

Pantheon Report

Generated at 2018-02-02 20:37:31 (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).

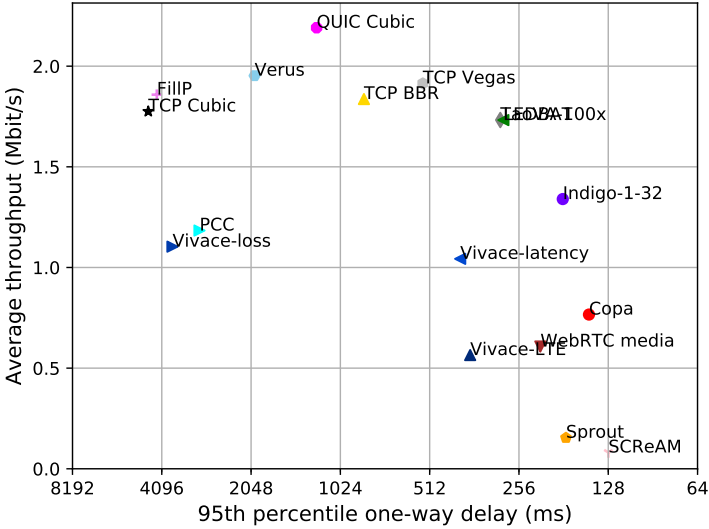
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

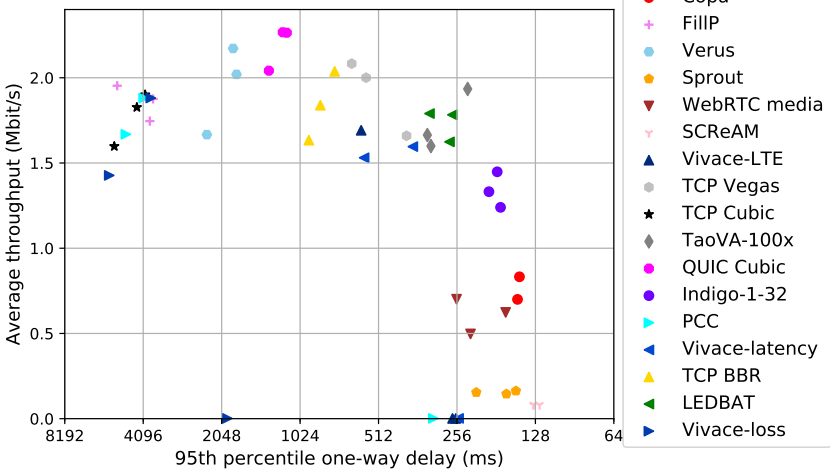
Git summary:

```
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-quick @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaeab30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/vivace @ 7a4ba531e75b4a6f66f5c4580192120401784ce3
third_party/webRTC @ a488197ddd041ace68a42849b2540ad834825f42
```

test from AWS 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	1.84	852.83	1.12
TCP Cubic	3	1.78	4548.97	18.28
LEDBAT	3	1.73	288.99	0.58
PCC	3	1.18	3055.90	44.15
QUIC Cubic	3	2.19	1231.44	4.59
SCReAM	3	0.08	127.89	0.00
WebRTC media	3	0.61	216.87	0.19
Sprout	3	0.15	177.75	0.09
TaoVA-100x	3	1.73	295.92	0.22
TCP Vegas	3	1.91	539.98	0.55
Verus	3	1.95	1993.33	3.92
Copa	2	0.76	148.66	0.08
FillP	3	1.86	4256.73	32.26
Indigo-1-32	3	1.34	182.20	0.04
Vivace-latency	3	1.04	404.11	0.67
Vivace-loss	3	1.10	3769.40	16.21
Vivace-LTE	3	0.56	373.93	0.02

Run 1: Statistics of TCP BBR

Start at: 2018-02-02 19:49:15

End at: 2018-02-02 19:49:45

Local clock offset: 0.4 ms

Remote clock offset: 4.449 ms

Below is generated by plot.py at 2018-02-02 20:36:55

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.63 Mbit/s

95th percentile per-packet one-way delay: 947.729 ms

Loss rate: 1.38%

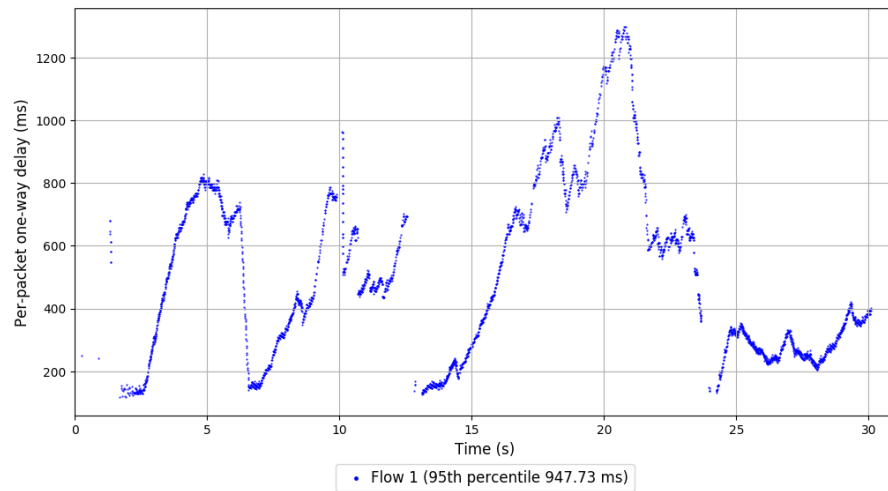
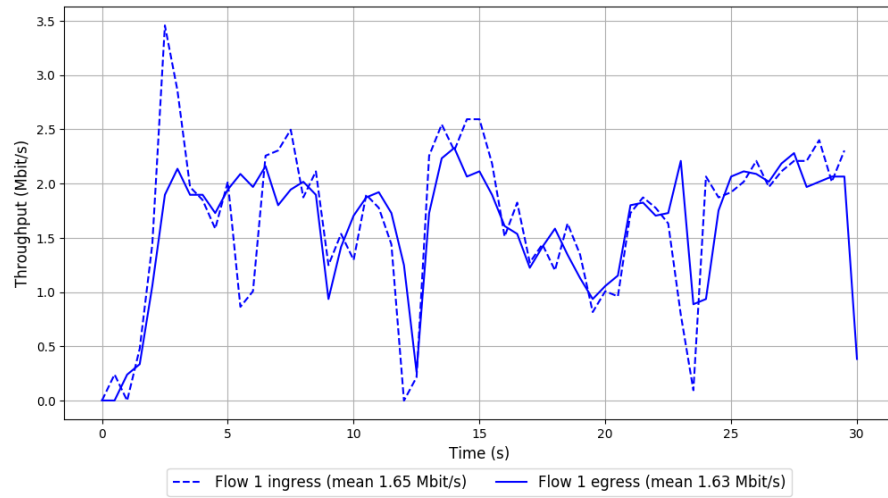
-- Flow 1:

Average throughput: 1.63 Mbit/s

95th percentile per-packet one-way delay: 947.729 ms

Loss rate: 1.38%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-02-02 20:09:29

End at: 2018-02-02 20:09:59

Local clock offset: 0.389 ms

Remote clock offset: 4.759 ms

Below is generated by plot.py at 2018-02-02 20:36:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.84 Mbit/s

95th percentile per-packet one-way delay: 856.134 ms

Loss rate: 1.23%

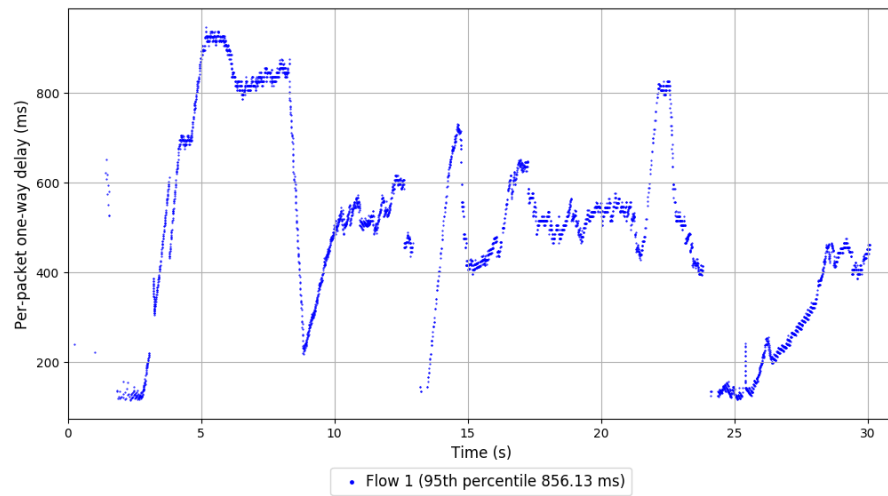
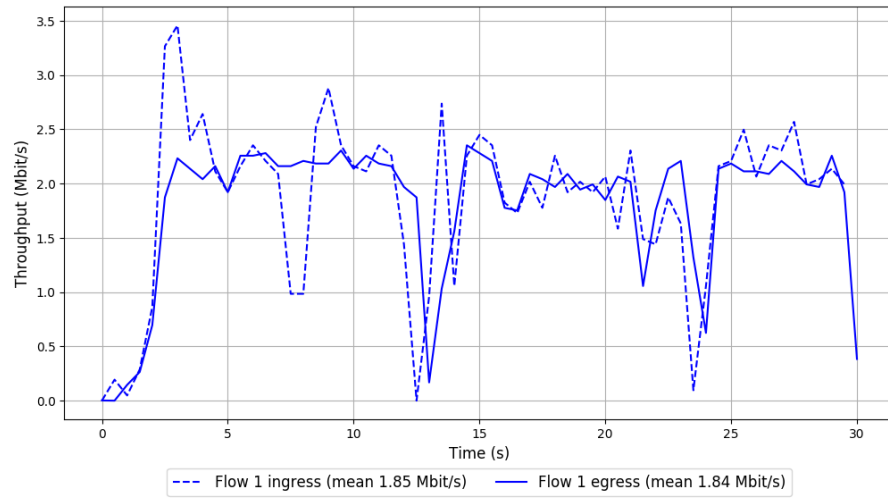
-- Flow 1:

Average throughput: 1.84 Mbit/s

95th percentile per-packet one-way delay: 856.134 ms

Loss rate: 1.23%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-02-02 20:29:36

End at: 2018-02-02 20:30:06

Local clock offset: 0.452 ms

Remote clock offset: 5.035 ms

Below is generated by plot.py at 2018-02-02 20:36:57

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.04 Mbit/s

95th percentile per-packet one-way delay: 754.625 ms

Loss rate: 0.76%

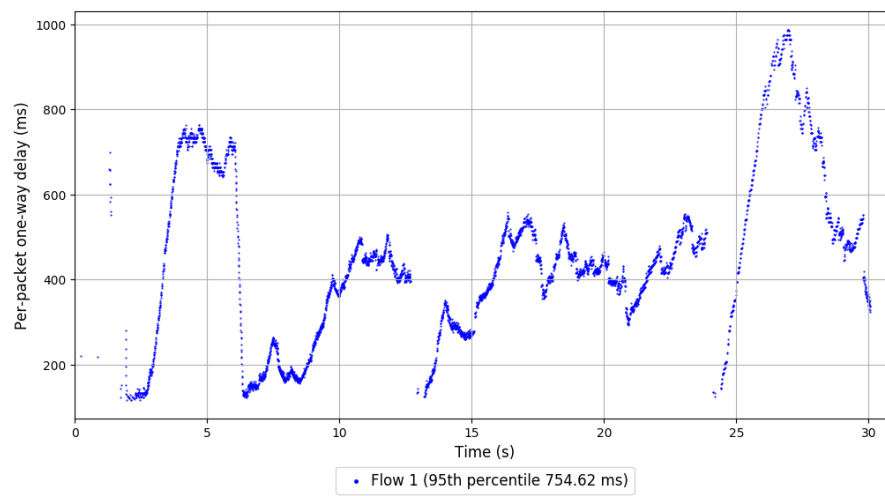
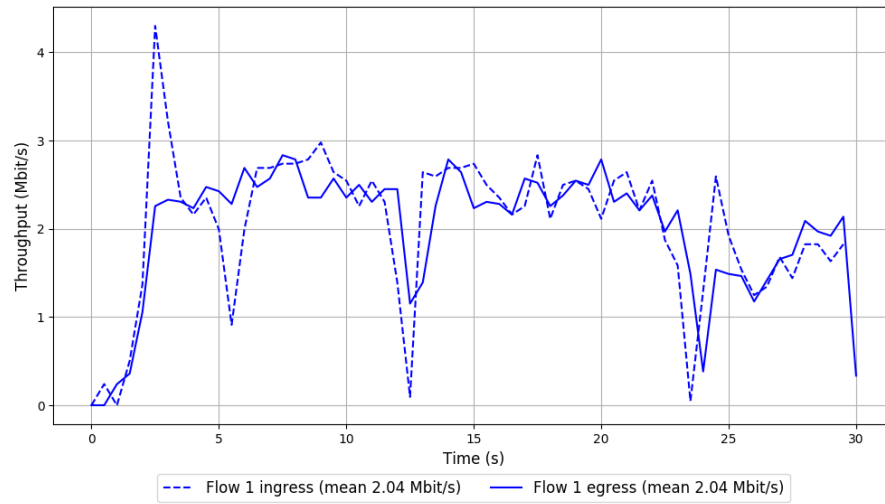
-- Flow 1:

Average throughput: 2.04 Mbit/s

95th percentile per-packet one-way delay: 754.625 ms

Loss rate: 0.76%

Run 3: Report of TCP BBR — Data Link

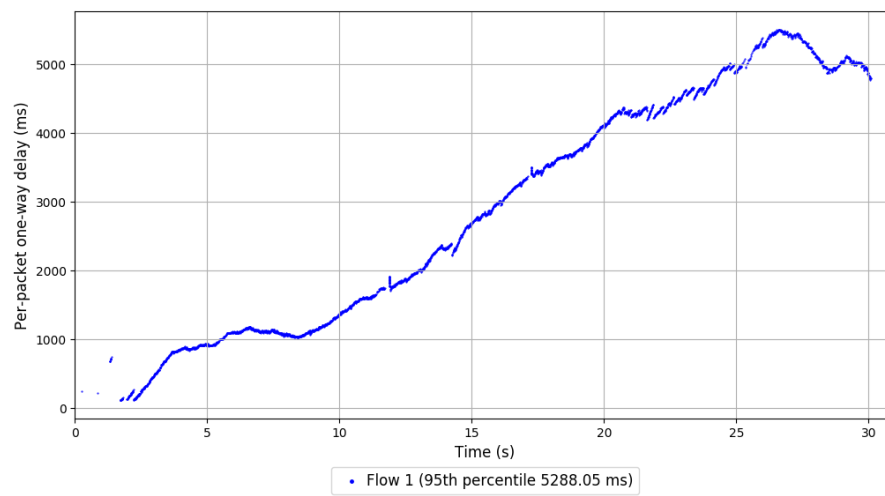
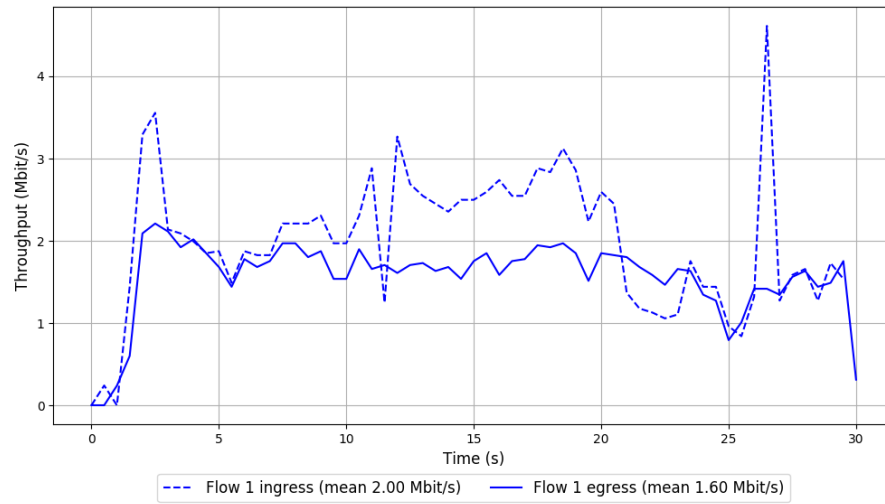


Run 1: Statistics of TCP Cubic

Start at: 2018-02-02 19:42:10
End at: 2018-02-02 19:42:40
Local clock offset: 0.379 ms
Remote clock offset: -0.497 ms

Below is generated by plot.py at 2018-02-02 20:36:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.60 Mbit/s
95th percentile per-packet one-way delay: 5288.046 ms
Loss rate: 20.32%
-- Flow 1:
Average throughput: 1.60 Mbit/s
95th percentile per-packet one-way delay: 5288.046 ms
Loss rate: 20.32%

Run 1: Report of TCP Cubic — Data Link

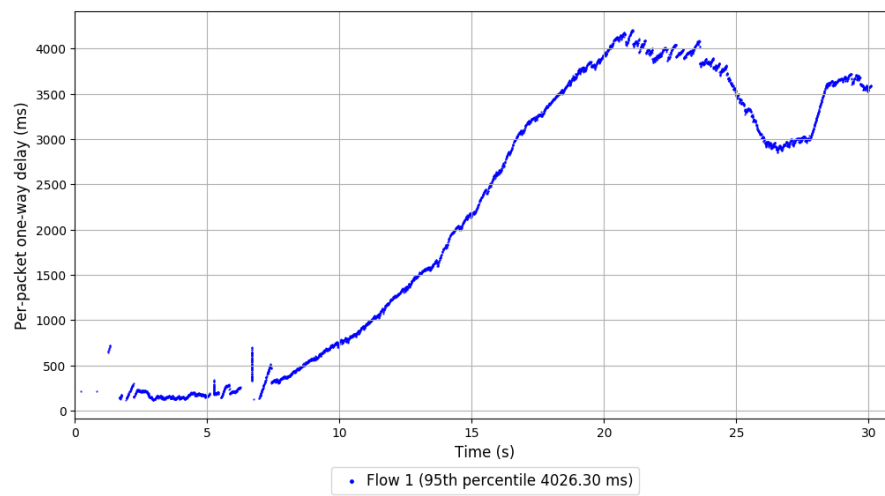
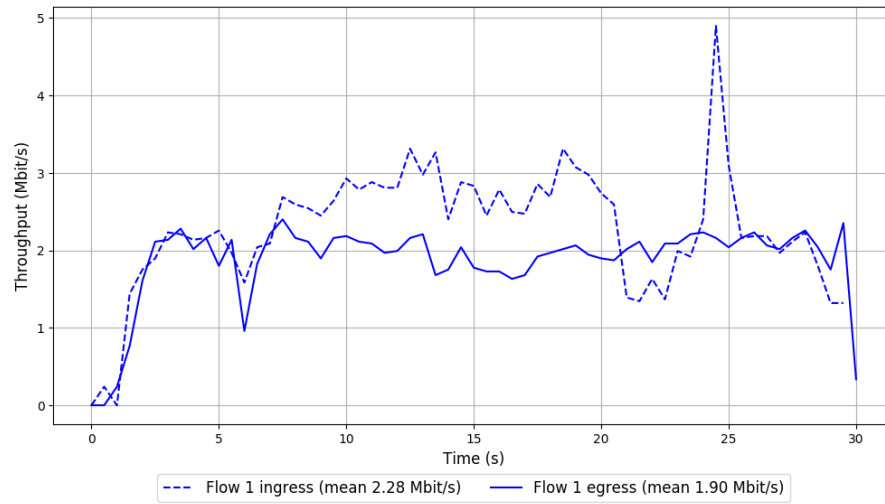


Run 2: Statistics of TCP Cubic

Start at: 2018-02-02 20:02:24
End at: 2018-02-02 20:02:54
Local clock offset: 0.328 ms
Remote clock offset: -1.072 ms

Below is generated by plot.py at 2018-02-02 20:36:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.90 Mbit/s
95th percentile per-packet one-way delay: 4026.298 ms
Loss rate: 16.84%
-- Flow 1:
Average throughput: 1.90 Mbit/s
95th percentile per-packet one-way delay: 4026.298 ms
Loss rate: 16.84%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-02-02 20:22:32

End at: 2018-02-02 20:23:02

Local clock offset: 0.402 ms

Remote clock offset: 5.81 ms

Below is generated by plot.py at 2018-02-02 20:36:57

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.83 Mbit/s

95th percentile per-packet one-way delay: 4332.570 ms

Loss rate: 17.68%

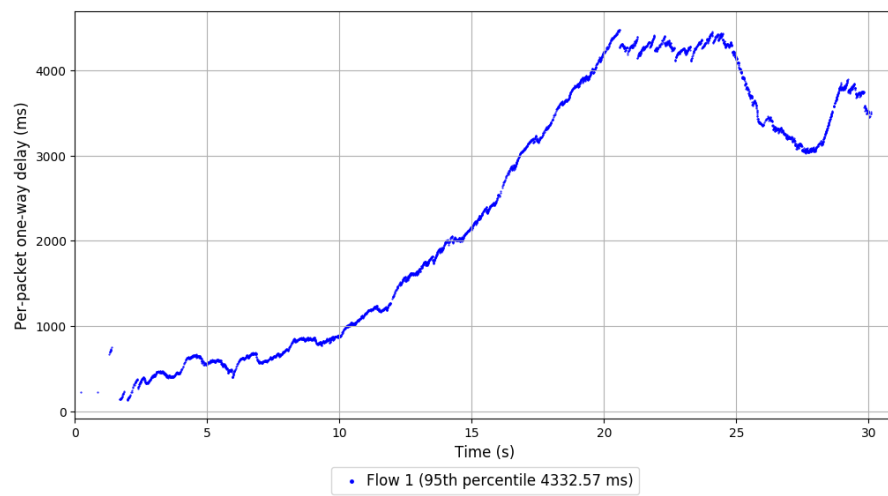
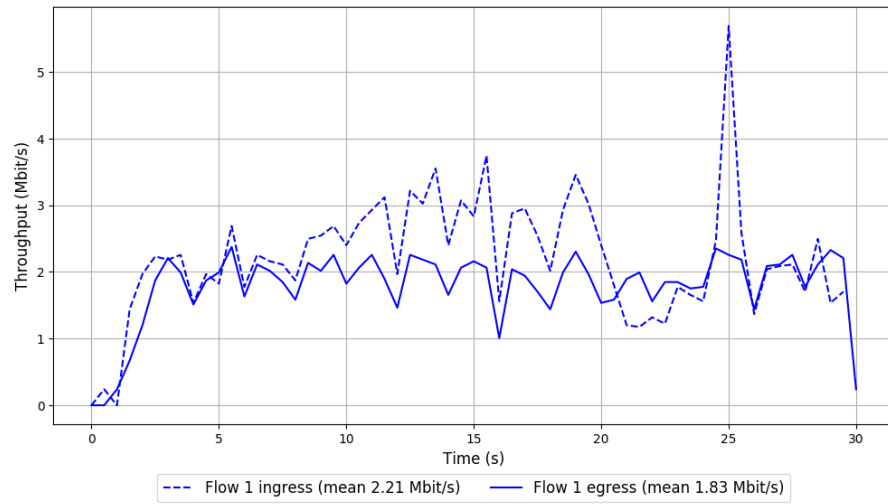
-- Flow 1:

Average throughput: 1.83 Mbit/s

95th percentile per-packet one-way delay: 4332.570 ms

Loss rate: 17.68%

Run 3: Report of TCP Cubic — Data Link

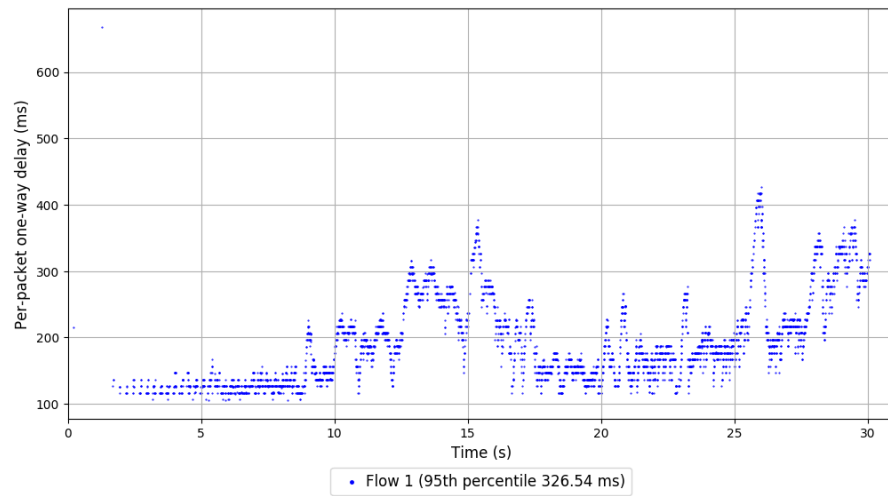
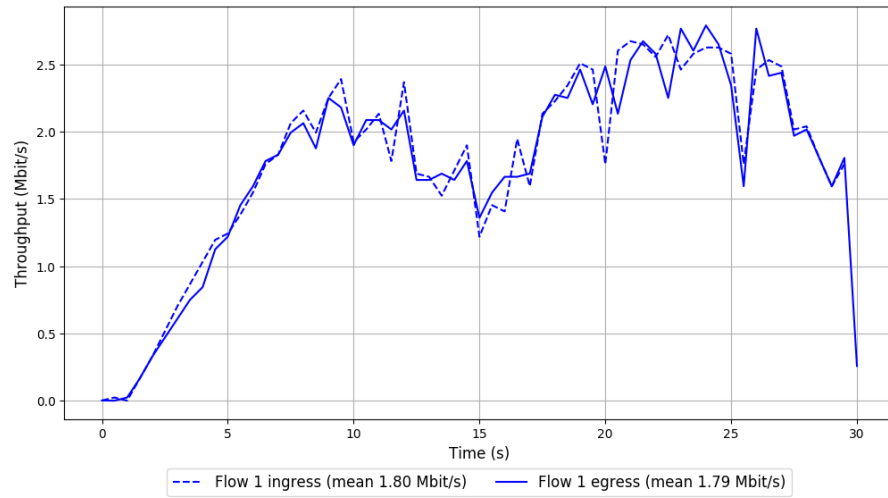


```
Run 1: Statistics of LEDBAT

Start at: 2018-02-02 19:44:32
End at: 2018-02-02 19:45:02
Local clock offset: 0.416 ms
Remote clock offset: -0.5 ms

# Below is generated by plot.py at 2018-02-02 20:36:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 326.539 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 326.539 ms
Loss rate: 0.78%
```

Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2018-02-02 20:04:45

End at: 2018-02-02 20:05:15

Local clock offset: 0.331 ms

Remote clock offset: 4.733 ms

Below is generated by plot.py at 2018-02-02 20:36:57

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.78 Mbit/s

95th percentile per-packet one-way delay: 266.819 ms

Loss rate: 0.66%

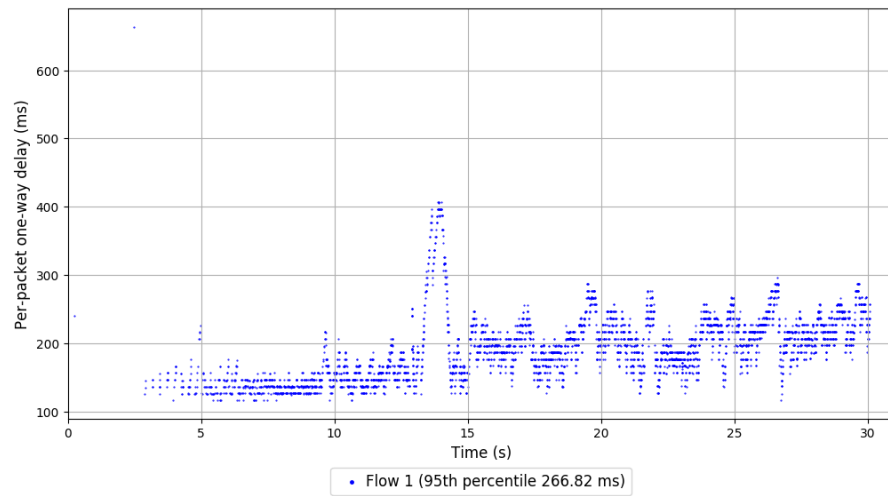
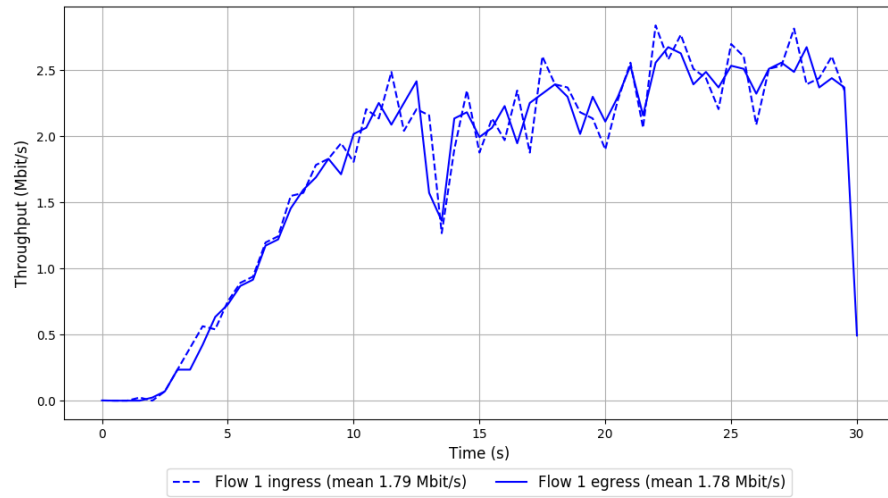
-- Flow 1:

Average throughput: 1.78 Mbit/s

95th percentile per-packet one-way delay: 266.819 ms

Loss rate: 0.66%

Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

Start at: 2018-02-02 20:24:53

End at: 2018-02-02 20:25:23

Local clock offset: 0.396 ms

Remote clock offset: 0.118 ms

Below is generated by plot.py at 2018-02-02 20:37:00

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.62 Mbit/s

95th percentile per-packet one-way delay: 273.621 ms

Loss rate: 0.29%

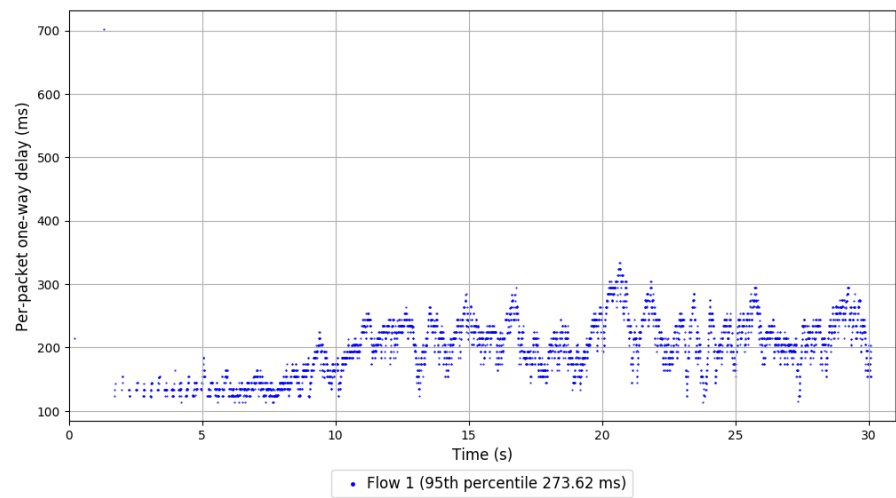
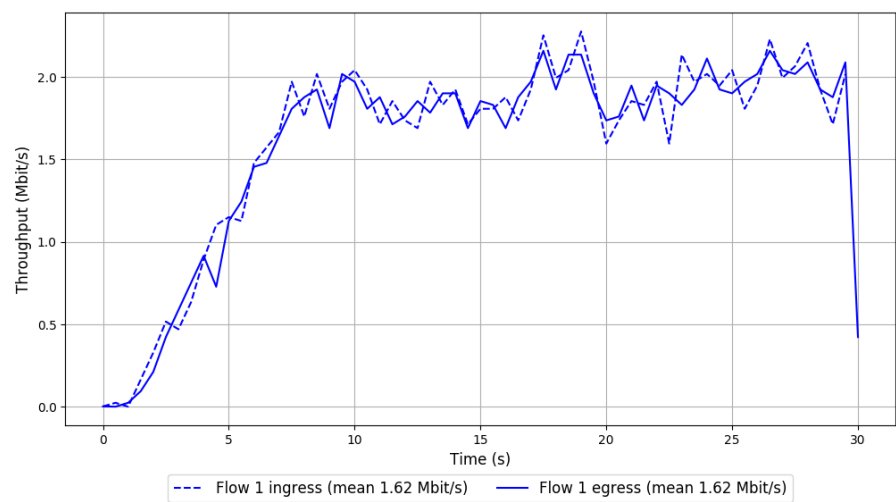
-- Flow 1:

Average throughput: 1.62 Mbit/s

95th percentile per-packet one-way delay: 273.621 ms

Loss rate: 0.29%

Run 3: Report of LEDBAT — Data Link

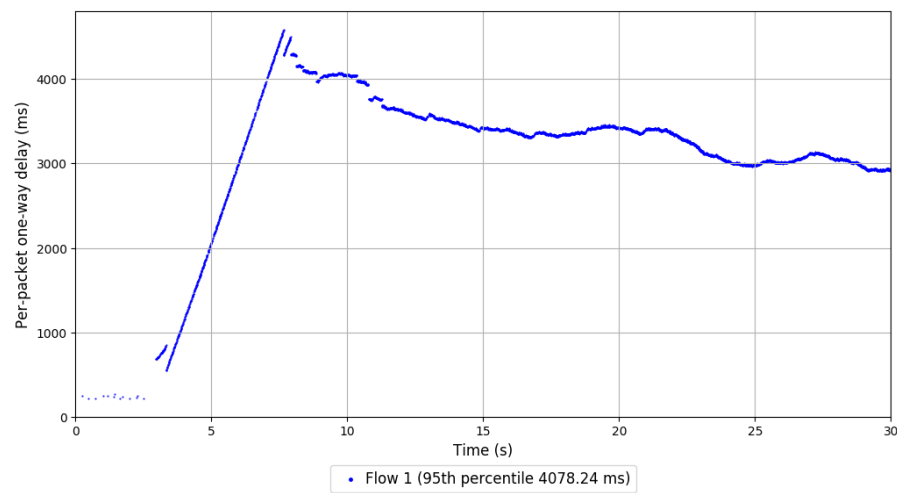
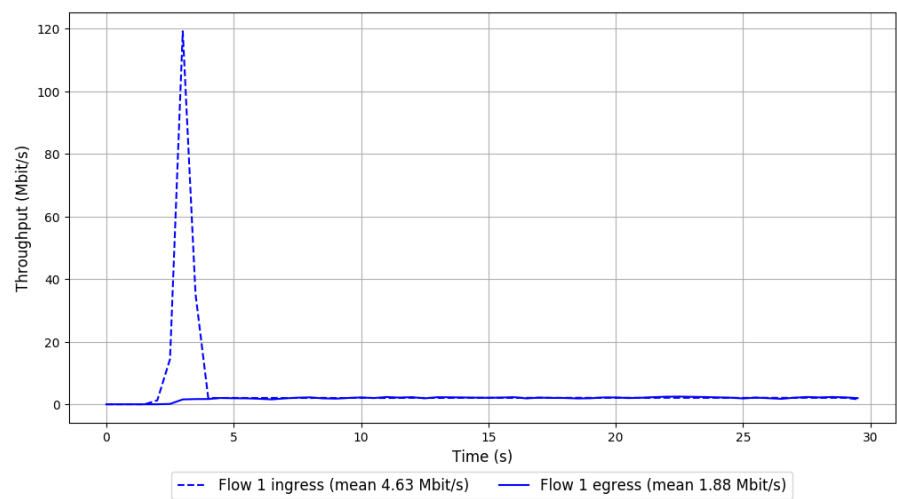


```
Run 1: Statistics of PCC

Start at: 2018-02-02 19:55:09
End at: 2018-02-02 19:55:39
Local clock offset: 0.392 ms
Remote clock offset: -0.278 ms

# Below is generated by plot.py at 2018-02-02 20:37:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.88 Mbit/s
95th percentile per-packet one-way delay: 4078.244 ms
Loss rate: 59.57%
-- Flow 1:
Average throughput: 1.88 Mbit/s
95th percentile per-packet one-way delay: 4078.244 ms
Loss rate: 59.57%
```

Run 1: Report of PCC — Data Link



Run 2: Statistics of PCC

Start at: 2018-02-02 20:15:25

End at: 2018-02-02 20:15:55

Local clock offset: 0.405 ms

Remote clock offset: 4.808 ms

Below is generated by plot.py at 2018-02-02 20:37:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.67 Mbit/s

95th percentile per-packet one-way delay: 4774.030 ms

Loss rate: 72.89%

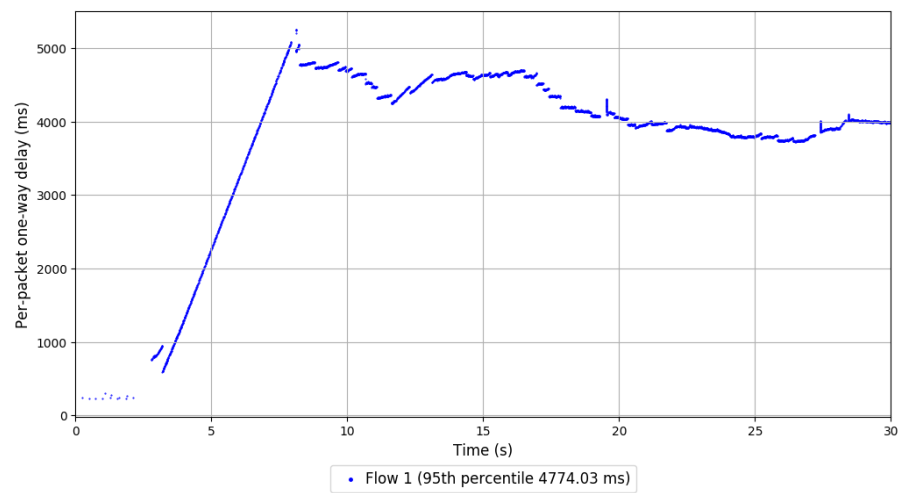
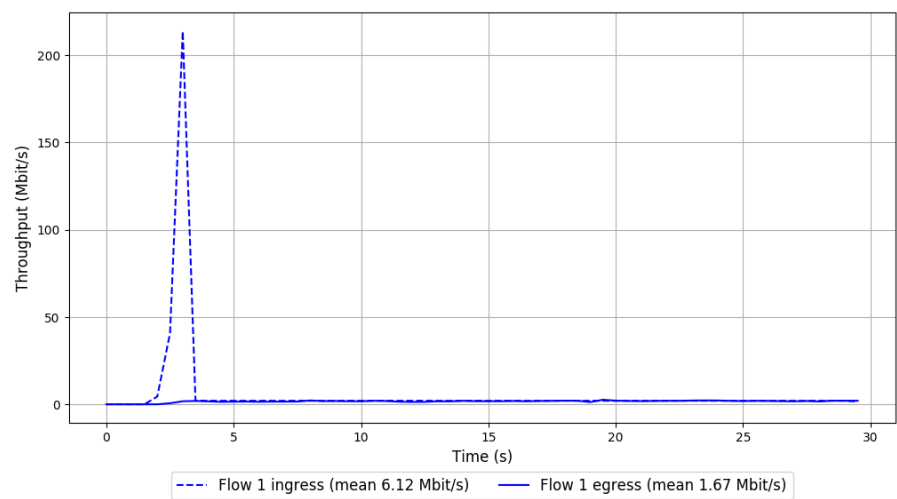
-- Flow 1:

Average throughput: 1.67 Mbit/s

95th percentile per-packet one-way delay: 4774.030 ms

Loss rate: 72.89%

Run 2: Report of PCC — Data Link



Run 3: Statistics of PCC

Start at: 2018-02-02 20:35:31

End at: 2018-02-02 20:36:01

Local clock offset: 0.519 ms

Remote clock offset: 0.287 ms

Below is generated by plot.py at 2018-02-02 20:37:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 315.425 ms

Loss rate: 0.00%

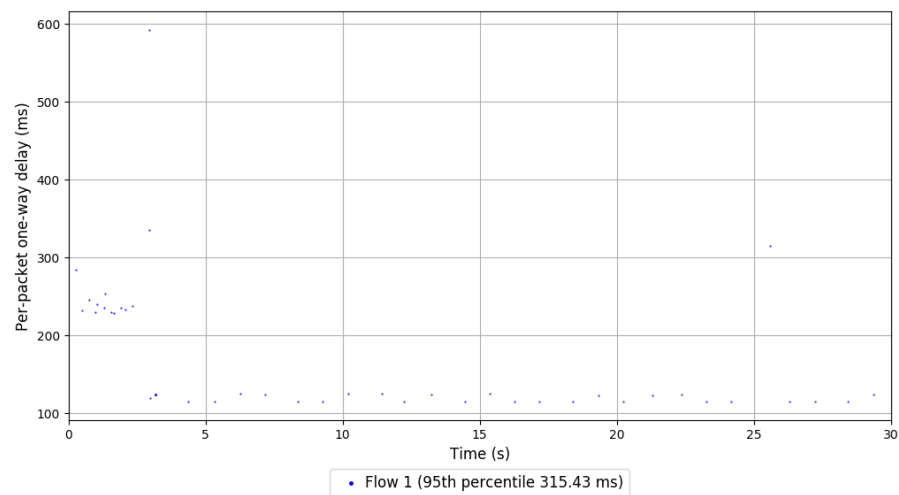
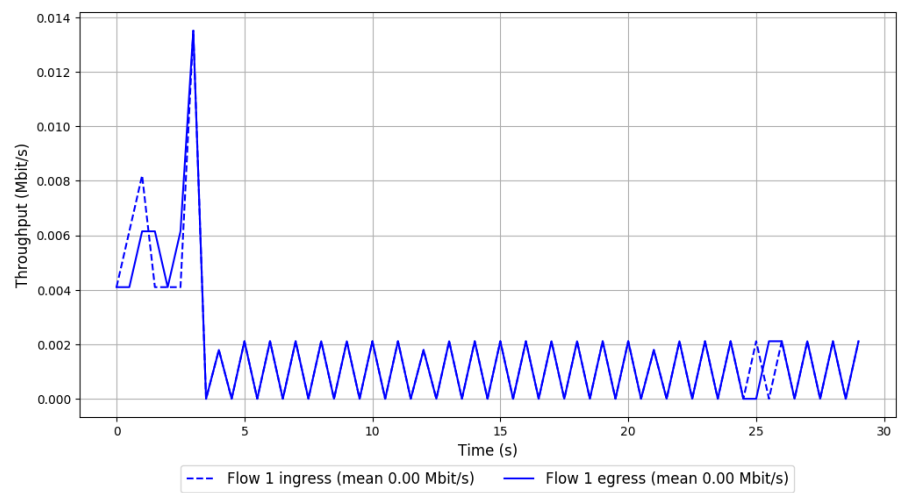
-- Flow 1:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 315.425 ms

Loss rate: 0.00%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-02-02 19:52:48

End at: 2018-02-02 19:53:18

Local clock offset: 0.319 ms

Remote clock offset: 4.392 ms

Below is generated by plot.py at 2018-02-02 20:37:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.27 Mbit/s

95th percentile per-packet one-way delay: 1193.514 ms

Loss rate: 4.41%

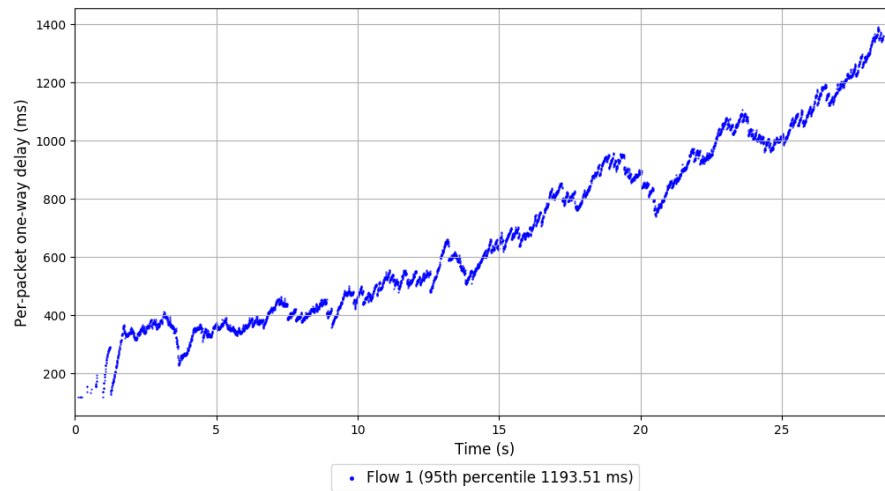
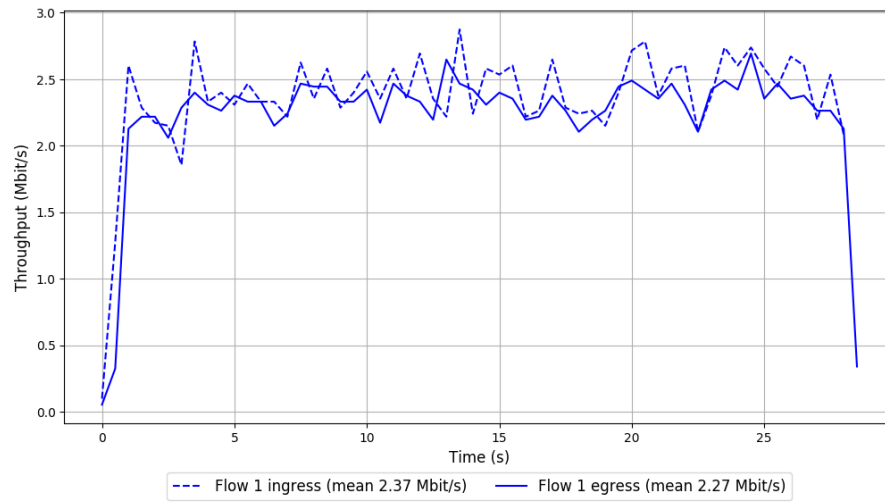
-- Flow 1:

Average throughput: 2.27 Mbit/s

95th percentile per-packet one-way delay: 1193.514 ms

Loss rate: 4.41%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-02-02 20:13:04

End at: 2018-02-02 20:13:34

Local clock offset: 0.378 ms

Remote clock offset: 5.678 ms

Below is generated by plot.py at 2018-02-02 20:37:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.04 Mbit/s

95th percentile per-packet one-way delay: 1349.183 ms

Loss rate: 5.00%

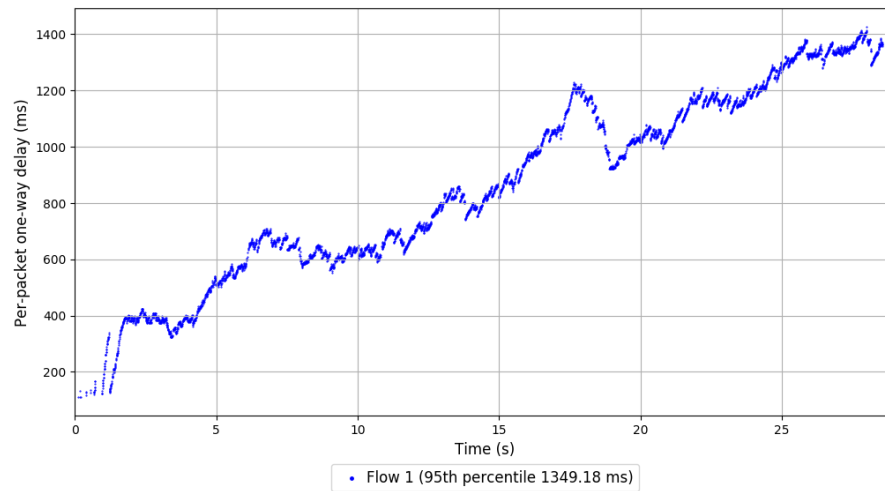
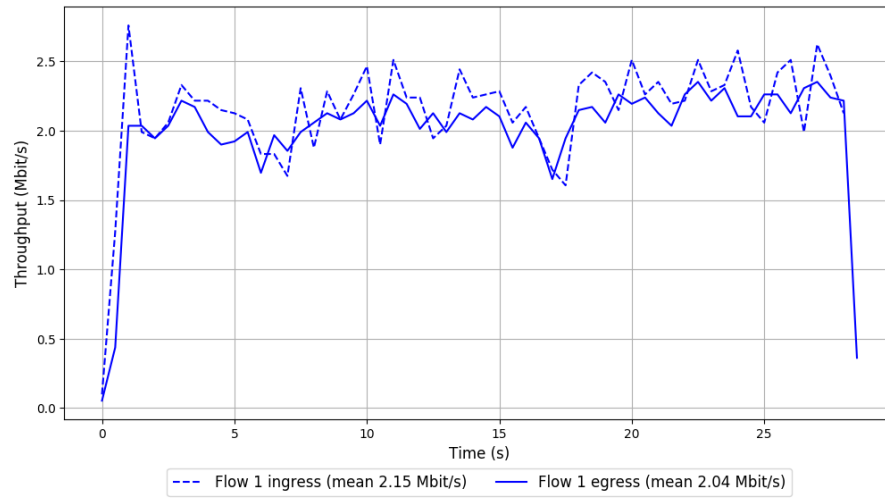
-- Flow 1:

Average throughput: 2.04 Mbit/s

95th percentile per-packet one-way delay: 1349.183 ms

Loss rate: 5.00%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-02-02 20:33:07

End at: 2018-02-02 20:33:38

Local clock offset: 0.402 ms

Remote clock offset: 0.237 ms

Below is generated by plot.py at 2018-02-02 20:37:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.26 Mbit/s

95th percentile per-packet one-way delay: 1151.631 ms

Loss rate: 4.36%

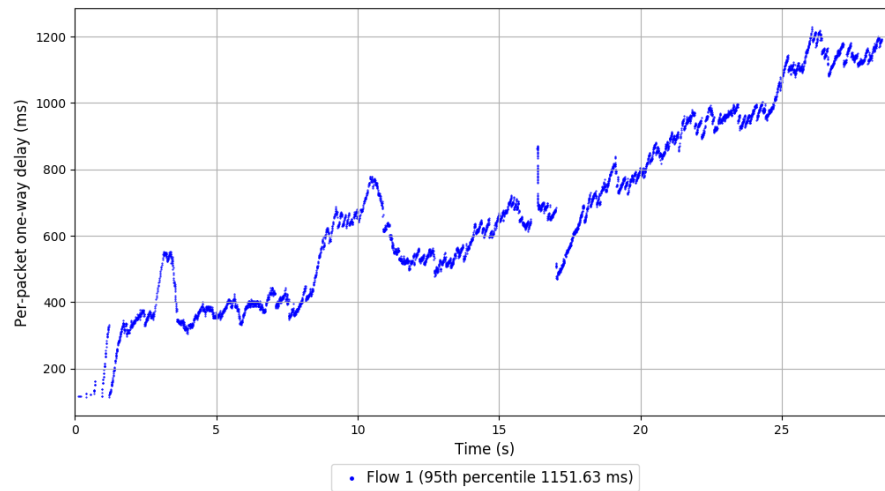
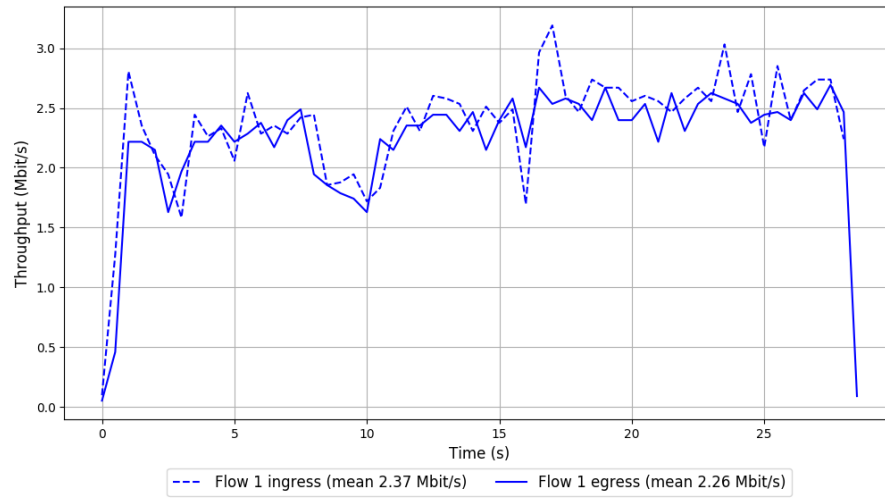
-- Flow 1:

Average throughput: 2.26 Mbit/s

95th percentile per-packet one-way delay: 1151.631 ms

Loss rate: 4.36%

Run 3: Report of QUIC Cubic — Data Link

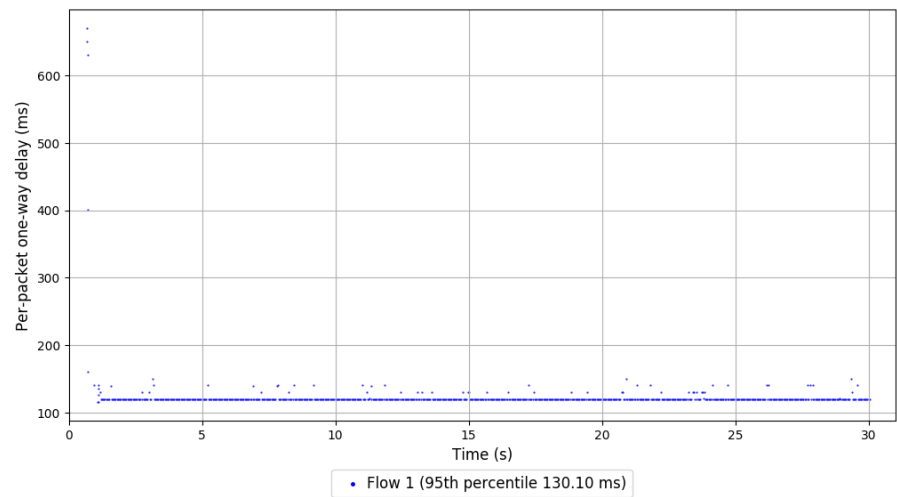
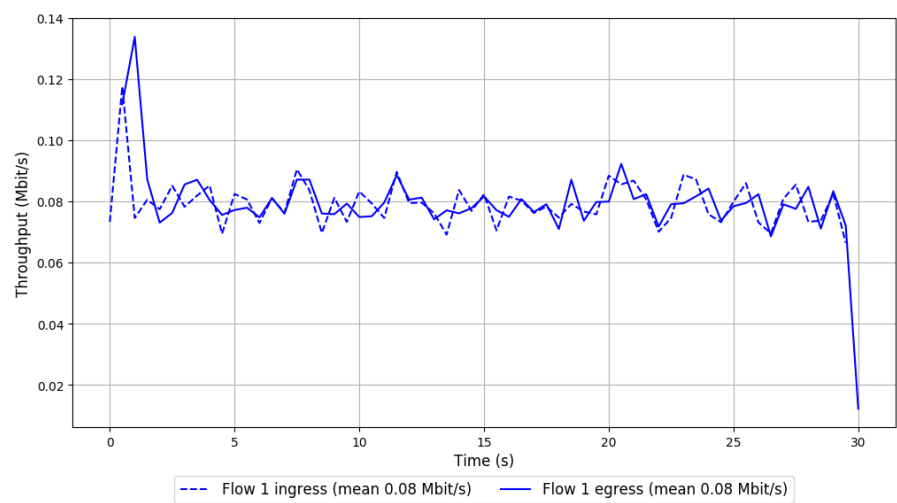


```
Run 1: Statistics of SCReAM

Start at: 2018-02-02 19:46:53
End at: 2018-02-02 19:47:23
Local clock offset: 0.402 ms
Remote clock offset: 5.185 ms

# Below is generated by plot.py at 2018-02-02 20:37:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 130.101 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 130.101 ms
Loss rate: 0.00%
```

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2018-02-02 20:07:07

End at: 2018-02-02 20:07:37

Local clock offset: 0.395 ms

Remote clock offset: 5.645 ms

Below is generated by plot.py at 2018-02-02 20:37:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 130.272 ms

Loss rate: 0.00%

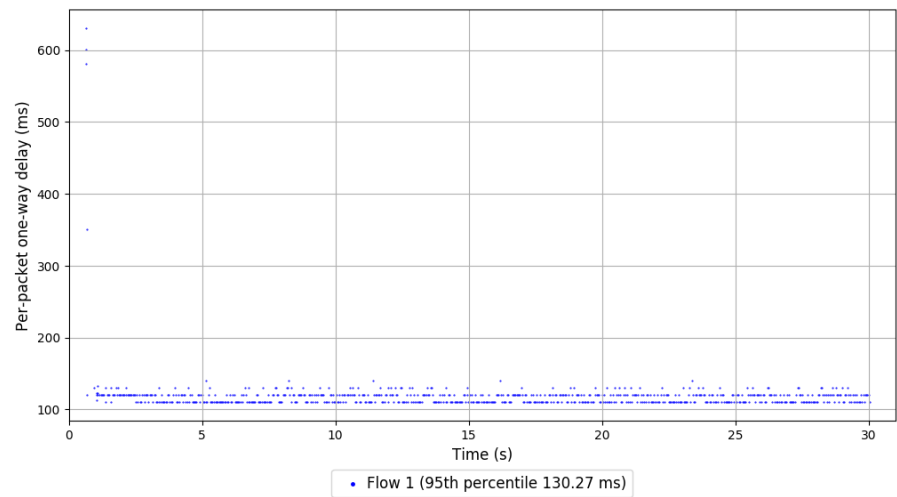
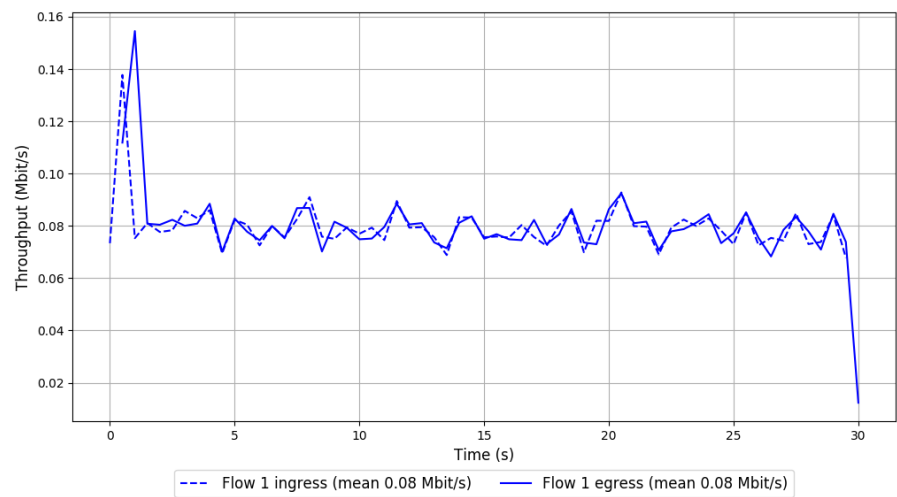
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 130.272 ms

Loss rate: 0.00%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-02-02 20:27:14

End at: 2018-02-02 20:27:44

Local clock offset: 0.433 ms

Remote clock offset: 0.132 ms

Below is generated by plot.py at 2018-02-02 20:37:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 123.288 ms

Loss rate: 0.00%

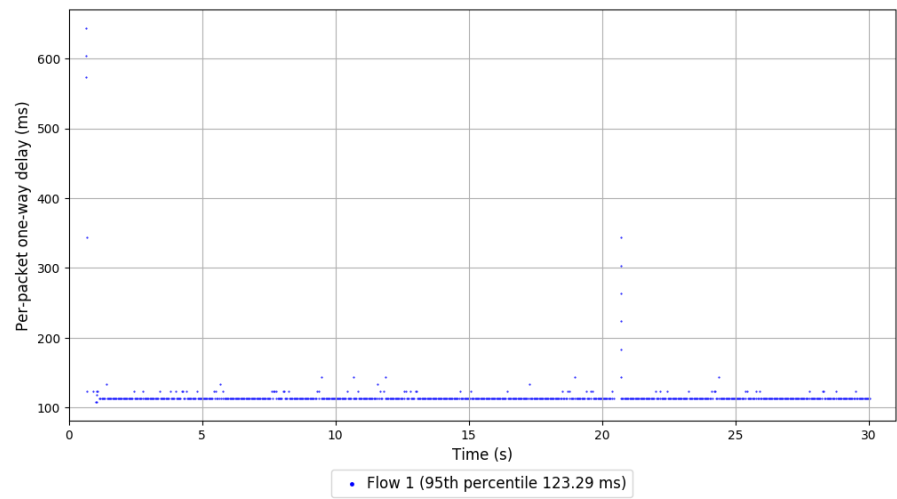
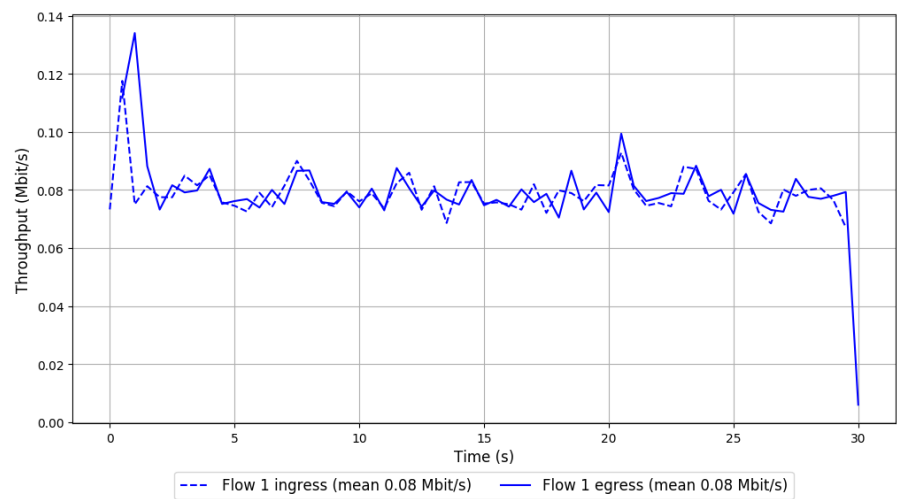
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 123.288 ms

Loss rate: 0.00%

Run 3: Report of SReAM — Data Link

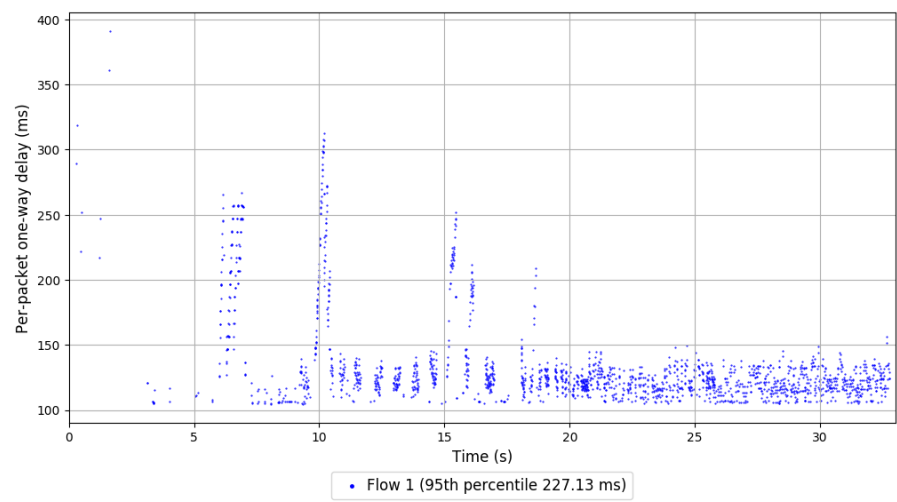
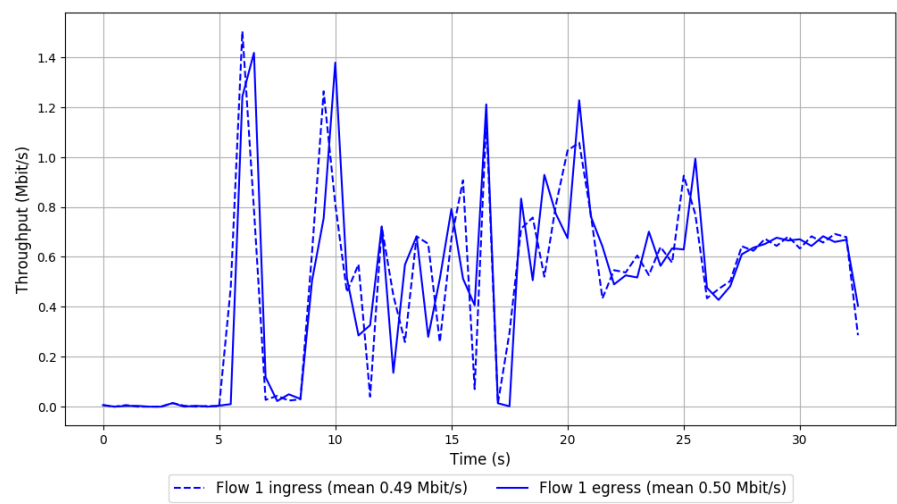


```
Run 1: Statistics of WebRTC media

Start at: 2018-02-02 19:48:04
End at: 2018-02-02 19:48:34
Local clock offset: 0.402 ms
Remote clock offset: -0.379 ms

# Below is generated by plot.py at 2018-02-02 20:37:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 227.133 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 227.133 ms
Loss rate: 0.18%
```

Run 1: Report of WebRTC media — Data Link

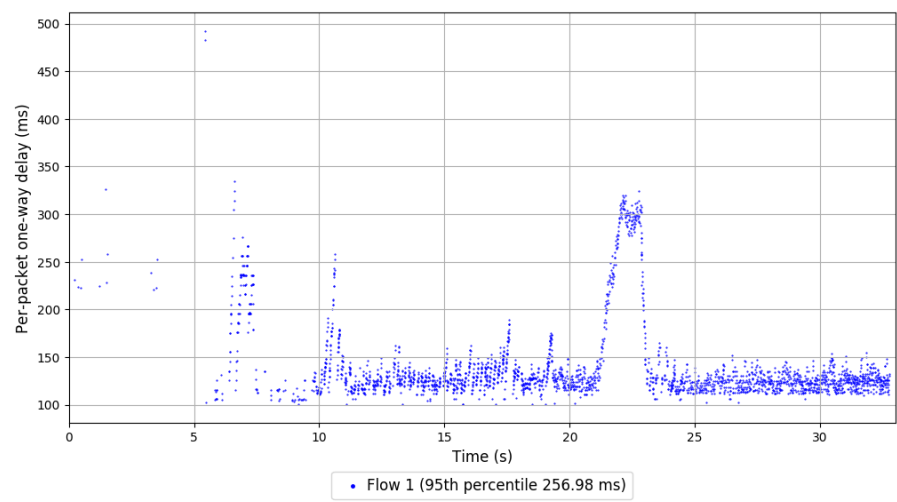
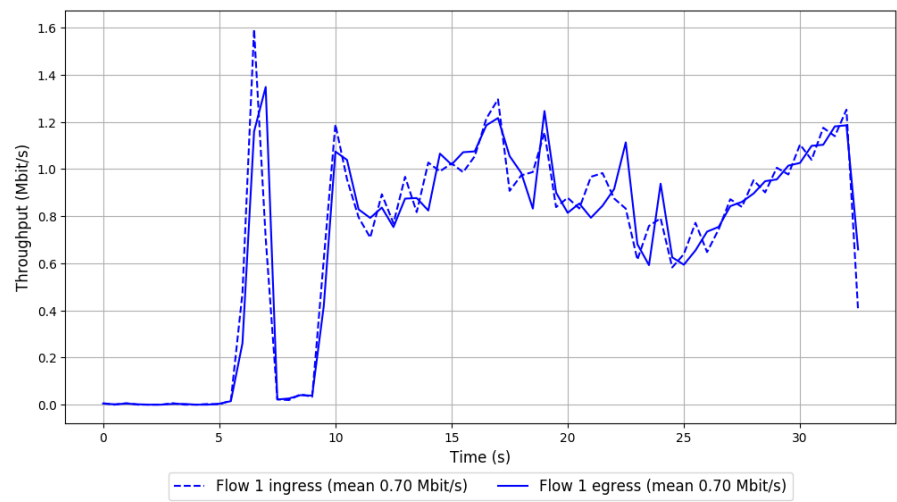


Run 2: Statistics of WebRTC media

Start at: 2018-02-02 20:08:18
End at: 2018-02-02 20:08:48
Local clock offset: 0.392 ms
Remote clock offset: -1.011 ms

Below is generated by plot.py at 2018-02-02 20:37:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 256.982 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 256.982 ms
Loss rate: 0.21%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-02-02 20:28:25

End at: 2018-02-02 20:28:55

Local clock offset: 0.415 ms

Remote clock offset: 0.213 ms

Below is generated by plot.py at 2018-02-02 20:37:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.62 Mbit/s

95th percentile per-packet one-way delay: 166.509 ms

Loss rate: 0.17%

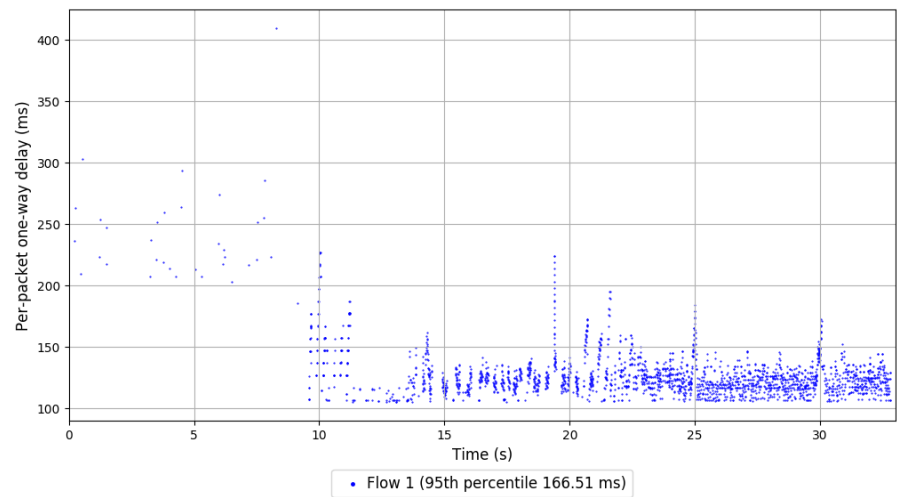
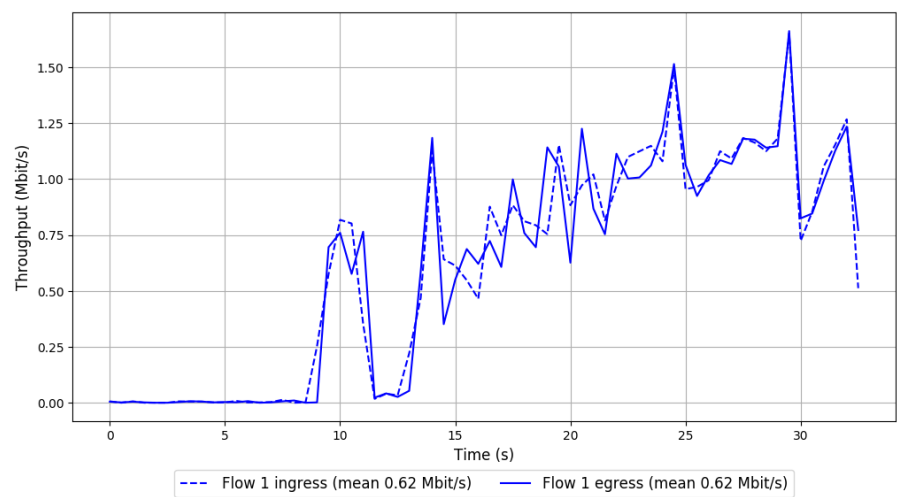
-- Flow 1:

Average throughput: 0.62 Mbit/s

95th percentile per-packet one-way delay: 166.509 ms

Loss rate: 0.17%

Run 3: Report of WebRTC media — Data Link



Run 1: Statistics of Sprout

Start at: 2018-02-02 19:45:42

End at: 2018-02-02 19:46:13

Local clock offset: 0.413 ms

Remote clock offset: -0.51 ms

Below is generated by plot.py at 2018-02-02 20:37:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 215.825 ms

Loss rate: 0.24%

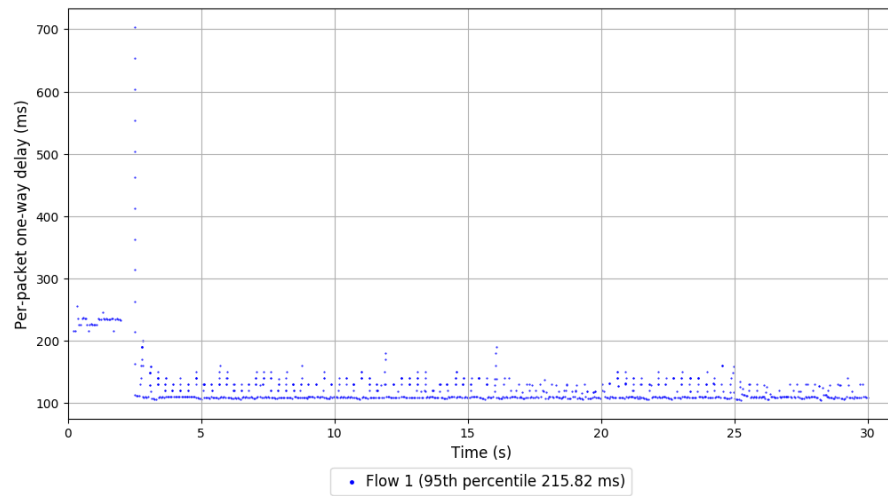
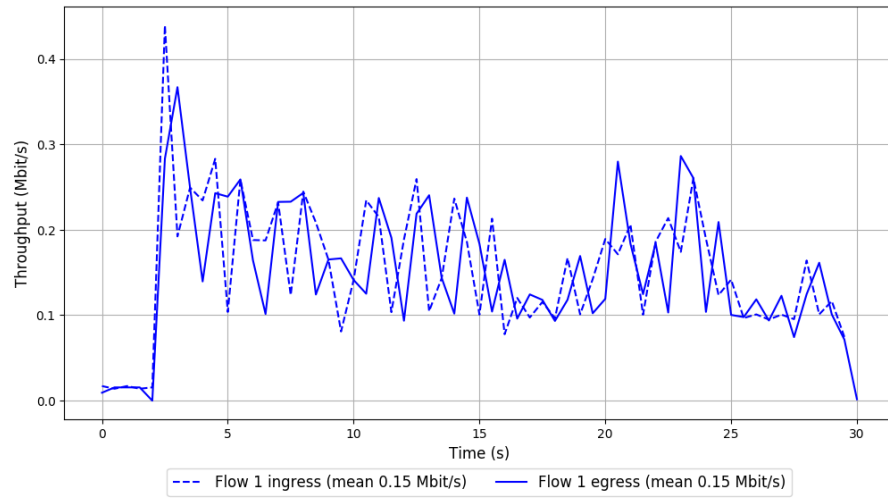
-- Flow 1:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 215.825 ms

Loss rate: 0.24%

Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

Start at: 2018-02-02 20:05:57

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

Local clock offset: 0.356 ms

Remote clock offset: 4.713 ms

Below is generated by plot.py at 2018-02-02 20:37:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 165.387 ms

Loss rate: 0.00%

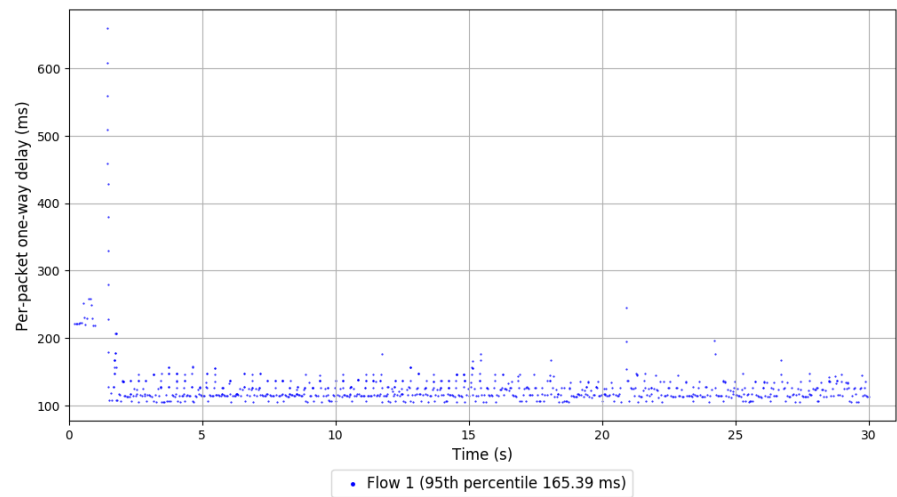
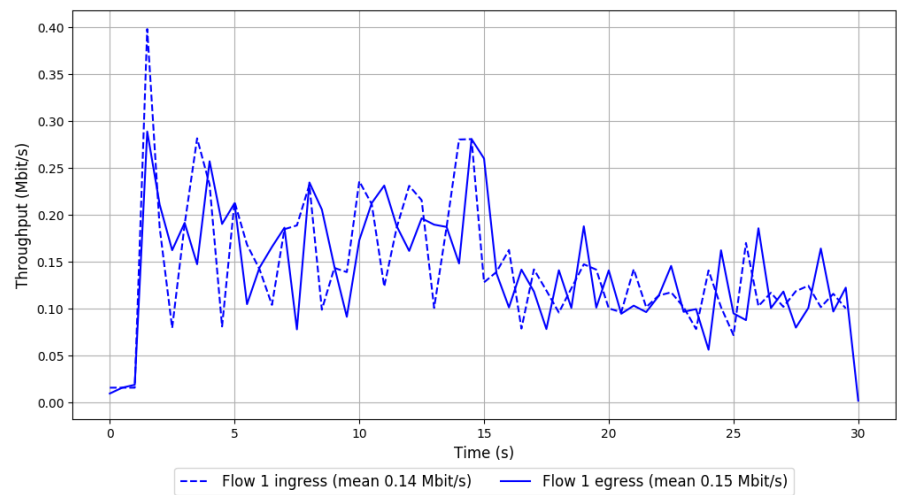
-- Flow 1:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 165.387 ms

Loss rate: 0.00%

Run 2: Report of Sprout — Data Link



Run 3: Statistics of Sprout

Start at: 2018-02-02 20:26:04

End at: 2018-02-02 20:26:34

Local clock offset: 0.351 ms

Remote clock offset: 0.186 ms

Below is generated by plot.py at 2018-02-02 20:37:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.16 Mbit/s

95th percentile per-packet one-way delay: 152.039 ms

Loss rate: 0.02%

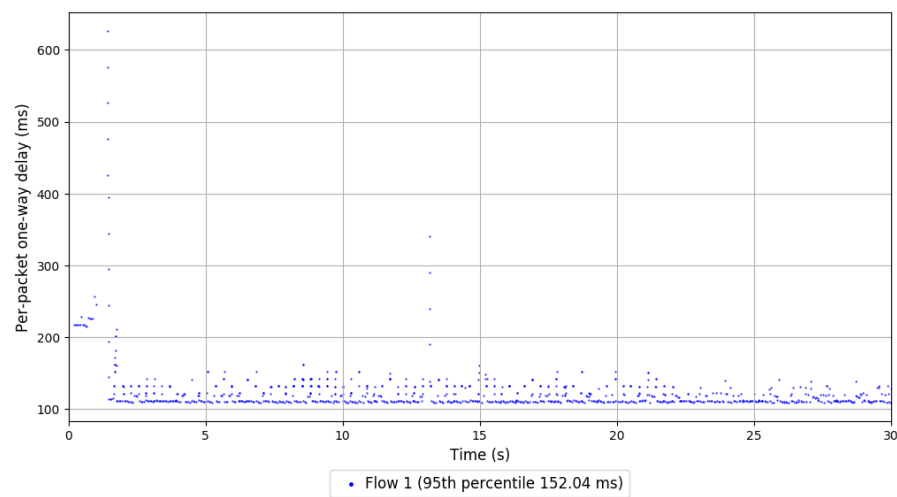
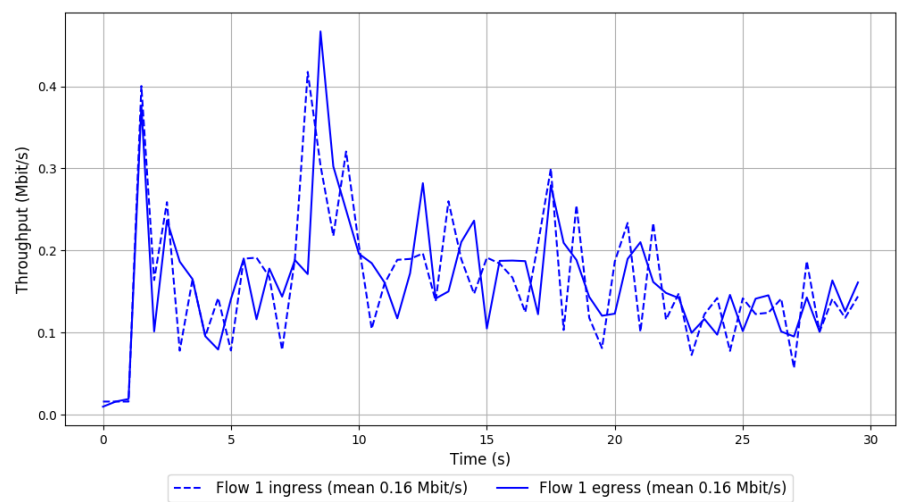
-- Flow 1:

Average throughput: 0.16 Mbit/s

95th percentile per-packet one-way delay: 152.039 ms

Loss rate: 0.02%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-02-02 19:50:25

End at: 2018-02-02 19:50:55

Local clock offset: 0.394 ms

Remote clock offset: 4.457 ms

Below is generated by plot.py at 2018-02-02 20:37:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.66 Mbit/s

95th percentile per-packet one-way delay: 332.589 ms

Loss rate: 0.18%

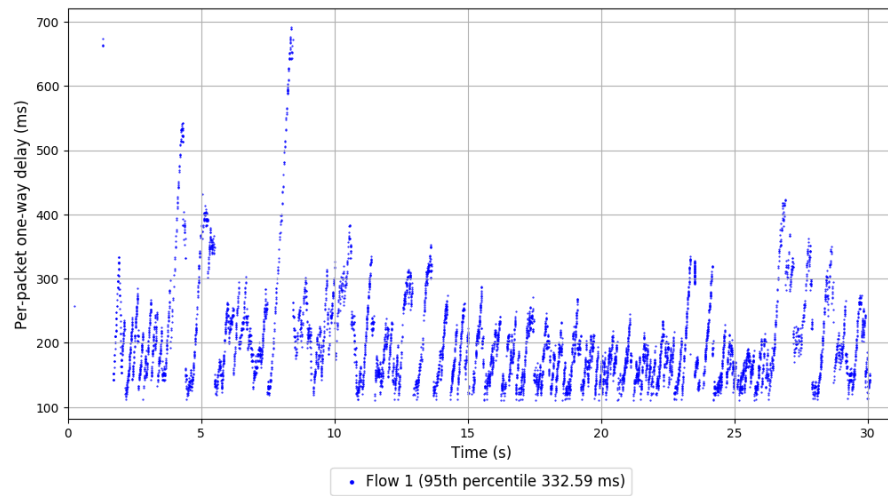
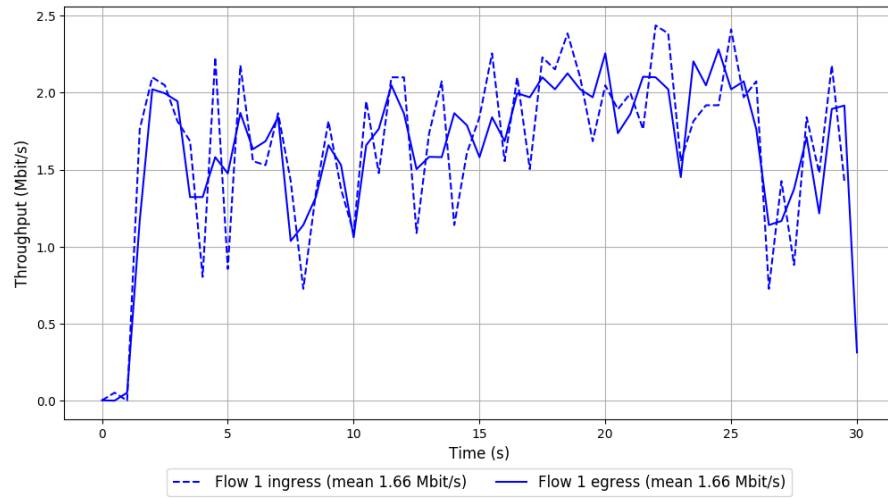
-- Flow 1:

Average throughput: 1.66 Mbit/s

95th percentile per-packet one-way delay: 332.589 ms

Loss rate: 0.18%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-02-02 20:10:40

End at: 2018-02-02 20:11:10

Local clock offset: 0.388 ms

Remote clock offset: 0.019 ms

Below is generated by plot.py at 2018-02-02 20:37:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.60 Mbit/s

95th percentile per-packet one-way delay: 322.249 ms

Loss rate: 0.35%

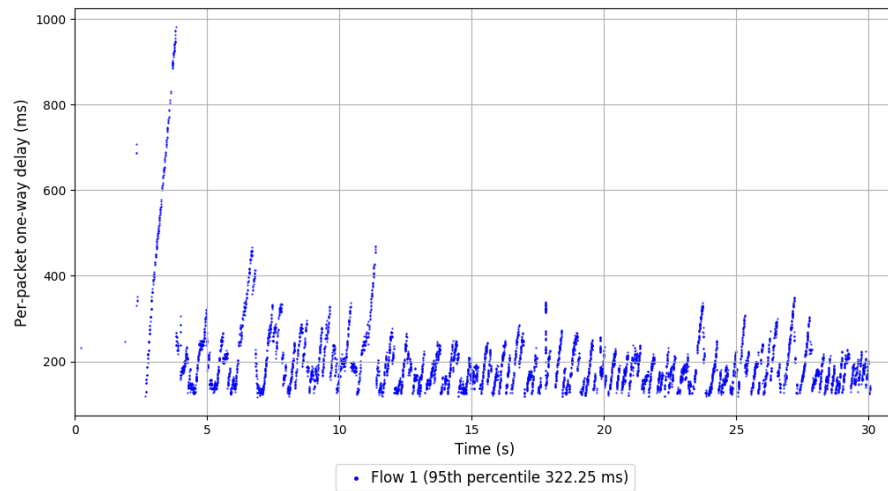
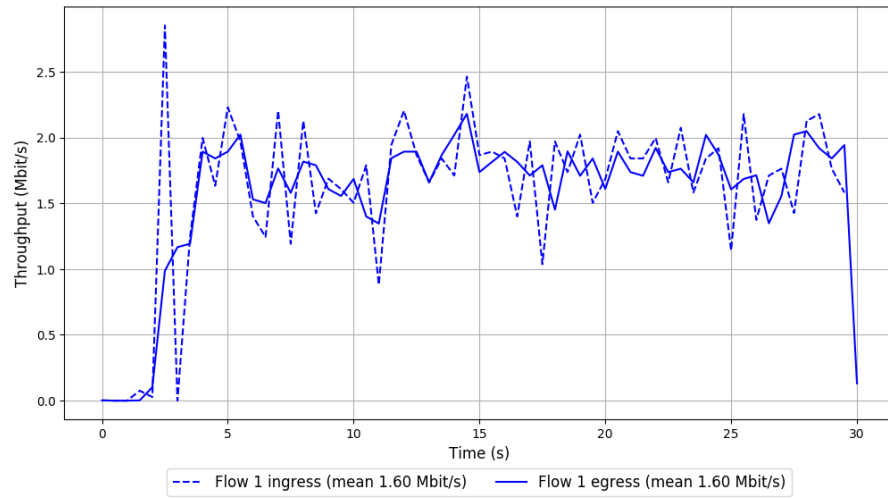
-- Flow 1:

Average throughput: 1.60 Mbit/s

95th percentile per-packet one-way delay: 322.249 ms

Loss rate: 0.35%

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



Run 3: Statistics of TaoVA-100x

Start at: 2018-02-02 20:30:46

End at: 2018-02-02 20:31:16

Local clock offset: 0.463 ms

Remote clock offset: -0.544 ms

Below is generated by plot.py at 2018-02-02 20:37:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.93 Mbit/s

95th percentile per-packet one-way delay: 232.909 ms

Loss rate: 0.13%

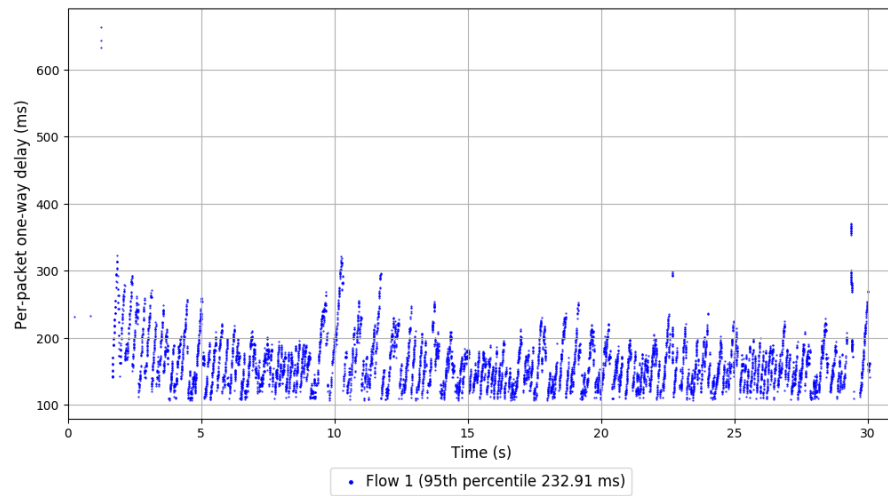
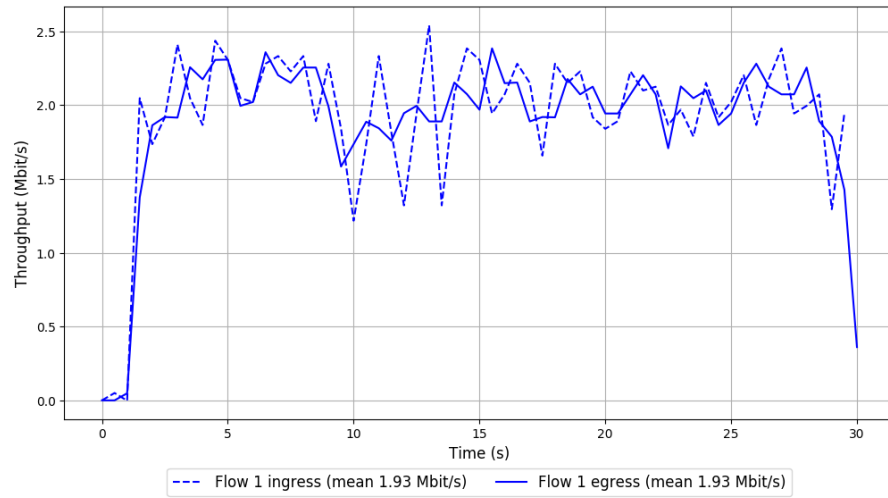
-- Flow 1:

Average throughput: 1.93 Mbit/s

95th percentile per-packet one-way delay: 232.909 ms

Loss rate: 0.13%

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

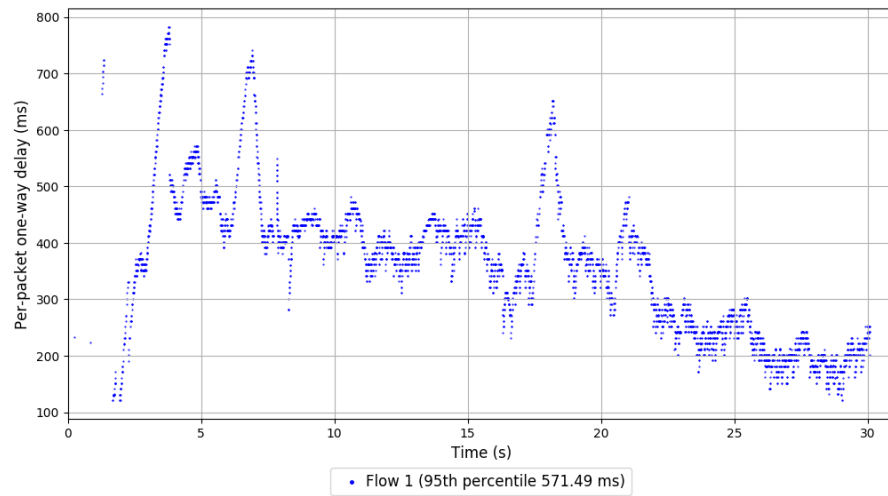
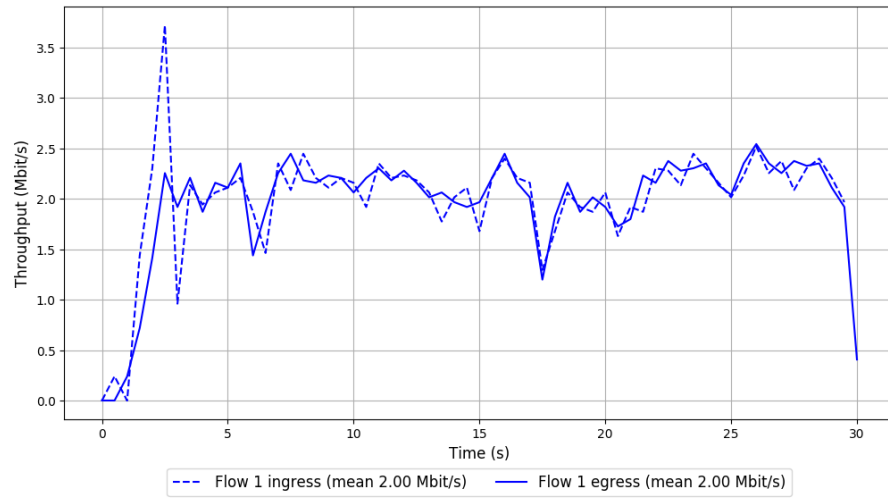


Run 1: Statistics of TCP Vegas

Start at: 2018-02-02 19:37:20
End at: 2018-02-02 19:37:50
Local clock offset: 0.444 ms
Remote clock offset: -1.531 ms

Below is generated by plot.py at 2018-02-02 20:37:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.00 Mbit/s
95th percentile per-packet one-way delay: 571.485 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 2.00 Mbit/s
95th percentile per-packet one-way delay: 571.485 ms
Loss rate: 0.38%

Run 1: Report of TCP Vegas — Data Link

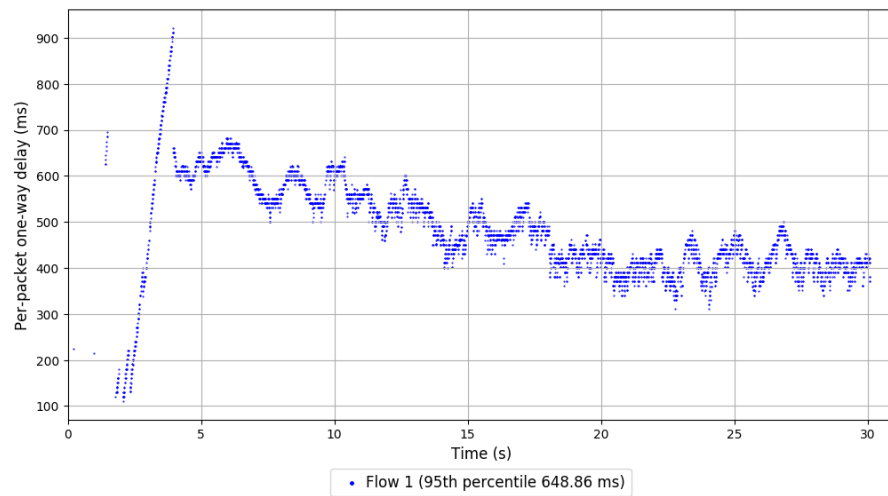
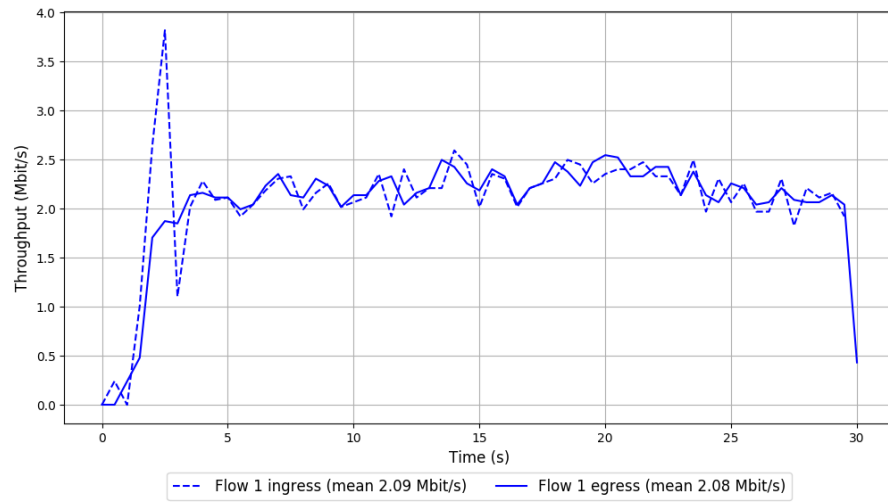


Run 2: Statistics of TCP Vegas

Start at: 2018-02-02 19:57:32
End at: 2018-02-02 19:58:02
Local clock offset: 0.377 ms
Remote clock offset: -1.069 ms

Below is generated by plot.py at 2018-02-02 20:37:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.08 Mbit/s
95th percentile per-packet one-way delay: 648.856 ms
Loss rate: 0.92%
-- Flow 1:
Average throughput: 2.08 Mbit/s
95th percentile per-packet one-way delay: 648.856 ms
Loss rate: 0.92%

Run 2: Report of TCP Vegas — Data Link



Run 3: Statistics of TCP Vegas

Start at: 2018-02-02 20:17:47

End at: 2018-02-02 20:18:17

Local clock offset: 0.368 ms

Remote clock offset: 0.075 ms

Below is generated by plot.py at 2018-02-02 20:37:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.66 Mbit/s

95th percentile per-packet one-way delay: 399.599 ms

Loss rate: 0.34%

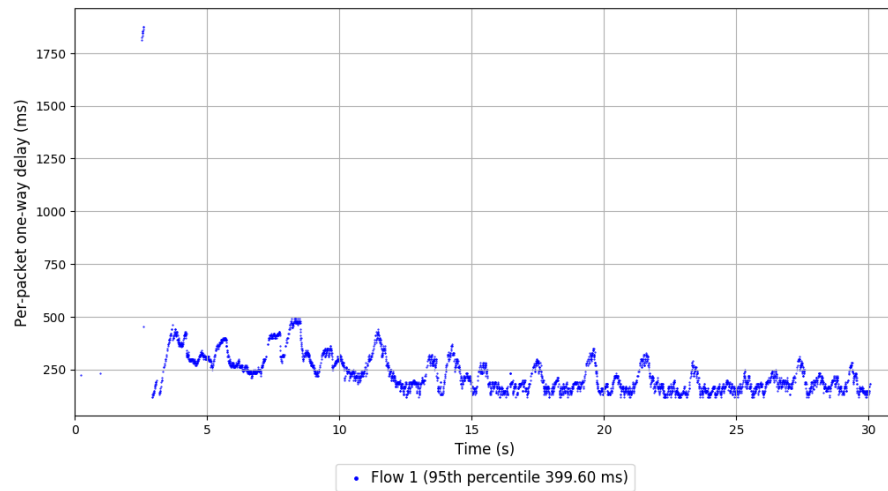
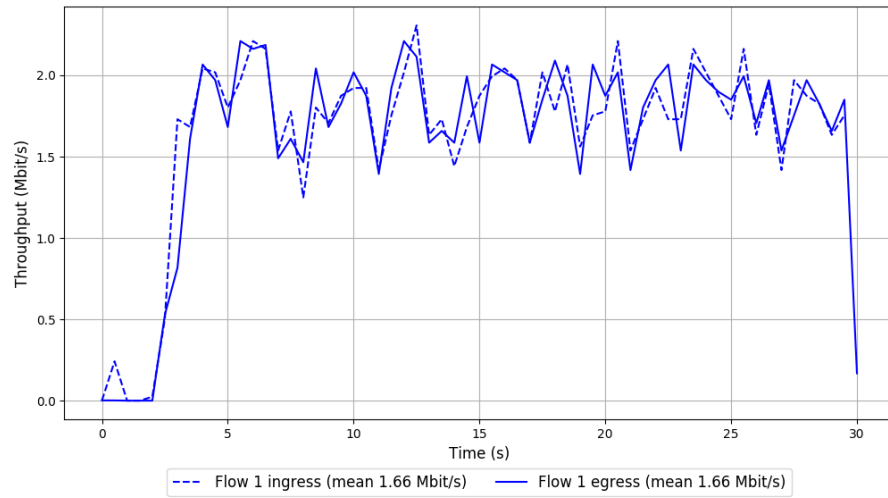
-- Flow 1:

Average throughput: 1.66 Mbit/s

95th percentile per-packet one-way delay: 399.599 ms

Loss rate: 0.34%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-02-02 19:43:21

End at: 2018-02-02 19:43:51

Local clock offset: 0.445 ms

Remote clock offset: 4.264 ms

Below is generated by plot.py at 2018-02-02 20:37:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.02 Mbit/s

95th percentile per-packet one-way delay: 1795.547 ms

Loss rate: 2.59%

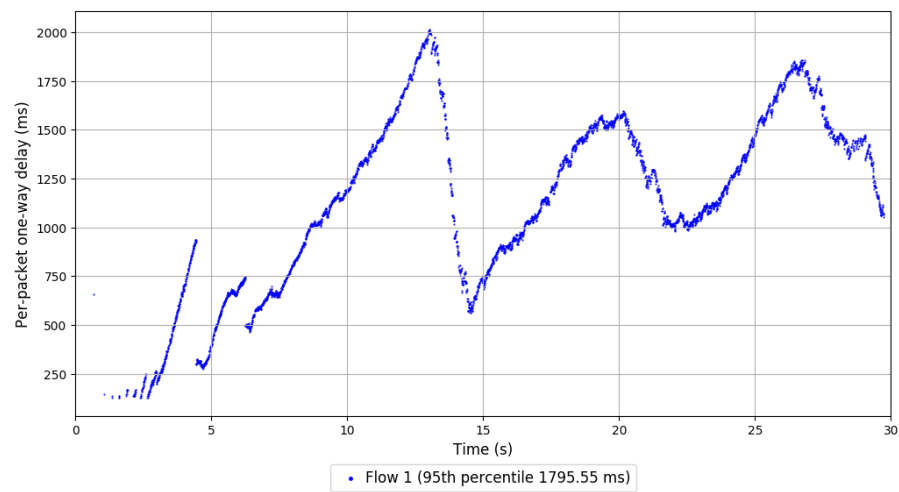
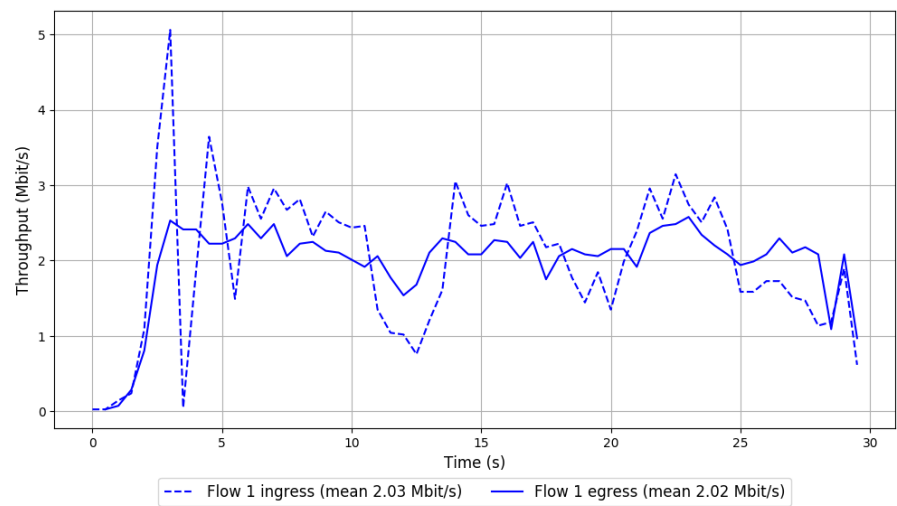
-- Flow 1:

Average throughput: 2.02 Mbit/s

95th percentile per-packet one-way delay: 1795.547 ms

Loss rate: 2.59%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2018-02-02 20:03:35

End at: 2018-02-02 20:04:05

Local clock offset: 0.38 ms

Remote clock offset: 4.693 ms

Below is generated by plot.py at 2018-02-02 20:37:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.17 Mbit/s

95th percentile per-packet one-way delay: 1850.740 ms

Loss rate: 5.15%

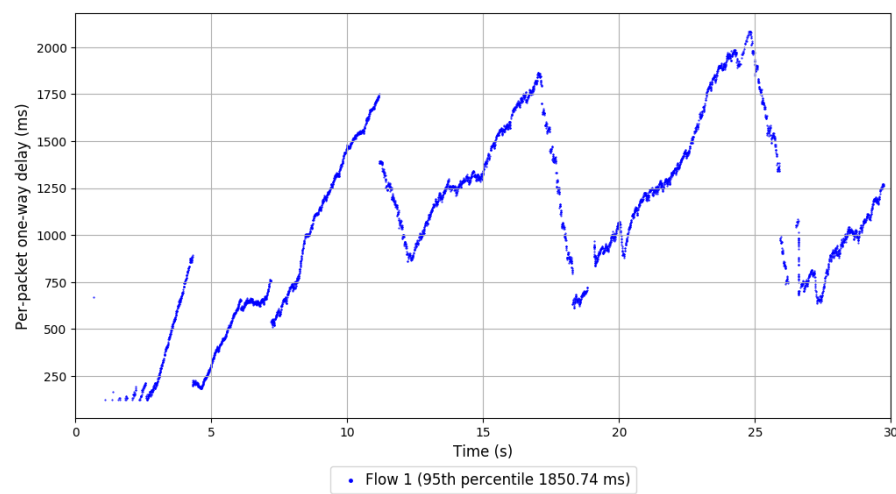
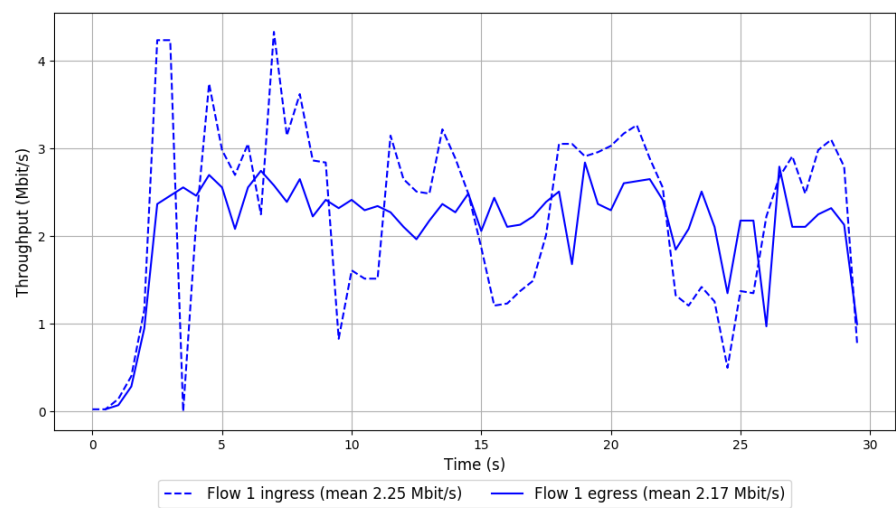
-- Flow 1:

Average throughput: 2.17 Mbit/s

95th percentile per-packet one-way delay: 1850.740 ms

Loss rate: 5.15%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2018-02-02 20:23:42

End at: 2018-02-02 20:24:13

Local clock offset: 0.401 ms

Remote clock offset: 4.186 ms

Below is generated by plot.py at 2018-02-02 20:37:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.67 Mbit/s

95th percentile per-packet one-way delay: 2333.700 ms

Loss rate: 4.03%

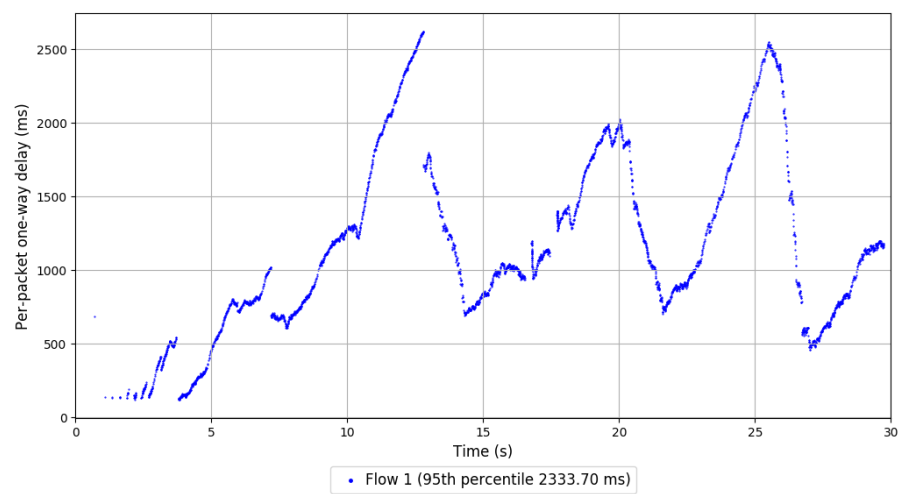
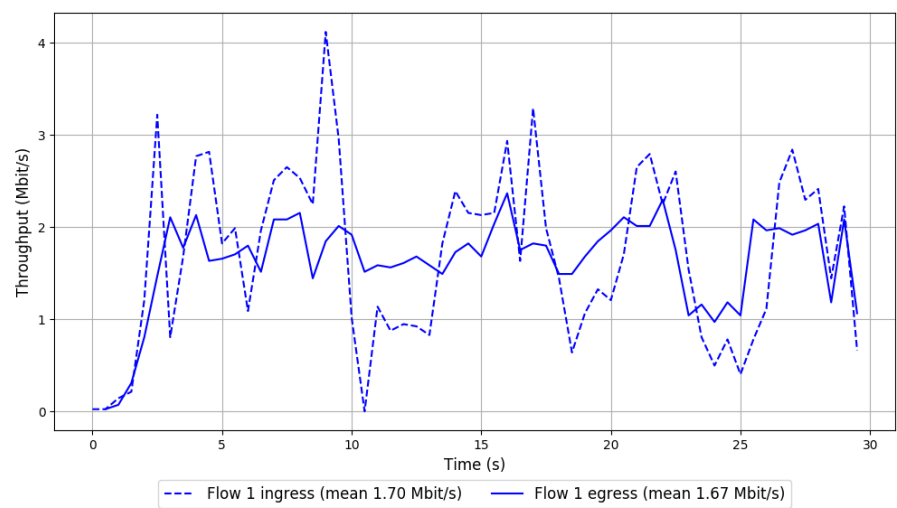
-- Flow 1:

Average throughput: 1.67 Mbit/s

95th percentile per-packet one-way delay: 2333.700 ms

Loss rate: 4.03%

Run 3: Report of Verus — Data Link



Run 1: Statistics of Copa

Start at: 2018-02-02 19:36:08

End at: 2018-02-02 19:36:39

Local clock offset: 0.449 ms

Remote clock offset: 3.355 ms

Below is generated by plot.py at 2018-02-02 20:37:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.70 Mbit/s

95th percentile per-packet one-way delay: 149.939 ms

Loss rate: 0.06%

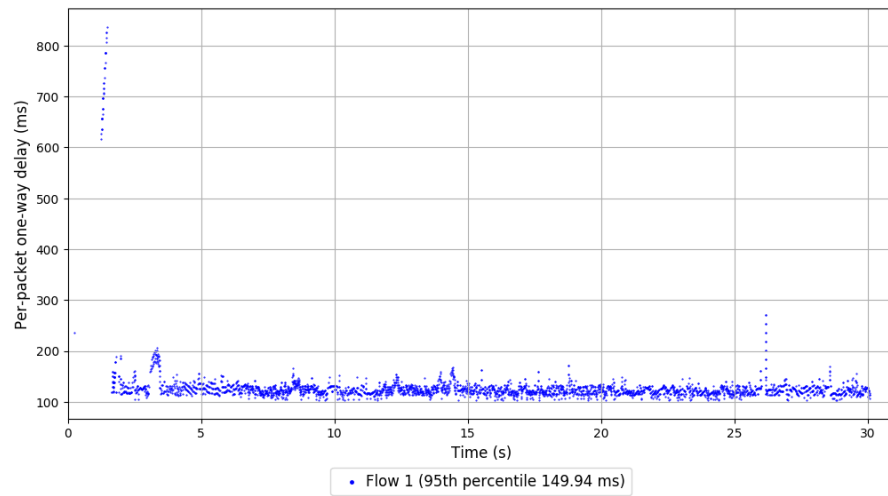
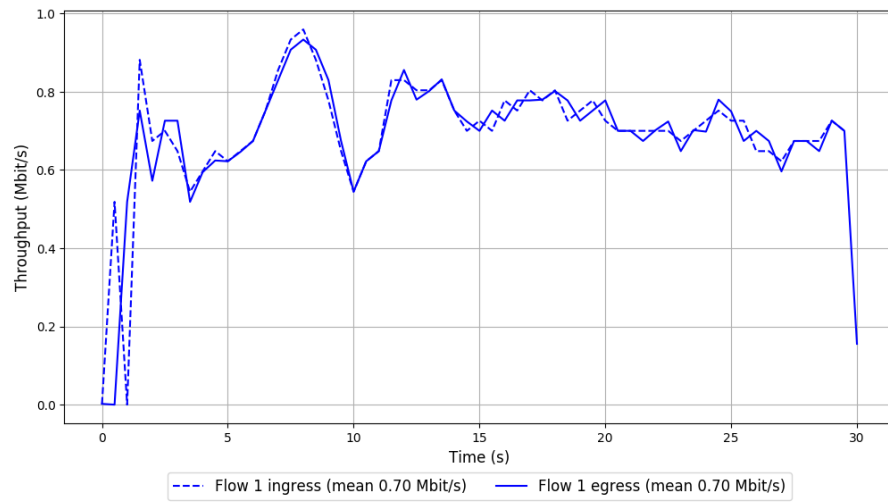
-- Flow 1:

Average throughput: 0.70 Mbit/s

95th percentile per-packet one-way delay: 149.939 ms

Loss rate: 0.06%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

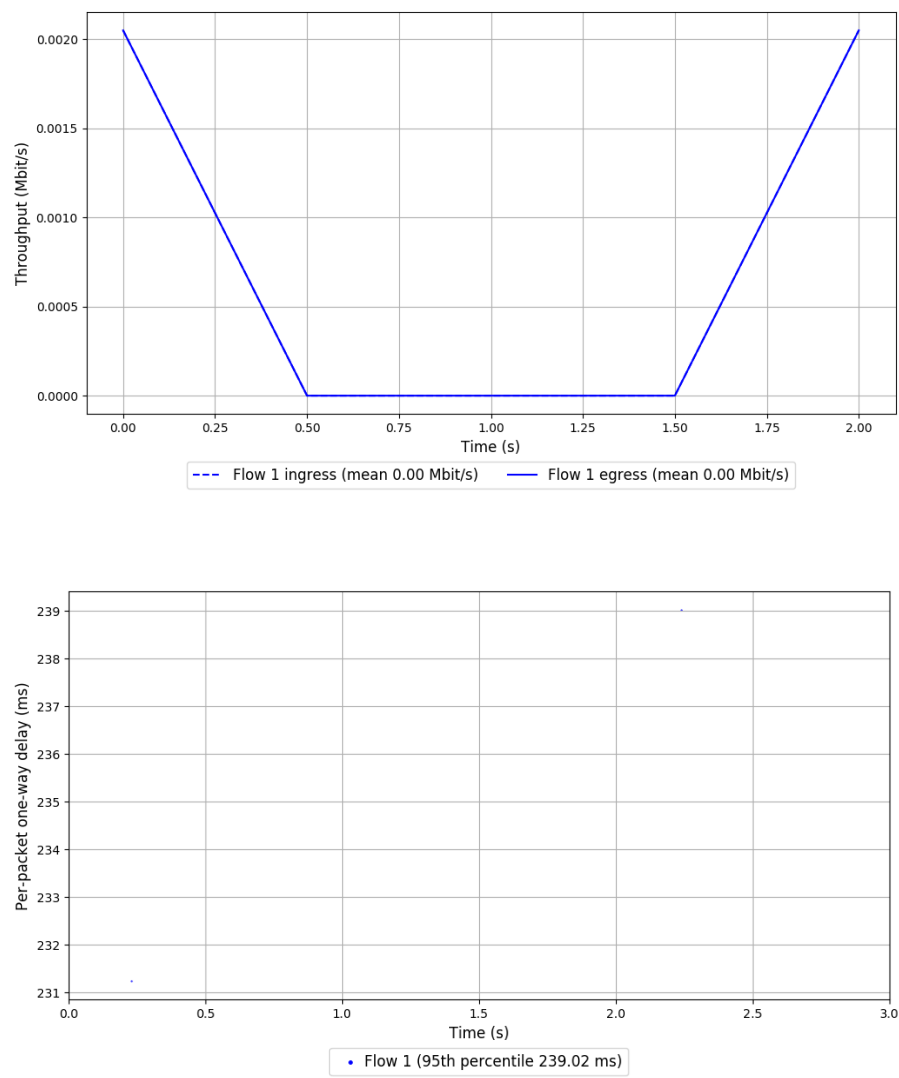
Start at: 2018-02-02 19:56:21

End at: 2018-02-02 19:56:51

Local clock offset: 0.39 ms

Remote clock offset: -0.25 ms

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

Start at: 2018-02-02 20:16:36

End at: 2018-02-02 20:17:06

Local clock offset: 0.393 ms

Remote clock offset: 4.112 ms

Below is generated by plot.py at 2018-02-02 20:37:19

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.83 Mbit/s

95th percentile per-packet one-way delay: 147.387 ms

Loss rate: 0.10%

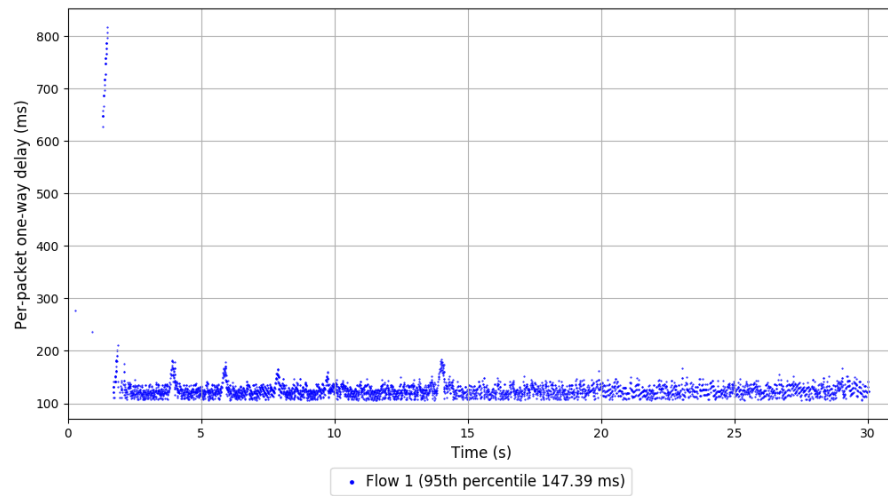
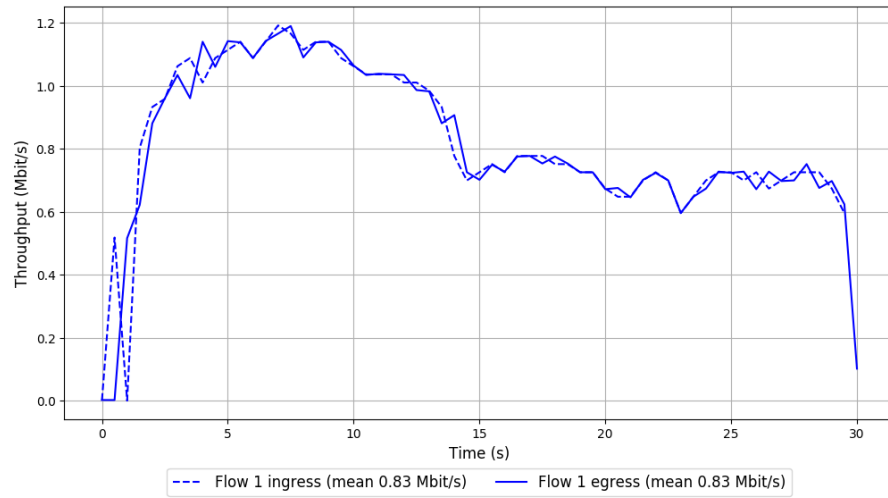
-- Flow 1:

Average throughput: 0.83 Mbit/s

95th percentile per-packet one-way delay: 147.387 ms

Loss rate: 0.10%

Run 3: Report of Copa — Data Link

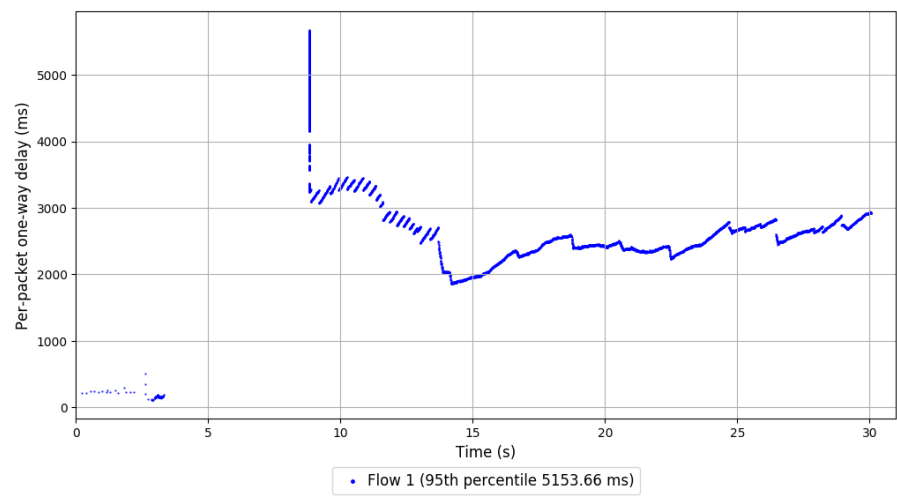
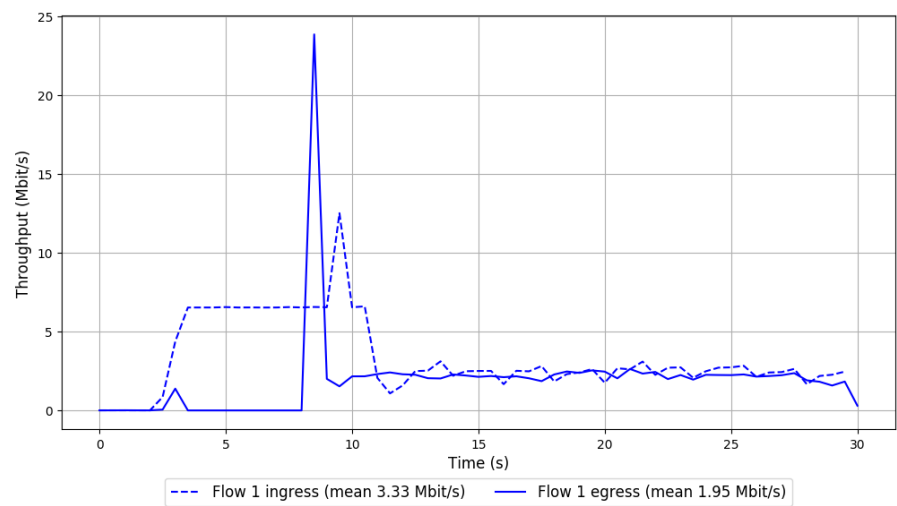


Run 1: Statistics of FillP

Start at: 2018-02-02 19:40:51
End at: 2018-02-02 19:41:21
Local clock offset: 0.448 ms
Remote clock offset: -0.554 ms

Below is generated by plot.py at 2018-02-02 20:37:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 5153.663 ms
Loss rate: 41.50%
-- Flow 1:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 5153.663 ms
Loss rate: 41.50%

Run 1: Report of FillP — Data Link

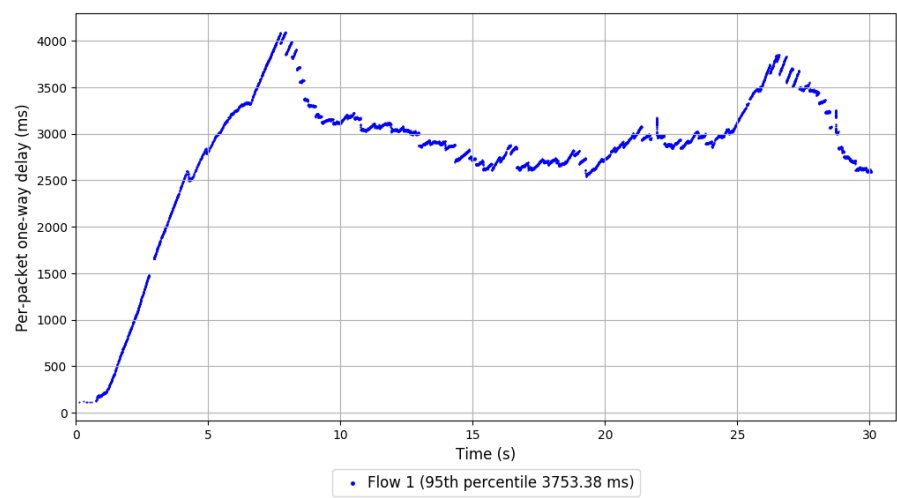
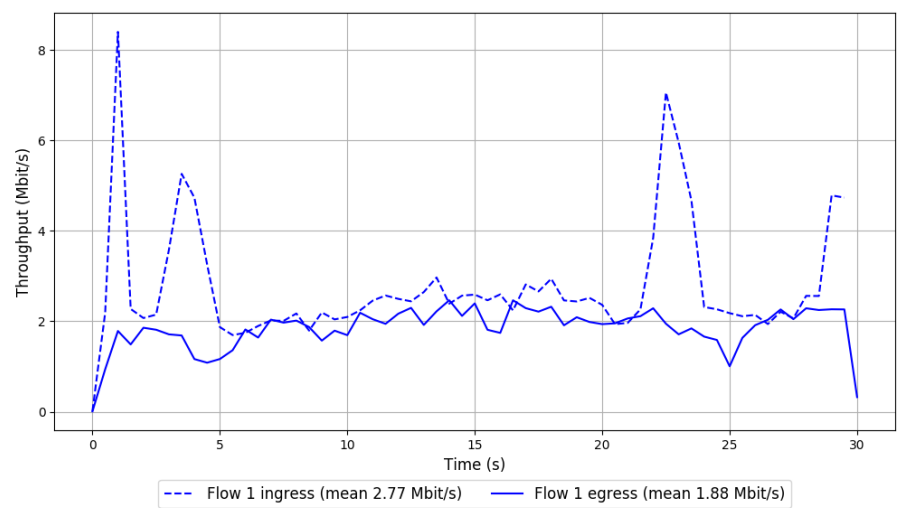


Run 2: Statistics of FillP

Start at: 2018-02-02 20:01:13
End at: 2018-02-02 20:01:43
Local clock offset: 0.393 ms
Remote clock offset: -1.015 ms

Below is generated by plot.py at 2018-02-02 20:37:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.88 Mbit/s
95th percentile per-packet one-way delay: 3753.383 ms
Loss rate: 32.21%
-- Flow 1:
Average throughput: 1.88 Mbit/s
95th percentile per-packet one-way delay: 3753.383 ms
Loss rate: 32.21%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-02-02 20:21:21

End at: 2018-02-02 20:21:51

Local clock offset: 0.335 ms

Remote clock offset: 5.04 ms

Below is generated by plot.py at 2018-02-02 20:37:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.75 Mbit/s

95th percentile per-packet one-way delay: 3863.135 ms

Loss rate: 23.07%

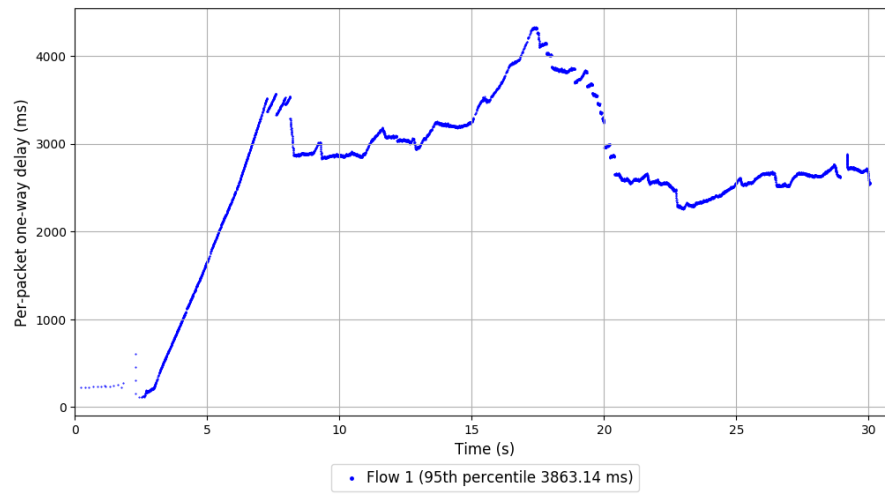
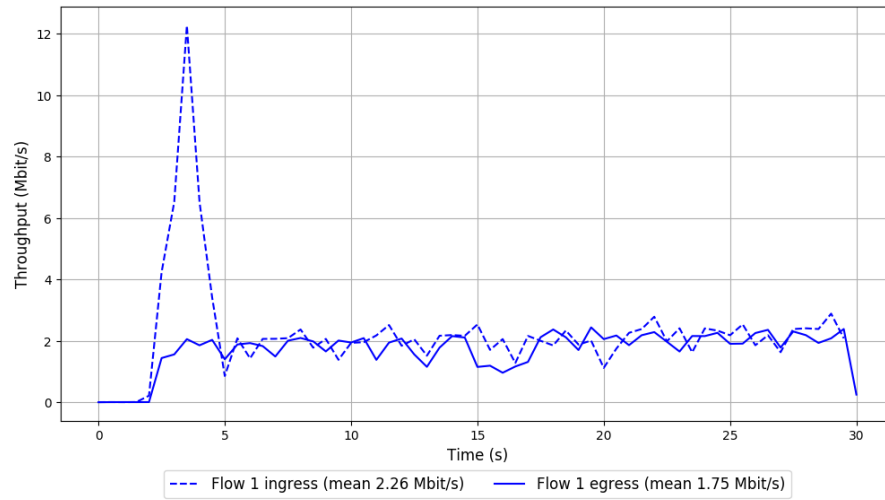
-- Flow 1:

Average throughput: 1.75 Mbit/s

95th percentile per-packet one-way delay: 3863.135 ms

Loss rate: 23.07%

Run 3: Report of FillP — Data Link



Run 1: Statistics of Indigo-1-32

Start at: 2018-02-02 19:53:59

End at: 2018-02-02 19:54:29

Local clock offset: 0.39 ms

Remote clock offset: 3.591 ms

Below is generated by plot.py at 2018-02-02 20:37:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.24 Mbit/s

95th percentile per-packet one-way delay: 174.204 ms

Loss rate: 0.07%

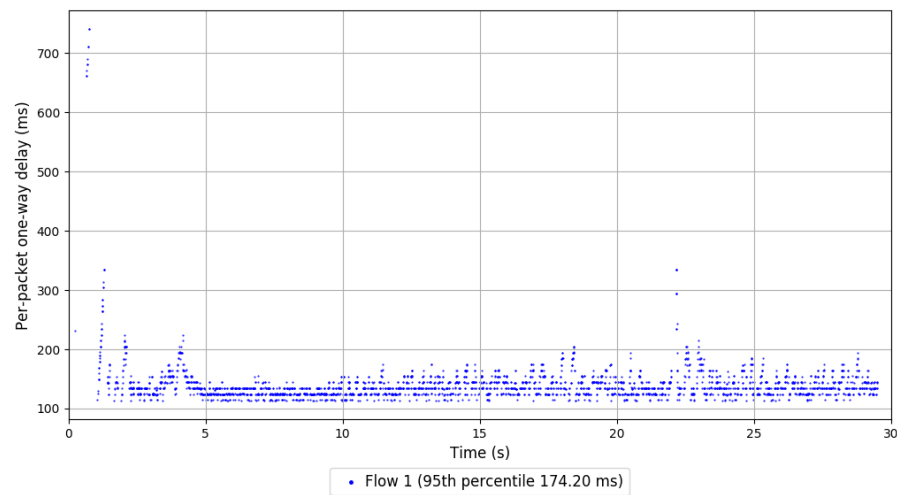
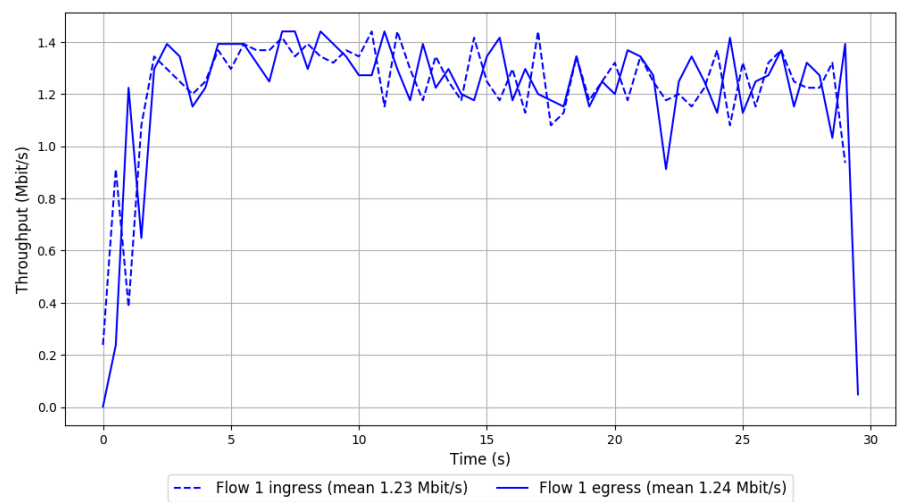
-- Flow 1:

Average throughput: 1.24 Mbit/s

95th percentile per-packet one-way delay: 174.204 ms

Loss rate: 0.07%

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



Run 2: Statistics of Indigo-1-32

Start at: 2018-02-02 20:14:14

End at: 2018-02-02 20:14:44

Local clock offset: 0.372 ms

Remote clock offset: -0.895 ms

Below is generated by plot.py at 2018-02-02 20:37:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.45 Mbit/s

95th percentile per-packet one-way delay: 179.400 ms

Loss rate: 0.03%

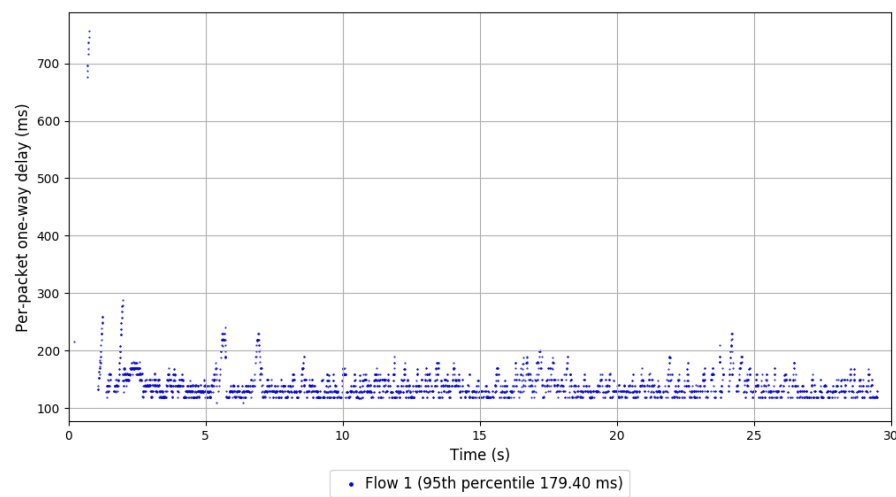
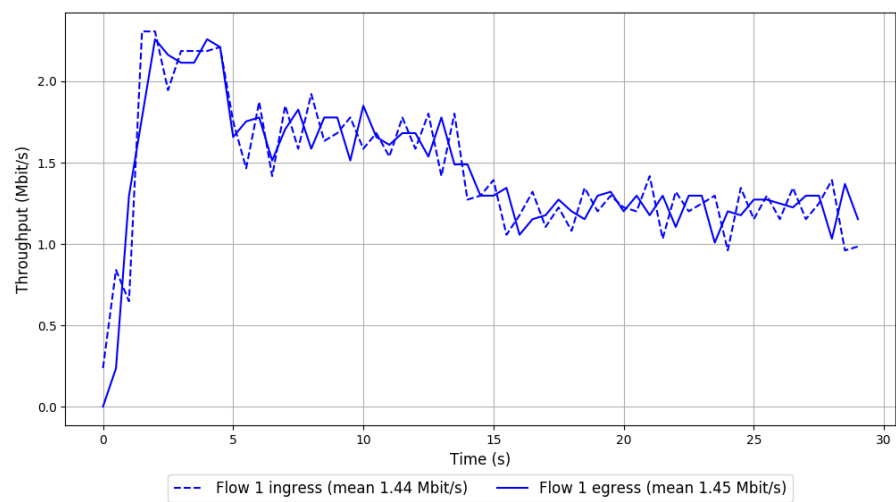
-- Flow 1:

Average throughput: 1.45 Mbit/s

95th percentile per-packet one-way delay: 179.400 ms

Loss rate: 0.03%

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



Run 3: Statistics of Indigo-1-32

Start at: 2018-02-02 20:34:18

End at: 2018-02-02 20:34:48

Local clock offset: 0.488 ms

Remote clock offset: 5.155 ms

Below is generated by plot.py at 2018-02-02 20:37:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.33 Mbit/s

95th percentile per-packet one-way delay: 192.992 ms

Loss rate: 0.03%

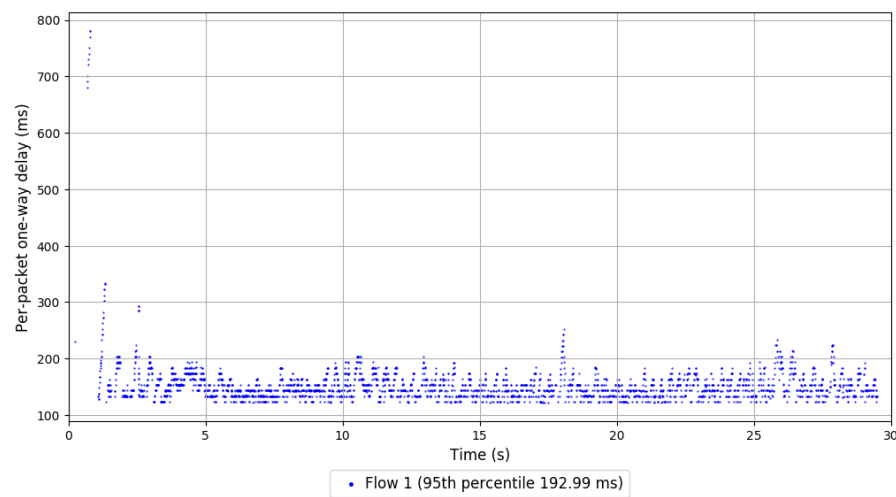
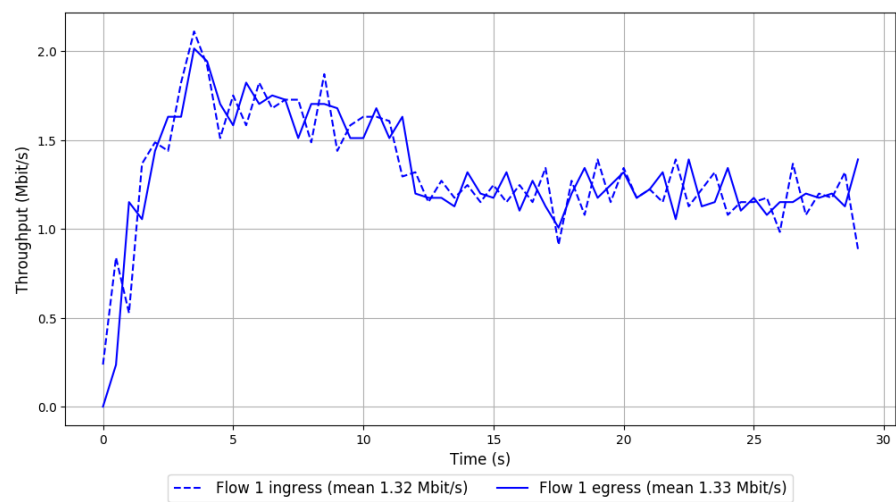
-- Flow 1:

Average throughput: 1.33 Mbit/s

95th percentile per-packet one-way delay: 192.992 ms

Loss rate: 0.03%

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



Run 1: Statistics of Vivace-latency

Start at: 2018-02-02 19:51:36

End at: 2018-02-02 19:52:06

Local clock offset: 0.391 ms

Remote clock offset: 4.534 ms

Below is generated by plot.py at 2018-02-02 20:37:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.60 Mbit/s

95th percentile per-packet one-way delay: 378.188 ms

Loss rate: 0.05%

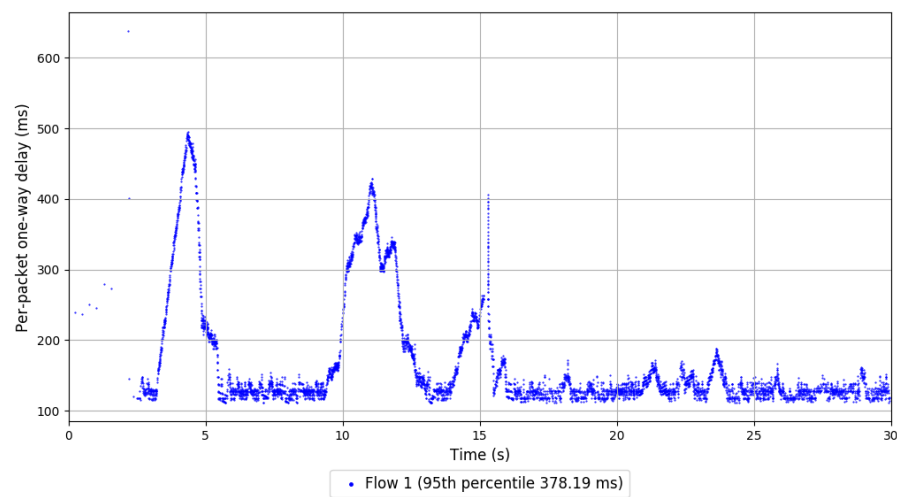
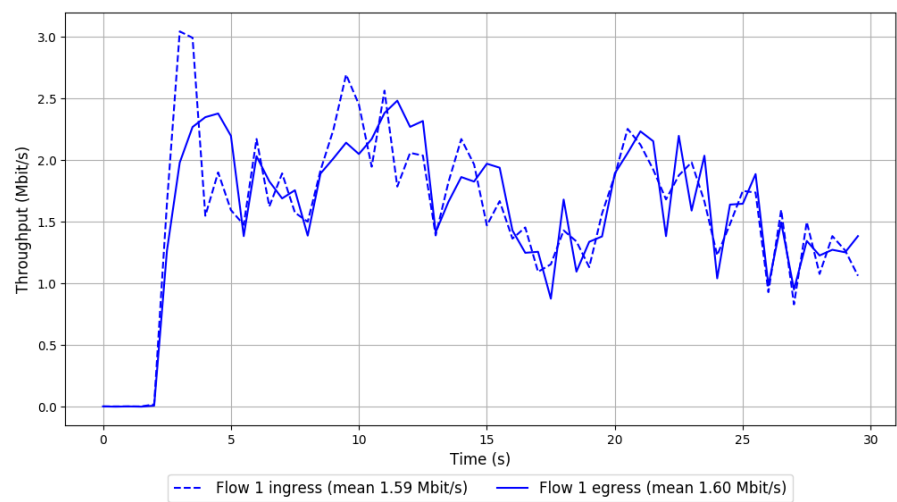
-- Flow 1:

Average throughput: 1.60 Mbit/s

95th percentile per-packet one-way delay: 378.188 ms

Loss rate: 0.05%

Run 1: Report of Vivace-latency — Data Link

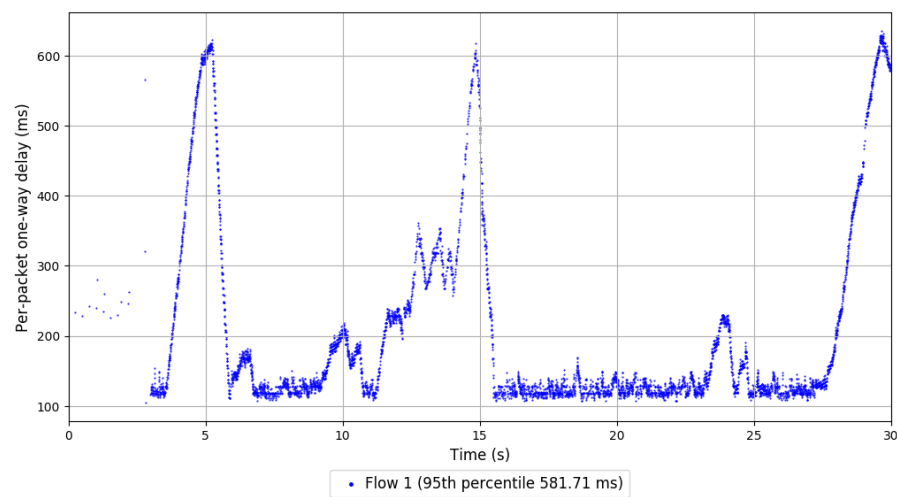
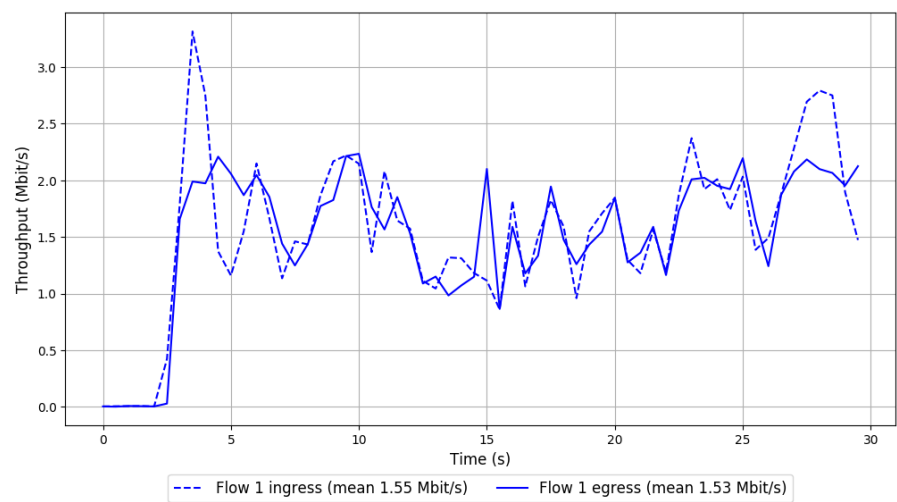


Run 2: Statistics of Vivace-latency

Start at: 2018-02-02 20:11:53
End at: 2018-02-02 20:12:23
Local clock offset: 0.304 ms
Remote clock offset: -0.045 ms

Below is generated by plot.py at 2018-02-02 20:37:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 581.713 ms
Loss rate: 1.97%
-- Flow 1:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 581.713 ms
Loss rate: 1.97%

Run 2: Report of Vivace-latency — Data Link



Run 3: Statistics of Vivace-latency

Start at: 2018-02-02 20:31:57

End at: 2018-02-02 20:32:27

Local clock offset: 0.467 ms

Remote clock offset: 0.161 ms

Below is generated by plot.py at 2018-02-02 20:37:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 252.418 ms

Loss rate: 0.00%

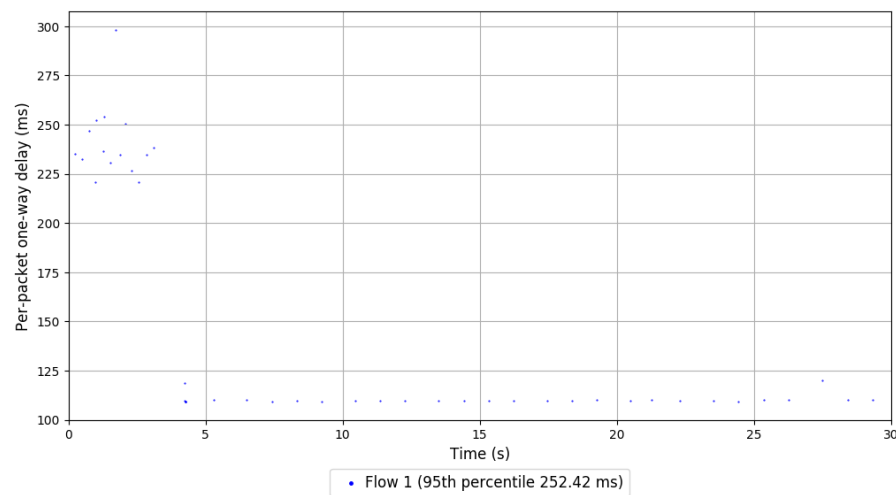
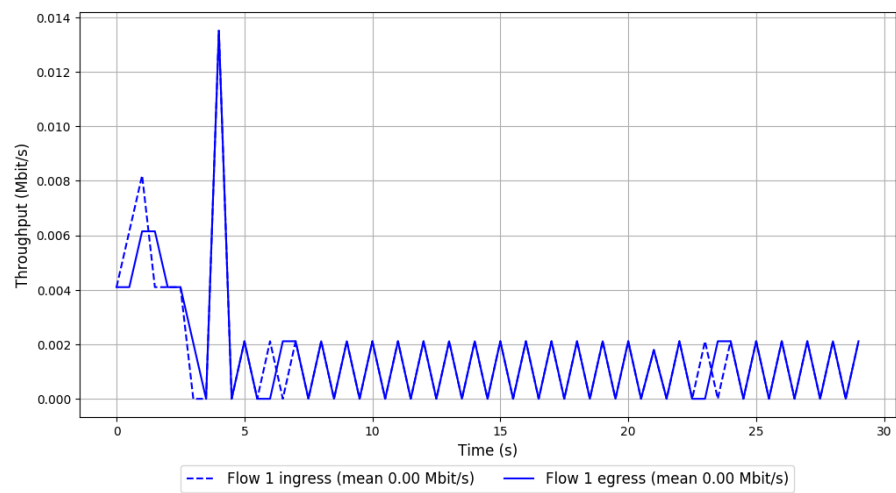
-- Flow 1:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 252.418 ms

Loss rate: 0.00%

Run 3: Report of Vivace-latency — Data Link



Run 1: Statistics of Vivace-loss

Start at: 2018-02-02 19:39:40

End at: 2018-02-02 19:40:10

Local clock offset: 0.456 ms

Remote clock offset: 4.199 ms

Below is generated by plot.py at 2018-02-02 20:37:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.88 Mbit/s

95th percentile per-packet one-way delay: 3830.846 ms

Loss rate: 21.36%

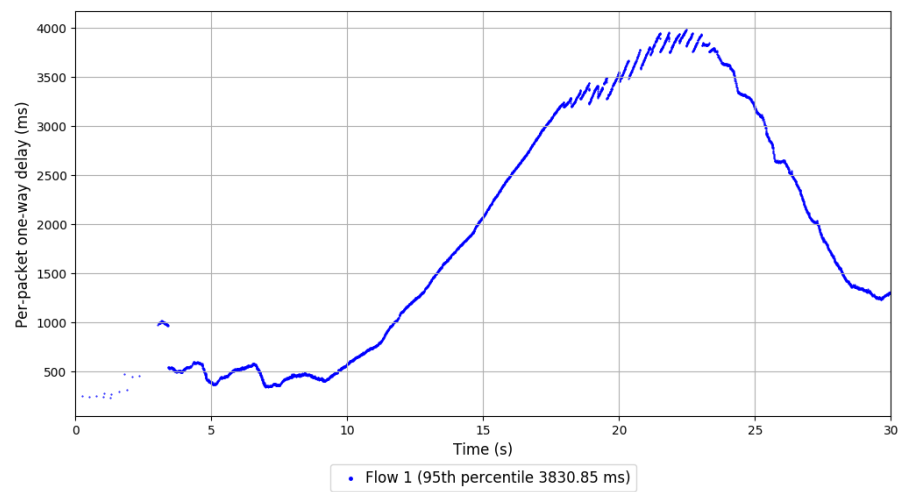
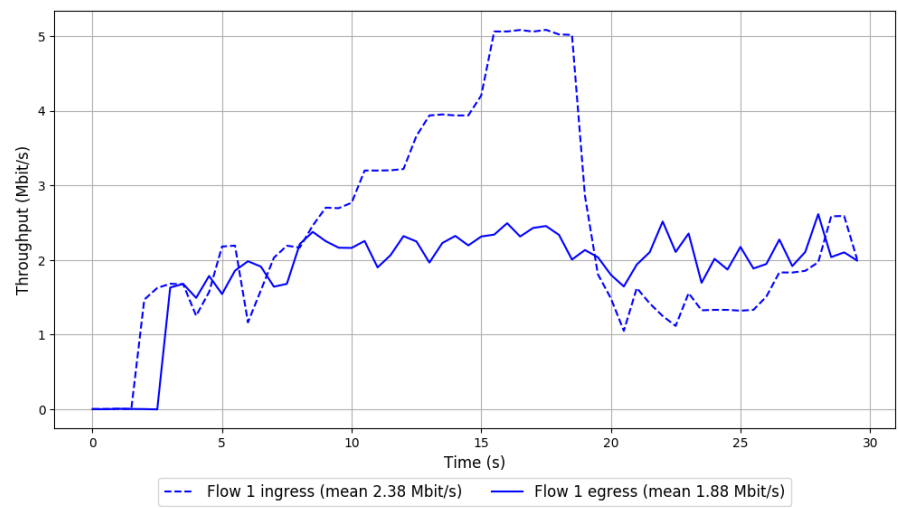
-- Flow 1:

Average throughput: 1.88 Mbit/s

95th percentile per-packet one-way delay: 3830.846 ms

Loss rate: 21.36%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-02-02 20:00:02

End at: 2018-02-02 20:00:32

Local clock offset: 0.376 ms

Remote clock offset: 4.614 ms

Below is generated by plot.py at 2018-02-02 20:37:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 1947.906 ms

Loss rate: 0.00%

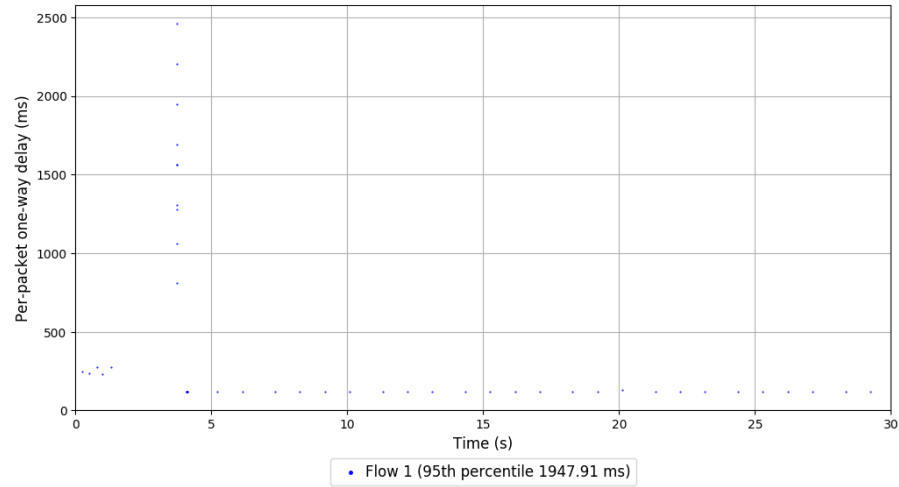
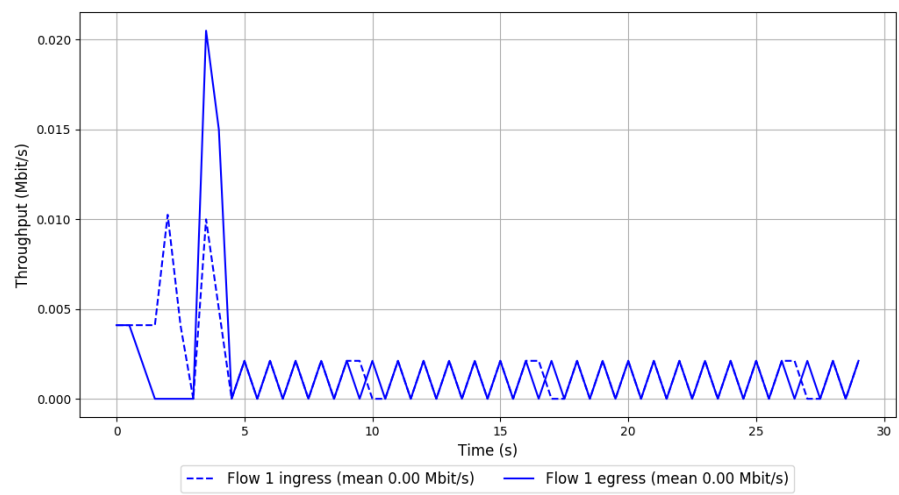
-- Flow 1:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 1947.906 ms

Loss rate: 0.00%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-02-02 20:20:08

End at: 2018-02-02 20:20:38

Local clock offset: 0.41 ms

Remote clock offset: 0.004 ms

Below is generated by plot.py at 2018-02-02 20:37:29

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.43 Mbit/s

95th percentile per-packet one-way delay: 5529.445 ms

Loss rate: 27.26%

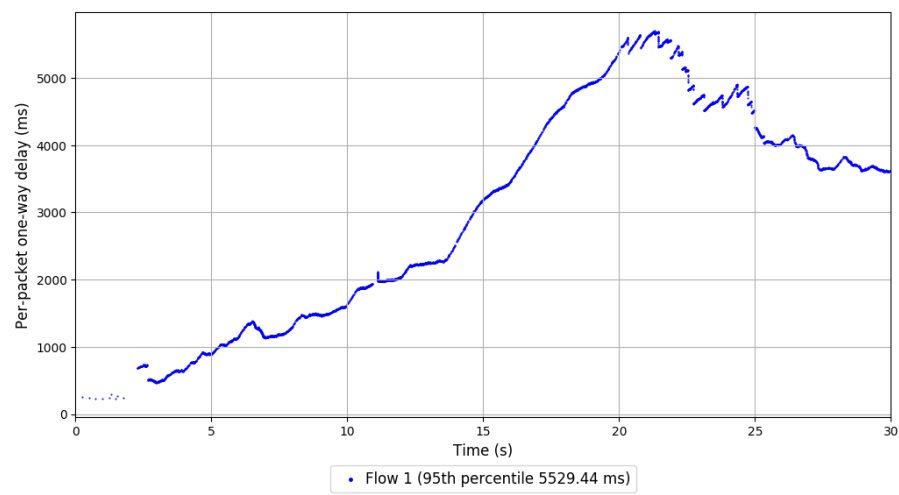
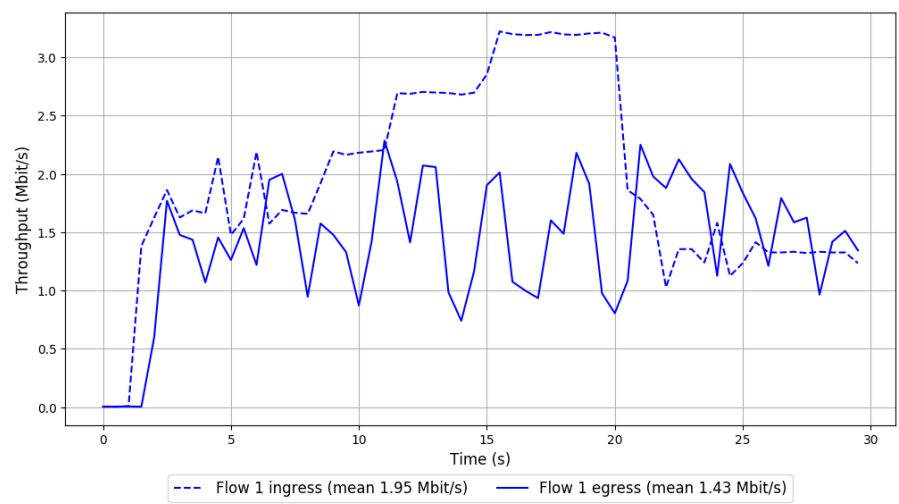
-- Flow 1:

Average throughput: 1.43 Mbit/s

95th percentile per-packet one-way delay: 5529.445 ms

Loss rate: 27.26%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-02-02 19:38:30

End at: 2018-02-02 19:39:00

Local clock offset: 0.381 ms

Remote clock offset: 3.407 ms

Below is generated by plot.py at 2018-02-02 20:37:29

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 258.560 ms

Loss rate: 0.00%

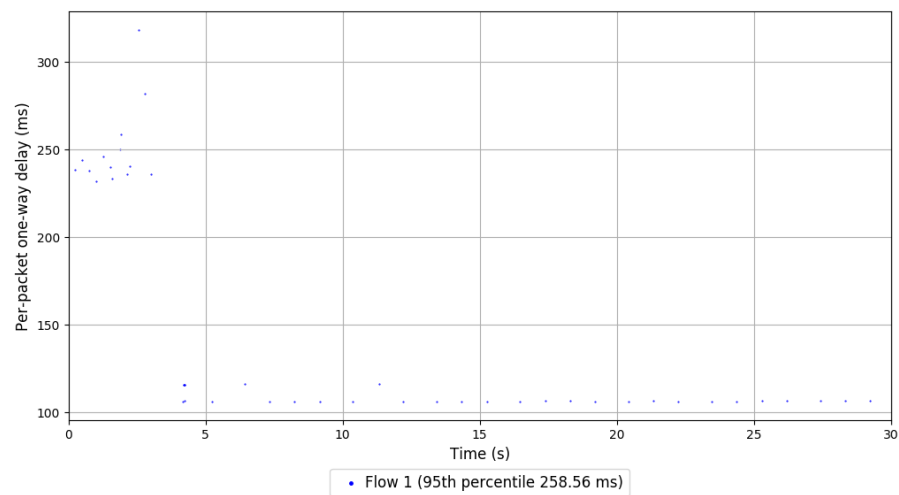
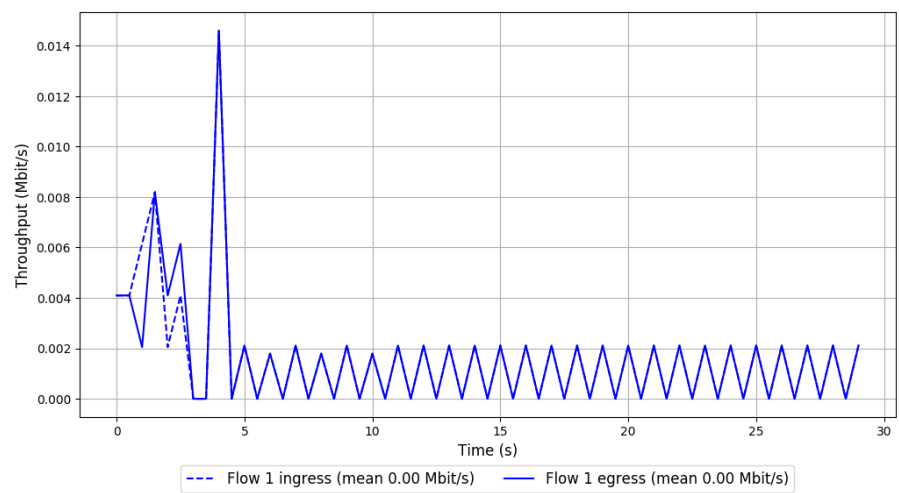
-- Flow 1:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 258.560 ms

Loss rate: 0.00%

Run 1: Report of Vivace-LTE — Data Link

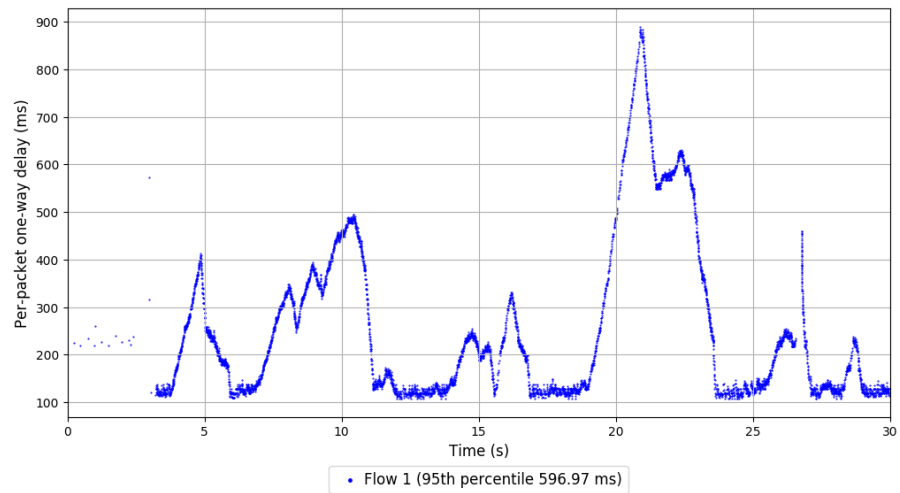
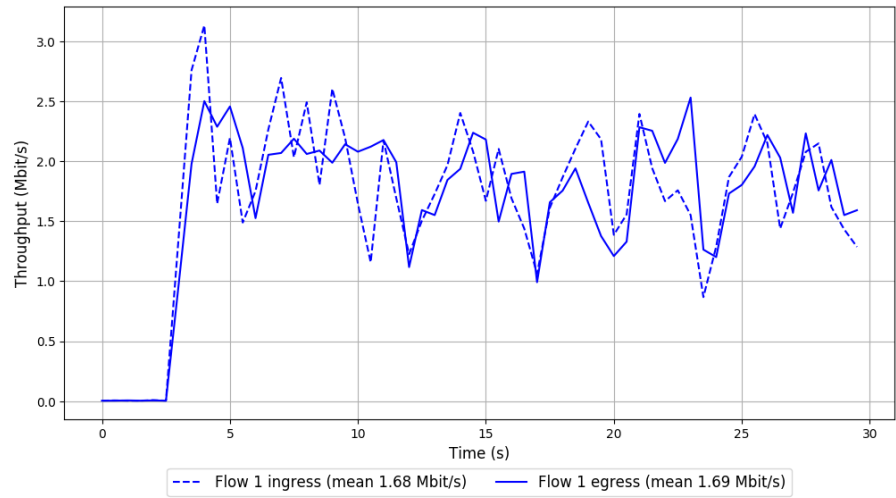


Run 2: Statistics of Vivace-LTE

Start at: 2018-02-02 19:58:43
End at: 2018-02-02 19:59:13
Local clock offset: 0.381 ms
Remote clock offset: -0.302 ms

Below is generated by plot.py at 2018-02-02 20:37:29
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 596.972 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 596.972 ms
Loss rate: 0.05%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-02-02 20:18:58

End at: 2018-02-02 20:19:28

Local clock offset: 0.408 ms

Remote clock offset: 5.673 ms

Below is generated by plot.py at 2018-02-02 20:37:29

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 266.266 ms

Loss rate: 0.00%

-- Flow 1:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 266.266 ms

Loss rate: 0.00%

Run 3: Report of Vivace-LTE — Data Link

