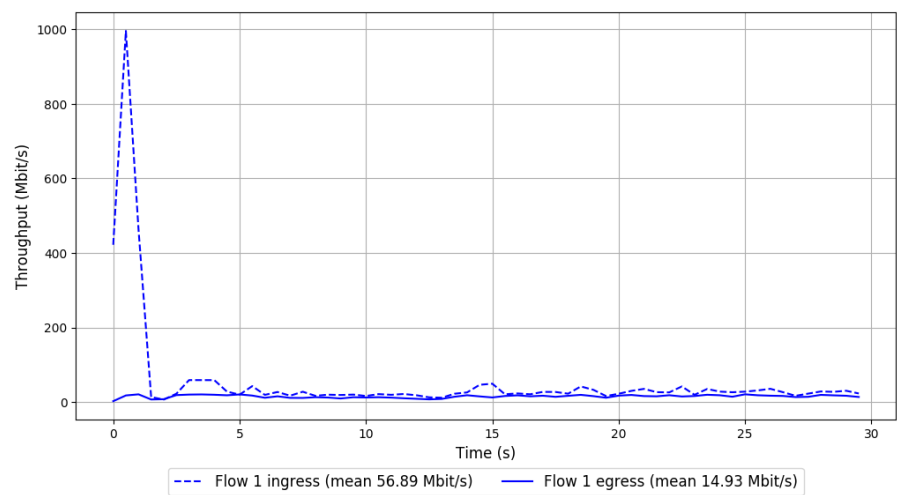


Run 2: Statistics of FillP

Start at: 2018-03-20 07:12:46
End at: 2018-03-20 07:13:16
Local clock offset: -17.735 ms
Remote clock offset: -4.024 ms

Below is generated by plot.py at 2018-03-20 07:46:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 14.93 Mbit/s
95th percentile per-packet one-way delay: 1102.041 ms
Loss rate: 73.79%
-- Flow 1:
Average throughput: 14.93 Mbit/s
95th percentile per-packet one-way delay: 1102.041 ms
Loss rate: 73.79%

Run 2: Report of FillP — Data Link

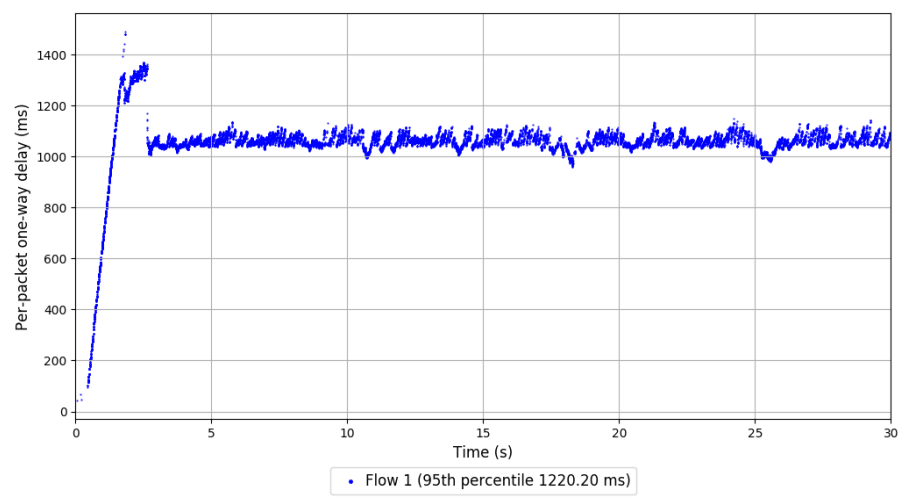
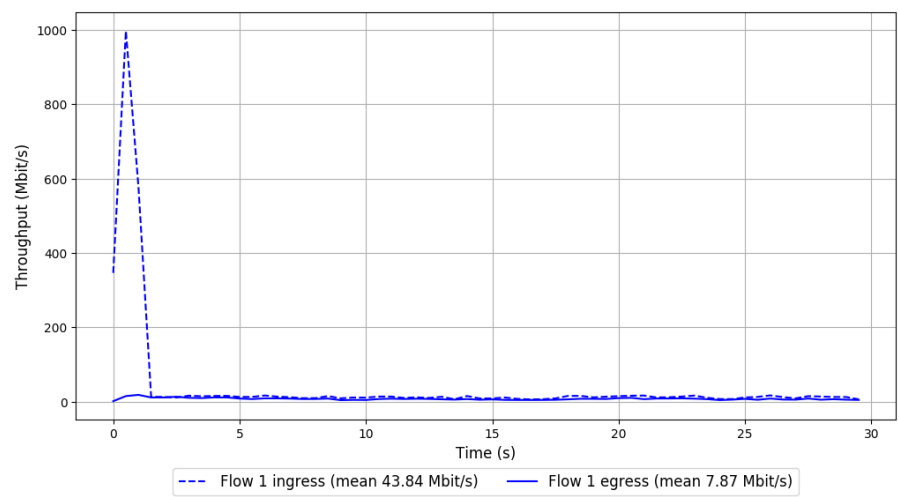


Run 3: Statistics of FillP

Start at: 2018-03-20 07:32:22
End at: 2018-03-20 07:32:52
Local clock offset: -8.902 ms
Remote clock offset: -4.284 ms

Below is generated by plot.py at 2018-03-20 07:46:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.87 Mbit/s
95th percentile per-packet one-way delay: 1220.201 ms
Loss rate: 82.06%
-- Flow 1:
Average throughput: 7.87 Mbit/s
95th percentile per-packet one-way delay: 1220.201 ms
Loss rate: 82.06%

Run 3: Report of FillP — Data Link

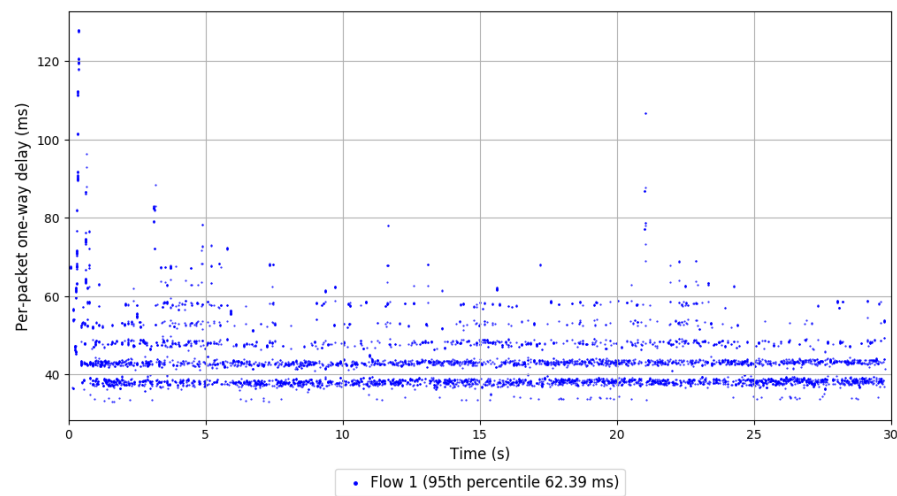
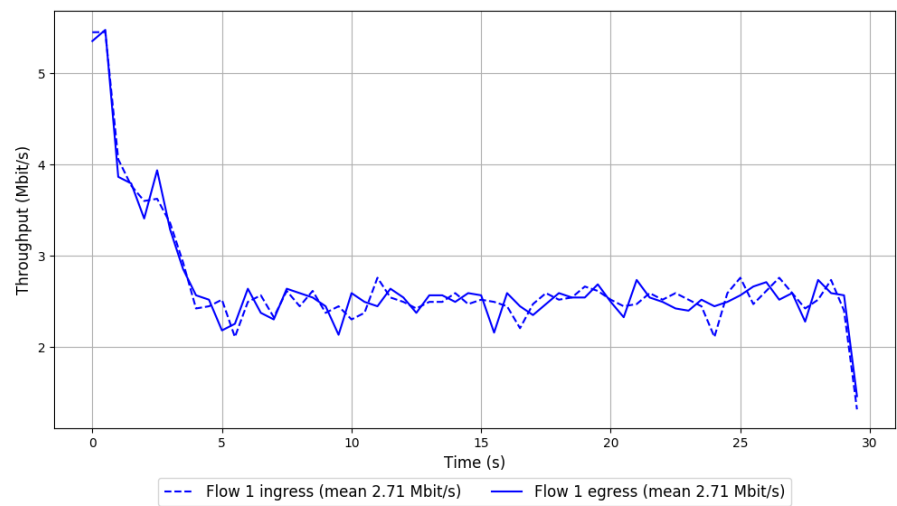


Run 1: Statistics of Indigo-1-32

Start at: 2018-03-20 07:02:54
End at: 2018-03-20 07:03:24
Local clock offset: -15.135 ms
Remote clock offset: -1.839 ms

Below is generated by plot.py at 2018-03-20 07:46:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 62.387 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 62.387 ms
Loss rate: 0.03%

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

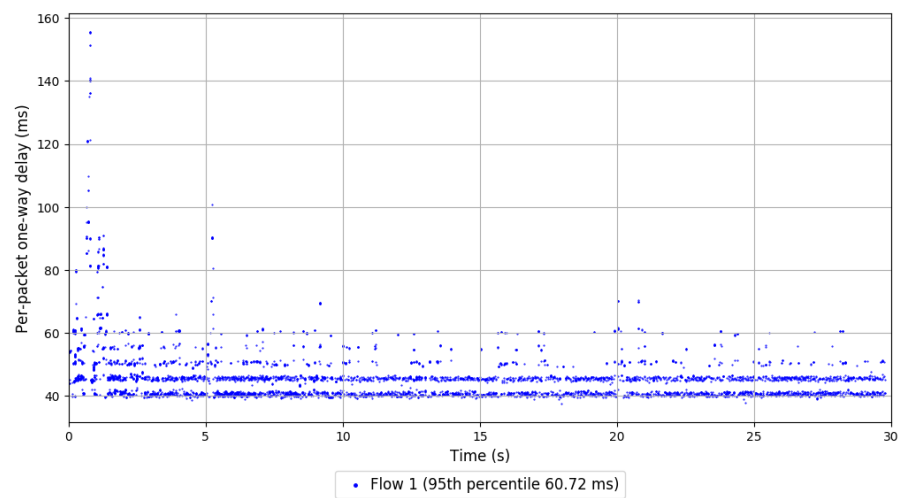
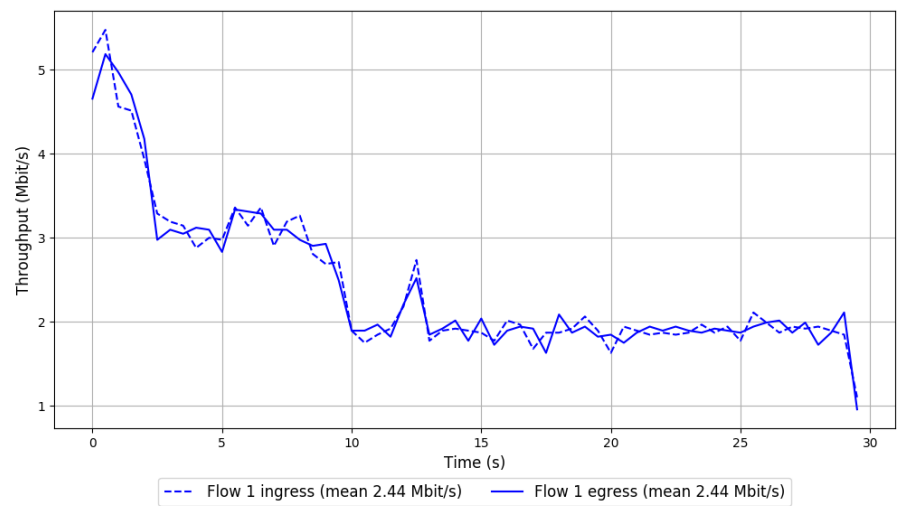


Run 2: Statistics of Indigo-1-32

Start at: 2018-03-20 07:22:34
End at: 2018-03-20 07:23:04
Local clock offset: -16.438 ms
Remote clock offset: -4.422 ms

Below is generated by plot.py at 2018-03-20 07:46:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.44 Mbit/s
95th percentile per-packet one-way delay: 60.719 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 2.44 Mbit/s
95th percentile per-packet one-way delay: 60.719 ms
Loss rate: 0.15%

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

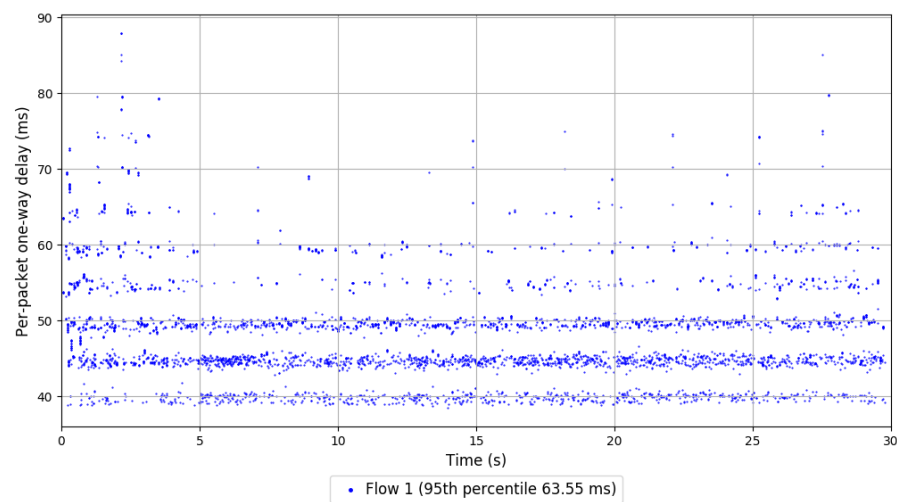
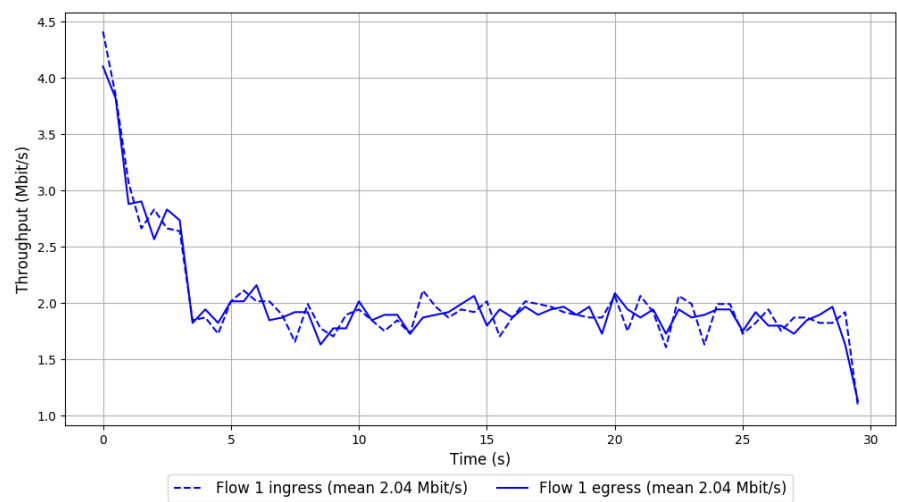


Run 3: Statistics of Indigo-1-32

Start at: 2018-03-20 07:42:11
End at: 2018-03-20 07:42:41
Local clock offset: -6.214 ms
Remote clock offset: -2.376 ms

Below is generated by plot.py at 2018-03-20 07:46:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 63.545 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 63.545 ms
Loss rate: 0.26%

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

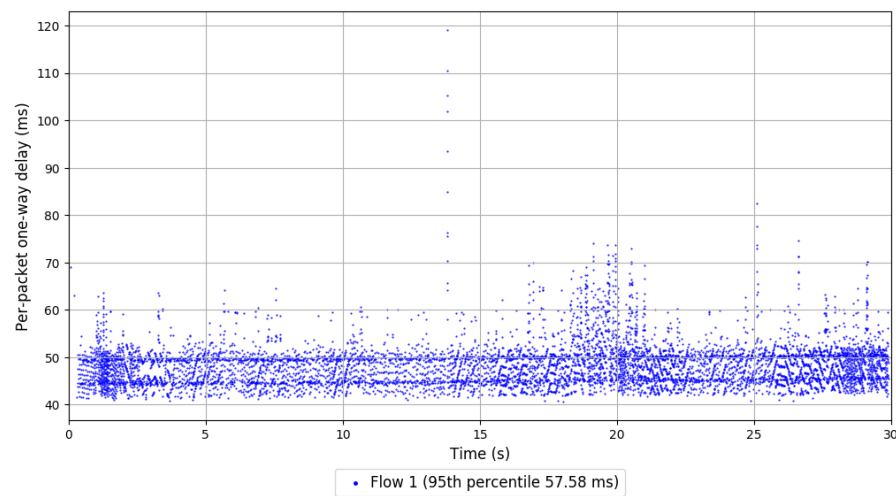
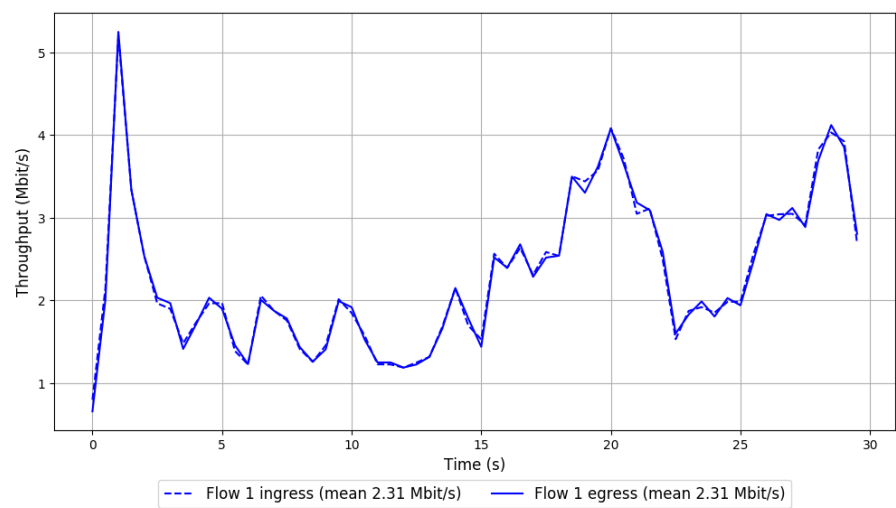


Run 1: Statistics of Vivace-latency

Start at: 2018-03-20 06:55:14
End at: 2018-03-20 06:55:44
Local clock offset: -24.995 ms
Remote clock offset: 2.636 ms

Below is generated by plot.py at 2018-03-20 07:46:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 57.575 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 57.575 ms
Loss rate: 0.19%

Run 1: Report of Vivace-latency — Data Link

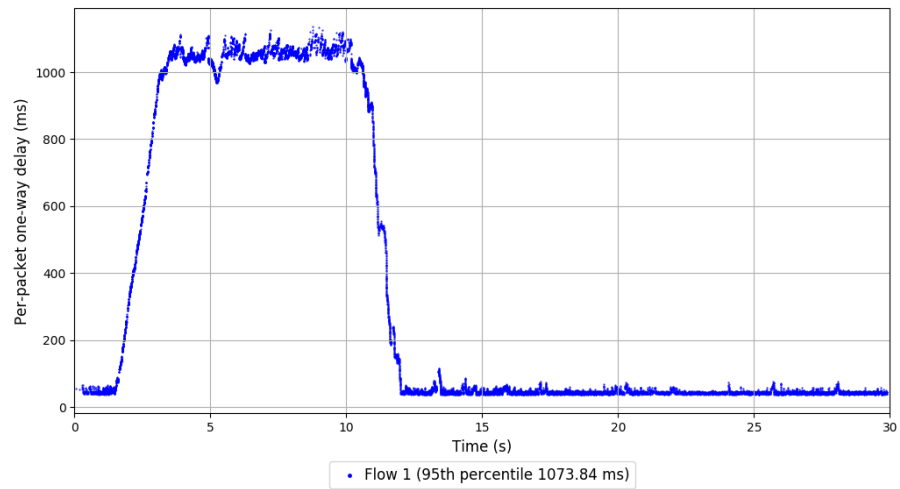
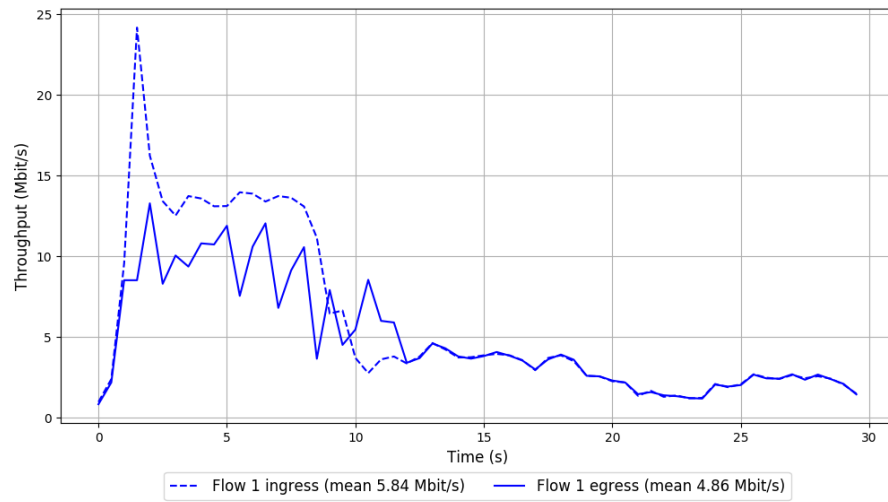


Run 2: Statistics of Vivace-latency

Start at: 2018-03-20 07:14:57
End at: 2018-03-20 07:15:27
Local clock offset: -15.113 ms
Remote clock offset: -3.73 ms

Below is generated by plot.py at 2018-03-20 07:46:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.86 Mbit/s
95th percentile per-packet one-way delay: 1073.840 ms
Loss rate: 17.00%
-- Flow 1:
Average throughput: 4.86 Mbit/s
95th percentile per-packet one-way delay: 1073.840 ms
Loss rate: 17.00%

Run 2: Report of Vivace-latency — Data Link

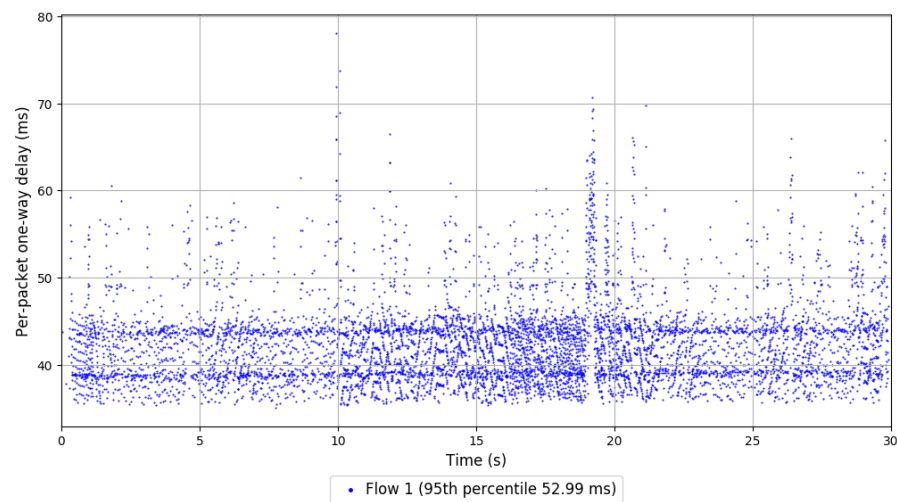
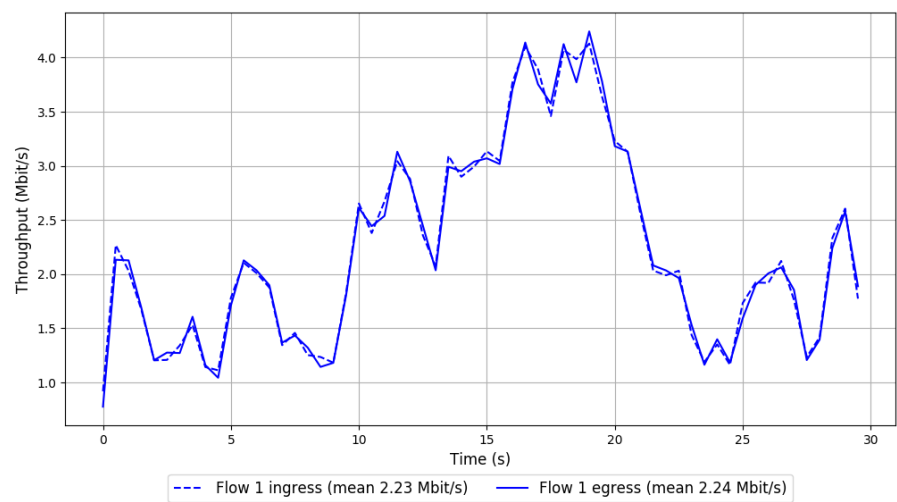


Run 3: Statistics of Vivace-latency

Start at: 2018-03-20 07:34:33
End at: 2018-03-20 07:35:03
Local clock offset: -6.306 ms
Remote clock offset: -4.558 ms

Below is generated by plot.py at 2018-03-20 07:46:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 52.987 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 52.987 ms
Loss rate: 0.12%

Run 3: Report of Vivace-latency — Data Link

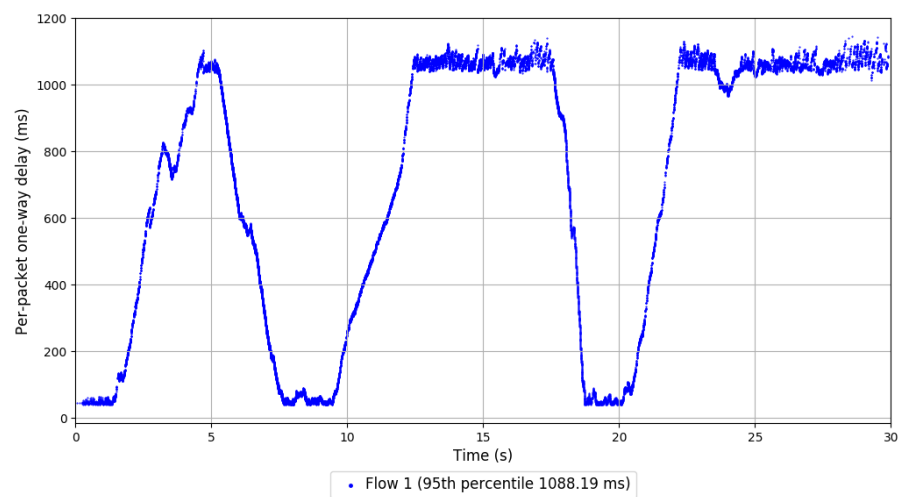
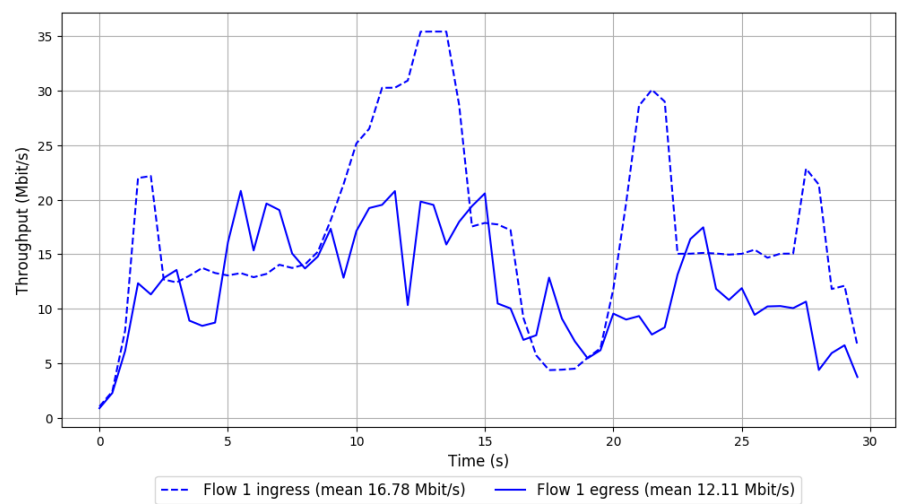


Run 1: Statistics of Vivace-loss

Start at: 2018-03-20 06:58:29
End at: 2018-03-20 06:58:59
Local clock offset: -21.687 ms
Remote clock offset: 1.395 ms

Below is generated by plot.py at 2018-03-20 07:46:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.11 Mbit/s
95th percentile per-packet one-way delay: 1088.195 ms
Loss rate: 27.93%
-- Flow 1:
Average throughput: 12.11 Mbit/s
95th percentile per-packet one-way delay: 1088.195 ms
Loss rate: 27.93%

Run 1: Report of Vivace-loss — Data Link

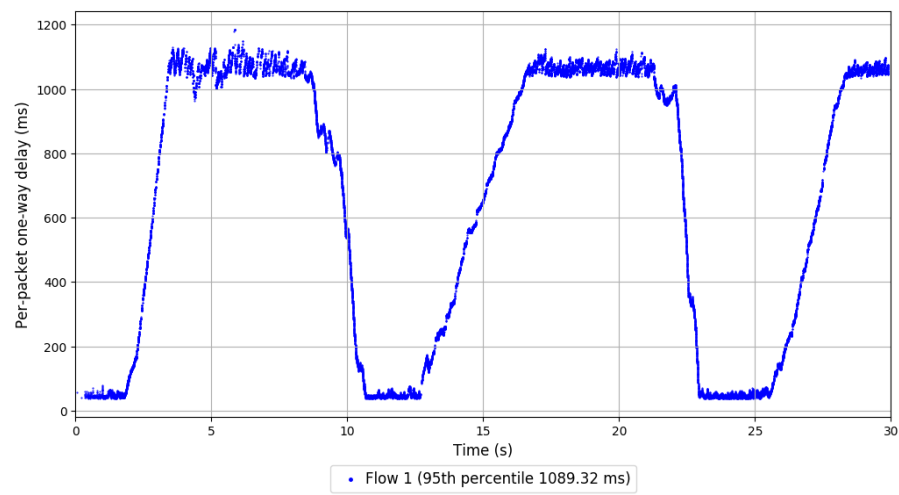
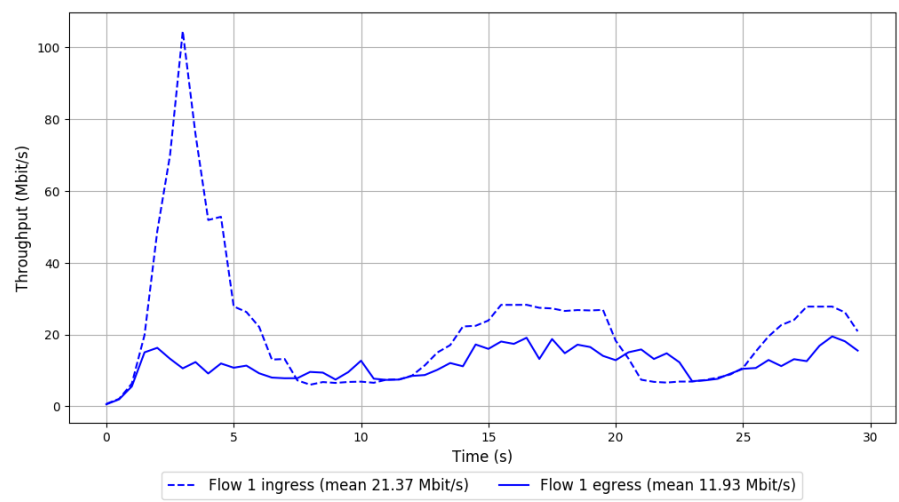


Run 2: Statistics of Vivace-loss

Start at: 2018-03-20 07:18:12
End at: 2018-03-20 07:18:42
Local clock offset: -17.422 ms
Remote clock offset: -4.206 ms

Below is generated by plot.py at 2018-03-20 07:46:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.93 Mbit/s
95th percentile per-packet one-way delay: 1089.319 ms
Loss rate: 44.23%
-- Flow 1:
Average throughput: 11.93 Mbit/s
95th percentile per-packet one-way delay: 1089.319 ms
Loss rate: 44.23%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-03-20 07:37:48

End at: 2018-03-20 07:38:18

Local clock offset: -6.734 ms

Remote clock offset: -3.828 ms

Below is generated by plot.py at 2018-03-20 07:46:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 16.60 Mbit/s

95th percentile per-packet one-way delay: 1083.343 ms

Loss rate: 32.32%

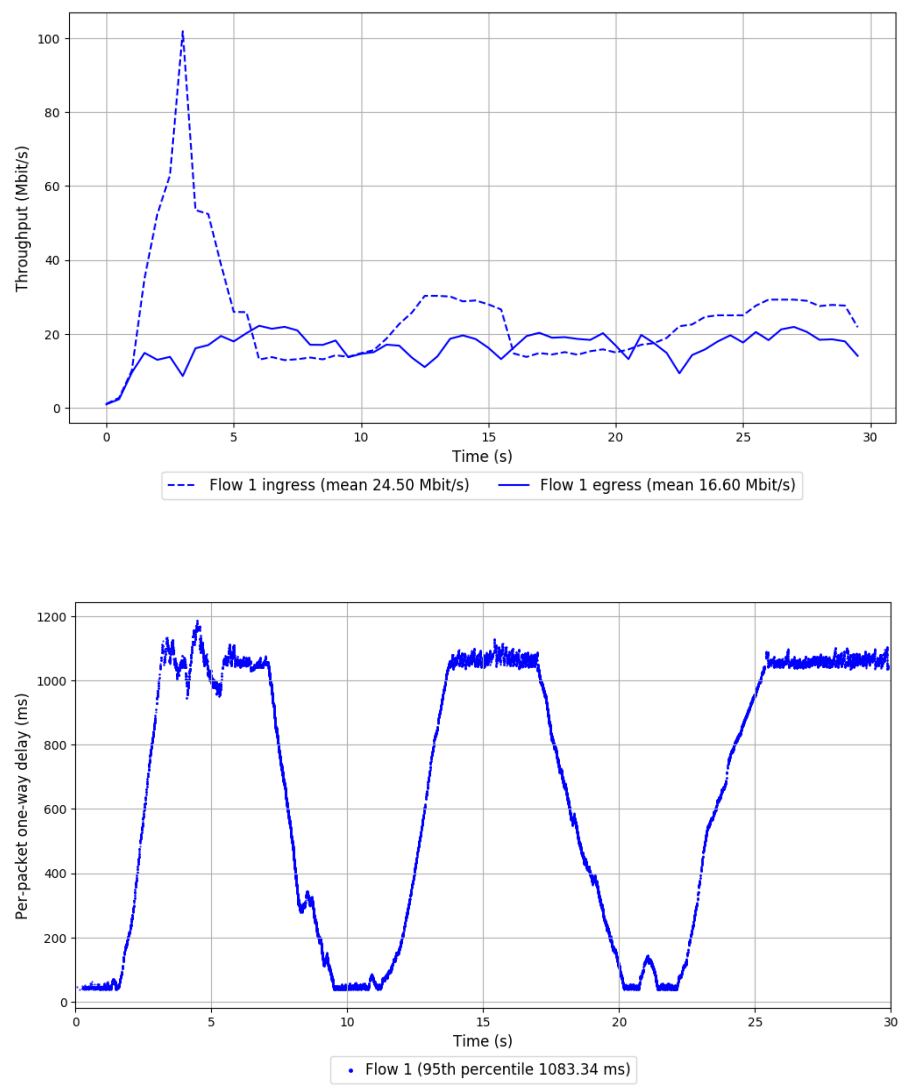
-- Flow 1:

Average throughput: 16.60 Mbit/s

95th percentile per-packet one-way delay: 1083.343 ms

Loss rate: 32.32%

Run 3: Report of Vivace-loss — Data Link

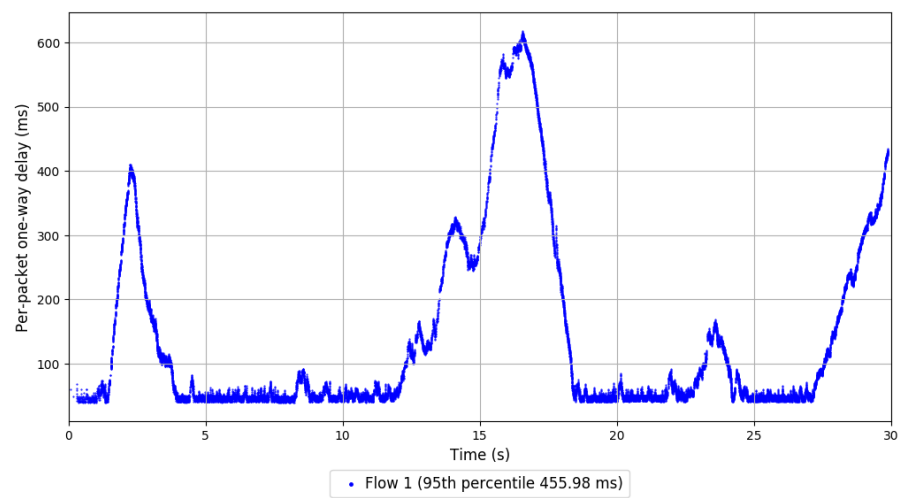
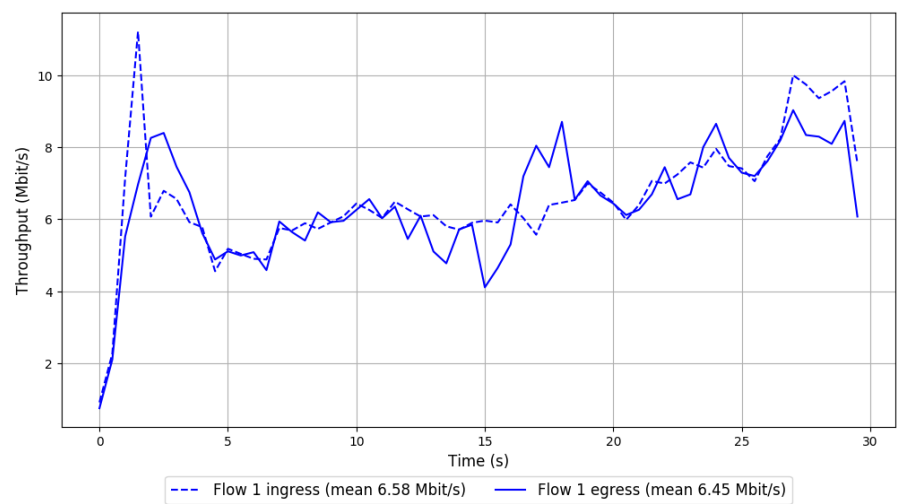


Run 1: Statistics of Vivace-LTE

Start at: 2018-03-20 06:51:58
End at: 2018-03-20 06:52:28
Local clock offset: -26.873 ms
Remote clock offset: 2.513 ms

Below is generated by plot.py at 2018-03-20 07:46:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.45 Mbit/s
95th percentile per-packet one-way delay: 455.982 ms
Loss rate: 2.20%
-- Flow 1:
Average throughput: 6.45 Mbit/s
95th percentile per-packet one-way delay: 455.982 ms
Loss rate: 2.20%

Run 1: Report of Vivace-LTE — Data Link

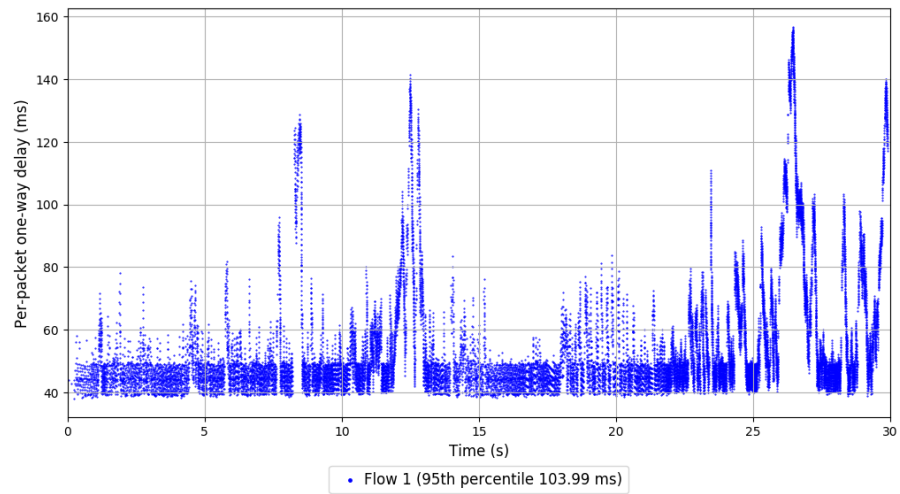
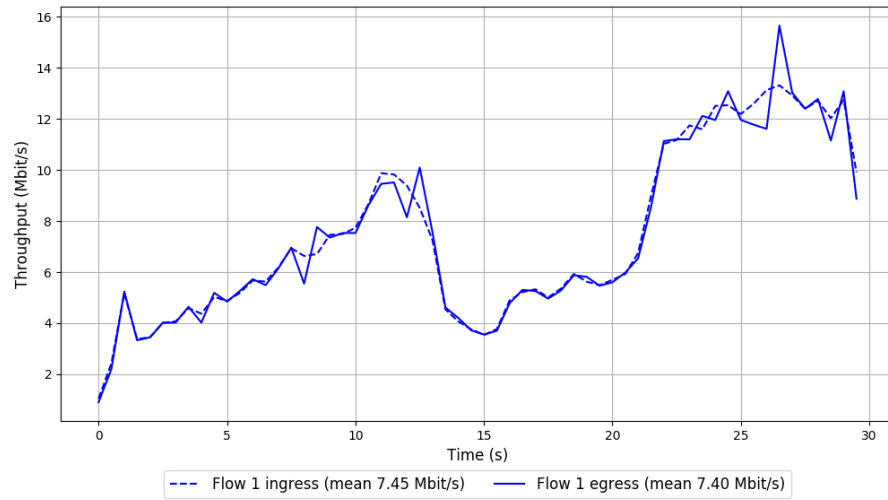


Run 2: Statistics of Vivace-LTE

Start at: 2018-03-20 07:11:41
End at: 2018-03-20 07:12:11
Local clock offset: -16.76 ms
Remote clock offset: -3.187 ms

Below is generated by plot.py at 2018-03-20 07:46:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.40 Mbit/s
95th percentile per-packet one-way delay: 103.991 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 7.40 Mbit/s
95th percentile per-packet one-way delay: 103.991 ms
Loss rate: 0.72%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-03-20 07:31:16

End at: 2018-03-20 07:31:46

Local clock offset: -11.07 ms

Remote clock offset: -5.07 ms

Below is generated by plot.py at 2018-03-20 07:46:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.58 Mbit/s

95th percentile per-packet one-way delay: 1020.132 ms

Loss rate: 1.08%

-- Flow 1:

Average throughput: 9.58 Mbit/s

95th percentile per-packet one-way delay: 1020.132 ms

Loss rate: 1.08%

Run 3: Report of Vivace-LTE — Data Link

