

Pantheon Report

Generated at 2018-03-26 22:07:49 (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).

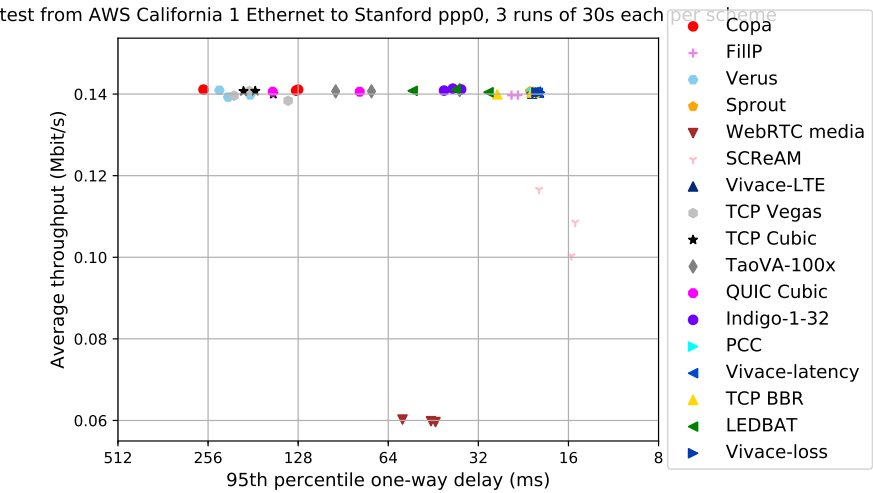
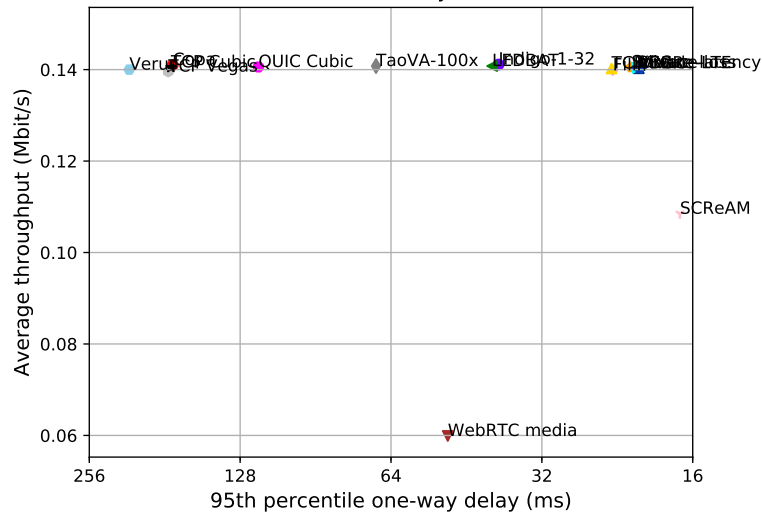
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

Git summary:

```
branch: master @ 503f51fe03f703a4c0a826a0792a4fead3e7d1b0
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 @ f271183af822eee5d0031620f4bebf38aedc5581
```

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



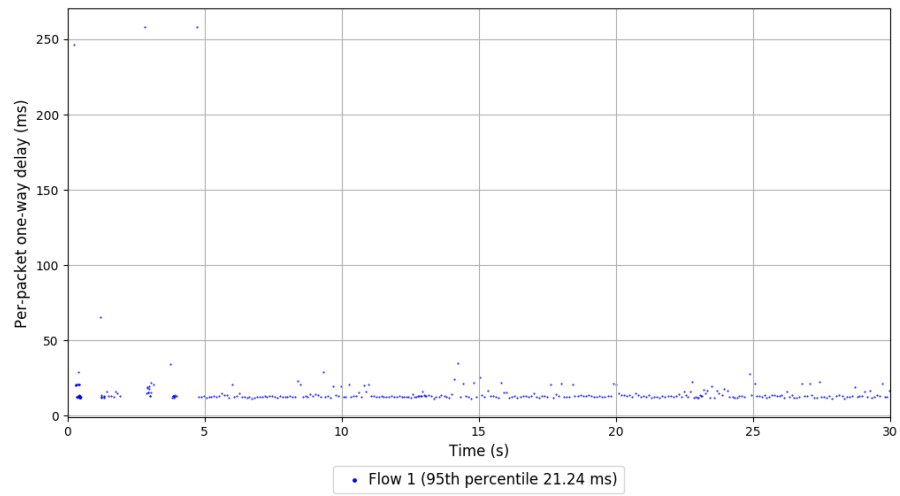
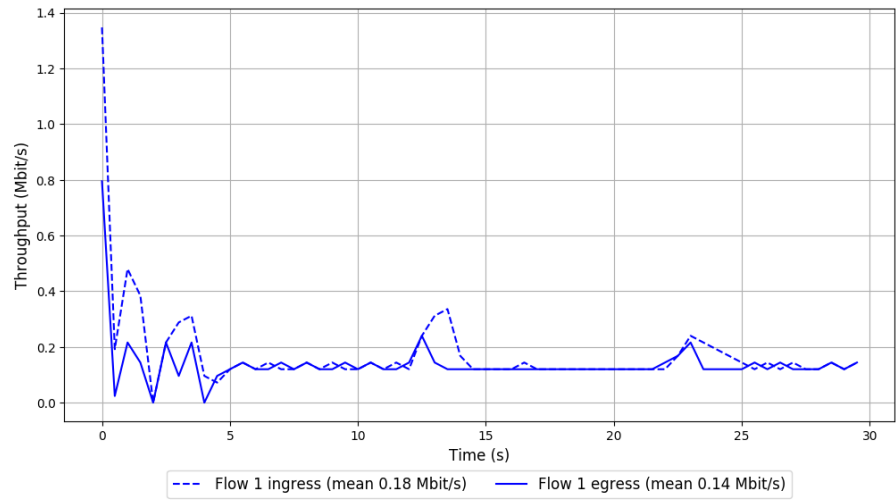
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	0.14	23.23	21.75
TCP Cubic	3	0.14	175.98	32.17
LEDBAT	3	0.14	40.23	32.93
PCC	3	0.14	20.58	94.42
QUIC Cubic	2	0.14	117.67	63.75
SCReAM	3	0.11	16.97	0.93
WebRTC media	3	0.06	49.31	40.00
Sprout	3	0.14	21.21	51.69
TaoVA-100x	3	0.14	68.56	91.41
TCP Vegas	3	0.14	178.14	32.67
Verus	3	0.14	213.03	75.47
Copa	3	0.14	174.39	51.86
FillP	3	0.14	23.11	98.66
Indigo-1-32	3	0.14	39.05	67.99
Vivace-latency	3	0.14	20.69	88.18
Vivace-loss	3	0.14	20.26	88.25
Vivace-LTE	3	0.14	20.50	88.30

Run 1: Statistics of TCP BBR

Start at: 2018-03-26 21:12:13
End at: 2018-03-26 21:12:43
Local clock offset: 1.025 ms
Remote clock offset: -5.473 ms

Below is generated by plot.py at 2018-03-26 22:07:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 21.241 ms
Loss rate: 21.44%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 21.241 ms
Loss rate: 21.44%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-03-26 21:35:43

End at: 2018-03-26 21:36:13

Local clock offset: 3.57 ms

Remote clock offset: -6.34 ms

Below is generated by plot.py at 2018-03-26 22:07:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 27.666 ms

Loss rate: 24.56%

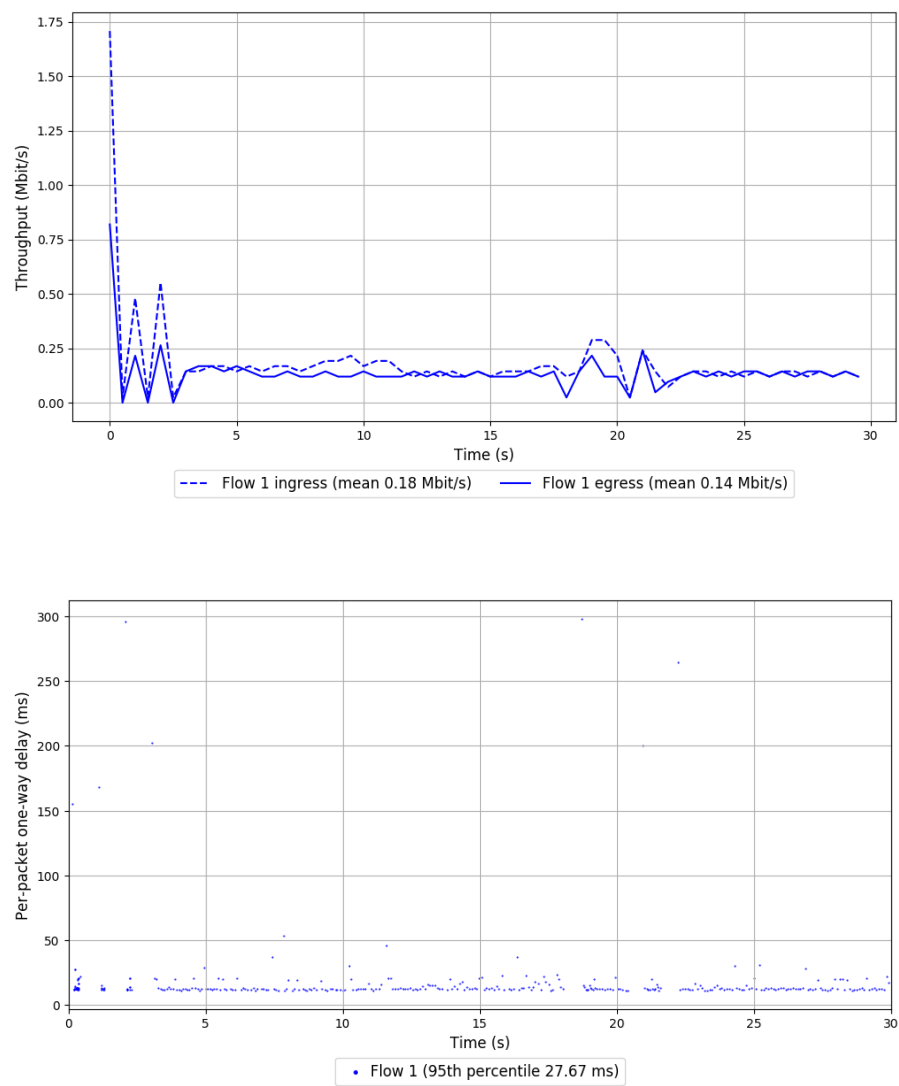
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 27.666 ms

Loss rate: 24.56%

Run 2: Report of TCP BBR — Data Link

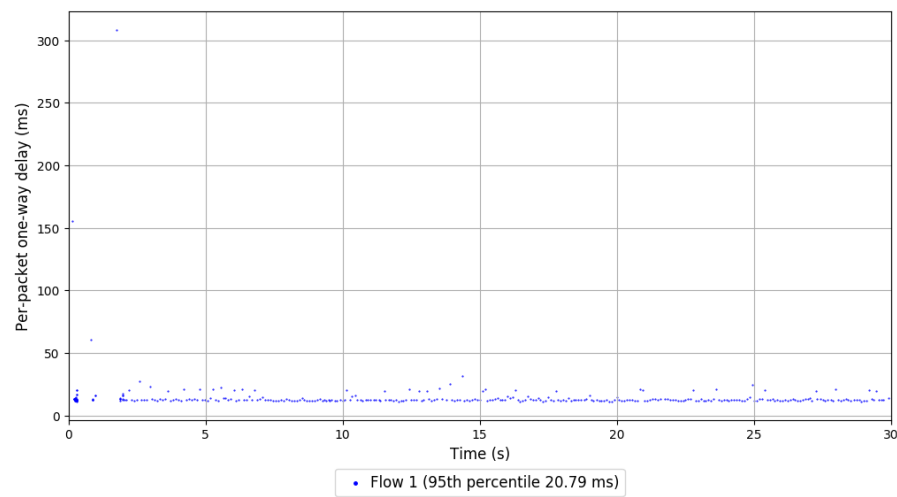
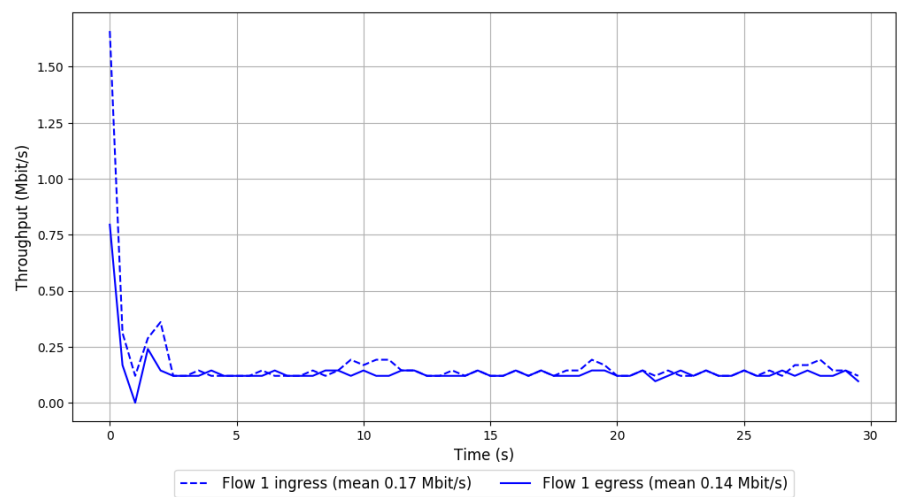


Run 3: Statistics of TCP BBR

Start at: 2018-03-26 21:59:12
End at: 2018-03-26 21:59:42
Local clock offset: 4.198 ms
Remote clock offset: -6.407 ms

Below is generated by plot.py at 2018-03-26 22:07:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 20.794 ms
Loss rate: 19.25%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 20.794 ms
Loss rate: 19.25%

Run 3: Report of TCP BBR — Data Link

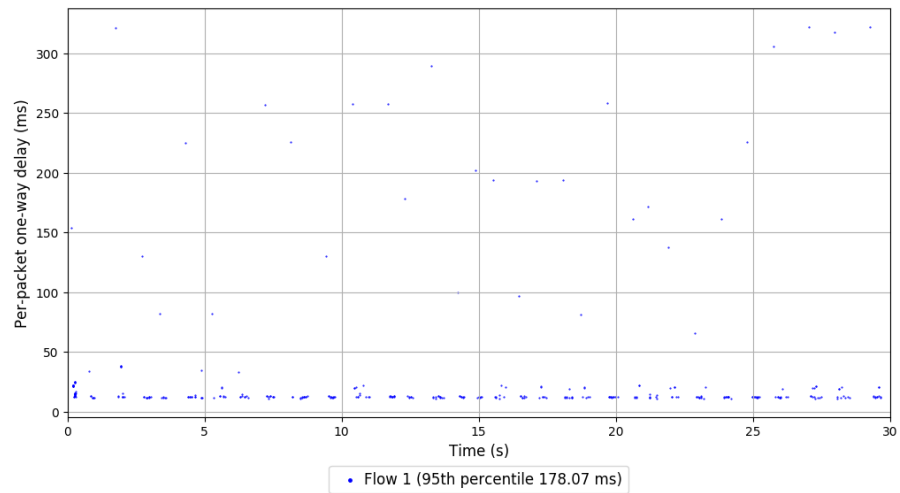
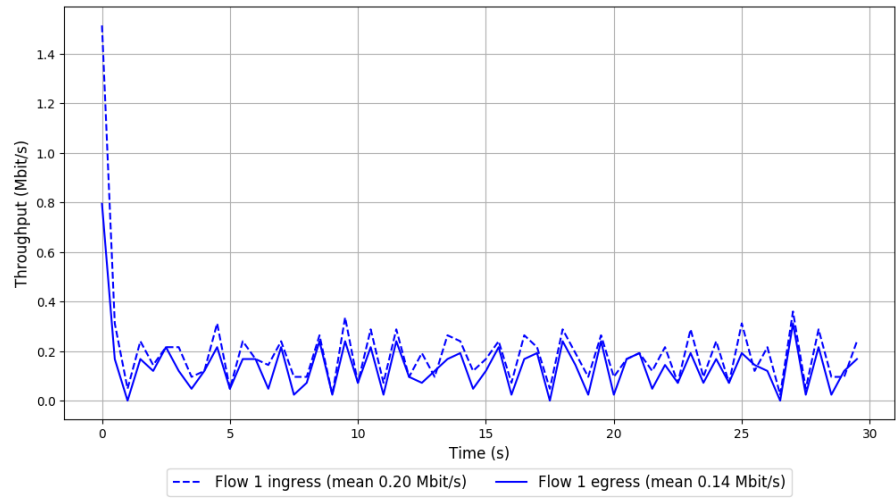


Run 1: Statistics of TCP Cubic

Start at: 2018-03-26 21:17:26
End at: 2018-03-26 21:17:56
Local clock offset: 1.125 ms
Remote clock offset: -5.845 ms

Below is generated by plot.py at 2018-03-26 22:07:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 178.072 ms
Loss rate: 29.67%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 178.072 ms
Loss rate: 29.67%

Run 1: Report of TCP Cubic — Data Link

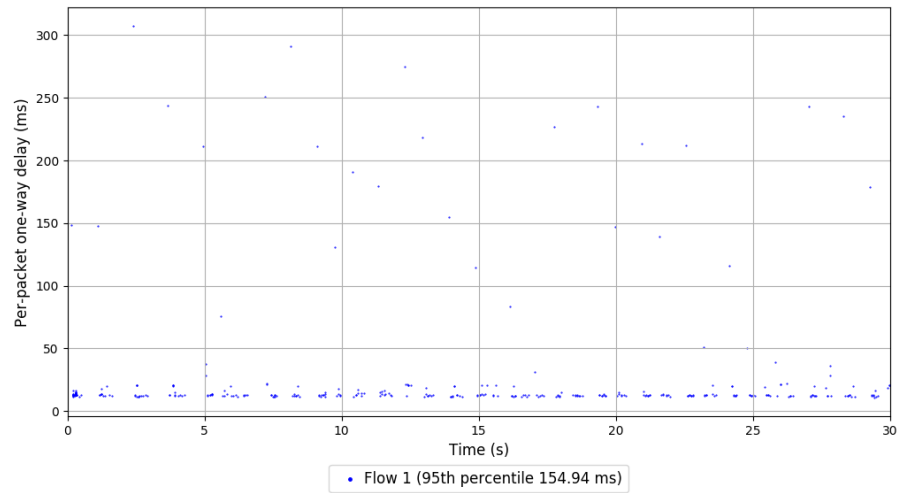
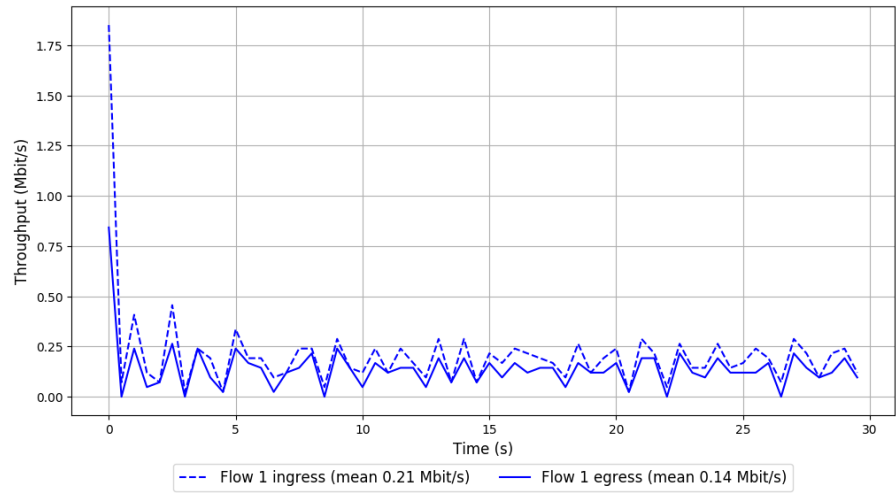


Run 2: Statistics of TCP Cubic

Start at: 2018-03-26 21:40:56
End at: 2018-03-26 21:41:26
Local clock offset: 3.869 ms
Remote clock offset: -6.369 ms

Below is generated by plot.py at 2018-03-26 22:07:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 154.945 ms
Loss rate: 33.45%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 154.945 ms
Loss rate: 33.45%

Run 2: Report of TCP Cubic — Data Link

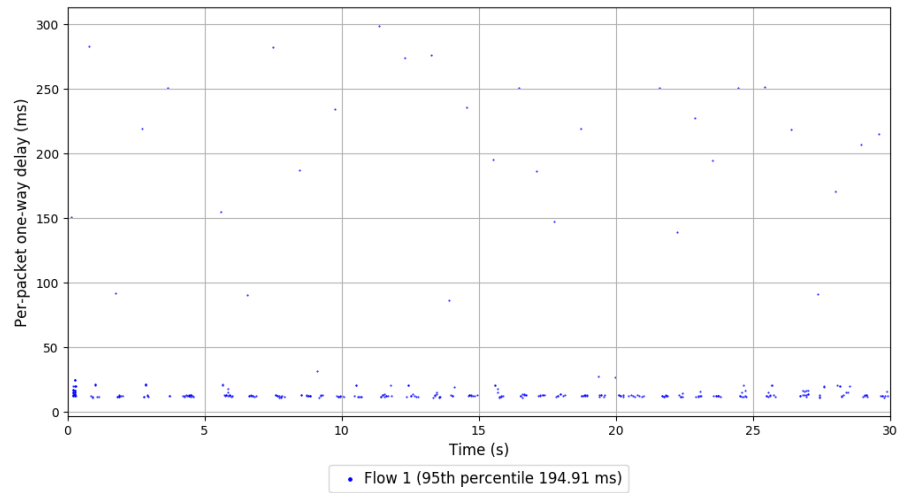
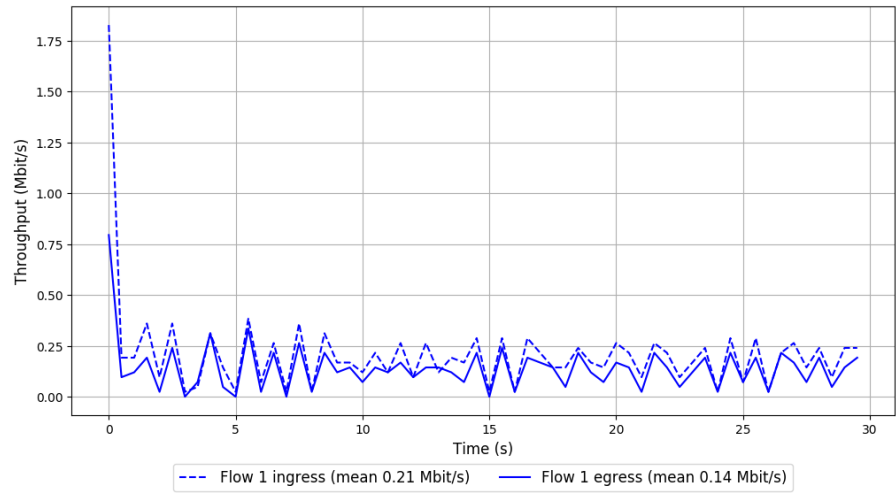


Run 3: Statistics of TCP Cubic

Start at: 2018-03-26 22:04:25
End at: 2018-03-26 22:04:55
Local clock offset: 3.95 ms
Remote clock offset: -6.442 ms

Below is generated by plot.py at 2018-03-26 22:07:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 194.912 ms
Loss rate: 33.39%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 194.912 ms
Loss rate: 33.39%

Run 3: Report of TCP Cubic — Data Link

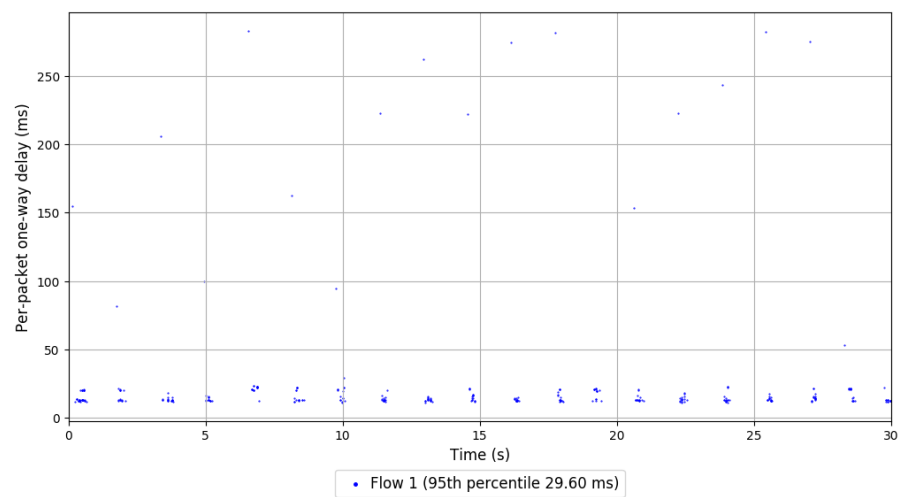
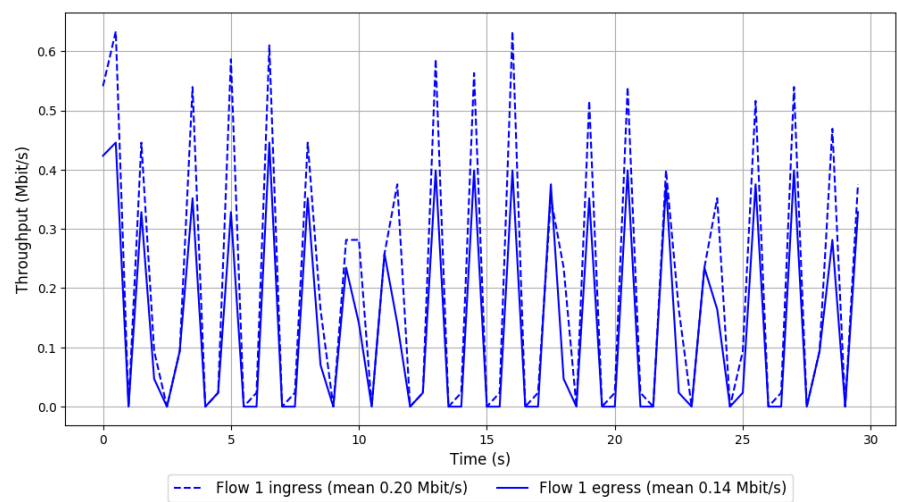


```
Run 1: Statistics of LEDBAT

Start at: 2018-03-26 21:00:28
End at: 2018-03-26 21:00:58
Local clock offset: 0.28 ms
Remote clock offset: -3.873 ms

# Below is generated by plot.py at 2018-03-26 22:07:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 29.599 ms
Loss rate: 31.61%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 29.599 ms
Loss rate: 31.61%
```

Run 1: Report of LEDBAT — Data Link

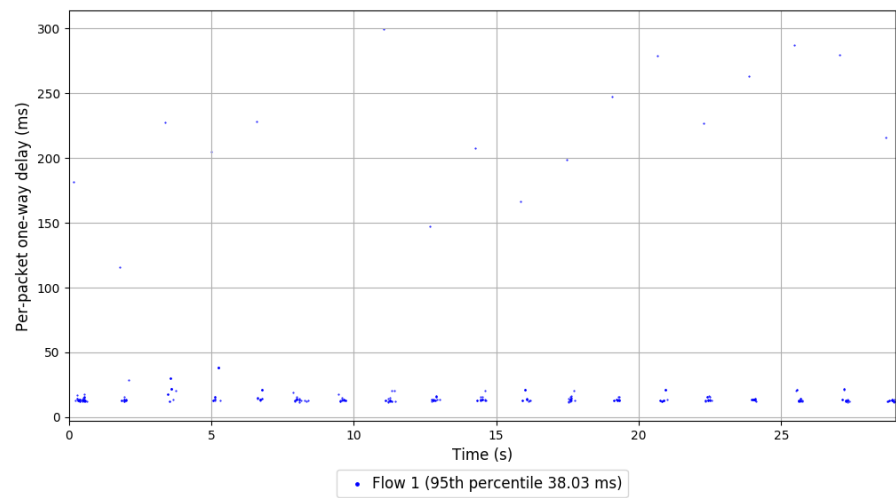
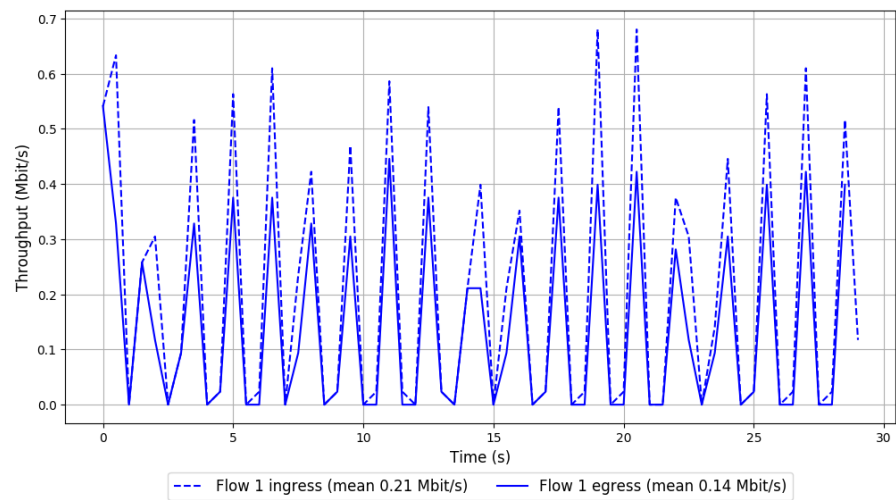


Run 2: Statistics of LEDBAT

Start at: 2018-03-26 21:23:57
End at: 2018-03-26 21:24:28
Local clock offset: 1.81 ms
Remote clock offset: -6.105 ms

Below is generated by plot.py at 2018-03-26 22:07:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 38.033 ms
Loss rate: 33.46%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 38.033 ms
Loss rate: 33.46%

Run 2: Report of LEDBAT — Data Link

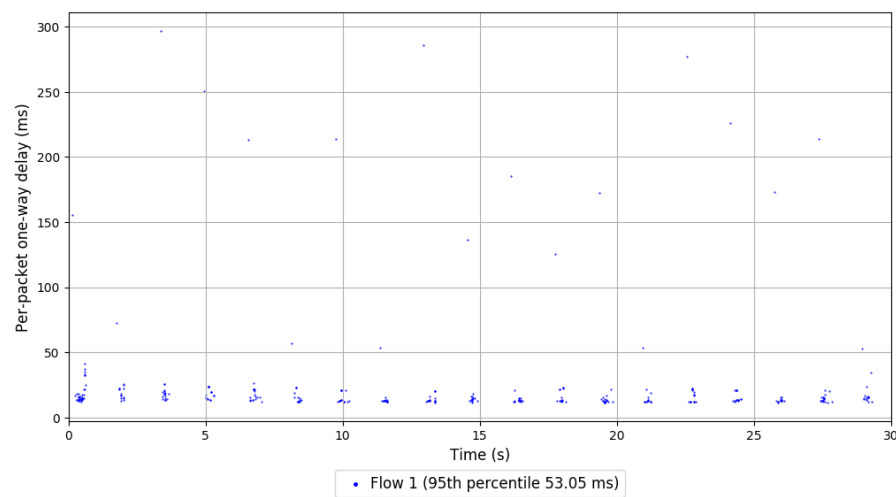
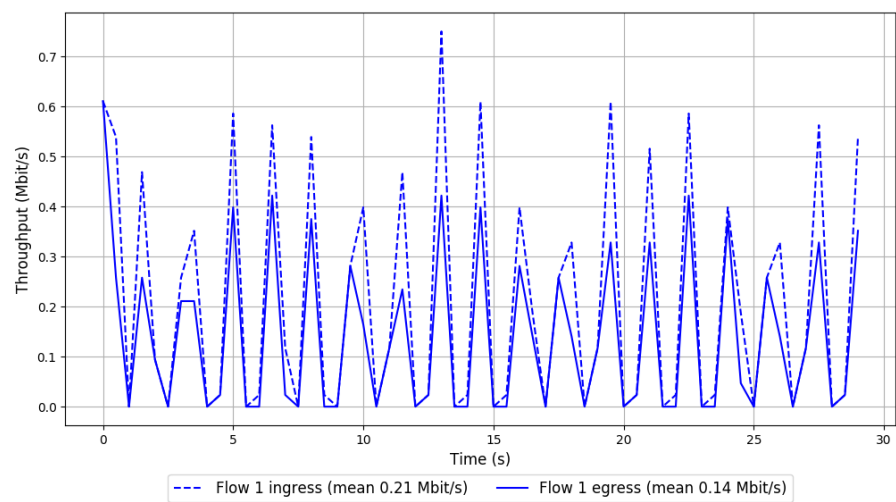


Run 3: Statistics of LEDBAT

Start at: 2018-03-26 21:47:26
End at: 2018-03-26 21:47:56
Local clock offset: 4.233 ms
Remote clock offset: -6.349 ms

Below is generated by plot.py at 2018-03-26 22:07:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 53.047 ms
Loss rate: 33.71%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 53.047 ms
Loss rate: 33.71%

Run 3: Report of LEDBAT — Data Link

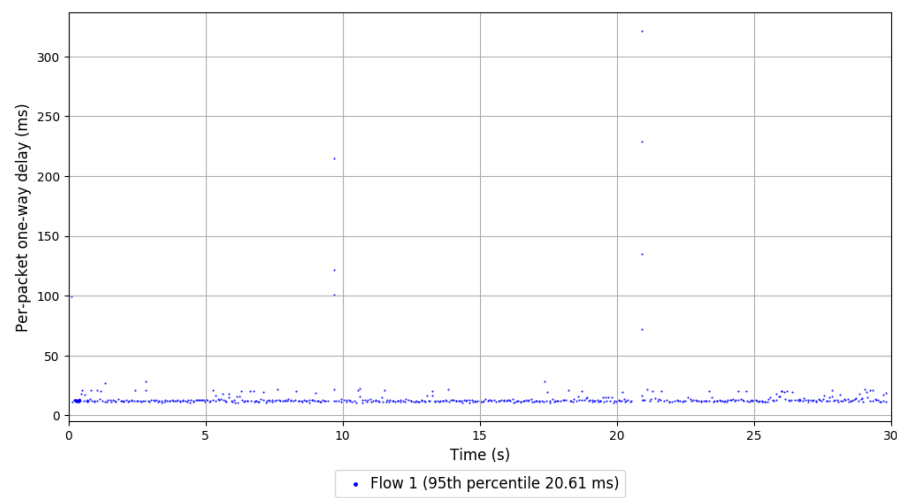
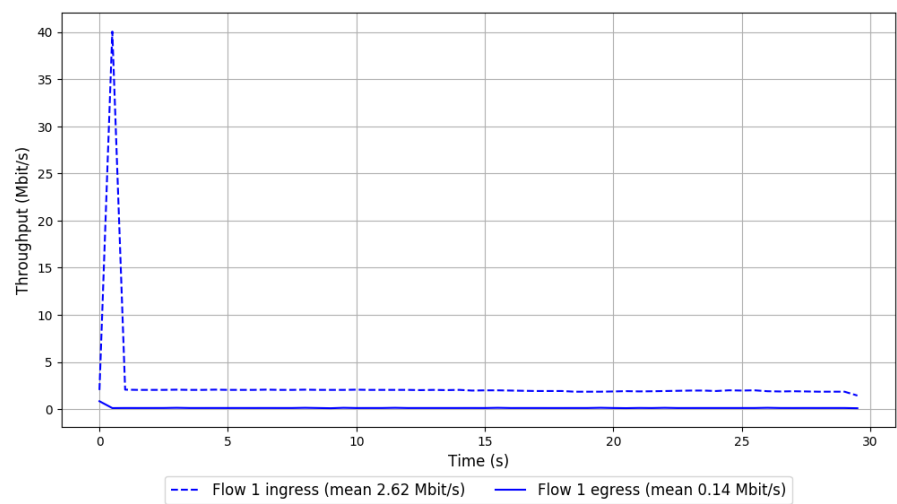


Run 1: Statistics of PCC

Start at: 2018-03-26 21:13:31
End at: 2018-03-26 21:14:01
Local clock offset: 1.046 ms
Remote clock offset: -5.524 ms

Below is generated by plot.py at 2018-03-26 22:07:26
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 20.606 ms
Loss rate: 94.66%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 20.606 ms
Loss rate: 94.66%

Run 1: Report of PCC — Data Link



Run 2: Statistics of PCC

Start at: 2018-03-26 21:37:01

End at: 2018-03-26 21:37:31

Local clock offset: 3.685 ms

Remote clock offset: -6.39 ms

Below is generated by plot.py at 2018-03-26 22:07:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.068 ms

Loss rate: 94.39%

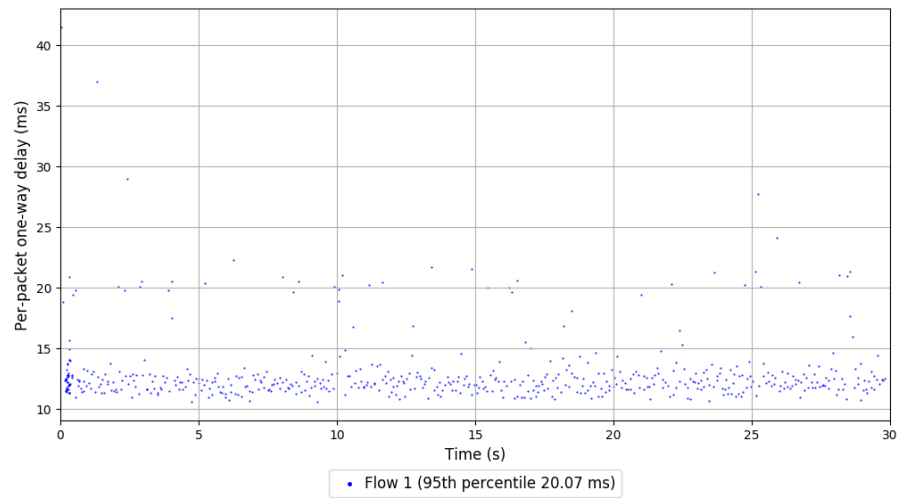
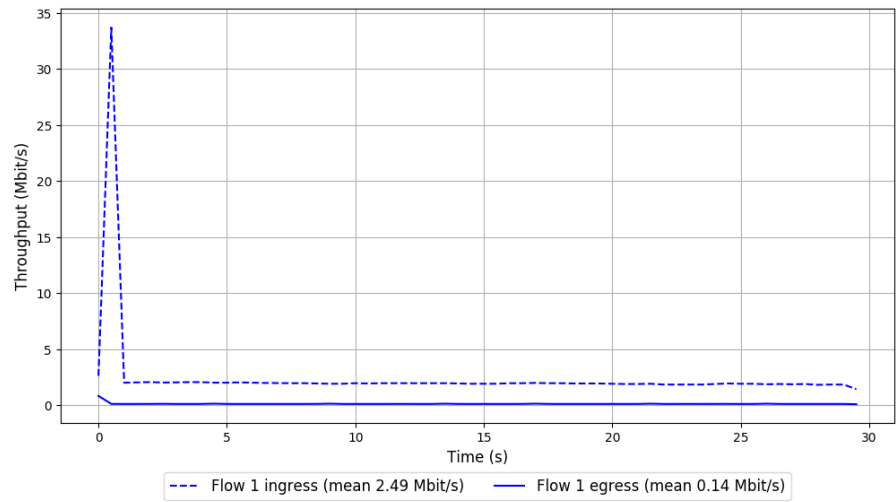
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.068 ms

Loss rate: 94.39%

Run 2: Report of PCC — Data Link



Run 3: Statistics of PCC

Start at: 2018-03-26 22:00:30

End at: 2018-03-26 22:01:00

Local clock offset: 4.104 ms

Remote clock offset: -6.41 ms

Below is generated by plot.py at 2018-03-26 22:07:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 21.072 ms

Loss rate: 94.20%

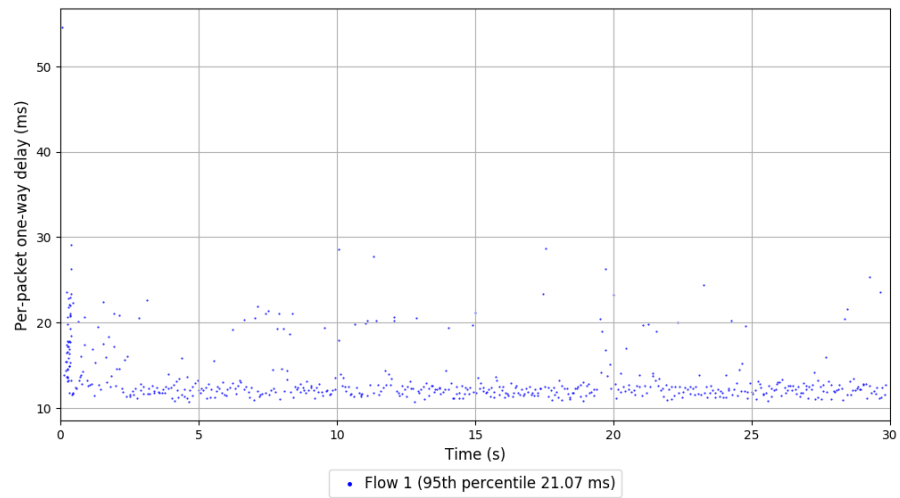
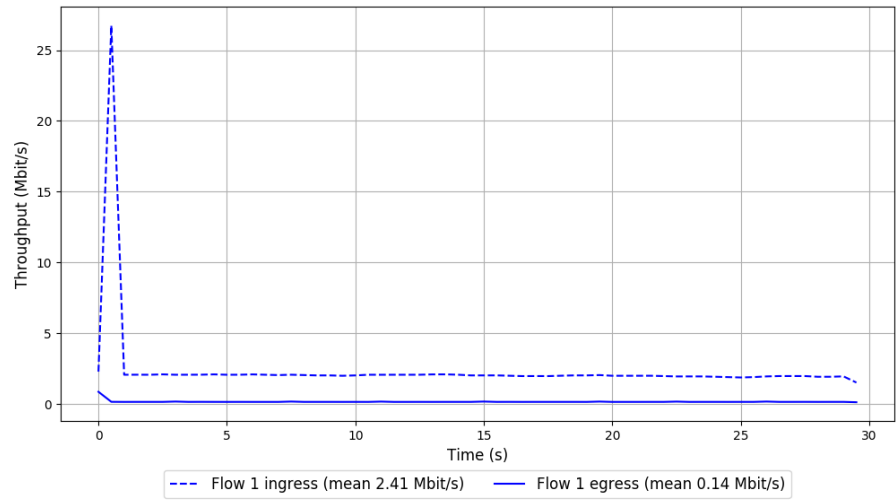
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 21.072 ms

Loss rate: 94.20%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

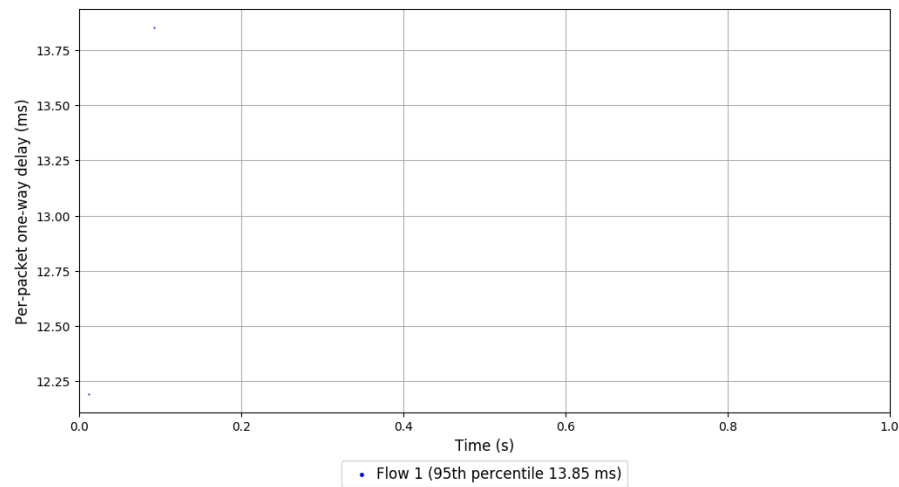
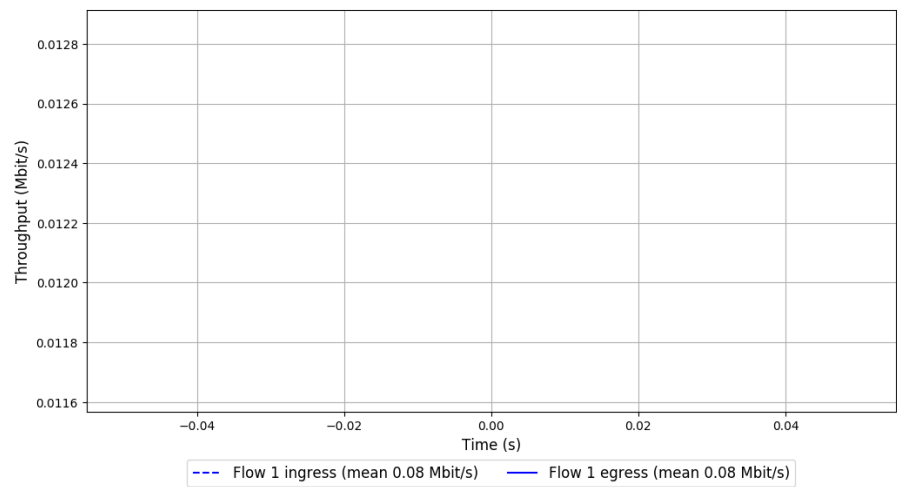
Start at: 2018-03-26 20:56:33

End at: 2018-03-26 20:57:03

Local clock offset: -0.412 ms

Remote clock offset: -4.046 ms

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-03-26 21:20:02

End at: 2018-03-26 21:20:32

Local clock offset: 1.119 ms

Remote clock offset: -5.971 ms

Below is generated by plot.py at 2018-03-26 22:07:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 155.624 ms

Loss rate: 63.67%

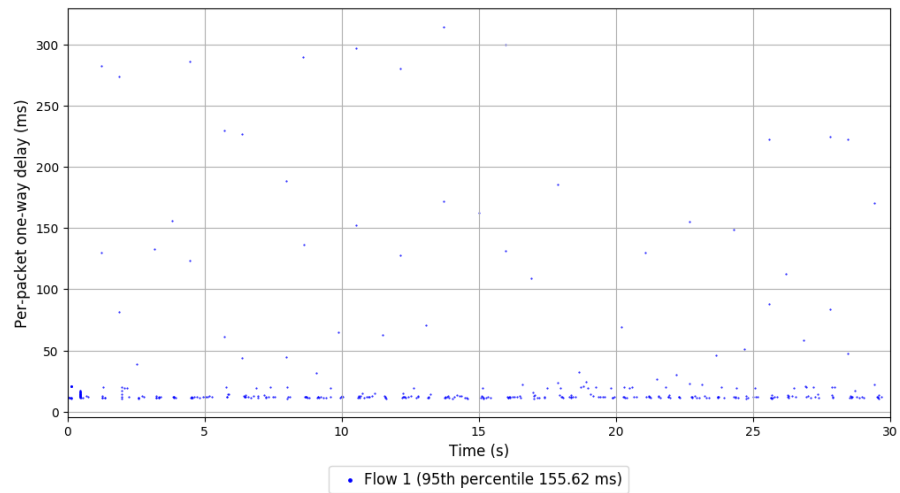
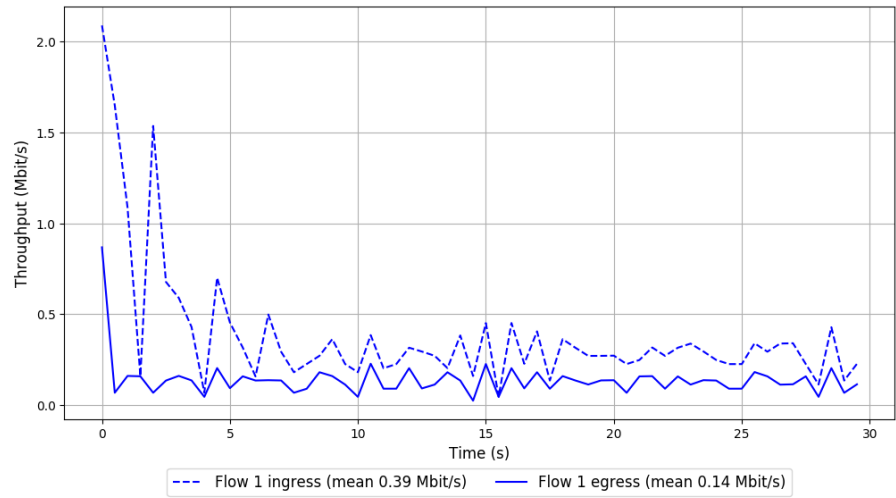
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 155.624 ms

Loss rate: 63.67%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-03-26 21:43:32

End at: 2018-03-26 21:44:02

Local clock offset: 3.989 ms

Remote clock offset: -6.295 ms

Below is generated by plot.py at 2018-03-26 22:07:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 79.717 ms

Loss rate: 63.83%

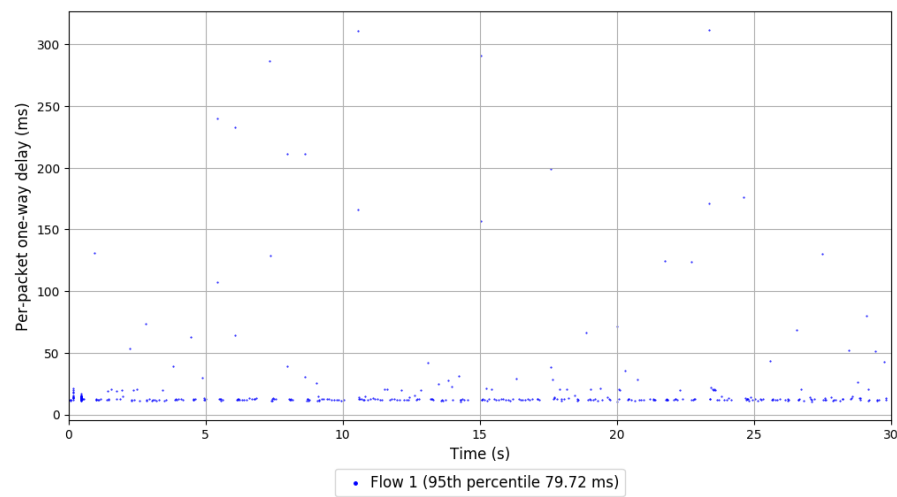
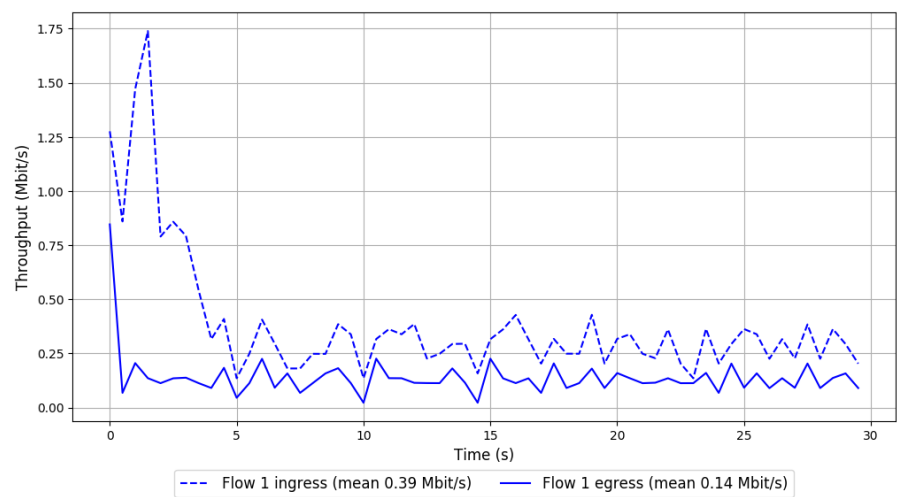
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 79.717 ms

Loss rate: 63.83%

Run 3: Report of QUIC Cubic — Data Link

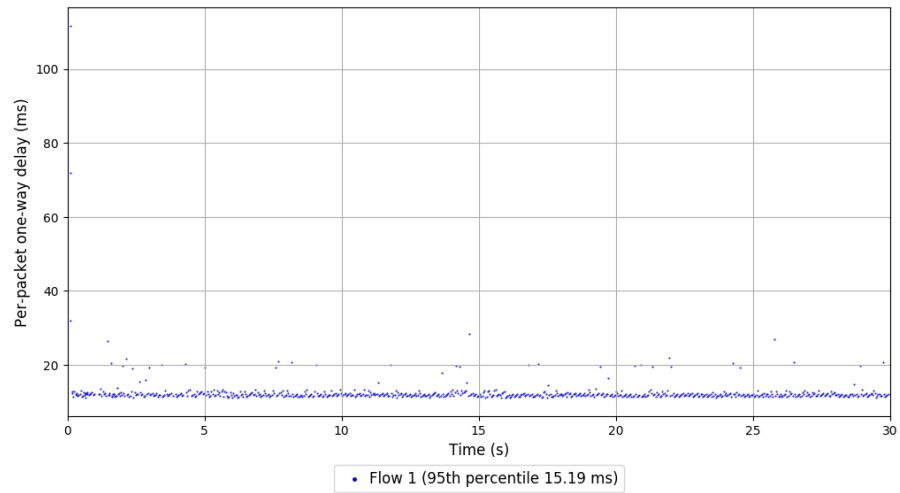
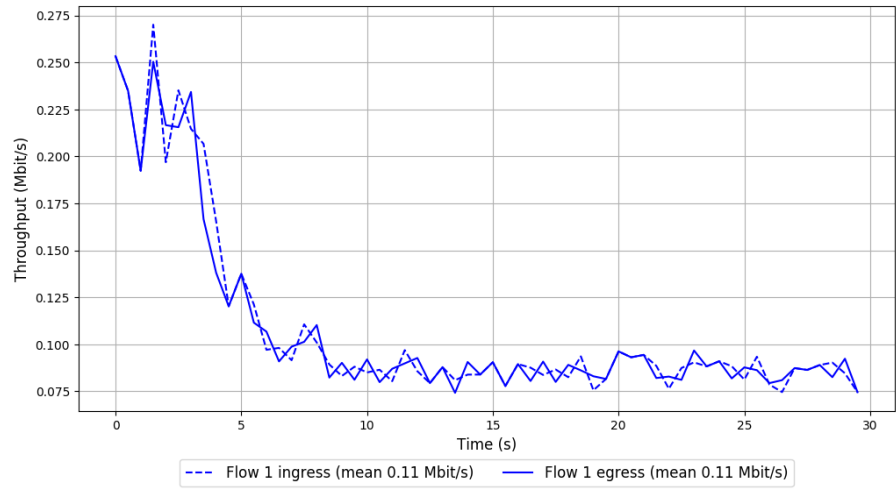


```
Run 1: Statistics of SCReAM

Start at: 2018-03-26 21:18:44
End at: 2018-03-26 21:19:14
Local clock offset: 1.121 ms
Remote clock offset: -5.845 ms

# Below is generated by plot.py at 2018-03-26 22:07:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 15.193 ms
Loss rate: 1.03%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 15.193 ms
Loss rate: 1.03%
```

Run 1: Report of SReAM — Data Link

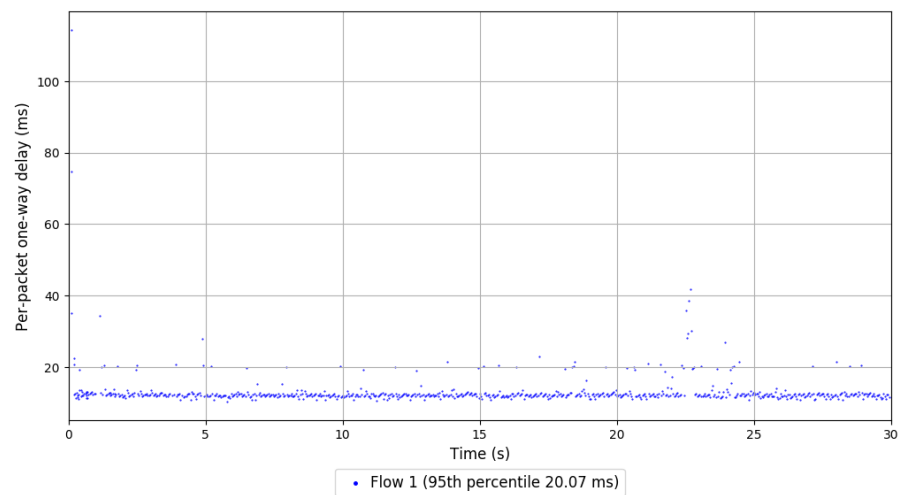
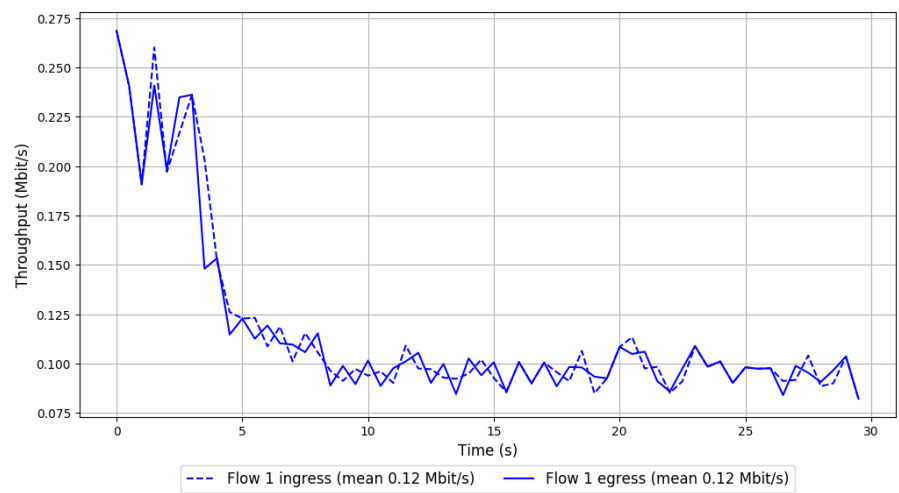


Run 2: Statistics of SCReAM

Start at: 2018-03-26 21:42:14
End at: 2018-03-26 21:42:44
Local clock offset: 4.014 ms
Remote clock offset: -6.284 ms

Below is generated by plot.py at 2018-03-26 22:07:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 20.071 ms
Loss rate: 0.92%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 20.071 ms
Loss rate: 0.92%

Run 2: Report of SReAM — Data Link

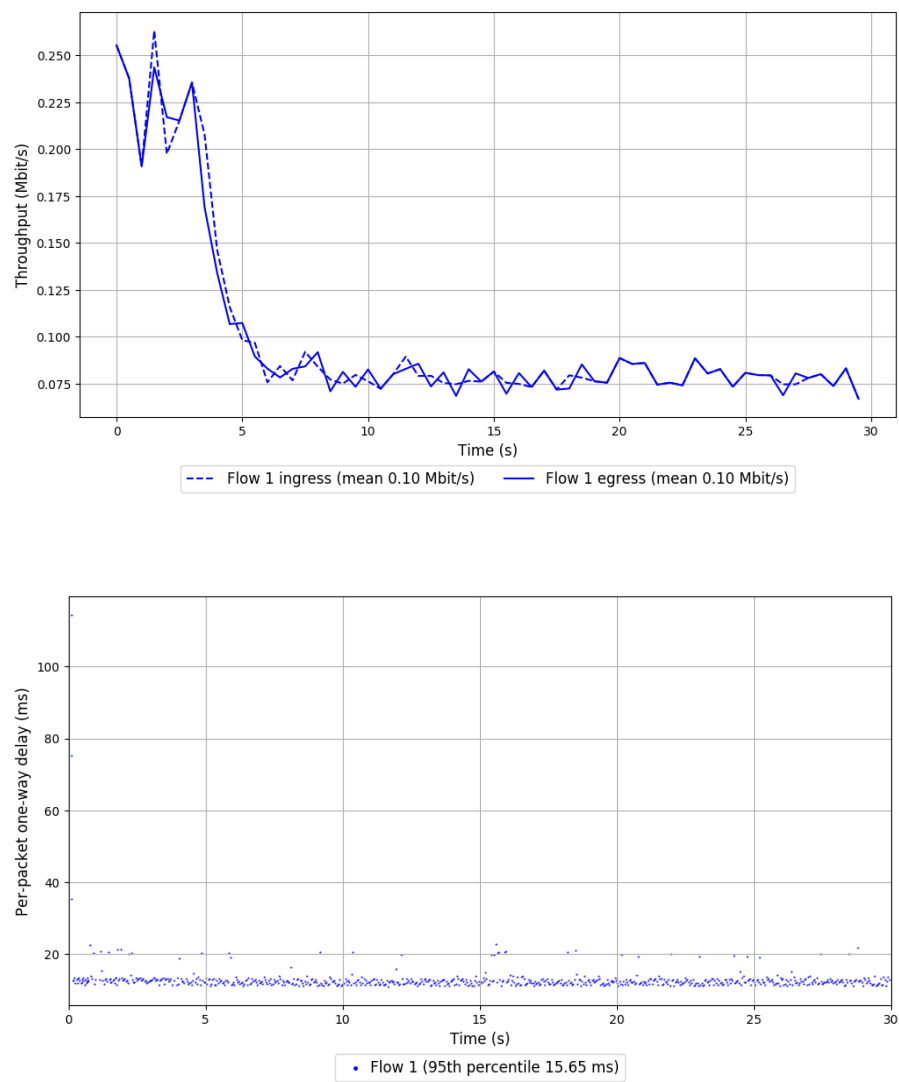


Run 3: Statistics of SCReAM

Start at: 2018-03-26 22:05:44
End at: 2018-03-26 22:06:14
Local clock offset: 3.927 ms
Remote clock offset: -6.358 ms

Below is generated by plot.py at 2018-03-26 22:07:29
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 15.650 ms
Loss rate: 0.84%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 15.650 ms
Loss rate: 0.84%

Run 3: Report of SReAM — Data Link

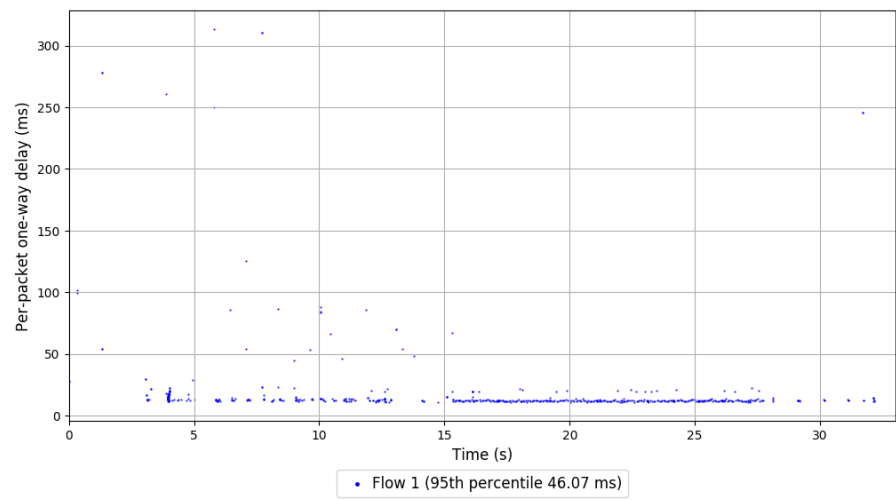
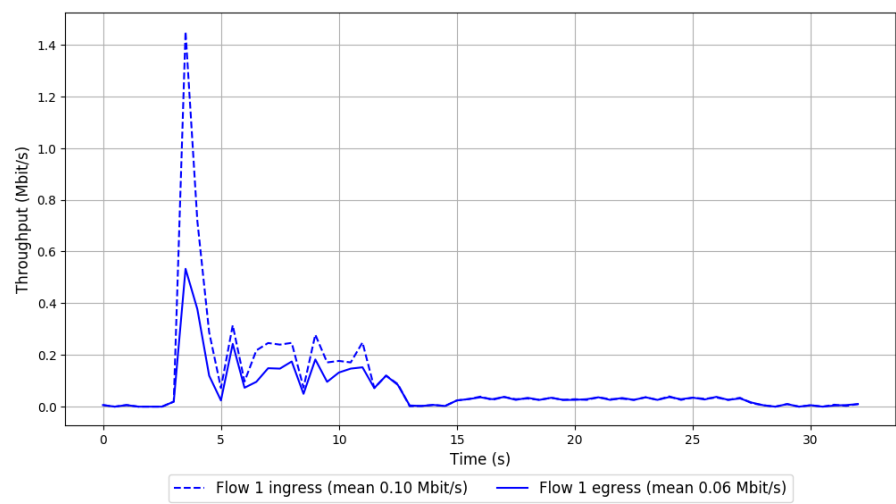


Run 1: Statistics of WebRTC media

Start at: 2018-03-26 20:57:51
End at: 2018-03-26 20:58:21
Local clock offset: -0.166 ms
Remote clock offset: -4.021 ms

Below is generated by plot.py at 2018-03-26 22:07:29
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 46.074 ms
Loss rate: 37.58%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 46.074 ms
Loss rate: 37.58%

Run 1: Report of WebRTC media — Data Link

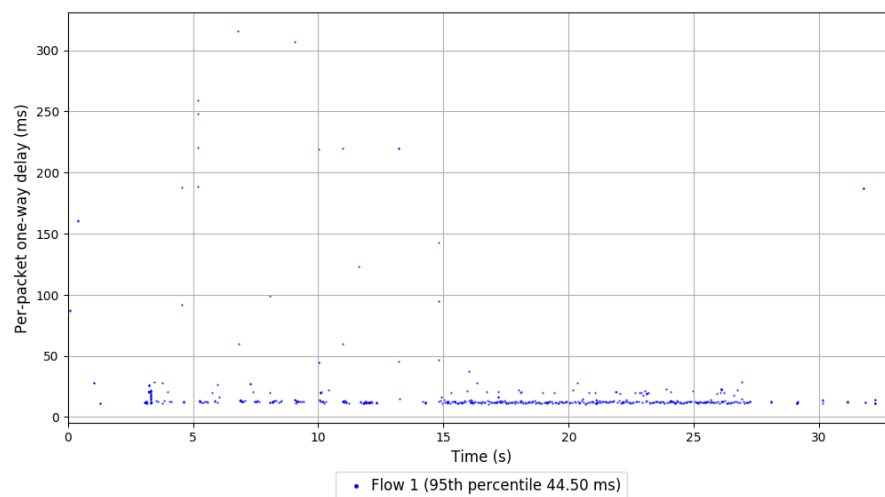
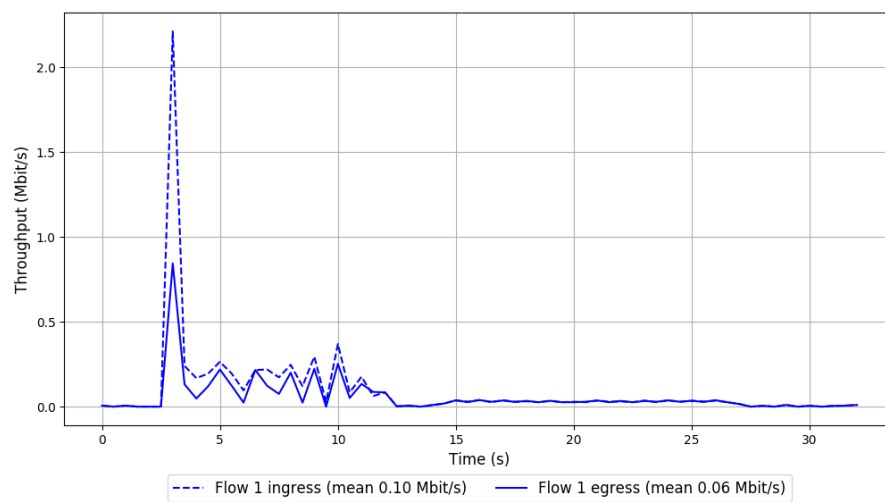


Run 2: Statistics of WebRTC media

Start at: 2018-03-26 21:21:21
End at: 2018-03-26 21:21:51
Local clock offset: 1.12 ms
Remote clock offset: -6.015 ms

Below is generated by plot.py at 2018-03-26 22:07:29
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 44.497 ms
Loss rate: 39.13%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 44.497 ms
Loss rate: 39.13%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-03-26 21:44:50

End at: 2018-03-26 21:45:20

Local clock offset: 4.052 ms

Remote clock offset: -6.28 ms

Below is generated by plot.py at 2018-03-26 22:07:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.06 Mbit/s

95th percentile per-packet one-way delay: 57.358 ms

Loss rate: 43.28%

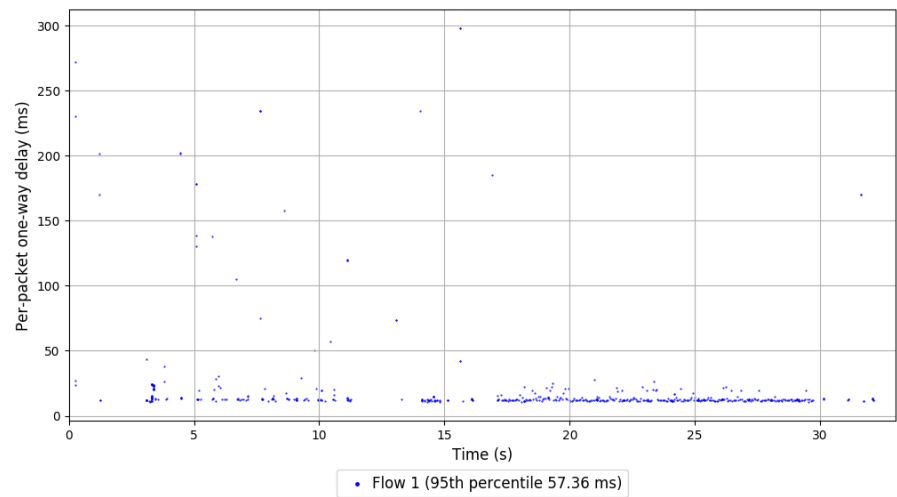
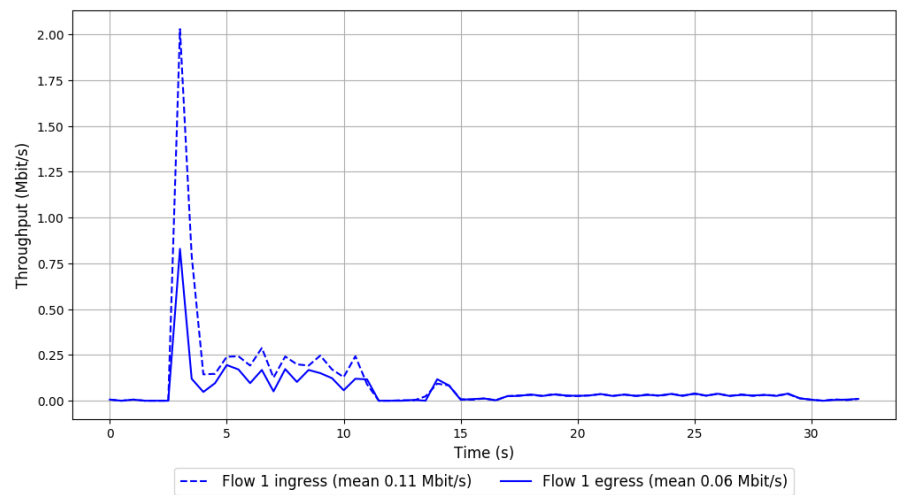
-- Flow 1:

Average throughput: 0.06 Mbit/s

95th percentile per-packet one-way delay: 57.358 ms

Loss rate: 43.28%

Run 3: Report of WebRTC media — Data Link

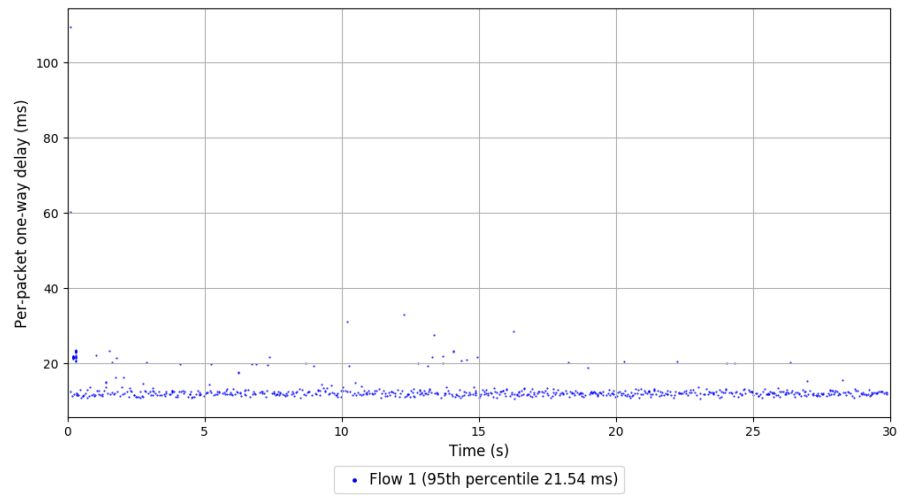
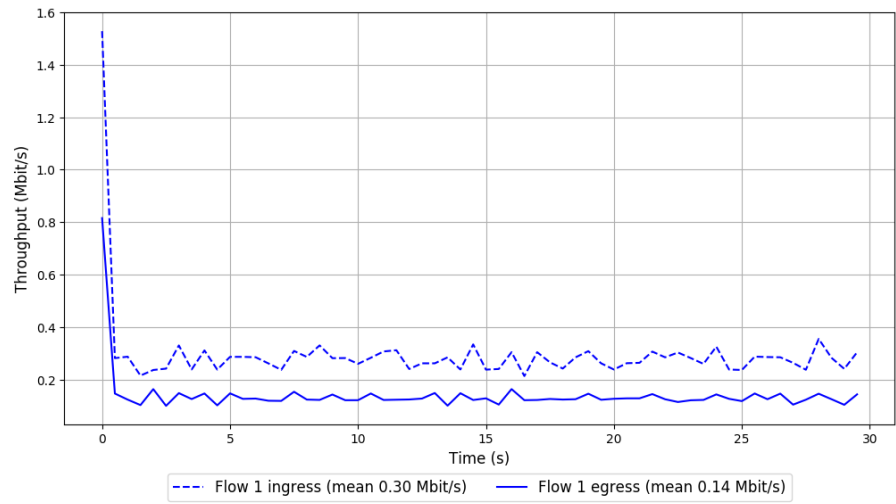


Run 1: Statistics of Sprout

Start at: 2018-03-26 21:09:36
End at: 2018-03-26 21:10:06
Local clock offset: 0.944 ms
Remote clock offset: -5.281 ms

Below is generated by plot.py at 2018-03-26 22:07:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 21.536 ms
Loss rate: 52.70%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 21.536 ms
Loss rate: 52.70%

Run 1: Report of Sprout — Data Link

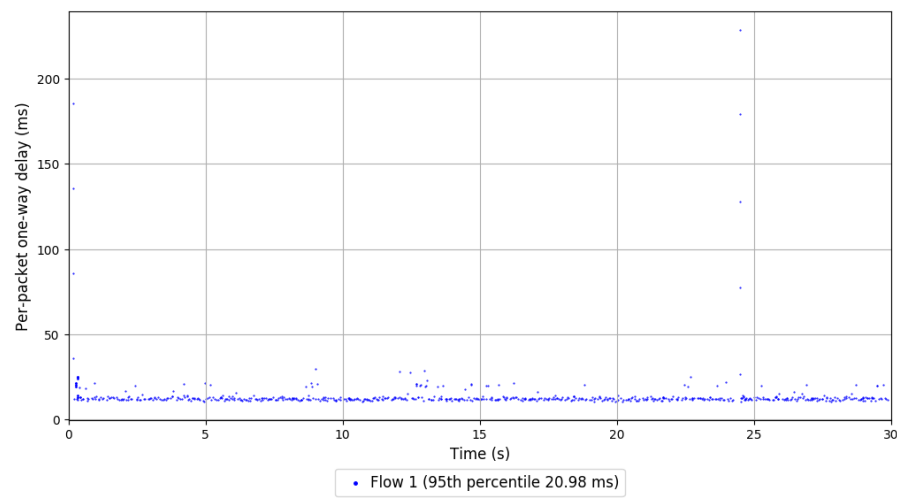
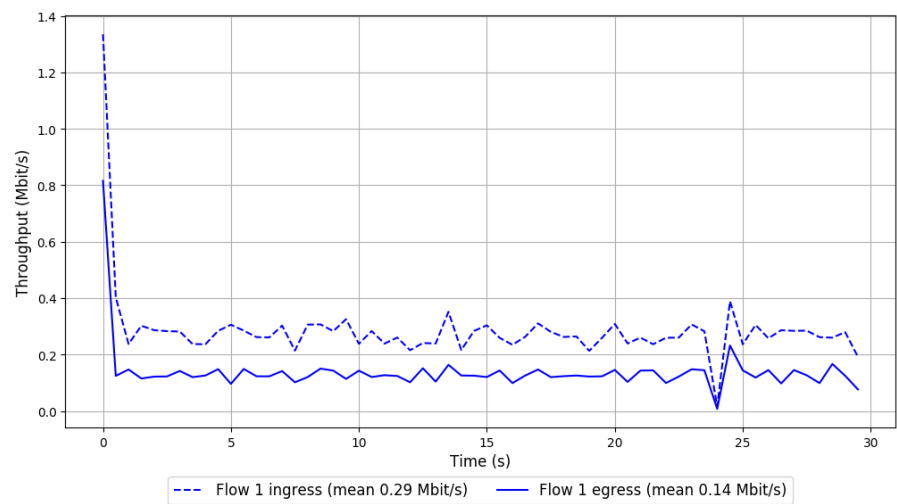


Run 2: Statistics of Sprout

Start at: 2018-03-26 21:33:06
End at: 2018-03-26 21:33:36
Local clock offset: 3.332 ms
Remote clock offset: -6.273 ms

Below is generated by plot.py at 2018-03-26 22:07:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 20.985 ms
Loss rate: 51.49%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 20.985 ms
Loss rate: 51.49%

Run 2: Report of Sprout — Data Link

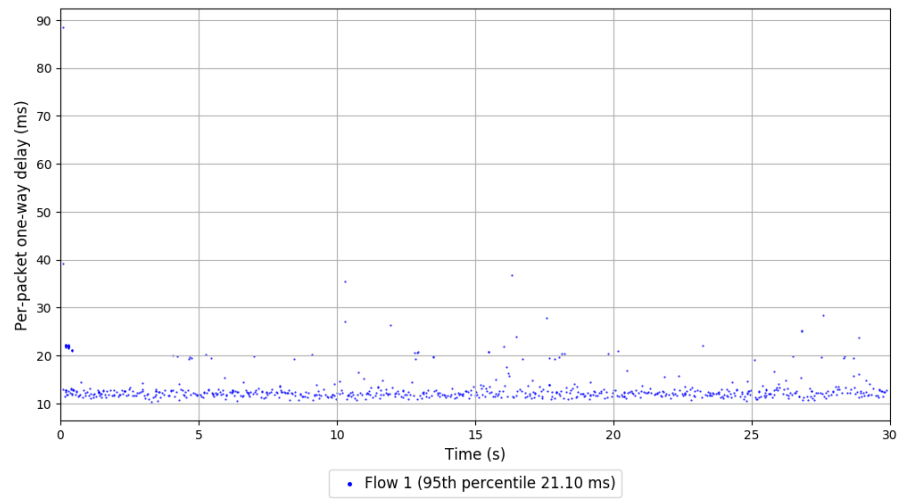
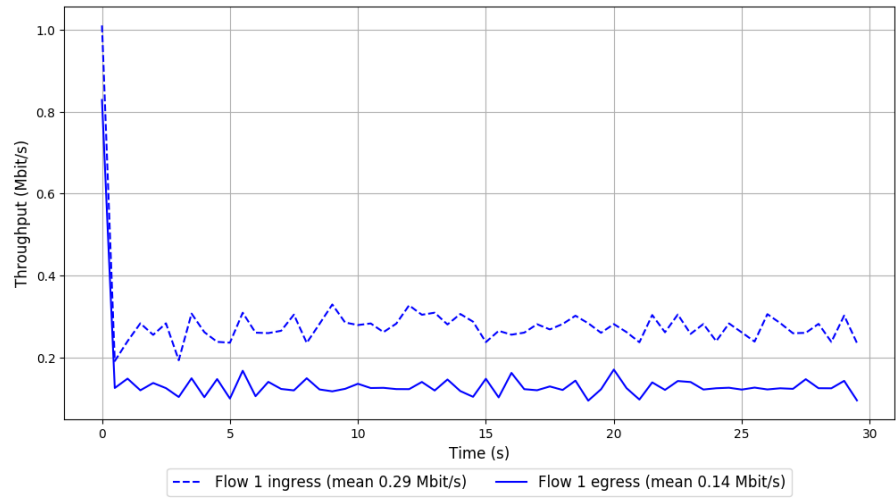


Run 3: Statistics of Sprout

Start at: 2018-03-26 21:56:35
End at: 2018-03-26 21:57:05
Local clock offset: 4.379 ms
Remote clock offset: -6.374 ms

Below is generated by plot.py at 2018-03-26 22:07:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 21.099 ms
Loss rate: 50.89%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 21.099 ms
Loss rate: 50.89%

Run 3: Report of Sprout — Data Link

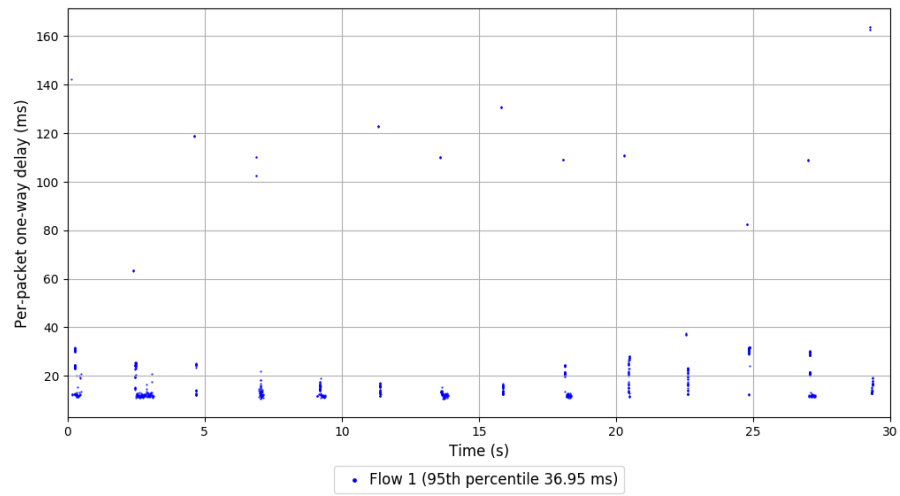
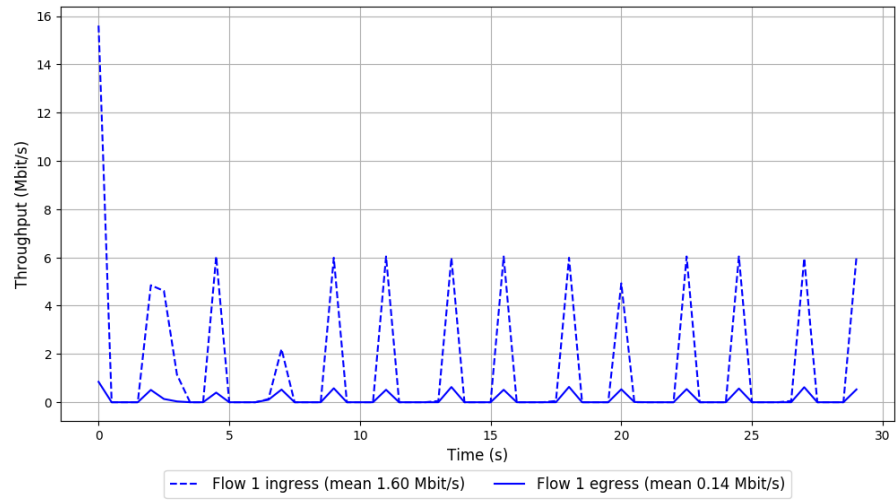


Run 1: Statistics of TaoVA-100x

Start at: 2018-03-26 21:05:41
End at: 2018-03-26 21:06:11
Local clock offset: 0.699 ms
Remote clock offset: -4.821 ms

Below is generated by plot.py at 2018-03-26 22:07:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 36.954 ms
Loss rate: 91.22%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 36.954 ms
Loss rate: 91.22%

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

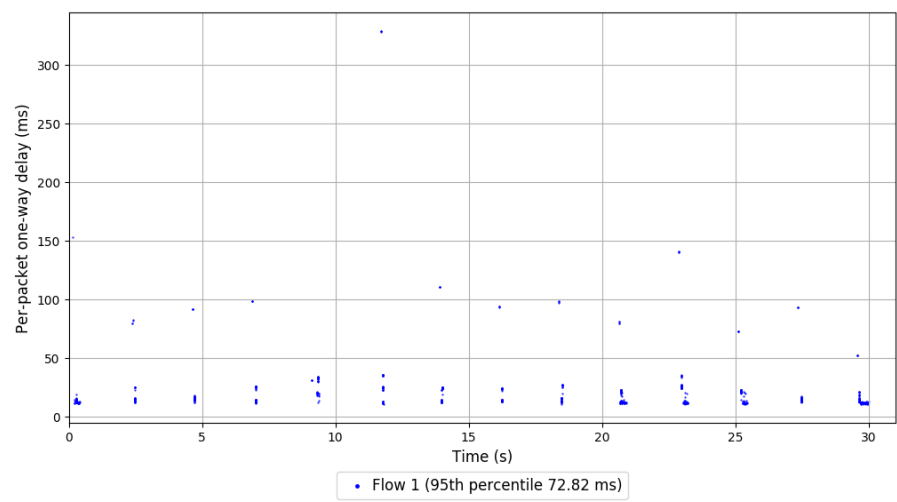
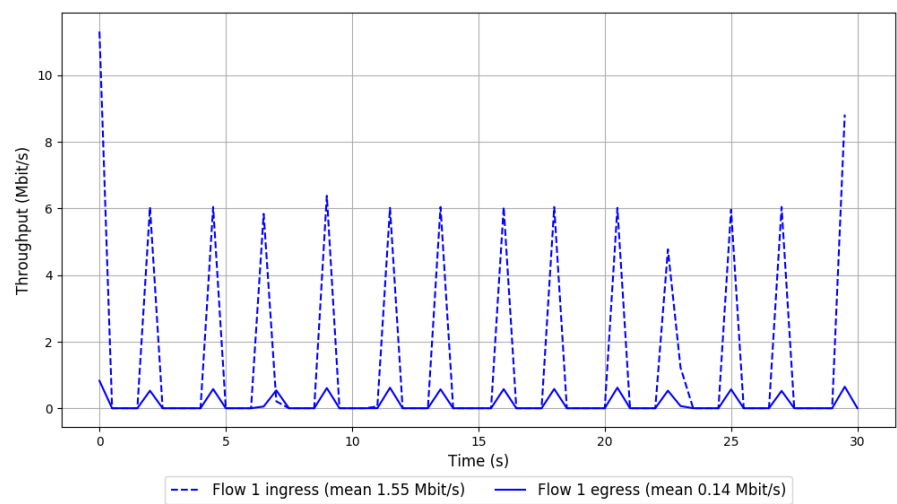


Run 2: Statistics of TaoVA-100x

Start at: 2018-03-26 21:29:11
End at: 2018-03-26 21:29:41
Local clock offset: 2.866 ms
Remote clock offset: -6.183 ms

Below is generated by plot.py at 2018-03-26 22:07:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 72.820 ms
Loss rate: 90.95%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 72.820 ms
Loss rate: 90.95%

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

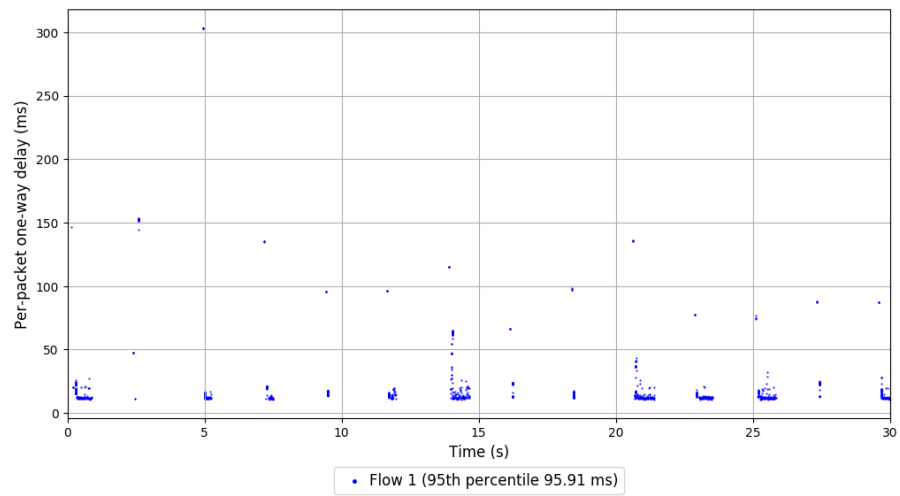
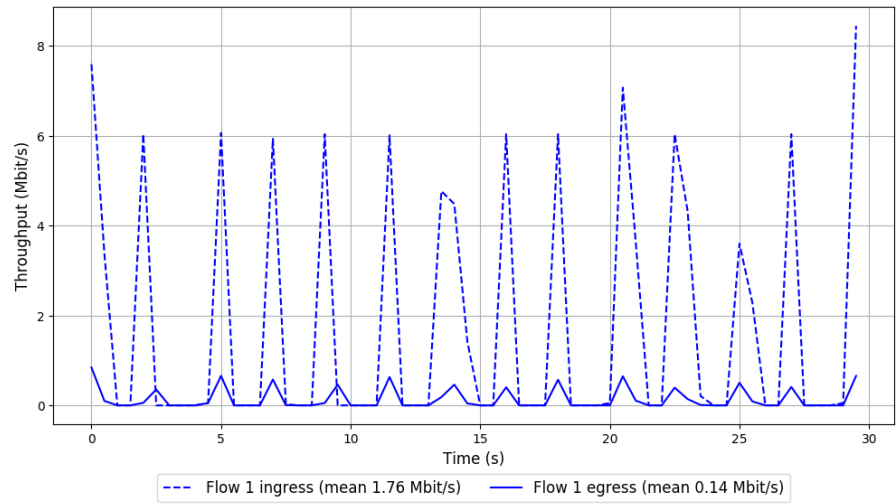


Run 3: Statistics of TaoVA-100x

Start at: 2018-03-26 21:52:40
End at: 2018-03-26 21:53:10
Local clock offset: 4.448 ms
Remote clock offset: -6.268 ms

Below is generated by plot.py at 2018-03-26 22:07:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 95.914 ms
Loss rate: 92.05%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 95.914 ms
Loss rate: 92.05%

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

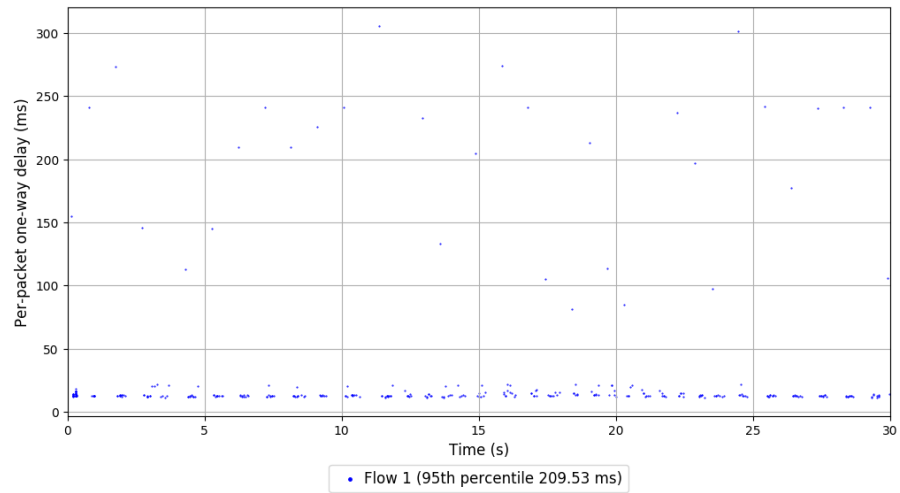
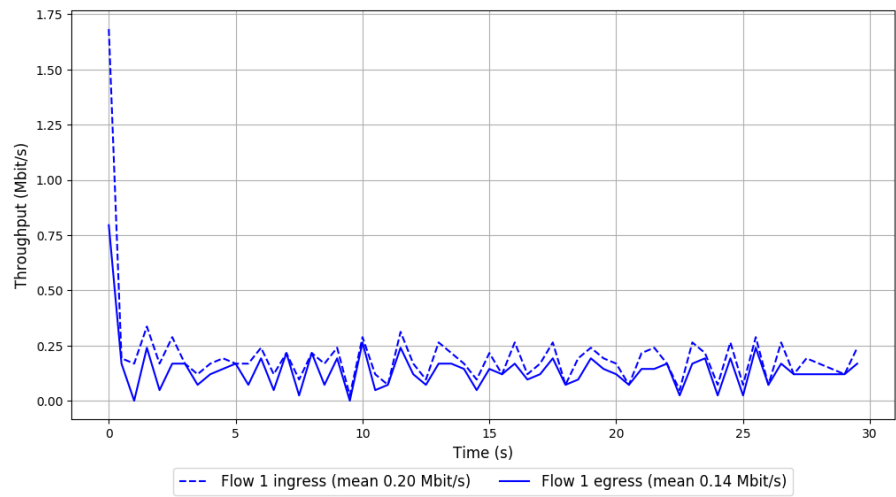


Run 1: Statistics of TCP Vegas

Start at: 2018-03-26 21:04:22
End at: 2018-03-26 21:04:52
Local clock offset: 0.558 ms
Remote clock offset: -4.597 ms

Below is generated by plot.py at 2018-03-26 22:07:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 209.528 ms
Loss rate: 31.69%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 209.528 ms
Loss rate: 31.69%

Run 1: Report of TCP Vegas — Data Link

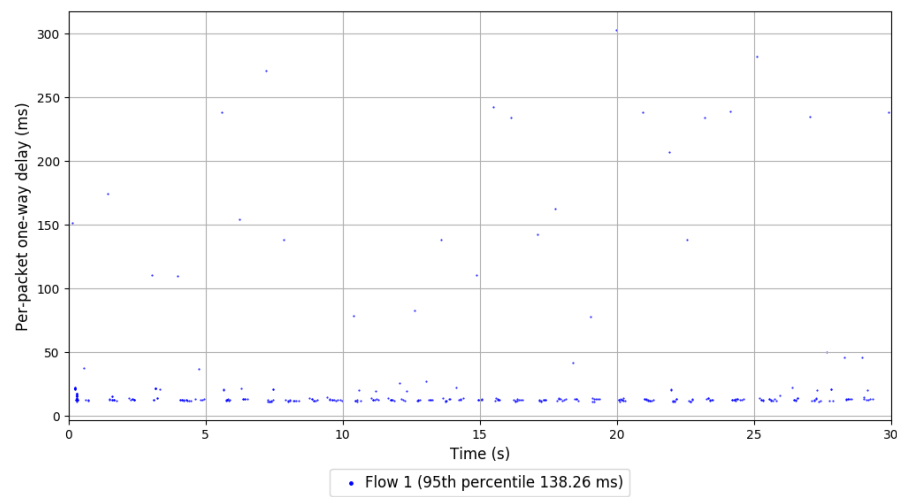
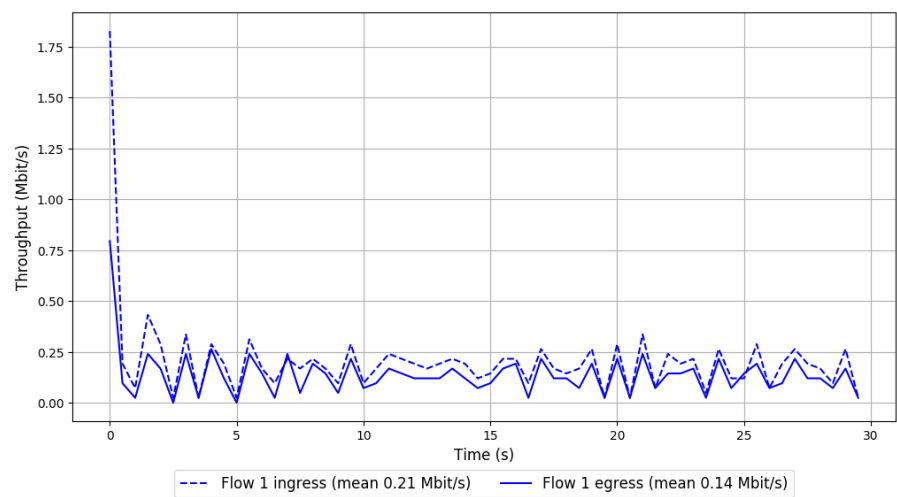


Run 2: Statistics of TCP Vegas

Start at: 2018-03-26 21:27:53
End at: 2018-03-26 21:28:23
Local clock offset: 2.535 ms
Remote clock offset: -6.231 ms

Below is generated by plot.py at 2018-03-26 22:07:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 138.263 ms
Loss rate: 33.65%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 138.263 ms
Loss rate: 33.65%

Run 2: Report of TCP Vegas — Data Link

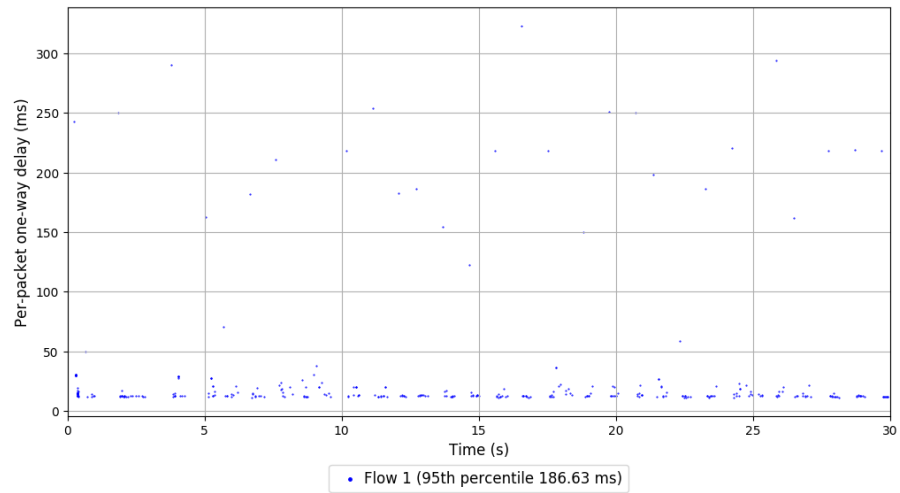
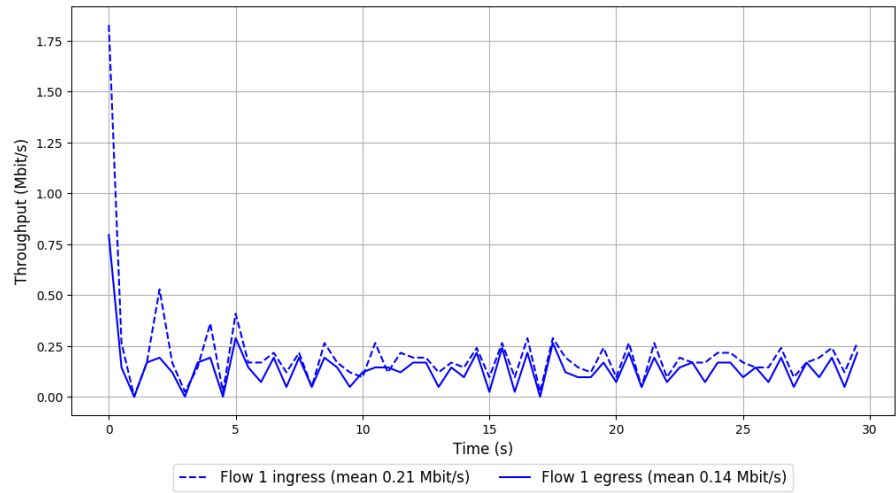


Run 3: Statistics of TCP Vegas

Start at: 2018-03-26 21:51:21
End at: 2018-03-26 21:51:51
Local clock offset: 4.415 ms
Remote clock offset: -6.342 ms

Below is generated by plot.py at 2018-03-26 22:07:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 186.628 ms
Loss rate: 32.68%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 186.628 ms
Loss rate: 32.68%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-03-26 21:08:17

End at: 2018-03-26 21:08:47

Local clock offset: 0.818 ms

Remote clock offset: -5.15 ms

Below is generated by plot.py at 2018-03-26 22:07:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 234.671 ms

Loss rate: 93.76%

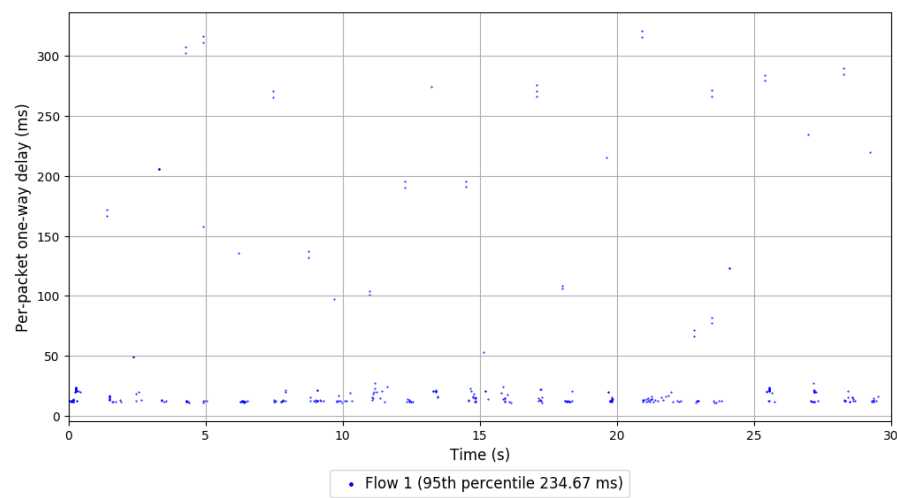
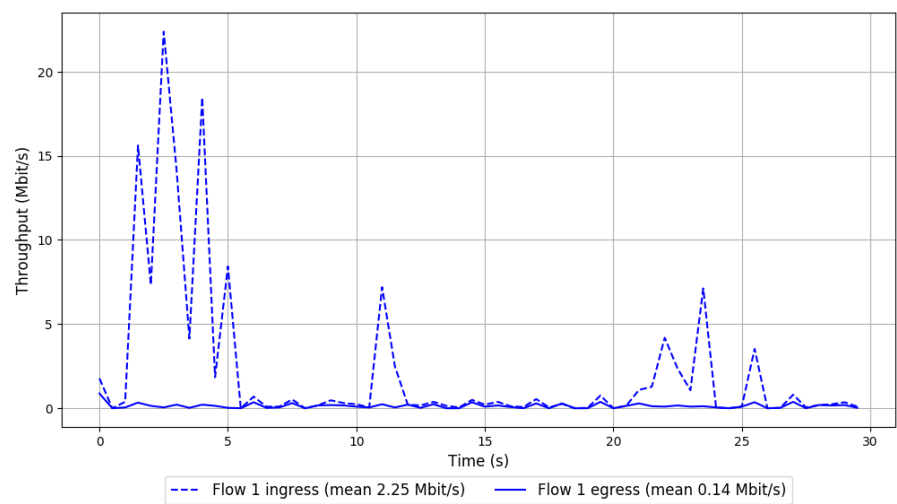
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 234.671 ms

Loss rate: 93.76%

Run 1: Report of Verus — Data Link

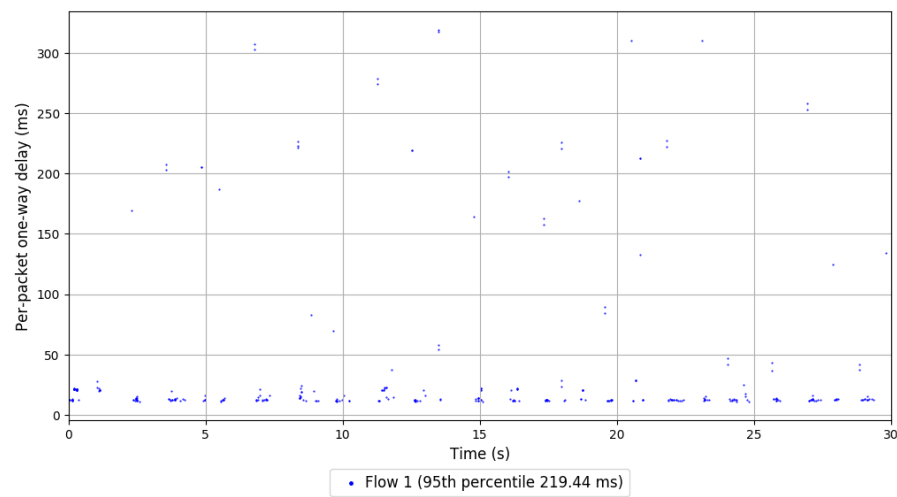
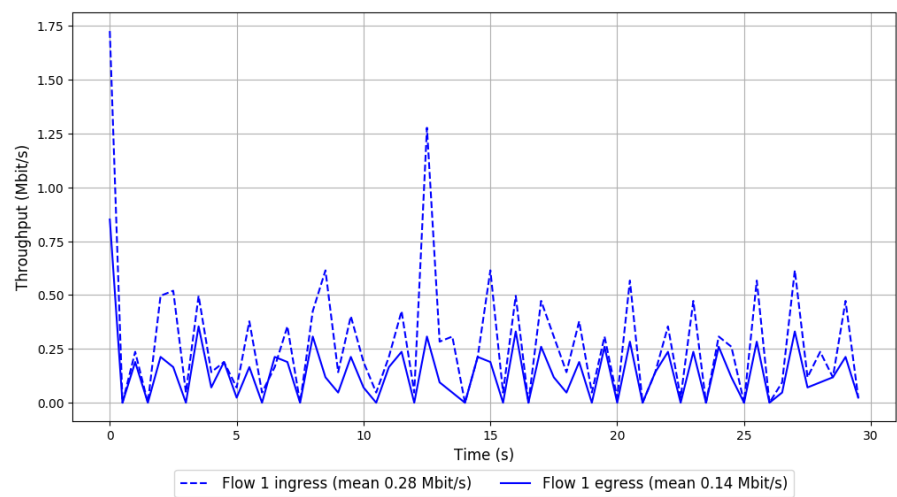


Run 2: Statistics of Verus

Start at: 2018-03-26 21:31:47
End at: 2018-03-26 21:32:18
Local clock offset: 3.154 ms
Remote clock offset: -6.321 ms

Below is generated by plot.py at 2018-03-26 22:07:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 219.442 ms
Loss rate: 50.21%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 219.442 ms
Loss rate: 50.21%

Run 2: Report of Verus — Data Link

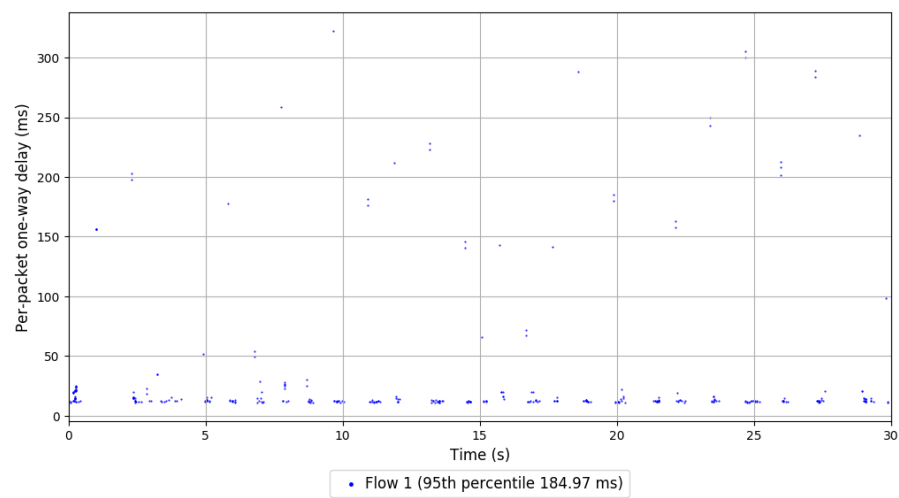
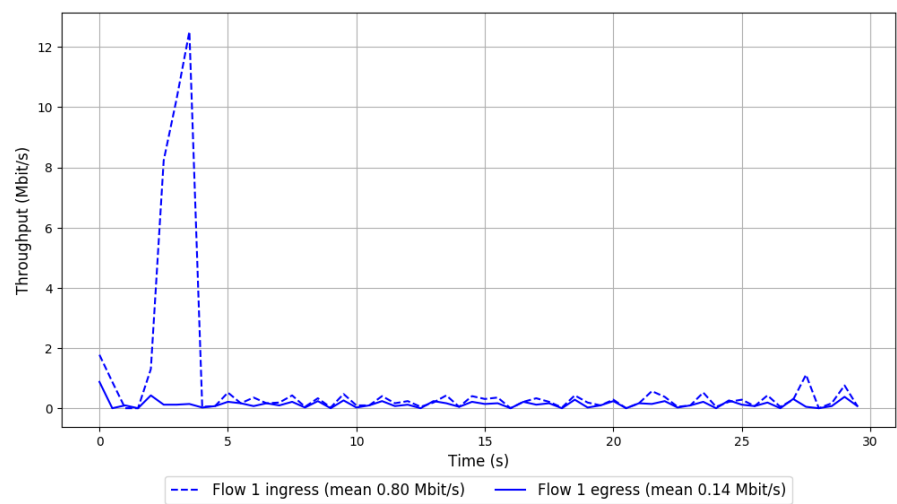


Run 3: Statistics of Verus

Start at: 2018-03-26 21:55:16
End at: 2018-03-26 21:55:46
Local clock offset: 4.547 ms
Remote clock offset: -6.371 ms

Below is generated by plot.py at 2018-03-26 22:07:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 184.966 ms
Loss rate: 82.45%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 184.966 ms
Loss rate: 82.45%

Run 3: Report of Verus — Data Link

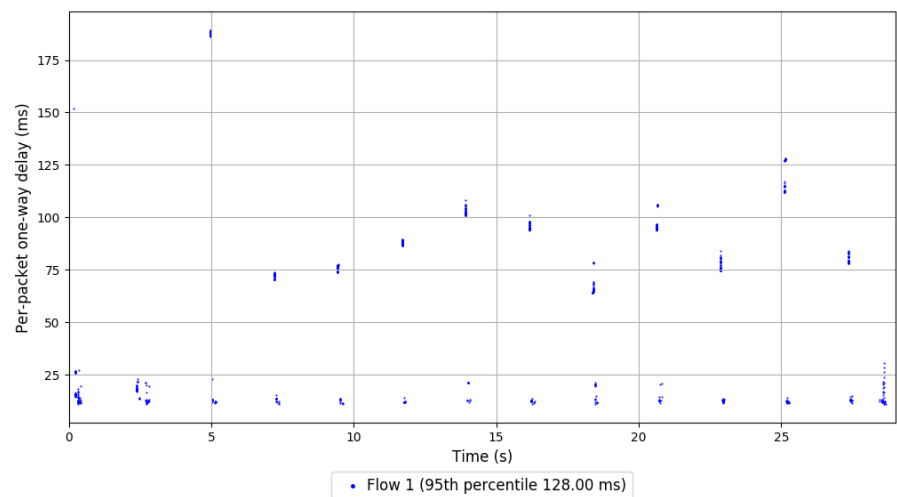
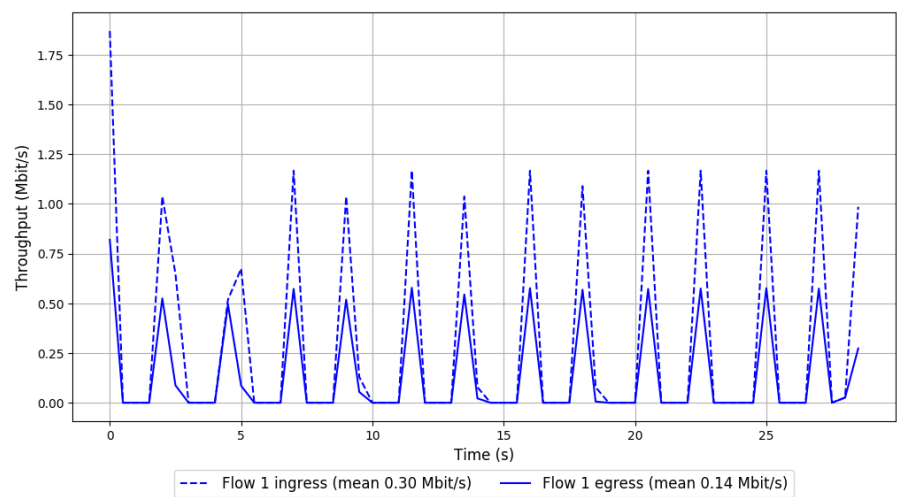


Run 1: Statistics of Copa

Start at: 2018-03-26 21:06:59
End at: 2018-03-26 21:07:29
Local clock offset: 0.836 ms
Remote clock offset: -4.844 ms

Below is generated by plot.py at 2018-03-26 22:07:38
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 127.996 ms
Loss rate: 53.68%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 127.996 ms
Loss rate: 53.68%

Run 1: Report of Copa — Data Link

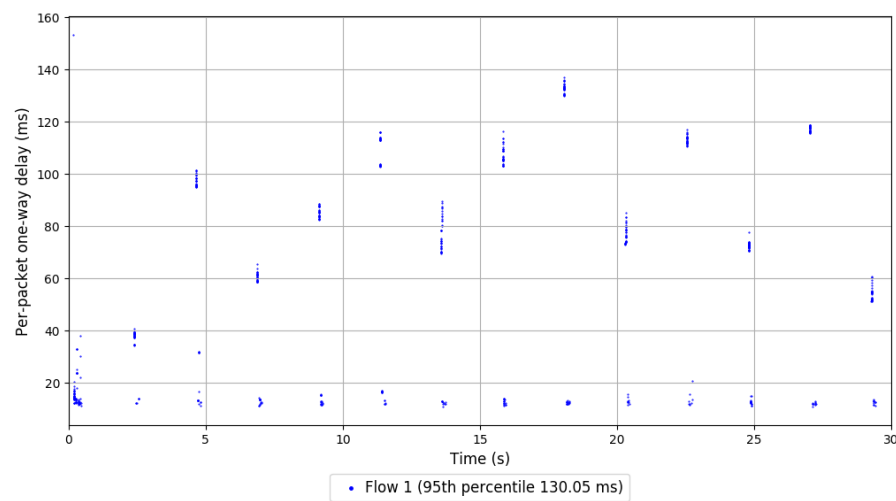
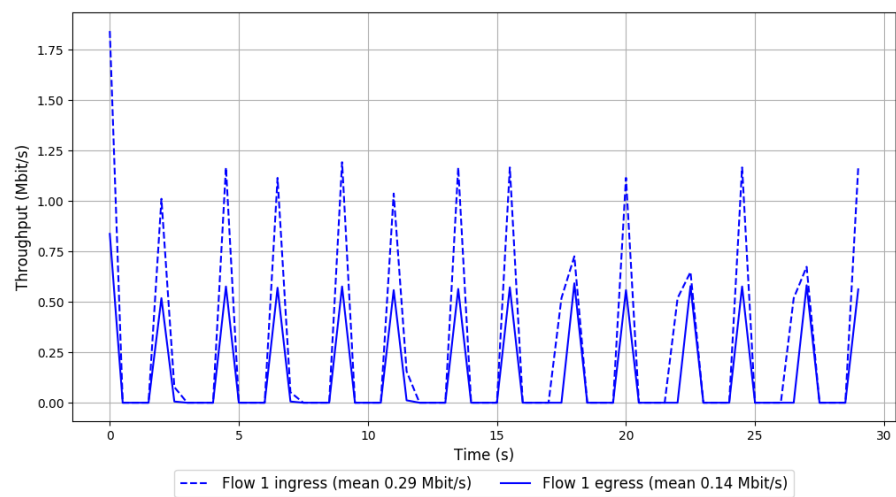


Run 2: Statistics of Copa

Start at: 2018-03-26 21:30:29
End at: 2018-03-26 21:30:59
Local clock offset: 2.936 ms
Remote clock offset: -6.224 ms

Below is generated by plot.py at 2018-03-26 22:07:38
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 130.049 ms
Loss rate: 51.59%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 130.049 ms
Loss rate: 51.59%

Run 2: Report of Copa — Data Link

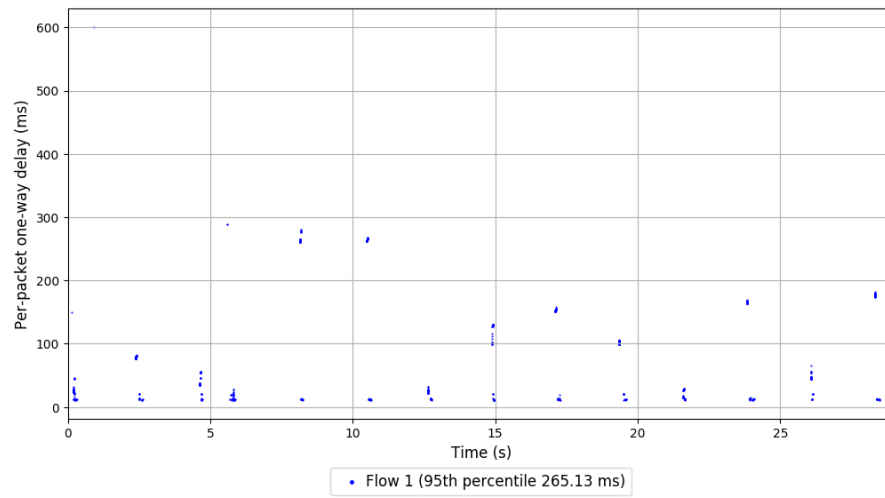
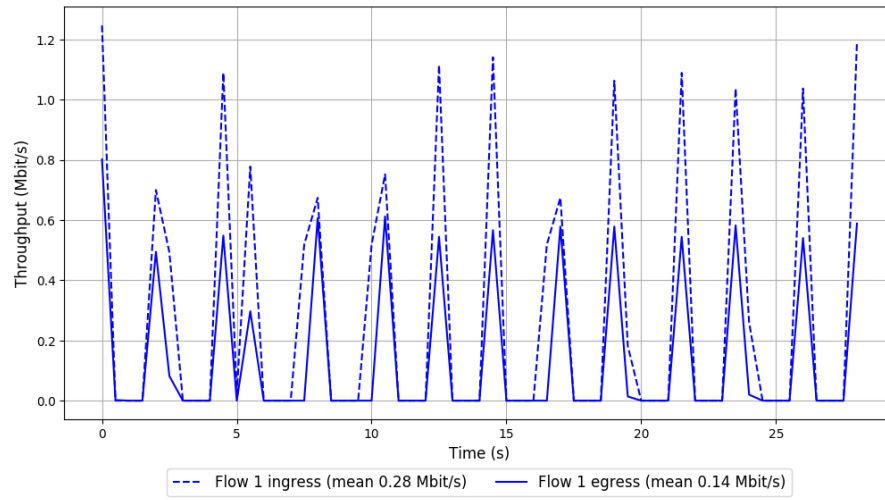


Run 3: Statistics of Copa

Start at: 2018-03-26 21:53:58
End at: 2018-03-26 21:54:28
Local clock offset: 4.505 ms
Remote clock offset: -6.341 ms

Below is generated by plot.py at 2018-03-26 22:07:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 265.129 ms
Loss rate: 50.32%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 265.129 ms
Loss rate: 50.32%

Run 3: Report of Copa — Data Link

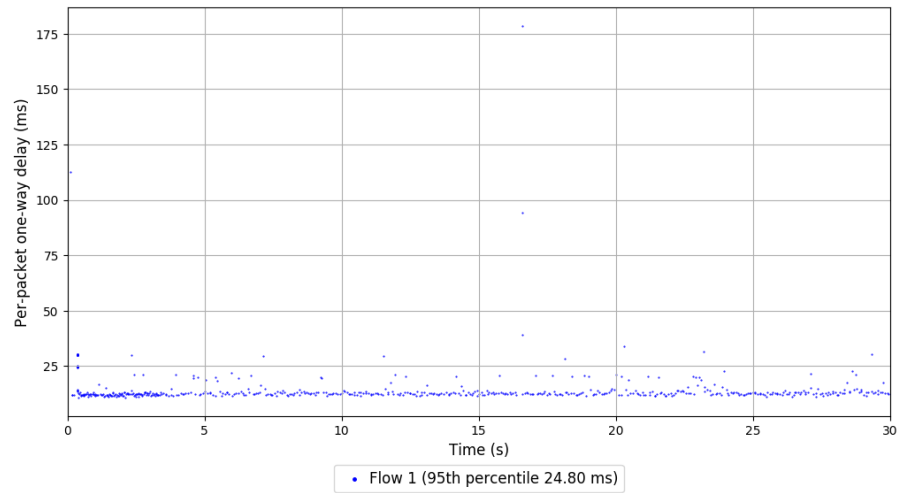
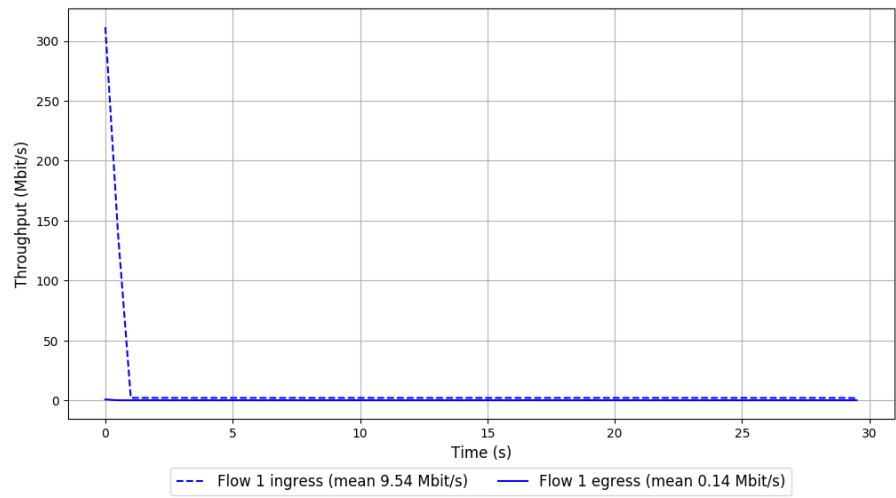


Run 1: Statistics of FillP

Start at: 2018-03-26 21:01:46
End at: 2018-03-26 21:02:16
Local clock offset: 0.342 ms
Remote clock offset: -3.946 ms

Below is generated by plot.py at 2018-03-26 22:07:45
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 24.799 ms
Loss rate: 98.54%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 24.799 ms
Loss rate: 98.54%

Run 1: Report of FillP — Data Link

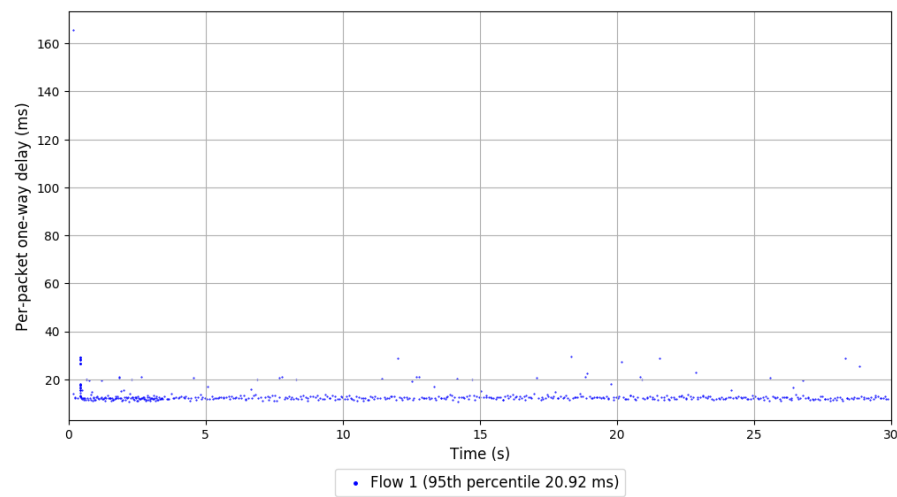
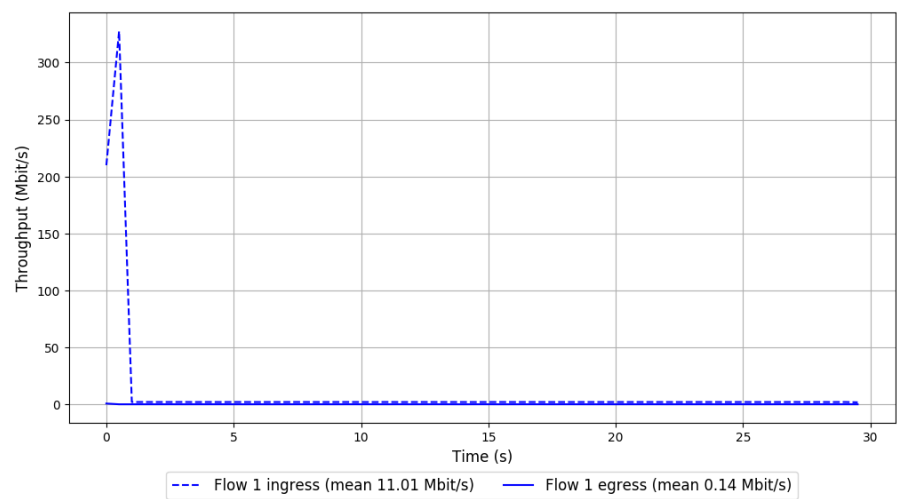


Run 2: Statistics of FillP

Start at: 2018-03-26 21:25:16
End at: 2018-03-26 21:25:46
Local clock offset: 2.009 ms
Remote clock offset: -6.145 ms

Below is generated by plot.py at 2018-03-26 22:07:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 20.923 ms
Loss rate: 98.74%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 20.923 ms
Loss rate: 98.74%

Run 2: Report of FillP — Data Link

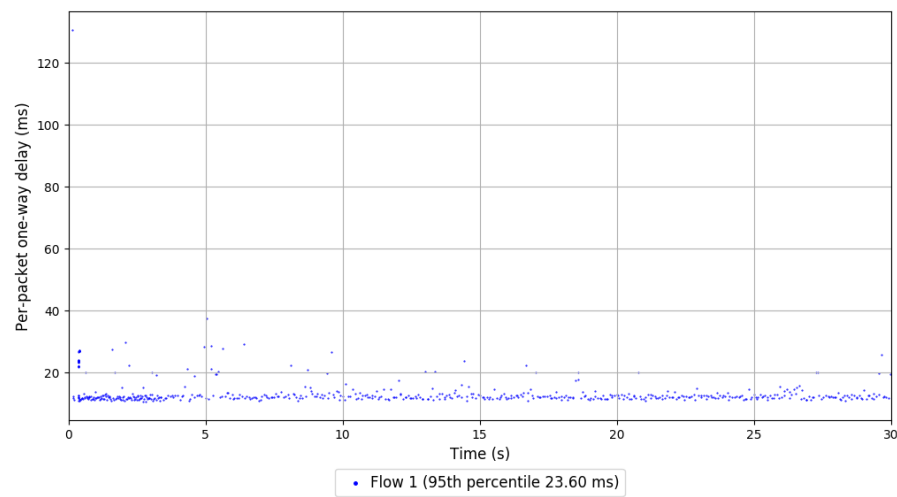
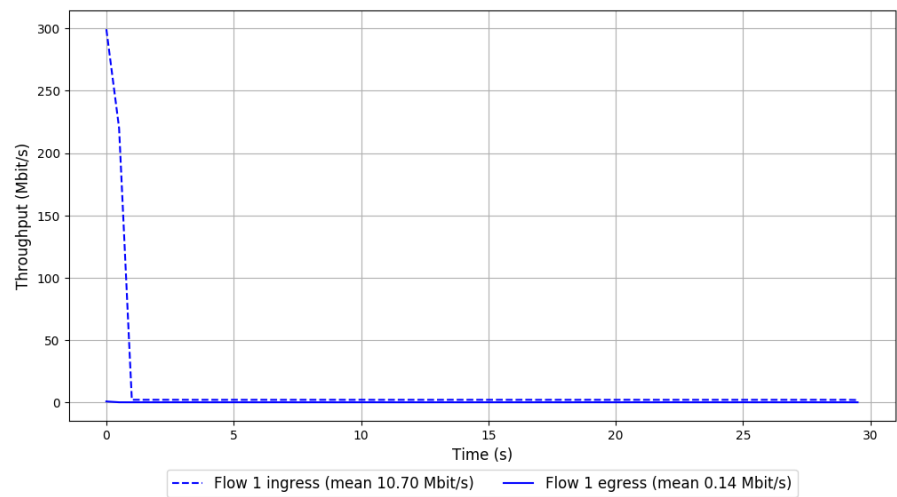


Run 3: Statistics of FillP

Start at: 2018-03-26 21:48:44
End at: 2018-03-26 21:49:14
Local clock offset: 4.287 ms
Remote clock offset: -6.344 ms

Below is generated by plot.py at 2018-03-26 22:07:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 23.601 ms
Loss rate: 98.70%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 23.601 ms
Loss rate: 98.70%

Run 3: Report of FillP — Data Link

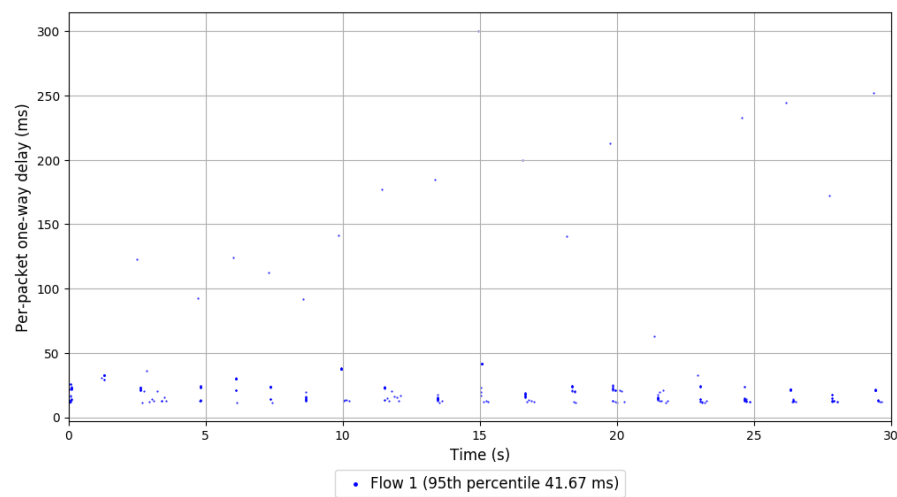
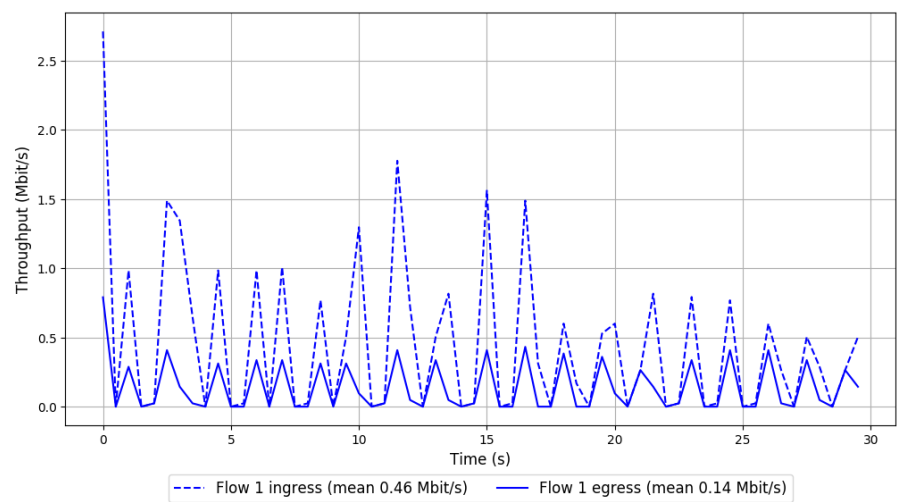


Run 1: Statistics of Indigo-1-32

Start at: 2018-03-26 21:16:08
End at: 2018-03-26 21:16:38
Local clock offset: 1.079 ms
Remote clock offset: -5.769 ms

Below is generated by plot.py at 2018-03-26 22:07:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 41.666 ms
Loss rate: 69.15%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 41.666 ms
Loss rate: 69.15%

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

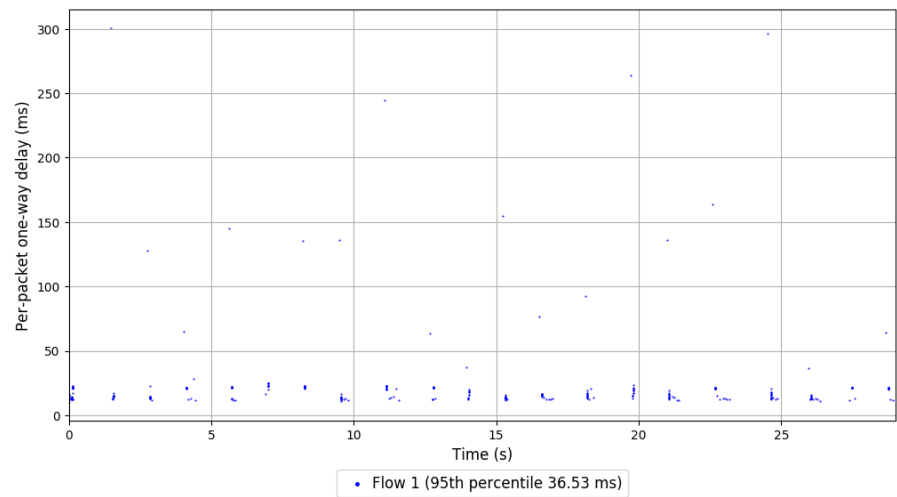
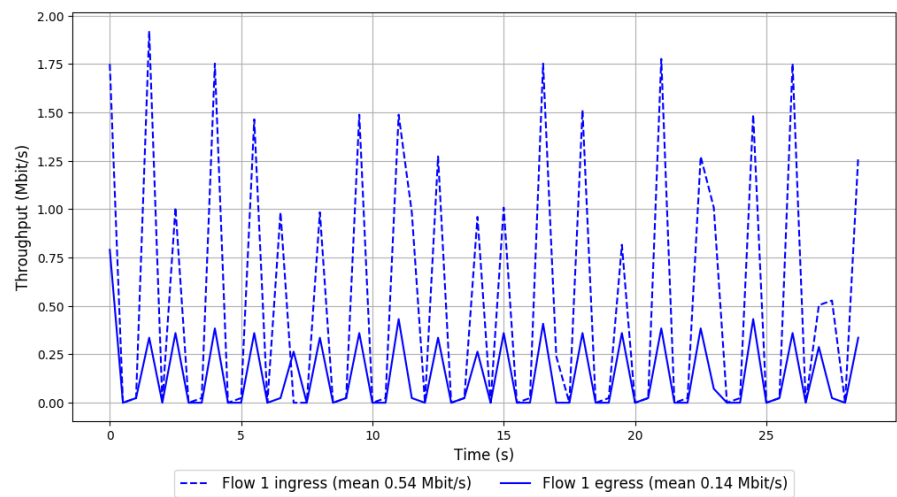


Run 2: Statistics of Indigo-1-32

Start at: 2018-03-26 21:39:38
End at: 2018-03-26 21:40:08
Local clock offset: 3.841 ms
Remote clock offset: -6.369 ms

Below is generated by plot.py at 2018-03-26 22:07:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 36.535 ms
Loss rate: 73.91%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 36.535 ms
Loss rate: 73.91%

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



Run 3: Statistics of Indigo-1-32

Start at: 2018-03-26 22:03:07

End at: 2018-03-26 22:03:37

Local clock offset: 4.071 ms

Remote clock offset: -6.436 ms

Below is generated by plot.py at 2018-03-26 22:07:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 38.947 ms

Loss rate: 60.91%

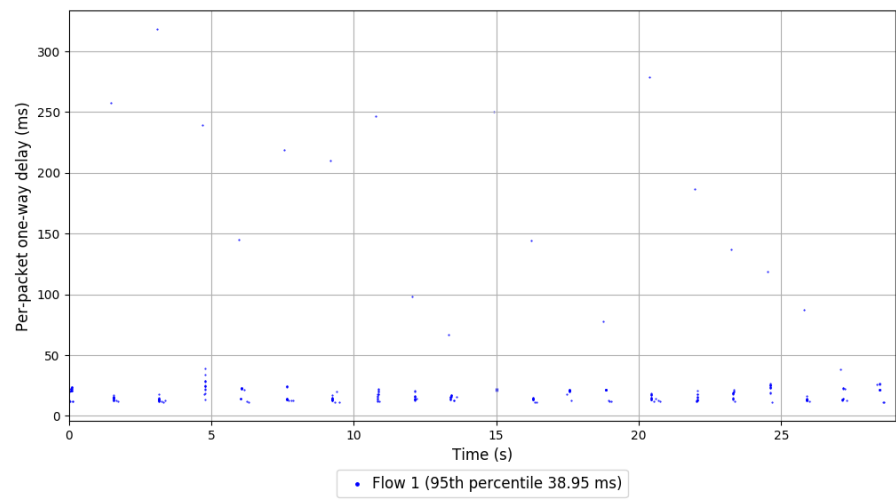
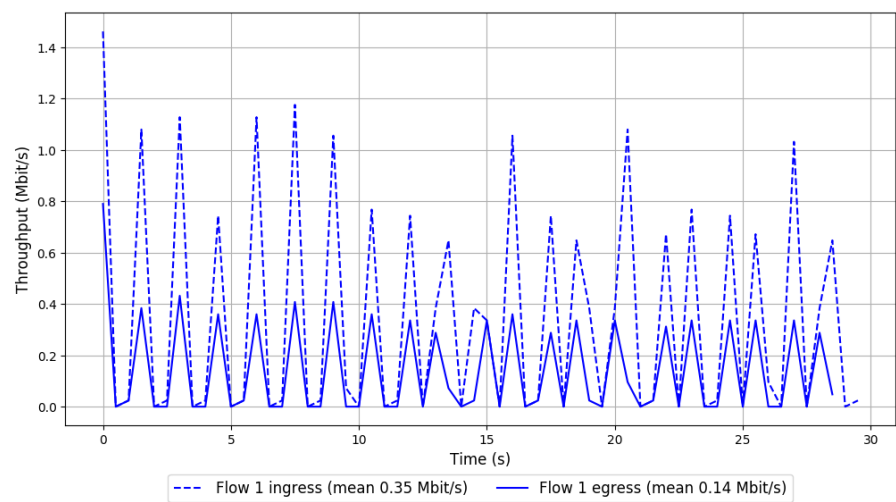
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 38.947 ms

Loss rate: 60.91%

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



Run 1: Statistics of Vivace-latency

Start at: 2018-03-26 21:14:49

End at: 2018-03-26 21:15:19

Local clock offset: 1.066 ms

Remote clock offset: -5.6 ms

Below is generated by plot.py at 2018-03-26 22:07:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.526 ms

Loss rate: 88.11%

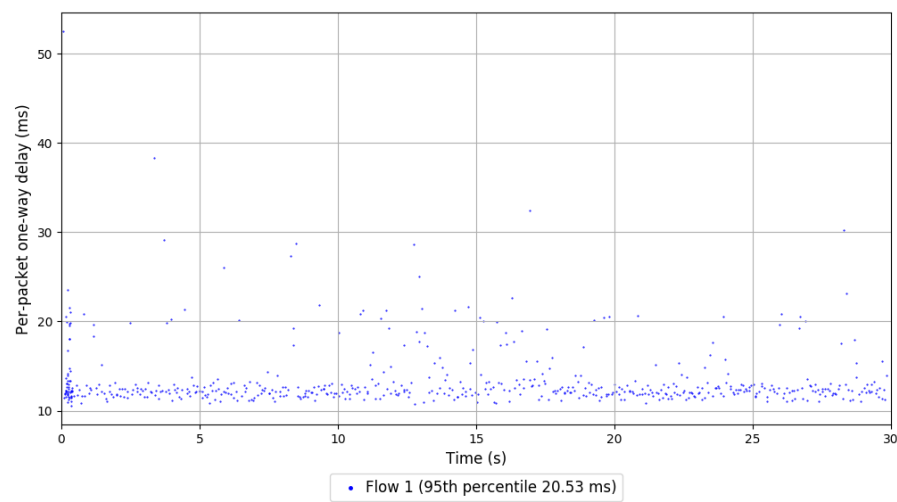
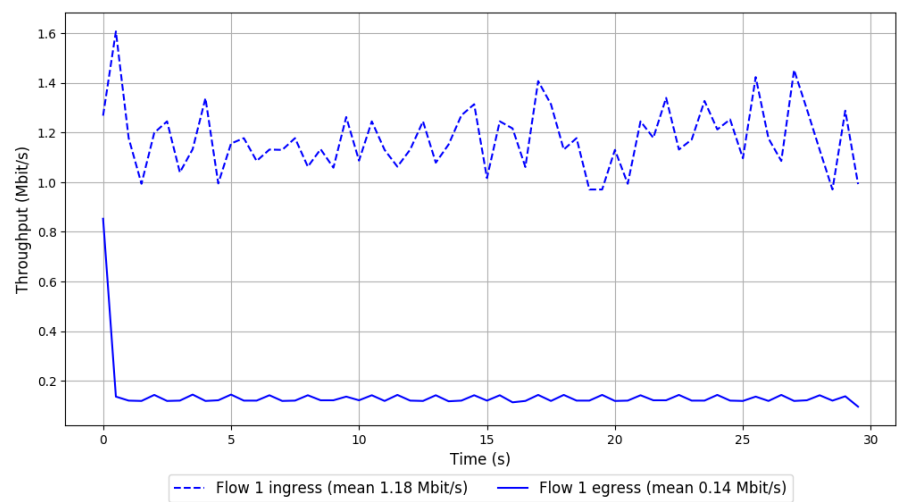
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.526 ms

Loss rate: 88.11%

Run 1: Report of Vivace-latency — Data Link

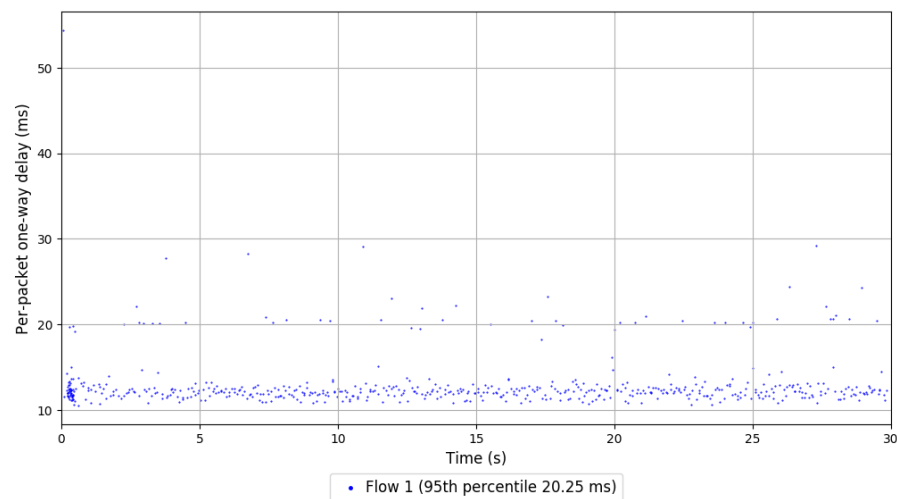
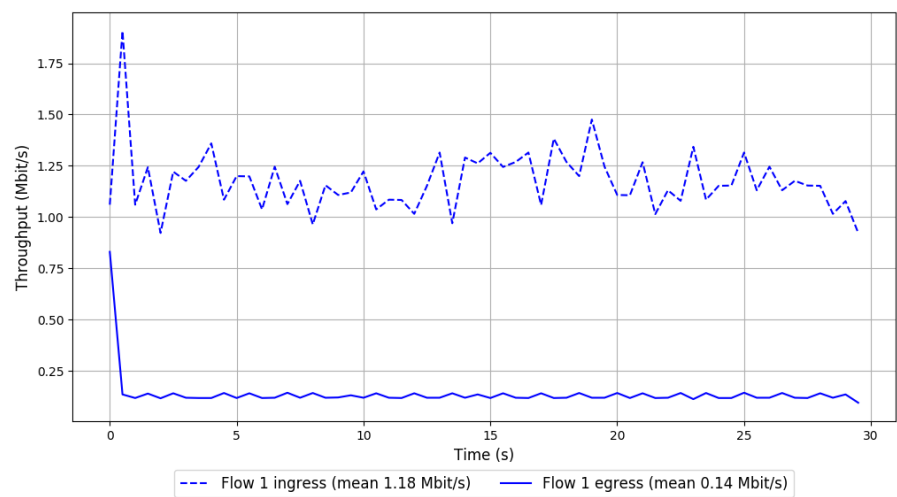


Run 2: Statistics of Vivace-latency

Start at: 2018-03-26 21:38:19
End at: 2018-03-26 21:38:49
Local clock offset: 3.795 ms
Remote clock offset: -6.378 ms

Below is generated by plot.py at 2018-03-26 22:07:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 20.255 ms
Loss rate: 88.15%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 20.255 ms
Loss rate: 88.15%

Run 2: Report of Vivace-latency — Data Link

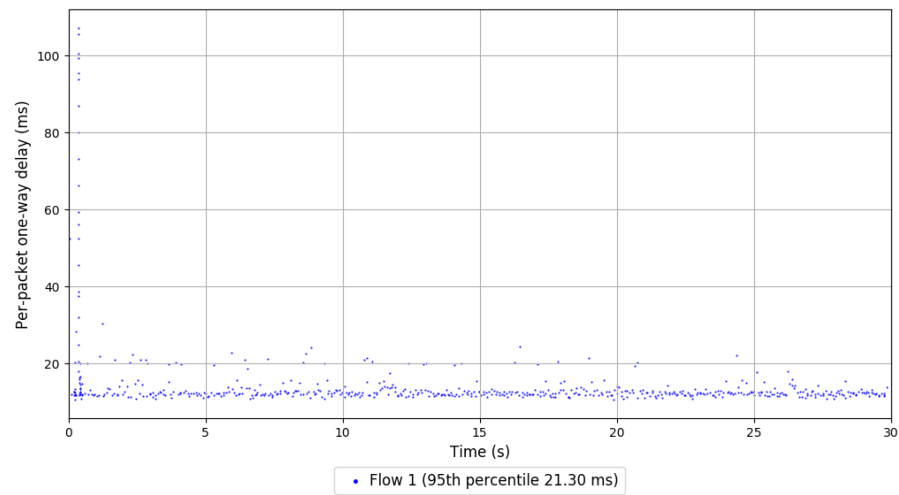
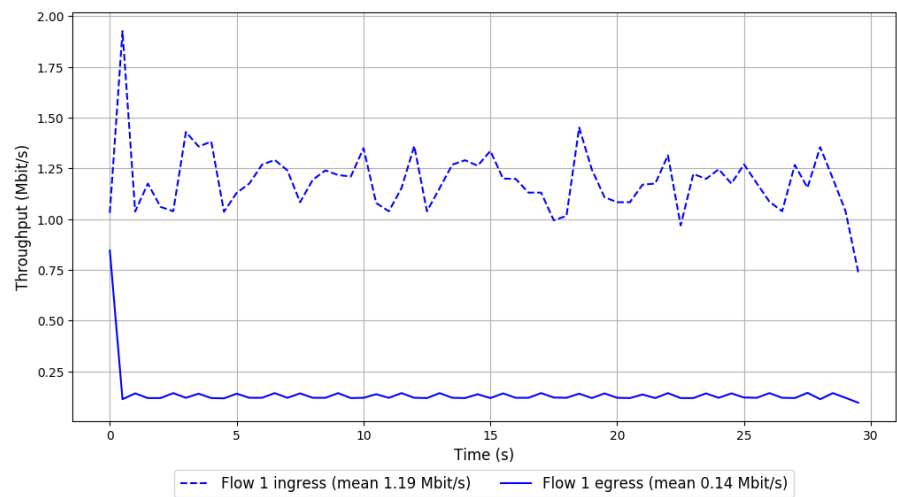


Run 3: Statistics of Vivace-latency

Start at: 2018-03-26 22:01:49
End at: 2018-03-26 22:02:19
Local clock offset: 4.138 ms
Remote clock offset: -6.348 ms

Below is generated by plot.py at 2018-03-26 22:07:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 21.299 ms
Loss rate: 88.28%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 21.299 ms
Loss rate: 88.28%

Run 3: Report of Vivace-latency — Data Link



Run 1: Statistics of Vivace-loss

Start at: 2018-03-26 21:03:04

End at: 2018-03-26 21:03:34

Local clock offset: 0.502 ms

Remote clock offset: -4.212 ms

Below is generated by plot.py at 2018-03-26 22:07:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.445 ms

Loss rate: 88.27%

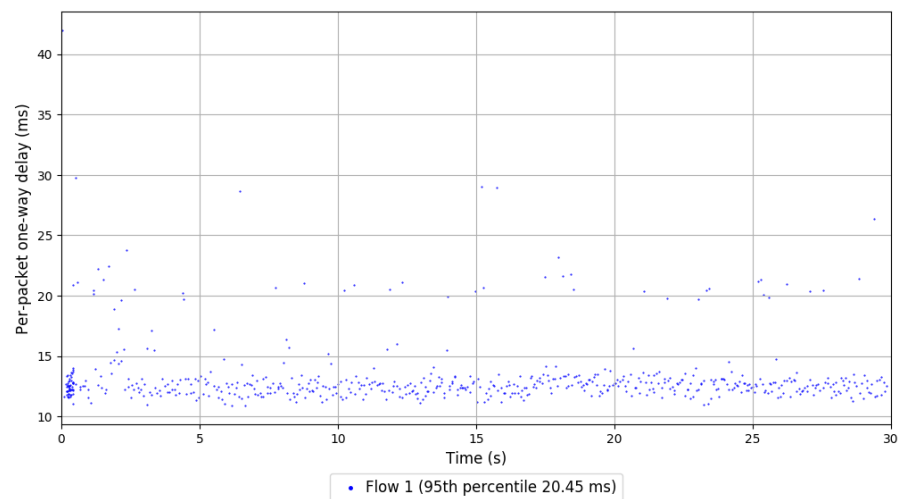
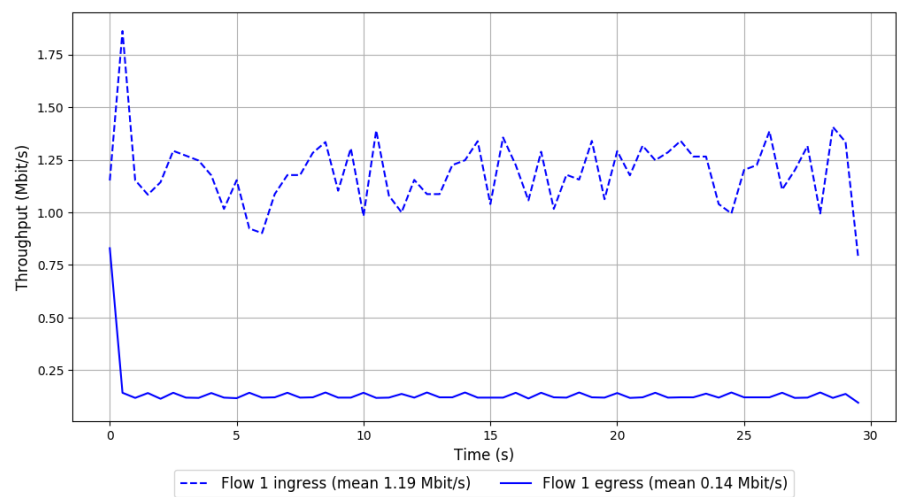
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.445 ms

Loss rate: 88.27%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-03-26 21:26:35

End at: 2018-03-26 21:27:05

Local clock offset: 2.299 ms

Remote clock offset: -6.087 ms

Below is generated by plot.py at 2018-03-26 22:07:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 19.925 ms

Loss rate: 88.29%

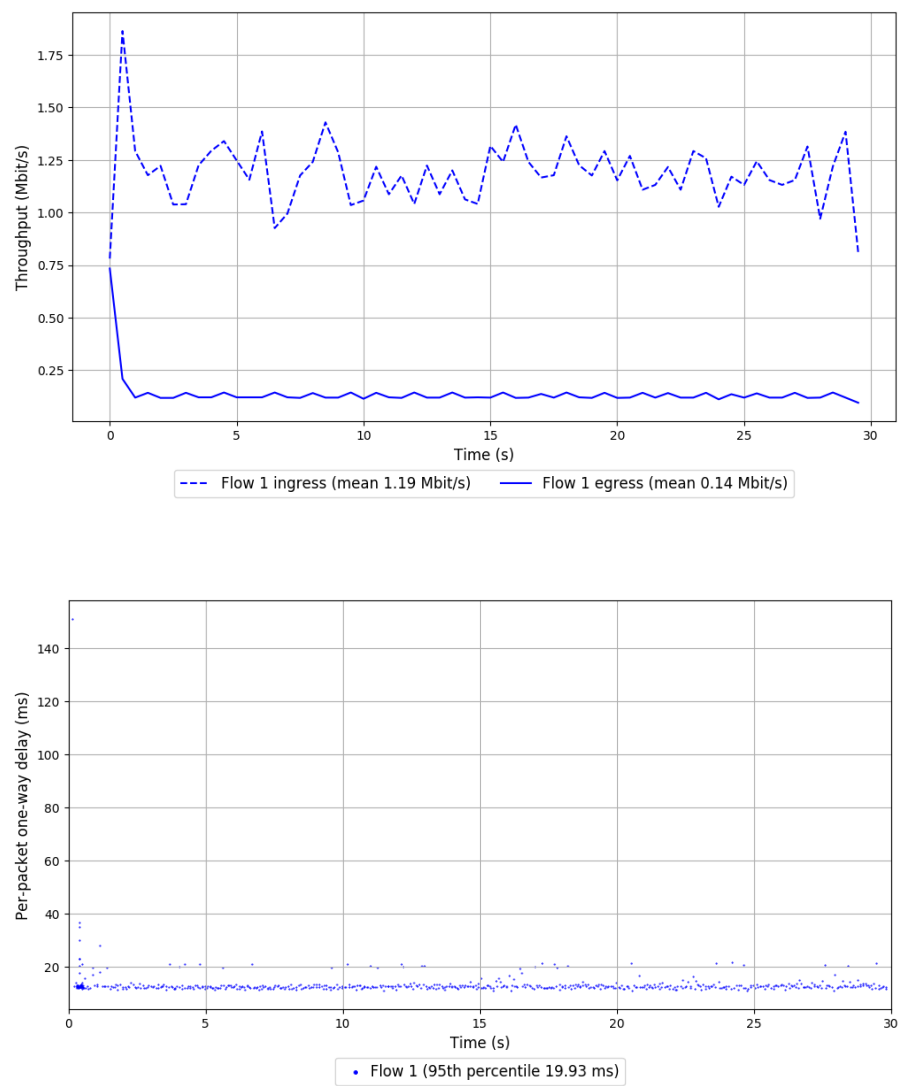
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 19.925 ms

Loss rate: 88.29%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-03-26 21:50:03

End at: 2018-03-26 21:50:33

Local clock offset: 4.25 ms

Remote clock offset: -6.341 ms

Below is generated by plot.py at 2018-03-26 22:07:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.410 ms

Loss rate: 88.20%

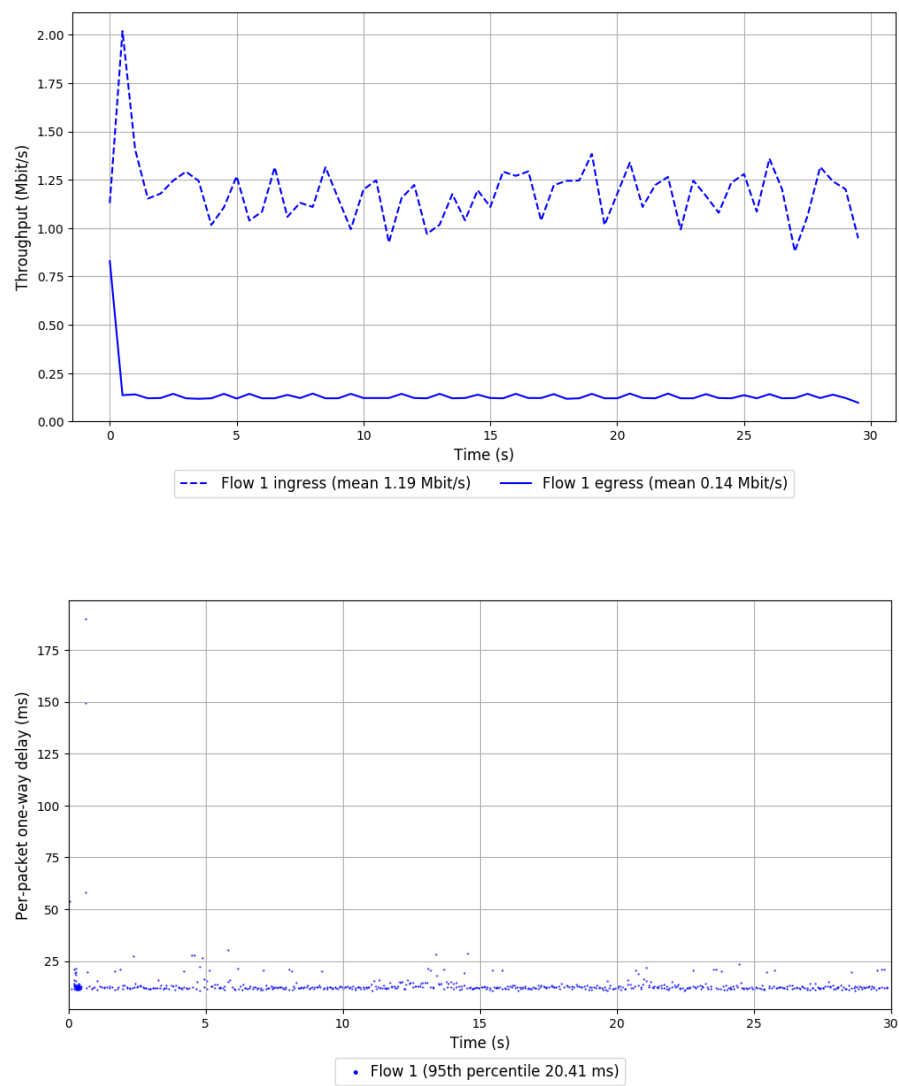
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.410 ms

Loss rate: 88.20%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-03-26 21:10:54

End at: 2018-03-26 21:11:24

Local clock offset: 0.905 ms

Remote clock offset: -5.336 ms

Below is generated by plot.py at 2018-03-26 22:07:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 21.149 ms

Loss rate: 88.13%

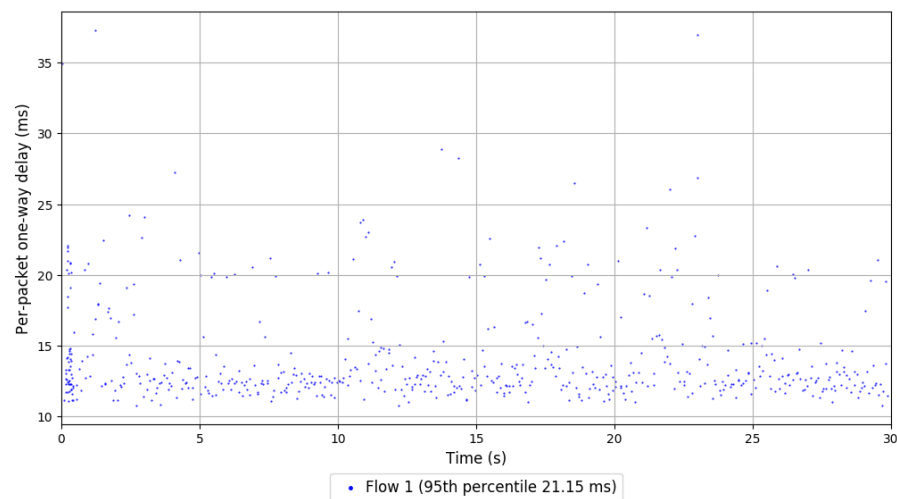
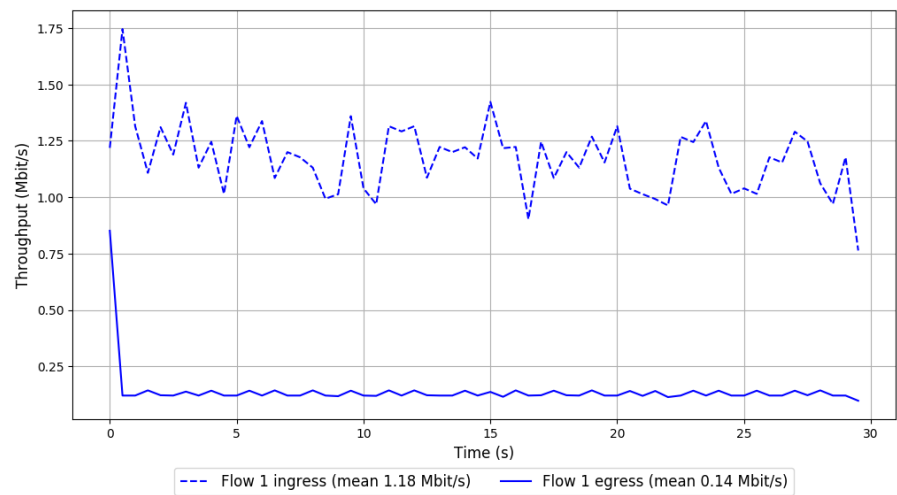
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 21.149 ms

Loss rate: 88.13%

Run 1: Report of Vivace-LTE — Data Link



Run 2: Statistics of Vivace-LTE

Start at: 2018-03-26 21:34:24

End at: 2018-03-26 21:34:54

Local clock offset: 3.364 ms

Remote clock offset: -6.282 ms

Below is generated by plot.py at 2018-03-26 22:07:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.284 ms

Loss rate: 88.46%

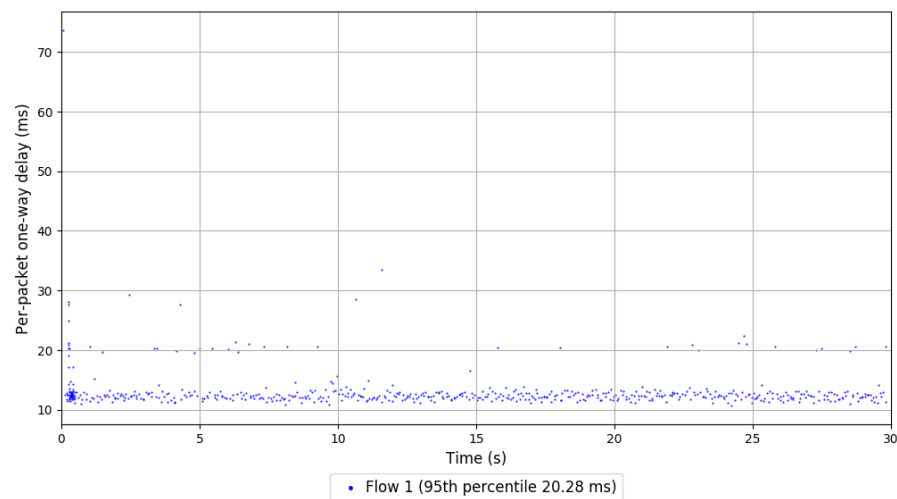
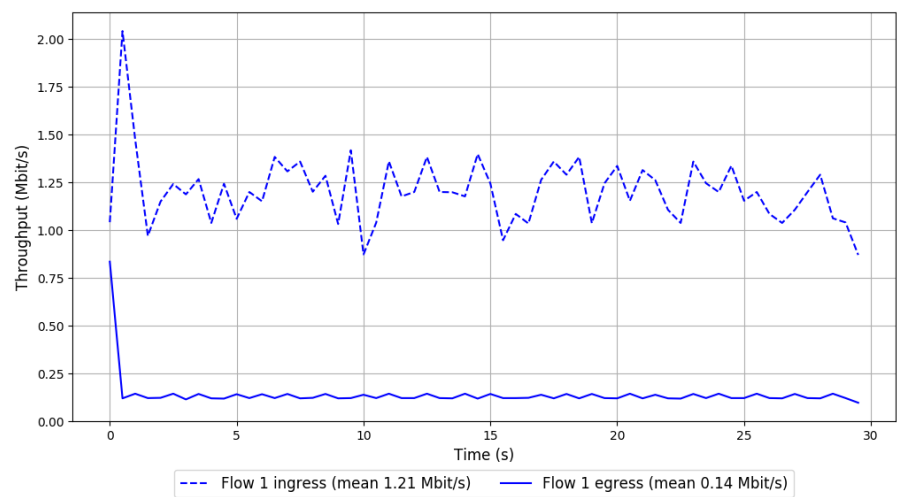
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.284 ms

Loss rate: 88.46%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-03-26 21:57:53

End at: 2018-03-26 21:58:23

Local clock offset: 4.276 ms

Remote clock offset: -6.39 ms

Below is generated by plot.py at 2018-03-26 22:07:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.080 ms

Loss rate: 88.30%

-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 20.080 ms

Loss rate: 88.30%

Run 3: Report of Vivace-LTE — Data Link

