

Pantheon Report

Generated at 2018-01-18 11:20:48 (UTC).

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

Repeated the test of 17 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

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

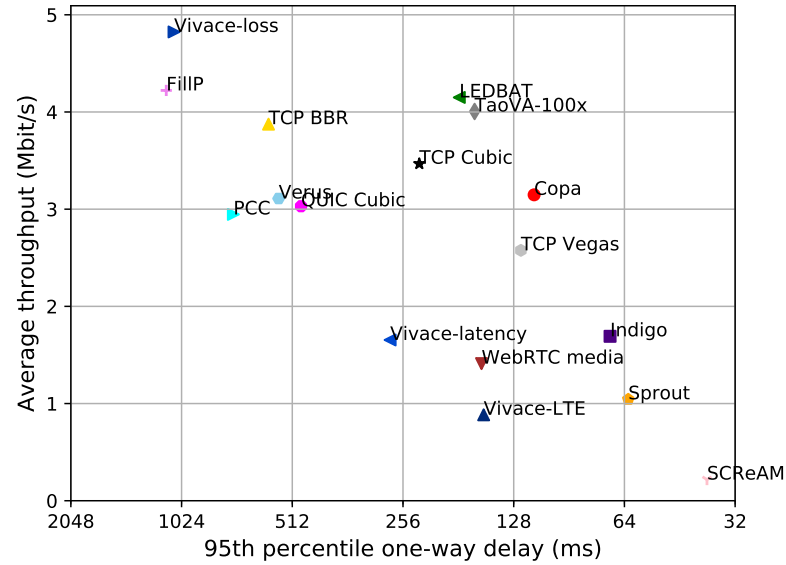
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

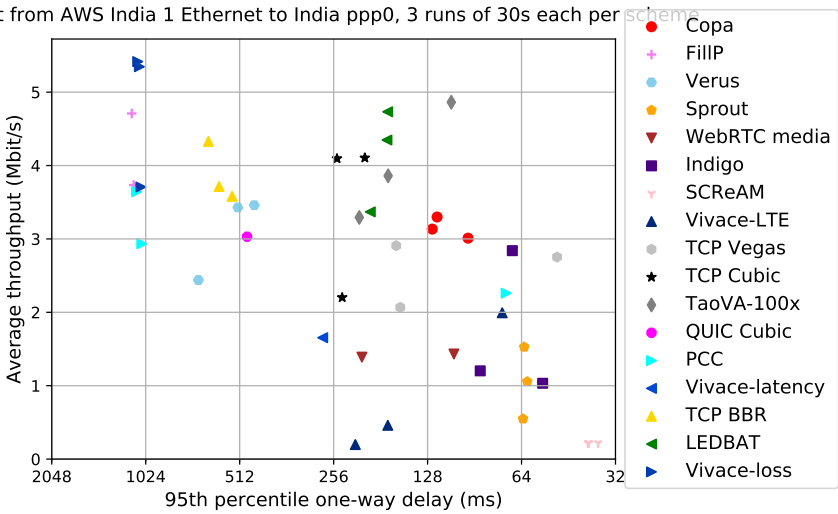
Git summary:

```
branch: master @ 54510ce29f849c716ac5c8199ca1604b6abdfbc3
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ ec9585325218d5048c4d4152fa42240af54c6e67
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
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 @ 423cbca3e8ea1d599e7b5cf725835e8a2b6bfac6
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

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



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



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	3.87	594.10	1.24
TCP Cubic	3	3.46	231.15	0.36
LEDBAT	3	4.15	179.99	0.28
PCC	3	2.94	740.29	29.07
QUIC Cubic	1	3.03	484.77	0.77
SCReAM	3	0.22	38.17	0.04
WebRTC media	2	1.41	156.60	0.07
Sprout	3	1.05	62.48	0.44
TaoVA-100x	3	4.00	163.50	0.26
TCP Vegas	3	2.58	122.38	0.19
Verus	3	3.11	557.60	2.69
Copa	3	3.15	112.65	0.24
FillP	2	4.22	1126.98	89.82
Indigo	3	1.69	70.02	0.07
Vivace-latency	1	1.65	277.54	0.25
Vivace-loss	3	4.83	1073.46	36.00
Vivace-LTE	3	0.88	154.50	0.01

Run 1: Statistics of TCP BBR

Start at: 2018-01-18 10:19:26

End at: 2018-01-18 10:19:56

Local clock offset: -21.663 ms

Below is generated by plot.py at 2018-01-18 11:20:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.71 Mbit/s

95th percentile per-packet one-way delay: 595.935 ms

Loss rate: 1.09%

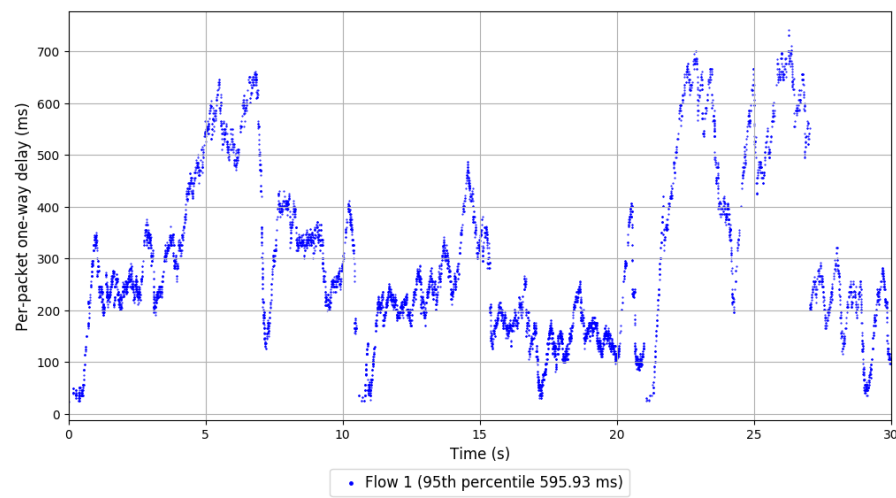
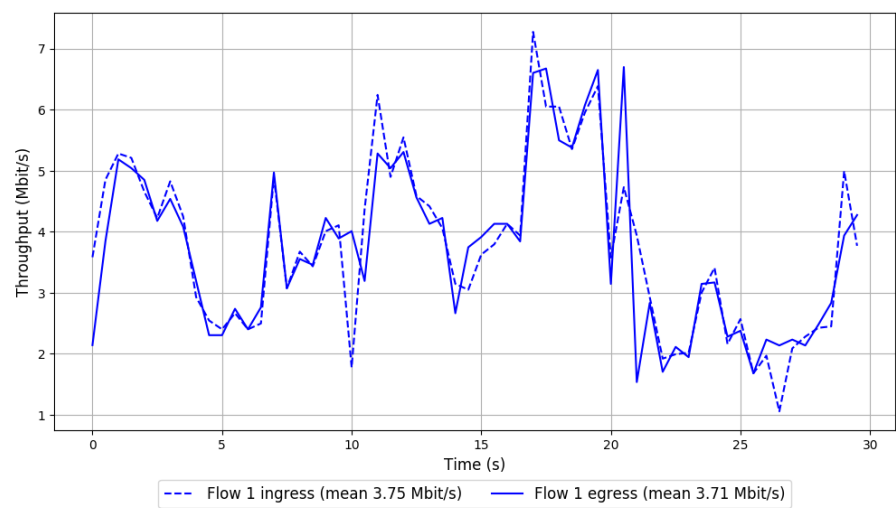
-- Flow 1:

Average throughput: 3.71 Mbit/s

95th percentile per-packet one-way delay: 595.935 ms

Loss rate: 1.09%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-01-18 10:53:29

End at: 2018-01-18 10:53:59

Local clock offset: -20.219 ms

Below is generated by plot.py at 2018-01-18 11:20:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.58 Mbit/s

95th percentile per-packet one-way delay: 541.408 ms

Loss rate: 1.46%

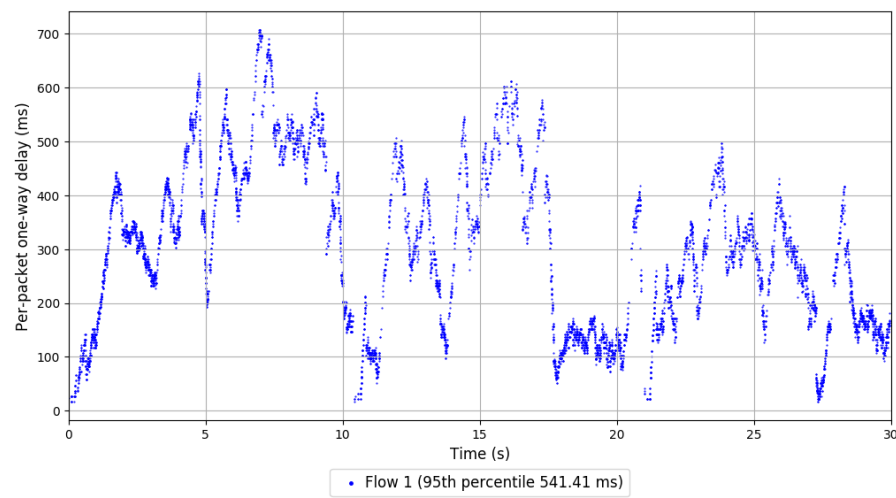
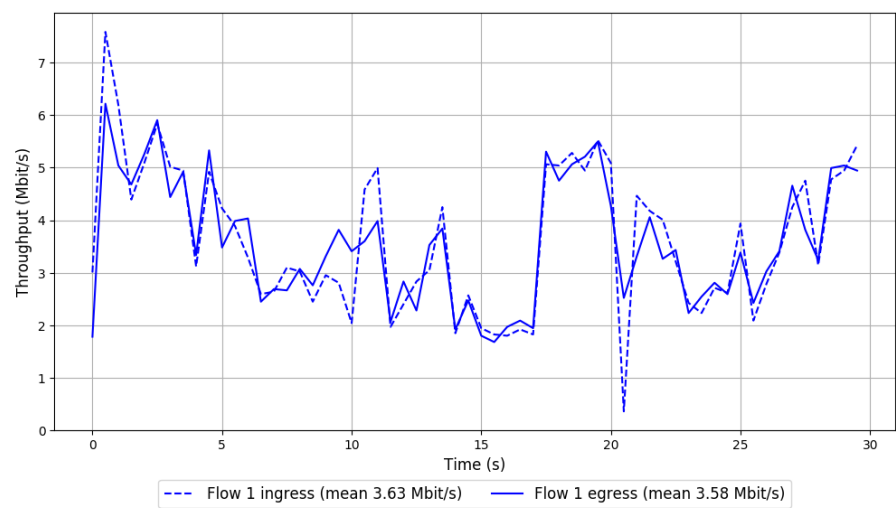
-- Flow 1:

Average throughput: 3.58 Mbit/s

95th percentile per-packet one-way delay: 541.408 ms

Loss rate: 1.46%

Run 2: Report of TCP BBR — Data Link

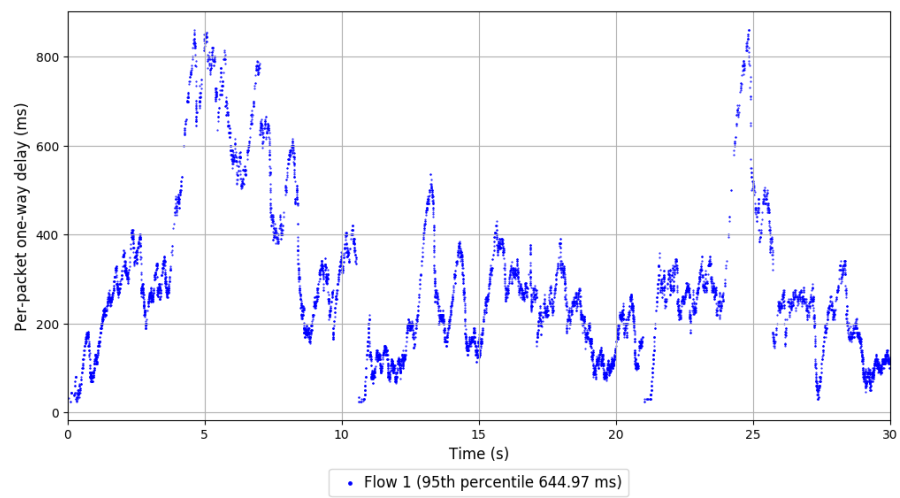
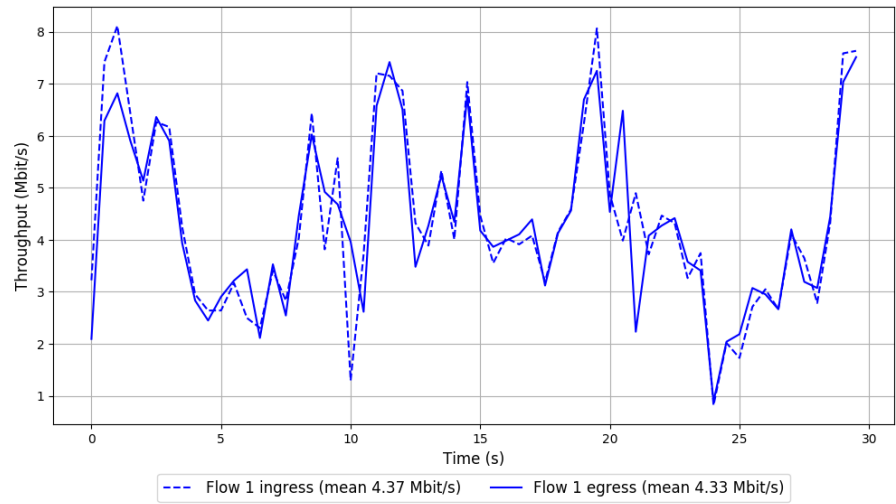


Run 3: Statistics of TCP BBR

Start at: 2018-01-18 11:18:27
End at: 2018-01-18 11:18:57
Local clock offset: -18.026 ms
Remote clock offset: -0.469 ms

Below is generated by plot.py at 2018-01-18 11:20:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.33 Mbit/s
95th percentile per-packet one-way delay: 644.968 ms
Loss rate: 1.17%
-- Flow 1:
Average throughput: 4.33 Mbit/s
95th percentile per-packet one-way delay: 644.968 ms
Loss rate: 1.17%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-01-18 10:00:51

End at: 2018-01-18 10:01:21

Local clock offset: -17.89 ms

Below is generated by plot.py at 2018-01-18 11:20:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.20 Mbit/s

95th percentile per-packet one-way delay: 240.363 ms

Loss rate: 0.42%

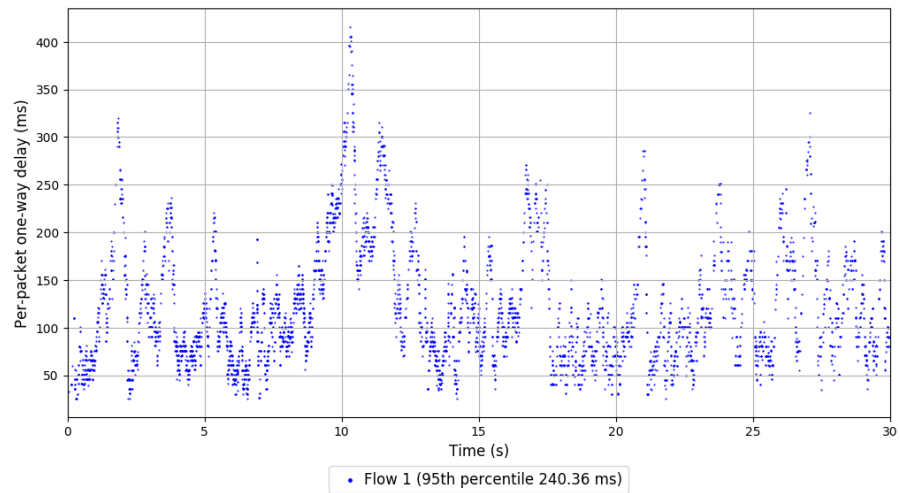
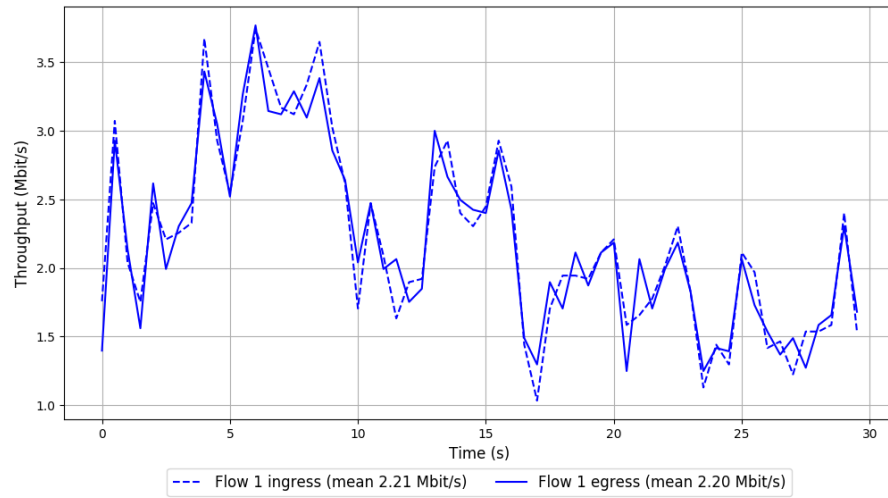
-- Flow 1:

Average throughput: 2.20 Mbit/s

95th percentile per-packet one-way delay: 240.363 ms

Loss rate: 0.42%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-01-18 10:34:31

End at: 2018-01-18 10:35:01

Local clock offset: -15.381 ms

Below is generated by plot.py at 2018-01-18 11:20:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.09 Mbit/s

95th percentile per-packet one-way delay: 249.721 ms

Loss rate: 0.26%

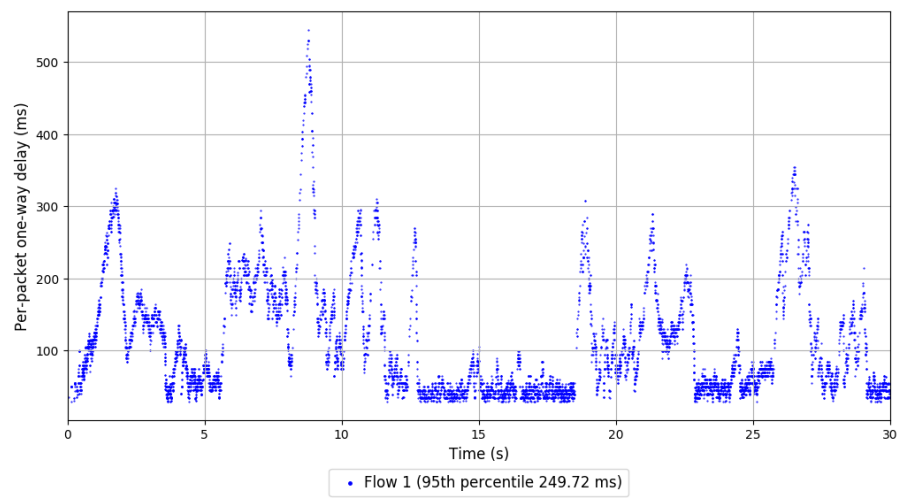
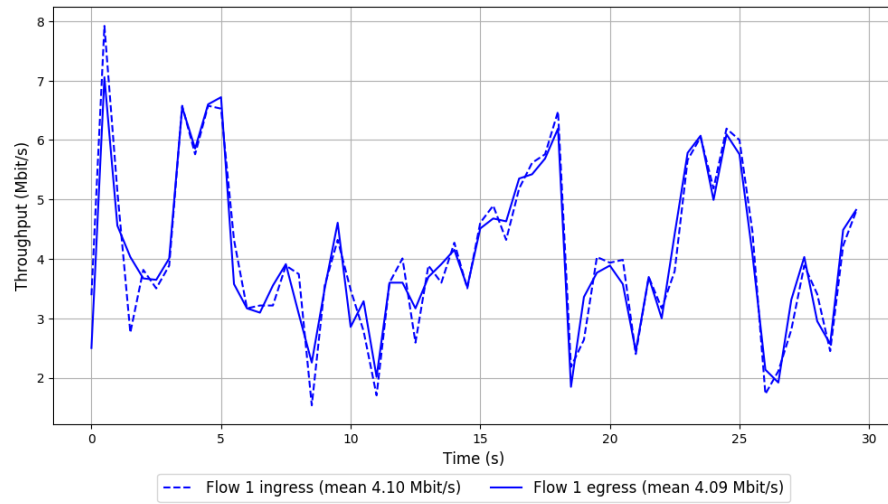
-- Flow 1:

Average throughput: 4.09 Mbit/s

95th percentile per-packet one-way delay: 249.721 ms

Loss rate: 0.26%

Run 2: Report of TCP Cubic — Data Link

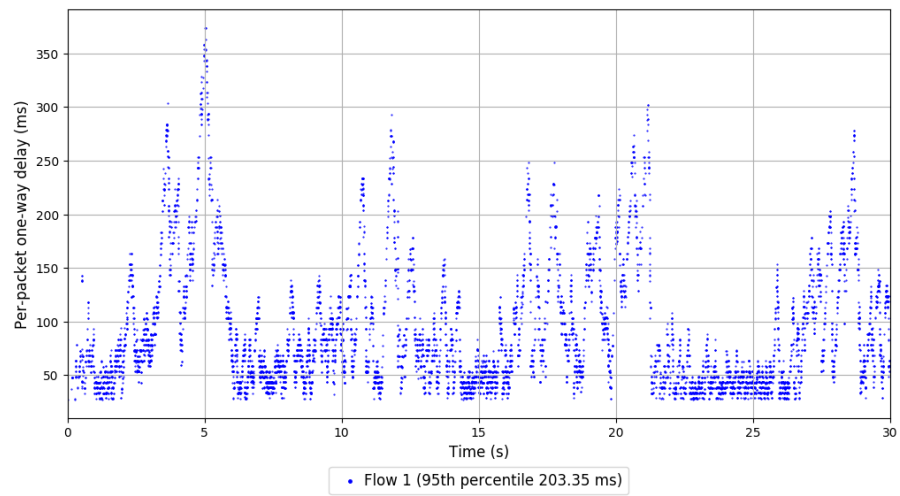
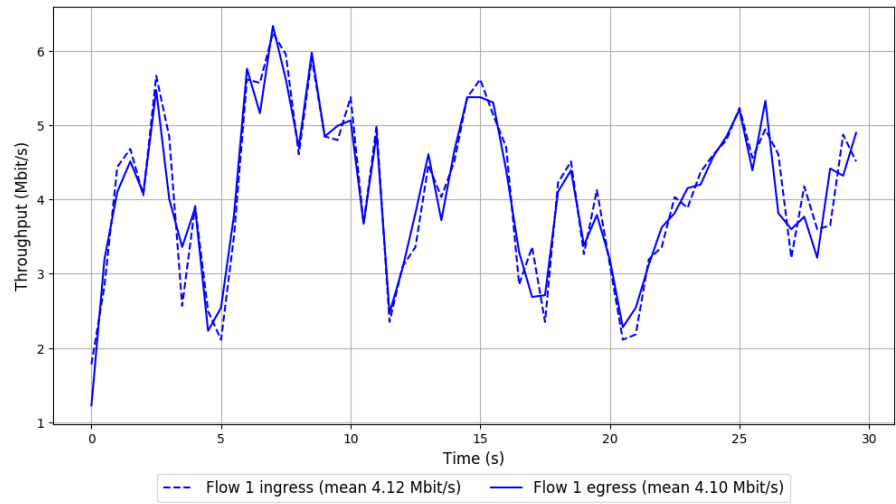


Run 3: Statistics of TCP Cubic

Start at: 2018-01-18 11:07:21
End at: 2018-01-18 11:07:51
Local clock offset: -24.541 ms
Remote clock offset: 0.598 ms

Below is generated by plot.py at 2018-01-18 11:20:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.10 Mbit/s
95th percentile per-packet one-way delay: 203.352 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 4.10 Mbit/s
95th percentile per-packet one-way delay: 203.352 ms
Loss rate: 0.39%

Run 3: Report of TCP Cubic — Data Link

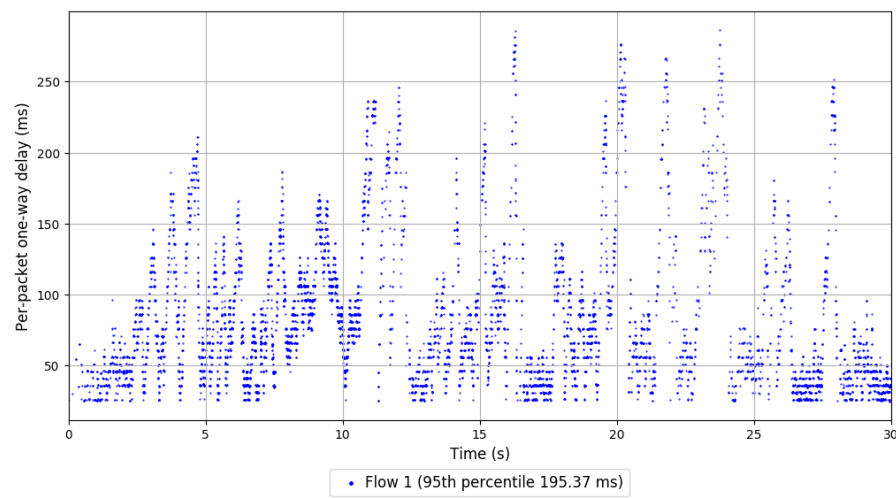
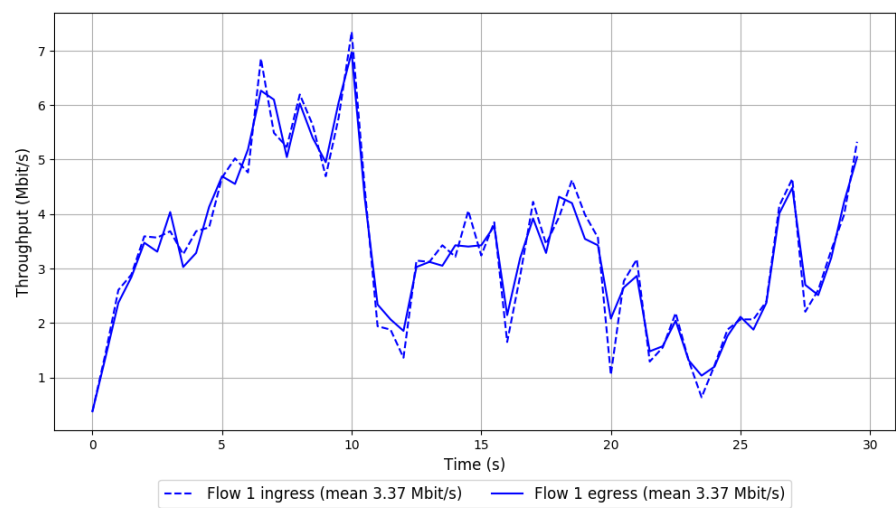


```
Run 1: Statistics of LEDBAT

Start at: 2018-01-18 10:15:44
End at: 2018-01-18 10:16:14
Local clock offset: -20.182 ms

# Below is generated by plot.py at 2018-01-18 11:20:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.37 Mbit/s
95th percentile per-packet one-way delay: 195.369 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 3.37 Mbit/s
95th percentile per-packet one-way delay: 195.369 ms
Loss rate: 0.29%
```


Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2018-01-18 10:49:48

End at: 2018-01-18 10:50:18

Local clock offset: -21.185 ms

Below is generated by plot.py at 2018-01-18 11:20:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.73 Mbit/s

95th percentile per-packet one-way delay: 171.829 ms

Loss rate: 0.23%

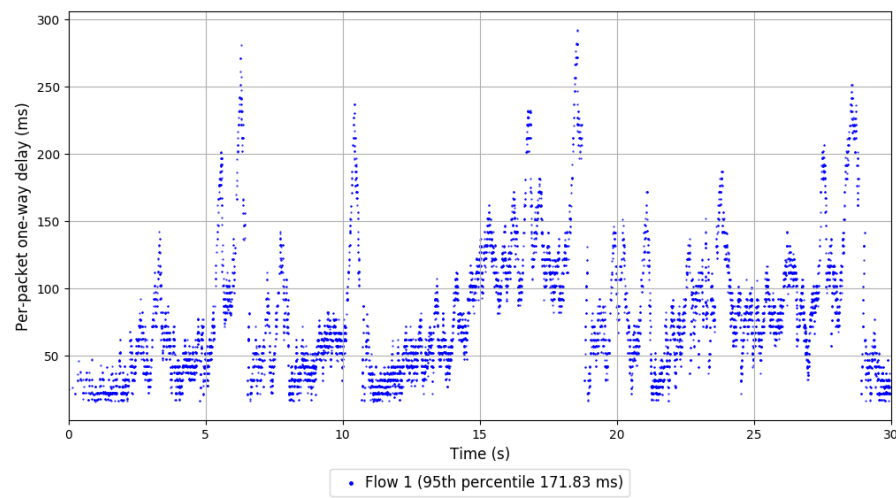
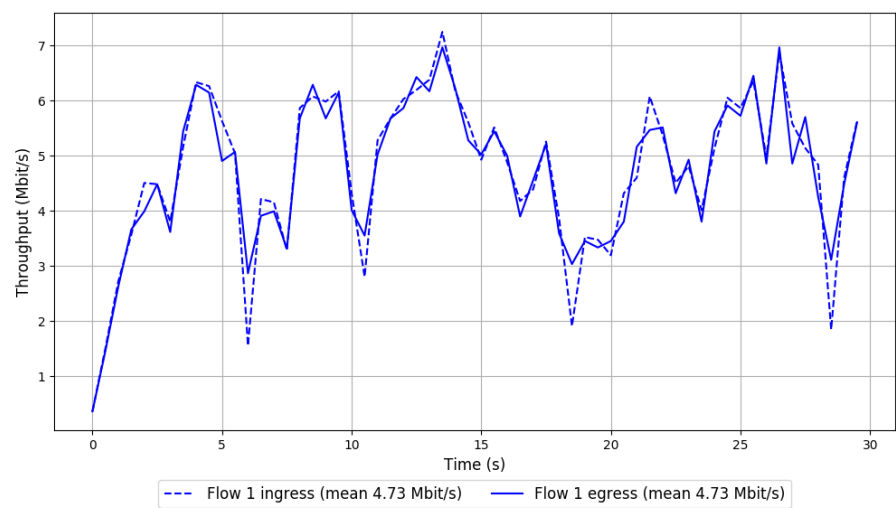
-- Flow 1:

Average throughput: 4.73 Mbit/s

95th percentile per-packet one-way delay: 171.829 ms

Loss rate: 0.23%

Run 2: Report of LEDBAT — Data Link

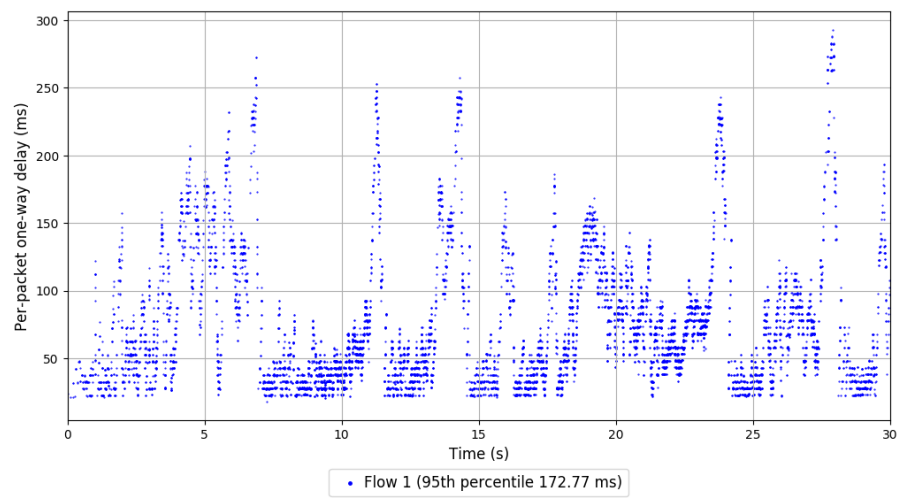
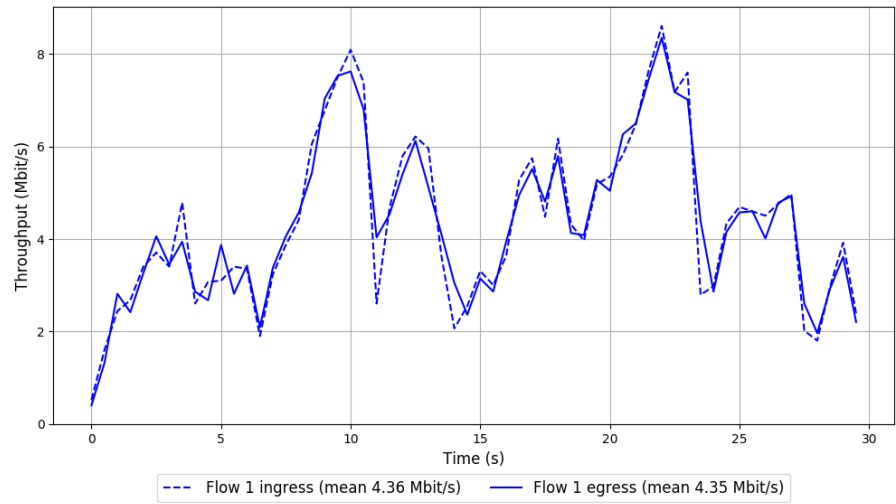


Run 3: Statistics of LEDBAT

Start at: 2018-01-18 11:16:11
End at: 2018-01-18 11:16:41
Local clock offset: -19.399 ms
Remote clock offset: -0.662 ms

Below is generated by plot.py at 2018-01-18 11:20:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.35 Mbit/s
95th percentile per-packet one-way delay: 172.766 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 4.35 Mbit/s
95th percentile per-packet one-way delay: 172.766 ms
Loss rate: 0.32%

Run 3: Report of LEDBAT — Data Link

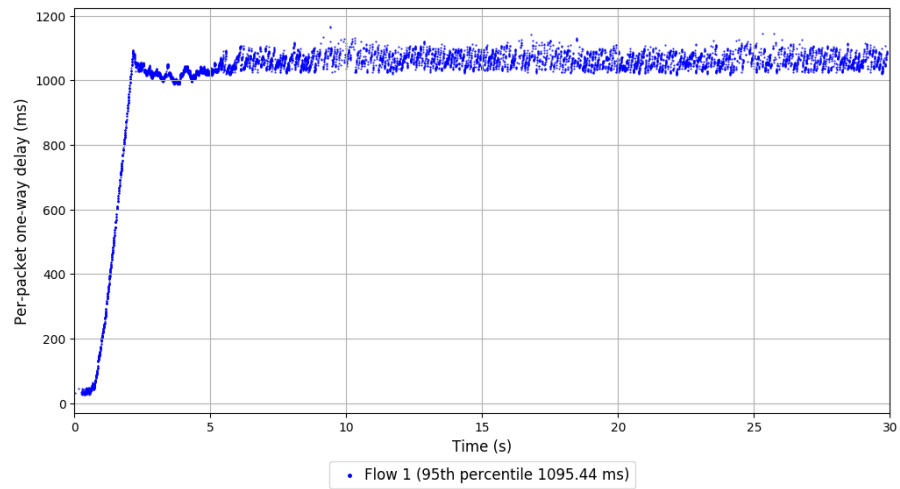
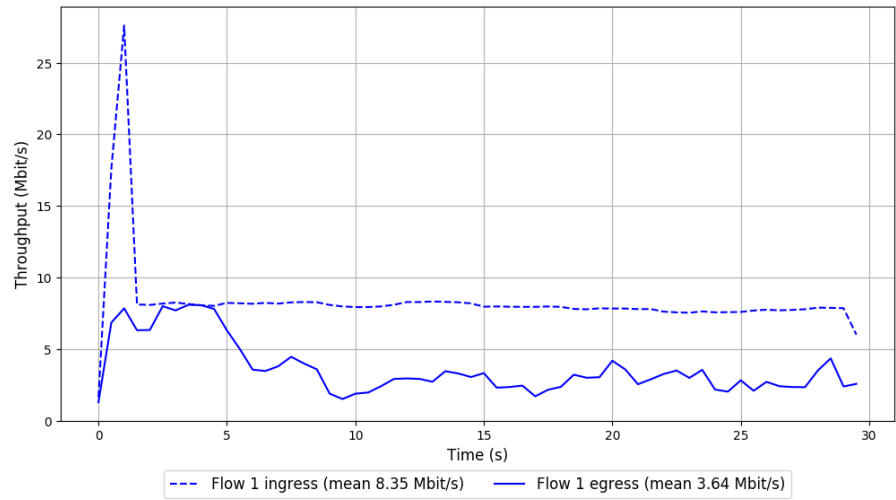


```
Run 1: Statistics of PCC

Start at: 2018-01-18 09:55:16
End at: 2018-01-18 09:55:46
Local clock offset: -14.229 ms

# Below is generated by plot.py at 2018-01-18 11:20:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.64 Mbit/s
95th percentile per-packet one-way delay: 1095.440 ms
Loss rate: 56.40%
-- Flow 1:
Average throughput: 3.64 Mbit/s
95th percentile per-packet one-way delay: 1095.440 ms
Loss rate: 56.40%
```

Run 1: Report of PCC — Data Link



Run 2: Statistics of PCC

Start at: 2018-01-18 10:28:50

End at: 2018-01-18 10:29:20

Local clock offset: -16.498 ms

Below is generated by plot.py at 2018-01-18 11:20:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.26 Mbit/s

95th percentile per-packet one-way delay: 71.688 ms

Loss rate: 0.32%

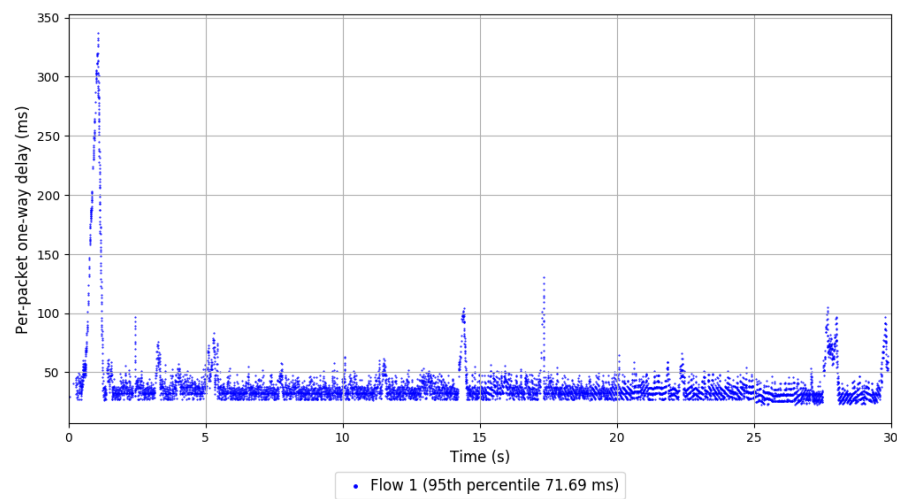
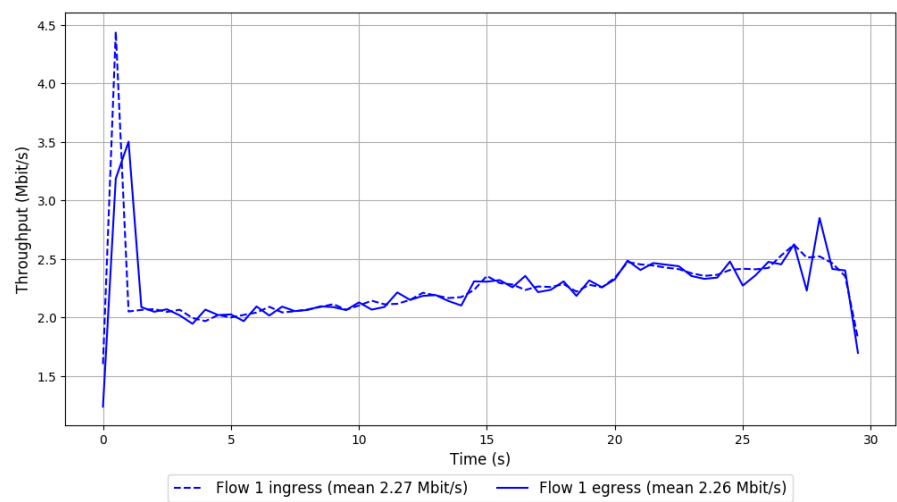
-- Flow 1:

Average throughput: 2.26 Mbit/s

95th percentile per-packet one-way delay: 71.688 ms

Loss rate: 0.32%

Run 2: Report of PCC — Data Link



Run 3: Statistics of PCC

Start at: 2018-01-18 11:02:53

End at: 2018-01-18 11:03:23

Local clock offset: -23.326 ms

Below is generated by plot.py at 2018-01-18 11:20:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.93 Mbit/s

95th percentile per-packet one-way delay: 1053.751 ms

Loss rate: 30.49%

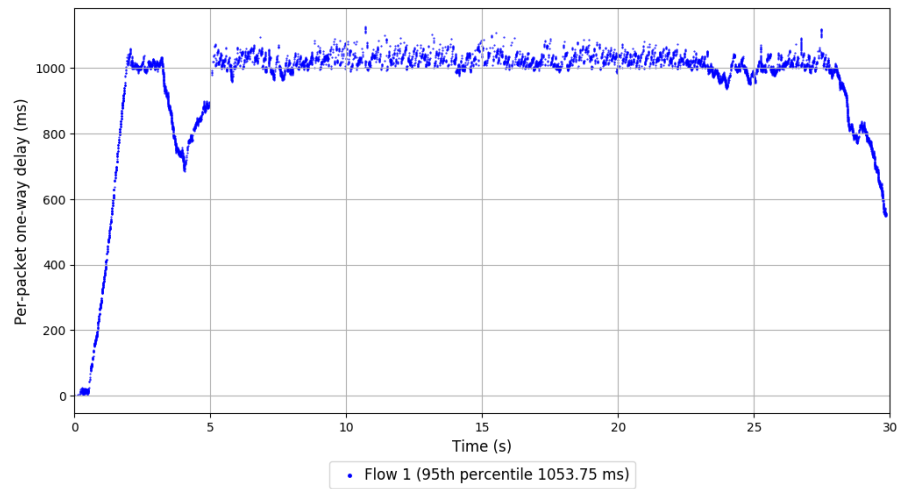
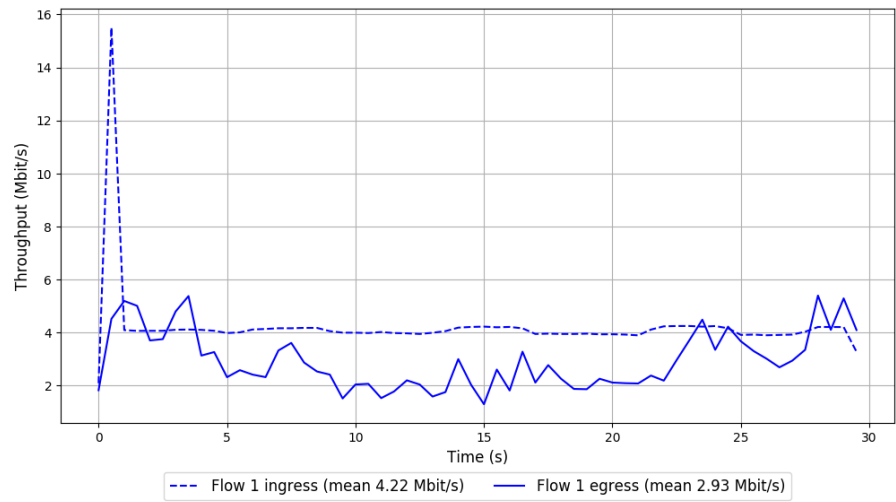
-- Flow 1:

Average throughput: 2.93 Mbit/s

95th percentile per-packet one-way delay: 1053.751 ms

Loss rate: 30.49%

Run 3: Report of PCC — Data Link



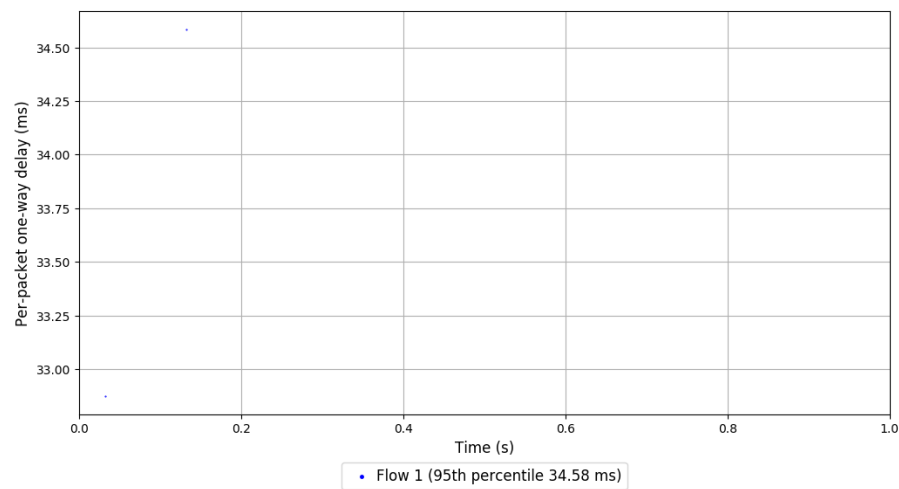
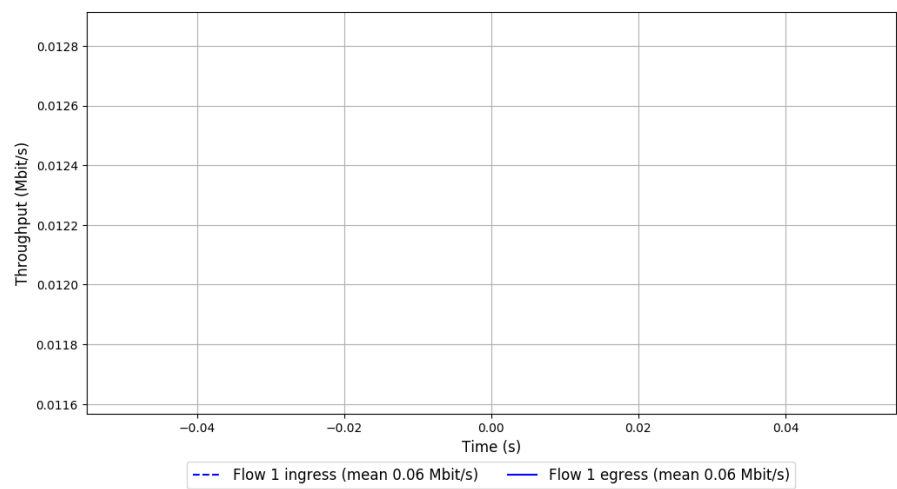
Run 1: Statistics of QUIC Cubic

Start at: 2018-01-18 10:08:14

End at: 2018-01-18 10:08:44

Local clock offset: -21.156 ms

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-01-18 10:41:57

End at: 2018-01-18 10:42:27

Local clock offset: -18.786 ms

Below is generated by plot.py at 2018-01-18 11:20:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.03 Mbit/s

95th percentile per-packet one-way delay: 484.769 ms

Loss rate: 0.77%

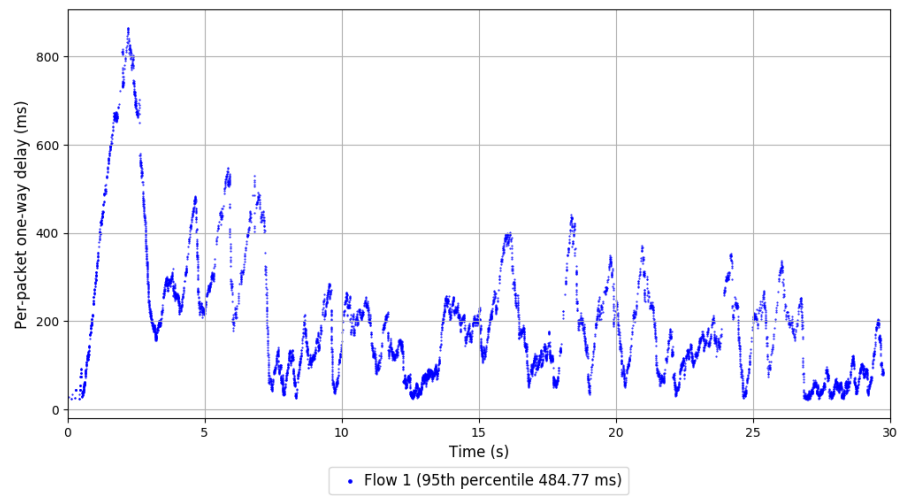
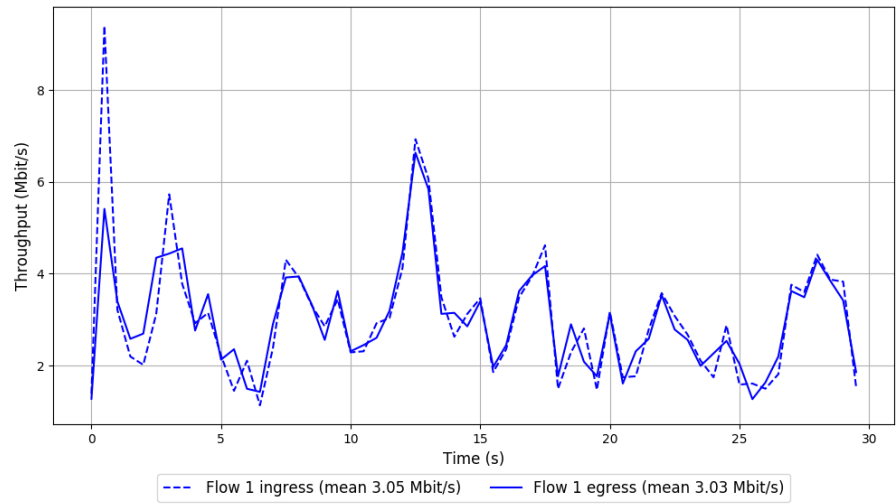
-- Flow 1:

Average throughput: 3.03 Mbit/s

95th percentile per-packet one-way delay: 484.769 ms

Loss rate: 0.77%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

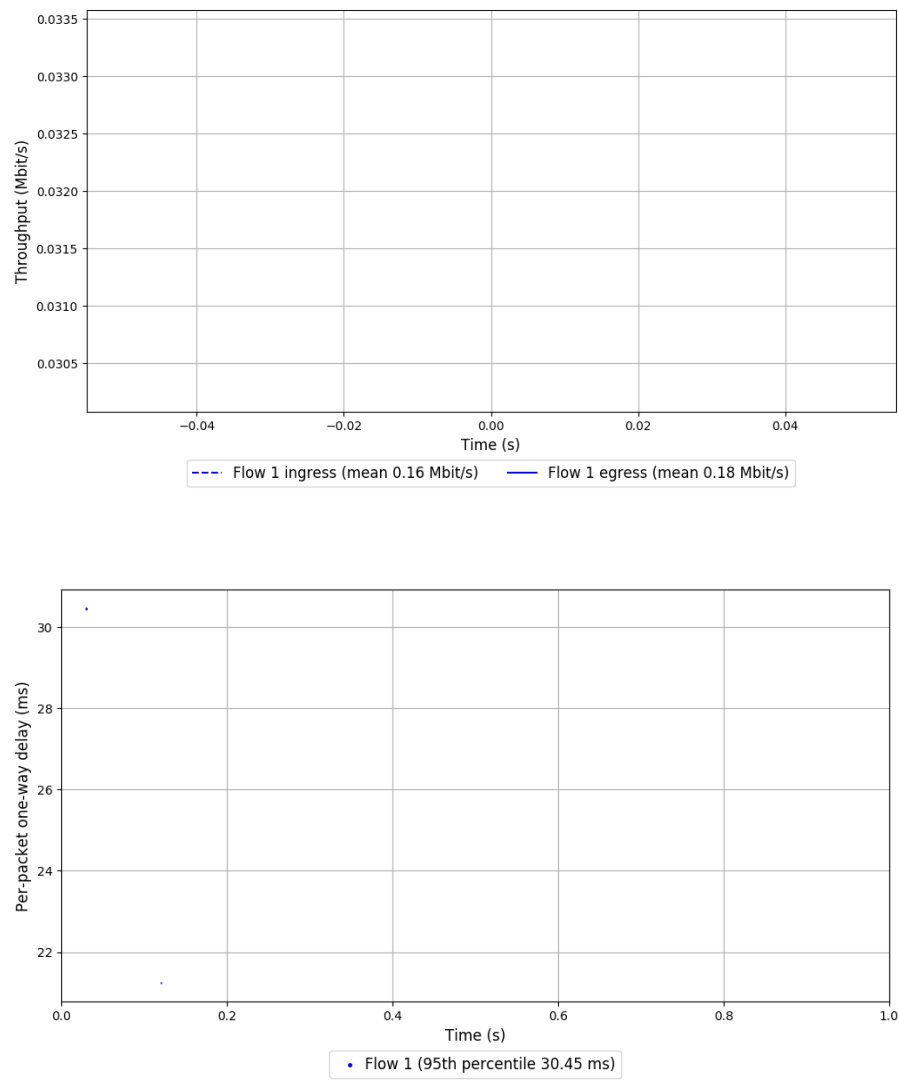
Start at: 2018-01-18 11:11:45

End at: 2018-01-18 11:12:15

Local clock offset: -19.393 ms

Remote clock offset: 0.437 ms

Run 3: Report of QUIC Cubic — Data Link

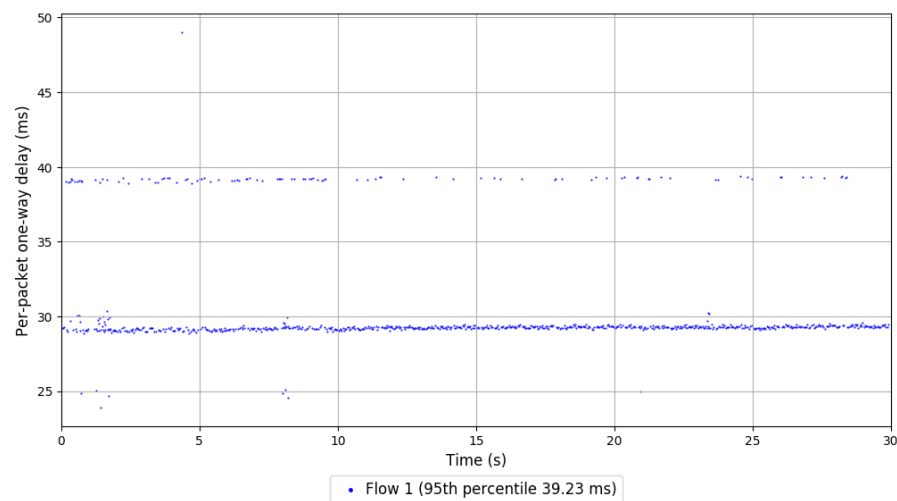
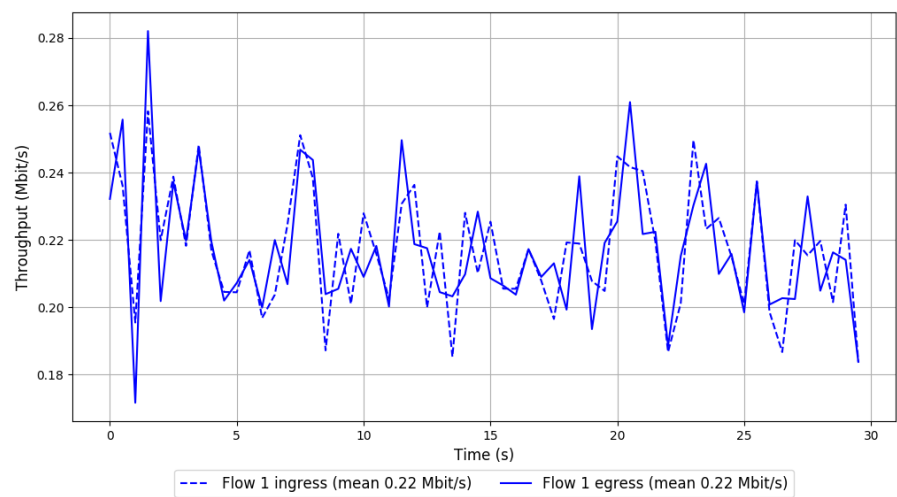


```
Run 1: Statistics of SCReAM

Start at: 2018-01-18 10:12:03
End at: 2018-01-18 10:12:33
Local clock offset: -21.173 ms

# Below is generated by plot.py at 2018-01-18 11:20:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 39.228 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 39.228 ms
Loss rate: 0.13%
```

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2018-01-18 10:45:45

End at: 2018-01-18 10:46:15

Local clock offset: -19.098 ms

Below is generated by plot.py at 2018-01-18 11:20:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 38.922 ms

Loss rate: 0.00%

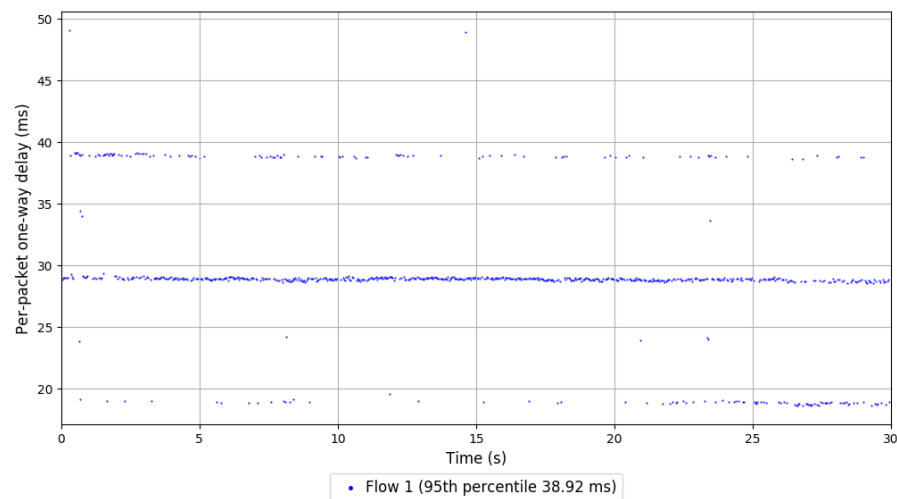
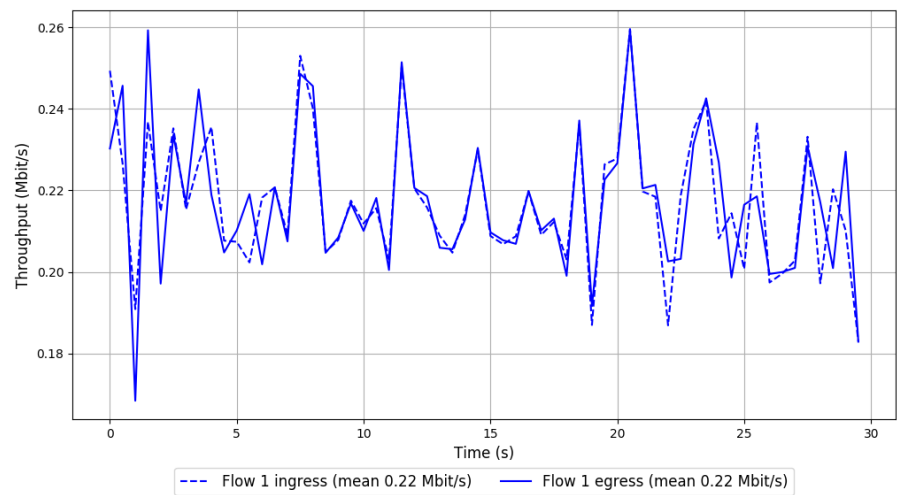
-- Flow 1:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 38.922 ms

Loss rate: 0.00%

Run 2: Report of SReAM — Data Link

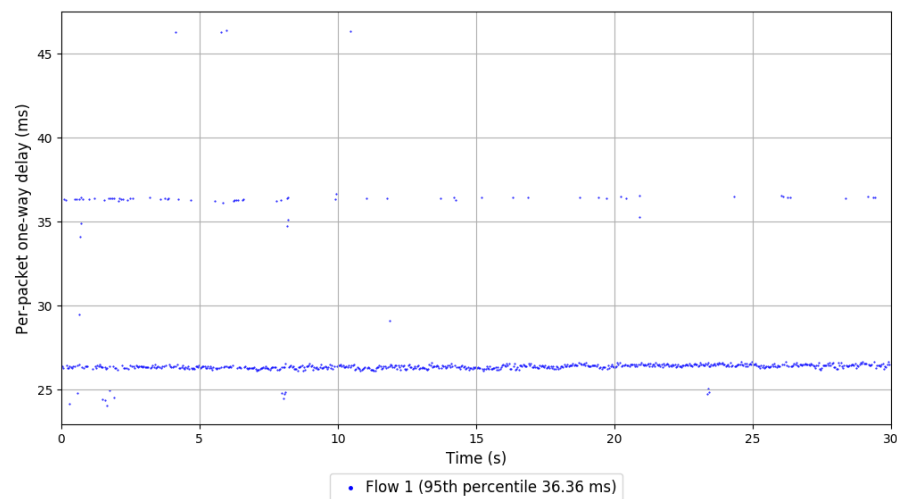
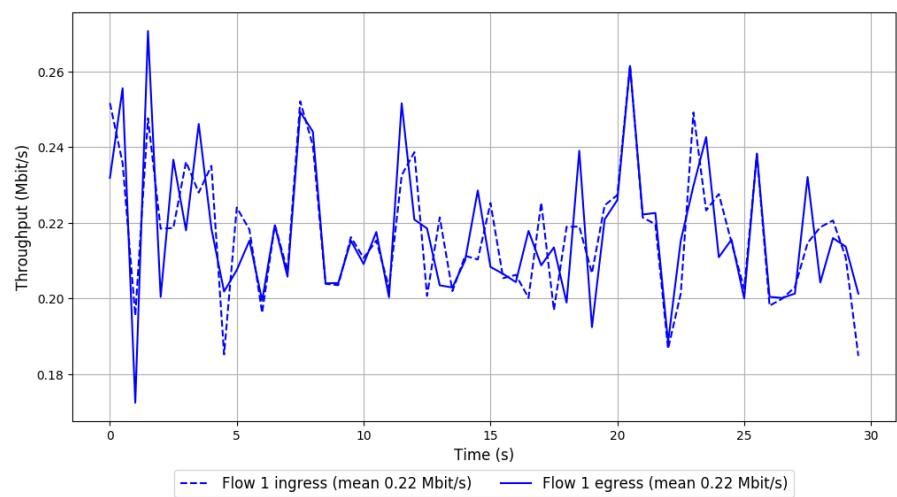


Run 3: Statistics of SCReAM

Start at: 2018-01-18 11:13:59
End at: 2018-01-18 11:14:29
Local clock offset: -21.769 ms
Remote clock offset: 0.875 ms

Below is generated by plot.py at 2018-01-18 11:20:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 36.361 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 36.361 ms
Loss rate: 0.00%

Run 3: Report of SReAM — Data Link

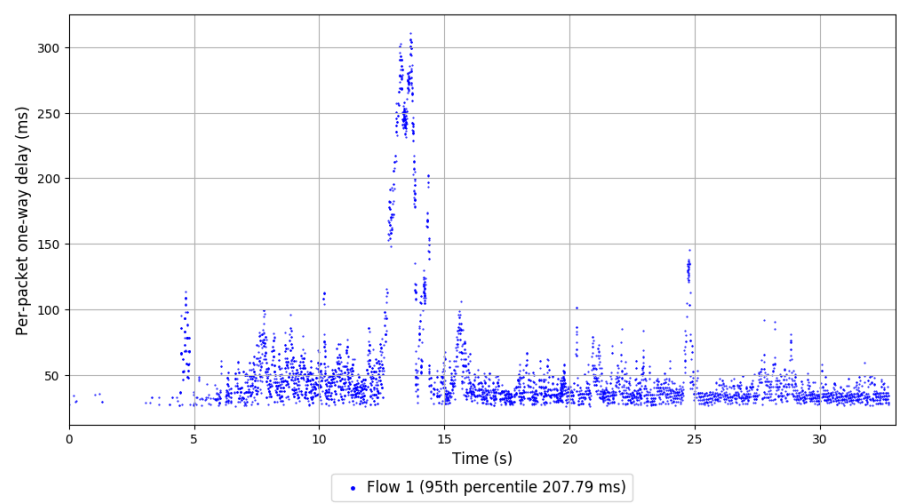
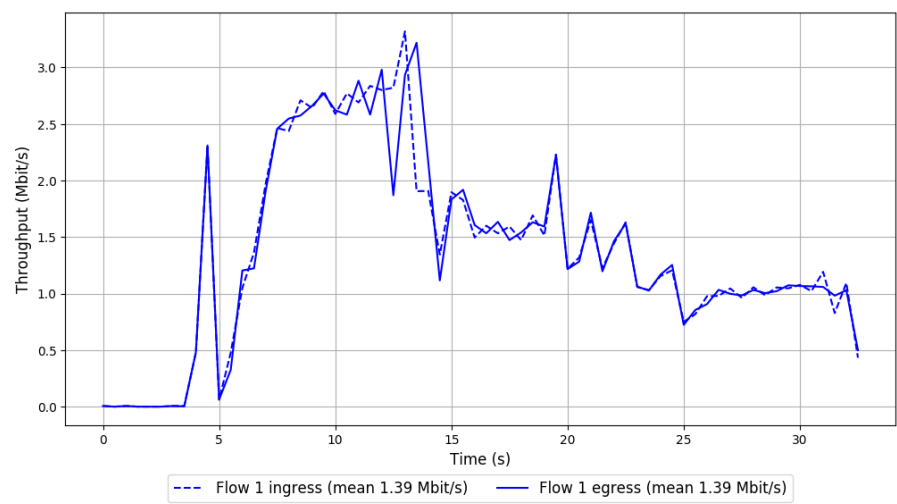


```
Run 1: Statistics of WebRTC media

Start at: 2018-01-18 09:59:01
End at: 2018-01-18 09:59:31
Local clock offset: -18.309 ms

# Below is generated by plot.py at 2018-01-18 11:20:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 207.794 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 207.794 ms
Loss rate: 0.06%
```


Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2018-01-18 10:32:40

End at: 2018-01-18 10:33:10

Local clock offset: -15.566 ms

Run 2: Report of WebRTC media — Data Link

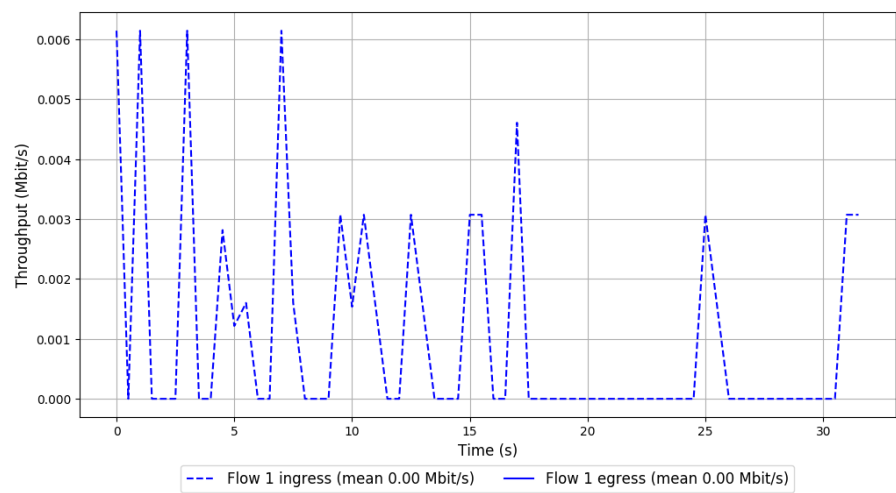


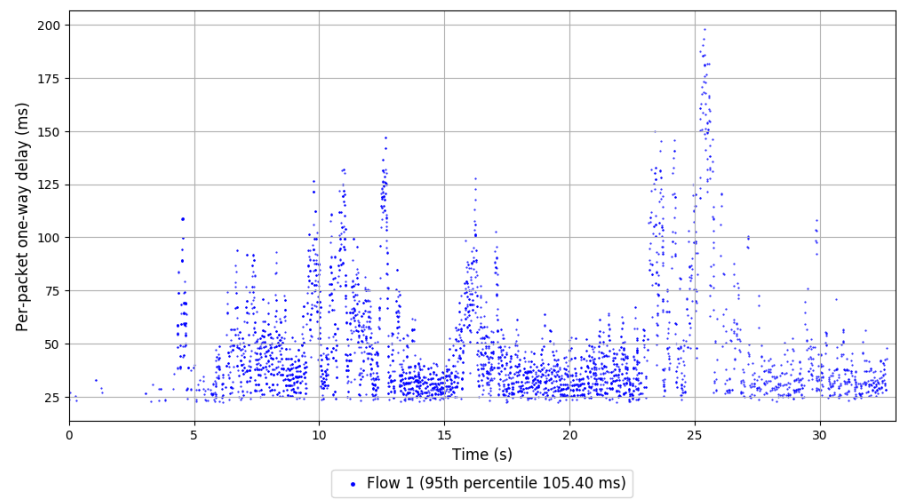
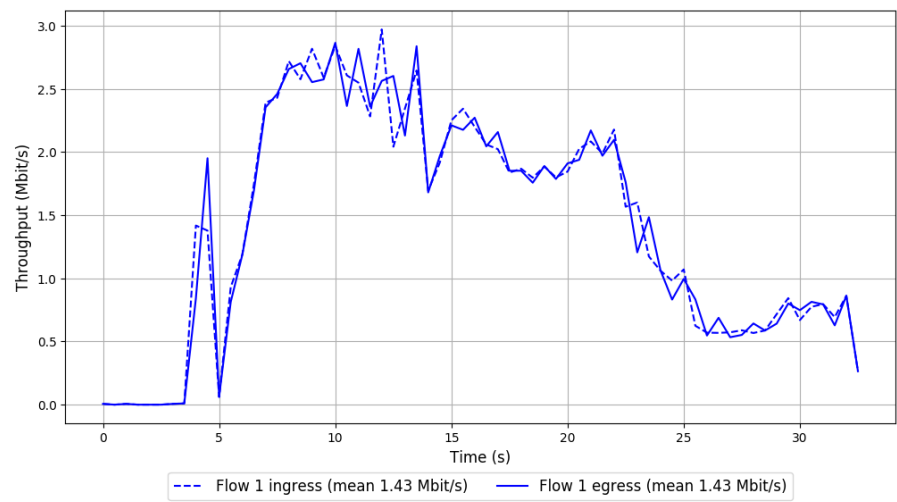
Figure is missing

Run 3: Statistics of WebRTC media

Start at: 2018-01-18 11:06:16
End at: 2018-01-18 11:06:46
Local clock offset: -20.657 ms
Remote clock offset: 0.153 ms

Below is generated by plot.py at 2018-01-18 11:20:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 105.403 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 105.403 ms
Loss rate: 0.07%

Run 3: Report of WebRTC media — Data Link

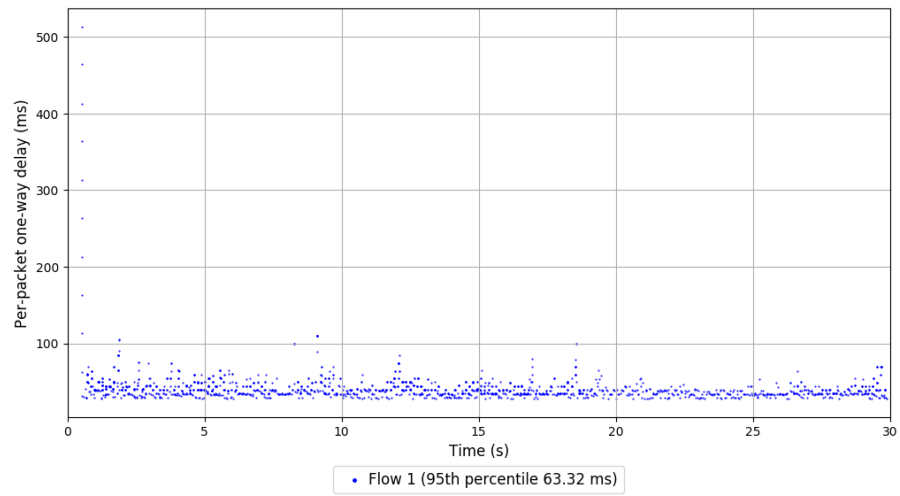
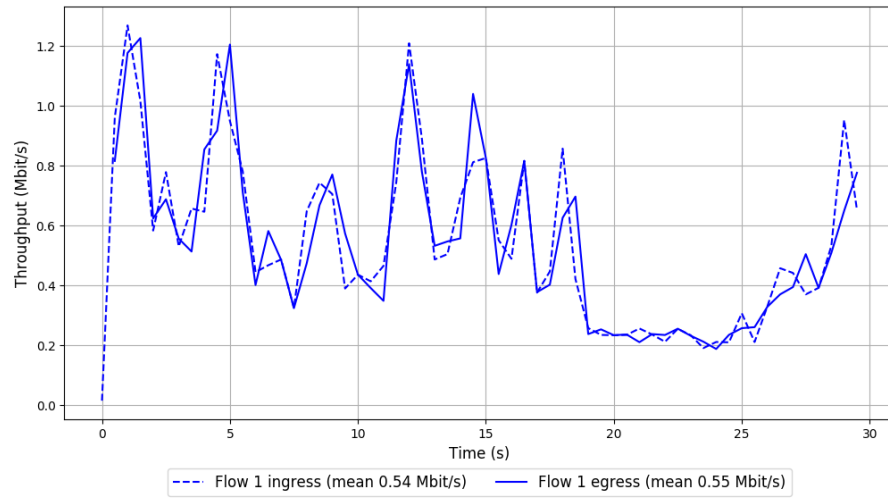


```
Run 1: Statistics of Sprout

Start at: 2018-01-18 10:04:33
End at: 2018-01-18 10:05:03
Local clock offset: -25.865 ms

# Below is generated by plot.py at 2018-01-18 11:20:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 63.321 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 63.321 ms
Loss rate: 0.63%
```

Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

Start at: 2018-01-18 10:38:13

End at: 2018-01-18 10:38:43

Local clock offset: -17.099 ms

Below is generated by plot.py at 2018-01-18 11:20:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.53 Mbit/s

95th percentile per-packet one-way delay: 62.773 ms

Loss rate: 0.25%

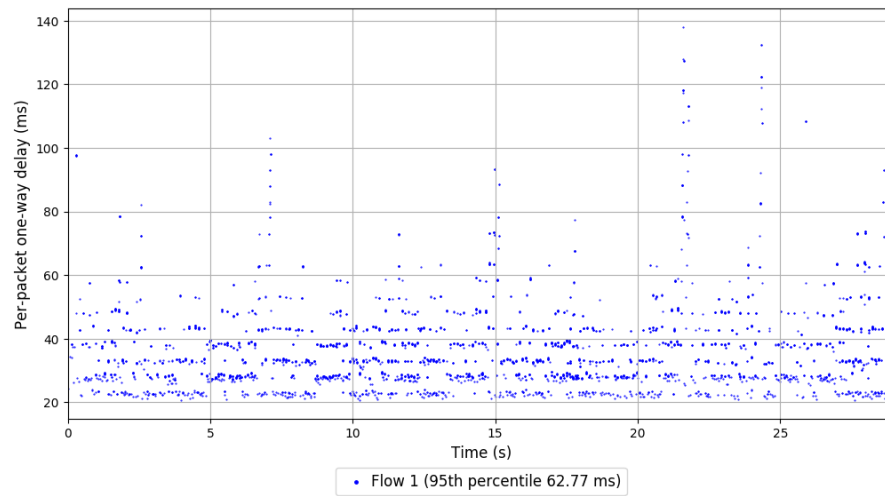
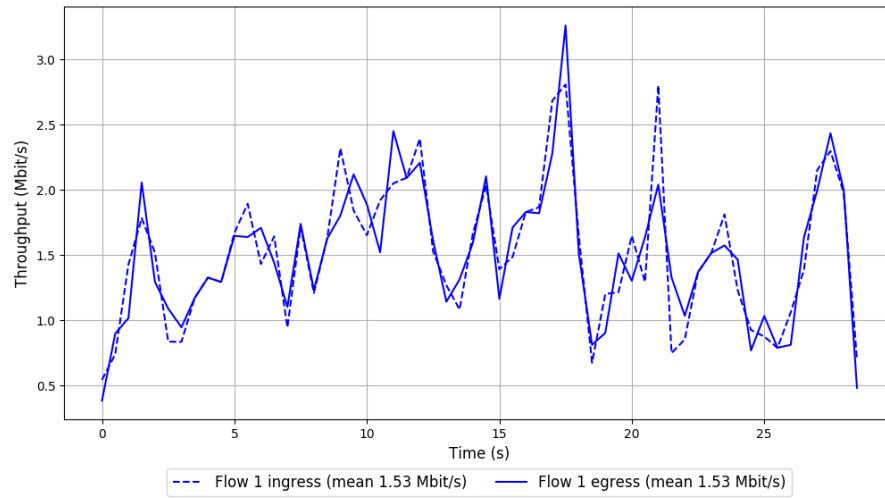
-- Flow 1:

Average throughput: 1.53 Mbit/s

95th percentile per-packet one-way delay: 62.773 ms

Loss rate: 0.25%

Run 2: Report of Sprout — Data Link

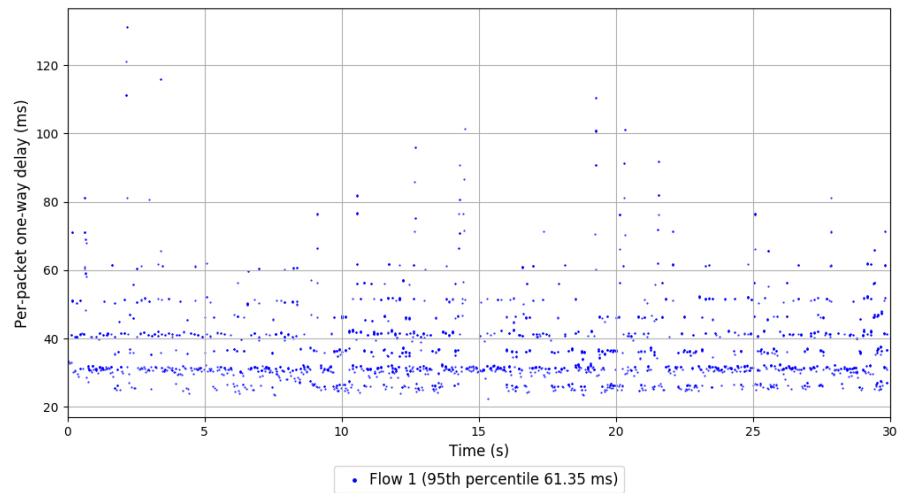
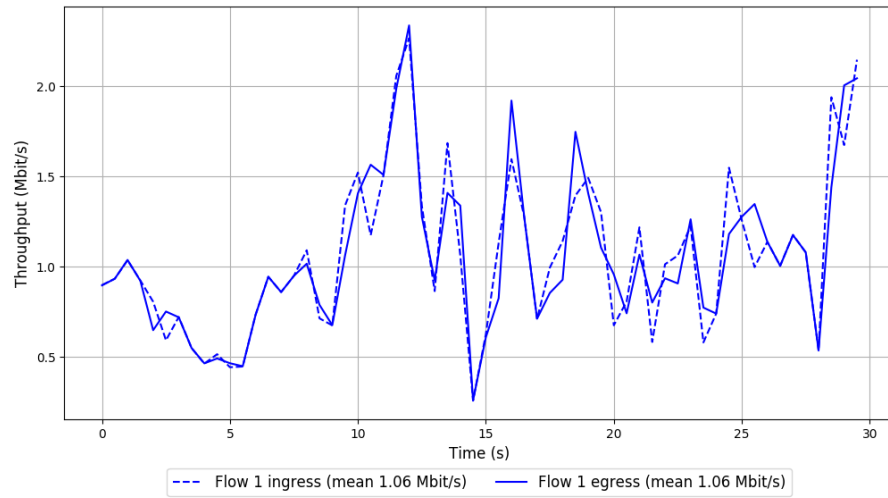


Run 3: Statistics of Sprout

Start at: 2018-01-18 11:09:31
End at: 2018-01-18 11:10:01
Local clock offset: -21.12 ms
Remote clock offset: -1.165 ms

Below is generated by plot.py at 2018-01-18 11:20:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 61.354 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 61.354 ms
Loss rate: 0.43%

Run 3: Report of Sprout — Data Link

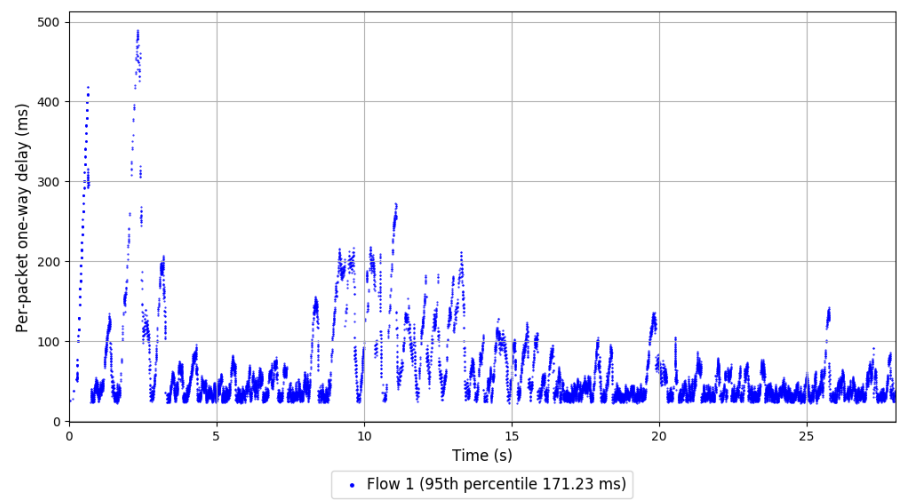
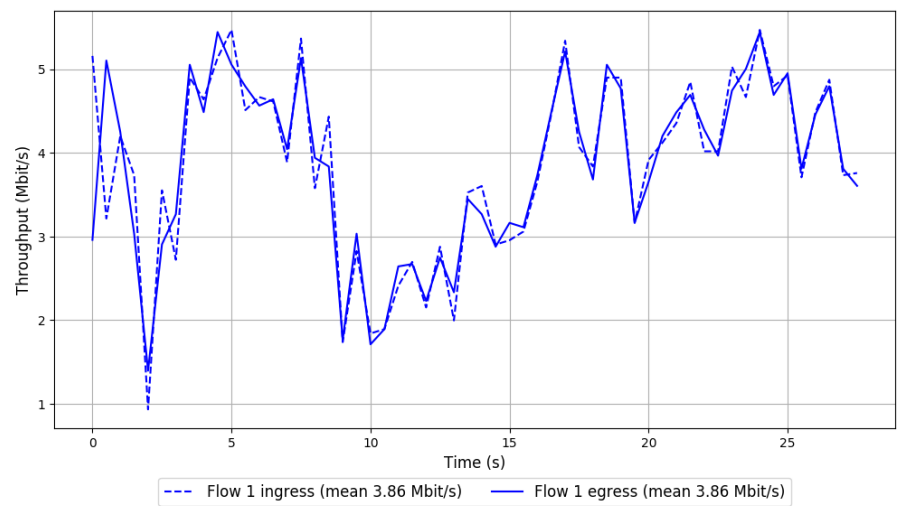


```
Run 1: Statistics of TaoVA-100x

Start at: 2018-01-18 10:10:08
End at: 2018-01-18 10:10:38
Local clock offset: -20.64 ms

# Below is generated by plot.py at 2018-01-18 11:20:24
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.86 Mbit/s
95th percentile per-packet one-way delay: 171.231 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 3.86 Mbit/s
95th percentile per-packet one-way delay: 171.231 ms
Loss rate: 0.23%
```

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-01-18 10:43:51

End at: 2018-01-18 10:44:21

Local clock offset: -18.611 ms

Below is generated by plot.py at 2018-01-18 11:20:24

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.29 Mbit/s

95th percentile per-packet one-way delay: 211.831 ms

Loss rate: 0.43%

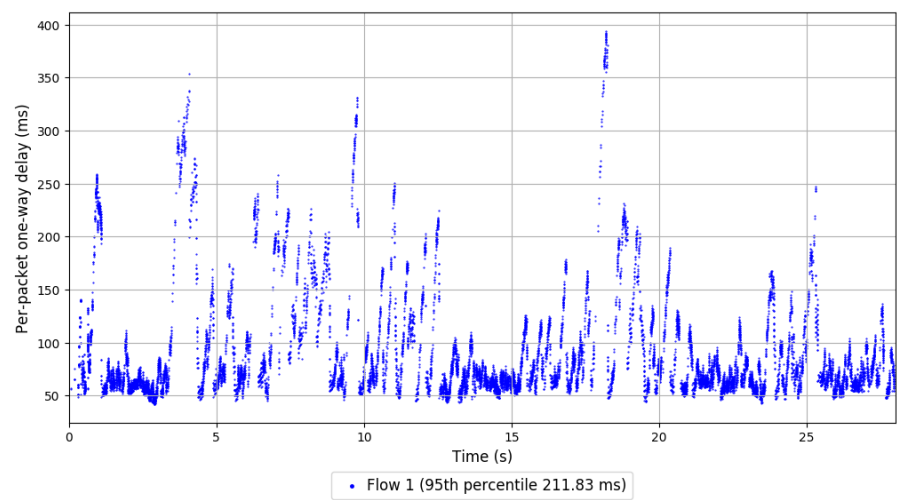
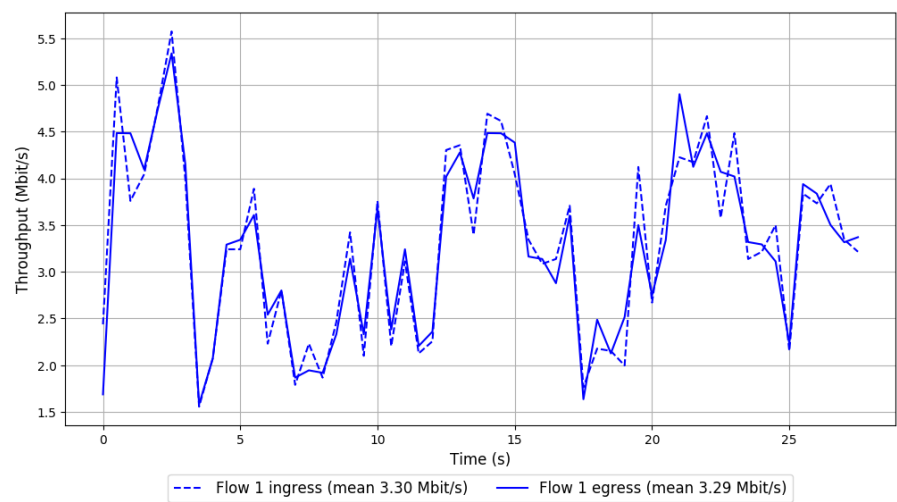
-- Flow 1:

Average throughput: 3.29 Mbit/s

95th percentile per-packet one-way delay: 211.831 ms

Loss rate: 0.43%

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

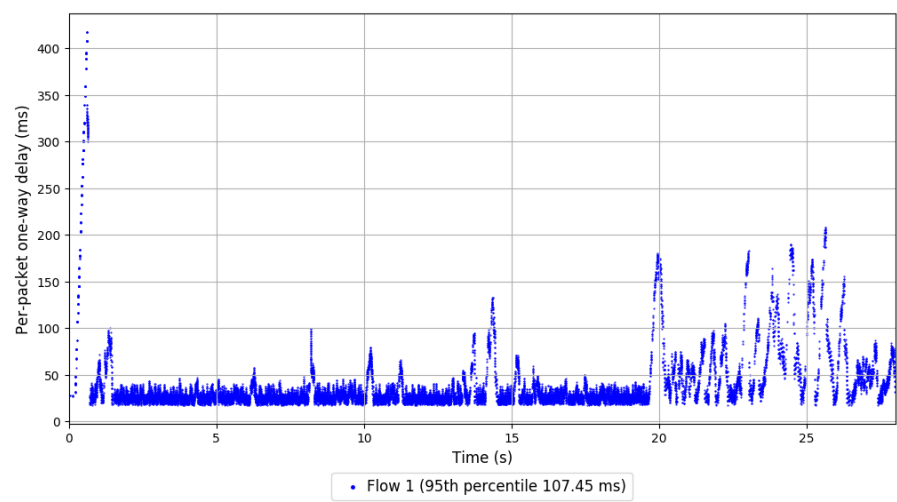
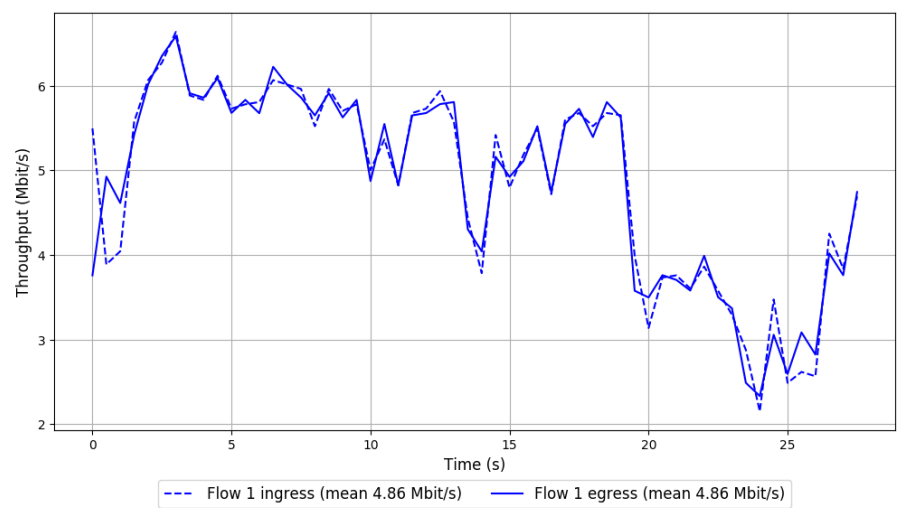


Run 3: Statistics of TaoVA-100x

Start at: 2018-01-18 11:12:52
End at: 2018-01-18 11:13:22
Local clock offset: -20.64 ms
Remote clock offset: -1.224 ms

Below is generated by plot.py at 2018-01-18 11:20:26
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.86 Mbit/s
95th percentile per-packet one-way delay: 107.452 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 4.86 Mbit/s
95th percentile per-packet one-way delay: 107.452 ms
Loss rate: 0.12%

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



Run 1: Statistics of TCP Vegas

Start at: 2018-01-18 09:53:25

End at: 2018-01-18 09:53:55

Local clock offset: -13.115 ms

Below is generated by plot.py at 2018-01-18 11:20:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.07 Mbit/s

95th percentile per-packet one-way delay: 156.533 ms

Loss rate: 0.12%

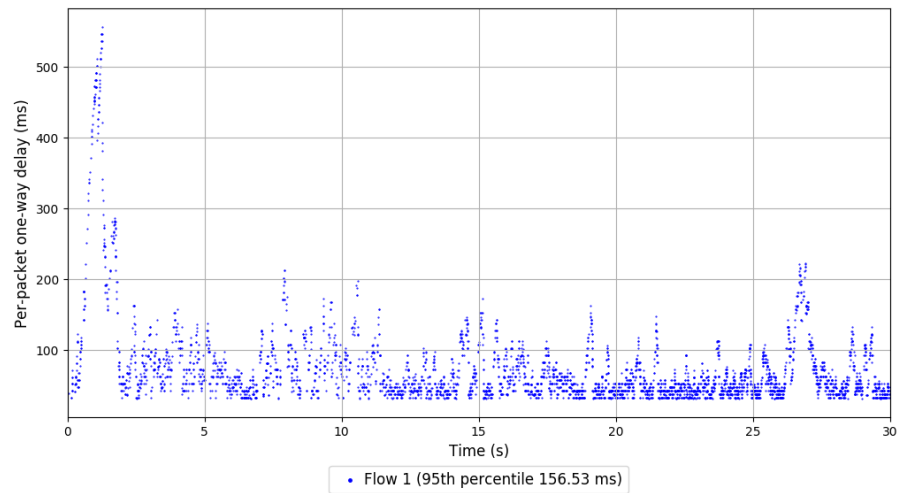
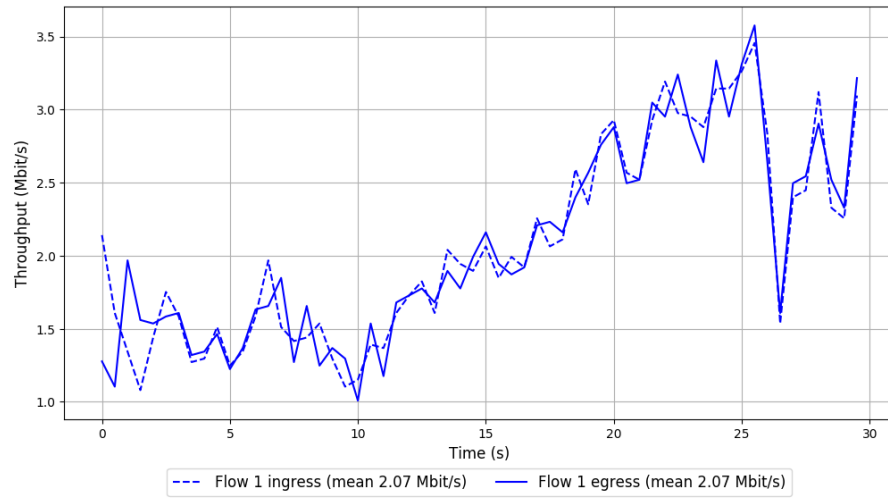
-- Flow 1:

Average throughput: 2.07 Mbit/s

95th percentile per-packet one-way delay: 156.533 ms

Loss rate: 0.12%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2018-01-18 10:26:55

End at: 2018-01-18 10:27:25

Local clock offset: -16.261 ms

Below is generated by plot.py at 2018-01-18 11:20:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.91 Mbit/s

95th percentile per-packet one-way delay: 161.351 ms

Loss rate: 0.25%

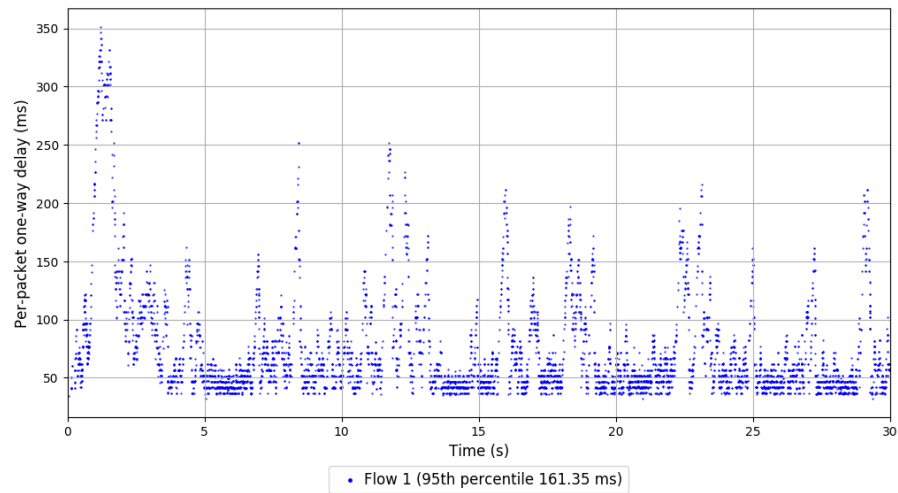
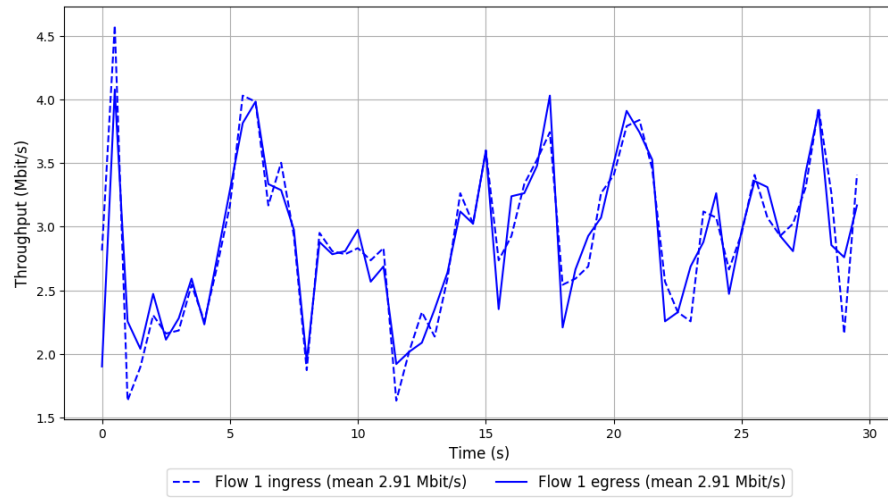
-- Flow 1:

Average throughput: 2.91 Mbit/s

95th percentile per-packet one-way delay: 161.351 ms

Loss rate: 0.25%

Run 2: Report of TCP Vegas — Data Link



Run 3: Statistics of TCP Vegas

Start at: 2018-01-18 11:01:02

End at: 2018-01-18 11:01:32

Local clock offset: -21.65 ms

Below is generated by plot.py at 2018-01-18 11:20:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.75 Mbit/s

95th percentile per-packet one-way delay: 49.242 ms

Loss rate: 0.20%

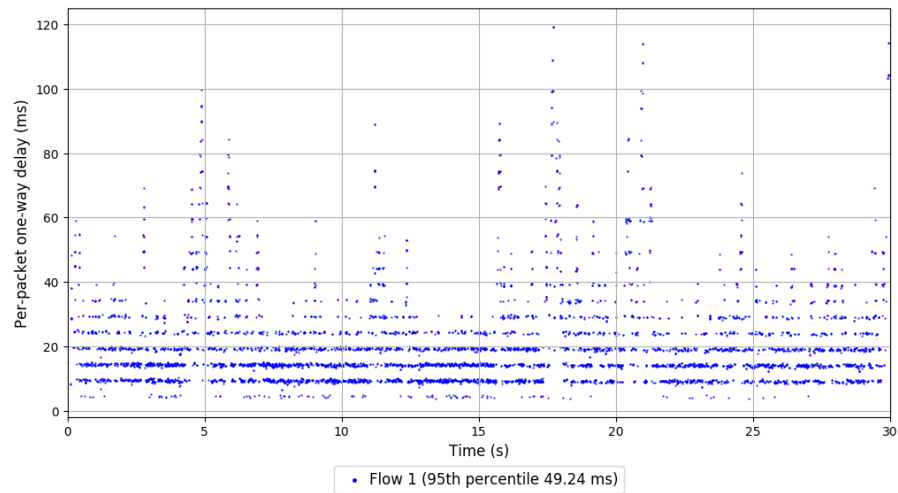
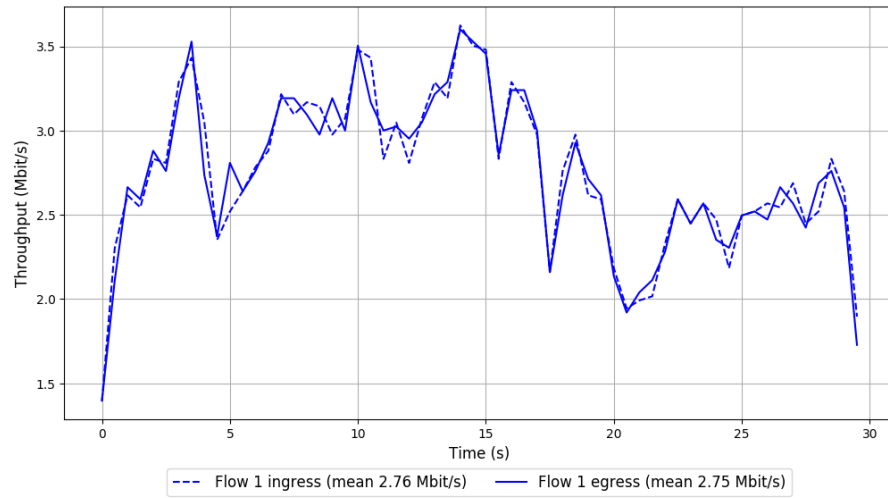
-- Flow 1:

Average throughput: 2.75 Mbit/s

95th percentile per-packet one-way delay: 49.242 ms

Loss rate: 0.20%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-01-18 10:02:42

End at: 2018-01-18 10:03:12

Local clock offset: -18.223 ms

Below is generated by plot.py at 2018-01-18 11:20:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.44 Mbit/s

95th percentile per-packet one-way delay: 694.264 ms

Loss rate: 3.84%

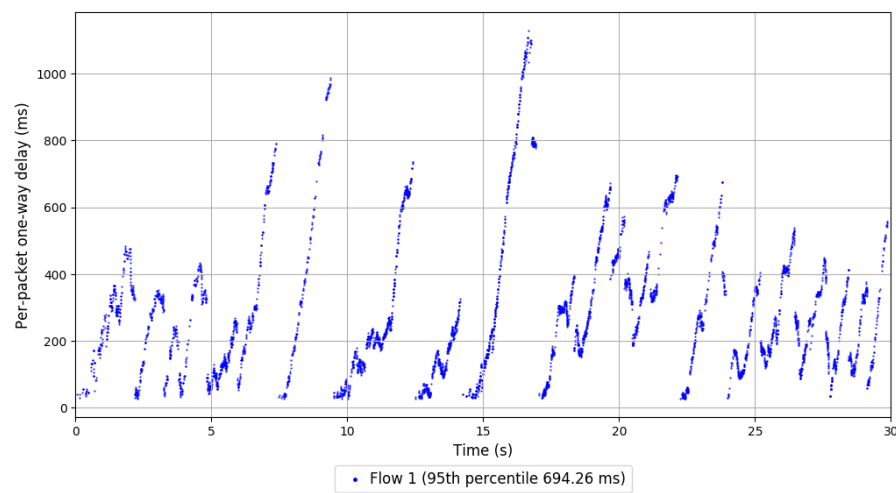
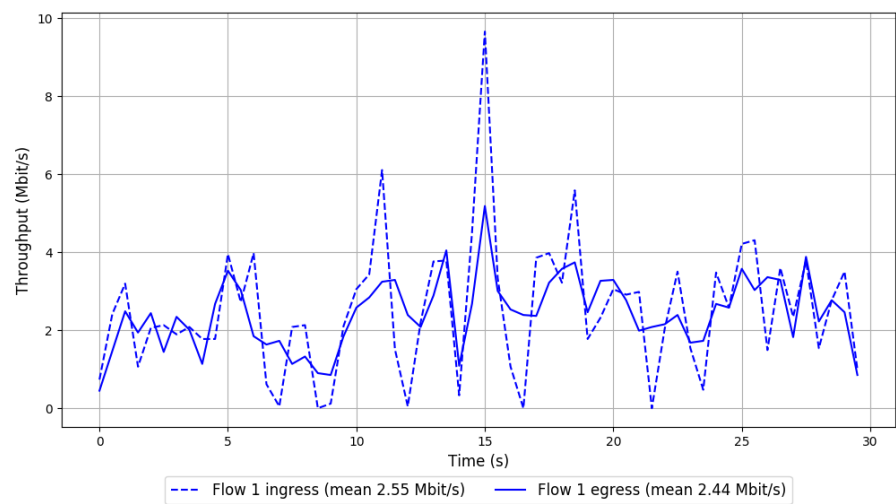
-- Flow 1:

Average throughput: 2.44 Mbit/s

95th percentile per-packet one-way delay: 694.264 ms

Loss rate: 3.84%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2018-01-18 10:36:22

End at: 2018-01-18 10:36:52

Local clock offset: -16.324 ms

Below is generated by plot.py at 2018-01-18 11:20:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.43 Mbit/s

95th percentile per-packet one-way delay: 518.824 ms

Loss rate: 1.56%

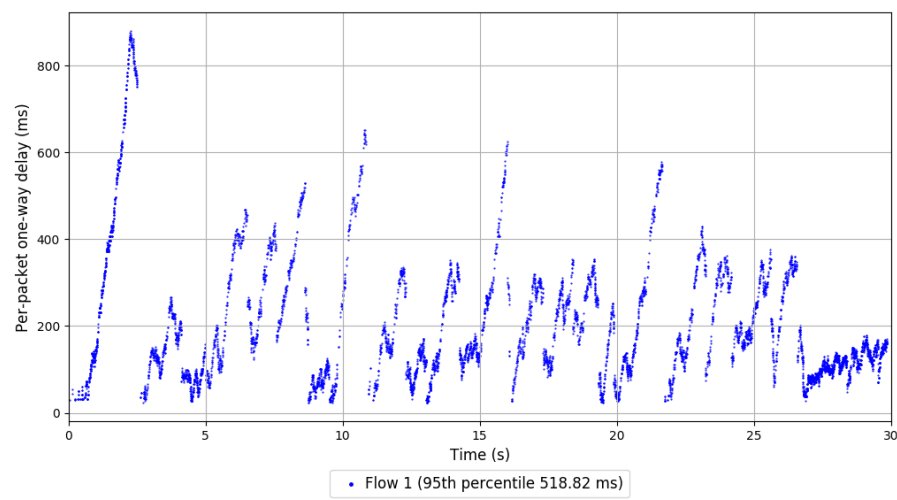
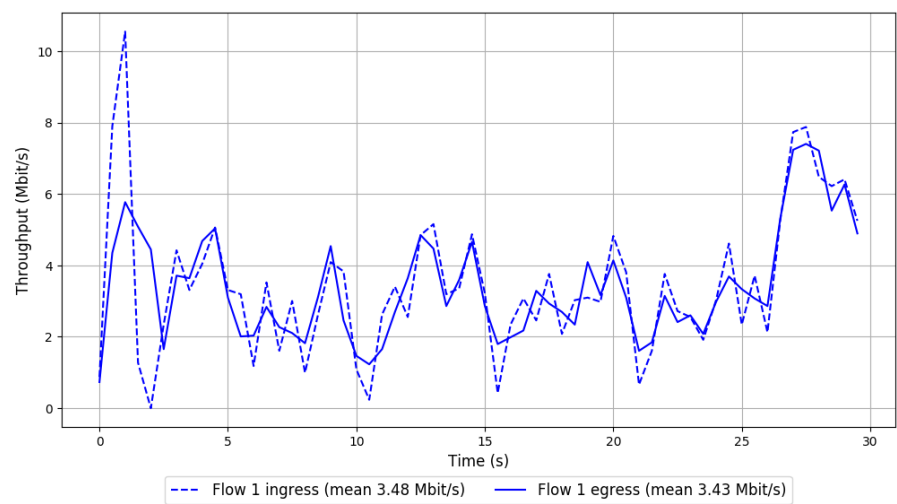
-- Flow 1:

Average throughput: 3.43 Mbit/s

95th percentile per-packet one-way delay: 518.824 ms

Loss rate: 1.56%

Run 2: Report of Verus — Data Link

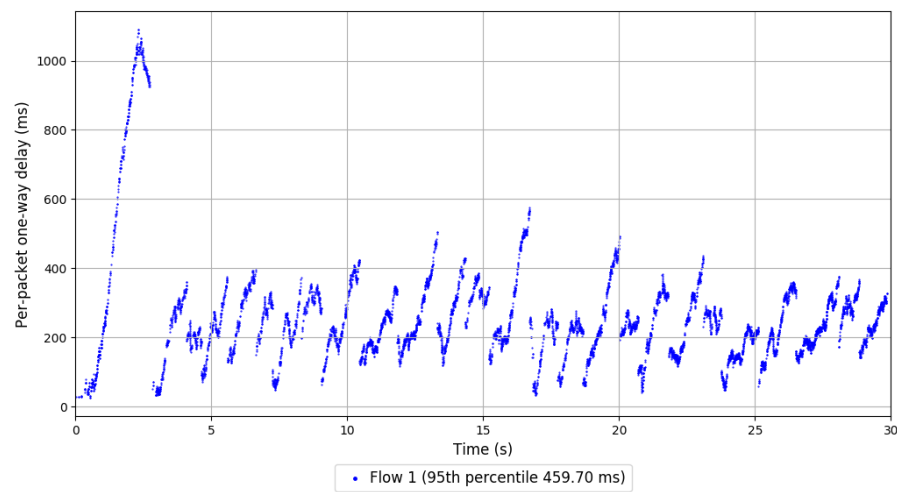
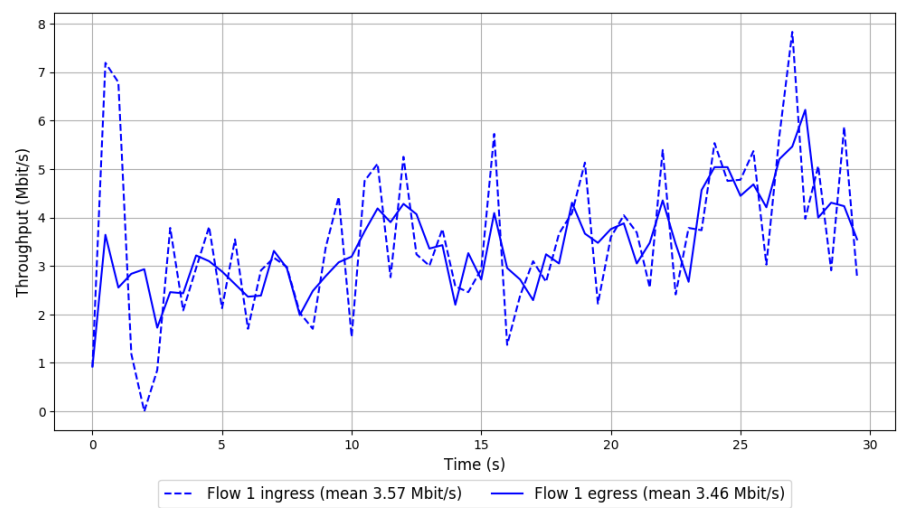


Run 3: Statistics of Verus

Start at: 2018-01-18 11:08:26
End at: 2018-01-18 11:08:56
Local clock offset: -19.998 ms
Remote clock offset: 1.707 ms

Below is generated by plot.py at 2018-01-18 11:20:26
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.46 Mbit/s
95th percentile per-packet one-way delay: 459.698 ms
Loss rate: 2.67%
-- Flow 1:
Average throughput: 3.46 Mbit/s
95th percentile per-packet one-way delay: 459.698 ms
Loss rate: 2.67%

Run 3: Report of Verus — Data Link



Run 1: Statistics of Copa

Start at: 2018-01-18 10:06:23

End at: 2018-01-18 10:06:53

Local clock offset: -19.472 ms

Below is generated by plot.py at 2018-01-18 11:20:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.13 Mbit/s

95th percentile per-packet one-way delay: 123.671 ms

Loss rate: 0.13%

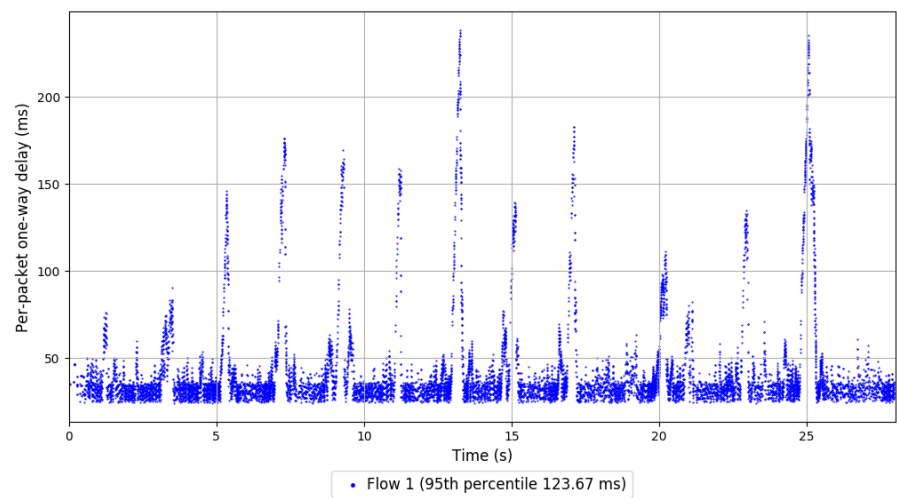
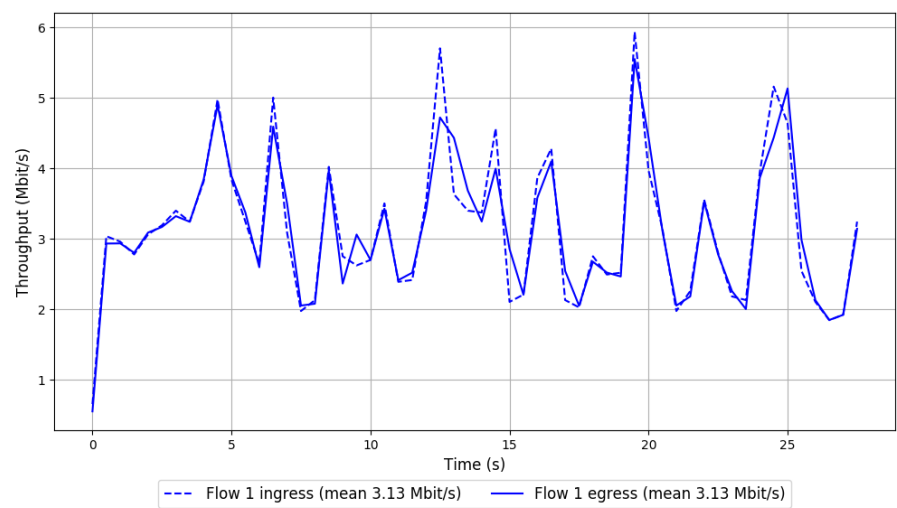
-- Flow 1:

Average throughput: 3.13 Mbit/s

95th percentile per-packet one-way delay: 123.671 ms

Loss rate: 0.13%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2018-01-18 10:40:05

End at: 2018-01-18 10:40:35

Local clock offset: -17.272 ms

Below is generated by plot.py at 2018-01-18 11:20:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.01 Mbit/s

95th percentile per-packet one-way delay: 94.957 ms

Loss rate: 0.31%

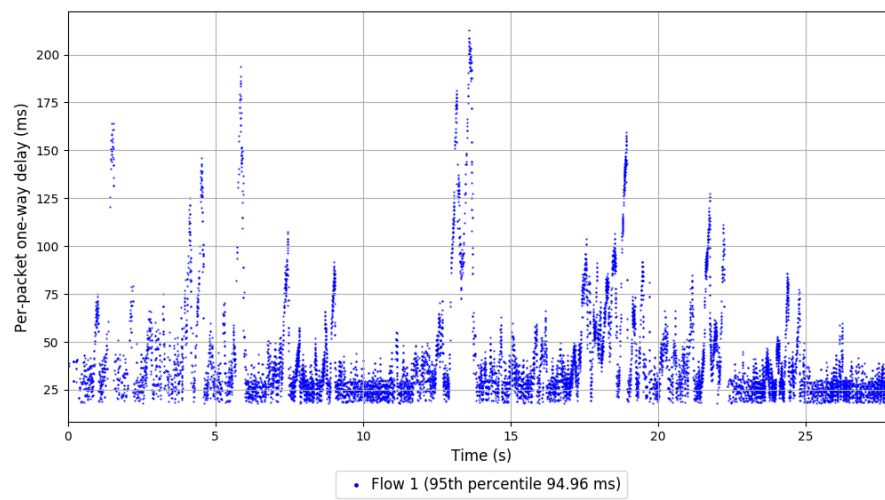
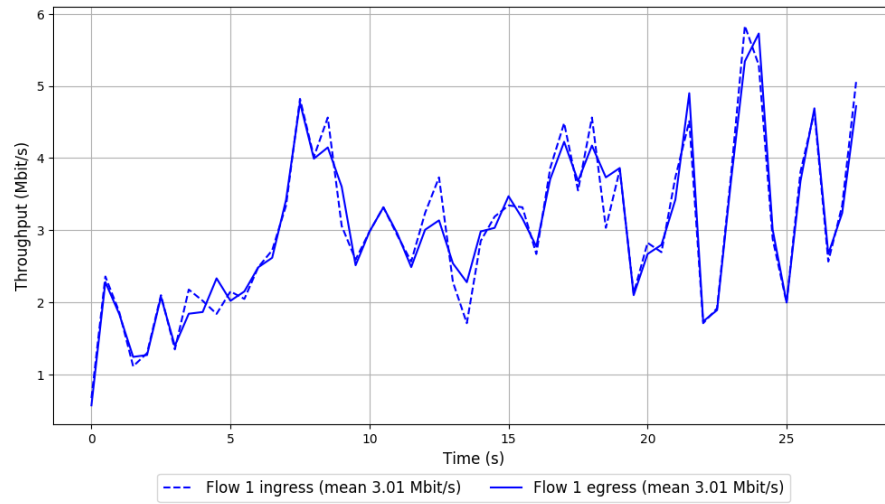
-- Flow 1:

Average throughput: 3.01 Mbit/s

95th percentile per-packet one-way delay: 94.957 ms

Loss rate: 0.31%

Run 2: Report of Copa — Data Link

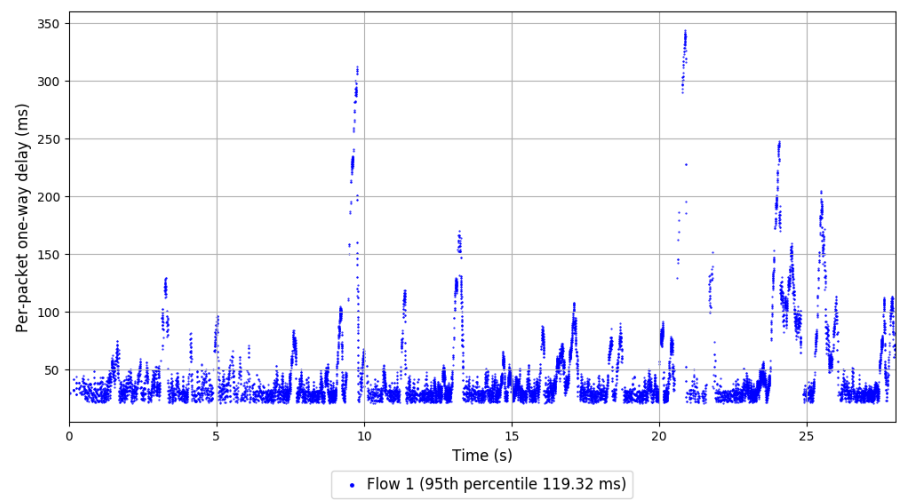
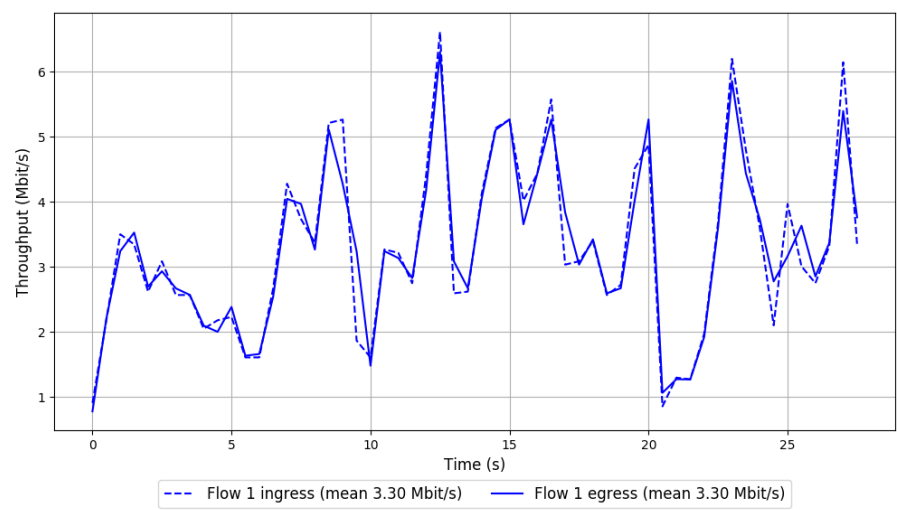


Run 3: Statistics of Copa

Start at: 2018-01-18 11:10:39
End at: 2018-01-18 11:11:09
Local clock offset: -20.59 ms
Remote clock offset: 0.341 ms

Below is generated by plot.py at 2018-01-18 11:20:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.30 Mbit/s
95th percentile per-packet one-way delay: 119.322 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 3.30 Mbit/s
95th percentile per-packet one-way delay: 119.322 ms
Loss rate: 0.27%

Run 3: Report of Copa — Data Link



Run 1: Statistics of FillP

Start at: 2018-01-18 09:47:51

End at: 2018-01-18 09:48:22

Local clock offset: -13.599 ms

Below is generated by plot.py at 2018-01-18 11:20:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.73 Mbit/s

95th percentile per-packet one-way delay: 1118.960 ms

Loss rate: 89.30%

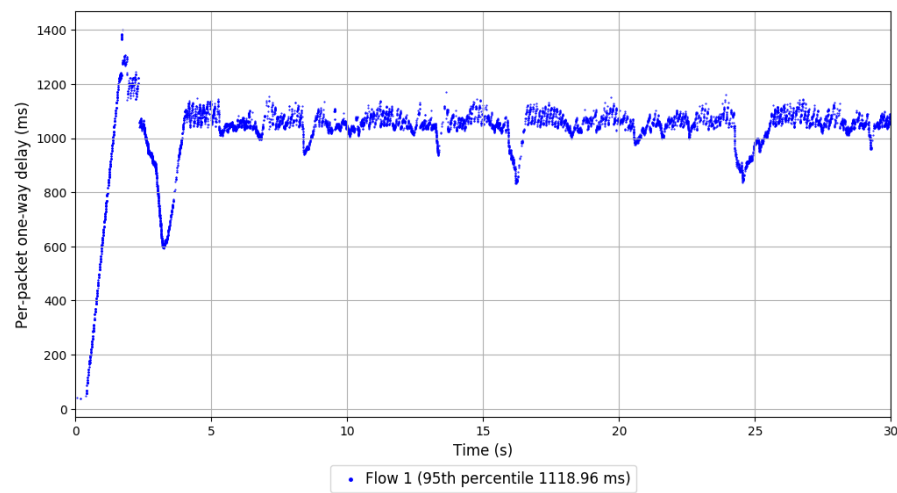
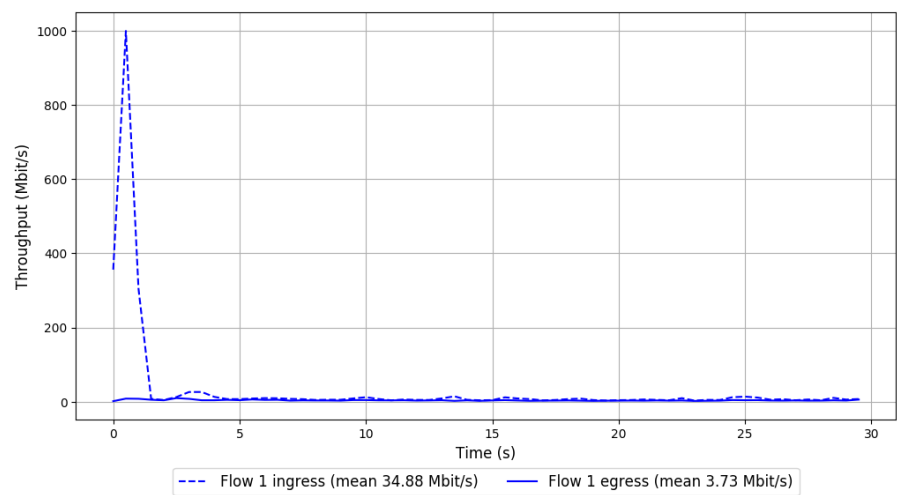
-- Flow 1:

Average throughput: 3.73 Mbit/s

95th percentile per-packet one-way delay: 1118.960 ms

Loss rate: 89.30%

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2018-01-18 10:21:18

End at: 2018-01-18 10:21:48

Local clock offset: -20.838 ms

Below is generated by plot.py at 2018-01-18 11:20:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.71 Mbit/s

95th percentile per-packet one-way delay: 1134.998 ms

Loss rate: 90.34%

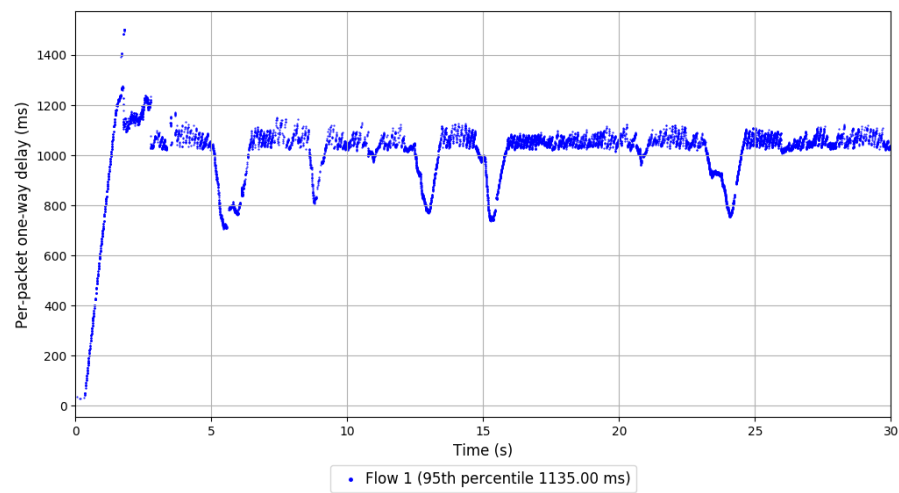
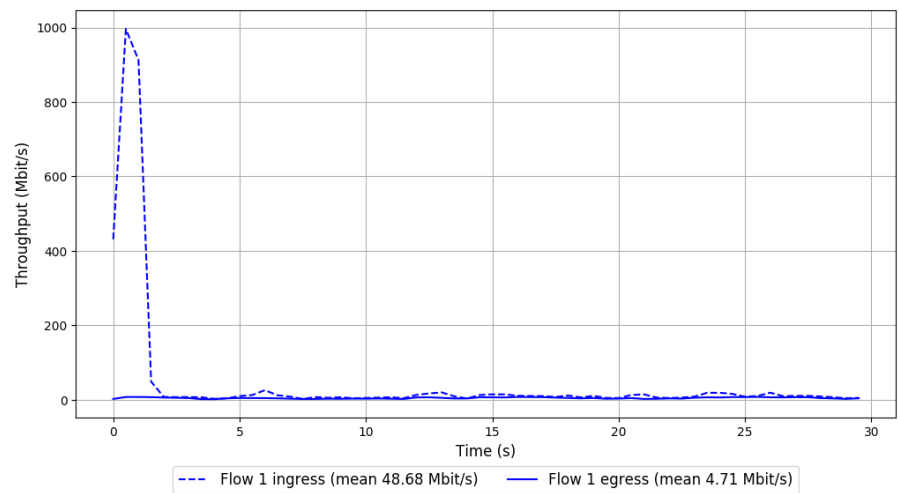
-- Flow 1:

Average throughput: 4.71 Mbit/s

95th percentile per-packet one-way delay: 1134.998 ms

Loss rate: 90.34%

Run 2: Report of FillP — Data Link



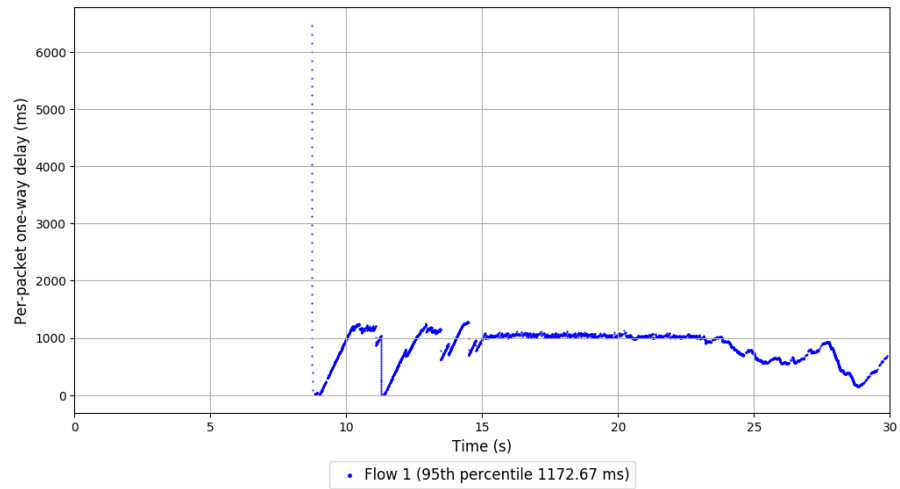
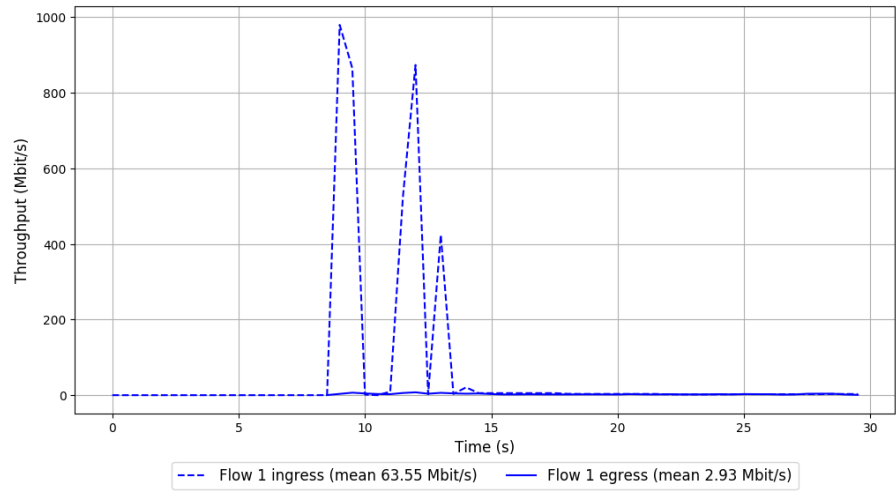
Run 3: Statistics of FillP

Start at: 2018-01-18 10:55:29

End at: 2018-01-18 10:55:59

Local clock offset: -21.002 ms

Run 3: Report of FillP — Data Link



Run 1: Statistics of Indigo

Start at: 2018-01-18 09:49:43

End at: 2018-01-18 09:50:13

Local clock offset: -13.278 ms

Below is generated by plot.py at 2018-01-18 11:20:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.84 Mbit/s

95th percentile per-packet one-way delay: 68.497 ms

Loss rate: 0.09%

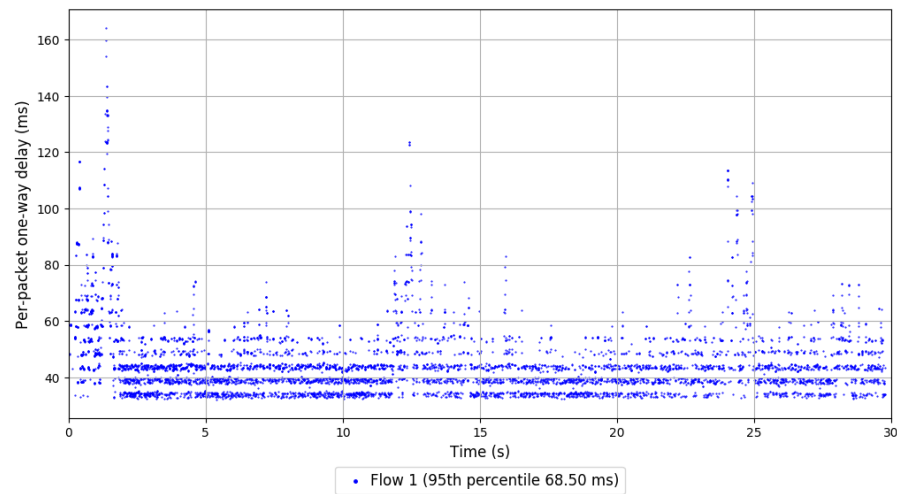
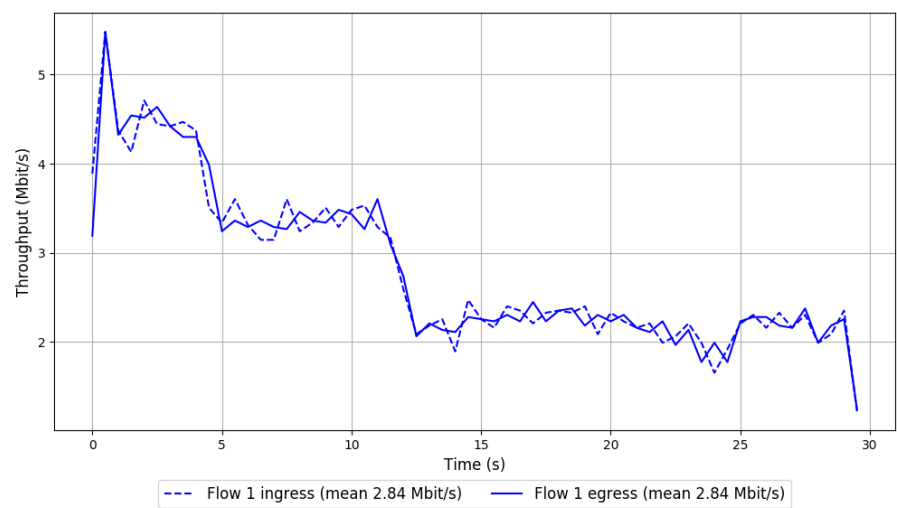
-- Flow 1:

Average throughput: 2.84 Mbit/s

95th percentile per-packet one-way delay: 68.497 ms

Loss rate: 0.09%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-01-18 10:23:15

End at: 2018-01-18 10:23:45

Local clock offset: -19.325 ms

Below is generated by plot.py at 2018-01-18 11:20:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.20 Mbit/s

95th percentile per-packet one-way delay: 86.798 ms

Loss rate: 0.07%

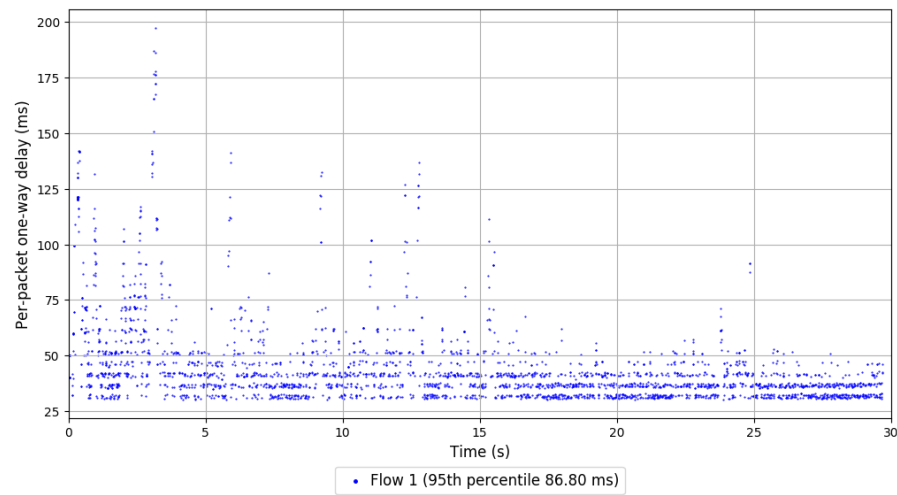
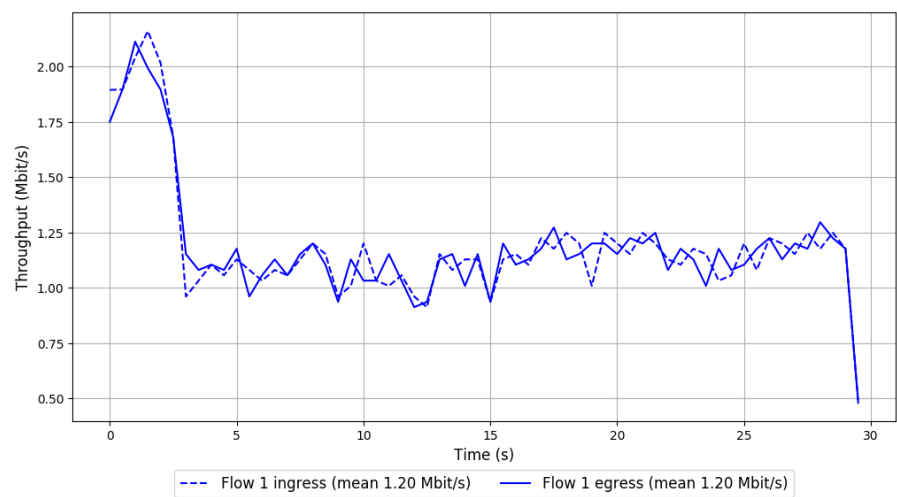
-- Flow 1:

Average throughput: 1.20 Mbit/s

95th percentile per-packet one-way delay: 86.798 ms

Loss rate: 0.07%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-01-18 10:57:21

End at: 2018-01-18 10:57:51

Local clock offset: -21.812 ms

Below is generated by plot.py at 2018-01-18 11:20:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.03 Mbit/s

95th percentile per-packet one-way delay: 54.768 ms

Loss rate: 0.04%

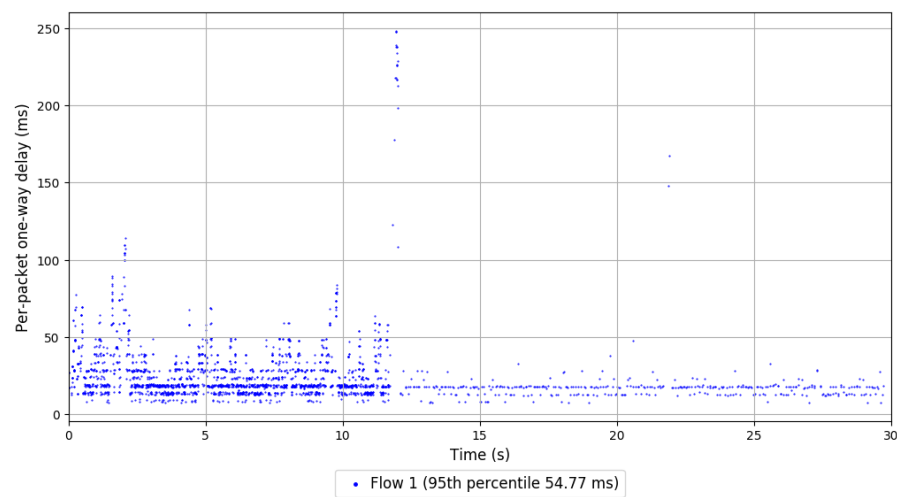
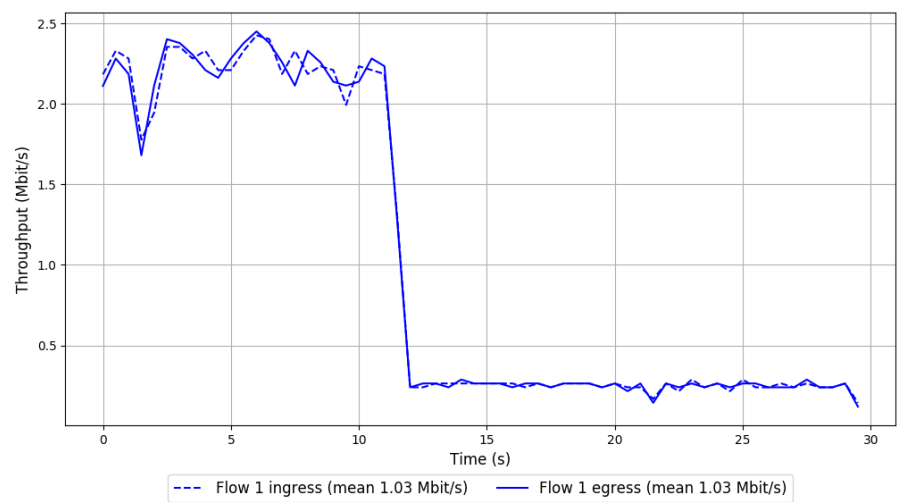
-- Flow 1:

Average throughput: 1.03 Mbit/s

95th percentile per-packet one-way delay: 54.768 ms

Loss rate: 0.04%

Run 3: Report of Indigo — Data Link



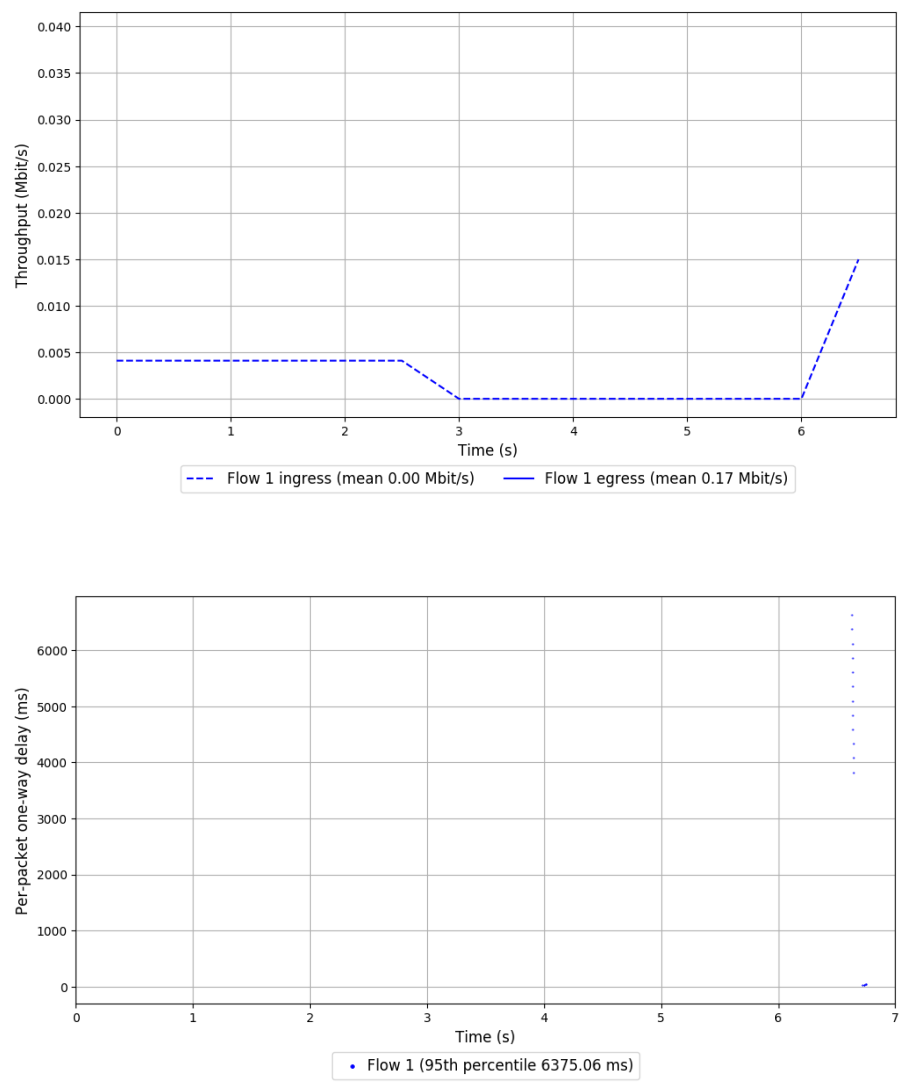
Run 1: Statistics of Vivace-latency

Start at: 2018-01-18 09:57:09

End at: 2018-01-18 09:57:39

Local clock offset: -14.409 ms

Run 1: Report of Vivace-latency — Data Link



Run 2: Statistics of Vivace-latency

Start at: 2018-01-18 10:30:44

End at: 2018-01-18 10:31:15

Local clock offset: -17.702 ms

Below is generated by plot.py at 2018-01-18 11:20:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.65 Mbit/s

95th percentile per-packet one-way delay: 277.536 ms

Loss rate: 0.25%

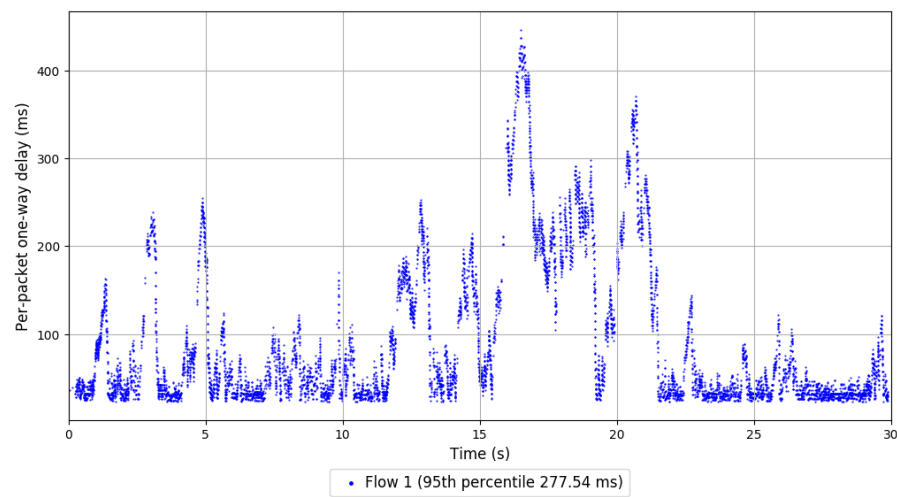
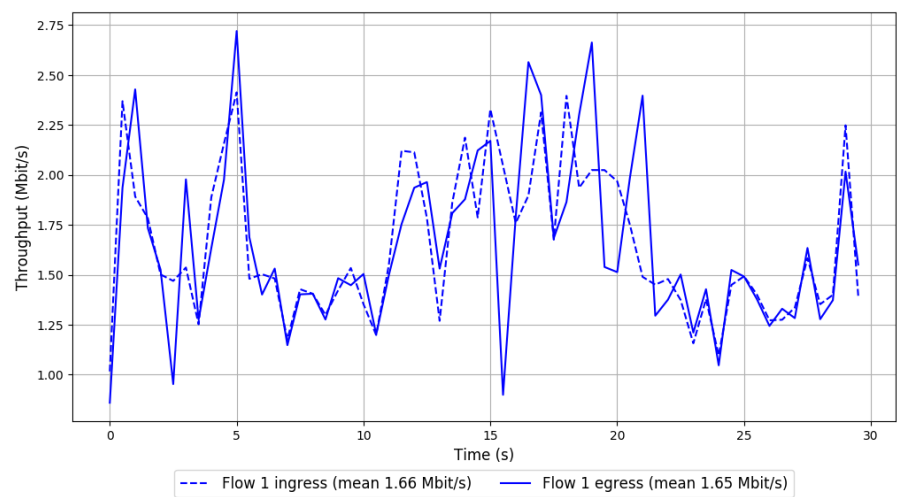
-- Flow 1:

Average throughput: 1.65 Mbit/s

95th percentile per-packet one-way delay: 277.536 ms

Loss rate: 0.25%

Run 2: Report of Vivace-latency — Data Link



Run 3: Statistics of Vivace-latency

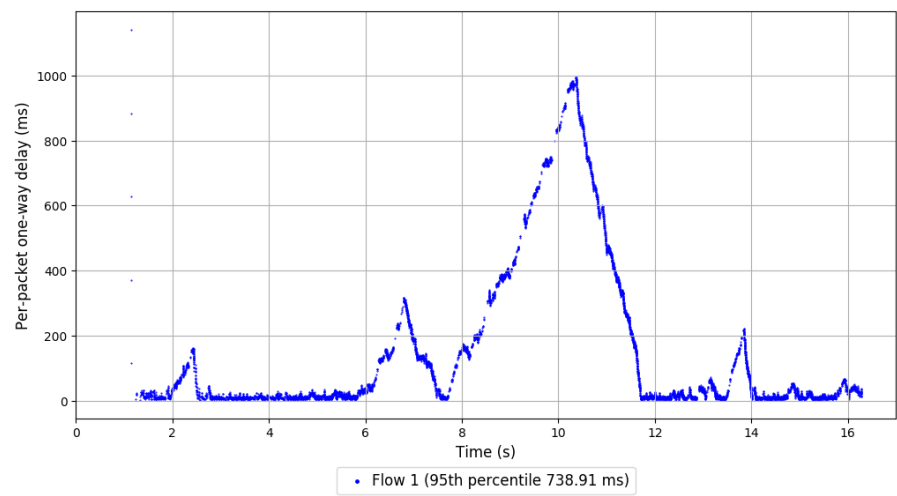
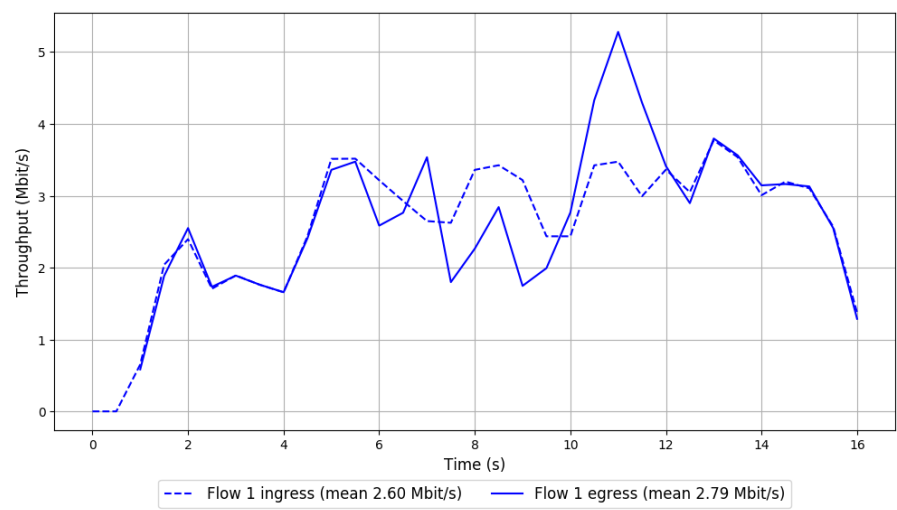
Start at: 2018-01-18 11:04:30

End at: 2018-01-18 11:05:00

Local clock offset: -25.624 ms

Remote clock offset: -25.152 ms

Run 3: Report of Vivace-latency — Data Link

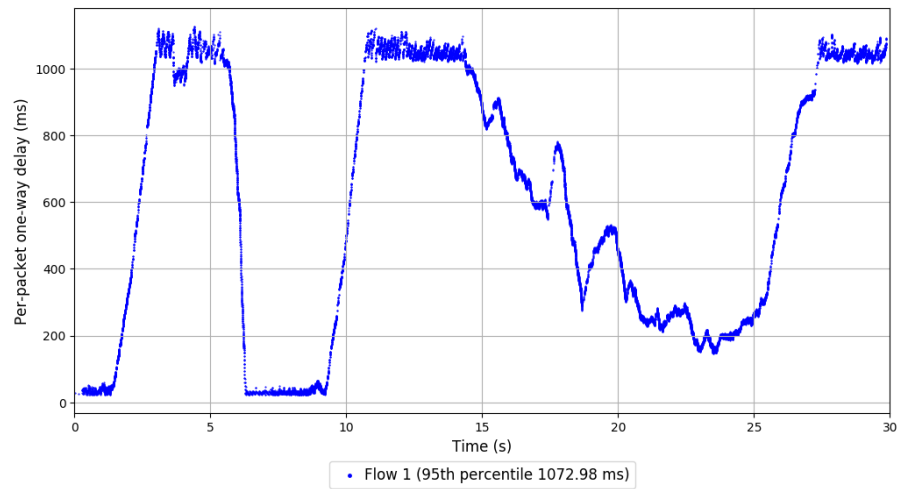
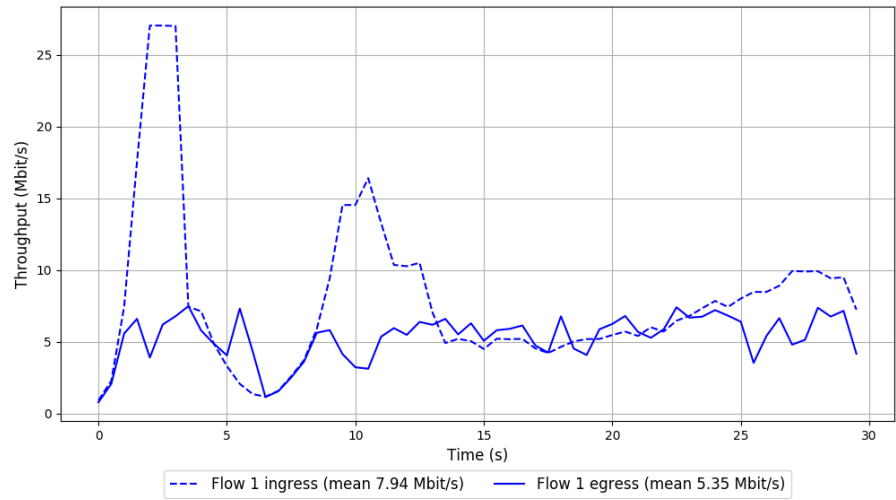


```
Run 1: Statistics of Vivace-loss

Start at: 2018-01-18 10:13:53
End at: 2018-01-18 10:14:23
Local clock offset: -21.262 ms

# Below is generated by plot.py at 2018-01-18 11:20:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.35 Mbit/s
95th percentile per-packet one-way delay: 1072.982 ms
Loss rate: 32.72%
-- Flow 1:
Average throughput: 5.35 Mbit/s
95th percentile per-packet one-way delay: 1072.982 ms
Loss rate: 32.72%
```

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-01-18 10:47:56

End at: 2018-01-18 10:48:26

Local clock offset: -17.895 ms

Below is generated by plot.py at 2018-01-18 11:20:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.71 Mbit/s

95th percentile per-packet one-way delay: 1061.175 ms

Loss rate: 24.92%

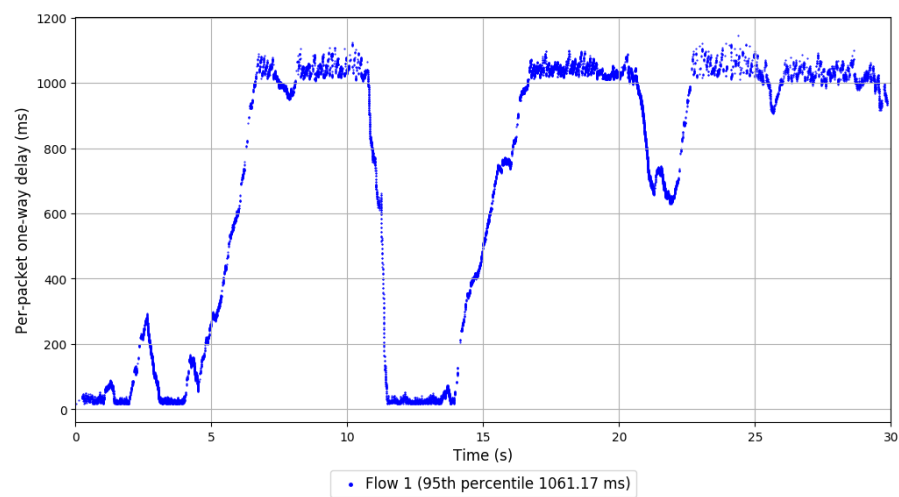
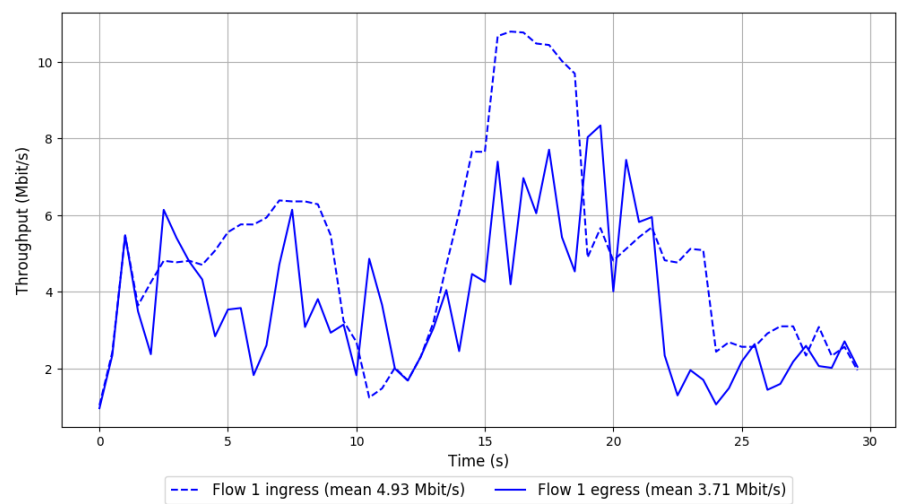
-- Flow 1:

Average throughput: 3.71 Mbit/s

95th percentile per-packet one-way delay: 1061.175 ms

Loss rate: 24.92%

Run 2: Report of Vivace-loss — Data Link

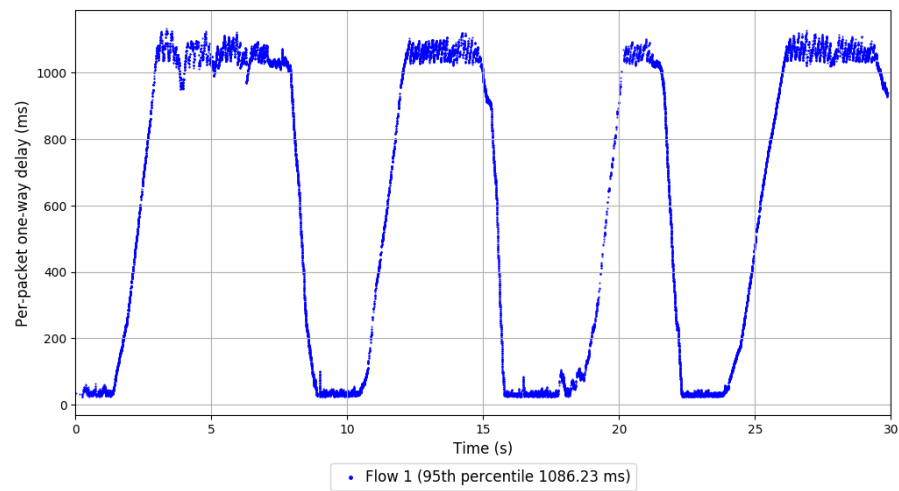
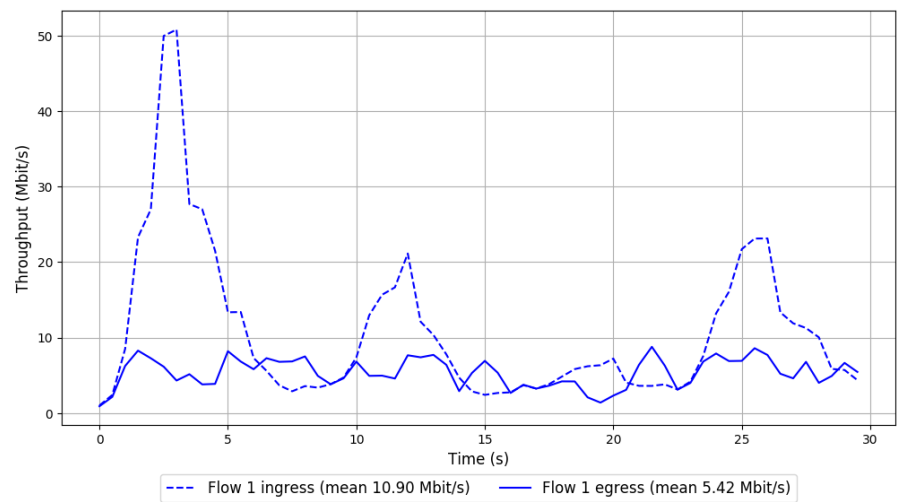


Run 3: Statistics of Vivace-loss

Start at: 2018-01-18 11:15:04
End at: 2018-01-18 11:15:34
Local clock offset: -20.115 ms
Remote clock offset: 0.859 ms

Below is generated by plot.py at 2018-01-18 11:20:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.42 Mbit/s
95th percentile per-packet one-way delay: 1086.230 ms
Loss rate: 50.36%
-- Flow 1:
Average throughput: 5.42 Mbit/s
95th percentile per-packet one-way delay: 1086.230 ms
Loss rate: 50.36%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-01-18 09:51:34

End at: 2018-01-18 09:52:04

Local clock offset: -15.252 ms

Below is generated by plot.py at 2018-01-18 11:20:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.20 Mbit/s

95th percentile per-packet one-way delay: 218.092 ms

Loss rate: 0.03%

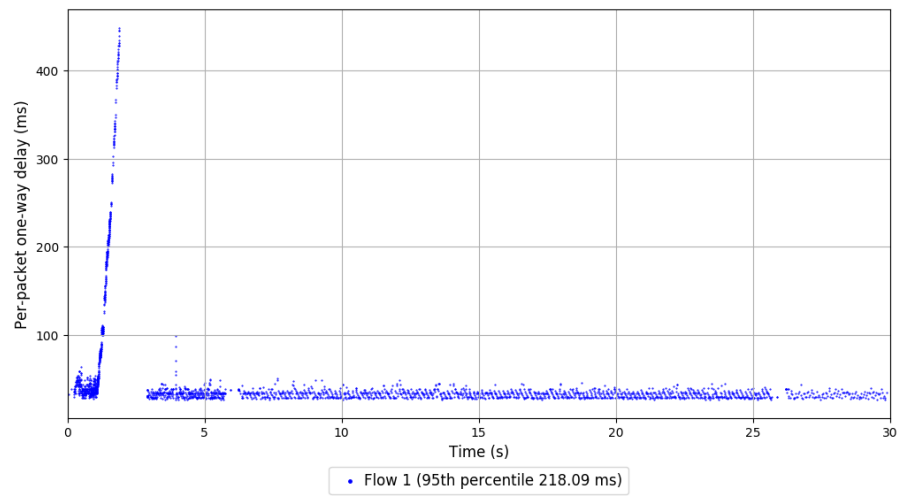
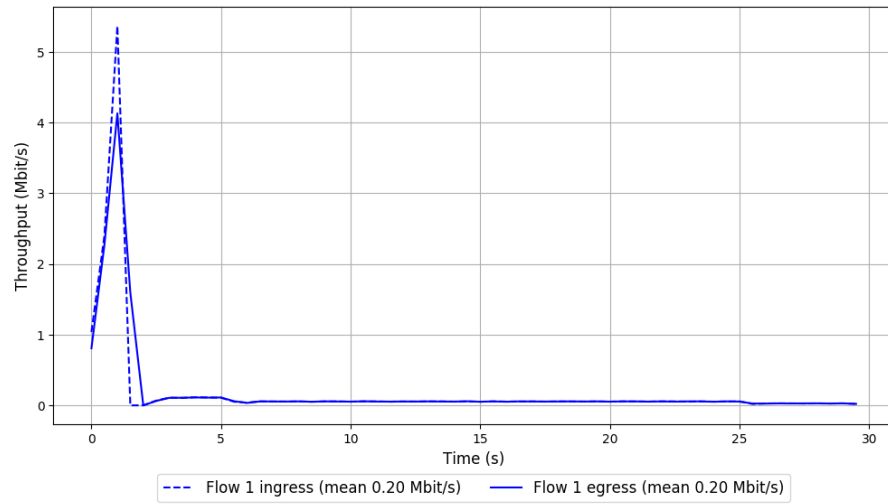
-- Flow 1:

Average throughput: 0.20 Mbit/s

95th percentile per-packet one-way delay: 218.092 ms

Loss rate: 0.03%

Run 1: Report of Vivace-LTE — Data Link



Run 2: Statistics of Vivace-LTE

Start at: 2018-01-18 10:25:05

End at: 2018-01-18 10:25:35

Local clock offset: -15.646 ms

Below is generated by plot.py at 2018-01-18 11:20:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.46 Mbit/s

95th percentile per-packet one-way delay: 171.621 ms

Loss rate: 0.00%

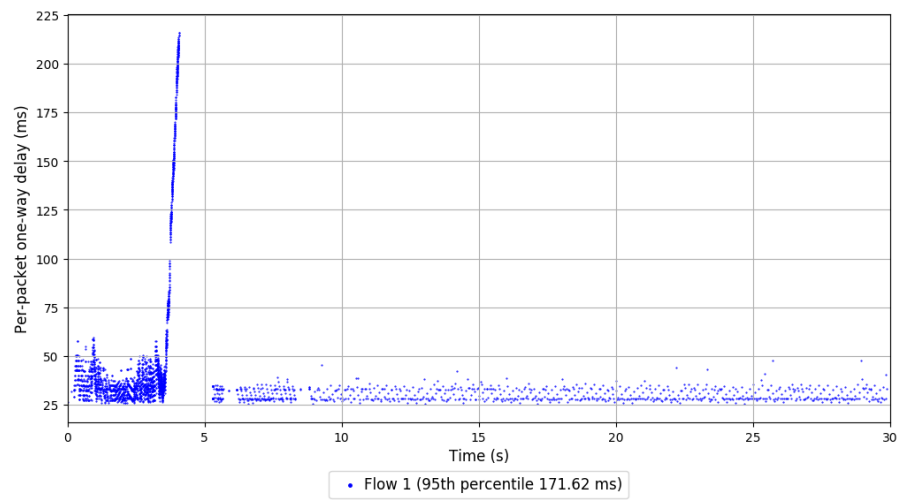
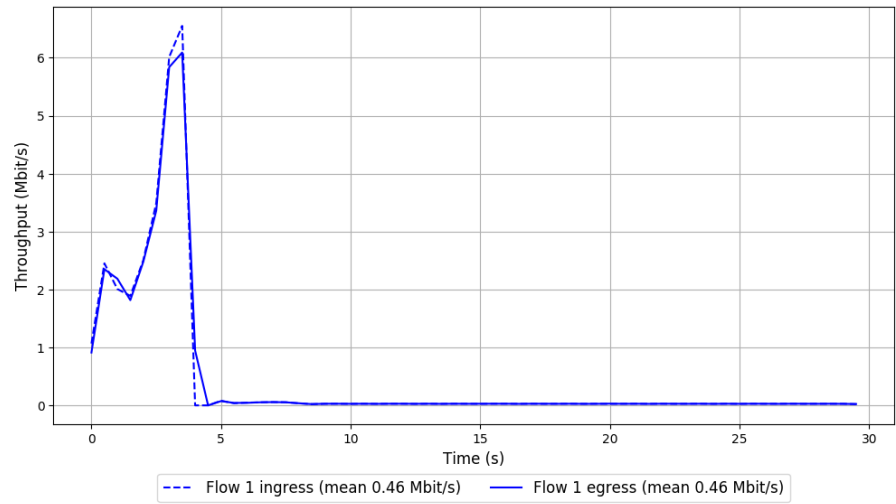
-- Flow 1:

Average throughput: 0.46 Mbit/s

95th percentile per-packet one-way delay: 171.621 ms

Loss rate: 0.00%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-01-18 10:59:11

End at: 2018-01-18 10:59:41

Local clock offset: -22.638 ms

Below is generated by plot.py at 2018-01-18 11:20:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.99 Mbit/s

95th percentile per-packet one-way delay: 73.799 ms

Loss rate: 0.01%

-- Flow 1:

Average throughput: 1.99 Mbit/s

95th percentile per-packet one-way delay: 73.799 ms

Loss rate: 0.01%

Run 3: Report of Vivace-LTE — Data Link

