

Pantheon Report

Generated at 2018-02-27 08:30:04 (UTC).

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

Repeated the test of 17 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

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

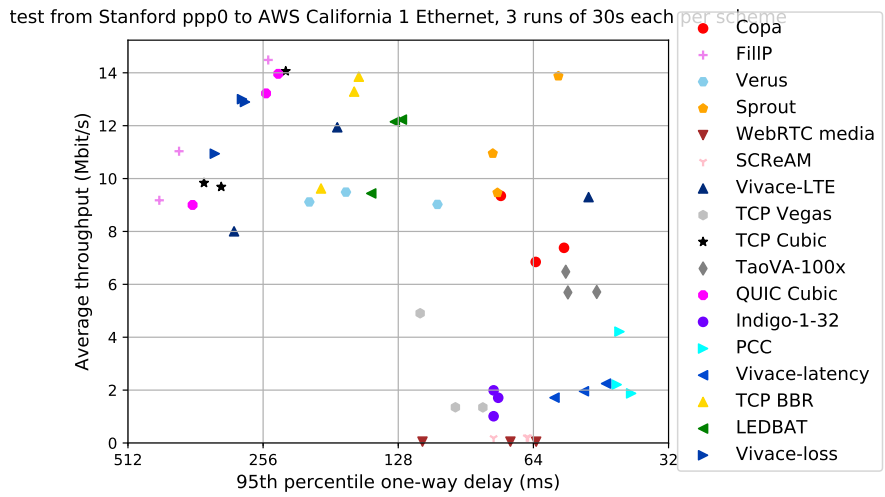
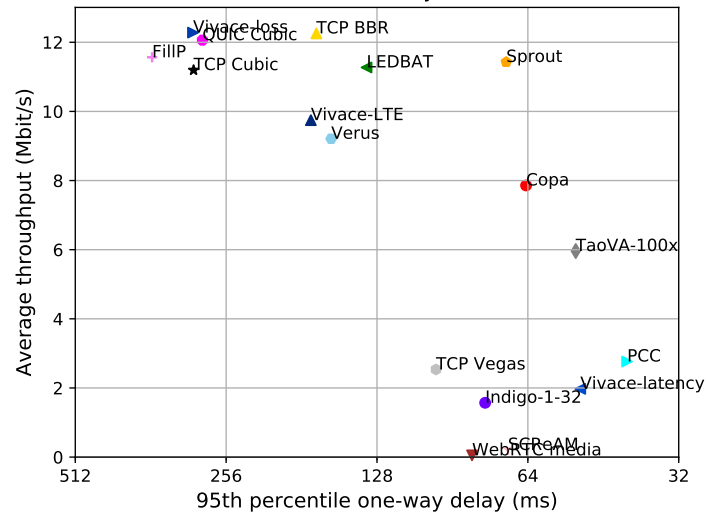
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

Git summary:

```
branch: master @ f12c42a2c63fdd9a862eefa0468859bf379b6623
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 828bbf95fd4941149b5cec90f281d1c69ae1a5c6
third_party/genericCC @ 9249eea3238475c4d8cca1443d28df70bff6c4a2
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ 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 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	12.26	169.13	0.54
TCP Cubic	3	11.20	297.33	1.14
LEDBAT	3	11.27	134.32	0.45
PCC	3	2.77	40.56	0.16
QUIC Cubic	3	12.06	285.54	1.55
SCReAM	3	0.21	70.15	0.15
WebRTC media	3	0.05	82.72	0.00
Sprout	3	11.43	70.70	1.41
TaoVA-100x	3	5.96	51.36	0.48
TCP Vegas	3	2.54	97.61	0.32
Verus	3	9.21	158.01	16.34
Copa	3	7.86	64.53	0.11
FillP	3	11.57	359.76	51.46
Indigo-1-32	3	1.57	77.88	0.20
Vivace-latency	3	1.97	50.31	0.35
Vivace-loss	3	12.28	298.09	15.55
Vivace-LTE	3	9.75	173.45	1.47

Run 1: Statistics of TCP BBR

Start at: 2018-02-27 06:20:04

End at: 2018-02-27 06:20:34

Local clock offset: -5.595 ms

Remote clock offset: -8.436 ms

Below is generated by plot.py at 2018-02-27 08:28:57

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.63 Mbit/s

95th percentile per-packet one-way delay: 190.223 ms

Loss rate: 0.58%

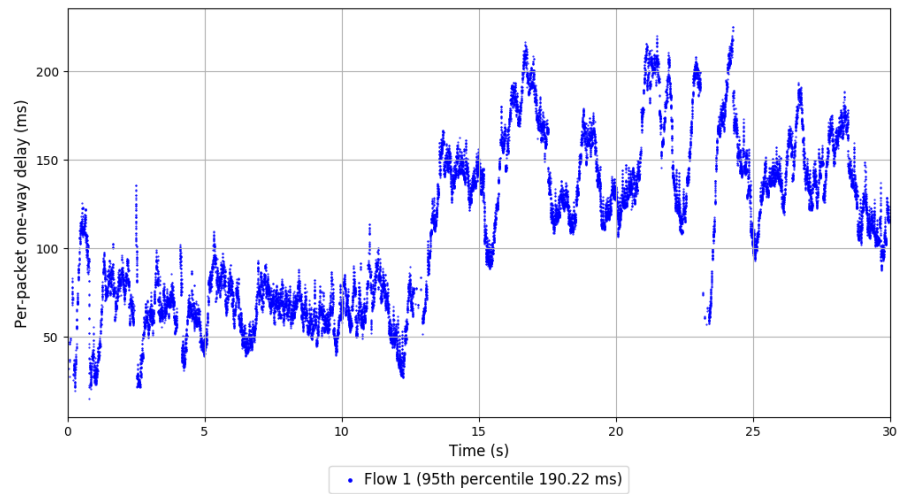
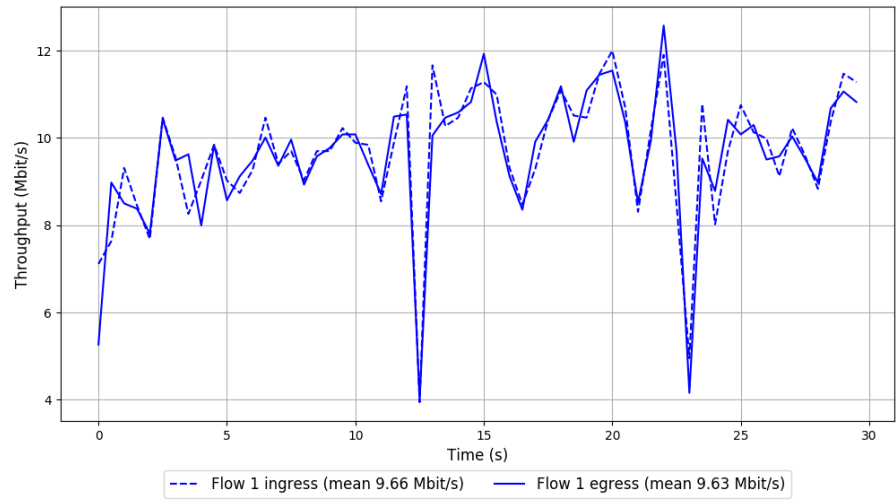
-- Flow 1:

Average throughput: 9.63 Mbit/s

95th percentile per-packet one-way delay: 190.223 ms

Loss rate: 0.58%

Run 1: Report of TCP BBR — Data Link

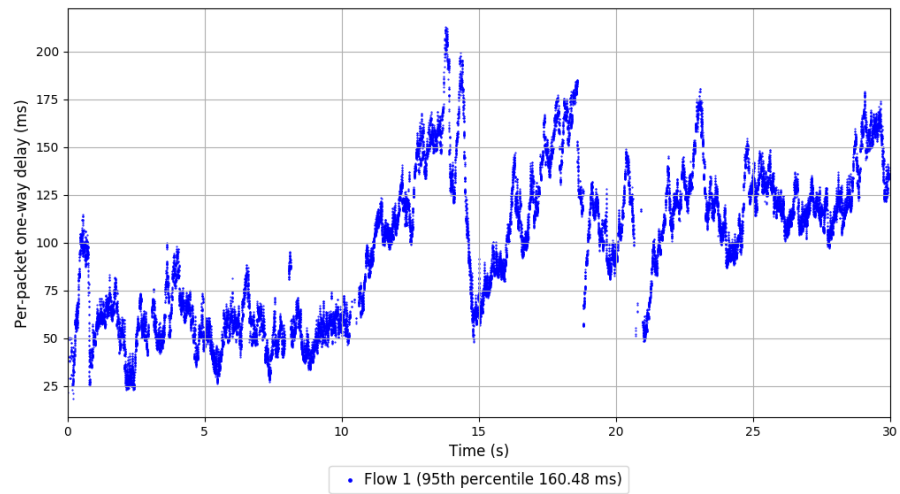
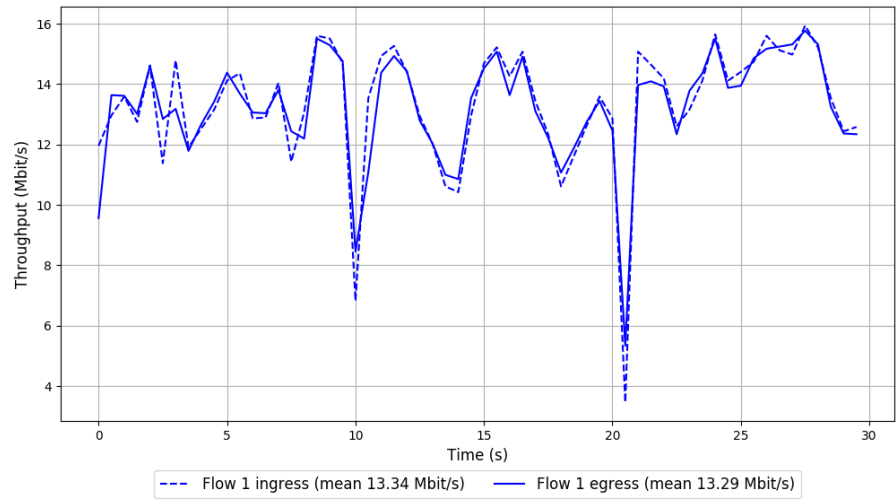


Run 2: Statistics of TCP BBR

Start at: 2018-02-27 06:43:37
End at: 2018-02-27 06:44:07
Local clock offset: -8.788 ms
Remote clock offset: -6.364 ms

Below is generated by plot.py at 2018-02-27 08:29:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.29 Mbit/s
95th percentile per-packet one-way delay: 160.480 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 13.29 Mbit/s
95th percentile per-packet one-way delay: 160.480 ms
Loss rate: 0.53%

Run 2: Report of TCP BBR — Data Link

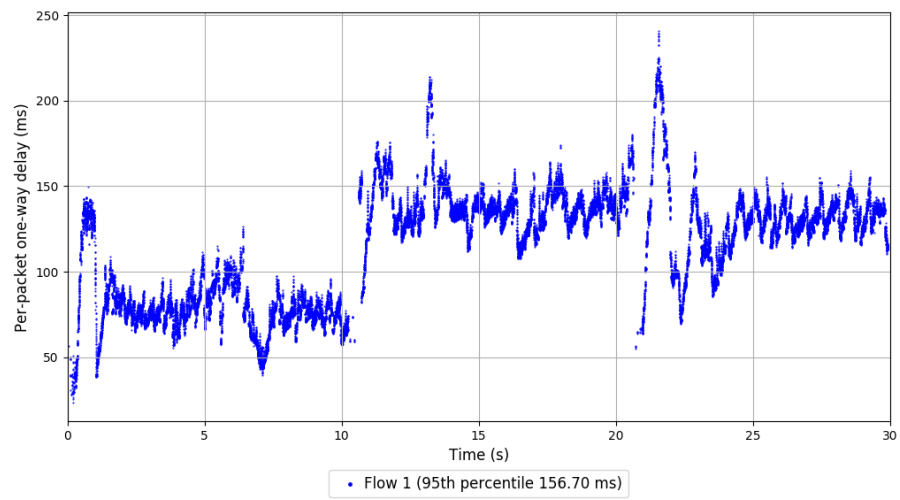
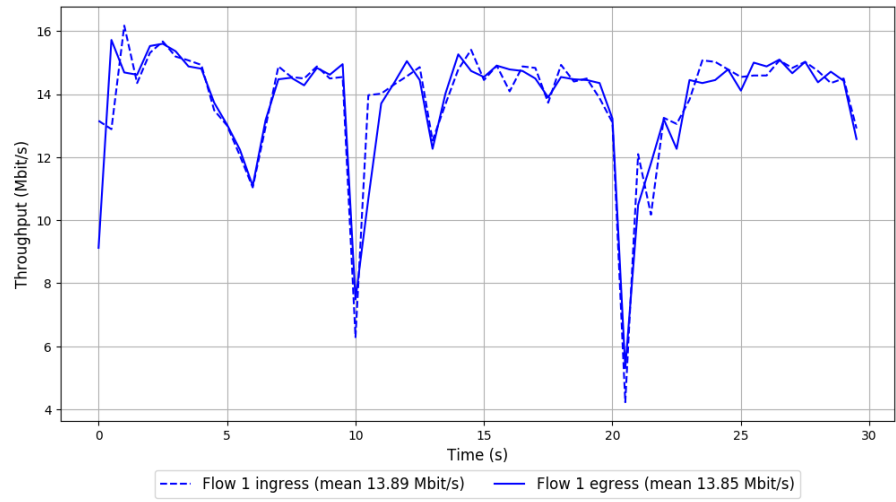


Run 3: Statistics of TCP BBR

Start at: 2018-02-27 07:07:13
End at: 2018-02-27 07:07:43
Local clock offset: -11.575 ms
Remote clock offset: -5.31 ms

Below is generated by plot.py at 2018-02-27 08:29:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.85 Mbit/s
95th percentile per-packet one-way delay: 156.699 ms
Loss rate: 0.51%
-- Flow 1:
Average throughput: 13.85 Mbit/s
95th percentile per-packet one-way delay: 156.699 ms
Loss rate: 0.51%

Run 3: Report of TCP BBR — Data Link

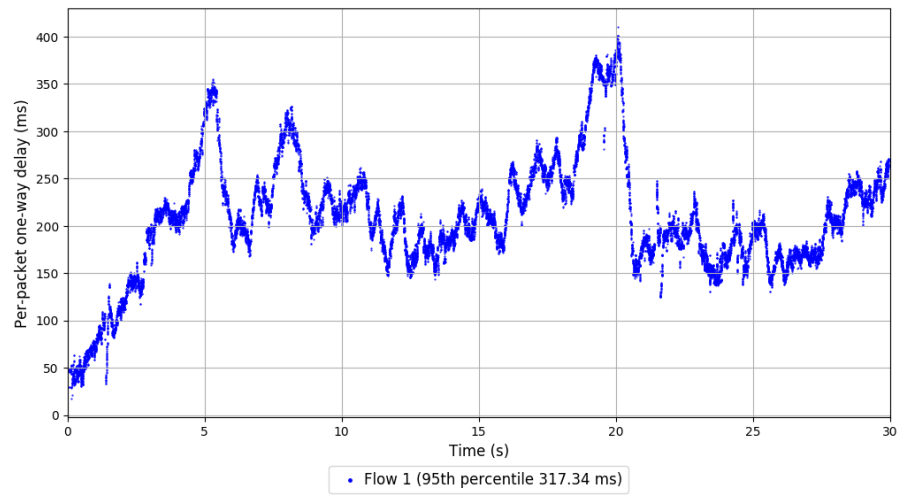
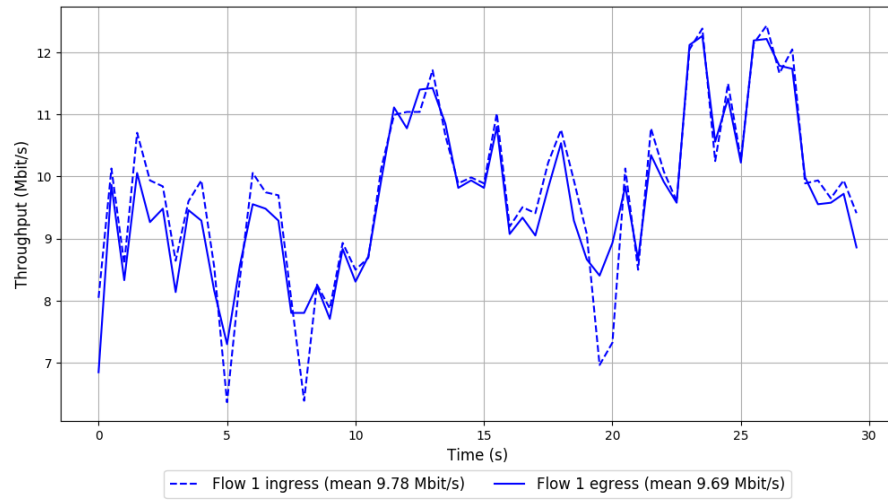


Run 1: Statistics of TCP Cubic

Start at: 2018-02-27 06:17:26
End at: 2018-02-27 06:17:56
Local clock offset: -4.801 ms
Remote clock offset: -8.383 ms

Below is generated by plot.py at 2018-02-27 08:29:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.69 Mbit/s
95th percentile per-packet one-way delay: 317.344 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 9.69 Mbit/s
95th percentile per-packet one-way delay: 317.344 ms
Loss rate: 1.09%

Run 1: Report of TCP Cubic — Data Link

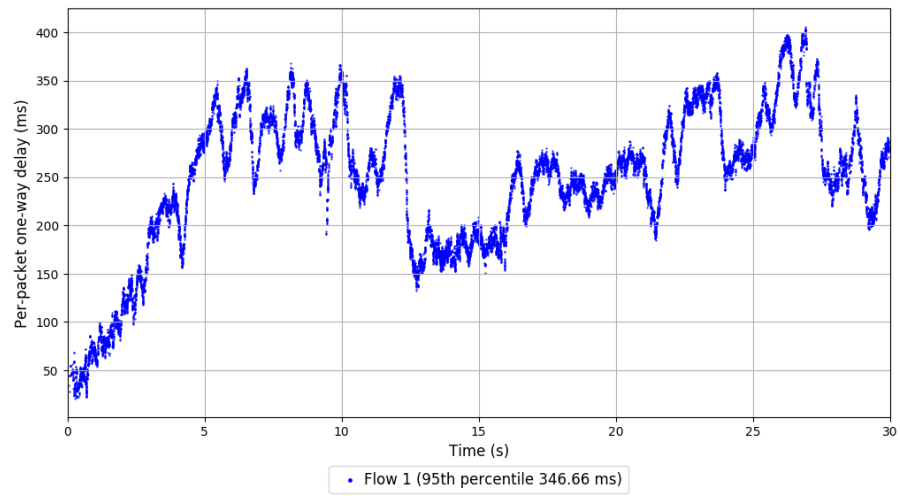
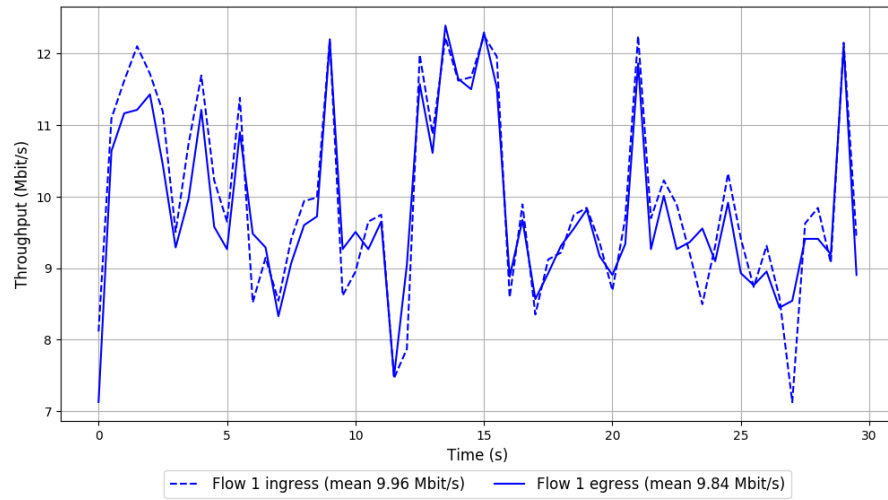


Run 2: Statistics of TCP Cubic

Start at: 2018-02-27 06:40:59
End at: 2018-02-27 06:41:29
Local clock offset: -8.121 ms
Remote clock offset: -6.608 ms

Below is generated by plot.py at 2018-02-27 08:29:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.84 Mbit/s
95th percentile per-packet one-way delay: 346.662 ms
Loss rate: 1.35%
-- Flow 1:
Average throughput: 9.84 Mbit/s
95th percentile per-packet one-way delay: 346.662 ms
Loss rate: 1.35%

Run 2: Report of TCP Cubic — Data Link

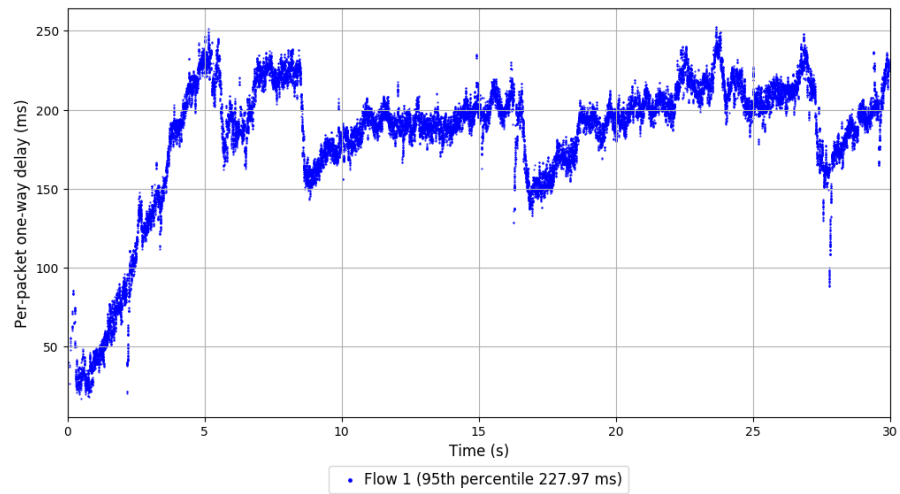
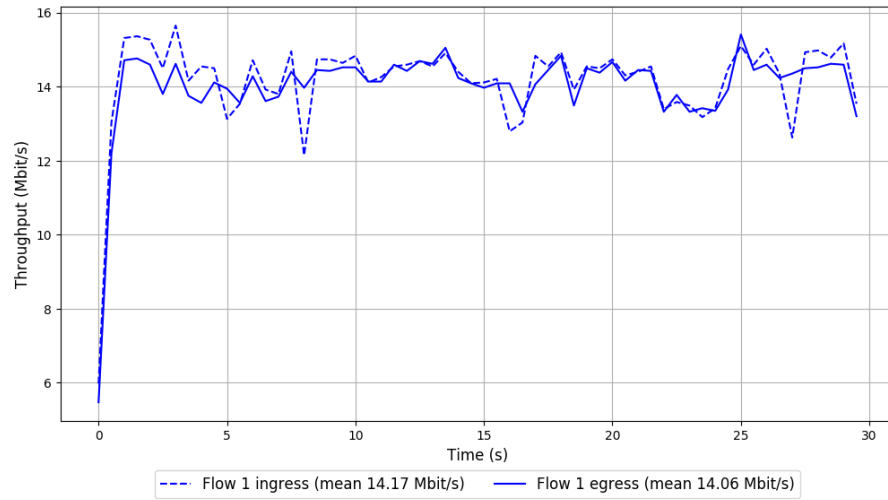


Run 3: Statistics of TCP Cubic

Start at: 2018-02-27 07:04:35
End at: 2018-02-27 07:05:05
Local clock offset: -14.675 ms
Remote clock offset: -5.405 ms

Below is generated by plot.py at 2018-02-27 08:29:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 14.06 Mbit/s
95th percentile per-packet one-way delay: 227.973 ms
Loss rate: 0.97%
-- Flow 1:
Average throughput: 14.06 Mbit/s
95th percentile per-packet one-way delay: 227.973 ms
Loss rate: 0.97%

Run 3: Report of TCP Cubic — Data Link

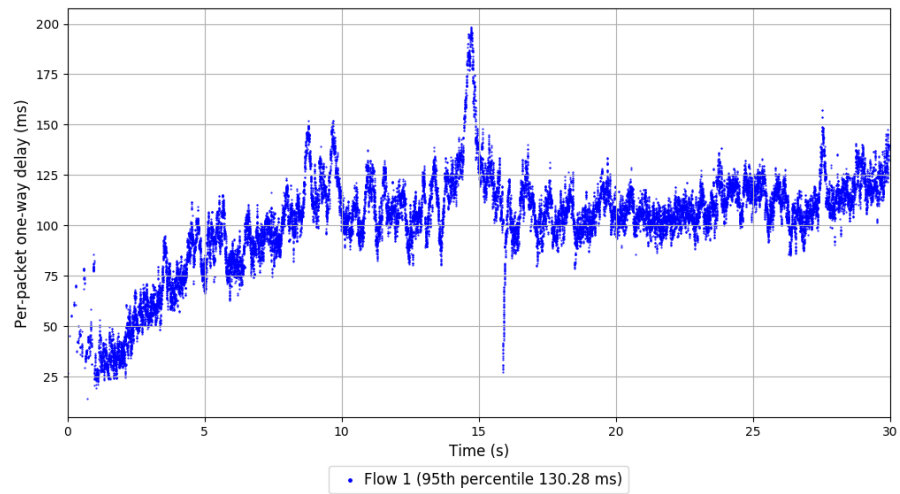
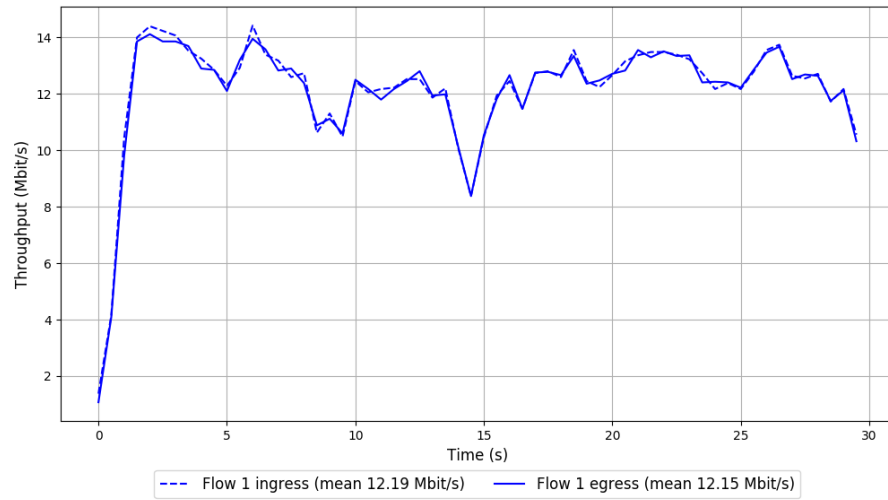


```
Run 1: Statistics of LEDBAT

Start at: 2018-02-27 06:09:34
End at: 2018-02-27 06:10:04
Local clock offset: -5.415 ms
Remote clock offset: -8.13 ms

# Below is generated by plot.py at 2018-02-27 08:29:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.15 Mbit/s
95th percentile per-packet one-way delay: 130.282 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 12.15 Mbit/s
95th percentile per-packet one-way delay: 130.282 ms
Loss rate: 0.43%
```

Run 1: Report of LEDBAT — Data Link

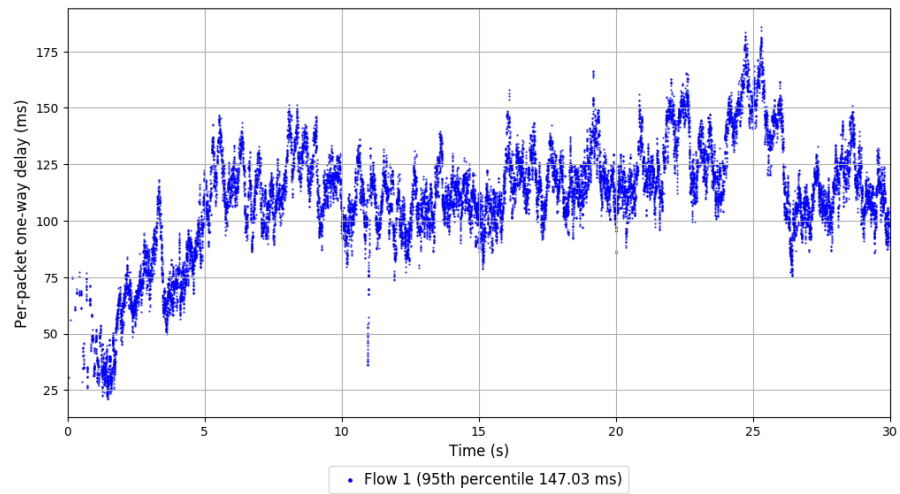
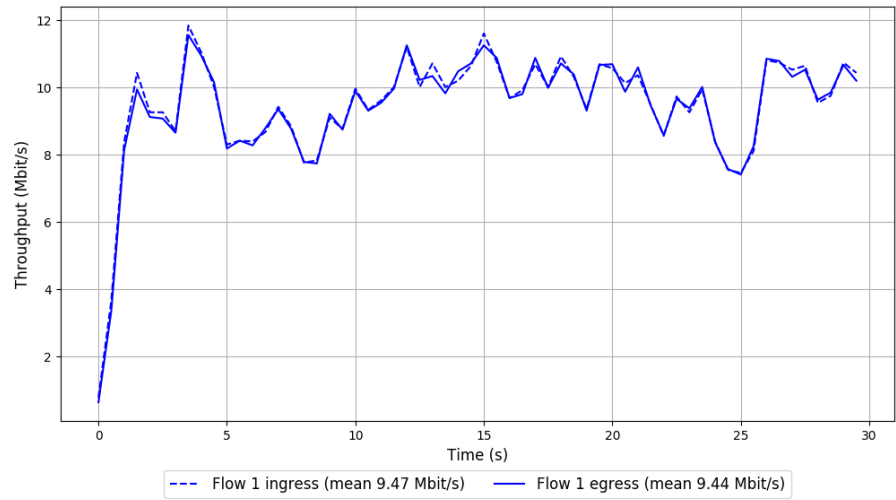


Run 2: Statistics of LEDBAT

Start at: 2018-02-27 06:33:09
End at: 2018-02-27 06:33:39
Local clock offset: -8.224 ms
Remote clock offset: -7.722 ms

Below is generated by plot.py at 2018-02-27 08:29:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.44 Mbit/s
95th percentile per-packet one-way delay: 147.027 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 9.44 Mbit/s
95th percentile per-packet one-way delay: 147.027 ms
Loss rate: 0.46%

Run 2: Report of LEDBAT — Data Link

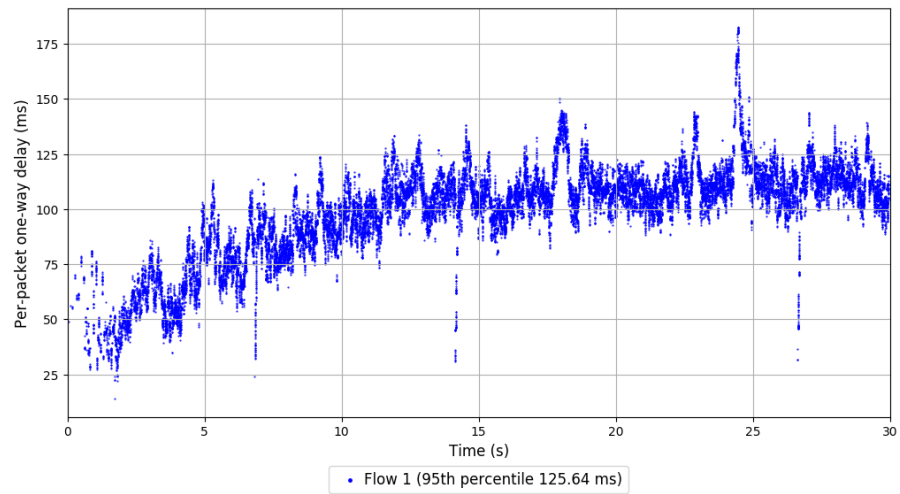
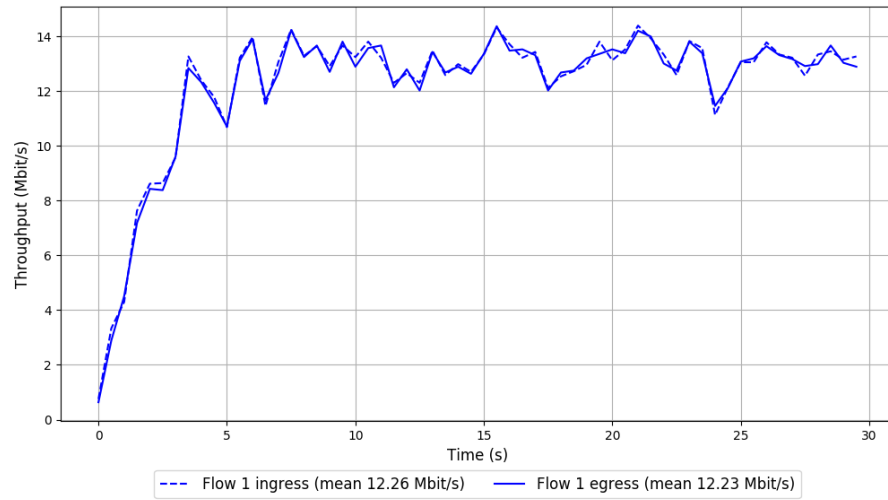


Run 3: Statistics of LEDBAT

Start at: 2018-02-27 06:56:43
End at: 2018-02-27 06:57:13
Local clock offset: -13.973 ms
Remote clock offset: -5.674 ms

Below is generated by plot.py at 2018-02-27 08:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.23 Mbit/s
95th percentile per-packet one-way delay: 125.640 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 12.23 Mbit/s
95th percentile per-packet one-way delay: 125.640 ms
Loss rate: 0.45%

Run 3: Report of LEDBAT — Data Link

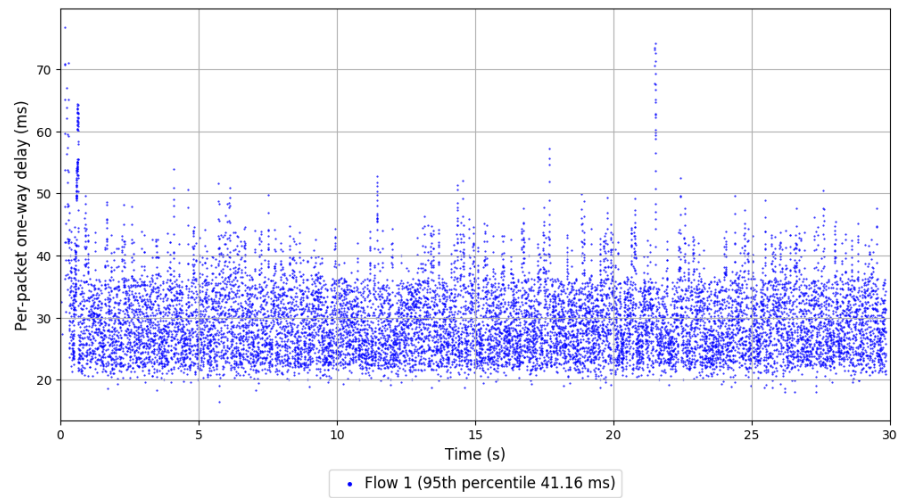
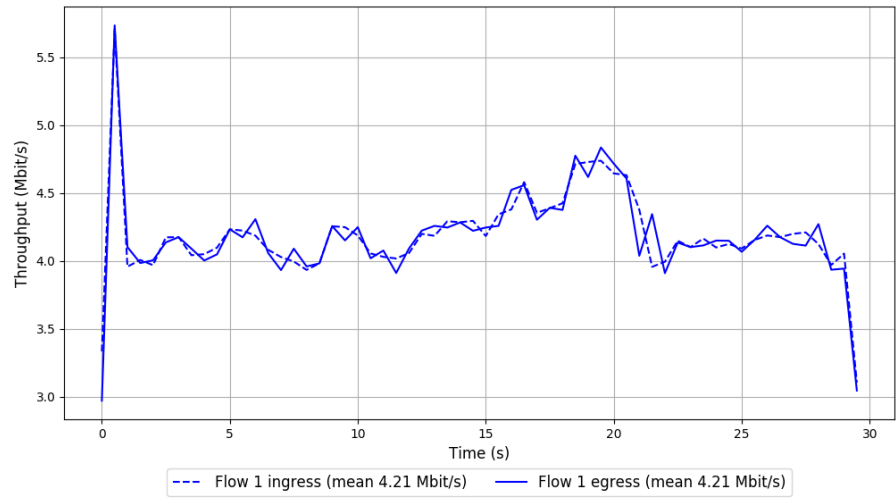


Run 1: Statistics of PCC

Start at: 2018-02-27 06:26:36
End at: 2018-02-27 06:27:06
Local clock offset: -9.141 ms
Remote clock offset: -8.648 ms

Below is generated by plot.py at 2018-02-27 08:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.21 Mbit/s
95th percentile per-packet one-way delay: 41.159 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 4.21 Mbit/s
95th percentile per-packet one-way delay: 41.159 ms
Loss rate: 0.17%

Run 1: Report of PCC — Data Link

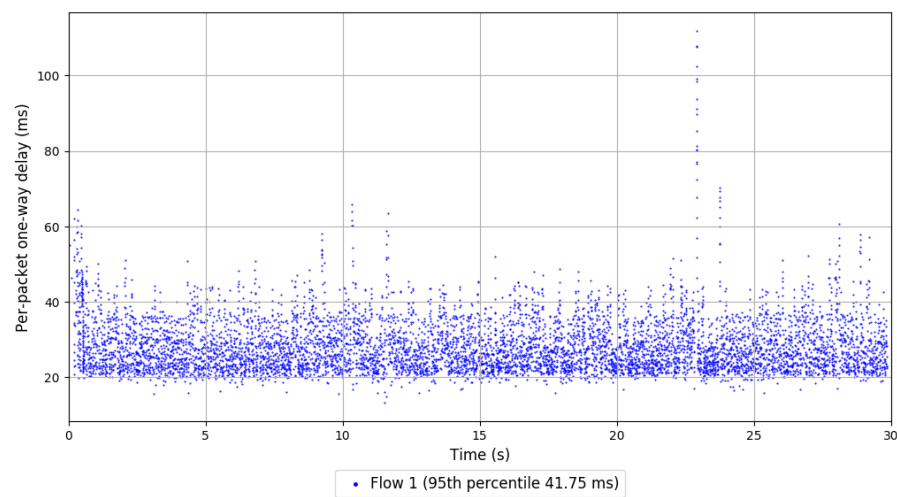
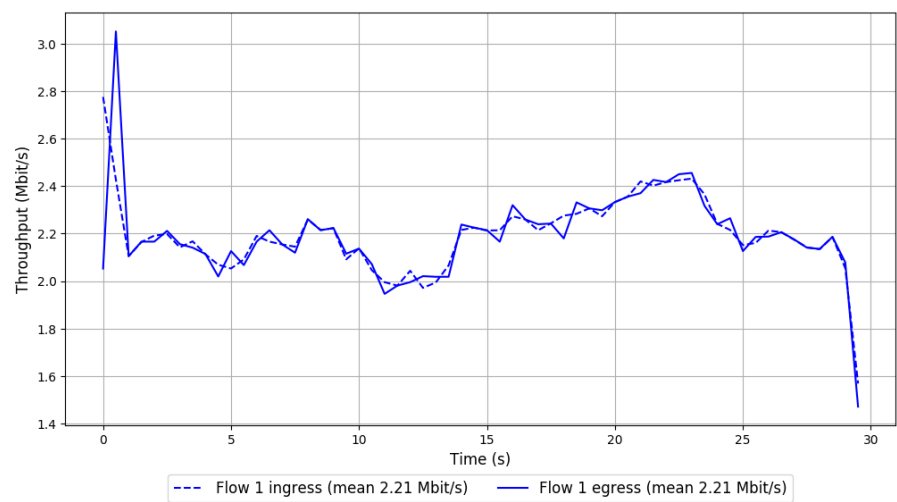


Run 2: Statistics of PCC

Start at: 2018-02-27 06:50:10
End at: 2018-02-27 06:50:40
Local clock offset: -11.102 ms
Remote clock offset: -5.961 ms

Below is generated by plot.py at 2018-02-27 08:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.21 Mbit/s
95th percentile per-packet one-way delay: 41.753 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 2.21 Mbit/s
95th percentile per-packet one-way delay: 41.753 ms
Loss rate: 0.15%

Run 2: Report of PCC — Data Link

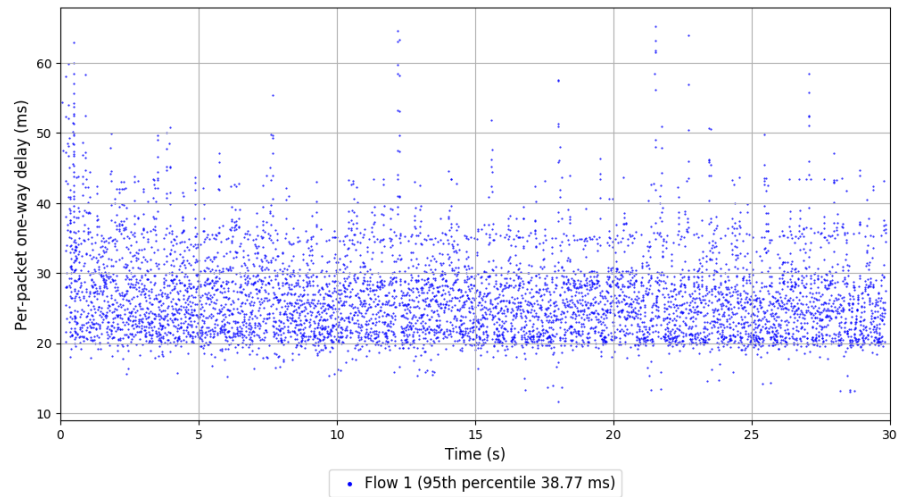
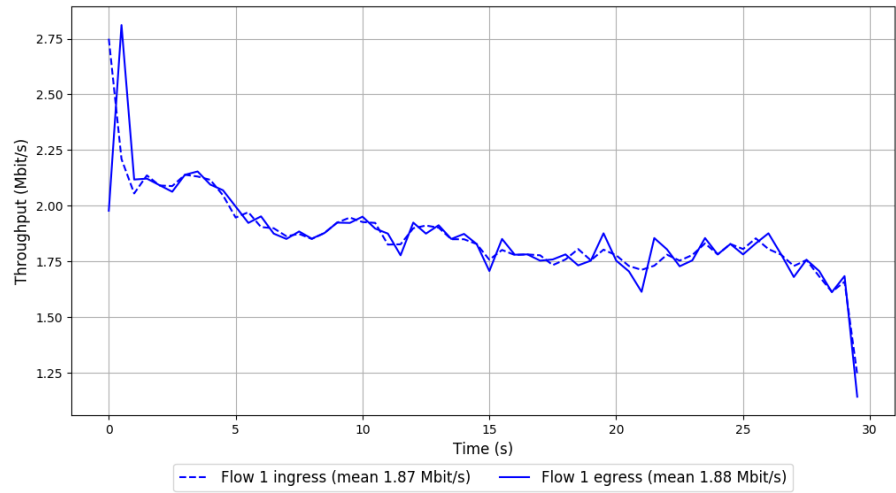


Run 3: Statistics of PCC

Start at: 2018-02-27 07:13:45
End at: 2018-02-27 07:14:15
Local clock offset: -7.592 ms
Remote clock offset: -5.188 ms

Below is generated by plot.py at 2018-02-27 08:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.88 Mbit/s
95th percentile per-packet one-way delay: 38.771 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 1.88 Mbit/s
95th percentile per-packet one-way delay: 38.771 ms
Loss rate: 0.15%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-02-27 06:14:49

End at: 2018-02-27 06:15:19

Local clock offset: -4.971 ms

Remote clock offset: -8.289 ms

Below is generated by plot.py at 2018-02-27 08:29:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 13.22 Mbit/s

95th percentile per-packet one-way delay: 252.151 ms

Loss rate: 1.36%

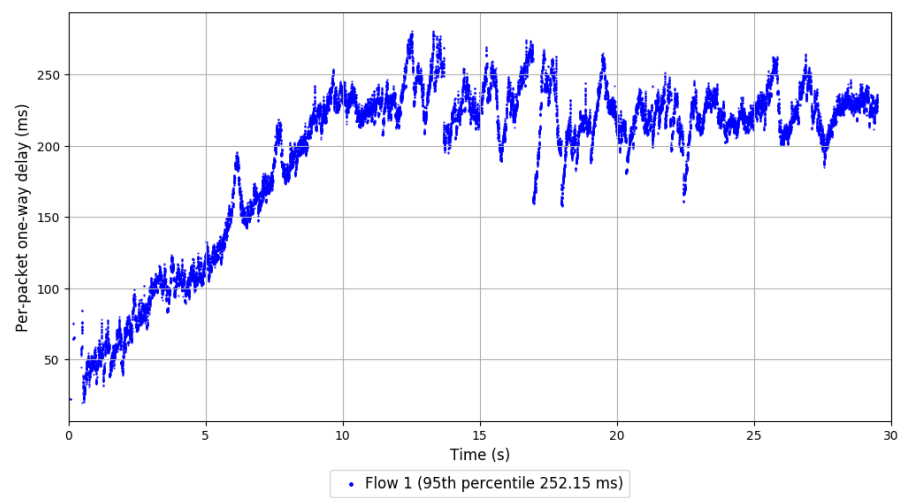
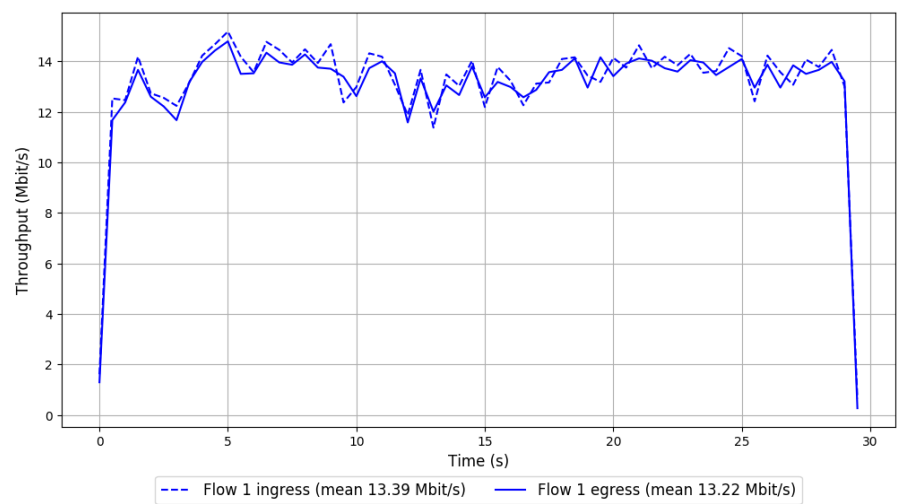
-- Flow 1:

Average throughput: 13.22 Mbit/s

95th percentile per-packet one-way delay: 252.151 ms

Loss rate: 1.36%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-02-27 06:38:22

End at: 2018-02-27 06:38:52

Local clock offset: -7.873 ms

Remote clock offset: -6.903 ms

Below is generated by plot.py at 2018-02-27 08:29:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.00 Mbit/s

95th percentile per-packet one-way delay: 367.555 ms

Loss rate: 1.91%

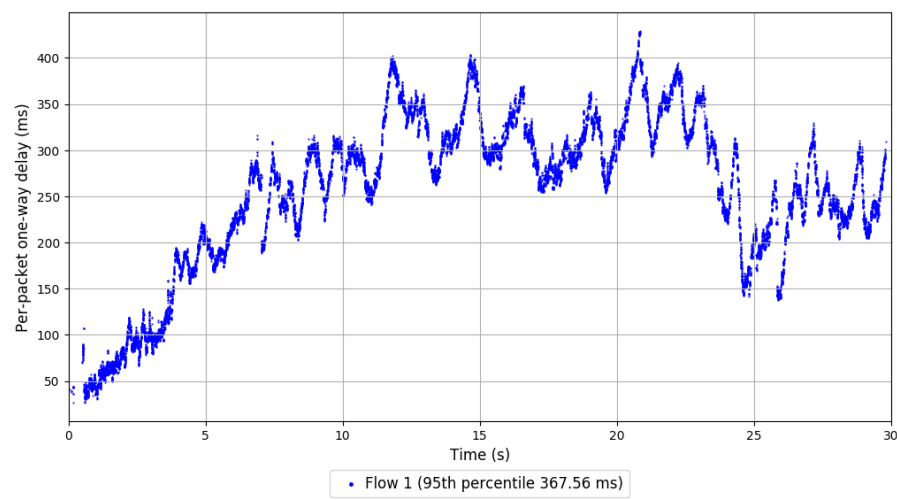
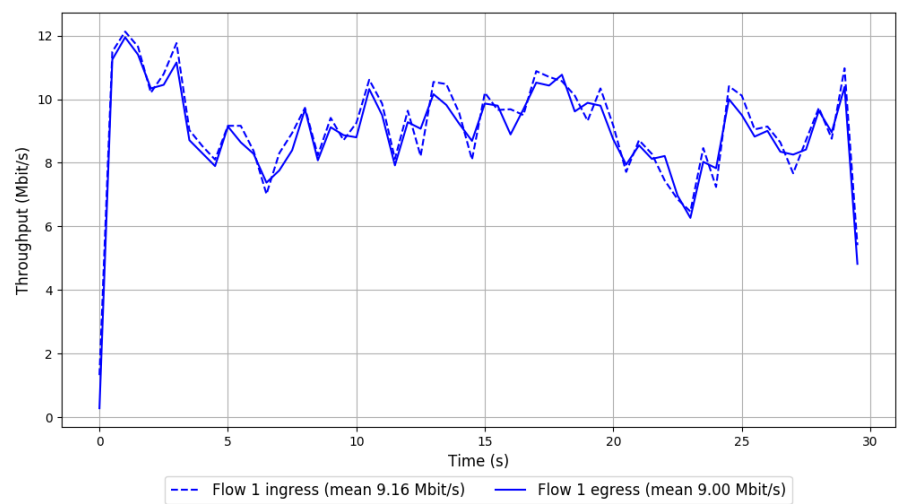
-- Flow 1:

Average throughput: 9.00 Mbit/s

95th percentile per-packet one-way delay: 367.555 ms

Loss rate: 1.91%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-02-27 07:01:58

End at: 2018-02-27 07:02:28

Local clock offset: -16.49 ms

Remote clock offset: -5.46 ms

Below is generated by plot.py at 2018-02-27 08:29:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 13.96 Mbit/s

95th percentile per-packet one-way delay: 236.913 ms

Loss rate: 1.37%

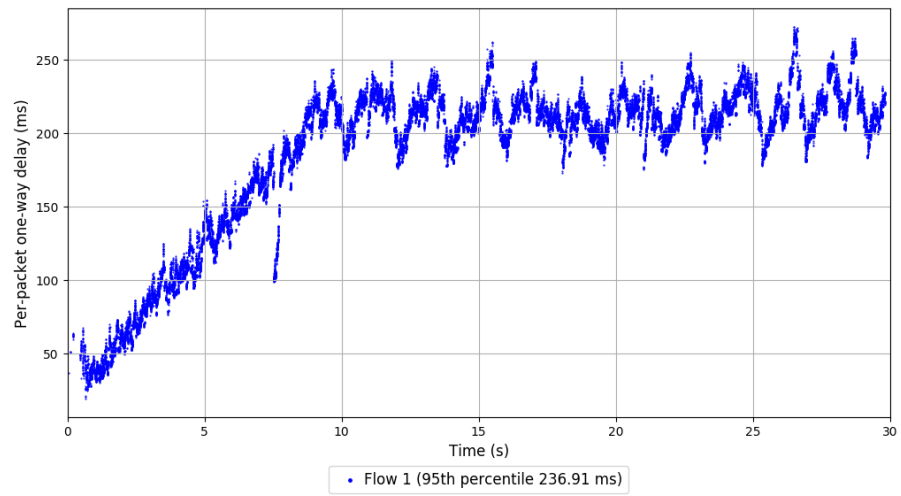
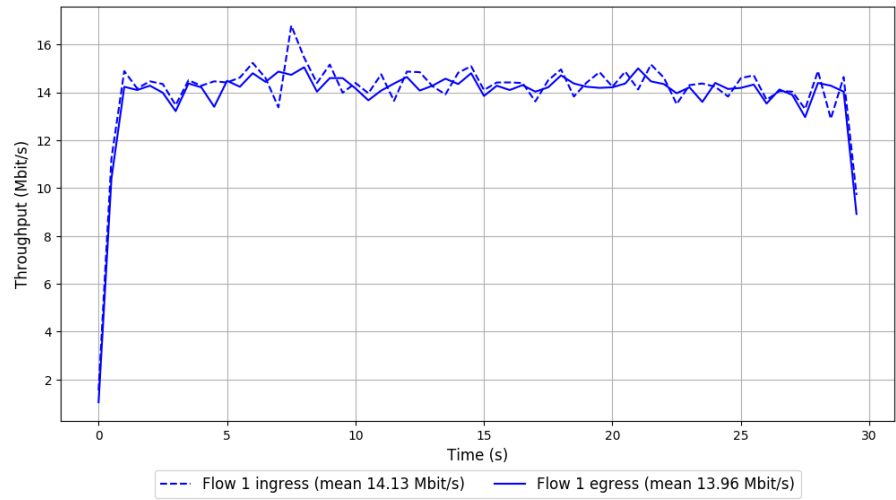
-- Flow 1:

Average throughput: 13.96 Mbit/s

95th percentile per-packet one-way delay: 236.913 ms

Loss rate: 1.37%

Run 3: Report of QUIC Cubic — Data Link

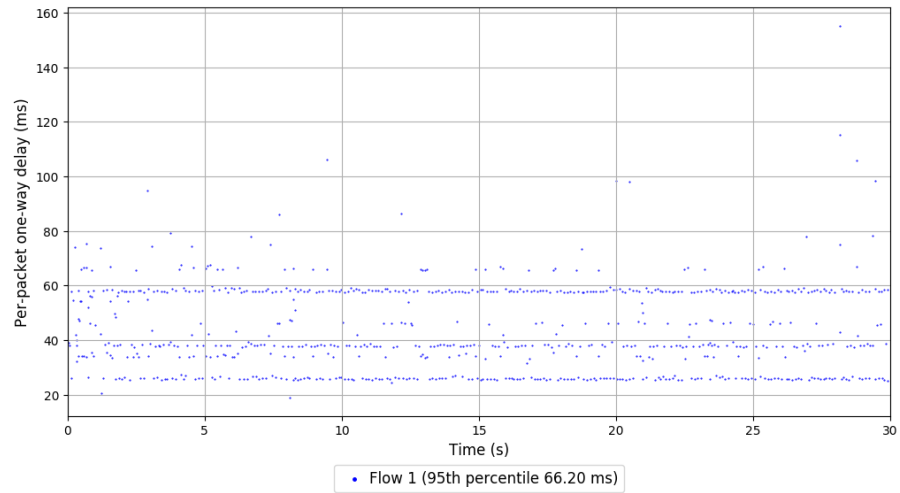
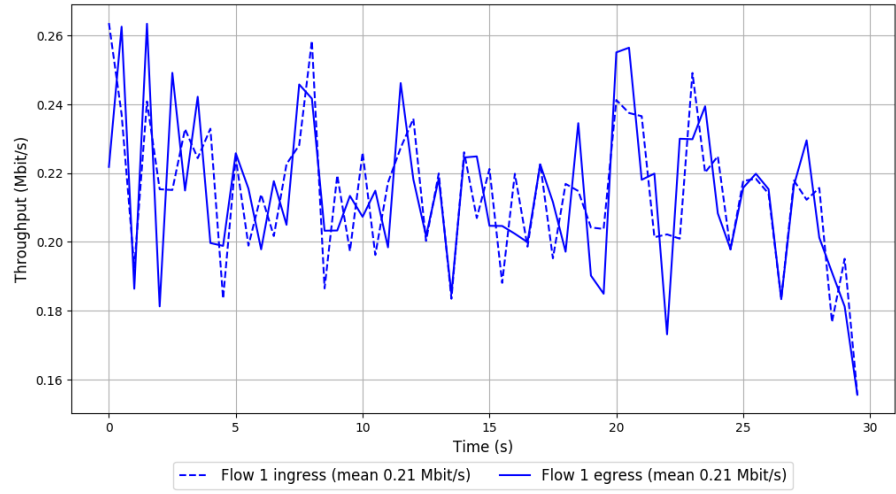


Run 1: Statistics of SCReAM

Start at: 2018-02-27 06:13:30
End at: 2018-02-27 06:14:01
Local clock offset: -5.59 ms
Remote clock offset: -8.257 ms

Below is generated by plot.py at 2018-02-27 08:29:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 66.205 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 66.205 ms
Loss rate: 0.11%

Run 1: Report of SReAM — Data Link

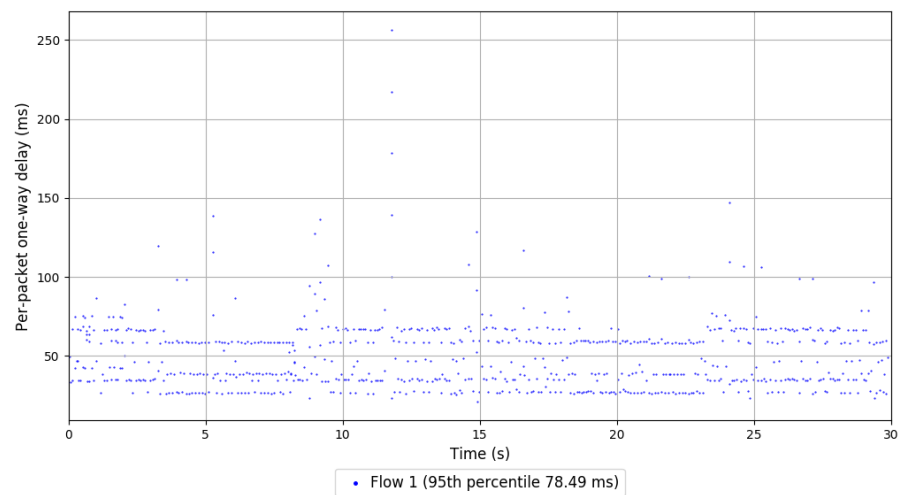
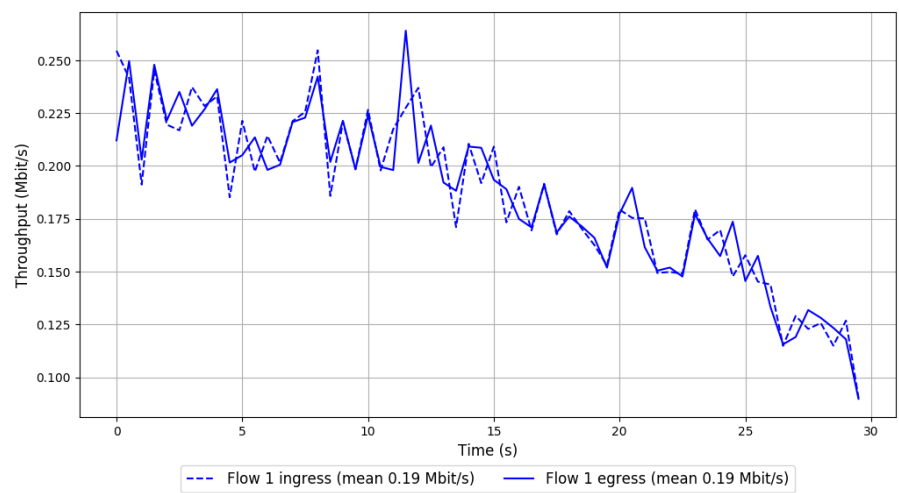


Run 2: Statistics of SCReAM

Start at: 2018-02-27 06:37:04
End at: 2018-02-27 06:37:34
Local clock offset: -7.714 ms
Remote clock offset: -7.018 ms

Below is generated by plot.py at 2018-02-27 08:29:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 78.488 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 78.488 ms
Loss rate: 0.08%

Run 2: Report of SReAM — Data Link

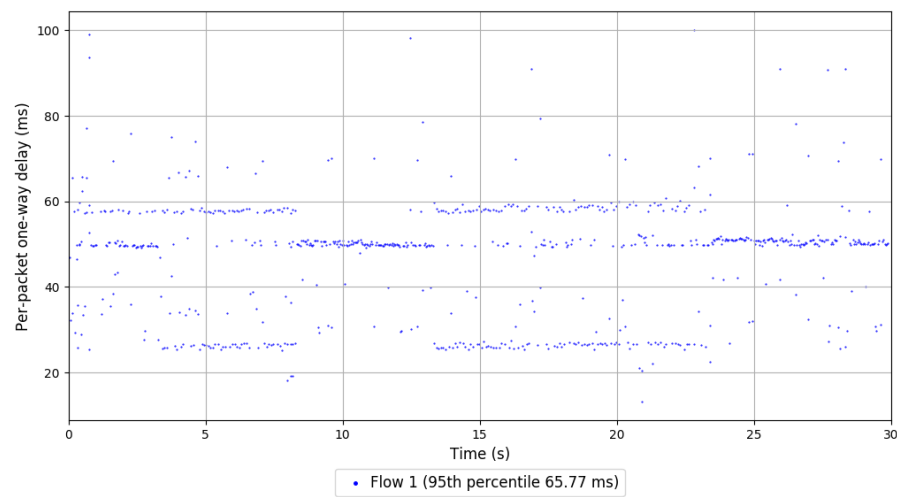
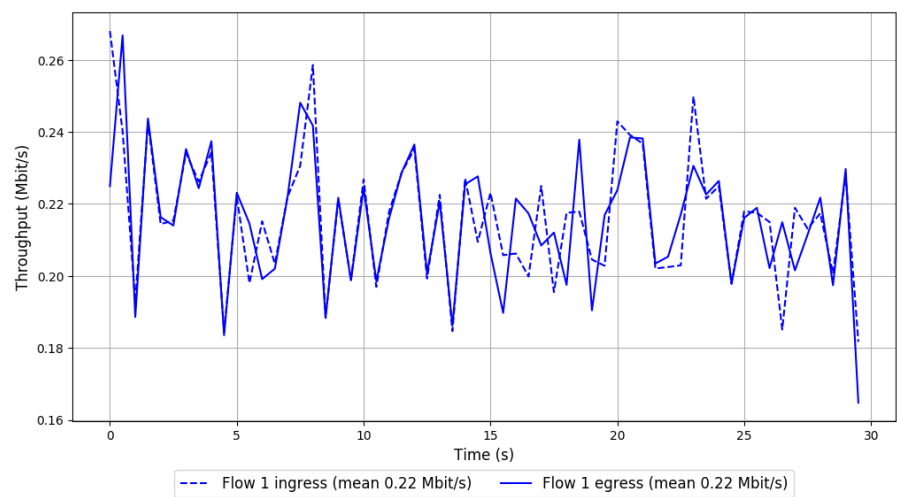


Run 3: Statistics of SCReAM

Start at: 2018-02-27 07:00:39
End at: 2018-02-27 07:01:09
Local clock offset: -15.999 ms
Remote clock offset: -5.563 ms

Below is generated by plot.py at 2018-02-27 08:29:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 65.765 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 65.765 ms
Loss rate: 0.26%

Run 3: Report of SCRaM — Data Link



Run 1: Statistics of WebRTC media

Start at: 2018-02-27 06:10:53

End at: 2018-02-27 06:11:23

Local clock offset: -6.57 ms

Remote clock offset: -8.078 ms

Below is generated by plot.py at 2018-02-27 08:29:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 63.106 ms

Loss rate: 0.00%

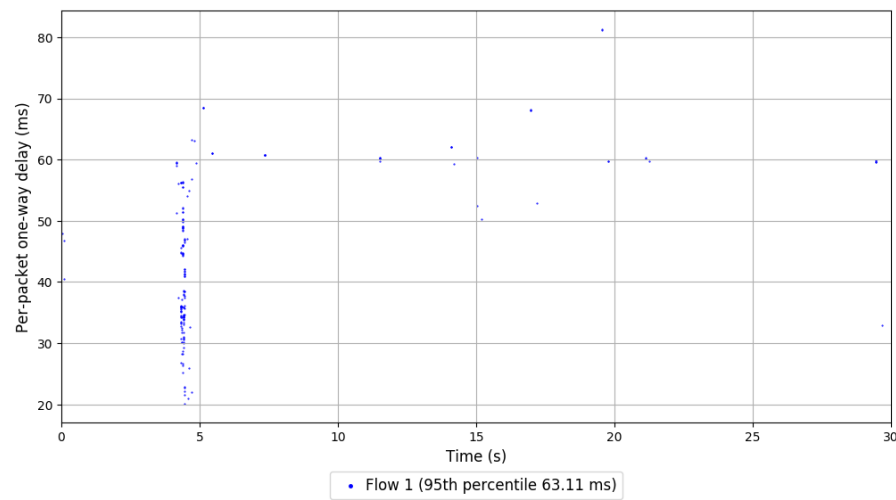
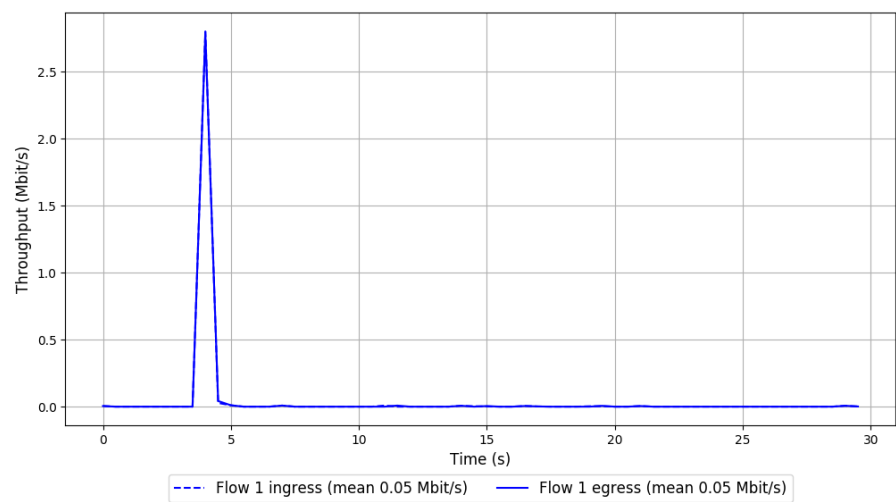
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 63.106 ms

Loss rate: 0.00%

Run 1: Report of WebRTC media — Data Link

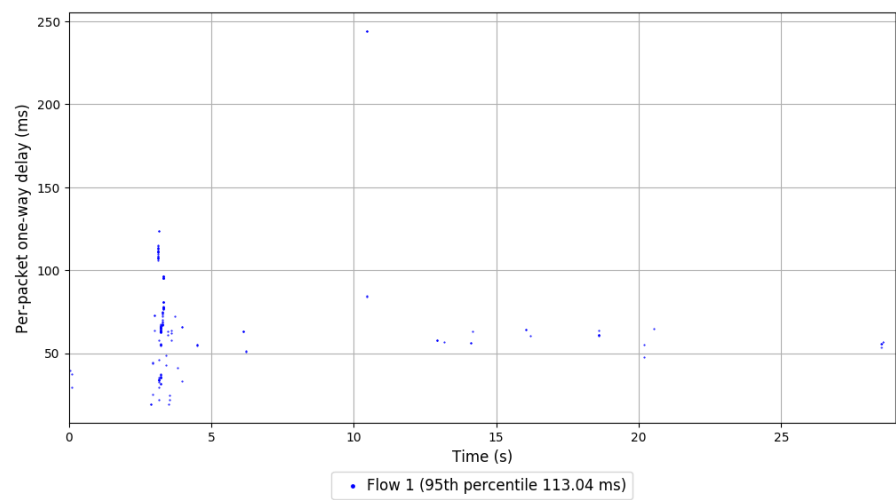
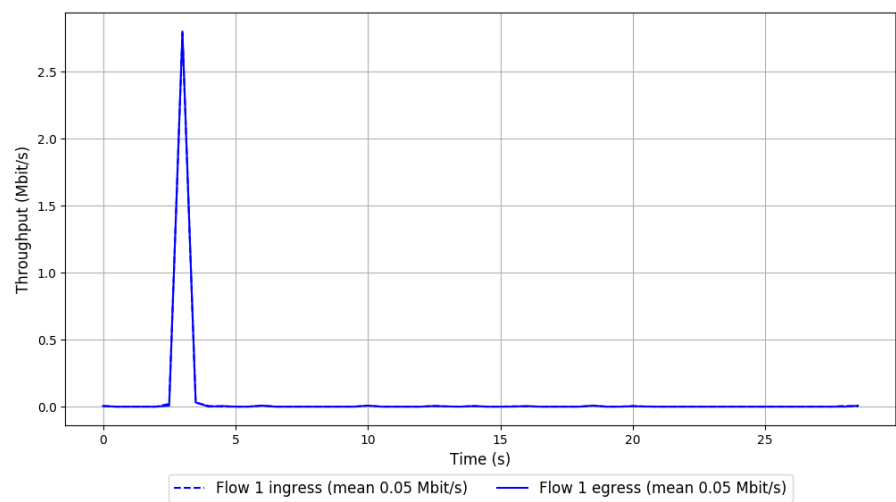


Run 2: Statistics of WebRTC media

Start at: 2018-02-27 06:34:27
End at: 2018-02-27 06:34:57
Local clock offset: -7.912 ms
Remote clock offset: -7.484 ms

Below is generated by plot.py at 2018-02-27 08:29:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 113.044 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 113.044 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link

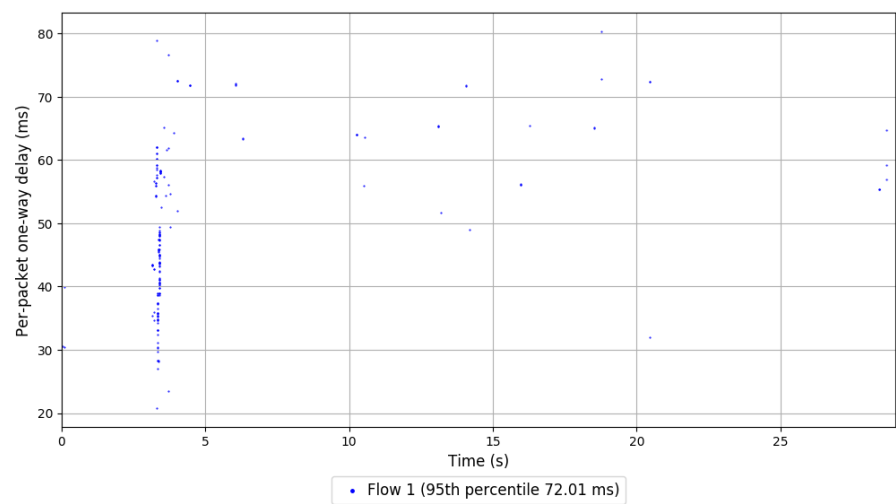
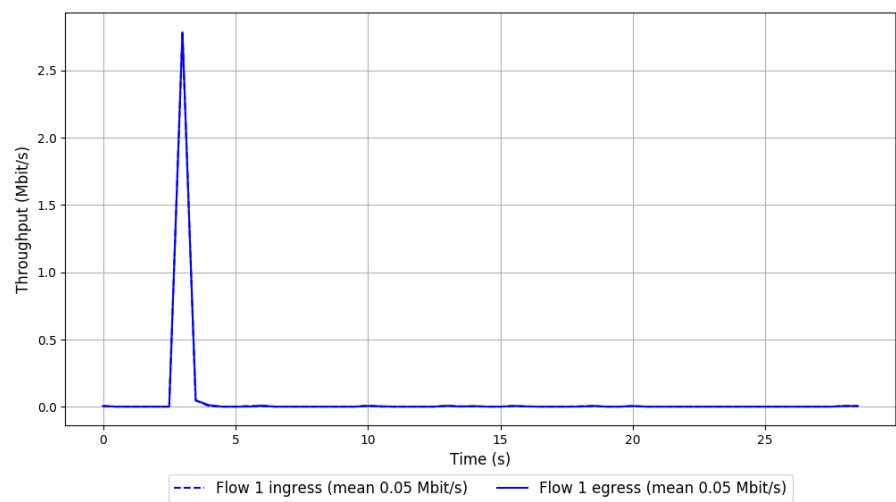


Run 3: Statistics of WebRTC media

Start at: 2018-02-27 06:58:02
End at: 2018-02-27 06:58:32
Local clock offset: -14.721 ms
Remote clock offset: -5.655 ms

Below is generated by plot.py at 2018-02-27 08:29:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 72.009 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 72.009 ms
Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

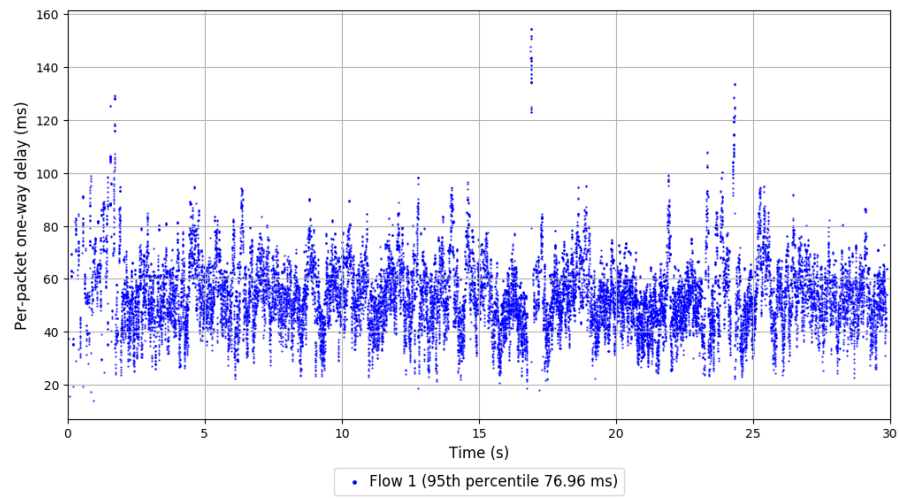
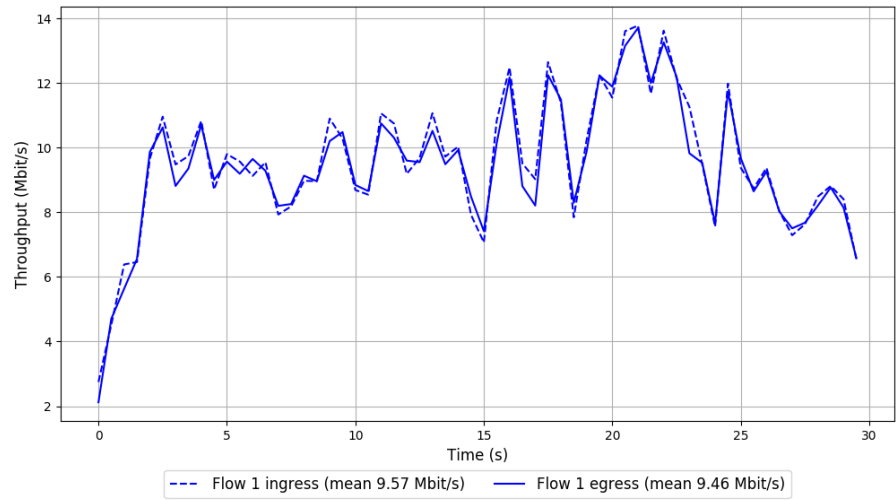


Run 1: Statistics of Sprout

Start at: 2018-02-27 06:22:41
End at: 2018-02-27 06:23:11
Local clock offset: -6.879 ms
Remote clock offset: -8.487 ms

Below is generated by plot.py at 2018-02-27 08:29:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.46 Mbit/s
95th percentile per-packet one-way delay: 76.964 ms
Loss rate: 1.27%
-- Flow 1:
Average throughput: 9.46 Mbit/s
95th percentile per-packet one-way delay: 76.964 ms
Loss rate: 1.27%

Run 1: Report of Sprout — Data Link

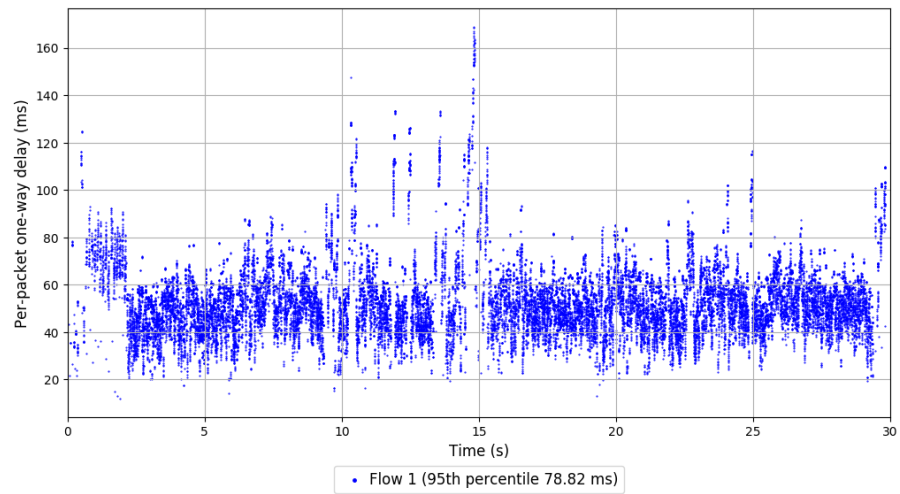
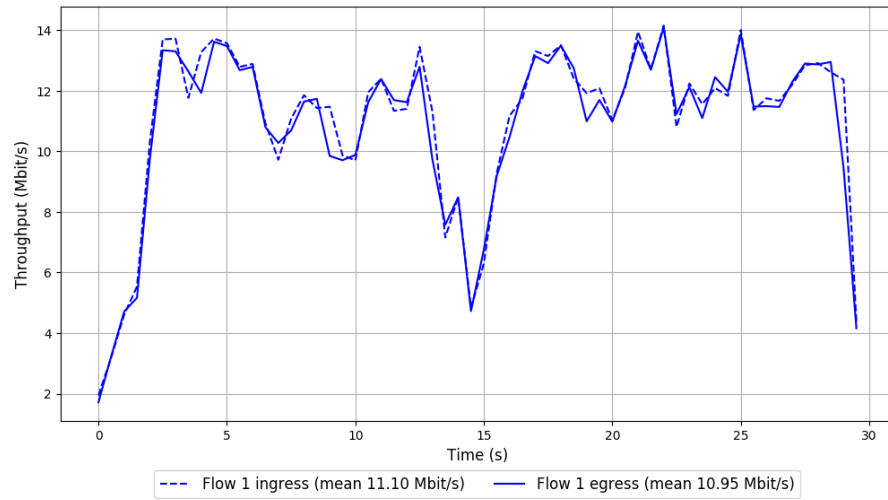


Run 2: Statistics of Sprout

Start at: 2018-02-27 06:46:14
End at: 2018-02-27 06:46:44
Local clock offset: -9.638 ms
Remote clock offset: -6.129 ms

Below is generated by plot.py at 2018-02-27 08:29:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.95 Mbit/s
95th percentile per-packet one-way delay: 78.821 ms
Loss rate: 1.59%
-- Flow 1:
Average throughput: 10.95 Mbit/s
95th percentile per-packet one-way delay: 78.821 ms
Loss rate: 1.59%

Run 2: Report of Sprout — Data Link

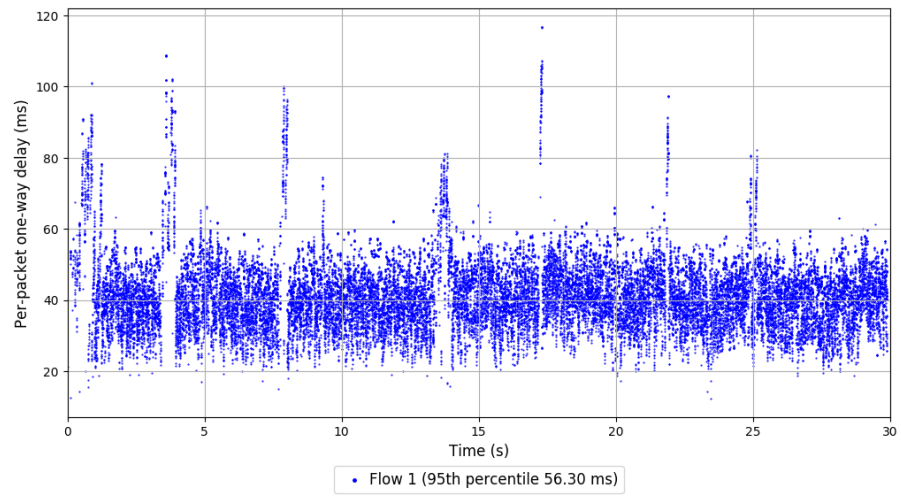
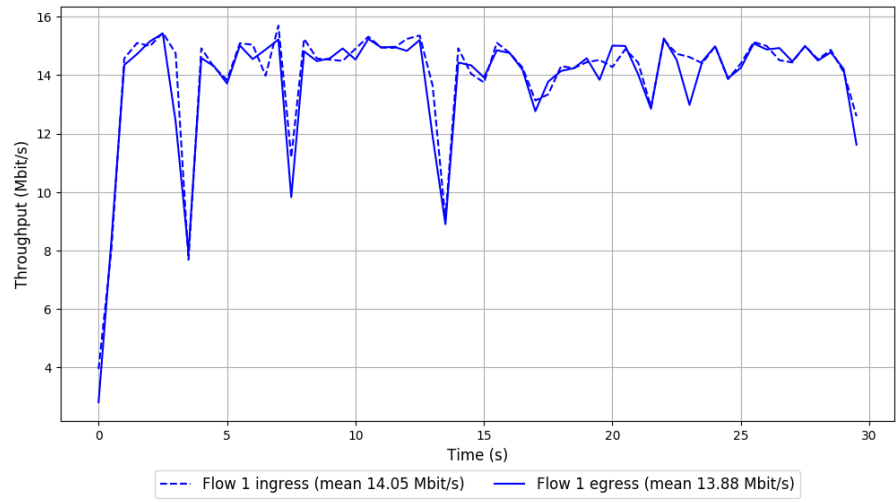


Run 3: Statistics of Sprout

Start at: 2018-02-27 07:09:50
End at: 2018-02-27 07:10:20
Local clock offset: -9.359 ms
Remote clock offset: -5.289 ms

Below is generated by plot.py at 2018-02-27 08:29:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.88 Mbit/s
95th percentile per-packet one-way delay: 56.305 ms
Loss rate: 1.36%
-- Flow 1:
Average throughput: 13.88 Mbit/s
95th percentile per-packet one-way delay: 56.305 ms
Loss rate: 1.36%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-02-27 06:30:32

End at: 2018-02-27 06:31:02

Local clock offset: -9.418 ms

Remote clock offset: -8.357 ms

Below is generated by plot.py at 2018-02-27 08:29:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 6.48 Mbit/s

95th percentile per-packet one-way delay: 54.218 ms

Loss rate: 0.14%

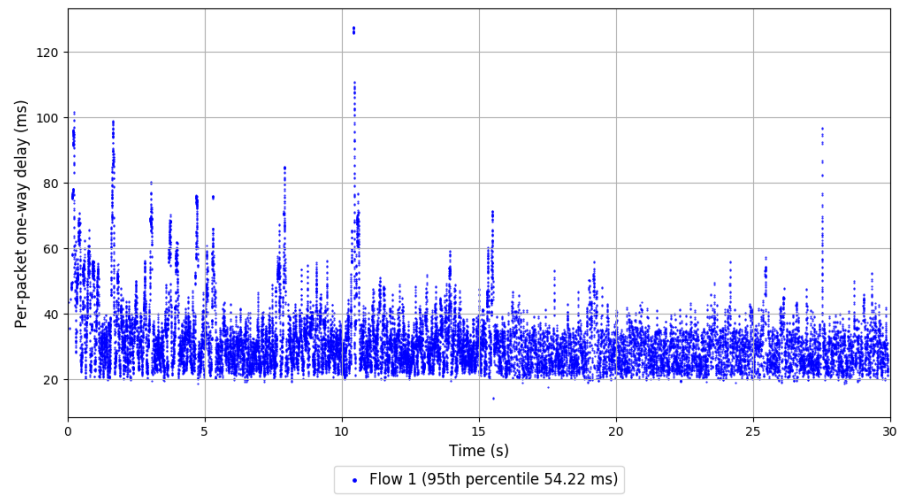
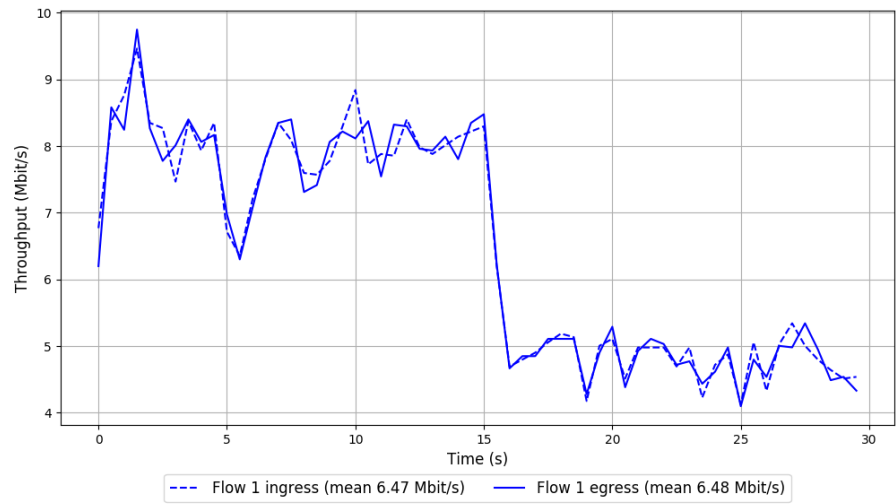
-- Flow 1:

Average throughput: 6.48 Mbit/s

95th percentile per-packet one-way delay: 54.218 ms

Loss rate: 0.14%

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

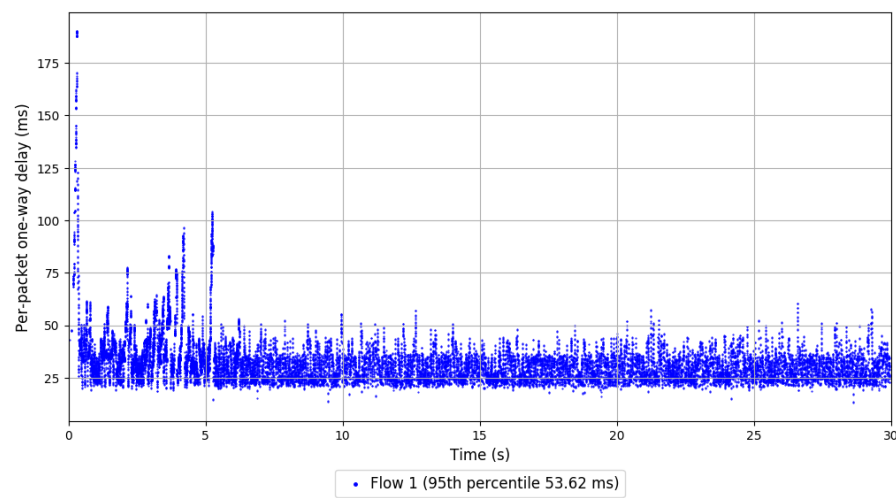
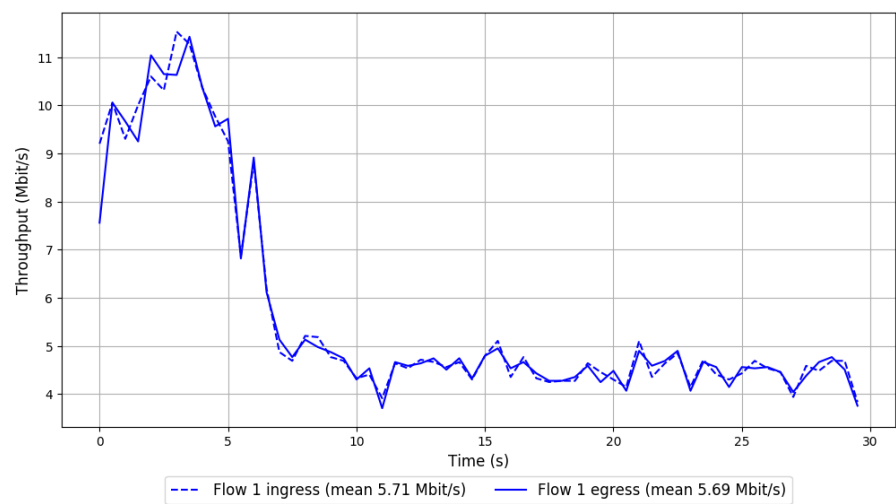


Run 2: Statistics of TaoVA-100x

Start at: 2018-02-27 06:54:06
End at: 2018-02-27 06:54:36
Local clock offset: -12.863 ms
Remote clock offset: -5.739 ms

Below is generated by plot.py at 2018-02-27 08:29:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.69 Mbit/s
95th percentile per-packet one-way delay: 53.624 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 5.69 Mbit/s
95th percentile per-packet one-way delay: 53.624 ms
Loss rate: 0.49%

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

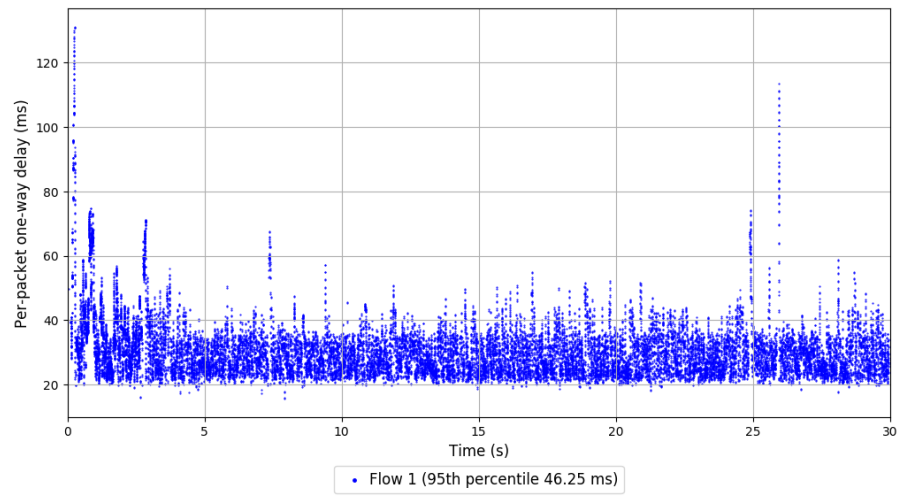
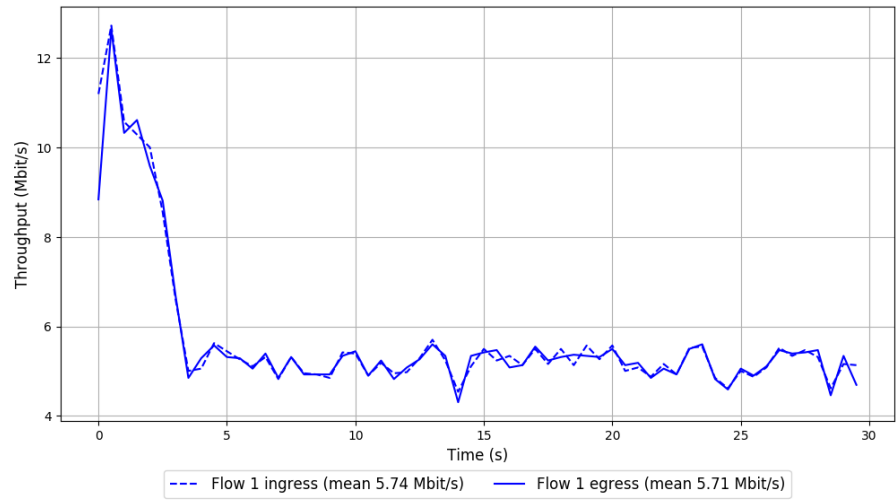


Run 3: Statistics of TaoVA-100x

Start at: 2018-02-27 07:17:42
End at: 2018-02-27 07:18:12
Local clock offset: -6.831 ms
Remote clock offset: -5.092 ms

Below is generated by plot.py at 2018-02-27 08:29:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.71 Mbit/s
95th percentile per-packet one-way delay: 46.248 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 5.71 Mbit/s
95th percentile per-packet one-way delay: 46.248 ms
Loss rate: 0.80%

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



Run 1: Statistics of TCP Vegas

Start at: 2018-02-27 06:21:23

End at: 2018-02-27 06:21:53

Local clock offset: -6.111 ms

Remote clock offset: -8.48 ms

Below is generated by plot.py at 2018-02-27 08:29:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.35 Mbit/s

95th percentile per-packet one-way delay: 95.485 ms

Loss rate: 0.44%

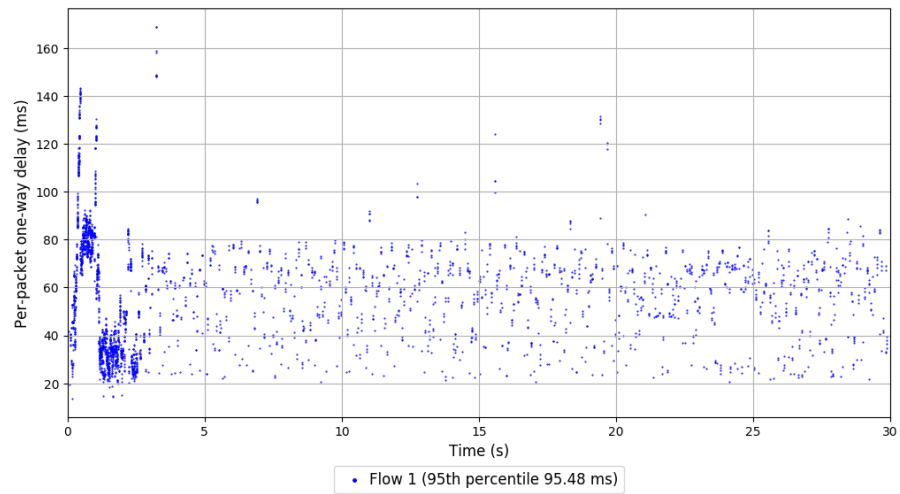
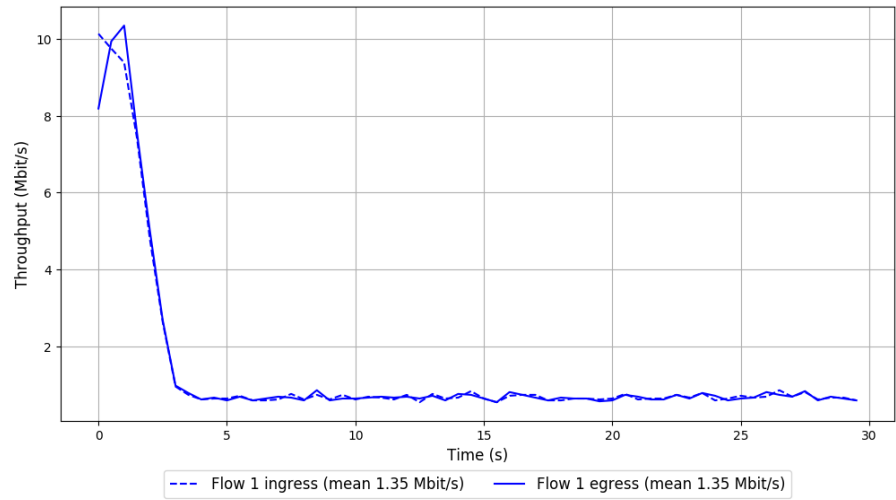
-- Flow 1:

Average throughput: 1.35 Mbit/s

95th percentile per-packet one-way delay: 95.485 ms

Loss rate: 0.44%

Run 1: Report of TCP Vegas — Data Link

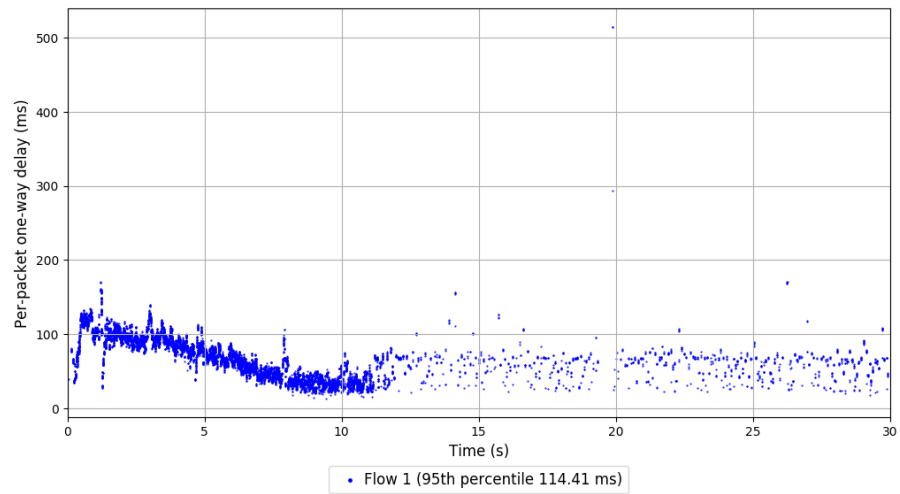
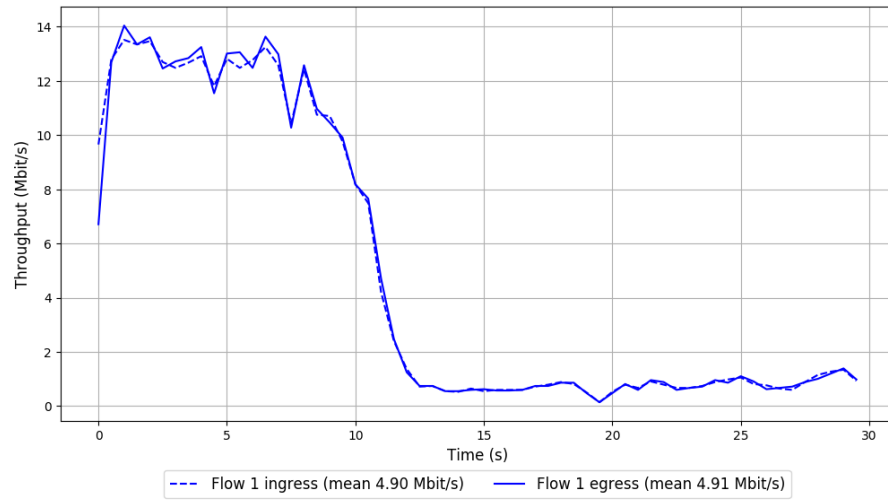


Run 2: Statistics of TCP Vegas

Start at: 2018-02-27 06:44:56
End at: 2018-02-27 06:45:26
Local clock offset: -9.127 ms
Remote clock offset: -6.256 ms

Below is generated by plot.py at 2018-02-27 08:29:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.91 Mbit/s
95th percentile per-packet one-way delay: 114.411 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 4.91 Mbit/s
95th percentile per-packet one-way delay: 114.411 ms
Loss rate: 0.07%

Run 2: Report of TCP Vegas — Data Link

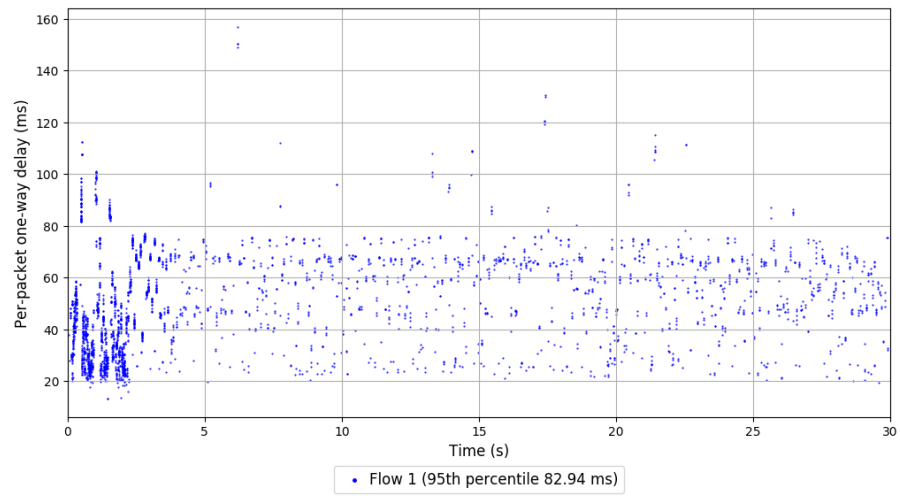
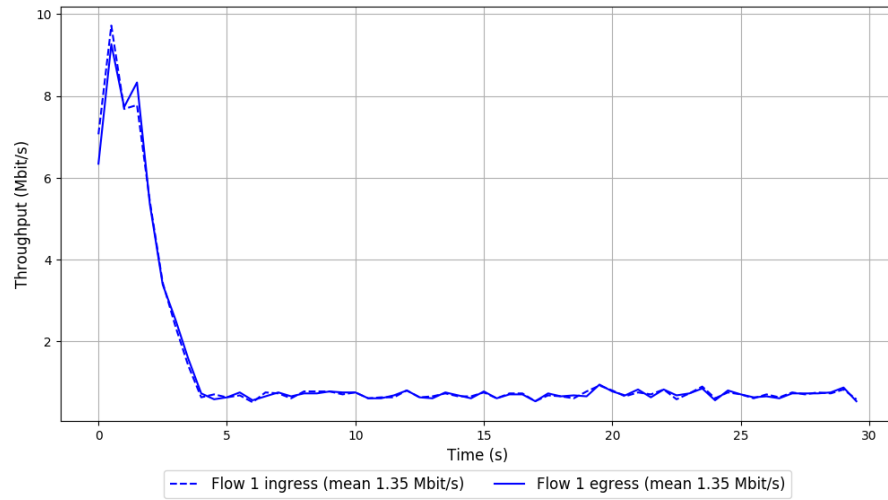


Run 3: Statistics of TCP Vegas

Start at: 2018-02-27 07:08:32
End at: 2018-02-27 07:09:02
Local clock offset: -10.428 ms
Remote clock offset: -5.324 ms

Below is generated by plot.py at 2018-02-27 08:29:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.35 Mbit/s
95th percentile per-packet one-way delay: 82.944 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 1.35 Mbit/s
95th percentile per-packet one-way delay: 82.944 ms
Loss rate: 0.45%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-02-27 06:16:08

End at: 2018-02-27 06:16:38

Local clock offset: -4.711 ms

Remote clock offset: -8.35 ms

Below is generated by plot.py at 2018-02-27 08:29:35

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.49 Mbit/s

95th percentile per-packet one-way delay: 167.379 ms

Loss rate: 3.04%

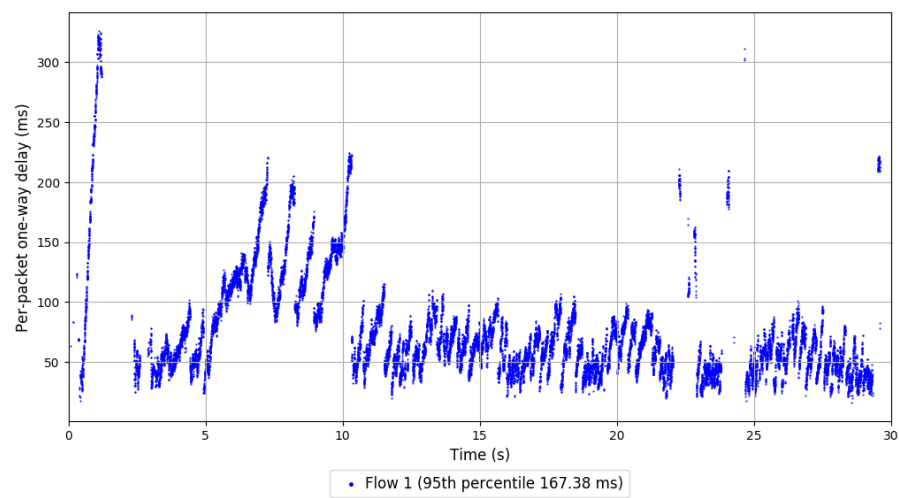
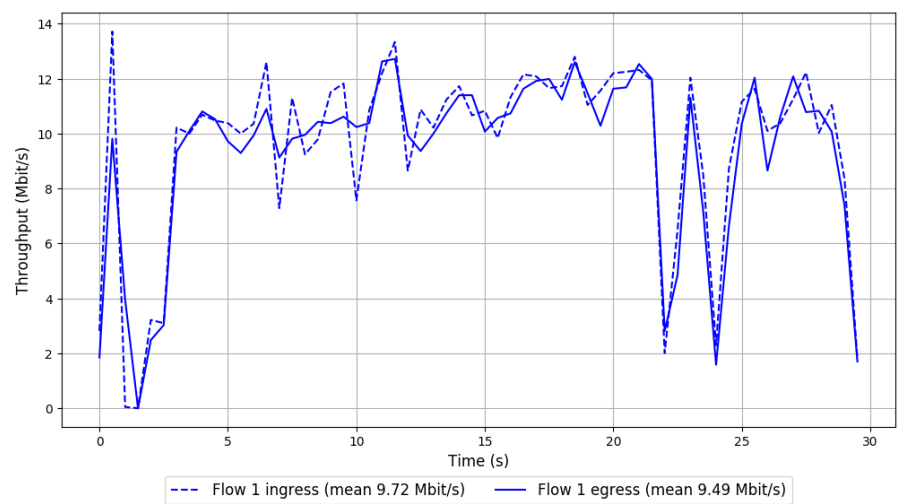
-- Flow 1:

Average throughput: 9.49 Mbit/s

95th percentile per-packet one-way delay: 167.379 ms

Loss rate: 3.04%

Run 1: Report of Verus — Data Link

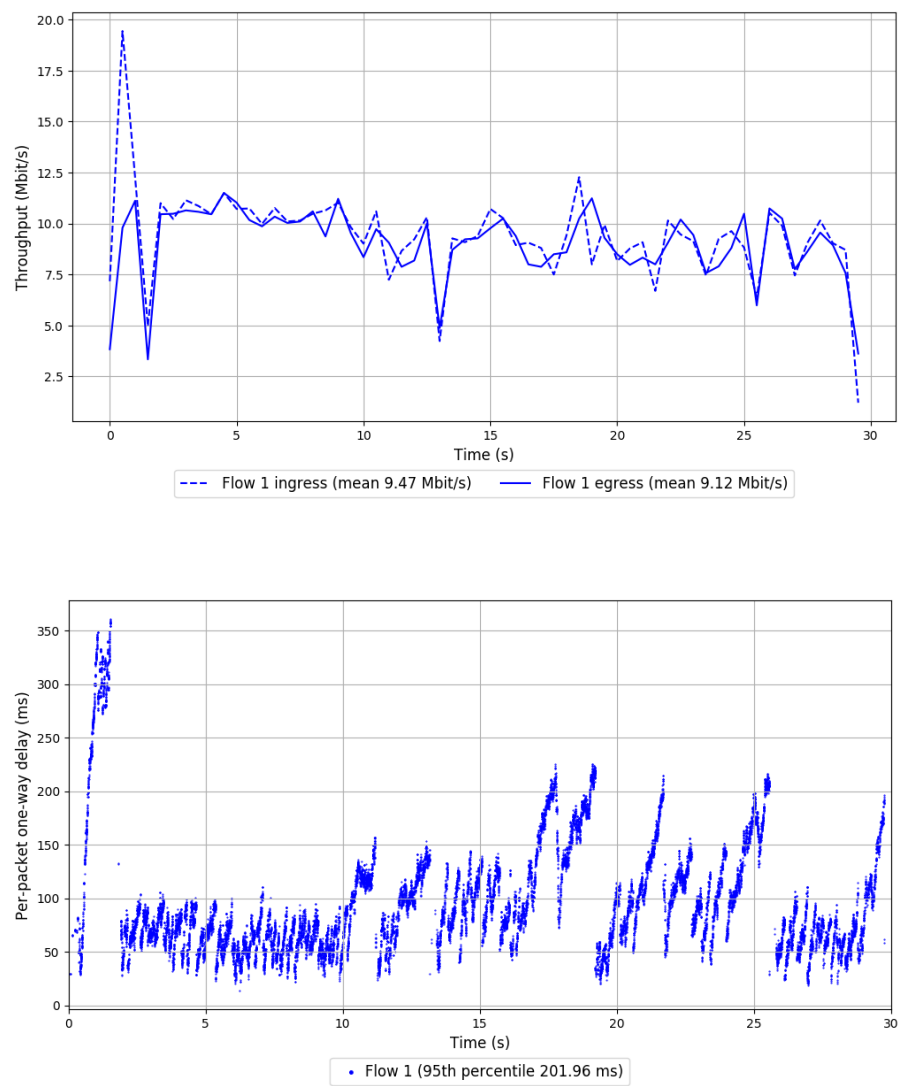


Run 2: Statistics of Verus

Start at: 2018-02-27 06:39:41
End at: 2018-02-27 06:40:11
Local clock offset: -7.935 ms
Remote clock offset: -6.756 ms

Below is generated by plot.py at 2018-02-27 08:29:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.12 Mbit/s
95th percentile per-packet one-way delay: 201.964 ms
Loss rate: 3.94%
-- Flow 1:
Average throughput: 9.12 Mbit/s
95th percentile per-packet one-way delay: 201.964 ms
Loss rate: 3.94%

Run 2: Report of Verus — Data Link

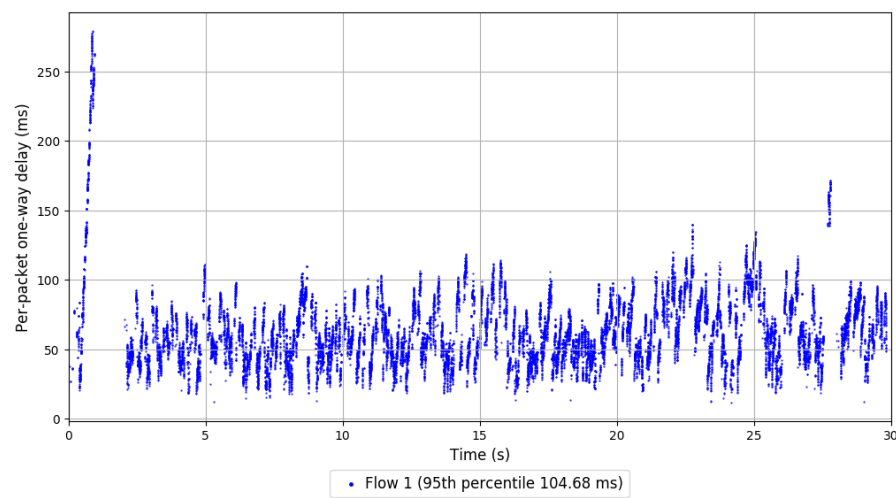
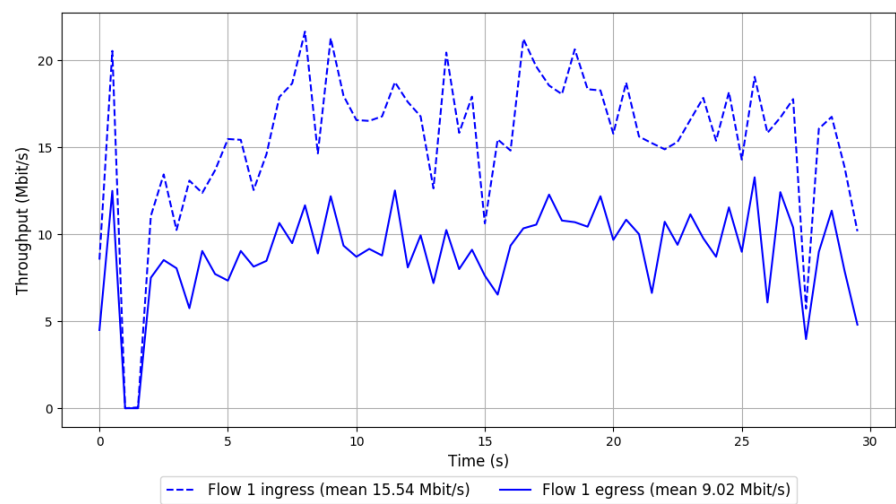


Run 3: Statistics of Verus

Start at: 2018-02-27 07:03:16
End at: 2018-02-27 07:03:46
Local clock offset: -16.706 ms
Remote clock offset: -5.448 ms

Below is generated by plot.py at 2018-02-27 08:29:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.02 Mbit/s
95th percentile per-packet one-way delay: 104.678 ms
Loss rate: 42.05%
-- Flow 1:
Average throughput: 9.02 Mbit/s
95th percentile per-packet one-way delay: 104.678 ms
Loss rate: 42.05%

Run 3: Report of Verus — Data Link

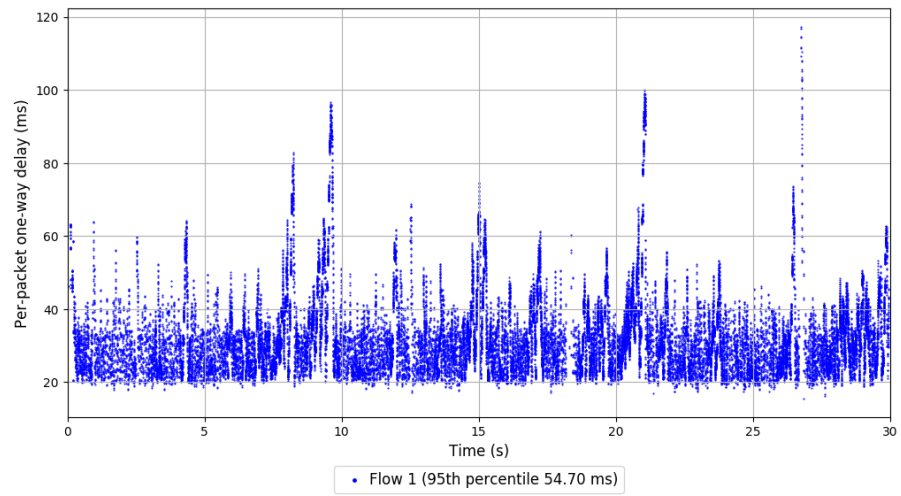
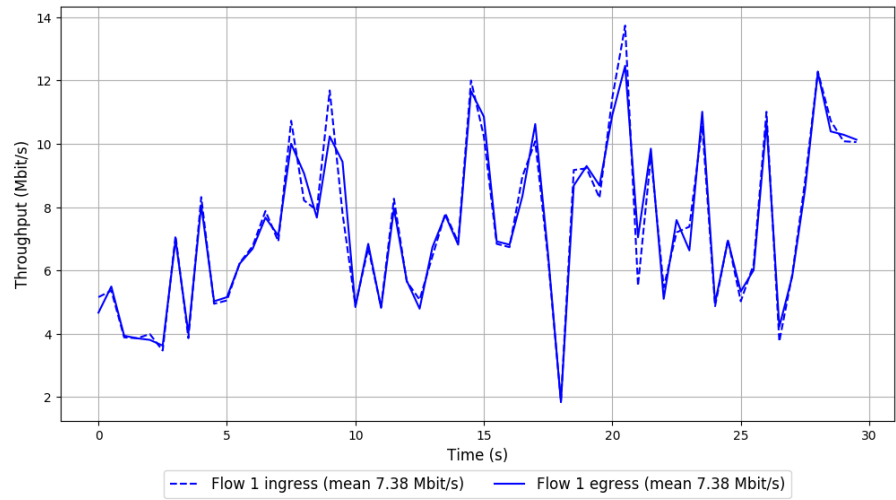


Run 1: Statistics of Copa

Start at: 2018-02-27 06:12:12
End at: 2018-02-27 06:12:42
Local clock offset: -6.712 ms
Remote clock offset: -8.115 ms

Below is generated by plot.py at 2018-02-27 08:29:42
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.38 Mbit/s
95th percentile per-packet one-way delay: 54.703 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 7.38 Mbit/s
95th percentile per-packet one-way delay: 54.703 ms
Loss rate: 0.17%

Run 1: Report of Copa — Data Link

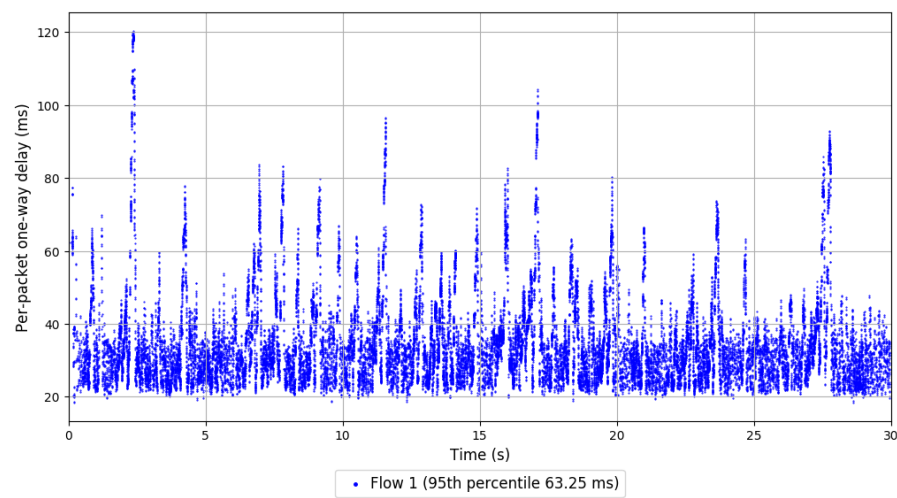
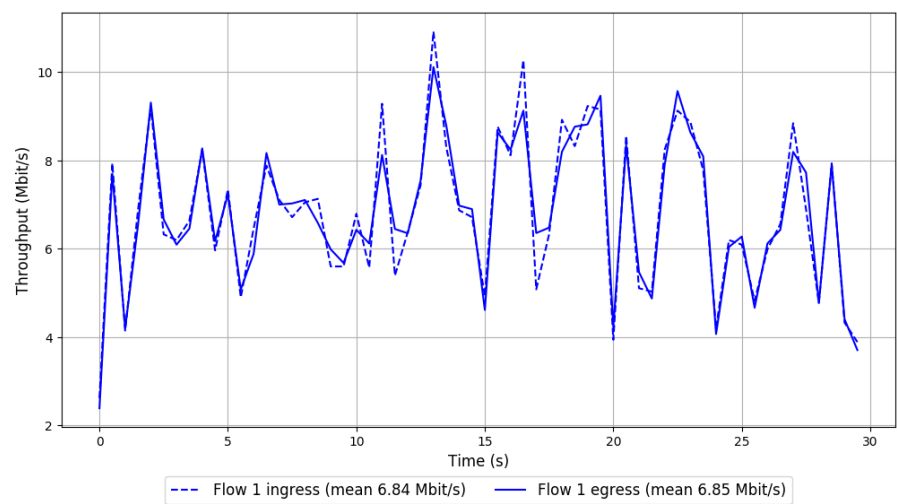


Run 2: Statistics of Copa

Start at: 2018-02-27 06:35:46
End at: 2018-02-27 06:36:16
Local clock offset: -7.761 ms
Remote clock offset: -7.224 ms

Below is generated by plot.py at 2018-02-27 08:29:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.85 Mbit/s
95th percentile per-packet one-way delay: 63.251 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 6.85 Mbit/s
95th percentile per-packet one-way delay: 63.251 ms
Loss rate: 0.10%

Run 2: Report of Copa — Data Link

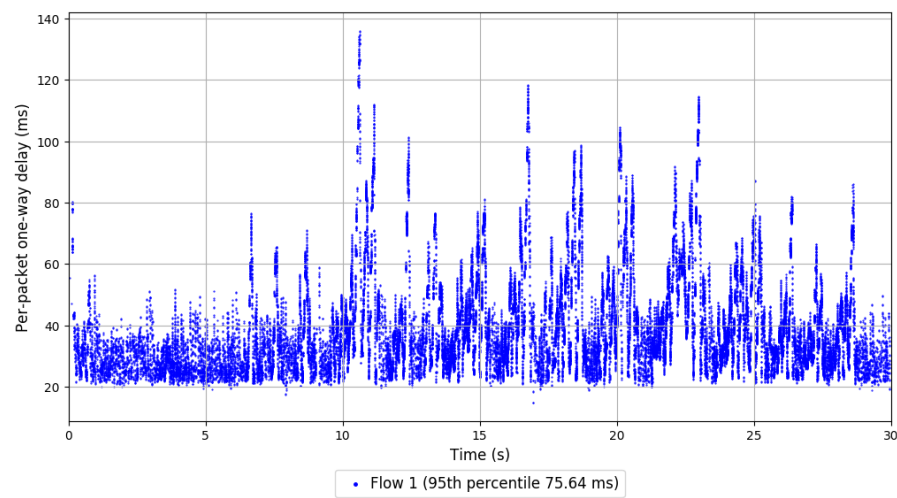
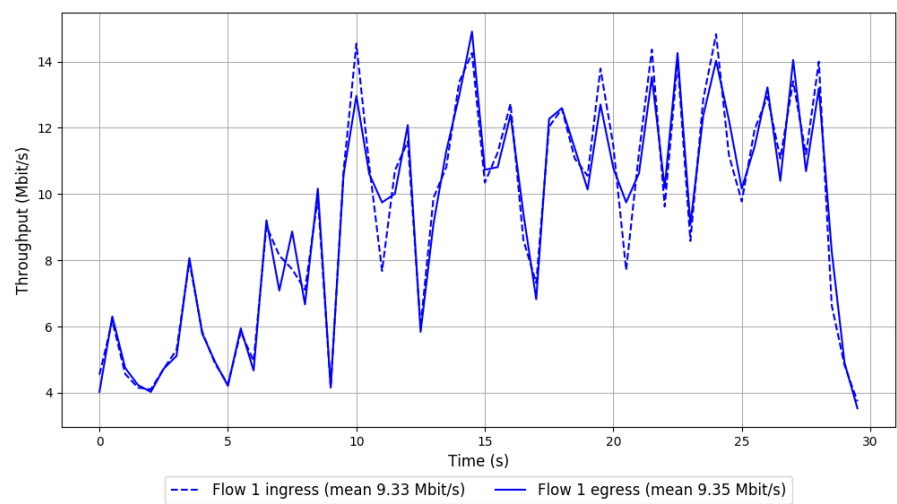


Run 3: Statistics of Copa

Start at: 2018-02-27 06:59:20
End at: 2018-02-27 06:59:50
Local clock offset: -15.212 ms
Remote clock offset: -5.609 ms

Below is generated by plot.py at 2018-02-27 08:29:50
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.35 Mbit/s
95th percentile per-packet one-way delay: 75.638 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 9.35 Mbit/s
95th percentile per-packet one-way delay: 75.638 ms
Loss rate: 0.07%

Run 3: Report of Copa — Data Link

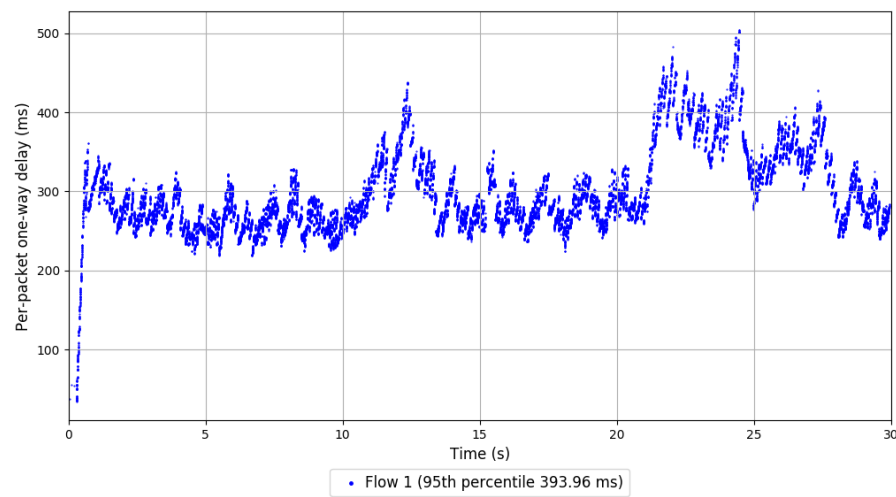
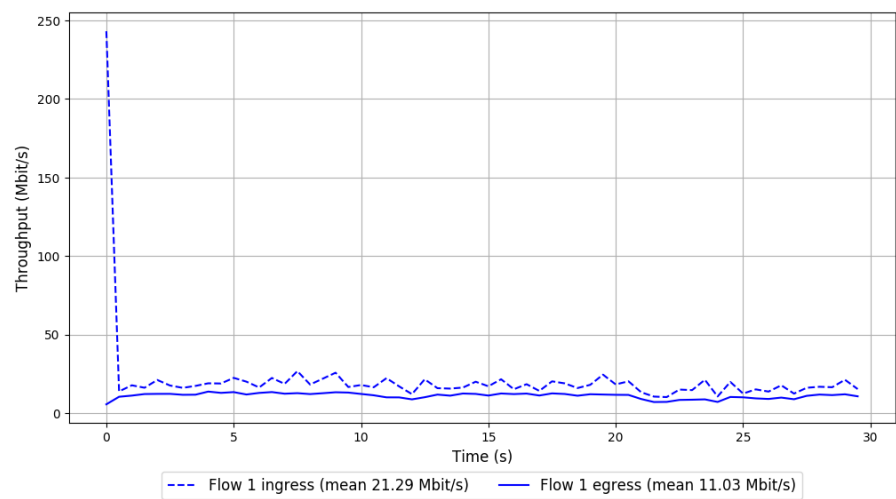


Run 1: Statistics of FillP

Start at: 2018-02-27 06:18:45
End at: 2018-02-27 06:19:15
Local clock offset: -5.211 ms
Remote clock offset: -8.413 ms

Below is generated by plot.py at 2018-02-27 08:29:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.03 Mbit/s
95th percentile per-packet one-way delay: 393.960 ms
Loss rate: 48.27%
-- Flow 1:
Average throughput: 11.03 Mbit/s
95th percentile per-packet one-way delay: 393.960 ms
Loss rate: 48.27%

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2018-02-27 06:42:18

End at: 2018-02-27 06:42:48

Local clock offset: -8.403 ms

Remote clock offset: -6.37 ms

Below is generated by plot.py at 2018-02-27 08:29:51

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.18 Mbit/s

95th percentile per-packet one-way delay: 435.962 ms

Loss rate: 56.83%

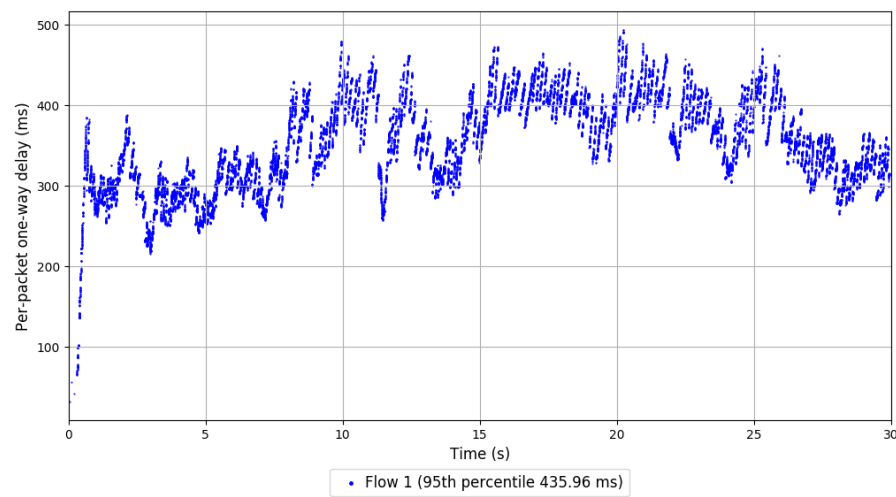
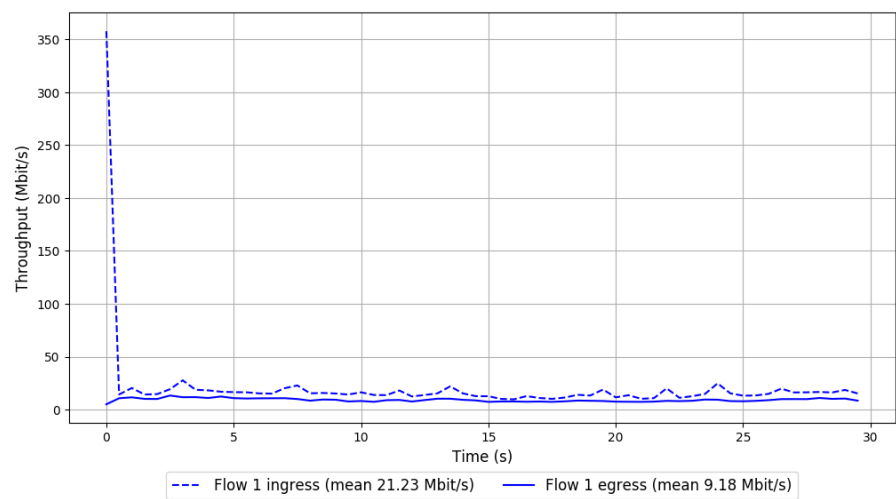
-- Flow 1:

Average throughput: 9.18 Mbit/s

95th percentile per-packet one-way delay: 435.962 ms

Loss rate: 56.83%

Run 2: Report of FillP — Data Link

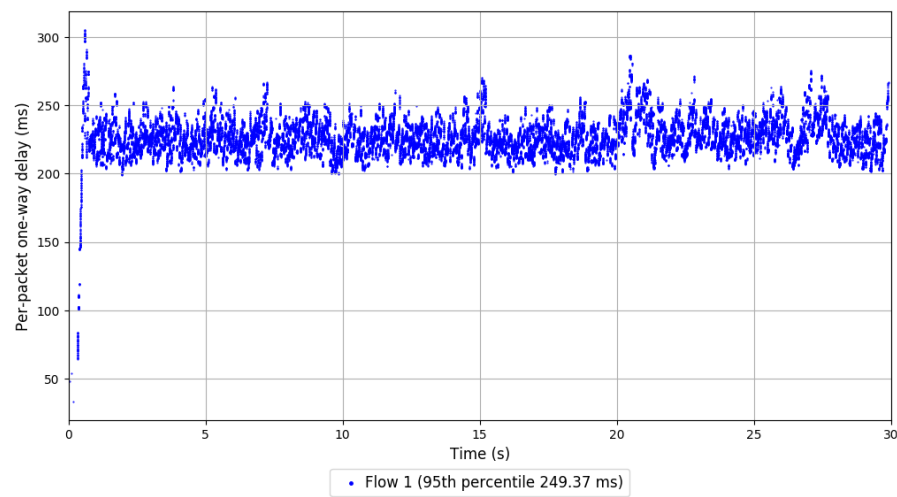
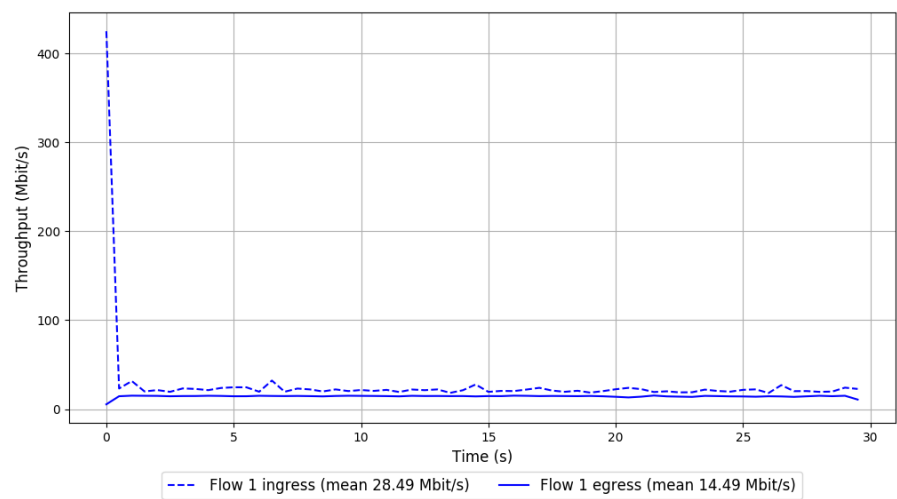


Run 3: Statistics of FillP

Start at: 2018-02-27 07:05:54
End at: 2018-02-27 07:06:24
Local clock offset: -12.769 ms
Remote clock offset: -5.407 ms

Below is generated by plot.py at 2018-02-27 08:30:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 14.49 Mbit/s
95th percentile per-packet one-way delay: 249.372 ms
Loss rate: 49.28%
-- Flow 1:
Average throughput: 14.49 Mbit/s
95th percentile per-packet one-way delay: 249.372 ms
Loss rate: 49.28%

Run 3: Report of FillP — Data Link



Run 1: Statistics of Indigo-1-32

Start at: 2018-02-27 06:23:59

End at: 2018-02-27 06:24:29

Local clock offset: -7.616 ms

Remote clock offset: -8.571 ms

Below is generated by plot.py at 2018-02-27 08:30:00

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.99 Mbit/s

95th percentile per-packet one-way delay: 78.491 ms

Loss rate: 0.27%

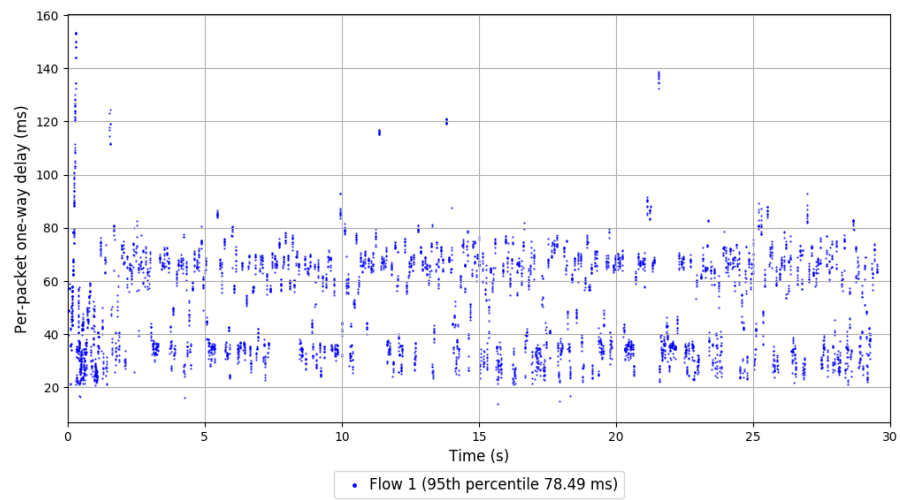
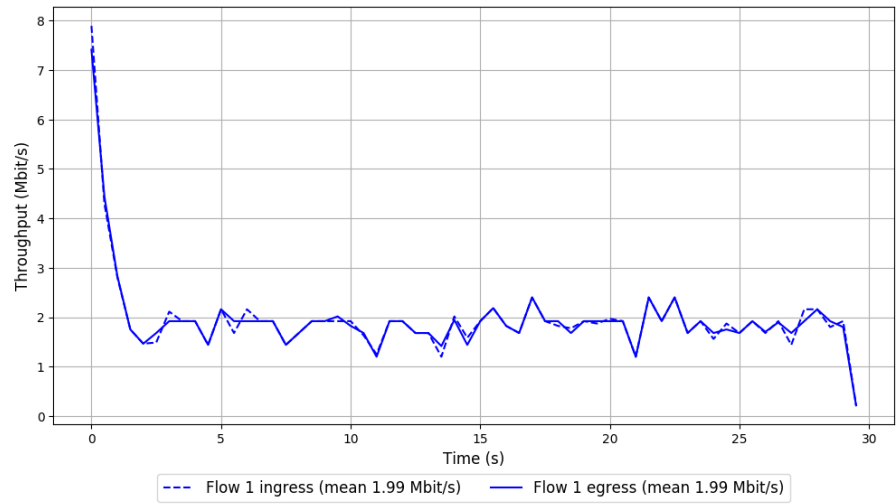
-- Flow 1:

Average throughput: 1.99 Mbit/s

95th percentile per-packet one-way delay: 78.491 ms

Loss rate: 0.27%

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

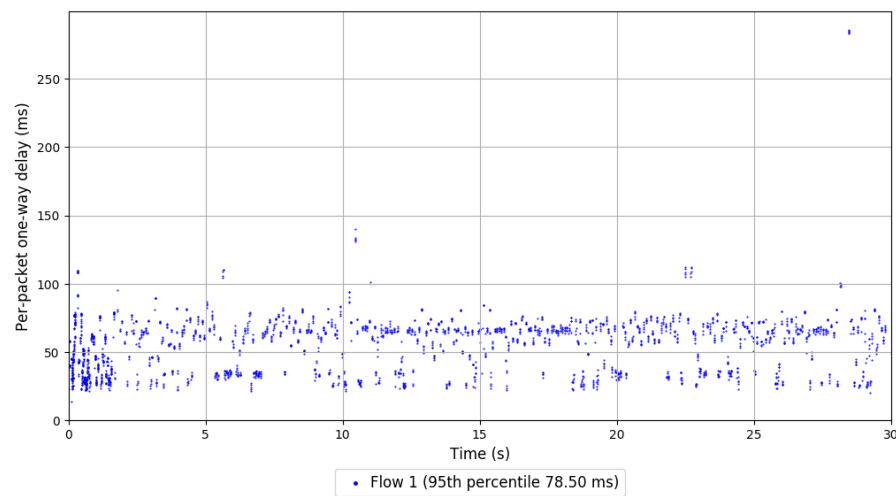
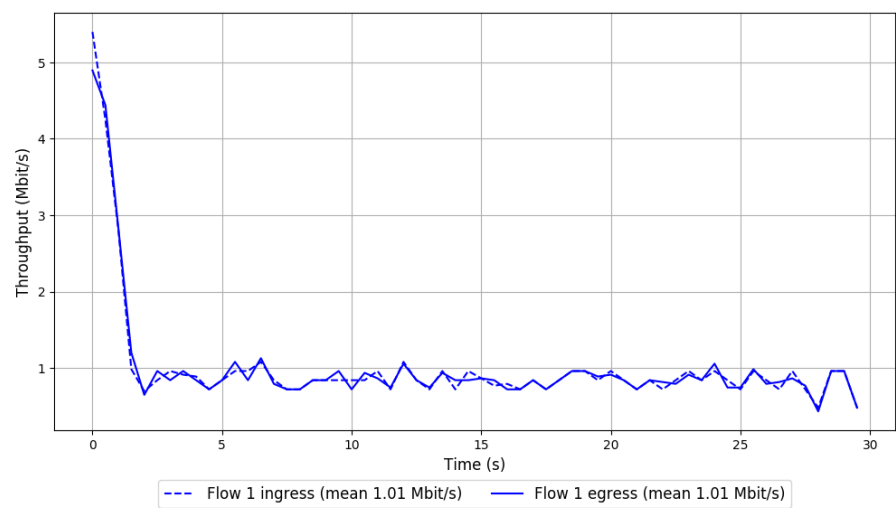


Run 2: Statistics of Indigo-1-32

Start at: 2018-02-27 06:47:33
End at: 2018-02-27 06:48:03
Local clock offset: -10.128 ms
Remote clock offset: -6.05 ms

Below is generated by plot.py at 2018-02-27 08:30:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 78.497 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 78.497 ms
Loss rate: 0.20%

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

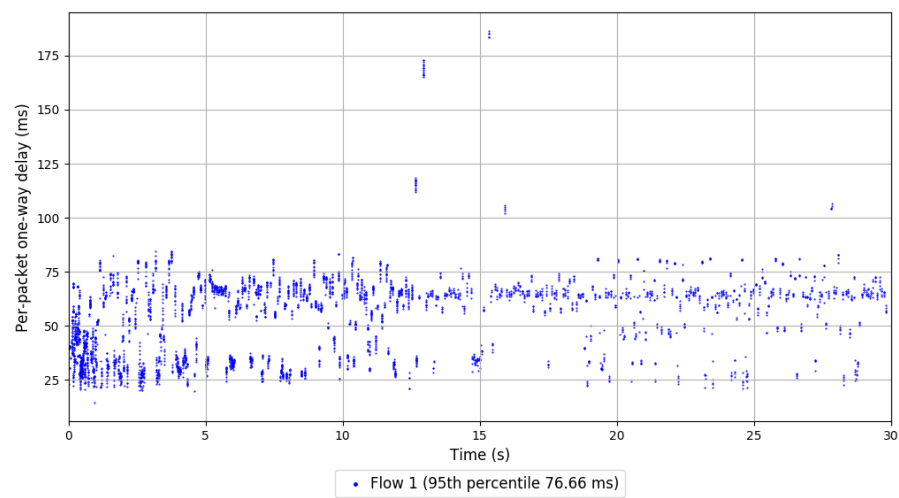
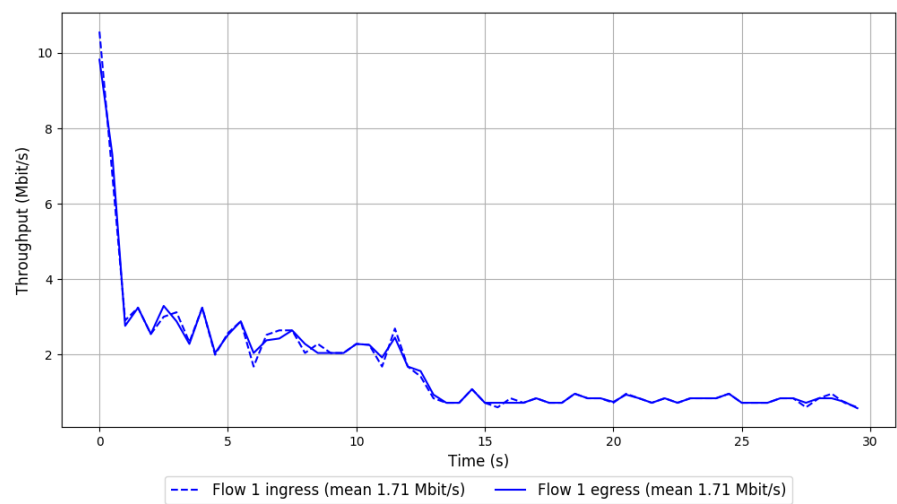


Run 3: Statistics of Indigo-1-32

Start at: 2018-02-27 07:11:09
End at: 2018-02-27 07:11:39
Local clock offset: -8.659 ms
Remote clock offset: -5.213 ms

Below is generated by plot.py at 2018-02-27 08:30:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 76.658 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 76.658 ms
Loss rate: 0.12%

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



Run 1: Statistics of Vivace-latency

Start at: 2018-02-27 06:08:16

End at: 2018-02-27 06:08:46

Local clock offset: -4.53 ms

Remote clock offset: -8.081 ms

Below is generated by plot.py at 2018-02-27 08:30:00

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.25 Mbit/s

95th percentile per-packet one-way delay: 44.099 ms

Loss rate: 0.21%

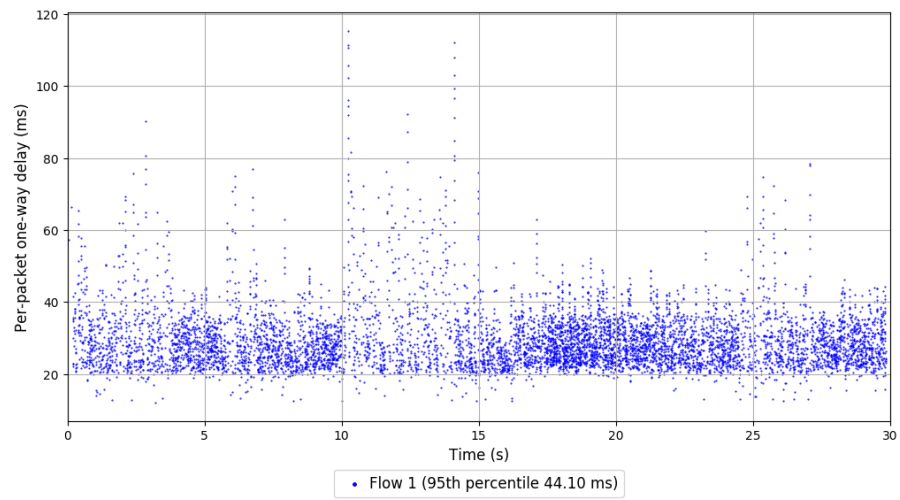
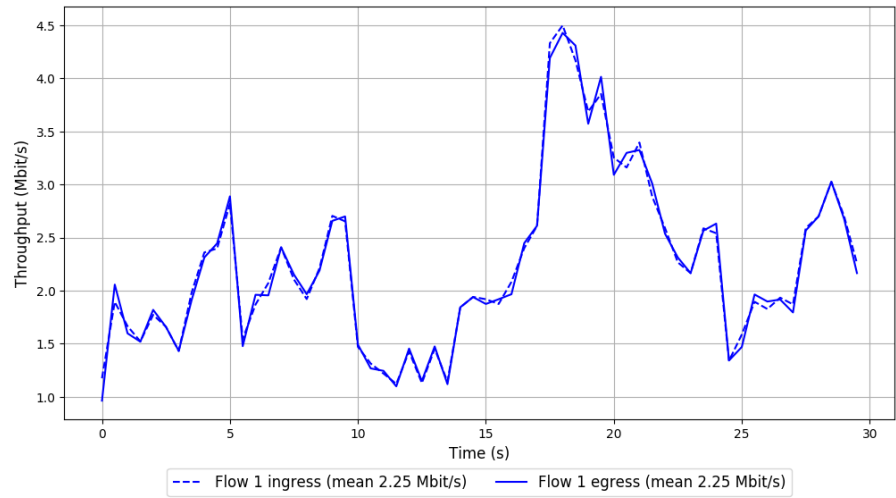
-- Flow 1:

Average throughput: 2.25 Mbit/s

95th percentile per-packet one-way delay: 44.099 ms

Loss rate: 0.21%

Run 1: Report of Vivace-latency — Data Link

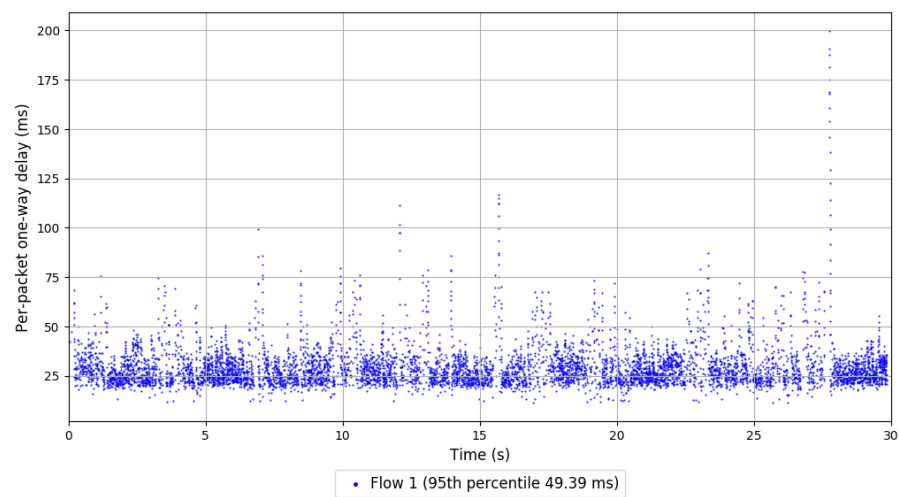
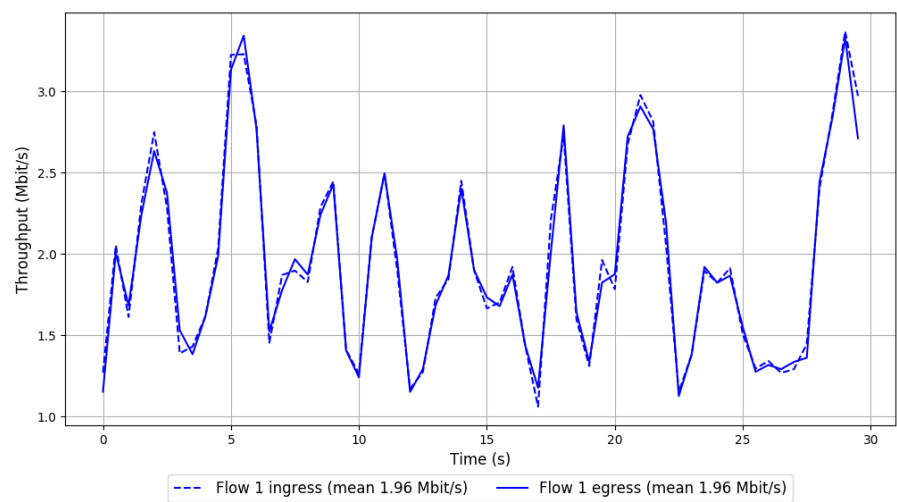


Run 2: Statistics of Vivace-latency

Start at: 2018-02-27 06:31:50
End at: 2018-02-27 06:32:20
Local clock offset: -8.711 ms
Remote clock offset: -8.072 ms

Below is generated by plot.py at 2018-02-27 08:30:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.96 Mbit/s
95th percentile per-packet one-way delay: 49.390 ms
Loss rate: 0.36%
-- Flow 1:
Average throughput: 1.96 Mbit/s
95th percentile per-packet one-way delay: 49.390 ms
Loss rate: 0.36%

Run 2: Report of Vivace-latency — Data Link

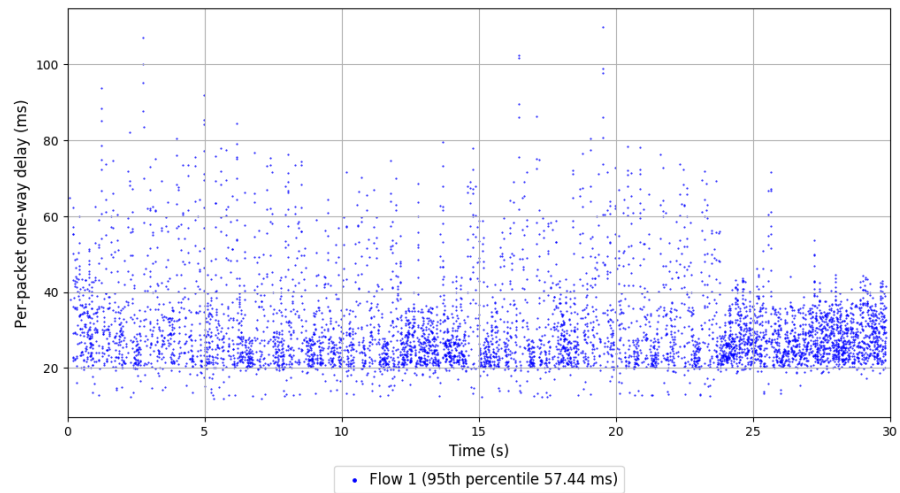
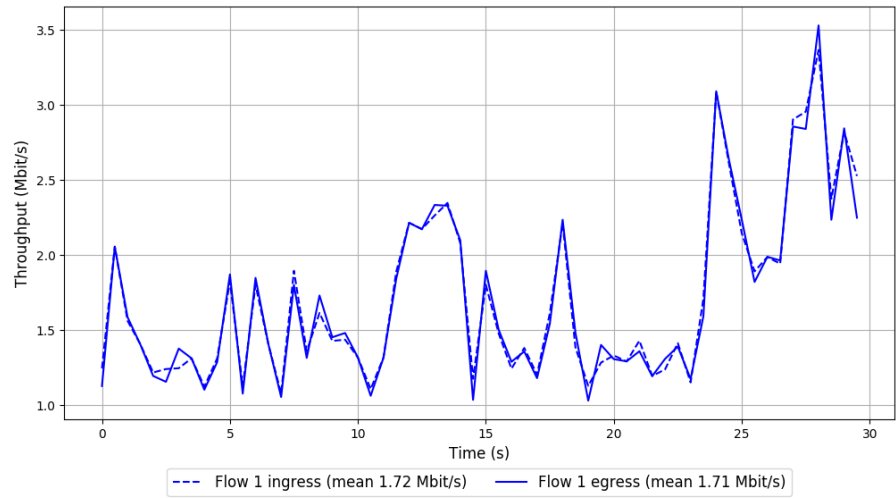


Run 3: Statistics of Vivace-latency

Start at: 2018-02-27 06:55:25
End at: 2018-02-27 06:55:55
Local clock offset: -13.374 ms
Remote clock offset: -5.661 ms

Below is generated by plot.py at 2018-02-27 08:30:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 57.443 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 57.443 ms
Loss rate: 0.48%

Run 3: Report of Vivace-latency — Data Link

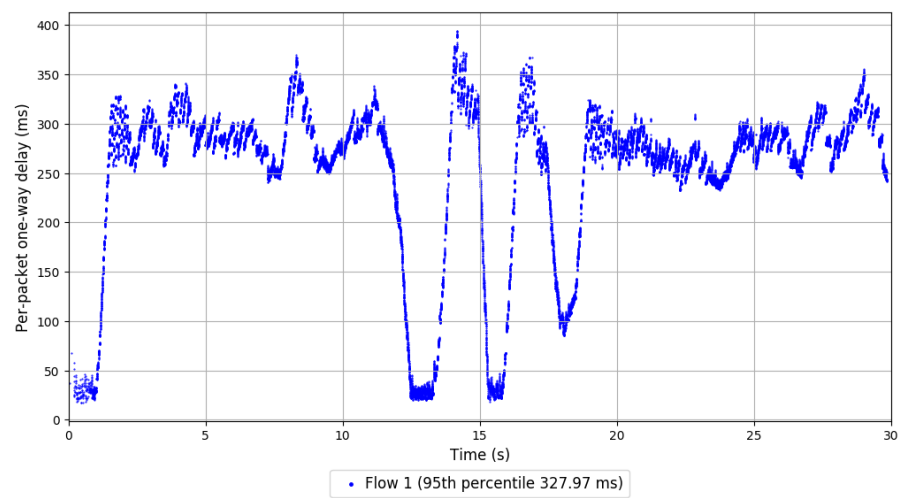
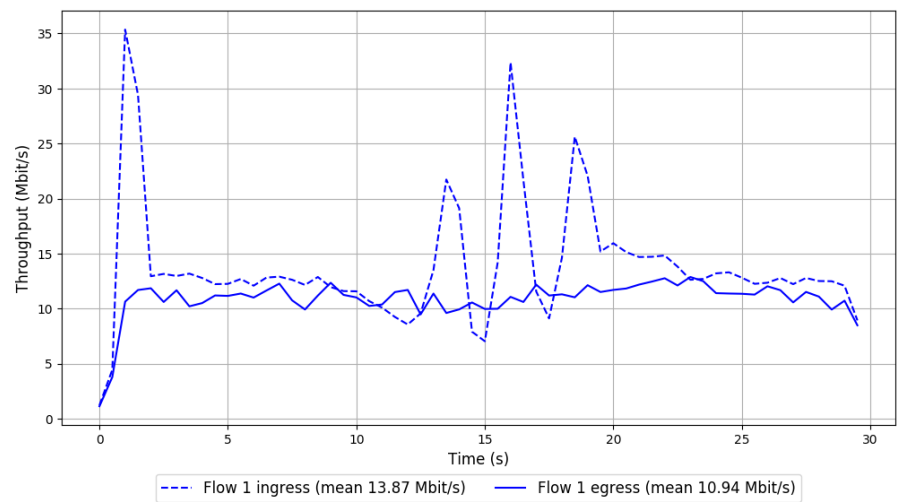


Run 1: Statistics of Vivace-loss

Start at: 2018-02-27 06:29:13
End at: 2018-02-27 06:29:43
Local clock offset: -10.331 ms
Remote clock offset: -8.646 ms

Below is generated by plot.py at 2018-02-27 08:30:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.94 Mbit/s
95th percentile per-packet one-way delay: 327.967 ms
Loss rate: 21.29%
-- Flow 1:
Average throughput: 10.94 Mbit/s
95th percentile per-packet one-way delay: 327.967 ms
Loss rate: 21.29%

Run 1: Report of Vivace-loss — Data Link

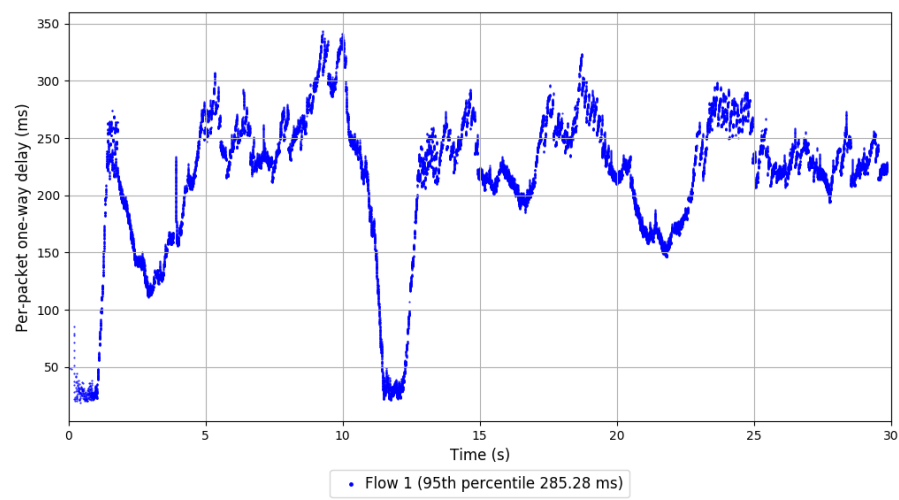
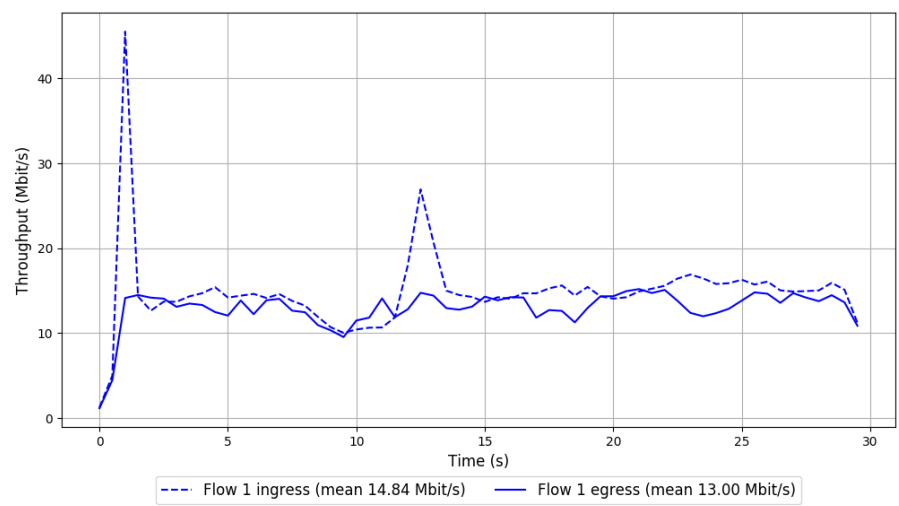


Run 2: Statistics of Vivace-loss

Start at: 2018-02-27 06:52:47
End at: 2018-02-27 06:53:17
Local clock offset: -12.278 ms
Remote clock offset: -5.852 ms

Below is generated by plot.py at 2018-02-27 08:30:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.00 Mbit/s
95th percentile per-packet one-way delay: 285.279 ms
Loss rate: 12.59%
-- Flow 1:
Average throughput: 13.00 Mbit/s
95th percentile per-packet one-way delay: 285.279 ms
Loss rate: 12.59%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-02-27 07:16:23

End at: 2018-02-27 07:16:53

Local clock offset: -7.103 ms

Remote clock offset: -5.129 ms

Below is generated by plot.py at 2018-02-27 08:30:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 12.90 Mbit/s

95th percentile per-packet one-way delay: 281.019 ms

Loss rate: 12.76%

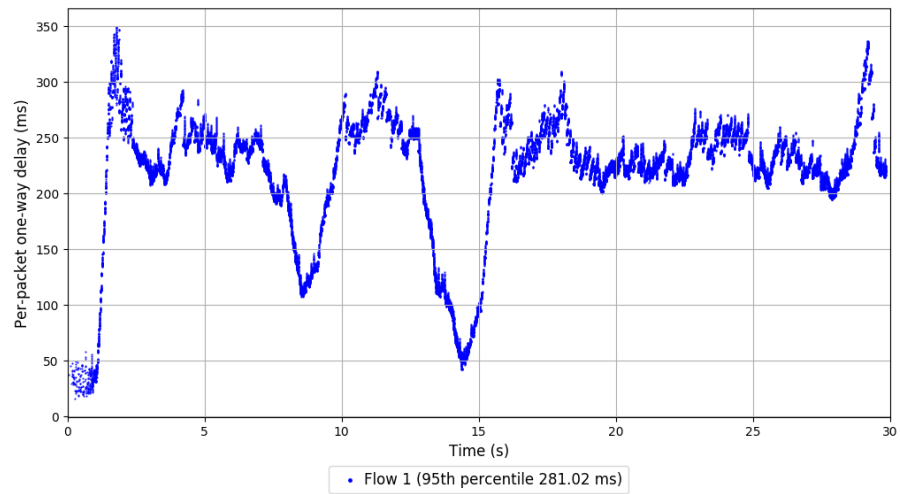
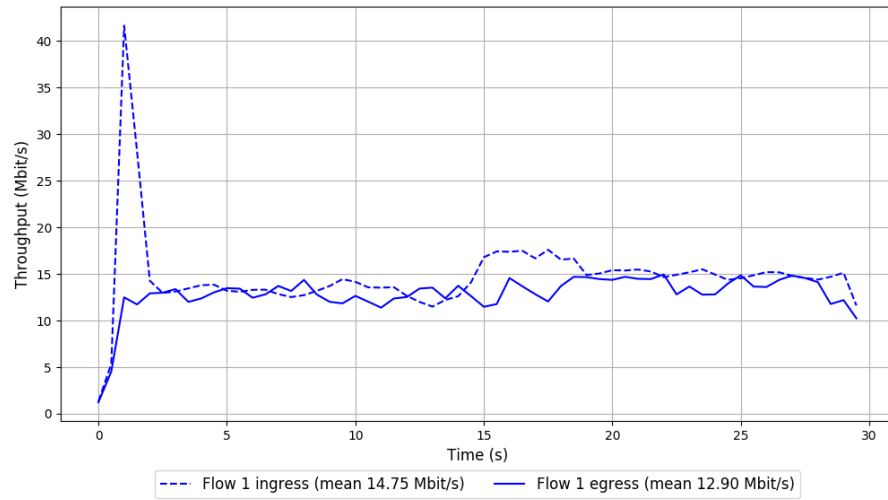
-- Flow 1:

Average throughput: 12.90 Mbit/s

95th percentile per-packet one-way delay: 281.019 ms

Loss rate: 12.76%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-02-27 06:27:54

End at: 2018-02-27 06:28:24

Local clock offset: -9.999 ms

Remote clock offset: -8.661 ms

Below is generated by plot.py at 2018-02-27 08:30:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 8.00 Mbit/s

95th percentile per-packet one-way delay: 297.145 ms

Loss rate: 4.04%

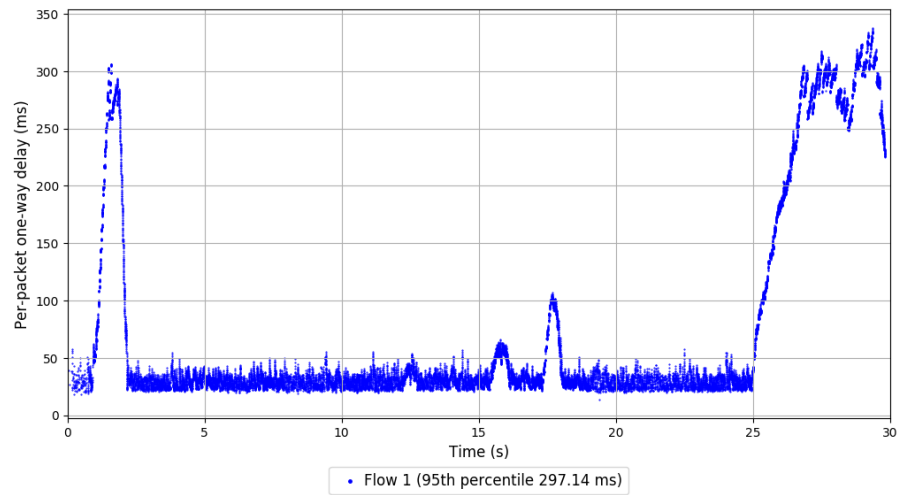
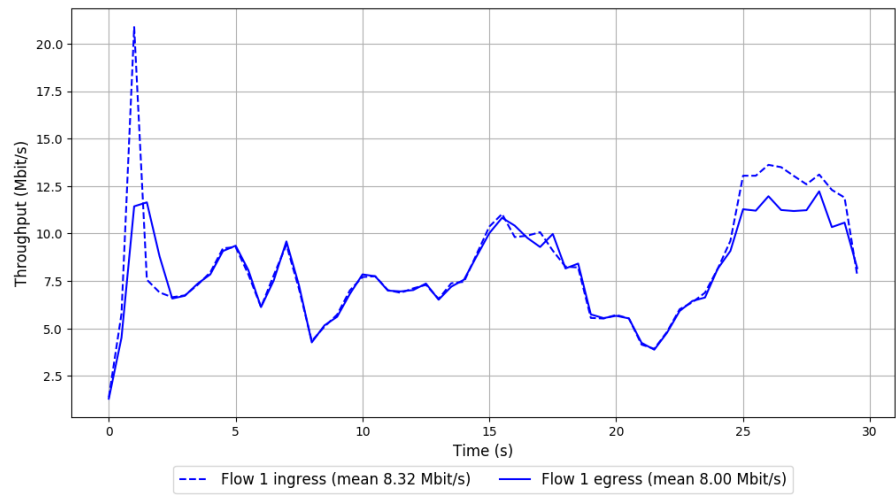
-- Flow 1:

Average throughput: 8.00 Mbit/s

95th percentile per-packet one-way delay: 297.145 ms

Loss rate: 4.04%

Run 1: Report of Vivace-LTE — Data Link

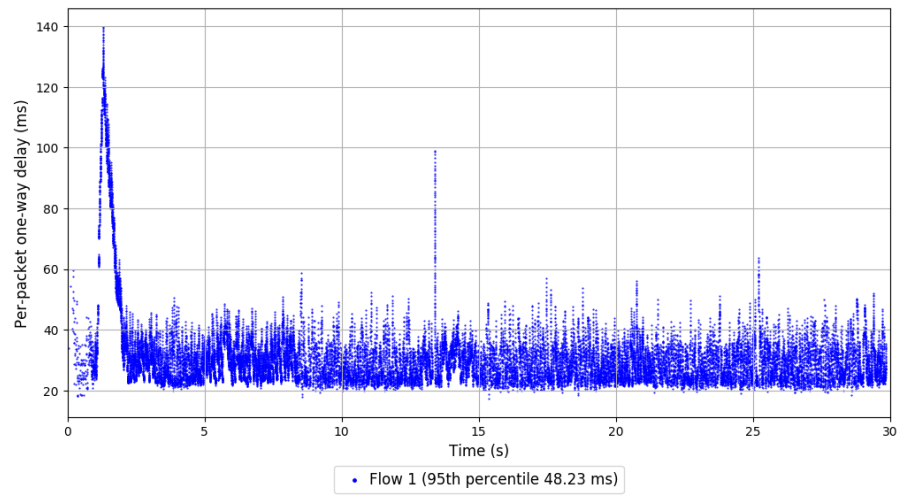
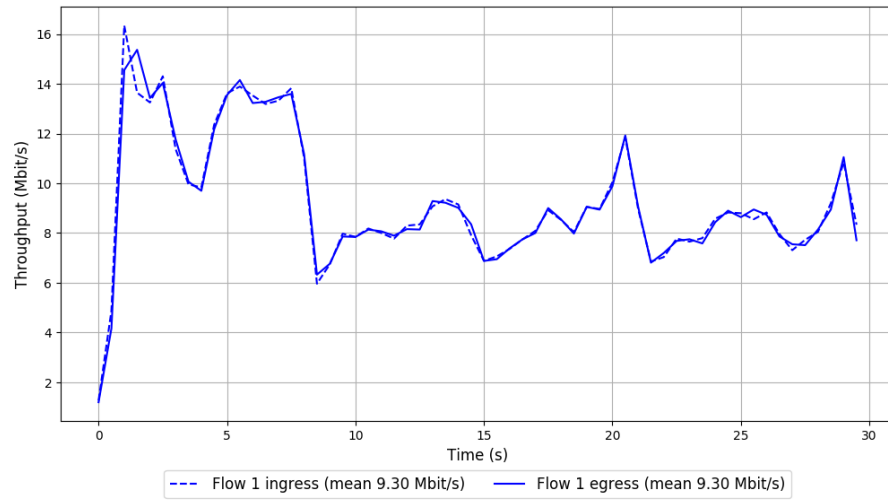


Run 2: Statistics of Vivace-LTE

Start at: 2018-02-27 06:51:28
End at: 2018-02-27 06:51:58
Local clock offset: -11.699 ms
Remote clock offset: -5.872 ms

Below is generated by plot.py at 2018-02-27 08:30:02
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.30 Mbit/s
95th percentile per-packet one-way delay: 48.228 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 9.30 Mbit/s
95th percentile per-packet one-way delay: 48.228 ms
Loss rate: 0.20%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-02-27 07:15:04
End at: 2018-02-27 07:15:34
Local clock offset: -7.272 ms
Remote clock offset: -5.106 ms

Below is generated by plot.py at 2018-02-27 08:30:02
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.94 Mbit/s
95th percentile per-packet one-way delay: 174.988 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 11.94 Mbit/s
95th percentile per-packet one-way delay: 174.988 ms
Loss rate: 0.17%

Run 3: Report of Vivace-LTE — Data Link

