

Pantheon Report

Generated at 2018-01-31 08:56:24 (UTC).

Data path: AWS Brazil 2 Ethernet (*local*) → Colombia 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).

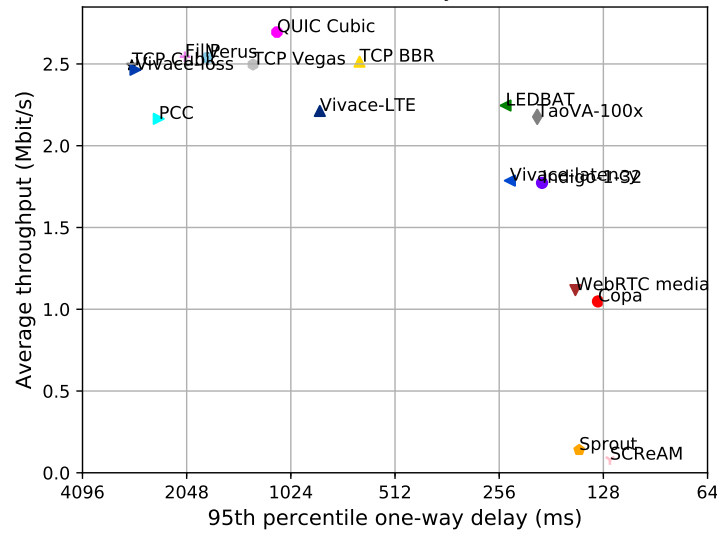
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

NTP offsets were measured against **gps.ntp.br** and have been applied to correct the timestamps in logs.

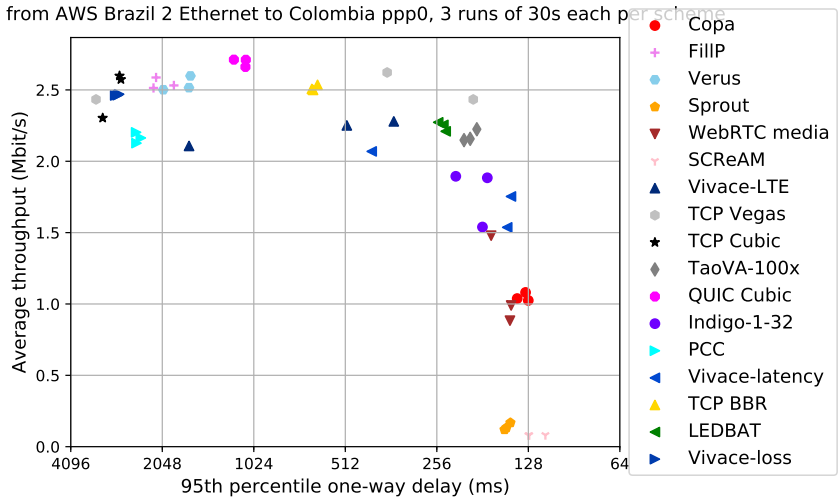
Git summary:

```
branch: master @ 70217998b3c9a7166a95460a70c0854d1326e100
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ fb9c9ab842e5614ad52911a76fb9bd1c1b0dca86
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaaeb30b267cde681
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 Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	2.52	648.35	1.14
TCP Cubic	3	2.49	2949.81	11.01
LEDBAT	3	2.24	245.49	0.46
PCC	3	2.16	2465.12	47.78
QUIC Cubic	3	2.69	1123.16	4.03
SCReAM	3	0.08	122.53	0.00
WebRTC media	3	1.12	154.20	0.21
Sprout	3	0.14	150.37	0.00
TaoVA-100x	3	2.18	198.75	0.31
TCP Vegas	3	2.49	1316.71	4.84
Verus	3	2.54	1786.55	4.55
Copa	3	1.05	132.69	0.07
FillP	3	2.54	2070.36	15.77
Indigo-1-32	3	1.77	192.53	0.17
Vivace-latency	3	1.79	238.51	0.76
Vivace-loss	3	2.46	2878.45	40.02
Vivace-LTE	3	2.21	844.31	0.96

Run 1: Statistics of TCP BBR

Start at: 2018-01-31 08:08:06

End at: 2018-01-31 08:08:36

Local clock offset: -0.777 ms

Remote clock offset: 6.344 ms

Below is generated by plot.py at 2018-01-31 08:55:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.54 Mbit/s

95th percentile per-packet one-way delay: 631.843 ms

Loss rate: 1.04%

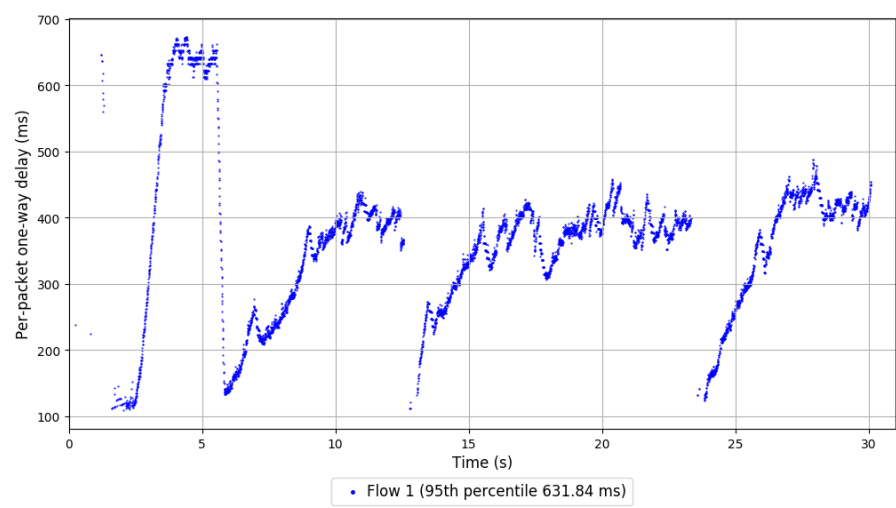
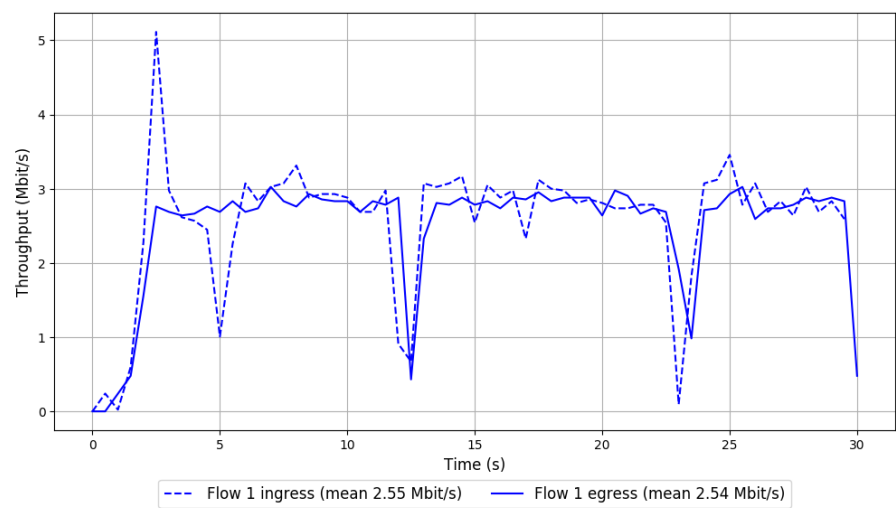
-- Flow 1:

Average throughput: 2.54 Mbit/s

95th percentile per-packet one-way delay: 631.843 ms

Loss rate: 1.04%

Run 1: Report of TCP BBR — Data Link

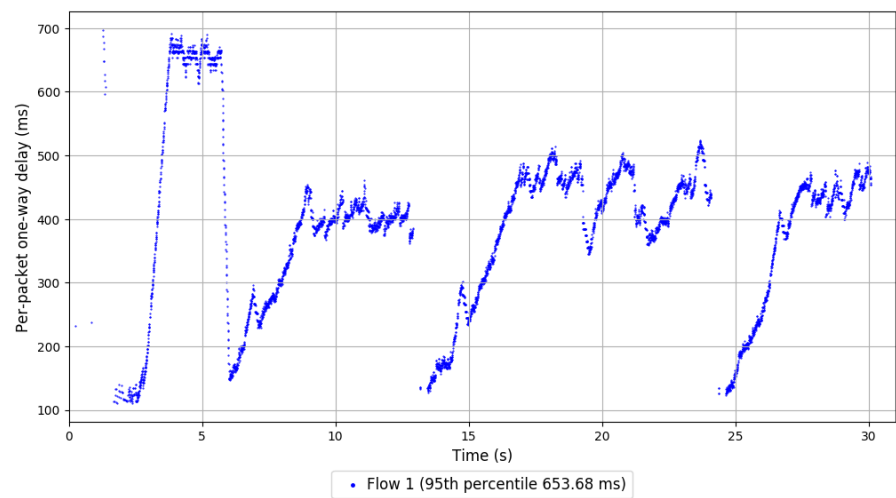
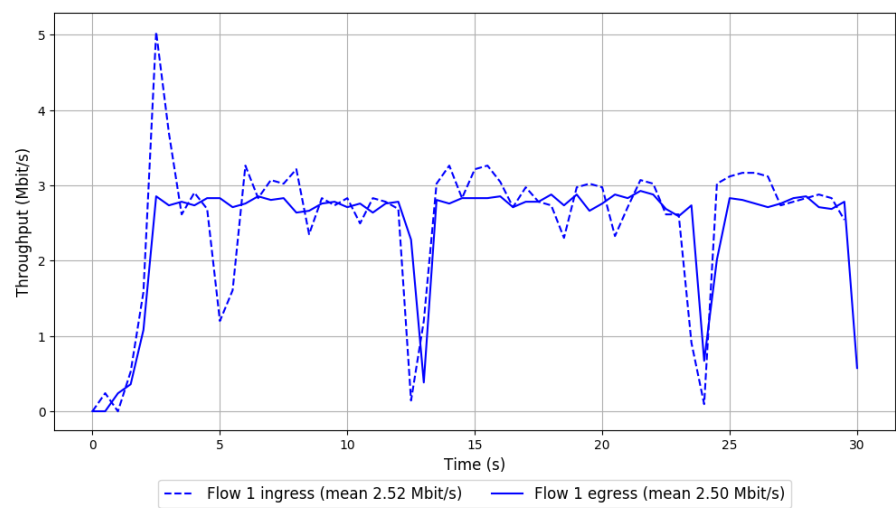


Run 2: Statistics of TCP BBR

Start at: 2018-01-31 08:29:23
End at: 2018-01-31 08:29:53
Local clock offset: -0.638 ms
Remote clock offset: -2.335 ms

Below is generated by plot.py at 2018-01-31 08:55:45
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.50 Mbit/s
95th percentile per-packet one-way delay: 653.682 ms
Loss rate: 1.24%
-- Flow 1:
Average throughput: 2.50 Mbit/s
95th percentile per-packet one-way delay: 653.682 ms
Loss rate: 1.24%

Run 2: Report of TCP BBR — Data Link

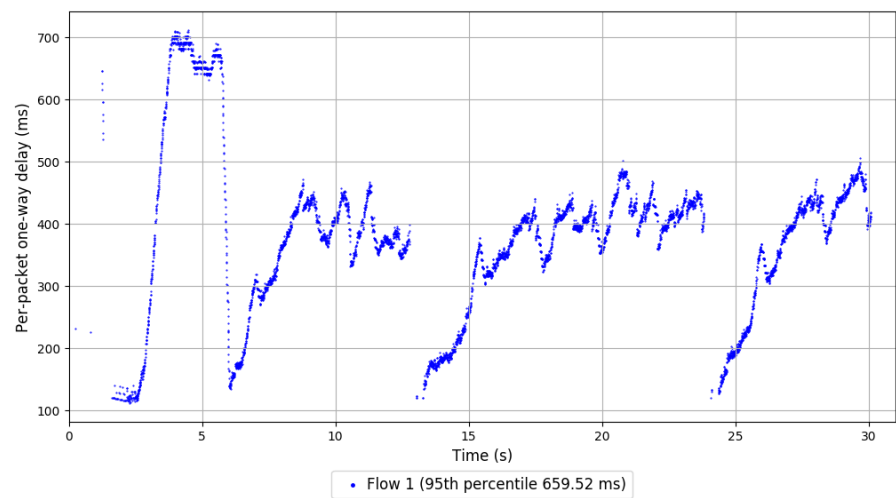
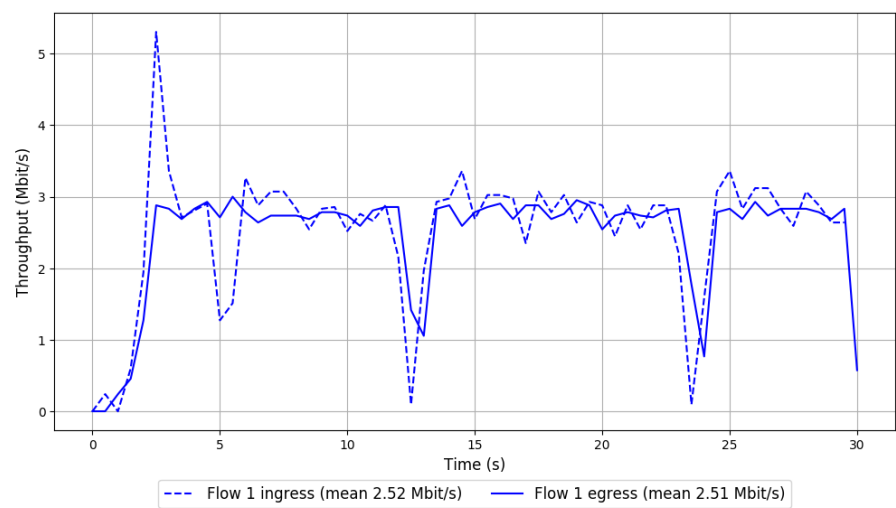


Run 3: Statistics of TCP BBR

Start at: 2018-01-31 08:50:41
End at: 2018-01-31 08:51:11
Local clock offset: -0.061 ms
Remote clock offset: -2.614 ms

Below is generated by plot.py at 2018-01-31 08:55:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.51 Mbit/s
95th percentile per-packet one-way delay: 659.522 ms
Loss rate: 1.14%
-- Flow 1:
Average throughput: 2.51 Mbit/s
95th percentile per-packet one-way delay: 659.522 ms
Loss rate: 1.14%

Run 3: Report of TCP BBR — Data Link

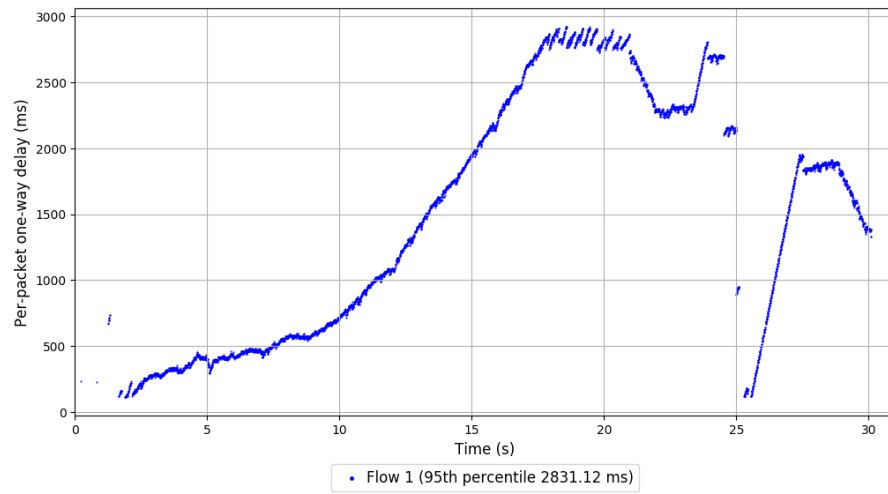
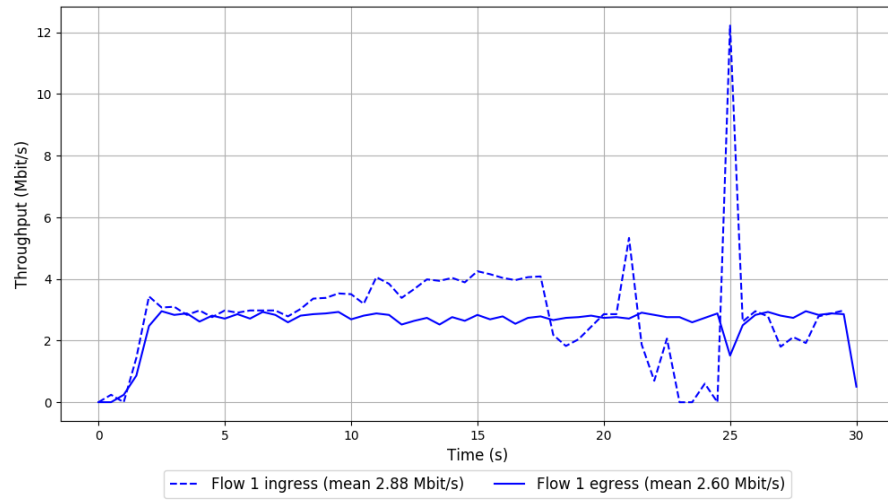


Run 1: Statistics of TCP Cubic

Start at: 2018-01-31 08:02:11
End at: 2018-01-31 08:02:41
Local clock offset: -0.754 ms
Remote clock offset: -0.213 ms

Below is generated by plot.py at 2018-01-31 08:55:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.60 Mbit/s
95th percentile per-packet one-way delay: 2831.120 ms
Loss rate: 10.10%
-- Flow 1:
Average throughput: 2.60 Mbit/s
95th percentile per-packet one-way delay: 2831.120 ms
Loss rate: 10.10%

Run 1: Report of TCP Cubic — Data Link

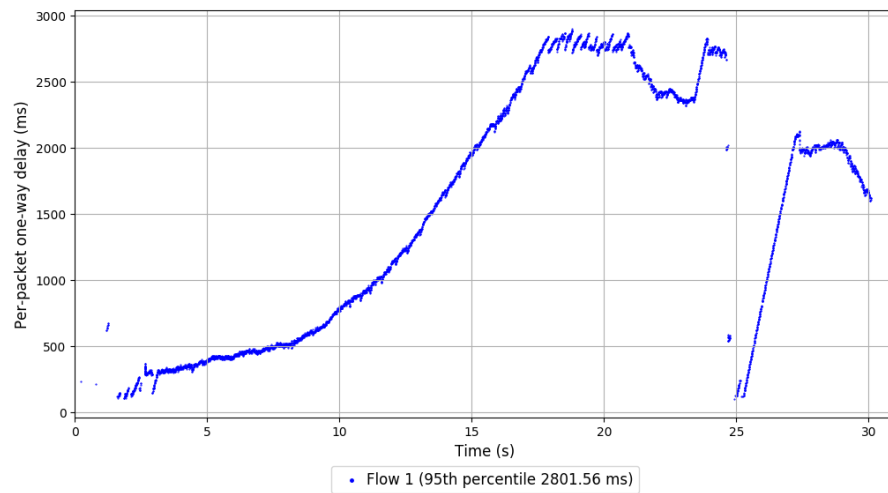
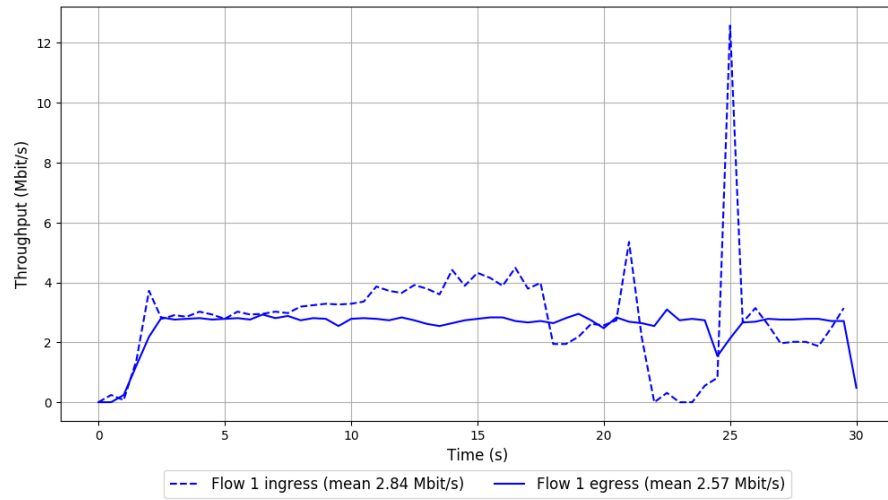


Run 2: Statistics of TCP Cubic

Start at: 2018-01-31 08:23:28
End at: 2018-01-31 08:23:58
Local clock offset: -0.826 ms
Remote clock offset: -1.934 ms

Below is generated by plot.py at 2018-01-31 08:55:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.57 Mbit/s
95th percentile per-packet one-way delay: 2801.556 ms
Loss rate: 9.82%
-- Flow 1:
Average throughput: 2.57 Mbit/s
95th percentile per-packet one-way delay: 2801.556 ms
Loss rate: 9.82%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-01-31 08:44:46

End at: 2018-01-31 08:45:16

Local clock offset: -0.119 ms

Remote clock offset: 2.693 ms

Below is generated by plot.py at 2018-01-31 08:55:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.30 Mbit/s

95th percentile per-packet one-way delay: 3216.749 ms

Loss rate: 13.10%

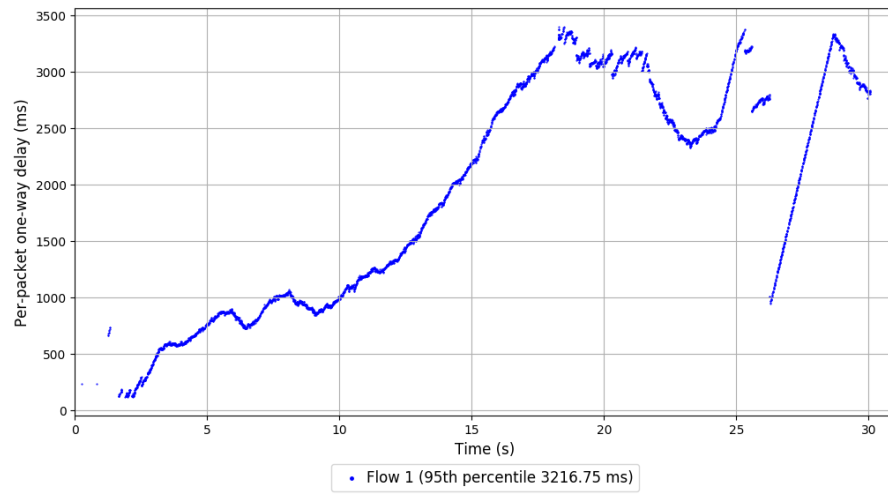
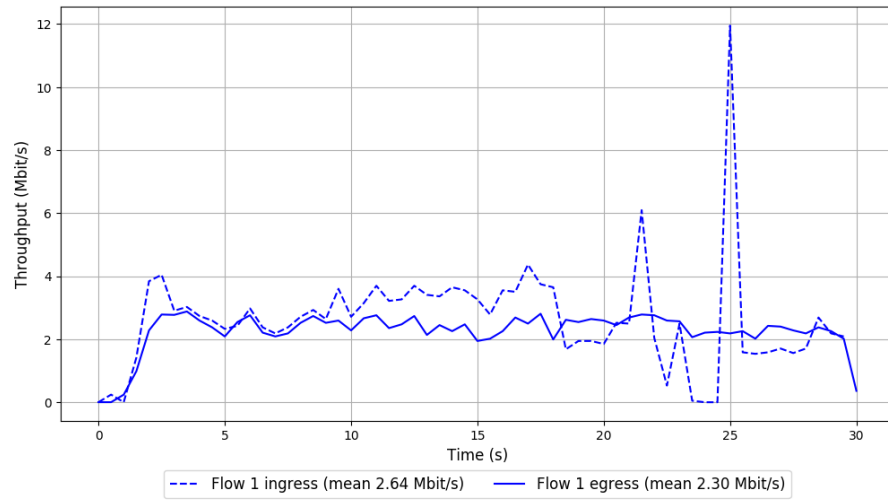
-- Flow 1:

Average throughput: 2.30 Mbit/s

95th percentile per-packet one-way delay: 3216.749 ms

Loss rate: 13.10%

Run 3: Report of TCP Cubic — Data Link

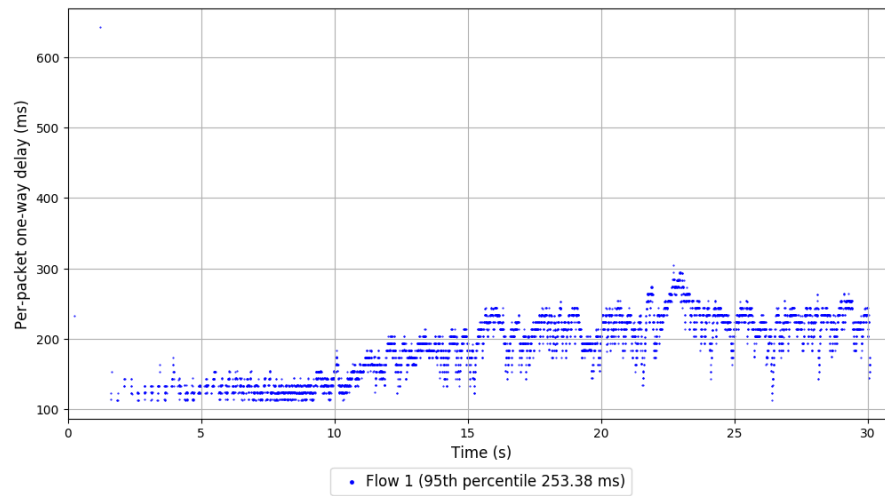
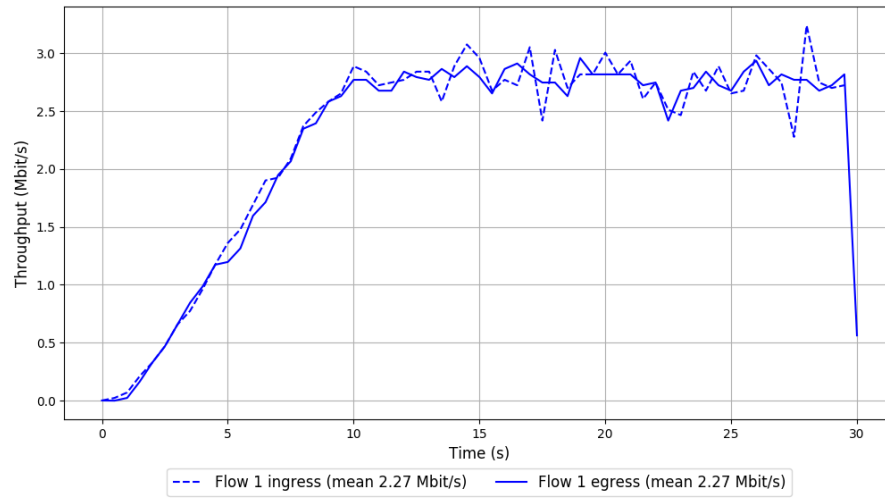


```
Run 1: Statistics of LEDBAT

Start at: 2018-01-31 07:58:38
End at: 2018-01-31 07:59:08
Local clock offset: -0.767 ms
Remote clock offset: 5.749 ms

# Below is generated by plot.py at 2018-01-31 08:55:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 253.381 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 253.381 ms
Loss rate: 0.48%
```


Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2018-01-31 08:19:55

End at: 2018-01-31 08:20:25

Local clock offset: -0.909 ms

Remote clock offset: 4.909 ms

Below is generated by plot.py at 2018-01-31 08:55:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.21 Mbit/s

95th percentile per-packet one-way delay: 239.425 ms

Loss rate: 0.57%

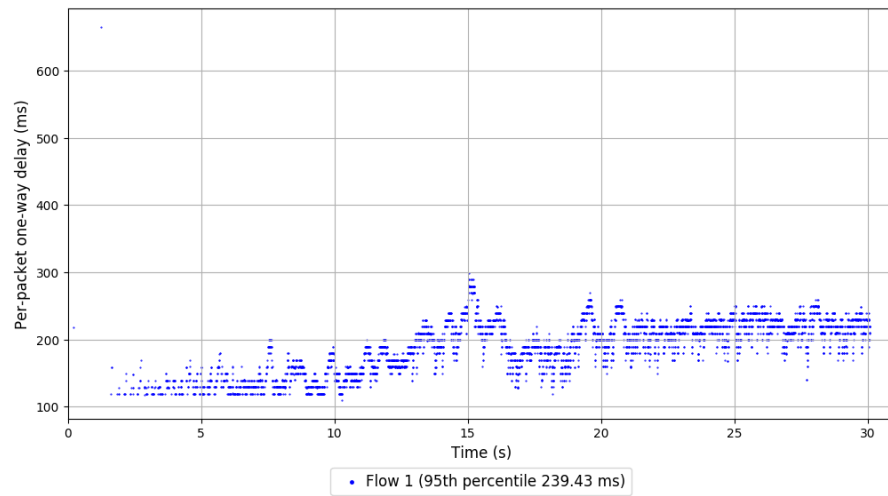
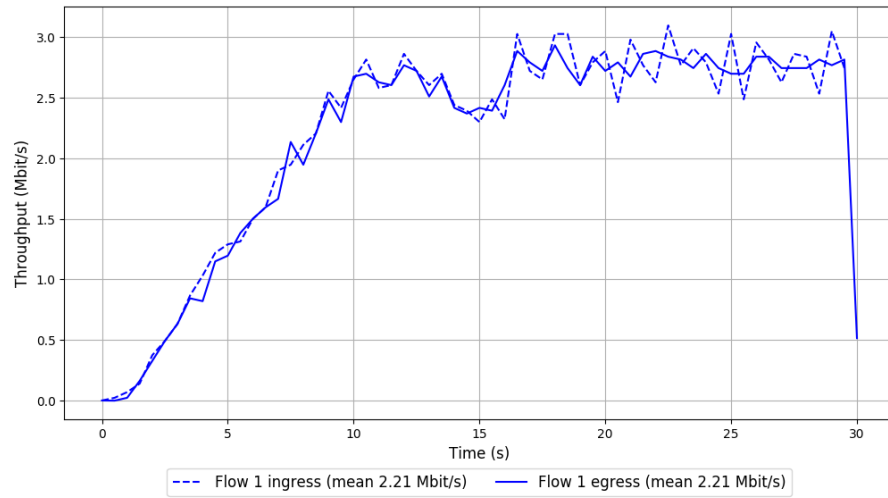
-- Flow 1:

Average throughput: 2.21 Mbit/s

95th percentile per-packet one-way delay: 239.425 ms

Loss rate: 0.57%

Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

Start at: 2018-01-31 08:41:13

End at: 2018-01-31 08:41:43

Local clock offset: -0.147 ms

Remote clock offset: 2.796 ms

Below is generated by plot.py at 2018-01-31 08:55:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.25 Mbit/s

95th percentile per-packet one-way delay: 243.650 ms

Loss rate: 0.33%

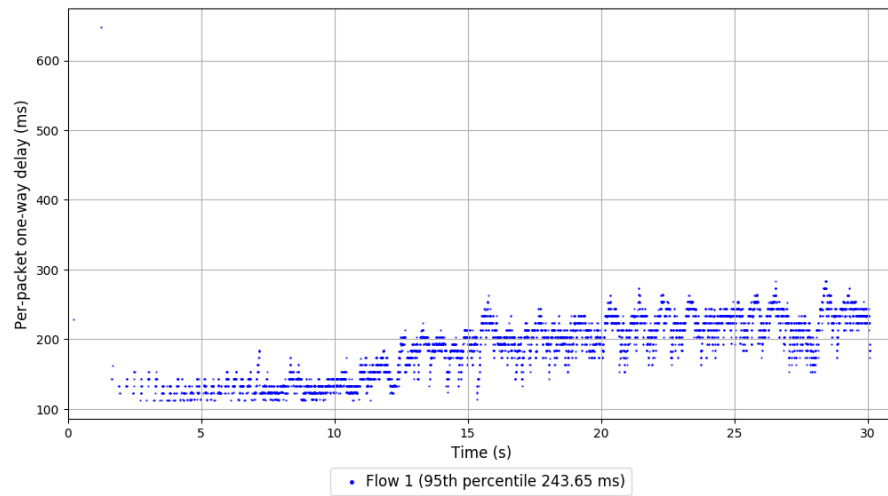
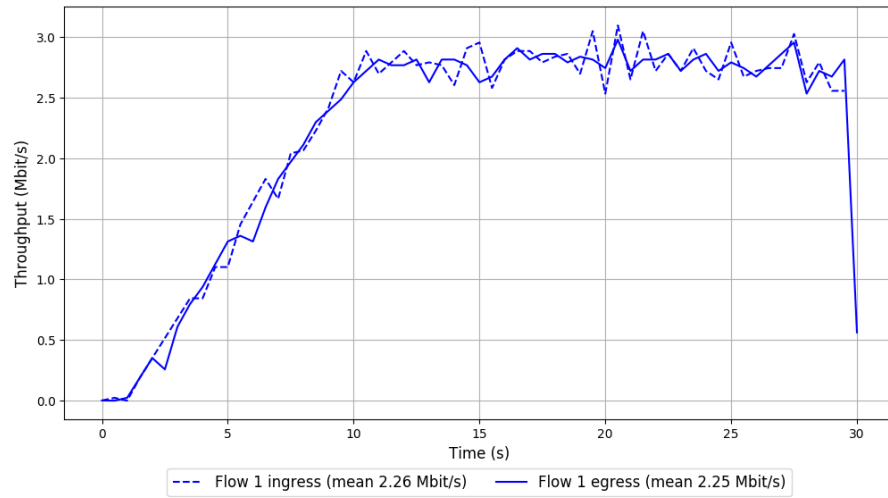
-- Flow 1:

Average throughput: 2.25 Mbit/s

95th percentile per-packet one-way delay: 243.650 ms

Loss rate: 0.33%

Run 3: Report of LEDBAT — Data Link

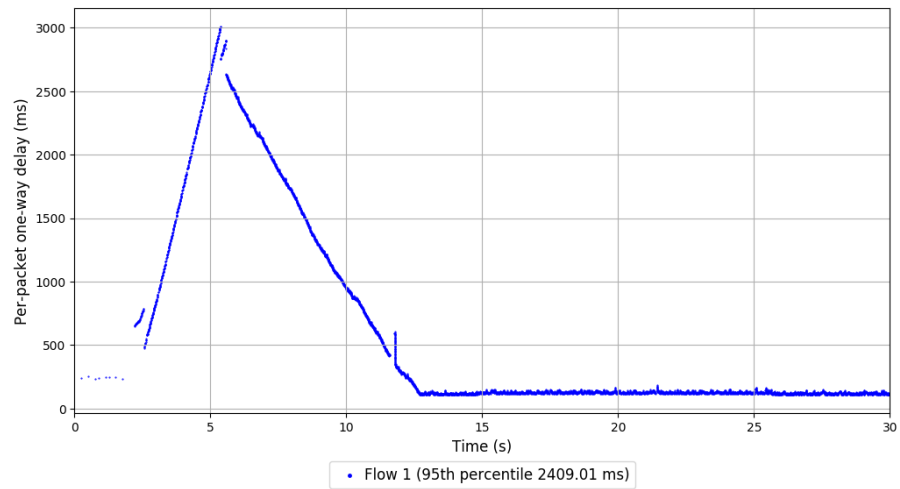
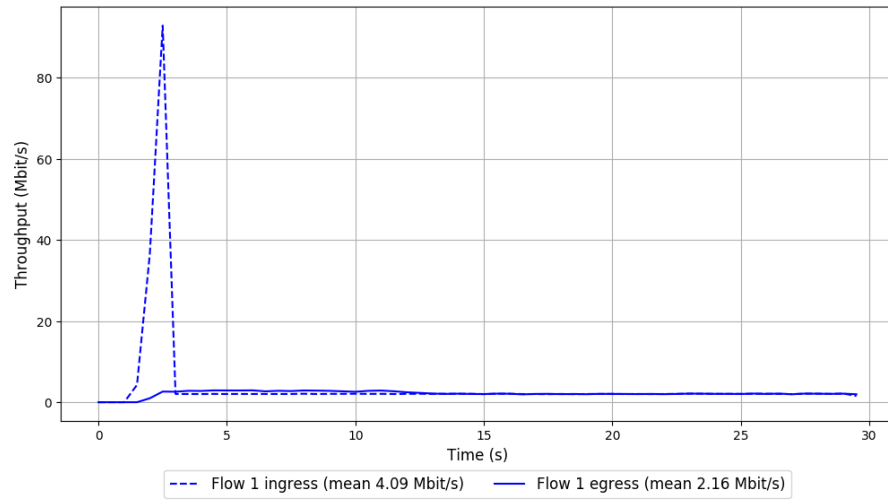


Run 1: Statistics of PCC

Start at: 2018-01-31 08:05:43
End at: 2018-01-31 08:06:13
Local clock offset: -0.768 ms
Remote clock offset: -0.306 ms

Below is generated by plot.py at 2018-01-31 08:55:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 2409.006 ms
Loss rate: 47.33%
-- Flow 1:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 2409.006 ms
Loss rate: 47.33%

Run 1: Report of PCC — Data Link

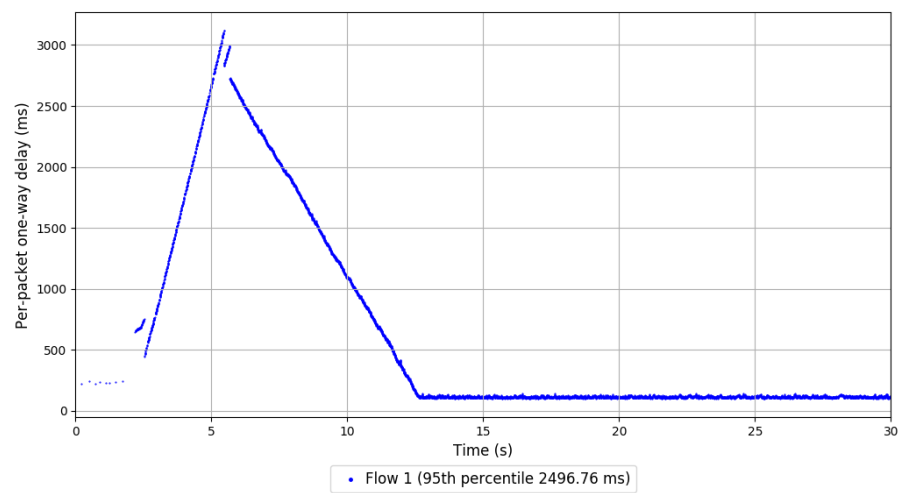
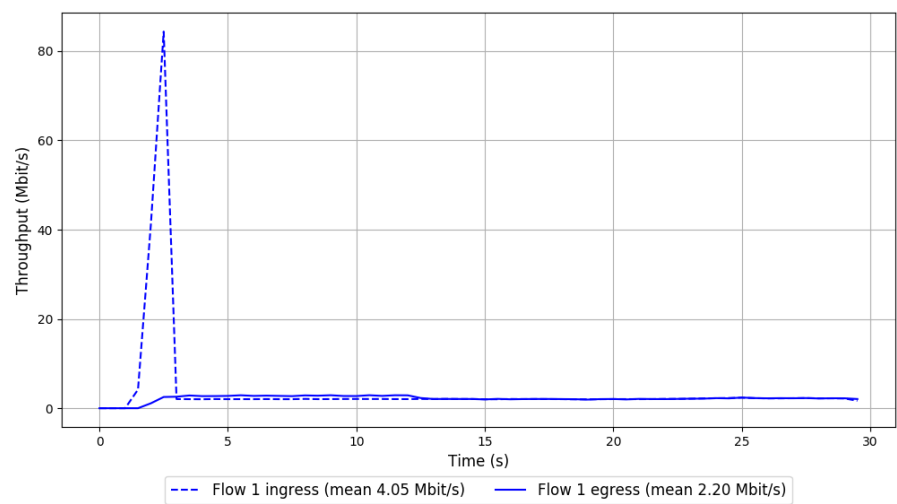


Run 2: Statistics of PCC

Start at: 2018-01-31 08:27:01
End at: 2018-01-31 08:27:31
Local clock offset: -0.638 ms
Remote clock offset: -2.187 ms

Below is generated by plot.py at 2018-01-31 08:55:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.20 Mbit/s
95th percentile per-packet one-way delay: 2496.756 ms
Loss rate: 45.90%
-- Flow 1:
Average throughput: 2.20 Mbit/s
95th percentile per-packet one-way delay: 2496.756 ms
Loss rate: 45.90%

Run 2: Report of PCC — Data Link



Run 3: Statistics of PCC

Start at: 2018-01-31 08:48:18

End at: 2018-01-31 08:48:48

Local clock offset: -0.097 ms

Remote clock offset: 2.635 ms

Below is generated by plot.py at 2018-01-31 08:55:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.13 Mbit/s

95th percentile per-packet one-way delay: 2489.587 ms

Loss rate: 50.12%

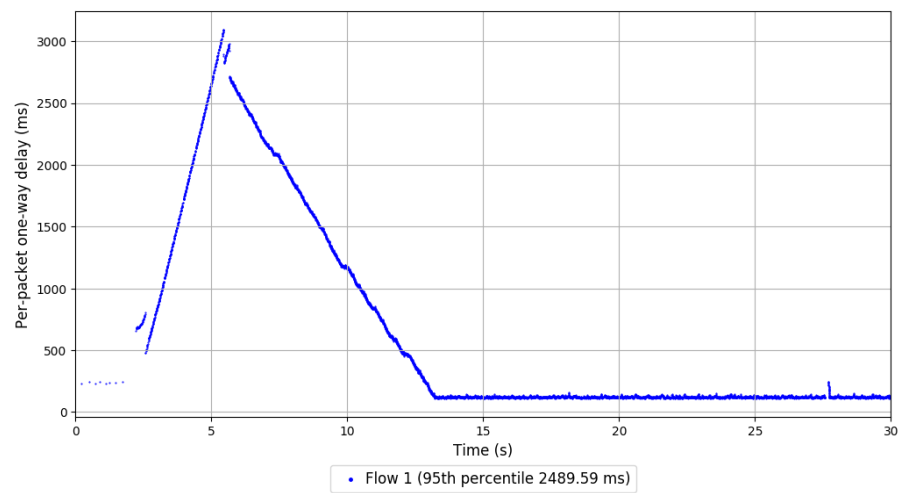
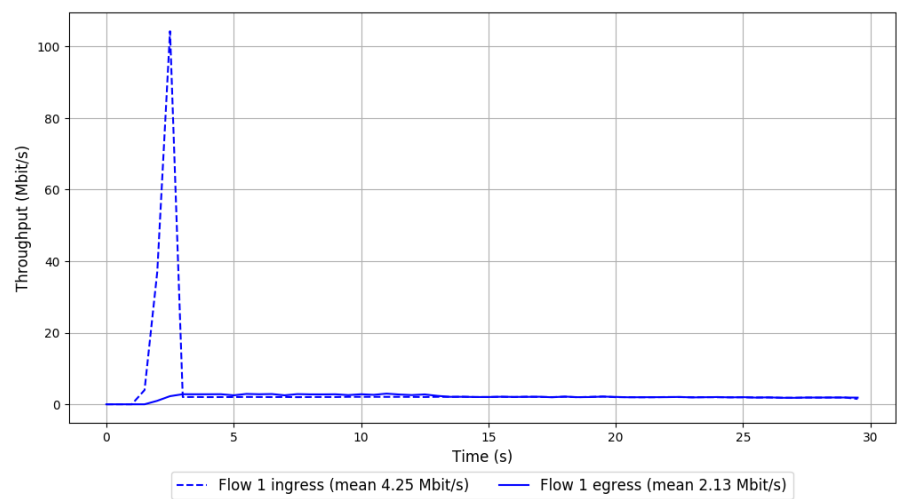
-- Flow 1:

Average throughput: 2.13 Mbit/s

95th percentile per-packet one-way delay: 2489.587 ms

Loss rate: 50.12%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-01-31 08:10:28

End at: 2018-01-31 08:10:58

Local clock offset: -0.779 ms

Remote clock offset: 6.261 ms

Below is generated by plot.py at 2018-01-31 08:55:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.66 Mbit/s

95th percentile per-packet one-way delay: 1090.985 ms

Loss rate: 3.80%

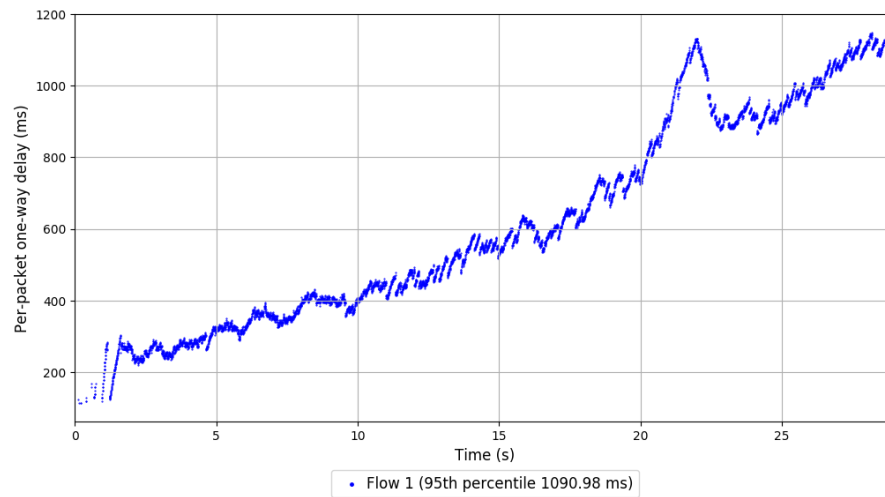
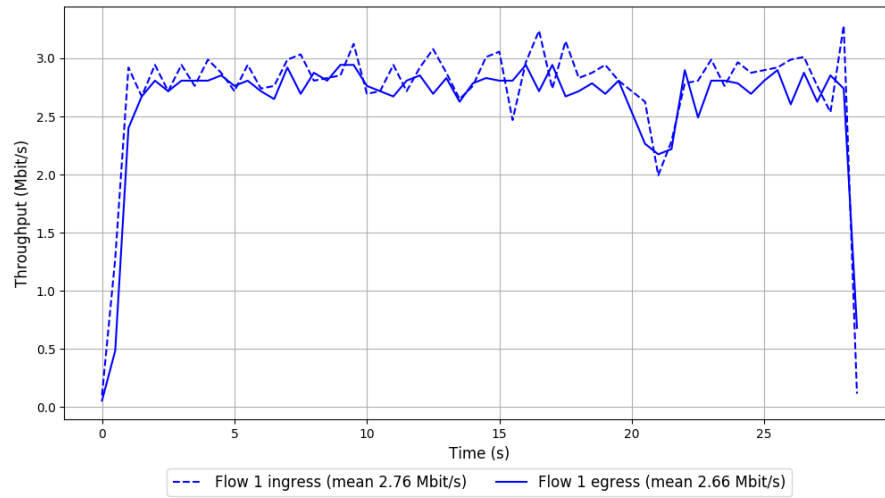
-- Flow 1:

Average throughput: 2.66 Mbit/s

95th percentile per-packet one-way delay: 1090.985 ms

Loss rate: 3.80%

Run 1: Report of QUIC Cubic — Data Link

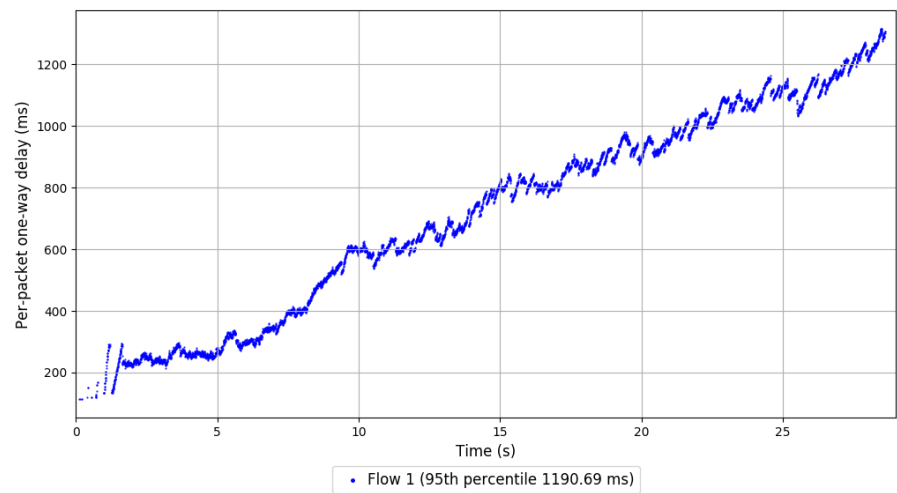
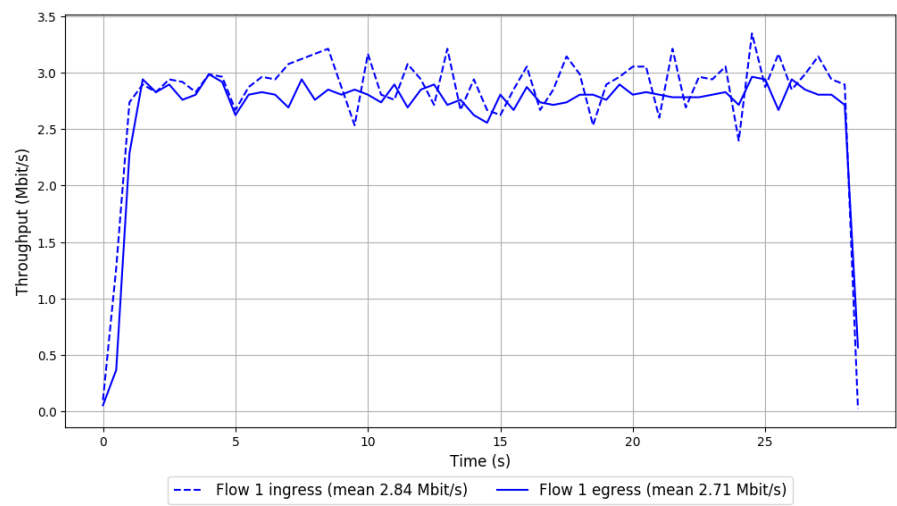


Run 2: Statistics of QUIC Cubic

Start at: 2018-01-31 08:31:45
End at: 2018-01-31 08:32:15
Local clock offset: -0.539 ms
Remote clock offset: -2.492 ms

Below is generated by plot.py at 2018-01-31 08:55:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 1190.692 ms
Loss rate: 4.39%
-- Flow 1:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 1190.692 ms
Loss rate: 4.39%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-01-31 08:53:03

End at: 2018-01-31 08:53:33

Local clock offset: -0.095 ms

Remote clock offset: -3.061 ms

Below is generated by plot.py at 2018-01-31 08:55:55

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.71 Mbit/s

95th percentile per-packet one-way delay: 1087.793 ms

Loss rate: 3.89%

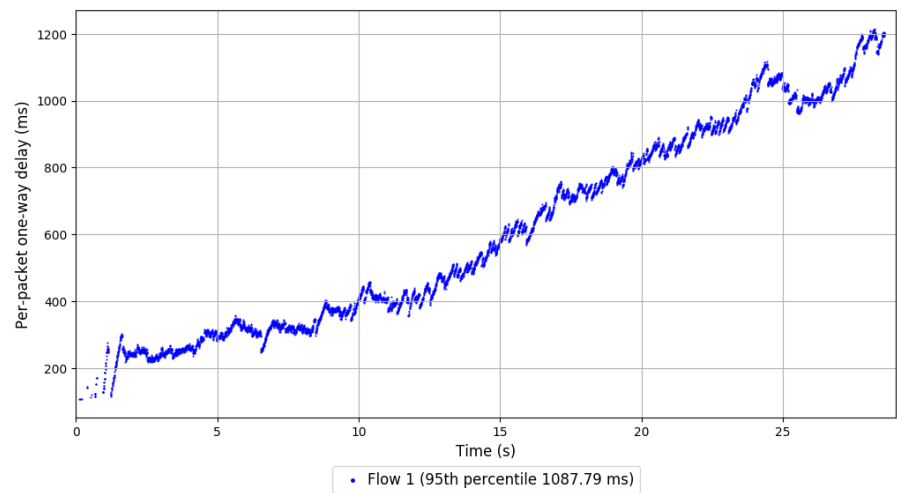
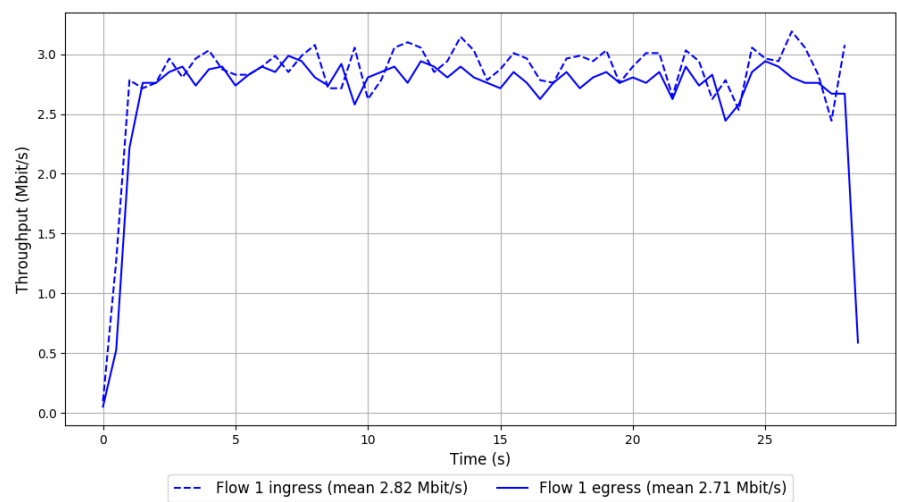
-- Flow 1:

Average throughput: 2.71 Mbit/s

95th percentile per-packet one-way delay: 1087.793 ms

Loss rate: 3.89%

Run 3: Report of QUIC Cubic — Data Link

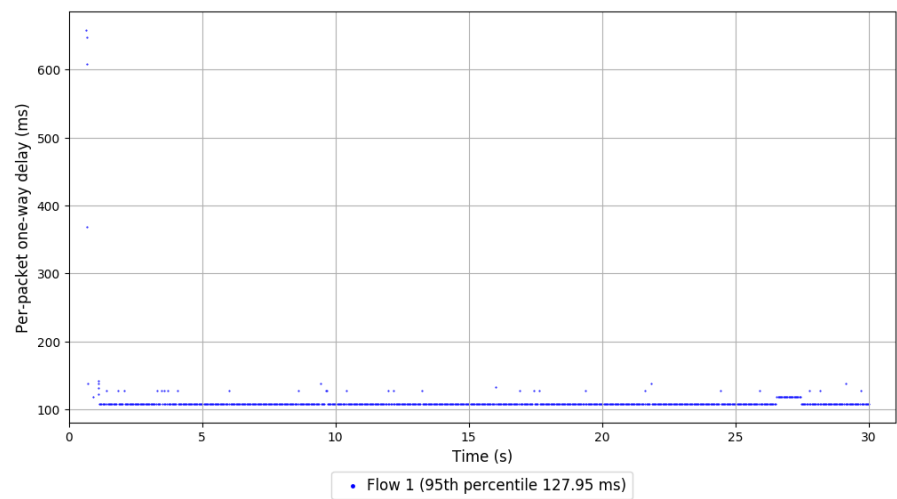
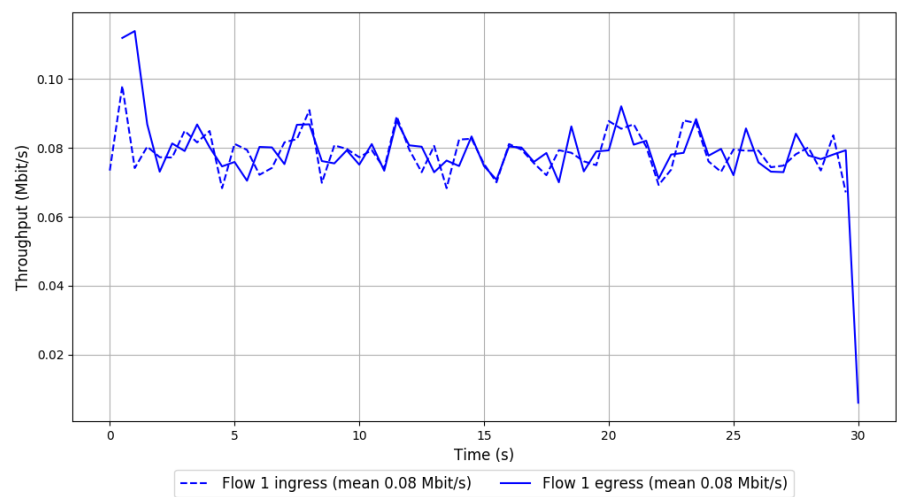


```
Run 1: Statistics of SCReAM

Start at: 2018-01-31 08:03:22
End at: 2018-01-31 08:03:52
Local clock offset: -0.773 ms
Remote clock offset: 6.358 ms

# Below is generated by plot.py at 2018-01-31 08:55:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 127.946 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 127.946 ms
Loss rate: 0.00%
```

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2018-01-31 08:24:39

End at: 2018-01-31 08:25:09

Local clock offset: -0.719 ms

Remote clock offset: 3.764 ms

Below is generated by plot.py at 2018-01-31 08:55:55

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 127.155 ms

Loss rate: 0.00%

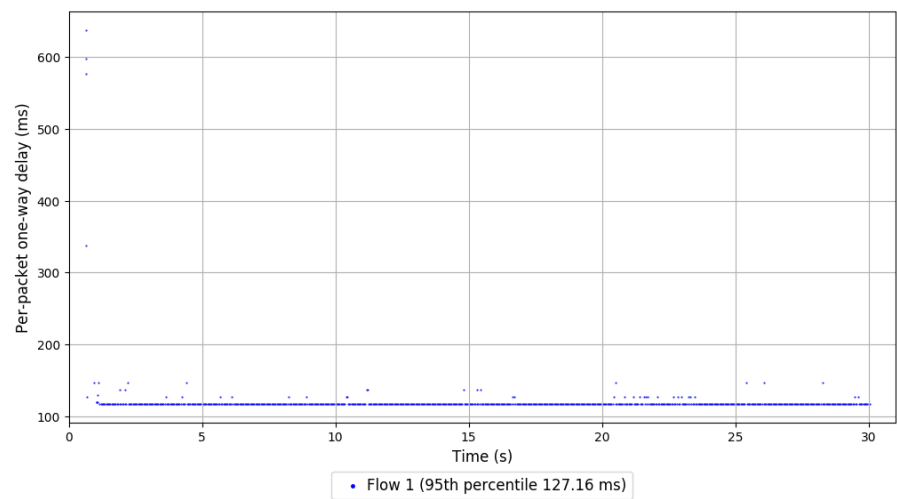
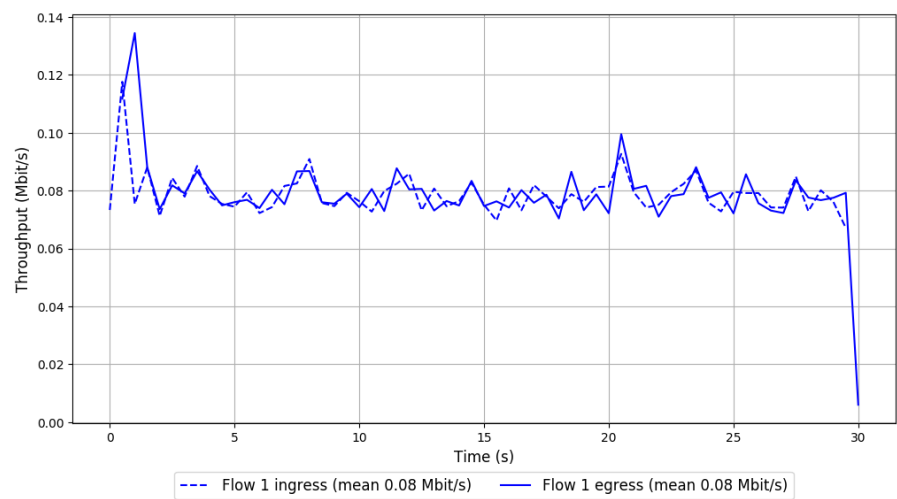
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 127.155 ms

Loss rate: 0.00%

Run 2: Report of SReAM — Data Link

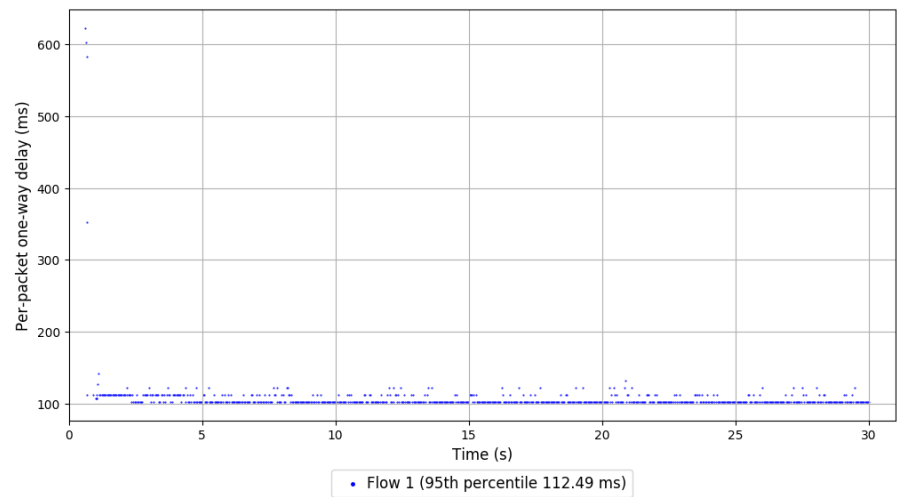
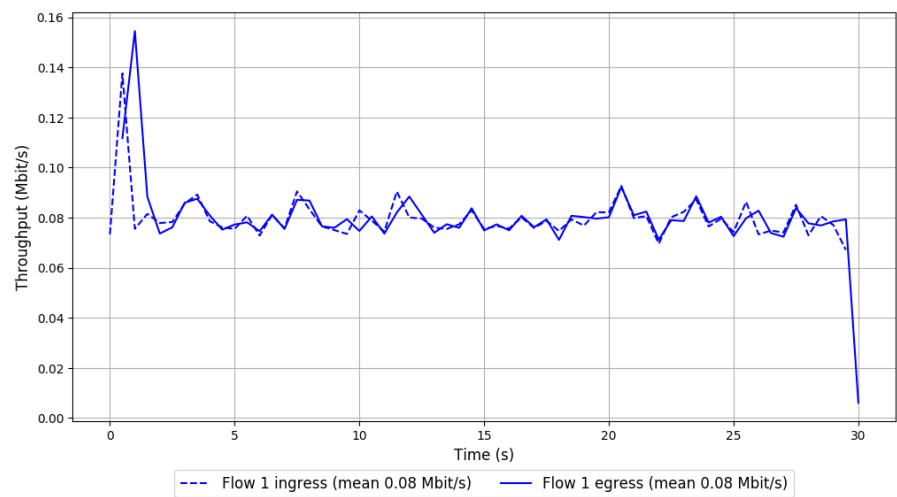


Run 3: Statistics of SCReAM

Start at: 2018-01-31 08:45:57
End at: 2018-01-31 08:46:27
Local clock offset: -0.111 ms
Remote clock offset: -2.249 ms

Below is generated by plot.py at 2018-01-31 08:55:55
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 112.494 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 112.494 ms
Loss rate: 0.00%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of WebRTC media

Start at: 2018-01-31 07:57:27

End at: 2018-01-31 07:57:57

Local clock offset: -0.791 ms

Remote clock offset: 0.922 ms

Below is generated by plot.py at 2018-01-31 08:55:55

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.99 Mbit/s

95th percentile per-packet one-way delay: 145.807 ms

Loss rate: 0.24%

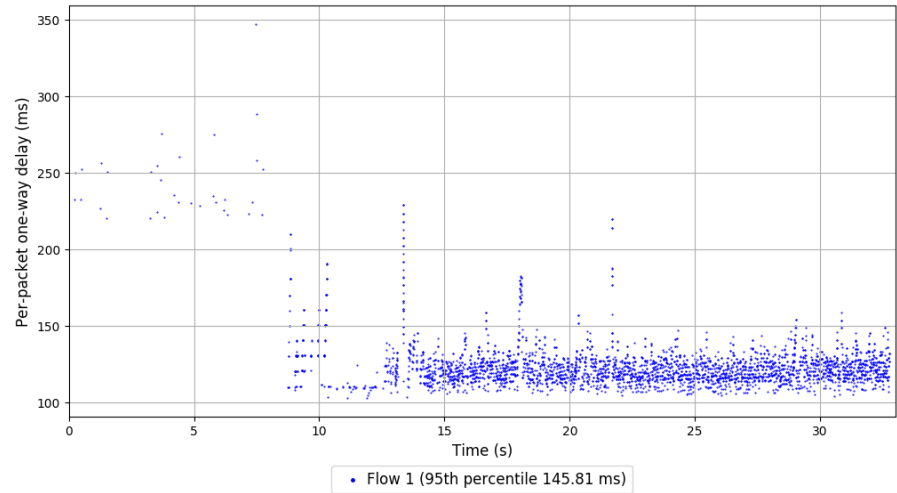
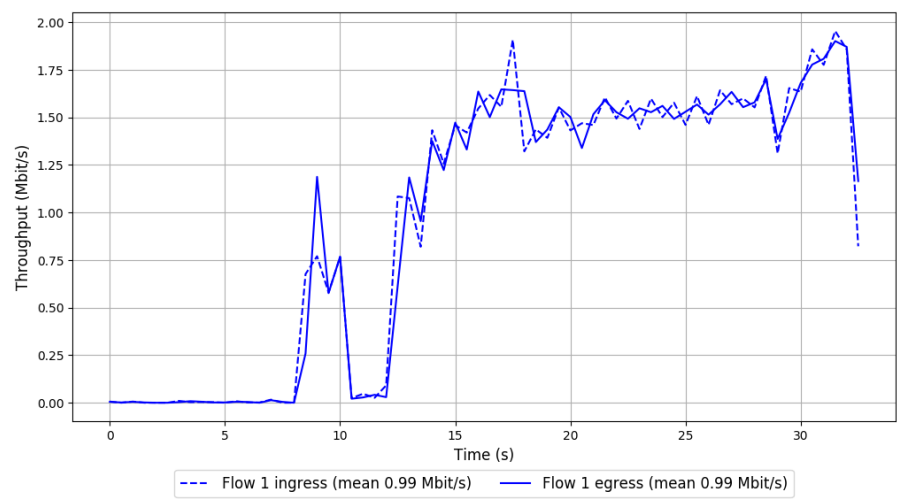
-- Flow 1:

Average throughput: 0.99 Mbit/s

95th percentile per-packet one-way delay: 145.807 ms

Loss rate: 0.24%

Run 1: Report of WebRTC media — Data Link

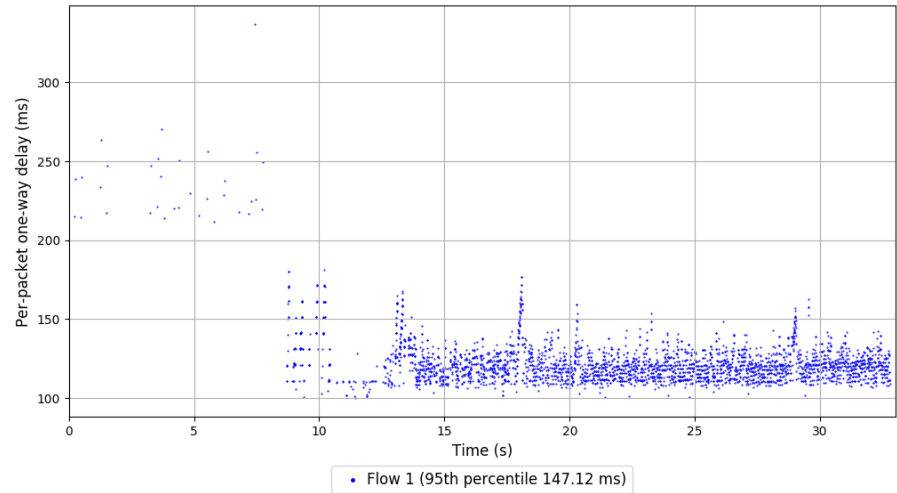
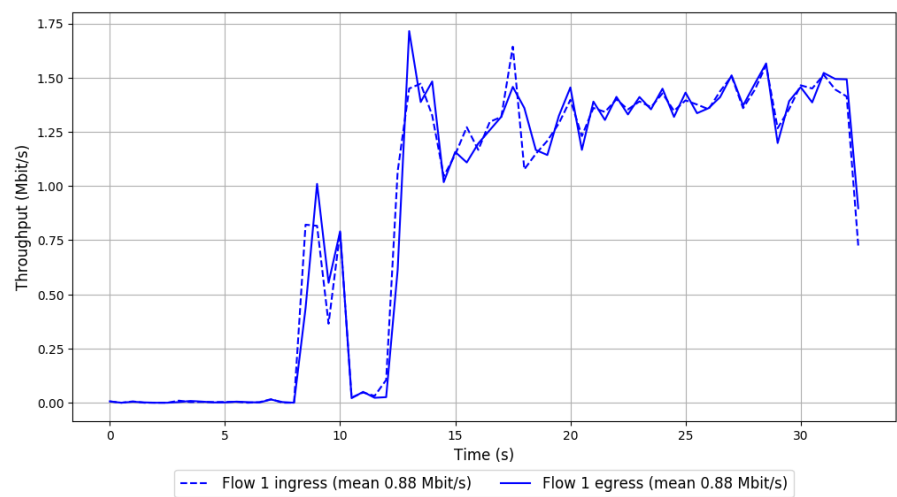


Run 2: Statistics of WebRTC media

Start at: 2018-01-31 08:18:44
End at: 2018-01-31 08:19:14
Local clock offset: -0.893 ms
Remote clock offset: -0.689 ms

Below is generated by plot.py at 2018-01-31 08:55:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 147.125 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 147.125 ms
Loss rate: 0.17%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-01-31 08:40:02

End at: 2018-01-31 08:40:32

Local clock offset: -0.183 ms

Remote clock offset: 2.802 ms

Below is generated by plot.py at 2018-01-31 08:55:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.48 Mbit/s

95th percentile per-packet one-way delay: 169.653 ms

Loss rate: 0.22%

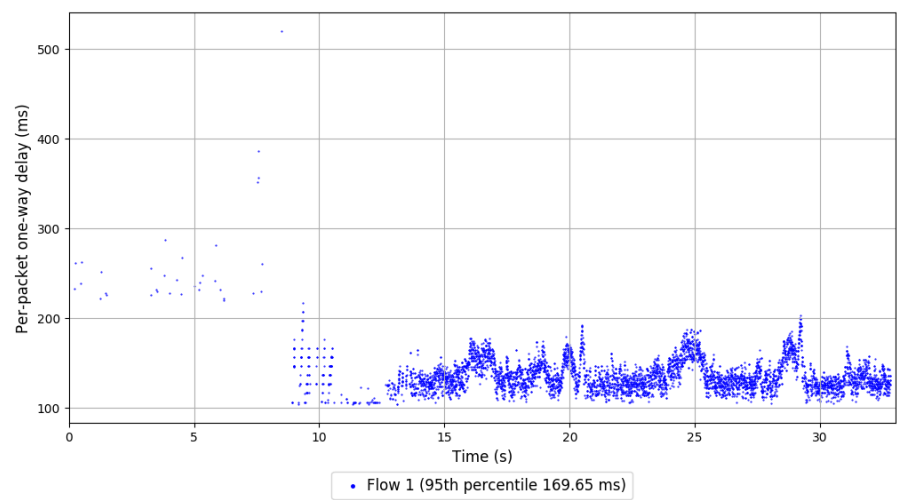
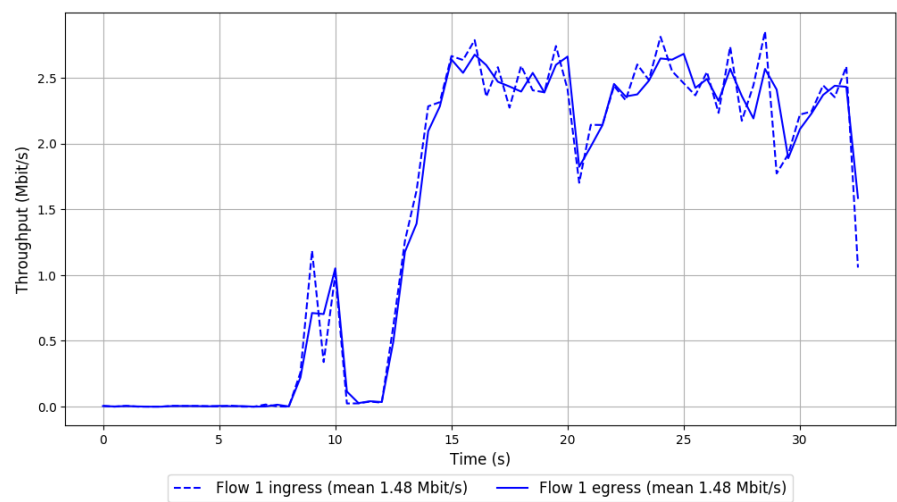
-- Flow 1:

Average throughput: 1.48 Mbit/s

95th percentile per-packet one-way delay: 169.653 ms

Loss rate: 0.22%

Run 3: Report of WebRTC media — Data Link



Run 1: Statistics of Sprout

Start at: 2018-01-31 07:53:54

End at: 2018-01-31 07:54:24

Local clock offset: -0.803 ms

Remote clock offset: 0.505 ms

Below is generated by plot.py at 2018-01-31 08:55:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.13 Mbit/s

95th percentile per-packet one-way delay: 151.188 ms

Loss rate: 0.00%

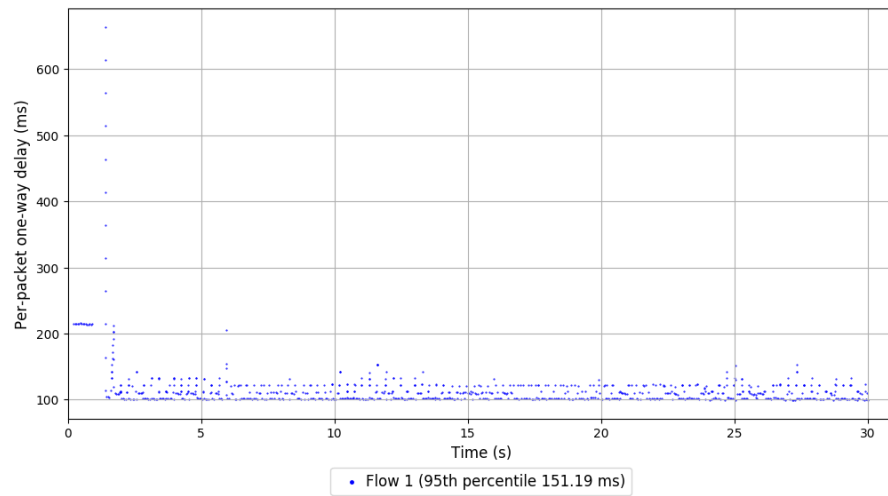
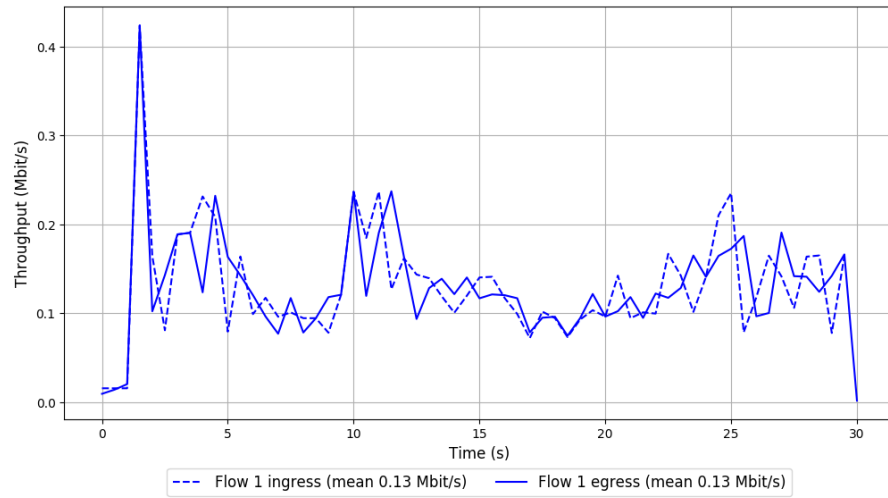
-- Flow 1:

Average throughput: 0.13 Mbit/s

95th percentile per-packet one-way delay: 151.188 ms

Loss rate: 0.00%

Run 1: Report of Sprout — Data Link

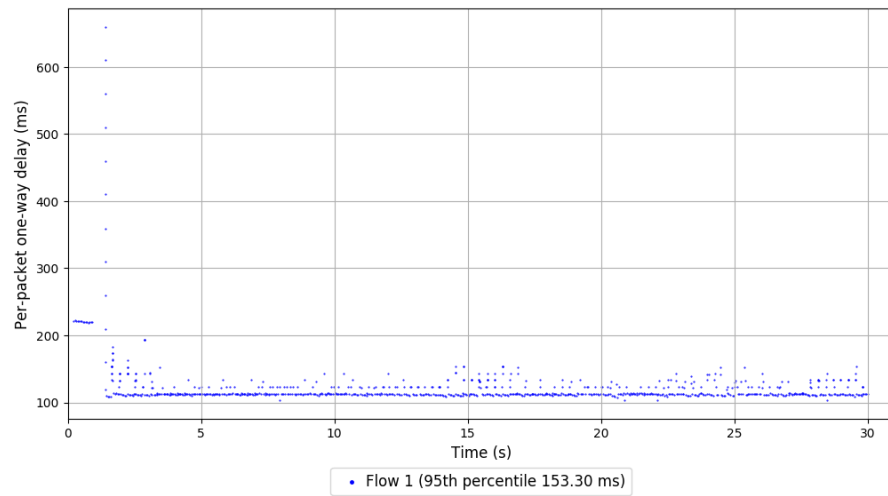
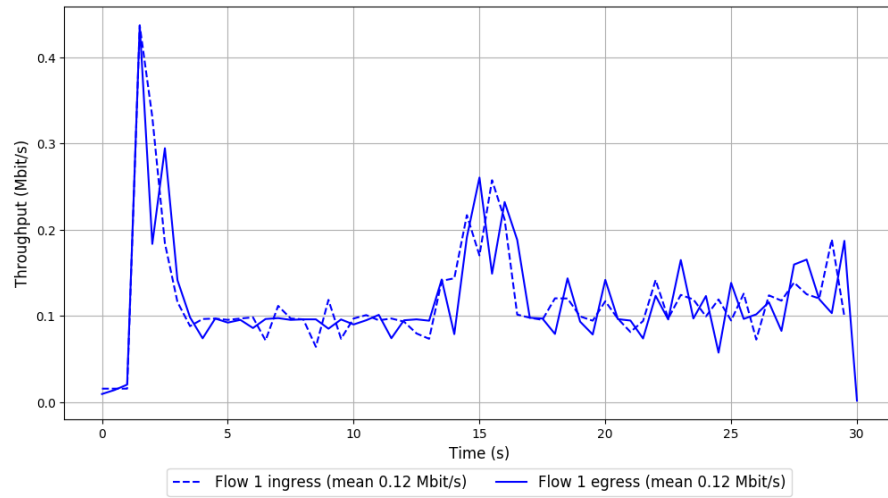


Run 2: Statistics of Sprout

Start at: 2018-01-31 08:15:12
End at: 2018-01-31 08:15:42
Local clock offset: -0.825 ms
Remote clock offset: 5.436 ms

Below is generated by plot.py at 2018-01-31 08:55:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 153.302 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 153.302 ms
Loss rate: 0.00%

Run 2: Report of Sprout — Data Link

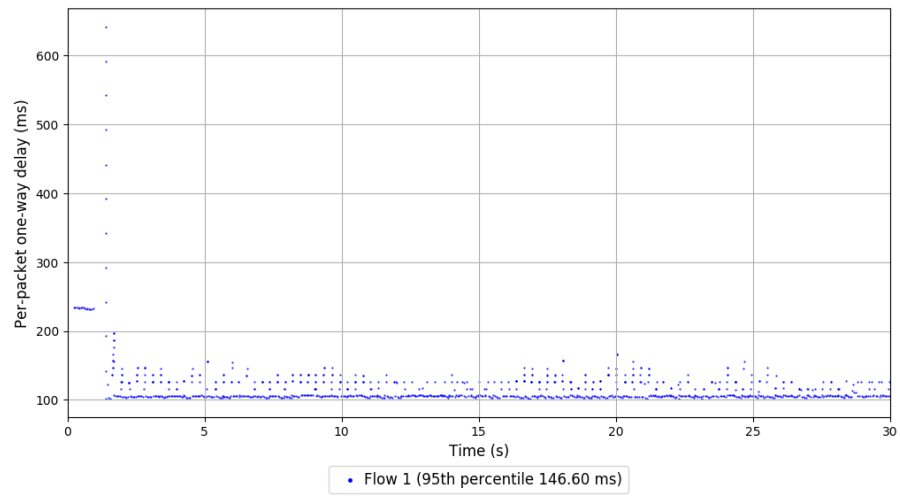
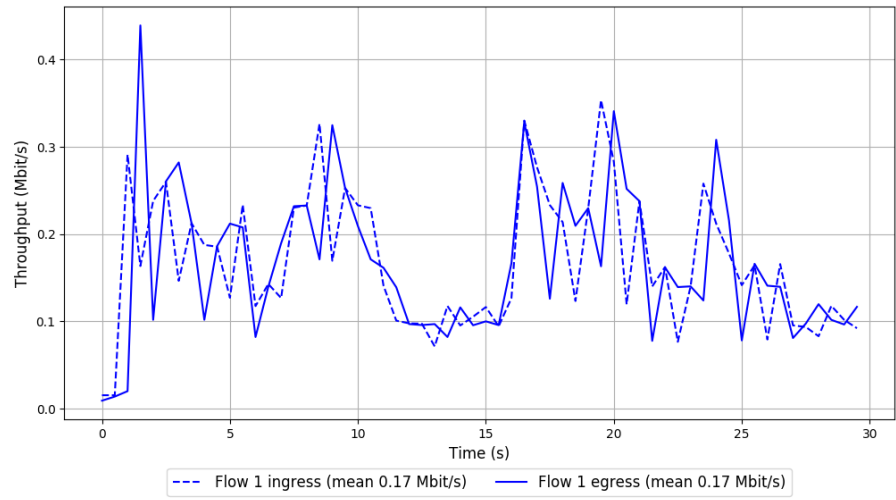


Run 3: Statistics of Sprout

Start at: 2018-01-31 08:36:29
End at: 2018-01-31 08:36:59
Local clock offset: -0.41 ms
Remote clock offset: -2.775 ms

Below is generated by plot.py at 2018-01-31 08:55:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 146.605 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 146.605 ms
Loss rate: 0.00%

Run 3: Report of Sprout — Data Link

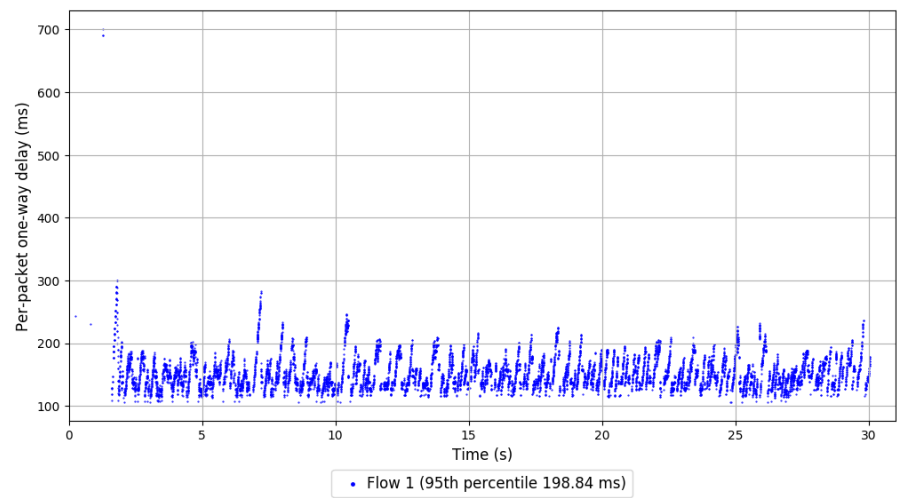
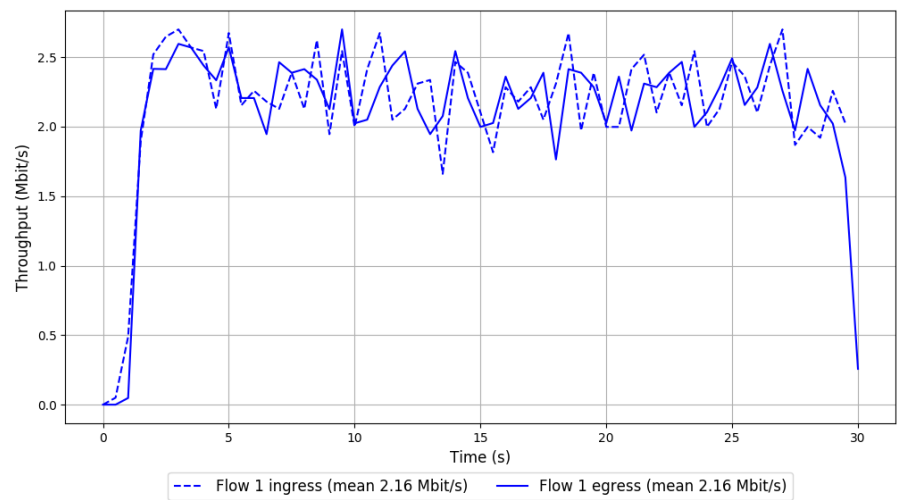


```
Run 1: Statistics of TaoVA-100x

Start at: 2018-01-31 08:04:32
End at: 2018-01-31 08:05:02
Local clock offset: -0.824 ms
Remote clock offset: 4.583 ms

# Below is generated by plot.py at 2018-01-31 08:56:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 198.835 ms
Loss rate: 0.50%
-- Flow 1:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 198.835 ms
Loss rate: 0.50%
```

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-01-31 08:25:50

End at: 2018-01-31 08:26:20

Local clock offset: -0.677 ms

Remote clock offset: 4.573 ms

Below is generated by plot.py at 2018-01-31 08:56:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.15 Mbit/s

95th percentile per-packet one-way delay: 208.331 ms

Loss rate: 0.30%

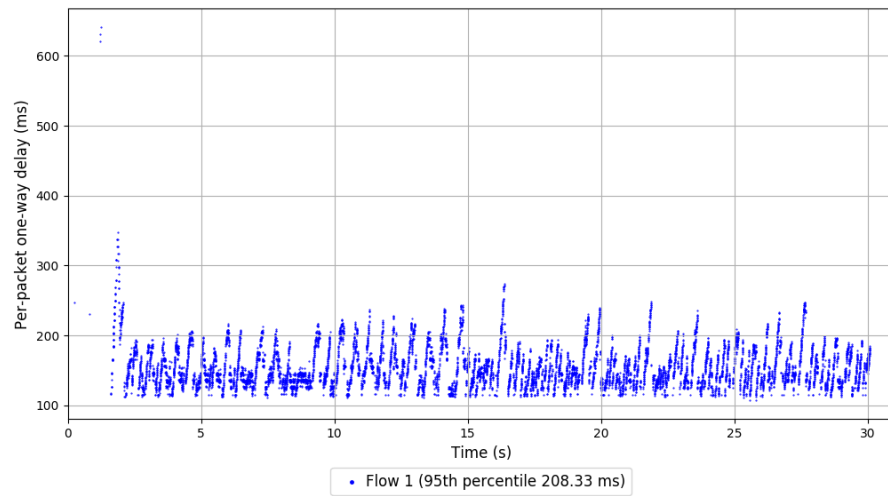
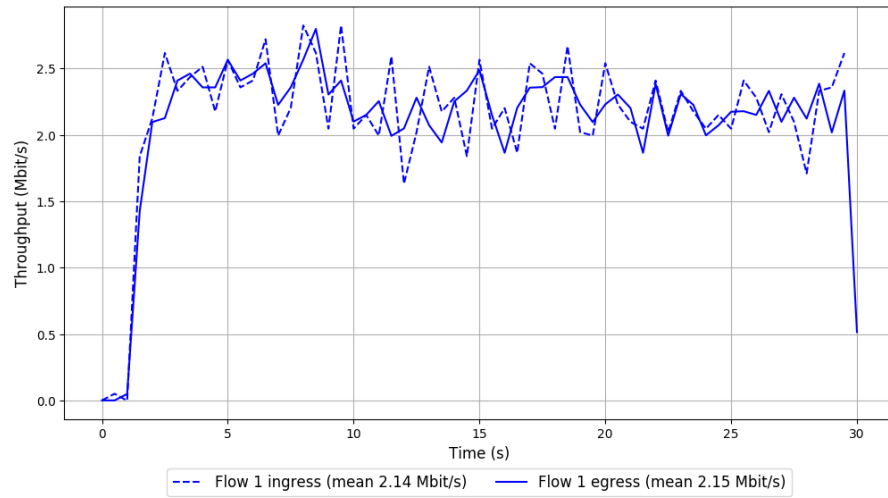
-- Flow 1:

Average throughput: 2.15 Mbit/s

95th percentile per-packet one-way delay: 208.331 ms

Loss rate: 0.30%

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

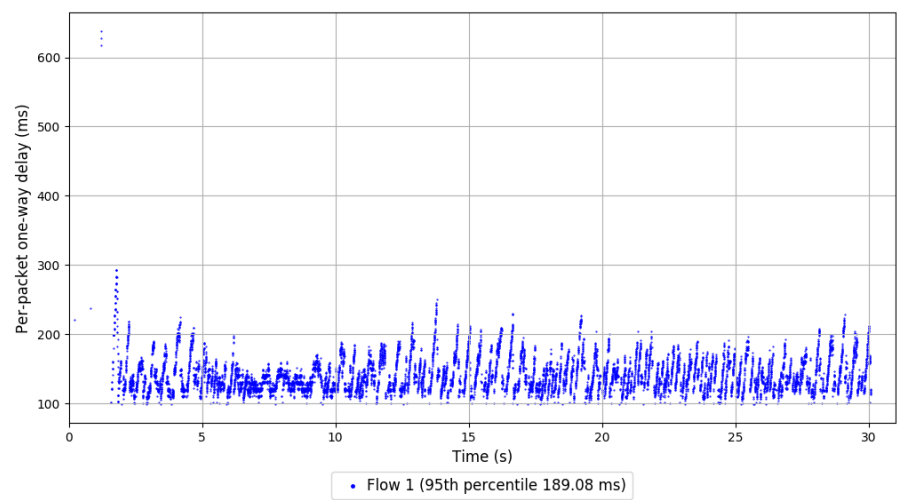
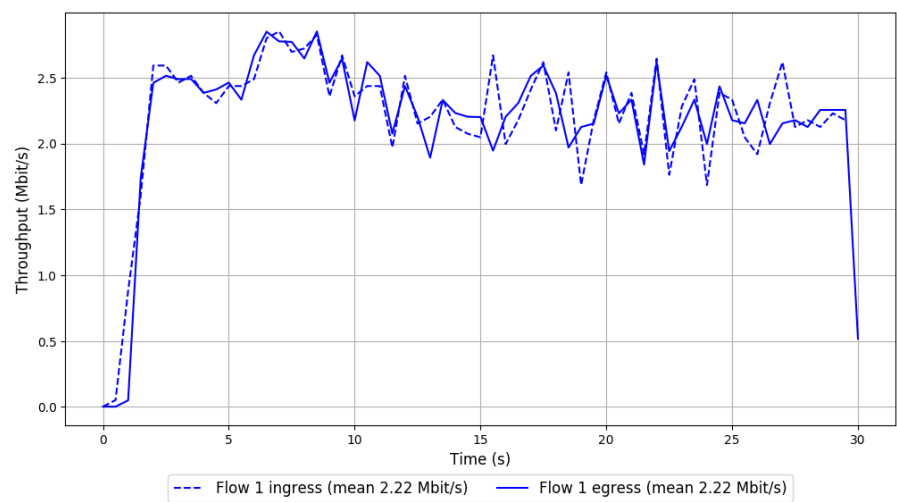


Run 3: Statistics of TaoVA-100x

Start at: 2018-01-31 08:47:07
End at: 2018-01-31 08:47:37
Local clock offset: -0.16 ms
Remote clock offset: -2.246 ms

Below is generated by plot.py at 2018-01-31 08:56:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 189.083 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 189.083 ms
Loss rate: 0.12%

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



Run 1: Statistics of TCP Vegas

Start at: 2018-01-31 07:59:49

End at: 2018-01-31 08:00:19

Local clock offset: -0.755 ms

Remote clock offset: 6.695 ms

Below is generated by plot.py at 2018-01-31 08:56:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.43 Mbit/s

95th percentile per-packet one-way delay: 3382.882 ms

Loss rate: 13.69%

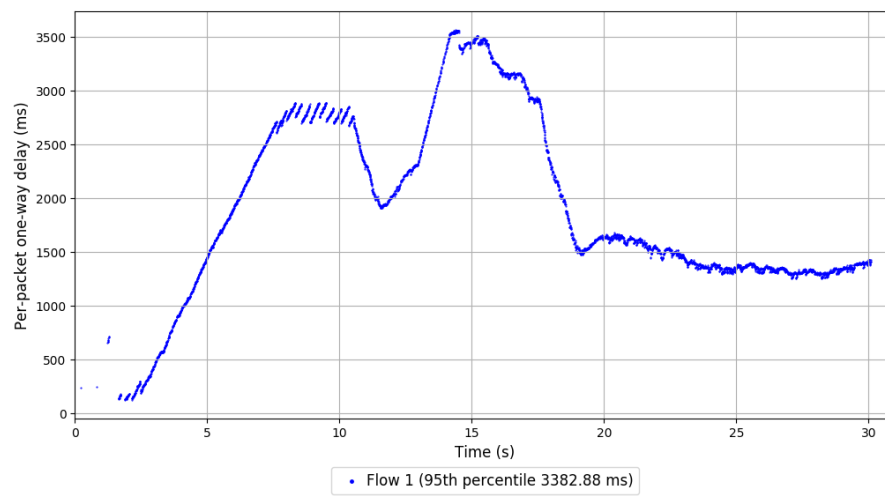
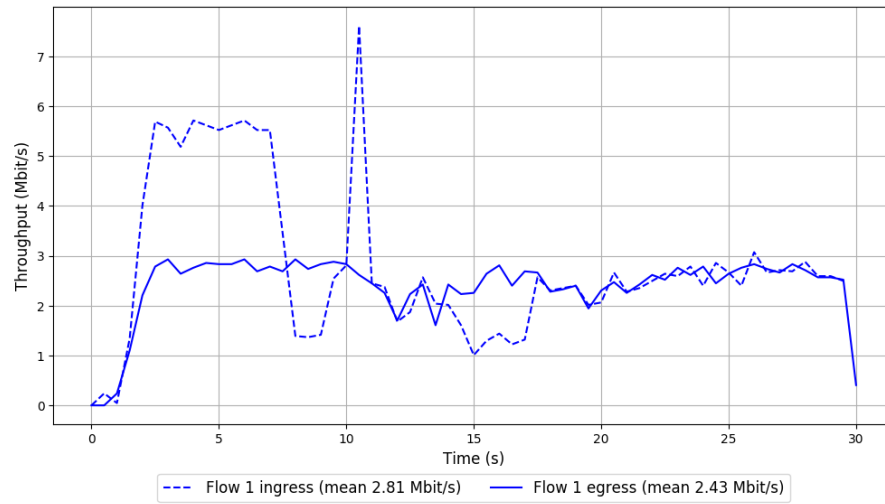
-- Flow 1:

Average throughput: 2.43 Mbit/s

95th percentile per-packet one-way delay: 3382.882 ms

Loss rate: 13.69%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2018-01-31 08:21:06

End at: 2018-01-31 08:21:36

Local clock offset: -0.863 ms

Remote clock offset: 4.839 ms

Below is generated by plot.py at 2018-01-31 08:56:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.43 Mbit/s

95th percentile per-packet one-way delay: 194.279 ms

Loss rate: 0.25%

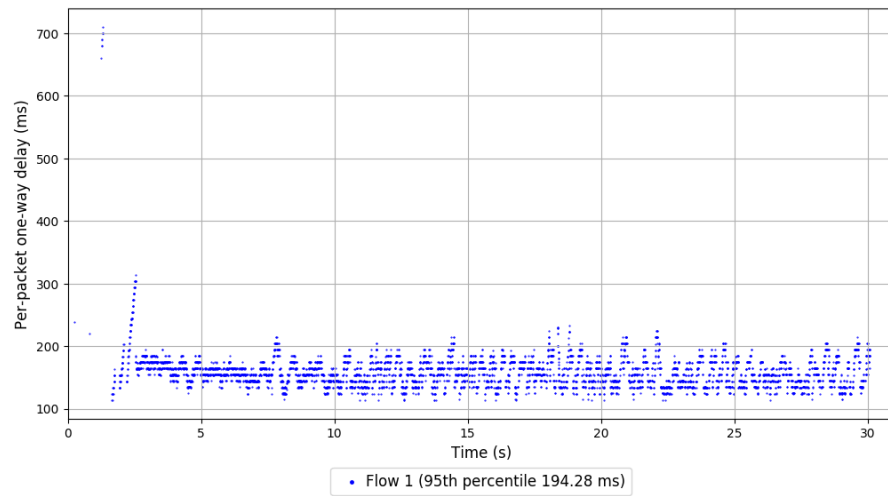
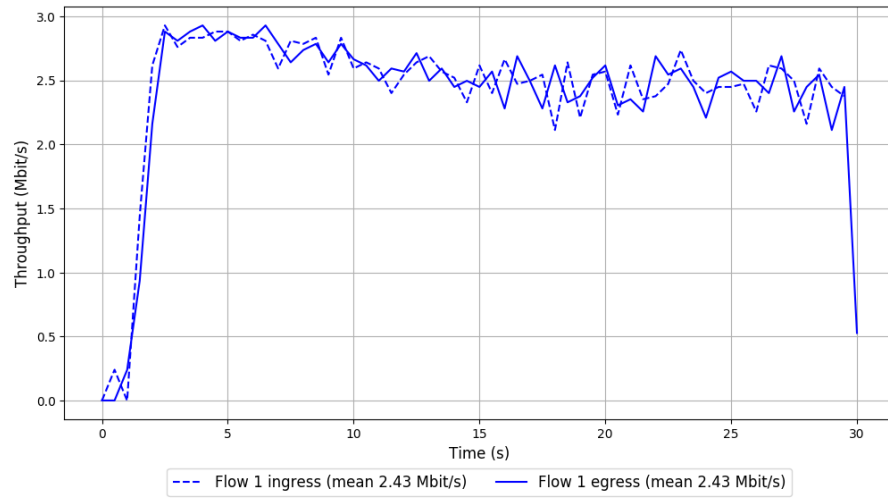
-- Flow 1:

Average throughput: 2.43 Mbit/s

95th percentile per-packet one-way delay: 194.279 ms

Loss rate: 0.25%

Run 2: Report of TCP Vegas — Data Link

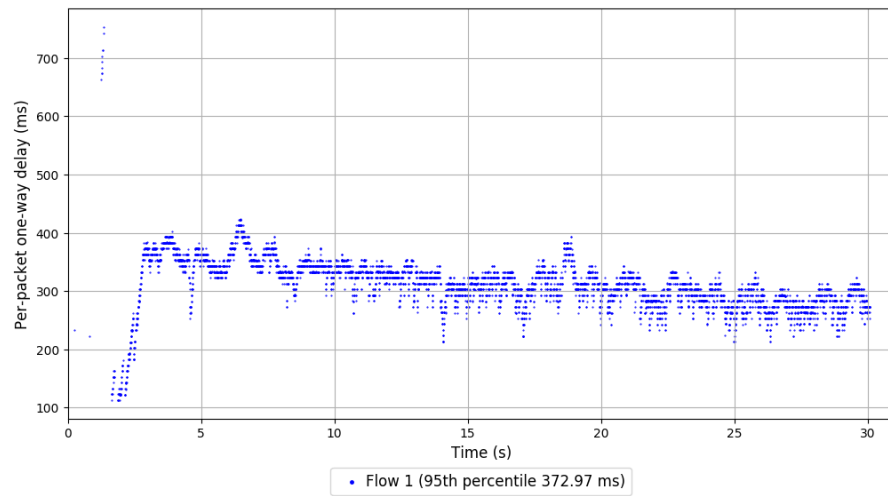
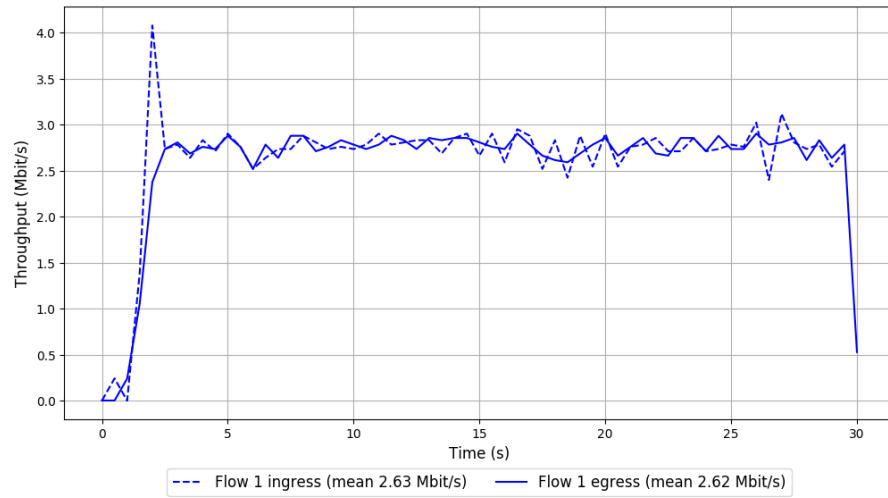


Run 3: Statistics of TCP Vegas

Start at: 2018-01-31 08:42:24
End at: 2018-01-31 08:42:54
Local clock offset: -0.223 ms
Remote clock offset: -2.049 ms

Below is generated by plot.py at 2018-01-31 08:56:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.62 Mbit/s
95th percentile per-packet one-way delay: 372.973 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 2.62 Mbit/s
95th percentile per-packet one-way delay: 372.973 ms
Loss rate: 0.58%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-01-31 08:00:59

End at: 2018-01-31 08:01:30

Local clock offset: -0.848 ms

Remote clock offset: 0.816 ms

Below is generated by plot.py at 2018-01-31 08:56:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.50 Mbit/s

95th percentile per-packet one-way delay: 2032.059 ms

Loss rate: 3.37%

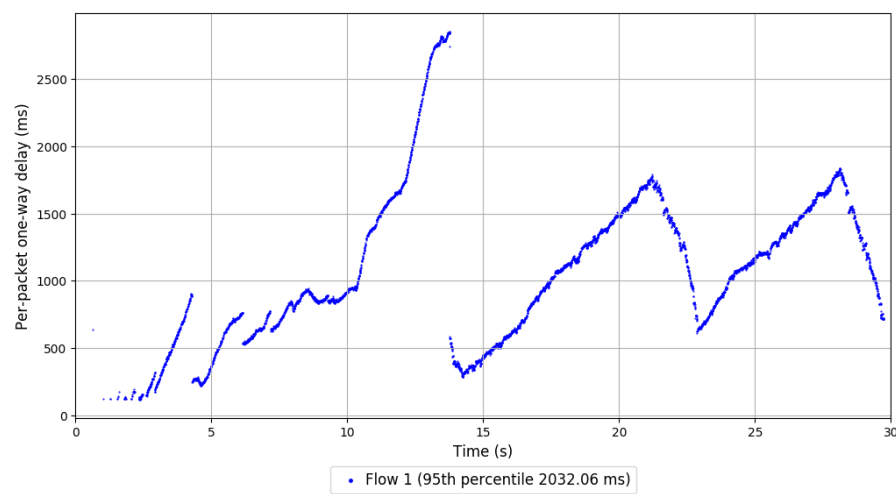
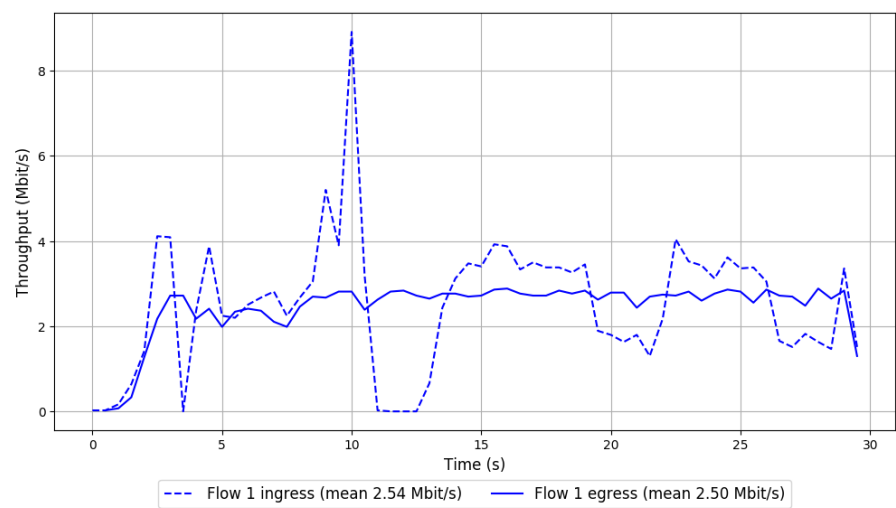
-- Flow 1:

Average throughput: 2.50 Mbit/s

95th percentile per-packet one-way delay: 2032.059 ms

Loss rate: 3.37%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2018-01-31 08:22:17

End at: 2018-01-31 08:22:47

Local clock offset: -0.87 ms

Remote clock offset: 4.856 ms

Below is generated by plot.py at 2018-01-31 08:56:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.52 Mbit/s

95th percentile per-packet one-way delay: 1673.154 ms

Loss rate: 5.39%

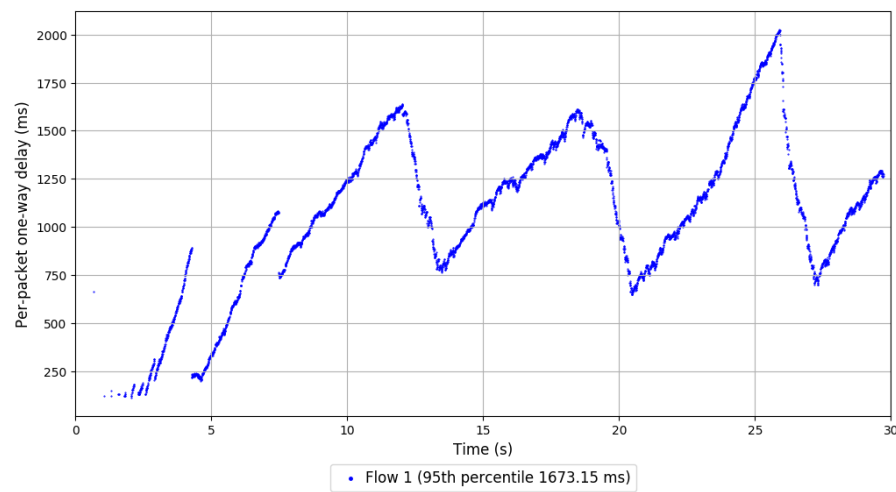
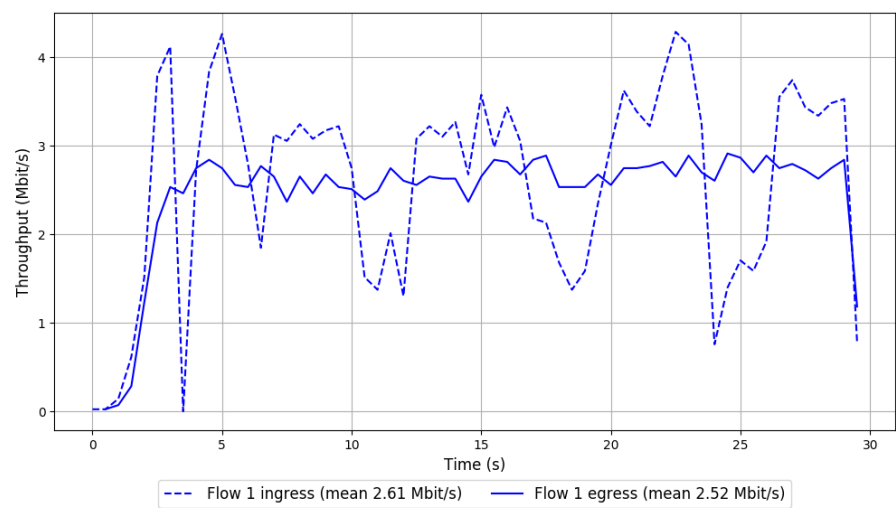
-- Flow 1:

Average throughput: 2.52 Mbit/s

95th percentile per-packet one-way delay: 1673.154 ms

Loss rate: 5.39%

Run 2: Report of Verus — Data Link

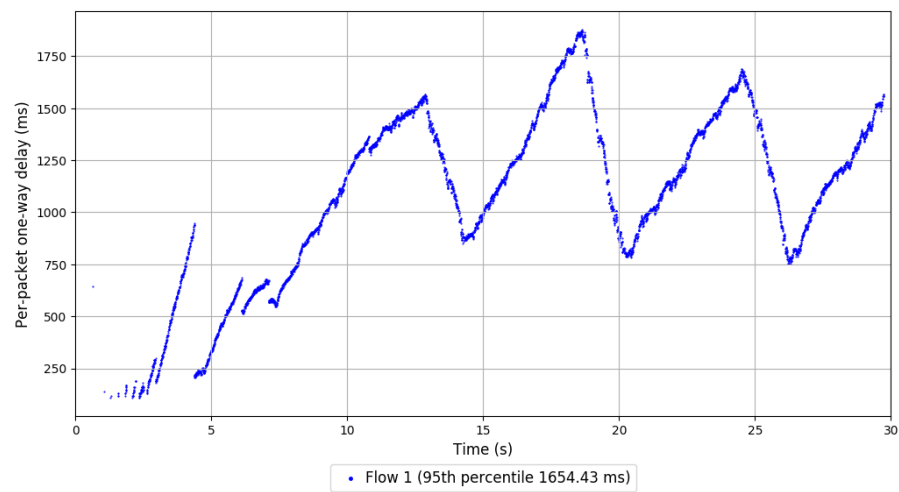
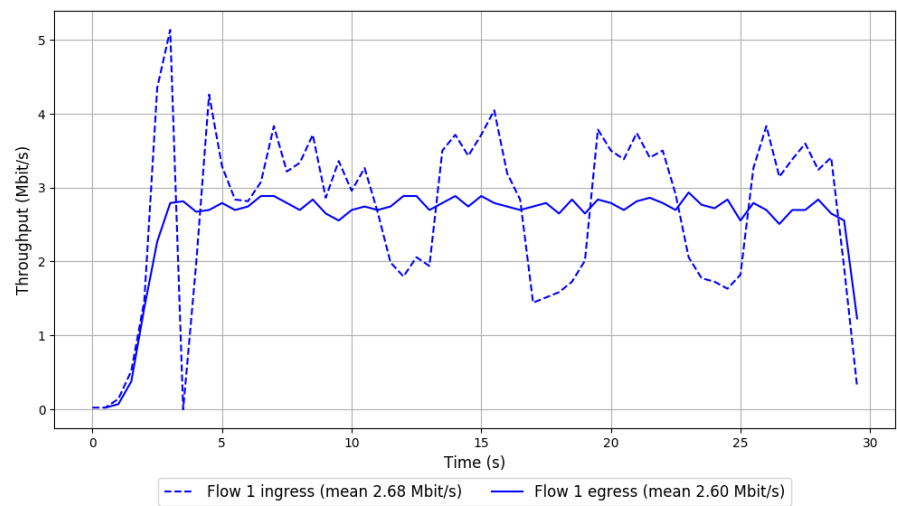


Run 3: Statistics of Verus

Start at: 2018-01-31 08:43:35
End at: 2018-01-31 08:44:05
Local clock offset: -0.135 ms
Remote clock offset: -2.111 ms

Below is generated by plot.py at 2018-01-31 08:56:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.60 Mbit/s
95th percentile per-packet one-way delay: 1654.426 ms
Loss rate: 4.90%
-- Flow 1:
Average throughput: 2.60 Mbit/s
95th percentile per-packet one-way delay: 1654.426 ms
Loss rate: 4.90%

Run 3: Report of Verus — Data Link



Run 1: Statistics of Copa

Start at: 2018-01-31 07:55:05

End at: 2018-01-31 07:55:35

Local clock offset: -0.788 ms

Remote clock offset: 0.335 ms

Below is generated by plot.py at 2018-01-31 08:56:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.02 Mbit/s

95th percentile per-packet one-way delay: 128.065 ms

Loss rate: 0.04%

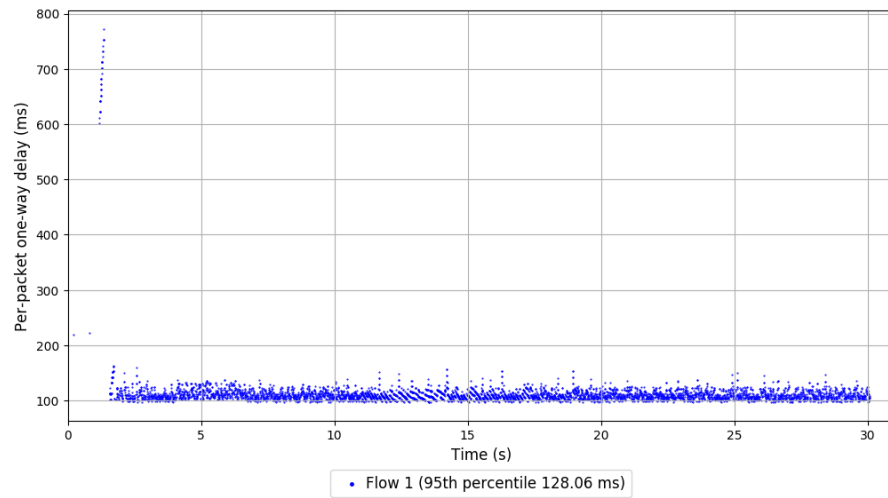
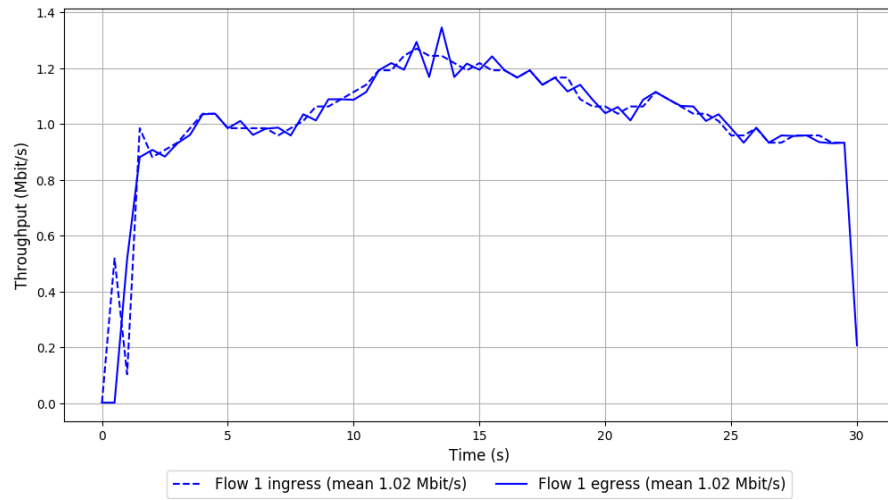
-- Flow 1:

Average throughput: 1.02 Mbit/s

95th percentile per-packet one-way delay: 128.065 ms

Loss rate: 0.04%

Run 1: Report of Copa — Data Link

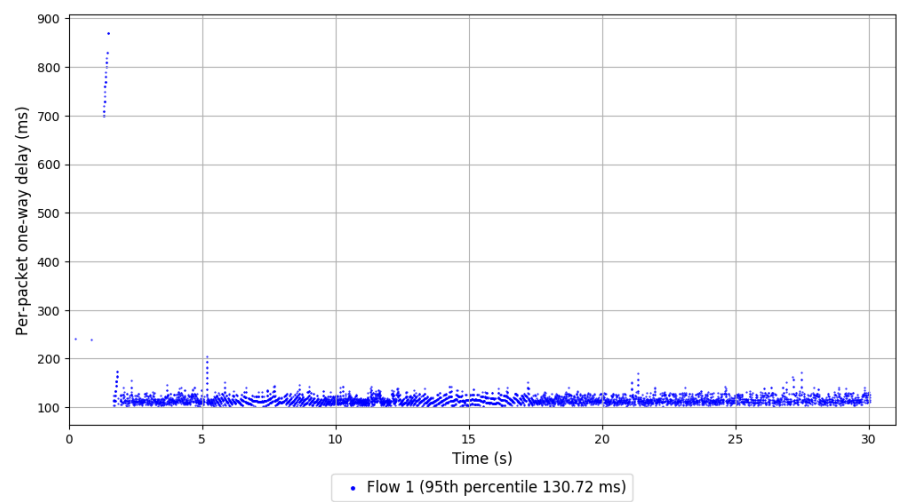
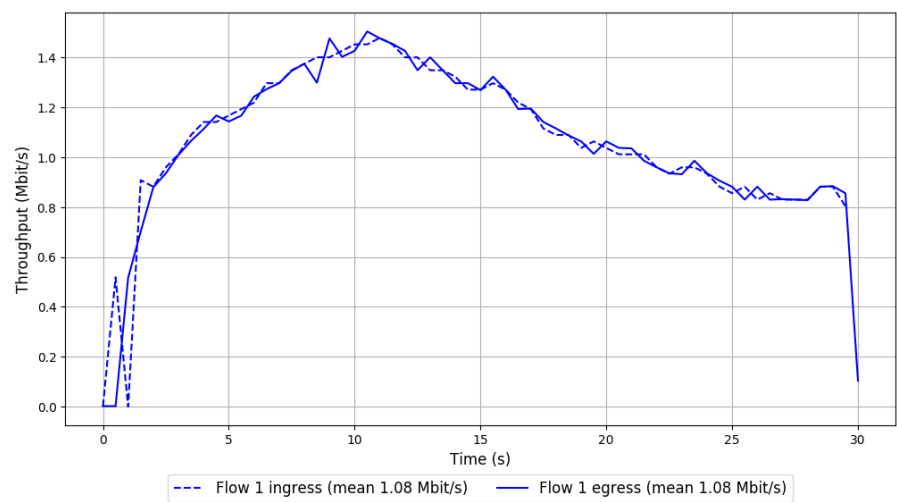


Run 2: Statistics of Copa

Start at: 2018-01-31 08:16:22
End at: 2018-01-31 08:16:52
Local clock offset: -0.91 ms
Remote clock offset: -0.476 ms

Below is generated by plot.py at 2018-01-31 08:56:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 130.723 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 130.723 ms
Loss rate: 0.08%

Run 2: Report of Copa — Data Link

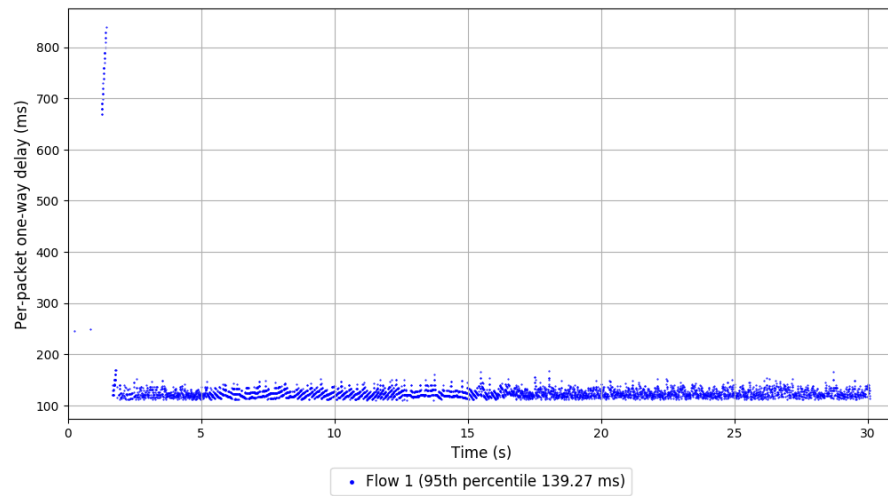
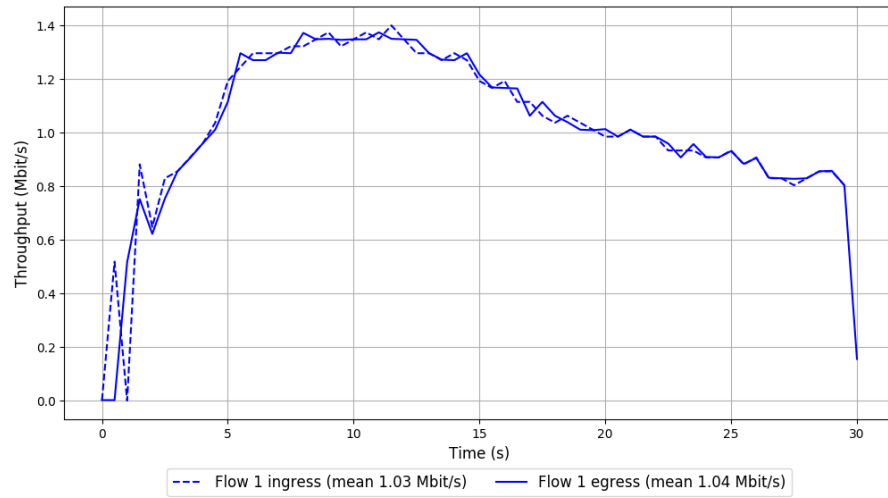


Run 3: Statistics of Copa

Start at: 2018-01-31 08:37:40
End at: 2018-01-31 08:38:10
Local clock offset: -0.322 ms
Remote clock offset: 2.971 ms

Below is generated by plot.py at 2018-01-31 08:56:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 139.272 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 139.272 ms
Loss rate: 0.08%

Run 3: Report of Copa — Data Link



Run 1: Statistics of FillP

Start at: 2018-01-31 08:06:54

End at: 2018-01-31 08:07:24

Local clock offset: -0.77 ms

Remote clock offset: 5.346 ms

Below is generated by plot.py at 2018-01-31 08:56:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.53 Mbit/s

95th percentile per-packet one-way delay: 1875.673 ms

Loss rate: 11.96%

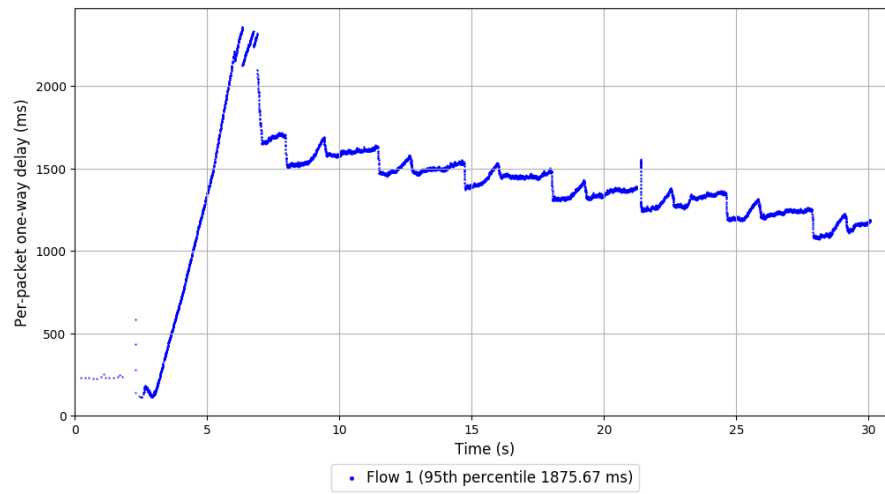
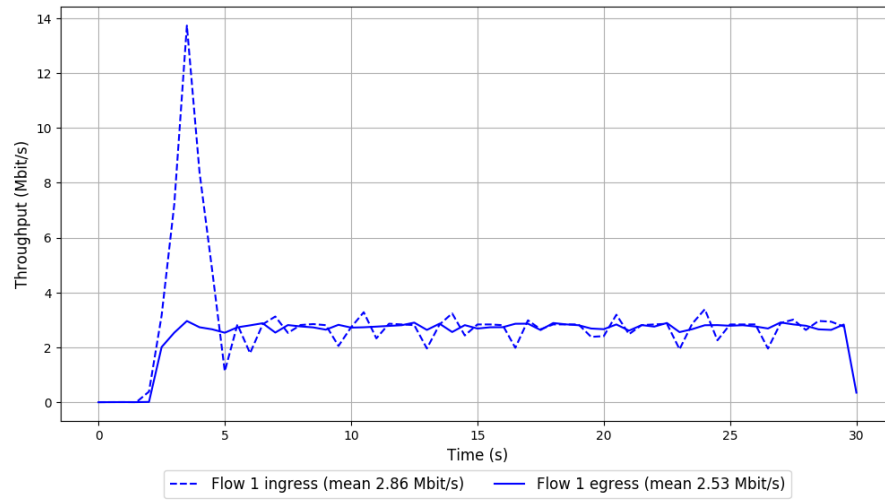
-- Flow 1:

Average throughput: 2.53 Mbit/s

95th percentile per-packet one-way delay: 1875.673 ms

Loss rate: 11.96%

Run 1: Report of FillP — Data Link

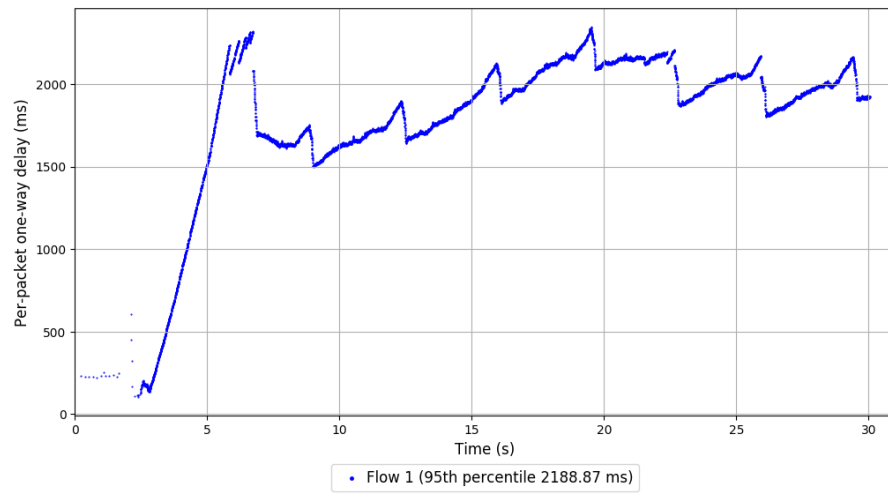
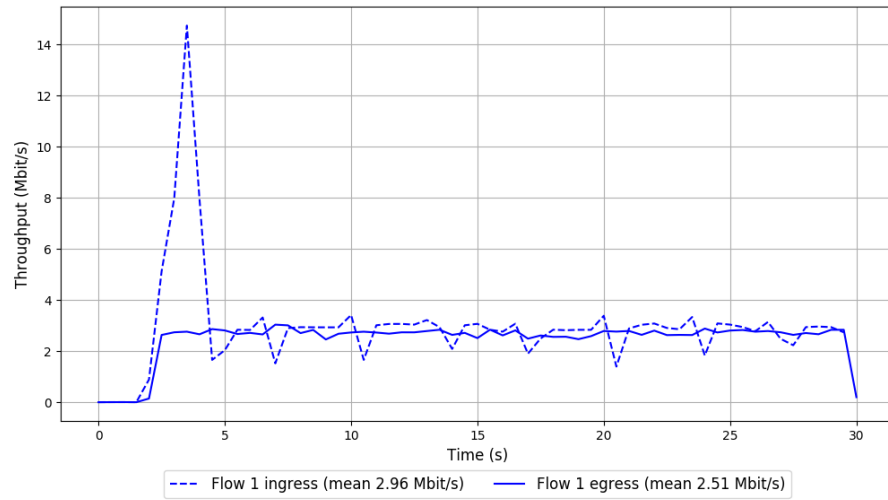


Run 2: Statistics of FillP

Start at: 2018-01-31 08:28:12
End at: 2018-01-31 08:28:42
Local clock offset: -0.605 ms
Remote clock offset: -1.302 ms

Below is generated by plot.py at 2018-01-31 08:56:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.51 Mbit/s
95th percentile per-packet one-way delay: 2188.867 ms
Loss rate: 15.54%
-- Flow 1:
Average throughput: 2.51 Mbit/s
95th percentile per-packet one-way delay: 2188.867 ms
Loss rate: 15.54%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-01-31 08:49:29

End at: 2018-01-31 08:49:59

Local clock offset: -0.079 ms

Remote clock offset: 1.504 ms

Below is generated by plot.py at 2018-01-31 08:56:17

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.59 Mbit/s

95th percentile per-packet one-way delay: 2146.543 ms

Loss rate: 19.82%

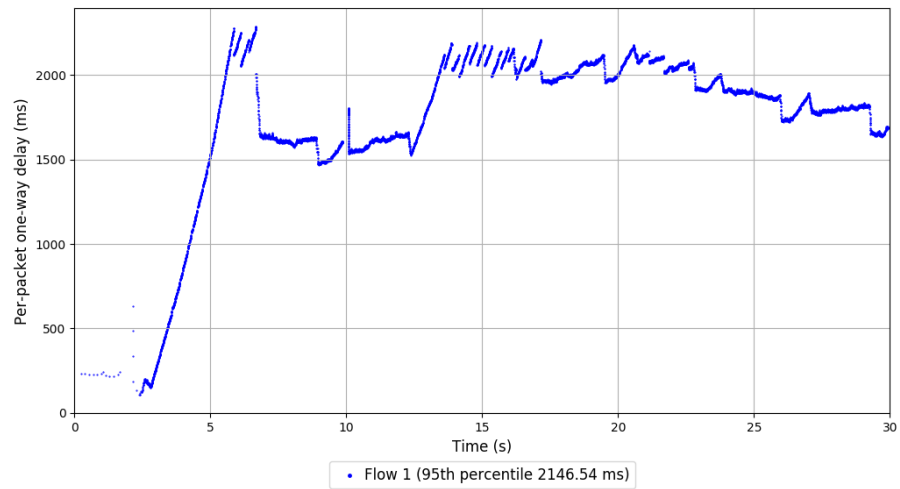
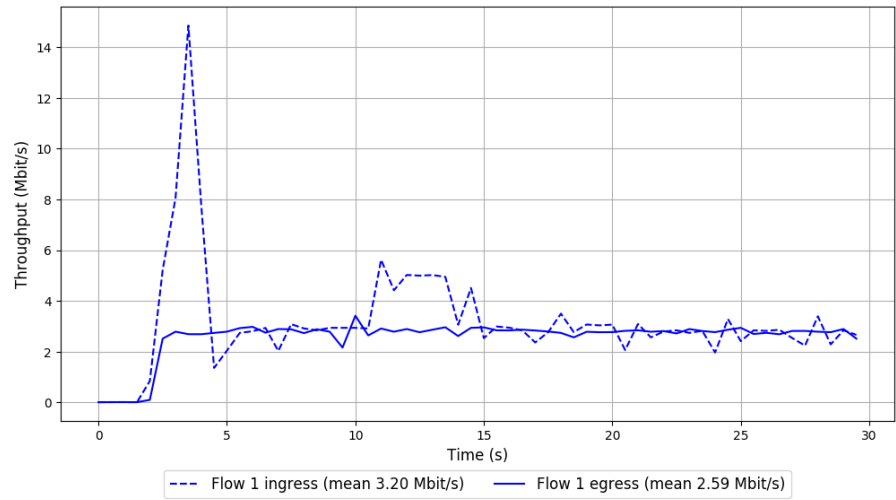
-- Flow 1:

Average throughput: 2.59 Mbit/s

95th percentile per-packet one-way delay: 2146.543 ms

Loss rate: 19.82%

Run 3: Report of FillP — Data Link



Run 1: Statistics of Indigo-1-32

Start at: 2018-01-31 07:51:33

End at: 2018-01-31 07:52:03

Local clock offset: -0.838 ms

Remote clock offset: 6.423 ms

Below is generated by plot.py at 2018-01-31 08:56:17

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.89 Mbit/s

95th percentile per-packet one-way delay: 221.742 ms

Loss rate: 0.18%

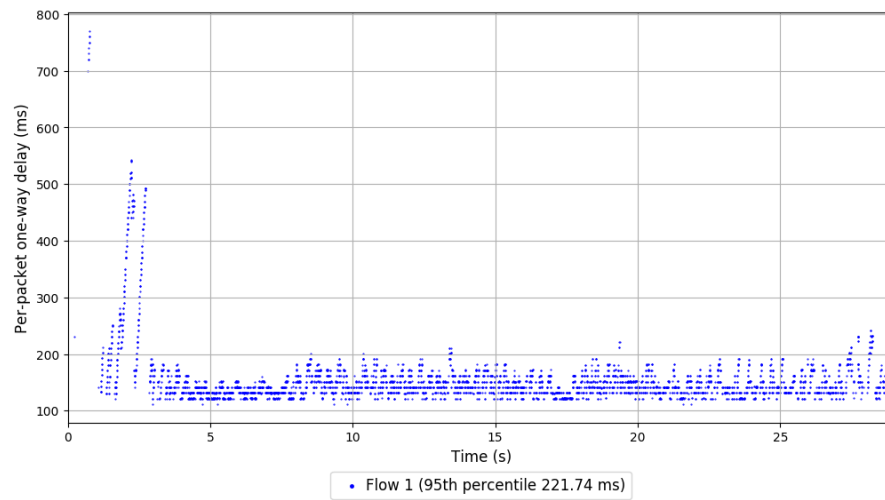
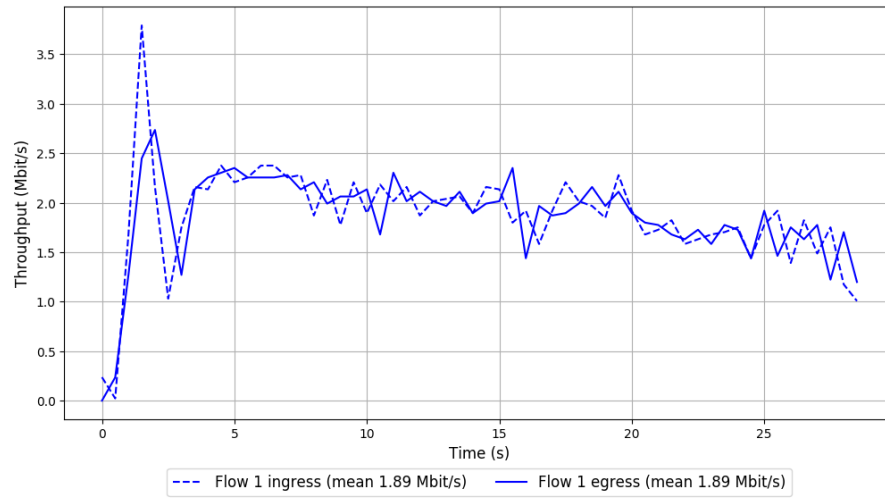
-- Flow 1:

Average throughput: 1.89 Mbit/s

95th percentile per-packet one-way delay: 221.742 ms

Loss rate: 0.18%

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



Run 2: Statistics of Indigo-1-32

Start at: 2018-01-31 08:12:50

End at: 2018-01-31 08:13:20

Local clock offset: -0.878 ms

Remote clock offset: 3.817 ms

Below is generated by plot.py at 2018-01-31 08:56:17

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.54 Mbit/s

95th percentile per-packet one-way delay: 181.197 ms

Loss rate: 0.13%

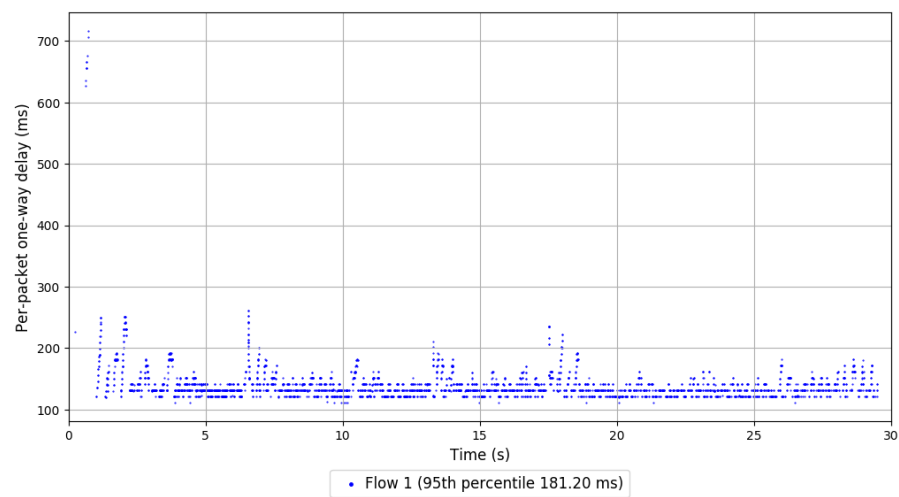
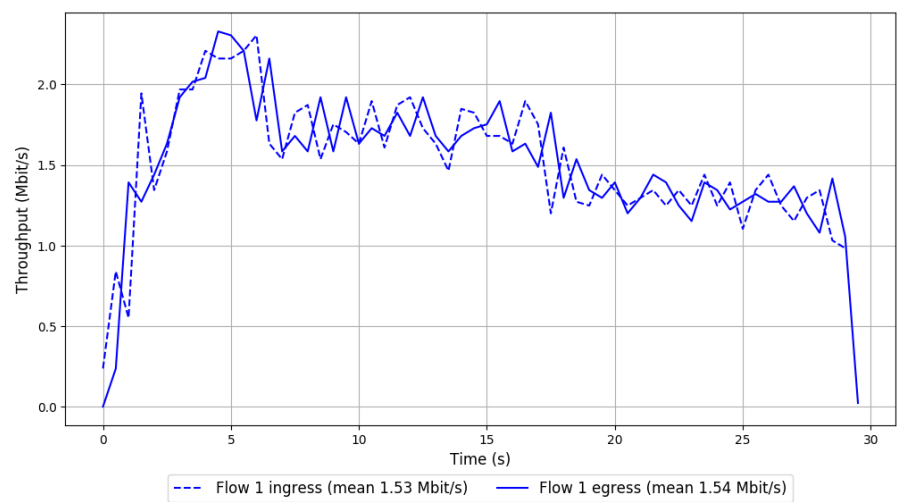
-- Flow 1:

Average throughput: 1.54 Mbit/s

95th percentile per-packet one-way delay: 181.197 ms

Loss rate: 0.13%

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



Run 3: Statistics of Indigo-1-32

Start at: 2018-01-31 08:34:08

End at: 2018-01-31 08:34:38

Local clock offset: -0.461 ms

Remote clock offset: 3.142 ms

Below is generated by plot.py at 2018-01-31 08:56:17

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.88 Mbit/s

95th percentile per-packet one-way delay: 174.642 ms

Loss rate: 0.20%

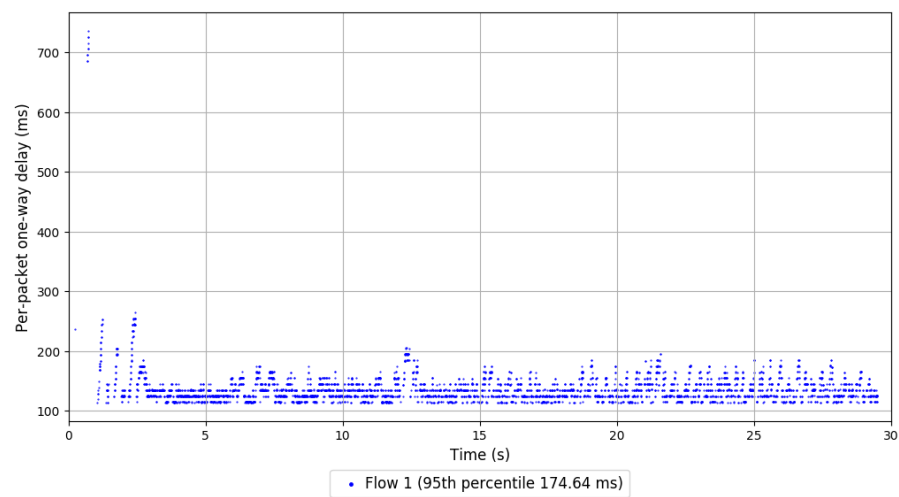
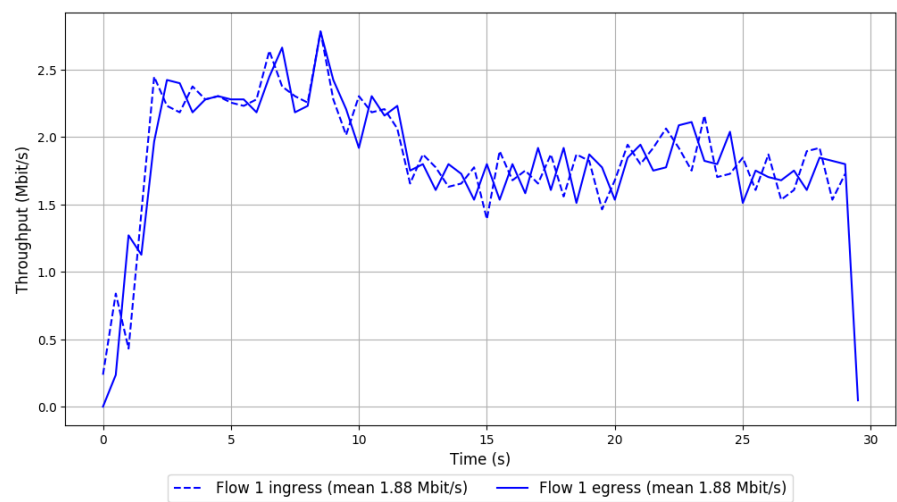
-- Flow 1:

Average throughput: 1.88 Mbit/s

95th percentile per-packet one-way delay: 174.642 ms

Loss rate: 0.20%

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

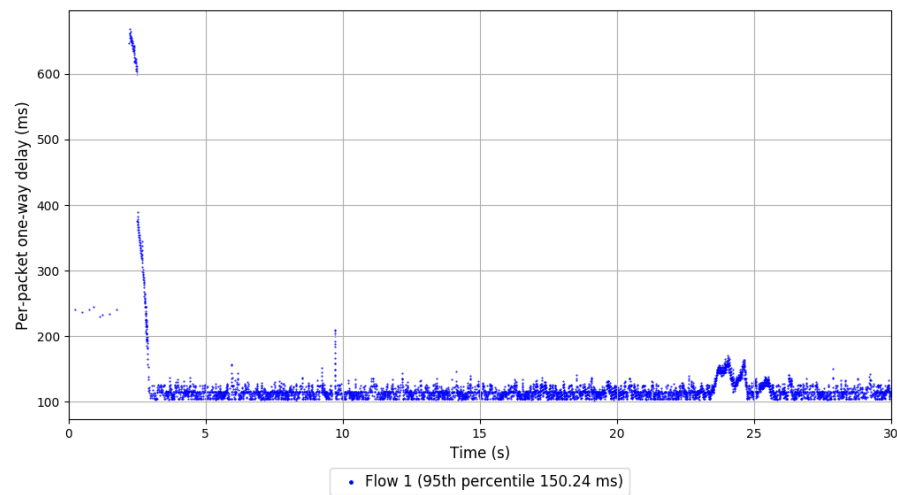
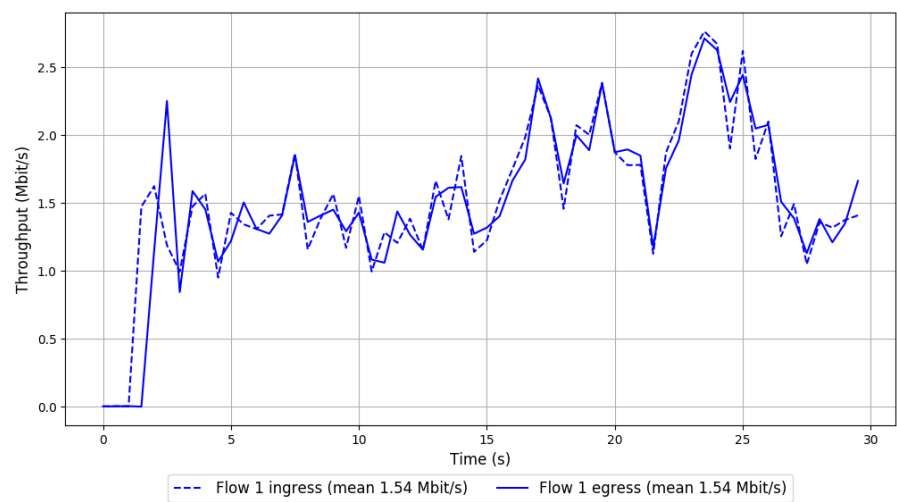


Run 1: Statistics of Vivace-latency

Start at: 2018-01-31 08:11:39
End at: 2018-01-31 08:12:09
Local clock offset: -0.792 ms
Remote clock offset: -0.887 ms

Below is generated by plot.py at 2018-01-31 08:56:17
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 150.241 ms
Loss rate: 0.84%
-- Flow 1:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 150.241 ms
Loss rate: 0.84%

Run 1: Report of Vivace-latency — Data Link



Run 2: Statistics of Vivace-latency

Start at: 2018-01-31 08:32:56

End at: 2018-01-31 08:33:26

Local clock offset: -0.493 ms

Remote clock offset: 3.173 ms

Below is generated by plot.py at 2018-01-31 08:56:17

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.07 Mbit/s

95th percentile per-packet one-way delay: 419.266 ms

Loss rate: 0.63%

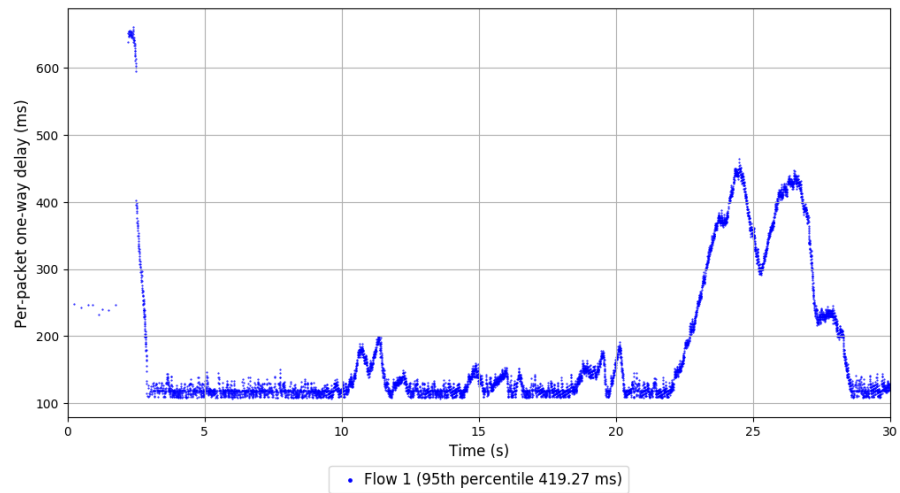
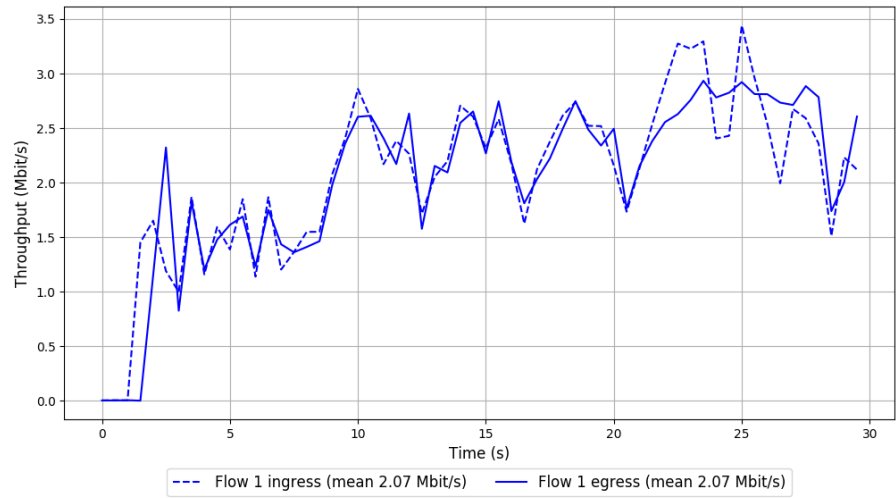
-- Flow 1:

Average throughput: 2.07 Mbit/s

95th percentile per-packet one-way delay: 419.266 ms

Loss rate: 0.63%

Run 2: Report of Vivace-latency — Data Link



Run 3: Statistics of Vivace-latency

Start at: 2018-01-31 08:54:14

End at: 2018-01-31 08:54:44

Local clock offset: -0.116 ms

Remote clock offset: 1.65 ms

Below is generated by plot.py at 2018-01-31 08:56:17

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.75 Mbit/s

95th percentile per-packet one-way delay: 146.024 ms

Loss rate: 0.81%

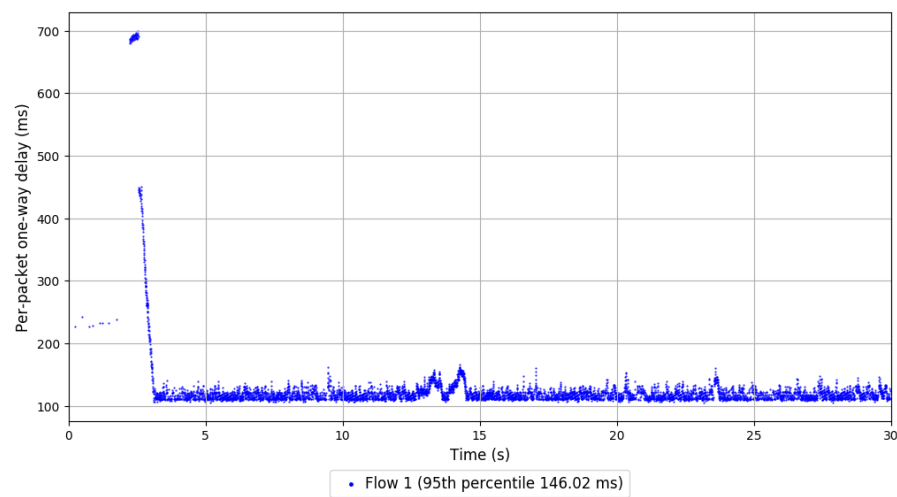
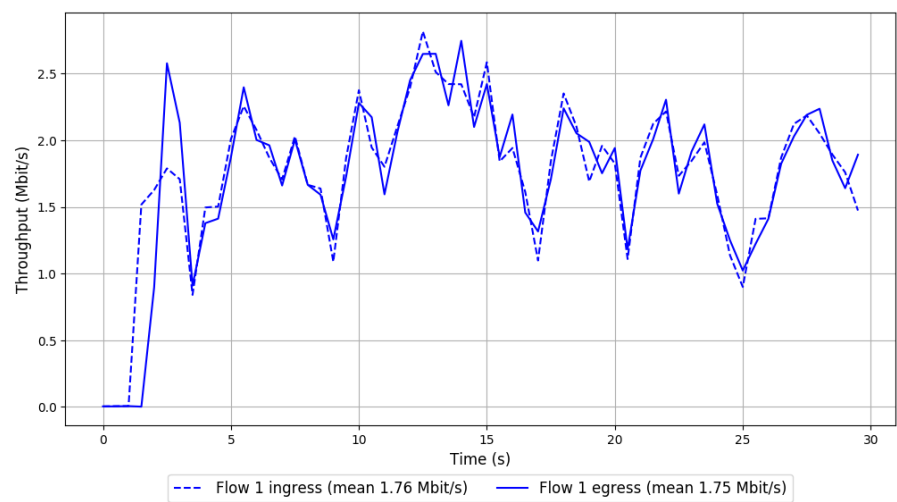
-- Flow 1:

Average throughput: 1.75 Mbit/s

95th percentile per-packet one-way delay: 146.024 ms

Loss rate: 0.81%

Run 3: Report of Vivace-latency — Data Link



Run 1: Statistics of Vivace-loss

Start at: 2018-01-31 07:56:16

End at: 2018-01-31 07:56:46

Local clock offset: -0.787 ms

Remote clock offset: 5.986 ms

Below is generated by plot.py at 2018-01-31 08:56:19

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.47 Mbit/s

95th percentile per-packet one-way delay: 2839.155 ms

Loss rate: 30.34%

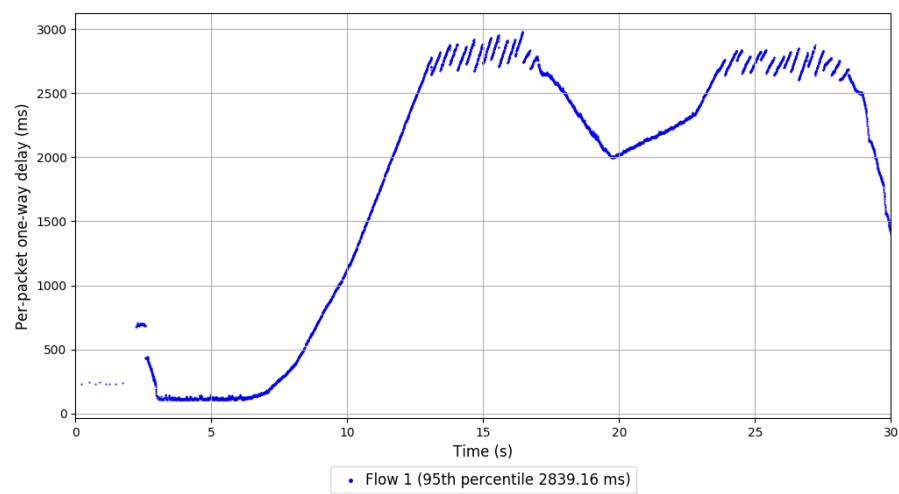
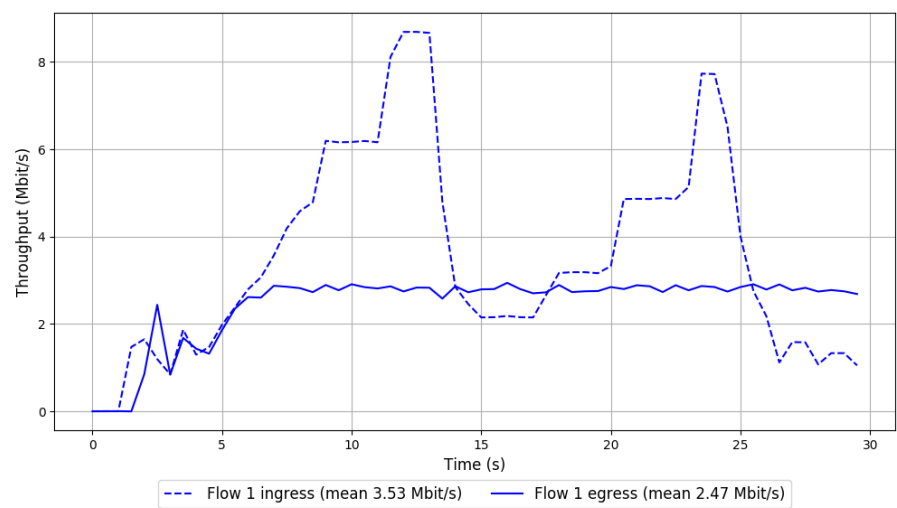
-- Flow 1:

Average throughput: 2.47 Mbit/s

95th percentile per-packet one-way delay: 2839.155 ms

Loss rate: 30.34%

Run 1: Report of Vivace-loss — Data Link

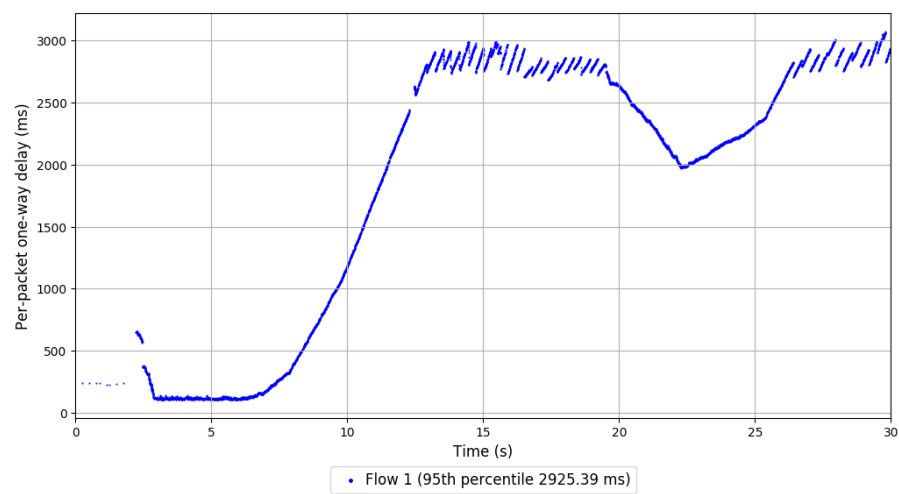
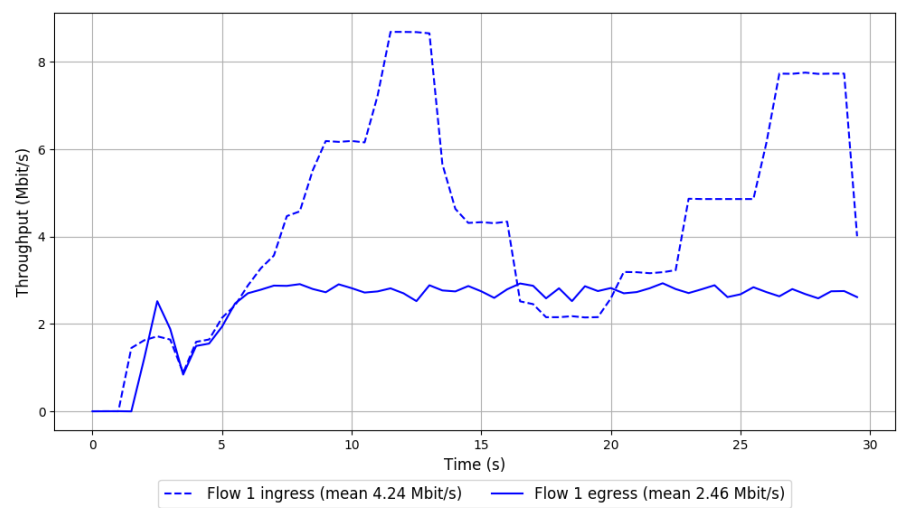


Run 2: Statistics of Vivace-loss

Start at: 2018-01-31 08:17:33
End at: 2018-01-31 08:18:03
Local clock offset: -0.845 ms
Remote clock offset: -0.513 ms

Below is generated by plot.py at 2018-01-31 08:56:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 2925.387 ms
Loss rate: 42.23%
-- Flow 1:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 2925.387 ms
Loss rate: 42.23%

Run 2: Report of Vivace-loss — Data Link

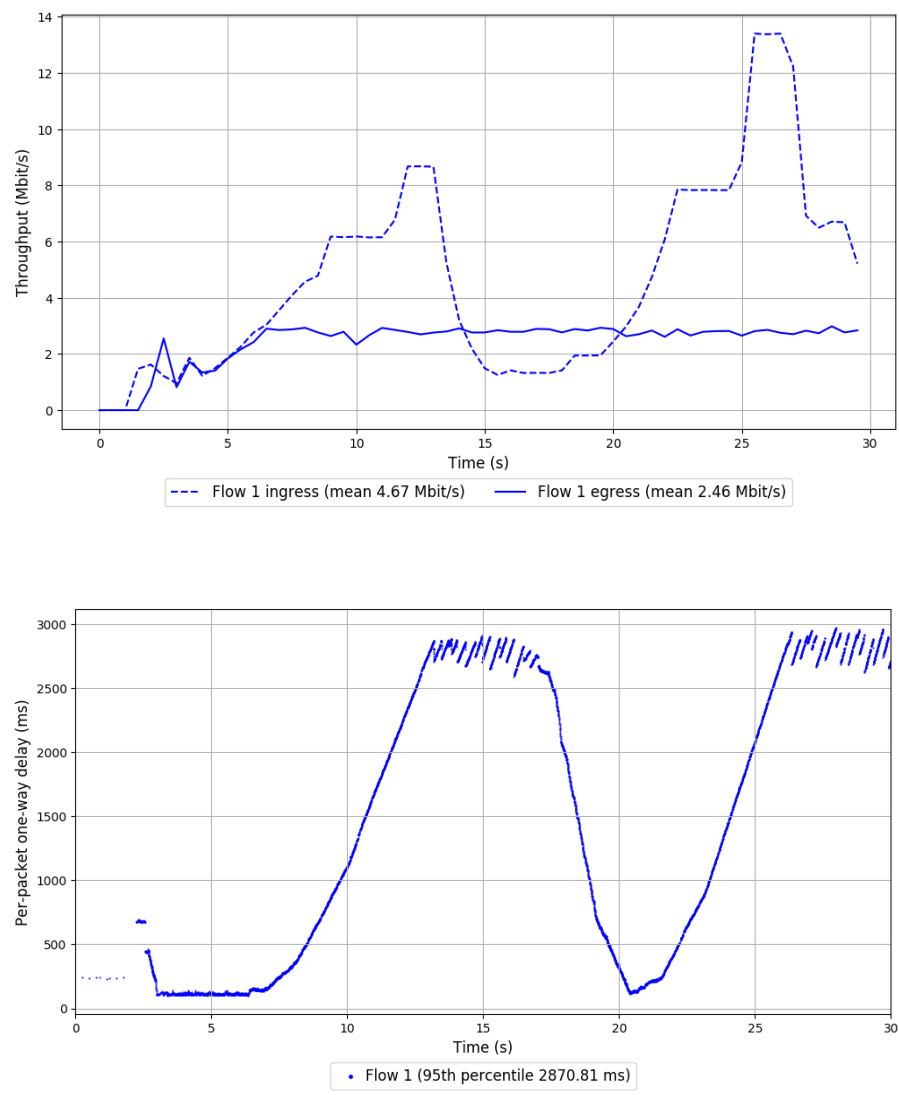


Run 3: Statistics of Vivace-loss

Start at: 2018-01-31 08:38:51
End at: 2018-01-31 08:39:21
Local clock offset: -0.262 ms
Remote clock offset: -2.815 ms

Below is generated by plot.py at 2018-01-31 08:56:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 2870.808 ms
Loss rate: 47.48%
-- Flow 1:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 2870.808 ms
Loss rate: 47.48%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-01-31 08:09:17

End at: 2018-01-31 08:09:47

Local clock offset: -0.774 ms

Remote clock offset: 5.366 ms

Below is generated by plot.py at 2018-01-31 08:56:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.28 Mbit/s

95th percentile per-packet one-way delay: 354.631 ms

Loss rate: 0.57%

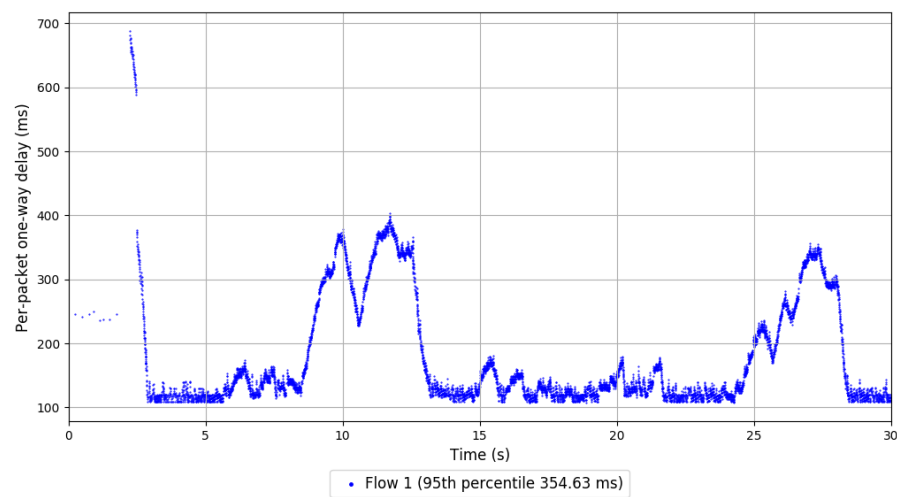
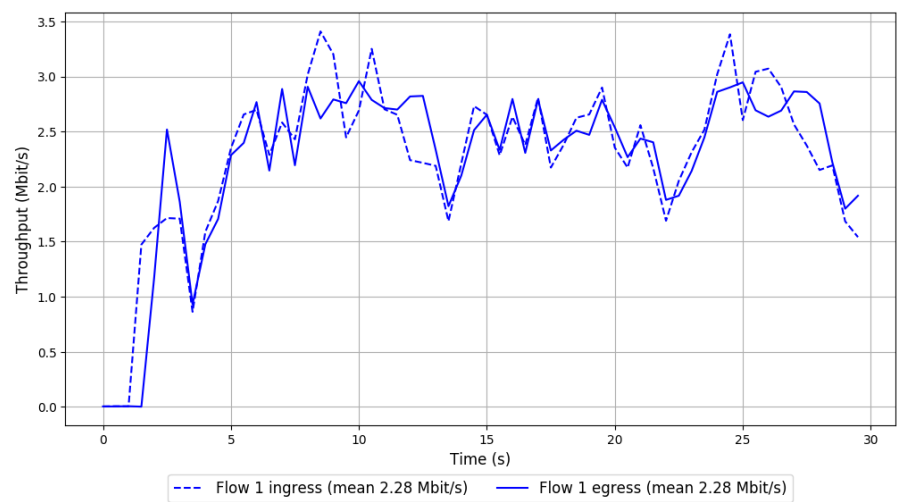
-- Flow 1:

Average throughput: 2.28 Mbit/s

95th percentile per-packet one-way delay: 354.631 ms

Loss rate: 0.57%

Run 1: Report of Vivace-LTE — Data Link



Run 2: Statistics of Vivace-LTE

Start at: 2018-01-31 08:30:34

End at: 2018-01-31 08:31:04

Local clock offset: -0.605 ms

Remote clock offset: 4.303 ms

Below is generated by plot.py at 2018-01-31 08:56:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.11 Mbit/s

95th percentile per-packet one-way delay: 1672.192 ms

Loss rate: 0.56%

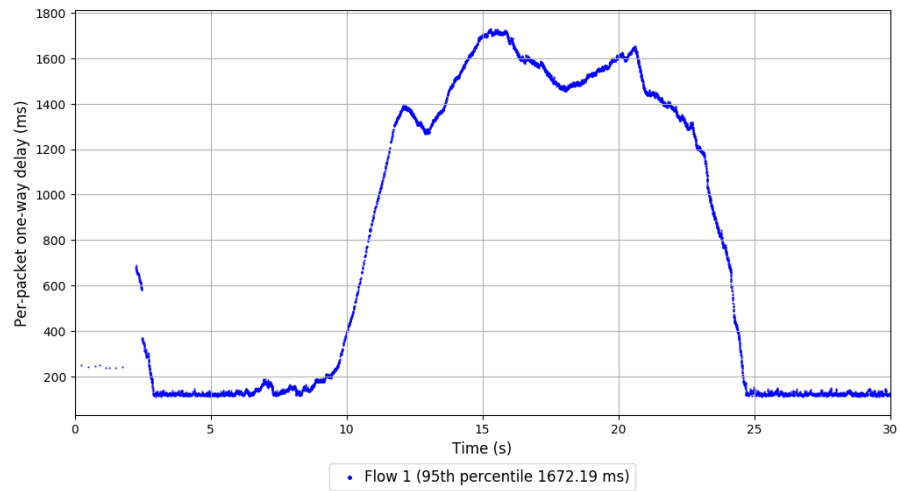
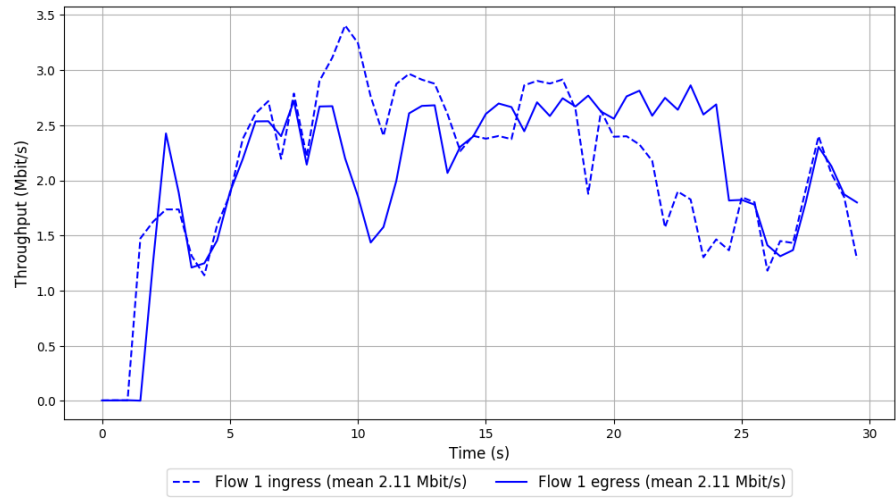
-- Flow 1:

Average throughput: 2.11 Mbit/s

95th percentile per-packet one-way delay: 1672.192 ms

Loss rate: 0.56%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-01-31 08:51:52

End at: 2018-01-31 08:52:22

Local clock offset: -0.123 ms

Remote clock offset: 1.262 ms

Below is generated by plot.py at 2018-01-31 08:56:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.25 Mbit/s

95th percentile per-packet one-way delay: 506.110 ms

Loss rate: 1.76%

-- Flow 1:

Average throughput: 2.25 Mbit/s

95th percentile per-packet one-way delay: 506.110 ms

Loss rate: 1.76%

Run 3: Report of Vivace-LTE — Data Link

