

Pantheon Report

Generated at 2018-02-27 08:30:51 (UTC).

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

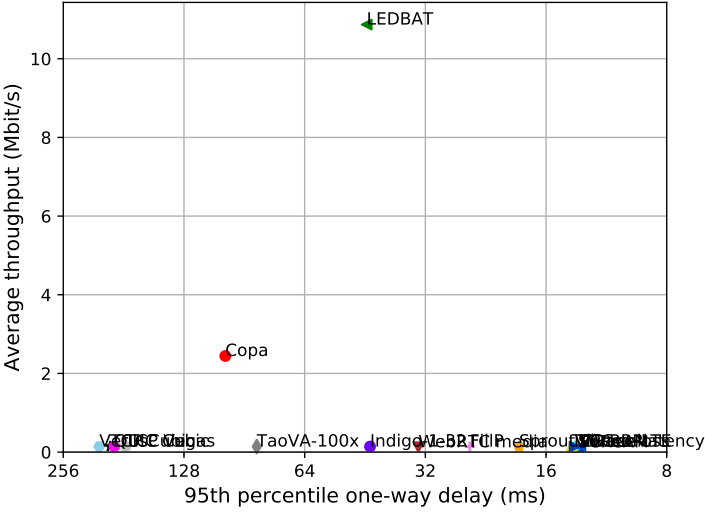
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

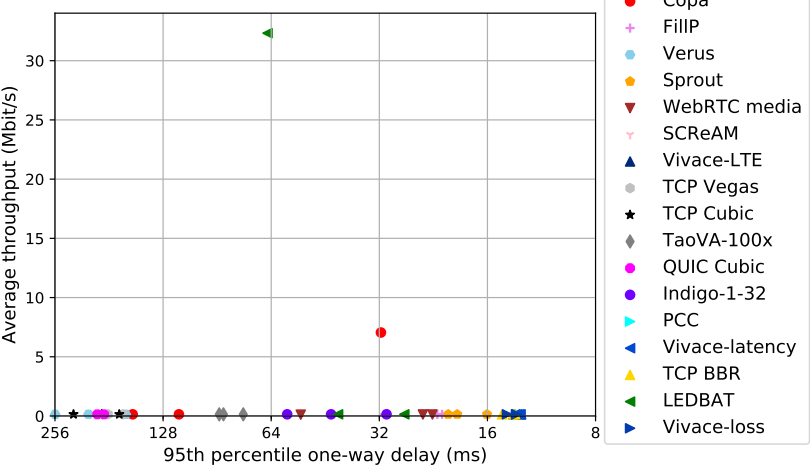
Git summary:

```
branch: master @ f12c42a2c63fdd9a862eefa0468859bf379b6623
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 828bbf95fd4941149b5cec90f281d1c69ae1a5c6
third_party/genericCC @ 9249eea3238475c4d8cca1443d28df70bff6c4a2
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eae30b267cde681
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 California 1 Ethernet to Stanford ppp0, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS California 1 Ethernet to Stanford 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	0.14	13.83	21.06
TCP Cubic	3	0.14	195.52	31.97
LEDBAT	3	10.87	44.83	23.71
PCC	3	0.14	13.20	94.51
QUIC Cubic	2	0.14	191.05	60.78
SCReAM	3	0.12	13.32	0.99
WebRTC media	3	0.12	33.31	67.22
Sprout	3	0.14	18.68	52.49
TaoVA-100x	3	0.14	84.26	91.40
TCP Vegas	3	0.14	178.90	32.35
Verus	3	0.14	208.24	90.65
Copa	3	2.44	100.95	34.42
FillP	3	0.14	24.79	98.43
Indigo-1-32	3	0.14	43.97	74.36
Vivace-latency	3	0.14	13.14	88.28
Vivace-loss	3	0.14	13.58	88.31
Vivace-LTE	3	0.14	13.27	88.22

Run 1: Statistics of TCP BBR

Start at: 2018-02-27 07:29:29

End at: 2018-02-27 07:29:59

Local clock offset: -7.852 ms

Remote clock offset: -4.762 ms

Below is generated by plot.py at 2018-02-27 08:30:17

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 13.547 ms

Loss rate: 21.44%

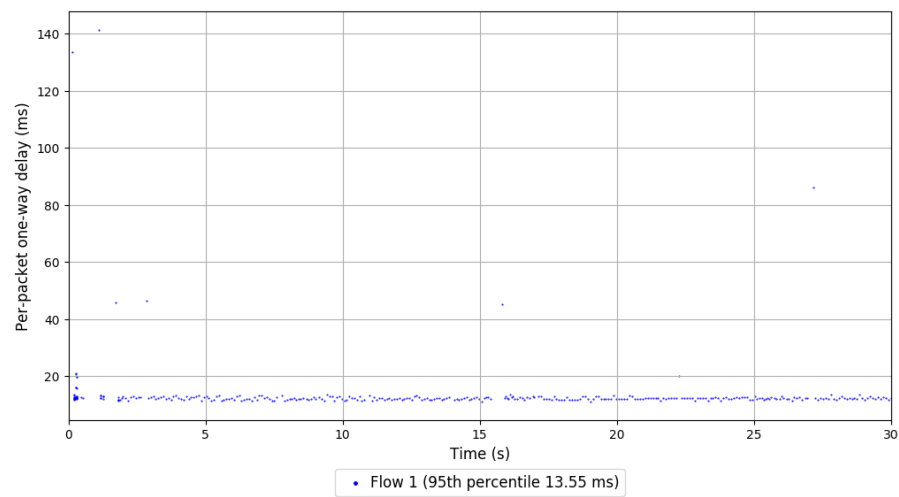
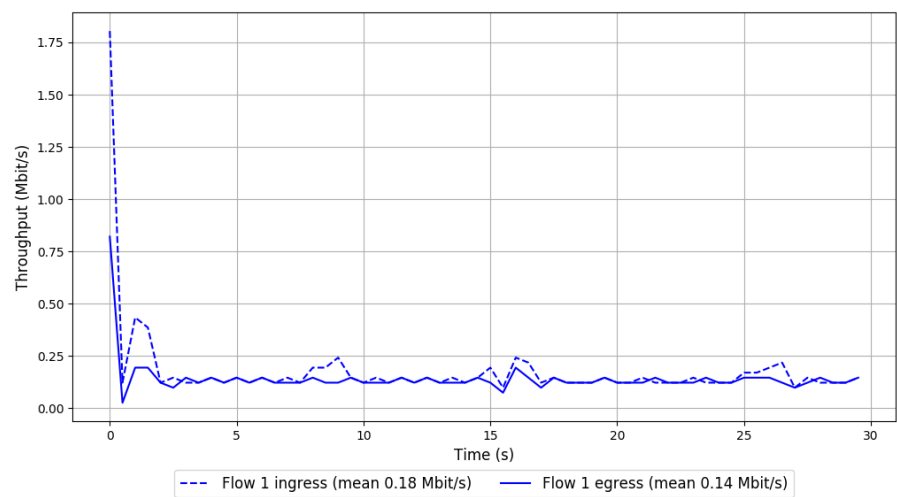
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 13.547 ms

Loss rate: 21.44%

Run 1: Report of TCP BBR — Data Link

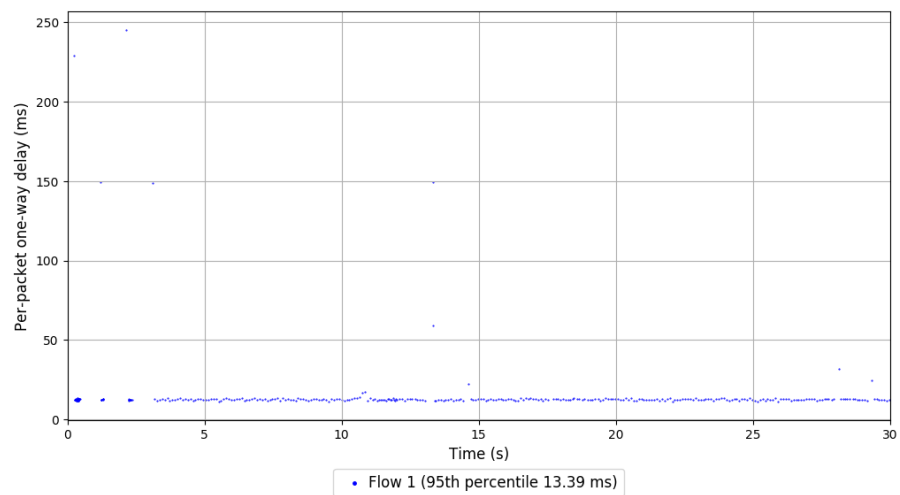
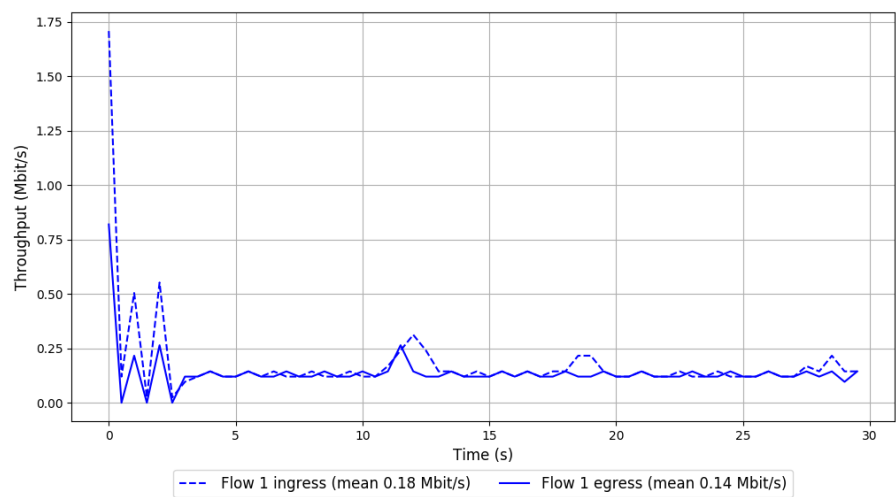


Run 2: Statistics of TCP BBR

Start at: 2018-02-27 07:52:58
End at: 2018-02-27 07:53:28
Local clock offset: -2.278 ms
Remote clock offset: -5.983 ms

Below is generated by plot.py at 2018-02-27 08:30:17
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.393 ms
Loss rate: 21.79%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.393 ms
Loss rate: 21.79%

Run 2: Report of TCP BBR — Data Link

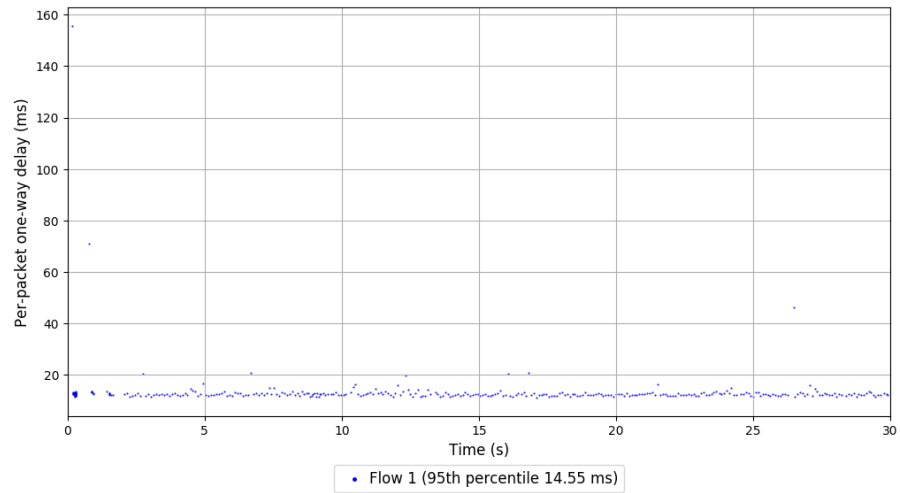
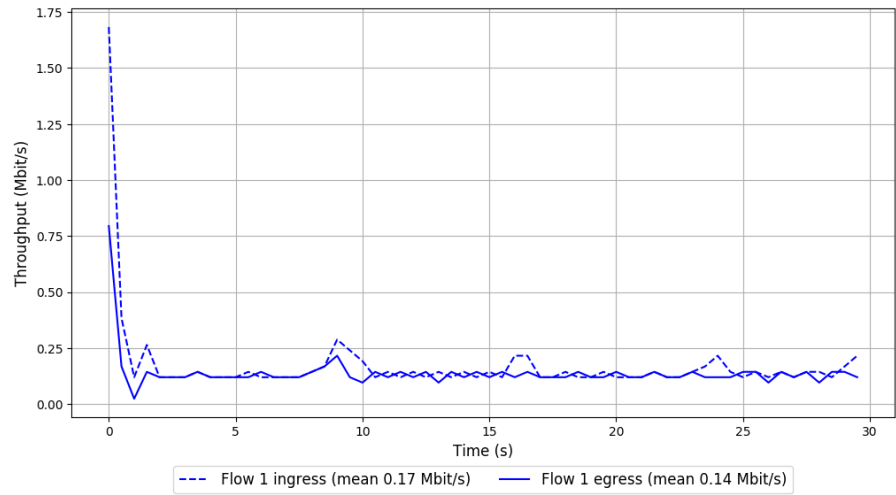


Run 3: Statistics of TCP BBR

Start at: 2018-02-27 08:16:27
End at: 2018-02-27 08:16:57
Local clock offset: -1.382 ms
Remote clock offset: -6.076 ms

Below is generated by plot.py at 2018-02-27 08:30:17
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 14.555 ms
Loss rate: 19.95%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 14.555 ms
Loss rate: 19.95%

Run 3: Report of TCP BBR — Data Link

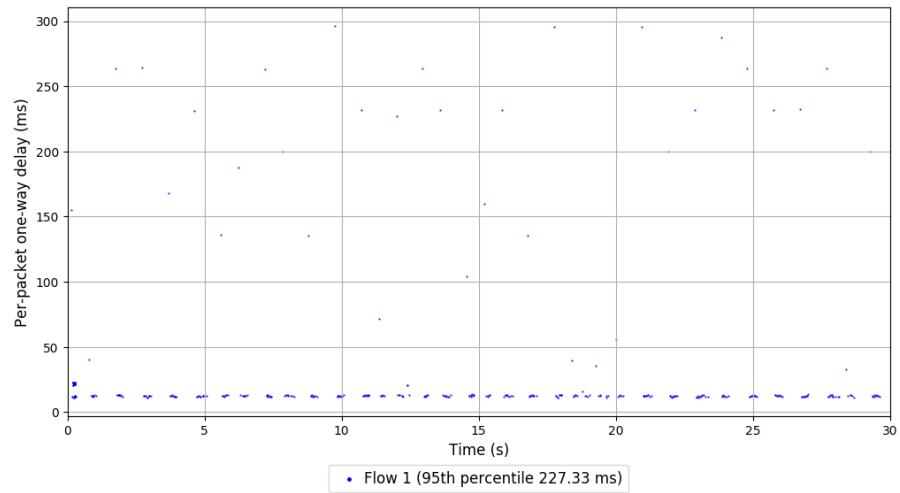
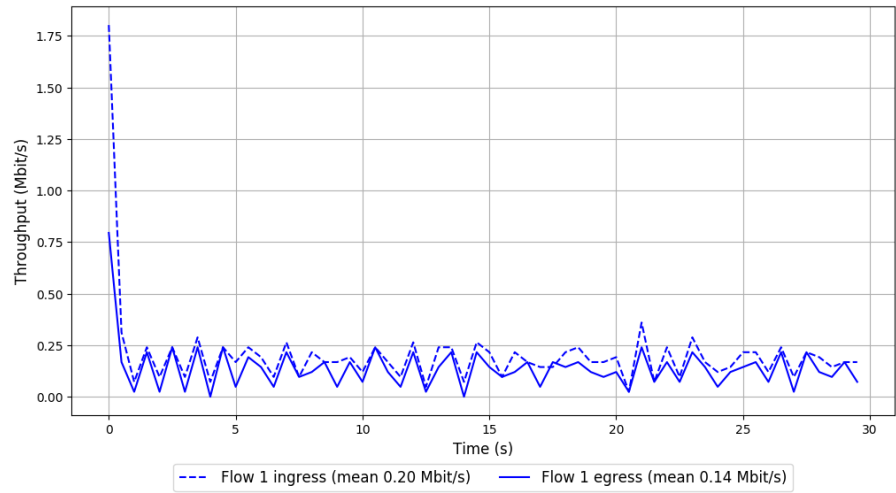


Run 1: Statistics of TCP Cubic

Start at: 2018-02-27 07:22:58
End at: 2018-02-27 07:23:28
Local clock offset: -6.872 ms
Remote clock offset: -4.903 ms

Below is generated by plot.py at 2018-02-27 08:30:17
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 227.334 ms
Loss rate: 32.28%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 227.334 ms
Loss rate: 32.28%

Run 1: Report of TCP Cubic — Data Link

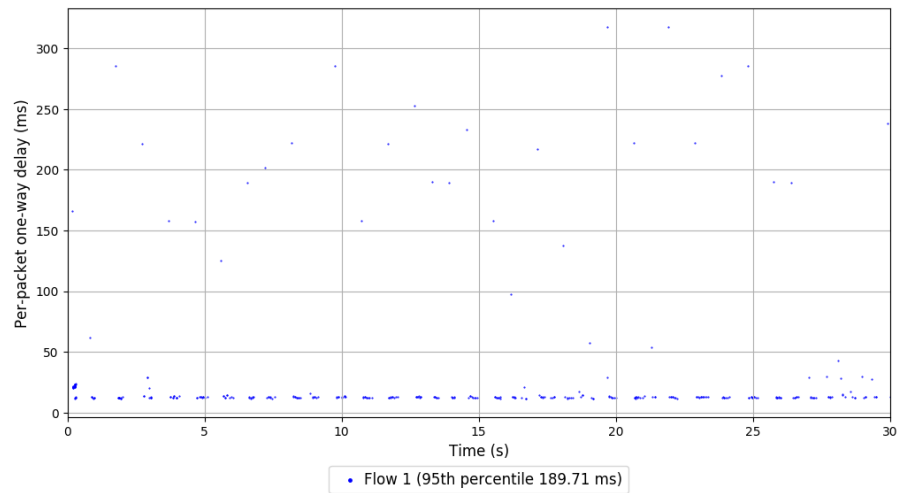
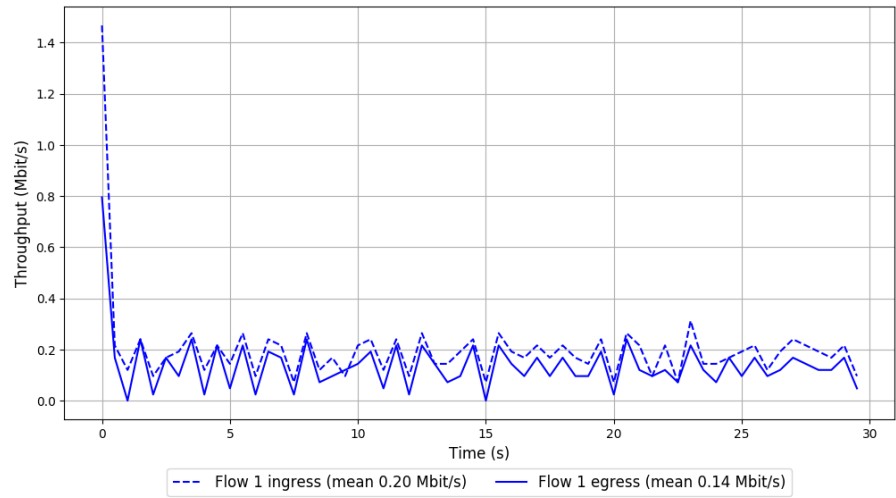


Run 2: Statistics of TCP Cubic

Start at: 2018-02-27 07:46:26
End at: 2018-02-27 07:46:56
Local clock offset: -3.602 ms
Remote clock offset: -5.581 ms

Below is generated by plot.py at 2018-02-27 08:30:17
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 189.710 ms
Loss rate: 31.21%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 189.710 ms
Loss rate: 31.21%

Run 2: Report of TCP Cubic — Data Link

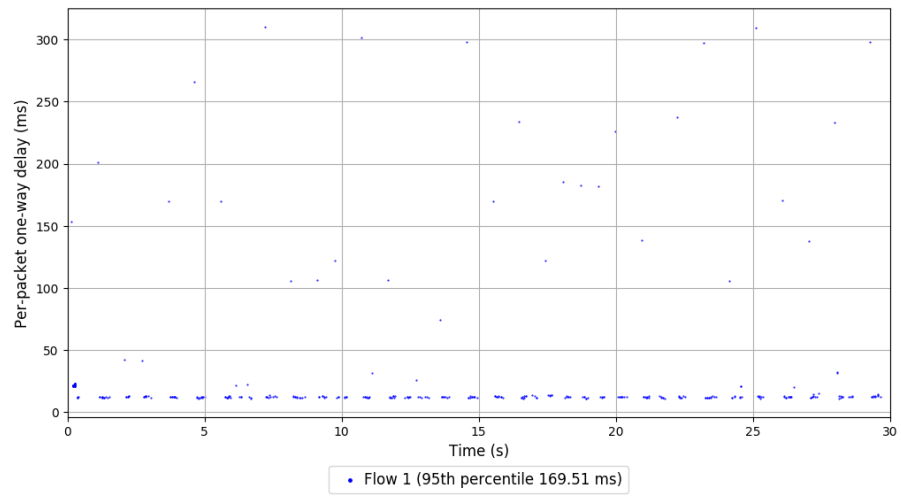
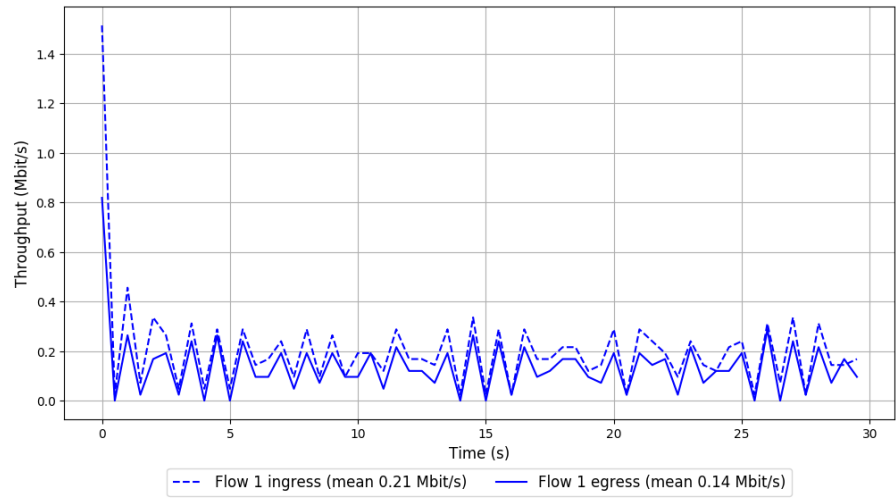


Run 3: Statistics of TCP Cubic

Start at: 2018-02-27 08:09:55
End at: 2018-02-27 08:10:25
Local clock offset: -2.019 ms
Remote clock offset: -6.422 ms

Below is generated by plot.py at 2018-02-27 08:30:18
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 169.506 ms
Loss rate: 32.41%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 169.506 ms
Loss rate: 32.41%

Run 3: Report of TCP Cubic — Data Link

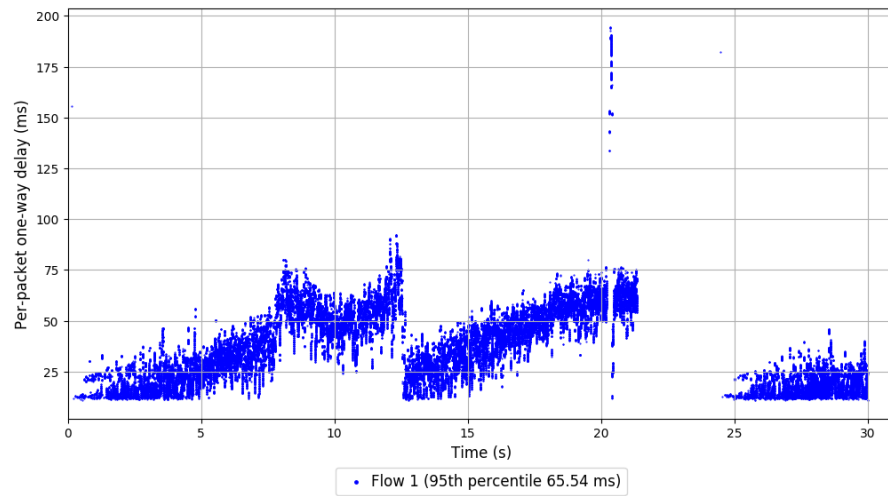
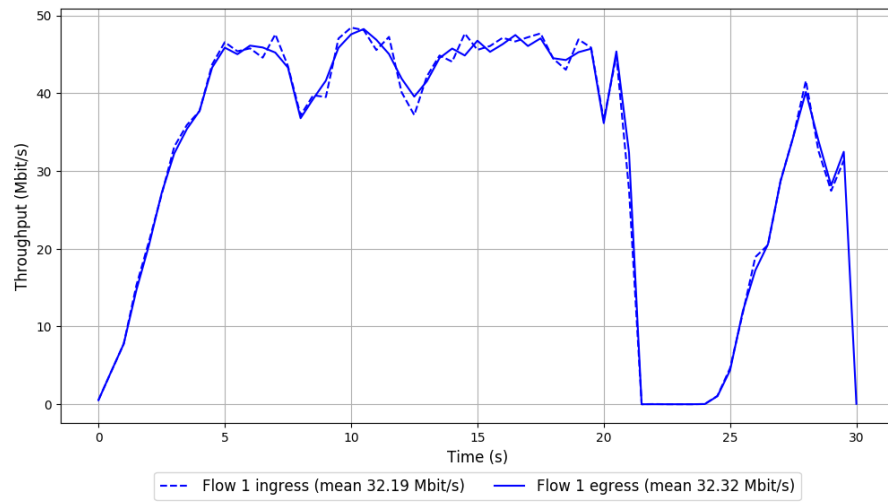


Run 1: Statistics of LEDBAT

Start at: 2018-02-27 07:19:01
End at: 2018-02-27 07:19:31
Local clock offset: -6.773 ms
Remote clock offset: -5.035 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 32.32 Mbit/s
95th percentile per-packet one-way delay: 65.540 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 32.32 Mbit/s
95th percentile per-packet one-way delay: 65.540 ms
Loss rate: 0.05%

Run 1: Report of LEDBAT — Data Link

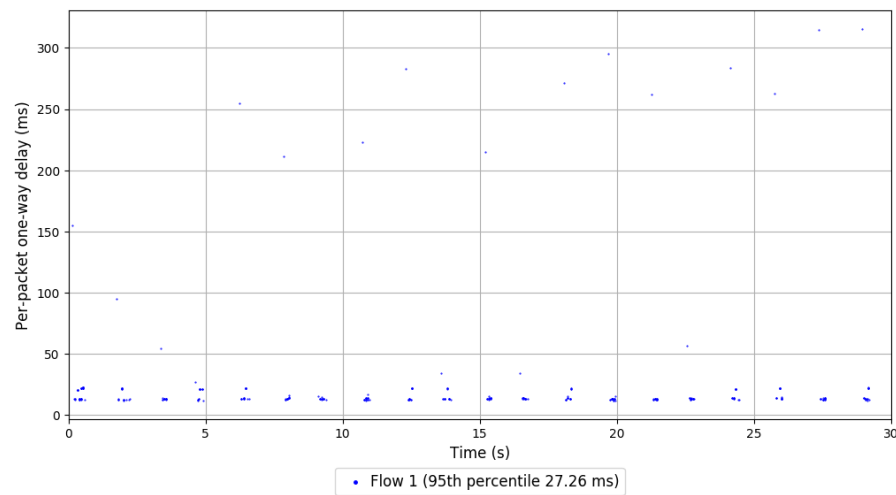
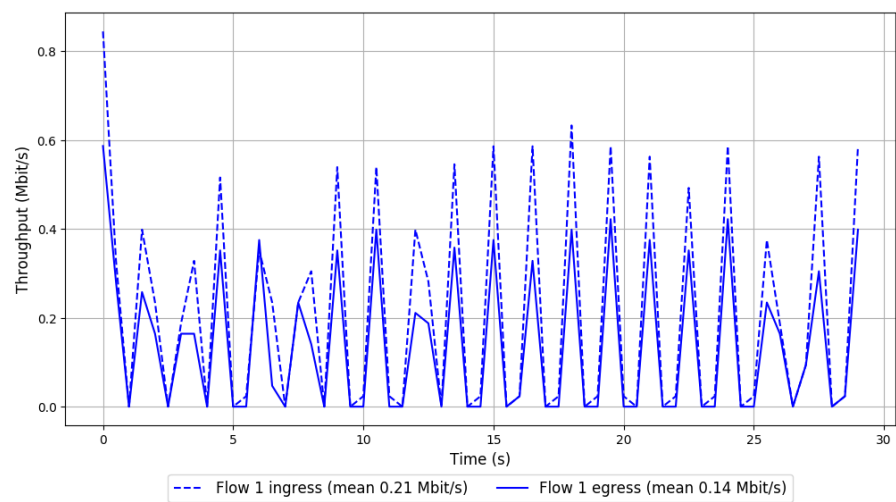


Run 2: Statistics of LEDBAT

Start at: 2018-02-27 07:42:32
End at: 2018-02-27 07:43:02
Local clock offset: -5.257 ms
Remote clock offset: -5.239 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 27.264 ms
Loss rate: 33.88%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 27.264 ms
Loss rate: 33.88%

Run 2: Report of LEDBAT — Data Link

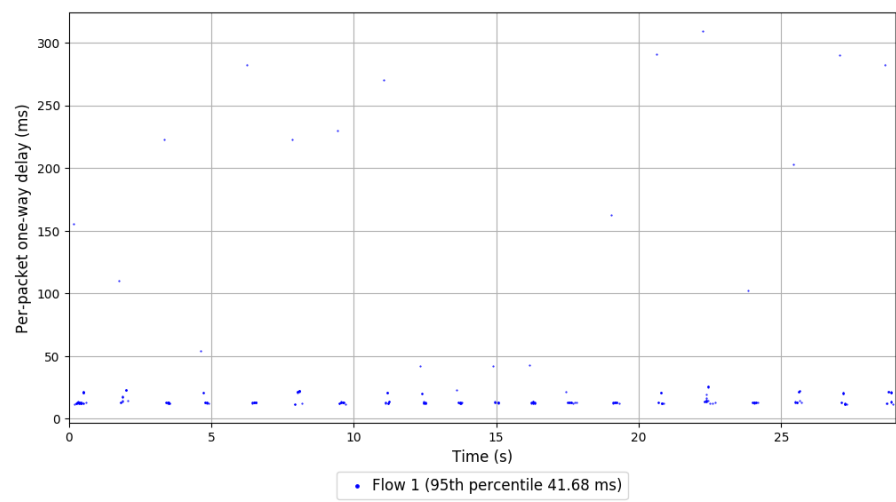
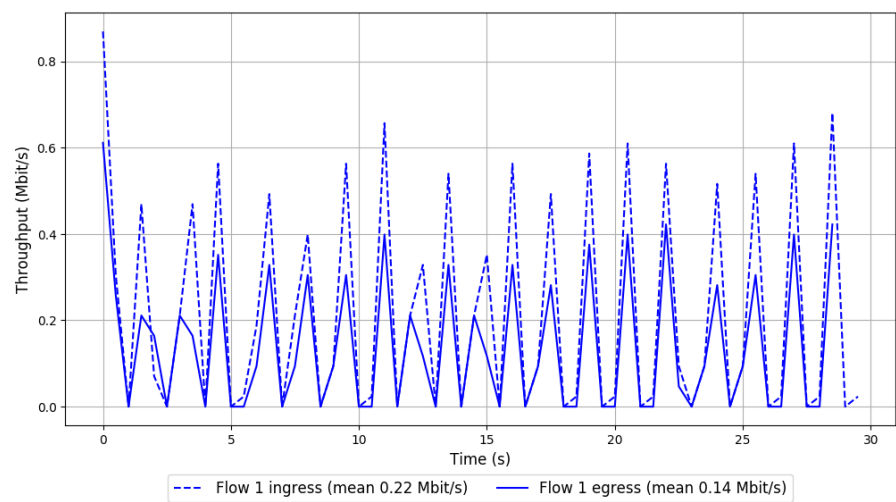


Run 3: Statistics of LEDBAT

Start at: 2018-02-27 08:06:01
End at: 2018-02-27 08:06:31
Local clock offset: -1.984 ms
Remote clock offset: -6.341 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 41.684 ms
Loss rate: 37.20%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 41.684 ms
Loss rate: 37.20%

Run 3: Report of LEDBAT — Data Link

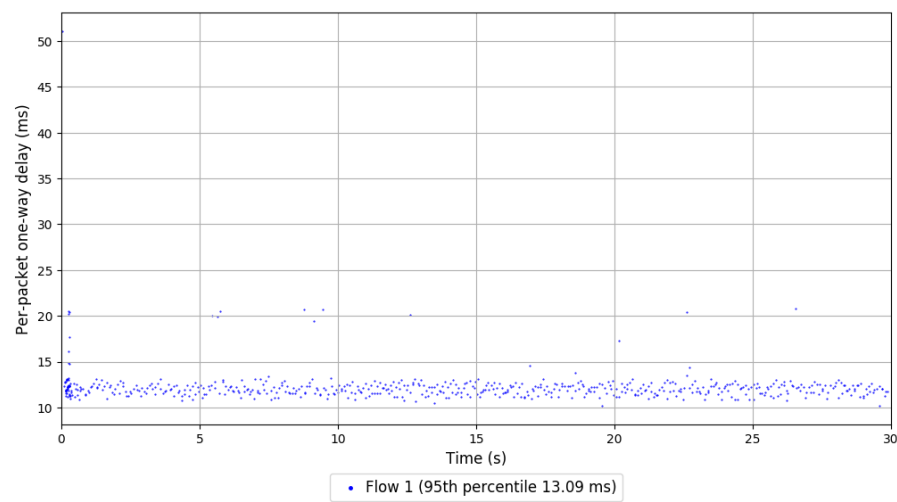
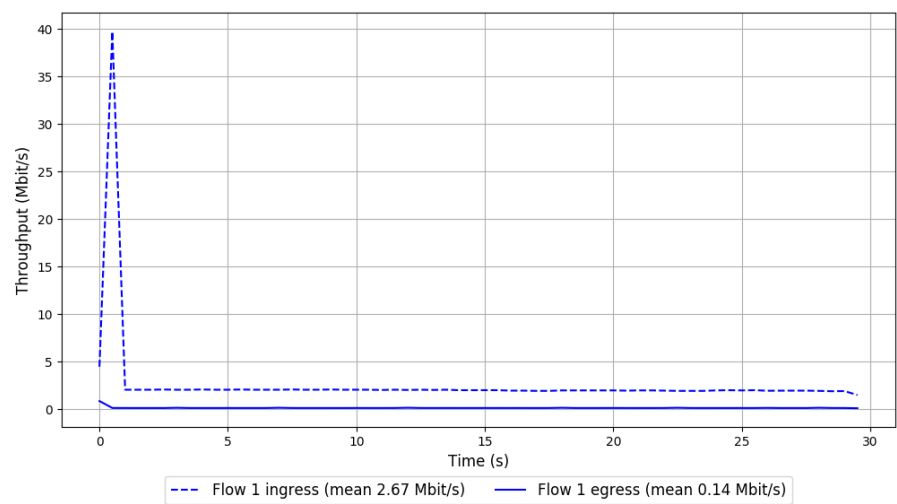


Run 1: Statistics of PCC

Start at: 2018-02-27 07:33:23
End at: 2018-02-27 07:33:54
Local clock offset: -8.669 ms
Remote clock offset: -4.723 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.090 ms
Loss rate: 94.75%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.090 ms
Loss rate: 94.75%

Run 1: Report of PCC — Data Link

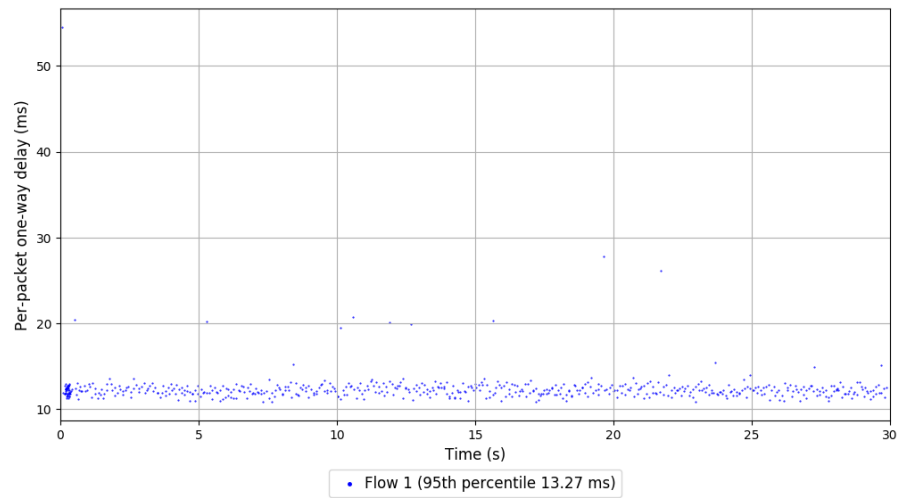
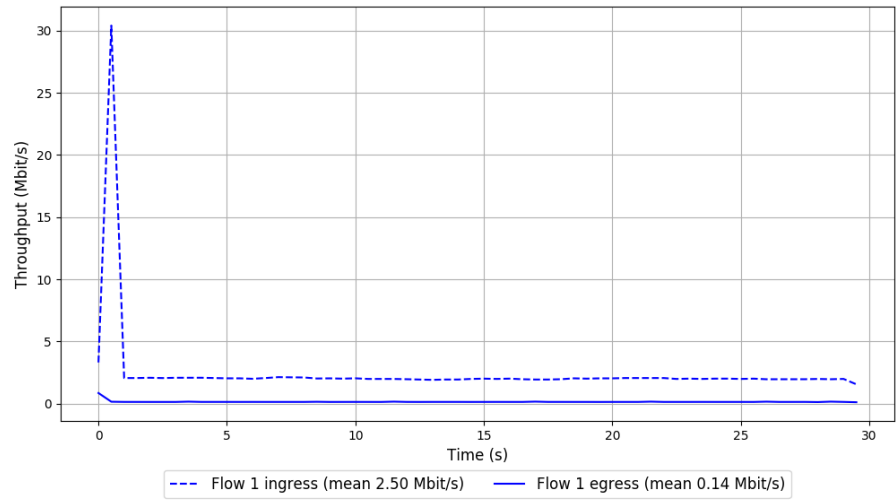


Run 2: Statistics of PCC

Start at: 2018-02-27 07:56:53
End at: 2018-02-27 07:57:23
Local clock offset: -1.964 ms
Remote clock offset: -6.036 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.269 ms
Loss rate: 94.38%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.269 ms
Loss rate: 94.38%

Run 2: Report of PCC — Data Link



Run 3: Statistics of PCC

Start at: 2018-02-27 08:20:22

End at: 2018-02-27 08:20:52

Local clock offset: -1.194 ms

Remote clock offset: -5.79 ms

Below is generated by plot.py at 2018-02-27 08:30:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 13.229 ms

Loss rate: 94.40%

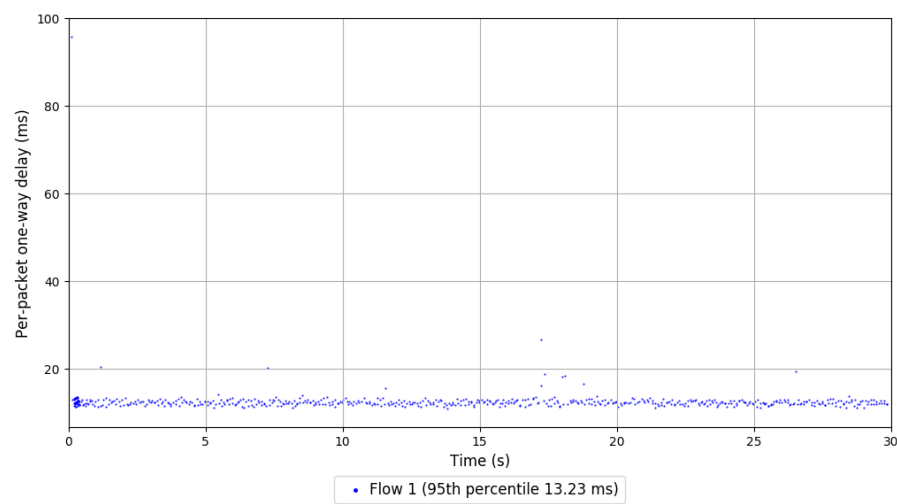
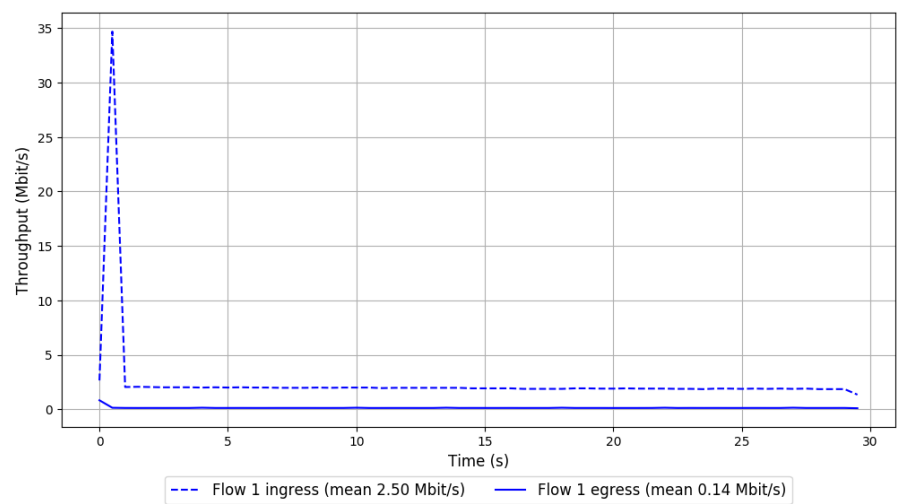
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 13.229 ms

Loss rate: 94.40%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

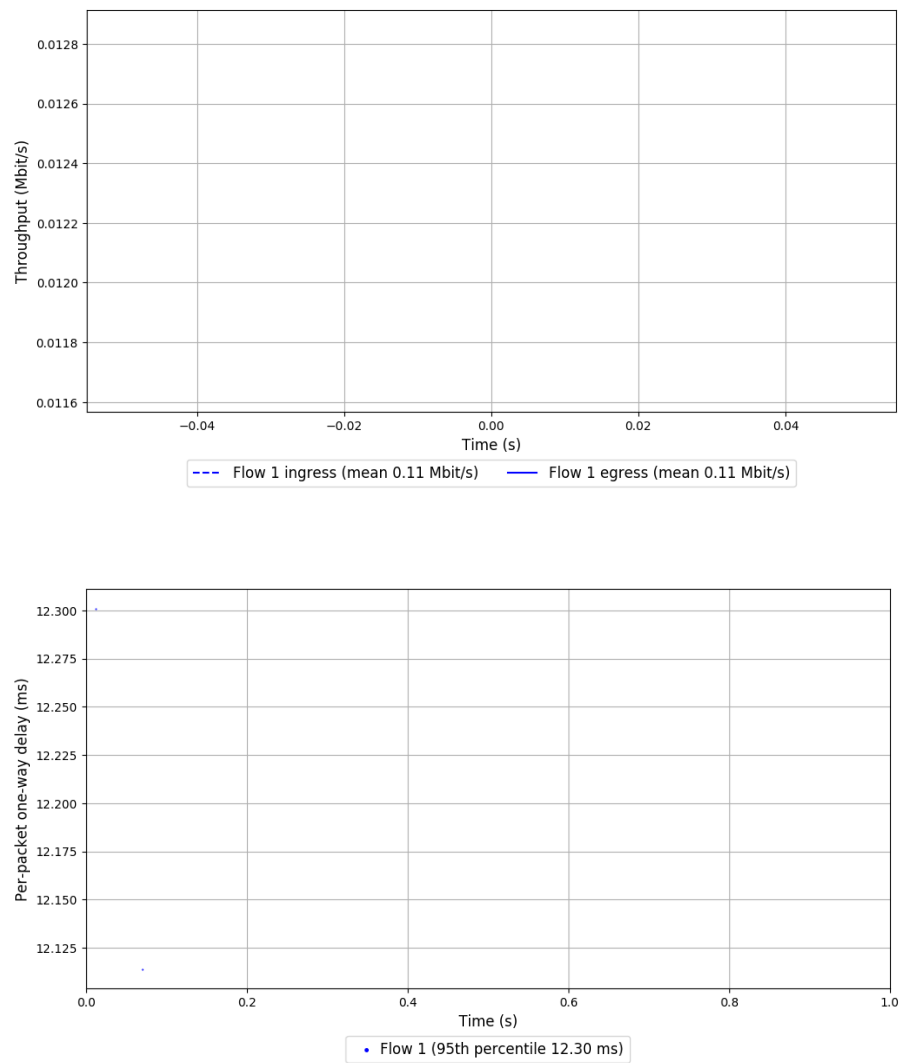
Start at: 2018-02-27 07:25:34

End at: 2018-02-27 07:26:04

Local clock offset: -7.229 ms

Remote clock offset: -4.825 ms

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-02-27 07:49:03

End at: 2018-02-27 07:49:33

Local clock offset: -2.902 ms

Remote clock offset: -5.821 ms

Below is generated by plot.py at 2018-02-27 08:30:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 195.235 ms

Loss rate: 59.98%

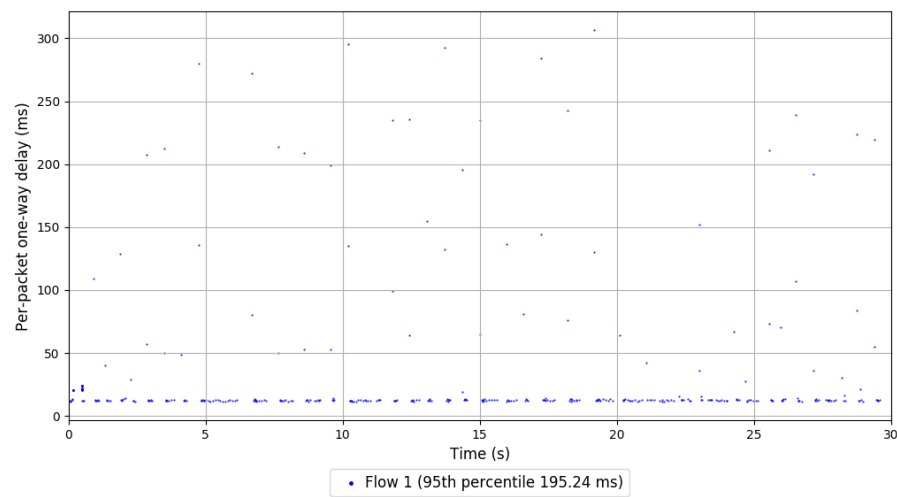
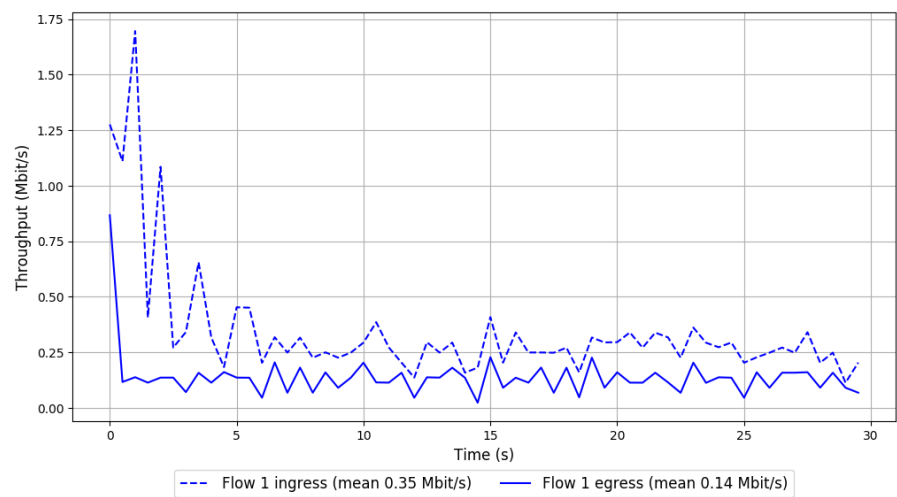
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 195.235 ms

Loss rate: 59.98%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-02-27 08:12:32

End at: 2018-02-27 08:13:02

Local clock offset: -1.927 ms

Remote clock offset: -6.32 ms

Below is generated by plot.py at 2018-02-27 08:30:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 186.865 ms

Loss rate: 61.59%

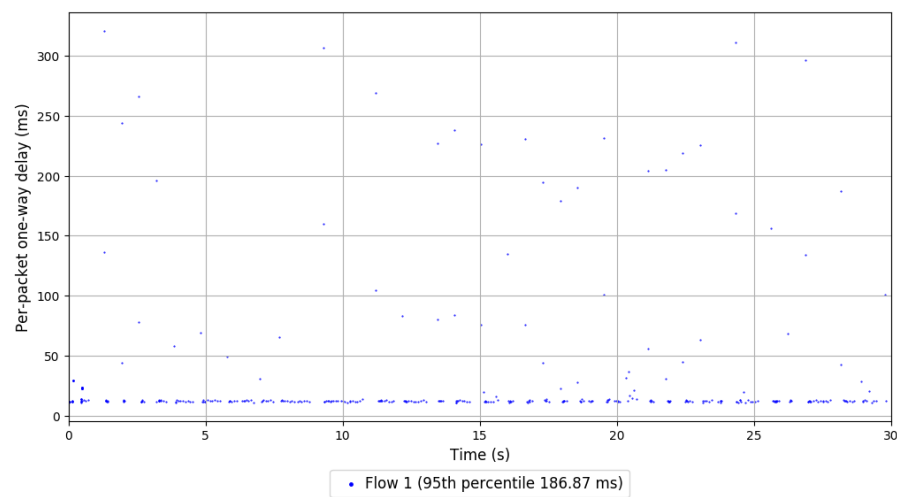
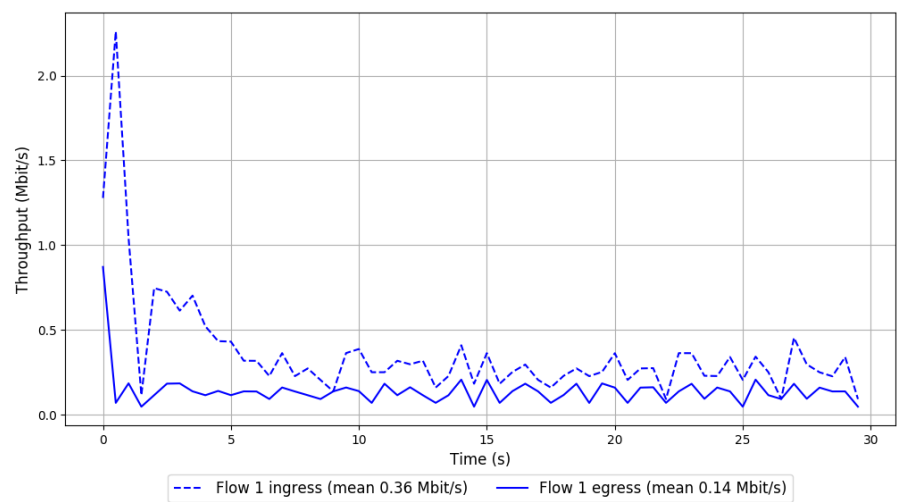
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 186.865 ms

Loss rate: 61.59%

Run 3: Report of QUIC Cubic — Data Link

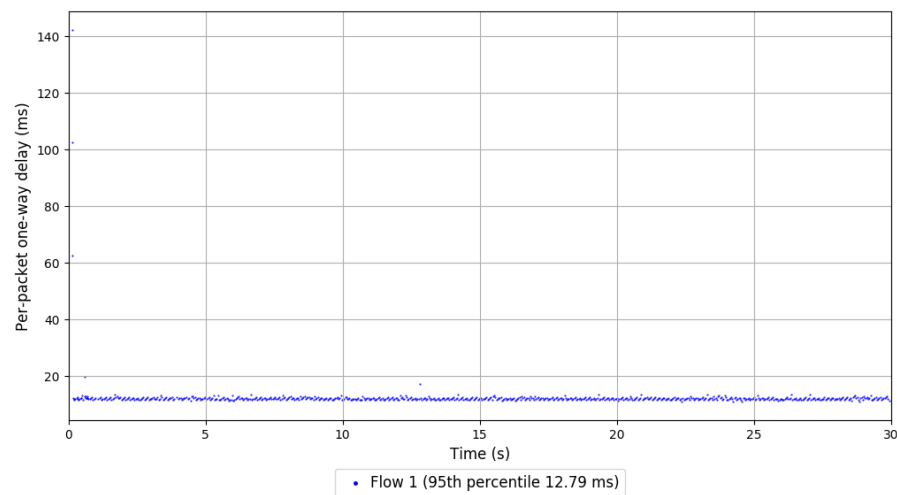
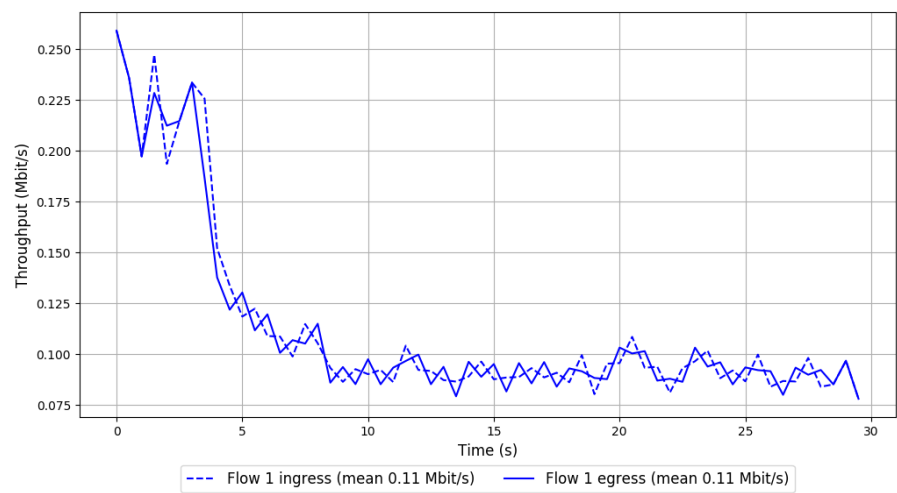


Run 1: Statistics of SCReAM

Start at: 2018-02-27 07:30:47
End at: 2018-02-27 07:31:17
Local clock offset: -8.11 ms
Remote clock offset: -4.718 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 12.792 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 12.792 ms
Loss rate: 0.79%

Run 1: Report of SReAM — Data Link

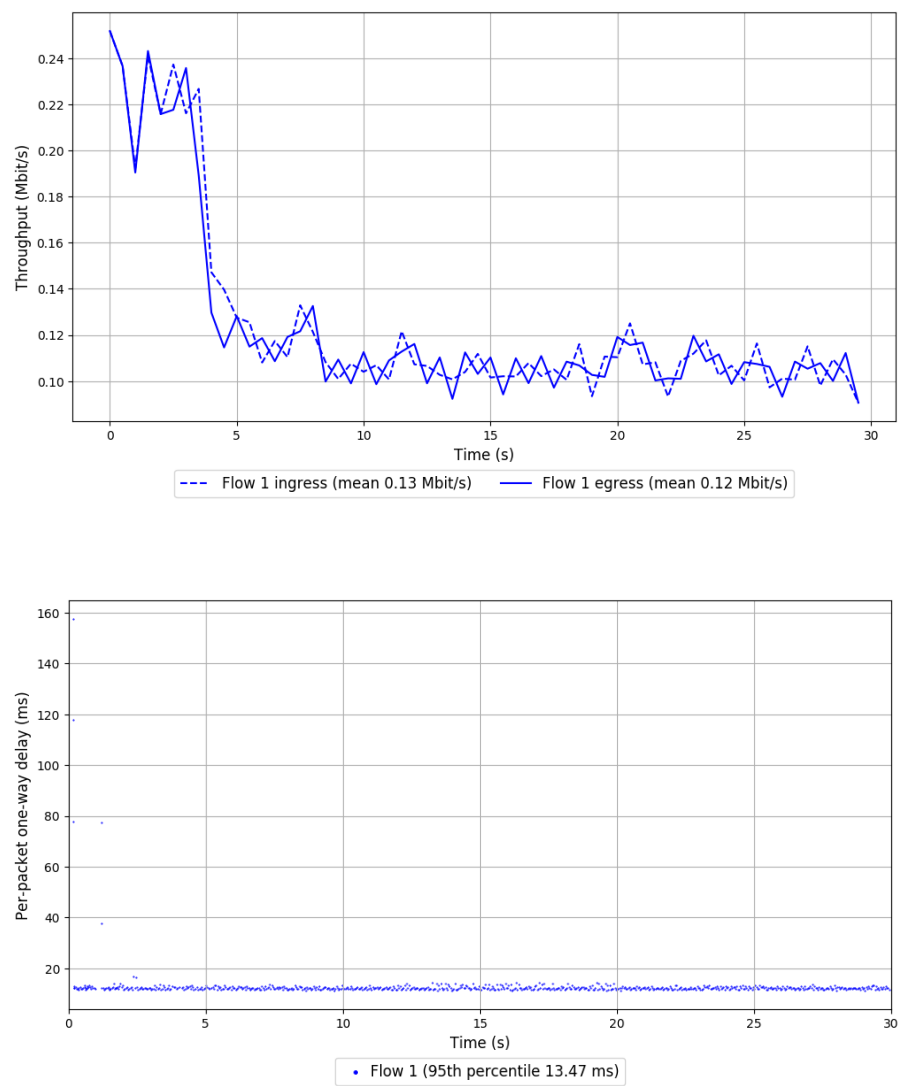


Run 2: Statistics of SCReAM

Start at: 2018-02-27 07:54:16
End at: 2018-02-27 07:54:46
Local clock offset: -2.252 ms
Remote clock offset: -6.053 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 13.473 ms
Loss rate: 1.06%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 13.473 ms
Loss rate: 1.06%

Run 2: Report of SReAM — Data Link

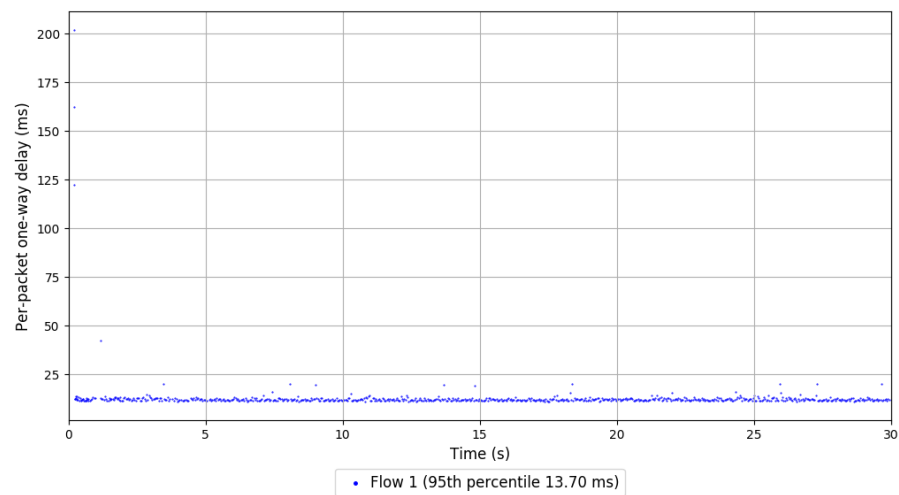
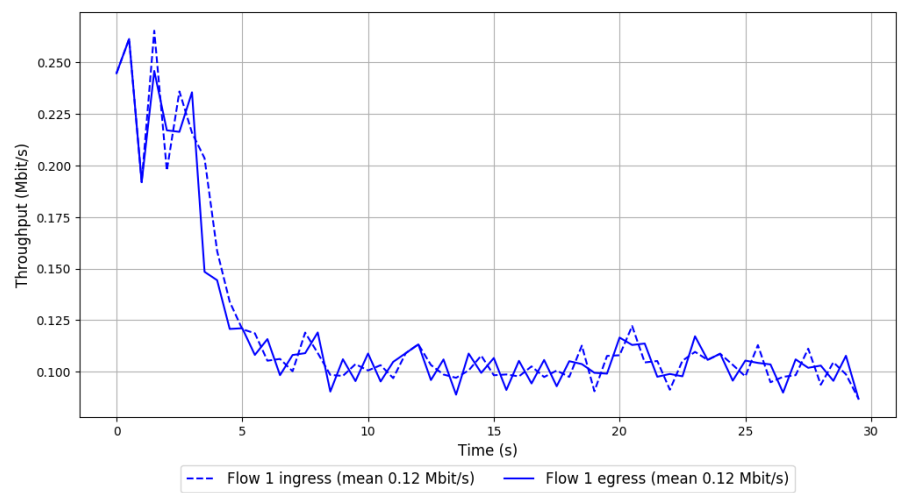


Run 3: Statistics of SCReAM

Start at: 2018-02-27 08:17:45
End at: 2018-02-27 08:18:15
Local clock offset: -1.271 ms
Remote clock offset: -5.926 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 13.695 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 13.695 ms
Loss rate: 1.13%

Run 3: Report of SReAM — Data Link

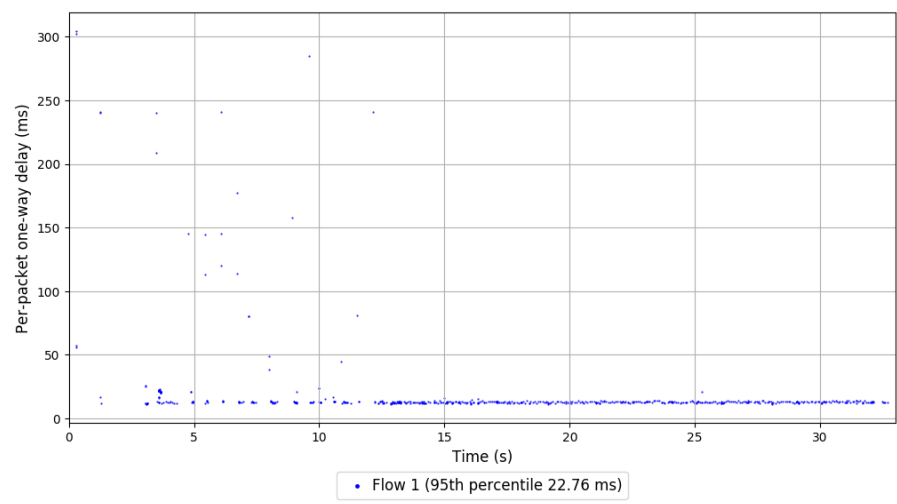
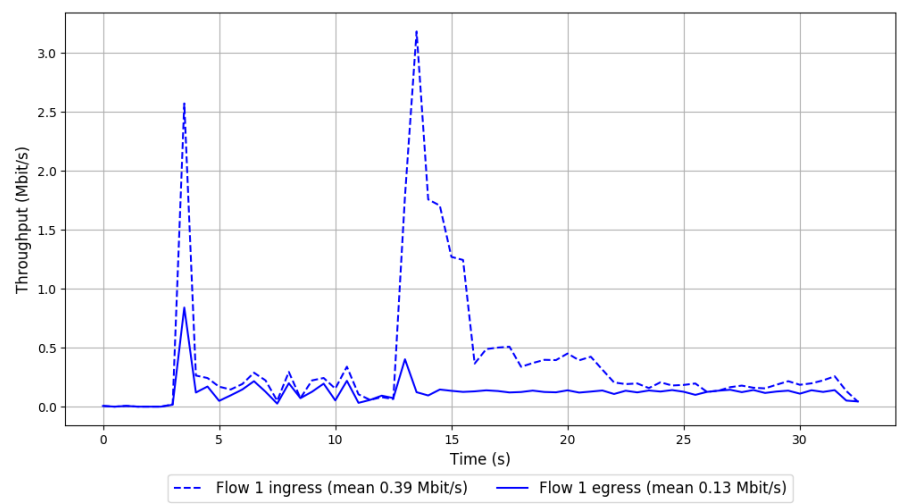


Run 1: Statistics of WebRTC media

Start at: 2018-02-27 07:37:19
End at: 2018-02-27 07:37:49
Local clock offset: -9.08 ms
Remote clock offset: -4.716 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 22.764 ms
Loss rate: 68.06%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 22.764 ms
Loss rate: 68.06%

Run 1: Report of WebRTC media — Data Link

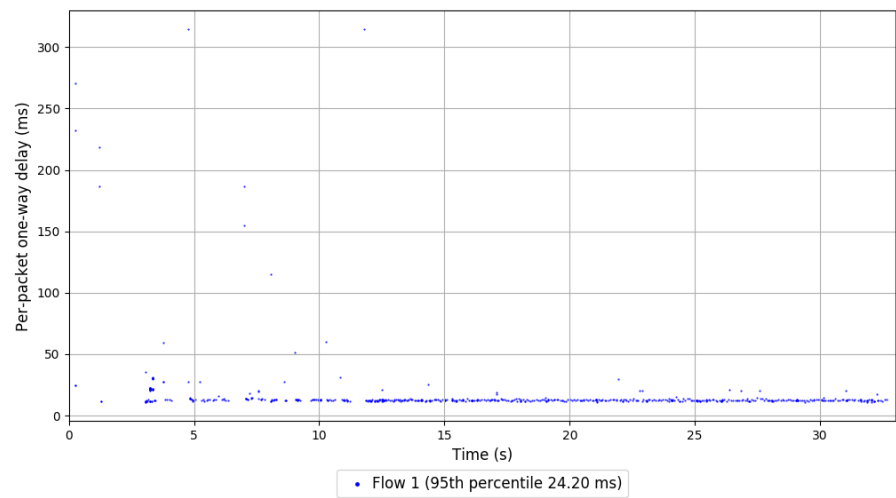
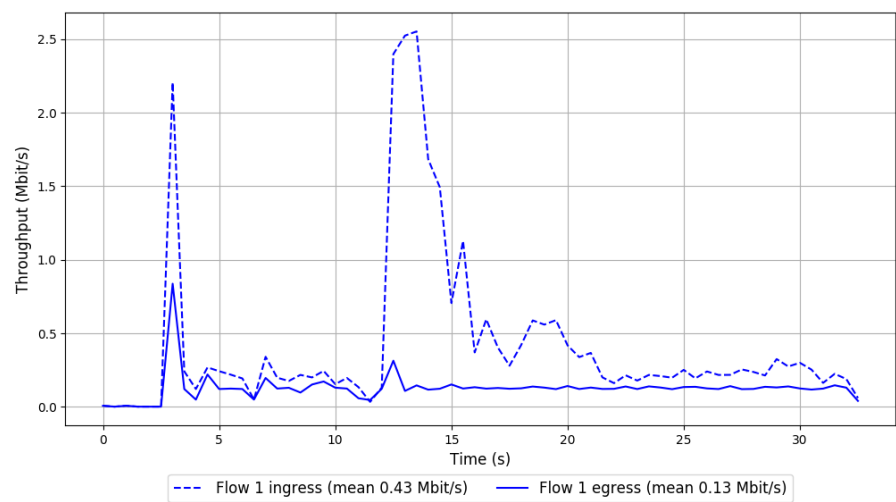


Run 2: Statistics of WebRTC media

Start at: 2018-02-27 08:00:47
End at: 2018-02-27 08:01:17
Local clock offset: -1.94 ms
Remote clock offset: -6.172 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 24.204 ms
Loss rate: 70.18%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 24.204 ms
Loss rate: 70.18%

Run 2: Report of WebRTC media — Data Link

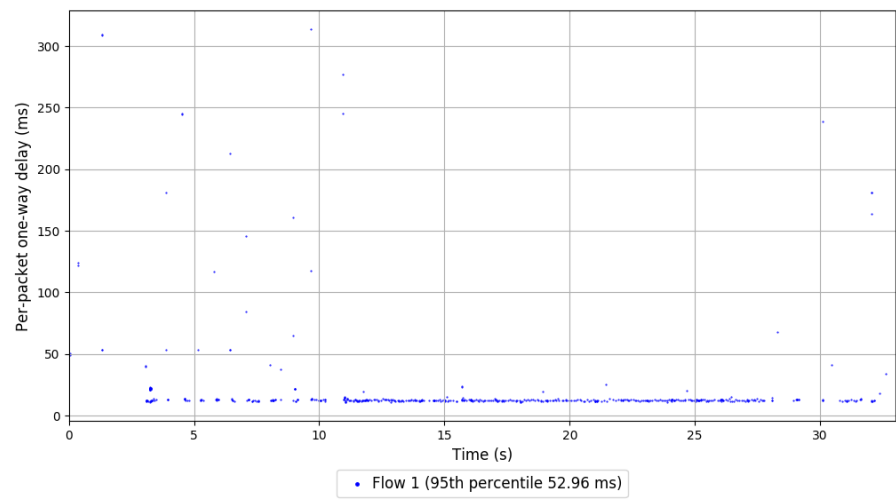
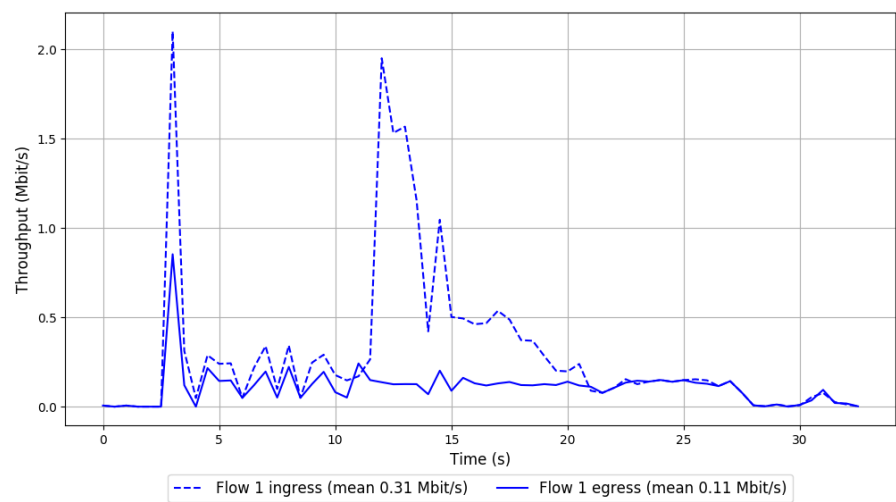


Run 3: Statistics of WebRTC media

Start at: 2018-02-27 08:24:16
End at: 2018-02-27 08:24:46
Local clock offset: -0.993 ms
Remote clock offset: -5.602 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 52.963 ms
Loss rate: 63.42%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 52.963 ms
Loss rate: 63.42%

Run 3: Report of WebRTC media — Data Link



Run 1: Statistics of Sprout

Start at: 2018-02-27 07:21:39

End at: 2018-02-27 07:22:09

Local clock offset: -6.801 ms

Remote clock offset: -4.92 ms

Below is generated by plot.py at 2018-02-27 08:30:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.573 ms

Loss rate: 53.29%

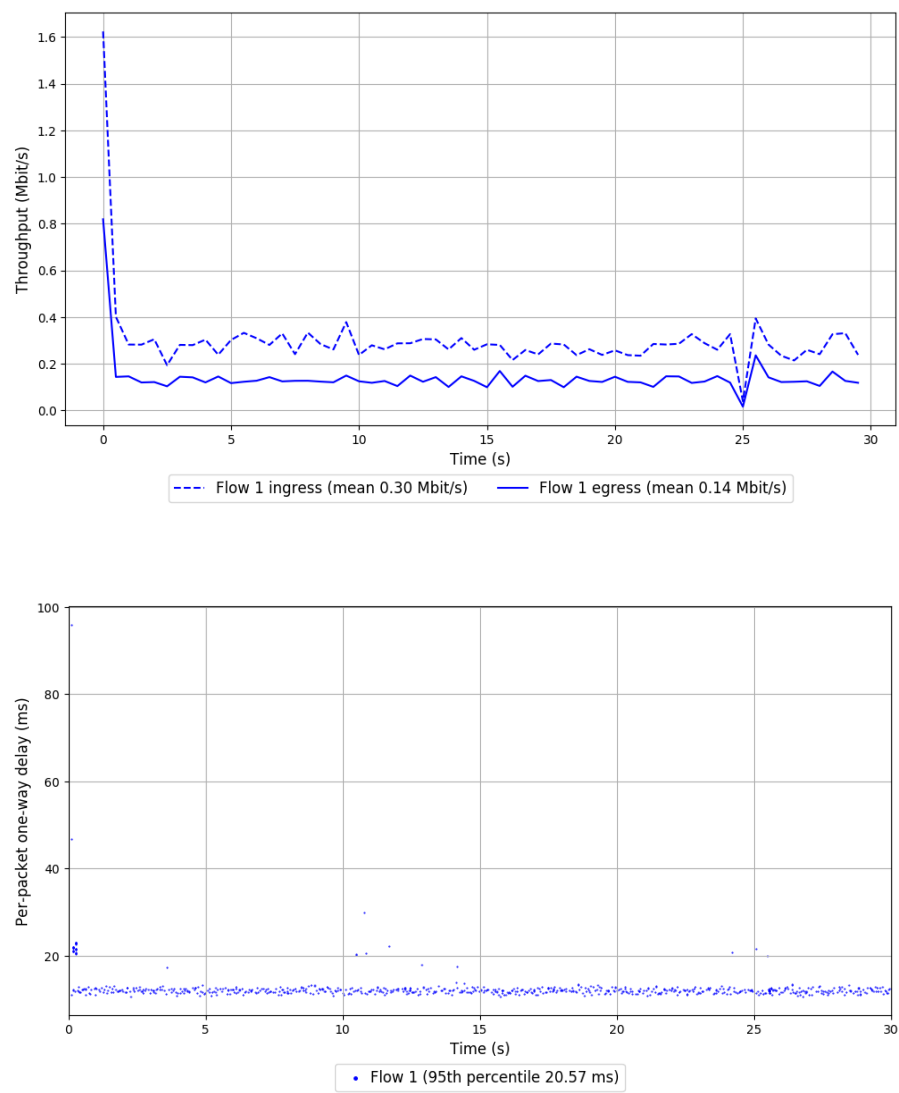
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.573 ms

Loss rate: 53.29%

Run 1: Report of Sprout — Data Link

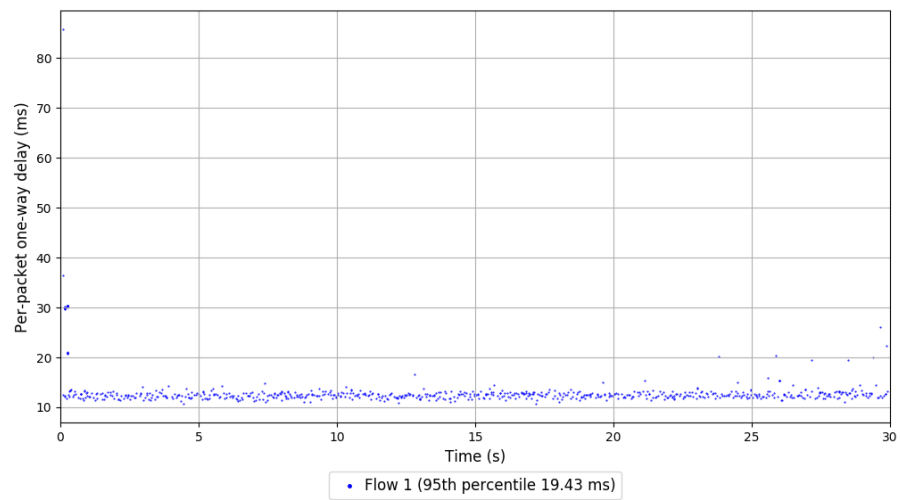
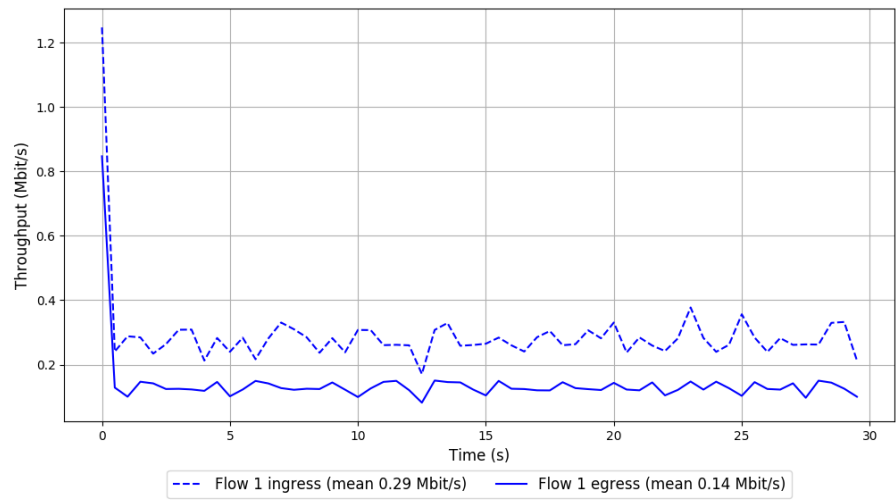


Run 2: Statistics of Sprout

Start at: 2018-02-27 07:45:08
End at: 2018-02-27 07:45:38
Local clock offset: -4.087 ms
Remote clock offset: -5.559 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 19.426 ms
Loss rate: 51.99%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 19.426 ms
Loss rate: 51.99%

Run 2: Report of Sprout — Data Link



Run 3: Statistics of Sprout

Start at: 2018-02-27 08:08:37

End at: 2018-02-27 08:09:07

Local clock offset: -2.062 ms

Remote clock offset: -6.4 ms

Below is generated by plot.py at 2018-02-27 08:30:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 16.044 ms

Loss rate: 52.18%

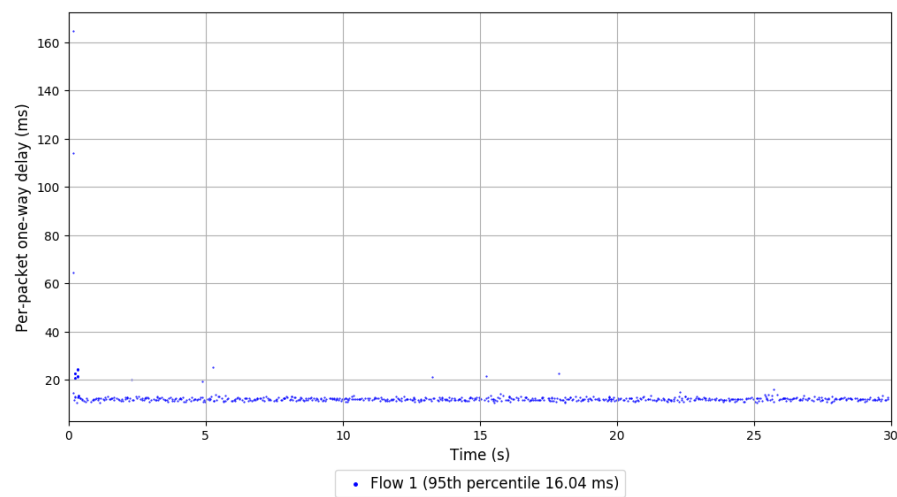
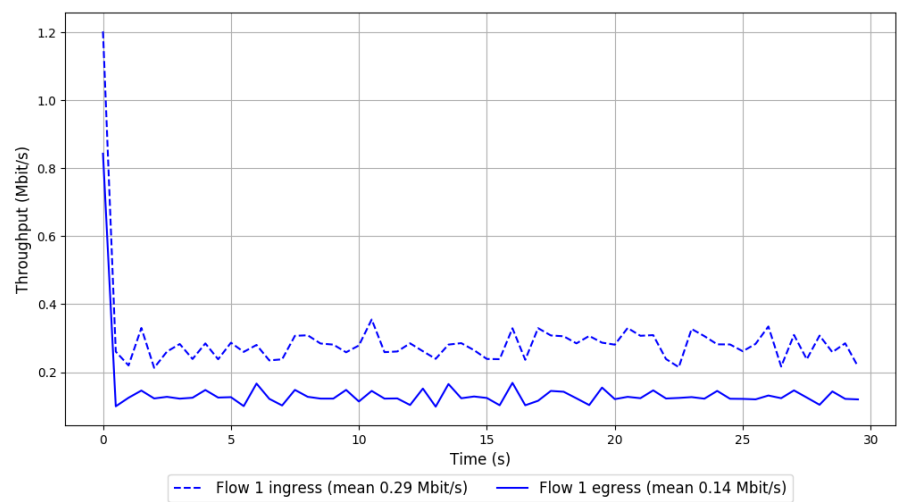
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 16.044 ms

Loss rate: 52.18%

Run 3: Report of Sprout — Data Link

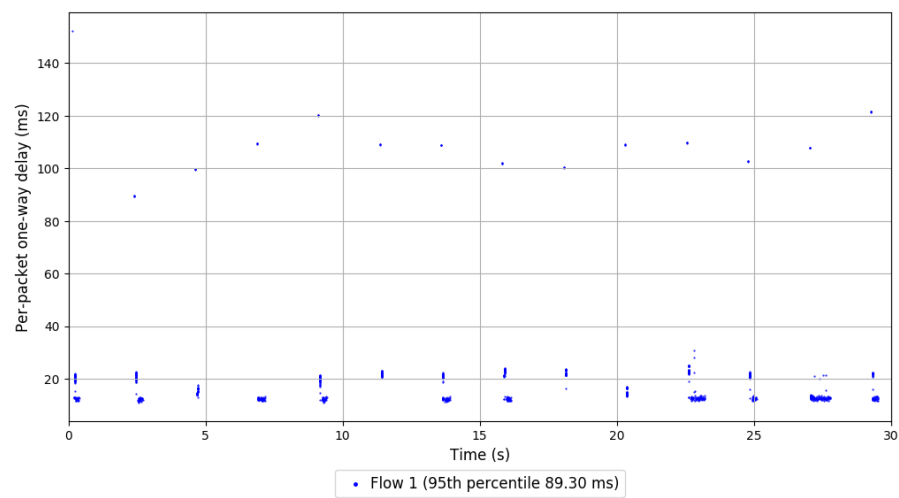
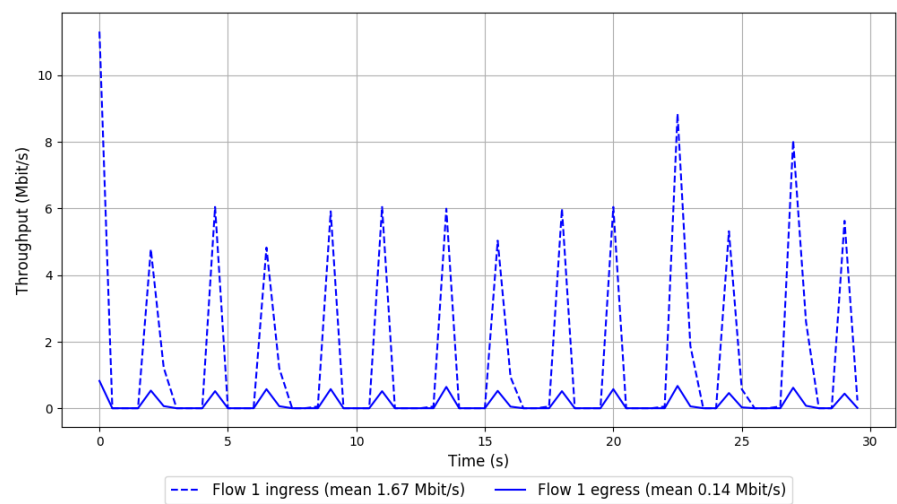


Run 1: Statistics of TaoVA-100x

Start at: 2018-02-27 07:41:13
End at: 2018-02-27 07:41:43
Local clock offset: -6.017 ms
Remote clock offset: -5.169 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 89.302 ms
Loss rate: 91.60%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 89.302 ms
Loss rate: 91.60%

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

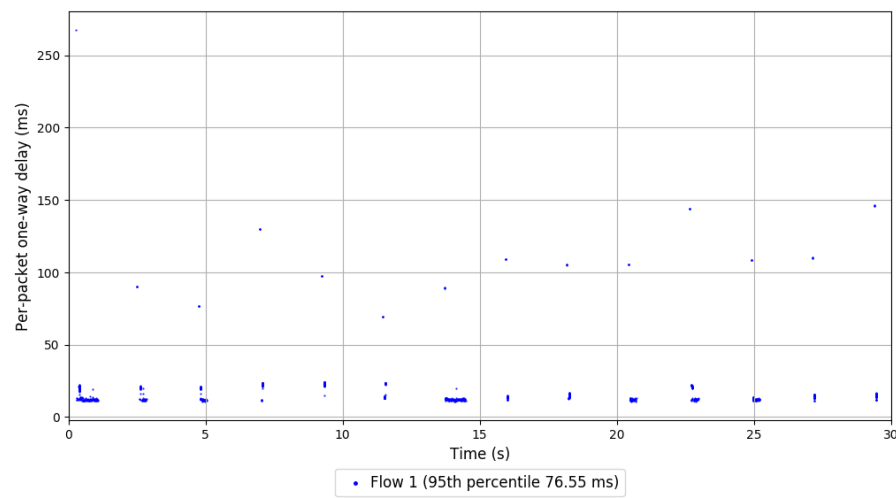
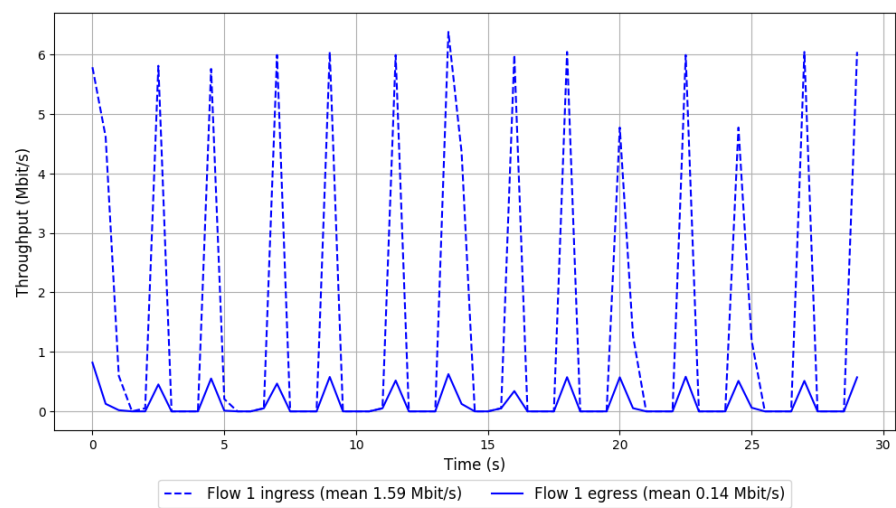


Run 2: Statistics of TaoVA-100x

Start at: 2018-02-27 08:04:42
End at: 2018-02-27 08:05:12
Local clock offset: -1.959 ms
Remote clock offset: -6.327 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 76.550 ms
Loss rate: 91.22%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 76.550 ms
Loss rate: 91.22%

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

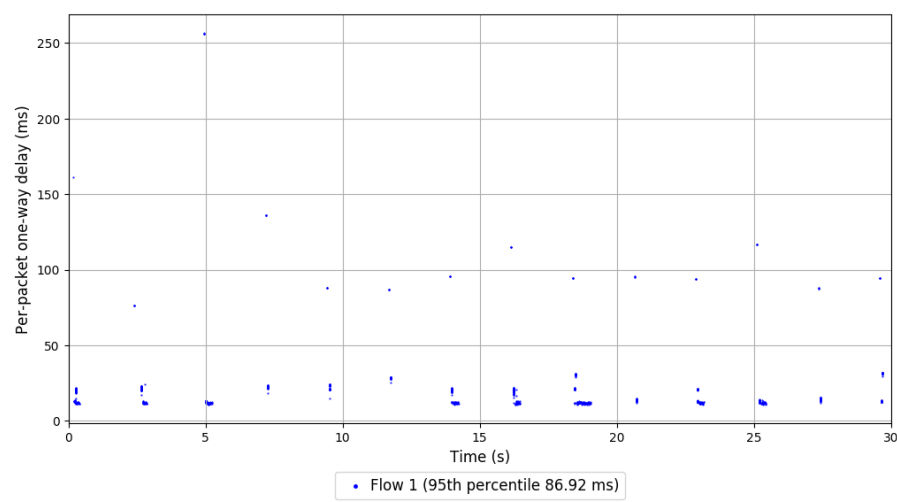
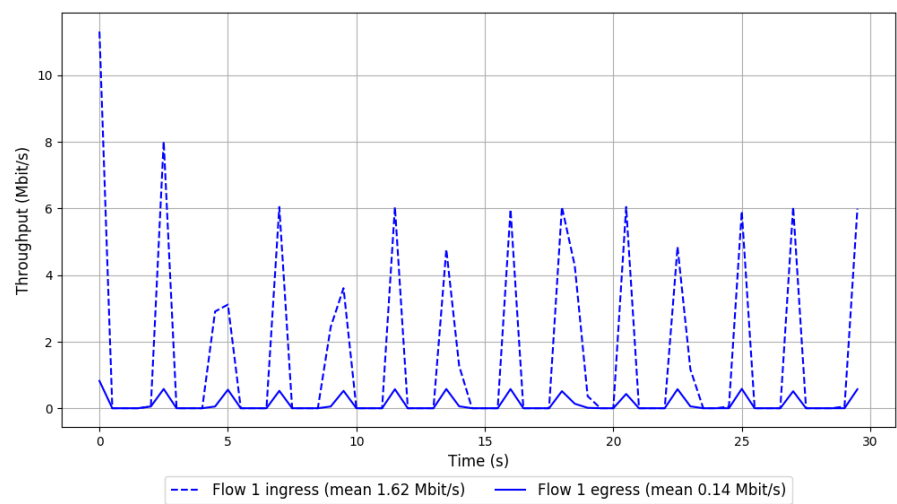


Run 3: Statistics of TaoVA-100x

Start at: 2018-02-27 08:28:11
End at: 2018-02-27 08:28:41
Local clock offset: -0.96 ms
Remote clock offset: -5.621 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 86.925 ms
Loss rate: 91.37%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 86.925 ms
Loss rate: 91.37%

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

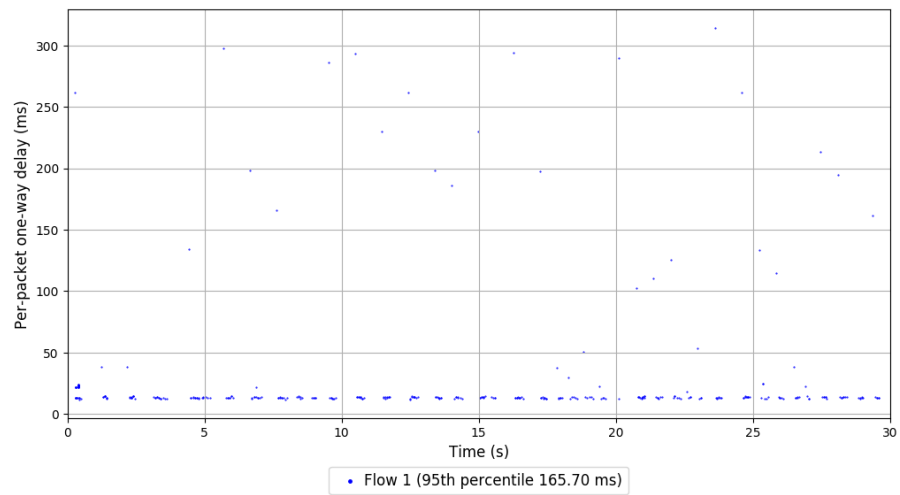
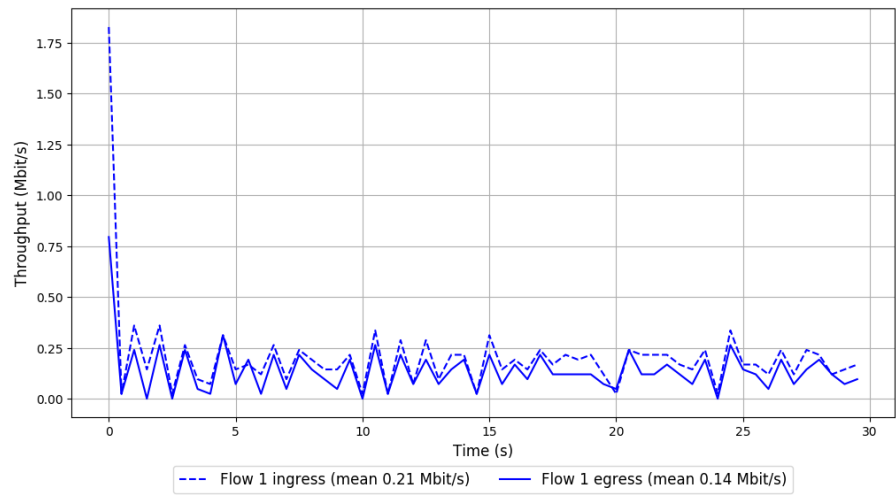


Run 1: Statistics of TCP Vegas

Start at: 2018-02-27 07:39:55
End at: 2018-02-27 07:40:25
Local clock offset: -6.917 ms
Remote clock offset: -4.896 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 165.702 ms
Loss rate: 32.67%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 165.702 ms
Loss rate: 32.67%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2018-02-27 08:03:24

End at: 2018-02-27 08:03:54

Local clock offset: -1.868 ms

Remote clock offset: -6.201 ms

Below is generated by plot.py at 2018-02-27 08:30:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 182.155 ms

Loss rate: 31.89%

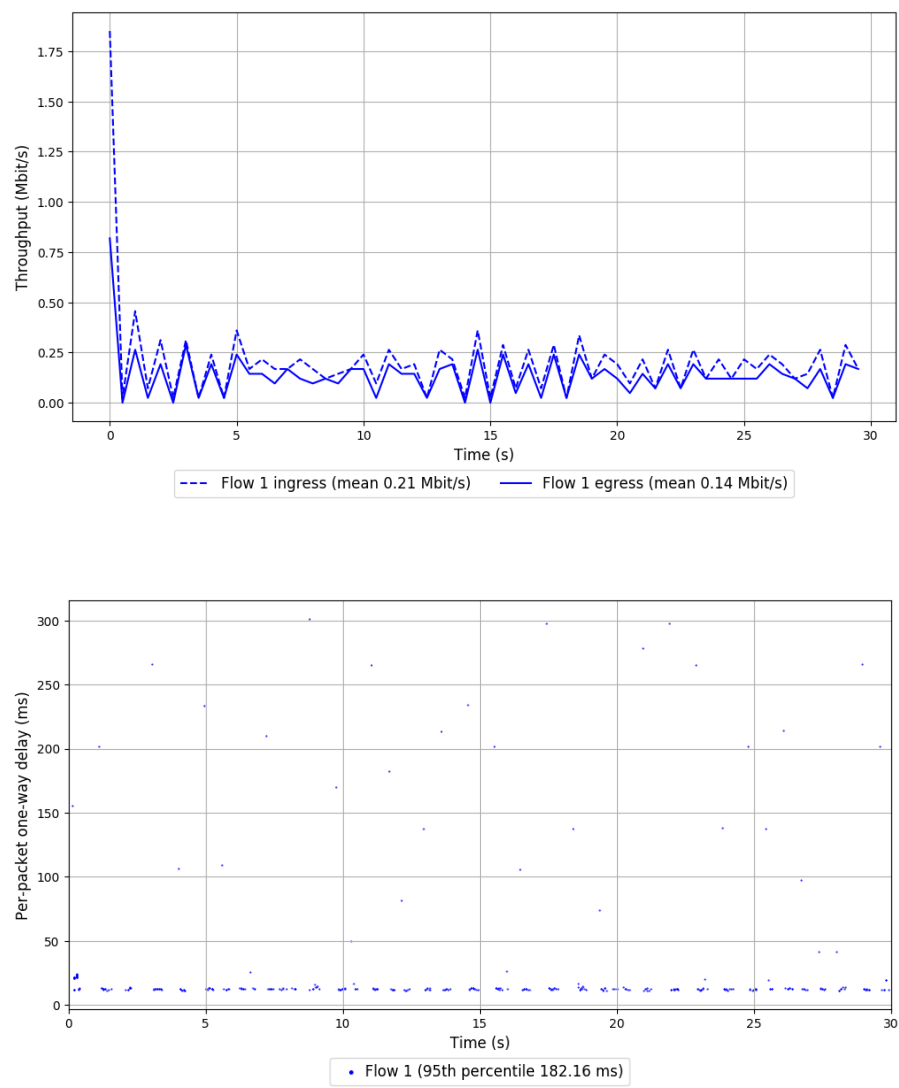
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 182.155 ms

Loss rate: 31.89%

Run 2: Report of TCP Vegas — Data Link

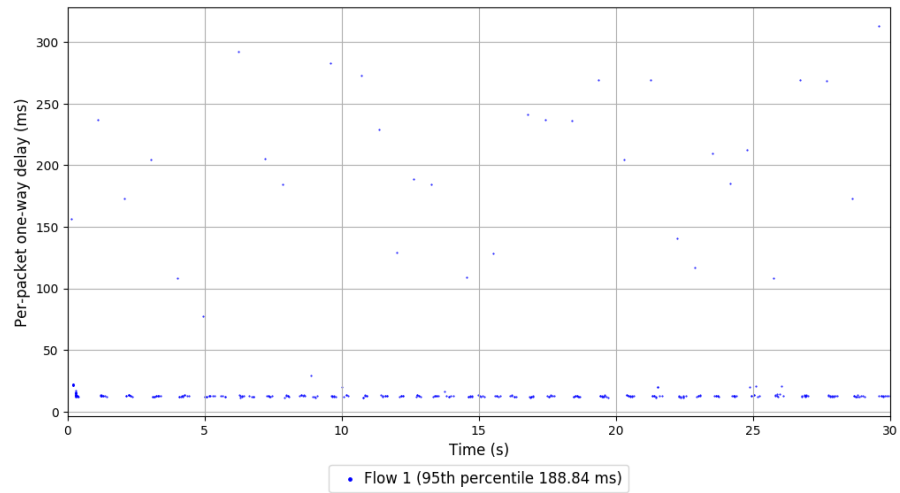
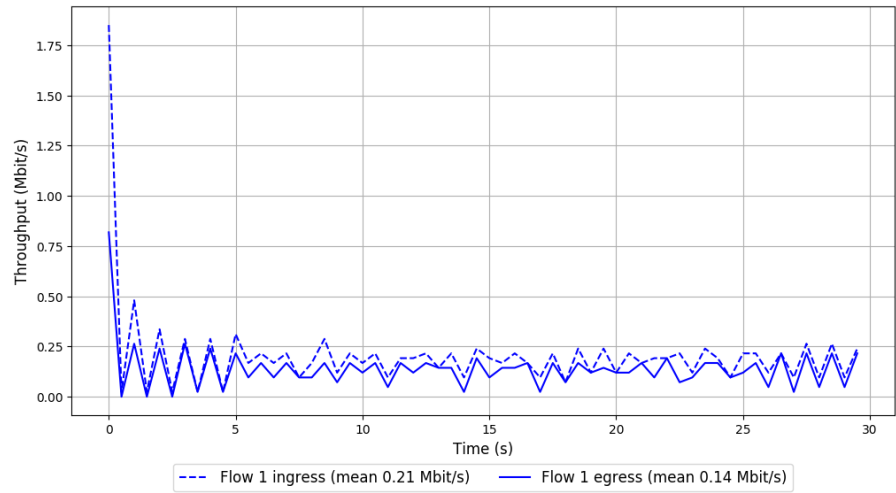


Run 3: Statistics of TCP Vegas

Start at: 2018-02-27 08:26:53
End at: 2018-02-27 08:27:23
Local clock offset: -0.972 ms
Remote clock offset: -5.604 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 188.844 ms
Loss rate: 32.49%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 188.844 ms
Loss rate: 32.49%

Run 3: Report of TCP Vegas — Data Link

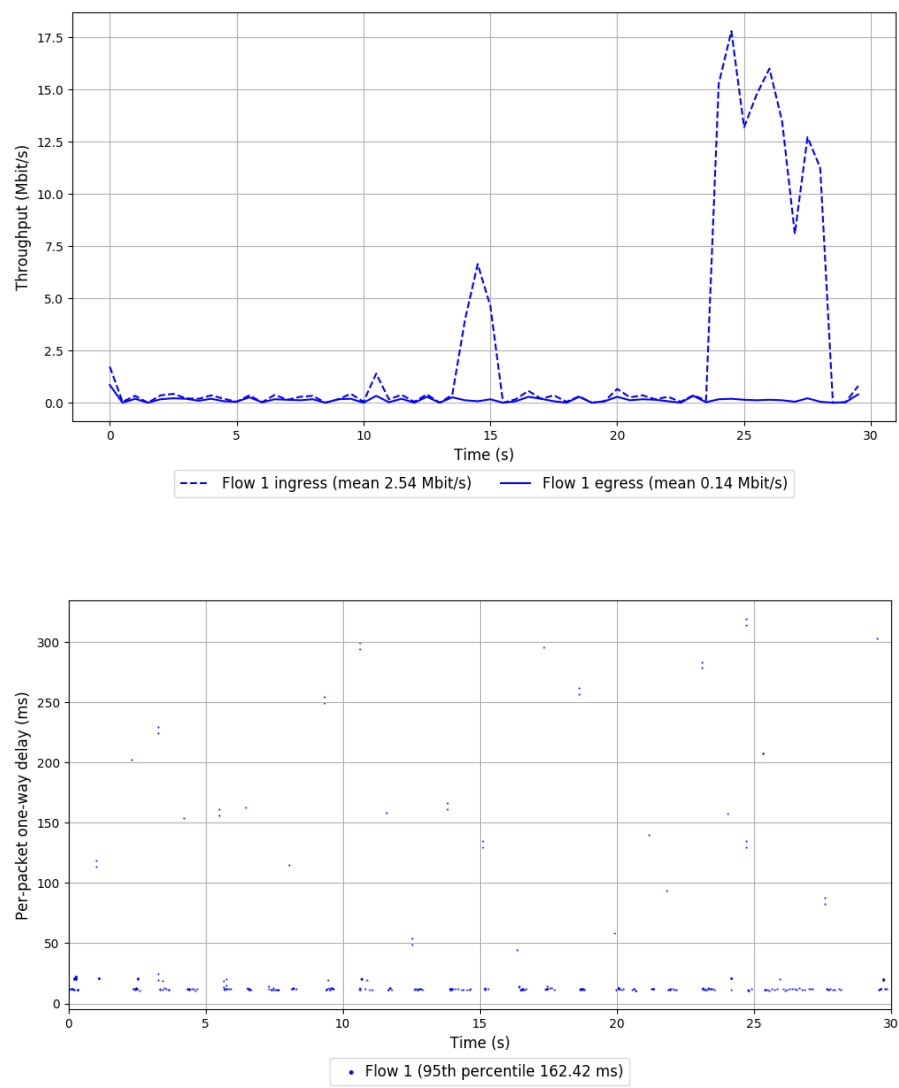


Run 1: Statistics of Verus

Start at: 2018-02-27 07:32:05
End at: 2018-02-27 07:32:35
Local clock offset: -8.263 ms
Remote clock offset: -4.797 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 162.422 ms
Loss rate: 94.46%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 162.422 ms
Loss rate: 94.46%

Run 1: Report of Verus — Data Link

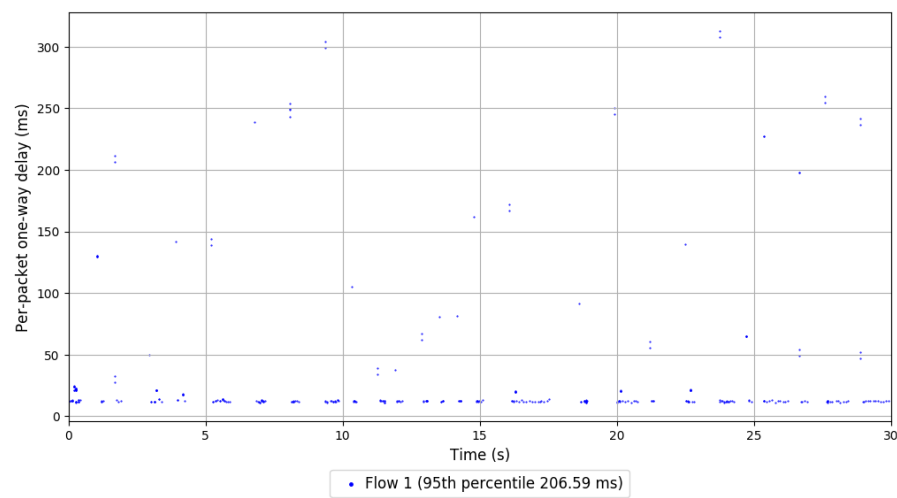
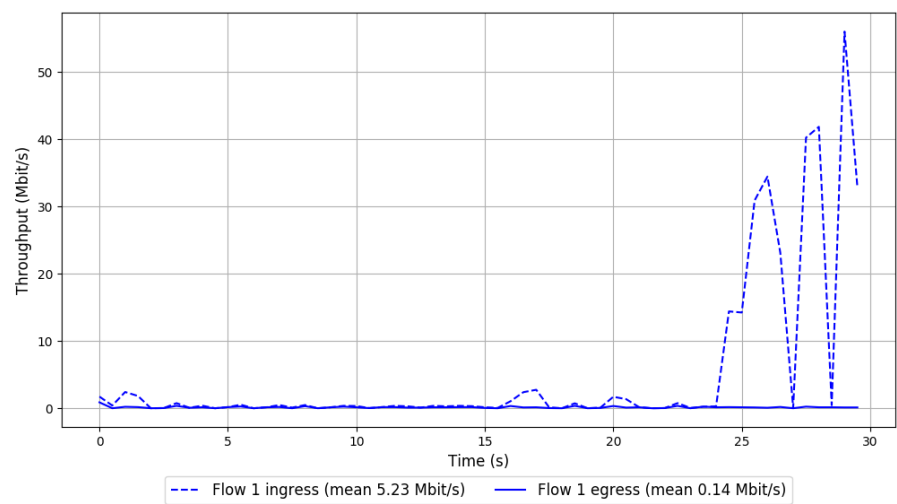


Run 2: Statistics of Verus

Start at: 2018-02-27 07:55:34
End at: 2018-02-27 07:56:05
Local clock offset: -2.067 ms
Remote clock offset: -6.092 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 206.590 ms
Loss rate: 97.31%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 206.590 ms
Loss rate: 97.31%

Run 2: Report of Verus — Data Link

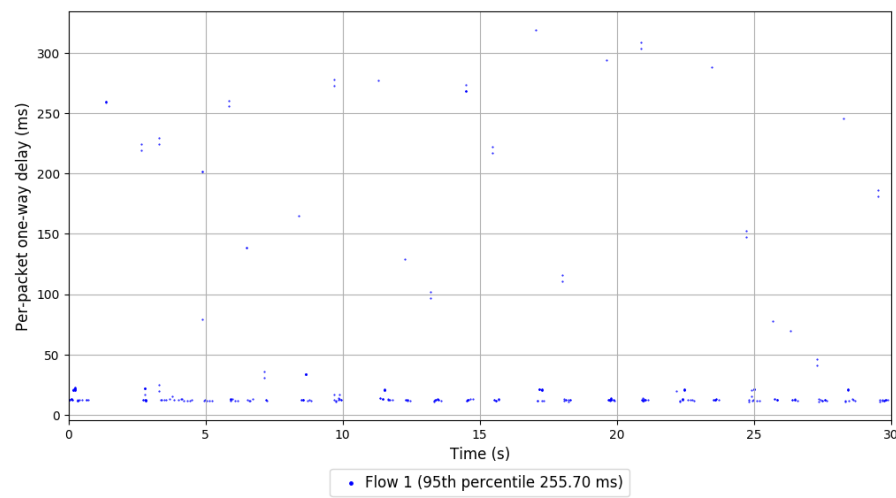
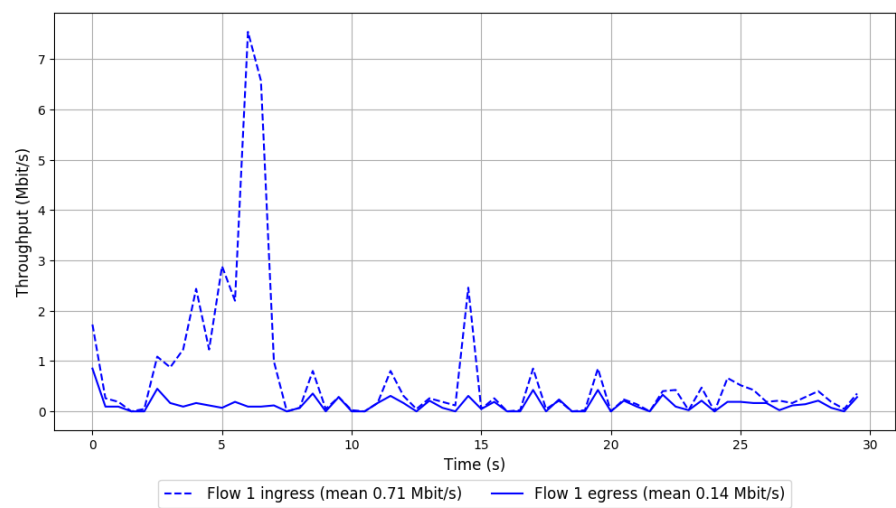


Run 3: Statistics of Verus

Start at: 2018-02-27 08:19:04
End at: 2018-02-27 08:19:34
Local clock offset: -1.253 ms
Remote clock offset: -5.866 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 255.697 ms
Loss rate: 80.17%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 255.697 ms
Loss rate: 80.17%

Run 3: Report of Verus — Data Link

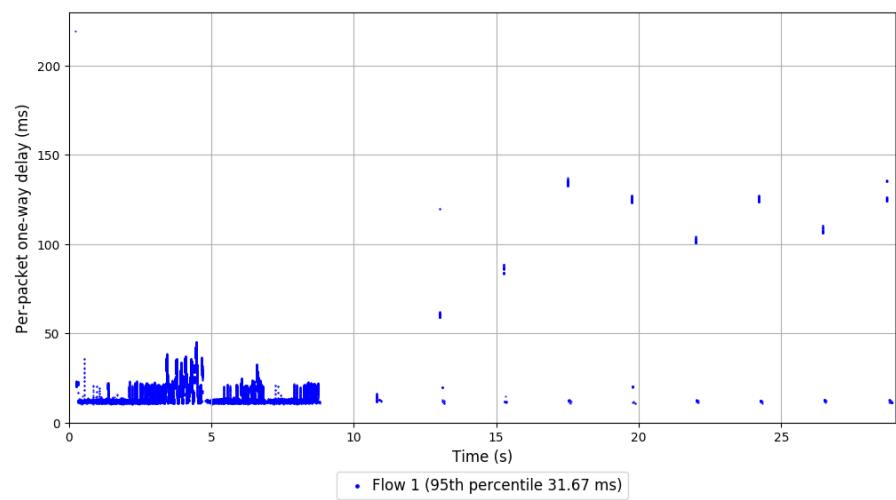
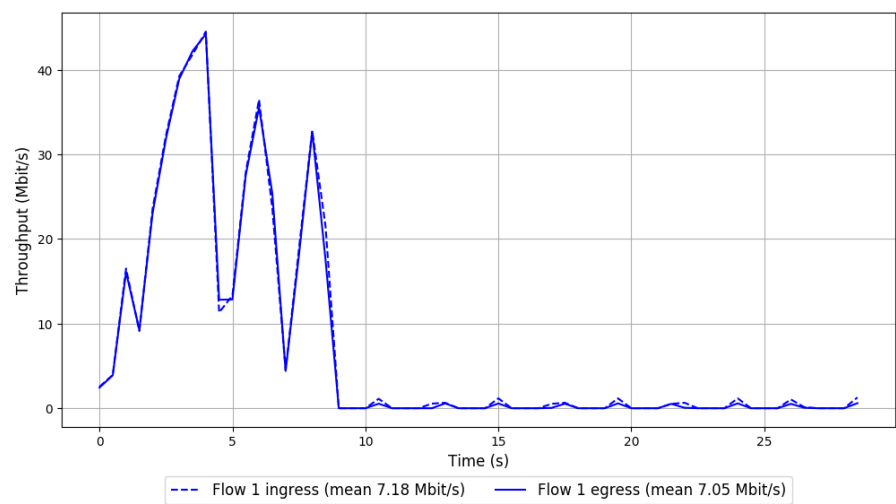


Run 1: Statistics of Copa

Start at: 2018-02-27 07:20:21
End at: 2018-02-27 07:20:51
Local clock offset: -6.746 ms
Remote clock offset: -4.998 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.05 Mbit/s
95th percentile per-packet one-way delay: 31.673 ms
Loss rate: 2.51%
-- Flow 1:
Average throughput: 7.05 Mbit/s
95th percentile per-packet one-way delay: 31.673 ms
Loss rate: 2.51%

Run 1: Report of Copa — Data Link

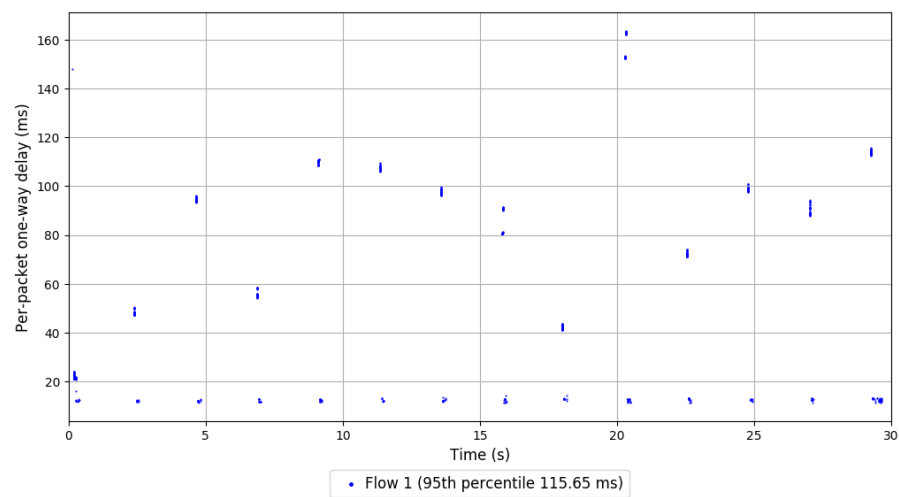
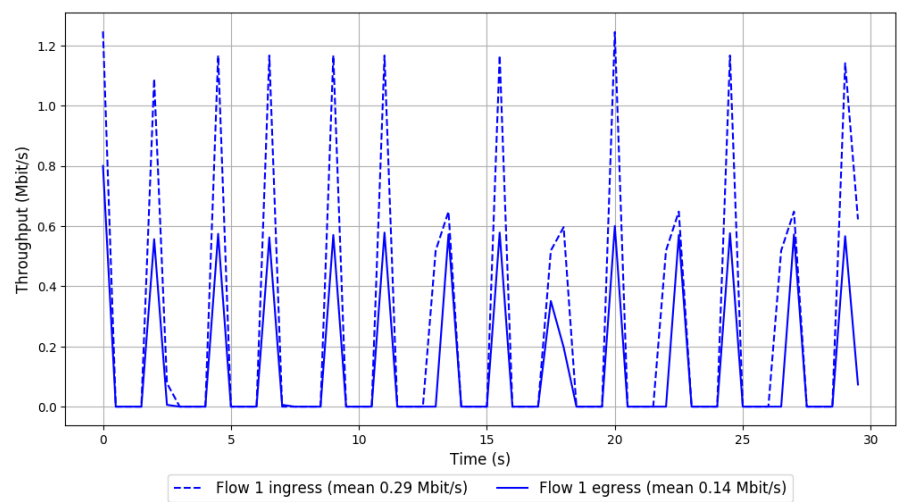


Run 2: Statistics of Copa

Start at: 2018-02-27 07:43:50
End at: 2018-02-27 07:44:20
Local clock offset: -4.586 ms
Remote clock offset: -5.444 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 115.646 ms
Loss rate: 51.22%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 115.646 ms
Loss rate: 51.22%

Run 2: Report of Copa — Data Link

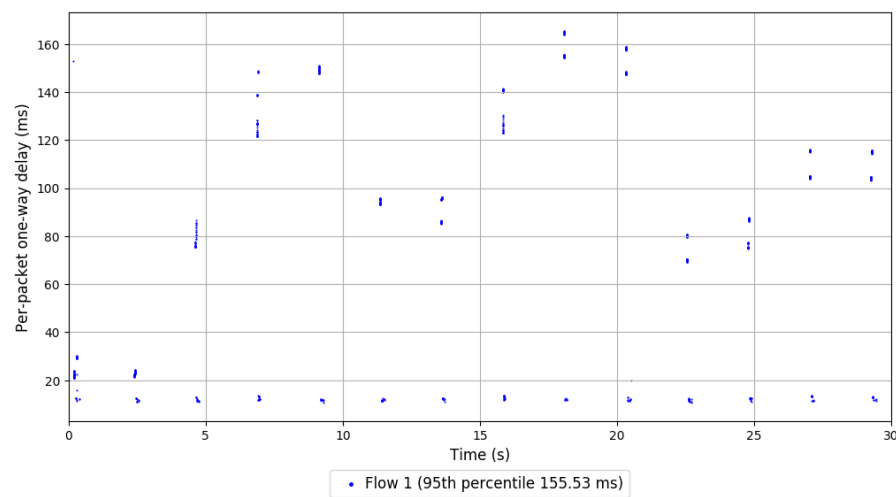
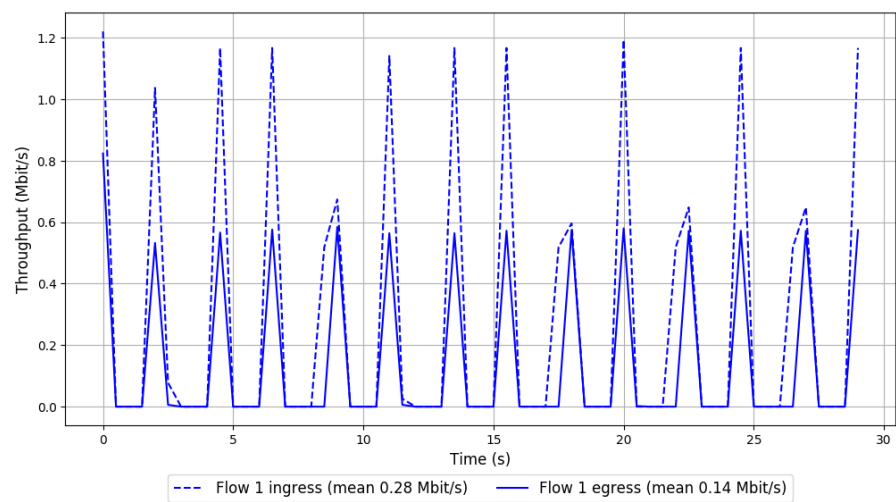


Run 3: Statistics of Copa

Start at: 2018-02-27 08:07:19
End at: 2018-02-27 08:07:49
Local clock offset: -1.949 ms
Remote clock offset: -6.367 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 155.527 ms
Loss rate: 49.54%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 155.527 ms
Loss rate: 49.54%

Run 3: Report of Copa — Data Link

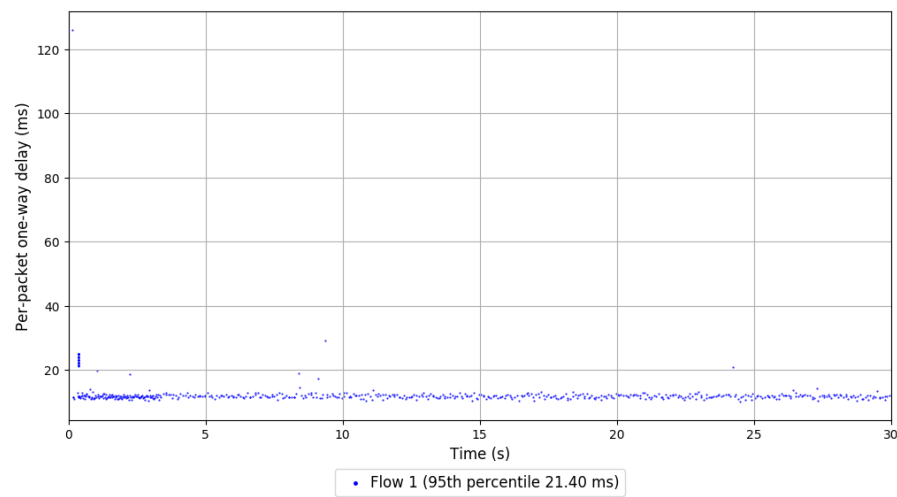
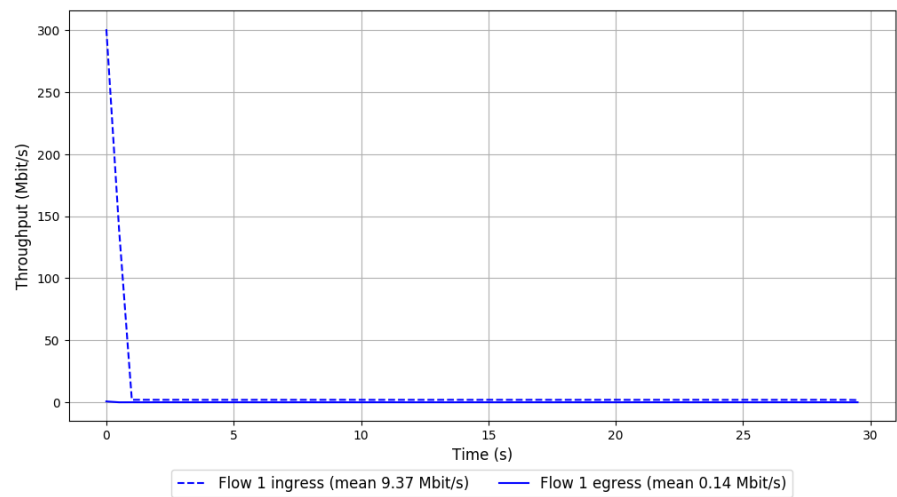


Run 1: Statistics of FillP

Start at: 2018-02-27 07:28:11
End at: 2018-02-27 07:28:41
Local clock offset: -7.51 ms
Remote clock offset: -4.871 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 21.404 ms
Loss rate: 98.51%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 21.404 ms
Loss rate: 98.51%

Run 1: Report of FillP — Data Link

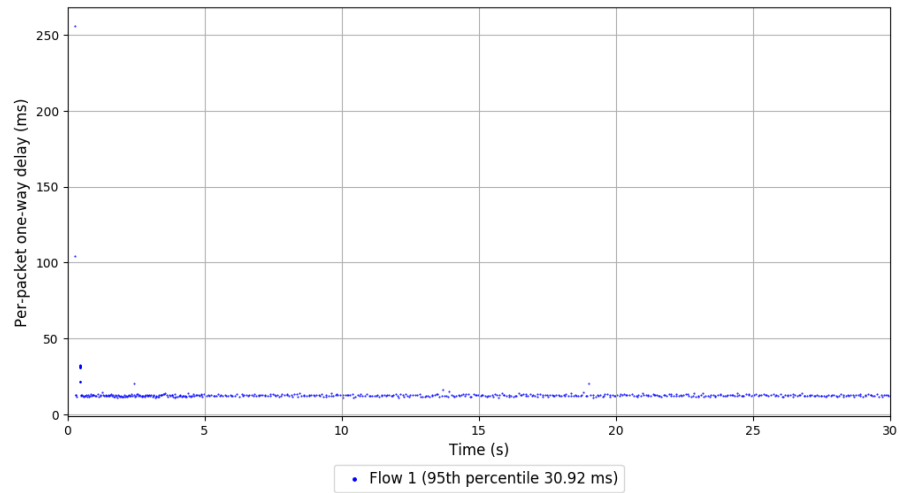
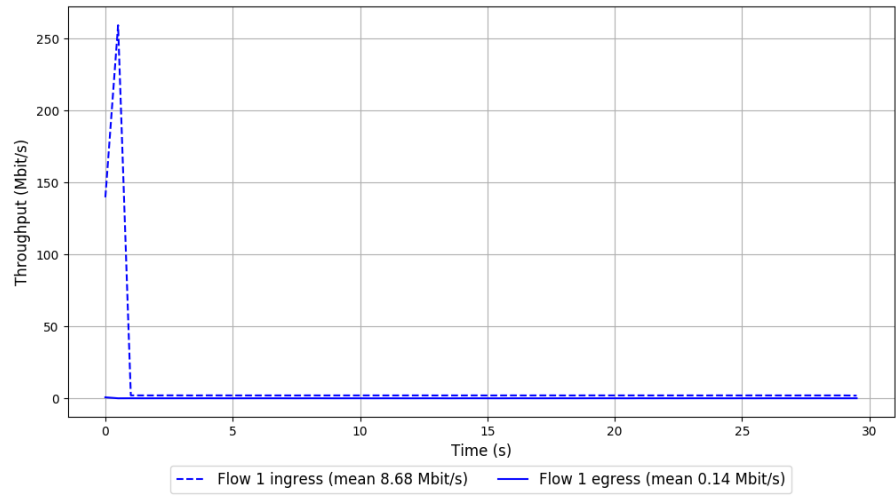


Run 2: Statistics of FillP

Start at: 2018-02-27 07:51:39
End at: 2018-02-27 07:52:09
Local clock offset: -2.566 ms
Remote clock offset: -5.864 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 30.919 ms
Loss rate: 98.40%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 30.919 ms
Loss rate: 98.40%

Run 2: Report of FillP — Data Link

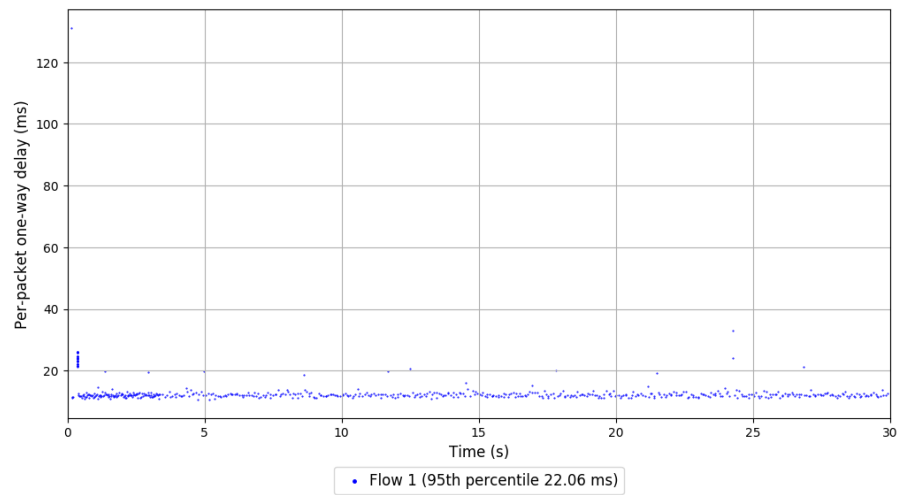
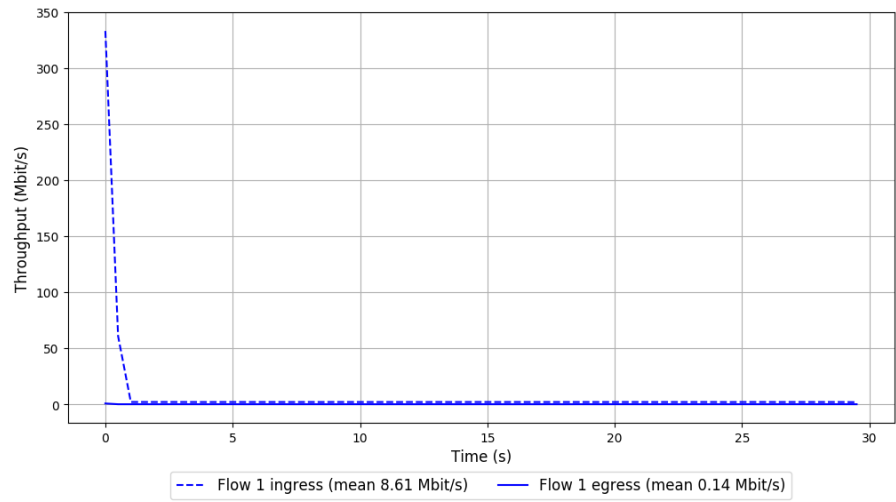


Run 3: Statistics of FillP

Start at: 2018-02-27 08:15:08
End at: 2018-02-27 08:15:39
Local clock offset: -1.505 ms
Remote clock offset: -6.169 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 22.057 ms
Loss rate: 98.38%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 22.057 ms
Loss rate: 98.38%

Run 3: Report of FillP — Data Link



Run 1: Statistics of Indigo-1-32

Start at: 2018-02-27 07:24:16

End at: 2018-02-27 07:24:46

Local clock offset: -7.001 ms

Remote clock offset: -4.879 ms

Below is generated by plot.py at 2018-02-27 08:30:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 30.552 ms

Loss rate: 78.22%

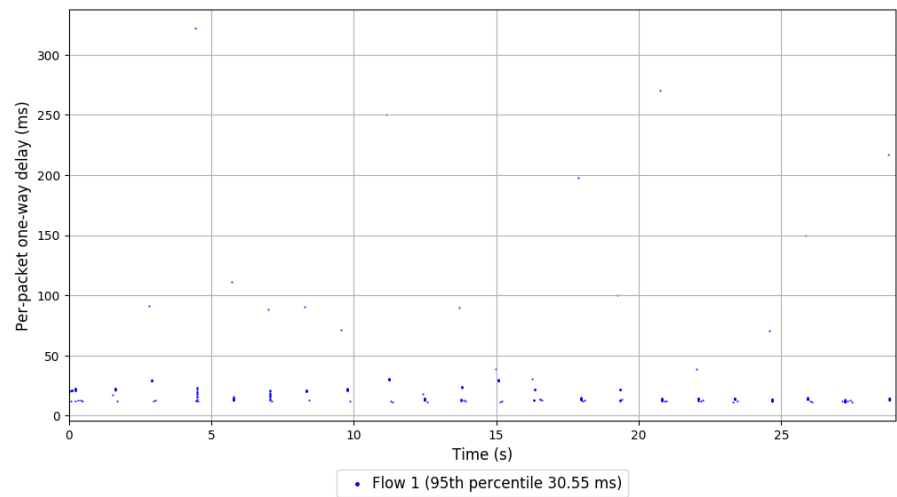
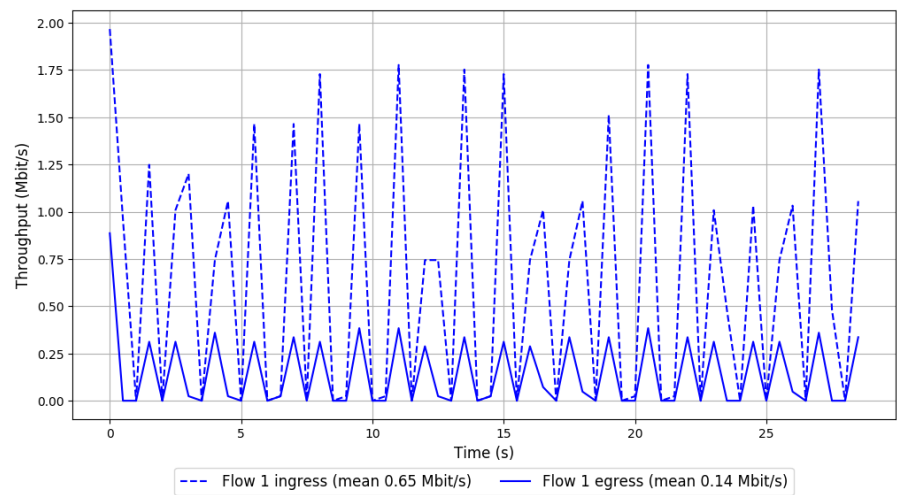
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 30.552 ms

Loss rate: 78.22%

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



Run 2: Statistics of Indigo-1-32

Start at: 2018-02-27 07:47:44

End at: 2018-02-27 07:48:14

Local clock offset: -3.208 ms

Remote clock offset: -5.702 ms

Below is generated by plot.py at 2018-02-27 08:30:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 57.771 ms

Loss rate: 82.12%

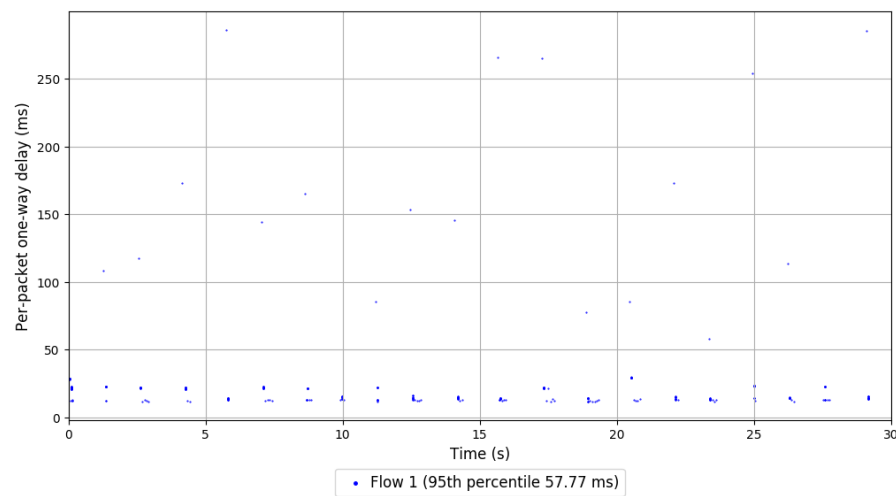
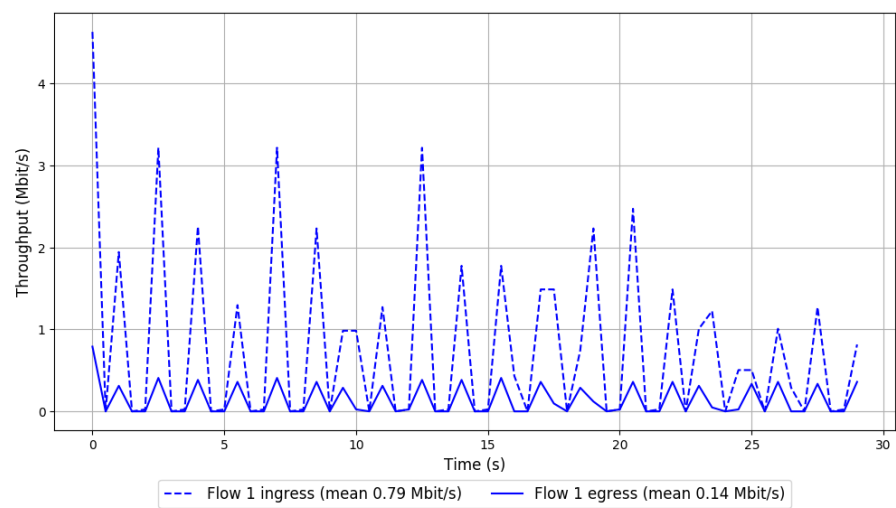
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 57.771 ms

Loss rate: 82.12%

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

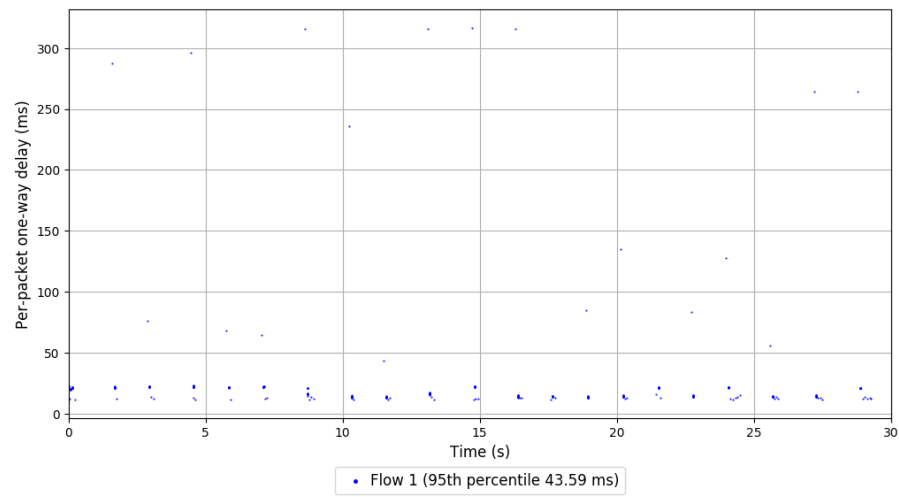
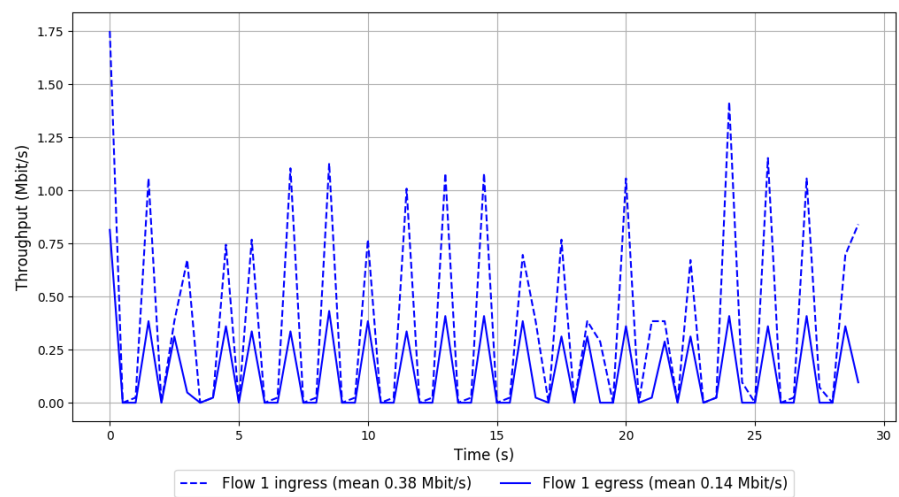


Run 3: Statistics of Indigo-1-32

Start at: 2018-02-27 08:11:14
End at: 2018-02-27 08:11:44
Local clock offset: -2.167 ms
Remote clock offset: -6.358 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 43.595 ms
Loss rate: 62.74%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 43.595 ms
Loss rate: 62.74%

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

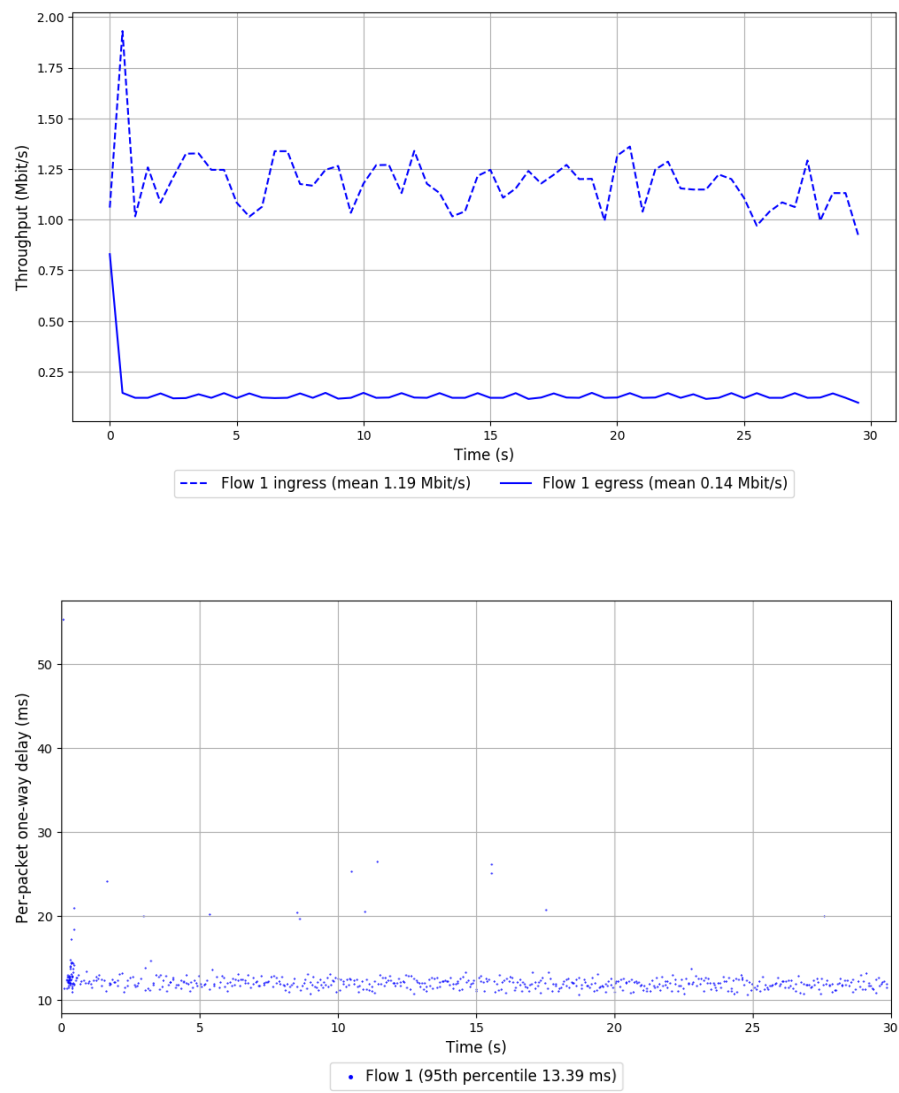


Run 1: Statistics of Vivace-latency

Start at: 2018-02-27 07:34:42
End at: 2018-02-27 07:35:12
Local clock offset: -8.934 ms
Remote clock offset: -4.694 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.390 ms
Loss rate: 88.21%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.390 ms
Loss rate: 88.21%

Run 1: Report of Vivace-latency — Data Link

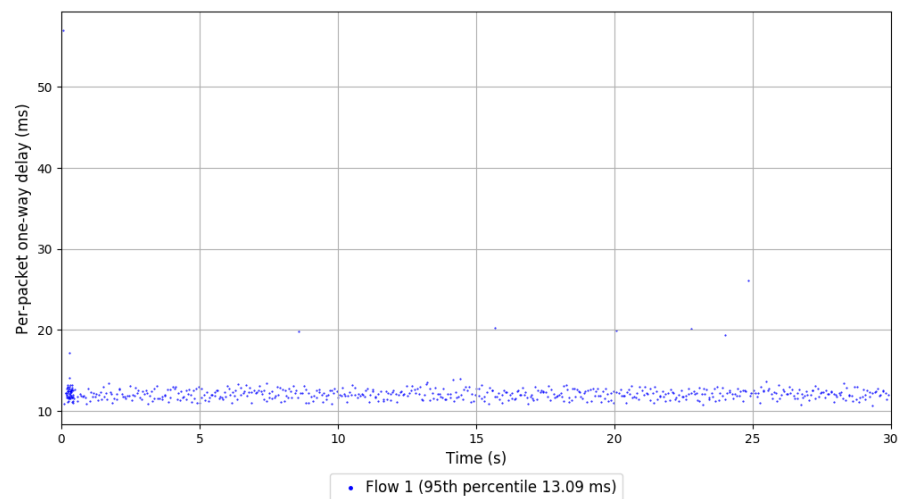
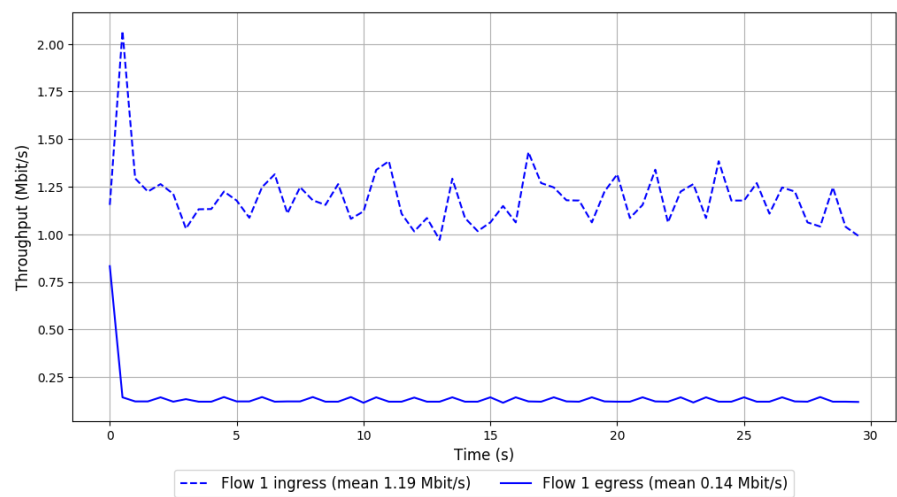


Run 2: Statistics of Vivace-latency

Start at: 2018-02-27 07:58:11
End at: 2018-02-27 07:58:41
Local clock offset: -1.915 ms
Remote clock offset: -6.164 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.085 ms
Loss rate: 88.26%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.085 ms
Loss rate: 88.26%

Run 2: Report of Vivace-latency — Data Link

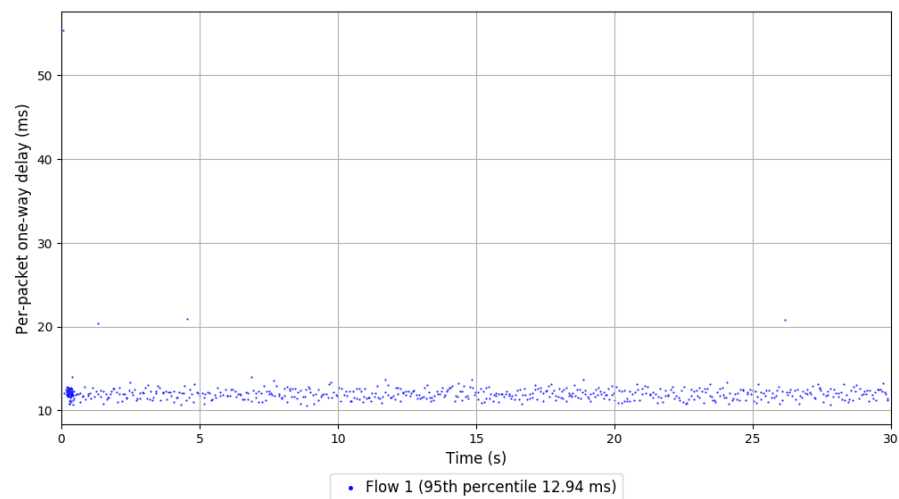
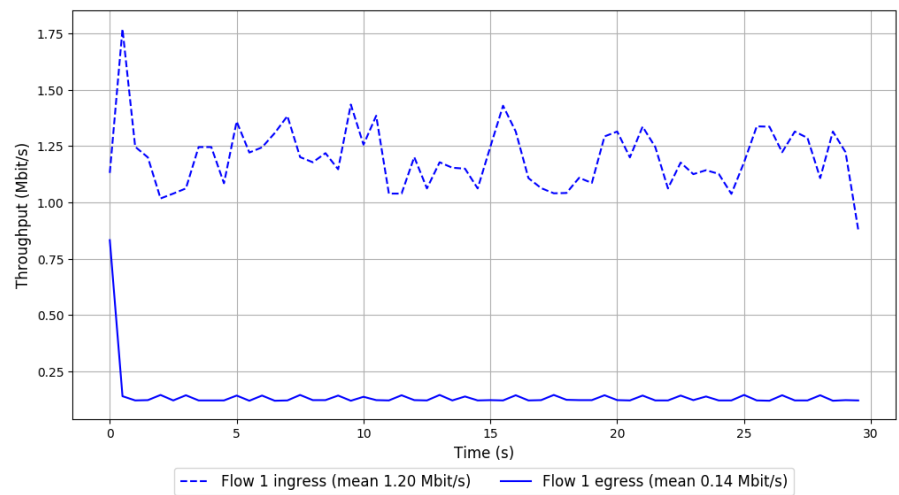


Run 3: Statistics of Vivace-latency

Start at: 2018-02-27 08:21:40
End at: 2018-02-27 08:22:10
Local clock offset: -1.044 ms
Remote clock offset: -5.818 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 12.940 ms
Loss rate: 88.36%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 12.940 ms
Loss rate: 88.36%

Run 3: Report of Vivace-latency — Data Link

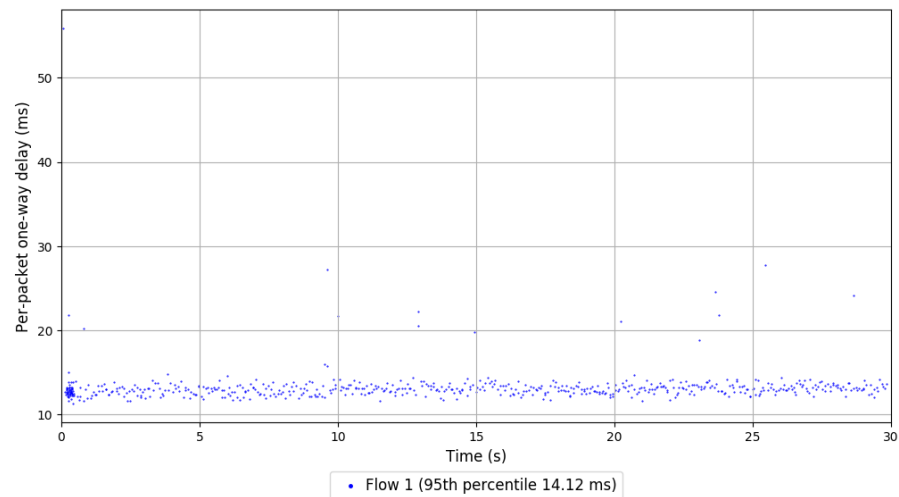
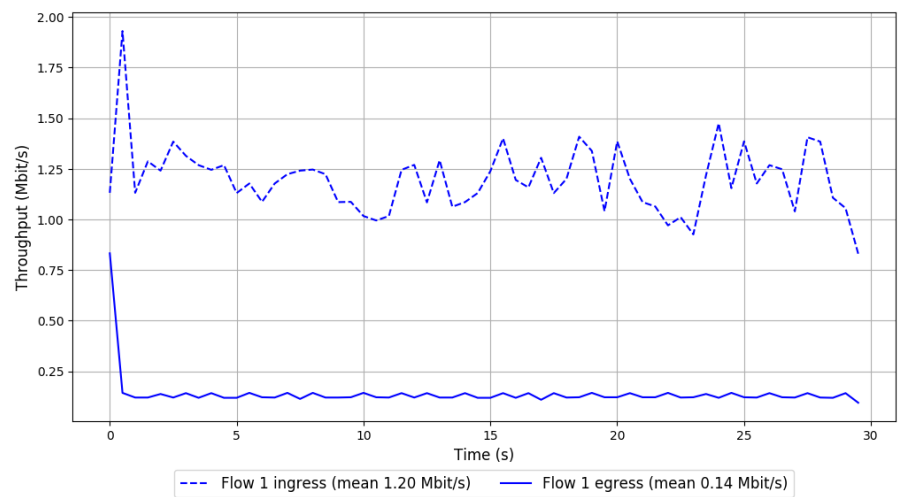


Run 1: Statistics of Vivace-loss

Start at: 2018-02-27 07:38:37
End at: 2018-02-27 07:39:07
Local clock offset: -7.935 ms
Remote clock offset: -4.691 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 14.116 ms
Loss rate: 88.36%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 14.116 ms
Loss rate: 88.36%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

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

End at: 2018-02-27 08:02:36

Local clock offset: -1.95 ms

Remote clock offset: -6.271 ms

Below is generated by plot.py at 2018-02-27 08:30:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 13.315 ms

Loss rate: 88.12%

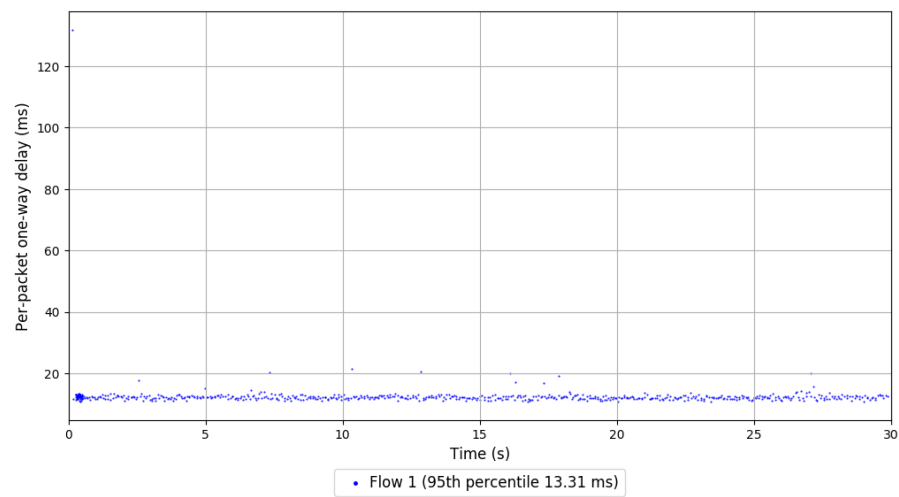
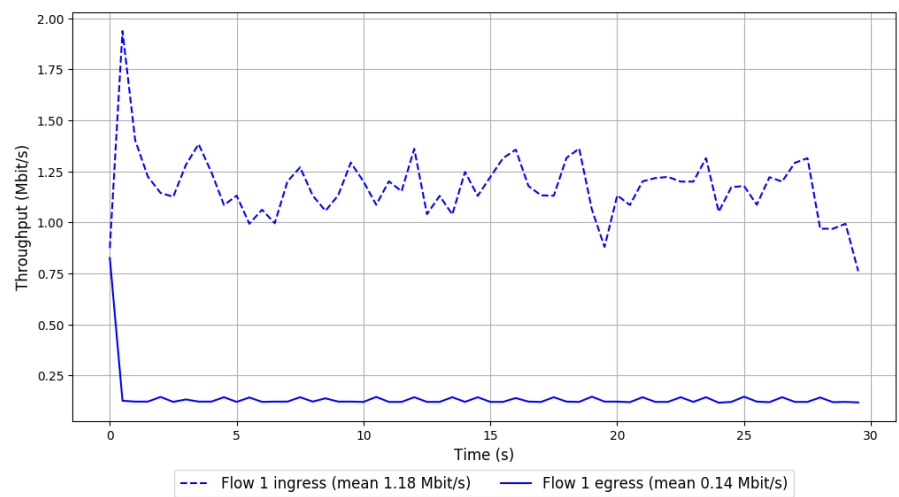
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 13.315 ms

Loss rate: 88.12%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-02-27 08:25:34

End at: 2018-02-27 08:26:04

Local clock offset: -0.961 ms

Remote clock offset: -5.695 ms

Below is generated by plot.py at 2018-02-27 08:30:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 13.305 ms

Loss rate: 88.44%

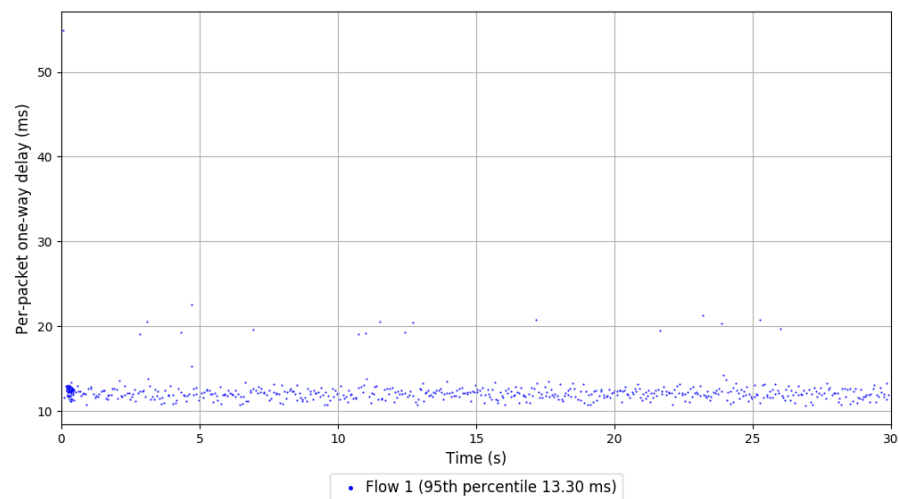
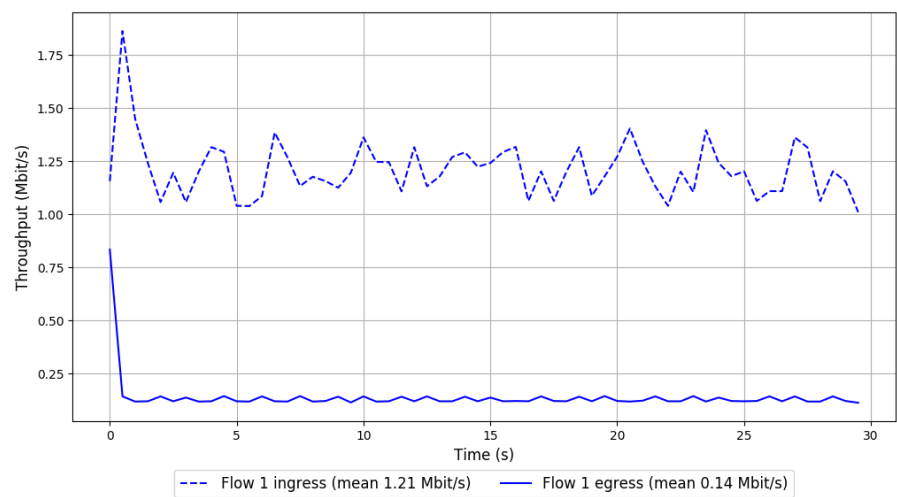
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 13.305 ms

Loss rate: 88.44%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-02-27 07:26:52

End at: 2018-02-27 07:27:23

Local clock offset: -7.399 ms

Remote clock offset: -4.88 ms

Below is generated by plot.py at 2018-02-27 08:30:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 12.888 ms

Loss rate: 88.30%

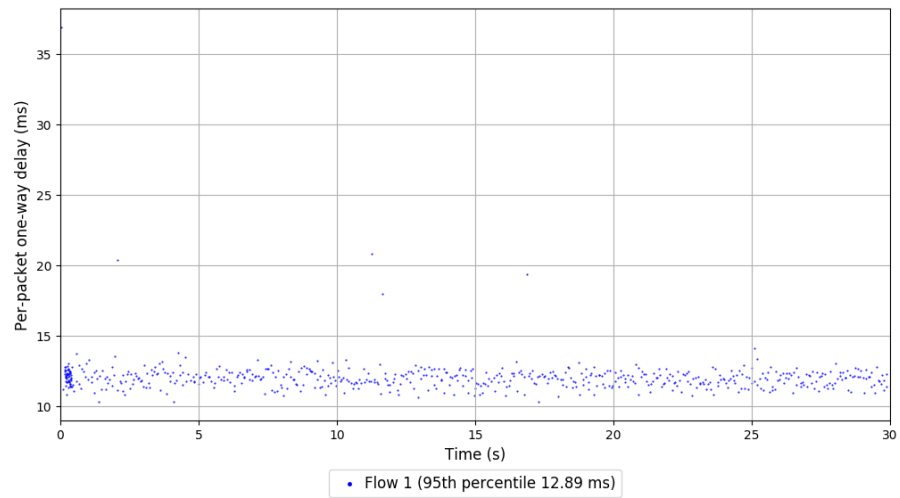
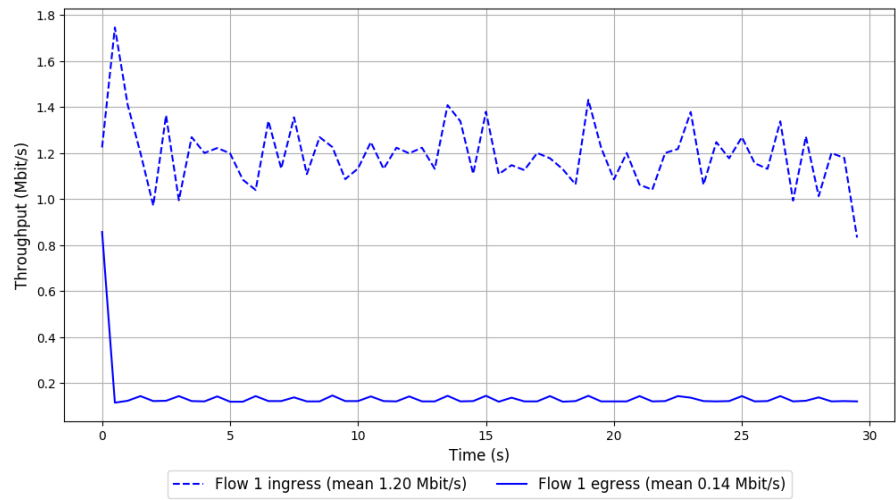
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 12.888 ms

Loss rate: 88.30%

Run 1: Report of Vivace-LTE — Data Link

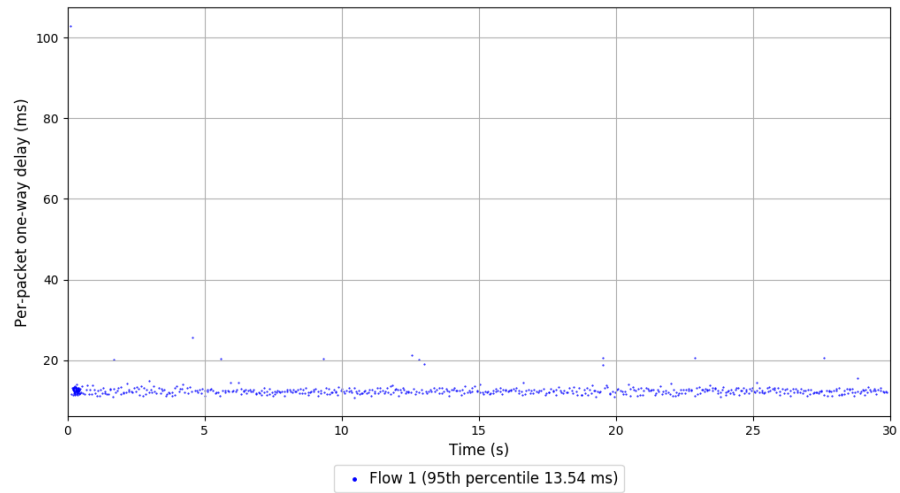
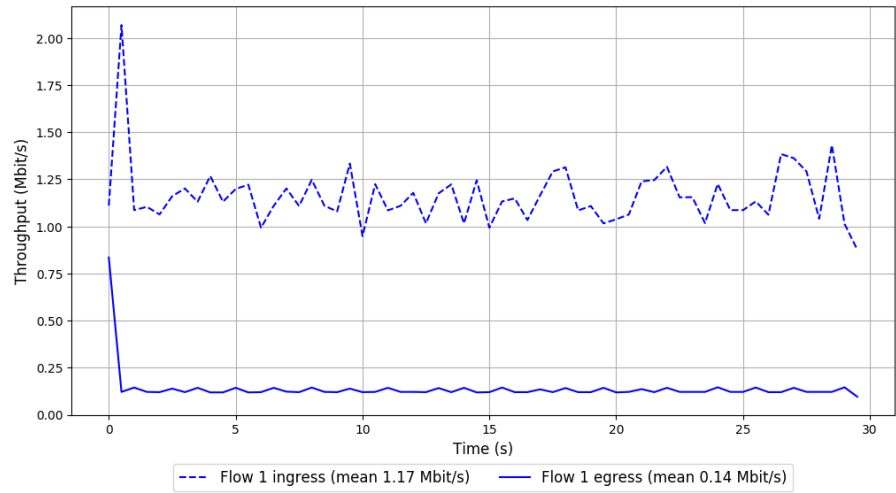


Run 2: Statistics of Vivace-LTE

Start at: 2018-02-27 07:50:21
End at: 2018-02-27 07:50:51
Local clock offset: -2.773 ms
Remote clock offset: -5.893 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.537 ms
Loss rate: 87.99%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.537 ms
Loss rate: 87.99%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-02-27 08:13:50
End at: 2018-02-27 08:14:20
Local clock offset: -1.648 ms
Remote clock offset: -6.258 ms

Below is generated by plot.py at 2018-02-27 08:30:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.389 ms
Loss rate: 88.38%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 13.389 ms
Loss rate: 88.38%

Run 3: Report of Vivace-LTE — Data Link

