

Pantheon Report

Generated at 2018-04-10 06:40:56 (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).

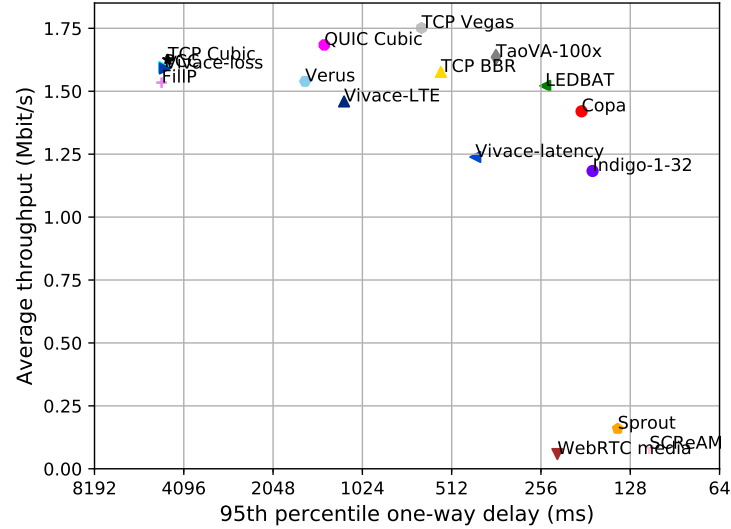
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

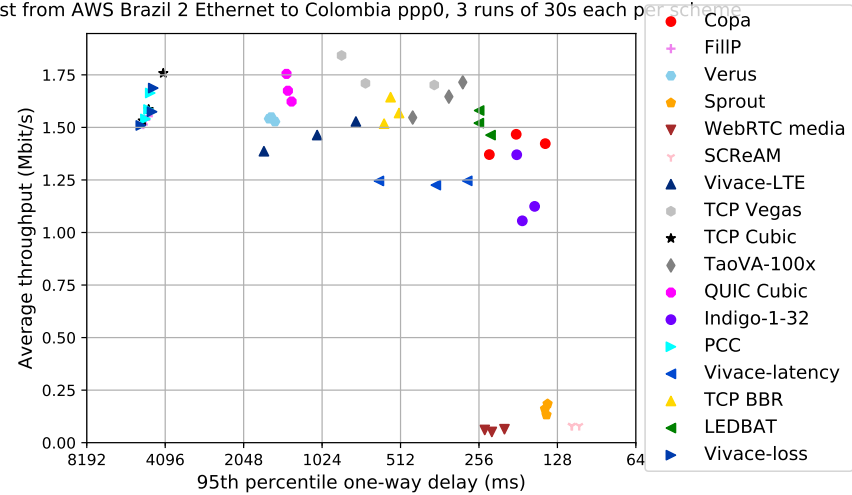
Git summary:

```
branch: master @ eb420b5be9bafccd22cf68b99ff5a2000462fc59
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 11f8c46a2bf1dc797253db7e8ca04076272b2a44
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 @ 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 @ f271183af822eee5d0031620f4bebf38aedc5581
```

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



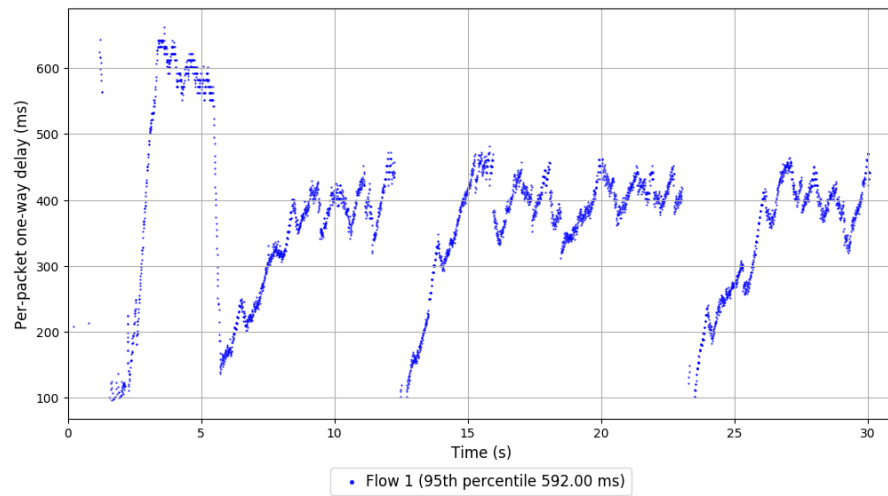
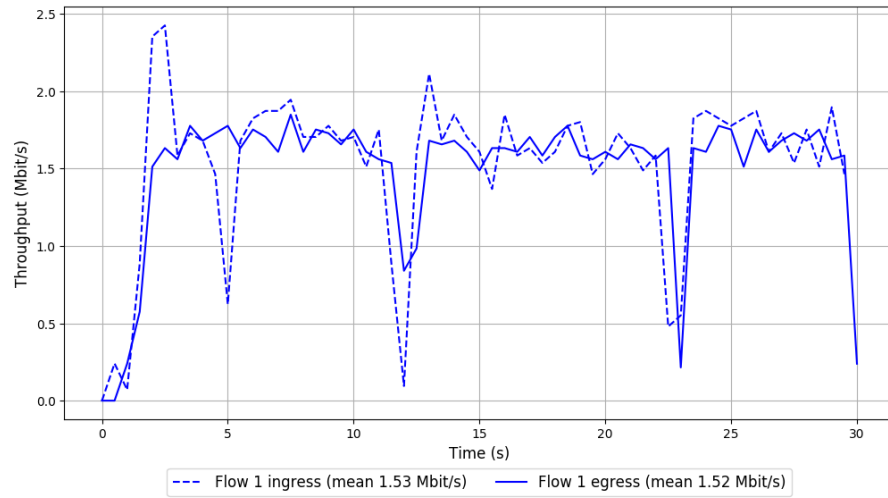
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	1.58	556.58	1.18
TCP Cubic	3	1.63	4634.17	17.58
LEDBAT	3	1.52	247.71	0.34
PCC	3	1.60	4765.26	73.59
QUIC Cubic	3	1.68	1376.14	4.67
SCReAM	3	0.08	110.33	0.00
WebRTC media	3	0.06	225.40	0.00
Sprout	3	0.16	141.13	0.00
TaoVA-100x	3	1.64	363.12	0.17
TCP Vegas	3	1.75	646.69	1.04
Verus	3	1.54	1597.59	3.34
Copa	3	1.42	186.77	0.03
FillP	3	1.53	4866.65	19.89
Indigo-1-32	3	1.18	171.49	0.13
Vivace-latency	3	1.24	426.22	1.15
Vivace-loss	3	1.59	4744.44	32.63
Vivace-LTE	3	1.46	1180.39	3.22

Run 1: Statistics of TCP BBR

Start at: 2018-04-10 05:52:51
End at: 2018-04-10 05:53:21
Local clock offset: -13.257 ms
Remote clock offset: 4.086 ms

Below is generated by plot.py at 2018-04-10 06:40:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 591.999 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 591.999 ms
Loss rate: 1.18%

Run 1: Report of TCP BBR — Data Link

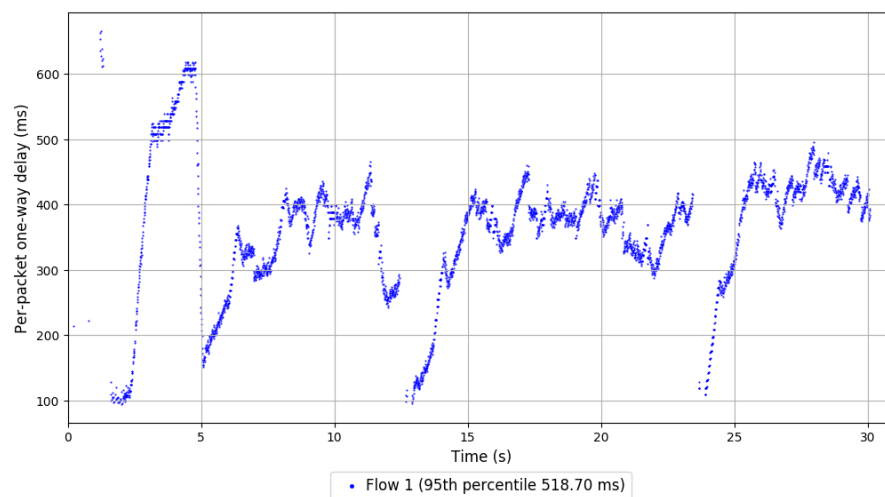
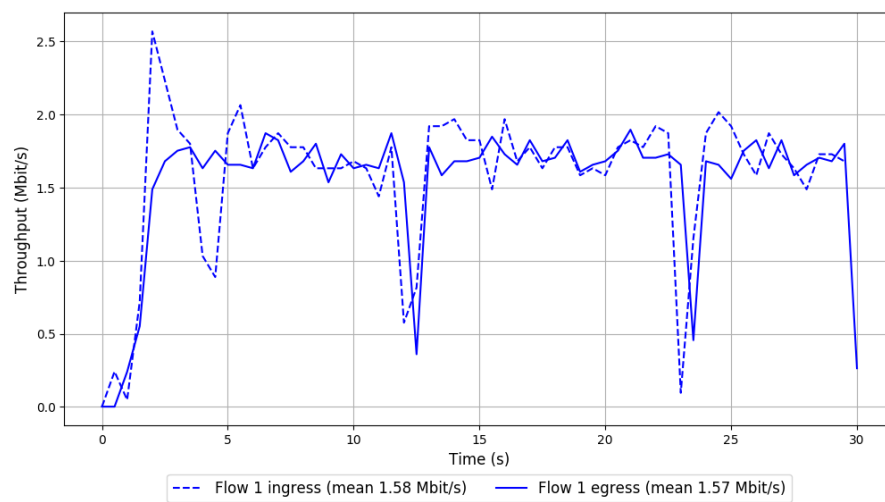


Run 2: Statistics of TCP BBR

Start at: 2018-04-10 06:14:06
End at: 2018-04-10 06:14:36
Local clock offset: -14.145 ms
Remote clock offset: 0.984 ms

Below is generated by plot.py at 2018-04-10 06:40:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 518.697 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 518.697 ms
Loss rate: 1.11%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-04-10 06:35:18

End at: 2018-04-10 06:35:48

Local clock offset: -9.487 ms

Remote clock offset: 2.14 ms

Below is generated by plot.py at 2018-04-10 06:40:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.64 Mbit/s

95th percentile per-packet one-way delay: 559.044 ms

Loss rate: 1.26%

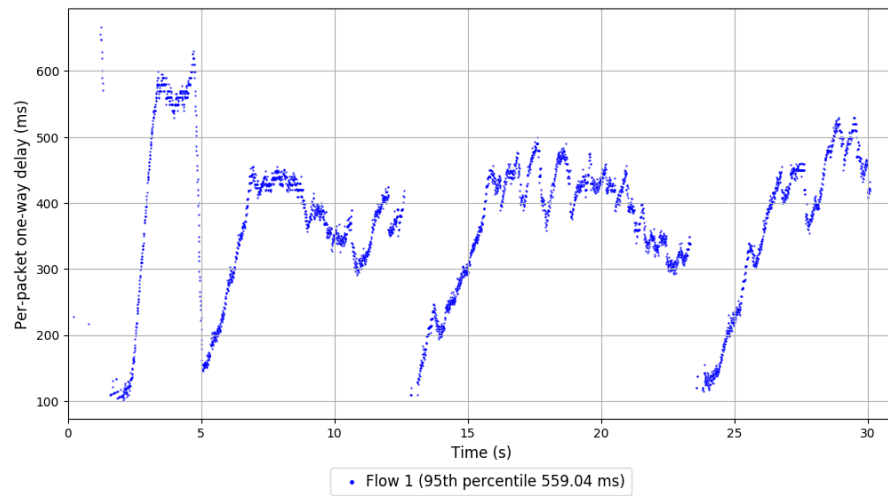
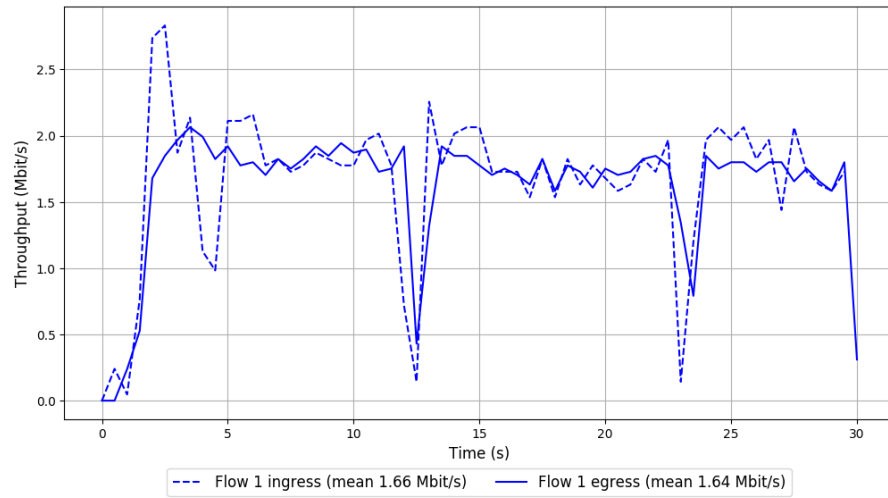
-- Flow 1:

Average throughput: 1.64 Mbit/s

95th percentile per-packet one-way delay: 559.044 ms

Loss rate: 1.26%

Run 3: Report of TCP BBR — Data Link

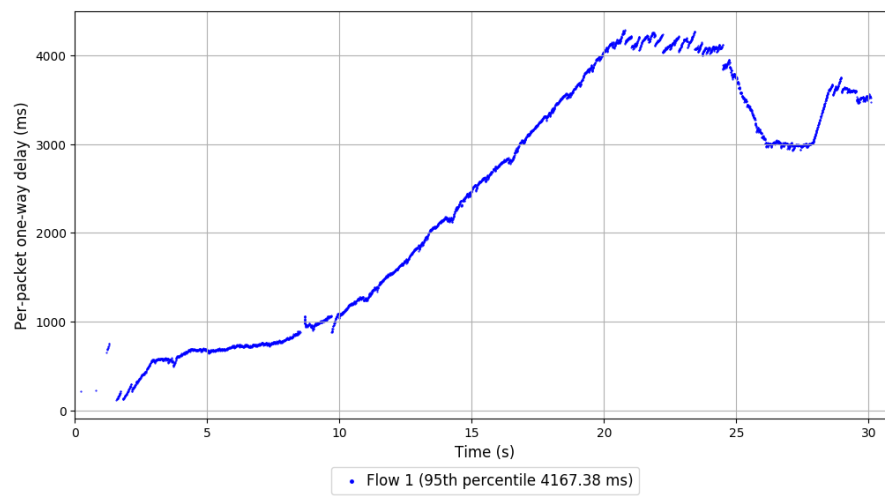
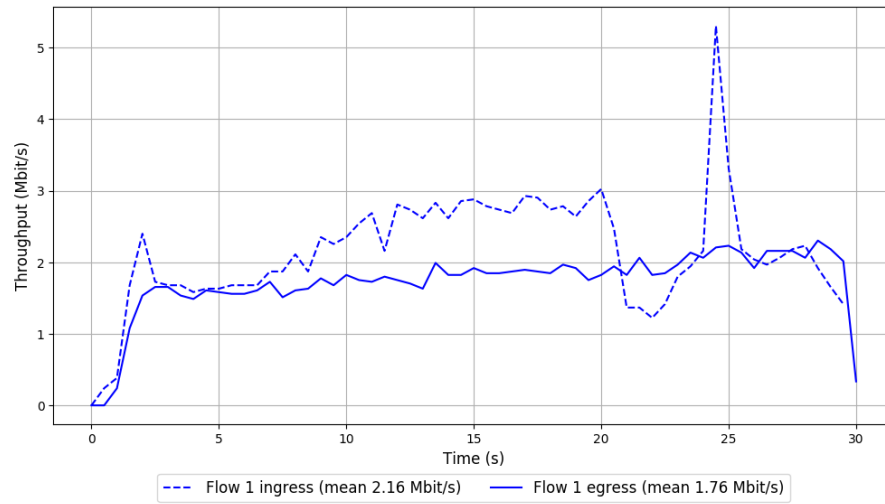


Run 1: Statistics of TCP Cubic

Start at: 2018-04-10 05:36:22
End at: 2018-04-10 05:36:52
Local clock offset: -23.785 ms
Remote clock offset: 11.383 ms

Below is generated by plot.py at 2018-04-10 06:40:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 4167.382 ms
Loss rate: 18.74%
-- Flow 1:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 4167.382 ms
Loss rate: 18.74%

Run 1: Report of TCP Cubic — Data Link

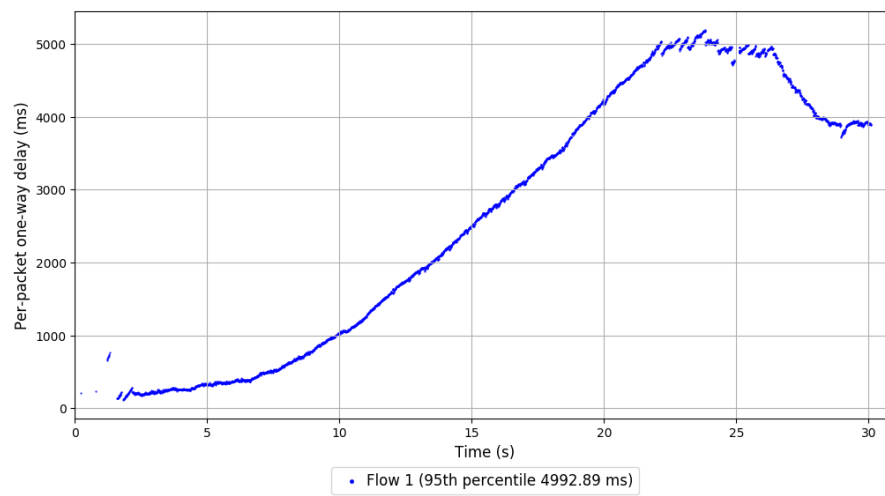
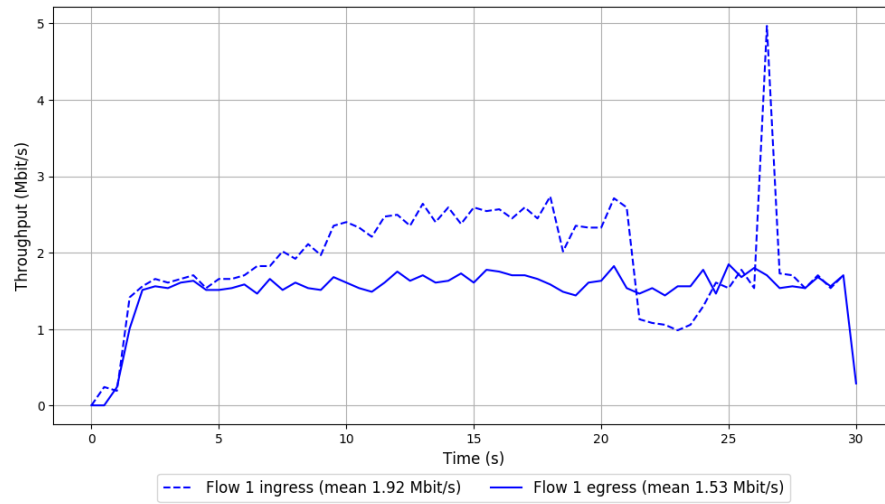


Run 2: Statistics of TCP Cubic

Start at: 2018-04-10 05:57:34
End at: 2018-04-10 05:58:04
Local clock offset: -13.828 ms
Remote clock offset: 8.047 ms

Below is generated by plot.py at 2018-04-10 06:40:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 4992.885 ms
Loss rate: 20.46%
-- Flow 1:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 4992.885 ms
Loss rate: 20.46%

Run 2: Report of TCP Cubic — Data Link

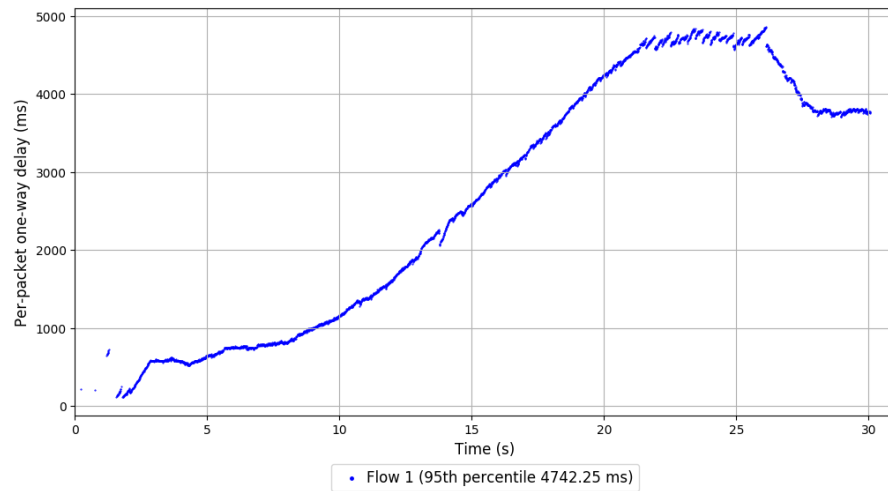
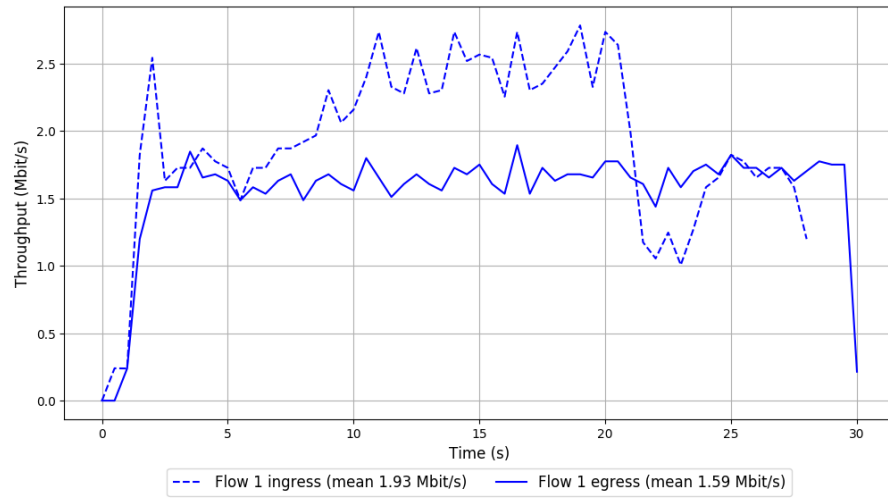


Run 3: Statistics of TCP Cubic

Start at: 2018-04-10 06:18:49
End at: 2018-04-10 06:19:19
Local clock offset: -11.405 ms
Remote clock offset: 5.521 ms

Below is generated by plot.py at 2018-04-10 06:40:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 4742.246 ms
Loss rate: 13.53%
-- Flow 1:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 4742.246 ms
Loss rate: 13.53%

Run 3: Report of TCP Cubic — Data Link

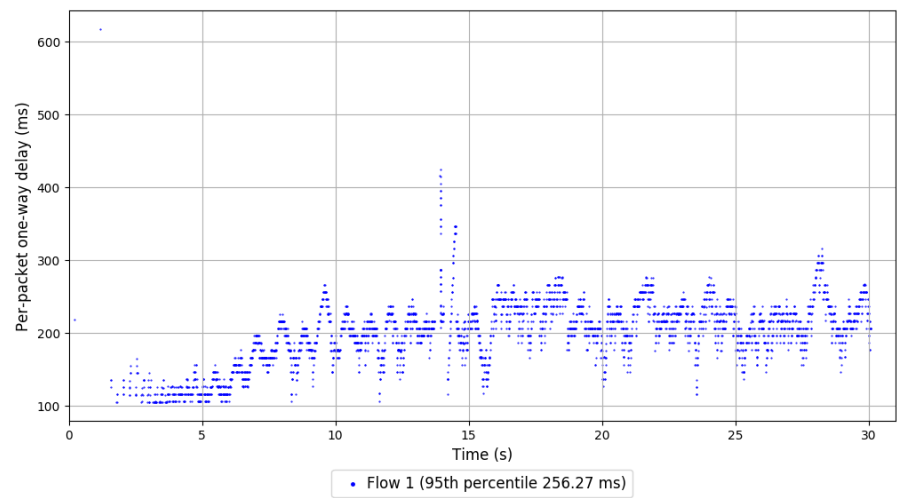
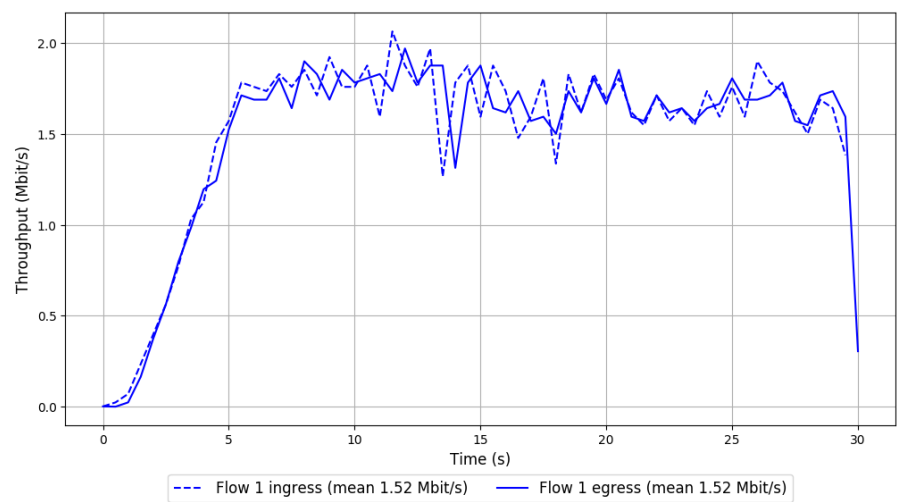


```
Run 1: Statistics of LEDBAT

Start at: 2018-04-10 05:49:19
End at: 2018-04-10 05:49:49
Local clock offset: -14.814 ms
Remote clock offset: 8.953 ms

# Below is generated by plot.py at 2018-04-10 06:40:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 256.271 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 256.271 ms
Loss rate: 0.15%
```

Run 1: Report of LEDBAT — Data Link

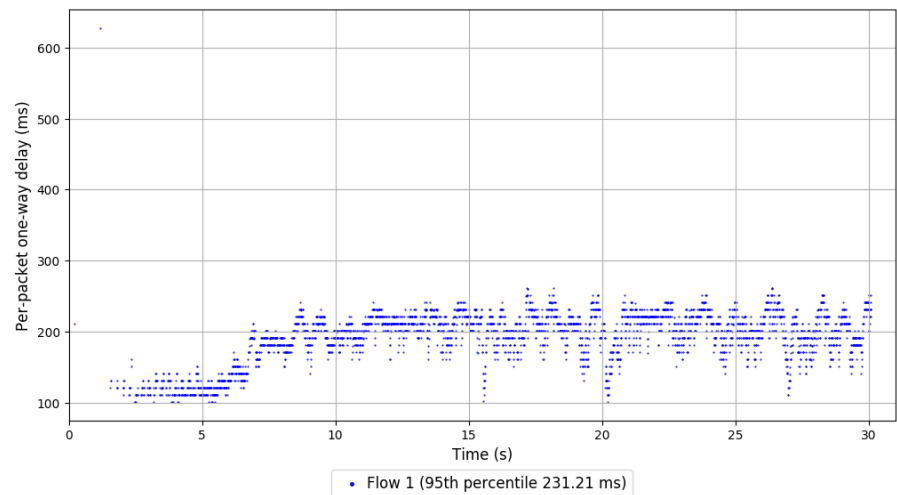
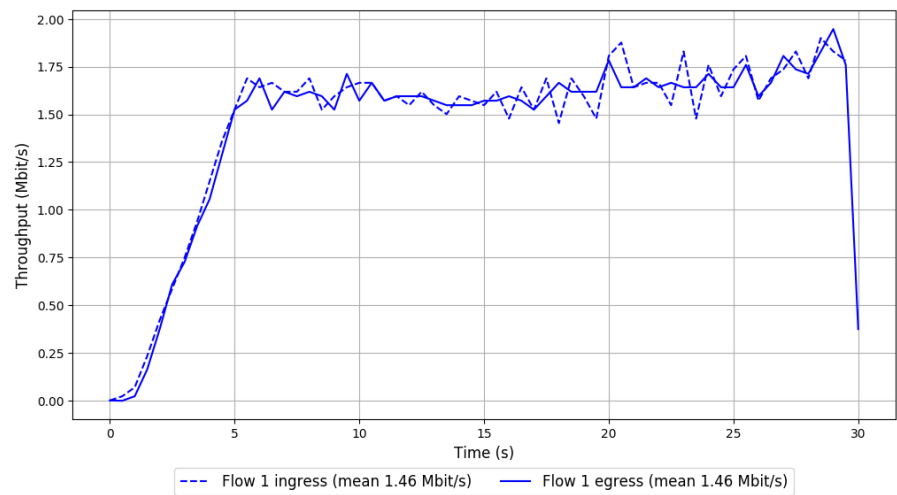


Run 2: Statistics of LEDBAT

Start at: 2018-04-10 06:10:31
End at: 2018-04-10 06:11:01
Local clock offset: -14.236 ms
Remote clock offset: 6.001 ms

Below is generated by plot.py at 2018-04-10 06:40:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.46 Mbit/s
95th percentile per-packet one-way delay: 231.208 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 1.46 Mbit/s
95th percentile per-packet one-way delay: 231.208 ms
Loss rate: 0.40%

Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

Start at: 2018-04-10 06:31:46

End at: 2018-04-10 06:32:16

Local clock offset: -9.499 ms

Remote clock offset: 1.299 ms

Below is generated by plot.py at 2018-04-10 06:40:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.58 Mbit/s

95th percentile per-packet one-way delay: 255.641 ms

Loss rate: 0.47%

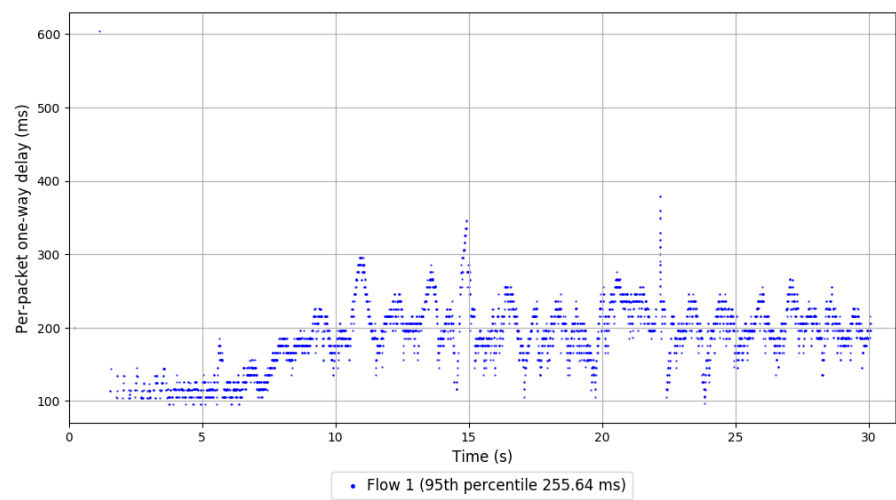
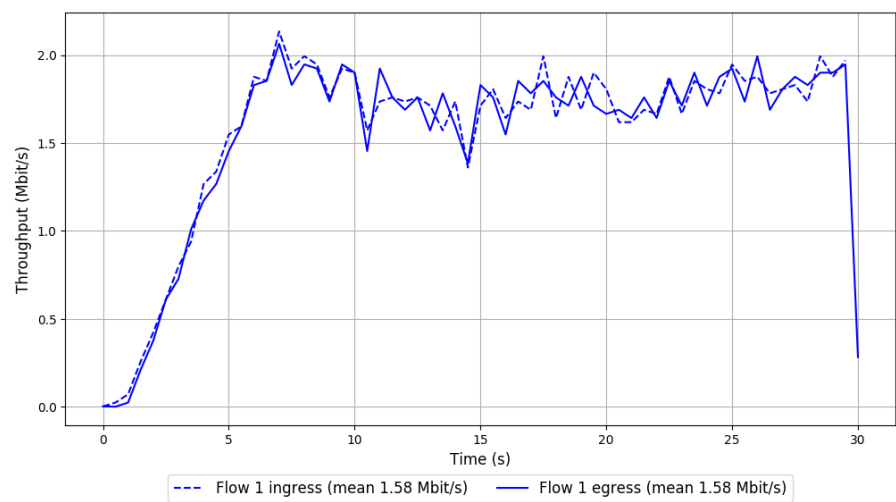
-- Flow 1:

Average throughput: 1.58 Mbit/s

95th percentile per-packet one-way delay: 255.641 ms

Loss rate: 0.47%

Run 3: Report of LEDBAT — Data Link

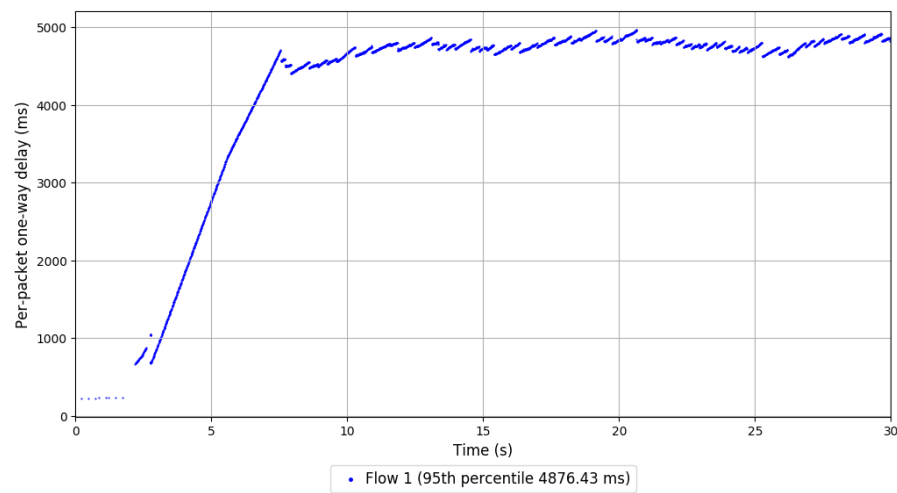
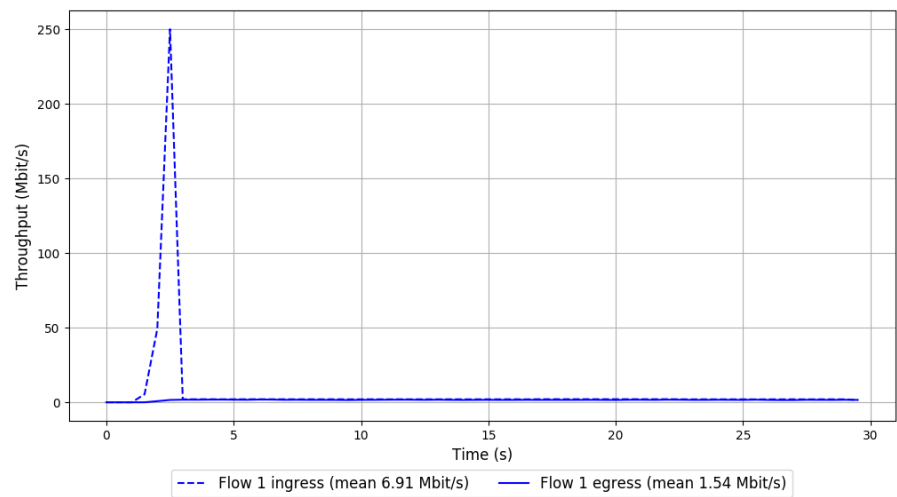


Run 1: Statistics of PCC

Start at: 2018-04-10 05:43:26
End at: 2018-04-10 05:43:56
Local clock offset: -17.594 ms
Remote clock offset: 9.865 ms

Below is generated by plot.py at 2018-04-10 06:40:29
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 4876.426 ms
Loss rate: 77.81%
-- Flow 1:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 4876.426 ms
Loss rate: 77.81%

Run 1: Report of PCC — Data Link

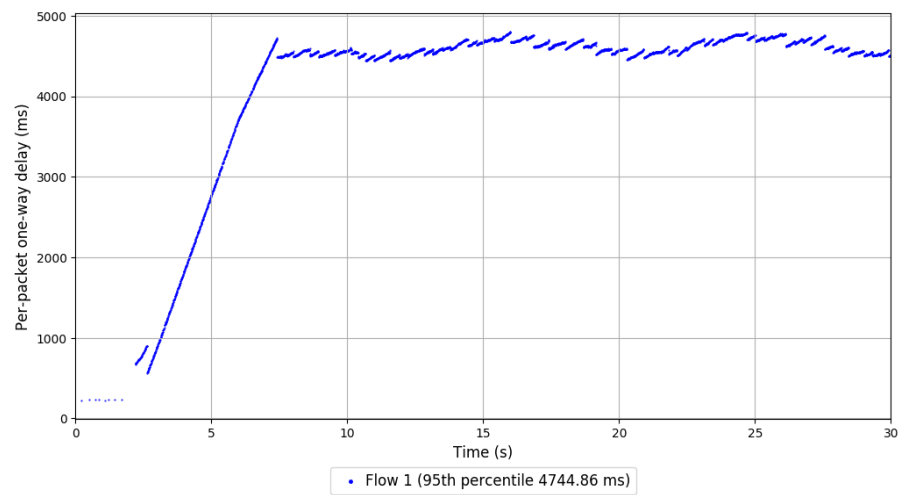
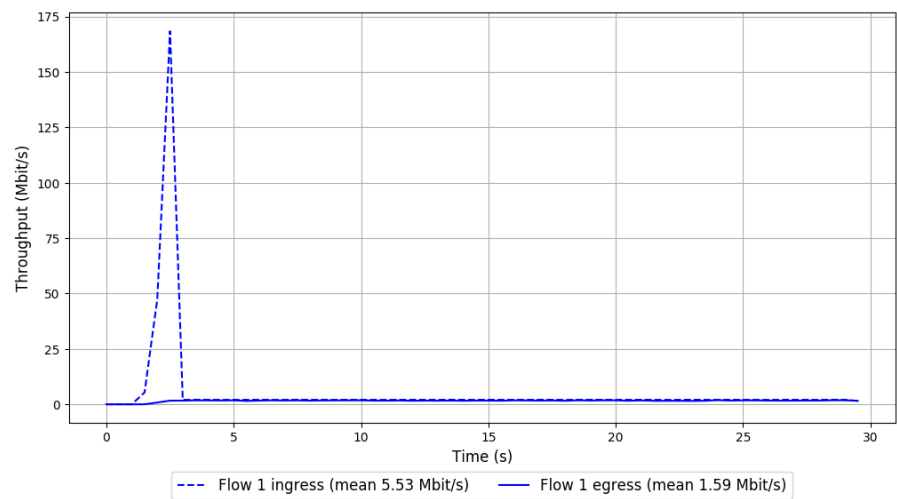


Run 2: Statistics of PCC

Start at: 2018-04-10 06:04:38
End at: 2018-04-10 06:05:08
Local clock offset: -13.872 ms
Remote clock offset: 7.239 ms

Below is generated by plot.py at 2018-04-10 06:40:29
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 4744.864 ms
Loss rate: 71.43%
-- Flow 1:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 4744.864 ms
Loss rate: 71.43%

Run 2: Report of PCC — Data Link



Run 3: Statistics of PCC

Start at: 2018-04-10 06:25:53

End at: 2018-04-10 06:26:23

Local clock offset: -9.629 ms

Remote clock offset: 1.062 ms

Below is generated by plot.py at 2018-04-10 06:40:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.66 Mbit/s

95th percentile per-packet one-way delay: 4674.491 ms

Loss rate: 71.52%

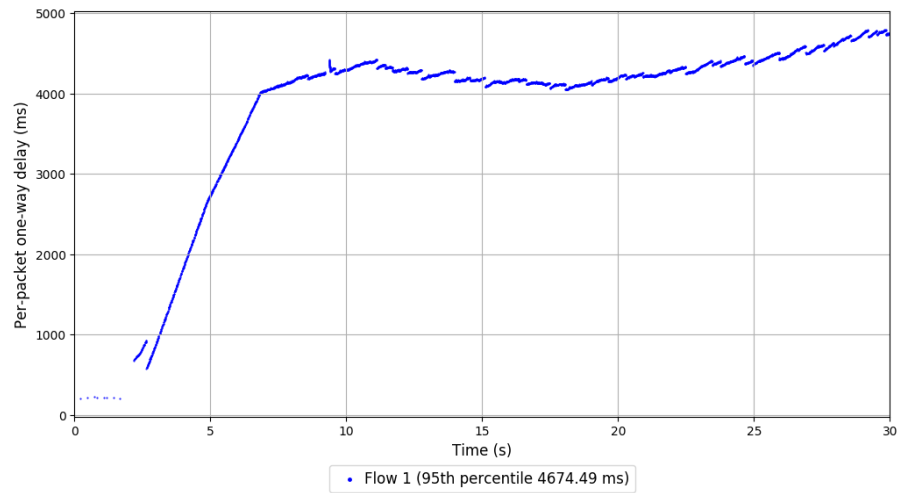
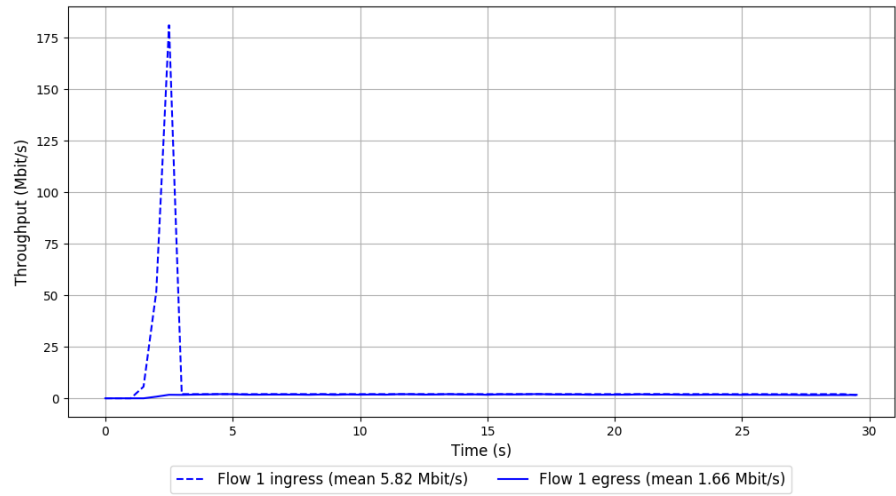
-- Flow 1:

Average throughput: 1.66 Mbit/s

95th percentile per-packet one-way delay: 4674.491 ms

Loss rate: 71.52%

Run 3: Report of PCC — Data Link

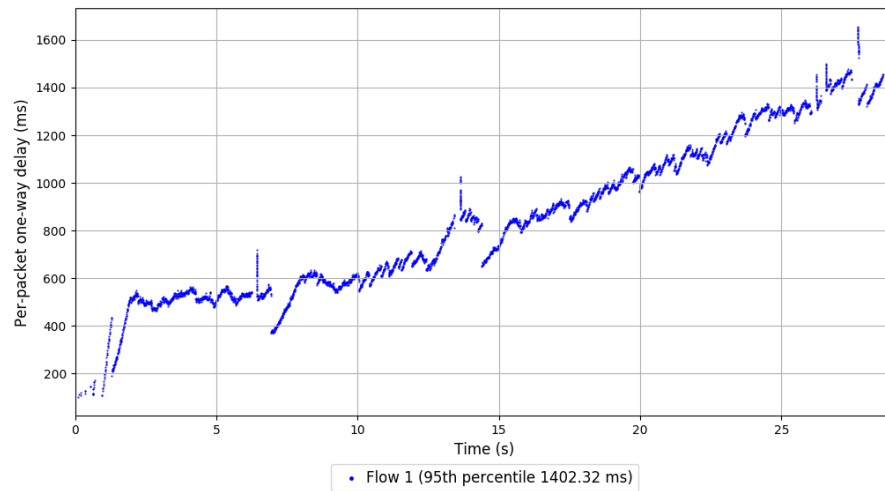
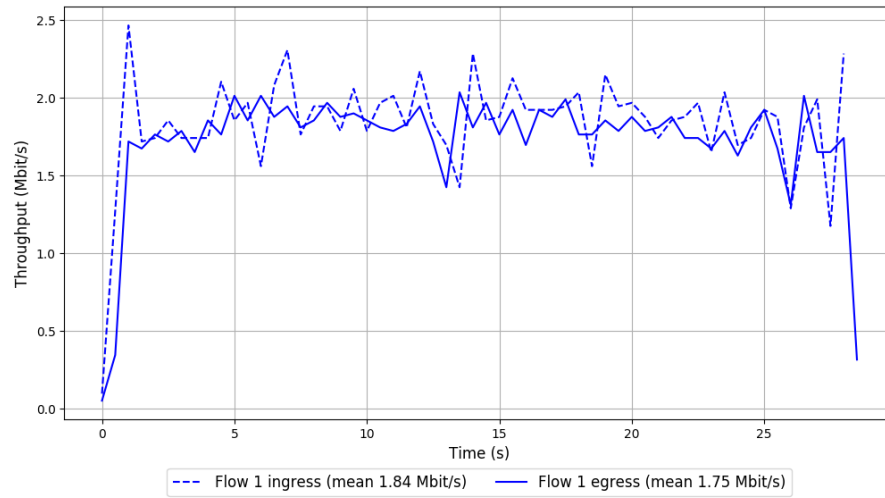


Run 1: Statistics of QUIC Cubic

Start at: 2018-04-10 05:45:47
End at: 2018-04-10 05:46:17
Local clock offset: -15.826 ms
Remote clock offset: 9.959 ms

Below is generated by plot.py at 2018-04-10 06:40:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 1402.322 ms
Loss rate: 4.56%
-- Flow 1:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 1402.322 ms
Loss rate: 4.56%

Run 1: Report of QUIC Cubic — Data Link

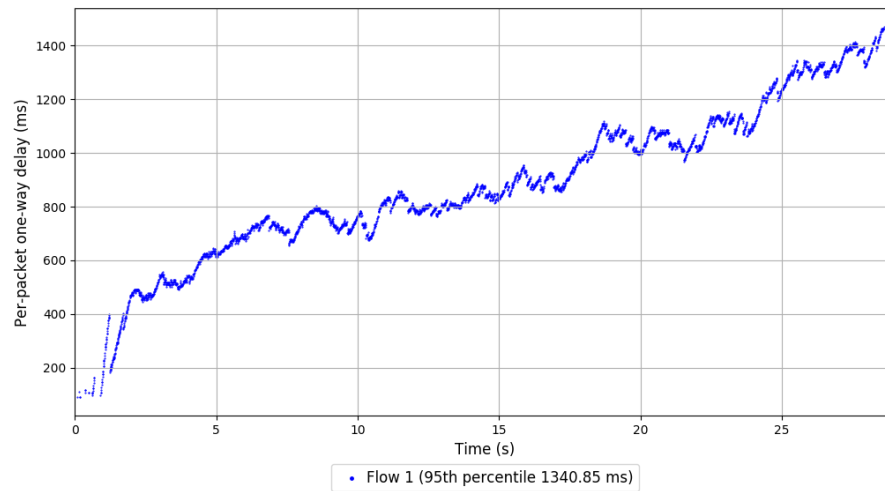
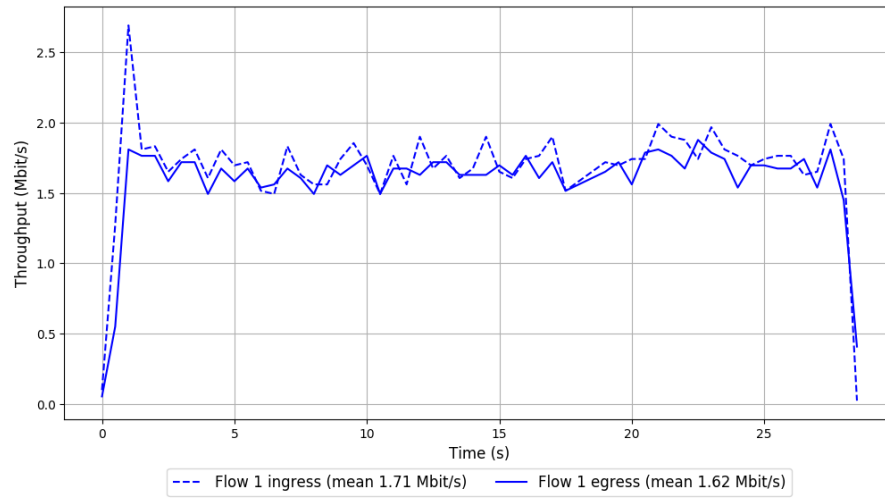


Run 2: Statistics of QUIC Cubic

Start at: 2018-04-10 06:07:00
End at: 2018-04-10 06:07:30
Local clock offset: -14.399 ms
Remote clock offset: 1.396 ms

Below is generated by plot.py at 2018-04-10 06:40:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 1340.854 ms
Loss rate: 4.93%
-- Flow 1:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 1340.854 ms
Loss rate: 4.93%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-04-10 06:28:15

End at: 2018-04-10 06:28:45

Local clock offset: -8.708 ms

Remote clock offset: 6.824 ms

Below is generated by plot.py at 2018-04-10 06:40:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.67 Mbit/s

95th percentile per-packet one-way delay: 1385.254 ms

Loss rate: 4.53%

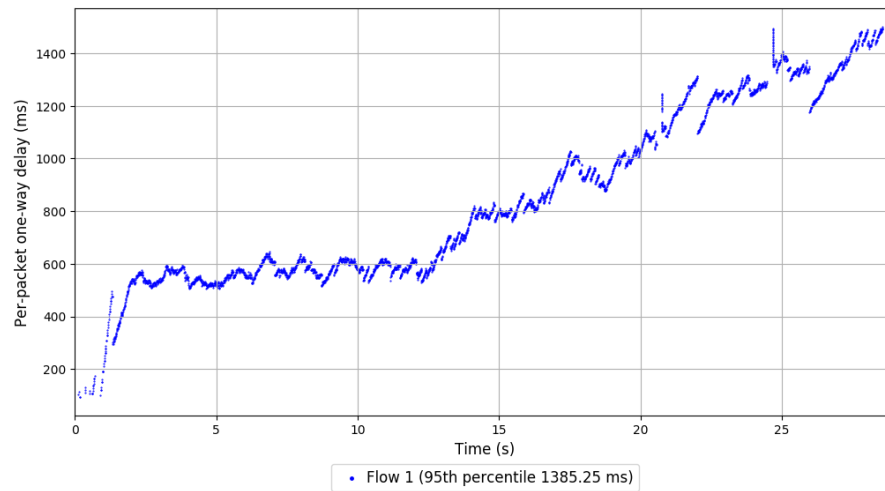
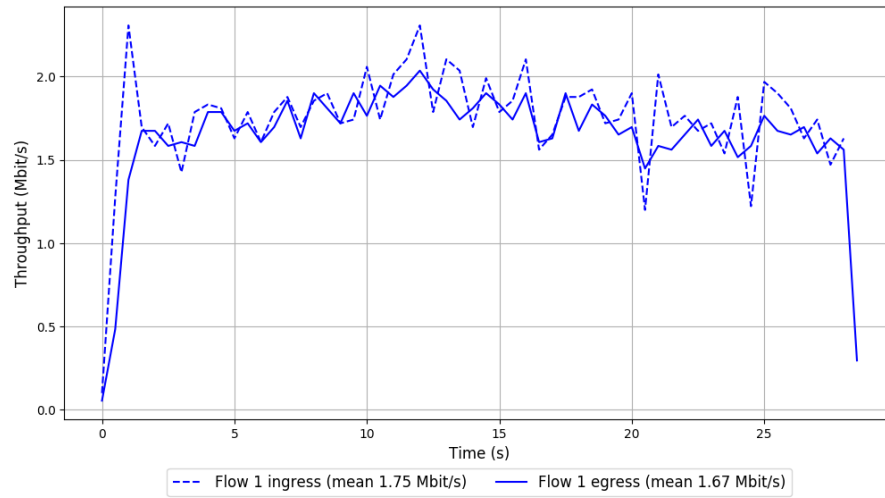
-- Flow 1:

Average throughput: 1.67 Mbit/s

95th percentile per-packet one-way delay: 1385.254 ms

Loss rate: 4.53%

Run 3: Report of QUIC Cubic — Data Link

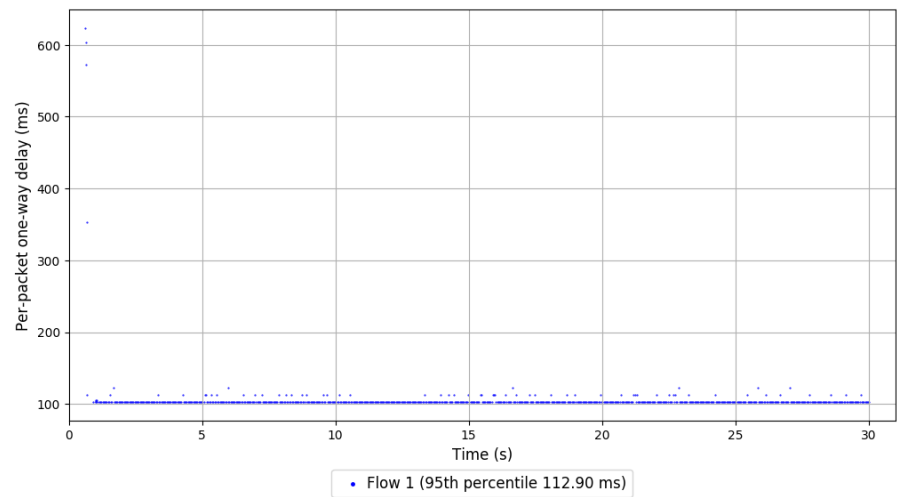
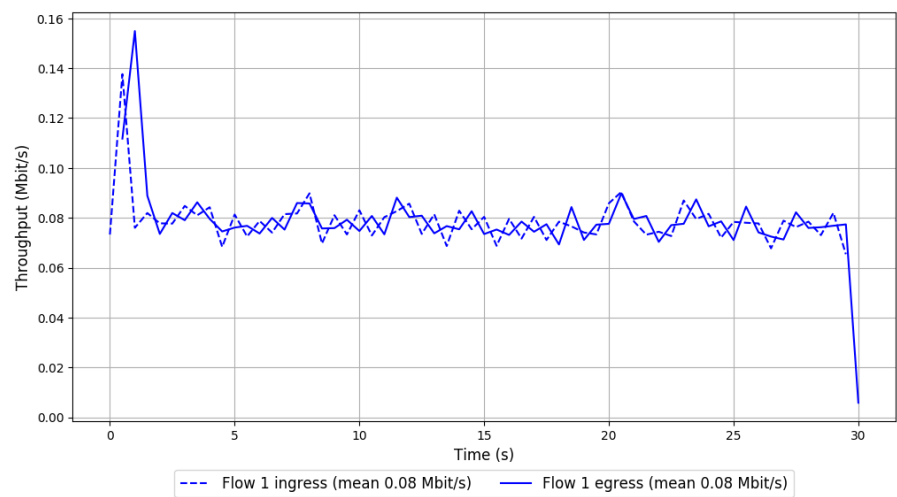


Run 1: Statistics of SCReAM

Start at: 2018-04-10 05:51:40
End at: 2018-04-10 05:52:10
Local clock offset: -13.419 ms
Remote clock offset: 8.377 ms

Below is generated by plot.py at 2018-04-10 06:40:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 112.898 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 112.898 ms
Loss rate: 0.00%

Run 1: Report of SReAM — Data Link

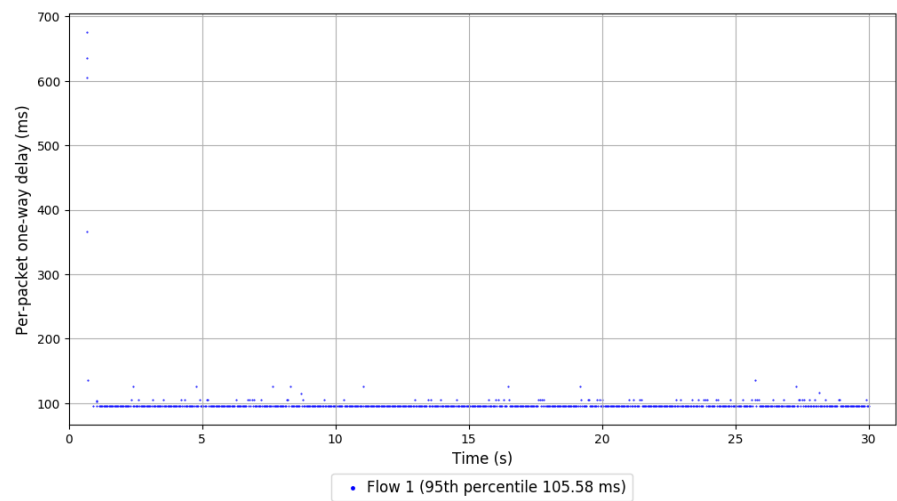
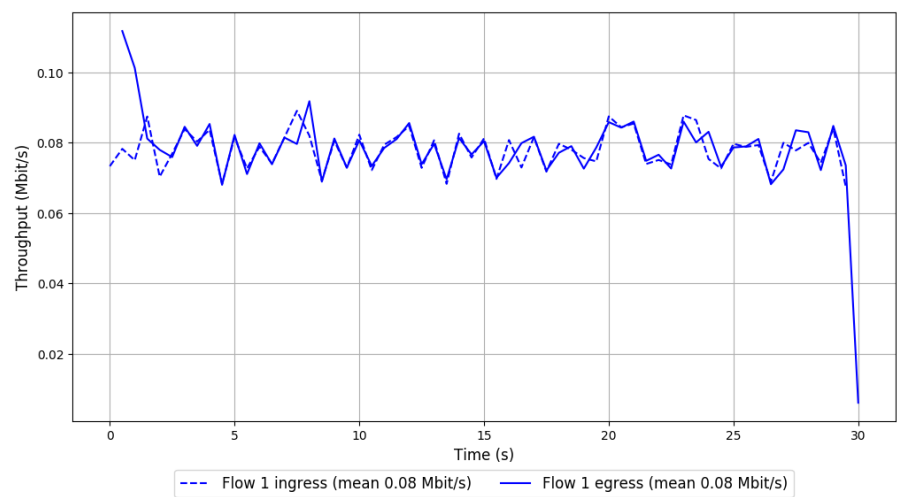


Run 2: Statistics of SCReAM

Start at: 2018-04-10 06:12:53
End at: 2018-04-10 06:13:23
Local clock offset: -14.592 ms
Remote clock offset: 1.003 ms

Below is generated by plot.py at 2018-04-10 06:40:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 105.581 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 105.581 ms
Loss rate: 0.00%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-04-10 06:34:08

End at: 2018-04-10 06:34:38

Local clock offset: -9.52 ms

Remote clock offset: 1.371 ms

Below is generated by plot.py at 2018-04-10 06:40:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 112.526 ms

Loss rate: 0.00%

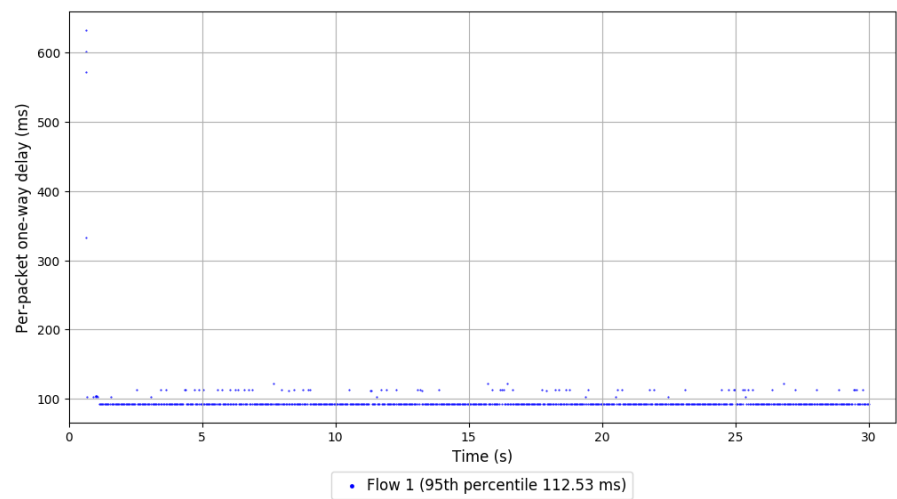
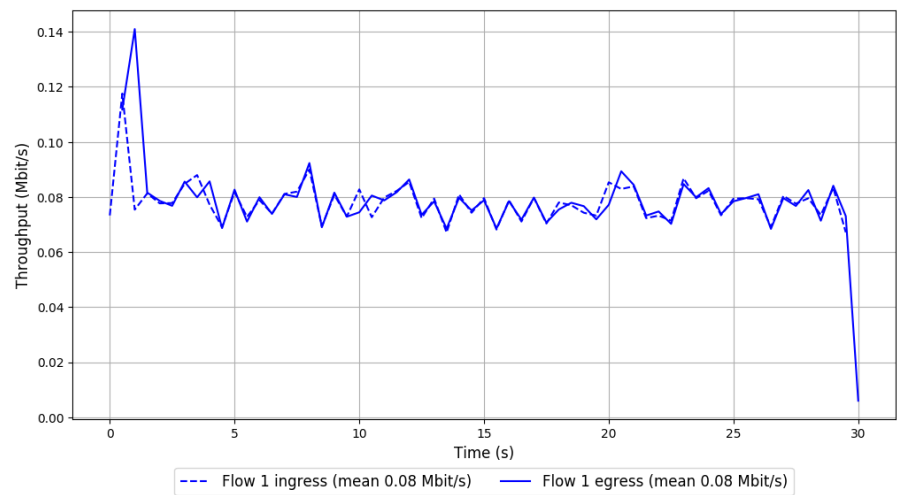
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 112.526 ms

Loss rate: 0.00%

Run 3: Report of SReAM — Data Link

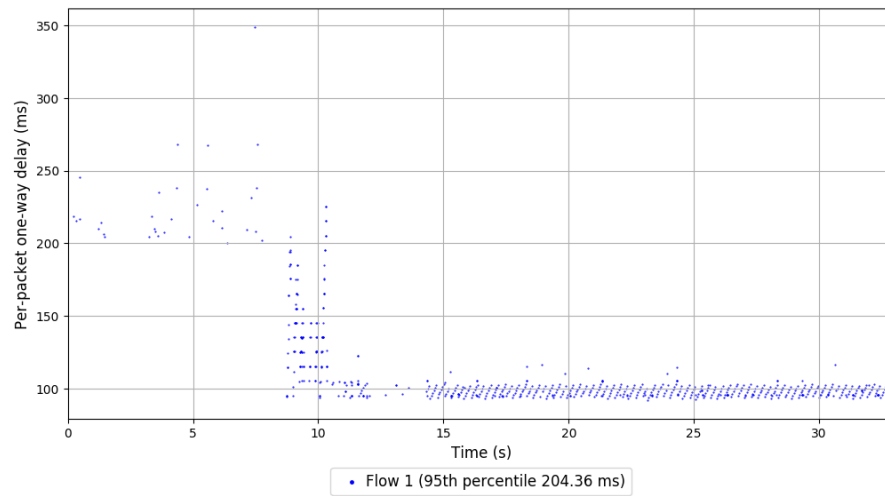
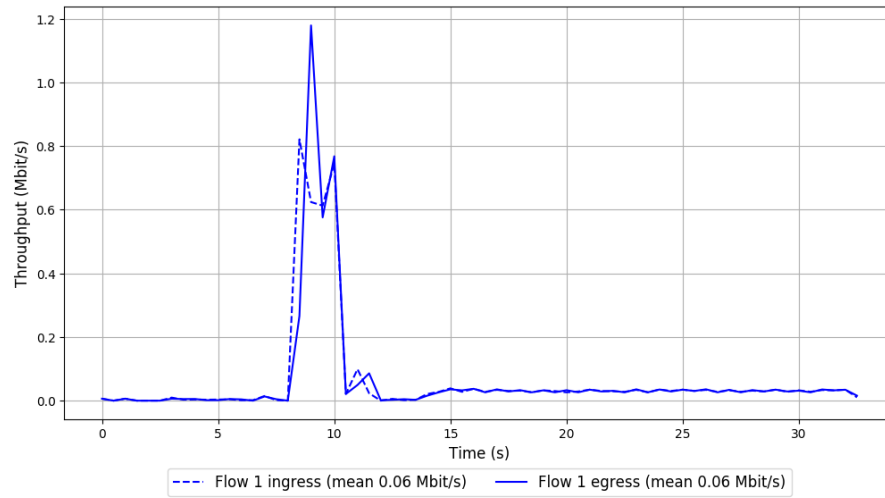


Run 1: Statistics of WebRTC media

Start at: 2018-04-10 05:48:08
End at: 2018-04-10 05:48:38
Local clock offset: -13.763 ms
Remote clock offset: 4.522 ms

Below is generated by plot.py at 2018-04-10 06:40:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 204.359 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 204.359 ms
Loss rate: 0.00%

Run 1: Report of WebRTC media — Data Link

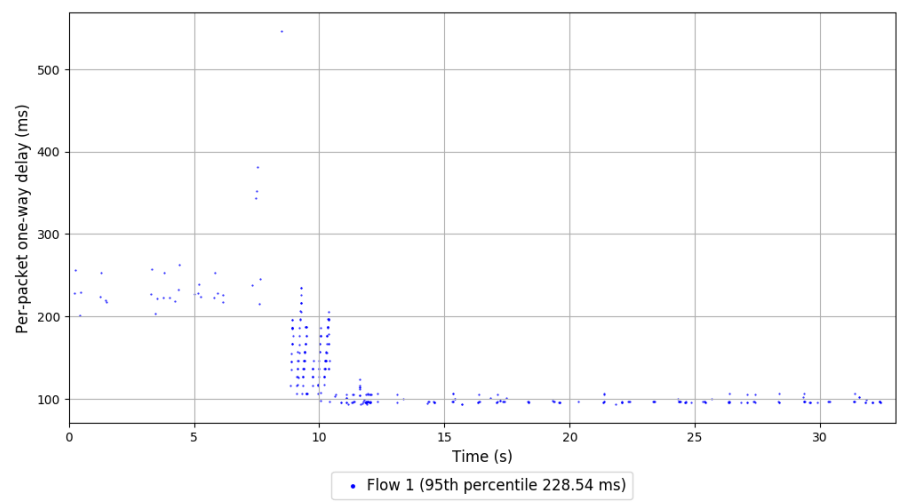
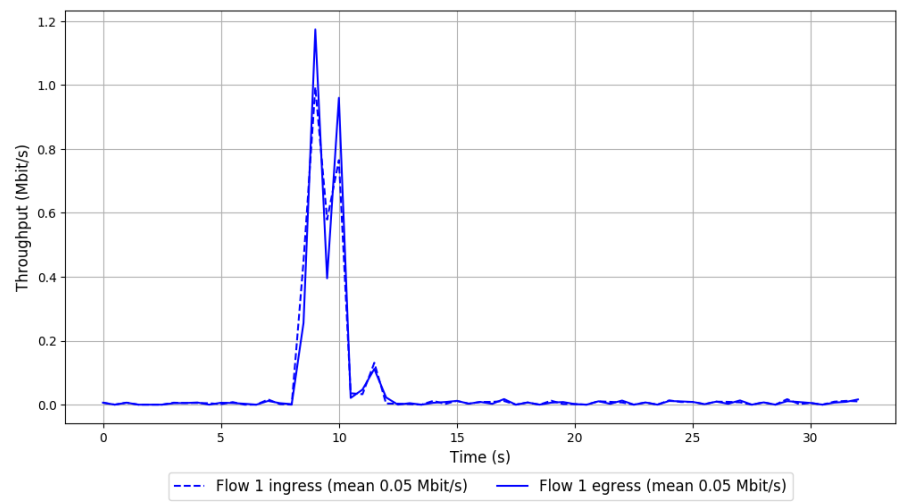


Run 2: Statistics of WebRTC media

Start at: 2018-04-10 06:09:21
End at: 2018-04-10 06:09:51
Local clock offset: -14.821 ms
Remote clock offset: 6.879 ms

Below is generated by plot.py at 2018-04-10 06:40:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 228.538 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 228.538 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-04-10 06:30:36

End at: 2018-04-10 06:31:06

Local clock offset: -9.432 ms

Remote clock offset: 1.251 ms

Below is generated by plot.py at 2018-04-10 06:40:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.06 Mbit/s

95th percentile per-packet one-way delay: 243.306 ms

Loss rate: 0.00%

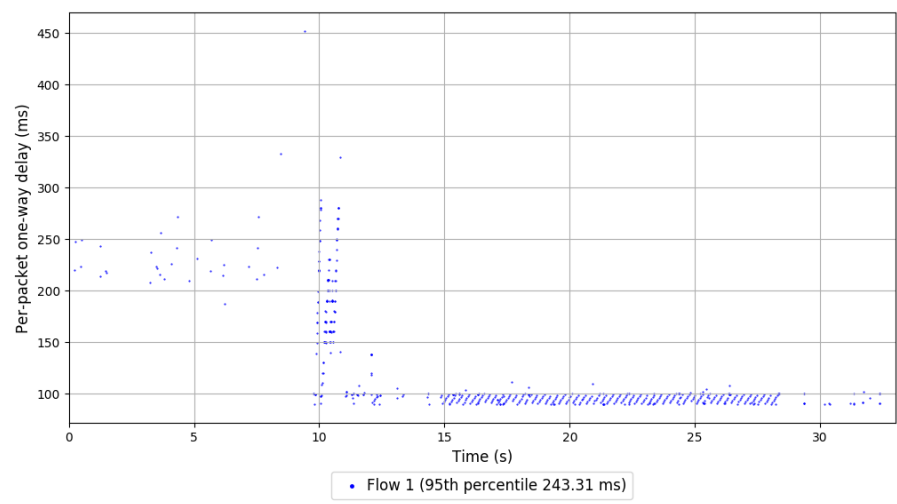
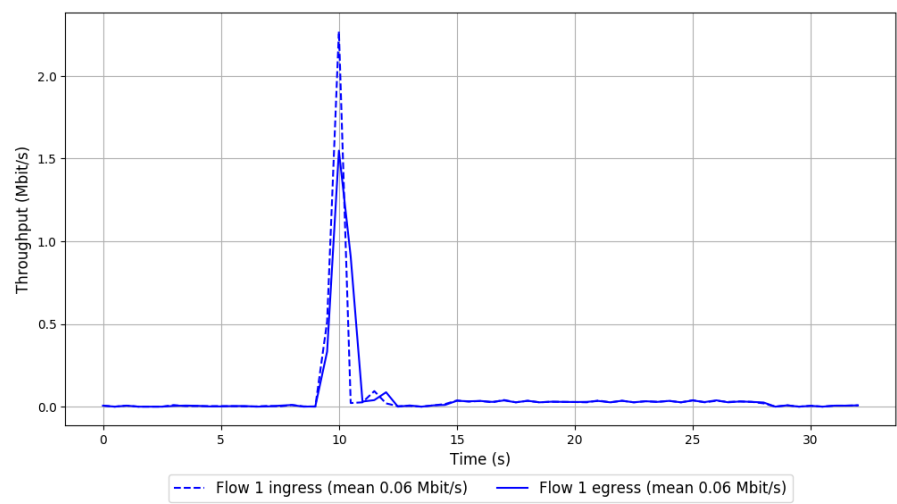
-- Flow 1:

Average throughput: 0.06 Mbit/s

95th percentile per-packet one-way delay: 243.306 ms

Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

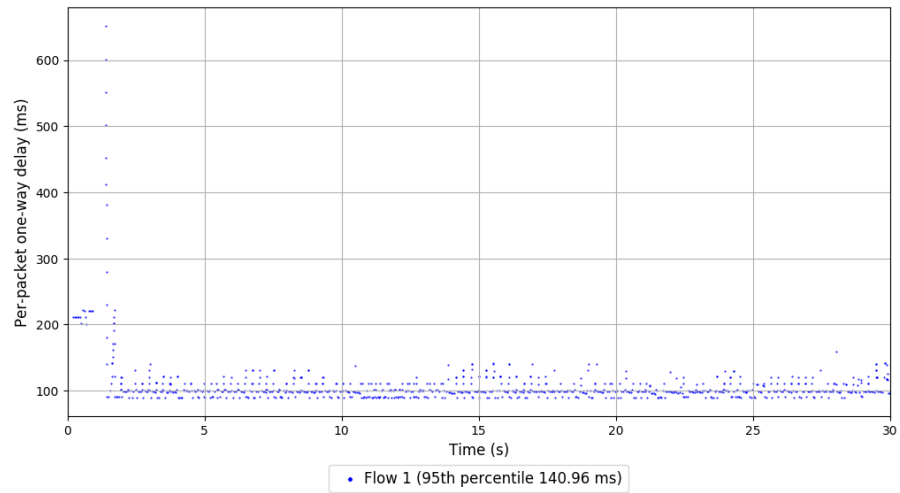
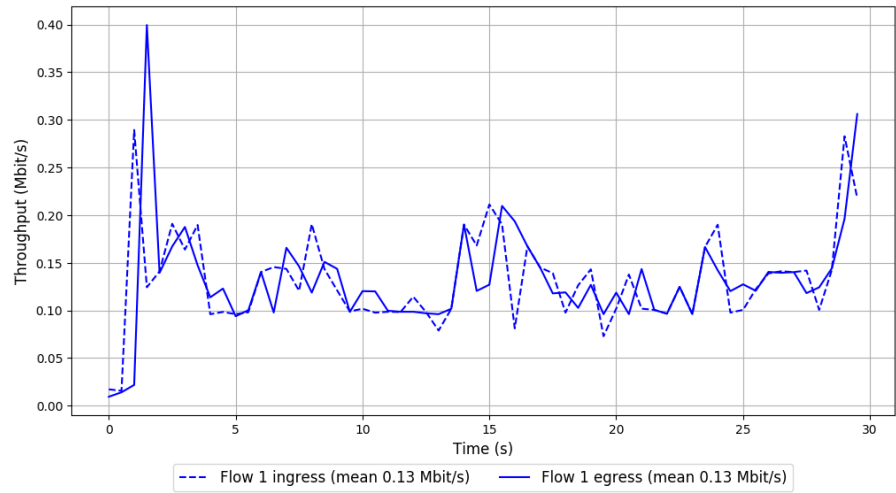


Run 1: Statistics of Sprout

Start at: 2018-04-10 05:37:32
End at: 2018-04-10 05:38:03
Local clock offset: -22.748 ms
Remote clock offset: 4.907 ms

Below is generated by plot.py at 2018-04-10 06:40:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 140.955 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 140.955 ms
Loss rate: 0.00%

Run 1: Report of Sprout — Data Link

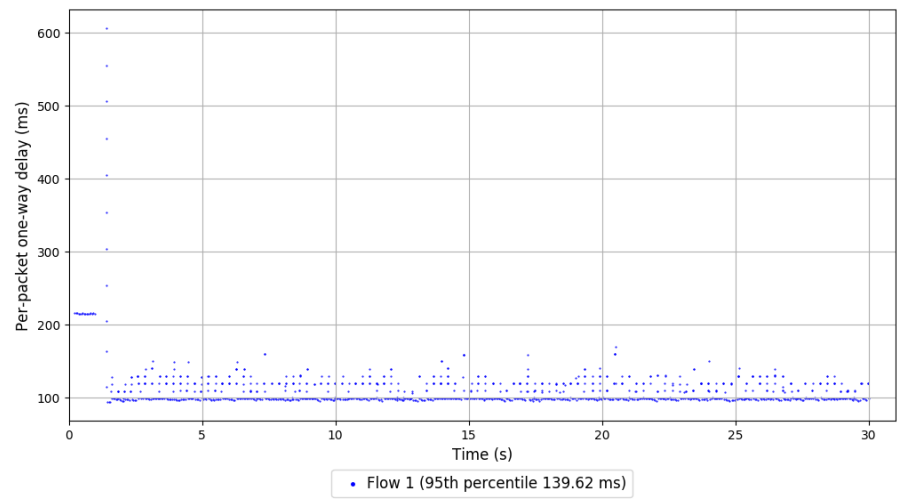
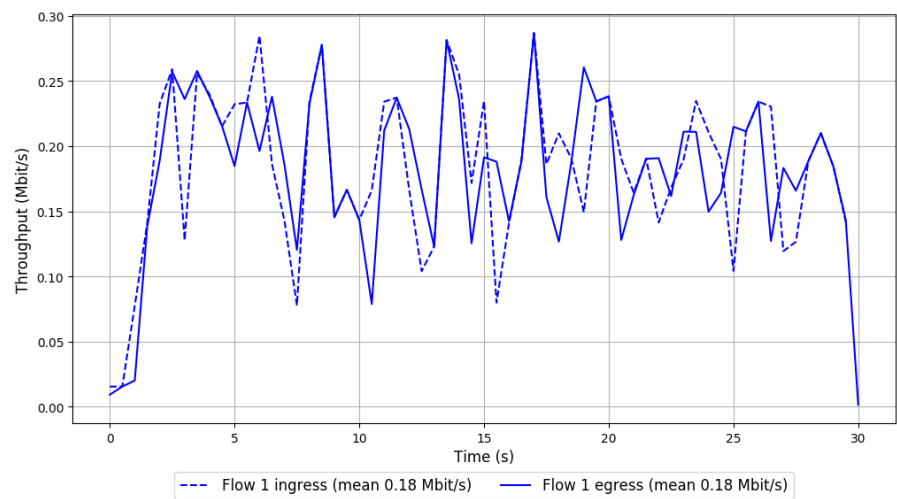


Run 2: Statistics of Sprout

Start at: 2018-04-10 05:58:45
End at: 2018-04-10 05:59:15
Local clock offset: -12.384 ms
Remote clock offset: 7.946 ms

Below is generated by plot.py at 2018-04-10 06:40:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 139.619 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 139.619 ms
Loss rate: 0.00%

Run 2: Report of Sprout — Data Link

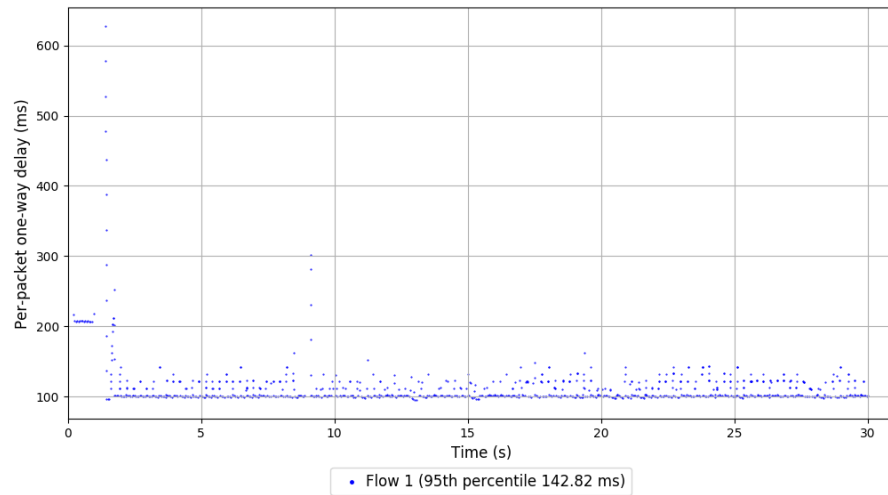
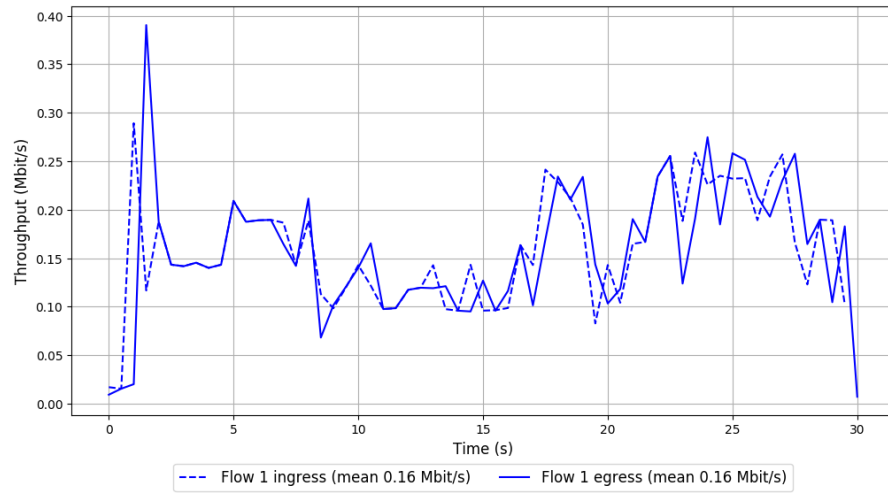


Run 3: Statistics of Sprout

Start at: 2018-04-10 06:20:00
End at: 2018-04-10 06:20:30
Local clock offset: -10.939 ms
Remote clock offset: 7.133 ms

Below is generated by plot.py at 2018-04-10 06:40:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 142.823 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 142.823 ms
Loss rate: 0.00%

Run 3: Report of Sprout — Data Link

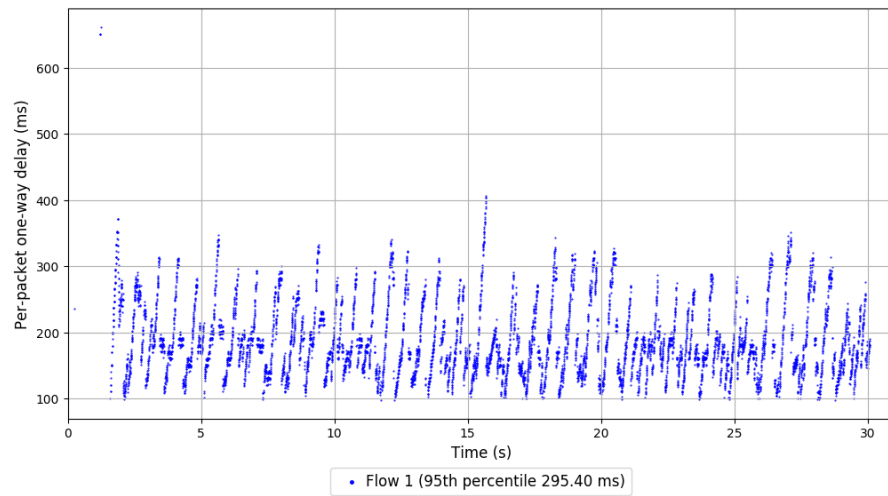
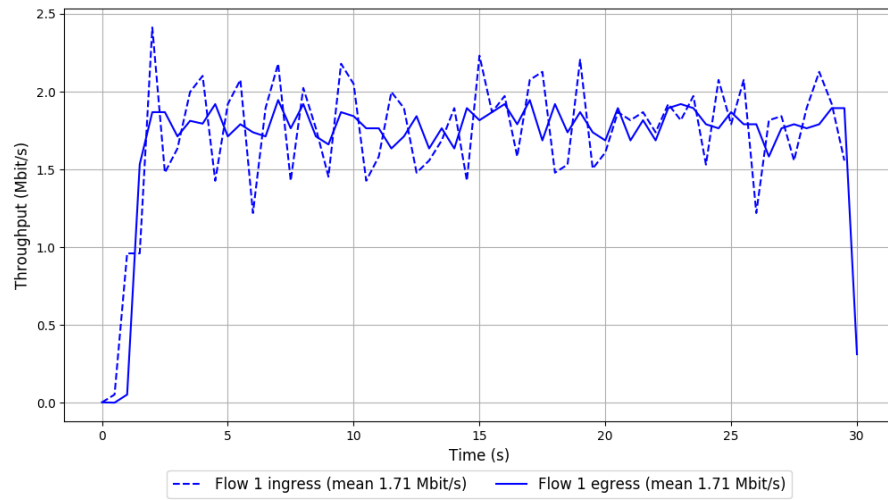


Run 1: Statistics of TaoVA-100x

Start at: 2018-04-10 05:41:04
End at: 2018-04-10 05:41:34
Local clock offset: -20.831 ms
Remote clock offset: 5.896 ms

Below is generated by plot.py at 2018-04-10 06:40:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 295.397 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 295.397 ms
Loss rate: 0.30%

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

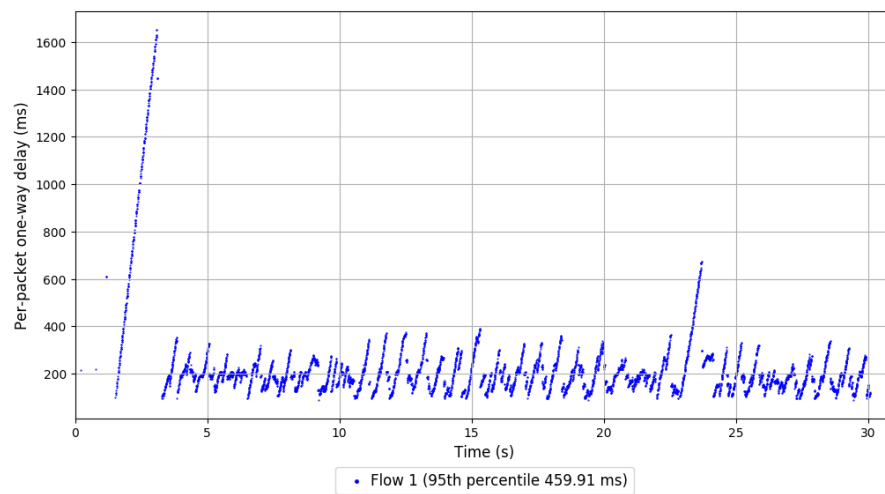
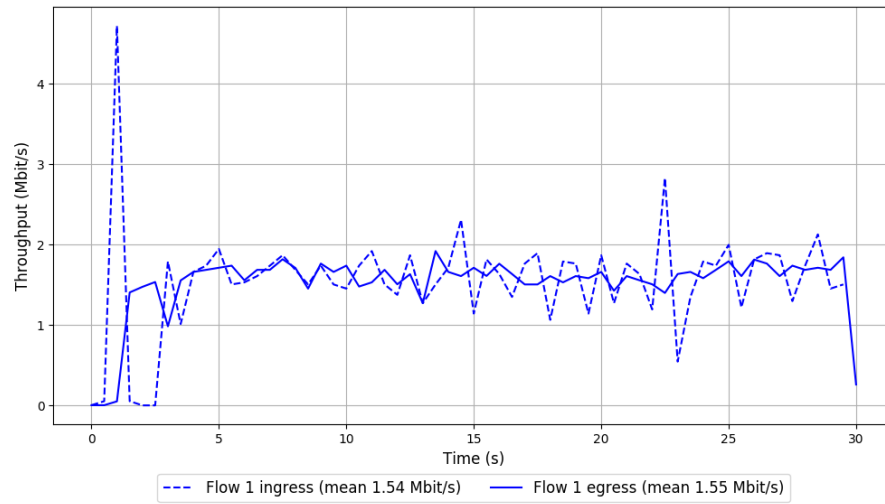


Run 2: Statistics of TaoVA-100x

Start at: 2018-04-10 06:02:17
End at: 2018-04-10 06:02:47
Local clock offset: -12.748 ms
Remote clock offset: 1.788 ms

Below is generated by plot.py at 2018-04-10 06:40:38
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 459.913 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 459.913 ms
Loss rate: 0.11%

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



Run 3: Statistics of TaoVA-100x

Start at: 2018-04-10 06:23:31

End at: 2018-04-10 06:24:01

Local clock offset: -9.247 ms

Remote clock offset: 1.685 ms

Below is generated by plot.py at 2018-04-10 06:40:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.65 Mbit/s

95th percentile per-packet one-way delay: 334.038 ms

Loss rate: 0.11%

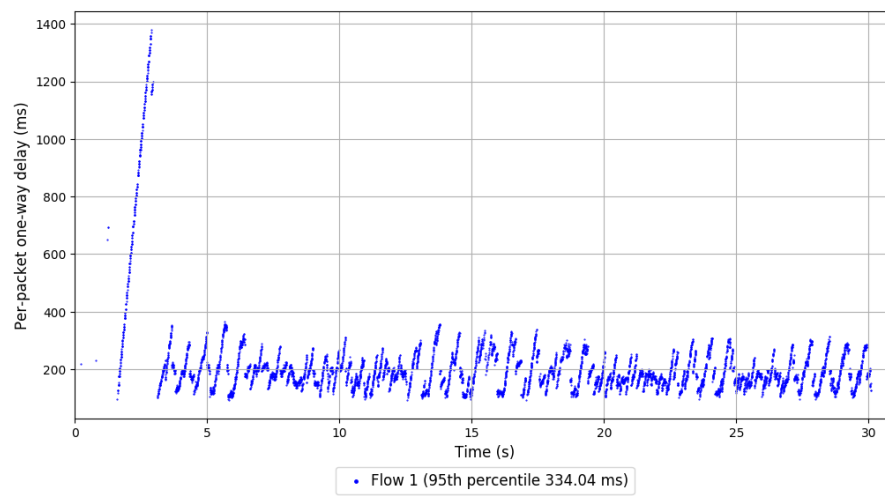
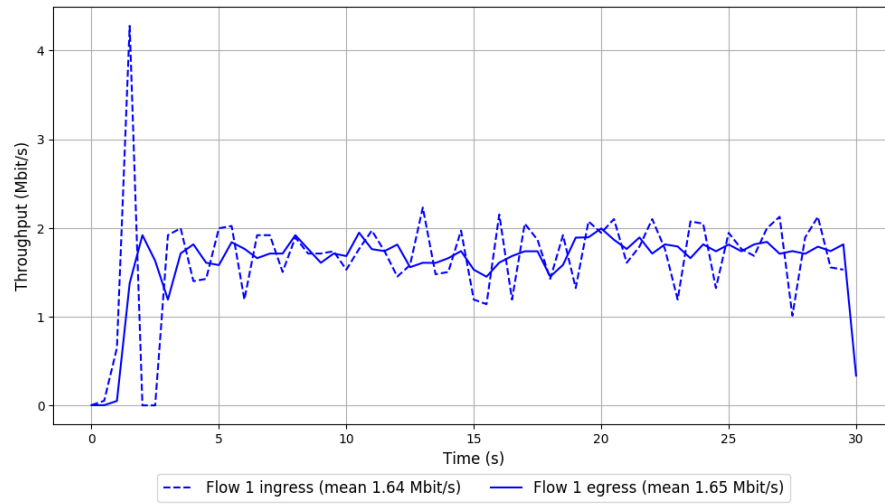
-- Flow 1:

Average throughput: 1.65 Mbit/s

95th percentile per-packet one-way delay: 334.038 ms

Loss rate: 0.11%

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

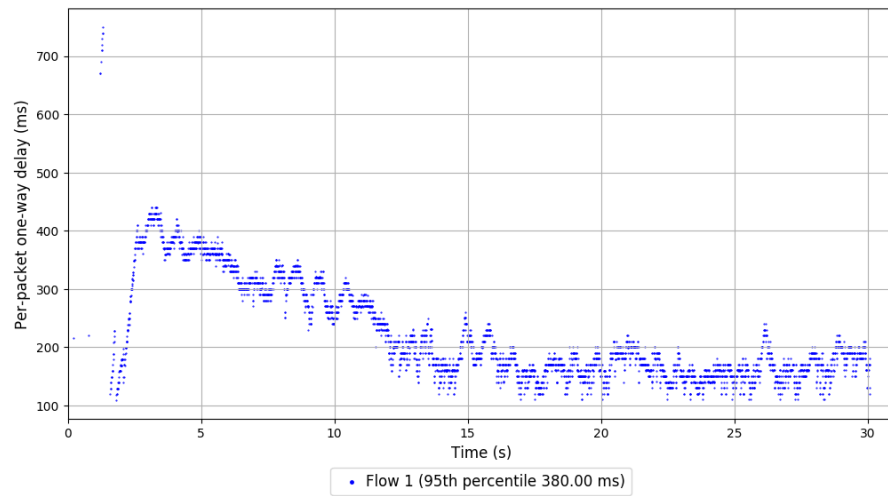
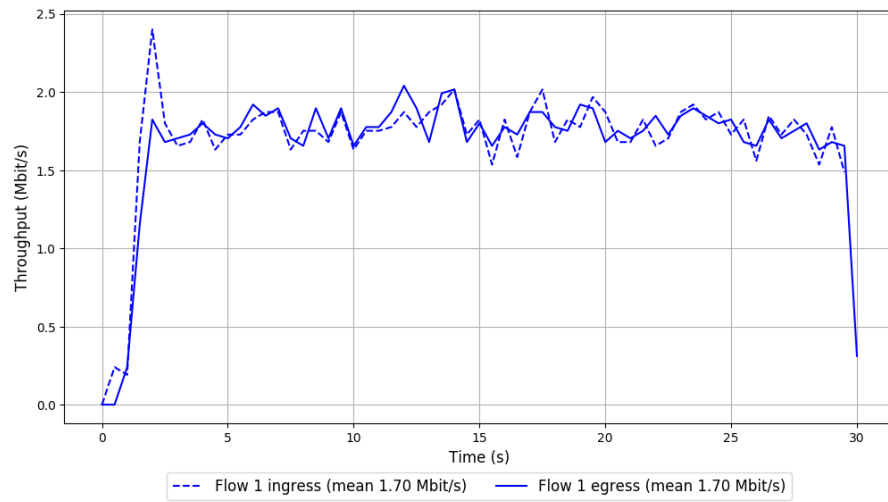


Run 1: Statistics of TCP Vegas

Start at: 2018-04-10 05:55:12
End at: 2018-04-10 05:55:42
Local clock offset: -13.073 ms
Remote clock offset: 8.477 ms

Below is generated by plot.py at 2018-04-10 06:40:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 380.002 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 380.002 ms
Loss rate: 0.09%

Run 1: Report of TCP Vegas — Data Link

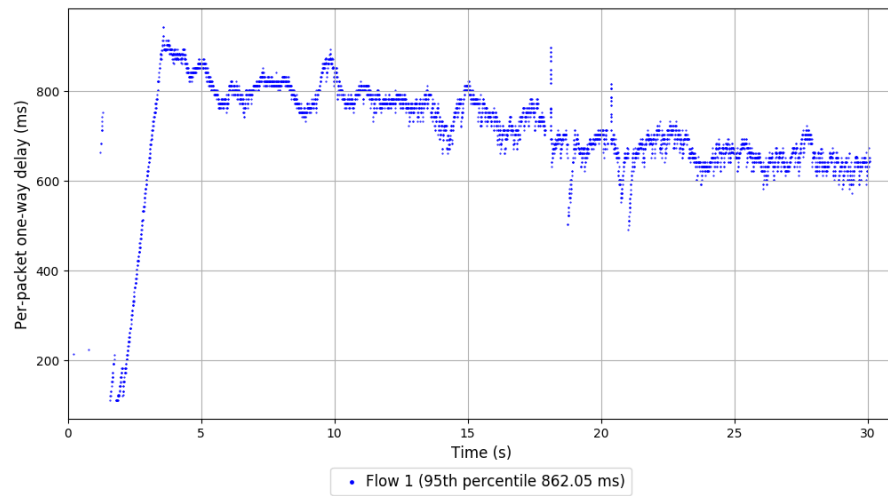
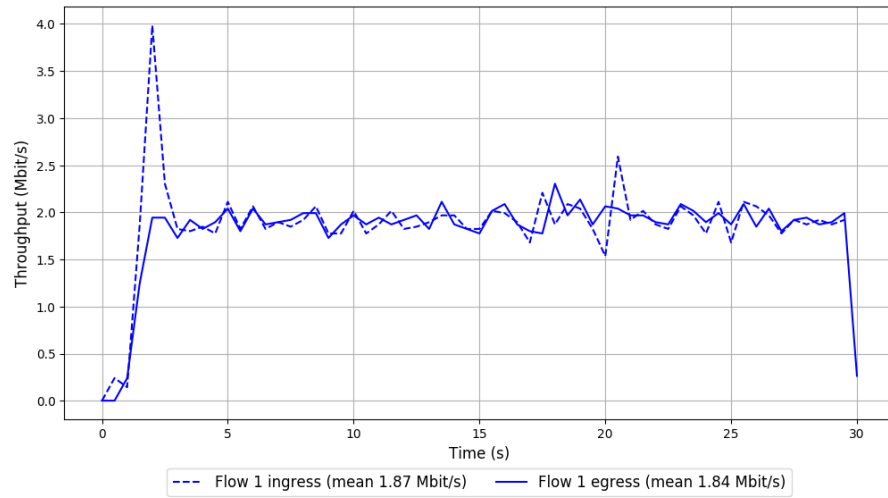


Run 2: Statistics of TCP Vegas

Start at: 2018-04-10 06:16:27
End at: 2018-04-10 06:16:57
Local clock offset: -11.736 ms
Remote clock offset: 6.429 ms

Below is generated by plot.py at 2018-04-10 06:40:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.84 Mbit/s
95th percentile per-packet one-way delay: 862.050 ms
Loss rate: 1.88%
-- Flow 1:
Average throughput: 1.84 Mbit/s
95th percentile per-packet one-way delay: 862.050 ms
Loss rate: 1.88%

Run 2: Report of TCP Vegas — Data Link

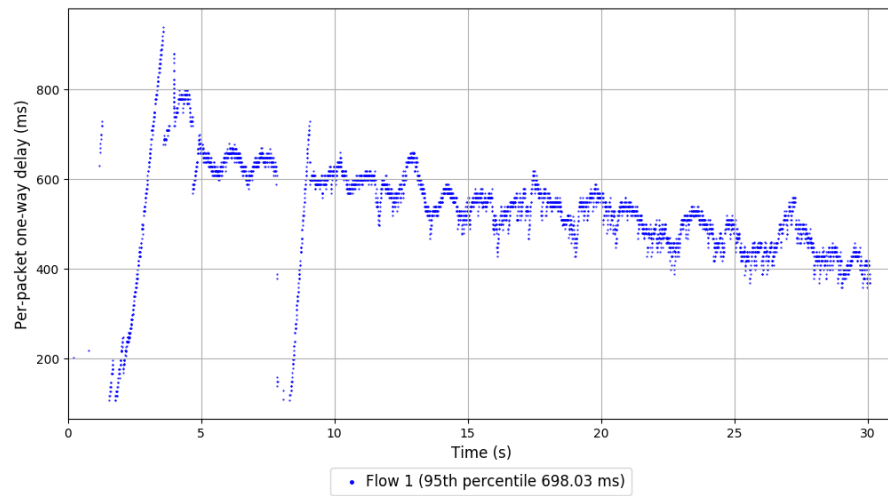
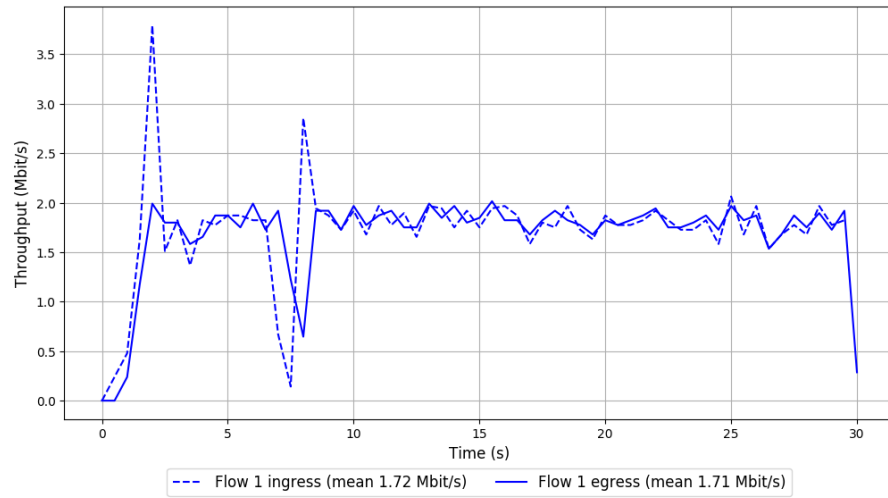


Run 3: Statistics of TCP Vegas

Start at: 2018-04-10 06:37:40
End at: 2018-04-10 06:38:10
Local clock offset: -8.888 ms
Remote clock offset: 6.924 ms

Below is generated by plot.py at 2018-04-10 06:40:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 698.029 ms
Loss rate: 1.14%
-- Flow 1:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 698.029 ms
Loss rate: 1.14%

Run 3: Report of TCP Vegas — Data Link

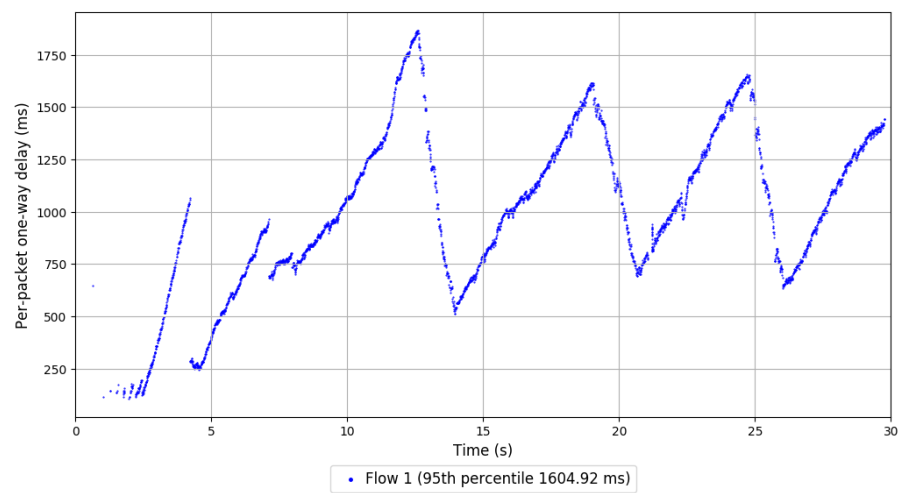
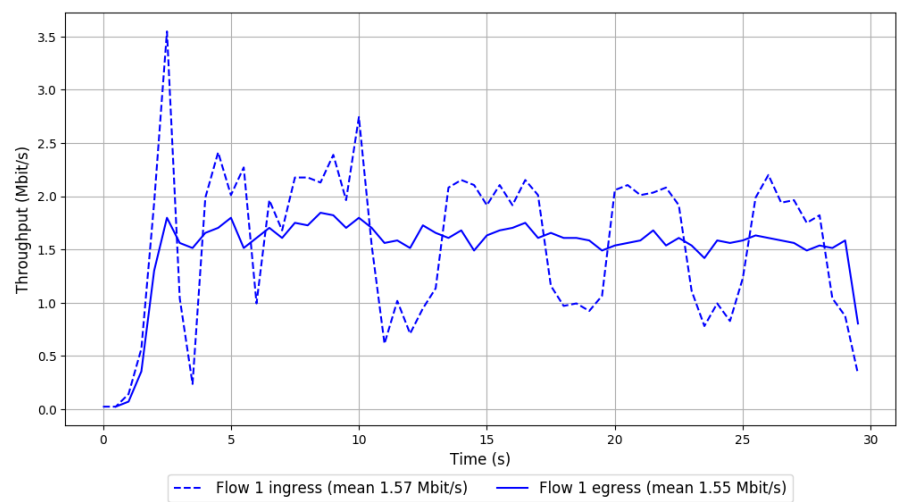


Run 1: Statistics of Verus

Start at: 2018-04-10 05:56:23
End at: 2018-04-10 05:56:53
Local clock offset: -13.148 ms
Remote clock offset: 8.228 ms

Below is generated by plot.py at 2018-04-10 06:40:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 1604.925 ms
Loss rate: 2.98%
-- Flow 1:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 1604.925 ms
Loss rate: 2.98%

Run 1: Report of Verus — Data Link

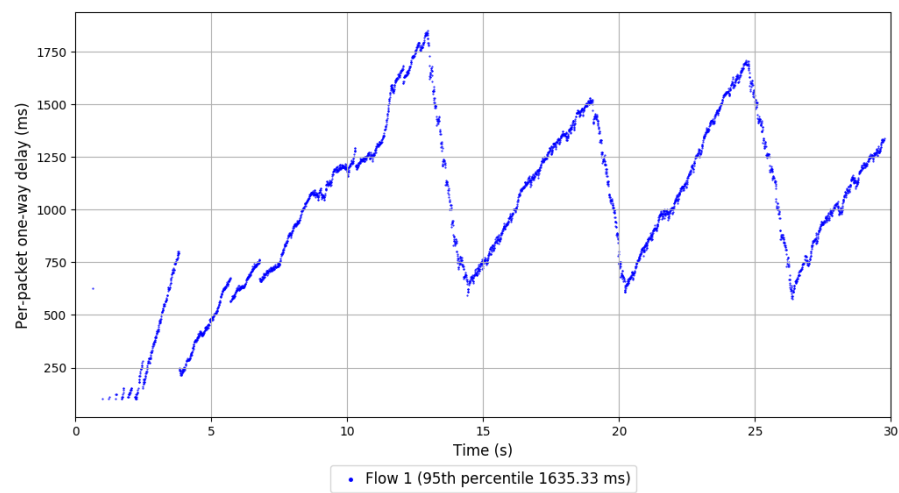
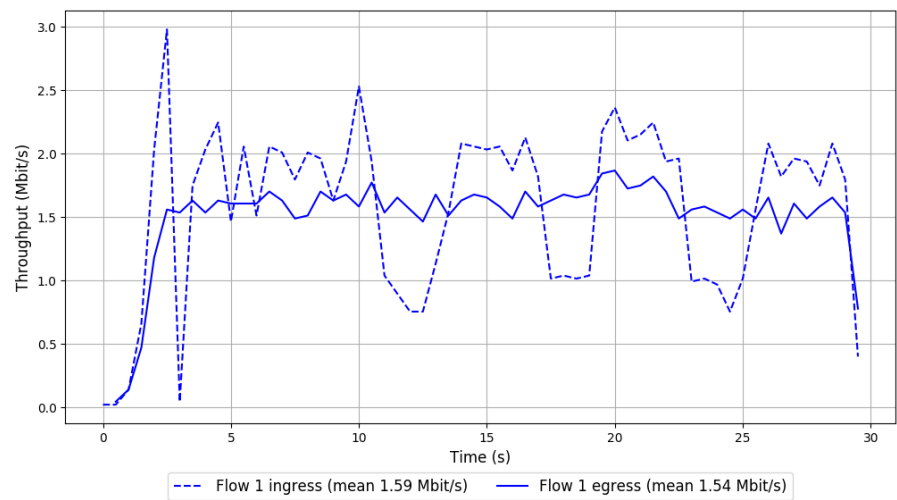


Run 2: Statistics of Verus

Start at: 2018-04-10 06:17:38
End at: 2018-04-10 06:18:08
Local clock offset: -11.096 ms
Remote clock offset: 0.761 ms

Below is generated by plot.py at 2018-04-10 06:40:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 1635.330 ms
Loss rate: 4.74%
-- Flow 1:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 1635.330 ms
Loss rate: 4.74%

Run 2: Report of Verus — Data Link

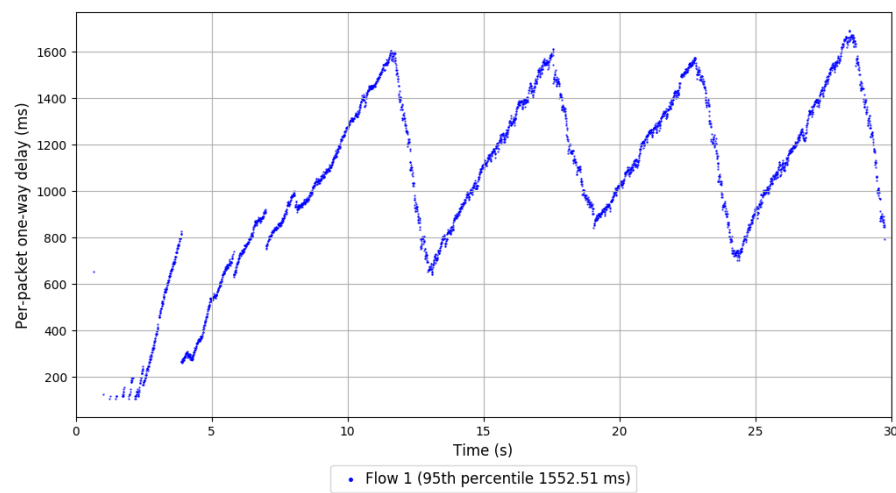
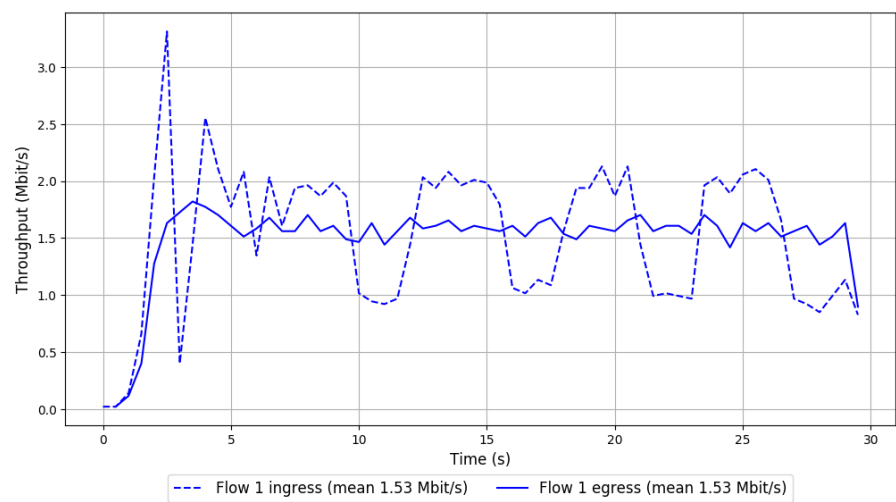


Run 3: Statistics of Verus

Start at: 2018-04-10 06:38:50
End at: 2018-04-10 06:39:20
Local clock offset: -10.549 ms
Remote clock offset: 1.294 ms

Below is generated by plot.py at 2018-04-10 06:40:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 1552.514 ms
Loss rate: 2.29%
-- Flow 1:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 1552.514 ms
Loss rate: 2.29%

Run 3: Report of Verus — Data Link

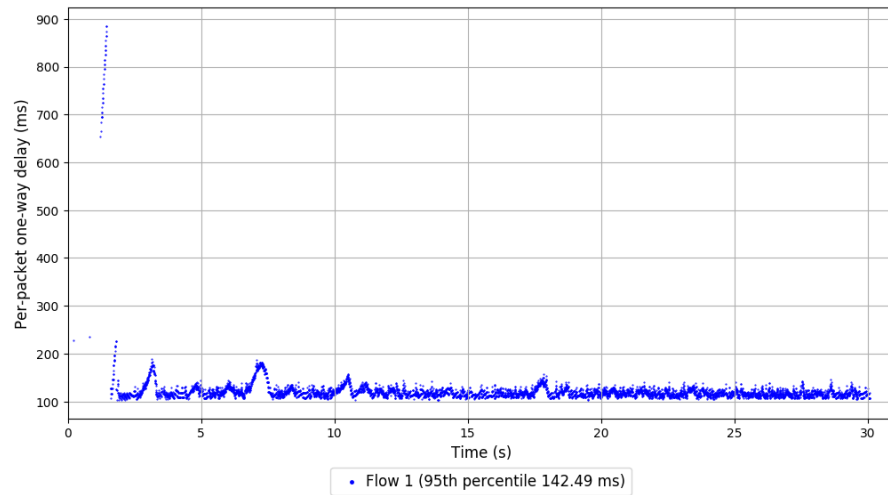
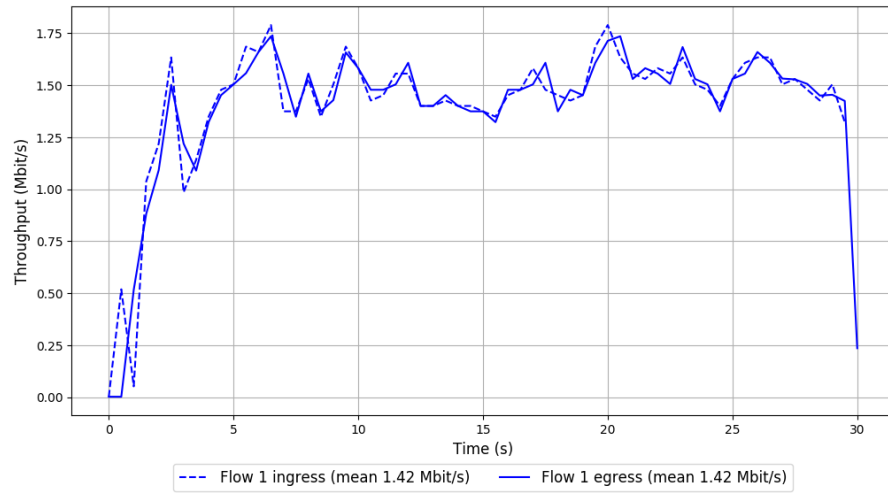


Run 1: Statistics of Copa

Start at: 2018-04-10 05:54:02
End at: 2018-04-10 05:54:32
Local clock offset: -13.207 ms
Remote clock offset: 8.64 ms

Below is generated by plot.py at 2018-04-10 06:40:45
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 142.491 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 142.491 ms
Loss rate: 0.03%

Run 1: Report of Copa — Data Link

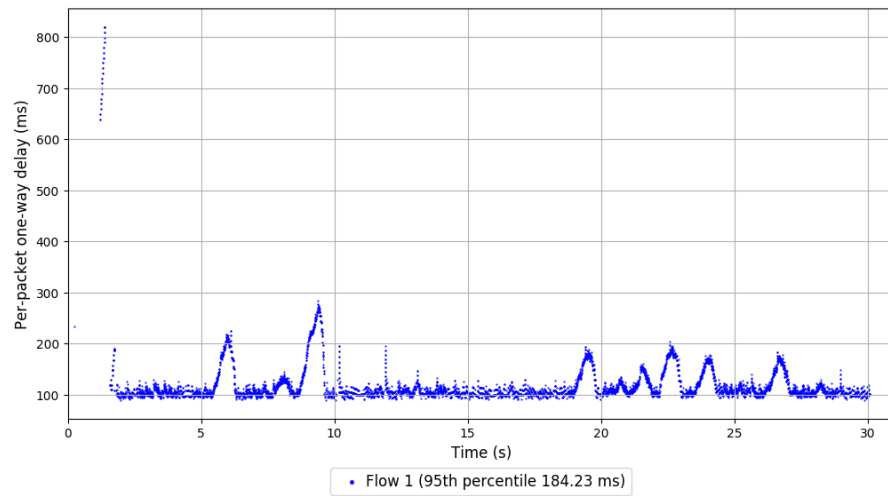
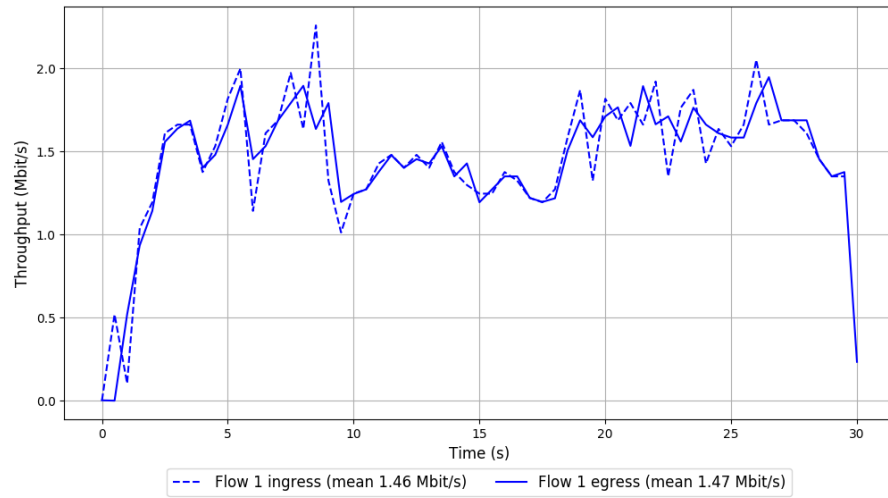


Run 2: Statistics of Copa

Start at: 2018-04-10 06:15:16
End at: 2018-04-10 06:15:47
Local clock offset: -12.541 ms
Remote clock offset: 0.858 ms

Below is generated by plot.py at 2018-04-10 06:40:45
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.47 Mbit/s
95th percentile per-packet one-way delay: 184.227 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 1.47 Mbit/s
95th percentile per-packet one-way delay: 184.227 ms
Loss rate: 0.03%

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

Start at: 2018-04-10 06:36:29

End at: 2018-04-10 06:36:59

Local clock offset: -8.814 ms

Remote clock offset: 7.754 ms

Below is generated by plot.py at 2018-04-10 06:40:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.37 Mbit/s

95th percentile per-packet one-way delay: 233.583 ms

Loss rate: 0.03%

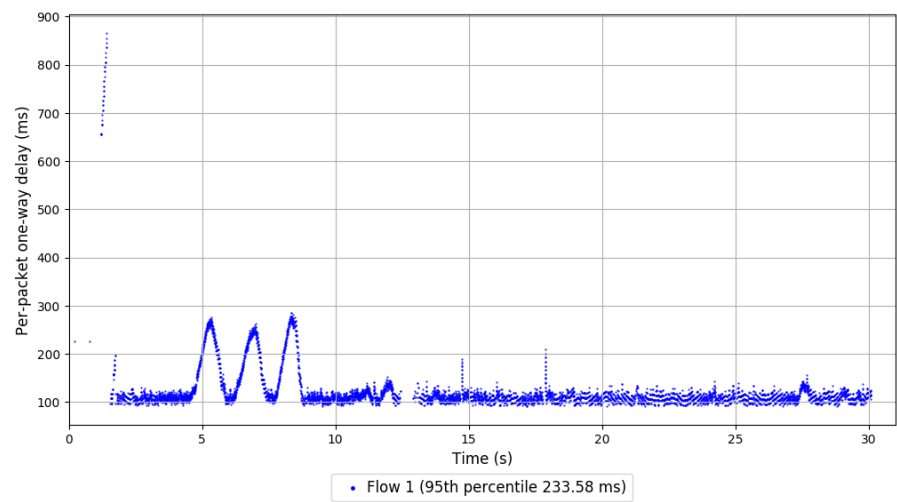
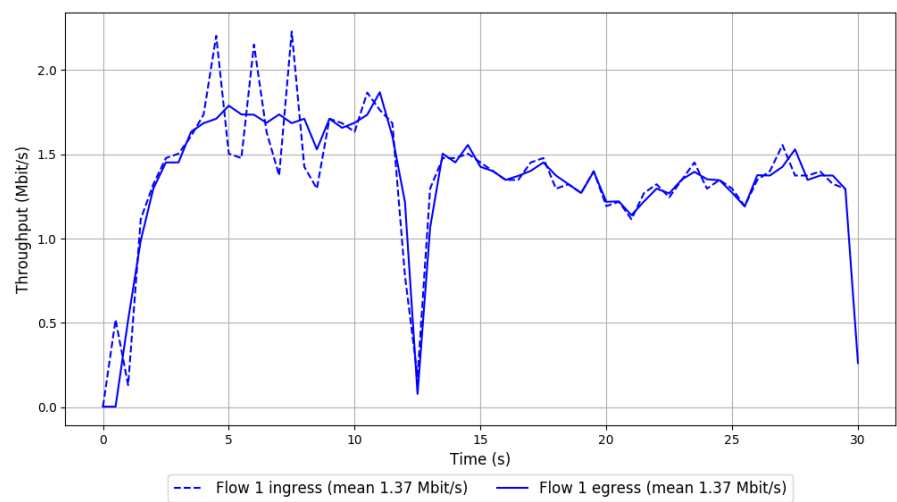
-- Flow 1:

Average throughput: 1.37 Mbit/s

95th percentile per-packet one-way delay: 233.583 ms

Loss rate: 0.03%

Run 3: Report of Copa — Data Link

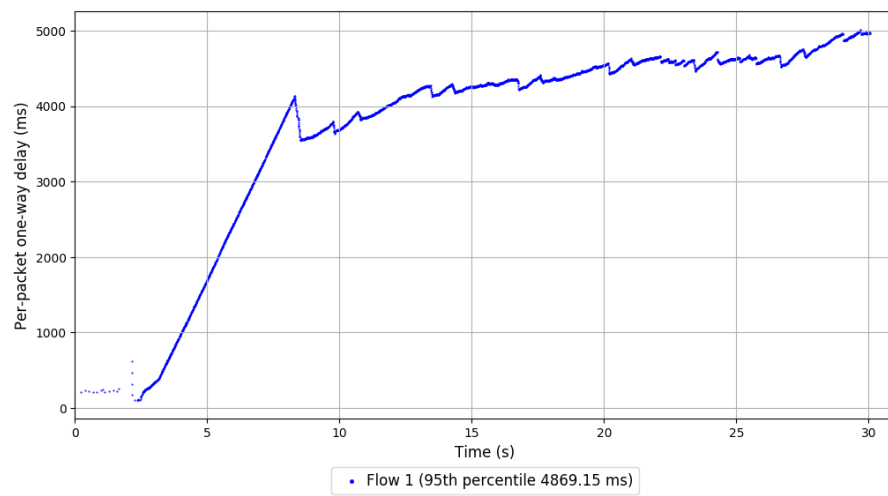
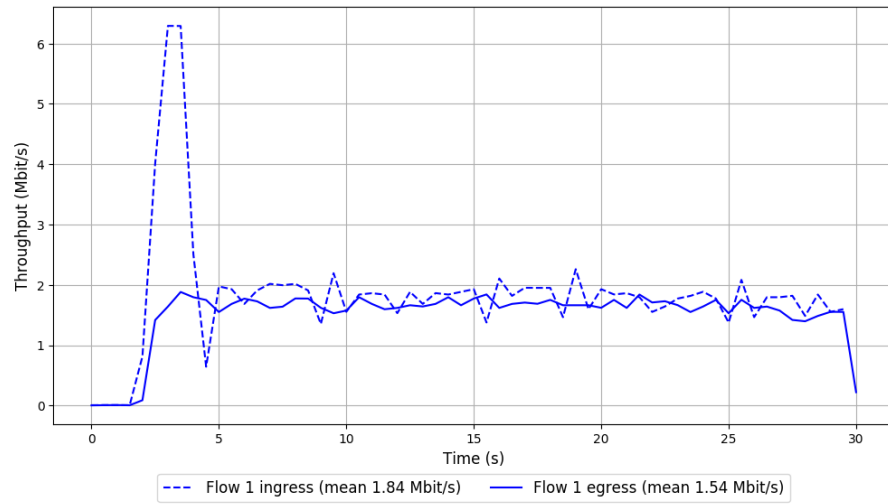


Run 1: Statistics of FillP

Start at: 2018-04-10 05:44:37
End at: 2018-04-10 05:45:07
Local clock offset: -15.825 ms
Remote clock offset: 9.962 ms

Below is generated by plot.py at 2018-04-10 06:40:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 4869.154 ms
Loss rate: 16.99%
-- Flow 1:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 4869.154 ms
Loss rate: 16.99%

Run 1: Report of FillP — Data Link

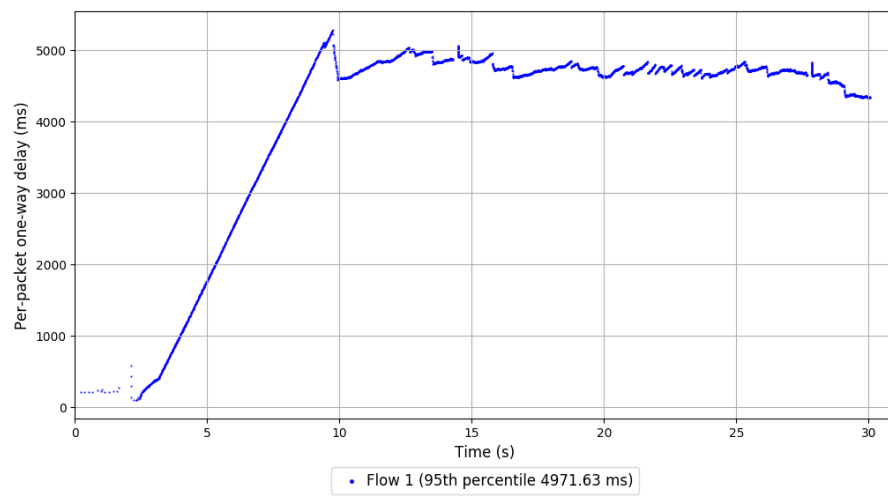
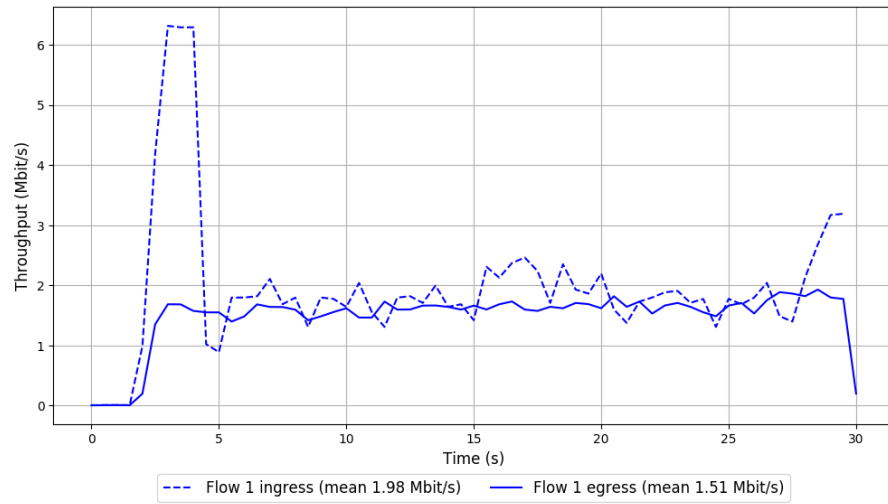


Run 2: Statistics of FillP

Start at: 2018-04-10 06:05:49
End at: 2018-04-10 06:06:19
Local clock offset: -14.878 ms
Remote clock offset: 2.283 ms

Below is generated by plot.py at 2018-04-10 06:40:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 4971.628 ms
Loss rate: 23.74%
-- Flow 1:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 4971.628 ms
Loss rate: 23.74%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-04-10 06:27:04

End at: 2018-04-10 06:27:34

Local clock offset: -9.564 ms

Remote clock offset: 1.153 ms

Below is generated by plot.py at 2018-04-10 06:40:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.55 Mbit/s

95th percentile per-packet one-way delay: 4759.155 ms

Loss rate: 18.94%

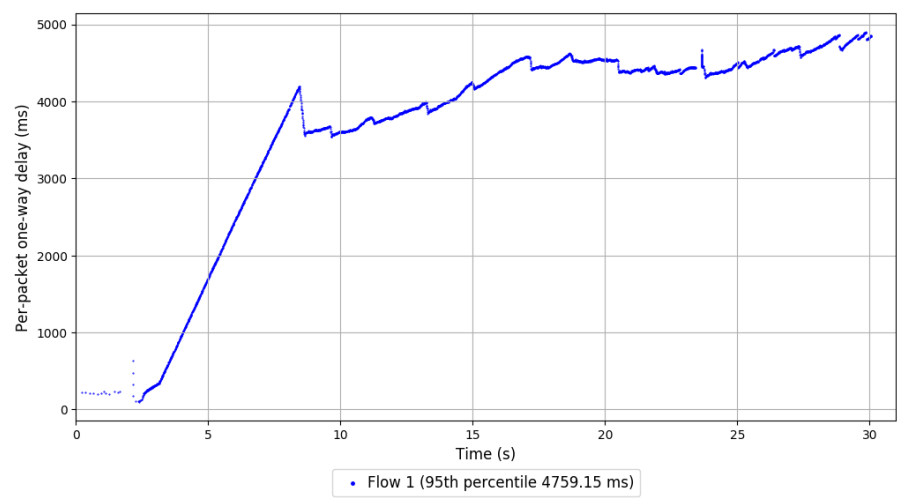
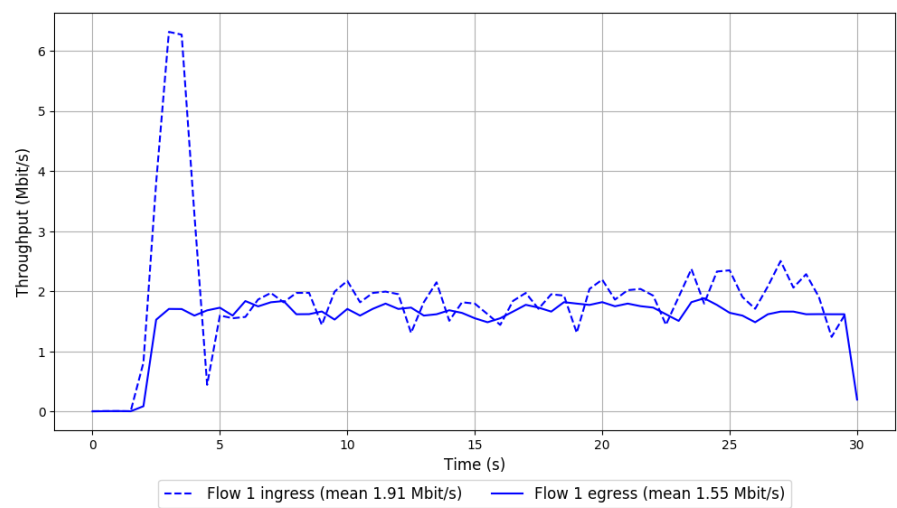
-- Flow 1:

Average throughput: 1.55 Mbit/s

95th percentile per-packet one-way delay: 4759.155 ms

Loss rate: 18.94%

Run 3: Report of FillP — Data Link



Run 1: Statistics of Indigo-1-32

Start at: 2018-04-10 05:38:43

End at: 2018-04-10 05:39:13

Local clock offset: -22.77 ms

Remote clock offset: 5.776 ms

Below is generated by plot.py at 2018-04-10 06:40:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.12 Mbit/s

95th percentile per-packet one-way delay: 156.542 ms

Loss rate: 0.18%

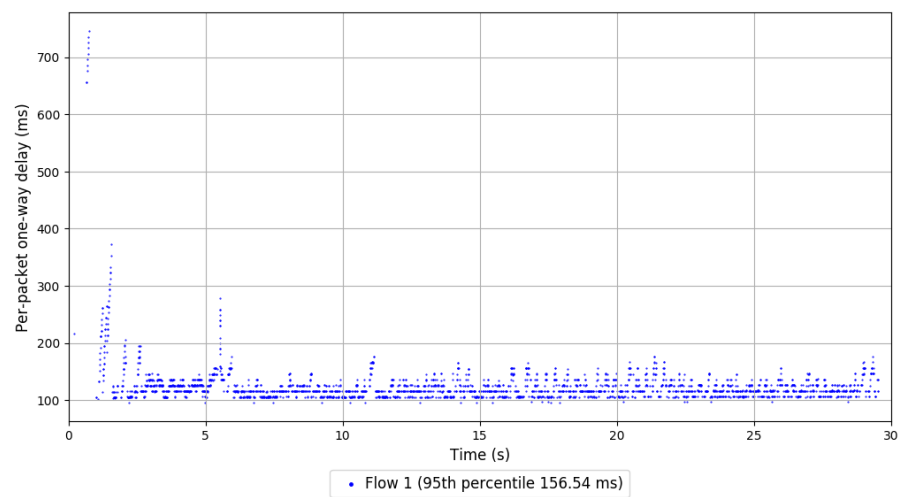
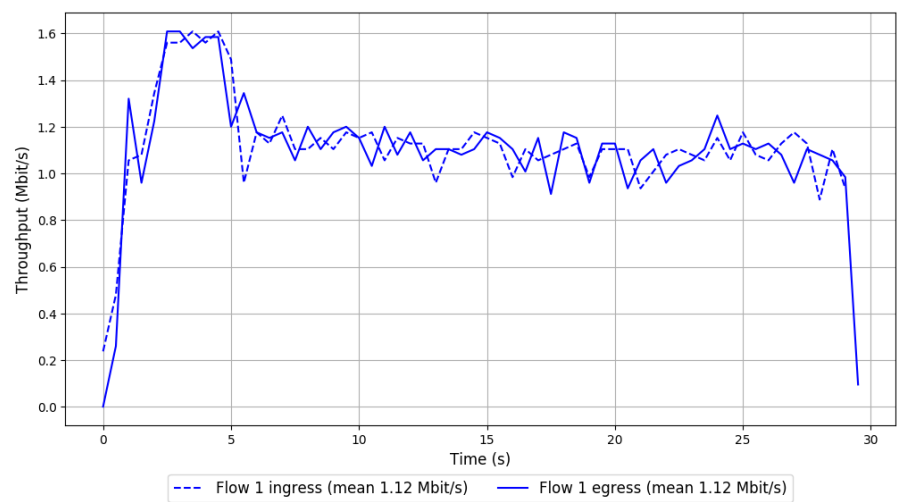
-- Flow 1:

Average throughput: 1.12 Mbit/s

95th percentile per-packet one-way delay: 156.542 ms

Loss rate: 0.18%

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

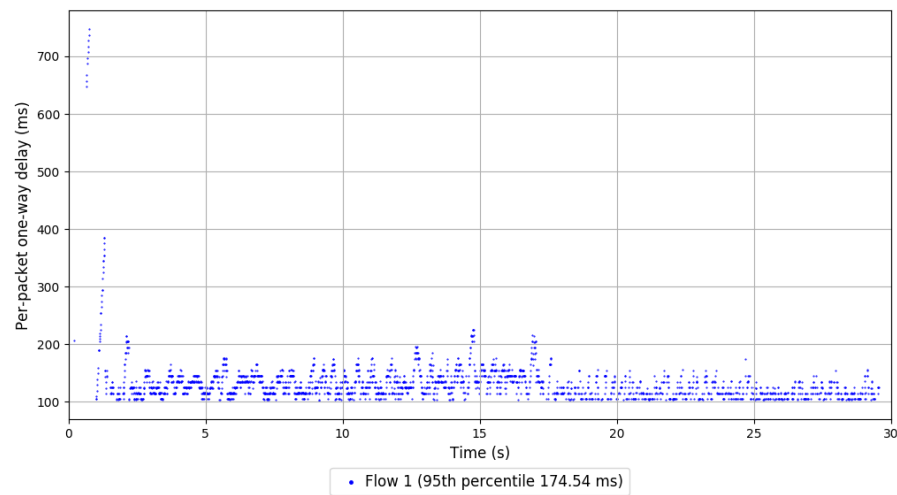
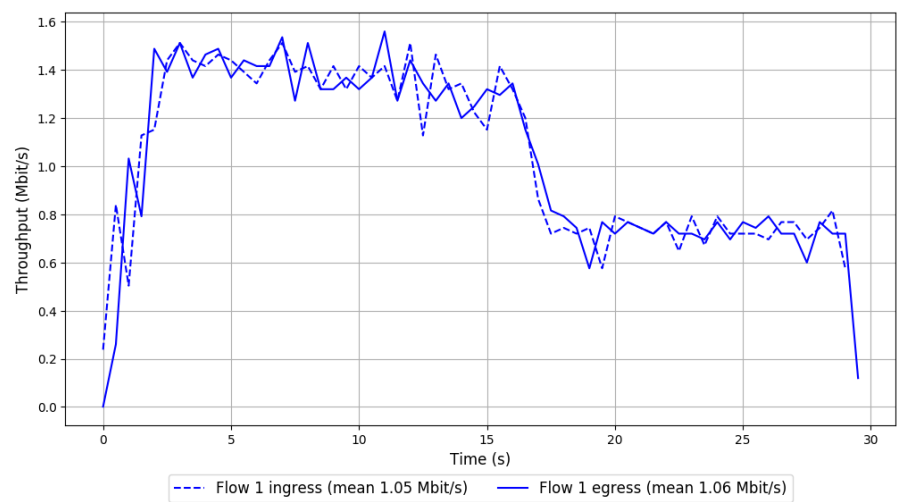


Run 2: Statistics of Indigo-1-32

Start at: 2018-04-10 05:59:55
End at: 2018-04-10 06:00:25
Local clock offset: -12.497 ms
Remote clock offset: 8.605 ms

Below is generated by plot.py at 2018-04-10 06:40:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 174.538 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 174.538 ms
Loss rate: 0.04%

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

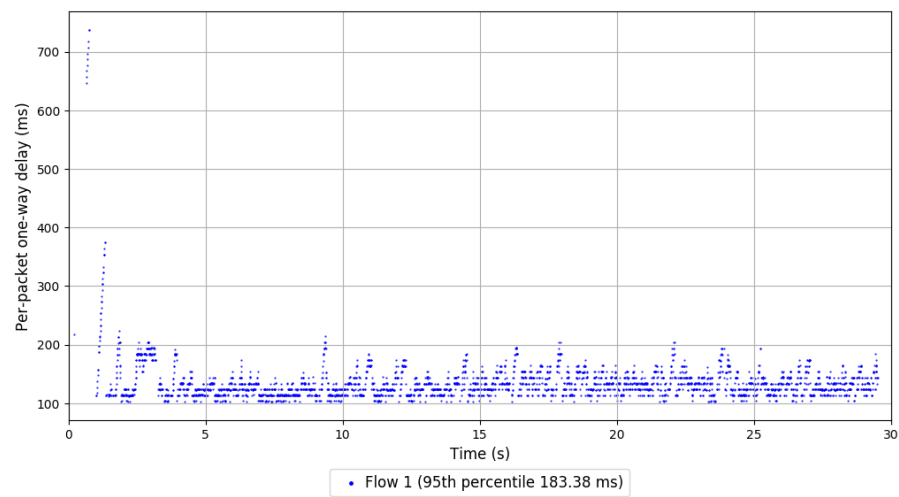
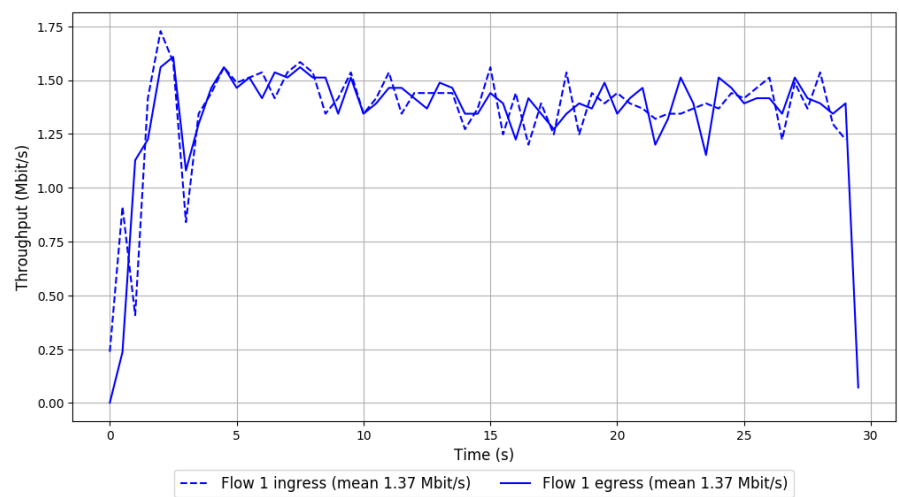


Run 3: Statistics of Indigo-1-32

Start at: 2018-04-10 06:21:10
End at: 2018-04-10 06:21:40
Local clock offset: -11.304 ms
Remote clock offset: 7.132 ms

Below is generated by plot.py at 2018-04-10 06:40:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 183.385 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 183.385 ms
Loss rate: 0.18%

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



Run 1: Statistics of Vivace-latency

Start at: 2018-04-10 05:50:29

End at: 2018-04-10 05:50:59

Local clock offset: -13.65 ms

Remote clock offset: 4.647 ms

Below is generated by plot.py at 2018-04-10 06:40:50

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.25 Mbit/s

95th percentile per-packet one-way delay: 619.840 ms

Loss rate: 0.97%

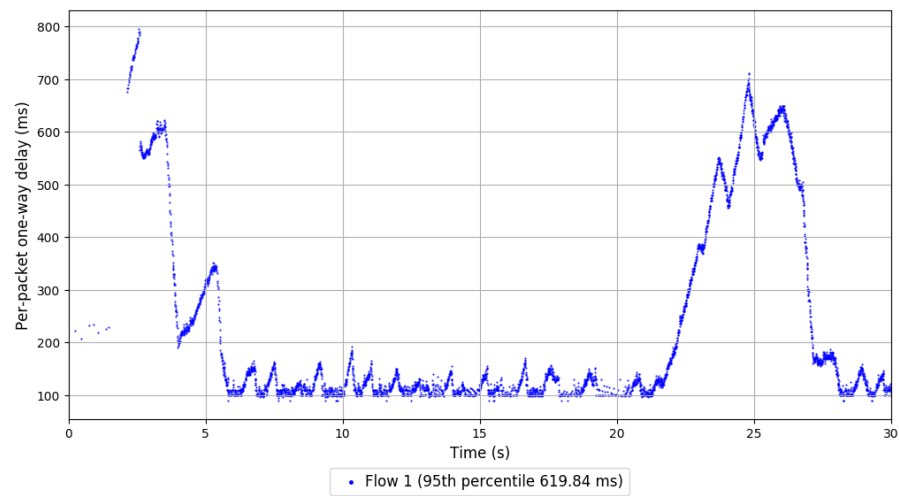
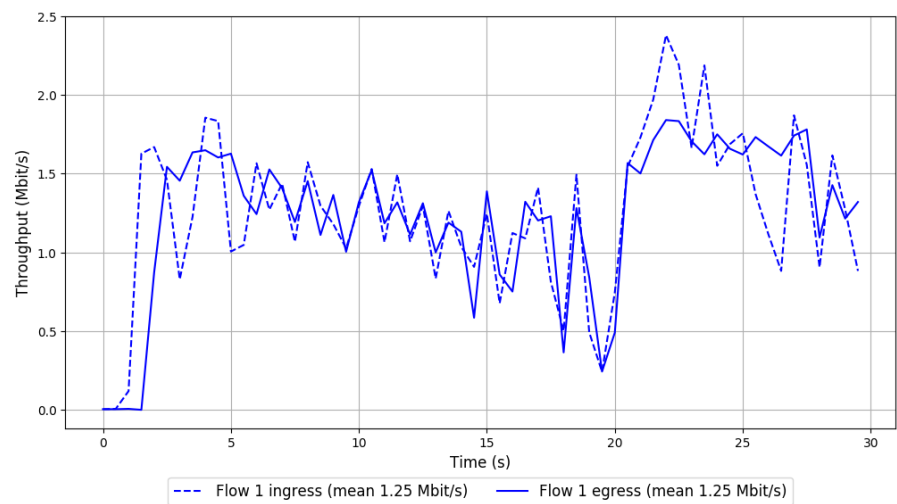
-- Flow 1:

Average throughput: 1.25 Mbit/s

95th percentile per-packet one-way delay: 619.840 ms

Loss rate: 0.97%

Run 1: Report of Vivace-latency — Data Link

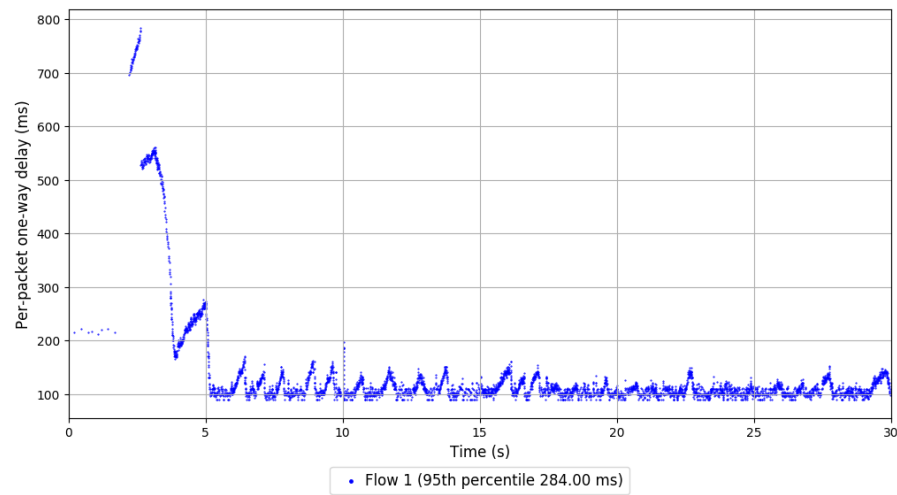
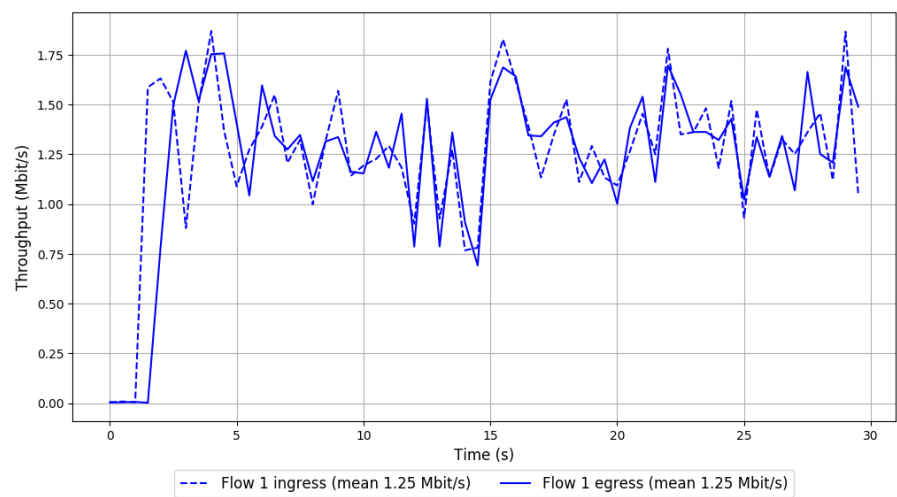


Run 2: Statistics of Vivace-latency

Start at: 2018-04-10 06:11:42
End at: 2018-04-10 06:12:12
Local clock offset: -14.482 ms
Remote clock offset: 1.149 ms

Below is generated by plot.py at 2018-04-10 06:40:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 283.999 ms
Loss rate: 1.10%
-- Flow 1:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 283.999 ms
Loss rate: 1.10%

Run 2: Report of Vivace-latency — Data Link

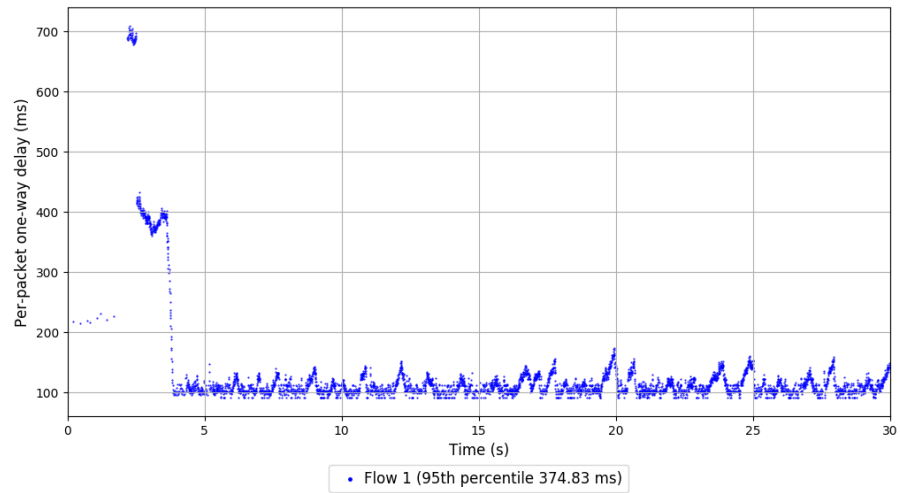
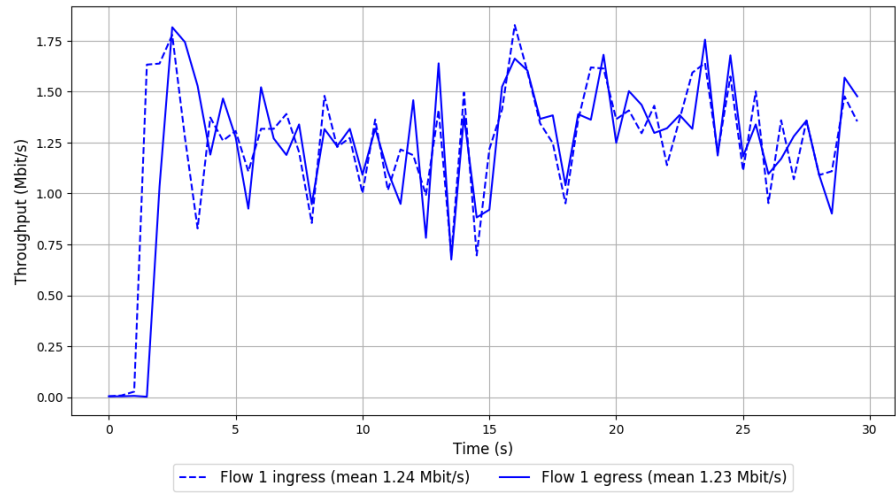


Run 3: Statistics of Vivace-latency

Start at: 2018-04-10 06:32:57
End at: 2018-04-10 06:33:27
Local clock offset: -10.136 ms
Remote clock offset: 1.338 ms

Below is generated by plot.py at 2018-04-10 06:40:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 374.827 ms
Loss rate: 1.39%
-- Flow 1:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 374.827 ms
Loss rate: 1.39%

Run 3: Report of Vivace-latency — Data Link

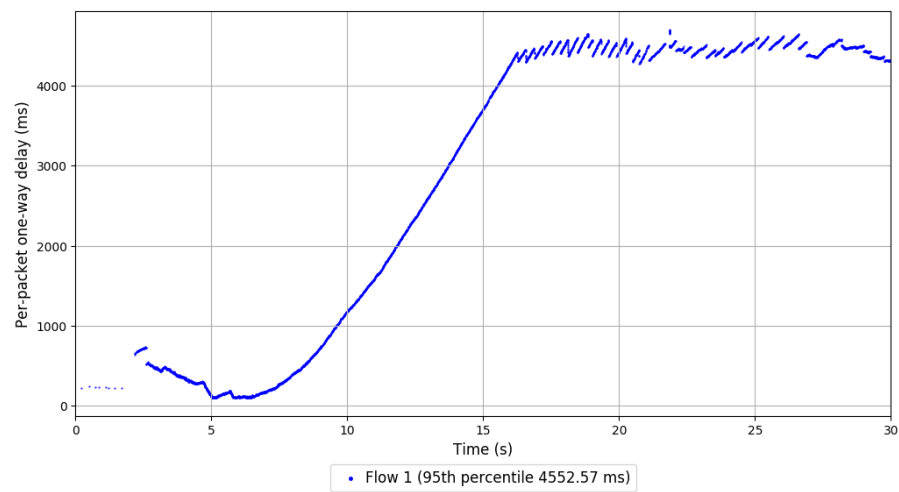
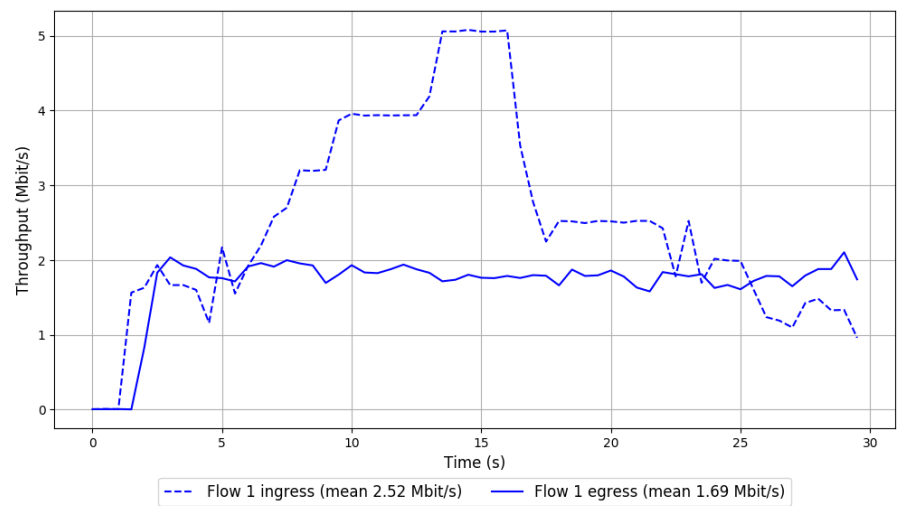


Run 1: Statistics of Vivace-loss

Start at: 2018-04-10 05:42:15
End at: 2018-04-10 05:42:45
Local clock offset: -18.752 ms
Remote clock offset: 5.881 ms

Below is generated by plot.py at 2018-04-10 06:40:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 4552.568 ms
Loss rate: 33.42%
-- Flow 1:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 4552.568 ms
Loss rate: 33.42%

Run 1: Report of Vivace-loss — Data Link

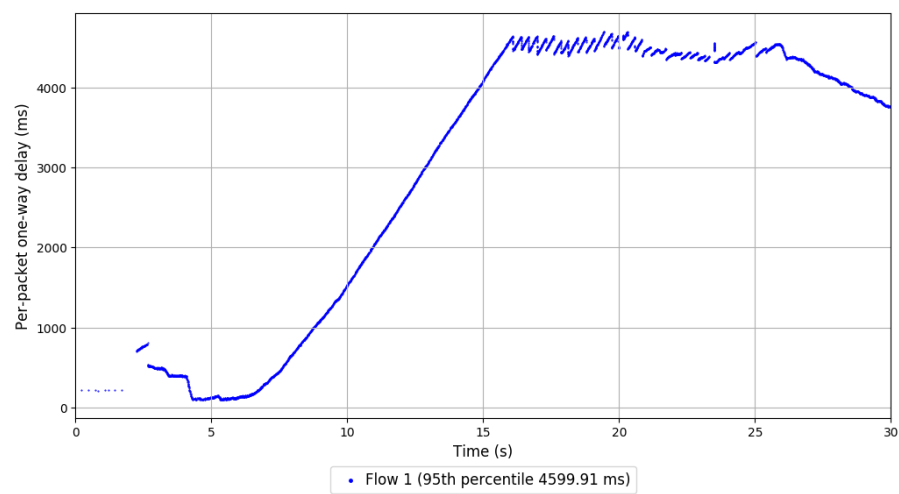
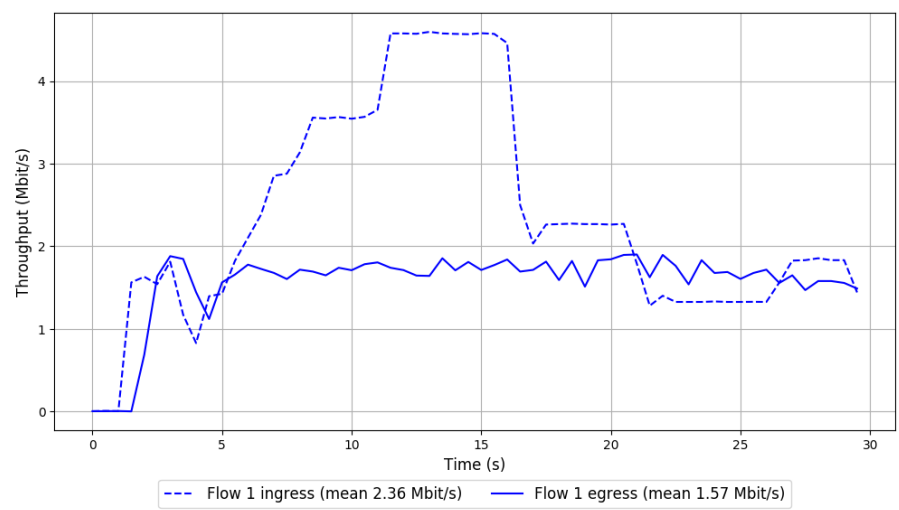


Run 2: Statistics of Vivace-loss

Start at: 2018-04-10 06:03:28
End at: 2018-04-10 06:03:58
Local clock offset: -13.693 ms
Remote clock offset: 1.662 ms

Below is generated by plot.py at 2018-04-10 06:40:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 4599.913 ms
Loss rate: 33.70%
-- Flow 1:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 4599.913 ms
Loss rate: 33.70%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-04-10 06:24:42

End at: 2018-04-10 06:25:12

Local clock offset: -9.787 ms

Remote clock offset: 7.415 ms

Below is generated by plot.py at 2018-04-10 06:40:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.51 Mbit/s

95th percentile per-packet one-way delay: 5080.854 ms

Loss rate: 30.76%

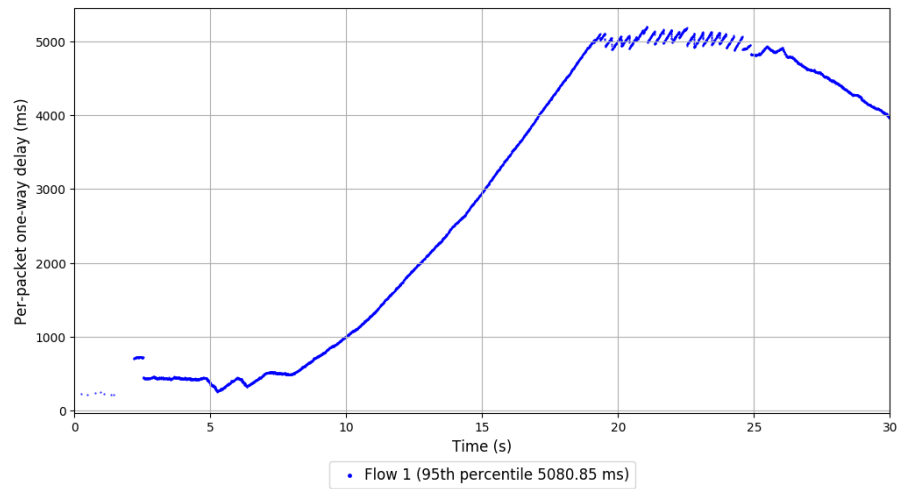
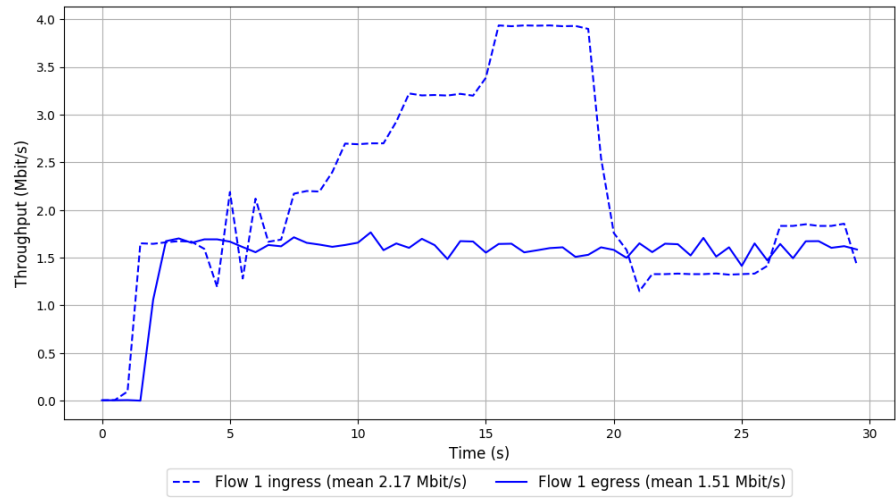
-- Flow 1:

Average throughput: 1.51 Mbit/s

95th percentile per-packet one-way delay: 5080.854 ms

Loss rate: 30.76%

Run 3: Report of Vivace-loss — Data Link

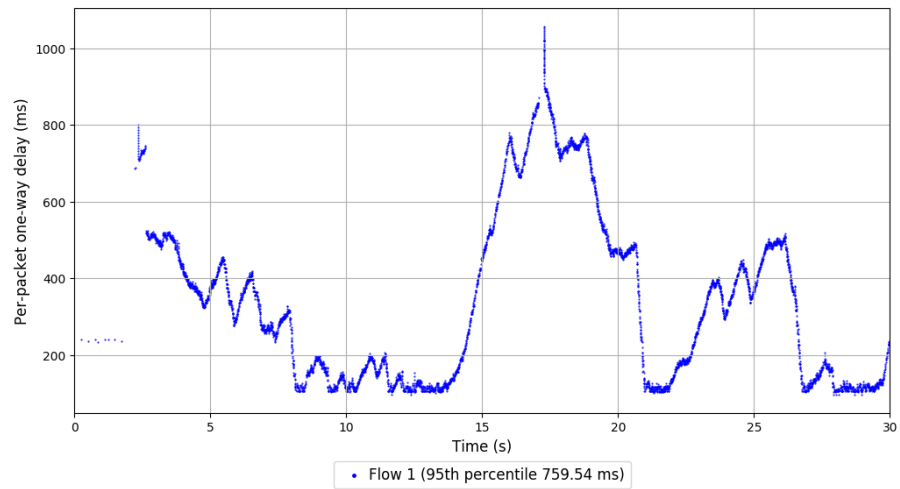
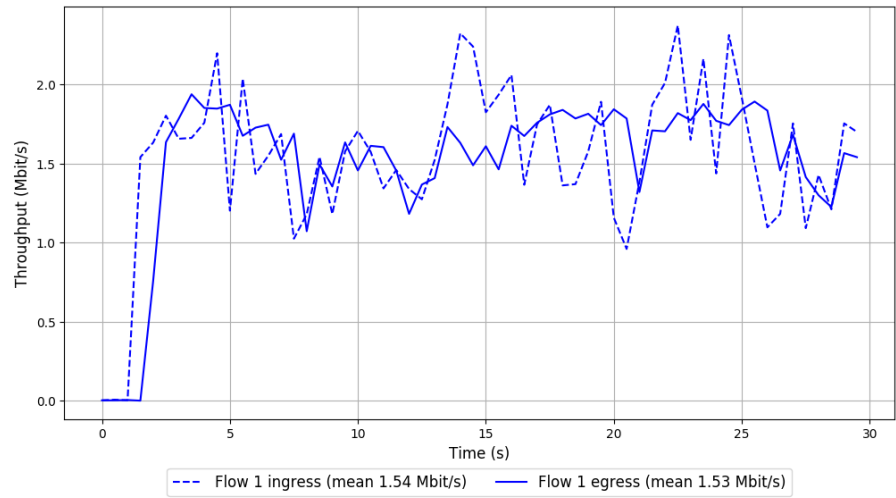


Run 1: Statistics of Vivace-LTE

Start at: 2018-04-10 05:39:53
End at: 2018-04-10 05:40:23
Local clock offset: -21.714 ms
Remote clock offset: 11.495 ms

Below is generated by plot.py at 2018-04-10 06:40:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 759.544 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 759.544 ms
Loss rate: 1.52%

Run 1: Report of Vivace-LTE — Data Link

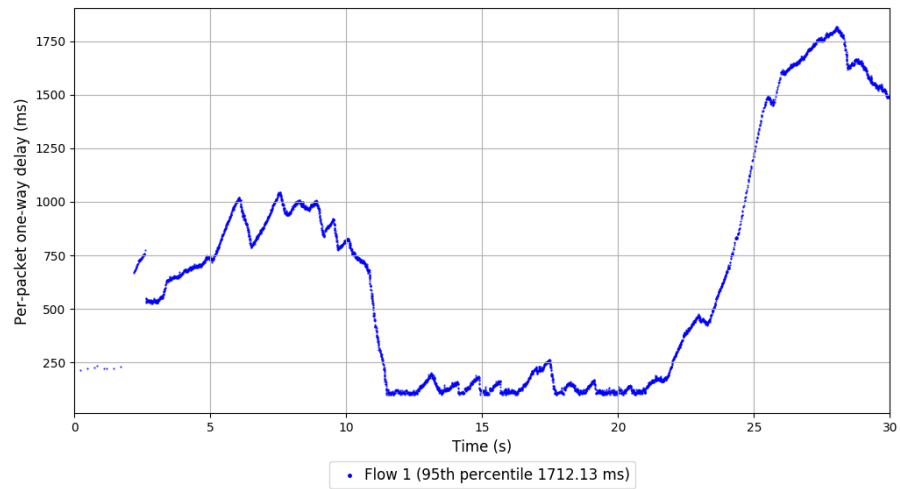
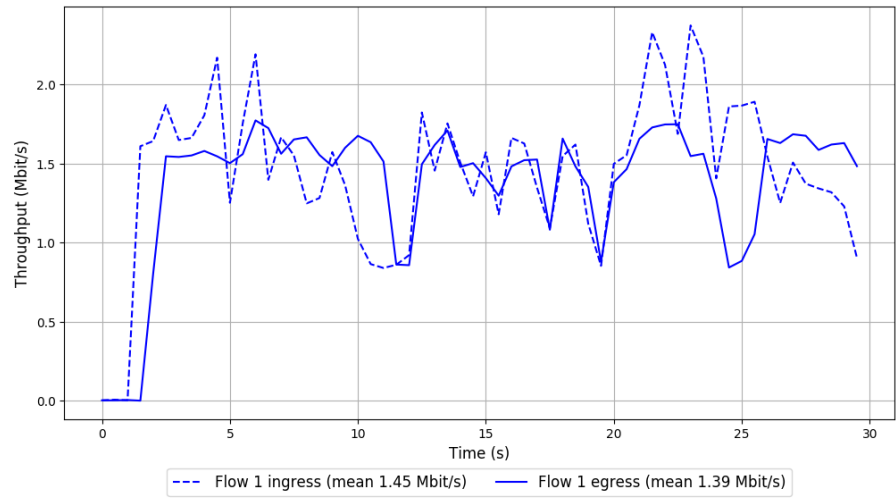


Run 2: Statistics of Vivace-LTE

Start at: 2018-04-10 06:01:06
End at: 2018-04-10 06:01:36
Local clock offset: -13.425 ms
Remote clock offset: 6.74 ms

Below is generated by plot.py at 2018-04-10 06:40:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 1712.129 ms
Loss rate: 4.85%
-- Flow 1:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 1712.129 ms
Loss rate: 4.85%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-04-10 06:22:21

End at: 2018-04-10 06:22:51

Local clock offset: -9.464 ms

Remote clock offset: 1.561 ms

Below is generated by plot.py at 2018-04-10 06:40:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.46 Mbit/s

95th percentile per-packet one-way delay: 1069.503 ms

Loss rate: 3.29%

-- Flow 1:

Average throughput: 1.46 Mbit/s

95th percentile per-packet one-way delay: 1069.503 ms

Loss rate: 3.29%

Run 3: Report of Vivace-LTE — Data Link

